

Operating manual

AMAZONE

ZA-M 900

ZA-M 1200

ZA-M 1500

Fertiliser spreader



MG 1486
BAG0034.0 04.06
Printed in Germany



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



READING THE INSTRUCTION

manual and adhering to it should not appear to be inconvenient and superfluous as it is not enough to hear from others and to realise that a machine is good, to buy it and to believe that now everything should work by itself. The person concerned would not only harm himself but also make the mistake of blaming the machine for the reason of a possible failure instead of himself. In order to ensure good success one should go into the mind of a thing, make himself familiar with every part of the machine and to get acquainted with its handling. Only in this way would you be satisfied both with the machine as also with yourself. To achieve this is the purpose of this instruction manual.

Leipzig-Plagwitz 1872. Rud. Sack.

Identification data

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

Machine identification number:
(ten-digit)

Type: ZA-M

Year of manufacture:

Basic weight (kg):

Approved total weight (kg):

Maximum load (kg):

Manufacturer's address

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Spare part orders

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E-mail: et@amazone.de

Online spare parts' catalogue: www.amazone.de

When ordering spare parts, always specify the (ten-digit) machine identification number.

Formalities of the operating manual

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Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER 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 problems or queries, please consult this operating manual or give us a call.

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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1 User Information

The User Information chapter supplies information on handling the operating manual.

1.1 Purpose of the document

This operating manual

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

1.2 Locations in the operating manual

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

1.3 Diagrams used

Handling instructions and reactions

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

Example:

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

Lists

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

Example:

- Point 1
- Point 2

Number items in diagrams

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

Example: (Fig. 3/6)

- Figure 3
- Item 6

2 General Safety Instructions

This chapter 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 understand the chapter "General safety information" of this operating manual.
- To read the chapter "Warning pictograms and other labelling on the machine" in 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 chapters 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 business" are always applicable. These shall be available to the operator, at the latest on the completion of the contract. Guarantee and liability claims for damage to people or goods will be excluded if they can be traced back to one or more of the following causes:

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

2.2 Representation of safety symbols

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



DANGER

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

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



WARNING

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

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



CAUTION

Indicates a low risk, which could incur 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⁾ A person shall be considered as having been instructed, if they have been instructed in the tasks they have to carry out and in the possible risks in the case of improper behaviour and also 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 this work carries the supplement "Workshop work". The personnel of a specialist workshop shall possess the appropriate knowledge and suitable aids (tools, lifting and support equipment) for carrying out the maintenance and repair work on the machine in a way which is both appropriate and safe.

2.7 Safety measures in normal operation

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

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

2.8 Dangers from residual energy

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

Use appropriate measures to inform the operating personnel. You can find detailed information in the appropriate chapters 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 carry 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 chassis.
- Increasing the size of existing holes on the frame or the chassis.
- Welding 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 of cutting!
2. The consequence of no observance of the danger protection instructions.
For example: causes serious injuries to fingers or hands.
3. Instructions for avoiding the danger.
For example: only touch machine parts when they have come to a complete standstill.

Order number and explanation

Warning pictogram

MD 075

Danger from cutting or cutting off fingers and hand through rotating machine parts!

This danger would cause extremely serious injuries with the loss of body parts such as fingers or hands.

Never reach into the danger area for as long as tractor engine is running with a connected PTO-shaft / hydraulic system.

Only touch machine parts when they have come to a full standstill.

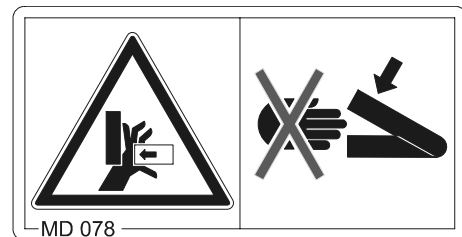


MD 078

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

This danger would cause extremely serious injuries with the loss of body parts such as fingers or hands.

Never reach into the danger area for as long as tractor engine is running with a connected PTO-shaft / hydraulic system.

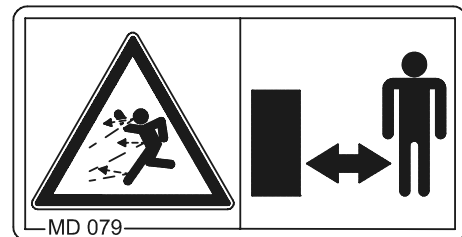


MD 079

Danger from parts of foreign particles being catapulted out of the machine.

This danger would cause extremely serious injuries anywhere on the body.

Ensure that persons keep a safe distance from the danger area of the machine as long as the tractor engine is running.

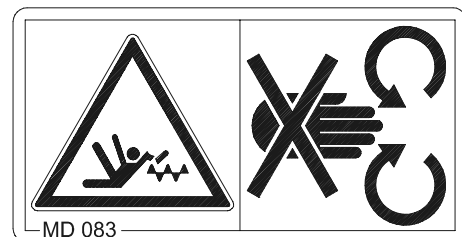


MD 083

Danger from dragging or trapping for arm or upper part of the body through driven, unsecured machine elements!

This danger would cause extremely serious injuries on arms or upper part of the body.

Never ever open or remove guards from driven machine elements as long as the tractor engine is running with connected PTO shaft / coupled hydraulic system.



MD 089

Danger!

Risk of contusions over the whole body in the danger area beneath suspended loads / machine parts!

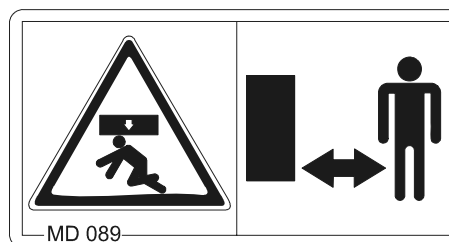
This danger will cause serious injuries anywhere on the body or death.

It is forbidden to stand beneath suspended loads / machine parts.

Keep a safe distance from suspended loads / machine parts.

Ensure that people maintain a sufficient safety distance from suspended loads / machine parts.

Instruct people to leave the danger area beneath suspended loads / machine parts.



MD 089

MD 093

Danger from dragging or trapping for the whole body through unsecured driven drive shafts.

This danger will cause serious injuries anywhere on the body or death.

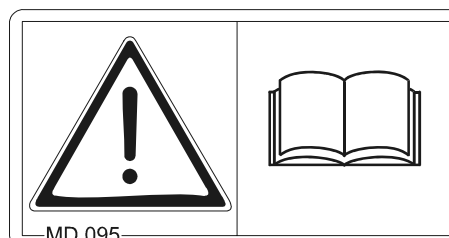
Never ever remove guards from drive shafts as long as the tractor engine with coupled PTO shaft / coupled hydraulic drive is running.



MD 093

MD 095

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



MD 095

MD 096

Danger of infection to the whole body from liquids escaping at a high pressure (hydraulic fluid)!

This danger will cause serious injuries over the whole body, if hydraulic fluid escaping at high pressure passes through the skin and into the body.

Never try to bung leaking hydraulic lines with your hand or with your fingers.

Read and understand the information in the operating manual before carrying out maintenance and repair work.

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



MD096

MD 097

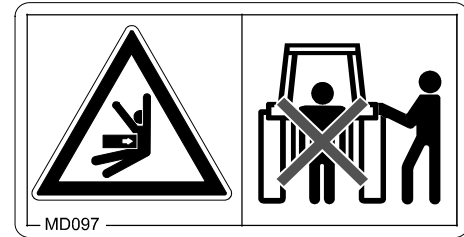
Danger of contusion for the whole body in the lifting area of the three point linkage by spacing narrowing when actuating the three point hydraulic system!

This danger will cause serious injuries anywhere on the body or death.

Persons are not allowed to stand in the lifting area of the three point linkage whilst the three point hydraulic system is actuated.

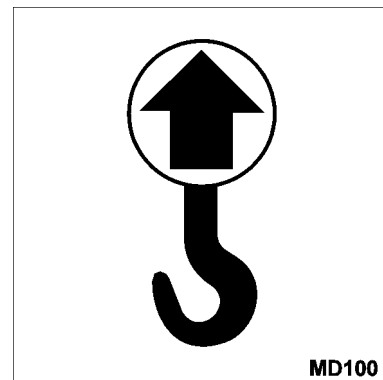
Actuate the setting levers for the three point hydraulic of the tractor

- only from the intended workplace.
- never when standing in the danger area between tractor and machine.



MD 100

This pictogram identifies points for fixing loading aids when loading the machine.

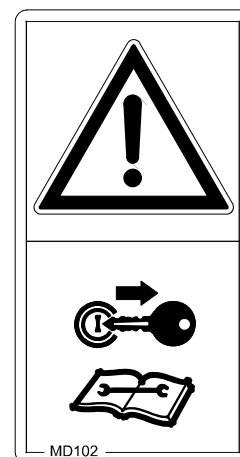


MD 102

Danger from unintentional machine starting and rolling during intervention in the machine, e.g. installation, adjusting, troubleshooting, cleaning, maintaining and repairing.

This danger will cause serious injuries anywhere on the body or death.

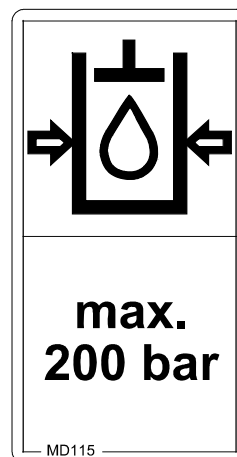
- Secure the tractor and the machine against unintentional start-up and rolling before any intervention in the machine.
- Depending on the type of intervention, read and understand the information in the appropriate chapters of the operating manual.



General Safety Instructions

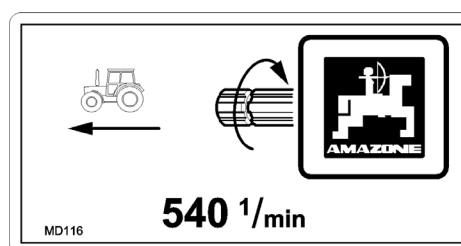
MD 115

Maximum operational pressure of the hydraulic system: 200 bar.



MD 116

Nominal rev. speed (540 1/min) and sense of rotation of the drive shaft on the implement side



MD 145

The CE identification informs of the compliance with the regulations of the valid EU guide lines.



ME 649



(D)

1. Vorderachsentslastung des Schleppers beachten.

2. Rührfinger, Auslauföffnungen und Streuschaufeln sauber und funktionsfähig halten.

(F)

1. Veiller à la bonne adhérence de l'essieu avant.

2. Maintenir propres et opérationnels les agitateurs, les orifices d'alimentation et les aubes.

(GB)

1. Bear in mind front axle weight reduction.

2. Always keep agitator fingers, outlets and vanes clean and replace when worn or damaged.

(NL)

1. Op de vooras ontlasting van de traktor letten.

2. Roerdervingers, uitloop-openingen en strooischoepen schoon en bedrijfsge-reed houden.

ME 649

ME 650



(D)

Zapfwelle nur bei niedriger Motordrehzahl einkuppeln.

Bei Überlastung schert die Sicherungsschraube ab.

Bei häufigem Abscheren Gelenkwelle mit Reibkupplung einsetzen.

(F)

La prise de force ne doit être enclenchée qu'à régime moteur réduit.

En cas de surcharge, la vis de sécurité se casse.

En cas de cisaillement fréquent, utiliser une transmission avec limiteur de couple à friction.

(GB)

Engage pto-shaft only at low engine speed.

In case of overstrain the shear bolt shears off.

If shear bolt shears off too frequently we recommend the use of a pto shaft with friction clutch.

(NL)

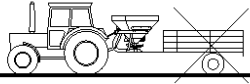
Aftakas alleen bij laag motortoerental inkoppelen.

