

Operating Manual

AMAZONE

ZA-TS Super

ZA-TS Ultra

Fertiliser spreader



MG4139
BAG0088.8 11.14
Printed in Germany

**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-TS

Year of manufacture:

Basic weight (kg):

Approved total weight (kg):

Maximum load (kg):

Manufacturer's address

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen

Tel.: + 49 (0)5405 501-0

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

Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER GmbH & 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. Send us your suggestions by fax.

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H. DREYER GmbH & Co. KG

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D-49202 Hasbergen

Tel.: + 49 (0)5405 501-0

E-mail: amazone@amazone.de

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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).

General safety instructions

Risks in handling the machine

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

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

Only use the machine

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

Eliminate any faults immediately which could impair safety.

Guarantee and liability

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

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

2.2 Representation of safety symbols

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



DANGER

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.

Check all the screw connections for a firm seat. On completing maintenance work, check the function of safety and protection equipment.

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.



Fig. 1

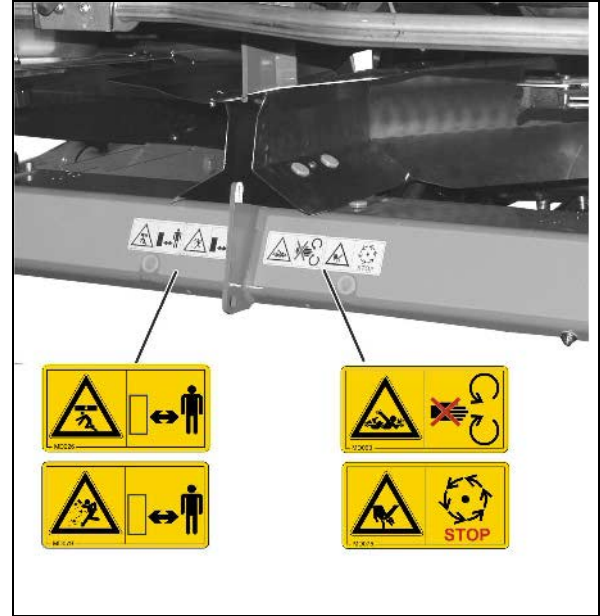


Fig. 2

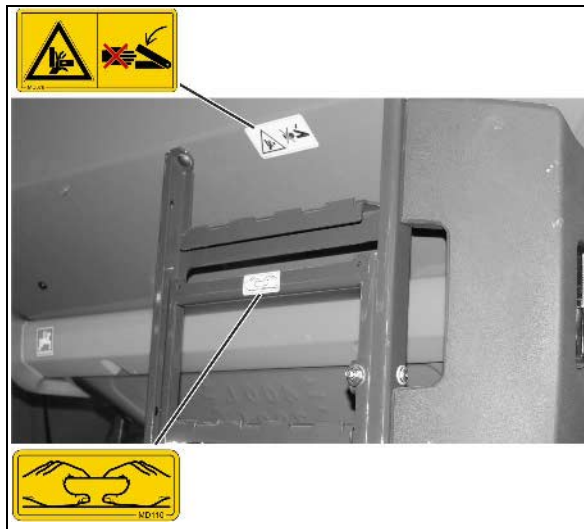


Fig. 3

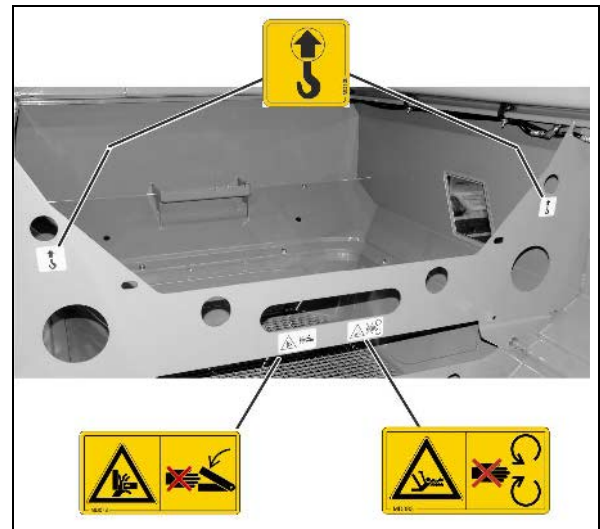


Fig. 4

Order number and explanation

Warning pictograms

MD 075

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

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

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

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



MD 078

Risk of contusions for fingers or hands through accessible moving machine parts!

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

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

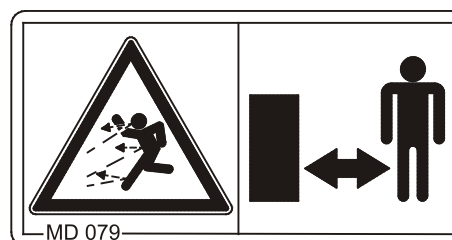


MD 079

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

These dangers can cause extremely serious and potentially fatal injuries.

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



Order number and explanation

Warning pictograms

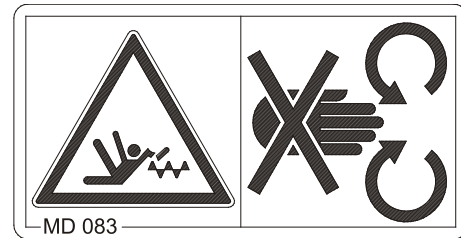
MD 083

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

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

Never open or remove protective devices from driven machinery

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



MD 089

Risk of crushing of whole body in the danger area of suspended loads/machine parts

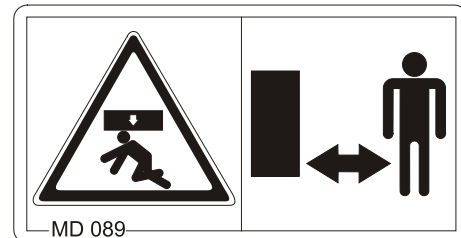
This danger can cause extremely serious and potentially fatal injuries.

The presence of persons under suspended loads/machine parts is prohibited.

Maintain a sufficient safety clearance between you and any suspended loads/machine parts.

Ensure that all personnel maintain a sufficient safety clearance from suspended loads/machine parts.

Direct persons out of the danger area of suspended loads/machine parts.



MD 093

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

These dangers can cause extremely serious and potentially fatal injuries.

Never open or remove protective devices from driven machinery

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



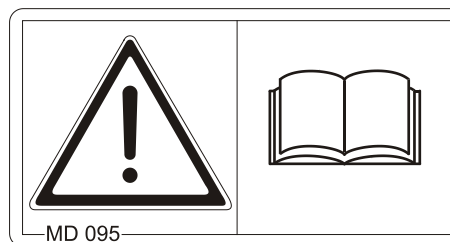
General safety instructions

Order number and explanation

Warning pictograms

MD 095

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



MD 096

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

This danger can cause serious injuries with long-term damage.

Read and observe the information in the operating manual before carrying out repair work on the hydraulic system.

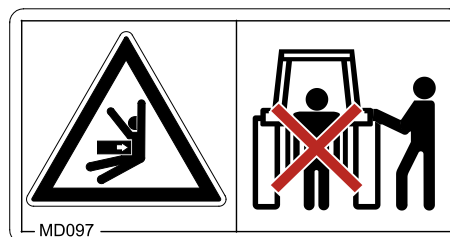


MD 097

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

These dangers can cause extremely serious and potentially fatal injuries.

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

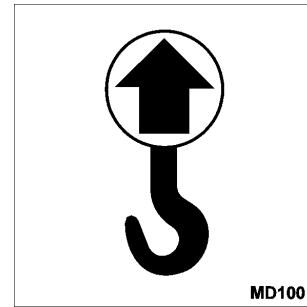


Order number and explanation

Warning pictograms

MD 100

This symbol indicates lashing points for fastening load supporting devices when loading the machine.

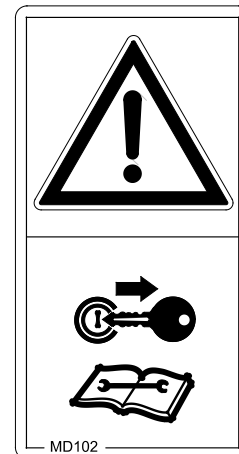


MD 102

Danger for the operator from unintentional starting and rolling during intervention in the machine, e.g. when carrying out installation work, adjustments, troubleshooting, cleaning or repairs.

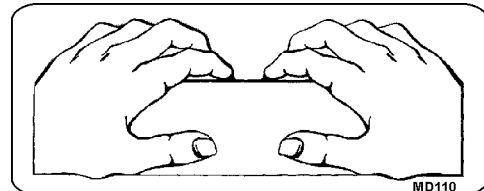
The potential dangers could result in extremely serious and possibly fatal injuries to the entire body.

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



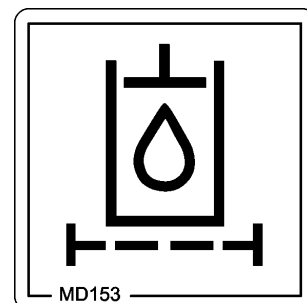
MD 110

This pictogram indicates which part of the machine serves as hand grips.



MD 153

This pictogram indicates a hydraulic oil filter.



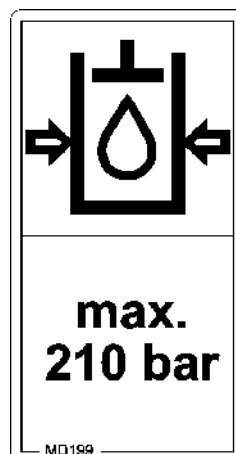
General safety instructions

Order number and explanation

Warning pictograms

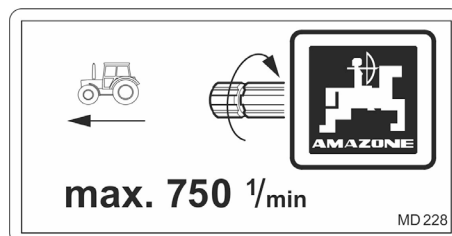
MD 199

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



MD 228

Nominal speed (750 rpm) and direction of rotation of the machine-side drive shaft.



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 AMAZONE original hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose connections made from thermoplastics, other guide values may be decisive.
- Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.

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

2.16.3 Electrical system

- When working on the electrical system, always disconnect the battery (negative terminal).
- Only use the prescribed fuses. Using unsuitable fuses will destroy the electrical system - risk of fire.
- Ensure that the battery is connected correctly - firstly connect the positive terminal and then connect the negative terminal. When disconnecting the battery, disconnect the negative terminal first, followed by the positive terminal.
- Always place the appropriate cover over the positive battery terminal. Accidental grounding poses the risk of an explosion.
- Risk of explosion – Avoid spark formation and naked flames in the area of the battery!
- The machine can be equipped with electronic components, the function of which may be influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed.
 - If retrofitting electrical units and/or components on the machine with a connection to the on-board power supply, the user is responsible for checking whether the installation might cause faults on the vehicle electronics or other components.
 - Ensure that the retrofitted electrical and electronic components comply with the EMC directive 2004/108/EC 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.
- Secure the PTO shaft guard by attaching the chain(s) to prevent movement.
- Observe the prescribed pipe overlaps in transport and operational positions. (Read and follow the operating manual from the PTO shaft manufacturer.)
- When turning corners, observe the permitted bending and displacement of the PTO shaft.
- Before switching on the universal joint shaft, check that the selected universal joint shaft speed of the tractor matches the permitted drive rev. speed of the machine.
- Instruct people to leave the danger area of the machine before you switch on the universal joint shaft.
- While work is being carried out with the universal joint shaft, there must be no one in the area of the universal drive or PTO shaft while it is turning.
- Never switch on the universal joint shaft while the tractor engine is shut off.
- Always switch off the universal joint shaft whenever excessive bending occurs or it is not needed.
- **WARNING!** After the universal joint shaft is switched off, there is a danger of injury from the continued rotation of freewheeling machine parts.

Do not approach the machine too closely during this time. You may work on the machine only after all machine parts have come to a complete stop.
- Secure the tractor and machine against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on universal joint shaft-driven machines or PTO shafts.
- After decoupling the PTO shaft, place it on the holder provided.

- After removing the PTO shaft, attach the protective sleeve to the universal joint shaft stub.
- When using the travel-dependent universal joint shaft, note that the universal joint shaft speed depends on the drive speed, and that the direction of rotation reverses when you drive in reverse.

2.16.5 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 on-board computer
- Regularly check the nuts and bolts for a firm seat and retighten them as necessary.
- Secure the raise machine and/or raised machine parts against unintentional falling, before cleaning, maintaining or repairing the machine.
- When replacing work tools with blades, use suitable tools and gloves.
- Dispose of oils, greases and filters in the appropriate way.
- Disconnect the cable to the tractor generator and battery, before carrying out electrical welding work on the tractor and on attached machines.
- Spare parts must meet at least the specified technical requirements of AMAZONEN-WERKE. This is ensured through the use of AMAZONE original spare parts.

