

Operating Manual

AMAZONE

E +S 301 E +S H 301

E +S 751 E +S H 751

Mounted spreader



MG5642
BAG0163.7 01.23
Printed in Germany

SmartLearning



**Please read this operating
manual before first
commissioning.
Keep it in a safe place
for future use.**

en



Reading the instruction

Manual and following it should seem to be inconvenient and superfluous as it is not enough to hear from others and to realize that a machine is good, to buy it and to believe that now everything should work by itself. The person in question would not only harm himself but also make the mistake of blaming the machine for possible failures instead of himself. In order to ensure success one should enter the mind of a thing, make himself familiar with every part of the machine and get acquainted with how it's handled. Only in this way could you be satisfied both with the machine and with yourself. This goal is the purpose of this instruction manual.

Leipzig-Plagwitz 1872. Rud. Sark.

Identification data

Enter the machine identification data here. You will find the identification data on the rating plate.

Machine identification number:
(ten-digit)

Type:

E+S

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

Manufacturer's address

AMAZONEN-WERKE

H. DREYER SE & Co. KG

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Spare part orders

Spare parts lists are freely accessible in the spare parts portal at www.amazone.de.

Please send orders to your AMAZONE dealer.

Formalities of the operating manual

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Foreword

Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER SE & Co. KG. We thank you for your confidence in our products.

On receiving the machine, check to see if it was damaged during transport or if parts are missing. Using the delivery note, check that the machine was delivered in full including the ordered special equipment. Damage can only be rectified if problems are signalled immediately!

Before first commissioning, read and understand this operating manual, and particularly the safety information. Only after careful reading will you be able to benefit from the full scope of your newly purchased machine.

Please ensure that all the machine operators have read this operating manual before commissioning the machine.

Should you have any questions or problems, please consult this operating manual or contact your local service partner.

Regular maintenance and timely replacement of worn or damaged parts increases the lifespan of your machine.

User evaluation

Dear Reader,

We update our operating manuals regularly. Your suggestions for improvement help us to create ever more user-friendly manuals.

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1 User Information

The User Information section provides information on use of the operating manual.

1.1 Purpose of the document

This operating manual

- Describes the operation and maintenance of the machine.
- Provides important information on safe and efficient handling of the machine.
- Is a component part of the machine and should always be kept with the machine or the traction vehicle.
- Keep it in a safe place for future use.

1.2 Locations in the operating manual

All the directions specified in the operating manual are always seen from the direction of travel.

1.3 Diagrams used

Handling instructions and reactions

Activities to be carried out by the user are given as numbered instructions. Always keep to the order of the handling instructions. The reaction to the handling instructions is given by an arrow.

Example:

1. Handling instruction 1
→ Machine reaction to handling instruction 1
2. Handling instruction 2

Lists

Lists without an essential order are shown as a list with bullets.

Example:

- Point 1
- Point 2

Number items in diagrams

Numbers in round bracket refer to items in diagrams. The first number refers to the diagram and the second number to the item in the figure.

Example: (6)

Item 6

2 General safety instructions

This section contains important information on safe operation of the machine.

2.1 Obligations and liability

Comply with the instructions in the operating manual

Knowledge of the basic safety information and safety regulations is a basic requirement for safe handling and fault-free machine operation.

Obligations of the operator

The operator is obliged only to let those people work with/on the machine who

- Are aware of the basic workplace safety information and accident prevention regulations.
- Have been trained in working with/on the machine.
- Have read and understood this operating manual.

The operator is obliged

- To keep all the warning pictograms on the machine in a legible state.
- To replace damaged warning pictograms.

If you still have queries, please contact the manufacturer.

Obligations of the user

Before starting work, anyone charged with working with/on the machine is obliged

- To comply with the basic workplace safety instructions and accident prevention regulations.
- To read and follow the "General safety information" section of this operating manual.
- To read the "Warning pictograms and other labelling on the machine" section of this operating manual and to follow the safety instructions of the warning pictograms when operating the machine.
- To get to know the machine.
- To read the sections of this operating manual, important for carrying out your work.

If the user discovers that a function is not working properly, then they must eliminate this fault immediately. If this is not the task of the user or if the user does not possess the appropriate technical knowledge, then they should report this fault to their superior (operator).

General safety instructions

Risks in handling the machine

The machine has been constructed to the state-of-the art and the recognised rules of safety. However, there may be risks and restrictions which occur when operating the machine

- For the health and safety of the user or third persons,
- For the machine,
- For other goods.

Only use the machine

- For the purpose for which it was intended.
- In a perfect state of repair.

Eliminate any faults immediately which could impair safety.

Guarantee and liability

Our "General conditions of sales and delivery" are always applicable. These shall be available to the operator, at the latest on the completion of the contract. Guarantee and liability claims for damage to people or goods will be excluded if they can be traced back to one or more of the following causes:

- Improper use of the machine.
- Improper installation, commissioning, operation and maintenance of the machine.
- Operation of the machine with defective safety equipment or improperly attached or non-functioning safety equipment.
- Non-compliance with the instructions in the operating manual regarding commissioning, operation and maintenance.
- Independently-executed construction changes to the machine.
- Insufficient monitoring of machine parts which are subject to wear.
- Improperly executed repairs.
- Disasters through the impact of foreign bodies and acts of God.

2.2 Representation of safety symbols

Safety instructions are indicated by the triangular safety symbol and the highlighted signal word. The signal word (DANGER, WARNING, CAUTION) describes the gravity of the risk and has the following significance:



DANGER

Indicates an immediate high risk which will result in death or serious physical injury (loss of body parts or long term damage) if not avoided.

If the instructions are not followed, then this will result in immediate death or serious physical injury.



WARNING

Indicates a medium risk, which could result in death or (serious) physical injury if not avoided.

If the instructions are not followed, then this may result in death or serious physical injury.



CAUTION

Indicates a low risk which could cause minor or medium level physical injury or damage to property if not avoided.



IMPORTANT

Indicates an obligation to special behaviour or an activity required for proper machine handling.

Non-compliance with these instructions can cause faults on the machine or in the environment.



NOTE

Indicates handling tips and particularly useful information.

These instructions will help you to use all the functions of your machine to the optimum.

2.3 Organisational measures

The operator must provide the necessary personal protective equipment, such as:

- Protective glasses
- Protective shoes
- Protective suit
- Skin protection agents, etc.



The operating manual

- Must always be kept at the place at which the machine is operated.
- Must always be easily accessible for the user and maintenance personnel.

Check all the available safety equipment regularly.

2.4 Safety and protection equipment

Before each commissioning of the machine, all the safety and protection equipment must be properly attached and fully functional. Check all the safety and protection equipment regularly.

Faulty safety equipment

Faulty or disassembled safety and protection equipment can lead to dangerous situations.

2.5 Informal safety measures

As well as all the safety information in this operating manual, comply with the general, national regulations pertaining to accident prevention and environmental protection.

When driving on public roads and routes, then you should comply with the statutory road traffic regulations.

2.6 User training

Only those people who have been trained and instructed may work with/on the machine. The operator must clearly specify the responsibilities of the people charged with operation, maintenance and repair work.

People being trained may only work with/on the machine under the supervision of an experienced person.

Activity \ People	Person specially trained for the activity ¹⁾	Trained person ²⁾	Person with specialist training (specialist workshop) ³⁾
Loading/Transport	X	X	X
Commissioning	--	X	--
Set-up, tool installation	--	--	X
Operation	--	X	--
Maintenance	--	--	X
Troubleshooting and fault elimination	--	X	X
Disposal	X	--	--

Legend:

X..permitted

--..not permitted

- o A person who can assume a specific task and who can carry out this task for an appropriately qualified company.
- o Instructed persons are those who have been instructed in their assigned tasks and in the possible risks in the case of improper behaviour, have been trained if necessary, and have been informed about the necessary protective equipment and measures.
- o People with specialist technical training will be considered specialists. Due to their specialist training and their knowledge of the appropriate regulations, they can evaluate the work with which they have been charged and detect possible dangers.

Comment:

A qualification equivalent to specialist training can be obtained through long term activity in the appropriate field of work.



Only a specialist workshop may carry out maintenance and repair work on the machine if such work is additionally marked "Workshop work". The personnel of a specialist workshop shall possess the appropriate knowledge and suitable aids (tools, lifting and support equipment) for carrying out the maintenance and repair work on the machine in a way which is both appropriate and safe.

2.7 Safety measures in normal operation

Only operate the machine if all the safety and protection equipment is fully functional.

Check the machine at least once a day for visible damage and check the function of the safety and protection equipment.

2.8 Dangers from residual energy

Note that there may be residual mechanical, hydraulic, pneumatic and electrical/electronic energy on the machine.

Use appropriate measures to inform the operating personnel. You can find detailed information in the relevant sections of this operating manual.

2.9 Maintenance and repair work, fault elimination

Carry out prescribed setting, maintenance and inspection work in good time.

Secure all media such as compressed air and the hydraulic system against unintentional start-up.

Carefully fix and secure larger subassemblies to lifting gear when carrying out replacement work.

Regularly check that bolted connections are firmly secured and tightened if necessary.

When the maintenance work is completed, check the function of the safety devices.

2.10 Constructive changes

You may make no changes, expansions or modifications to the machine without the approval of AMAZONEN-WERKE. This is also valid when welding support parts.

Any expansion or modification work shall require the written approval of AMAZONEN-WERKE. Only use the modification and accessory parts released by AMAZONEN-WERKE, so that the type approval remains valid according to the national and international regulations.

Vehicles with an official type approval or with equipment connected to a vehicle with a valid type approval or approval for road transport according to the German road traffic regulations must be in the state specified by the approval.



WARNING

Risk of contusions, cuts, dragging, catching or knocks from support parts.

It is forbidden to:

- Drill holes in the frame or on the running gear.
- Increase the size of existing holes on the frame or the running gear.
- Weld support parts.

2.10.1 Spare and wear parts and aids

Immediately replace any machine parts which are not in a perfect state.

Only use AMAZONE spare and wear parts released by AMAZONEN-WERKE, so that the type approval remains valid according to the national and international regulations. The use of wear and spare parts from third parties does not guarantee that they have been constructed in a way as to meet the requirements placed on them.

AMAZONEN-WERKE shall accept no liability for damage caused by the use of unreleased spare and wear parts or aids.

2.11 Cleaning and disposal

Handle and dispose of any materials used carefully, in particular

- When carrying out work on lubrication systems and equipment and
- When cleaning using solvents.

2.12 User workstation

The machine may only be operated by one person sitting in the driver's seat of the tractor.

2.13 Warning pictograms and other signs on the machine

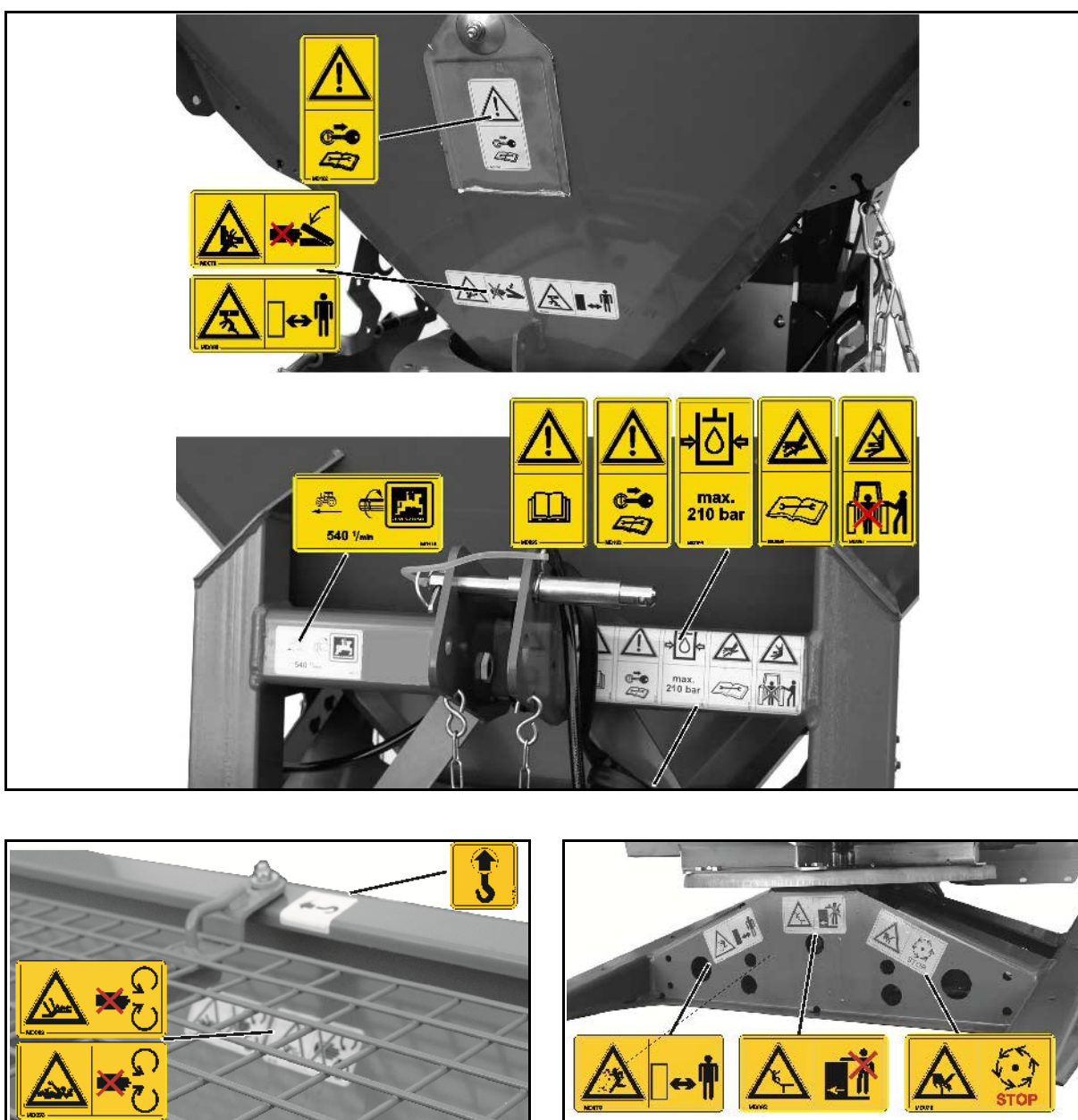


Always keep all the warning pictograms of the machine clean and in a legible state. Replace illegible warning pictograms. You can obtain the warning pictograms from your dealer using the order number (e.g. MD075).

2.13.1 Positions of warning pictograms and other labels

Warning pictograms

The following diagrams show the arrangement of the warning pictograms on the machine.



Warning pictograms - structure

Warning pictograms indicate dangers on the machine and warn against residual dangers. At these points, there are permanent or unexpected dangers.

A warning pictogram consists of two fields:



Field 1

is a pictogram describing the danger, surrounded by triangular safety symbol.

Field 2

is a pictogram showing how to avoid the danger.

Warning pictograms - explanation

The column **Order number and explanation** provides an explanation of the neighbouring warning pictogram. The description of the warning pictograms is always the same and specifies, in the following order:

1. A description of the danger.
For example: danger of cutting!
2. The consequence of non-compliance with the danger protection instructions.
For example: causes serious injuries to fingers or hands.
3. Instructions for avoiding the danger.
For example: only touch machine parts when they have come to a complete standstill.

Order number and explanation

Warning pictograms

MD075

Danger to fingers or hands from moving operating elements due to cutting or cutting off.

In these cases there is a danger of extremely serious injuries leading to the loss of body parts such as fingers or hands.

Never reach into the danger area when the tractor engine is running with the cardan shaft/hydraulic system connected.

Only touch moving operating elements once they have come to a complete standstill.



MD078

Danger of crushing fingers or hands owing to accessible moving parts of the machine!

This danger can cause extremely serious injuries and loss of limbs.

Never reach into the danger area when the tractor engine is running with PTO shaft / hydraulic system / electronic system connected.

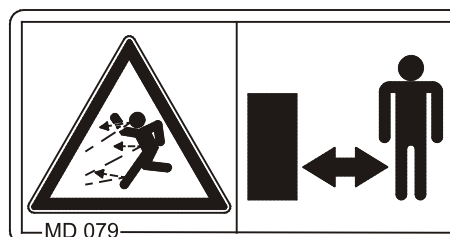


MD079

Danger from materials or foreign objects that are thrown from or ejected by the machine at high speeds.

These dangers can cause extremely serious and potentially fatal injuries.

- Stay at a safe distance from the machine when the tractor engine is running.
- Ensure that bystanders maintain a sufficient safety distance from the danger area of the machine as long as the tractor engine is running.



Order number and explanation

Warning pictograms

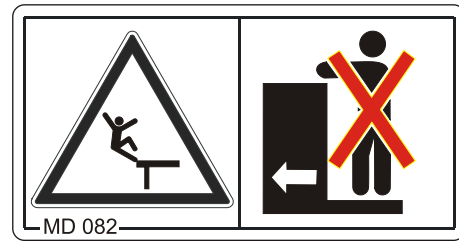
MD082

Danger of persons falling from tread surfaces and platforms when riding on the machine or when climbing on powered machines.

This danger can cause extremely serious and potentially fatal injuries.

It is forbidden to ride on the machine and/or climb on the machine when it is in operation. This also applies to machines with tread surfaces or platforms.

Make sure that nobody is riding on the machine.



MD083

Danger of your arm or upper torso being drawn in or caught by power driven, unprotected machine elements!

This danger can cause extremely serious injuries to the arm or upper torso.

Never open or remove protective devices from driven machinery

- as long as the tractor engine is running with the PTO shaft connected / hydraulic drive engaged or
- as long as the tractor engine can be unintentionally started with the PTO shaft connected / hydraulic drive engaged.

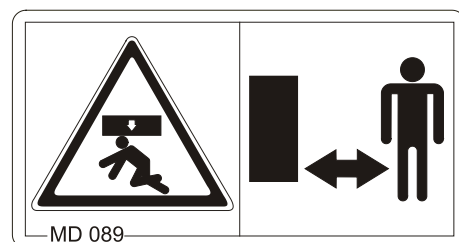


MD089

Risk of crushing the entire body due to standing under suspended loads or raised machine parts.

This danger can cause extremely serious and potentially fatal injuries.

- It is forbidden to stand under suspended loads or raised machine parts.
- Maintain an adequate safety distance from any suspended loads or raised machine parts.
- Ensure that all personnel maintain an adequate safety distance from suspended loads or raised machine parts.



General safety instructions

Order number and explanation

Warning pictograms

MD093

Danger due to catching or entrapment due to accessible powered elements of the machine.

These dangers can cause extremely serious and potentially fatal injuries.

Never open or remove protective devices from driven machinery

- as long as the tractor engine is running with the PTO shaft connected / hydraulic drive engaged or
- as long as the tractor engine can be unintentionally started with the PTO shaft connected / hydraulic drive engaged.



MD095

Read and follow the operating manual and safety information before starting up the machine!

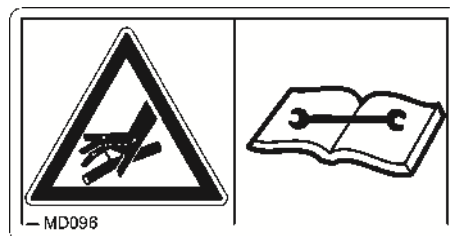


MD096

Danger from escaping high-pressure hydraulic fluid due to leaking hydraulic hose lines.

This danger may cause serious injuries, perhaps even resulting in death, if escaping high-pressure hydraulic fluid passes through the skin and into the body.

- Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.
- Read and observe the information in the operating manual before carrying out maintenance work on the hydraulic hose lines.
- If you are injured by hydraulic fluid, contact a doctor immediately.



Order number and explanation

Warning pictograms

MD097

Risk of crushing the entire body due to standing in the stroke area of the three-point suspension when the three-point hydraulics are actuated.

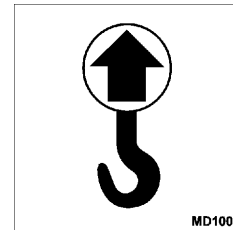
This danger can cause extremely serious and potentially fatal injuries.