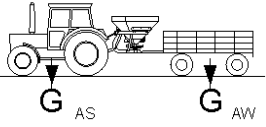
Bij overbelasting breekt de breekbout af.

Bij dikwijls breken een aftakas met slipkoppeling toepassen.

ME 650


ME 656





1) $V_{\max} = 25 \text{ km/h}$

2) $G_{AW} = \max. 1,25 \times G_{AS}$; $G_{AW\max} = 5t$




(D) Nur zulässig bei Anhängern mit Auflauf- oder Seilzugbremse.

(F) Autorisé seulement sur remorque disposant de son propre système de freinage

(GB) Only permissible with trailers which are equip-ped with over-run or with Bowden cable brakes.

(NL) Uitsluitend toegestaan bij aanhangers met oploop-of-kabel-trekrem

ME 667



(D) Gelenkwellenlänge beachten (sonst Getriebeschaden). Siehe Betriebsanleitung.

(F) Veiller impérativement à la longueur de la transmission (risque d'endommagement du boîtier). Voir le manuel d'utilisation.

(GB) Check correct p.t.o. shaft length (otherwise gearbox damage will result). – see instruction book.

(NL) Geeft aandacht aan de lengte van de aftakas zoals de gebruikshandleiding aangeeft, anders kan de aandrijfkast beschadigen.

2.13.1 Positioning of warning pictograms and other labels

Warning pictograms

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

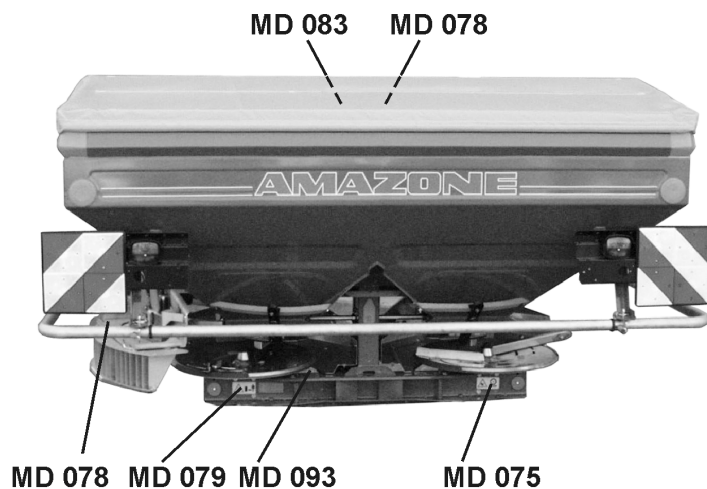


Fig. 1

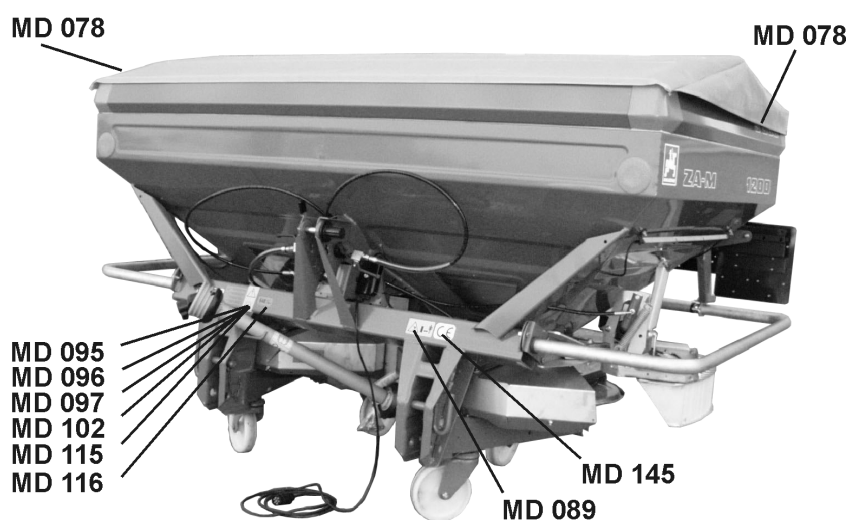


Fig. 2

2.14 Dangers of no observance of the safety information

No observance of 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 three-point hydraulic system, the attachment categories of the tractor and the machine must always be the same!
- Connect the machine to the prescribed equipment in accordance with the specifications.
- When coupling machines to the front or the rear of the tractor, the following may not 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 decoupling the machine.
- It is forbidden for people to stand between the machine to be coupled and the tractor, whilst the tractor is moving towards the machine!
Any helpers may only act as guides standing next to the vehicles, and may only move between the vehicles when both are at a standstill.
- Secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is impossible, before connecting the machine to or disconnecting the machine from the tractor's three-point hydraulic system.



General Safety Instructions

- When coupling and decoupling 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 decoupling it from the tractor! There are contusion and cutting points in the area of the coupling point between the tractor and the machine.
- It is forbidden to stand between the tractor and the machine when actuating the three-point hydraulic system.
- Coupled supply lines:
 - Must give without tension, bending or rubbing on all movements when travelling round corners.
 - May not scour other parts.
- The release ropes for quick action couplings must hang loosely and may not release themselves when lowered.
- Also ensure that decoupled 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!
- Secure the tractor against unintentional start-up and rolling, before you leave the tractor.
For this:
 - Lower the machine onto the ground
 - Apply the parking brake
 - Switch off the tractor engine
 - Remove the ignition key

Machine transportation

- When using public highways, comply with the national road transport regulations.
- 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 released completely
 - The function of the brake system
- Ensure that the tractor has sufficient steering and braking power. Any machines and front/rear weights connected to the tractor influence the driving behaviour and the steering and braking power of the tractor.
- If necessary, use front weights.
The front tractor axle must always be loaded with at least 20% of the empty tractor weight, in order to ensure sufficient steering power.
- Always fix the front or rear weights to the intended fixing points according to regulations.
- Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor.
- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected machine).
- Check the brake power before moving off.
- When turning corners with the machine connected, take the broad load and balance weight of the machine into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the machine is fixed to the three-point hydraulic system or lower links of the tractor.
- Before moving off, move all the swivel machine parts to the transport position.
- Before moving off, secure all the swivel machine parts in the transport position against risky position changes. Use the transport locks intended for this.
- Before moving off, secure the operating lever of the three-point hydraulic system against 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 for equipment movements which:
 - Are continuous or
 - Are automatically locked or
 - Require a floating position or pressed position to function
- Before working on the hydraulic system
 - Lower the machine
 - Depressurise the hydraulic system
 - Switch off the tractor engine
 - Apply the parking brake
 - Remove the ignition key
- Have the hydraulic hose line checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose line if it is damaged or worn. Only use original **AMAZONE** hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose connections made from thermoplastics, other guide values may be decisive.
- Never try to bung leaking hydraulic lines with your hand or with your 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.
 - In the case of retrofitting of electrical units and/or components on the machine, with a connection to the on-board power supply, the user must check 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 89/336/EEC in the appropriate version and carry the CE label.



2.16.4 Operation with PTO shafts

- Only use PTO shafts which are designed for the implement by the manufacturer and which are equipped with all legally requested guards!
- Please also observe the operator's manual of the PTO shaft manufacturer.
- Guard tube and guard cone of the PTO shaft must not be damaged and the guard of the tractor- and implement universal joint shaft must be fitted and in a proper condition.
- Working with damaged guards is prohibited.
- Fit and remove the PTO shaft only when
 - the PTO shaft is stopped
 - engine is stopped
 - parking brake is applied
 - ignition key is removed
- Ensure correct fitting and securing of the PTO support!
- When using wide angle PTO shaft always attach the wide angle joint on to the pivot point!
- Prevent PTO guard from spinning by fixing the provided chain to a nearby static part!
- On PTO shafts always ensure the tube has sufficient overlap in transport- and operating position. (Observe instruction manual of the PTO shaft manufacturer)
- When travelling in curves mind the permissible angling and sliding length!
- Prior to engaging the universal joint shaft ensure the coincidence of the chosen tractor's universal joint shaft rev. speed and the permissible drive rev. speed of the machine.
- Prior to engaging the universal joint shaft advise people to leave the danger area.
- No one is allowed to stand within the operational range of the universal joint shaft or the PTO shaft whilst the universal joint shaft is operated.
- Never switch on the tractor PTO while the engine is stopped!
- Always stop PTO when it is not needed or when the shaft is in an adverse position!
- **WARNING! Danger of injury!** After switching off the PTO the mounted implement may continue to run by its dynamic masses! During this period never come too close to the implement. Begin work on the implement only after it has come to a full standstill!
- Secure tractor and machine against unintentional start up and unintentional rolling prior to carrying out any cleaning, greasing or setting work on universal joint shaft driven implements or on PTO shafts.
- Deposit removed PTO shaft on the provided carrier!
- When travelling in curves mind the permissible angling and sliding length!
- When using the ground-related PTO take note that the PTO speed is related to the forward speed and that the sense of rotation reverses when backing up!

2.16.5 Fertiliser spreader operation

- Standing in the operational range is forbidden. Danger from flinging fertiliser particles. Prior to switching on the spreading discs advise people to leave the spreading area of the fertiliser spreader. Never come near rotating spreading discs.
- Only fill the fertiliser spreader with the tractor engine stopped, ignition key removed and closed shutters.
- Do not deposit any foreign particles into the hoppers!
- During the spread rate check observe danger areas from rotating machine parts.
- Never park or move the filled fertiliser spreader (danger of tipping over)!
- For border spreading on fields' sides, open waters or roads make use of the border spreading device!
- Prior to any operation ensure the appropriate fitting of the fixing parts, especially for the spreading disc- and spreading vane fixing.

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

3 Loading and unloading

Loading with a hoist crane:



DANGER!

When loading the machine with a hoist crane use the indicated points for fixing the lifting straps.



DANGER!

The minimum tensile strength per lifting belt must be 300 kg!



Prior to loading open the swivel hopper cover.

Each 1 fixing point is located at the front and in the back of the hopper (Fig. 3/1).

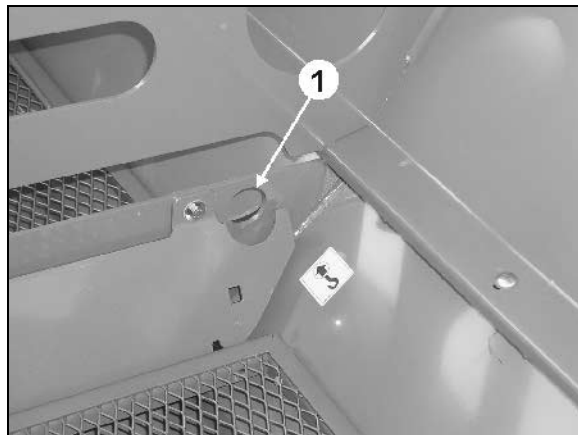


Fig. 3

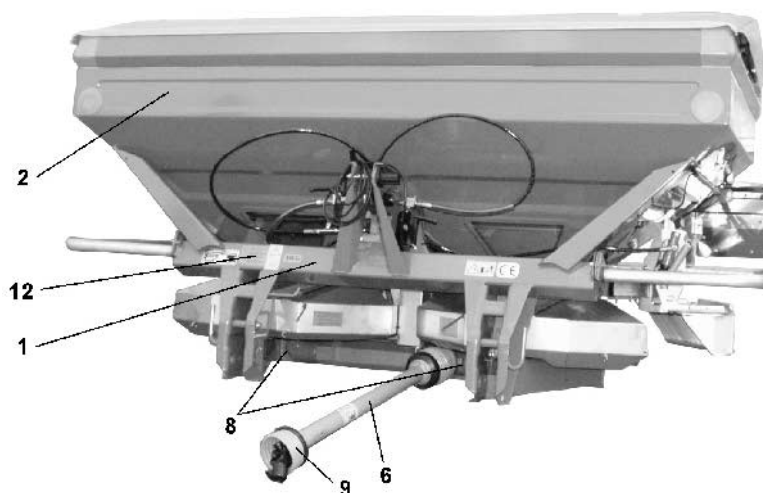
4 Product description

This chapter:

- Provides a comprehensive overview of the machine structure.
- Provides the names of the individual modules and controls.