3 Loading and unloading

**WARNING**

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

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

Loading using a lifting crane:

- (1) Lashing points for securing load supporting devices

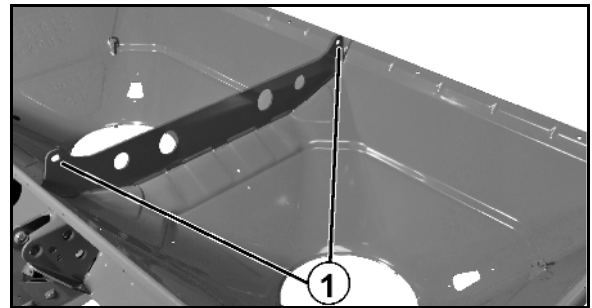


Fig. 5

4 Product description

4.1 Overview of subassemblies

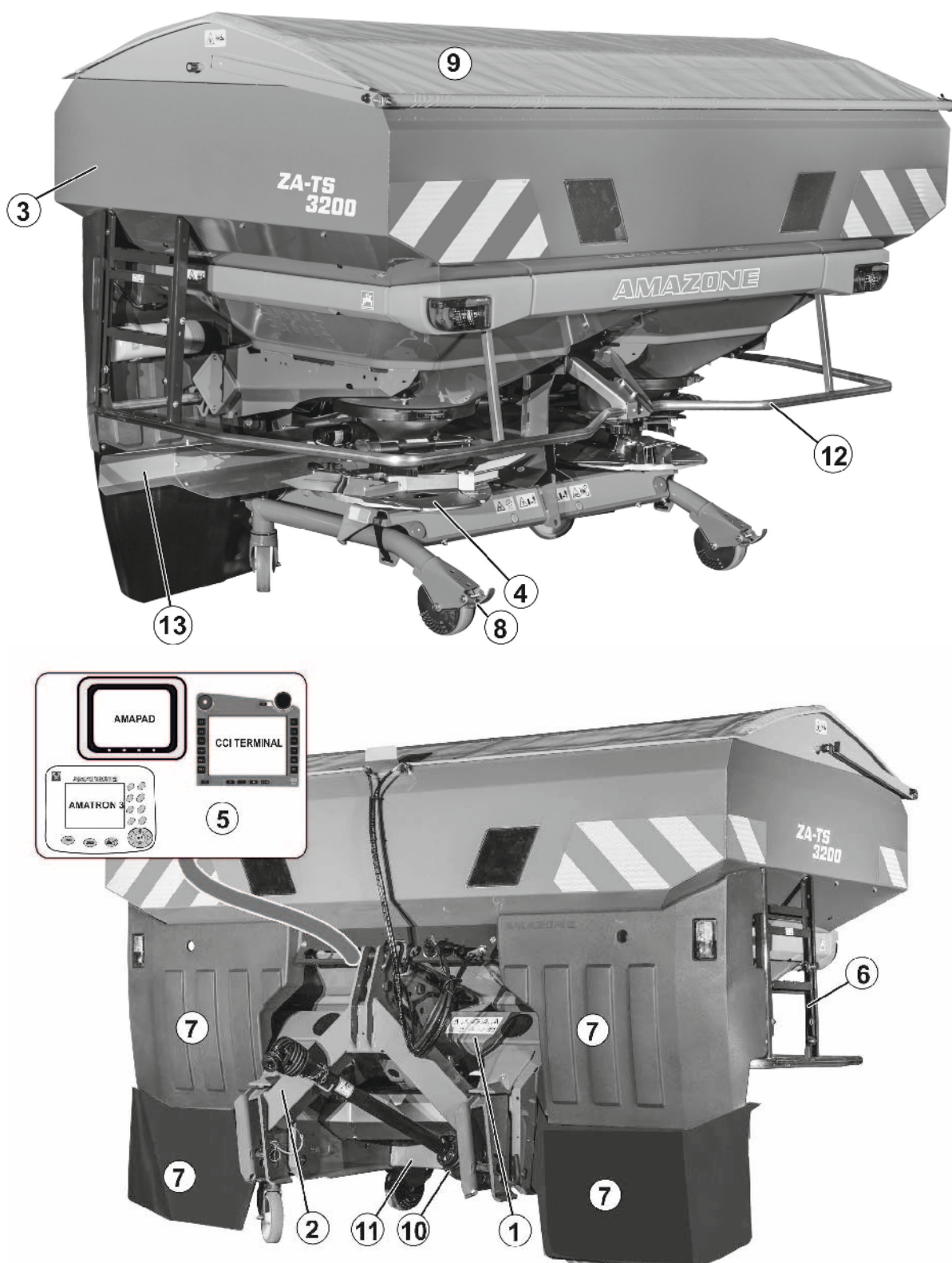


Fig. 6

- (1) Frame
- (2) Hopper
- (3) Weighing frame
- (4) Spreading discs with spreading vanes
- (5) Operating terminal
- (6) Foldable ascent
- (7) Dirt trap
- (8) Transport device
- (9) Hopper cover

4.2 Safety and protection equipment

- (10) PTO shaft guard (not for hydraulic drive) as separating protection for the universal joint shaft
 - (11) Shaft guard between the centre and angular gearbox (not for hydraulic drive)
 - (12) Guard tube as protection against contact with driven spreading discs
 - (13) Shield plates as protection against fertiliser grains that are thrown off to the front
- Guard screen in the tank as protection against contact with the rotating agitator
 - Warning pictograms

4.3 Thread pack with machine documentation

The thread pack with the implement documentation is behind the left mud flap.



Fig. 7

4.4 Supply lines between the tractor and the machine

- Hydraulic hose lines (depending on equipment provided)
- Cable with connection for lighting
- Computer cable with machine connector

4.5 Transportation equipment

Rear traffic light kit,

- (1) rear lights, brake lights and direction indicators
- (2) warning signs
- (3) red reflectors
- (4) side reflectors

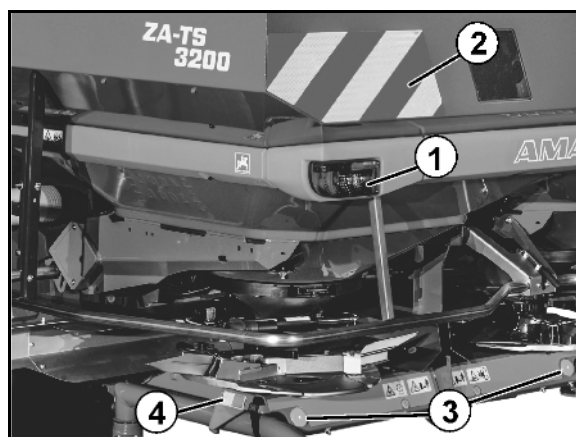


Fig. 8

Front traffic light kit

- (1) side lights and direction indicators
 - (2) front warning signs
- One additional warning sign on each side in France.

Connect the lighting system via the connector to the 7-pin tractor socket.

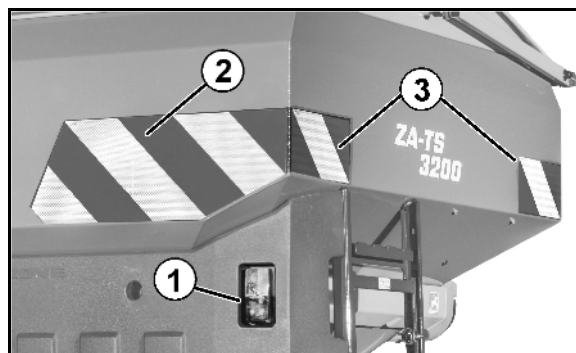


Fig. 9

4.6 Intended use

The AMAZONE fertiliser spreader ZA-TS

- is designed exclusively for conventional agricultural applications and are suitable for spreading dry, granuled, prilled and crystal-line 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.
- must not be used in combination with a caterpillar tractor.
- Slope terrain can be travelled as follows:
 - Along the contours
 - Direction of travel to the left 15 %
 - Direction of travel to the right 15 %
 - Along the gradient
 - Up the slope 15 %
 - Down the slope 15 %

The intended use also includes:

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

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

For any damage resulting from improper use:

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

4.7 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.

Product description

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:

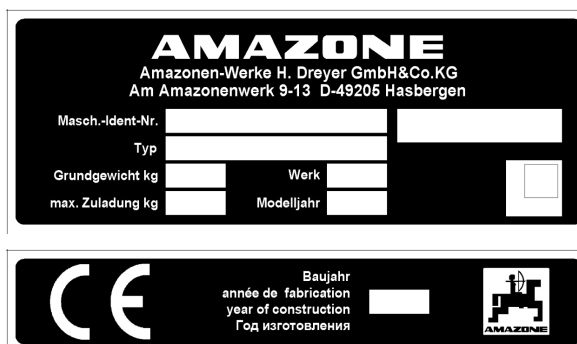
- Between the tractor and the machine, particularly during coupling and uncoupling operations.
- In the area of moving parts:
 - Rotating spreading discs with spreading vanes
 - Rotating agitator shaft and agitator shaft drive
 - Actuation of the dosing sliders
- When climbing onto the machine being 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.

4.8 Rating plate and CE marking

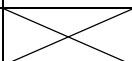
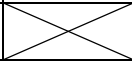
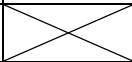
The rating plate and the CE marking are placed on the frame.

The rating plate shows:

- Machine ID no.:
- Type
- Basic weight kg
- Maximum load kg
- Factory
- Model year



4.9 Technical data

ZA-TS	Hopper volume [l]	Extension [l]	Weight [kg]	Fill level [mm]	Filling width [mm]	Total width [mm]	Total length [mm]
ZA-TS Super Payload 3200 kg							
ZA-TS 1500	1500	S 600	550	1155	2205	2590	1493
ZA-TS 2000	2000	S 600	560	1305	2205	2590	1493
ZA-TS 2200	2200	L 800	568	1290	2710	2920	1680
ZA-TS 2700	2700	L 800	588	1420	2710	2920	1680
ZA-TS 3200	3200		606	1540	2710	2920	1680
ZA-TS Super Profis Payload 3200 kg							
ZA-TS 1500	1500	S 600	600	1155	2205	2590	1493
ZA-TS 2000	2000	S 600	610	1305	2205	2590	1493
ZA-TS 2200	2200	L 800	618	1290	2710	2920	1680
ZA-TS 2700	2700	L 800	638	1420	2710	2920	1680
ZA-TS 3200	3200		656	1540	2710	2920	1680
ZA-TS Ultra ZA-TS Ultra Profis Payload 4500 kg							
ZA-TS 2200	2200	L 800	625	1290	2710	2920	1680
ZA-TS 2700	2700	L 800	645	1420	2710	2920	1680
ZA-TS 3200	3200	L 800	663	1540	2710	2920	1680
ZA-TS 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-TS	D*	Three-point hitch	Mounting height	Drive rev. speed of the spreading disc	PTO shaft speed (Tronic)	Working width			
	[mm]	Category	[mm]	[min ⁻¹]	[min ⁻¹]	[m]			
Super	685	II	800	500 - 1000	375 – 750	18 - 36			
Super Profis	765								
Ultra	800	III				18 - 54			
Ultra Profis	800								

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



4.10 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 |
| Required flow rate: | • At least 70l/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 51 |

Universal joint shaft

- | | |
|------------------------|---|
| Required speed: | • maximum 750 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.

4.11 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 **ZA-TS** fertiliser spreader is equipped with two hopper tips and replaceable spreading discs that are driven from the inside out in opposite directions and counter to the direction of travel.

The spreading vane units are fitted with two spreading vanes for normal spreading and on one side (as an option on both sides) additionally with two spreading vanes for border spreading.

The fertiliser is

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

Use the setting chart to adjust the fertiliser spreader to the fertiliser being distributed.

Weighing technology is integrated into the front frame of the ZA-TS Profis.

This provides a convenient way to check the spread rate while the machine is in use, and the on-board computer displays the contents of the hopper.

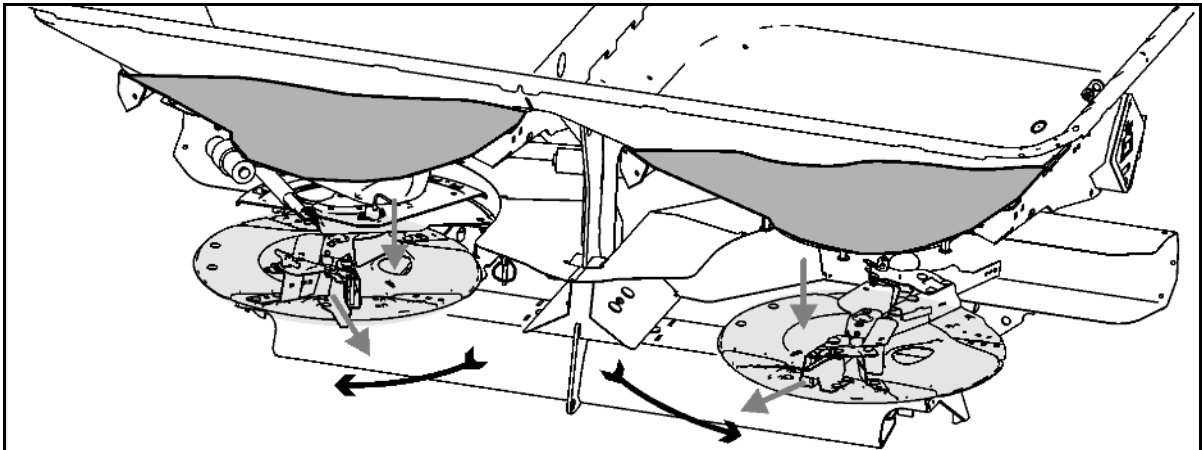


Fig. 10

5.2 Guard and function screens in the hopper (protective device)

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

- As protection against unintentional contact with the rotating agitator.
- Protecting from foreign particles and fertilizer clods.