- Personnel are prohibited from entering the stroke area of the three-point suspension when the three-point hydraulics are actuated.
- Only actuate the operator controls for the tractor's three-point hydraulic system
 - from the intended workstation.
 - if you are outside of the stroke area between the tractor and the machine.



MD100

This symbol indicates anchorage points for fastening slinging gear when loading the machine.

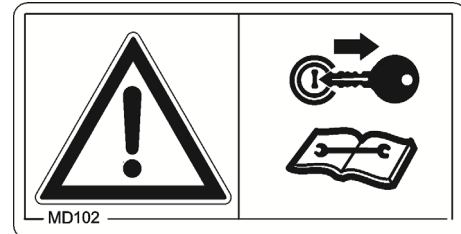


MD102

Danger from intervention in the machine, e.g. installation, adjusting, troubleshooting, cleaning, maintaining and repairing, due to the tractor and the machine being started unintentionally and rolling.

These dangers can cause extremely serious and potentially fatal injuries.

- Secure the tractor and the machine against unintentional start-up and rolling before any intervention in the machine.
- Depending on the type of intervention, read and understand the information in the relevant sections of the operating manual.



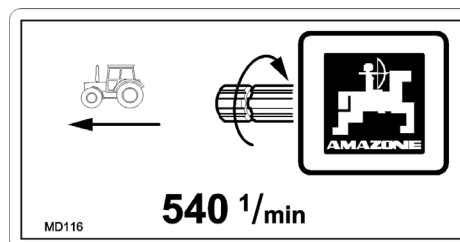
General safety instructions

Order number and explanation

Warning pictograms

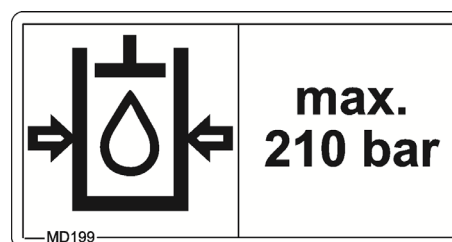
MD116

This symbol indicates the required drive speed (540 rpm) and direction of rotation of the drive shaft on the machine side.



MD199

The maximum operating pressure of the hydraulic system is 210 bars.



2.14 Dangers if the safety information is not observed

Non-compliance with the safety information

- Can pose both a danger to people and also to the environment and machine.
- Can lead to the loss of all warranty claims.

Seen individually, non-compliance with the safety information could pose the following risks:

- Danger to people through non-secured working areas.
- Failure of important machine functions.
- Failure of prescribed methods of maintenance and repair.
- Danger to people through mechanical and chemical impacts.
- Risk to environment through leakage of hydraulic fluid.

2.15 Safety-conscious working

Besides the safety information in this operating manual, the national general workplace safety and accident prevention regulations are binding.

Comply with the accident prevention instructions on the warning pictograms.

When driving on public roads and routes, comply with the appropriate statutory road traffic regulations.

2.16 Safety information for users



WARNING

Risk of contusions, cuts, dragging, catching or knocks from insufficient traffic and operational safety.

Before starting up the machine and the tractor, always check their traffic and operational safety.

2.16.1 General safety and accident prevention information

- Beside these instructions, comply with the general valid national safety and accident prevention regulations.
- The warning pictograms and labels attached to the machine provide important information on safe machine operation. Compliance with this information guarantees your safety.
- Before moving off and starting up the machine, check the immediate area of the machine (children)! Ensure that you can see clearly!
- It is forbidden to ride on the machine or use it as a means of transport!
- Drive in such a way that you always have full control over the tractor with the attached machine.
In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected machine.

Connecting and disconnecting the machine

- Only connect and transport the machine with tractors suitable for the task.
- When connecting machines to the tractor's three-point hydraulic system, the attachment categories of the tractor and the machine must always be the same!
- Connect the machine to the prescribed equipment in accordance with the specifications.
- When coupling machines to the front or the rear of the tractor, the following may not be exceeded:
 - The approved total tractor weight
 - The approved tractor axle loads
 - The approved load capacities of the tractor tyres
- Secure the tractor and the machine against unintentional rolling, before coupling or uncoupling the machine.
- It is forbidden for people to stand between the machine to be coupled and the tractor, whilst the tractor is moving towards the machine!
Any helpers may only act as guides standing next to the vehicles, and may only move between the vehicles when both are at a standstill.
- Secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is impossible, before connecting the machine to or disconnecting the machine from the tractor's three-point hydraulic system.

General safety instructions

- When coupling and uncoupling machines, move the support equipment (if available) to the appropriate position (stability).
- When actuating the support equipment, there is a danger of injury from contusion and cutting points!
- Be particularly careful when coupling the machine to the tractor or uncoupling it from the tractor! There are contusion and cutting points in the area of the coupling point between the tractor and the machine.
- It is forbidden to stand between the tractor and the machine when actuating the three-point hydraulic system.
- Coupled supply lines:
 - Must easily give way to all movements in bends without tensioning, kinking or rubbing.
 - Must not rub against other parts.
- The release ropes for quick action couplings must hang loosely and may not release themselves when lowered.
- Also ensure that uncoupled machines are stable!

Use of the machine

- Before starting work, ensure that you understand all the equipment and actuation elements of the machine and their function. There is no time for this when the machine is already in operation!
- Do not wear loose-fitting clothing! Loose clothing increases the risk over being caught by drive shafts!
- Only start-up the machine, when all the safety equipment has been attached and is in the safety position!
- Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor. If necessary, drive only with a partially filled hopper.
- It is forbidden to stand in the working area of the machine.
- It is forbidden to stand in the turning and rotation area of the machine.
- There are contusion and cutting points at externally-actuated (e.g. hydraulic) machine points.
- Only actuate externally-actuated machine parts when you are sure that there is no-one within a sufficient distance from the machine!
- Before leaving the tractor, secure it from unintentionally starting up or rolling away.
For this:
 - Lower the machine onto the ground
 - Apply the parking brake
 - Switch off the tractor engine
 - Remove the ignition key

Machine transportation

- Comply with the national road traffic regulations when using public highways.
- Before moving off, check:
 - The correct connection of the supply lines
 - The lighting system for damage, function and cleanliness
 - The brake and hydraulic system for visible damage
 - That the parking brake is completely disengaged
 - The function of the brake system
- Ensure that the tractor has sufficient steering and braking power. Any machines and front/rear weights connected to the tractor influence the driving behaviour and the steering and braking power of the tractor.
- If necessary, use front weights.

The front tractor axle must always be loaded with at least 20% of the empty tractor weight, in order to ensure sufficient steering power.
- Always fix the front or rear weights to the intended fixing points according to regulations.
- Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor.
- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected machine).
- Check the brake power before moving off.
- When turning corners with the machine connected, take the broad load and balance weight of the machine into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the machine is fixed to the three-point hydraulic system or lower links of the tractor.
- Before moving off, move all the swivel machine parts to the transport position.
- Before moving off, secure all the swivel machine parts in the transport position against risky position changes. Use the transport locks intended for this.
- Before moving off, secure the operating lever of the three-point hydraulic system against the unintentional raising or lowering of the connected machine.
- Check that the transport equipment, e.g. lighting, warning equipment and protective equipment, is correctly mounted on the machine.
- Before transportation, carry out a visual check that the upper and lower link pins are firmly fixed with the lynch pin against unintentional release.
- Adjust your driving speed to the prevailing conditions.
- Before driving downhill, switch to a low gear.
- Before moving off, always switch off the independent wheel braking (lock the pedals).

2.16.2 Hydraulic system

- The hydraulic system is under a high pressure.
- Ensure that the hydraulic hose lines are connected correctly.
- When connecting the hydraulic hose lines, ensure that the hydraulic system is depressurised on both the machine and tractor sides.
- It is forbidden to block the operator controls on the tractor which are used for hydraulic and electrical movements of components, e.g. folding, swivelling and pushing movements. The movement must stop automatically when you release the appropriate control. This does not apply to equipment movements that:
 - Continuous
 - Automatically controlled
 - Require a float position or pressure position to function
- Before working on the hydraulic system
 - Lower the machine
 - Depressurise the hydraulic system
 - Shut off the tractor engine
 - Apply the parking brake
 - Remove the ignition key
- Have the hydraulic hose line checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose line if it is damaged or worn. Use only AMAZONE original hydraulic hose lines!
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose connections made from thermoplastics, other guide values may be decisive.
- Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.

Escaping high pressure fluid (hydraulic fluid) may pass through the skin and ingress into the body, causing serious injuries!
If you are injured by hydraulic fluid, contact a doctor immediately.
Danger of infection.
- When searching for leakage points, use suitable aids, to avoid the serious risk of infection.

2.16.3 Electrical system

- When working on the electrical system, always disconnect the battery (negative terminal).
- Only use the prescribed fuses. Using unsuitable fuses will destroy the electrical system - risk of fire.
- Ensure that the battery is connected correctly - firstly connect the positive terminal and then connect the negative terminal. When disconnecting the battery, disconnect the negative terminal first, followed by the positive terminal.
- Always place the appropriate cover over the positive battery terminal. Accidental grounding poses the risk of an explosion.
- Risk of explosion – Avoid spark formation and naked flames in the area of the battery!
- The machine can be equipped with electronic components, the function of which may be influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed.
 - If retrofitting electrical units and/or components on the machine with a connection to the on-board power supply, the user is responsible for checking whether the installation might cause faults on the vehicle electronics or other components.
 - Ensure that the retrofitted electrical and electronic components comply with the EMC directive 2014/30/EU in the appropriate version and carry the CE mark.

2.16.4 Universal joint shaft operation

- Use only the PTO shafts prescribed by the AMAZONEN-WERKE factories, equipped with the proper safety devices.
- Also read and follow the operating manual from the PTO shaft manufacturer.
- The protective tube and PTO shaft guard must be undamaged, and the shield of the tractor and machine universal joint shaft must be attached and be in proper working condition.
- Work is prohibited while the safety devices are damaged.
- You may install or remove the PTO shaft only after you have done all of the following:
 - Switched off the universal joint shaft
 - Switched off the tractor engine
 - Applied the parking brake
 - The ignition key has been removed
- Always ensure that the universal joint shaft is installed and secured correctly.
- When using wide-angle PTO shafts, always install the wide angle joint at the pivot point between the tractor and machine.
- Secure the PTO shaft guard by attaching the chain(s) to prevent movement.
- Observe the prescribed pipe overlaps in transport and operational positions. (Read and follow the operating manual from the PTO shaft manufacturer.)

- When turning corners, observe the permitted bending and displacement of the PTO shaft.
- Before switching on the universal joint shaft, check that the selected universal joint shaft speed of the tractor matches the permitted drive rev. speed of the machine.
- Instruct people to leave the danger area of the machine before you switch on the universal joint shaft.
- While work is being carried out with the universal joint shaft, there must be no one in the area of the universal drive or PTO shaft while it is turning.
- Never switch on the universal joint shaft while the tractor engine is shut off.
- Always switch off the universal joint shaft whenever excessive bending occurs or it is not needed.
- **WARNING!** After the universal joint shaft is switched off, there is a danger of injury from the continued rotation of freewheeling machine parts.
Do not approach the machine too closely during this time. You may work on the machine only after all machine parts have come to a complete stop.
- Secure the tractor and machine against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on universal joint shaft-driven machines or PTO shafts.
- After decoupling the PTO shaft, place it on the holder provided.
- After removing the PTO shaft, attach the protective sleeve to the universal joint shaft stub.
- When using the travel-dependent universal joint shaft, note that the universal joint shaft speed depends on the drive speed, and that the direction of rotation reverses when you drive in reverse.

2.16.5 Spreading operation

- Stay clear of the working area! Danger from flying particles. Direct persons away from the throwing range of the winter service spreader before switching on the spreading discs. Do not walk or stand close to rotating spreading discs.
- Fill the multi-purpose spreader only when the tractor engine is shut off, the ignition key is pulled and the shutters are closed.
- While carrying out the spread rate check, beware of danger points from rotating machine parts.
- Never unhitch a multi-purpose spreader or roll it while it is full (tipping hazard).
- Before each use, ensure that the attachment parts are properly fitted, particularly those for attaching the spreading discs and spreading vanes.

2.16.6 Cleaning, maintenance and repairs

- Only carry out cleaning, maintenance and repair work on the machine when:
 - The drive is switched off
 - The tractor engine has come to a complete stop
 - The ignition key has been removed
 - The implement plug has been removed from the on-board computer
- Regularly check the nuts and bolts for a firm seat and retighten them as necessary.
- Secure the raise machine and/or raised machine parts against unintentional falling, before cleaning, maintaining or repairing the machine.
- When replacing work tools with blades, use suitable tools and gloves.
- Dispose of oils, greases and filters in the appropriate way.
- Disconnect the cable to the tractor generator and battery, before carrying out electrical welding work on the tractor and on attached machines.
- Spare parts must meet at least the specified technical requirements of AMAZONEN-WERKE. This is ensured through the use of AMAZONE original spare parts.

3 Loading and unloading

**WARNING**

Danger from crushing and / or impacts due to unintentional dropping of the raised machine!

- It is essential to use the marked lashing points for securing load supporting devices if you are loading or unloading the machine with lifting gear.
- Use load supporting devices with a load bearing capacity of at least 300 kg.
- Never enter the area below the raised machine.

Loading using a lifting crane:

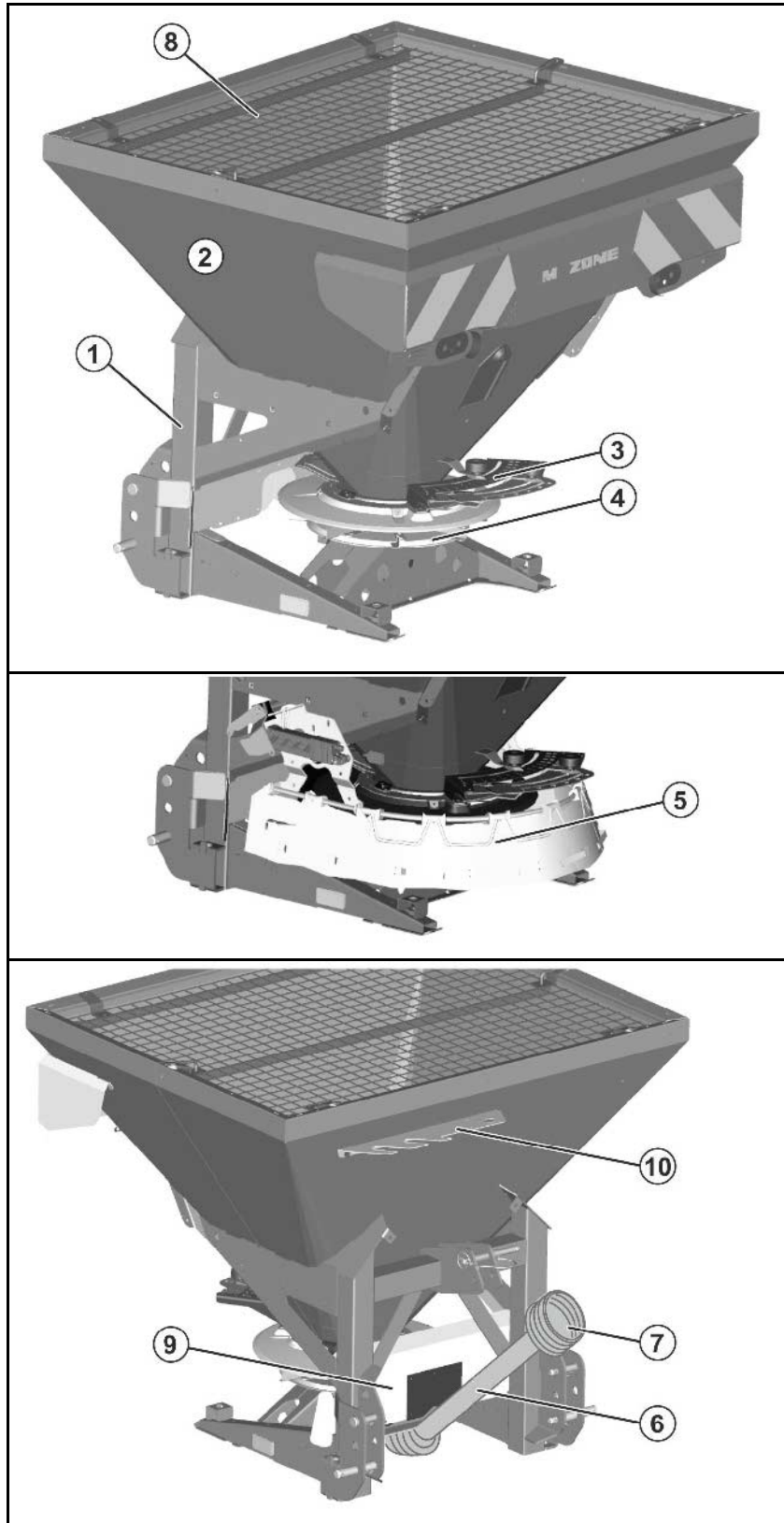
There is one attachment point each at the front and rear of the hopper (1).



4 Product description

Read this section when actually at the machine. This helps you to understand the machine better.

4.1 Overview of subassemblies



Product description

- (1) Frame
- (2) Hopper
- (3) Bottom group
- (4) Spreading discs
- (5) multiple spread width reducer (option)
- (6) PTO shaft or hydraulic drive
- (7) PTO shaft guard
- (8) Upper and lower deflector plates
- (9) Deflector plate
- (10) Hose cabinet

4.2 Safety and protection equipment

- PTO shaft guard to protect against contact with the rotating PTO shaft.
- Guard and function screen in the hopper to protect against contact with the rotating agitator.
- Deflector plate to protect spreading material from being thrown to the front.
- Protective hood over the spreading disk to prevent access to the rotating spreading disc

4.3 Supply lines between the tractor and the machine

Supply lines in parking position:

Depending on equipment:

- (1) Hydraulic hose lines
- (2) Cable with connection for lighting
- (3) Computer cable with machine connector

4.4 Transportation equipment

- (1) 2 rear lights,
- (2) 2 brake lights and
- (3) 2 turn indicators
- (4) 1 rear warning sign



- One additional warning sign on each side in France.
- Connect the lighting system via the connector to the 7-pin tractor socket.

4.5 Intended use

The AMAZONE winter service spreader E + S 301 / 751

- is suitable exclusively for the usual application in winter for gritting roads, paths etc.
- is attached to the tractor's three-point hydraulic system (Cat. I and II) and operated by one person.
- must only be mounted on a transport frame approved by AMAZONEN-Werke.
- Sloping terrain can be travelled as follows:
 - Along the contours

Direction of travel to the left	15 %
Direction of travel to the right	15 %
 - Along the gradient

Up the slope	15 %
Down the slope	15 %

The intended use also includes:

- Compliance with all the instructions in this operating manual.
- Execution of inspection and maintenance work.
- Exclusive use of AMAZONE original spare parts.

Other uses to those specified above are forbidden and shall be considered as improper.

For any damage resulting from improper use:

- the operator bears the sole responsibility,
- AMAZONEN-WERKE accepts no liability.

4.6 Danger areas and danger points

The danger area is the area around the machine in which people can be caught:

- By work movements made by the machine and its tools
- By materials or foreign bodies thrown out of the machine
- By tools rising or falling unintentionally
- By unintentional rolling of the tractor and the machine

Within the machine danger area, there are danger points with permanent or unexpected risks. Warning pictograms indicate these danger points and warn against residual dangers, which cannot be eliminated for construction reasons. Here, the special safety regulations of the appropriate section shall be valid.

No-one may stand in the machine danger area:

- as long as the tractor engine is running with a connected PTO shaft / hydraulic system.
- as long as the tractor and machine are not protected against unintentional start-up and running.

The operating person may only move the machine or switch or drive the tools from the transport position to the working position or vice-versa when there is no-one in the machine danger area.

Danger points exist:

- Between the tractor and the machine, particularly during coupling and decoupling operations.
- In the area of moving parts:
 - Rotating spreading discs with spreading vanes
 - Rotating agitator finger
 - Hydraulic actuation of the sliders
- By climbing onto the machine.
- If the machine or machine parts are lifted and not secured.
- In the working range of the spreading discs when spreading work is in progress due to grains being thrown out.