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

4.1 Module overview



- (1) Frame
- (2) Hopper
- (3) Omnia-Set spreading discs
- (4) Setting lever for shutter
- (5) Boundary spreading device Limiter
- (6) PTO shaft

4.2 Safety and protection equipment

- (7) Chain guard of agitator shaft drive
- (8) Guard for shaft between centre and angular gearbox
- (9) PTO shaft guard
- (10) Guard tube for operation with the spreading discs OM 24-36
- (11) Guard screen in hopper
- (12) Safety symbols (warning signs)

4.3 Overview – Supply lines between the tractor and the machine

- 1. Hydraulic hose lines
- depending on equipment:
- 2. connection traffic lights
 - 3. computer cable with machine plug

4.4 Transportation equipment

Fig. 4/...

- (1) 2 rear lights
- (2) 2 brake lights
- (3) 2 travel direction displays (necessary when the tractor travel direction displays are covered)
- (4) 1 registration plate holder with lighting (necessary if tractor registration plate is covered).
- (5) 2 red rear reflectors
- (6) 2 warning panels rear



Fig. 4

- 2 warning panels front
- 2 clearance lamps right and left hand side

4.5 Designated use of the machine

The **AMAZONE** fertiliser spreader **ZA-M 900 / 1200 / 1500**

- has exclusively been designed for the usual operation in agriculture for spreading dry, granular, prilled and crystalline fertilizers, seeds and slug pellet.
- have to be mounted on the tractor's three point cat. II and are operated by one person.

Slopes can be travelled

- Along the contours
Direction of travel to left 20 %
Direction of travel to right 20 %
- Along the gradient
Up the slope 20 %
Down the slope 20 %

The intended use also includes:

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

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

Any damage resulting from improper use means that:

- The operator carries the sole responsibility,
- AMAZONEN-WERKE assumes no liability.

4.6 Danger areas and danger points

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

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

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

No-one may stand in the machine danger area

- For as long as the tractor engine is running with a connected turbine shaft / hydraulic system.
- For 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 areas exist.

- Between the tractor and the machine, particularly during coupling and decoupling operations.
- In the area of moving components:
 - Rotating spreading discs with spreading vanes
 - Rotating agitator shaft and agitator shaft drive
 - Hydraulic actuation of the shutter slides
 - Electric actuation of the metering shutter slides
- By climbing the machine.
- Underneath the lifted not secured machine or machine parts
- During spreading operation within the spread fan range by fertiliser grains.

4.7 Nameplate and CE labelling

The following diagrams show the arrangement of the nameplate (Fig. 5/1) and the CE label (Fig. 5/2).

The nameplate shows:

- Machine ID no.:
- Type
- Max. payload
- Basic weight (kg)
- Year of manufacture
- Factory

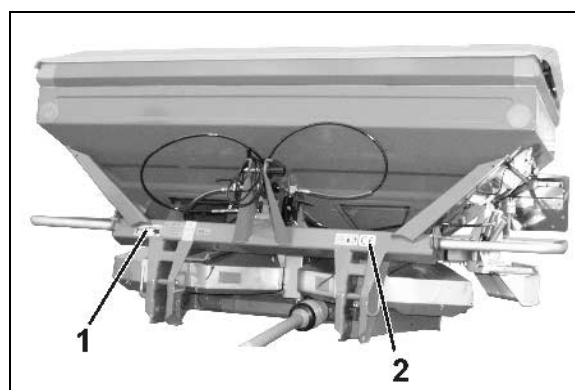


Fig. 5

4.8 Technical data

Type	Hopper capacity (litres)	Payload (kg)	Weight (kg)	Filling height (m)	Filling width (m)	Total width (m)	Total length (m)
ZA-M 900	900	1800	260	0,98	1,91	2,02	1,35
+S 350	1250	1800	280	1,12	1,88	2,07	1,40
+2x S 350	1600	1800	300	1,26	1,88	2,07	1,40
+ L 800	1700	1800	310	1,25	2,51	2,70	1,40
+ S350 +L800	2050	1800	336	1,39	2,51	2,70	1,40
ZA-M 1200	1200	2200	284	1,05	2,15	2,30	1,35
+ S 500	1700	2200	312	1,19	2,06	2,35	1,40
+2x S 500	2200	2200	340	1,34	2,06	2,35	1,40
+ S 500 + L 1000	2700	2700	368	1,46	2,75	2,89	1,40
ZA-M 1500	1500	2500	289	1,12	2,15	2,30	1,35
+S500	2000	2500	317	1,26	2,06	2,35	1,40
+2xS500	2500	2500	345	1,40	2,06	2,35	1,40
+ L 1000	2500	2500	351	1,39	2,75	2,89	1,40
+ S 500 + L 1000	3000	3000	373	1,53	2,75	2,89	1,40

Typ	Working width (m)	
ZA-M 900	10-24	depending on spreading discs used and kind of fertiliser
ZA-M 1200 / 1500	10-36	

Distance between the centre of the lower link ball and the centre of gravity of the rear implement / rear ballast weight

$$D = 0,62 \text{ m}$$

4.9 Conformity

Directives / standards

The machine fulfils the:

- Machines directive 98/37/EC
- EMC directive 89/336/EEC



4.10 Necessary tractor equipment

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

Tractor engine power

Hopper capacity:

900 l	from 45 kW (60 HP)
1200 l	from 60 kW (80 HP)
1500 l	from 65 kW (90 HP)
3000 l	from 112 kW (150 HP)

Electrical system

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

Hydraulic system

Maximum operating pressure:	• 200 bar
Tractor pump power:	• At least 15 l/min at 150 bar
Machine hydraulic fluid:	• Transmission/hydraulic fluid, petrol SAE 80W API GL4 The machine hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.
Control unit:	• at least 2 single acting control valves (depending on execution)

4.11 Noise production data

The workplace-related emission value (noise level) is 74 dB(A), measured during operation at the ear of 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 chapter provides information on the machine structure and the functions of the individual components.

5.1 Method of operation

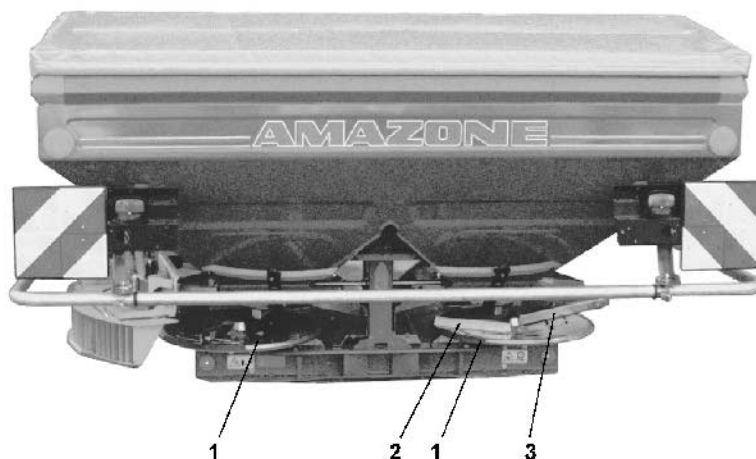


Fig. 6

The fertilizer spreader **AMAZONE ZA-M** with its two hopper tips can be equipped with exchangeable spreading discs (Fig. 6/1) which are driven contrary to the operating direction rotating adverse from inside to outside. They are equipped with a short (Fig. 6/2) and a long spreading vane (Fig. 6/3).



WARNING

For operation with the spreading discs

- **OM 24-36**
- **OM 18-24 (nur ZA-M 900)**

equip the spreader – as a matter of principle – with the guard tube (accident safety)!

5.2 PTO shaft

The PTO shaft provides the power transmission between tractor and machine.

- PTO shaft standard (810 mm)
- PTO shaft with friction clutch (option, 760 mm)
The friction clutch must always be mounted to the machine side!
- PTO shaft Telespace (option, 810 mm, telescopic)



WARNING

Risk of contusion from unintentional start up and unintentional rolling of tractor and machine!

Only couple and uncouple the PTO shaft to and off the tractor when the tractor and the machine are secured against unintentional start up and unintentional rolling.



WARNING

Danger from catching or trapping by unsecured PTO shaft or damaged safety devices.

- Never ever use the PTO shaft without safety device or with defective safety device or without proper use of the fixing chain.
- Prior to any operation ensure that all guards of the PTO shaft are fitted and of proper function.
- Hook in the fixing chains (does not apply to PTO shafts with all around guard) in such a way that a sufficient movement in all operational positions is ensured. Chains must not get caught on components of the tractor or the machine.
- Take care for immediate replacement of defective or missing parts of the PTO shaft by genuine parts of the PTO shaft manufacturer.

Bear in mind that only a specialist workshop is entitled to repair the PTO shaft .



WARNING

Danger from catching or trapping through unsecured parts of the PTO shaft within the range of the power transmission between tractor and driven machine!

This danger will cause extremely serious injuries or even death.

Only operate with completely secured drive between tractor and driven machine.

- Ensure that the unsecured parts of the PTO shaft are always secured by a guard plate on the tractor and a guard cone on the machine.
- Ensure that the guard plate on the tractor and the guard cone on the machine and the safety devices and guards of the stretched PTO shaft always overlap by 50 mm. If not, you are not allowed to drive the machine via the PTO shaft.



- Only use the supplied PTO shaft and the supplied PTO shaft type.
- Read and adhere to the operator's manual of the PTO shaft. The appropriate use and maintenance of the PTO shaft will protect from severe accidents.
- When coupling the PTO shaft adhere to the operator's manual of the PTO shaft manufacturer.
- Ensure sufficient space within the swivel range of the PTO shaft. Insufficient space would cause damage on the PTO shaft..
- Observe the permissible drive rev. speed of the machine.
- In case the PTO shaft is equipped with an overload- or free-wheel coupling always mount the overload- or freewheel coupling on the implement side.
- Observe the correct positioning when fitting the PTO shaft. The tractor symbol on the guard tube of the PTO shaft identifies the tractor side connection of the PTO shaft.
- Before engaging the universal joint shaft read and adhere to the safety advice for universal joint shaft operation in the chapter "Safety information for the users", page 31.

5.2.1 Coupling the PTO shaft

1. Clean and grease the universal joint shaft on the tractor and the input shaft of the gearbox on the machine.
2. Couple tractor and machine.
3. Secure the tractor against unintentional start up and unintentional rolling.
4. Ensure that the PTO shaft is disengaged.
5. Couple the PTO shaft on to the universal joint shaft of the tractor. When doing this observe the hints of the PTO shaft manufacturer and the permissible drive rev. speed of the machine.

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

6. Use the fixing chain(s) to secure the PTO shaft from spinning.
 - 6.1 Attach the fixing chain(s) as far as possible in an right angle to the PTO shaft.
 - 6.2 Attach the fixing chain(s) in such a way that the sufficient swivel range of the PTO shaft in all operational positions is ensured. Fixing chains must not get caught on components of the tractor or the machine.