- (1) Guard and function screen
- (2) Guard screen locking mechanism
- (3) Lock for opened guard screen

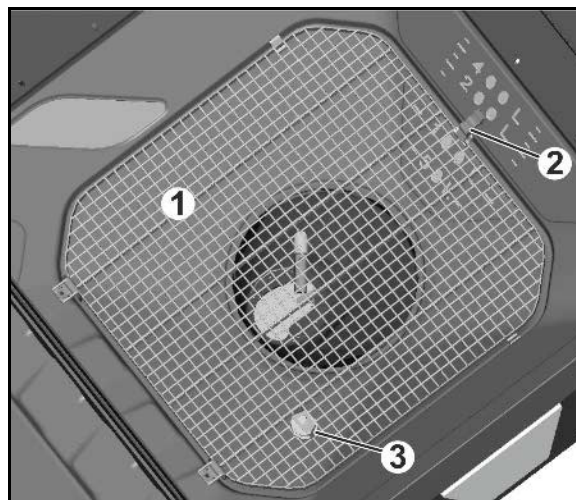


Fig. 11

- (4) Unlocking tool in parking position

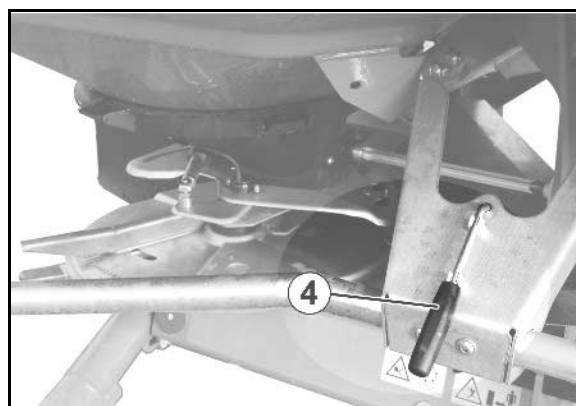


Fig. 12

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

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.
4. Remove the unlocking tool.

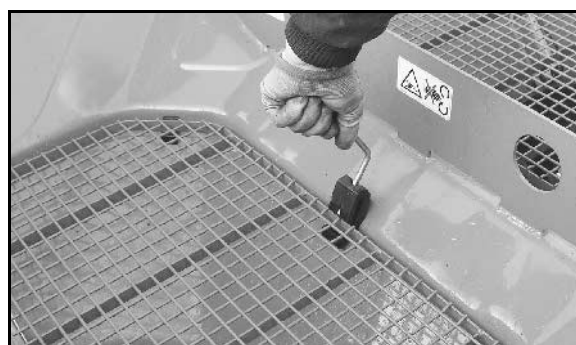


Fig. 13



- Before closing the guard screen, push down the lock.
- The guard screen locks automatically once closed.

5.3 Spreading discs AutoTS

Variants:

- Spreading vane unit TS1 for small working widths.
- Spreading vane unit TS2 for medium working widths.
- Spreading vane unit TS3 for large working widths (only for ZA-TS Ultra).



The implement is equipped with the TS boundary spreading system.

The boundary spreading system is available in the versions AutoTS and ClickTS, and can be selected as desired for any spreading disc.

AutoTS is switched using the control terminal.

ClickTS is adjusted manually on the spreading disc.

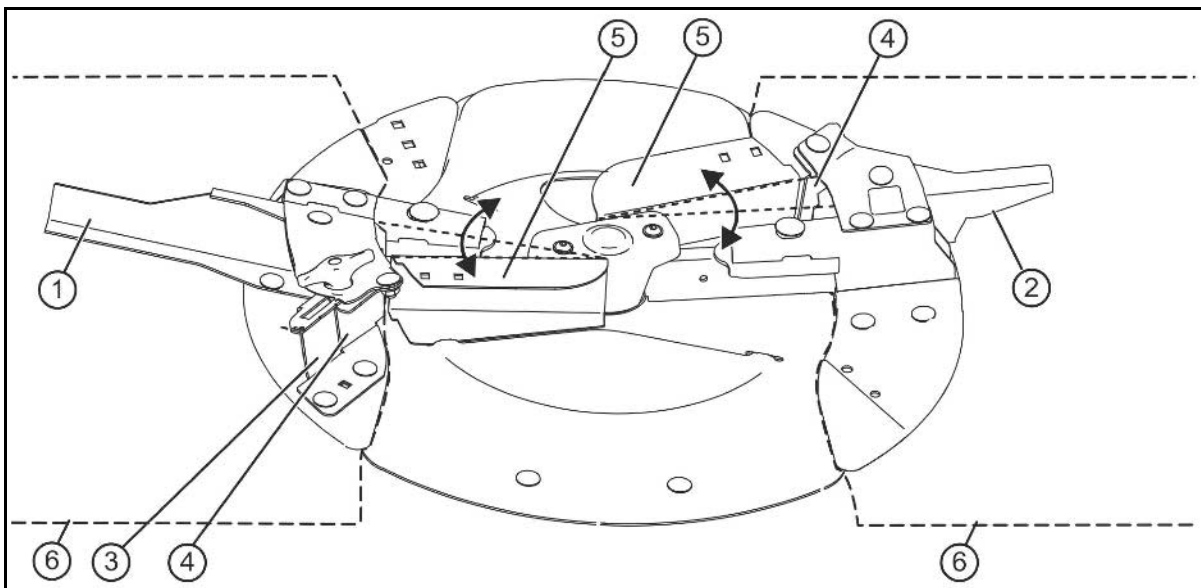


Fig. 14

- (1) Long spreading vane for normal spreading
- (2) Short spreading vane for normal spreading
- (3) Telescopic spreading vane for border spreading
- (4) Rigid spreading vane for border spreading
- (5) Swivel-mounted inner part of the spreading vane
- (6) Replaceable spreading vane unit for varying the spectrum of the working width

Structure and function

- (1) Coloured marking of the spreading vane unit
- (2) Markings on the spreading vanes
- (3) Marking on the telescopic boundary spreading vane

Selection of the spreader units:

TS 1, TS 2, TS 3

Selection of the telescopic boundary spreading vane:

A, A+, B, C, D

Adjustment range according to the setting chart

- 1, 2, 3
- 0 - no telescope

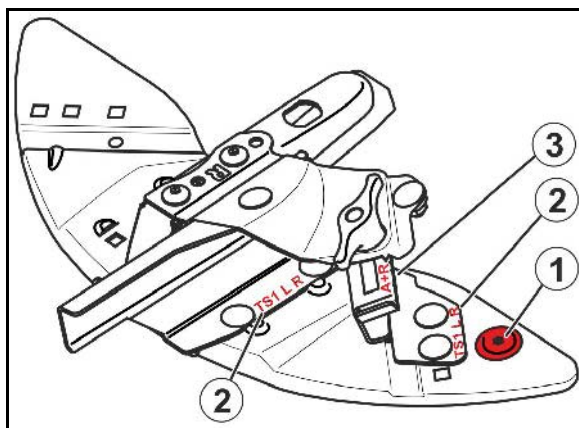


Fig. 15

Manual adjustment of the boundary spreading system with ClickTS on the spreading disc.

- (1) Hand lever
- (2) Slotted link guide
- (3) End position normal spreading (implement-side, outer) or boundary spreading (implement-side, inner)

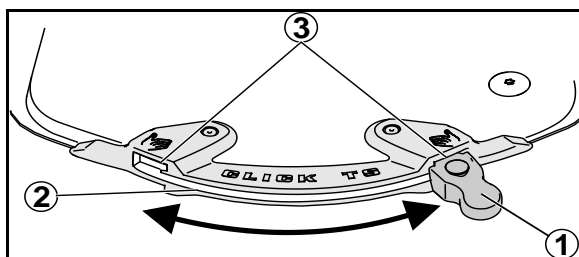


Fig. 16

5.4 Agitator

Agitators in the tips of the hopper (Fig. 16) ensure a uniform fertiliser flow to the spreading discs. The slowly rotating agitators convey the fertiliser uniformly to the respective outlet opening.

The drive is carried out electrically.

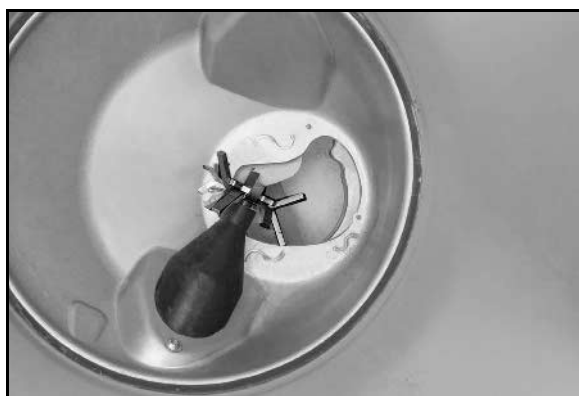


Fig. 17

5.5 Spread rate metering

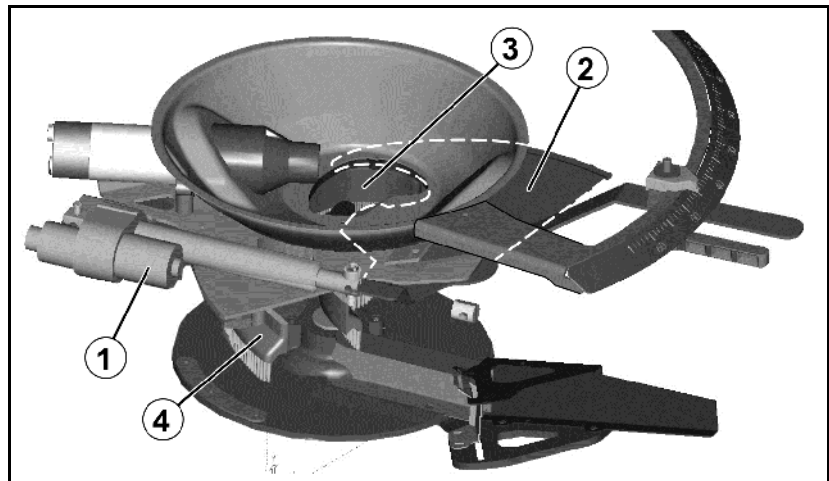


Fig. 18

- (1) Setting motor for metering
- (2) Metering shutter
- (3) Outlet opening
- (4) Brushing unit

Metering shutter

The spread rate is set **electronically** via the control terminal.

In this case, dosing sliders operated by setting motors release a range of different diameters at the outlet openings.

The brushing unit ensures a clean delivery onto the spreading disc without fertiliser turbulence and dust.

When the metering shutter is completely shut it closes the outlet opening in the tank.



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

5.6 Drop-point system

The drop-point system that drops the fertiliser onto the spreading disc is above the spreading discs.

The drop-point system can be attached so that it rotates under the tips of the tank.

The position of the drop point system influences the lateral distribution and must be adjusted as specified in the setting chart.

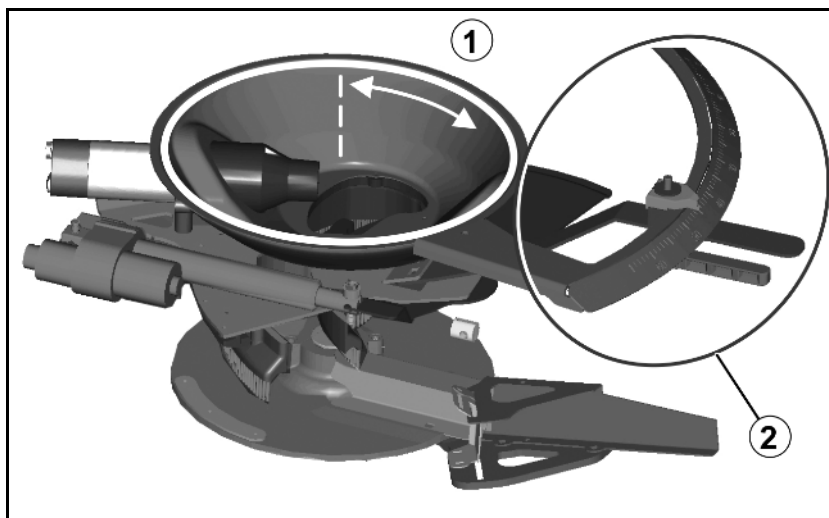


Fig. 19

The position of the feed system over the spreading disc depends on:

- the working width and
- the type of fertiliser.

(1) Inlet system, adjustable

(2) Manual adjustment

Option: electrically setting the feed system, adjustable via the operating terminal.

5.7 Weighing technology (Profis)

Fig. 16/...

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

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

Perform online calibration

Continuous fertiliser calibration while spreading.

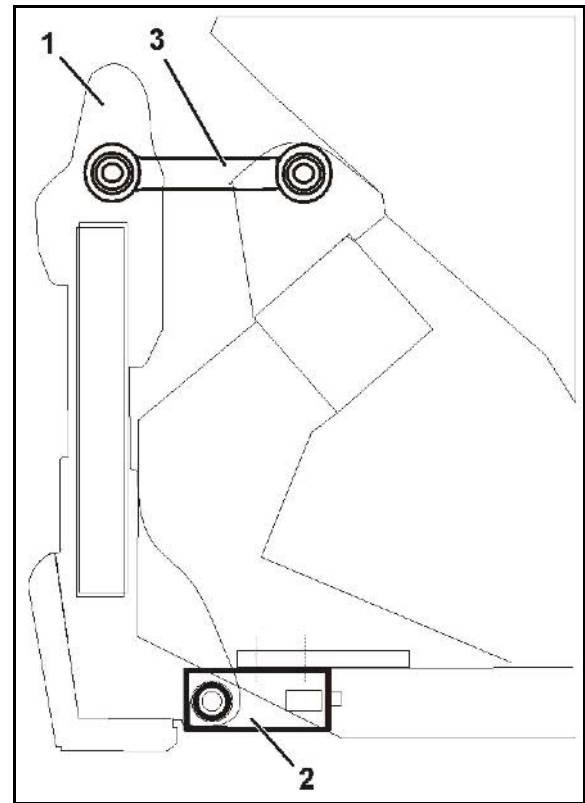


Fig. 20

5.8 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.