4.7 Rating plate

Machine rating plate

- (1) Implement number
- (2) Vehicle identification number
- (3) Product
- (4) Permissible technical implement weight
- (5) Model year
- (6) Year of manufacture



4.8 Technical data

Type	Hopper content	Payload	Weight	Filling height	Filling width	Overall width	Overall length
E+S 301	300 l	1300 kg	160 kg	1,00 m	0,98 m	1,08 m	0,90 m
+ Extension S95	395 l	1300 kg	174 kg	1,11 m	0,95 m	1,08 m	0,90 m
+ Extension S190	490 l	1300 kg	182 kg	1,22 m	0,95 m	1,08 m	0,90 m
E + S 751	750 l	1300 kg	195 kg	1,30 m	1,40 m	1,50 m	1,23 m
+ Extension S180	930 l	1300 kg	215 kg	1,41 m	1,37 m	1,50 m	1,23 m
+ Extension S360	1110 l	1300 kg	225 kg	1,52 m	1,37 m	1,50 m	1,23 m

Working width	4 - 8 m (with long spreading vanes)
	1 - 6 m (with standard spreading vanes)
d (Distance between the lower link ball and the centre of gravity)	0,48 m

4.9 Necessary tractor equipment

For proper machine operation, the tractor must fulfil the following requirements:

Tractor engine power

E+S 301 from 15 kW (20 bhp) upwards

E+S 751 from 30 kW (40 bhp) upwards

Electrical system

Battery voltage: • 12V (Volt)

Lighting socket: • 7-pin

Hydraulic system

Maximum operating pressure: • 210 bar

Tractor pump power: E+S with hydraulic shutter control

- At least 10 l/min at 150 bar

E+S with hydraulic spreading disc drive:

- At least 46 l/min at 150 bar (hydraulic motor 160 ccm)
- At least 58 l/min at 150 bar (hydraulic motor 200 ccm)

Machine hydraulic fluid: • HLP68 DIN 51524

The machine hydraulic fluid is suitable for the combined hydraulic fluid circuits of all standard makes of tractor.

Control unit: • Depending on equipment, see page 44.

Universal joint shaft

Required speed: • 540 rpm

Direction of rotation: • Clockwise, viewed from rear toward the tractor.

4.10 Noise production data

The workplace-related emission value (acoustic pressure level) is 74 dB(A), measured in operating condition at the ear of the tractor driver with the cabin closed.

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.

5 Structure and function

5.1 Function

- (1) Outlet opening
- (2) Floor assembly
- (3) Agitator
- (4) Spreading disc
- (5) Spreading vanes
- (6) Scale
- (7) Rate shutter

The spreading material slides down the hopper walls to the discharge opening (1) in the bottom group (2). The agitator (3) provides an even spreading material flow on to the spreading disc.

The spreading disc (4) rotates in clockwise direction and is provided with 6 spreading vanes (5).

The spreading disc is driven:

- by the universal joint shaft
- hydraulically

Different working widths are set:

- via multi-part spreading width limiter (optional)
- via spreading disc speed with hydraulic spreading disc drive (optional).

The spread width reducer is adjusted via the chain suspension according to experience values.

The outlet opening is opened and closed:

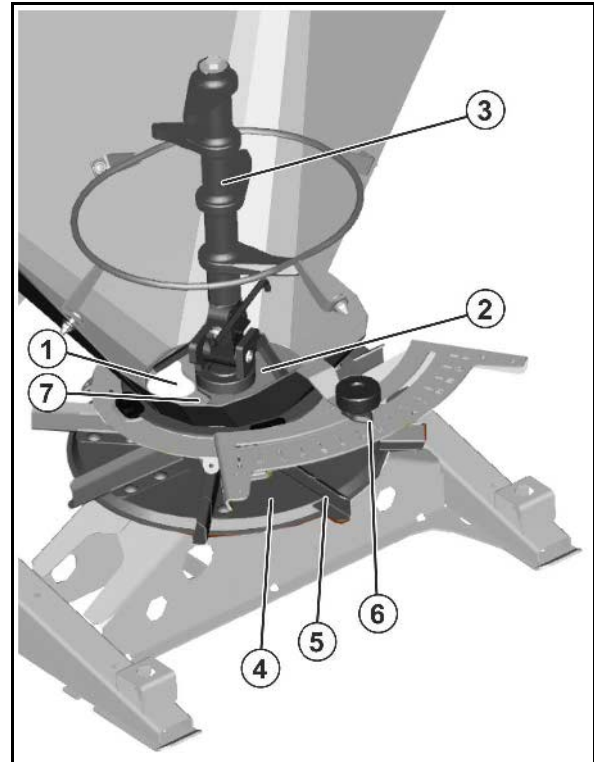
- hydraulically by a separate shutter
- electrically by the rate shutter.

The spread rate is set:

- manually using a rate shutter by means of a setting lever.

To adjust the spread rate, read off the shutter position on the scale. The respective required shutter position is determined either according to experience or is taken from the setting chart.

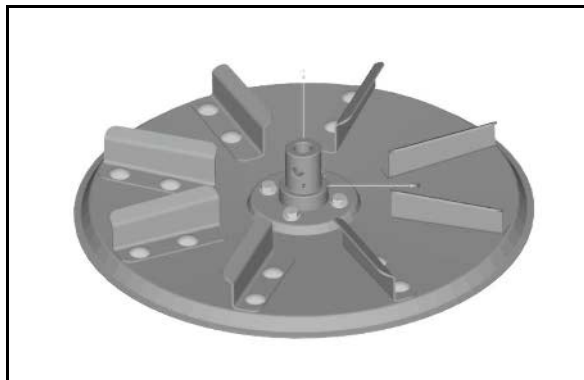
- electrically by the rate shutter using the operating computer.



5.2 Spreader discs

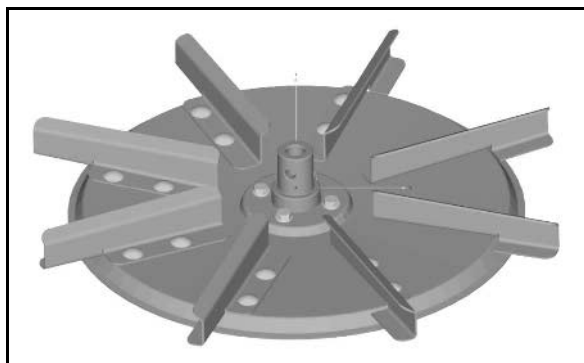
Spreading disc with standard spreading vanes.

Spreading vane length: 110 mm



Spreading disc with long spreading vane.

Spreading vane length: 170 mm



5.3 Spreader disc drive with hydraulic motor

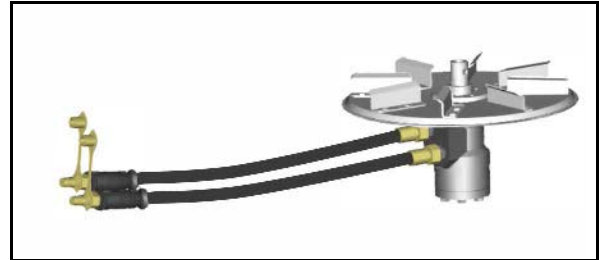
The spreader disc and agitator are driven by the hydraulic motor.

Hydraulic motor displacement 165 ccm.

Hydraulic spreading vane drive versions:

Spreading vane drive with speed control via EasySet:

- The spreading disc drive is switched on and off by EasySet.
- The working width is adjusted by changing the spreading disc speed through EasySet.

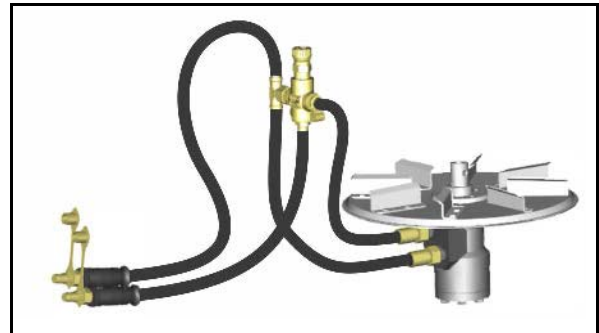


WARNING

Risk of injury due to accidental starting up of the spreading disc!
The handwheel on the hydraulic block must be in Position 0.

Spreading vane drive with speed control via flow control valve:

- The spreading disc drive is switched on and off through the tractor oil supply.
- The working width is adjusted by changing the spreading disc speed through the flow control valve on the E+S.



Spreading disc drive with speed control via volume flow regulation on the tractor:

- The spreading disc drive is switched on and off through the tractor oil supply.
- Working width adjustment
 - by using the spreading width limiter.
Set a constant spreading disc speed of 280 rpm. A hydraulic oil flow of 46 l/min (hydraulic motor 160 ccm) or 58 l/min (hydraulic motor 200 ccm) is required for this.
 - by changing the spreading disc speed through the tractor's oil supply.
Set the hydraulic oil flow according to the required spreading disc speed.

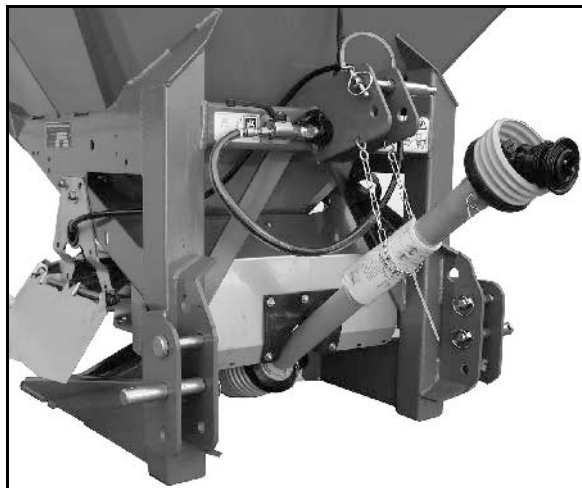


5.4 Spreader disc drive with PTO shaft

The PTO shaft transmits power between the tractor and machine. The reduction gearbox ($i = 1:1.9$) for the spreader disc and the agitator is driven by the PTO shaft. With this gearbox, the spreader disc speed is approx. 280 rpm with a universal joint shaft speed of 540 rpm.

PTO shaft in parking position.

- E+S 301: PTO shaft 560 mm
- E+S 751: PTO shaft 810 mm



For winter service, a universal joint shaft speed of 540 rpm is set as standard.

→ Here, select a universal joint shaft drive that rotates at a nominal speed of 540 rpm.



WARNING

Danger of crushing from tractor and machine unintentionally starting up or rolling away!

Couple or decouple the PTO shaft and tractor only when tractor and machine have been secured against both unintentional starting and unintentional rolling away.



WARNING

Danger of catching or entrapment due to the unprotected gearbox input shaft owing to the use of a PTO shaft with a short PTO shaft guard!

Use only one of the listed permissible PTO shafts.

**WARNING**

Danger from being entangled and drawn in by unguarded PTO shaft parts in the power transmission area between the tractor and driven machine!

Work only when the drive between the tractor and driven machine is fully guarded.

- The unguarded parts of the PTO shaft must always be guarded by a shield on the tractor and a PTO shaft guard on the machine.
- Check that the shield on the tractor or the PTO shaft guard on the machine and the safety devices and guards of the extended PTO shaft overlap by at least 50 mm. If they do not, you must not power the machine via the PTO shaft.

**WARNING**

Danger of trapping and entrapment by unguarded PTO shaft or damaged safety devices!

- Never use the PTO shaft if the safety device is missing or damaged, or without correctly using the supporting chain.
- Before all use, check that
 - all PTO shaft protective devices are installed and fully functional.
 - the clearance around the PTO shaft is sufficient in all operating modes. Insufficient clearance will result in damage to the PTO shaft.
- Attach the supporting chains in a way that ensures sufficient swivelling range of the PTO shaft in all operating positions. Supporting chains must not become caught on machine or tractor parts.
- Have any damaged or missing parts of the PTO shaft replaced immediately with OEM parts from the PTO shaft manufacturer. Note that only a specialist workshop may repair a PTO shaft.
- After decoupling the PTO shaft, place it on the holder provided. This protects the PTO shaft from damage and dirt.
 - Never use the supporting chain of the PTO shaft to suspend the uncoupled PTO shaft.



- Use only the provided PTO shaft or one of the same type.
- Read and follow the operating manual provided for the PTO shaft. Correct use and maintenance of the PTO shaft prevents serious accidents.
- When coupling the PTO shaft
 - refer to the operating manual provided for the PTO shaft.
 - observe the permissible drive speed of the machine.
 - observe the correct installation length of the PTO shaft. Here, see the chapter "Adjusting the length of the PTO shaft to the tractor", page 60.
 - observe the correct installation position of the PTO shaft. The tractor symbol on the protective tube of the PTO shaft identifies the tractor-side connection of the PTO shaft.
- Always mount the overload or freewheel clutch on the machine if the PTO shaft has an overload or freewheel clutch.
- Before switching on the universal joint shaft, read and follow the safety precautions for universal joint shaft operation in the chapter entitled "Safety information for the user", page 27.

5.4.1 Coupling the PTO shaft



WARNING

Danger from crushing or impact if there is insufficient clearance when coupling the PTO shaft!

Couple the PTO shaft with the tractor before coupling the machine with the tractor. This will ensure the necessary clearance for safe coupling of the PTO shaft.

1. Drive the tractor up to the machine, leaving a clearance of approximately 25 cm between the tractor and the machine.
2. Secure the tractor against unintentional starting and rolling away, see the chapter "Securing the tractor against unintentional starting and rolling away", from page 62.
3. Check whether the universal joint shaft of the tractor is switched off.
4. Clean and grease the tractor's universal joint shaft.
5. Fit the latch of the PTO shaft over the universal joint shaft of the tractor until the latch is heard to engage. When coupling the PTO shaft, refer to the operating manual provided for the PTO shaft and observe the permissible universal joint shaft speed of the tractor.
6. Secure the PTO shaft guard using the supporting chain(s) to prevent movement.
 - 6.1 Fasten the supporting chain(s) so that it is as perpendicular to the PTO shaft as possible.
 - 6.2 Attach the supporting chain(s) in a way that ensures sufficient swivelling range of the PTO shaft in all operating positions.



Supporting chains must not become caught on machine or tractor parts.

7. Check that there is sufficient clearance around the PTO shaft in all operational positions. Insufficient clearance will result in damage to the PTO shaft.
8. Provide the necessary clearance (if required).

5.4.2 Uncoupling the PTO shaft



WARNING

Danger from crushing or impact if there is insufficient clearance when uncoupling the PTO shaft!

First uncouple the machine from the tractor before uncoupling the PTO shaft from the tractor. This will ensure the necessary clearance for safe uncoupling of the PTO shaft.



WARNING

Danger from burns on hot components of the PTO shaft!

Do not touch components of the PTO shaft that have become hot (particularly clutches).



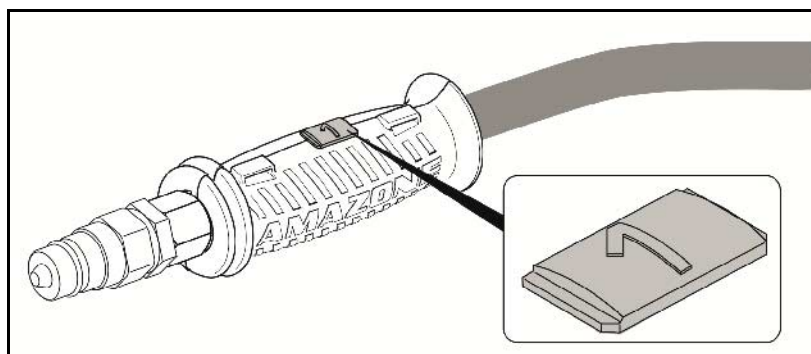
- After decoupling the PTO shaft, place it on the holder provided. This protects the PTO shaft from damage and dirt. Never use the supporting chain of the PTO shaft to suspend the uncoupled PTO shaft.
- Clean and lubricate the universal joint shaft if it will not be used for an extended period.

1. Uncouple the machine from the tractor. Also refer to the chapter "Uncoupling the machine", page 66.
2. Drive the tractor up to the machine, leaving a clearance of approximately 25 cm between the tractor and the machine.
3. Secure the tractor against unintentional starting and rolling away, see the chapter "Securing the tractor against unintentional starting and rolling away", from page 62.
4. Pull the latch of the PTO shaft off the universal joint shaft of the tractor. Observe the operating manual supplied with the PTO shaft when uncoupling the PTO shaft.
5. Place the PTO shaft in the holder provided.
6. Clean and lubricate the universal joint shaft if it is not going to be used for a longer period of time.

5.5 Hydraulic connections




- All hydraulic hose lines are equipped with grips.








Coloured markings with a code number or code letter have been applied to the gripping sections in order to assign the respective hydraulic function to the pressure line of a tractor control unit!



Films are stuck on the implement for the markings that illustrate the respective hydraulic function.

- The tractor control unit must be used in different types of activation, depending on the hydraulic function.

Latched, for a permanent oil circulation	
Tentative, activate until the action is executed	
Float position, free oil flow in the control unit	

Marking		Function		Tractor control unit	
yellow			Hydraulic shutter control (optional)	Single-acting	
Marking		Function		Tractor control unit	
red			Hydraulic spreader disc drive	Single-acting with priority	
red		Pressure-free return flow			

Maximum permissible pressure in oil return: 10 bar

Therefore do not connect the oil return to the tractor control unit, but to a pressure-free oil return flow with a large plug coupling.


WARNING

For the oil return, use only DN16 lines and select short return paths.

Pressurise the hydraulic system only when the free return has been correctly coupled.

Install the coupling union (supplied) on the pressure-free oil return flow.


WARNING

Danger of infection from escaping hydraulic fluid at high pressure!

When coupling and uncoupling the hydraulic hose lines, ensure that the hydraulic system is depressurised on both the machine and tractor sides.

If you are injured by hydraulic fluid, contact a doctor immediately.

5.5.1 Coupling the hydraulic hose lines


WARNING

Risk of crushing, cutting, catching, drawing in and impact from faulty hydraulic functions when the hydraulic hose lines are incorrectly connected.

When coupling the hydraulic hose lines, observe the coloured markings on the hydraulic plugs.



- Observe the maximum approved hydraulic operating pressure of 210 bar.
- Check the compatibility of the hydraulic fluids before connecting the machine to the hydraulic system of your tractor.
- Do not mix any mineral oils with biological oils.
- Slide the hydraulic connector(s) into the hydraulic sleeves until they are heard to engage.
- Check the coupling points of the hydraulic hose lines for a correct, tight seat.
- Coupled hydraulic hose lines
 - must easily give way to all movements in bends without tensioning, kinking or rubbing.
 - must not rub against other parts.

1. Swivel the actuation lever on the tractor control unit on the tractor to float position (neutral position).
2. Clean the hydraulic connector for the hydraulic hose lines before connecting them to the tractor.
3. Connect the hydraulic hose line(s) to the tractor control unit(s).

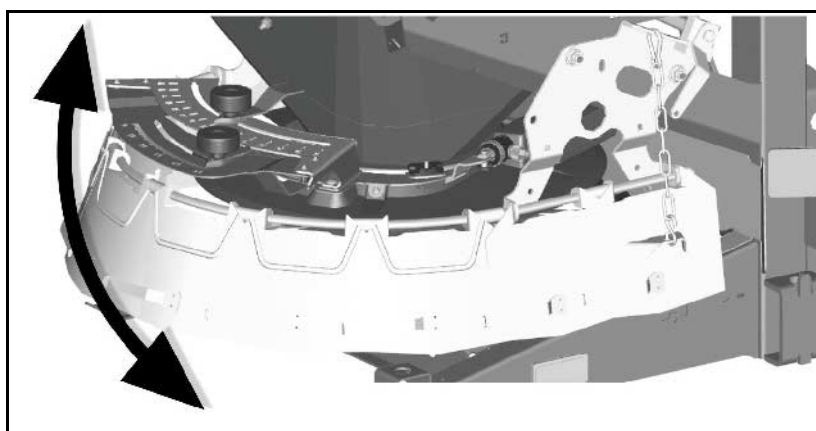
5.5.2 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the control unit on the tractor to float position (neutral position).
2. Unlock the hydraulic connectors from the hydraulic sockets.
3. Protect the hydraulic connector and hydraulic socket against soiling using the dust protection caps.
4. Place the hydraulic hose lines in the hose cabinet

5.6 Spreading width limiter

The spreading width limiter serves to adjust the working width on implements with mechanical spreading disc drive.