5.2.2 Uncoupling the PTO shaft

**CAUTION**

Danger from getting burnt through hot components of the PTO shaft.

This danger will cause slight to severe injury of the hands.

Never touch hot components of the PTO shaft (especially no couplings).



- Deposit the uncoupled PTO shaft in the provided retainer. In this way you will protect the PTO shaft from damage and dirt.
Never ever use the fixing chain of the PTO shaft to hang up the uncoupled PTO shaft.
- Prior to any prolonged standstill clean and grease the PTO shaft.

1. Switch off the universal joint shaft.
2. Lower the machine on to the ground.
3. Secure tractor and machine against unintentional start up and unintentional rolling.
4. Pull the PTO shaft off the universal joint shaft of the tractor.
5. Deposit the PTO shaft into the provided retainer.

5.3 Hydraulic system connections



WARNING

Danger of infection from escaping hydraulic fluid at high pressure!

When coupling and decoupling 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.



All the hydraulic hose lines possess the following coloured markings to allow assignment of the appropriate hydraulic function to the pressure line of a tractor control unit.

Control unit		Function	Hose marking
1	Single-action	Hydraulic shutter left hand side	yellow
2	Single-action	Hydraulic shutter right hand side	green
3	Single-action	Limiter M (Option)	blue

Machines with Comfort equipment:

4	Single-action	Oil circuit All functions can be controlled via AMATRON⁺ .	red
5	Pressure free return flow		2 x red

Maximum permissible pressure in the oil return flow: 10 bar

Therefore do not connect the oil return flow to the spool valve but to a pressure less oil return flow with a large plug coupling.



WARNING

Only use DN16 hoses for the oil return flow and ensure a short return flow.

Only pressurise the hydraulic system when the free return flow has been correctly coupled.

Install the supplied coupling sleeve on the pressure less oil return flow.



CAUTION

In case of leaking control spool valves and/or a prolonged standstill, e.g. during road transport, shutting the lock taps prevent the closed shutters from opening by themselves..

Lock tap closed (Fig. 7/A).
Lock tap opened (Fig. 7/B).

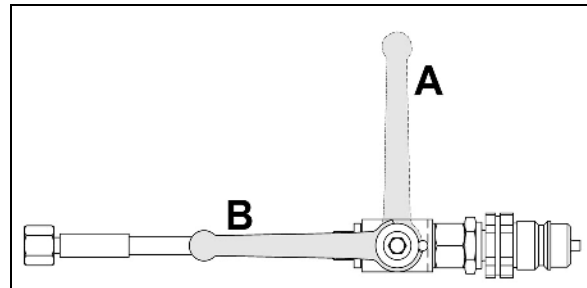


Fig. 7

5.3.1 Coupling the hydraulic hose lines



WARNING

Risk of contusions, cutting, catching, drawing in and knocks from faulty hydraulic functions when the hydraulic hose lines are connected incorrectly!

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



- Check the compatibility of the hydraulic fluids before connecting the machine to the hydraulic system of the tractor.
Do not mix any mineral oils with biological oils.
- Observe the maximum approved hydraulic fluid pressure of 200 bar.
- Only couple clean hydraulic connectors.
- Plug the hydraulic connector(s) into the hydraulic sleeves, until the hydraulic connector(s) audibly lock.
- Check the coupling points of the hydraulic hose lines for a correct, tight seat.

1. Swivel the actuation lever on the control valve on the tractor into the float position (neutral position).
2. Clean the hydraulic plug of the hydraulic hose lines before you couple hydraulic hose lines and tractor.
3. Couple the hydraulic hose line(s) with the tractor control valve(s).

5.3.2 Uncoupling the hydraulic hose lines

1. Move the actuation lever on the control valve of the tractor to the float position (neutral position).
2. Unlock the hydraulic plugs from the hydraulic sockets.
3. Secure the hydraulic socket from dirt using the dust caps.
4. Deposit the hydraulic hose lines in the hose rack.

5.4 Spreading discs

The use of the spreading discs OM (Fig. 8) allows the infinitely variable setting of the working widths by swivelling the spreading vanes on the spreading discs.

The spreading discs **OM 10-12** are usable for working widths of 10-12 m .

The spreading discs **OM 10-16** are usable for working widths of 10-16 m .

The spreading discs **OM 18-24** are usable for working widths of 10-24 m .

The spreading discs **OM 24-36** are usable for working widths of 24-36 m .

For setting, please adhere to the data given in the setting chart. Re-checking the adjusted working width is simply possible with the aid of the mobile test kit (option).

On the **ZA-M** the drive of spreading discs and agitators is provided via the PTO shaft.

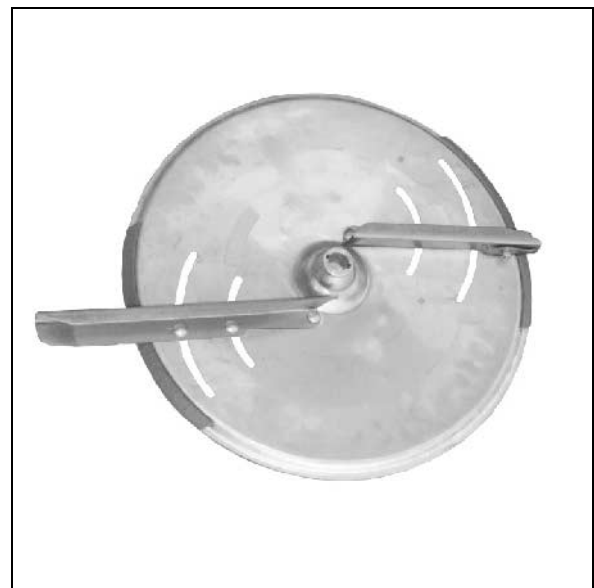


Fig. 8

5.4.1 Comments on spreading discs OM 10-12 and OM 10-16

The spreading disc OM 10-12 has been developed for customers who

- intend to create tramlines in bout widths of 10 or 12 m (Fig. 9 and Fig. 10).
- have problems with border spreading.
- reject a multiple overlapping with the OM 10-16.

The spreading width of the OM10-12 is approx. 24 m, i.e. double overlapping at 12 m.

The OM 10-16 has got a spread width of approx. 36 m (see Fig. 10). This way large overlapping zones result for 15 and 16 m which are of advantage for an even fertiliser application. At 10 and 12 m working width this large spreading width may be disadvantageous, especially when using the boundary spread deflector.

Border spreading (with border spread deflector) at a spacing of 1.5 m with 16 m tramlines is recommended as no fertiliser is thrown beyond the field's border. If, however, one travels with 12 m or 10 m bout width, the OM 10-16 with the same vane position (with some kinds of fertiliser, e.g. CAN, it is possible to achieve with the same vane position an optimum lateral distribution at working widths of 10 – 16 m) throw considerable amounts of fertiliser beyond the border (approx. 4.5 or 6.5 m) when driving back (see Fig. 9)

As according to the fertiliser decree fertilising beyond the field's border is not allowed, the decree can only be followed for the above mentioned operational ranges by using OM 10-12 (see Fig. 9). When operating with the border spreading disc TS 5-9 with 5 m distance towards the border the OM 10-16 also throws approx. 3 m beyond the field's border, so that also here the use of OM10-12 will be necessary.

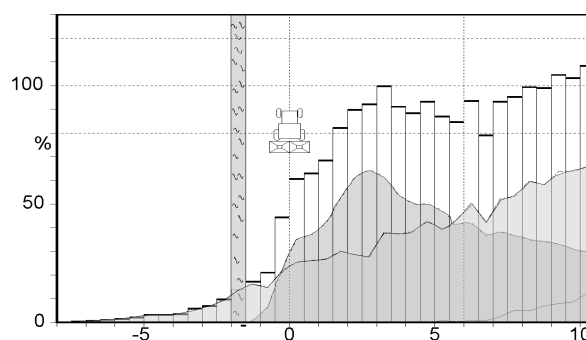


Fig. 9

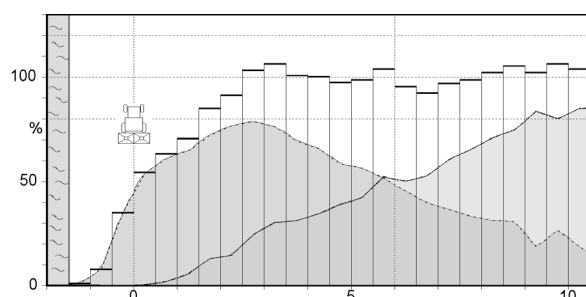


Fig. 10

5.5 Agitator

Spiral agitators in the hopper tips (Fig. 11/1) provide an even fertilizer flow onto the spreading discs. The slowly rotating spiral shaped segments of the agitator guide the fertilizer evenly to the corresponding outlet opening.

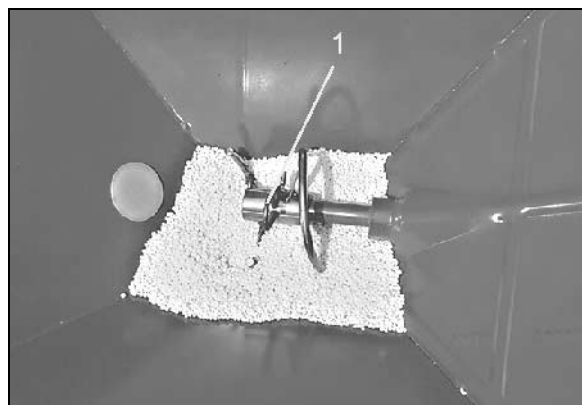


Fig. 11

5.6 Spread rate shutter slides

Metering slide

The spread rate adjustment is carried out

- electronically via the on-board computer. the spread rate shutter slides (Fig. 12/2) actuated by setting motors (Fig. 12/1) set various opening widths (Fig. 12/4).
- manually via the setting levers (Fig. 13/1) by setting various opening widths (Fig. 12/4). The required shutter position is taken either from the data given in the **setting chart** or with the aid of the **calculation disc rule**.

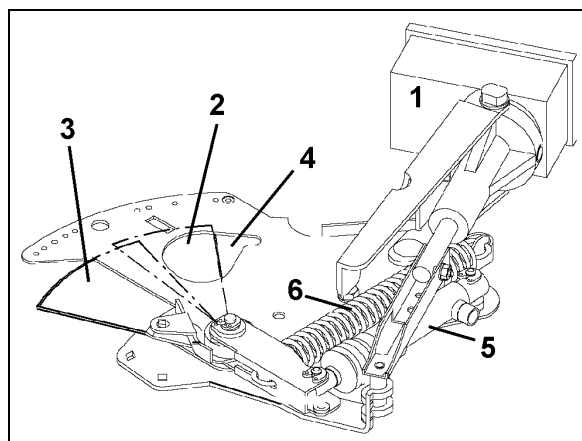


Fig. 12

Hydraulic shutter

The opening and closing of the outlet openings is achieved by two additional shutters (Fig. 12/3) hydraulically (closing) (Fig. 12/5) or by a tensioning spring (opening) (Fig. 12/6).

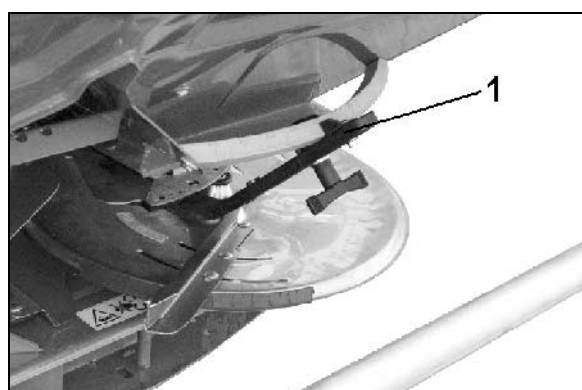


Fig. 13

Structure and function

The shutter is opened when the shutter rod (Fig. 14/1) is extended.