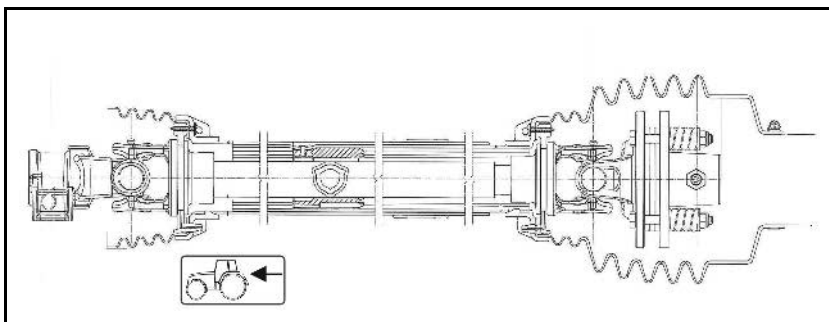


Fig. 21



WARNING

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

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



WARNING

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

Use only one of the listed permissible PTO shafts.

**WARNING**

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

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

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

**WARNING**

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

- Never use the PTO shaft if the safety device is missing or damaged, or without correctly using the supporting chain.
- Before all use, check that
 - all PTO shaft protective devices are installed and fully functional.
 - the clearance around the PTO shaft is sufficient in all operating modes. Insufficient clearance will result in damage to the PTO shaft.
- 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.



- 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 67.
 - 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 29.

5.8.1 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 69.
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).

5.8.2 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).



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 74.
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 69.
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. 18).
6. Clean and lubricate the universal joint shaft if it is not going to be used for a longer period of time.

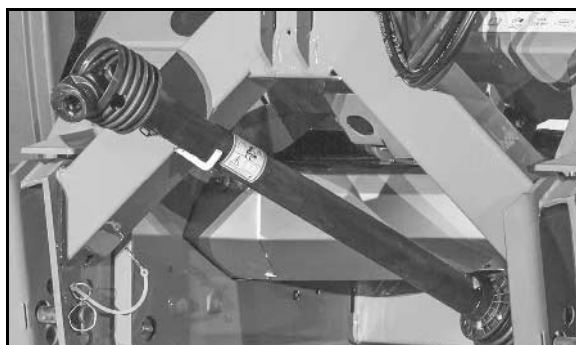
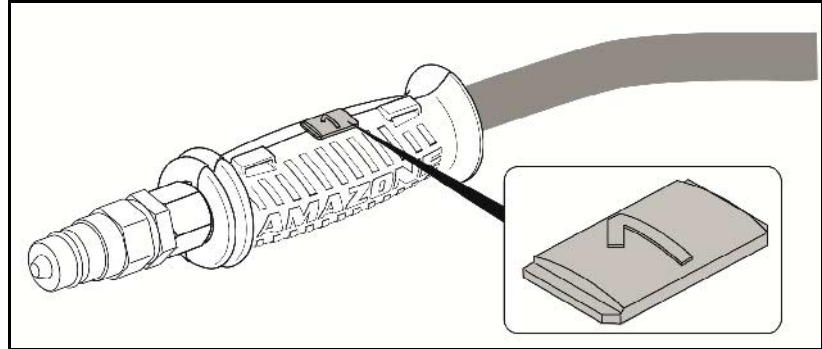


Fig. 22

5.9 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	
natural			open	double-acting	
			close		
Hydro:					
red		Permanent oil circulation		single-acting	
red		Pressure-free return flow			
red		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.

5.9.1 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 52.



- 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.

5.9.2 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.

5.10 3-point attachment frame

The frame of the ZA- TS is designed so that it meets the requirements and dimensions of 3-point attachment of Category 2 or 3 (only for ZA-TS Ultra).

- (1) Lower coupling points that can be selected
- (2) Upper coupling point
- (3) ZA-TS Ultra: Bolts for attaching to the tractor with category 2 or 3 coupling points with linch pin for securing the lower link and top link.
- (4) ZA-TS Super: Bolts for attaching to the tractor with category 2 coupling points with linch pin for securing the lower link and top link.

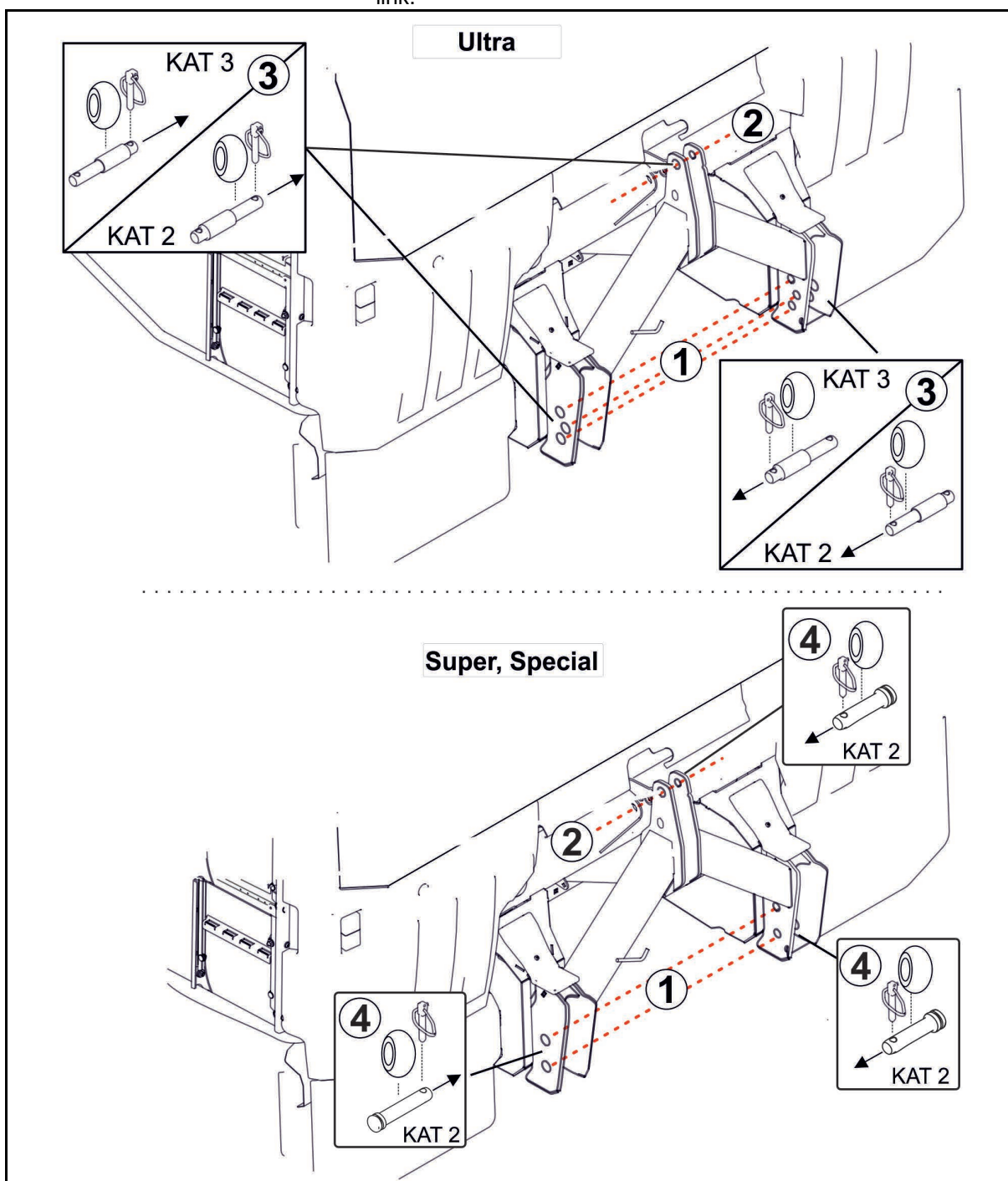


Fig. 23

5.11 Setting chart

All common kinds of fertiliser on the market are spread in the **Amazone** spreading hall, and the setting data measured during this process are incorporated into the setting chart. The types of fertiliser listed in the setting chart were in perfect condition when the measurements were taken.

It may be necessary to adapt the information in the spreading table due to variations in fertiliser condition from:

- Crop height and/or unfavourable storing conditions
- Fluctuations in the physical fertiliser properties, even within the same kind and brand
- Changes of the spreading properties of the fertiliser

may mean that deviations from the information in the setting chart are necessary when setting the desired spread rate or working width.

We cannot guarantee that your fertiliser will have identical spreading properties to that tested by us, even if it is the same kind and brand.



It is recommended to use the fertiliser database with the biggest fertiliser selection for all countries and the most current setting recommendations

- Through the FertiliserService application for Android and iOS mobile devices
- From the online FertiliserService

See www.amazone.de → Service → FertiliserService

Using the QR codes shown below, you can directly access the AMAZONE website to download the FertiliserService application.

iOS



Android



Identification of the fertiliser

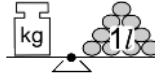


Representation of the fertiliser

Name of the fertiliser



Grain diameter



Bulk density


Calibration factor

The calibration factor is used as a default value for fertiliser calibration.



If you cannot definitively assign the fertiliser to a kind listed in the setting chart

- the AMAZONE Fertiliser Service will assist you over the telephone in assigning the fertilisers and setting recommendations.

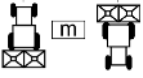


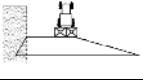
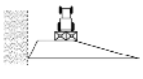
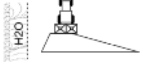
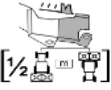
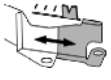
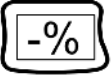
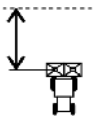
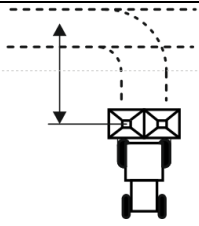

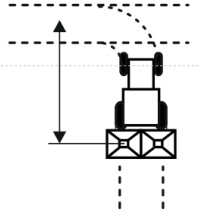
 +49 (0) 54 05 / 501 111

- please consult the contact partner in your country




Settings

	Manually before use	TS-3	TS-2	Spreading vane unit	ZA-TS																
						On the operating terminal before use	Working width	Position of the feed system	Spreading disc speed for normal spreading	Telescope for boundary spreading	Side spreading			Boundary spreading			Ditch spreading				
	On the operating terminal before use / Manually before use	36,0	18	720	C	2	800	2	20	720	2	25	600	36	0						
	On the operating terminal before use / Manually before use	40,0	24	800	C	3	900	3	15	800	3	20	720	39	2						
	On the operating terminal before use / Manually before use	48,0	36	800	D	X	900	3	5	800	2	10	720	45	4						
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Symbols and units:

TS-2	Fit spreading vane units TS1, TS2 or TS3 onto the spreading disc for one working width spectrum each	
	Working width in m (metre)	
	Position of the inlet system as value in the adjustment scale or entry in the operating terminal	
	Spreader disc speed in rpm depending on the type of spreading	
	Side spreading	
	Boundary spreading	
	Ditch spreading	
	Select telescope A, B, C or D for boundary spreading for a half working width as boundary stand-off distance	
	Setting 1, 2 or 3 on the telescope for boundary spreading 0 - do not use the telescope for boundary spreading	
	Quantity reduction for boundary spreading / ditch spreading in % for entry in the control terminal	
X	Border spreading without switching on the boundary / ditch spreading vanes	
	Switch-on point (point at which the shutters open) when driving into the field given as distance in m. Measured from the centre of the spreading disc to the centre of the track in the headlands.	
	Switch-off point (point at which the shutters close) prior to driving into the headlands given as distance in m. Measured from the centre of the spreading disc to the centre of the track in the headlands.	

Contact partners in the respective countries:

					
(GB)	0044 1302 755720	(I)	0039 (0) 39652 100	(H)	0036 52 475555
(IRL)	00353 (0) 1 8129726	(DK)	0045 74753112	(HR)	00385 32 352 352
(F)	0033 892680063	(FIN)	00358 10 768 3097	(BG)	00359 (0) 82 508000
(B)	0032 (0) 3 821 08 52	(N)	0047 63 94 06 57	(GR)	0030 22620 25915
(NL)	0031 316369111	(S)	0046 46 259200	(AUS)	0061 3 9369 1188
(L)	00352 23637200	(EST)	00372 50 62 246	(NZ)	0064 (0) 272467506
				(J)	0081 (0) 3 5604 7644

5.12 Operating terminal ISOBUS



It is absolutely imperative to pay attention to the operating manual for the operating terminal and the operating manual for the software for implement control!

An ISOBUS compatible operating terminal makes it easy to control, operate and monitor the machine.

The spread rate is set electronically.

5.13 Calibration kit (option)

Using the calibration kit, the operating terminal can determine the calibration factor of the fertilizer.

The calibration factor and the application rate set are used to calculate the necessary shutter position.

Refer to the software operating manual Implement control.

