Operating Manual

AMAZONE

ZA-V
ZA-V Easy
ZA-V Control
ZA-V Tronic
ZA-V Hydro
ZA-V Profis Control
ZA-V Profis Tronic
ZA-V Profis Hydro

Mounted spreader



MG4136
BAG0087.18 10.25
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: ZA-V

Year of manufacture: _____

Basic weight (kg): _____

Approved total weight (kg): _____

Maximum load (kg): _____

Manufacturer's address

AMAZONEN-WERKE
H. DREYER SE & Co. KG
Postfach 51
D-49202 Hasbergen
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E-mail: amazone@amazone.de

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

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 brackets refer to the item numbers in the diagrams. The first number refers to the diagram and the second number to the item in the figure.

Example: (Fig. 3/6)

- Figure 3
- 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 signs 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).

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

Identifies an immediate danger with a high risk that may cause death or serious physical injuries (loss of limbs 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.



WARNING

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 operation 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

1) A person who can assume a specific task and who can carry out this task for an appropriately qualified company.

2) 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.

3) People with specialist technical training shall be considered as a specialist. 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 Danger 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 tighten 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. MD 075).

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:

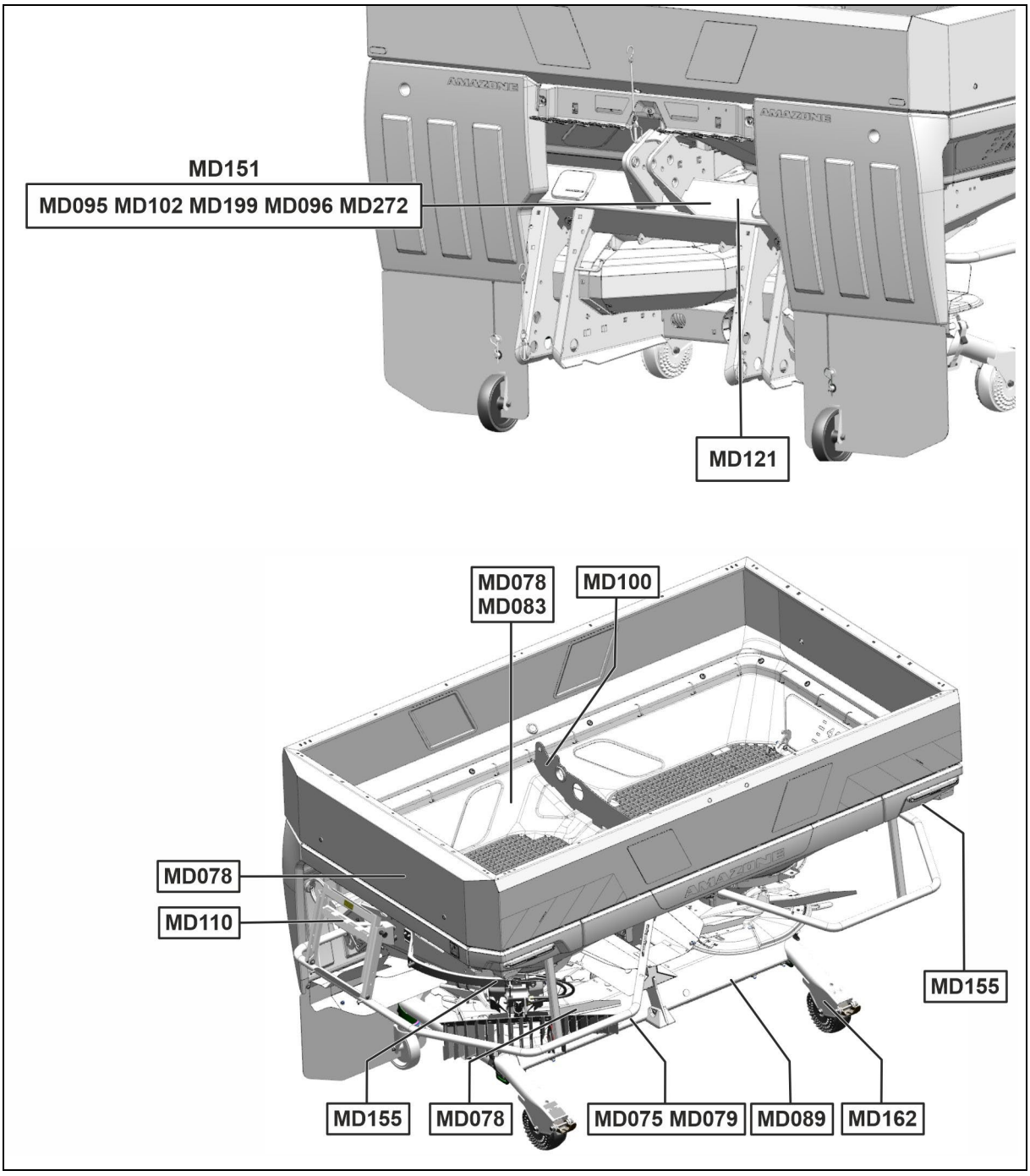
1. A description of the danger.
   For example: danger to fingers or hands from moving operating elements due to cutting or cutting off.
2. The consequence of non-compliance with the danger protection instructions.
   For example: in these cases there is a danger of extremely serious injuries leading to the loss of body parts such as fingers or hands.
3. Instructions for avoiding the danger.
   For example: 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.

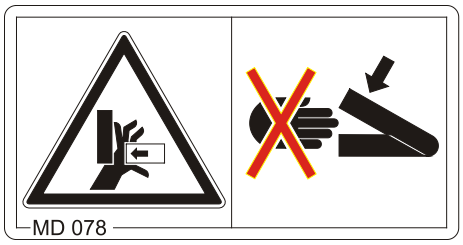
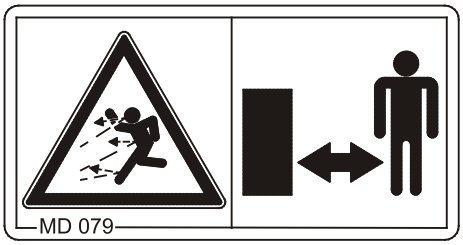
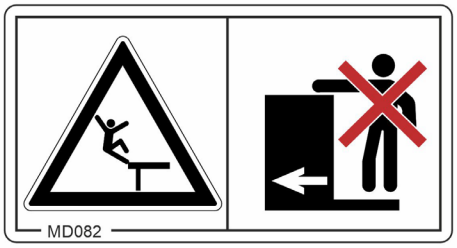
2.13.1 Positions of warning symbols and other labels

Warning symbols

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



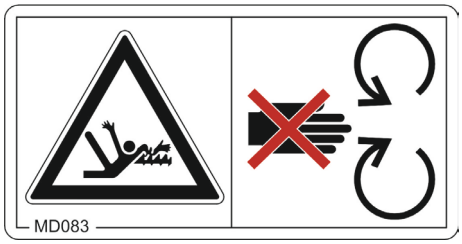
2.13.2 Positions of warning pictograms and other labels

Order number and explanation	Warning pictograms
MD 075 **Risk of cuts for fingers, hands, and arms** • Disconnect the power supply from the machine before approaching the danger zone. • Wait until all moving parts are at a standstill before reaching into the danger area. • Make sure that there is nobody standing in the danger zone or close to moving parts.	
MD 078 **Risk of crushing fingers or hands!** • Disconnect the power supply from the machine before approaching the danger zone. • Wait until all moving parts are at a standstill before reaching into the danger area. • Make sure that there is nobody standing in the danger zone or close to moving parts.	
MD 079 **Danger due to ejected material!** • Make sure that there is nobody standing in the danger zone or close to moving parts.	
MD 082 **Risk of falling from tread surfaces and platforms** • Do not let anybody ride on the machine. • Do not let anybody climb onto the driving machine.	

MD 083

Risk of being pulled in

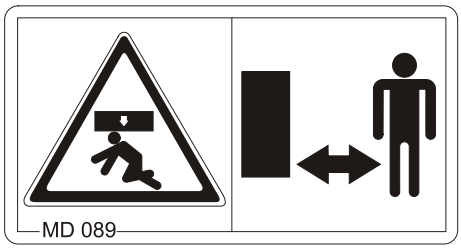
- Disconnect the power supply from the machine before approaching the danger zone.
- Wait until all moving parts are at a standstill before reaching into the danger area.
- Make sure that there is nobody standing in the danger zone or close to moving parts.



MD 089

Risk of crushing from the machine parts unintentionally lowering

- Make sure that there is nobody standing in the danger zone.



MD 093

Risk due to being drawn in and caught

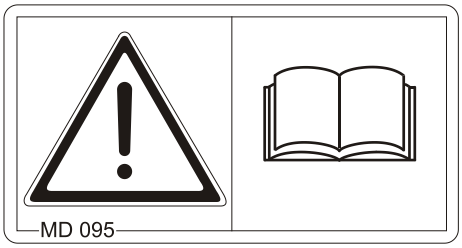
- Disconnect the power supply from the machine before approaching the danger zone.
- Wait until all moving parts are at a standstill before reaching into the danger area.
- Make sure that there is nobody standing in the danger zone or close to moving parts.



MD 095

Risk of accident due to non-compliance with the instructions in the operating manual

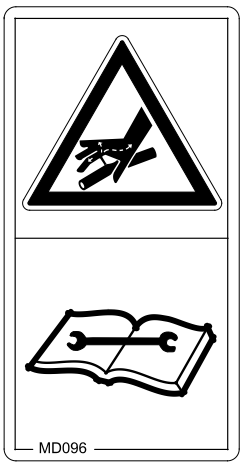
- Before you work on or with the machine, read and understand the operating manual.



MD 096

Risk of infection from escaping hydraulic fluid under high pressure

- Have the hydraulic system checked and repaired by a qualified specialist workshop only.
- Stay away from leaks in the hydraulic system.
- If you are injured by hydraulic oil, contact a doctor immediately.



MD 100

Risk of accidents due to improperly attached lifting gear

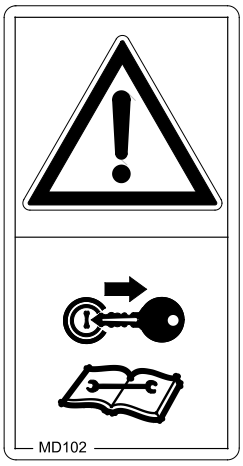
- Attach the lifting gear only at the marked positions.



MD 102

Danger due to unintentional starting as well as unintentional and uncontrolled movements of the machine

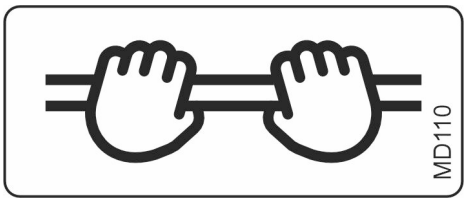
- Before performing any work, secure the machine against unintentional starting as well as unintentional and uncontrolled movements.



MD 110

Labelling of the handles

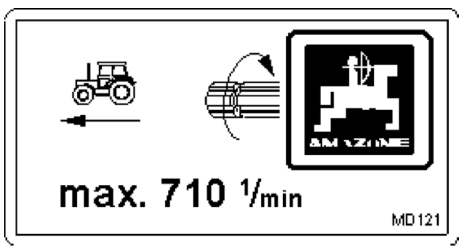
- Use the marked handles.



MD 121

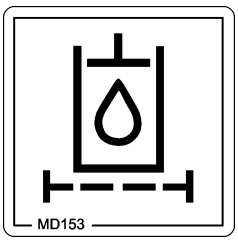
Risk of machine damage due to excessively high drive speeds and incorrect direction of rotation of the drive shaft

- Comply with the maximum drive speed and direction of rotation of the drive shaft on the machine side, as shown on the pictogram.



MD 153

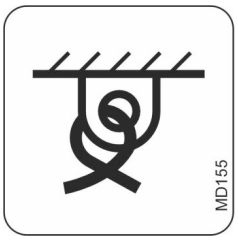
The figure shows the hydraulic oil filter.



MD 155

Risk of accident and machine damage during transport due to improperly secured machine

- Only attach the lashing belts at the marked lashing positions for transporting the machine.



MD 162

Danger due to overload on the transport roller

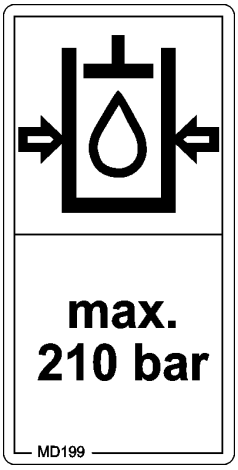
- Never exceed the maximum load capacity.



MD 199

Risk of accident if the hydraulic system pressure is too high

- Couple the machine only to tractors with a maximum tractor hydraulic pressure of 210 bar.



MD 272

Risk of crushing between tractor and machine

- Before you actuate the tractor hydraulic system, instruct persons away from the area between the tractor and the machine.
- Actuate the tractor hydraulic system only from the designated work station.



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 linkage, 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 linkage.

- 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 linkage.
- 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 linkage 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 linkage against 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 bolts 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:
  - are continuous
  - are automatically controlled
  - require a floating position or pressed 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. Only use original AMAZONE 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 label.

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.
- 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 Fertiliser spreader operation

- Stay clear of the working area! Danger from flying fertiliser particles. Direct persons away from the throwing range of the fertiliser spreader. Do not walk or stand close to rotating spreading discs.
- Fill the fertiliser spreader only when the tractor engine is shut off, the ignition key is pulled and the sliders are closed.
- Do not place any foreign objects in the hopper.
- While carrying out the spread rate check, beware of danger points from rotating machine parts.
- Never unhitch a fertiliser spreader or roll it while it is full (tipping hazard).
- For boundary spreading at field edges, bodies of water or roads, use boundary spreading devices.
- 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 machine connector has been removed from the control 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 original AMAZONE spare parts.

3 Loading the machine

3.1 Loading the machine with a crane

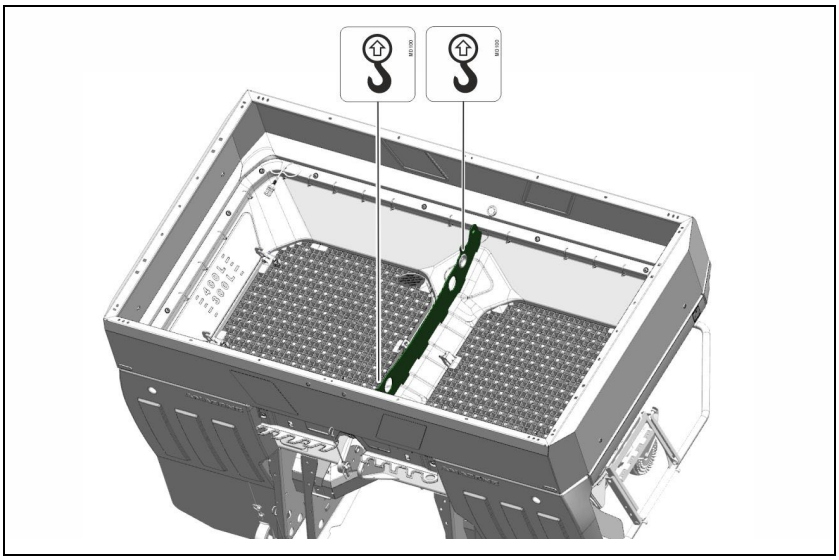


Fig. 1

The machine has 2 lashing points for lifting.

WARNING

Risk of accidents due to improperly attached slings for lifting.

If the slings are not attached at the marked lashing points, the machine can be damaged during lifting and endanger safety.

- Only attach the slings for lifting at the marked lashing points.

3.2 Lashing the machine

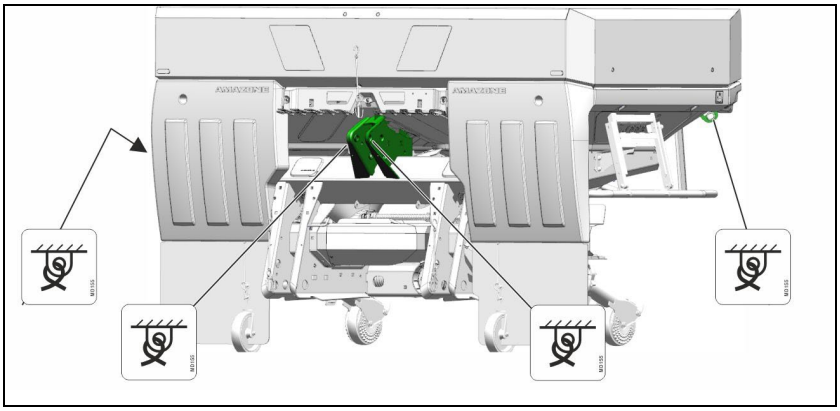


Fig. 2

Depending on the equipment, the machine has 4 lashing points for lashing straps.

WARNING

Risk of accidents due to improperly attached lashing straps

If the lashing straps are not attached at the marked lashing points, the machine can be damaged during lashing and endanger safety.

- Attach the lashing straps only at the marked lashing points.

1. Put the machine on the transport vehicle.
2. Attach the lashing straps at the marked lashing points.
3. Lash down the machine in compliance with the national regulations for load securing.

4 Product description

4.1 Overview of subassemblies

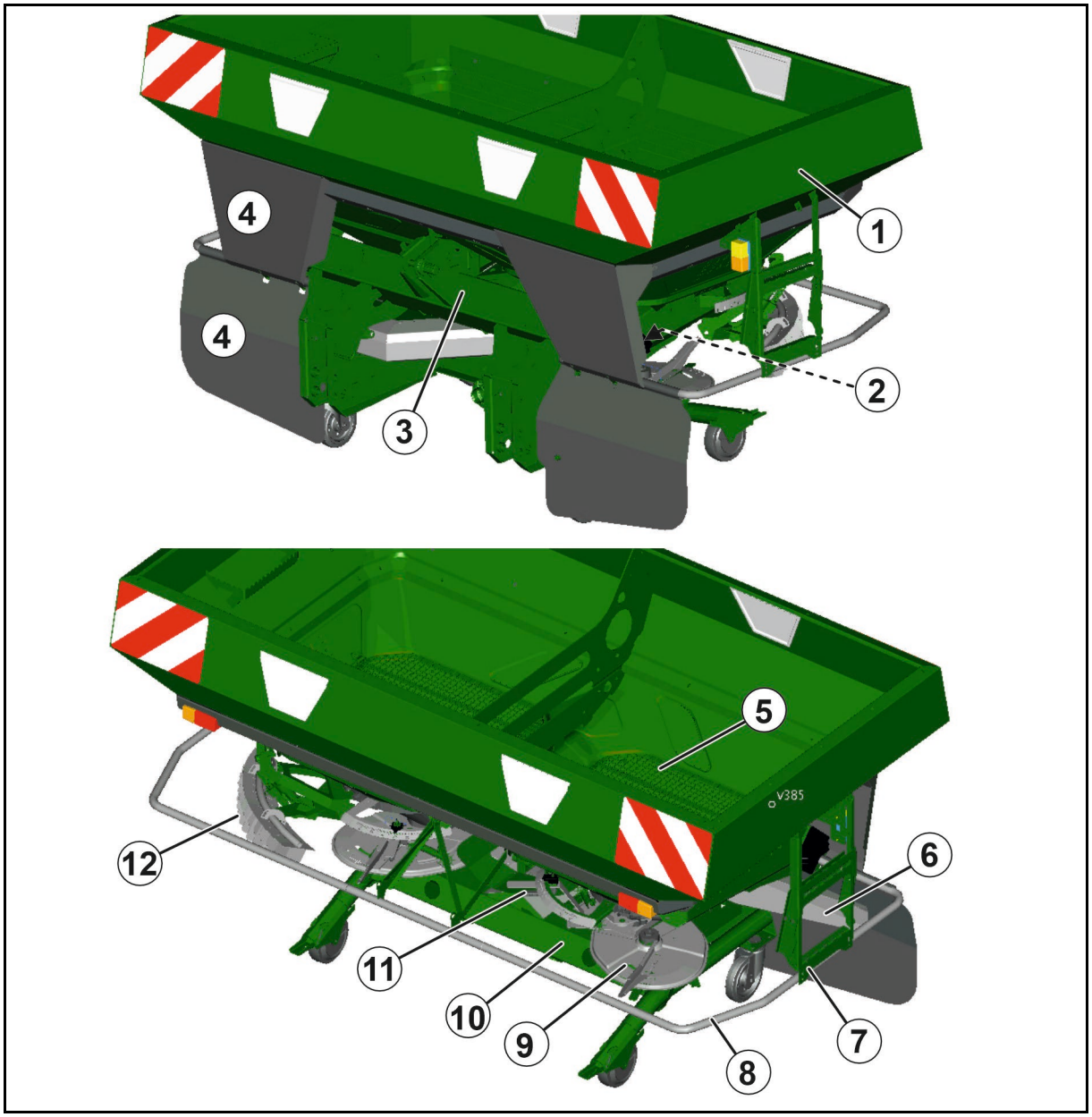


Fig. 3

(1) Hopper
(2) Threaded cartridge
(3) Frame
(4) Dirt trap
(5) Guard screen
(6) Deflector plates
(7) Folding ladder (optional with S extension)
(8) Guard tube
(9) Spreading discs with spreading vanes
(10) Shaft guard
(11) Setting lever for manual spread rate adjustment
(12) Limiter

4.2 Safety and protection equipment

- Shaft guard between the input shaft and angular gearbox as protection from the rotating shaft
- Guard tube as protection from driven spreading discs
- Guard screen in the tank as protection against contact with the rotating agitator
- Deflector plates as protection against fertiliser granules that are ejected to the front
- Spiral-shaped casing of the agitator shaft between the hopper tips as protection against the rotating agitator shaft
- Universal joint shaft guard as protection against the driven universal joint shaft
- Warning signs

4.3 Equipment versions

ZA-V with

- hydraulic actuation of the shutter
- hydraulic actuation of the limiters

ZA-V Easy / Control / Tronic with

- operating terminal
- electrical actuation of the shutter
- electrical actuation of the limiters

ZA-V Profis with

- weighing technology

ZA-V Hydro with

- with hydraulic spreading disc drive

4.4 Threaded cartridge

The threaded cartridge contains documents and, depending on the machine equipment, other aids.