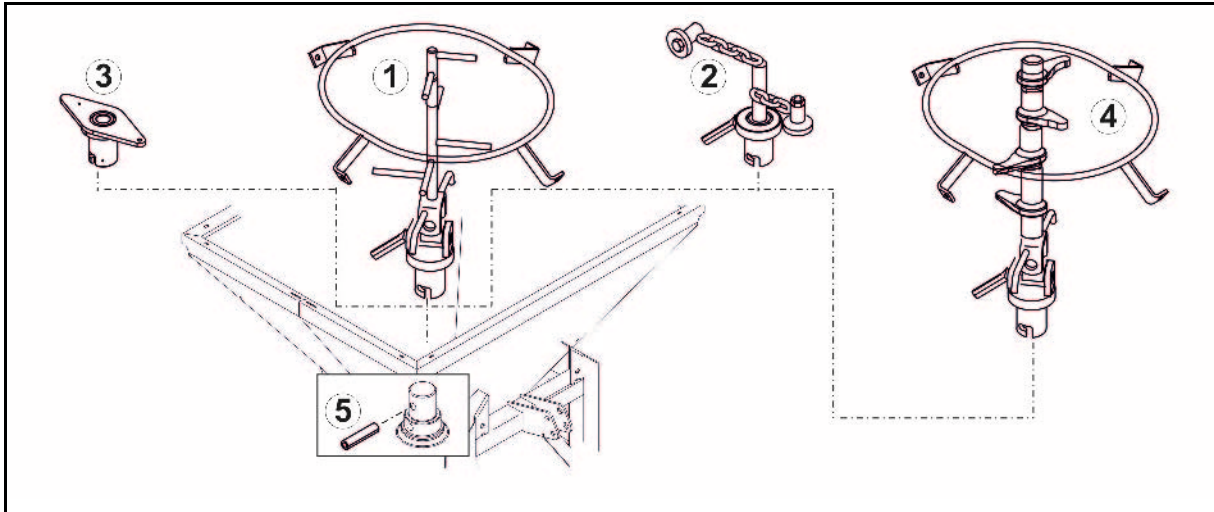
The angle position of the deflector plate can be adjusted.



5.7 Agitator

The E+S can be equipped with various agitators, depending on application.

The agitators direct the spreading material to the outlet opening and break up clumps.



- (1) rod agitator: spreading sand and salt
- (2) chain agitator: spreading grit and grit/salt mixture
- (3) agitator head: spreading granuled fertiliser
- (4) Finger agitator from spreading salt
- (5) tension sleeve as overload safety



The agitator is fitted with a tension sleeve as overload safety.

- Two tension sleeves 10X 50 1.4310 are provided with the machine as spares.
- Always keep a tension sleeve at hand as overload safety.

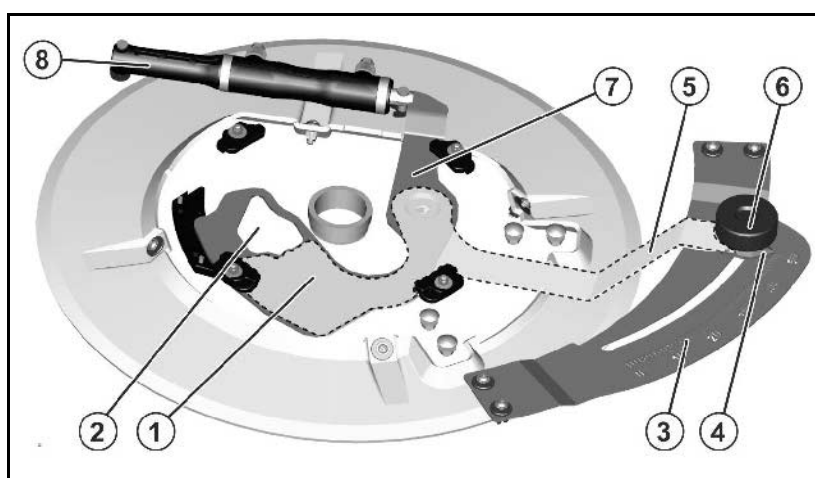
5.8 Rate shutter with setting lever and hydraulic slide gate

The rate slider adjusts the outlet diameter of the outlet opening in the hopper, according to its setting.

The spreading material passes through the opening onto the spreader disc.



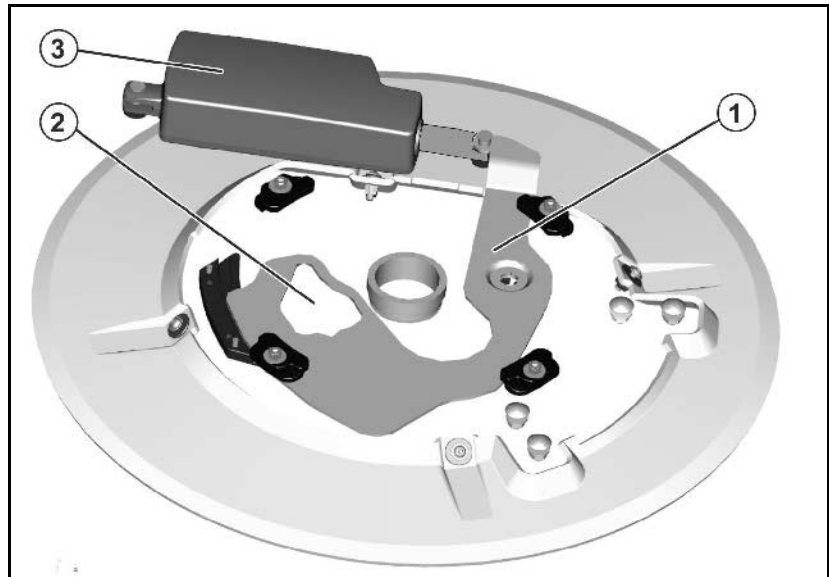
As the spreading properties of the spreading material are subject to considerable fluctuations, it is recommended that a spread rate check be carried out for the selected shutter position.



- (1) Shutter for rate setting
- (2) Outlet opening in the hopper
- (3) Scale for manual rate setting
- (4) Pointer for display of rate setting
- (5) Hand lever on the shutter
- (6) Lock for rate setting
- (7) Shutter to open and close the outlet opening
- (8) Hydraulic cylinder to actuate the slide gate.

5.9 Electric shutter control

The spread rate is adjusted using an electric motor with the EasySet operating computer.



- (1) Rate setting shutter to open and close the outlet opening
- (2) Outlet opening in the hopper
- (3) Electric motor to control the shutter

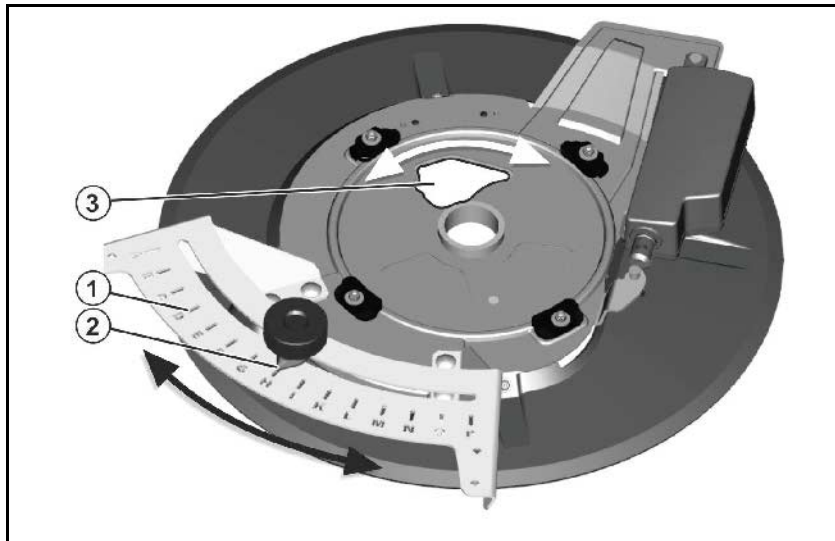
5.10 Rotatable base assembly

The base assembly with the outlet opening for the spreading material can be rotated around the vertical central axis.

In this way, the point of application of the spreading material on the spreader disc can be set and the spreading area thus adjusted according requirements.

For a symmetrical spread pattern, set the base assembly (point of application) in accordance with the setting chart.

To be able to spread on one side, the point of application must be adjusted.

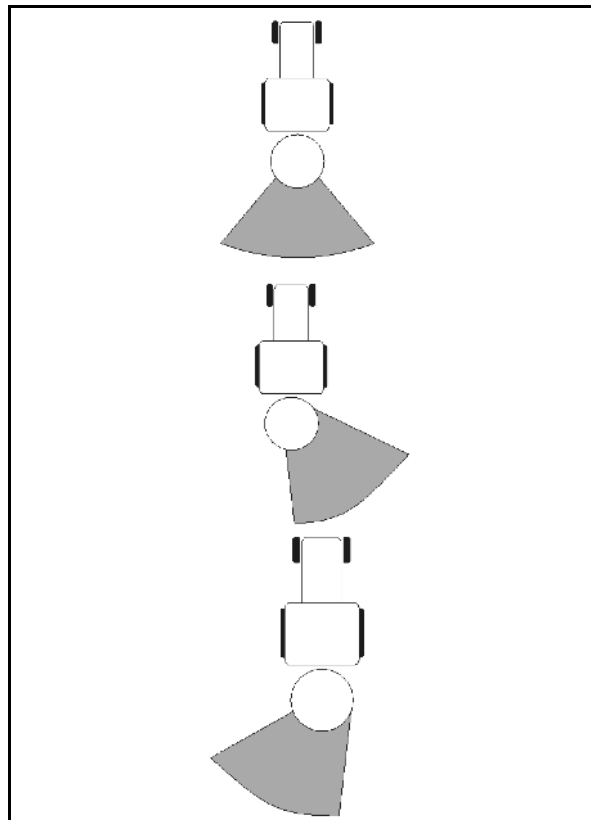


- (1) Scale for point of application adjustment (A-P)
- (2) Pointer for point of application adjustment
- (3) Adjustable point of application

If the base assembly is set in accordance with the setting chart, the spreader disc creates a spread fan that is symmetrical with regard to the machine's longitudinal axis.

If the base assembly is rotated towards scale value A, the spreader disc creates a spread fan to the right of the machine's longitudinal axis.

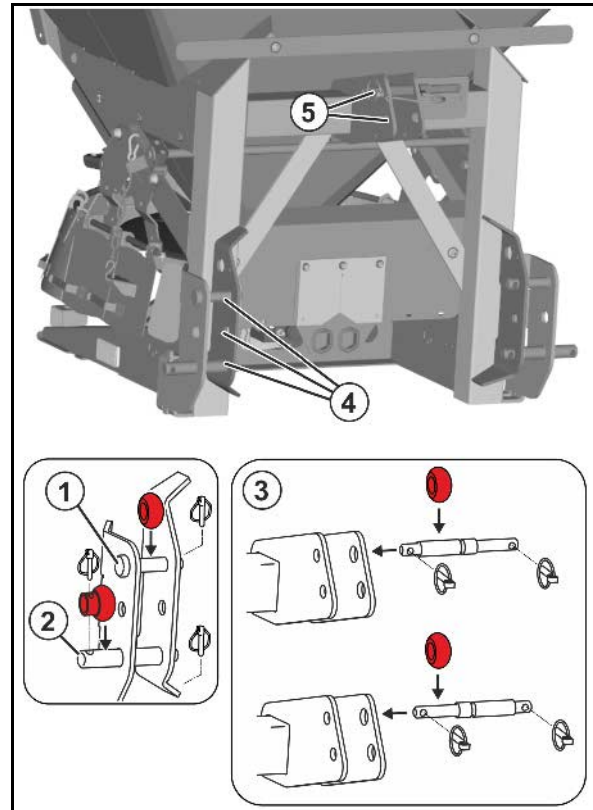
If the base assembly is rotated towards scale value P, the spreader disc creates a spread fan to the left of the machine's longitudinal axis.



5.11 3-point attachment frame

The frame of the E+S is designed so that it meets the requirements and dimensions of 3-point attachment of Category 1 or 2.

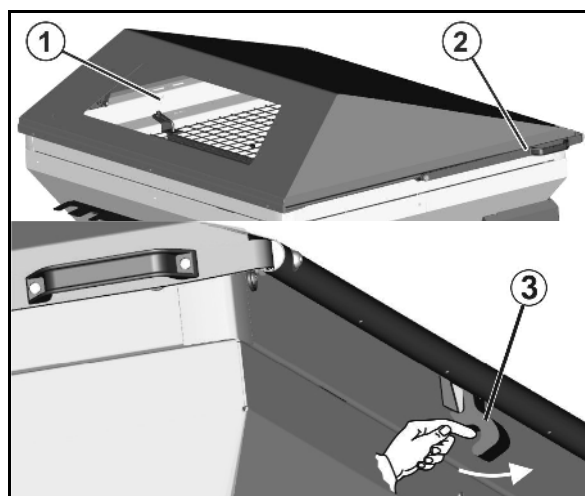
- (1) Lower link pin, Category 1
- (2) Lower link pin, Category 2
- (3) Upper link pin, Category 1 and 2
- (4) Three positioning holes for lower link
- (5) Two positioning holes for upper link



5.12 Swivelable hopper cover (optional)

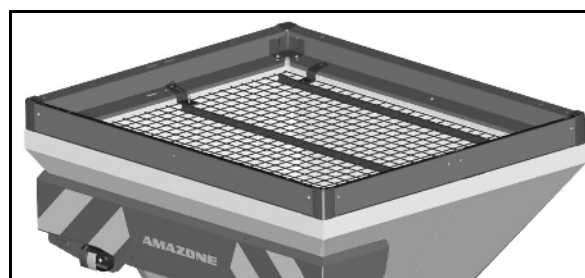
The swivelable hopper cover ensures that the product remains dry even in wet weather.

- (1) View window
- (2) Turning lever with grip
- (3) Locking mechanism



5.13 Hopper extensions (optional)

- Hopper extension S95 and S190 for E+S 300
- Hopper extension S180 for E+S 751



5.14 Transport and parking device (removable, optional)

The removable transport and parking device enables easy coupling to the tractor's three-point linkage and easy manoeuvring in the yard and indoors.

To prevent the fertiliser spreader from rolling, the guide rollers are equipped with a locking system.



WARNING

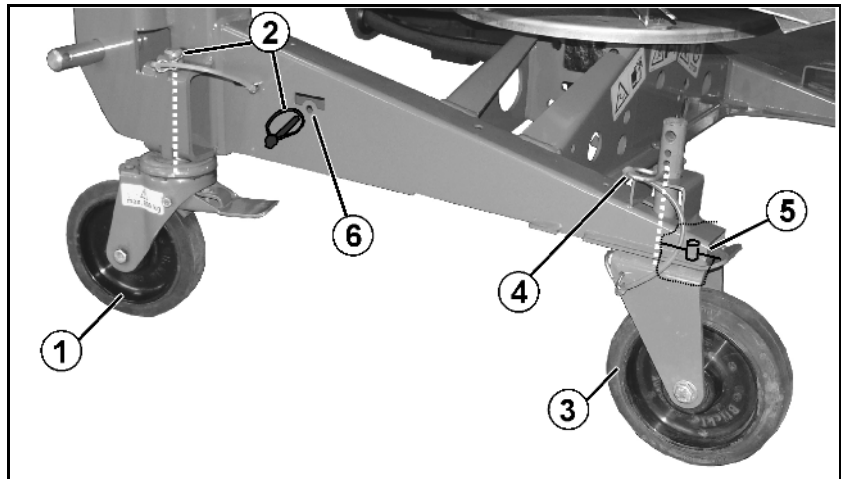
Danger of injury due to the filled implement tipping.

Couple and uncouple the implement only when it is empty.



WARNING

When installing/removing the transportation device, secure the raise machine against unintended lowering.



Installation/removal of transportation device:

1. Couple the machine to the tractor.
2. Raise the machine with the tractor's hydraulic system.
3. Secure the machine against unintentional starting and unintentional rolling away.
4. Support the raised machine to prevent unintentional lowering.
5. Steerable brake rollers (1), front
 - o Install and secure with clip pin (2),
 - or
 - o Remove after taking out clip pin and move safety splint into parking position (6).
6. Rigid rollers (3), rear
 - o Install and secure with safety splint (4) in lowest bore,
 - or
 - o Remove after taking out safety splint.

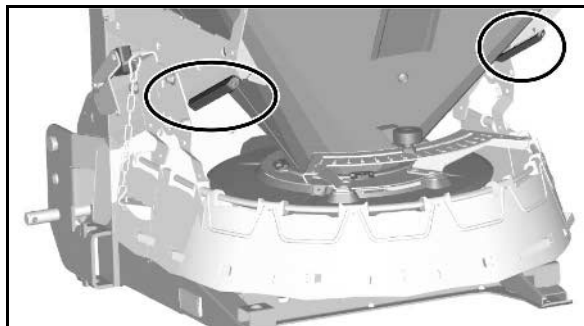


When installing the rigid rollers ensure that the pin (5) goes through the bore of the frame, thus holding the rollers in longitudinal direction.

5.15 Work lights (optional)

The work lights ensure good vision on the working field at night.

- Work lights can be switched using the EasySet on-board computer
- Work lights can be switched using the 12 V power supply in the cab



5.16 Protective rubber

The protective rubber prevents soiling of the implement by the tractor wheels.



6 Commissioning

This section contains information

- on commissioning your machine.
- on checking how you may connect the machine to your tractor.



- Before operating the machine for the first time the operator must have read and understood the operating manual.
- Comply with the chapter "Safety information for the user", from Page 23 when
 - connecting and disconnecting the machine
 - transporting the machine
 - using the machine
- Only couple and transport the machine to/with a tractor which is suitable for the task.
- The tractor and machine must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.

6.1 Checking the suitability of the tractor



WARNING

Danger of breaking during operation, insufficient stability and insufficient tractor steering and braking power on improper use of the tractor!

- Check the suitability of your tractor, before connecting the machine to the tractor.
You may only connect the machine to tractors suitable for the purpose.
- Carry out a brake test to check whether the tractor achieves the required braking delay with the machine connected.

Requirements for the suitability of a tractor are, in particular:

- The permissible total weight
- The approved axle loads
- The approved drawbar load at the tractor coupling point
- The load capacity of the installed tyres
- The approved trailer load must be sufficient

You can find this data on the rating plate or in the vehicle documentation and in the tractor operating manual.

The front axle of the tractor must always be subjected to at least 20% of the empty weight of the tractor.

The tractor must achieve the brake delay specified by the tractor manufacturer, even with the machine connected.

6.1.1 Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast



The permissible total tractor weight, specified in the vehicle documentation, must be greater than the sum of the

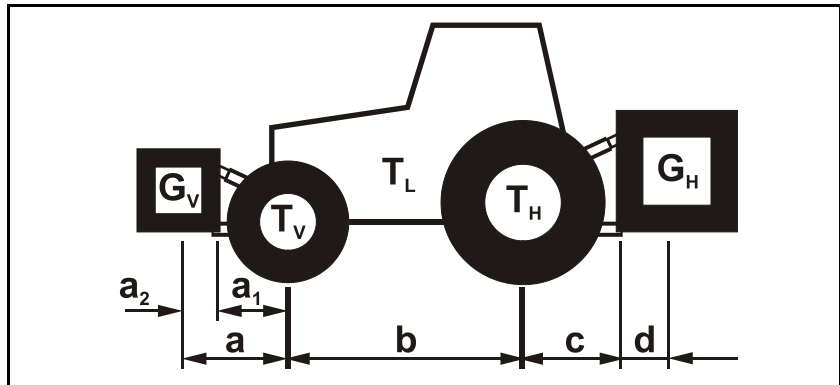
- Empty tractor weight,
- ballast weight and
- total weight of the connected machine or drawbar load of the connected machine



This information is only valid for the Federal Republic of Germany:

If, having tried all possible alternatives, it is not possible to comply with the axle loads and / or the permissible total weight, then a survey by an officially-recognised motor traffic expert can, with the approval of the tractor manufacturer, be used as a basis for the responsible authority to issue an exceptional approval according to § 70 of the German Regulations Authorising the Use of Vehicles for Road Traffic and the required approval according to § 29, paragraph 3 of the German Road Traffic Regulations.