- (1) Calibration kit is mounted on the hopper at the rear on the left.
- (2) Hand lever
- (3) Sensor
- (4) Bucket to collect the fertilizer

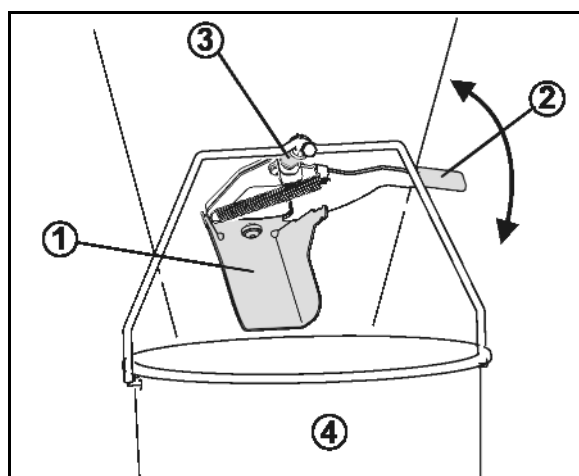


Fig. 24

5.14 Rollover cover (option)

The rollover cover ensures for dry goods to be spread, even in event of wet weather.

The actuation of the rollover cover is carried out

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

The rollover cover 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.

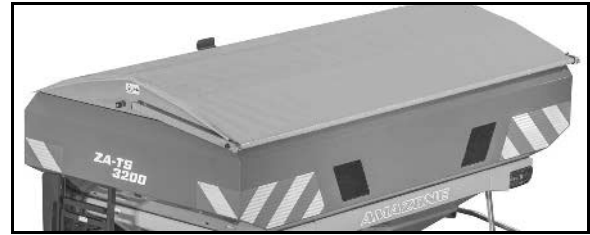


Fig. 25

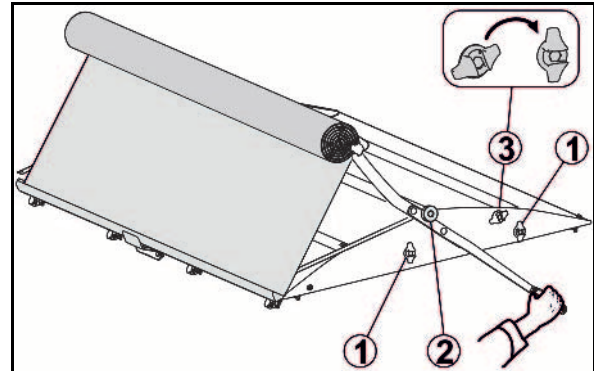


Fig. 26

5.15 Transport and parking device (option)

The swivel-mounted 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.



CAUTION

Risk of tipping

When setting down the fertilizer spreader, only a small residual amount may be found in the hopper.

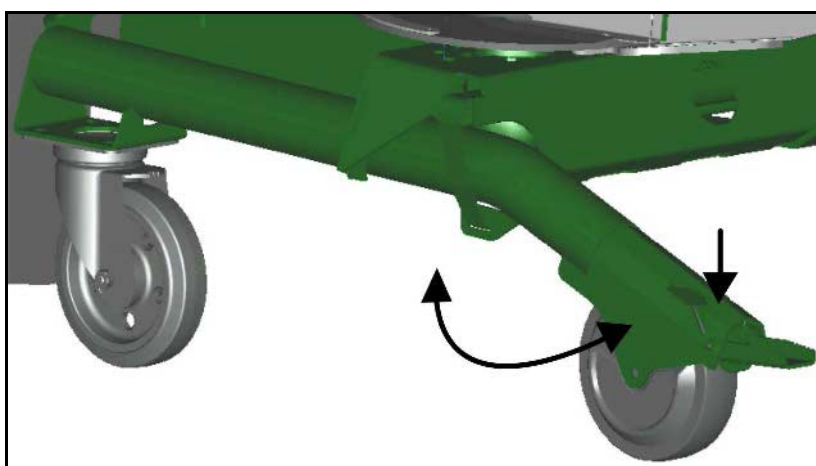


Fig. 27

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.

5.16 Border spreading deflector and bed spreading deflector

The border spreading deflector and the bed spreading deflector are installed between the spreading discs and influence the spread fans such that border spreading or bed spreading is possible.

- (1) Hand lever to operate the spreading deflector.
Alternative: Electric actuation with a separate dashboard
- (2) Adjustable telescope on the bed spreading deflector

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.

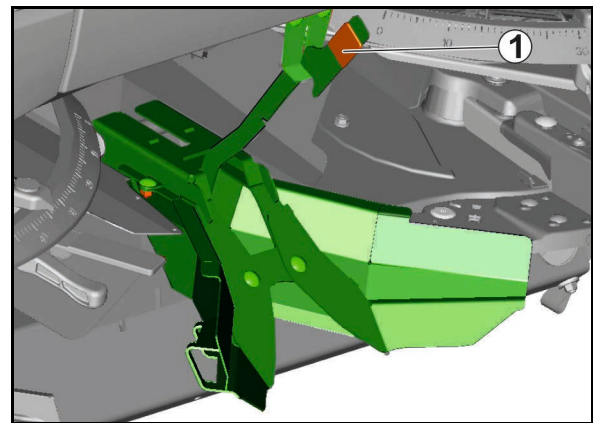
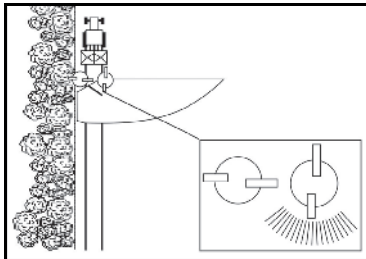


Fig. 28

Bed spreading deflector:

- Fertiliser spreading on both sides over the whole area
- Recess in the area of the tractor wheel mark

The telescope serves to adjust the inner limitation of the spread fan.

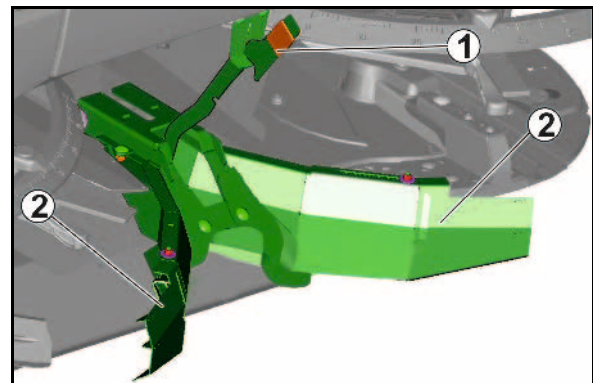
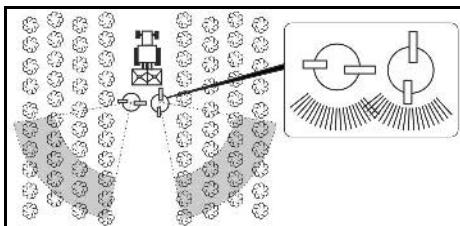


Fig. 29

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 24.

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.

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

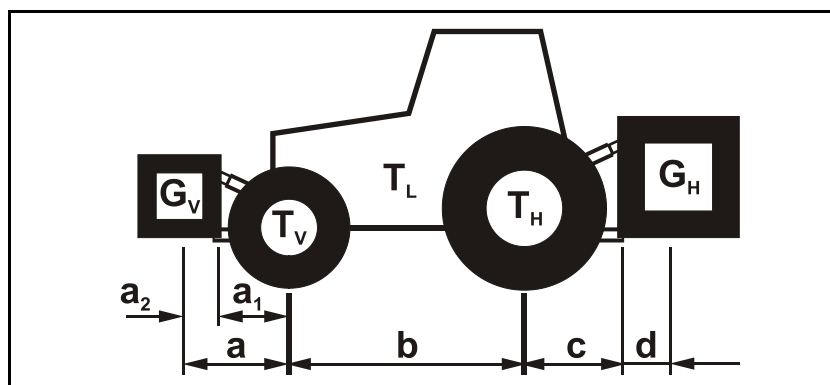


Fig. 30

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

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

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

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

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

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

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

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

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

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

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

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

6.1.1.6 Tractor tyre 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	<div>/ kg</div>	--	--
Total weight	<div>kg</div>	<div>kg</div>	--
Front axle load	<div>kg</div>	<div>kg</div>	<div>kg</div>
Rear axle load	<div>kg</div>	<div>kg</div>	<div>kg</div>



- 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 (\leq) 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 Setting the system converting bolt on the spreader valve block

ZA-TS Hydro:

- (1) System converting bolt
- (2) LS connection for the load sensing control line

The setting of the system converting bolt on the spreader valve block depends on the tractor's hydraulic system. Depending on the hydraulic system:

Tighten the system converting bolt as far as it will go (**factory setting**)

for tractors with

- o Open-centre hydraulic system (continuous flow system, geared pump hydraulics).
- o Setting pump with adjustable oil extraction via the control unit

Unscrew the system converting bolt as far as it will go

for tractors with:

- o Closed-centre hydraulic system (constant pressure system, pressure regulated setting pump).
 - o Load-sensing hydraulic system (pressure and power controlled setting pump) with direct load-sensing pump connection and control line. The required flow rate is regulated by the tractor hydraulic pump.
- (1) Tractor connection for the load sensing control line
 - (2) Tractor connection for the load sensing pressure hose
 - (3) Tractor connection for the pressure-free return flow

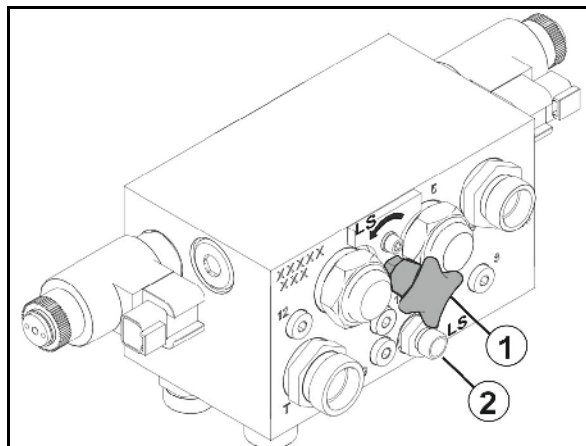


Fig. 31

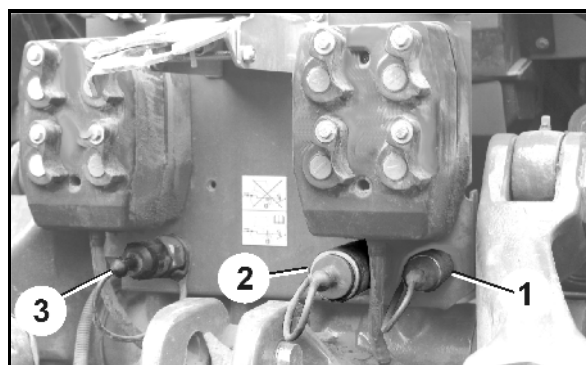


Fig. 32



The machine must be depressurised before making adjustments.

7 Coupling and uncoupling the machine



When coupling and decoupling the machine, comply with the chapter "Safety information for the user", page 24.



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 69.



WARNING

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

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

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 63.



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 60.
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.
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 53.
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 69.
 - 6.3 Check whether the universal joint shaft of the tractor is switched off.
 - 6.4 ZA-TS: Couple the PTO shaft, see the chapter "Coupling the PTO shaft", from page 49.
 - 6.5 ZA-TS Profis Hydro: Couple the hydraulic hose lines, see the chapter "Coupling the hydraulic hose lines", from page 52.
 - 6.6 Couple the lighting system, see the chapter "Transportation equipment", page 34.
 - 6.7 Couple the on-board 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 60.



CAUTION

Danger of injury due to the implement tipping.

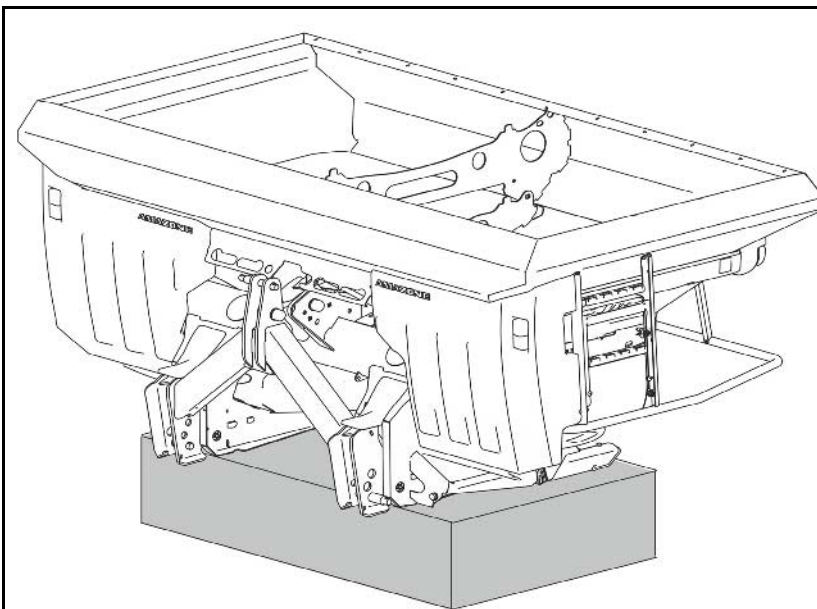
When setting down the fertilizer spreader, only a small residual amount may be found in the hopper.



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.



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 69.
 - 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 60.
 - 3.8 ZA-TS: Uncouple the PTO shaft, see the chapter "Uncoupling the PTO shaft", from page 50.
 - 3.9 ZA-TS Profis Hydro: Uncouple the hydraulic hose lines, see the chapter "Uncoupling the hydraulic hose lines", from page 52.
 - 3.10 Uncouple the lighting system, see the chapter "Transportation equipment", page 34.
 - 3.11 Couple the on-board computer (if installed), refer to separate operating manual.