As the spreading properties of the fertiliser may heavily deviate we recommend that you to recheck the chosen shutter position for the desired spread rate by a spread rate check.

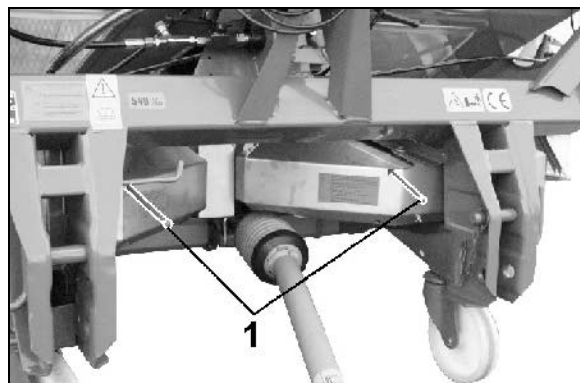


Fig. 14

5.7 Boundary / side spreading

Limitier M (option)

If the first tramline has been created on half the working width from the field's side, the border can be spread remote controlled with the aid of the Limitier M.



Fig. 15

For the comfortable operation of the **Limitier**, against unintentional lowering of the border spread deflector in case of leaking tractor valves (separate double acting control valve required).



Fig. 16

Border spread discs "**Tele-Set**" (option)

Enables a fertilizing alongside the field's boundary as prescribed by the draft of a fertilizer decree.

- TS 5-9** for distances from 5 to 9 m to field's boundary
- TS 10-14** for distances from 10 to 14 m to field's boundary
- TS 15-18** for distances from 15 to 18 m to field's boundary



Fig. 17

Boundary spread deflector (Option)

If the first tramline has been created directly on the field's side, the boundary spread limiter (special option) for one-sided spreading to the field's border is used.

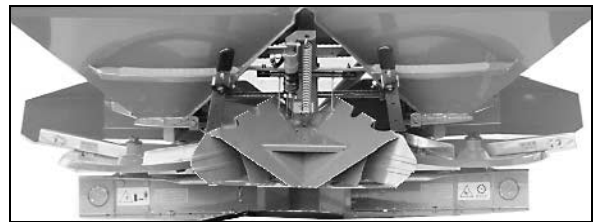


Fig. 18

5.8 On board computer (Option)



When making use of the ZA-M with **AMATRON⁺** or **AMADOS⁺** on-board computer adhering to the operator's manual for **AMATRON⁺** or **AMADOS⁺** is inevitable!

With the aid of the on board computer (option) **AMATRON** or **AMADOS II D** the **ZA-M** fertiliser broadcaster can conveniently be accessed, controlled and monitored.

The spread rate setting is done electronically. The shutter slides which are actuated by the setting motors free different opening widths of the outlet openings. The shutter position which is required for a specific spread rate is determined by a fertiliser calibration.

With the **Comfort-package** (option) the hydraulic functions are achieved via the **AMATRON⁺**

- Opening and closing of shutters
- Switching on and off the Limiter.

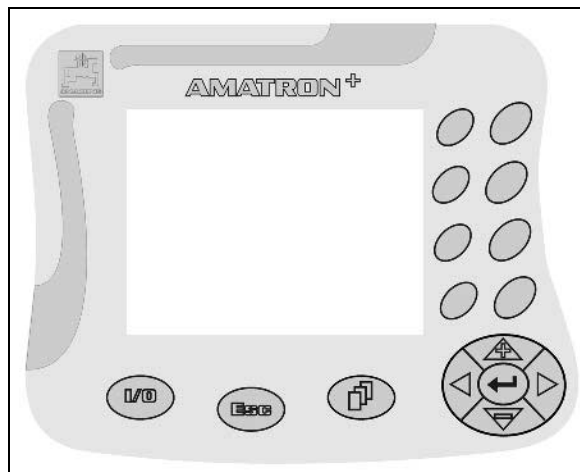


Fig. 19

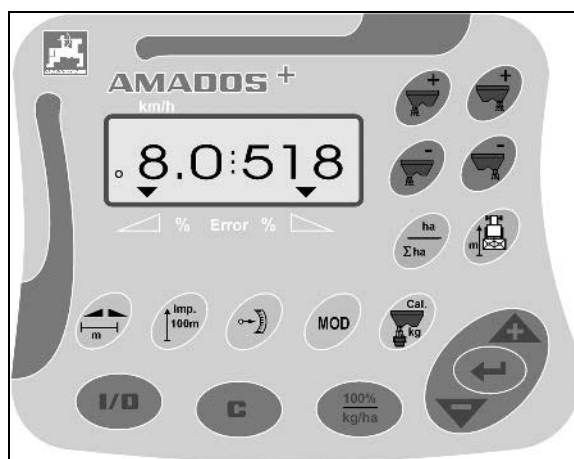


Fig. 20

5.9 Guard screen inside the hopper

The foldable guard screens cover the entire hopper and serve as

- protection against touching the rotating agitator spiral.
- protection against foreign particles or fertiliser clods during the filling procedure.

Fig. 21/...

- (1) Guard screen
- (2) Handle with guard screen locking device
- (3) Locking device for opened guard screen
- (4) Unlocking tool

For cleaning, maintenance and repair work the guard screen inside the hopper can be swivelled upwards with the aid of the unlocking tool.

Unlocking tool in:

- (Fig. 22/1) parking position (standard position)
- (Fig. 23/1) Unlocking position for swivelling the guard screen upwards

Opening the guard screen:

1. Take the unlocking tool out of its parking position and insert into the unlocking position.
 2. Hold on the handle and turn the unlocking tool towards the handle (Fig. 23).
- The guard screen locking is unlocked.
3. Swivel the guard screen upwards until the locking catches.
 4. Put the unlocking tool into its parking position.

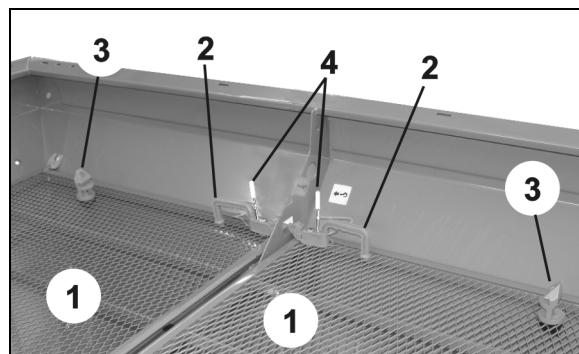


Fig. 21

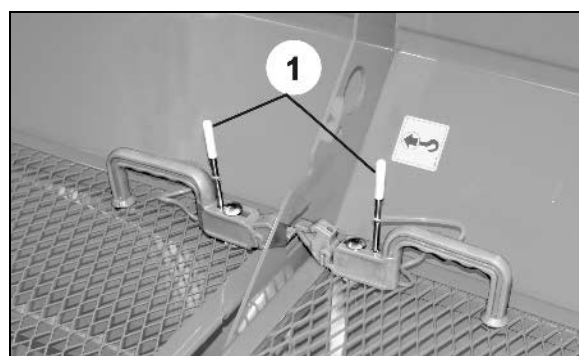


Fig. 22

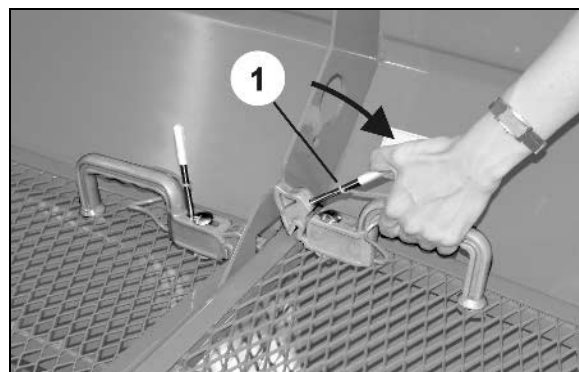


Fig. 23





	<p>WARNING</p> <p>Only take the tool out of its parking position to open the hopper.</p>
	<ul style="list-style-type: none"> • Prior to closing the guard screen press down the locking device (Fig. 24). • When closing the guard screen locks automatically.



Fig. 24

5.10 Transport- and parking device (detachable, option)

The detachable transport- and parking device (Fig. 25) allows a comfortable coupling to the three-point hydraulic of the tractor and an easy manoeuvring in the yard and inside buildings.

	<p>WARNING Do not park or roll your broadcaster with filled hopper (danger of tipping over).</p>
	<p>For a direct filling from a tipping trailer remove roll kit.</p>

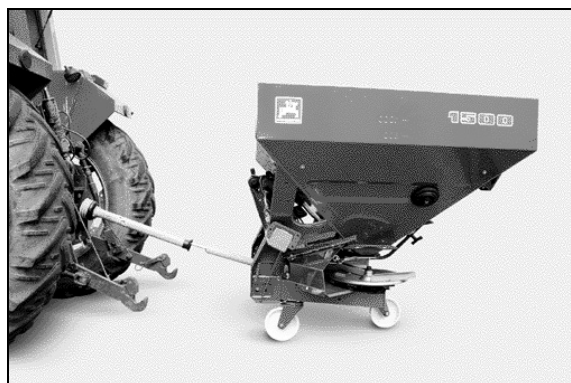


Fig. 25

5.11 Guard tube (Option)

Required as guard when using the spreading

- **OM 24-36**
Fig. 26 – for all **ZA-M**
(swivelable for convenient spreading disc change).
- **OM 18-24**
Fig. 27 – for **ZA-M 900**

Serves as bumper, for accident prevention at running spreading discs.



Fig. 26



Fig. 27

5.12 Swivelable hopper cover (option)

Also in wet weather conditions, the swivelable hopper cover guarantees dry spreading material. For filling the swivelable hopper cover is simply swivelled upward.



Fig. 28

5.13 Hopper extensions (Option)

Narrow hopper extensions:

S350 for **ZA-M 900**

S500 for **ZA-M 1200 / 1500**

Wide hopper extensions

L800 for **ZA-M 900**

L1000 for **ZA-M 1200 / 1500**

The hopper extensions allow the combination in different versions so that a hopper volume of up to 3000 l (ZA-M 1500) is possible (see technical data).

Fig. 29/...

- (1) Swivelable hopper cover **S**
- (2) Swivelable hopper cover **L**



CAUTION

The equipment of the ZA-M 1200 / 1500 with extension **S500** and **L1000** is only allowed in conjunction with re-inforced upper link.



Fig. 29

5.14 Two-way-valve unit (option)

The two-way-valve is required for the hydraulic single shutter control on tractors with only **one** single acting hydraulic connection.

Fig. 30 → Block ball taps closed

Fig. 31 → Block ball taps opened

Half sided spreading with two-way valve unit:

For the independent closing or opening the shutters, the following actuations have to be conducted at half-sided spreading or spreading of arable fields.

- **One-side opening of the right hand shutter, e. g. for left hand border spreading with the boundary spread deflector:**

1. Close both shutters.
2. Shut block ball tap for the hydraulic ram of the left hand hopper tip.

When actuated by the control valve, now only the right hand shutter is opened or closed, the left hand one remains closed.

- **One-sided closing of the right hand shutter when spreading:**

1. Both shutters are open.
2. Shut block ball tap for the hydraulic ram of the left hand hopper tip.
3. Set control valve on "**lifting**" and hereby close the right hand shutter.