6.1.1.1 Data required for the calculation



T_L	[kg]	Empty tractor weight	See tractor operating manual or vehicle documentation
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of the empty tractor	
G_H	[kg]	Total weight of rear-mounted machine or rear ballast	See technical data for machine or rear ballast
G_V	[kg]	Total weight of front-mounted machine or front ballast	See technical data for front-mounted machine or front ballast
a	[m]	Distance between the centre of gravity of the front machine mounting or the front weight and the centre of the front axle (total $a_1 + a_2$)	See technical data of tractor and front machine mounting or front weight or measurement
a_1	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement
a_2	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front machine mount or front weight (centre of gravity distance)	See technical data of front machine mounting or front weight or measurement
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement
d	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the rear-mounted machine or rear ballast (centre of gravity distance)	See technical data of machine

6.1.1.2 Calculation of the required minimum ballasting at the front $G_{V \min}$ of the tractor to ensure steering capability

$$G_{V \min} = \frac{G_H \cdot (c + d) - T_V \cdot b + 0,2 \cdot T_L \cdot b}{a + b}$$

Enter the numeric value for the calculated minimum ballast $G_{V \min}$, required on the front side of the tractor, in the table (section 6.1.1.7).

6.1.1.3 Calculation of the actual front axle load of the tractor $T_{V \text{ tat}}$

$$T_{V \text{ tat}} = \frac{G_V \cdot (a + b) + T_V \cdot b - G_H \cdot (c + d)}{b}$$

Enter the numeric value for the calculated actual front axle load and the permissible tractor front axle load specified in the tractor operating manual in the table (section 6.1.1.7).

6.1.1.4 Calculation of the actual total weight of the combined tractor and machine

$$G_{\text{tat}} = G_V + T_L + G_H$$

Enter the numeric value for the calculated actual total weight and the approved total tractor weight specified in the tractor operating manual in the table (section 6.1.1.7).

6.1.1.5 Calculation of the actual rear axle load of the tractor $T_{H \text{ tat}}$

$$T_{H \text{ tat}} = G_{\text{tat}} - T_{V \text{ tat}}$$

Enter the numeric value for the calculated actual rear axle load and the approved tractor rear axle load specified in the tractor operating manual in the table (section 6.1.1.7).

6.1.1.6 Tractor tyre load bearing capacity

Enter the double value (two tyres) of the approved load capacity (see, for example, tyre manufacturer's documentation) in the table (section 6.1.1.7).

6.1.1.7 Table

	Actual value according to calculation	Approved value according to tractor operating manual	Double approved load capacity (two tyres)
Minimum ballast front / rear	<input type="text"/> / <input type="text"/> kg	--	--
Total weight	<input type="text"/> kg	≤ <input type="text"/> kg	--
Front axle load	<input type="text"/> kg	≤ <input type="text"/> kg	≤ <input type="text"/> kg
Rear axle load	<input type="text"/> kg	≤ <input type="text"/> kg	≤ <input type="text"/> kg



- You can find the approved values for the total tractor weight, axle loads and load capacities in the tractor registration papers.
- The actually calculated values must be less than or equal to (≤) the permissible values!



WARNING

Risk of crushing, cutting, entrapment, drawing in and impact through insufficient stability of the tractor and insufficient tractor steering capability and braking power.

It is forbidden to couple the machine to the tractor used as the basis for calculation, if

- one of the actual, calculated values is greater than the approved value.
- there is no front weight (if required) attached to the tractor for the minimum front ballast ($G_{V \min}$).



- Ballast your tractor with weights at the front or rear if the tractor axle load is exceeded on only one axle.
- Special cases:
 - If you do not achieve the minimum ballast at the front ($G_{V \min}$) from the weight of the front-mounted machine (G_V), you must use ballast weights in addition to the front-mounted machine.
 - If you do not achieve the minimum ballast at the rear ($G_{H \min}$) from the weight of the rear-mounted machine (G_H), you must use ballast weights in addition to the rear-mounted machine.

6.2 Adjusting the length of the PTO shaft to the tractor



WARNING

Dangers exist from damaged and/or destroyed, flying parts if the PTO shaft is upended or pulls apart while the machine coupled to the tractor is being raised/lowered because the length of the PTO shaft has not been adjusted properly.

Have the length of the PTO shaft in all operational positions checked by a specialised workshop and, if necessary, adjusted before coupling the PTO shaft to your tractor for the first time.

In this way, you prevent upending of the PTO shaft or insufficient profile overlap.



This adjustment of the PTO shaft applies only for the current tractor type. You may need to readjust the PTO shaft if you couple the machine to another tractor. When adjusting the PTO shaft, it is mandatory to observe the operating manual from the PTO shaft manufacturer.



WARNING

Danger of being caught and drawn in if the PTO shaft is installed incorrectly or if unauthorised design changes are made.

Only a specialist workshop may make design changes to the PTO shaft. When doing so, read and follow the operating manual from the manufacturer.

Adjusting the length of the PTO shaft is permitted with consideration of the minimum profile overlap.

Design changes to the PTO shaft that are not described in the operating manual from the PTO shaft manufacturer are not permitted.



WARNING

Danger of being crushed between the rear of the tractor and the machine when raising and lowering the machine to determine the shortest and longest operating position of the PTO shaft.

Only actuate the operator controls for the tractor's three-point hydraulic system

- from the intended workstation.
- if you are outside of the danger area between the tractor and the machine.



WARNING

Danger of crushing from unintentional:

- **Rolling of the tractor and the connected machine!**
- **Lowering of the lifted machine!**

Secure the tractor and machine from unintentional starting and unintentional rolling and secure the machine unintentional lowering before entering the danger zone between the tractor and lifted machine in order to adjust the PTO shaft.



The PTO shaft is at its shortest when it is horizontally. The PTO shaft is at its longest when the machine is fully lifted.

1. Couple the tractor to the machine (do not connect the PTO shaft).
2. Apply the tractor's parking brake.
3. Determine the clearance height of the machine with the shortest and longest operating position for the PTO shaft.
 - 3.1 To do so, raise and lower the machine via the tractor's three-point hydraulic system.

While doing so, actuate the manual controls for the tractor's three-point hydraulic system on the rear of the tractor, from the provided workstation.
4. Secure the machine, lifted in the measured clearance height, against unintentional lowering (for example, by supporting it or hooking it to a crane).
5. Secure the tractor from unintentional starting before entering the danger area between the tractor and machine.
6. When measuring the length and shortening the PTO shaft, read and follow the operating manual from the PTO shaft manufacturer.
7. Put the shortened halves of the PTO shaft back together.
8. Grease the universal joint shaft of the tractor and the gearbox input shaft before connecting the PTO shaft.

The tractor symbol on the protective tube of the PTO shaft identifies the tractor-side connection of the PTO shaft.

6.3 Securing the tractor / machine against unintentional start-up and rolling



WARNING

Risk of contusions, cutting, catching, drawing in and knocks when making interventions in the machine through

- **Unintentional falling of the unsecured machine raised using the tractor's three-point hydraulic system.**
- **Unintentional falling of raised, unsecured machine parts.**
- **Unintentional start-up and rolling of the tractor-machine combination.**
- Secure the tractor and the machine against unintentional start-up and rolling before any intervention in the machine.
- It is forbidden to make any intervention in the machine, such as installation, adjustment, troubleshooting, cleaning, maintenance and repairs
 - When the machine is running
 - For as long as the tractor engine is running with a connected PTO shaft / hydraulic system.
 - When the ignition key is inserted in the tractor and the tractor engine with the connected PTO shaft / hydraulic system could be started unintentionally.
 - When the tractor and machine are not secured against unintentional rolling using their parking brakes and/or wheel chocks.
 - When moving parts are not blocked against unintentional movement.

During this work, there is particular danger from unintended contact with driven, unsecured operating elements.

1. Shut down the tractor engine.
2. Remove the ignition key.
3. Apply the tractor's parking brake.
4. Ensure that no persons (children) are on the tractor.
5. If necessary, lock the tractor cabin.

7 Coupling and uncoupling the machine



When coupling and decoupling the machine, comply with the chapter "Safety information for the user", page 23.



WARNING

Danger from crushing, catching, entanglement and / impacts caused by unintentional starting and rolling of the tractor when the tractor's PTO shaft and supply lines are coupled or decoupled!

Secure the tractor and machine against unintentional start-up and rolling, before entering the danger area between the tractor and machine when coupling or decoupling the PTO shaft. See page 62.



WARNING

Danger from crushing and impacts between the rear of the tractor and the machine during coupling/uncoupling.

- It is prohibited to operate the tractor's 3-point hydraulic system while persons are present between the rear of the tractor and the machine.
- Only actuate the operator controls for the tractor's three-point hydraulic system
 - from the intended workstation beside the tractor.
 - if you are outside of the danger area between the tractor and the machine.



CAUTION

Tipping hazard!

Couple and uncouple the winter service spreader only when it is empty.

7.1 Coupling the machine



WARNING

Danger from crushing and / or impacts when coupling the machine between the tractor and the machine!

Instruct people to leave the danger area between the tractor and the machine before you approach the machine.

Any helpers may only act as guides standing next to the tractor and the machine, and may only move between the vehicles when both are at a standstill.



WARNING

Risk of crushing, catching, entrapment and impacts when the machine is unexpectedly released from the tractor!

- Use the intended equipment to connect the tractor and the machine in the proper way.
- When coupling the machine to the tractor's three-point hydraulic system, ensure that the attachment categories of the tractor and the machine are the same.
- Be absolutely certain to upgrade the category I upper and lower link pins of the machine to category II using reducing sleeves if your tractor has a category II three-point linkage.
- Only use the upper and lower link pins provided to couple up the machine (original pins).
- Check the upper and lower link pins for visible defects whenever the machine is coupled. Replace the upper and lower link pins in the event of clearly visible wear.
- Secure the upper and lower link pins against unintentional release.
- Perform a visual inspection to ensure that the upper and lower link hooks are correctly locked before reversing the tractor.



WARNING

Danger of breaking during operation, insufficient stability and insufficient tractor steering and braking power on improper use of the tractor!

You may only connect the machine to tractors suitable for the purpose. For this, see the chapter "Checking the suitability of the tractor", page 56.



WARNING

Risk of energy supply failure between the tractor and the machine through damaged power lines!

During coupling, check the course of the power lines. The power lines

- must give slightly without tension, bending or rubbing on all movements of the connected machine.
- may not scour other parts.

1. Always check for visible damage when coupling the machine:

See the chapter "Obligation of operator" on page 9.

2. Direct people out of the danger area between the tractor and machine before you approach the machine with the tractor.
3. Reverse the tractor up to the machine so that the lower hinging points of the machine can pick up the lower link hooks of the tractor.
4. Secure the tractor against unintentional starting and unintentional rolling away. For this, see the chapter "Securing the tractor against unintentional starting and rolling", from page 62.
5. Fit the lower link on the lower link pins (Cat. I or II) and secure with a clip pin.
6. Fit upper link with upper link pin (Cat. I or II) and secure.
7. Couple the PTO shaft, see the chapter "Coupling the PTO shaft", from page 42.
8. Couple the hydraulic hose lines, see the chapter "Coupling the hydraulic hose lines", from page 45.
9. Couple the lighting system, see the chapter "Transportation equipment", page 33.

7.2 Uncoupling the machine



WARNING

Danger of injury due to the filled implement tipping.

Couple and uncouple the implement only when it is empty.



When uncoupling the machine, there must always be enough space in front of the machine, so that you can align the tractor with the machine if necessary.

1. Always place the machine with empty hopper on a horizontal storage space with a solid base.
2. Always check for visible damage when uncoupling the machine. See the chapter "Obligation of operator" on page 9.
3. Secure the tractor against unintentional starting and rolling away, see the chapter "Securing the tractor against unintentional starting and rolling away", from page 62.
4. Uncouple the PTO shaft, see the chapter "Uncoupling the PTO shaft", from page 43.
5. Uncouple the hydraulic hose lines, see the chapter "Uncoupling the hydraulic hose lines", from page 46.
6. Uncouple the lighting system, see the chapter "Transportation equipment", page 33.
7. Relieve the load from the top link.
8. Uncouple the top link.
9. Relieve the load from the lower link.
10. Uncouple the lower link.

8 Adjustments



When performing any adjustment work on the machine, observe the information in the following chapters

- "Warning pictograms and other labels on the machine" from page 16 and
- "Safety information for the operator" from page 23.

Observing this information is important for your safety.



WARNING

Danger of, shearing, cutting, entrapment, entanglement, being drawn in, caught or struck during all adjustment work on the machine

- **due to unintentional contact with moving operating elements (spreading vanes of rotating spreading discs).**
- **due to tractor and connected machine unintentionally starting up or rolling away.**
- Secure the tractor and the machine against unintentional start-up and rolling, before adjusting the machine. See page 62.
- Only touch moving operating elements (rotating spreading discs) when they have come to a complete standstill.



WARNING

Risk of contusions, catching and knocks during all adjustment work on the machine due to unintentional lowering of the coupled and raised machine.

Secure the tractor cabin against entry of other persons to prevent unintentional actuation of the tractor's hydraulic system.

Please note that the individual spreading properties of the spread material have a significant influence on the lateral distribution and spread rate. For this reason, the listed setting values should only be considered as a reference.

The spreading properties depend on the following factors:

- The fluctuations in the physical data (specific weight, grain size, frictional resistance, cw value, etc.) within the same type and brand
- The different properties of the spread material due to weather factors and/or storage conditions.

As a result of this, we cannot guarantee that your spreading material, even with the same name and from the same manufacturer, has the same spreading properties as the listed spreading material. The specified setting recommendations for the lateral distribution are based exclusively on the weight distribution and not on the nutrient distribution (this applies particularly for mixed fertilisers) or the active substance distribution (e.g., for slug pellets or lime). Claims for damages not caused by the centrifugal spreader itself are excluded.

Adjustments



Use the setting chart data to adjust the implement.

Adapt the setting if necessary to the individual spreading properties of the spreading material.

8.1 Settings with the values from the setting chart

(3) Short spreading vane (110 mm)				(3) Long spreading vane (170 mm)			
(2) Working width	(4) Spreading width limiter	(5) Spreading disc speed	(6) Delivery point	(2) Working width	(4) Spreading width limiter	(5) Spreading disc speed	(6) Delivery point
1	0	2	G	1	-	-	-
2	40	4	G	2	-	2	B
3	50	6,5	I	3	-	4	B
4	70	8	I	4	-	6	C
5	90	10	I	5	-	7	C
6	-	-	-	6	-	8	C
7	-	-	-	7	-	9	C
8	-	-	-	8	-	10	C

(1) De-icing salt (loose bulk density : 1,29 kg/l)									
Spread rate	(7)	(2) 1 m Working width			(7) Shutter position				
	g/m ²								
	10	9	10	10	↓	11	12	14	
	→ 20			→	13	14	15	17	
	30	12	13	14	↑	16	17	20	
km/h	40	13	14	15		18	19	22	
		6	8	10	12	15	20	30	

- (1) Select spreading material.
- (2) Select working width.
- (3) Look for values for long or short spreading vanes.
- (4) Mechanical spreading disc drive:
Set value for spreading width limiter.
- Or:
- (5) Hydraulic spreading disc drive:
Set value for spreading disc speed.
- (6) Set value for delivery point.
- (7) Set value for shutter position according to the desired forward speed and desired spread rate.



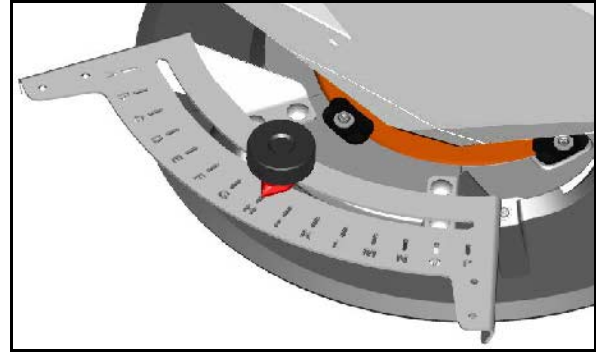
EasySet with forward speed-proportional rate control:

Only select the values for the spread rate in the setting chart EasySet, see on page 110.

8.2 Setting the delivery point

Turn the floor assembly to the value (A - P) specified in the setting chart.

1. Loosen knob.
2. Turn the floor assembly until the pointer stands at the desired scale value.
3. Tighten knob.



8.3 Setting the working width

The working width depends on:

- on the spreading material
- on the mounted spreading vanes (long -170 mm / short -110 mm)

For the adjustment:

- use the setting values from the setting chart.
- Perform a visual check during operation and optimise the setting if necessary.



When changing the working width, the spread quantity (scale value) must be adapted to ensure a constant area-specific spread rate.

8.3.1 Adjusting the working width with the spreading width limiter

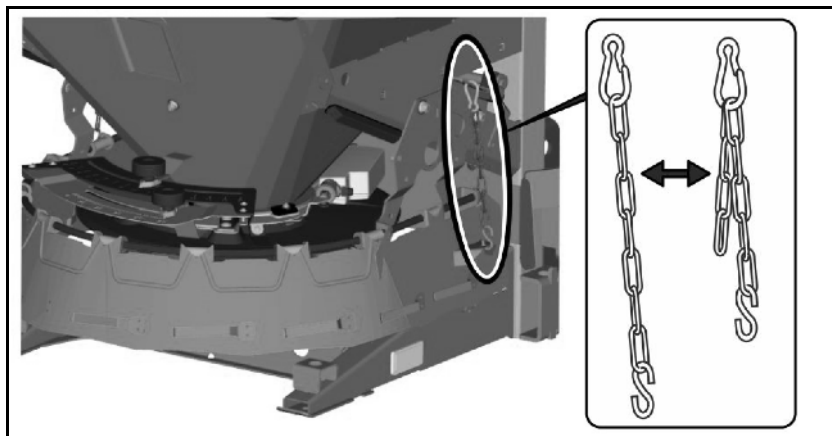
Raise the spreading width limiter by the angle specified in the setting chart.

Value 0: Spreading width limiter raised to maximum setting.

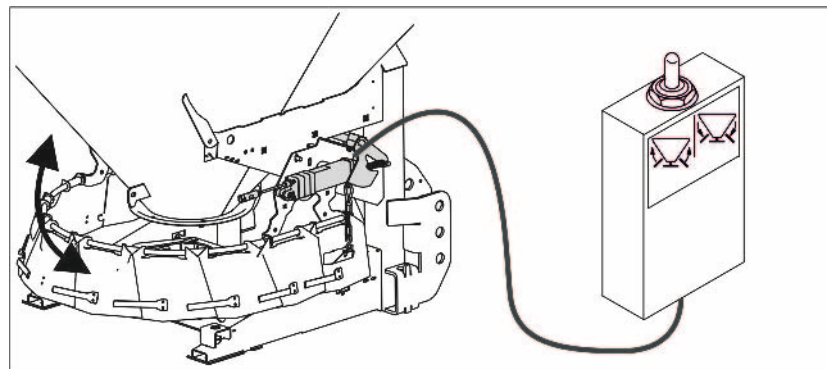
Value 90: Spreading vane limiter lowered to maximum setting.

Depending on the equipment, adjust the spreading width:

- Adjust the setting on both sides using the chain suspension. To do so, hook a chain link onto the locking hook and thus raise / lower the spreading width limiter.



- Electrical adjustment using the dashboard / EasySet.
See section on EasySet operating computer
- Electrical adjustment using the dashboard.



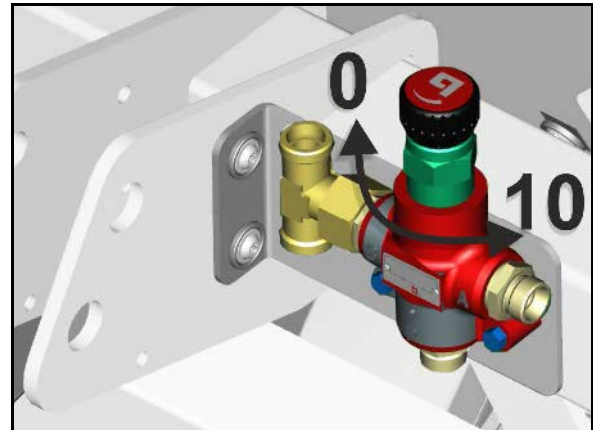
8.3.2 Setting the working width via the spreading disc speed

Flow control valve:

Set the flow control valve to the value specified in the setting chart.