Fig. 4

4.5 Supply lines between the tractor and the machine

- Hydraulic hose lines

  Depending on equipment
- Cable with connection for lighting
- Computer cable with machine connector

4.6 Lighting and identification for road travel

The equipment can vary depending on the machine type or country-specific regulations.

4.6.1 Rear lighting and identification

(1) Warning boards
(2) Rear lights, brake lights, and turn indicators
(3) Red reflector
(4) Yellow reflecting warning sticker
(5) Red reflecting warning sticker
(6) Identification panel for slow-driving vehicles

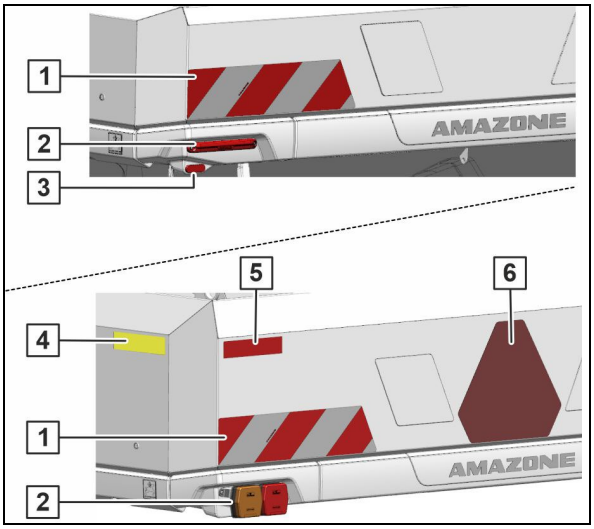


Fig. 5

4.6.2 Front lighting and identification

(1) Warning boards
(2) White reflector
(3) Yellow reflecting warning sticker

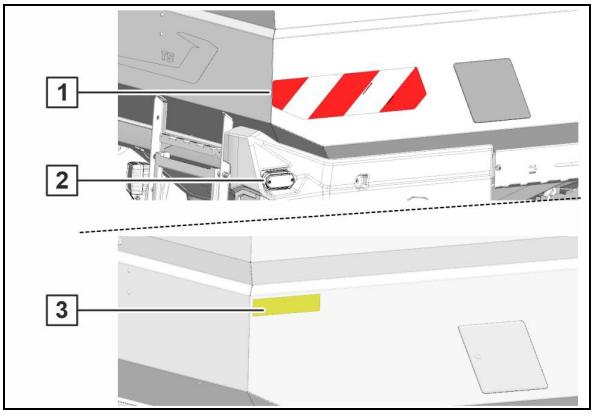


Fig. 6

4.7 Intended use

The AMAZONE fertiliser spreader ZA-V

- is designed exclusively for conventional agricultural applications and are suitable for spreading dry, granuled, prilled and crystalline fertiliser, seed and slug pellets.
- is attached to the tractor's 3-point hydraulic system and operated by one person.
- must only be mounted on a transport frame approved by AMAZONEN-WERKE.
- Slopey 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 %

ZA-V 1400 and ZA-V 1400 without extension enlargement:

The fertiliser spreader can be mounted on the tractor's front hydraulic system and be driven on public roads provided that the field of view is not impeded.

Front mounting is only permitted in combination with an implement mounted at the rear!

The intended use also includes:

- Compliance with all the instructions in this operating manual.
- Execution of inspection and maintenance work.
- Exclusive use of original AMAZONE 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 assumes no liability whatsoever.

4.8 Confirmation of the Fertiliser Directive

EN standard 13739-1 and -2 define the requirements for boundary spreading and normal spreading. The requirements for boundary spreading are met by all AMAZONE boundary spreading devices. The requirements for distribution accuracy for normal spreading resulting from the standards are also fully met by all AMAZONE mineral fertiliser spreaders.



4.9 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 function-related 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 cardan 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 uncoupling operations.
- In the area of moving parts:
  - Rotating spreading discs with spreading vanes
  - Rotating agitator shaft and agitator shaft drive
  - Actuation of the dosing sliders
- When climbing onto the machine being driven.
- 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 of fertiliser being thrown out.

4.10 Rating plate

Machine rating plate

(1) Serial number

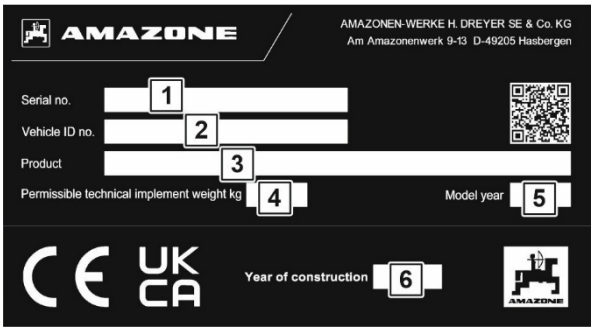
(2) Vehicle identification number

(3) Product

(4) Permissible technical machine weight

(5) Model year

(6) Year of manufacture



4.11 Technical data

ZA-V	Hopper volume [l]	Weight [kg]	Fill level [mm]	Filling width [mm]	Total width [mm]	Total length [mm]	Extension (option)** [l]
ZA-V Special Payload 2200 kg							
ZA-V 1400	1400	349	1130	2205	2590	1493	S 600
ZA-V 1700	1700	357	1155	2205	2590	1493	
ZA-V 2000	2000	366	1305	2205	2590	1493	
ZA-V Super Payload 3200 kg							
ZA-V 1400	1400	349	1130	2205	2590	1493	S 600
ZA-V 1700	1700	396	1155	2205	2590	1493	
ZA-V 2000	2000	405	1305	2205	2590	1493	
ZA-V 2200	2200	425	1290	2710	2920	1680	
ZA-TS 2600	2600	580	1480	2205	2590	1493	
ZA-V 2700	2700	435	1420	2710	2920	1680	
ZA-V 3200	3200	445	1540	2710	2920	1680	
ZA-V Super Profis Payload 3200 kg							
ZA-V 1400	1400	349	1130	2205	2590	1493	S 600
ZA-V 1700	1700	455	1230	2205	2590	1493	
ZA-V 2000	2000	465	1320	2205	2590	1493	
ZA-TS 2600	2600	580	1480	2205	2590	1493	
ZA-V 2200	2200	485	1290	2710	2920	1680	
ZA-V 2700	2700	495	1420	2710	2920	1680	
ZA-V 3200	3200	505	1540	2710	2920	1680	
ZA-V Ultra **ZA-V Ultra Profis** Payload 4500 kg							
ZA-V 2200	2200	625	1290	2710	2920	1680	
ZA-V 2700	2700	645	1420	2710	2920	1680	
ZA-V 3200	3200	663	1540	2710	2920	1680	
ZA-V 4200	4200	701	1770	2710	2920	1680	

* The filling height is based on machines without rolling device / with lifted rolling device. For lowered rolling device add 255 mm.

** When using an extension, the filling height increases by 205 mm.

ZA-V	D*	Mounting heigh	PTO shaft speed (Tronic)	Working width	Working width
Special	700 mm	800 mm	Standard: 720 min^{-1} Maximum permissible: 945 min^{-1}	Standard: 540 min^{-1} Maximal zuläs-sig: 710 min^{-1}	V-Set 1: 10 – 21 m V-Set 2: 18 – 28 m V-Set 3: 24 – 36 m
Super	685 mm				
Super Profis	765 mm				
Ultra	800 mm				
Ultra Profis	800 mm				

* Distance between lower link connection point and the centre of gravity

4.12 Permitted mounting category

Attachment category	Implement
Category 2	• ZA-V Special • ZA-V Super • ZA-V Super Profis • ZA-V Ultra up to an actual payload of 3200 kg • ZA-V Ultra Profis up to an actual payload of 3200 kg
Category 3	• ZA-V Ultra up to an actual payload of 4500 kg • ZA-V Ultra Profis up to an actual payload of 4500 kg

4.13 Necessary tractor equipment

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

Tractor engine power

from 65 kW (90 bhp) upwards

Electrical system

Battery voltage:	• 12V (Volt)
Lighting socket:	• 7-pin

Hydraulic system

Maximum operating pressure:	• 210 bar
Tractor pump power:	• At least 15l/min at 150 bar • At least 70 l/min at 160 bar (Hydro)
Machine hydraulic fluid:	• HLP68 DIN 51524 The implement hydraulic fluid is suitable for the combined hydraulic fluid circuits of all standard tractor brands.
Control units	• Depending on equipment, see Page 54

Universal joint shaft

Required speed:	• max. 675 rpm
Direction of rotation:	• Clockwise, viewed from rear toward the tractor.

Three-point attachment

- The tractor's lower links must have lower link hooks.
- The tractor's upper links must have upper link hooks.

4.14 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

The following section provides information on the machine structure and the functions of the individual components.

5.1 Function

The AMAZONE ZA-V fertiliser spreader is equipped with two hopper tips and replaceable spreading discs (Fig. 7/1) that are driven from the inside out in opposite directions and counter to the direction of travel, and are equipped with one short (Fig. 7/2) and one long spreading vane (Fig. 7/3).

The fertiliser is

- transferred evenly by the agitator shaft from the hopper onto the spreading discs.
- led outwards along the spreading vane and discharged.

Perform a spread rate check before using the fertiliser spreader.

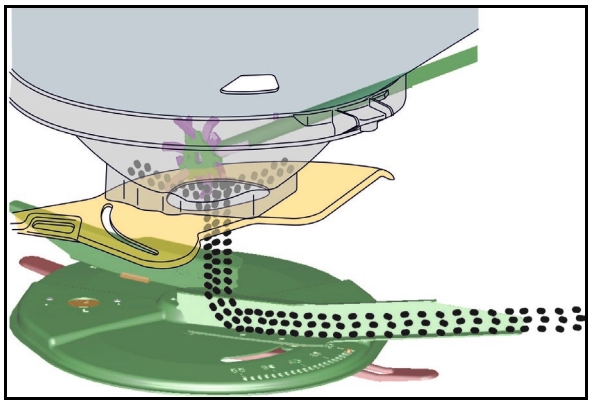


Fig. 7

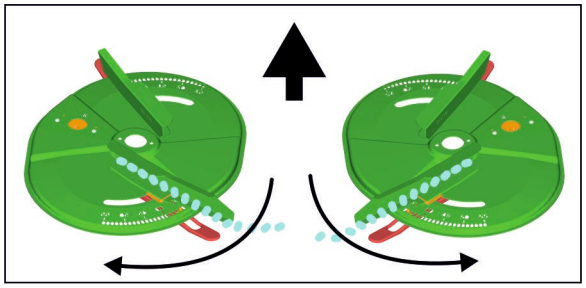


Fig. 8

5.2 Guard and function screens in the hopper

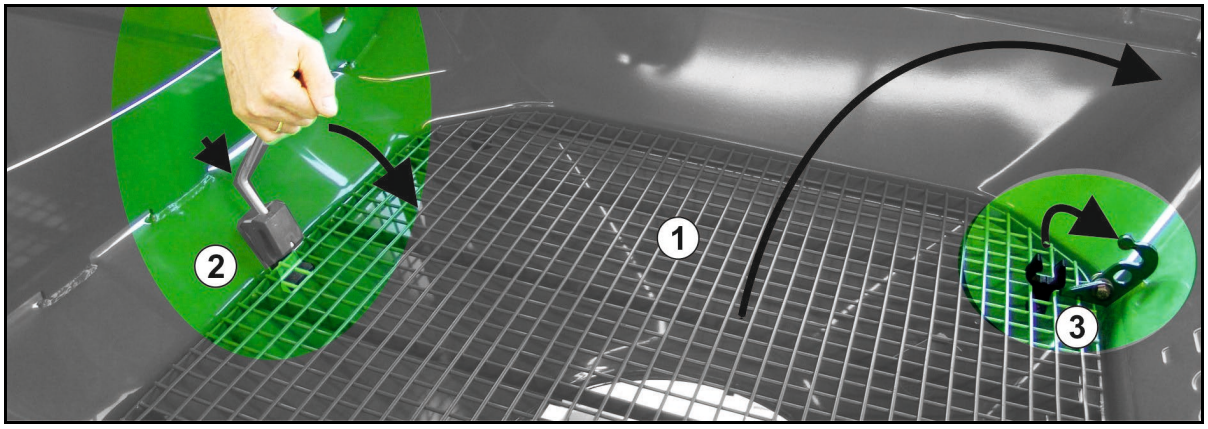


Fig. 9

Di The foldable guard and function screens cover the entire hopper and serve

- as protection against accidental contact with the rotating agitator spiral.
- Protecting from foreign particles and fertiliser clods.

(1) Guard and function screen

(2) Guard screen locking mechanism with tools for unlocking

(3) Lock for opened guard screen

(4) Tool for unlocking in parking position..

For cleaning, maintenance or repair purposes, the guard screen in the hopper can be folded up using the unlocking tool.

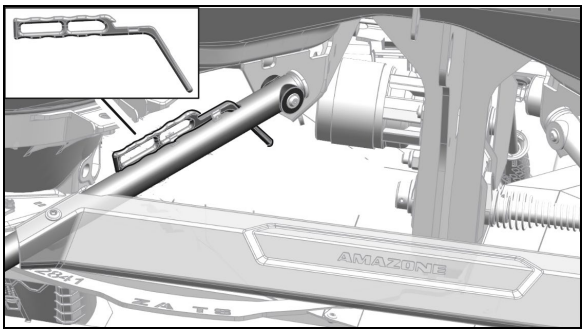


Fig. 10

Opening the guard screen:

1. Insert the unlocking tool into locking mechanism.
2. Unlock the guard screen using the tool.
3. Raise the guard screen until it catches onto the stop on the tank.

The guard screen locks automatically once closed.

4. Remove the unlocking tools and fasten in parking position.

5.3 Basic hopper

The basic hopper holds 650 litres.

It is equipped with a scale.

At the transition to the vertical wall, the hopper is 80% full with 520 litres.

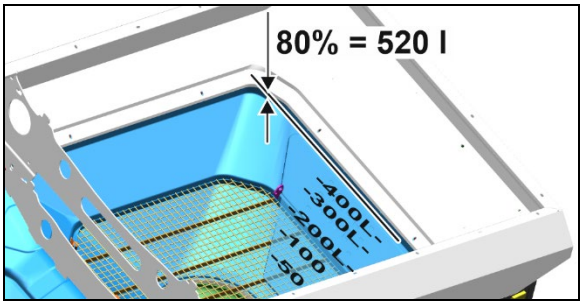


Fig. 11

5.4 Spreading discs with spreading vanes

An infinite adjustment of the working widths is possible by

- swivelling the spreading vanes onto the spreading discs,
- replacing the spreading vanes on the spreading discs.

In the case of the ZA-V, the spreading discs and agitators are powered by the PTO shaft via the middle gearbox and angular gearbox.

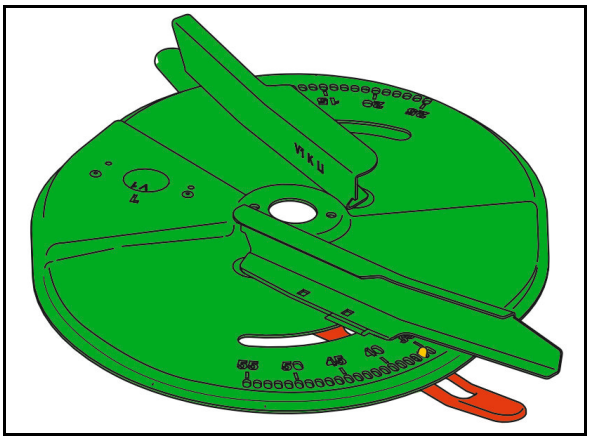


Fig. 12

Looking in the direction of travel:

(1) Left spreading disc

(2) Right spreading disc

(3) Long spreading vane - Adjustment scale with values from 35 to 55.

(4) Short spreading vane – Adjustment scale with values from 5 to 25.

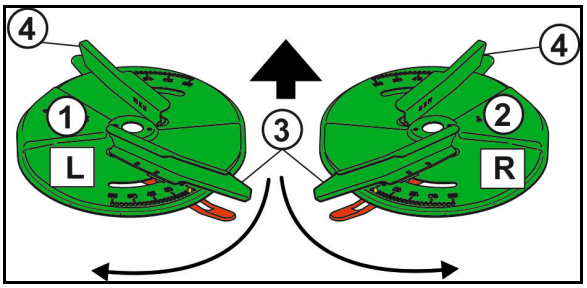


Fig. 13

Markings on spreading disc

Example of a marking:

V2 K LI

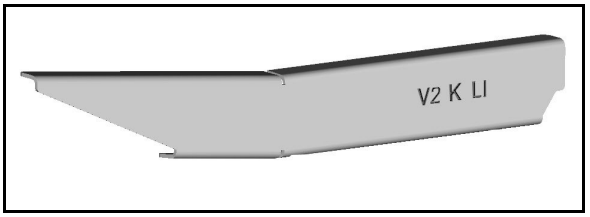


Fig. 14

Spreading vane		Mounting side
V1 V2 V3	L = Long	RE = right LI = left
	K = Short	RE = right LI = left

The spreading vanes are installed in such a way that the open sides point in the direction of rotation and take in the fertiliser.

5.5 Agitator

The spiral agitators (Fig. 14/1) in the hopper tips ensure uniform fertiliser flow to the spreading discs. The slow-rotating, spiral-shaped segments of the agitator carry the fertiliser evenly to the corresponding outlet opening.

The PTO shaft is responsible for the drive. The speed reduction is attained by means of a free-wheel.

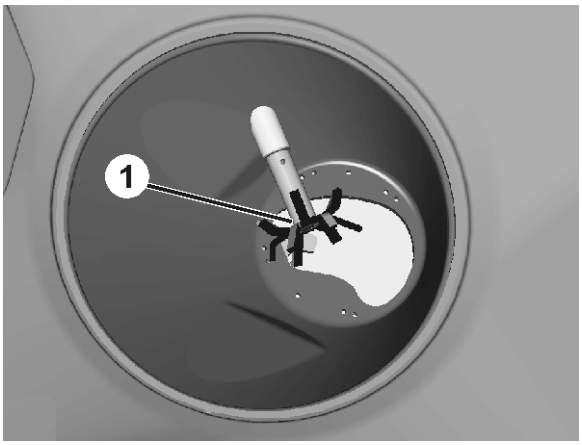


Fig. 15

5.6 Dosing slider

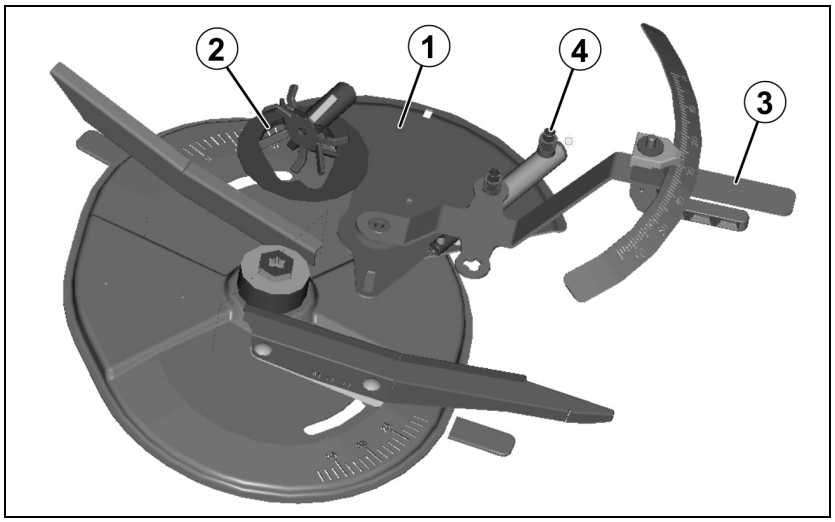


Fig. 16

The spread rate is set

- **electronically** with the control terminal.
  In this case, dosing sliders (Fig. 15/2) operated by setting motors (Fig. 15/1) release a range of different diameters at the outlet openings (Fig. 15/3).

  The electrically shut metering shutter closes the outlet opening in the tank.
- **Manually** using the setting lever (Fig. 15/3) by adjusting different opening widths of the outlet opening (Fig. 15/2). The required shutter position in each case is determined either according to the setting chart or using the sliding ruler.

  The metering shutter is actuated hydraulically to open and close the outlet opening (Fig. 15/4).

5.7 Boundary, ditch and border spreading with Limiter V

If the first tramline is half the working width of the field edge, you can carry out boundary spreading via remote control.

For this, the limiter can be lowered into the spreading area and thereby influence the spread pattern.

For the adjustment, the limiter can be turned around the spreading disc axis and lowered to different positions.