- **Change from one-sided spreading to spreading to both sides, e. g. additional actuation of left hand shutter:**

1. Right hand shutter opened (left hand shutter closed via block ball tap).
2. Open block ball tap for hydraulic ram of the left hand hopper tip.
3. Set control valve on "**lowering**" and hereby open both shutters.

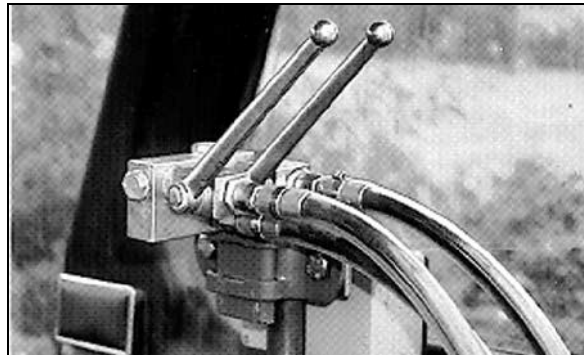


Fig. 30



Fig. 31

5.15 Three way valve (option)

The three way valve is required for the hydraulic single shutter control and use of the Limiter M on tractors with only one single acting hydraulic control valve.

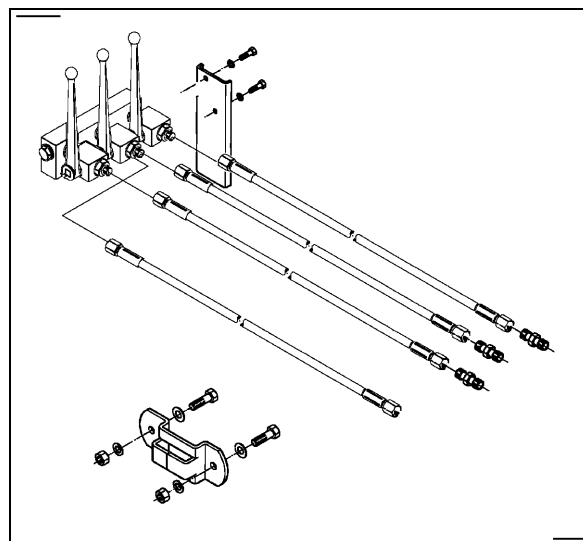


Fig. 32

5.16 PTO shaft with friction clutch (option)

If the shear bolt between connecting yoke- and gearbox input shaft repeatedly shears off and on tractors with roughly engaging tractor PTO the Walterscheid PTO shaft with friction clutch is recommended (Fig. 33).

Fitting:

1. Remove PTO shaft supplied as standard.
2. Loosen and pull off the fitted protective cone from the gearbox neck.
3. Lift up twisting securing.
4. Twist and pull off the protective cone.



WARNING

Replace the protective cone by the supplied longer protective cone (accident prevention)!

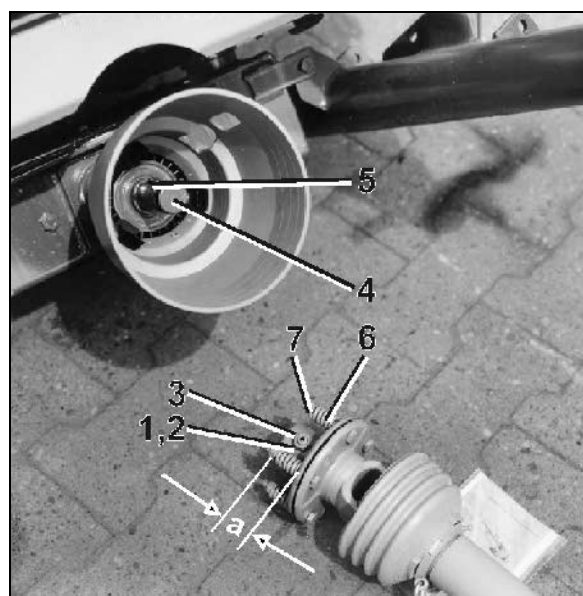


Fig. 33

5. Detach yoke flange from gearbox input shaft.
6. Clean gearbox input shaft.
7. Slacken counter nut (Fig. 33/1) inside connecting yoke from friction clutch (until the grub screw does not protrude the counter nut outside any longer). Unbolt inner hex. grub screw (Fig. 33/2) and check whether the connecting yoke can easily be pushed onto the PTO shaft.

Structure and function

8. Pull connecting yoke off the gearbox input shaft again.
9. Set protective cone on the gearbox extension and arrest by twisting.
10. Push connecting yoke (Fig. 33/3) with grease applied until the stop of the gearbox input shaft (Fig. 33/4).



Take care for a complete covering of the key (Fig. 33/5) !

11. Secure special PTO shaft against axial shifting. For this firmly tighten grub screw with Allen key and secure with nut (Fig. 33/1).

Dismounting:

1. Slacken counter nut (Fig. 33/1) in connecting yoke from friction clutch. Drive out grub screw.
2. With the aid of a flat bar push the connecting yoke off the gearbox input shaft from the rear through the slit in the protective cone rear wall (on hopper lower side).

Functioning and maintenance of friction clutch

Short-time torque peaks of above **approx. 400 Nm**, as they might occur for example when engaging the PTO shaft, are limited by the friction clutch. The friction clutch prevents damages on PTO shaft and gearbox elements. Therefore, the function of the friction clutch has always to be assured. A baking of the friction linings by corrosion prevent an actuation of the friction clutch.

6 Commissioning

This chapter contains information

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



- Before commissioning the machine, the operator must have read and understood the operating manual.
- Comply with the chapter "Safety information for the user", from Page 25 when
 - Connecting and disconnecting the machine
 - Transporting the machine
 - Using the machine
- Only couple and transport the machine to/with a tractor which is suitable for the task.
- The tractor and machine must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks in the area of hydraulically or electrically actuated components.

Do not 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 for equipment movements which:

- Are continuous or
- Are automatically locked or
- Require a floating position or pressed position to function



Ensure the correct fitting of the spreading discs. Seen in direction of driving: left hand spreading disc "L" and right hand spreading disc "R".

Please ensure the correct fitting of the scale on the spreading discs. The scales with the figures from 5 to 28 are related to the shorter spreading vanes and the scales with the figures from 35 to 55 are related to the longer spreading vanes.

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 approved drawbar load at the tractor coupling point
- The load capacity of the installed tyres
- The approved trailer load must be sufficient

You can find this data on the nameplate 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

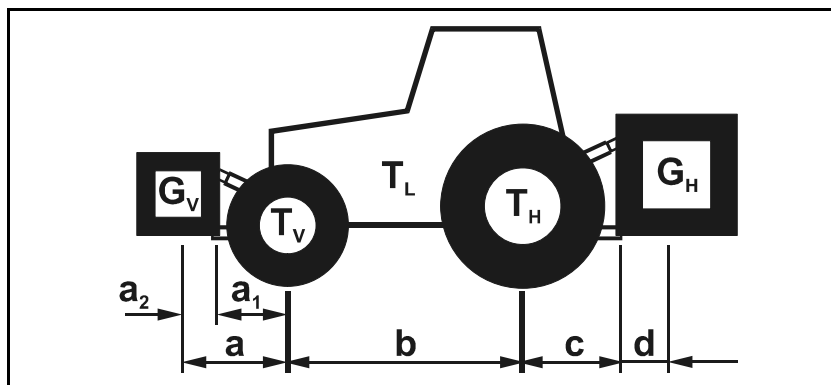


Fig. 34

T_L	[kg]	Tractor net weight	please see tractor Operator's manual / registration papers
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of empty tractor	
G_H	[kg]	Front weight (if existing)	please see technical data of the machine or rear ballast weight
G_V	[kg]	Support load with full hopper	please see technical data of the front mounted machine or front ballast weight
a	[m]	Distance between the centre of gravity of the front mounted machine or front weight and centre of the front axle (sum $a_1 + a_2$)	please see technical data of tractor and front mounted machine or front ballast weight or measure
a_1	[m]	Distance between centre of the front axle and the lower link joint	please see tractor Operator's manual or measure
a_2	[m]	Spacing between centre lower link ball and centre of gravity of the front mounted machine or front weight (point of gravity spacing)	please see technical data front mounted machine or front ballast weight or measure
b	[m]	Wheel base of tractor	please see tractor Operator's manual or vehicle registration papers or measure
c	[m]	Spacing between centre rear axle and centre lower link ball	please see tractor Operator's manual or vehicle registration papers or measure
d	[m]	Tractor net weight	please see technical data of the machine

6.1.1.2 Calculation of the minimum ballast front $G_{V \min}$ to ensure the steer ability

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

Enter into the table the figure for the determined minimum ballast weight $G_{V \min}$, which is required in the front of the tractor (see on page 61).

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

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

Enter the figure for the calculated actual total front axle load and the permissible front axle load indicated in the operator's manual for the tractor into the table (see on page 61).

6.1.1.4 Calculation of the actual total weight of the combination tractor/mounted implement

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

Enter the figure for the calculated actual total weight and the permissible tractor total weight as indicated in the tractor-operator's manual into the table (see on page 61).

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

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

Enter the figure for the actual rear axle load and the permissible tractor rear axle load indicated in the tractor-operator's manual into the table (see on page 61).

6.1.1.6 Tyre carrying capacity

Enter double the value (two tyres) of the tyre carrying capacity (please refer e.g. to the documentation of the tyre manufacturer) into the table (see on page 61).

6.1.1.7 Table

	Actual value according to the calculation	Permissible value according to the tractor-operator's manual	Double the permissible tyre carrying capacity (two tyres)
Minimum ballast Front / rear	<div style="border: 1px solid black; padding: 5px; text-align: center;">/ kg</div>	--	--
Total weight	<div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	--
Front axle load	<div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>
Rear axle load	<div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>



- Please take the permissible values for the tractor total weight, axle loads and tyre carrying capacity from the registration papers of your tractor.
- The actual calculated values must be smaller than /equal to (\leq) the permissible values!


WARNING

Risk of contusions, cutting, catching, drawing in and knocks through insufficient stability and insufficient tractor steering and brake 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 ($G_{V \min}$).



- Apply ballast to your tractor with the aid of a front or rear weight if the tractor axle load is exceeded only on one axle.
- Special cases:
 - If the required minimum front ballast weight ($G_{V \min}$) is not achieved with the weight of the front mounted machine (G_V), additional weights in addition to the front mounted machine are required.
 - If the required minimum rear ballast weight ($G_{H \min}$) is not achieved with the weight of the rear mounted machine (G_H) additional weights in addition to the rear mounted machine are required.

6.2 Fitting the PTO shaft



CAUTION

- Only use the PTO shaft prescribed by the **AMAZONE** manufacturer!
- The PTO shaft must be fitted when the spreader is empty and has been parked.

1. Remove fixing bolt (Fig. 35/1).
2. Twist the funnel (Fig. 36/1) in fitting position (Fig. 36./2).
3. Pull off guard cone (Fig. 36/3).
4. Clean and grease the gearbox input shaft.
5. Slacken grease nipples (Fig. 37/1) and push on the PTO shaft (Fig. 37/2).
6. Affix connecting yoke (Fig. 37/3) by using a shear bolt (Fig. 37/4)
7. Insert grease nipples (Fig. 37/1).
8. Push on guard cone (Fig. 38/1) and twist guard funnel (Fig. 38/2) into fitting position
9. Insert locking bolt (Fig. 38/3).