Value 0: Minimum spreading disc speed

Value 10: Maximum spreading disc speed



EasySet:

Enter the value specified in the setting chart on the EasySet.

Value 0: Minimum spreading disc speed

Value 10: Maximum spreading disc speed

→ See section on the EasySet operating computer.

Oil volume flow control of the tractor:

Calculate the hydraulic oil flow according to the value required in the setting chart or read it from the table.

Calculate the required hydraulic oil flow:

Hydraulic oil flow [l/min] =	$\frac{165 \text{ ccm} \times \text{spreading disc speed [rpm]}}{1000}$
------------------------------	---

Hydraulic oil flow chart:

From the setting chart: Value for the spreading disc speed	Hydraulic oil flow [l/min]	Spreading disc speed [rpm]
0,5	9,5	60
1	11,5	70
2	14,5	90
3	18	110
4	22,5	140
5	26	160
6	30	190
7	35,5	220
8	41	255
9	46	285
10	50	310

8.3.3 Checking the spreading width

Check the set working width with the aid of

- a yard stick or
- by sight.

If the actual and the required working width do not coincide, re-adjust the selected working width setting.

Correction of working width setting:

Increasing the working width:

- Lift the spread width reducer by shortening the chain.
- Increase the drive speed of the spreading disc.

Reducing the working width

- Lower the working width reducer by extending the chain.
- Reduce the drive speed of the spreading disc.

8.4 Adjusting the mounting height

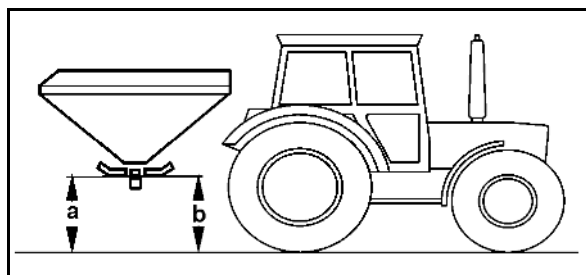


WARNING

Danger of crushing and / or impact for persons behind / under the winter service spreader due to unintentional dropping of the winter service spreader if the upper link halves are accidentally rotated apart or tear apart!

Make sure no persons are present in the danger area behind or below the machine before adjusting the mounting height via the upper link.

Set the exact mounting height of the machine in the field according to the information in the setting chart with the machine loaded. The measurement is taken at the front and rear of the spreader discs, each beginning at the ground surface



1. Switch off the universal joint shaft of the tractor (if necessary).
2. Wait until rotating spreading discs come to a complete standstill (if necessary) before adjusting the mounting height.
3. Direct persons away from the danger zone behind or under the machine.
4. Adjust the required mounting height on the field as per the specifications in the setting chart for the required fertiliser type.
 - 4.1 Raise or lower the winter service spreader via the tractor's three-point hydraulic system until the spreader disc at the side in the centre reaches the required mounting height.
 - 4.2 Change the length of the upper link if the mounting heights a and b on the front and reverse side of the spreading discs deviate from the required mounting heights.

8.5 Setting the spread rate

The shutter slide position depends on

- the kind of spreading material and its characteristics (granular, coarse/fine, moist, dry).
- the desired spreading width [m].
- the desired operational speed [km/h].
- the desired spread rate [g/m²].

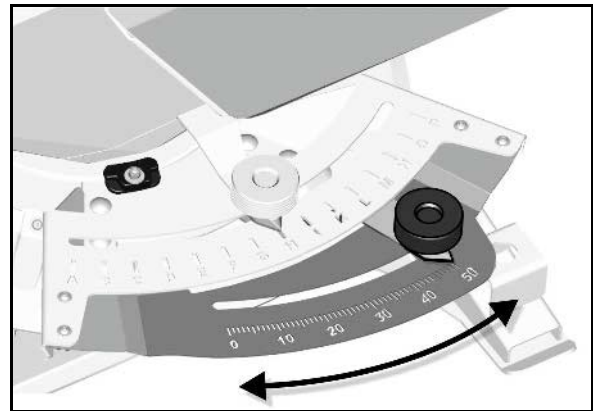
Moving the shutter slide lock to a higher figure of the scale means:

- larger opening diameter of the discharge openings.
- increased spread rate.

The spread rate is set according to experience values or details from the setting chart.

Spread rate setting with manual shutter control

1. Loosen knob.
2. Rotate the pointer until it stands at the desired scale value.
3. Tighten knob.



The EasySet operating computer is used to set the spread rate by means of the electric shutter control.

8.6 Spread rate check

The spread rate [g/m²] depends on:

- the shutter position.
- the operational speed.
- the PTO shaft rev. speed.
- condition of spreading material (granular, coarse/fine, moist, dry)

A spread rate check is recommended with any change of spreading material or when it changed its condition.

The **spread rate check** can be performed at a standstill if the working speed of the tractor is known.

The spread rate check compares the volume flowing out of the implement within one minute to the theoretical value.



EasySet with forward speed-proportional spread rate:

During the spread rate check, always assume a forward speed of 12 km/h.

1. Calculating the required target spread rate TR [g/min]

$$TR [g/min] = 16.66 SR [g/m^2] \times V [km/h] \times AB [m]$$

- **TR**: Required target spread rate [g] per unit time [min]
- **SR**: Desired spread rate [g] per unit area [m²] (spreading density)
- **V** – Forward speed [km/h]
- **AB** – Working width [m]

Example:

- **TR**: =?
- **SR**: = 20 g/m²
- **V** – 12 km/h
- **AB** – 2m

$$TR [g/min] = 16.66 \times 20 [g/m^2] \times 12 [km/h] \times 2 [m]$$

$$= 7997 \text{ g/min} \sim 8 \text{ kg/min}$$

2. Performing the spread rate check

- 2.1 Spread out foil under the winter service spreader
- 2.2 Lower the winter service spreader to its lowest position.
- 2.3 Set the spreading width limiter (if equipped) to its lowest position.

Otherwise:

Limit the throw distance of the implement by other means (possibly drive backwards into a garage)

2.4 Mechanical spreading disc drive:

Set a constant PTO shaft speed (e.g. **540 rpm**)

Hydraulic spreading disc drive:

Set the spreading disk speed according to setting chart.

- 2.5 Open the shutter for exactly 1 minute at the desired shutter position.
- 2.6 Collect and weigh the spread quantity.

3. Compare the weighed spread quantity to the theoretical spread quantity TR.

- Weighed spread quantity is greater than theoretical spread quantity.
→ Set the shutter to a lower value.
- Weighed spread quantity is smaller than theoretical spread quantity.
→ Set shutter to a higher value



If the actual and the desired spread rate do not coincide, re-adjust the shutter slide position. If necessary repeat the spread rate check.



During the spread rate check be aware of rotating implement parts and spreading material particles being thrown around. Danger of injury.

9 EasySet control computer

The EasySet operating computer serves to operate the implement from the tractor.

Functions of the EasySet operating computer:

- Starting up / shutting down the implement from the tractor.
 - Opening / closing the shutter.
 - Switching the hydraulic spreading disc drive on / off.
- Spread rate adjustment from the tractor.
- Forward ground speed-related control of the spread rate (only in Mode 4 and 5 with speed signal from the tractor)
- Working width adjustment from the tractor.

The working width is adjusted via the spreading disc speed (hydraulic spreading disc drive) or via the spreading width limiter.

(1) Switch On and Off button

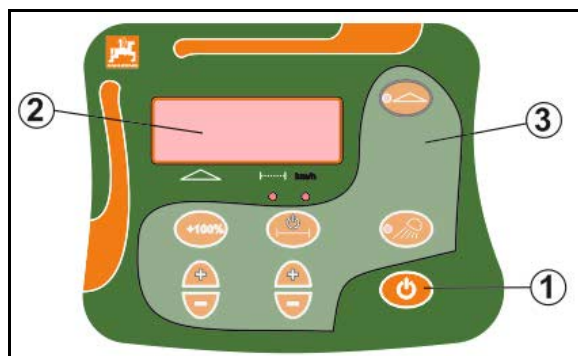
After switching on:

- The installed software version is briefly shown,
- The set mode (type) is briefly shown,
- The work screen (the set spread rate and the set working width) is shown.

(2) Display

(3) Function keys

Some with LED for showing the activated function




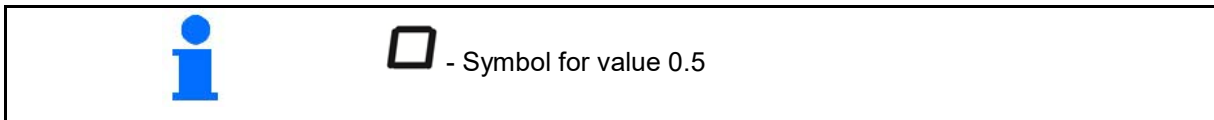
When keeping the button pressed, the values are scrolled through rapidly to reach the required value.

Display

(1) Display of the value for the spread rate

The value is also shown when the shutter is closed.

- Value 1 – lowest spread rate
- Value approx. 50 – maximum spread rate
-  – Symbol for the value 0.5 (here 37.5).



(2) Display of the working width (Mode 2, 3)

The display is also shown when the spreading width limiter is raised.

Spreading width limiter:

- o Value 0 – Spreading width limiter all the way up (largest working width)
- o Value 90 – Spreading width limiter all the way down (smallest working width)

Spreading disc speed:

- o Value 0 – Minimum spreading disc speed (smallest working width)
- o Value 10 – Maximum spreading disc speed (largest working width)



(3) Display of the forward speed (Mode 4, 5)



9.1 Selecting the EasySet operating mode



Check that the mode is correctly set before operation.

The mode is displayed briefly when switching on the EasySet.



The mode to be selected depends on:

- the tractor with or without speed signal.
- the implement with mechanical or hydraulic spreading disc drive.

Mode 1: do not select!

Mode 2:

- Shutter control (without speed signal from the tractor)
- Setting the working width via the spread deflector

Mode 3:

- Shutter control (without speed signal from the tractor)
- Hydraulic spreading disc drive

Mode 4:

- Ground speed-related shutter control (speed signal from the tractor)
- Setting the working width via the spread deflector

Mode 5:






- Ground speed-related shutter control (speed signal from the tractor)
- Hydraulic spreading disc drive





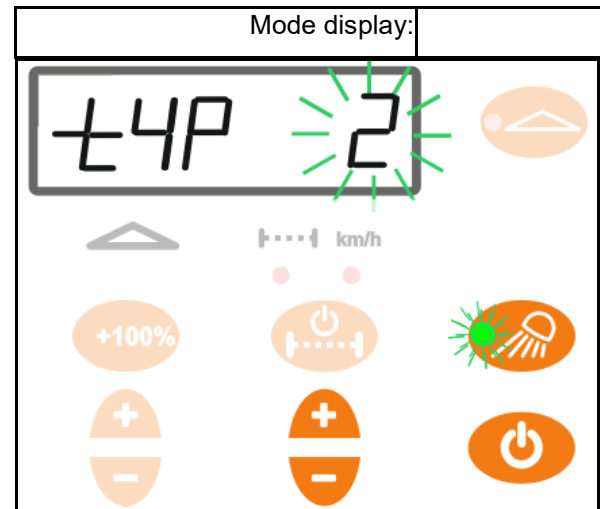
Mode 4 is set after a reset!!

Setting the mode


EasySet is switched off!

1. Press and hold , and press  at the same time and hold until the display permanently shows **type**.
2.  /  Set mode (type)
→ Changed mode display flashes.
3.  Save entry.
→ Mode is saved, EasySet will be switched off.

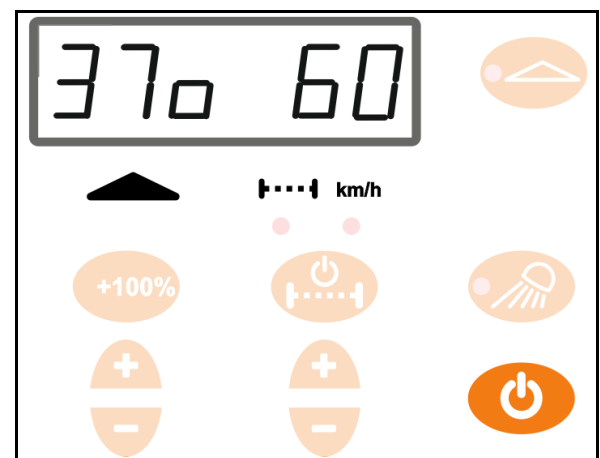
  Abort configuration without saving.




Switching on the EasySet

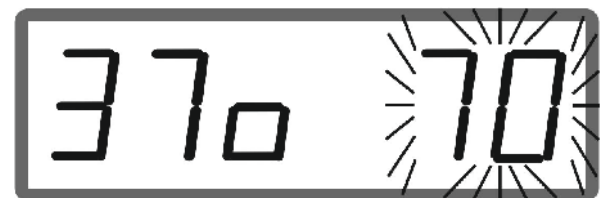
 After switching on

- The mode set appears briefly.
- A check is run to see if the real shutter position corresponds to the theoretical position from the EasySet.
- The work screen with the set values appears



A flashing display shows that the shutter position or the spreading width limiter is not synchronised.

-  Synchronise the shutters.
-  Synchronise the spreading width limiters.



9.2 Functions

Opening / closing the shutter



Open/close the shutter.

- The shutter opens when starting to drive.
- The LED shows which shutter is open.
- The set value is also shown when the shutter is closed.



If the shutter is closed when the hydraulic spreading disc drive is switched on, the spreading disc speed is automatically reduced.

- A low agitator speed protects the spreading material.



Pre-metering when starting to drive (only in Mode 4, 5)



Press and hold the button for 2 seconds.

- Shutter opens directly up to the target value, light diode flashes.
- As soon as a forward speed of 2 km/h is reached, the ground speed-related shutter control takes effect.

Setting the spread rate via the shutter opening

Take the value for the shutter position from the setting chart for the desired spread rate [g/m²] or use the result of the spread rate check.

In Mode 2, 3:

Use the value for the shutter position for the intended working speed.

In Mode 4, 5:

Always use the value for the shutter position at 12 km/h! Even if the working speed used later is not 12 km/h.

- Enter values for the shutter position before operation.
- Values can be changed during operation.



rates.



Enter a higher value for higher spread

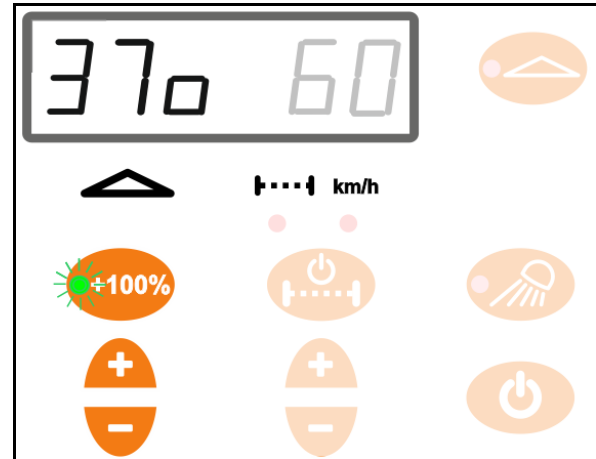


rates.

Enter a lower value for lower spread

To briefly increase the spread rate

1.  To briefly increase the spread rate under special circumstances (for example higher requirement for winter road maintenance on bridges).
 - The rate display on the screen remains the same.
 - LED is illuminated when the rate increase is active.
2.  Reduce spread rate back to the target value



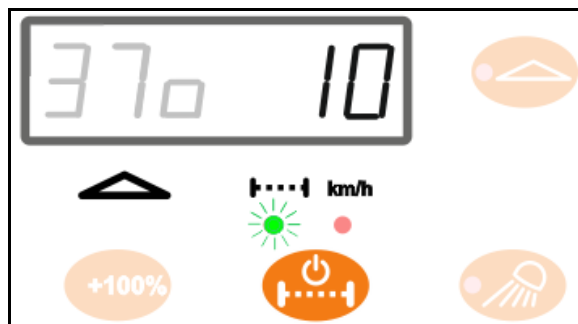
Switching the hydraulic spreading disc drive / spreading width adjustment

Hydraulic spreading disc drive:



Switch the hydraulic spreading width drive on (press and hold switch for 3 seconds) / off.

- The light diode displays the driven spreading disc.
- The spreading disc speed entered is displayed as a value (0 to 10).
- The value for the spreading disc speed is displayed even if the spreading disc has come to a standstill.

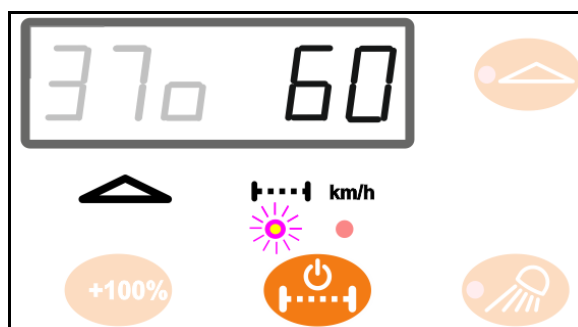


Mechanical spreading disc drive:



Raise / lower spreading width setting to target value

- The LED indicates the lowered spreading width setting.
- The spreading width limiter lowers until the set value for the working width.
- The value for the working width is also displayed when the spreading width limiter is raised.



Adjust the working width

Mechanical spreading disc drive:

The working width is set via the spreading width limiter (here always set the PTO shaft speed at 540 rpm).

Value range from 0 (smallest working width) to 90 (largest working width).

Hydraulic spreading disc drive:

The working width is set via the spreading disc speed.

Value range from 0 (smallest working width) to 90 (largest working width) in increments of 0.5.



Adjust the value for the spreading width setting such that the rate setting from the setting chart fits with the indicated working width.

- Enter the values from the setting chart or experiential values for the working width before operation.
- Values can be changed during operation.



Enter a higher value for larger working widths.

Hydraulic spreading disc drive:

→ Increase spreading disc speed

Mechanical spreading disc drive:

→ Raise the spreading disc limiter further.



Enter a lower value for smaller working widths.

Hydraulic spreading disc drive:

→ Reduce the spreading disc speed

Mechanical spreading disc drive:

→ Lower the spreading disc limiter further.

- Quick adjustment: Press buttons longer.
- The last entered value is saved.

Mode 4, 5

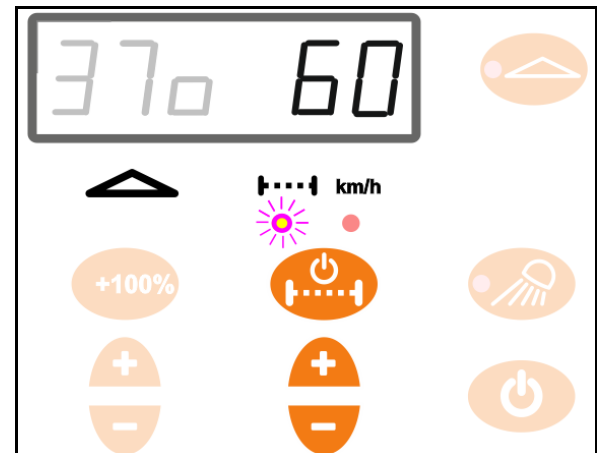
The working width does not appear on the work screen.



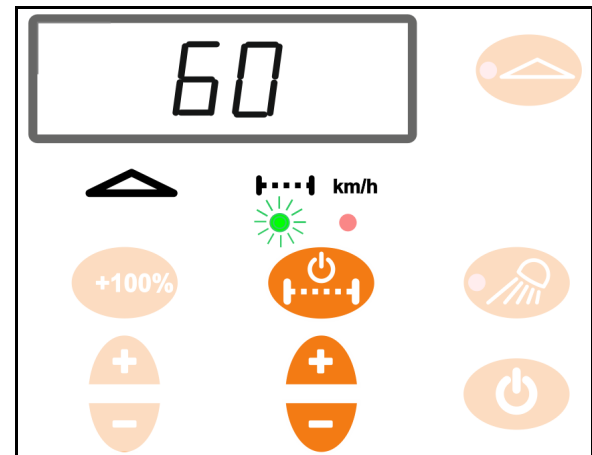
To check the set working width.