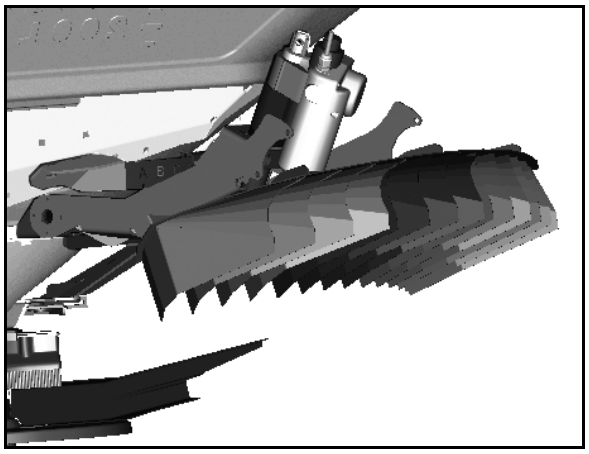


Fig. 17

As an option, the spread deflector can be equipped with a position indicator:

1 – Spread deflector in use

0 – Spread deflector not in uses

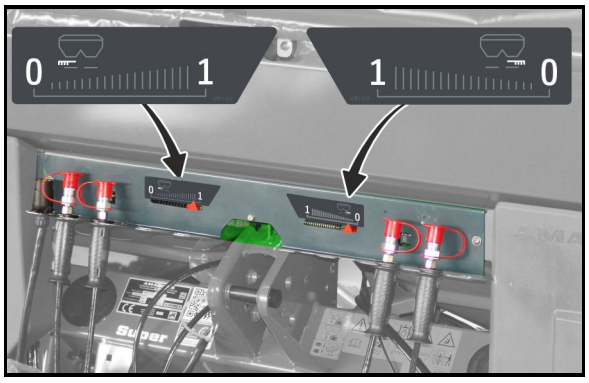


Fig. 18

5.8 Boundary, ditch and border spreading with the ZA-V Hydro

Boundary, ditch and border spreading with the ZA-V HYdro is achieved by reducing the spreading disc speed.

5.9 Bed spreading deflector

The bed spread deflector is installed between the spreading discs and influence the spread fans in a way that makes bed spreading possible.

(1) Hand lever to operate the spreading deflector.
Alternative: Hydraulic actuation

(2) Adjustable telescope on the bed spreading deflector

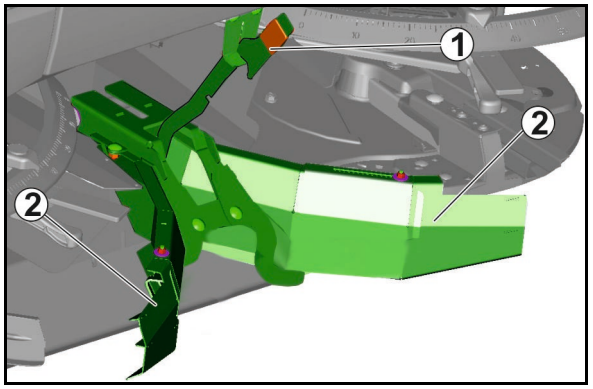


Fig. 19

One-sided installation is possible.

Combination of boundary spread deflector and bed spread deflection possible on the right.

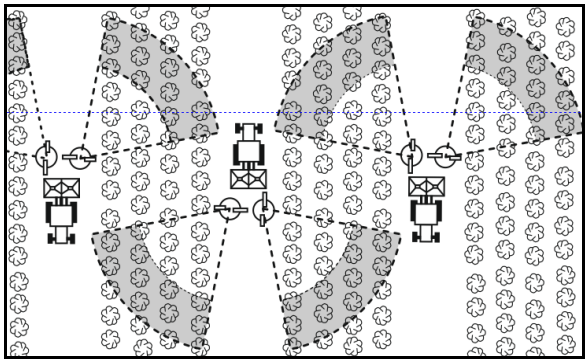


Fig. 20

Fertiliser spreading on both sides with recess in the area of the tractor track.

To achieve uniform distribution over the bed, fertiliser must be spread into the bed from both sides of the bed.

The telescopes can be pulled out to throw the fertiliser further outwards into the bed.

The telescopes can be pushed in to throw the fertiliser further inwards towards the tractor.

As an option, the spread deflector can be equipped with a position indicator:

1 – Spread deflector in use

0 – Spread deflector not in use

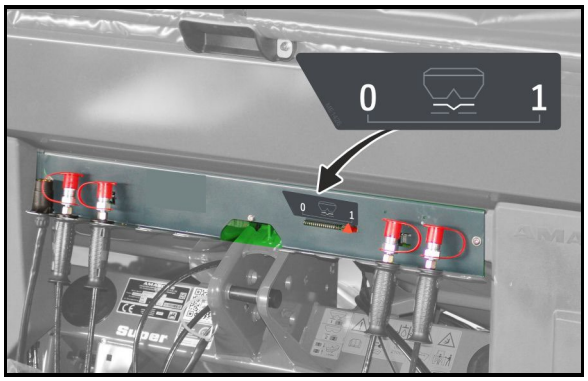


Fig. 21

5.10 Boundary spread deflector

The boundary spread deflector is installed between the spreading discs to influence the spread fans such that boundary spreading is possible.

(1) Hand lever to operate the spread deflector. Alternative: hydraulic actuation

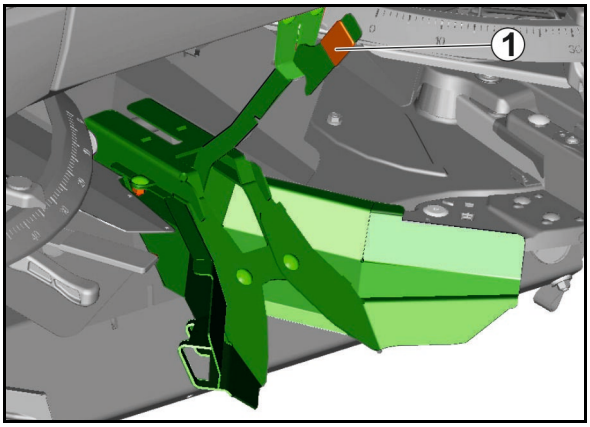


Fig. 22

Border spreading deflector:

- Boundary spreading when the 1st tramline is located directly at the field boundary.
- The shutter on the border side stays closed during boundary spreading.

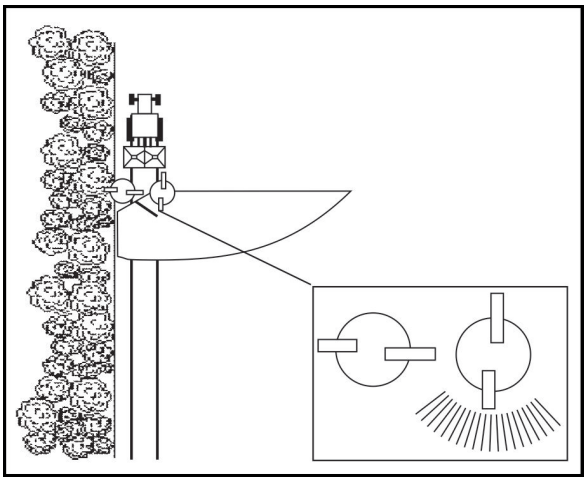


Fig. 23

5.11 Weighing technology (optional)

(1) Weighing frame
(2) Weighing cell
(3) Horizontally aligned tie rod

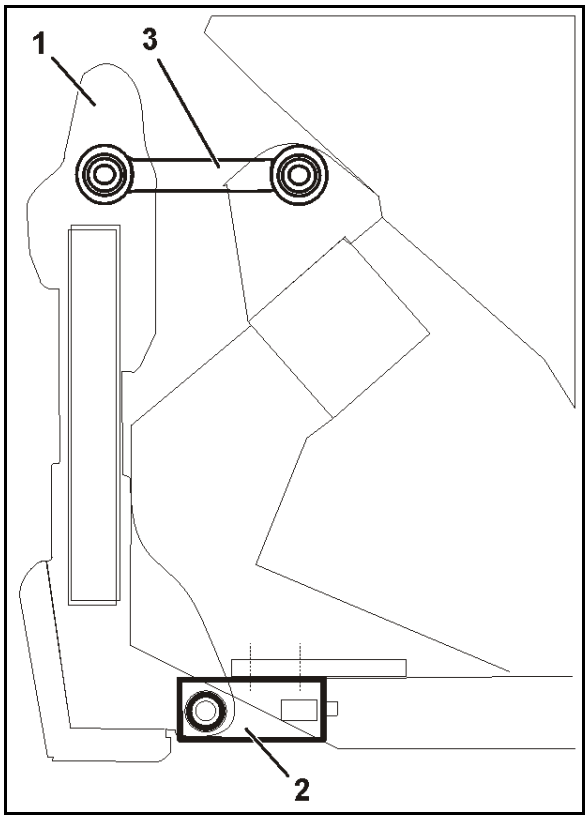


Fig. 24

The fertiliser spreader makes it possible, with the aid of weighing technology, to determine exactly the fertiliser spread quantity.

Likewise, an exact metering can be ensured without a calibration test.

The fertiliser spreader has a weighing frame mounted in front of the spreader on which the weighing cell is located.

The horizontal position of the leaf springs and the bearing straps is very important in order to determine the weight accurately.

Perform calibration travel

After entering the calibration factor from the setting chart, the calibration run can begin. For this purpose, the calibration procedure is started on the field with the machine at standstill on the control computer control computer. After spreading at least 200 kg of fertiliser, with the machine at standstill the calibration procedure is terminated on the control computer. It has now calculated a new calibration factor, with which the exact required fertiliser quantity can be spread.

Perform online calibration

After entering the calibration factor from the setting chart, a continuous calibration of the fertiliser will be performed while spreading.

5.12 PTO shaft

For machines with mechanical spreading disc drives, the drive shaft transmits the power from the tractor to the machine.

Drive shaft with friction clutch (910 mm)

Maximum speeds which briefly occur from approx. 400 Nm, that can occur, e.g., when switching on the PTO shaft, are limited by the friction clutch. The friction clutch prevents damage being caused to the drive shaft and gearbox elements. This is why it is important to always ensure that the friction coupling is working. Deposits on the friction lining prevent the friction coupling working.

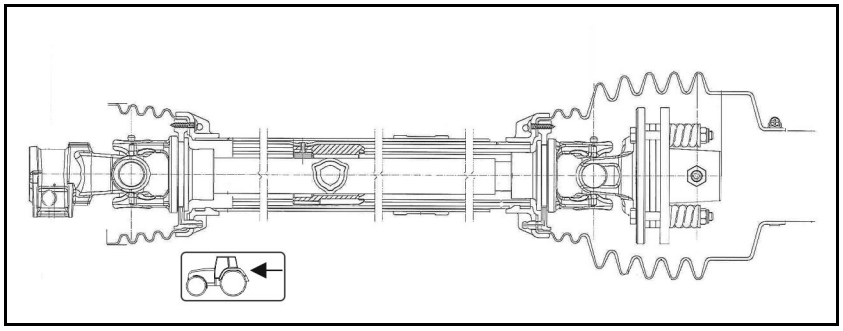


Fig. 25

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

- 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.
- 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.



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.



- 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 74.
  - 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.

5.12.1 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 76.
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. Check that there is sufficient clearance around the PTO shaft in all operational positions. Insufficient clearance will result in damage to the PTO shaft.
7. Provide the necessary clearance (if required).

5.12.2 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.
- 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 82.
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 76.
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 (Fig. 20).
6. Clean and lubricate the universal joint shaft if it is not going to be used for a longer period of time.

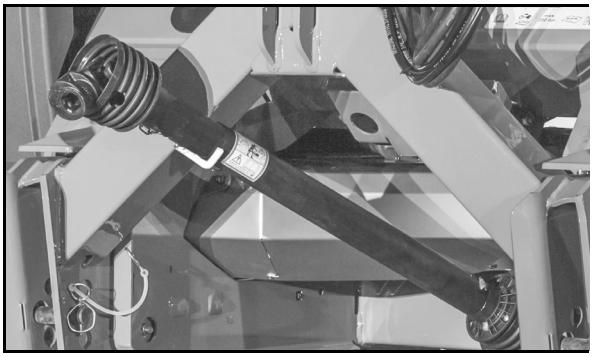
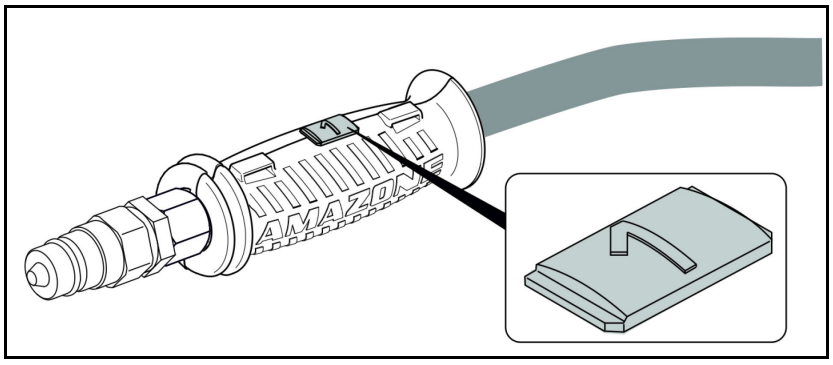


Fig. 26

5.13 Hydraulic system 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	
beige	1		open		double-acting	
	2		close			
Only on implements with manual spread rate adjustment:						
yellow	1	L	Metering shutter, left	open	double-acting	
	2			close		
green	1	R	Metering shutter, right	open	double-acting	
	2			close		
blue	1		Limiter (Option)	lower	double-acting	
	2			lifting		

Hydro:				
red	P	Permanent oil circulation	single-acting	∞
red	T	Pressure-free return flow		
red	LS	Load-Sensing-control line (where required / settings on the hydraulic block)		

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.

5.13.1 Coupling the hydraulic hose lines



WARNING

Danger from faulty hydraulic functions in event of incorrectly connected hydraulic hose lines!

When coupling the hydraulic hose lines, observe the coloured markings on the hydraulic plugs. Here, see "Hydraulic connections", page 55.

- 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 control valve on the tractor to float position (neutral position).
2. Clean the hydraulic plug for the hydraulic hose lines before connecting them to the tractor.
3. Couple the hydraulic hose lines with the tractor control units.

5.13.2 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the control valve on the tractor to float position (neutral position).
2. Unlock the hydraulic connectors from the hydraulic sockets.
3. Safeguard the hydraulic sockets against soiling with the dust protection caps.
4. Insert the hydraulic plug into the plug holder.

5.14 Three-point hitch frame

(1) Upper coupling point and lower coupling points.

(2) Turning pins for mounting on the tractor with Category 2 or 3 coupling points with linch pin for securing.

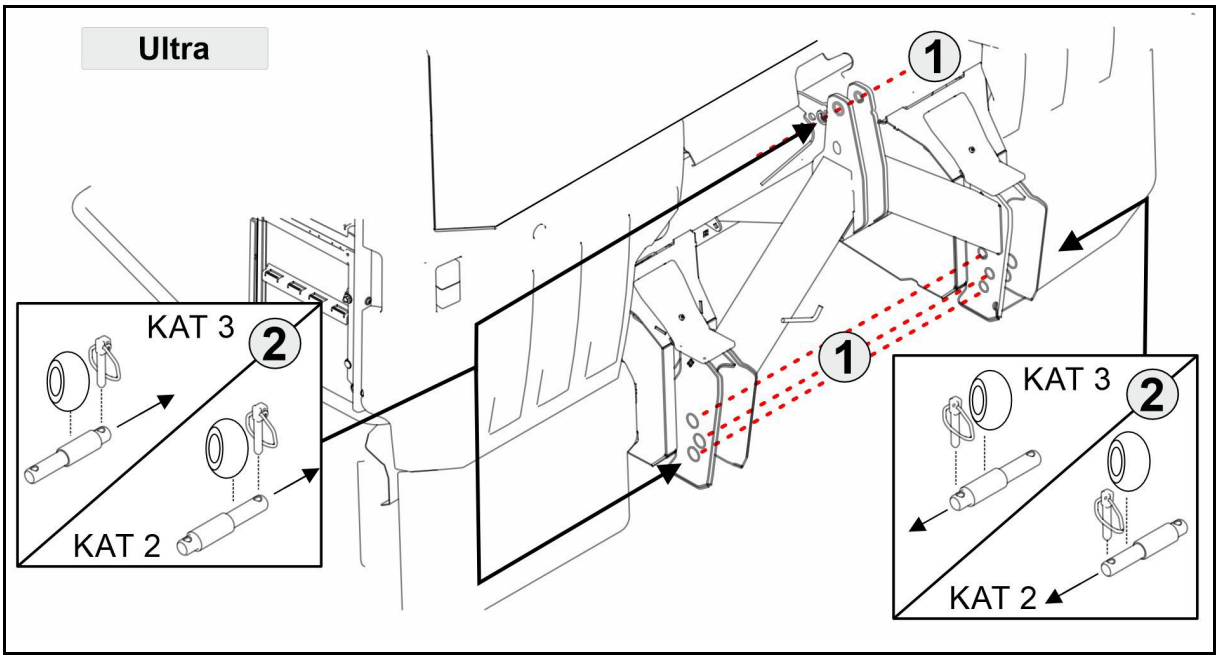


Fig. 27

(1) Upper coupling point and lower coupling points.

(2) Pins for mounting on the tractor with Category 2 coupling points with linch pin for securing.

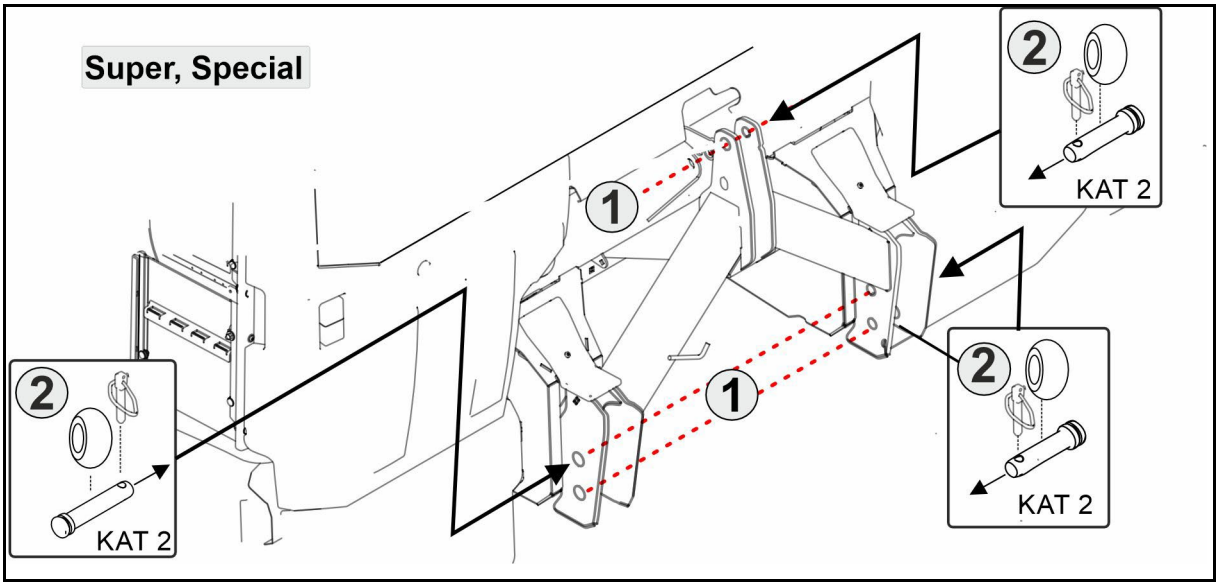


Fig. 28

ZA - Ultra quick hitch:

(1) Upper coupling point and lower coupling points

(2) Lower link turning pins for mounting on the tractor with Category 3 or 4N coupling points with linch pin for securing.

(3) Top link pins for mounting on the tractor with Category 3 coupling points with linch pin for securing.

(4) Top link pins for mounting on the tractor with Category 4N coupling points with linch pin for securing.

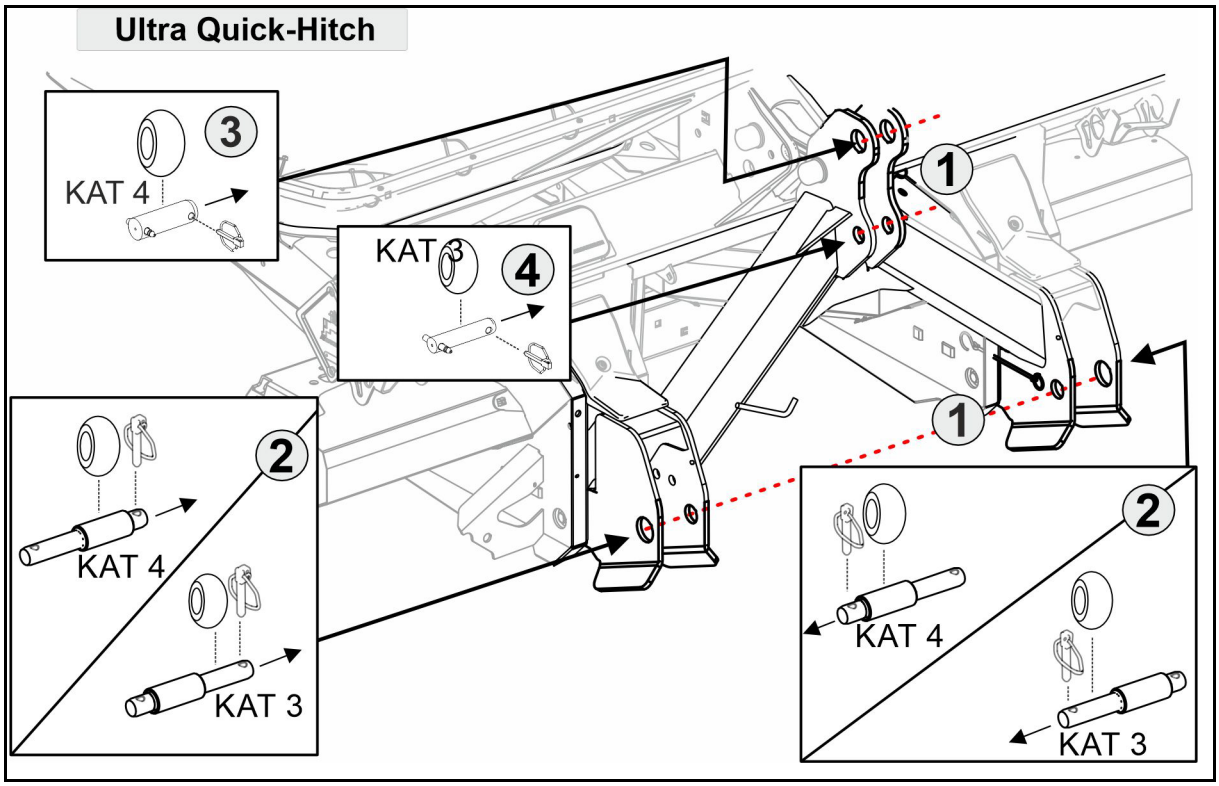


Fig. 29

5.15 Control computer / Operating terminal ISOBUS

When using the machine with control computer, it is essential to refer to the operating manual for the Control computer!