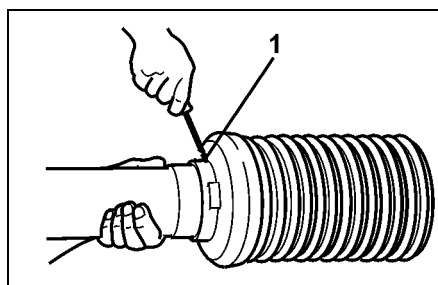


Fig. 35

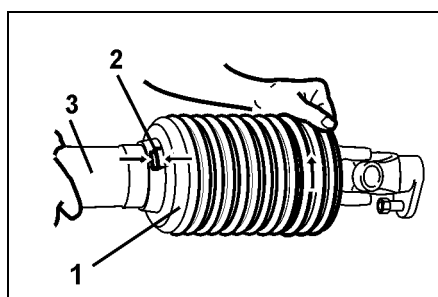


Fig. 36

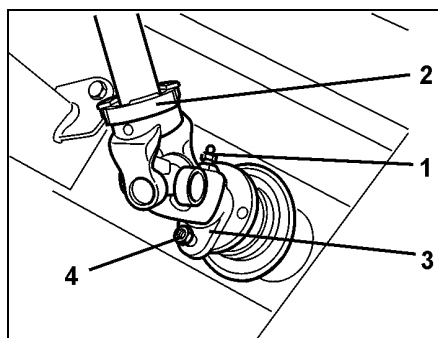


Fig. 37

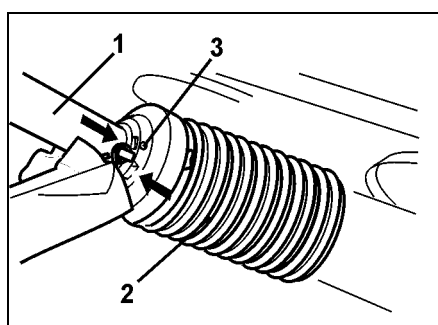


Fig. 38

6.3 Matching the PTO shaft length to the tractor



WARNING

Danger from defective and/or destroyed flinging components result if the PTO shaft upsets or is pulled apart due to improper matching of the PTO shaft length when lifting/lowering the machine coupled on to the tractor!

Prior to the initial coupling of the PTO shaft on to your tractor have the length of the PTO shaft in all operational conditions checked by a specialist workshop and match, if necessary.

In this way upsetting of the PTO shaft or insufficient profile overlapping is avoided.



This matching of the PTO shaft is only valid for the actual tractor type. Possibly you would have to repeat matching the PTO shaft if you couple the machine on to another tractor. When matching the PTO shaft, please implicitly adhere to the operator's manual of the PTO shaft manufacturer.



WARNING

Danger from dragging and catching due to incorrect fitting or unapproved constructive changes of the PTO shaft!

Only a specialist workshop is entitled to carry out constructional changes on the PTO shaft. For this the operator's manual of the PTO shaft manufacturer should be observed.

Matching of the PTO shaft length is permitted when the minimum profile overlapping is ensured.

Constructional changes on the PTO shaft are not permitted unless they are described in the operator's manual of the PTO shaft manufacturer.



WARNING

Risk of contusion between the rear of the tractor and the machine when lifting and lowering the machine to determine the shortest and longest operational position of the PTO shaft.

Actuate the setting levers for the three point hydraulic system of the tractor

- only from the intended workstation.
- never ever when staying within the danger zone between tractor and machine.



WARNING

Risk of contusion through unintentional

- **rolling of the tractor and the coupled machine!**
- **lowering the lifted machine!**

Prior to matching the PTO shaft and entering the danger zone between tractor and lifted machine, secure the tractor and the machine from unintentional start-up, unintentional rolling and the machine from unintentional lowering.



Shortest dimension of the PTO shaft at horizontal arrangement of the PTO shaft. The longest dimension of the PTO shaft results when the machine is completely lifted.

1. Couple the tractor onto the machine (do not connect the PTO shaft).
2. Apply the parking brake of the tractor.
3. Determine the lifting height of the machine with the shortest and longest operational position of the PTO shaft.
 - 3.1 To do this lift and lower the machine via the three point hydraulic system of the tractor.

Actuate the setting levers for the tractor's three point hydraulics on rear of the tractor from the intended workstation.
4. Secure the lifted machine in the determined lifting height from unintentional lowering (e.g. by using supports or hooking into a hoist crane).
5. Prior to entering the danger zone between tractor and machine secure the tractor from unintentional start-up.
6. When determining the length and when shortening the PTO shaft observe the operator's manual of the PTO shaft manufacturer.
7. Re-insert the shortened halves of the PTO shaft again.
8. Prior to connecting the PTO shaft grease the universal joint shaft of the tractor and the input shaft of the gearbox.

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

6.4 Securing tractor/machine from unintentional start-up and rolling



WARNING

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

- **unintentional lowering of the machine when it is raised with the tractor's three-point hydraulic system and unsecured.**
- **unintentional lowering of parts of the machine when in a raised position and unsecured.**
- **Unintentional start-up and rolling of the tractor-machine combination.**
- Secure the tractor and the machine against unintentional start-up and rolling before any intervention in the machine.
- It is forbidden to make any intervention in the machine, such as installation, adjustment, troubleshooting, cleaning, maintenance and repairs
 - when the machine is being operated.
 - as long as the tractor engine is running with the Cardan shaft / hydraulic system connected.
 - if the ignition key is in the tractor and the tractor engine can be started unintentionally with the Cardan shaft / hydraulic system connected.
 - if the tractor and machine have not each been prevented from unintentionally rolling away by applying their parking brakes and/or securing them with wheel chocks
 - if moving parts are not blocked against unintentional movement.

When carrying out such work, there is a high risk of contact with unsecured components.

1. Lowering machine and machine parts when raised and unsecured.
- This is how to prevent unintentional falling:
2. Turn off the tractor engine.
 3. Remove the ignition key.
 4. Apply the tractor's parking brake.
 5. Secure the machine against unintentionally rolling away (hitched machine only)
 - by applying the parking brake (if fitted) or by using wheel chocks, if the terrain is level.
 - by applying the parking brake and using wheel chocks if the machine is on undulated terrain or on slopes.

6.5 Setting the system converting bolt on the broadcaster valve block

Comfort equipment only!

The setting of the converting bolt (Fig. 39/1) on the spreader valve block depends on the tractor's hydraulic system. Depending on the hydraulic system

- **unscrew the system converting bolt until its stop (factory setting) on tractors with**
 - Open-Centre-hydraulic system (stabilised **power supply** system, gear pump hydraulic).
 - Load-Sensing-hydraulic system (pressure- and current controlled setting pump) – oil decrease via control unit.
- **screw in the system converting bolt until its stop (contrary to the factory setting) on tractors with**
 - Closed-Centre-hydraulic system (constant **pressure** system, pressure controlled setting pump).
 - Load-Sensing-hydraulic system (Pressure- and current controlled setting pump) with direct load-sensing pump connection. Adapt the provided volume current to the required volume current via the volume current valve of the tractor.
- **Setting the system converting bolt:**
 - Slacken the counter nut.
 - Unscrew the system converting bolt with the aid of a screw driver until its stop (factory setting) or screw in.
 - Tighten the counter nut.

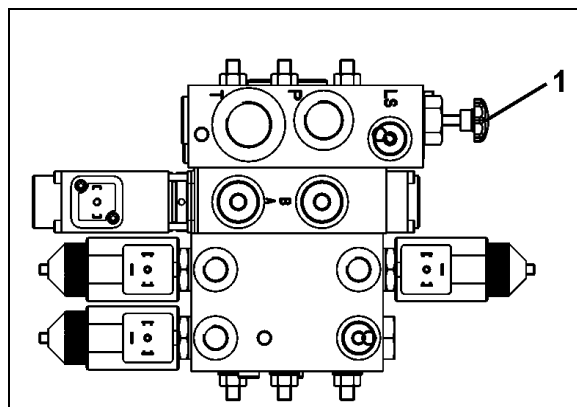


Fig. 39

7 Coupling and uncoupling the machine



When coupling and uncoupling machines, follow the instructions given in the section "Safety instructions for the operator" page 25.



WARNING

Risk of contusions from unintentional starting and rolling of the tractor and machine when coupling or uncoupling the machine!

Secure the tractor and machine against unintentional start-up and rolling away before entering the danger area between the tractor and machine to couple or uncouple the machine. See page 65.



WARNING

Risk of contusions between the rear of the tractor and the machine when coupling and uncoupling the machine!

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

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

7.1 Coupling the machine



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. See section "Checking tractor suitability", page 58.



WARNING

Risk of contusions when coupling the machine and standing 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 contusions, cutting, catching, drawing in and knocks when the machine unexpectedly releases 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.
You must upgrade the machine's cat. II upper and lower links to cat. III with the aid of adapter sleeves if your tractor has a cat. III three-point hydraulic system.
- Only use the upper and lower link pins provided for coupling the machine.
- Visually check the upper and lower link pins for obvious defects whenever the machine is coupled. Replace upper and lower link pins if there are clear signs of wear.
- Use a lynch pin on each of the upper and lower link pins in the pivot points on the three-point frame attachment to secure them against unintentional release.



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. Affix the ball sleeves above the upper and lower link pins (Fig. 40/1,2) in the linkage points of the three point mounting frame.

Using reducing sleeves, always upgrade the Cat. II lower link bolts of the machine to Cat. III, if your tractor possesses a Cat. III three-point hydraulic system..

2. Secure the lower link bolt with the folding plug against unintentional release

Secure upper link pin.

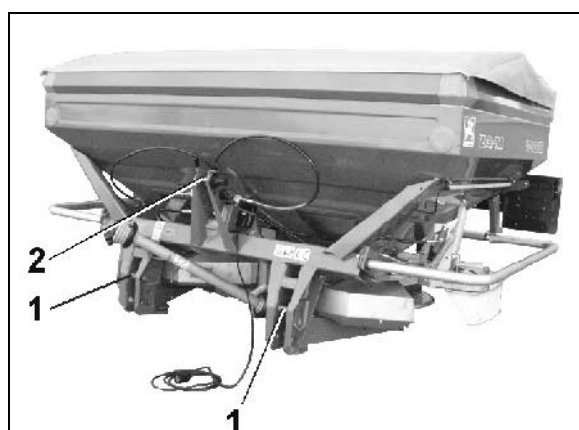


Fig. 40

Locking lever must catch! (Fig. 41)

3. Instruct people to leave the danger area between the tractor and the machine before you approach the machine.
4. Couple the power lines before coupling the machine and the tractor.
 - 4.1 In the tractor, approach the machine in such a way that there is a space of approximately 25 cm between the tractor and the machine.
 - 4.2 Secure the tractor against unintentional start-up and rolling.
 - 4.3 Check that the power take-off shaft of the tractor is switched off.
 - 4.4 Couple the PTO shaft and the supply lines on to the tractor.
 - 4.5 Align the lower link hooks in such a way that they are in alignment with the lower linkage points of the machine..
5. Now, go on backing up the tractor to the machine so that the lower link hooks automatically accept the ball sockets at the lower steering points of the machine.
 - The lower link hooks lock automatically.
6. Couple the upper link from the tractor seat via the upper link hook on to the upper linkage point of the three point mounting frame.
 - The upper link hook locks automatically.
7. Carry out a visual check to ensure that the upper and lower link hooks are properly locked before starting up.



Fig. 41

7.2 Uncoupling the machine



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through insufficient stability and possible tilting of the decoupled machine!

Park the empty machine on a horizontal space with a hard surface.