8 Adjustments



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

- "Warning pictograms and other labels on the machine" from page 16 and
- "Safety information for the operator" from page 24.

Observing this information is important for your safety.



WARNING

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

- **due to unintentional contact with moving operating elements (spreading vanes of rotating spreading discs).**
- **due to tractor and connected machine unintentionally starting up or rolling away.**
- Secure the tractor and the machine against unintentional start-up and rolling, before adjusting the machine. See page 69.
- Only touch moving operating elements (rotating spreading discs) when they have come to a complete standstill.



WARNING

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


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

All settings on the machine are made on the basis of the setting chart for the corresponding fertilizer.

- Pay attention to the grain diameter and bulk density.
- The calibration factor can be used as a starting value for fertilizer calibration.

1. Pay attention to the working width.
2. **ZA-TS** Selection of spreading vane unit.
3. Setting the position of the feed system (manually / using the control terminal, option).
4. Setting of the spreader vane speed (via PTO shaft speed / on the control terminal with a hydraulic drive).
5. Setting for boundary and trench spreading, see page 85.

Excerpt from the setting chart





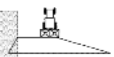













YaraMila® NPK 21-9-8
(83008263)

3,61 mm

1,08 kg/l

Calibration factor **0,99**

ZA-TS														
					Side spreading		Boundary spreading			Ditch spreading				
														
TS-2	24,0	16	600	B	2	720	2	5	600	2	10	550	24	-2
	27,0	16	600	B	2	720	2	5	600	2	10	550	24	-2
	30,0	16	800	B	2	900	2	7	800	2	12	720	29	-1
TS-3	36,0	18	720	C	2	800	2	20	720	2	25	600	36	0
	40,0	25	800	C	3	900	3	15	800	3	20	720	39	2
	48,0	36	800	D	X	900	3	5	800	3	10	720	45	4



We expressly disclaim liability for consequential damages resulting from spreading errors.

Adjustments



Configure all settings with the utmost caution. Deviations from the optimum setting can have a negative effect on the spreading pattern.

The settings listed in the setting chart are intended solely as guide numbers, as the spreading properties of the fertiliser can change, making different settings necessary.

The recommended settings specified for lateral distribution (working width) pertain solely to weight distribution, not to nutrient distribution.



For unknown kinds of fertiliser or a general check of the set working width, you can easily check the working width using the mobile fertiliser test rig (optional).

8.1 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 attachment height of the loaded implement on the field to 80 cm. Measure the set attachment height on the front and the rear of the spreading disc, from the ground surface to the lower edge of the spreading disc (Fig. 30).

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 (Standard fitting 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.

Installation dimension a smaller than b	=	Extend length of the top link
Installation dimension a greater than b	=	Shorten length of the top link

Standard fitting height: a = B = 80 cm

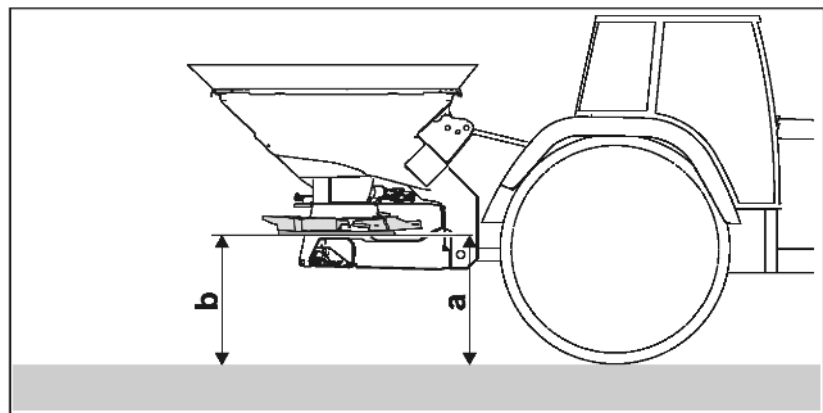


Fig. 33

8.2 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.

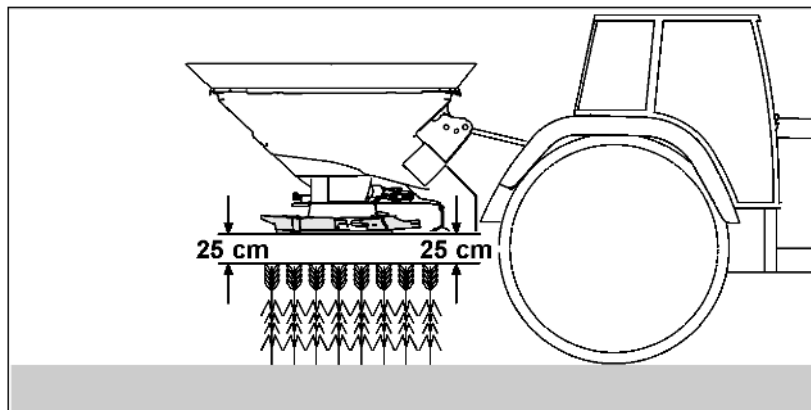


Fig. 34

8.3 Setting the spread rate



See the operating manual Implement control software ISOBUS / Chapter Calibrate Fertilizer.

The **slider position** required for the desired **spread rate** is adjusted electronically via the two rate slides.

After entering the desired spread rate on the operating terminal [nominal quantity in kg/ha], the fertiliser calibration factor must be determined (spread rate check). It determines the spread rates set by the on-board computer.

8.4 Spread rate check



See operating manual
Implement control software ISOBUS / Chapter Calibrate Fertilizer

Carry out spread rate check:

- each time fertiliser is changed
- when spread rate is changed
- when working width is changed

Prior to checking the spread rate, see the setting chart for the calibration factor (as the initial basis) for the respective fertiliser, and enter it in the Fertiliser menu of the ISOBUS software.

Alternatively, the spread rate check is:

- carried out at the beginning of the spreading process (the calibration factors are measured while spreading the first 200 kg of fertiliser).
 - Machine data menu:
Calibration procedure switch on offline calibration.
 - Work menu: select Automatic fertiliser calibration
- carried out continually throughout the spreading process (online calibration).
 - Machine data menu:
Calibration procedure switch on online calibration
- Executed before spreading, when the machine is at a standstill
 - Fertiliser menu:
Determine the calibration factor via the calibrating device or left hopper tip with calibration chute



The fertiliser flow characteristics can change even after a brief fertiliser storage period.

Consequently, before each use, re-determine the calibration factor for the fertiliser to be spread.

The fertiliser calibration factor must always be re-determined if deviations occur between the theoretical and actual spread rate.

8.5 Setting the spreading disc speed



See the setting chart for the spreader disc speed for the respective fertiliser, and enter it in the Fertiliser menu of the ISOBUS software.

- Tronic: Correctly set and maintain the spreader disc speed via the PTO shaft.
- Hydro: The spreader disc speed is regulated automatically when switching on.



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
750		1000

8.6 Setting the working width



- There are different spreading disc pairs for the various spreading vane units.
- The existing tramline system (distance between the tramlines) determines the selection of the required spreading vane units.



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.

8.6.1 Changing the spreading vane units

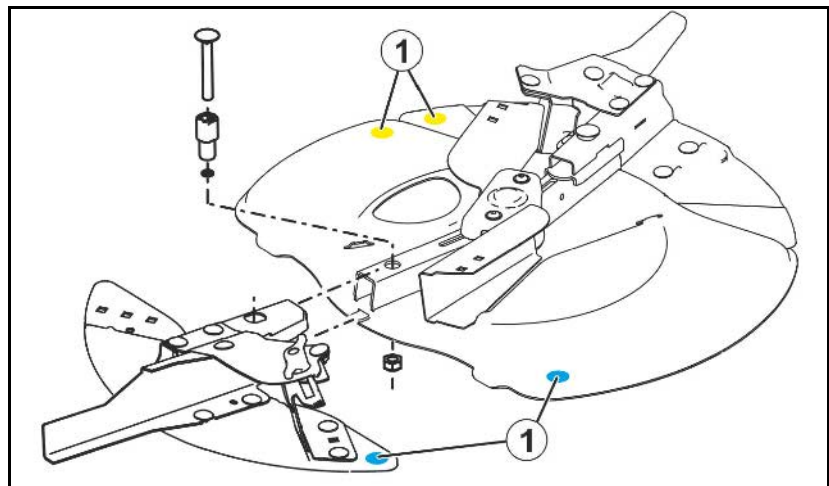


Fig. 35

1. Undo the bolt and remove the screw and the bushing.
2. Remove the spreading vane unit to the outside.
3. Insert the other spreading vane in reverse order and secure it with bolts and bushing.

See the setting chart for the designation of the spreading vane unit and enter it in the Fertiliser menu of the ISOBUS software.



Always change short and long spreading vane units on both sides.

When mounting the spreading vane units on the spreading disc, ensure that the coloured markings (1) are the same!

8.6.2 Setting the feed system



See the setting chart for the setting value for the drop point system for the respective fertiliser, and enter it in the Fertiliser menu of the ISOBUS software.

The adjustment occurs:

- manually using a setting lever
- automatically using an electric motor according to the entry in the operating terminal.

Use the setting lever with scale to adjust the feed system on the left and right sides of the base plates manually.

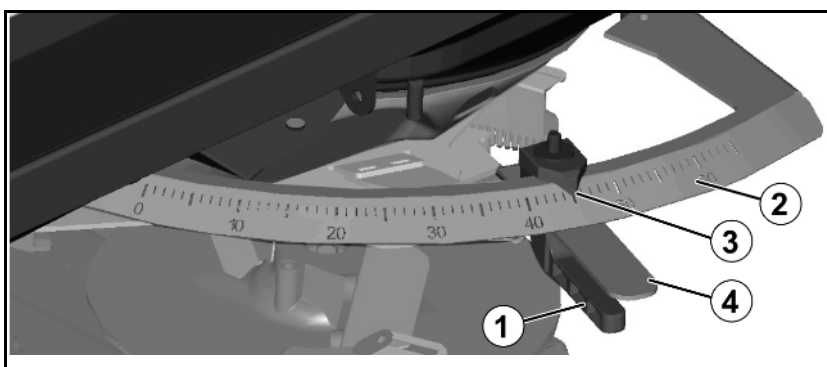


Fig. 36

- Release locking mechanism (Fig. 29/1).
- Look for the value for the position of the feed system on the scale (Fig. 29/2).
- Adjust the read-off edge (Fig. 29/3) on the setting lever (Fig. 29/4) so that it corresponds to the scale value.
- Tighten the locking mechanism again.



Setting the feed system to a higher value widens the working width, a smaller value reduces the working width.

8.6.3 Checking the working width with the mobile test rig (optional)

The setting values of the setting chart are to be considered **guideline values**, as the spreading properties of the different types of fertiliser change. We recommend checking the set working width of the throw spreader using the **mobile fertiliser test rig** (Fig. 30).

For more information, refer to the operating manual for the "mobile test rig".



Fig. 37

8.7 Boundary, ditch and side spreading

1. Boundary spreading in accordance with fertiliser ordinance (Fig. 31):

Along the field boundary there is a road, a field path or another person's lot.

Fertiliser is not permitted to fall beyond the boundaries in accordance with the fertiliser ordinance.

2. Ditch spreading in accordance with fertiliser ordinance (Fig. 32):

There is body of water or a ditch along the field boundary.

The fertiliser ordinance specifies the following:

- No fertiliser must be spread within one metre of the boundary (with use of boundary spreading devices).
- No fertiliser must be spread within three metres of the boundary (without use of boundary spreading devices).
- Erosion and wash-away (e.g. in surface waters) must be prevented.

3. Side spreading in accordance with fertiliser ordinance (

The boundary is delineated by an area in agricultural use. It is acceptable for a small amount of fertiliser to be thrown across the field boundary.

The fertiliser distribution in towards the centre of the field is still close to the nominal quantity. A small amount of fertiliser is thrown across the field boundary.

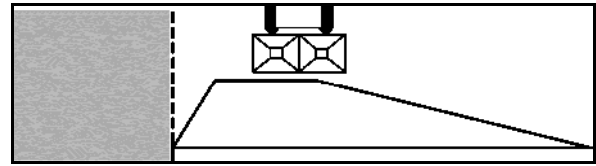


Fig. 38

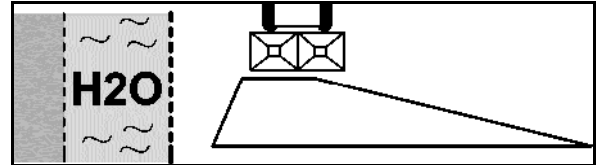


Fig. 39

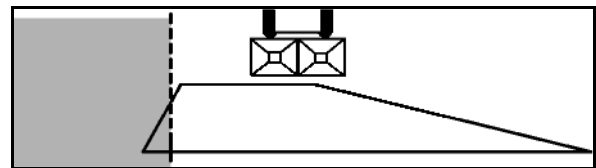
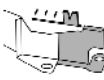
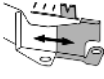


Fig. 40

8.7.1 Settings for border spreading



See the setting chart for the values for boundary spreading the appropriate fertiliser and enter them in the Fertiliser menu of the ISO-BUS software:

- 
 Select TS border spreading vane (A, A+, B, C, D).
- 
 Set TS border spreading vane (1, 2, 3)
 0 – do not mount a telescope
- X** – Perform border spreading with normal spreading vanes. Border spreading is not switched on with the operating terminal (without TS)
- Do not switch ClickTS to the boundary spreading position.
- PTO shaft drive: reduce r.p.m.