With the control computer / operating terminal the machine can be conveniently controlled, operated and monitored.

The spread rate is set electronically.

The slider position required for a specific spreading quantity is determined by means of fertiliser calibration.

5.16 Bluetooth connection

For a Bluetooth connection, the Bluetooth adapter must be connected to the implement computer or to the diagnosis plug.

For Bluetooth coupling, refer to the ISOBUS software operating manual.

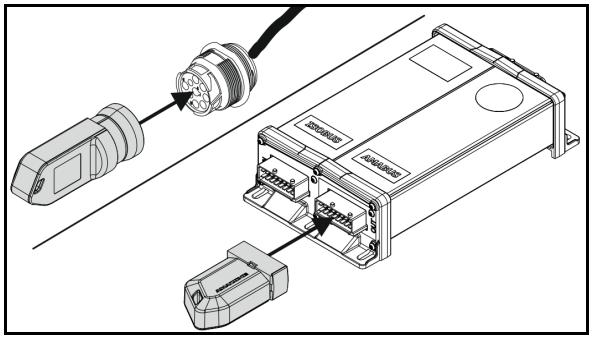


Fig. 30

5.17 mySpreader app

Content of the mySpreader app:

- A fertiliser selection with setting recommendations for the fertiliser spreader
- EasyCheck for determining the lateral distribution
- EasyMix with setting recommendations for mixed fertiliser
- EasyMatch for fertiliser identification



Fig. 31

With the required machine equipment, the machine can be connected to a mobile device via Bluetooth or the Internet, and exchange data with the mySpreader app.

Selected and stored fertilisers will be stored in the history of the mySpreader app.

The mySpreader app can be obtained from the iOS Store or the Play Store. To do so, use the QR code or the link.

https://ama.zone/feouxwz

5.18 Fertiliser identification with EasyMatch

EasyMatch is an integrated fertiliser identification tool in the mySpreader app.

The fertiliser is identified with a photo using a template. The settings for the detected fertiliser can be transferred to the "Products" menu of the ISOBUS software.

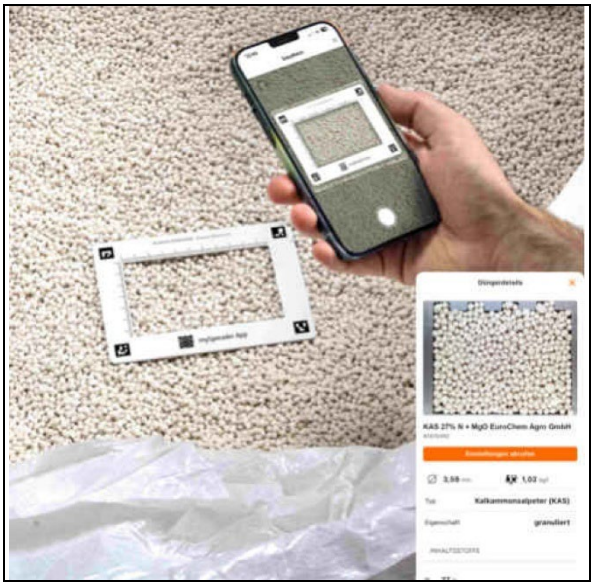


Fig. 32

5.19 EasyCheck digital mobile test rig

EasyCheck is a digital mobile test rig for simple optimisation of the lateral distribution with centrifugal fertiliser spreaders.

EasyCheck includes collection mats for fertiliser. The collection mats are placed at defined positions on the field and are strewn with fertiliser by driving back and forth one time.

Afterwards, the collection mats are photographed using the mobile device and evaluated with the mySpreader app. If necessary, changes to the settings are suggested.

The operating manual is available via the AMAZONE website https://amazone.net under Service & Support.

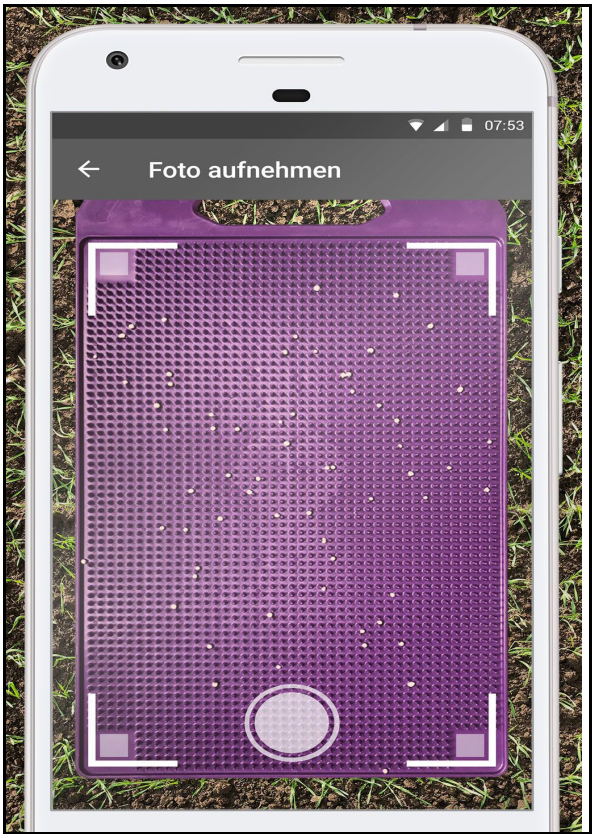


Fig. 33

5.20 Mobile test rig (optional)

The mobile test rig serves to check the lateral distribution on the field.

The mobile test rig consists of collection trays for the fertiliser and a measuring funnel.

The collection trays are placed at defined positions on the field and are strewn with fertiliser by driving back and forth.

Afterwards, the collected fertiliser is filled into a measuring cup. The evaluation is based on the fill level in the measuring funnel.

The evaluation is performed using:

- The calculation model in the mobile test rig operating manual.
- The ISOBUS software on the control terminal
- EasyCheck in the mySpreader app, refer to the AMAZONE website https://amazone.net under Service & Support

The mobile test rig operating manual is available via the AMAZONE website https://amazone.net under Service & Support.



Fig. 34

5.21 Cover tarpaulin (optional)

Cover tarpaulin for dry goods to be spread, even in event of wet weather.

The actuation of the rollover cover is carried out

- manually using the hand lever
- hydraulically using the tractor control unit *beige.*



Fig. 35

Cover tarpaulin with hand lever

(1) Locking mechanism

The tarpaulin locked in open and closed position.

(2) Locking pin

Pull the locking pin for unlocking the cover tarpaulin.

(3) Rotating locking mechanism for tarpaulin in slightly opened cleaning position.

Thus the underside of the cover tarpaulin can be cleaned.

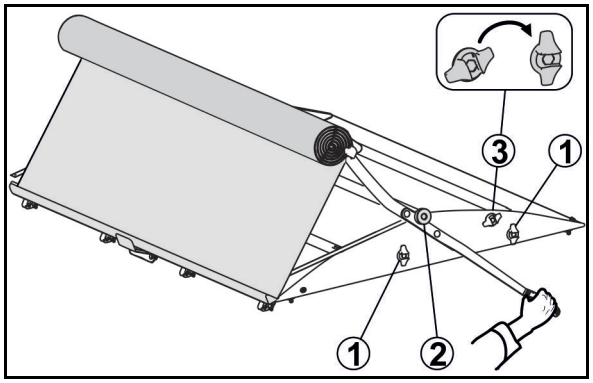


Fig. 36

Swivellable hopper cover

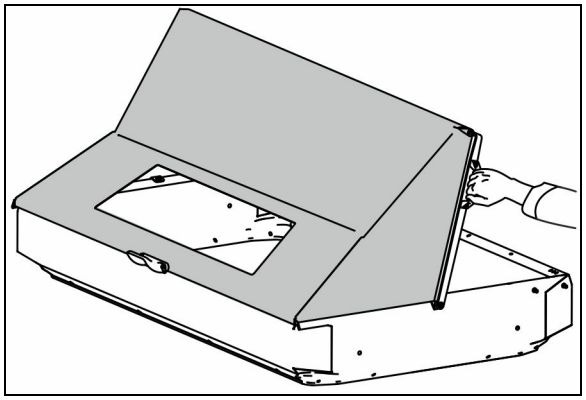


Fig. 37

5.22 Transport and parking device

WARNING

Danger of injury due to the filled implement tipping.

Couple and uncouple the implement only when it is empty.

The 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 2 guide rollers are equipped with a locking system.

Super, Ultra:

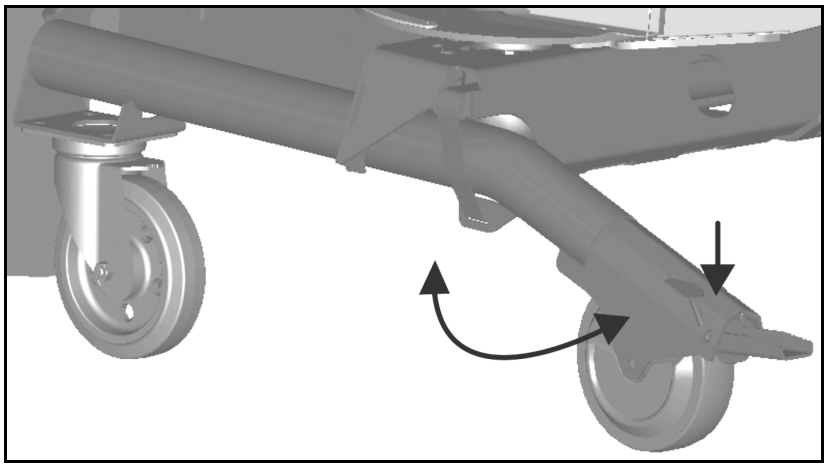


Fig. 38

Putting the stop device into operation

1. Secure the tractor and machine against unintentional start-up and rolling.
2. Approach the machine from the side.
3. Swivel the stop device on the rear roller downwards with your foot until the stop device catches.

Putting the stop device out of operation

1. Secure the tractor and machine against unintentional start-up and rolling.
2. Approach the machine from behind.
3. Push the rear roller downwards with your foot.

→ The stop device automatically swivels upwards.

Always actuate the stop devices on both sides of the machine.

Special

WARNING

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

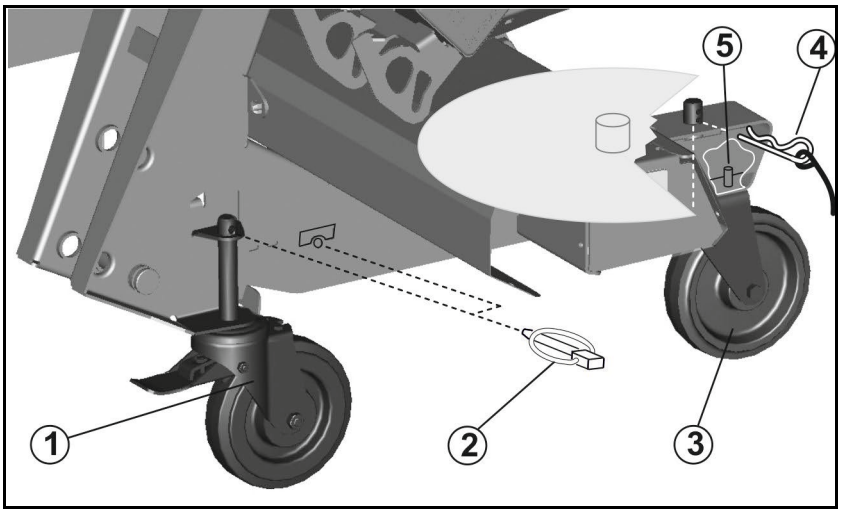


Fig. 39

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 (Fig. 42/1), front
   - o Install and secure with clip pin (Fig. 42/2),

   or
   - o Remove after taking out clip pin.
6. Rigid rollers (Fig. 42/3), rear
   - o Install and secure with safety splint (Fig. 42/4) in lowest bore,

   or
   - o Remove after taking out safety splint

When installing the rigid rollers ensure that the pin (Fig. 42/5) goes through the bore of the frame, thus holding the rollers in longitudinal direction.

5.23 Three-way control (optional)

Hose identification		
R	green	Shutter right
L	Yellow	Shutter left
	blue	Limiter

The three-way-control is necessary for hydraulic single slider actuation with

- tractors with only a double-acting tractor control unit and
- use of Limiter M.

A – Ball valve closed

B – Ball valve open

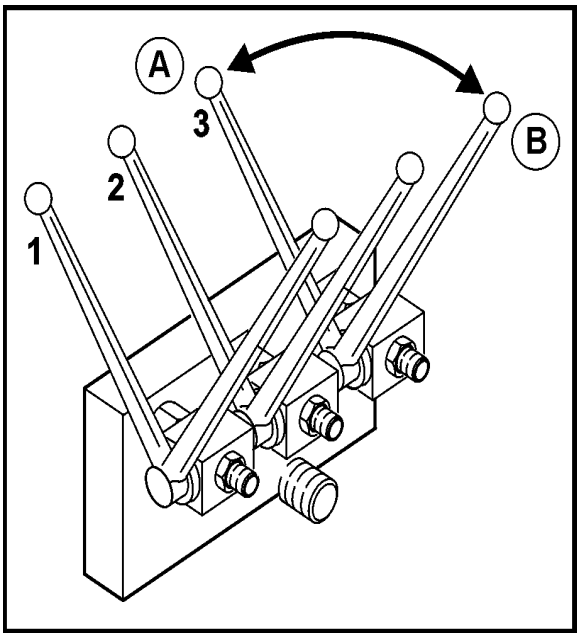


Fig. 40

Two-sided spreading with three-way control

1. Keep actuating lever for Limiter M closed.
2. Open the two actuating levers for slide gates.
3. Operate tractor control unit.

→ Open/close the sliders.

Boundary spreading with three-way control

1. Keep the two actuating levers for slide gates closed.
2. Open the actuating lever for Limiter M.
3. Operate tractor control unit.

→ Lower Limiter M.

4. Close the actuating lever for Limiter M.
5. Open the two actuating levers for slide gates.
6. Operate tractor control unit.

→ Open the slide gates.

→ **Carry out boundary spreading**.

After boundary spreading:

7. Operate tractor control unit.

→ Close the slide gates.

8. Close the two actuating levers for slide gates.
9. Open the actuating lever for Limiter M.
10. Operate tractor control unit.

→ Raise Limiter M.

11. Close actuating levers.

Half-sided spreading with three-way control

1. Keep actuating lever for slide gate of side **not** for spreading closed.
2. Close the actuating lever (Fig. 46/3) for Limiter M.
3. Open actuating lever for slide gate of side for spreading.
4. Operate tractor control unit.

→ Only one slide gate opens.

After one-sided spreading:

5. Operate tractor control unit.

→ Slide gate closes.

6. Close actuating levers.

5.24 Camera system (option)



WARNING

Risk of injury or even death.

If the camera display alone is used for manoeuvring, persons or objects can be overlooked. The camera system is an aid. It does not replace the operator's awareness of the immediate surroundings.

- **Before manoeuvring, ensure that there are no people or objects in the manoeuvring area by taking a direct look**

5.25 Implement mounted on the front of the tractor

Prerequisites for front mounting:

- Hydraulic spreading disc drive
- ISOBUS control terminal (select front spreader, the left and right shutters are then exchanged in the software)

Regulating restrictions in the field of view by the lifting height of the front hopper

Road transport:

- Prevent restrictions in the field of view by maintaining the lifting height, see Table below.
- Maintain a ground clearance of 0.2 m.

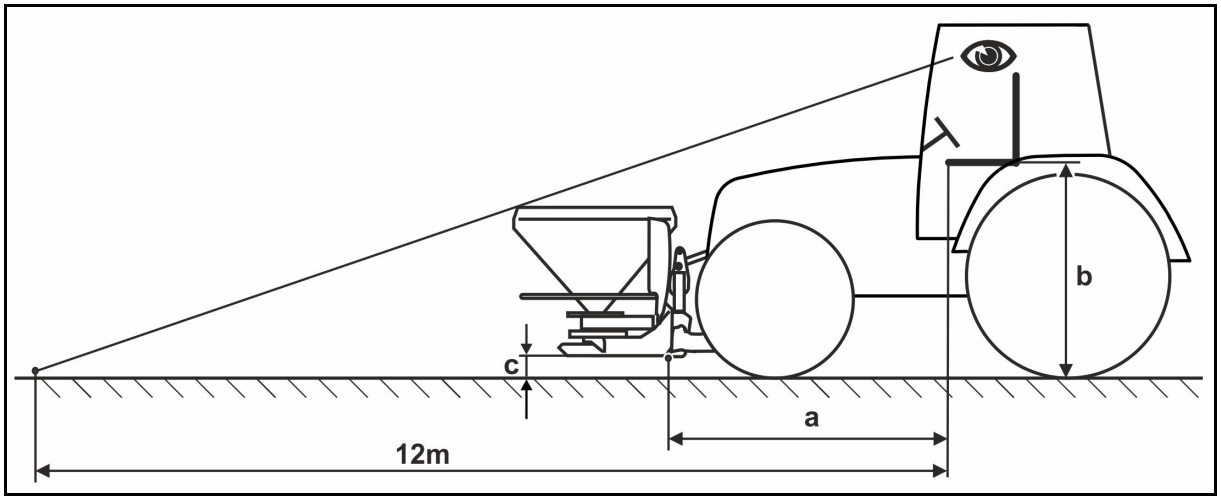


Table for determining the lifting height

Maximum lifting height for ZA-TS 1700		Distance from the front edge of the seat to the eye of the lower link **a** [m]								
		2.40	2.50	2.60	2.70	2.80	2.90	3.00	3.10	3.20
Height of the seating surface b [m]	1.70	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08
	1.75	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12
	1.80	0.31	0.29	0.28	0.26	0.23	0.21	0.19	0.17	0.15
	1.85	0.35	0.33	0.31	0.28	0.26	0.24	0.22	0.20	0.18
	1.90	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.21
	1.95	0.41	0.39	0.37	0.35	0.33	0.30	0.27	0.26	0.24
	2.00	0.45	0.43	0.41	0.38	0.36	0.33	0.31	0.29	0.27
	2.05	0.48	0.46	0.43	0.41	0.38	0.36	0.34	0.32	0.30
	2.10	0.52	0.49	0.47	0.45	0.42	0.40	0.38	0.35	0.33
	2.15	0.55	0.53	0.50	0.48	0.46	0.44	0.41	0.39	0.36
	2.20	0.59	0.56	0.53	0.51	0.49	0.46	0.44	0.41	0.39
	2.25	0.62	0.60	0.57	0.54	0.52	0.50	0.47	0.44	0.42
		Lifting height C [m]								

The maximum lifting height for the ZA-TS 1400 is 0.1 m greater than for the ZA-TS 1700.

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.
- Observe the following chapters
  - "Obligation of the operator" on page 9.
  - "Training of personnel" on page 13.
  - "Warning pictograms and other signs on the machine" from page 16.
  - "Safety information for the operator" from page 23.

  It is important to observe these chapters in the interests of your safety.
- Only couple and transport the machine to/with a tractor which is suitable for the task.
- The tractor and machine must comply with the national road traffic regulations.
- The owner (operator) and the driver (user) of the vehicle are responsible for complying with the statutory road traffic regulations.
- Check that the spreading discs are installed correctly. Viewed in direction of travel: left spreading disc "L" and right spreading disc "R".