→ The first time the button is pressed, the working width is only displayed and is not changed.

Display in Mode 2,3:



Display in Mode 4, 5:



If the working width is changed, the area-specific spread rate is also changed [g/m²]. Change the value for the shutter position accordingly.

Work lights / dimming display



Switch the work lights on/off / dimming display

→ The LED indicates whether the work lights are switched on.

→ The display is dimmed.

Only use LED lamps (maximum 2 A)



During road transport, keep the work lights switched off.

9.3 Calibrate pulses per 100 m



The operating computer requires the calibration value "Pulses per 100m" to:

- determine the actual forward speed [km/h].
- calculate the speed-proportional shutter position.

If the calibration value is not known, it must be determined by means of a "Pulses per 100 m" calibration run.

You can enter the "Pulses per 100m" calibration value manually in the if the precise calibration value is known.



Always determine the precise calibration value for "Pulses per 100 m" by means of a calibration run:

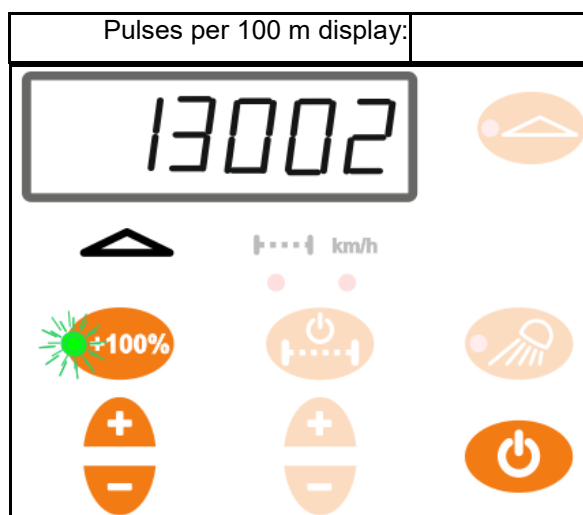
- before initial operation.
- when using a different tractor or after changing the tractor tyre size.
- if there are differences between the measured and actual forward speed.
- if there are differences between the desired and actual spread rate.
- if there are different soil conditions.

The "Pulses per 100 m" calibration value must be determined under the prevailing operating conditions. If operation is carried out with all-wheel drive switched on, you must also switch on the all-wheel drive when determining the calibration value.

EasySet is switched off!



Press and hold  , and press  at the same time and hold for 5 seconds.

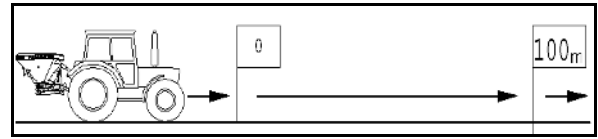
→ Pulses per 100 m display appears.





The required minimum value for the pulses per 100 m is of 250.






Determining the pulses per 100 m

1. Measure a calibration distance of exactly 100 m.
2. Mark the start and end points.
3. Drive up to the start point.
4. Press and hold  for 2 seconds.
 - Display 0 pulses
5. Drive the calibration distance of exactly 100 m and come to a stop.
 - Display pulses per 100 m.
6.  Save pulses per 100 m.
 - Calibration procedure is completed. EasySet will be switched off.



-   Abort calibration without saving.

Entering the pulses per 100 m

1.  /  Set the pulses per 100 m.
 - Pressing and holding the button increases the counting rate by two steps.
 2.  Save the pulses per 100 m.
 - EasySet will be switched off.
-   Abort calibration without saving.



 EasySet must be calibrated in the following situations:

- After working on the base plate or replacing the metering motor.
- If the desired and actual spread rate do not concur.



1. Press and hold , and press  at the same time and hold until the display permanently shows **CAL.**

Metering shutter voltage in volts:

Closed	open	
--------	------	--


The screenshot shows a digital display with two values: 2.50 and 2.48. Below the display are several icons: a roof icon, a battery level indicator (four dots), a power button, a sun icon, a plus/minus button, a battery level indicator (four dots), a sun icon, and a power button.

-

  Abort calibration without saving.

9.5 Restoring the terminal to factory settings (reset).

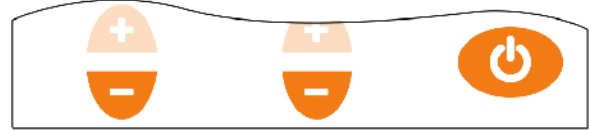
1. Press  and  simultaneously.

2.  Switch off the EasySet.

→ The EasySet is restored to the factory settings.

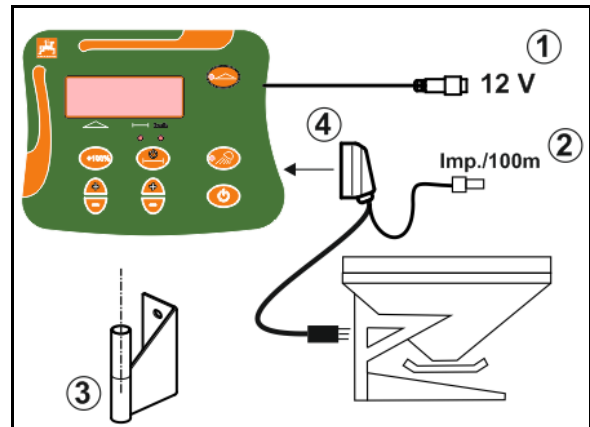


After resetting, the EasySet must be calibrated.



9.6 Connection

- (1) Connection cable 12V
- (2) Connection cable for the speed signal
For ground speed-related spread rate control (Mode 4, 5), the connection cable for the speed signal (pul./100m) must be connected to the signal socket or to a wheel sensor.
- (3) Equipment for installing the EasySet in the tractor cab
- (4) Implement plug to connect the implement to the EasySet.



Store the operating computer in a dry place when you remove it from the tractor cab.

9.7 Error messages

Error messages are identified with an E (error).

- E06 – The shutter setting motor is not reacting
- E11 – Target value cannot be maintained → Reduce the forward speed.
- E32 – The setting motor for the spreading width limiter is not reacting
- E39 – Shutter sensor failure
- E41 – Spreading width limiter sensor failure

After switching the EasySet back on after a spreading width limiter sensor failure, the electric setting of the spreading width limiter will be logged off.



10 Transportation



- Comply with the chapter "Safety information for the user", from page 25 when moving.
- Before moving off, check:
 - The correct connection of the supply lines
 - The lighting system for damage, function and cleanliness
 - The brake and hydraulic system for visible damage



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through unintentional releasing of the coupled machine!

Carry out a visual check that the upper and lower link pins are firmly fixed with the lynch pin against unintentional release.



WARNING

Risk of contusions, cuts, dragging, catching or knocks from tipping and insufficient stability.

- Drive in such a way that you always have full control over the tractor with the attached machine.
In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected machine.
- Before transportation, fasten the side locking of the tractor lower link, so that the connected or coupled machine cannot swing back and forth.



WARNING

Danger of breaking during operation, insufficient stability and insufficient tractor steering and braking power on improper use of the tractor!

These risks pose serious injuries or death.

Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor. If necessary, drive only with a partially filled hopper.

**WARNING****Risk of falling from the machine if riding against regulations!**

It is forbidden to ride on the machine and/or climb the running machine.



- During road transport, only lift the winter service spreader until the top edge of the reflector is no more than 900 mm above the road surface.
- Secure the machine against unintentional lowering before driving on the road!
- EasySet: Disconnect the power supply.

**CAUTION**

- Switch the work lights off during transport to avoid blinding other motorists.

11 Use of the machine



When using the machine, observe the information in the following sections:

- "Warning pictograms and other labels on the machine"
- "Safety information for the user", on page 23 ff.

Observing this information is important for your safety.



WARNING

Danger from catching, entanglement, pulling in or entrapment due to accessible moving elements (e.g. agitator shaft, spreader discs)!

Only start up the machine, when all the safety equipment has been attached and is in the safety position.



WARNING

Danger from catching, entanglement, pulling in or entrapment due to accessible moving elements (e.g. agitator shaft, spreading discs)!

Only start up the machine, when all the safety equipment has been attached and is in the safety position.



WARNING

Danger from catching, entanglement, pulling in or entrapment during machine operation due to accessible powered elements of the machine.

- Only start up the machine, when all the safety equipment has been attached and is in the closed position.
- It is forbidden to open the safety equipment
 - when the machine is running
 - for as long as the tractor engine is running with a connected PTO shaft/hydraulic system.
 - when the ignition key is inserted in the tractor and the tractor engine with the connected turbine shaft / hydraulic system could be started unintentionally.



WARNING

Danger from ejected, damaged components caused by impermissibly high drive speeds of the tractor universal joint shaft!

Observe the approved machine drive speed before switching on the tractor universal joint shaft.


WARNING

Danger from being entangled and drawn in and danger from foreign objects being caught and thrown in the danger area of the driven PTO shaft!

- Whenever the machine is used, first check to ensure that the safety devices and guards of the PTO shaft are fully intact and functional.
Have damaged safety devices and guards of the PTO shaft replaced immediately by a specialised workshop.
- Check that the PTO shaft guard is secured against rotation by the supporting chain.
- Maintain a sufficient safety clearance between you and the driven PTO shaft.
- Direct people out of the danger area of the driven PTO shaft.
- Shut down the tractor engine immediately in case of danger.


WARNING

Risk of contusions, cutting, catching, drawing in and knocks through unintentional releasing of the coupled machine!

Before each use of the machine, carry out a visual check that the upper and lower link pins are firmly secured against unintentional release.


WARNING

Danger of catching or entanglement and drawing in or entrapment of loose clothing by moving elements (rotating spreading discs)!

Do not wear loose-fitting clothing. Tight clothing reduces the risk of unintentional catching or entanglement and drawing in or entrapment by moving elements.



- For new machines, after 3-4 full hopper loads, check that the screws are tight and retighten if necessary.
- Only use well-granulated spreading materials that are listed in the setting chart. Perform a spread rate check if it is not known.
- After each use, remove the spreading material sticking to the spreading vanes!



- The max. joint angle of a cross joint on the PTO shaft must not exceed 25°.
- Always switch off the universal joint shaft if joint angles are exceeded or if it is not needed!
- To avoid damage, couple the universal joint shaft slowly and only at low tractor engine speed!

11.1 Filling



WARNING

Danger of breaking during operation, insufficient stability and insufficient tractor steering and braking power on improper use of the tractor!

Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor. If necessary, drive only with a partially filled hopper.



- Remove residues or foreign bodies from the hopper before filling with fertiliser.
- Observe the permissible payload for the winter service spreader (see technical data) and axle loads of the tractor, if necessary, only drive on public roads with a partially filled hopper!
 - Here, the specific spreading material weight [kg/l] must be taken into account. Depending on the condition of the spreading material (moist or dry), different specific weights are obtained.
 - Before filling the hopper, check the specific weight of your spreading material. Weigh exactly 1 litre of spreading material, the weight delivers the specific weight [kg/l].
- Observe the permitted payload of the spreader (see technical data) and axle loads of the tractor.
- Only fill the hopper when the sliders are closed.
- Be sure to observe the safety instructions from the spreading material manufacturer. Use suitable protective clothing if necessary.



CAUTION

Tipping hazard!

- Never fill a winter service spreader unless it is hitched to the tractor.
- Never unhitch a multi-purpose spreader



E+S H with finger agitator:

After filling, briefly drive the spreading disc until the finger agitator is positioned vertically.

This makes it easier for the spreading disc to start up when starting work.



Therefore, when filling the winter service spreader observe that the required towing vehicle front axle load is maintained (20 % of the vehicle's empty weight, however, also refer to the instruction manual of the vehicle manufacturer).



- To avoid a grinding of the spreading material and thus an increased wear of the agitator and the float hopper bottom open the shutters wide enough so that an unhindered flow of the spreading material is ensured.
- especially important with grit!
- Spreading material which has frozen overnight may cause damage on the agitating device when switching on the spreading disc drive.

11.2 Calculating the spreading distances

The maximum possible distance to be spread with one hopper filling depends on:

- the quantity of spreading material carried
- the spreading thickness (g/m²)
- the working width (m)

The spreading distance can be determined as follows:

$$\frac{\text{Hopper volume}}{\text{spreading thickness}} = \text{spreading distance}$$

(for 1 m working width)

Example:

Hopper quantity 300 kg (300,000 g)

Spreading thickness 30 g/m²

Spreading distance with **1 m** spreading width:

$$\frac{300.000}{30} = 10 \text{ km}$$

spreading distance

Spreading distance with **4 m** spreading width:

$$\frac{10 \text{ km}}{4} = 2,5 \text{ km}$$

spreading distance

11.3 Spreading operation



- The spreading vanes and swivel blades are made of especially hard-wearing stainless steel. However, the spreading vanes are wearing parts.



WARNING

Danger of ejection of parts of the spreading vanes, caused by worn spreading vanes!

Every day, at the start and end of spreading work, check all spreading vanes and swivel blades for visible damage/defects. Refer to the criteria for the replacement of wearing parts in the chapter "Replacing spreading vanes", page 103.



WARNING

Danger from materials or foreign objects that are thrown from or ejected by the machine at high speeds.

- Make sure that uninvolved persons are kept well clear of the danger area of the machine in the following situations:
 - Before you switch on the power for the spreading discs.
 - Before you open the slider.
 - While the tractor engine is running.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through insufficient stability and tipping of the tractor and/or the connected machine.

Drive in such a way that you always have full control over the tractor with the attached machine.

In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the driver and the connected machine.



CAUTION

Danger from failure of the PTO shaft in case of excessive bending of the driven PTO shaft!

Observe the permitted bending of the driven PTO shaft when lifting the machine. Excessive bending of the driven PTO shaft causes increased, premature wear to or immediate destruction of the PTO shaft.

Switch off the universal joint shaft of the tractor immediately if the lifted machine makes a lot of noise while running.


WARNING

Danger of being entangled and drawn in event of contact with the driven agitator when climbing onto the machine!

- Never climb on the machine when the tractor engine is running.
- Secure the tractor and the machine against unintentional start-up and rolling before climbing onto the machine.


WARNING

Danger of being caught and drawn in with driven agitator!

Never insert any objects through the guard and function screen while the tractor engine is running.

- The winter service spreader is coupled to the tractor and the supply lines are connected.
- The settings have been configured.
- 1. Couple the universal joint shaft at a low tractor engine speed or switch on the hydraulic fluid supply.



- Mechanical spreading disc drive: Standard spreading disc speed: 280 rpm.
Set PTO shaft speed to 540 rpm, if not otherwise specified in the setting chart.
- Provide the necessary hydraulic oil volume flow from the tractor.

2. Open the shutter and move off.
3. When you have finished spreading:
 - 3.1 Close the shutter.
 - 3.2 Decouple the universal joint shaft at a low tractor engine speed or switch off the hydraulic fluid supply.



- After long transport with a full hopper, ensure that the spreading rate is correct before spreading begins.
- Maintain a constant spreader disc speed.

12 Faults



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through

- **Unintentional falling of the machine raised using the tractor's three-point hydraulic system.**
- **Unintentional falling of raised, unsecured machine parts.**
- **Unintentional start-up and rolling of the tractor-machine combination.**

Secure the tractor and the machine against unintentional start-up and rolling, before eliminating faults on the machine. See page 62.

Wait for the machine to stop before entering the machine danger area.

EasySet: Disconnect the power supply.

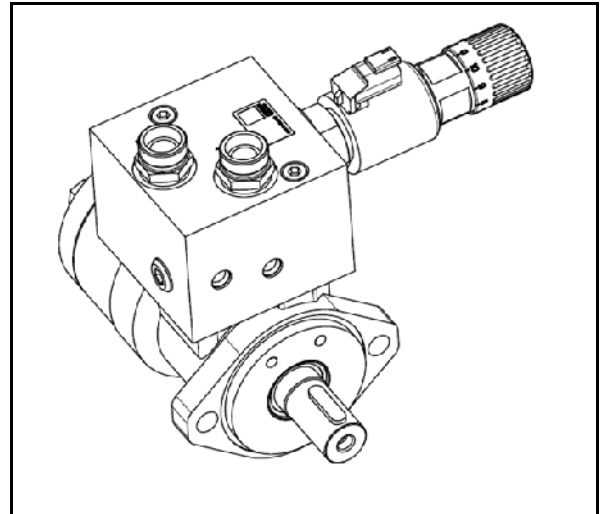
Fault	Cause	Remedy
EasySet: Shutter closes	The shutter is blocked due to foreign objects in the outlet opening	<ul style="list-style-type: none"> • Switch the EasySet off and back on again. → After switching on, the shutter can be moved within 5 seconds without actuating force limit.
No spreading material is discharged from hopper.	Shutter is not open wide enough.	<ul style="list-style-type: none"> • Open shutter further so that also coarse spreading material can pour out. • If necessary, briefly open shutter completely.
	Agitator shear-off safety device is broken.	<ul style="list-style-type: none"> • Replace shear-off safety device.
Set spread rate is incorrect	Spreading material is not identical to spreading material as per setting chart.	<ul style="list-style-type: none"> • Check quantity. • Adjust quantity setting.
Working width is incorrect	Wrong spreading vanes fitted.	<ul style="list-style-type: none"> • Fit correct spreading vanes.
	Spreading width limiter is not correctly set	<ul style="list-style-type: none"> • Set the correct value for spreading width limiter.
	Oil quantity from tractor is incorrect.	<ul style="list-style-type: none"> • Select suitable tractor speed.
	Oil quantity on the E+S is not correctly set	<ul style="list-style-type: none"> • Set the correct oil quantity.
	Universal joint shaft speed is incorrect.	<ul style="list-style-type: none"> • Use tractor with correct universal joint shaft nominal speed. • Select suitable tractor speed.

12.1 Emergency actuation of the EasySet spreading disc drive

Continuing work after failure of the EasySet hydraulic spreading disc drive.

Set the handwheel on the hydraulic block according to the specification in the setting chart (1-10).

After fixing the malfunction, set the handwheel back to 0.



13 Cleaning, maintenance and repairs



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through

- Unintentional falling of the machine raised using the tractor's three-point hydraulic system.
- Unintentional falling of raised, unsecured machine parts.
- Unintentional start-up and rolling of the tractor-machine combination.

Secure the tractor and machine against unintentional start-up and rolling, before carrying out cleaning, maintenance or repair work on the machine when coupling or decoupling the machine. See also page 62.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through unprotected danger points!

- Mount protective equipment, which you removed when cleaning, maintaining and repairing the machine.
- Replace defective protective equipment with new equipment.



WARNING

When carrying out maintenance work on raised equipment, always secure by means of suitable support elements!



CAUTION

After the universal joint shaft has been switched off, there is danger from the after-running centrifugal mass! Wait for all rotating parts to be at a complete standstill before carrying out any work on the machine.

13.1 Cleaning

Cleaning with a high pressure cleaner / steam jet



- Always observe the following points when using a high pressure cleaner / steam jet for cleaning:
 - Do not clean any electrical components.
 - Do not clean any chromed components.
 - Never aim the cleaning jet of the cleaning nozzle of the high pressure cleaner/steam jet directly at lubrication points, bearings, rating plates, warning signs, and stickers.
 - Always maintain a minimum jet distance of 300mm between the high pressure cleaning or steam jet cleaning nozzle and the machine.
 - The set pressure of the high-pressure cleaner/steam jet must not exceed 120 bar.
 - Comply with safety regulations when working with high pressure cleaners.