On the boundary side, the quantity and spreading vane r.p.m. (ZA-TS Hydro) are reduced automatically.

Setting the AutoTS border spreading vane on the long spreading vane on the right / left depends on:

- boundary clearance,
- type of fertilizer

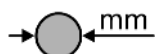


- The values in the setting table are intended as guideline values, since fertiliser condition may differ.
- The border distance on the setting chart basically represents half the working width.

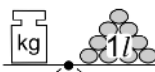
Excerpt from the setting chart



YaraMila® NPK 21-9-8
(83008263)





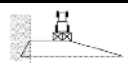
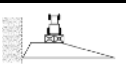













3,61 mm



1,08 kg/l

Calibration factor **0,99**

ZA-TS															
					Side spreading		Boundary spreading		Ditch spreading						
															
TS-2	24,0	16	600	B	2	720	2	5	600	2	10	550	24	-2	
	27,0	16	600	B	2	720	2	5	600	2	10	550	24	-2	
	30,0	16	800	B	2	900	2	7	800	2	12	720	29	-1	
TS-3	36,0	18	720	C	2	800	2	20	720	2	25	600	36	0	
	40,0	25	800	C	3	900	3	15	800	3	20	720	39	2	
	48,0	36	800	D	X	900	3	5	800	3	10	720	45	4	

Setting the TS border spreading vane

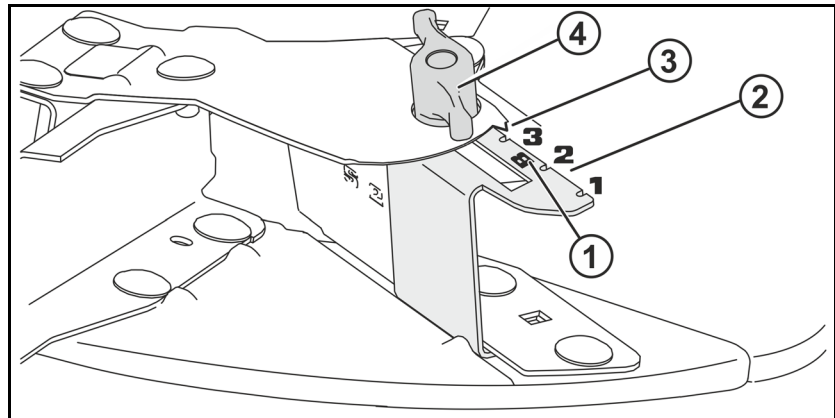


Fig. 41

(1) Telescope identification

TS1 → A, A+ / TS2 → B, D / TS3 → C, D

(2) Scale (1, 2, 3)

(3) Pointer

(4) Thumb nut

1. Undo thumb nut.
2. Read the set value from the setting chart.
3. Set the telescopic part of the border spreading vane to the required value on the scale.
4. Tighten the thumb nut.



Setting the boundary spreading vane TS

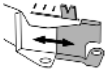


- to a higher value causes an elongation of the spreading range toward the border,
- to a smaller value causes a reduction of the spreading range toward the field.

8.7.2 Adapting the settings for boundary spreading

To optimise the boundary spreading pattern, the settings can be adapted in deviation from the setting chart.

To adapt the settings you must proceed in the following sequence.

Always make only one change at a time.

	Elongation of the spreading range toward the boundary (more fertiliser to the outside)	Delimitation of the spreading range toward the field (less fertiliser to the outside).
1. 	Telescope of the boundary spreading vane to a larger adjustment value.	Telescope of the boundary spreading vane to a smaller adjustment value.
Telescope is already set to the maximum value: 2. 	Replace telescope of the boundary spreading vane. $A \rightarrow A+ \rightarrow B \rightarrow C \rightarrow D$	Replace telescope of the boundary spreading vane. $D \rightarrow C \rightarrow B \rightarrow A+ \rightarrow A$
3. 	Increase spreading disc speed.	Reduce spreading disc speed.
For extremely large working widths: 4. X	Do not switch on AutoTS / ClickTS for boundary spreading.	

8.7.3 Switch ClickTS

1. Secure the tractor against unintentional starting and unintentional rolling away.
 2. Actuate the hand lever on the boundary side. Brace your thumbs on the console.
- For boundary spreading: swivel the hand lever to the implement-side inner end position and lock into place.
 - For normal spreading: swivel the hand lever to the implement-side outer end position and lock into place.

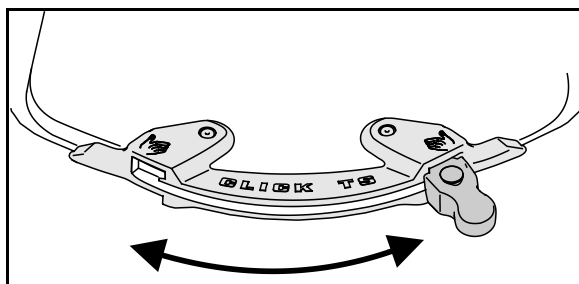




Fig. 42



Before beginning boundary spreading with ClickTS, the corresponding boundary spreading function must be called up on the control terminal. This adjusts the spreading disc speed (Hydro) and the spread rate for the boundary spreading method.

8.8 Switch-on point and switch-off point

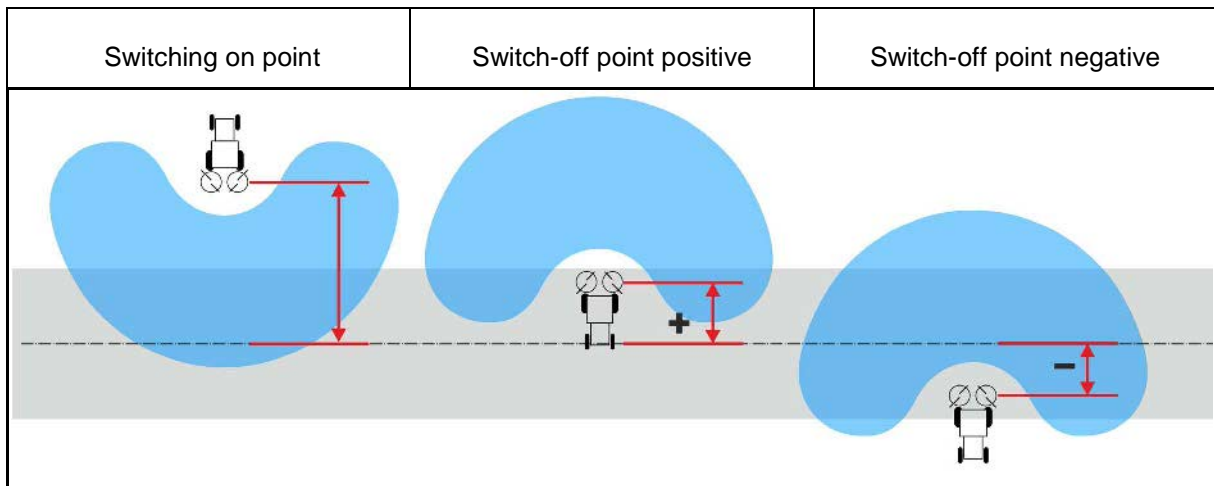
- 
 The switch-on point is the optimal position of the fertiliser spreader for opening the shutters when moving out of the headlands.
- 
 The switch-off point is the optimal point of the fertiliser spreader for closing the shutters when moving into the headlands.

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.

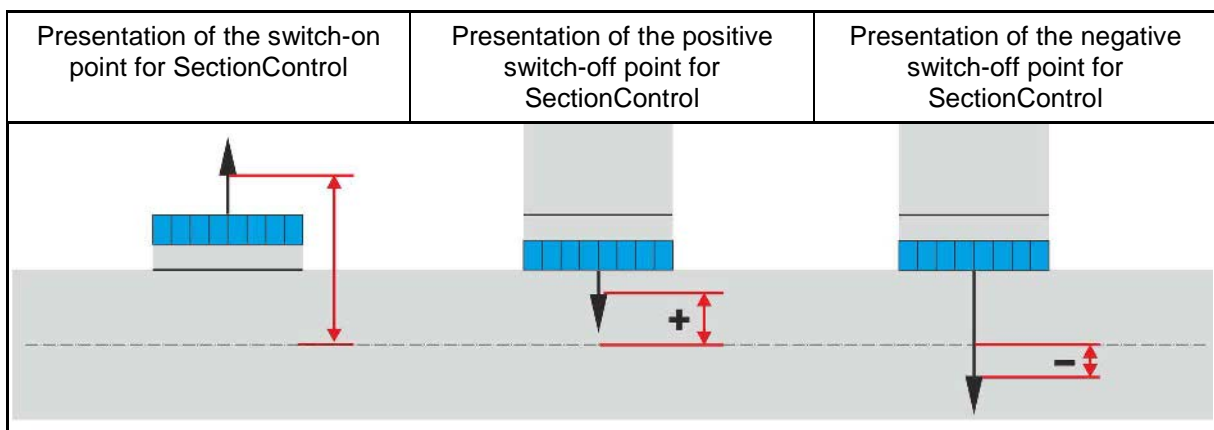
Implements without SectionControl:

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



If direct moving into the tramline of the headlands is desired, it may be necessary to increase the value for the switch-off point. However this is not positive for fertiliser distribution on the headlands.

Switch-on point and switch-off point for SectionControl



9 Transportation



- Comply with the chapter “Safety information for the user”, from page 26 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

Danger of injury for persons standing in the vicinity of the machine due to unintentional start-up of the implement!

Switch-off the control terminal before road transport.



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!

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 24 ff.

Observing this information is important for your safety.



WARNING

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

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



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 every 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.

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 and swivel blades 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.



The machine is operated using the operating terminal.

- Refer to operating manual Implement Control Software ISOBUS.
- Refer to the operating manual for the operating terminal.

- The fertilizer spreader is connected to the tractor.
- The supply lines are connected.
- The operating terminal is connected.
- The settings have been made.

1. Operate the tractor control unit and secure the hydraulic oil supply.

Or

Decouple the PTO shaft at low tractor engine speed.





- 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 border spreading: Switch on AutoTS / ClickTS.
5. After finishing spreading.
 - 5.1 Close shutter.
 - 5.2 Disengage spreader disc drive.



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



- The service life of the spreading vanes depends on the kinds of fertiliser used, the operating times and the spread rates.

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.



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

- 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.



CAUTION

When filling the spreader, avoid inhaling product dust and direct skin contact (wear protective gloves). After use, thoroughly clean hands and all affected parts of the skin with water and soap.



DANGER

Slug pellets in some cases can be very dangerous for children and pets. Store in a place that is inaccessible to children and pets. Always comply with the instructions for use provided by the agent manufacturer!

Concerning the handling of slug pellets, in all other aspects we refer you to the instructions provided by the manufacturer of the agent and to the general precautionary measures for handling agricultural pesticides.

- When spreading slug pellets, ensure that the outlet openings are always covered with the spreading material, and that the implement runs at constant spreading disc speed. A residual quantity of substance 0.7 kg per hopper tip cannot be properly applied. To empty the spreader, open the shutters and collect the spreading material that trickles out (e.g. on a tarpaulin).
- Slug pellets must **not** be mixed with fertiliser or other substances in order to work with the spreader in a different adjustment 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.
2. Turn the spreader disc by hand so that the hole in the spreader disc is pointing inwards, directly under the opening on the hopper.
3. On the operating terminal:
 - 3.1 Open shutter.
 - 3.2 Switch agitator on.
4. Finish emptying process once hopper is empty.

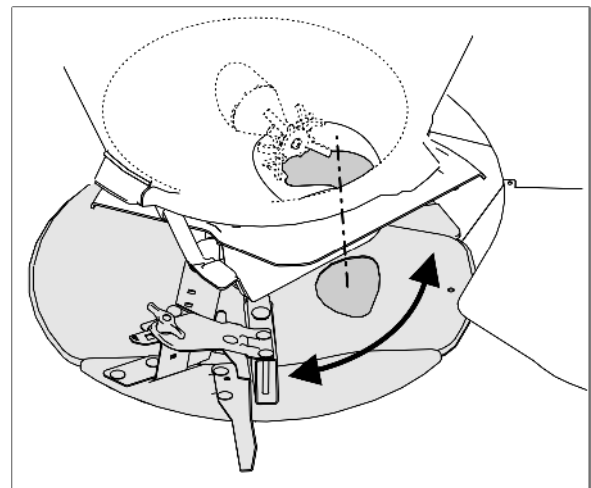


Fig. 43



Machines with a mechanical spreading disc drive:

Empty the residue on the left and right sides separately, as only one hole in the spreader disc can each be positioned over the opening in the hopper.

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 69.

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 40.

11.2 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. Pull out the actuator of the piston rod manually.

→ Shutter closes.