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 approved total weight
- The approved axle loads
- The load capacity of the installed tyres
  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 dead-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 approved 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 approved 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

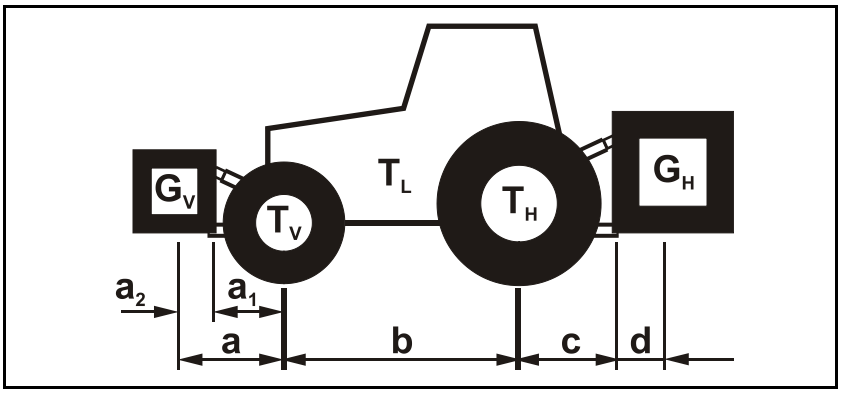


Fig. 41

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

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

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 $T_{V\,tat}$

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

Enter the numeric value for the calculated actual front axle load and the approved 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

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

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 $T_{H\,tat}$

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

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 loadbearing 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 instruction manual		Double approved load capacity (two tyres)
Minimum ballast front / rear	/ kg		--		--
Total weight	kg	≤	kg		--
Front axle load	kg	≤	kg	≤	kg
Rear axle load	kg	≤	kg	≤	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

Danger 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. Always observe the operating manual supplied with the PTO shaft when adjusting the PTO shaft.



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 provided.

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

Design changes to the PTO shaft that are not described in the PTO shaft operating manual provided 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 linkage

- 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

Danger of crushing, shearing, cutting, entrapment, entanglement, being drawn in, caught or struck during all interventions in the machine.

- **Due to powered operating elements.**
- **Due to unintentional actuation of operating elements or running of hydraulic functions when the tractor engine is running.**
- **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 any intervention in the machine.
- It is forbidden to make any intervention in the machine, such as installation, adjustment, troubleshooting, cleaning 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 turbine shaft / hydraulic system could be started unintentionally.
  - when moving parts are not blocked against unintentional movement.
  - when persons (children) are on the tractor.

  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.

6.4 Adjusting the hydraulic system with the system setting screw

ZA-V Hydro

- Be sure to match the hydraulic systems of the tractor and the implement.
- The implement hydraulic system is adjusted using the system setting screw on the hydraulic block of the implement.
- Elevated hydraulic oil temperatures are the result of incorrect adjustment of the system setting screw, caused by persistent strain on the pressure relief valve of the tractor hydraulic system.
- Adjustments may only be made in a pressureless state!
- If there are hydraulic malfunctions between the tractor and the implement during start-up, please contact your service partner.

(1) System setting screw can be adjusted in position A and B

(2) LS connection for the load sensing control line

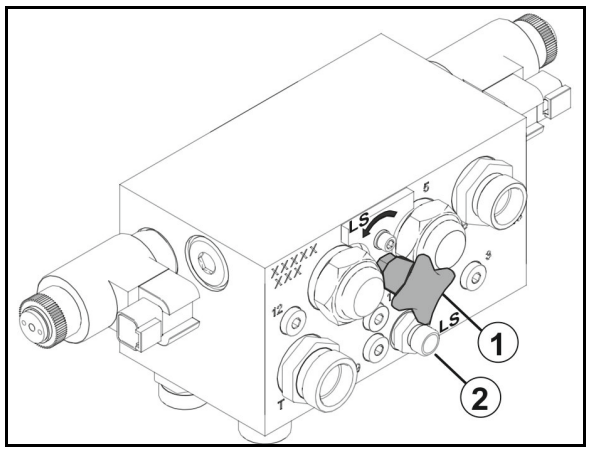


Fig. 42

Implement-side connections in compliance with ISO15657:

(1) P – feed line, pressure line, plug standard width 20

(2) LS – control line, plug standard width 10

(3) T - return line, socket standard width 20

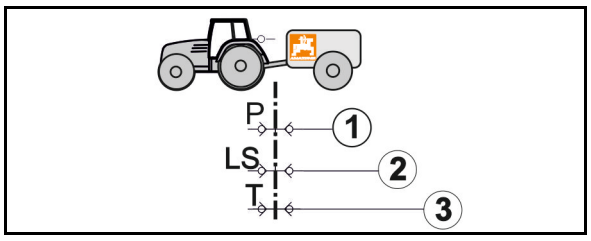


Fig. 43

(1) Open-Center hydraulic system with constant flow pump (gear pump) or setting pump.

→ Put the system setting screw in position A.

Setting pump: Set the maximum required oil quantity on the tractor control unit. If the oil quantity is insufficient, correct functioning of the implement cannot be ensured.

(2) Load-Sensing hydraulic system (pressure- and flow-regulated setting pump) with direct load sensing pump connection and LS setting pump.

→ Put the system setting screw in position B.

(3) Load-Sensing hydraulic system with constant flow pump (gear pump).

→ Put the system setting screw in position B.

(4) Closed-Center hydraulic system with pressure-regulated setting pump.

→ Put the system setting screw in position B.

Risk of overheating of the hydraulic system: the Closed-Center hydraulic system is less suitable for the operation of hydraulic motors.

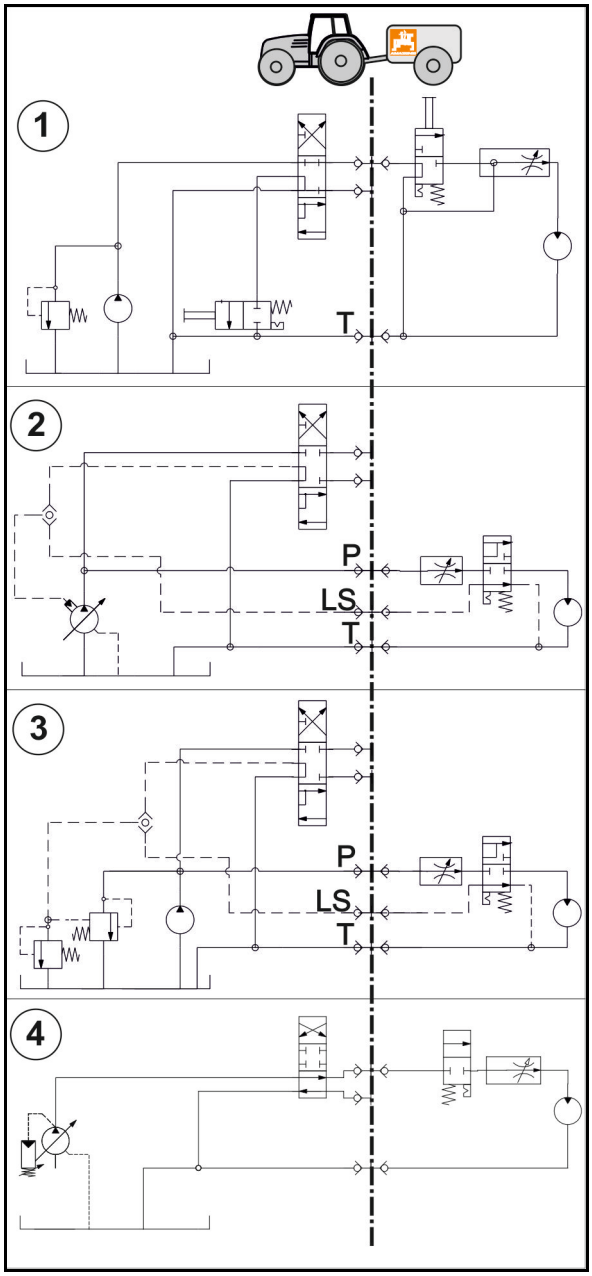


Fig. 44

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 76.



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

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 II upper and lower link pins of the machine to category III using reducing sleeves if your tractor has a category III 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 70.



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. Secure the machine to prevent it from accidentally rolling away if the machine is equipped with a transport fixture – see "Transport and parking device" chapter on page 64.
2. Always check for visible damage when coupling the machine: See the chapter "Obligation of operator" on page 9.
3. Fasten the ball sleeves over the upper link pins and fasten the lower link pins in the pivot points of the three-point attachment frame.



Be absolutely certain to upgrade the category II upper and lower link pins of the machine to category III using reducing sleeves if your tractor has a category III three-point linkage.

4. Secure the upper link pin and the lower link pin against unintentional release with a linchpin each. See the chapter "3-point attachment frame", Page 57.
5. Direct people out of the danger area between the tractor and machine before you approach the machine with the tractor.
6. First couple the PTO shaft and the supply lines to the tractor before you couple the machine with the tractor as follows:
   - 6.1 Drive the tractor up to the machine to leave a clearance of approximately 25 cm between tractor and machine.
   - 6.2 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 76.
   - 6.3 Check whether the universal joint shaft of the tractor is switched off.
   - 6.4 Couple the PTO shaft, see the chapter "Coupling the PTO shaft", from page 52.
   - 6.5 Couple the hydraulic hose lines, see the chapter "Coupling the hydraulic hose lines", from page 55.
   - 6.6 Couple the lighting system, see the chapter "Transportation equipment", page 34.
   - 6.7 Couple the control computer (if installed), refer to separate operating manual.
   - 6.8 Align the lower link hooks so that they are flush with the lower attachment points of the machine.
7. Now continue to reverse the tractor up to the machine so that the lower linking points of the machine pick up the lower link hook of the tractor.
8. Raise the three-point hydraulic system of the tractor until the lower link hooks receive the ball sleeves and automatically interlock.

9. From the tractor seat, couple the upper link to the top attachment point of the three-point attachment frame using the top link hook.

→ The top link hooks lock automatically.

10. Perform a visual inspection to ensure that the upper and lower link hooks are correctly locked before reversing the tractor.

7.2 Uncoupling the machine



WARNING

Danger from crushing and / or impacts

- **due to insufficient stability and tilting of the uncoupled machine on uneven, soft ground!**
- **due to unintentional rolling of the machine parked on a transportation device!**
- Secure the machine against unintentional rolling when you park the machine on a transportation device. Here, see the chapter "Transportation and parking device", page 64.



WARNING

Danger of injury due to the filled implement tipping.

Couple and uncouple the implement only when it is empty.



Setting down the implement without transport device / with lifted transport device:

Set down the implement on a platform that is approx. 25 cm so that the lower link receptacle is easily accessible and the coupling procedure can be carried out easily.

The platform must be sufficiently wide and long so that the machine cannot tip.

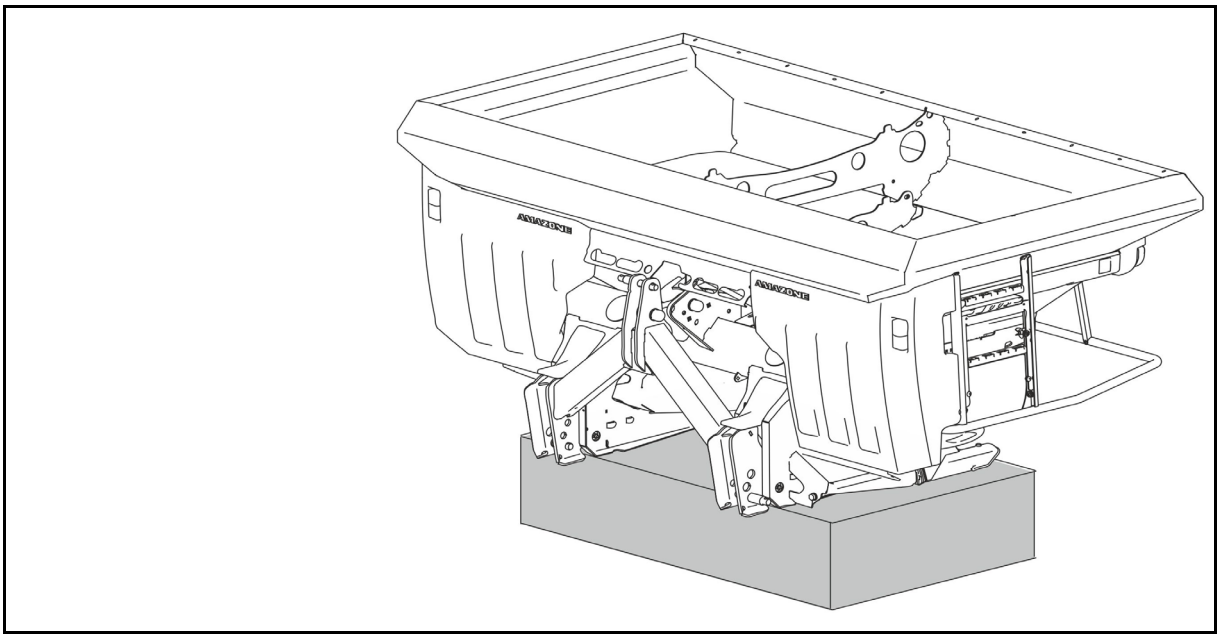


Fig. 45

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. Uncouple the machine from the tractor as follows:
   - 3.1 Relieve the load from the top link.
   - 3.2 Unlock and uncouple the top link hooks from the tractor seat.
   - 3.3 Relieve the load from the lower link.
   - 3.4 Unlock and uncouple the lower link hooks from the tractor seat.
   - 3.5 Draw the tractor approximately 25 cm forwards.
     → The space created between the tractor and the machine allows better access for decoupling the turbine shaft and the power lines.
   - 3.6 Secure the tractor against unintentional starting and rolling away, see the chapter "Securing the tractor against unintentional starting and rolling away", from page 76.
   - 3.7 Secure the machine to prevent it from accidentally rolling away if the machine is equipped with a transport fixture – see "Transport and parking device" chapter on page 64.
   - 3.8 Uncouple the PTO shaft, see the chapter "Uncoupling the PTO shaft", from page 53.
   - 3.9 Uncouple the hydraulic hose lines, see the chapter "Uncoupling the hydraulic hose lines", from page 56.
   - 3.10 Uncouple the lighting system, see the chapter "Transportation equipment", page 34.
   - 3.11 Couple the control computer (if installed), refer to separate operating manual.

8 Adjustments



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 76.
- Only touch moving operating elements (rotating spreading discs) when they have come to a complete standstill.

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.

8.1 Determining the setting data for the fertiliser

8.1.1 Selecting the fertiliser

In the AMAZONE Spreader Application Center (SAC), setting values are determined for all commercially available fertilisers and they are entered in the fertiliser database and in setting charts.

1. To select a fertiliser:

   Retrieve data from the mySpreader app or

   Retrieve data from the fertiliser database through the AMAZONE website https://amazone.net under Service & Support via the on-line FertiliserService or

   Read data from the printed setting chart.

2. With the mySpreader app, data is automatically adopted in the ISOBUS software or are manually entered.

8.1.2 Identifying unknown fertilisers with EasyMatch

1. Open the mySpreader app on your mobile device.
2. Select EasyMatch for the fertiliser selection.
3. Place the template on the fertiliser and take a picture.
4. Select a suggested fertiliser.

   The topmost fertiliser in the list is the closest match.

5. Adopt the fertiliser data.

8.1.3 Retrieving spreader settings in the mySpreader app

1. Open the mySpreader app on the mobile device.
2. To be able to manage the settings, configure the machine.
3. Search for and select the fertiliser or

   Scan the QR code for the submitted fertiliser sample or

   Create EasyMix.

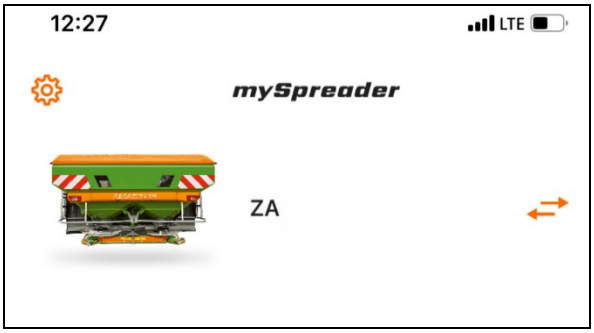


Fig. 46

4. Retrieve the setting recommendations.

→ The setting chart for the selected fertiliser will be shown.

5. Enter the spread rate in kg/ha.

→ The spreader settings will be displayed.

6. Save the spreader settings.

→ Machines with ISOBUS and Bluetooth connection to the machine: product-specific data will be transmitted to the machine.

7. Machine with manual operation or on-board computer:
   Keep the following spreader settings at hand for entry on the on-board computer or setting on the machine:

- Calibration factor
- Spreading vane positions
- Shutter position for manual spread rate setting
- Spreading disc speed / PTO shaft speed
- Switch-on point and switch-off point
- Settings for border spreading, boundary spreading and ditch spreading

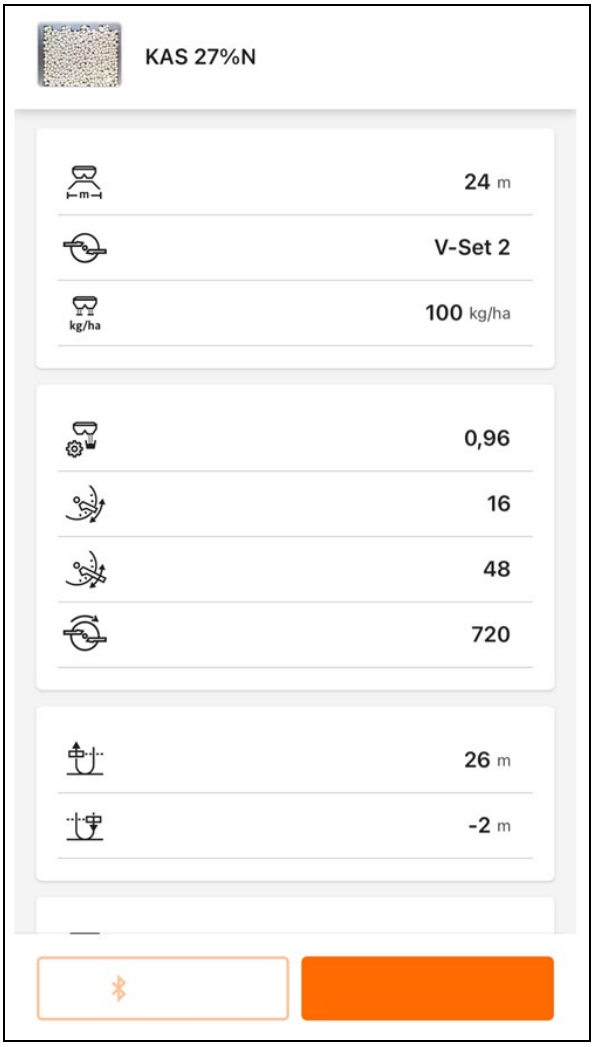


Fig. 47

8.2 Adjusting the mounting height

WARNING

Danger of crushing and / or impact for persons behind / under the fertiliser spreader due to unintentional dropping of the fertiliser spreader if the top 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 loaded machine on the field in accordance with the setting chart. Following the adjustment, measure the mounting height at the front and rear side of the fertiliser spreader from the surface of the ground (Fig. 54).

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 (Standard height = 80 cm).
   - 4.1 Raise or lower the fertiliser spreader via the tractor's three-point hydraulic system until the spreading 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.

Standard mounting height	=	a / b = 80 cm
Installation dimension a smaller than b	=	Extend length of the top link
Installation dimension a greater than b	=	Shorten length of the top link

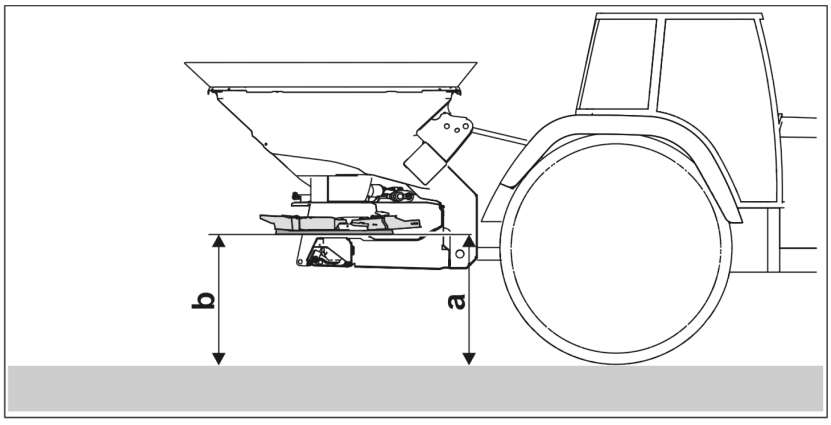


Fig. 48

8.3 Mounting height for late top dressing

Using the tractor's three-point linkage, set the mounting height of the spreader so that the distance between the grain tips and the spreading discs is approx. 25 cm. Fasten the lower link pins in the lower link connections at the bottom if required.

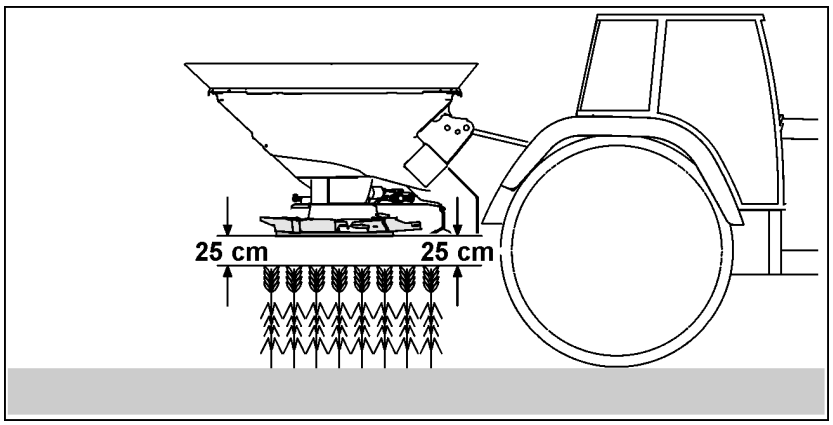


Fig. 49

8.4 Setting the spread rate

For the **ZA-V** with control terminal, see separate operating manual!