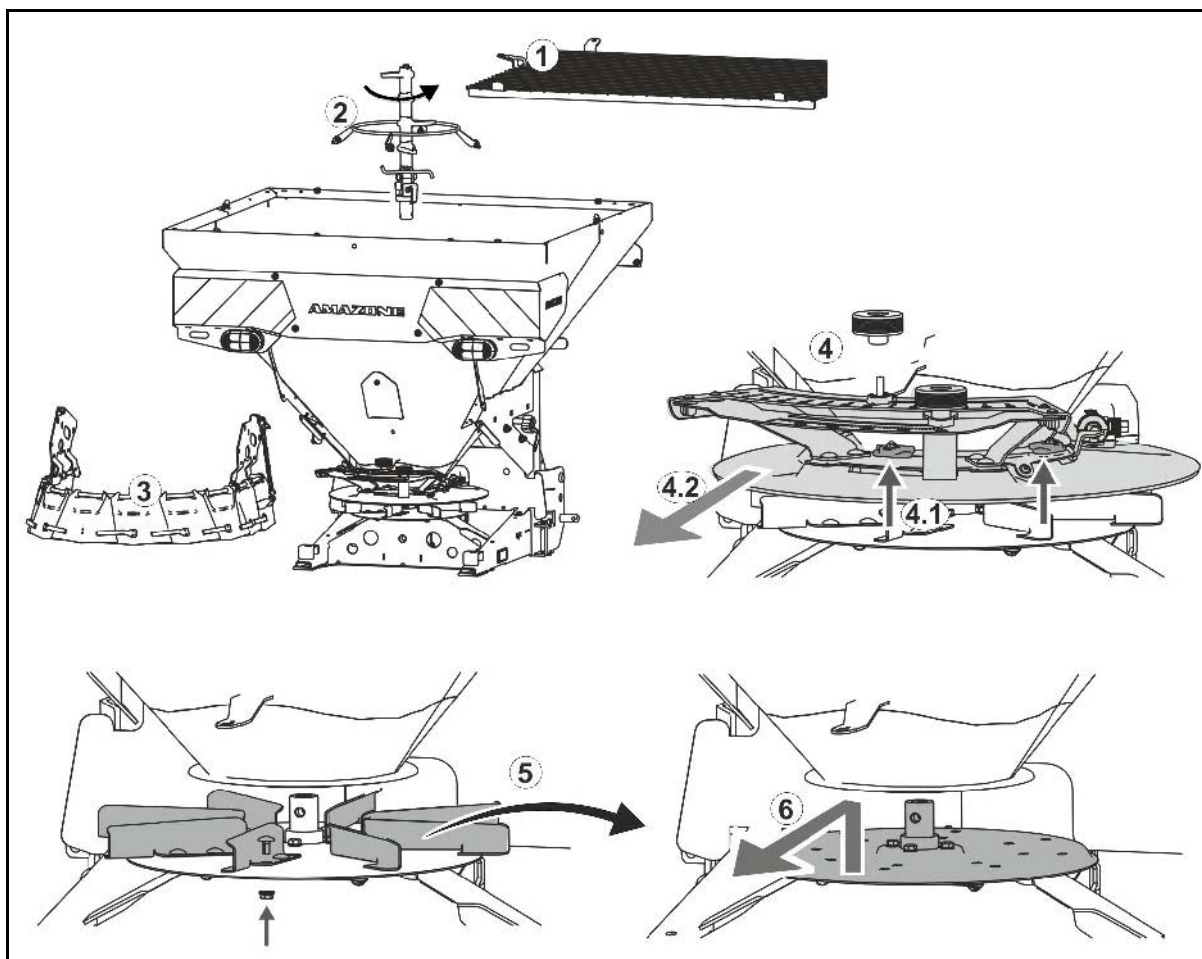
- Clean machine with regular water jet (oiled implements only at washbays with oil separators).
- Give particular attention to cleaning discharge openings and sliders.
- Remove fertiliser deposits from the spreading discs and the spreading vanes.
- When the machine is dry, apply a coat of anti-rust compound. (Use only biodegradable compounds).
- Stow the machine with the sliders **opened**.



Dispose of oils and greases in accordance with regulations!

13.2 Complete end-of-season cleaning

At the end of the season, disassemble and clean components separately.



To disassemble the machine:

1. Remove the guard screen.
2. Rotate the agitator anti-clockwise and remove.
3. Dismantle the spread deflector.
4. Dismantle the floor assembly.
 - 4.1 Loosen the two plastic guides.
 - 4.2 Lift the floor assembly and pull out to the rear.
5. 8 Dismantle the spreading vanes.
6. Dismantle the spreading disc.

After cleaning, reassemble the components in the reverse order.

13.3 Lubrication instructions

Lubricants



For lubrication, use a lithium saponified, multipurpose grease with EP additives:

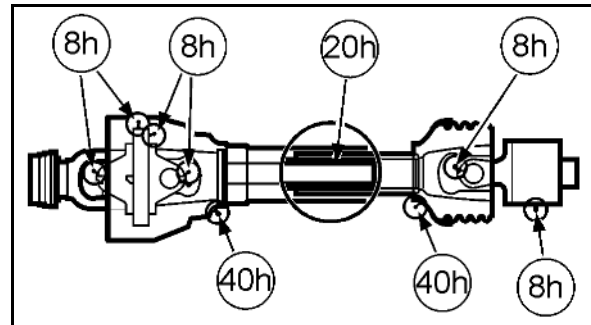
Company	Lubricant designation	
	Normal use conditions	Extreme use conditions
ARAL	Aralub HL 2	Aralub HLP 2
FINA	Marson L2	Marson EPL-2
ESSO	Beacon 2	Beacon EP 2
SHELL	Retinax A	Tetinax AM

PTO shaft

For winter operation, grease the protective tubes to prevent them from freezing.

Also observe the installation and service instructions from the PTO shaft manufacturer, which are fastened to the PTO shaft.

The lubrication intervals for the PTO shaft are stated in the adjacent illustration in hours.



13.4 Maintenance plan – Overview



- Carry out maintenance work when the first interval is reached.
- The times, continuous services or maintenance intervals of any third party documentation shall have priority.

Daily

Component	Maintenance work	see page	Workshop work
Spreading vanes	<ul style="list-style-type: none"> • Condition check 	103	

Weekly / Every 50 operating hours

Component	Maintenance work	see page	Workshop work
Hydraulic system	<ul style="list-style-type: none"> • Condition check 	104	X
Upper and lower link pins	<ul style="list-style-type: none"> • Condition check 	108	

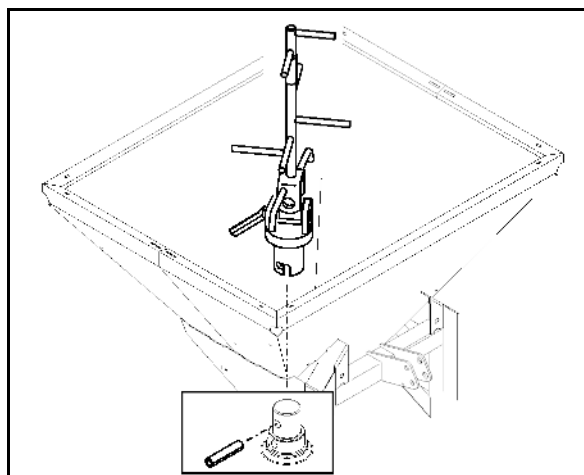
As necessary

Component	Maintenance work	see page	Workshop work
Spreading vanes	<ul style="list-style-type: none"> • Replace 	103	
Agitator shear-off safety device	<ul style="list-style-type: none"> • Replace 	102	

13.5 Agitator shear-off safety device

To replace the tension sleeve:

1. Remove the guard screen.
2. Remove the agitator from the hopper.
3. Drive the tension sleeve through the upper hole in the spreader disc until it is centrally positioned.
4. Fit the agitator and rotate anti-clockwise.
5. Reinstall the guard screen.



13.6 Replacing the spreading vanes



WARNING

Danger of, shearing, cutting, entrapment, entanglement, being drawn in, caught or struck during all adjustment work on the machine

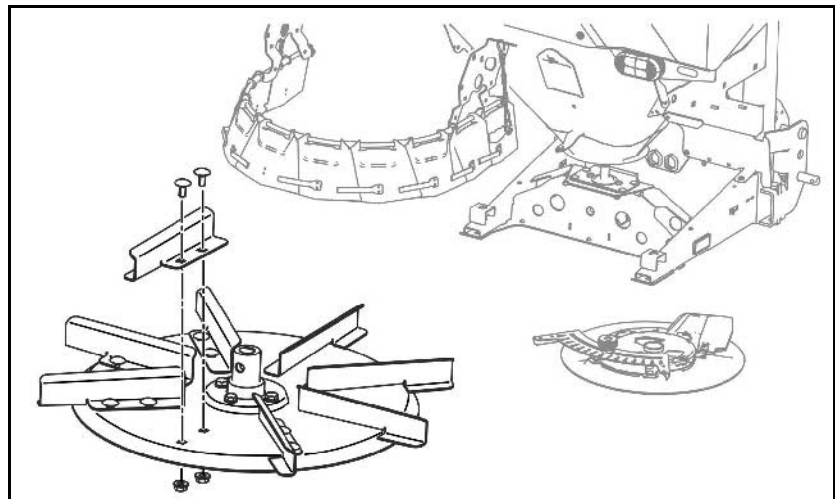
- **due to unintentional contact with moving operating elements (spreading vanes of rotating spreading discs).**
- **due to tractor and connected machine unintentionally starting up or rolling away.**
- Secure the tractor and the machine against unintentional start-up and rolling, before adjusting the machine. See page 62.
- Only touch moving operating elements (rotating spreading discs) when they have come to a complete standstill.



Replace the spreading vanes and / or swivel blades as soon as holes from abrasion are visible.



It is essential to ensure that the spreading vanes are installed correctly!



Replace the spreading vane as follows:

1. Remove the spreading width limiter.
2. Replace the spreading vane.
3. Retighten the screws.
4. Reinstall the spreading width limiter.

13.7 Hydraulic system



WARNING

Risk of infection through the high pressure hydraulic fluid of the hydraulic system entering the body!

- Only a specialist workshop may carry out work on the hydraulic system.
- Depressurise the hydraulic system before carrying out work on the hydraulic system.
- When searching for leak points, always use suitable aids.
- Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.

Escaping high pressure fluid (hydraulic fluid) may pass through the skin and ingress into the body, causing serious injuries!

If you are injured by hydraulic fluid, contact a doctor immediately. Risk of infection!



WARNING

Danger of unintentional contact with hydraulic fluid!

Please take the following first-aid measures:

- Following inhalation:
 - No special action required.
- Following contact with the skin:
 - Wash off with plenty of soap and water.
- Following contact with the eyes:
 - Rinse eyes for several minutes under running water, holding the eyelid open.
- Following ingestion:
 - Seek medical assistance.

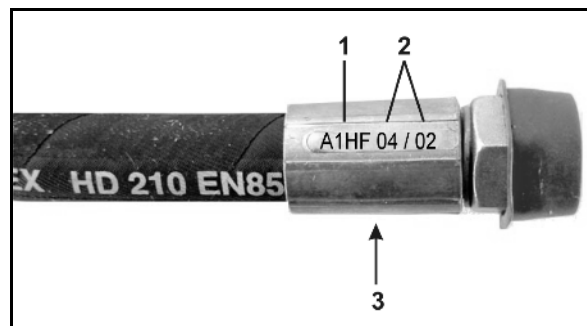


- When connecting the hydraulic hose lines to the tractor's hydraulic system, ensure that the hydraulic system is depressurised on both the tractor and the machine.
- Ensure that the hydraulic hose lines are connected correctly.
- Regularly check all the hydraulic hose lines and couplings for damage and impurities.
- Have the hydraulic hose line checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose line if it is damaged or worn. Only use AMAZONE original hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose connections made from thermoplastics, other guide values may be decisive.
- Dispose of old oil in the correct way. If you have problems with disposal, contact your oil supplier.
- Keep hydraulic fluid out of the reach of children!
- Ensure that no hydraulic fluid enters the soil or waterways.

13.7.1 Labelling of hydraulic hose lines

The valve chest identification provides the following information:

- (1) Manufacturer's mark on the hydraulic hose line (A1HF)
- (2) Date of manufacturer of the hydraulic hose line
(04 / 02 = Year / Month = February 2004)
- (3) Maximum approved operating pressure
(210 BAR).



13.7.2 Maintenance intervals

After the first 10 operating hours, and then every 50 operating hours

1. Check all the components of the hydraulic system for tightness.
2. If necessary, tighten screw unions.

Before each start-up:

1. Check hydraulic hose lines for visible damage.
2. Eliminate any scouring points on hydraulic hose lines and pipes.
3. Immediately replace worn or damaged hydraulic hose lines.

13.7.3 Inspection criteria for hydraulic hose lines



For your own safety, comply with the following inspection criteria!

Replace hydraulic hose lines, on determining any of the following during the inspection:

- Damage to the outer layer up to the ply (e.g. scouring points, cuts, cracks).
- Brittleness of the outer layer (crack formation of the hose material).
- Deformations which do not match the natural shape of the hose or the hose line. Both in a depressurised and pressurised state or when bent (e.g. layer separation, bubble formation, pinching, bends).
- Leak points.
- Damage or deformation of the hose assembly (sealing function restricted); minor surface damage is not a reason for replacement.
- Movement of the hose out of the assembly.
- Corrosion of assembly, reducing the function and tightness.
- Installation requirements not complied with.
- Life span of 6 years has been exceeded.

The date of manufacture of the hydraulic hose line on the assembly is decisive for determining these six years. If the date of manufacture on the assembly is "2004", then the hose should not be used beyond February 2010. See also on page 105.

13.7.4 Installation and removal of hydraulic hose lines



When installing and removing hydraulic hose lines, always observe the following information:

- Use only AMAZONE original hydraulic hose lines!
- Ensure cleanliness.
- Always install the hydraulic hose lines to ensure the following in all operating positions
 - There is no tension, apart from the hose's own weight.
 - There is no possibility of jolting on short lengths.
 - Outer mechanical influences on the hydraulic hose lines are avoided.Use appropriate arrangements and fixing to prevent any scouring of the hoses on components or on each other. If necessary, secure hydraulic hose lines using protective covers. Cover sharp-edged components.
 - The approved bending radii may not be exceeded.
- When connecting a hydraulic hose line to moving parts, the hose length must be appropriate so that the smallest approved bending radius is not undershot over the whole area of movement and/or the hydraulic hose line is not overtensioned.
- Fix the hydraulic hose lines at the specified fixing points. There, avoid hose clips, which impair the natural movement and length changes of the hose.
- The coating of hydraulic hose lines is not permitted.

13.8 Upper and lower link pins



WARNING

Risk of contusions, catching, and knocks when the machine unexpectedly releases from the tractor!

Check the upper and lower link pins for visible damage each time you couple the machine. Replace the upper and lower link pins in the event of clearly visible wear.

13.9 Upper and lower link pins check



DANGER!

Risk of contusions, catching, and knocks when the implement unexpectedly releases from the tractor!

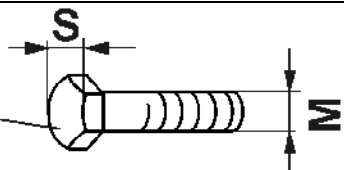
Replace damaged top link pins and lower link pins immediately for road traffic safety reasons.

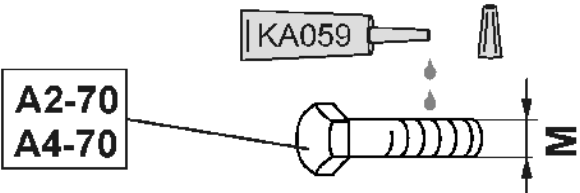
Test criteria for top link pins and lower link pins:

- Visual check for cracks
- Visual check for fractures
- Visual check for permanent deformations
- Visual check and measurements for wear. The permissible wear is 2 mm.
- Visual check for wear on the ball sleeves
- If applicable: check the fastening bolts for tightness

If a wear criterion is met, replace the top link pin or lower link pin.

13.10 Screw tightening torques

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> 8.8 10.9 12.9 </div>  </div>				
M	S	Nm		
		8.8	10.9	12.9
M 8	13	25	35	41
M 8x1		27	38	41
M 10	16 (17)	49	69	83
M 10x1		52	73	88
M 12	18 (19)	86	120	145
M 12x1.5		90	125	150
M 14	22	135	190	230
M 14x1.5		150	210	250
M 16	24	210	300	355
M 16x1.5		225	315	380
M 18	27	290	405	485
M 18x1.5		325	460	550
M 20	30	410	580	690
M 20x1.5		460	640	770
M 22	32	550	780	930
M 22x1.5		610	860	1050
M 24	36	710	1000	1200
M 24x2		780	1100	1300
M 27	41	1050	1500	1800
M 27x2		1150	1600	1950
M 30	46	1450	2000	2400
M 30x2		1600	2250	2700

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> A2-70 A4-70 </div>  </div>												
M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Nm	2,4	4,9	8,4	20,6	40,7	70,5	112	174	242	342	470	589



Coated bolts have different tightening torques.












Observe the specific data for tightening torques in the maintenance section.

14 Setting charts - De-icing salt (loose bulk density : 1,29 kg/l)

- Mechanical spreading disc drive:
Required PTO shaft speed: 540 rpm.
Exception: ☐ Reduced PTO shaft speed is required.
- Distance of spreading disc from the ground: 60 cm
- The chart values for the spread rate are specified in g/m².
- Shutter positions for spread rates [g/m²] that are not listed can be calculated by linear interpolation.






Depending on the spreading material quality and composition, the working width and spread rate can vary. Furthermore, an insufficiently opened metering shutter can get clogged and damage the spreading material. In this case, the values set must be corrected to ensure that the spreading material can be flow out freely and that the desired lateral distribution is achieved.

14.1 Setting chart EasySet



 [m]									
Working width		1	2	3	4	5	6	7	8
 Short spreading vane (110 mm)	 Spreading width limiter	0	40	50	70	90	-	-	-
	 Spreading disc speed	1	3	5	6	8	-	-	-
	 Delivery point	G	G	I	I	I	-	-	-
 Long spreading vane (170 mm)	 Spreading width limiter	-	-	-	-	-	-	-	-
	 Spreading disc speed	-	1	3	5	6	7	9	10
	 Delivery point	-	B	B	C	C	C	C	C
 Spread rate in g/m²	10	10	13	15	16	17	18	19	20
	20	13	16	18	20	22	24	25	27
	30	15	18	21	24	26	28	30	31
	40	16	20	24	27	29	31	33	35
		Shutter position  1 - 50							

14.2 Setting chart speed dependent

→ nor for E+S with EasySet!

 Long spreading vane (170 mm)				 Short spreading vane (110 mm)			
Working width	Spreading width limiter	Spreading disc speed	Delivery point	Working width	Spreading width limiter	Spreading disc speed	Delivery point
1	0	-	-	1	0	1	G
2	40	1	B	2	40	3	G
3	50	3	B	3	50	5	I
4	70	5	C	4	70	6	I
5	90 	9	C	5	90	8	I
6	90 	7	C	6	-	-	-
7	90 	9	C	7	-	-	-
8	90	10	C	8	-	-	-

Required shutter position

Working width	 Shutter position							Spread rate g/m ²	Working width	 Shutter position							Spread rate g/m ²
1	9	10	10	10	11	12	14	10	5	14	15	16	17	19	21	24	10
	10	11	12	13	14	15	17	20		17	19	21	22	24	27	32	20
	12	13	14	15	16	17	20	30		20	22	24	26	28	32	38	30
	13	14	15	16	18	19	22	40		22	25	27	29	32	36	44	40
2	10	11	12	13	14	15	17	10	6	15	16	17	18	20	22	26	10
	13	14	15	16	17	19	22	20		18	20	22	24	26	29	34	20
	15	16	17	18	20	22	26	30		21	24	26	28	31	34	42	30
	16	18	19	20	22	25	29	40		24	27	29	31	34	39	-	40
3	12	13	14	15	16	17	20	10	7	16	17	18	19	21	23	28	10
	15	16	17	18	20	22	26	20		19	21	23	25	28	31	37	20
	17	18	20	21	23	26	31	30		22	25	28	30	32	37	46	30
	18	20	22	24	26	29	34	40		25	28	31	33	37	42	-	40
4	13	14	15	16	17	19	22	10	8	16	18	19	20	22	25	29	10
	16	18	19	20	22	25	29	20		20	23	25	27	29	33	39	20
	18	20	22	24	26	29	34	30		24	27	29	31	34	39	-	30
	20	23	25	27	29	33	39	40		27	30	33	35	39	46	-	40
km/h	6	8	10	12	15	20	30		km/h	6	8	10	12	15	20	30	



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