Adjustment force required: 150 N

4. Switch the operating terminal back on and check the functions.

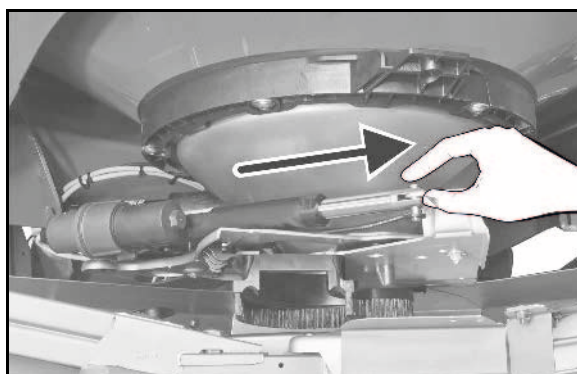


Fig. 44

11.3 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 501111
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.
The temperature of the hydraulic fluid is too high in a tractor equipped with a constant flow system (gear pump)	The system converting bolt on the spreader valve block has not been unscrewed to the limit stop (factory setting).	Unscrew the system converting bolt on the spreader valve block until it reaches the limit stop
The temperature of the hydraulic fluid is too high in a tractor equipped with a constant pressure system (some older John Deere tractors)	The system converting bolt on the spreader valve block has not been unscrewed to the limit stop (factory setting).	Unscrew the system converting bolt on the spreader valve block until it reaches the limit stop
The temperature of the hydraulic fluid is too high for a tractor with load-sensing system and oil removal via the tractor control unit	The system converting bolt on the spreader valve block has not been unscrewed to the limit stop (factory setting).	Unscrew the system converting bolt on the spreader valve block until it reaches the limit stop.
	The quantity of oil at the tractor control unit has not sufficiently reduced.	Reduce the quantity of oil at the tractor control unit.
The temperature of the hydraulic fluid is too high for a tractor with load-sensing system, direct oil removal and control line	The system converting bolt on the spreader valve block has not been screwed in to the limit stop (opposite of factory setting).	Screw the system converting bolt on the spreader valve block until it reaches the limit stop

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 69.



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 40.

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 from the nozzle of the high pressure cleaner / steam jet directly on lubrication and bearing points and adhesive films.
 - Always maintain a minimum jet distance of 300mm between the high pressure cleaning or steam jet cleaning nozzle and the machine.
 - 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).

12.2 Lubrication instructions

Lubricants



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

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

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. 45

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	Maintenance work	See page	Specialist workshop
Angular gearbox	<ul style="list-style-type: none"> • Oil change 	106	

Daily

Component	Maintenance work	See page	Specialist workshop
Spreading vanes	<ul style="list-style-type: none"> • Condition check 	107	

Weekly / Every 50 operating hours

Component	Maintenance work	See page	Specialist workshop
Hydraulic system	<ul style="list-style-type: none"> • Condition check 	109	X
Hydraulic fluid filter	<ul style="list-style-type: none"> • Check 	112	X

Every six months / 200 operational hours

Component	Maintenance work	See page	Specialist workshop
PTO shaft with friction clutch	<ul style="list-style-type: none"> • Ventilate friction clutch 	107	X

As necessary

Component	Maintenance work	See page	Specialist workshop
Spreading vanes	<ul style="list-style-type: none"> • Replace 	107	

12.1 Oil change angular gearbox

1. 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.

2. Dismantle the cover underneath the gearbox.
 3. Place a container under the angular gearbox.
 4. Remove the bleed screw.
- Oil flows out.
5. Dismantle filler plug / sensor.
 6. Reinstall the bleed screw, use a new copper washer.
 7. Fill the gearbox with oil.
 8. Reinstall the filler plug / sensor.
 - use a new O-ring
 - Protect the cylindrical part of the sensor against moisture with a generous amount of grease.
 9. 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

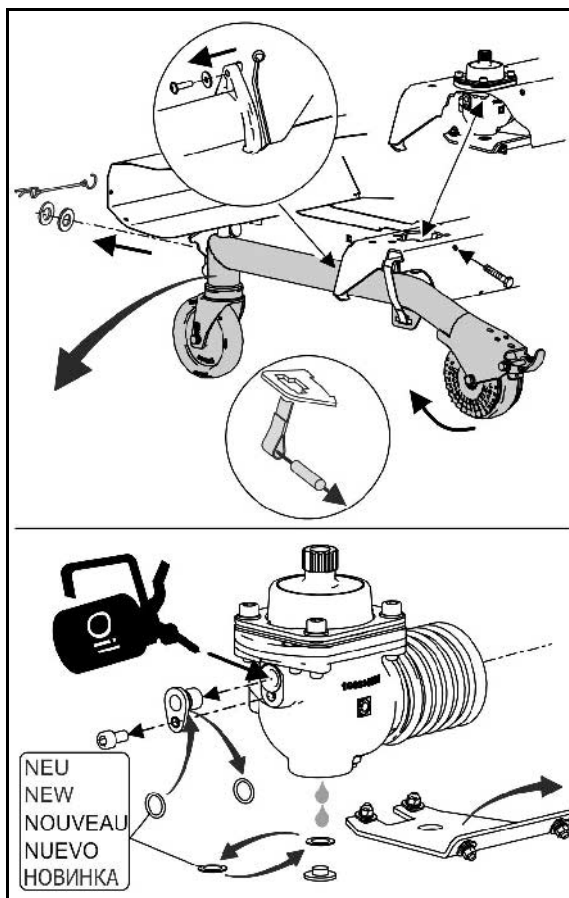


Fig. 46

12.2 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.

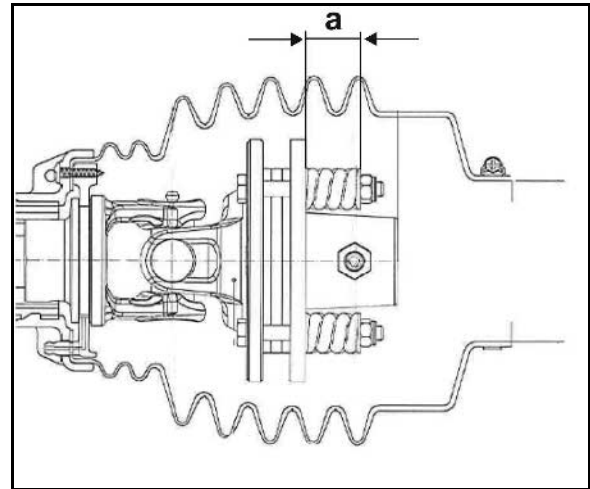


Fig. 47

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

12.3 Replacing the spreading vanes

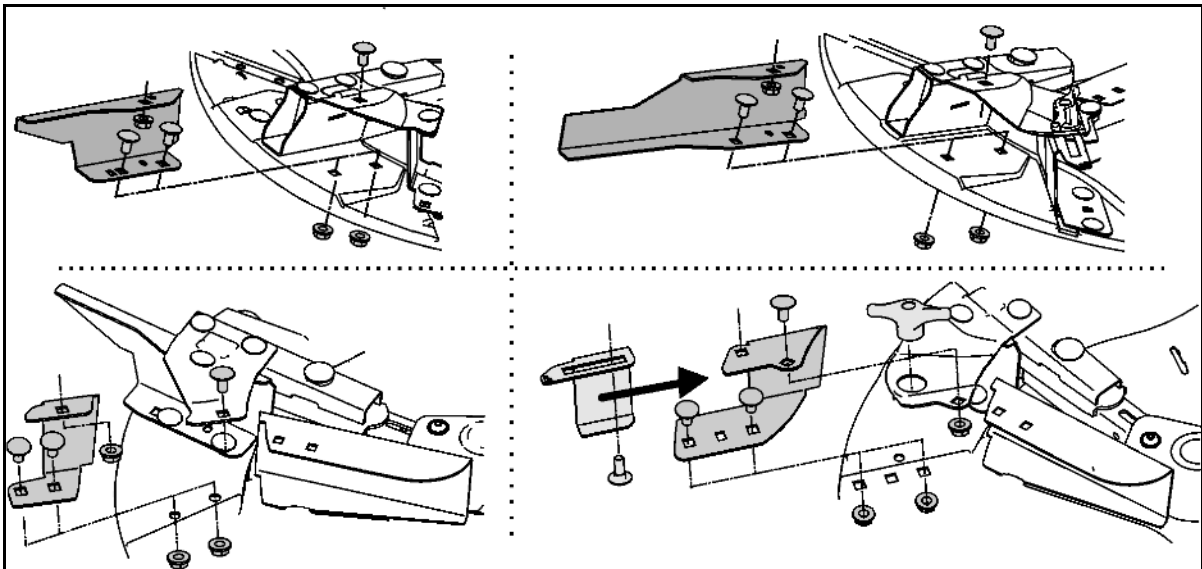


Fig. 48



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: 19.3 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.

12.4 Taring the spreader

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

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

12.5 Calibrating the spreader

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

12.6 Hydraulic system (ZA-TS Profis Hydro)



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



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

12.6.1 Labelling of hydraulic hose lines

The assembly labelling provides the following information:

Fig. 40/...

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

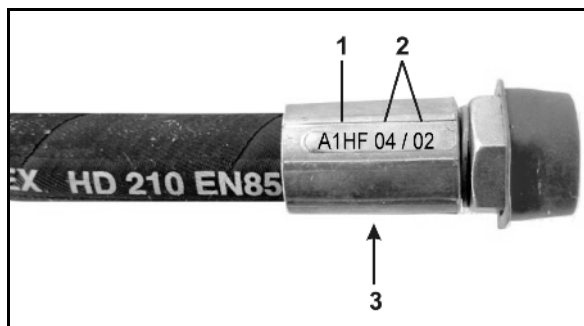


Fig. 49

12.6.2 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.

12.6.3 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 Fig. 40

12.6.4 Installation and removal of hydraulic hose lines



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

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

Use appropriate arrangements and 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.

 - 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.

12.6.5 Checking the hydraulic fluid filter

Hydraulic fluid filter (Fig. 41/1) with contamination indicator (Fig. 41/2).

- 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.

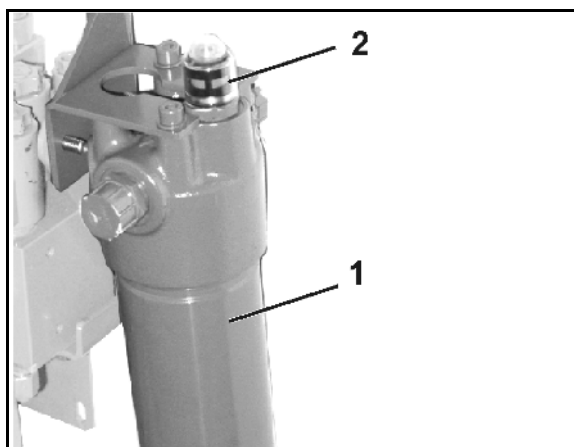


Fig. 50

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

→ Green ring again visible.

12.7 Upper and lower link pins

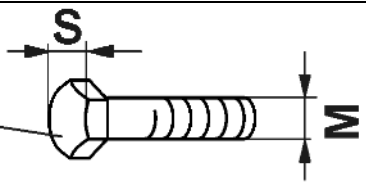


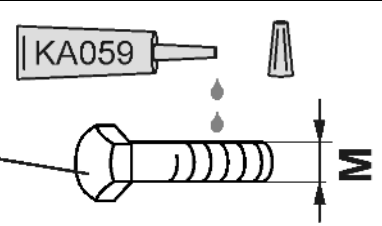
WARNING

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

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

12.8 Screw tightening torques

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

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> A2-70 A4-70 </div>  </div>												
M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Nm	2,3	4,6	7,9	19,3	39	66	106	162	232	326	247	314

13 Hydraulic diagram

ZA-TS Hydro

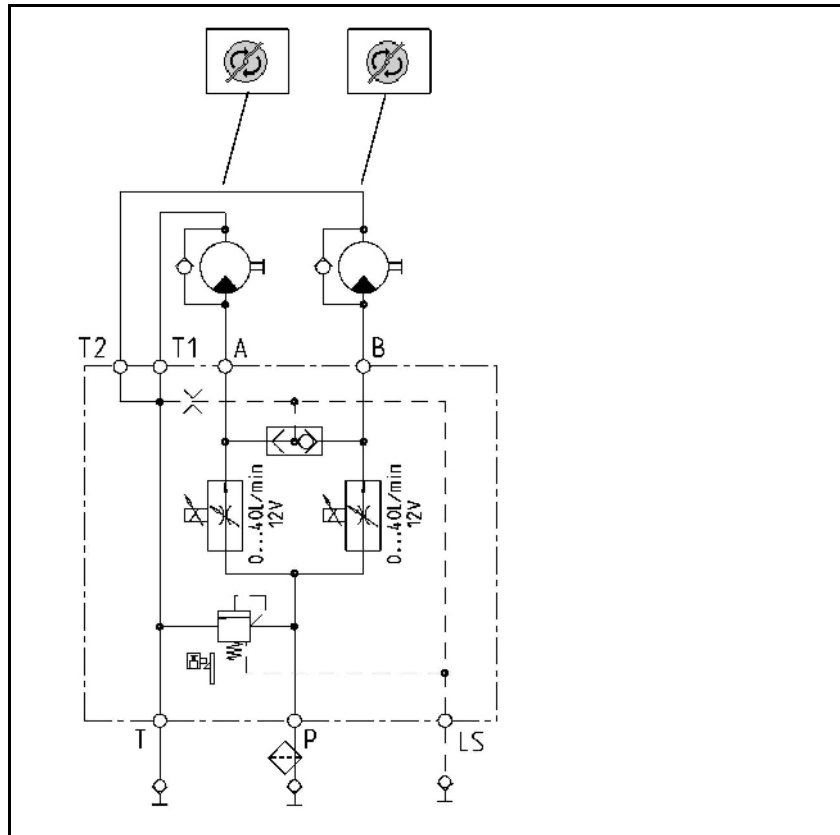


Fig. 51



AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51	Tel.:	+ 49 (0) 5405 501-0
D-49202 Hasbergen-Gaste	e-mail:	amazone@amazone.de
Germany	http://	www.amazone.de

Plants: D-27794 Hude • D-04249 Leipzig • F-57602 Forbach
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