Setting the spread rate for implements without control terminal

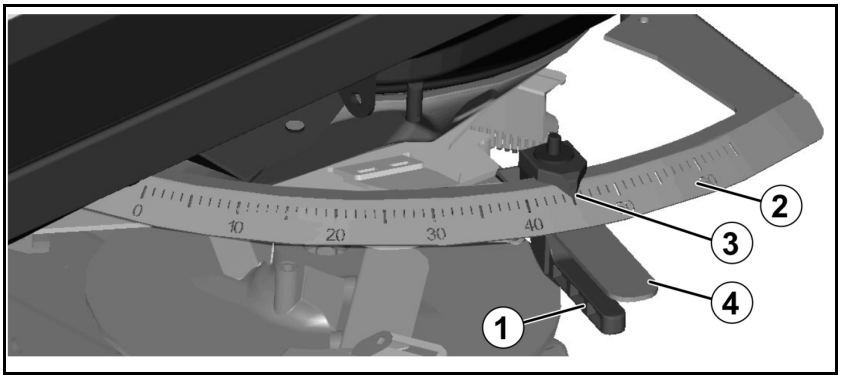


Fig. 50

Determine the required slider position either directly from the setting chart or using the calculating disc rule.

1. Close the metering shutter hydraulically.
2. Release the (Fig. 56/1) locking mechanism.
3. Look for the required slider position on the scale (Fig. 56/2).
4. Adjust the read-off edge (Fig. 56/3) of the setting lever pointer (Fig. 56/4) so that it corresponds to the scale value..
5. Tighten the locking mechanism again.

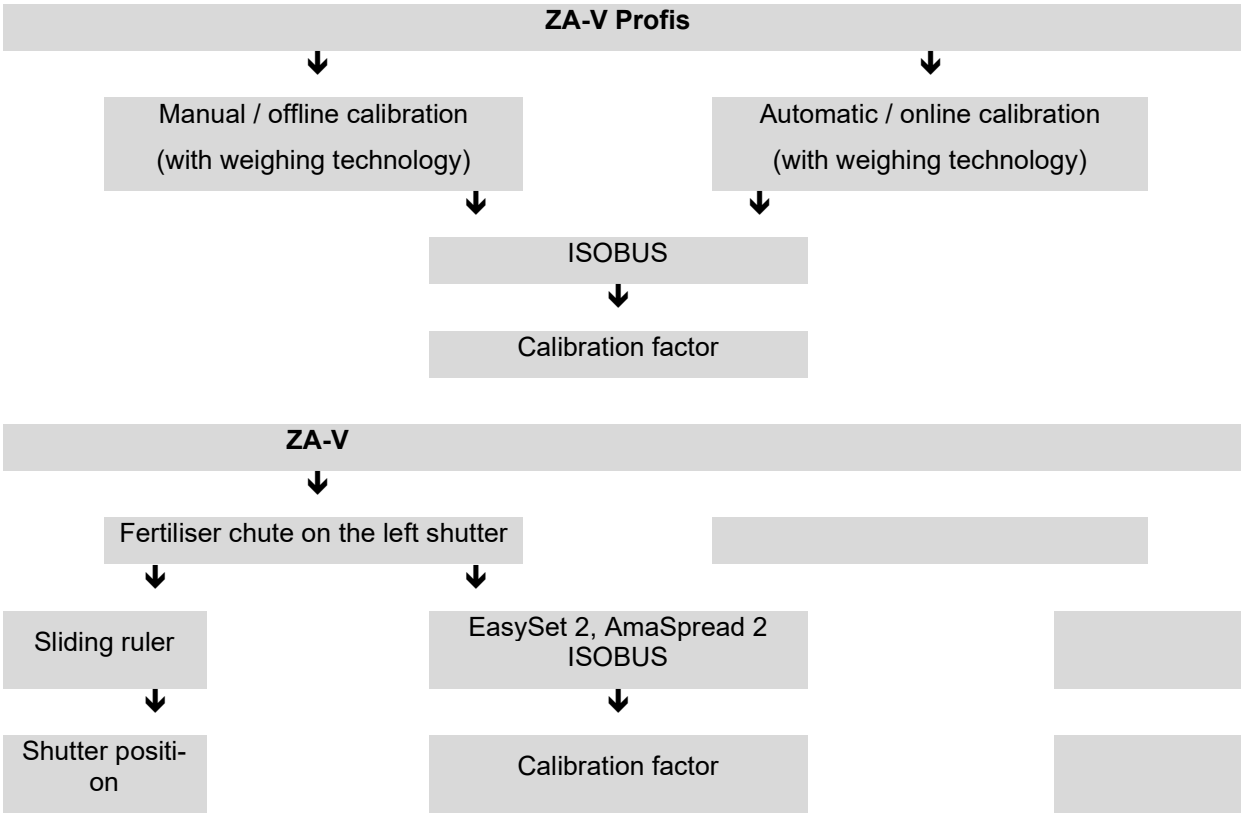
Select identical slider positions for the left and right sliders!

8.5 Spread rate check

During the spread rate check, the correct calibration factor is determined for electric shutter control or for the shutter position with manual shutter control.

For the **ZA-V** with control terminal, see separate operating manual!

Diagram for spread rate check



8.5.1 Online, offline calibration while spreading

Offline calibration:

The spread rate check when beginning to spread.

The calibration factor is determined while spreading the first 200 kg of fertiliser.

→ Implement data menu: Switch on the offline calibration procedure.

→ Work menu: select automatic fertiliser calibration.

Online calibration:

The spread rate check is performed continuously while spreading.

→ Implement data menu: Switch on the online calibration procedure.

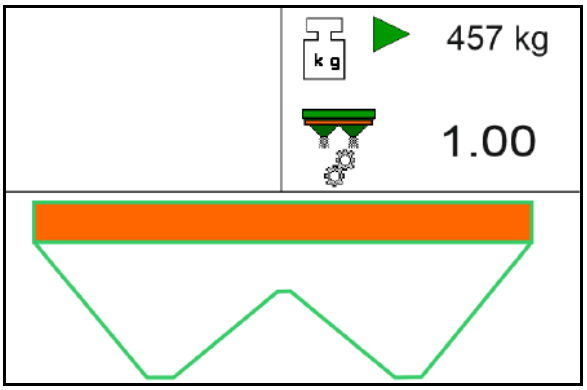


Fig. 51

8.5.2 Spread rate check with the fertiliser chute on the left shutter

Preparations for the spread rate check with the fertiliser chute

1. Remove both spreading discs.

Always install the central bolt for the spreading disc as protection from water / fertiliser, even if the spreading discs are not installed.

2. Hook the fertiliser chute onto the two attachments on the base plate.
3. Put the collection bucket under the fertiliser chute.

WARNING

Risk of injury from rotating spreading discs!

Remove both spreading discs before the spread rate check.

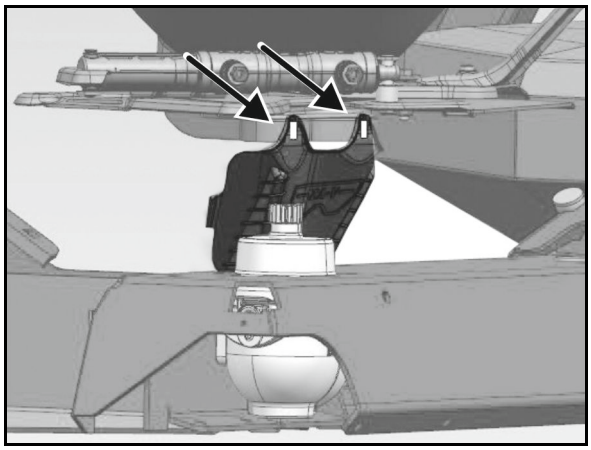


Fig. 52

Fertiliser chute attached with holding clips in parking position.

Before removing from the parking position, press the fertiliser chute together at the sides.

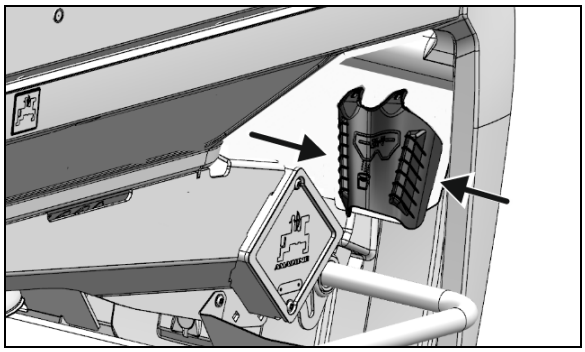


Fig. 53

Performing a spread rate check with the fertiliser chute

- The spread rate check is performed before operation while standing still.
- Always perform a spread rate check with the fertiliser chute for slug pellets or fine seeds.
- Perform a spread rate check during each fertiliser change.
- Perform a test run first in order to ensure for continuous fertiliser flow.
- Take note of the following values during the rate check:
  - Flow time in s
  - Discharged quantity in kg
- Fill the collection bucket as full as possible during the spread rate check.

1. Add a sufficient quantity of fertiliser to the hopper.
2. Put the collection bucket under the fertiliser chute
3. Adjust the left shutter position according to the setting chart.
4. Set the PTO shaft speed.
5. Open the left shutter hydraulically and start the time measurement.
6. As soon as the collection bucket is full, close the shutter and stop the time measurement.
7. Weigh the collected fertiliser (allow for the weight of the collection bucket).

After the spread rate check:

- Determine the shutter position with the sliding ruler and adjust the shutter position on both sides of the fertiliser spreader.

or

- Determine the calibration factor with EasySet 2.

8.5.3 Determining the shutter position with the sliding ruler

The sliding ruler is used to determine the shutter position after performing a spread rate check.

This is required for implements with manual shutter adjustment.

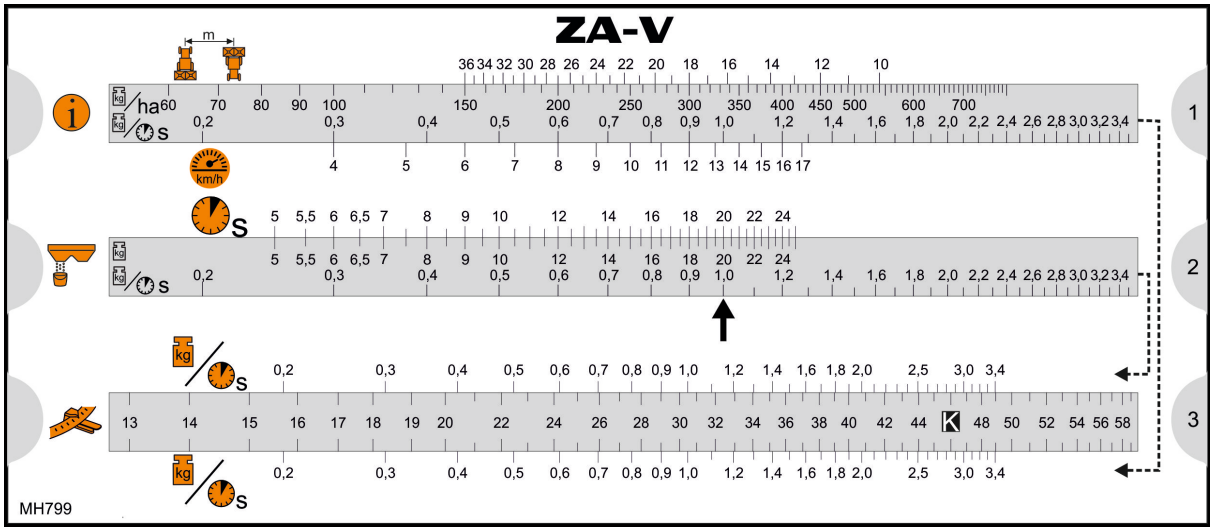
The sliding ruler consists of the covering film and 3 sliding inserts.

- Insert 1 for determining the desired target quantity in kg/s.
- Insert 2 for determining the actual spread rate during the spread rate check in kg/s.
- Insert 3 for determining the shutter position.

Both sides of the sliding ruler must be used, depending on the spread rate.

To determine the shutter position for normal and high spread rates (fertiliser).

To determine the shutter position for low spread rates (slug pellets or fine seeds). Only for the spread rate check using the left shutter.



Inserts:

1. Slide insert 1 so that the values for the working width and target quantity are lined up on top of each other.
2. Look for the value for the forward speed and read off the desired flow rate written above it.

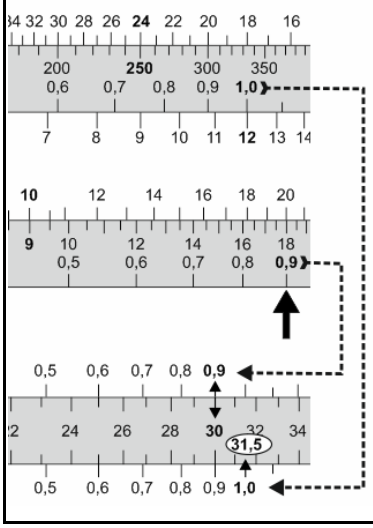


3. Perform the spread rate check and take note of the values for the fertiliser discharge time and the collected fertiliser quantity in kg.
4. Slide insert 2 such that the value for discharge time and the collected fertiliser quantity in kg are lined up on top of each other.
5. Read off the real flow rate above the arrow .

For spread rate check on the left shutter:



1. Slide insert 3 such that the value for the real flow rate (above insert 3) is lined up on top of the set shutter position .
2. Look for the value for the desired flow rate (below insert 3) and read off the shutter position to be set above it.
3. Adjust the shutter position on both sides of the fertiliser spreader.

Example:	
	Working width: 24 m, target quantity: 250 kg/ha, forward speed: 12 km/h: → Desired flow rate: 1.0 kg/s
	From the spread rate check at shutter position 30: flow time: 10 s, collected fertiliser quantity: 9 kg → Real flow rate: 0.9 kg/s
	Real flow rate: 0.9 kg/s, shutter position 30, desired flow rate: 1.0 kg/s → Shutter position to be set: 31.5

8.6 Setting the spreading disc speed

Take the spreading disc speed for the corresponding fertiliser from the setting chart.

Correctly set and maintain the spreading disc speed via the PTO shaft.

Hydro: the spreading disc speed must be entered on the control terminal.

Tronic: the gearbox translates the PTO shaft speed with the transmission ratio 1:1.33 in the upper speed range (see table below).

Speed - PTO shaft [rpm]	Translation	Speed - spreading disc [rpm]
375	1 :1,33	500
415		550
450		600
540		720
600		800
675		900

8.7 Setting the working width

- There are different spreading disc pairs for the various working widths.
- The working widths are adjustable within the working ranges of the respective spreading disc pairs (however, there may be deviations for the spreading of urea).
- The type of fertiliser and desired working width determine the setting of the pivotable spreading vanes.

  The specific spreading properties of a fertiliser influence its throwing range. The pivotable spreading vanes allow the adjustment of these specific spreading properties of a fertiliser, so that the respective fertiliser can be spread over the desired working width.

The primary factors that affect the spreading properties are:

- Granule size
- Bulk density
- Surface condition
- Humidity

We therefore recommend the use of a well granulated fertiliser by a renowned manufacturer and also checking of the working width setting using the mobile fertiliser test rig.

8.7.1 Replacing the spreading discs

1. Loosen the central bolt with the tool.
2. Remove the spreading disc from the gearbox shaft.
3. Put on the other spreading disc.
4. For easier assembly, apply assembly paste (KA059) on the thread of the central bolt.
5. Fasten the spreading disc by tightening the central bolt with a tool.

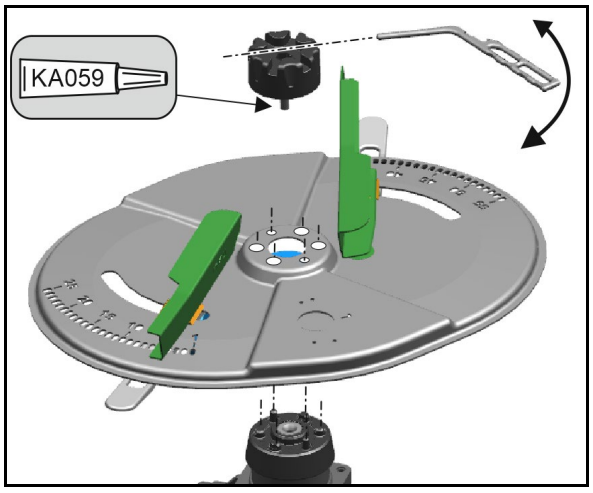


Fig. 54

When installing the spreading discs, the 2 thin long pins (1) must engage in the small drilled holes (2) with a diameter of 8 mm.

The inner diameter of the spreading disc (3) and the gearbox attachment (4) are larger on the right to prevent confusion of the right and left spreading discs.

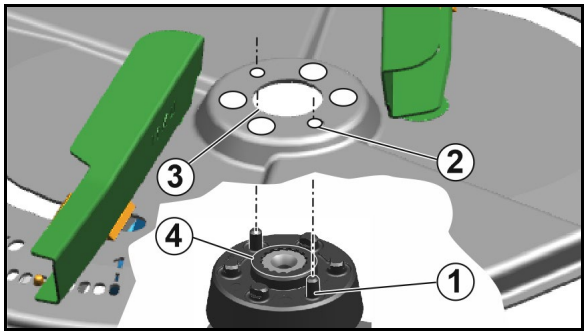


Fig. 55

8.7.2 Adjusting the spreading vane positions

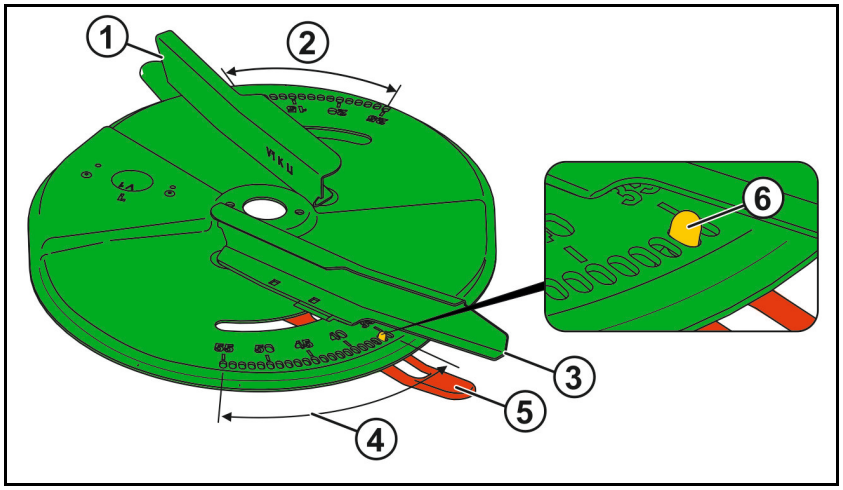


Fig. 56

(1) Short spreading vane

(2) Adjustment scale (5-25) for short spreading vane

(3) Long spreading vane

(4) Adjustment scale (35-55) for long spreading vane

(5) Adjustment lever for spreading vane

(6) Vane locking mechanism as indicator of the vane position

The spreading vane position depends on:

- the working width and
- the type of fertiliser.

- Swivelling the spreading vanes to a higher scale value increases the working width.
- The shorter spreading vanes primarily distribute the fertiliser in the centre of the spread pattern, while the longer vanes primarily distribute it to the outer area.

Adjust the spreading vanes as follows:

1. Switch off the tractor PTO shaft.
2. Secure the tractor against unintentional starting and unintentional rolling away.
3. Wait until any rotating spreading discs have come to a full stop.
4. Adjust the desired working width on both spreading discs by swivelling the short and long spreading vane.
   - 4.1 Turn the spreading disc in such a manner that each spreading vane can be easily adjusted.
   - 4.2 Obtain the required setting values for the short and long spreading vane from the setting chart.
   - 4.3 Press the hand lever down and adjust the spreading vane in such a manner that the vane locking mechanism indicates the required setting value on the scale.
   - 4.4 Release the hand lever so that the vane locking mechanism secures the set position.

8.8 Checking the working width and lateral distribution

The working width is influenced by the respective spreading properties of the fertiliser.

The most important influential factors on the spreading properties are known to be

- the grain size,
- the bulk density,
- the surface properties and
- the moisture.

Check the working width and lateral distribution and optimise the fertiliser spreader settings by using:

- a mobile test rig
- EasyCheck

→ See separate operating manual

8.9 Boundary, ditch and side spreading

1. **Boundary spreading:**

There is a road, a field track or someone else's field at the field boundary.

Only minimal quantities of fertiliser fall beyond the boundary.

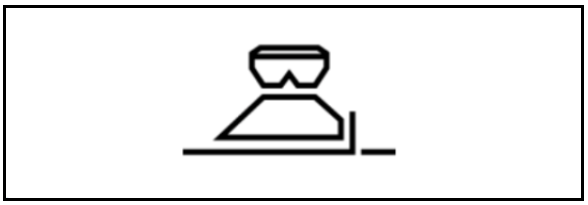


Fig. 57

2. **Ditch spreading:**

There is a water body or ditch at the field boundary.

No fertiliser may fall closer than one metre from the boundary

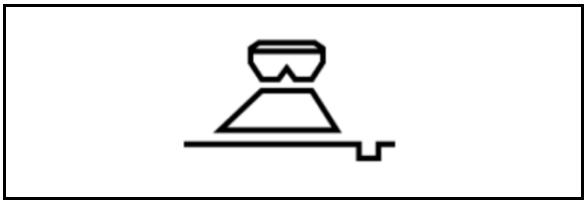


Fig. 58

3. **Border spreading:**

The neighbouring field is an area under agricultural use.

Minimal quantities of fertiliser fall beyond the boundary.

The quantity of fertiliser at the field edge is close to the target rate.

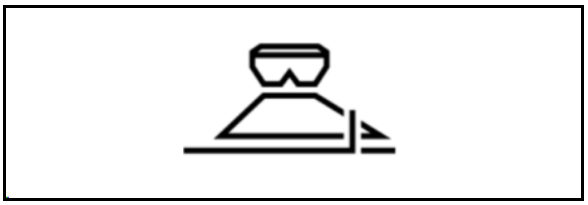


Fig. 59

Boundary spreading and ditch spreading:

To prevent over-fertilising in the inside of the field, the spread rate at the boundary must be reduced. There is a slight under-fertilising in front of the field boundary.

- **Manual shutter control:**

  Reduce the shutter position on the boundary side by the number of increments given in the setting chart.

- **AMASPREAD+ or ISOBUS:**

  The spread rate is reduced automatically.

  -% Set the rate reduction according to the setting chart on the control terminal / control computer beforehand

8.9.1 Boundary spreading with limiter

The height of the spread deflector can be set to adjust the limiter to the field boundary characteristics (boundary spreading or border spreading).

- Manually using the hole bar
- Electrically using the control computer, see separate operating manual.

The spread deflector can be swivelled around the spreading disc to adjust the limiter to the border distance and the fertiliser type.

The value to be set should be read from the setting chart.

Manual conversion boundary spreading / border spreading / ditch spreading

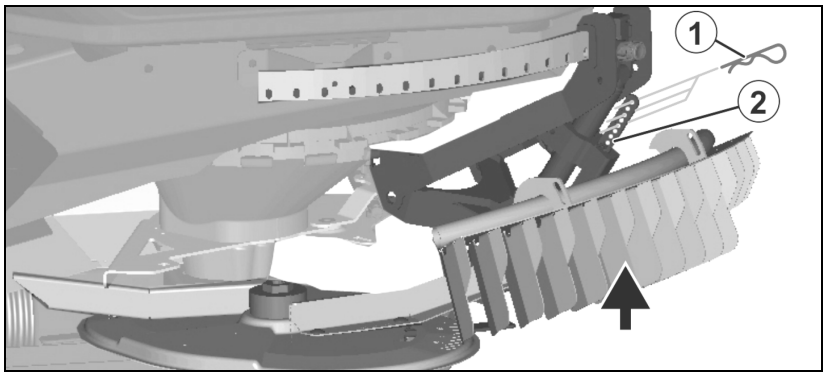


Fig. 60

1. Lift the spread deflector hydraulically.
2. Peg the spring cotter pin (1) into the hole bar (2) according to the setting chart.

Adjust according to the type of fertiliser and border distance

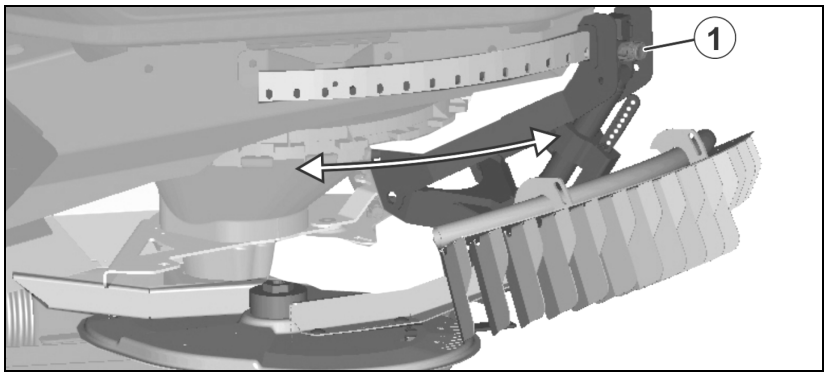


Fig. 61

1. Pull the adjusting knob (1) and swivel the spread deflector up to the set value on the scale according to the setting chart.
2. Let go of the adjusting knob, so that it engages in the scale.

- The values in the setting table are intended as guideline values, since fertiliser condition may differ. Readjust the limiter if necessary.
- The border/edge distance in the setting table always represents half of the working width.

8.9.2 Boundary spreading by reducing the spreading disc speed

For boundary spreading with the ZA-V Hydro, the spreading disc speed on the boundary side is reduced.

Read the spreading disc speed for the boundary spreading method from the setting chart and enter it on the control terminal.

↓With smaller working widths, the field-side spreading disc speed may also need to be reduced.

Enter the boundary-side quantity reduction for boundary spreading (25%) and ditch spreading (60%).

8.10 Switch-on point and switch-off point

- The switch-on point is the position for opening the shutters when moving out of the headlands at which the best possible fertiliser distribution is achieved.
- The switch-off point is the position for closing the shutters when moving onto the headlands at which the best possible fertiliser distribution is achieved.

The switch-on point and switch-off point are measured from the centre of the headlands to the centre of the spreading disc.

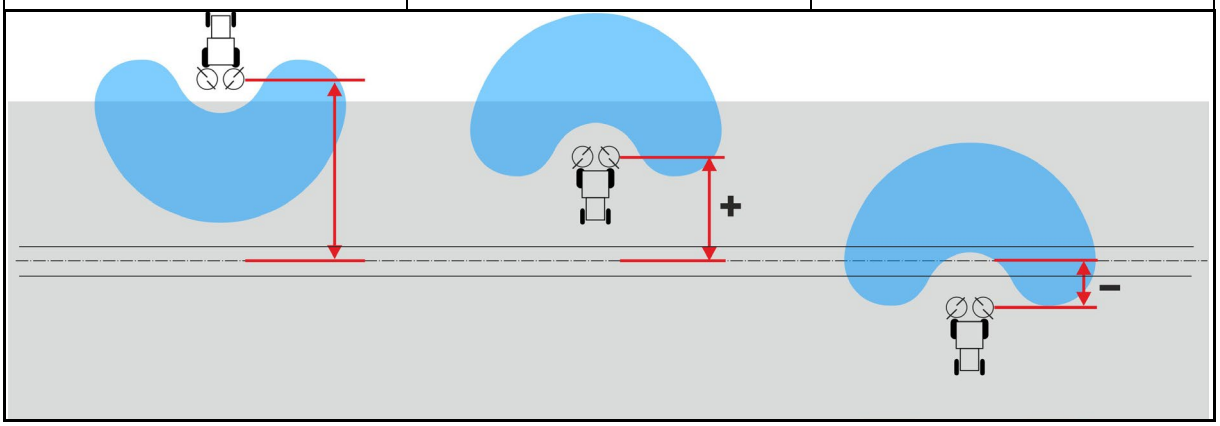
See the setting chart for the switch-on point and switch-off point and enter it in the Fertiliser menu of the ISOBUS software.

The switch-off point can have a positive or negative value.

Implements without SectionControl:

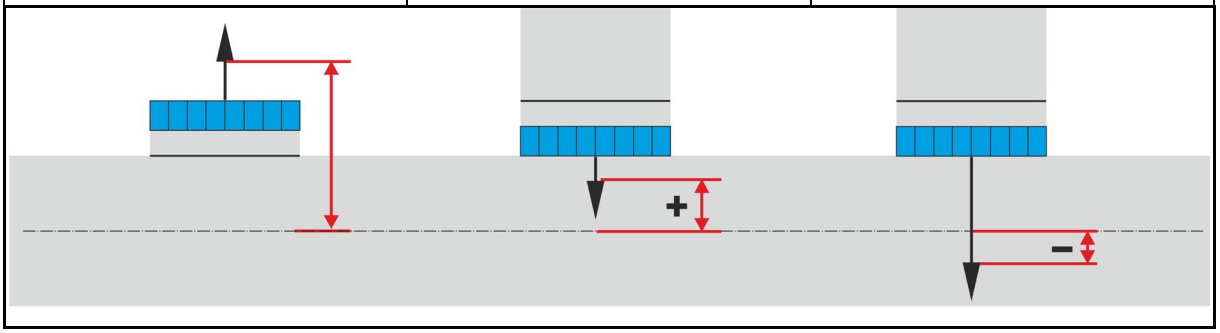
- Open shutters at the switch-on point.
- Close shutters, at the switch-off point.

Switching on point	Switch-off point positive	Switch-off point negative



Switch-on point and switch-off point for SectionControl

Presentation of the switch-on point for SectionControl	Presentation of the positive switch-off point for SectionControl	Presentation of the negative switch-off point for SectionControl



Adjusting the switch-off point for the driving style

The selection of the switch-off point depends on the driving style on the headlands.

- Distribution-optimised driving style

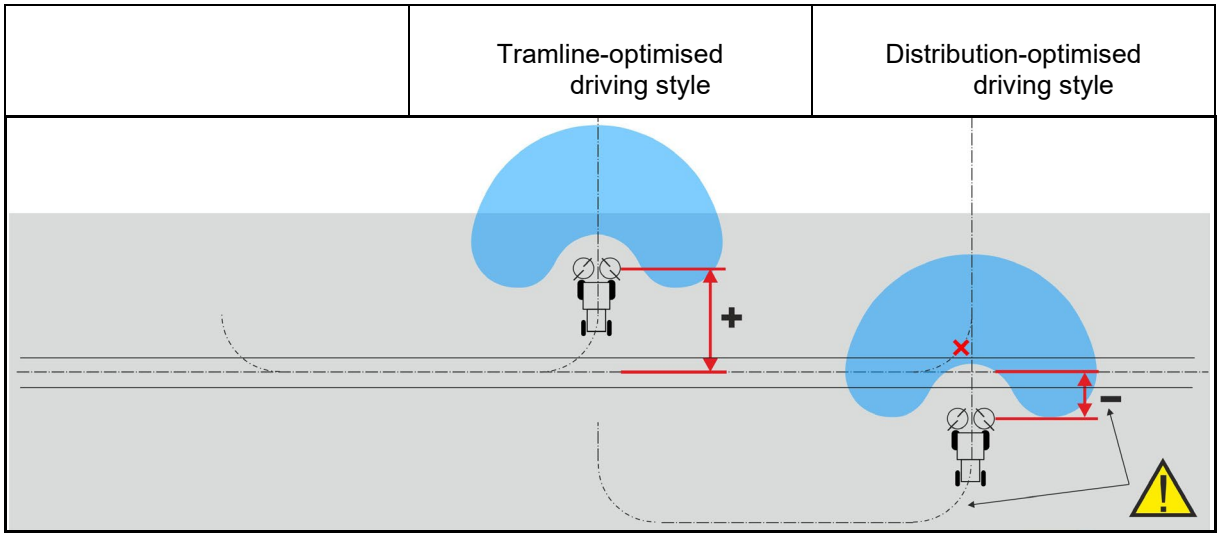
  With the distribution-optimised driving style, it is not possible to turn into the headland tramline in many cases, as, in particular with small/negative switch-off points, the shutters close too late.

→ Read the switch-off point from the setting chart.

- Tramline-optimised driving style
- With the tramline-optimised driving style, the switch-off point must be big enough so that the shutters close in due time before driving into the headland tramline.

  However, this is not positive for fertiliser distribution on the headlands.

→ Switch-off point: at least 7 m.



9 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 hydraulic system for visible defects



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 secured 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!

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 centrifugal broadcaster until the top edge of the reflector is no more than 1500 mm above the road surface.
- Secure the machine against unintentional lowering before driving on the road!
- Fold up the hopper access ladder before driving on roads.

10 Use of the machine

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

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

Observing this information is important for your safety.

WARNING

Danger from ejected objects (fertiliser particles, foreign bodies, e.g. small stones) in the direction of the tractor without the intended protective equipment (deflector plates)!

Only ever start up the machine when the protective equipment (deflector plates) is fully installed.

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.
- 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.
- Use only fertiliser with the proper grain size, of the kinds listed in the setting chart. If you do not have accurate knowledge of the fertiliser, check the fertiliser lateral distribution for the set working width using the mobile fertiliser test rig.
- When spreading mixed fertilisers, note the following:
  - Each variety may have different flight characteristics.
  - The individual varieties may separate.
- After ever use, remove any fertiliser clinging to the spreading vanes.

10.1 Filling the centrifugal broadcaster



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.
- Always fill the hopper with the guard and function screen closed. Only a closed guard and function screen prevents clumps of fertiliser and/or foreign bodies getting into the hopper and blocking the agitator.
- 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.
- It is essential to observe the safety instructions from the fertiliser manufacturer. Use appropriate protective clothing as necessary.



WARNING

Tipping hazard!

- **Never fill a fertiliser spreader unless it is hitched to the tractor.**
- **Never unhitch a fertiliser spreader or roll it (using a transport system) while it is full.**



CAUTION

Damage to the implement frame caused by filling the implement when it is set down on the ground!

Do not lower the coupled implement down onto the ground before filling.

10.2 Spreading operation

- The spreading vanes are made of especially hard-wearing stainless steel. However, the spreading vanes are wearing parts.
- The type of fertiliser, times of use and spread rates influence the service life of spreading vanes.
- The technical condition of the spreading vanes is essential for uniform lateral distribution of the fertiliser on the field (i.e. forming strips).

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 for visible damage/defects.

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 slide gate.
  - While the tractor engine is running.
- When spreading fertiliser at field edges in residential areas / along roads, take care not to endanger persons or damage objects. Maintain a sufficient safety distance and use the appropriate devices for boundary spreading and/or reduce the drive speed of the spreading discs.

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.



WARNING

Danger from breaking age during operation when the overload clutch of the PTO shaft engages (if installed)!

Switch off the universal joint shaft of the tractor immediately if the overload clutch of the PTO shaft engages.

This avoids damaging the overload clutch.



WARNING

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.



ZA-V with control terminal: See separate operating manual.

- The fertilizer spreader is connected to the tractor.
- The supply lines are connected.
- The operating terminal is connected.
- The settings have been made.
- ZA-V without an in-cab-terminal or EasySet: While spreading, always observe the selected operational speeds indicated on the setting chart.

1. Couple the universal joint shaft at a low tractor engine speed.

   Hydro: Switch on the hydraulic spreading disc drive.

- Do not open the shutter until you have reached the specified spreader disc speed!
- Maintain a constant spreading disc speed.
- Always carry out a spread rate check or turn on the online calibration at the beginning of the spreading process.

Observe the point for switching on and off in the setting chart!

The point for switching on and off is specified as distance in metres from the spreading disc centre to the centre of the track in the headlands in the setting chart.

-  Switching on point when driving into the field.
- Switching off point when driving into the headlands.

2. Moving to, and when the switching on point is reached, open the shutter.
3. At the switching off point before reaching the headlands, close the shutter.
4. For boundary spreading:
   - o lower the Limiter hydraulically.
   - o Hydro: Reduce the spreading disc speed.
5. When you have finished spreading:
   - 5.1 Close the slider.
   - 5.2 Disengage spreader disc drive.

After long transport with a full hopper, ensure that the yield is correct before spreading begins.

If, despite an identical shutter position, you determine that the two hopper tips are not emptying uniformly, check the basic setting of the sliders.

10.3 Notes for spreading slug pellets (e.g. Mesurol)



CAUTION

After the special spread rate check, the machine is suitable for the application of slug pellets.



Before spreading slug pellets:

- Use the hopper cover.
- Perform a visual check of the metering devices.
- Check the metering devices for leaks.



Pay attention to the following particularities for application of slug pellets.

- Select **Fine spreading material** on the control terminal.
- Spreading of slug pellets must be executed at constant forward speed because speed-proportional quantity regulation is not active.
- Calibration of slug pellets is executed on the left hopper tip with the calibration chute.



WARNING

When filling the spreader, avoid breathing in product dust and direct skin contact (wear protective gloves). After the application, thoroughly wash your hands and all affected areas of your skin with soap and water.



DANGER

Some slug pellets can harm children and pets. Ensure that they are stored in an area that is inaccessible to both children and pets. Always refer to the directions for use from the slug pellet manufacturer.

For additional information on handling slug pellets, refer to the manufacturer's instructions and the general safety precautions for handling crop protection agents (in Germany, data sheet No. 18 of the Federal Biological Research Centre for Agriculture and Forestry.

- When spreading slug pellets, ensure that the outlet opening are always covered with product and make sure to always drive at a constant speed. A residue of approx. 0.7 kg for each hopper tip remains, which is impossible to spread according to the intended use of the fertiliser. To empty the spreader, open the slider and catch the flow of product (using a tarp, for example).
- Slug pellets must **not** be mixed with fertiliser or other materials in an attempt to operate the spreader in a different setting range.

10.4 Complete discharging

DANGER

Risk of injury from rotating spreader discs.

Do not drive spreader discs to remove any residue.

WARNING

Danger of being caught and drawn in with driven agitator!

- Never open the guard and function screen while the tractor engine is running.
- Never insert any object through the protection grating and function screen when the agitator is running.

1. Secure the tractor against unintentional start-up and unintentional rolling.

1. Remove the spreading discs.

→ Use tool

2. Open shutter.

→ Residual fertiliser runs out.

3. Close shutter.
4. Fit the spreading discs after emptying.

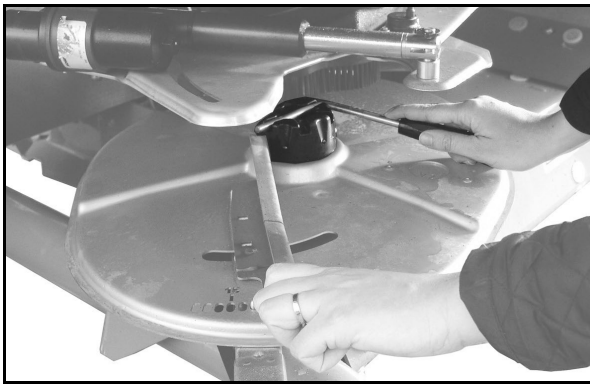


Fig. 62

Tool in parking position:

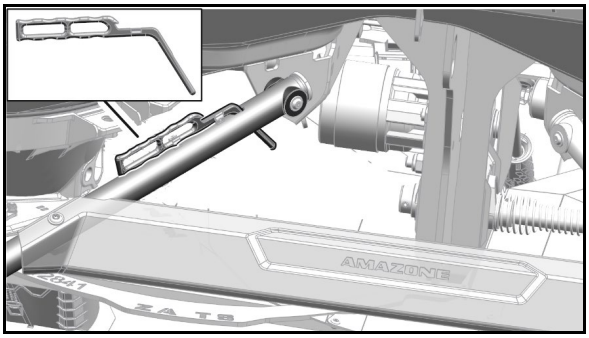


Fig. 63

11 Faults

WARNING

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

- **Unintentional falling of the machine raised using the tractor's three-point linkage.**
- **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 76.

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

11.1 Eliminating agitator malfunctions

WARNING

Danger from crushing, shearing and/or impact through unintentional closing of the open, unsecured guard and function screen!

Secure the open guard and function screen so that it cannot move accidentally before carrying out work in this area. See page 42.

11.2 Faults in electronics

If faults develop in the control computer or the electric setting motors that cannot be eliminated immediately, it is still possible to continue working (see the operating manual for the control computer).

11.3 Faults in electronics

Close the shutter manually

The manual closing of the shutter prevents the fertilizer from running out accidentally if the electrics do not react due to a fault.

1. De-energize the electrics.
2. Secure the tractor against unintentional start-up and unintentional rolling.
3. Disconnect the motor from the shutter. To do so, pull out the connecting pin.
4. Close the shutter by hand.

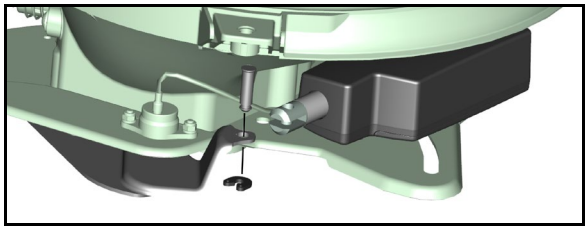


Fig. 64

11.4 Faults, causes and remedies

Fault	Cause	Remedy
Fertiliser lateral distribution not uniform	Fertiliser deposits on the spreading discs and the spreading vanes.	Clean the spreading discs and the spreading vanes.
	Sliders do not open all the way.	
Too much fertiliser in the tractor track	Prescribed spreading disc speed is **not** reached.	Increase tractor engine speed.
	Spreading vanes and outlets defective or worn.	Check the spreading vanes and outlets. Replaced defective or worn parts immediately.
	The spreading properties of your fertiliser differ from those of the one we tested when creating the setting chart.	Contact the AMAZONE Fertiliser Service. ☎ +49 5405 501-111
Too much fertiliser in the overlap area	Prescribed spreading disc speed is exceeded.	Reduce tractor engine speed.
	The spreading properties of your fertiliser differ from those of the one we tested when creating the setting chart.	Contact the AMAZONE Fertiliser Service. ☎ +49 5405 501 - 111
Both hopper tips do not empty uniformly at the identical slider position	Bridging of fertiliser.	Eliminate cause of bridging.
	R-clip in the spiral agitator has shorn off due to overloading.	Replace R-clip.
	Basic settings of the sliders differ	Check basic settings of the sliders.
Overheating of the tractor hydraulic fluid	System converting bolt on the hydraulic block is incorrectly set	Adjust the system converting bolt correctly on the hydraulic block
	Fluid quantity not reduced enough on the tractor control unit.	Reduce the fluid quantity on the tractor control unit.

12 Cleaning, maintenance and repairs



WARNING

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

- **Unintentional falling of the machine raised using the tractor's three-point linkage.**
- **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 76.



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

Danger from crushing, shearing and/or impact through unintentional closing of the open, unsecured guard and function screen!

Secure the open guard and function screen so that it cannot move accidentally before carrying out work in this area. See page 42.

12.1 Cleaning

- Pay particular attention to the brake, air and hydraulic hose lines.
- Never treat brake, air and hydraulic hose lines with benzene, benzole, petroleum or mineral oils.
- After cleaning, grease the machine, in particular after cleaning with a high pressure cleaner / steam jet or liposoluble agents.
- Observe the statutory requirement for the handling and removal of cleaning agents.

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).

Always install the central bolt for the spreading disc as protection from water, even if the spreading discs are not installed.

- Clean the spreading discs very carefully and protect from corrosion.

Stainless steel components can also corrode when they come into contact with the spreading material, however, this does not affect their function.

12.2 Lubrication instructions

Lubricants

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

Company	Lubricant designation
ARAL	Aralub HL2
FINA	Marson L2
ESSO	Beacon 2
SHELL	Retinax A

12.2.1 Lubricating the 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.



Fig. 65

Lubricate the weighing pin annually.

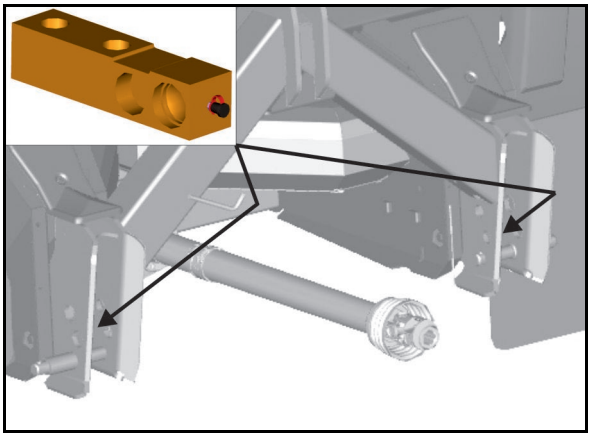


Fig. 66

12.3 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.

Once after 50 operating hours

Component	Servicing work	See page	Workshop work
Angular gearbox	• Oil change	**120**	

Daily

Component	Maintenance work	See page	Specialist workshop
Spreading vanes	• Condition check	**122**	

Weekly / Every 50 operating hours

Component	Maintenance work	See page	Specialist workshop
Whole implement	• Check for visible defects		
Hydraulic system	• Condition check	**125**	**X**
Hydraulic fluid filter	• Check	**129**	**X**

Every six months / 200 operational hours

Component	Maintenance work	See page	Specialist workshop
PTO shaft with friction clutch	• Ventilate friction clutch	**121**	**X**

As necessary

Component	Maintenance work	See page	Specialist workshop
Spreading vanes	• Replace	**122**	
Shutter	• Basic shutter setting	**123**	

12.4 Oil change angular gearbox

1. Run the spreading discs to warm up the oil and disperse particles.
2. Dismantle the transport device if necessary.

   Maintain the tension in the extension spring by inserting a retaining screw in the frame, swivel the transport device up and dismantle.
3. Dismantle the cover underneath the gearbox.
4. Dismantle filler plug / sensor.
5. Rotate the spreading discs so that there is no cog on the bevel gear in front of the sensor.

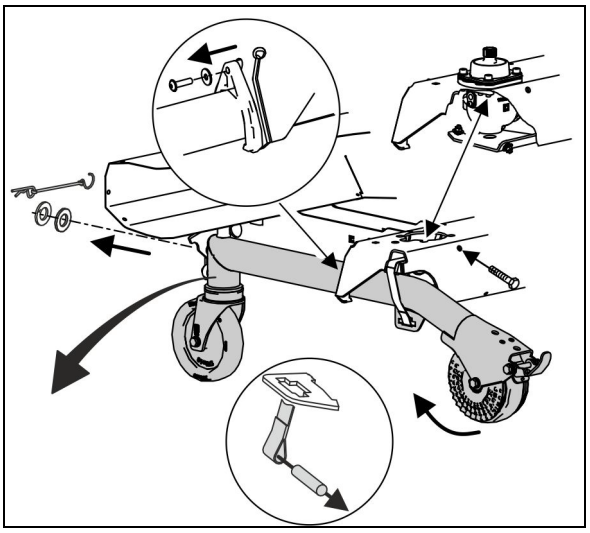


Fig. 67

6. Insert a 40 cm-long thin hose approx. 12 cm into the gearbox.
7. Suction oil with a syringe.
8. Fill in new oil with a syringe.
9. Reinstall the filler plug / sensor.
   - o Use a new O-ring.
   - o Protect the cylindrical part of the sensor against moisture with a generous amount of grease.
10. Reinstall the dismantled parts, remove the retaining screw from the extension spring.

- Oil: ISO VG 150 EP / SAE 90
- Oil filling quantity: 0.23 l

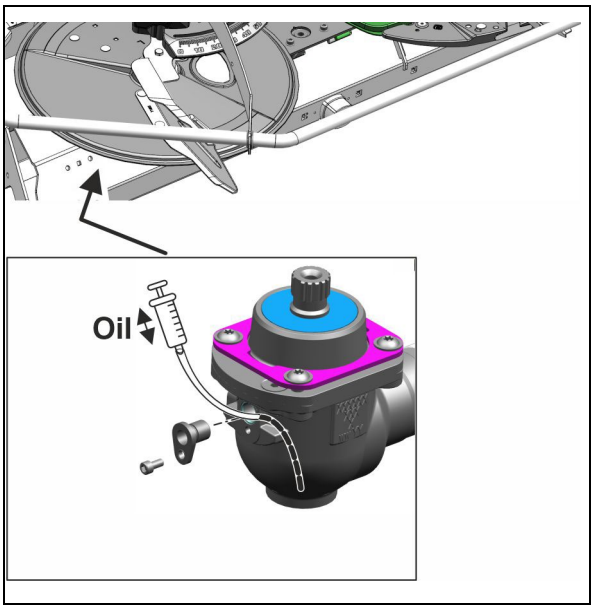


Fig. 68

12.5 Ventilate the friction clutch

After long periods of disuse and before using it for the first time, "ventilate" the friction clutch as follows:

1. Dismantle the friction clutch from the gearbox input shaft.
2. Precisely measure the fitting length a of the springs and write it down.
3. Relieve the springs by loosening the nuts.
4. Crank the clutch manually. This loosens any deposits caused by rust or moisture between the friction surfaces.
5. Tighten the nuts until the the compression springs have the indicated fitting length a.
6. Push the friction clutch onto the gearbox input shaft and fasten.
7. Refasten the all-round protective cover.

High humidity, large amounts of dirt or cleaning the machine with high-pressure cleaners increase the likelihood of thermal distortion of the friction linings.

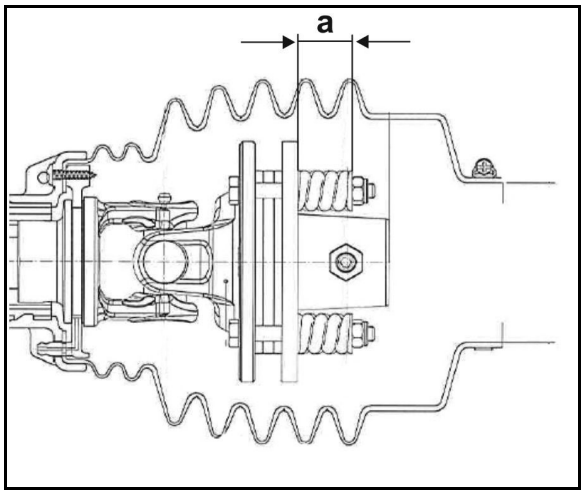


Fig. 69

12.6 Replacing the spreading vanes

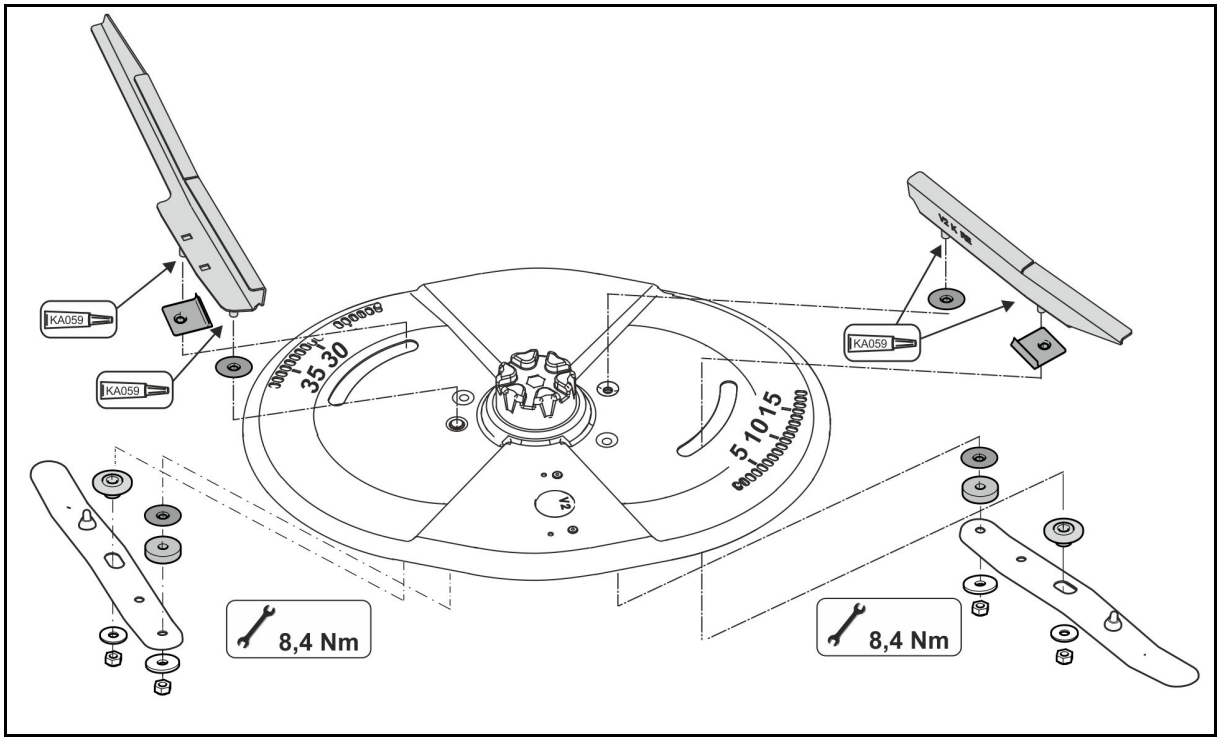


Fig. 70

When exchanging the spreading vanes, use the assembly paste provided. This is the only way to ensure that the specified tightening torque is sufficient.

Required tightening torque: 8,4 Nm

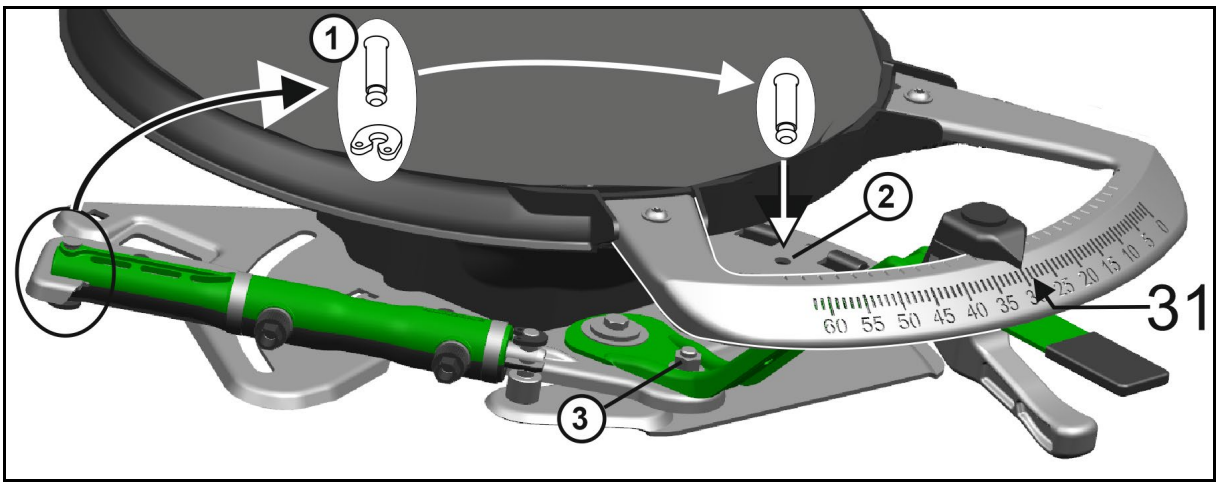
- The technical condition of the spreading vanes is essential for uniform lateral distribution of the fertiliser on the field (i.e. forming strips).
- The spreading vanes are made of especially wear-resistant stainless steel. Nevertheless, we remind you that the spreading vanes and their swivel vanes are wear parts.

Replace the spreading vanes as soon as holes from abrasion are visible.

12.7 Performing the basic shutter setting

If the two hopper tips are emptied unevenly with the same shutter position, adjust the basic shutter setting as follows.

Only for implements with manual shutter control.



1. Pull out the pin (1) from the hydraulic cylinder.
2. Insert the pin through the calibration hole (2) of the floor plate and shutter.

→ Calibration position for basic shutter setting.

3. Loosen the nut (3) on the shutter.
4. Set the shutter to Position 31.
5. Tighten the nut.
6. Use the pin to fasten the hydraulic cylinder again.

→ The basic shutter setting is complete.

7. Perform the basic shutter setting on the second shutter.

12.8 Taring the spreader

If the control computer does not show 0 kg (+/- 5 kg) fill weight with the spreader empty, the spreader must be retared
(see control computer operating manual).

This may occur, for example, after the attachment of special accessories.

12.9 Calibrating the spreader

If after filling the retared spreader does not show the correct fill weight, the spreader must be recalibrated
(see the control computer operating manual).

12.10 Hydraulic system



WARNING

Danger due to escaping high-pressure hydraulic fluid which can penetrate the body through the skin (danger of infection).

- Only a specialist workshop may carry out work on the hydraulic system.
- The hydraulic system is under high pressure. 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:
  - o No special action required.
- Following contact with the skin:
  - o Wash off with plenty of soap and water.
- Following contact with the eyes:
  - o Rinse eyes for several minutes under running water, holding the eyelid open.
- Following ingestion:
  - o 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 original AMAZONE 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.

12.10.1 Labelling of hydraulic hose lines

The assembly labelling provides the following information:

Fig. 78/...

(1) Manufacturer's marking on the hydraulic hose line (A1HF)

(2) Date of manufacturer of the hydraulic hose line
(04 / 02 = Yes / Month = February 2004)

(3) Maximum approved operating pressure (210 BAR).

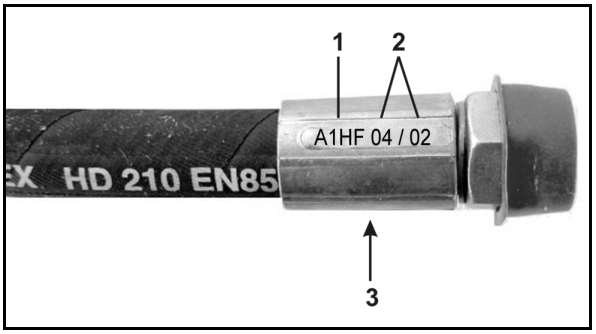


Fig. 71

12.10.2 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 and pipes.

12.10.3 Inspection criteria for hydraulic hose lines



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

Replace hydraulic hose lines if the respective hydraulic hose line fulfils at least one of the following criteria:

- 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 "Labelling of hydraulic hose lines", page 54

12.10.4 Installation and removal of hydraulic hose lines

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

- Only use original AMAZONE hydraulic hose lines.
- Ensure cleanliness.
- Always install the hydraulic hose lines to ensure the following in all operational positions
  - o There is no tension, apart from the hose's own weight.
  - o There is no possibility of jolting on short lengths.
  - o Outer mechanical influences on the hydraulic hose lines are avoided.

    Use appropriate arrangements and fixings to prevent abrasion of the hydraulic hose lines by components or from rubbing against one another. If necessary, secure hydraulic hose lines using protective covers. Cover sharp-edged components.
  - o 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.

12.10.5 Checking the hydraulic fluid filter

Hydraulic fluid filter (Fig. 79/1) with contamination indicator (Fig. 79/2):

- Green Filter fully functional
- Red Replace filter

To remove the filter, twist off the filter cover and remove the filter.

WARNING

Beforehand, depressurise the hydraulic system.

After replacing the filter, press the contamination indicator back into place.

→ **Green ring again visible.**

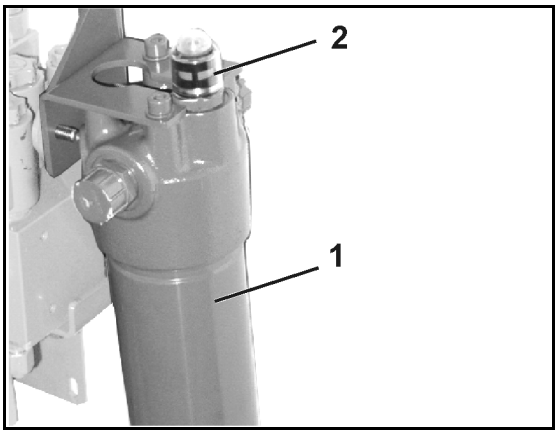


Fig. 72

12.11 Upper and lower link pins check



DANGER!

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

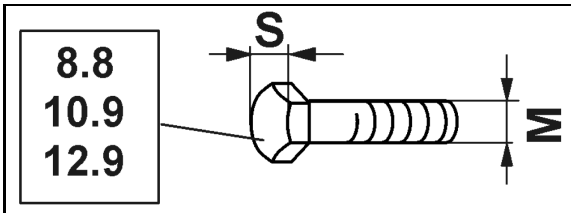
Replace damaged top link pins and lower link pins immediately for road traffic safety reasons.

Test criteria for top link pins and lower link pins:

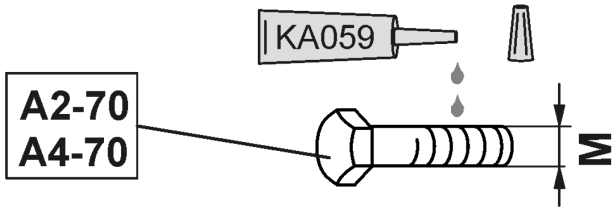
- Visual check for cracks
- Visual check for fractures
- Visual check for permanent deformations
- Visual check and measurements for wear. The permissible wear is 2 mm.
- Visual check for wear on the ball sleeves
- If applicable: check the fastening bolts for tightness

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

12.12 Screw tightening torques



M	S	Nm 8.8	10.9	12.9
M 8	13	25	35	41
M 8x1		27	38	41
M 10	16 (15,17)	49	69	83
M 10x1		52	73	88
M 12	18 (19)	86	120	145
M 12x1,5		90	125	150
M 14	22 (21)	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



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.

13 Hydraulic diagram

ZA-V Hydro

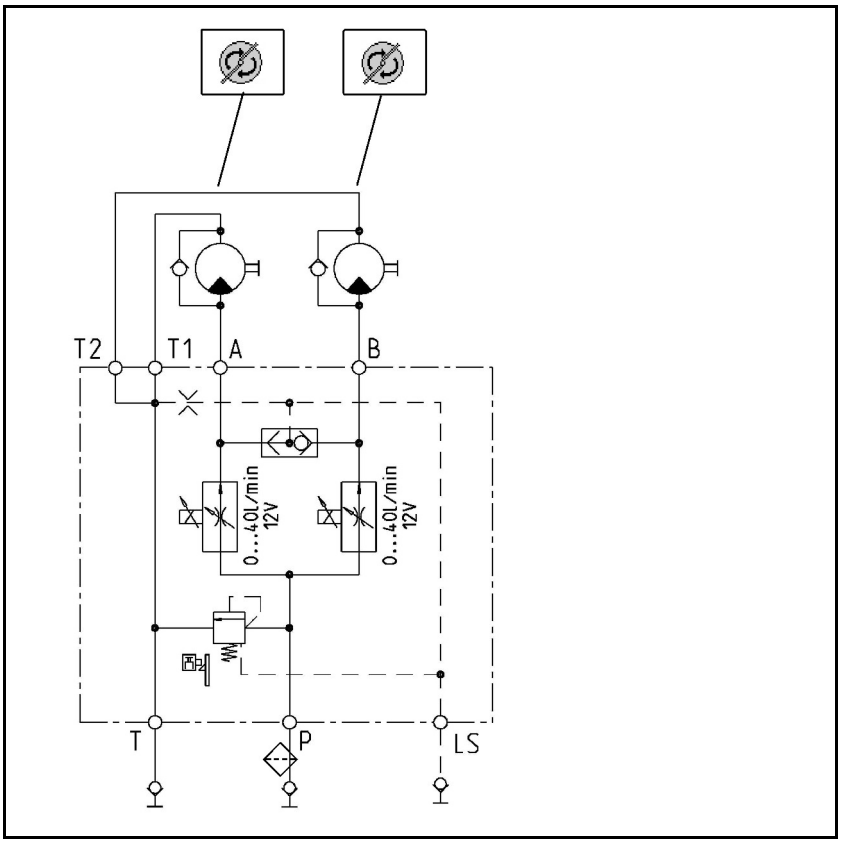


Fig. 73

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