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

1. Park the machine on a horizontal space with a hard surface.
2. Decouple the machine from the tractor.
 - 2.1 Secure the machine against unintentional rolling. See Page 65.
 - 2.2 Relief of the upper link.
 - 2.3 From the tractor seat, unlock and decouple the upper link hooks.
 - 2.4 Relief of the lower link.
 - 2.5 From the tractor seat, unlock and uncouple the lower link hooks.
 - 2.6 Move the tractor approximately 25 cm forward.
 - The space created between the tractor and the machine allows better access for decoupling the turbine shaft and the power lines.
 - 2.7 Secure the tractor and machine against unintentional start-up and rolling.
 - 2.8 Uncouple the PTO shaft.
 - 2.9 Deposit the PTO shaft in its retainer.
 - 2.10 Uncouple the power lines.
 - 2.11 Fix the power lines in the appropriate parking sockets.

8 Adjustments



WARNING

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

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

Secure the tractor and the machine against unintentional start-up and rolling, before making adjustments to the machine. See Page 65.

All settings on the centrifugal broadcaster **AMAZONE ZA-M Ultra** follow the indications of the **setting chart**.

All common fertilisers are test-spread in the **AMAZONE**-test hall and the hereby determined setting figures are entered into the setting chart. All fertilisers mentioned in the setting chart were in excellent condition when determining the setting values.

Due to varying fertiliser characteristics because of

- weather influence and/or unfavourable storing conditions,
- deviations of the physical properties of the fertiliser – also within the same kind and brand –,
- the spreading behaviour of the fertiliser,

may change and thus deviations from the figures for setting the desired spread rate or working width in the setting chart may become necessary.

No guarantee can be given that your fertiliser – even with the same name and from the same manufacturer – has the same spreading behaviour as the fertiliser tested by us.



We strictly point out that no compensation will be accepted for damage resulting from spreading errors.



Carry out all settings with great care. Deviations from the optimum setting may change the spread pattern in a negative way.

The figures in the setting chart can only be taken as standard data as the spreading properties of the fertiliser may change and thus require other settings.

The indicated setting recommendations for the lateral distribution (working width) only correspond to the weight distribution and not to the nutritious distribution



With unknown kinds of fertiliser or for a checking of the working width set, a working width check can easily be carried out with the mobile test kit (option).

If the fertiliser cannot distinctly be associated with a certain kind in the **setting chart**, the **AMAZONE- fertiliser service** will give you **recommendations** for the setting, either immediately on the phone or after sending a small fertiliser sample (**3 kg**).

AMAZONE- fertiliser service ☎ **05405/ 501 111**

8.1 Setting the mounting height



DANGER

Ask people to leave the danger zone behind or underneath the machine, as it may swing to the rear and down if the upper link halves erroneously are twisted apart resp. tear off..

Set the mounting height of the filled broadcaster in the field exactly according to the figures given in the setting chart. Measure the distance between soil surface and the spreading disc front- and rear side (Fig. 42).

8.1.1 Normal fertilising

The indicated mounting height, normally level 80/80 cm, are valid for the normal fertilising.

For the spring spreading season, when the crop has grown up to a height of 10 – 40 cm, one half of the crop height should be added to the stated mounting heights (e.g. 80/80). Thus set a mounting height of 95/95 when the crop is 30 cm tall. If the crop stands taller follow the instructions for late top dressing. If the crop stands very dense (rape) the fertiliser broadcaster should be set with the indicated mounting height (e.g. 80/80) above the crop. If that is no longer possible due to taller crop, then please also follow the instructions for late top dressing.

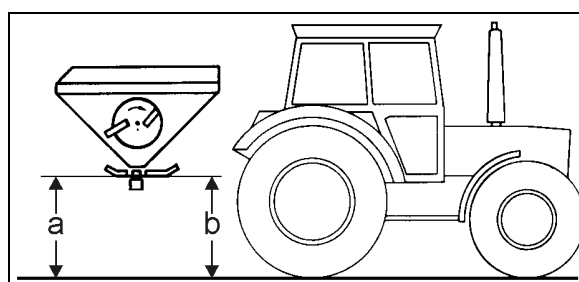


Fig. 42

8.1.2 Late top dressing

The spreading discs are supplied as standard with spreading vanes by which besides the normal spreading procedure also late top dressing in crops to growth height of 1 m may be conducted.

Set the mounting height of the spreader with the aid of the tractor's three-point hydraulic that high that the distance between the top of the grain and the spreading discs is approx. **5 cm** (Fig. 43). If necessary insert the lower link pins into the lower link pin connections.

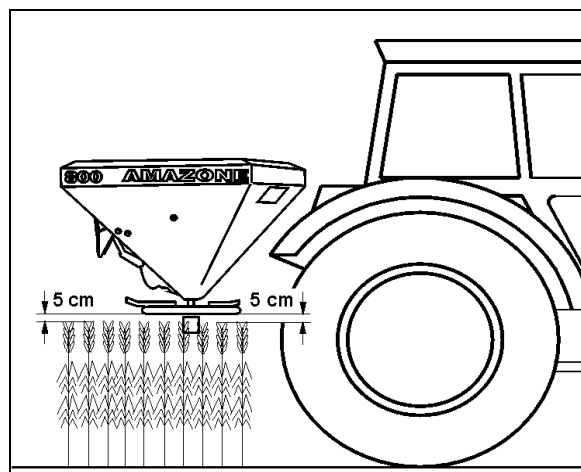


Fig. 43

8.2 Setting the spread rate



For **ZA-M** with onboard computer, please refer to the instruction manual for the on-board computer.

The **shutter slide position** for the desired **spread rate** is set with the aid of the two setting levers (Fig. 44/1).

Take the required shutter slide position either directly from the setting chart or determine with the aid of the calculating disc rule.

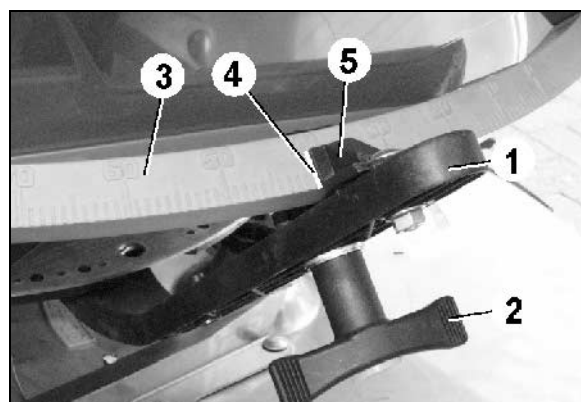


Fig. 44



The setting figures of the setting chart may only be considered as standard data. The flowing properties of the fertilizer may change and thus require other settings. Therefore always carry out a spread rate check before commencing the spreading work.



The determination of the shutter slide position with the aid of the calculating disc rule is carried out after a spread rate check. This way the varying flowing properties of the fertilizer are already considered when determining the shutter slide position.

8.2.1 Setting the shutter slide position with the aid of the setting levers

1. Closing the hydraulic shutter slide.
2. Slacken the thumb nut (Fig. 45/2).
3. Find the required shutter slide position on scale (Fig. 45/3).
4. Set the read off edge (Fig. 45/4) of the setting lever pointer (Fig. 45/5) on to the scale figure.
5. Firmly retighten the thumb nut (Fig. 45/2).

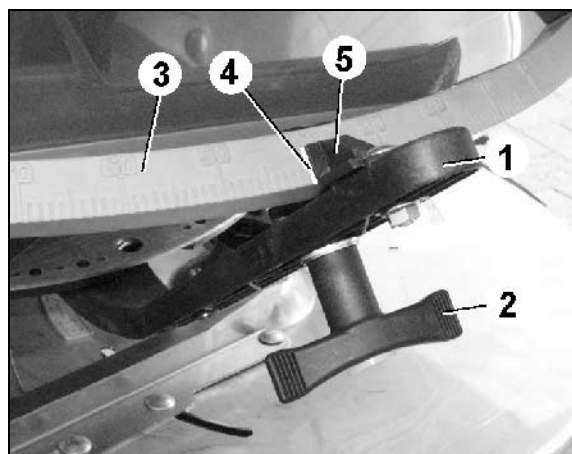


Fig. 45

! Choose the same shutter slide positions for the right hand and the left hand shutter!

8.2.2 Take the shutter slide position from the setting chart

The shutter slide position depends on:

- the kind of fertilizer to be spread (**quantity factor**).
- the working width [m].
- the speed of operation [km/h].
- the desired spread rate [kg/ha].

Example:

Kind of fertilizer: CAN 27 % N prilled BASF

→ Quantity factor a 0.915

Working width: 24 m

Speed of operation: 10 km/h

Desired spread rate: 350 kg/ha

Shutter slide position: ?

1. Find in the setting chart the pages Shutter slide position for the spread rates for mineral fertilizer CAN
2. Find among the columns with the working width **24 m** the column **10 km/h**.
3. Find in column **10 km/h** the spread rate **358 kg/ha**.
4. In the same line read off the shutter **slide position 43** for **358 kg/ha**.
5. Set the shutter slide position with the aid of the setting levers on to the scale figure **43** as described.

Quantity factor a=0.915																				
Schieberstellung	20				21				24				27				28			
	km/h				km/h				km/h				km/h				km/h			
	8	10	12		8	10	12		8	10	12		8	10	12		8	10	12	
25	135	108	90		128	103	86		112	90	75		100	80	67		96	77	64	
26	150	120	100		143	115	95		125	100	84		111	89	74		107	86	72	
27	167	133	111		159	127	106		139	111	93		124	99	82		119	95	79	
28	184	147	123		175	140	117		154	123	102		136	109	91		132	105	88	
29	203	162	135		193	154	129		169	135	113		150	120	100		145	116	96	
30	222	178	148		211	169	141		185	123	104		164	131	110		158	127	106	
31	242	194	161		231	184	154		202	134	109		179	143	120		173	138	115	
32	263	210	175		251	200	167		219	146	119		195	156	130		188	150	125	
33	285	228	190		271	217	181		237	158	129		211	169	141		203	163	136	
34	307	246	205		293	234	195		256	171	141		228	182	152		220	176	146	
35	331	265	220		315	252	210		276	184	154		245	196	163		236	189	157	
36	355	284	236		338	270	225		296	206	171		263	210	175		253	203	169	
37	379	303	253		361	289	241		316	253	211		281	225	187		271	217	181	
38	404	323	270		385	308	257		337	270	225		299	240	200		289	231	193	
39	430	344	287		409	328	273		358	287	239		318	255	212		307	246	205	
40	456	365	304		434	348	290		380	304	253		338	270	225		326	261	217	
41	483	386	322		460	368	306		402	322	268		358	286	238		345	276	230	
42	510	408	341		486	389	324		425	349	283		377	302	252		364	291	243	
43	537	429	359		513	410	342		447	358	298		398	318	265		383	307	256	
44	564	451	376		537	430	358		470	376	313		418	334	279		403	322	269	
45	592	473	395		564	451	376		493	395	329		438	351	292		423	338	282	
46	620	496	413		590	472	393		516	413	344		459	367	306		443	354	295	
47	647	518	432		617	493	411		540	432	360		480	384	320		462	370	308	
48	675	540	450		643	514	429		563	450	375		500	400	333		482	386	322	
49	703	562	469		670	536	446		586	469	391		521	417	347		502	402	335	
50	731	584	487		696	557	464		609	487	406		541	433	361		522	417	348	
51	758	606	505		722	578	481		632	505	421		561	449	374		541	433	361	
52	785	628	523		748	598	498		654	523	436		582	465	388		561	449	374	
53	812	650	541		773	619	515		677	541	451		601	481	401		580	464	387	
54	838	671	559		798	639	532		699	559	466		621	497	414		599	479	399	

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Fig. 46



We recommend to carry out a spread rate check with this shutter slide position.

8.2.3 Determine the shutter slide position with the aid of the calculating disc rule

The calculating disc rule consists of:

- The outer white scale with the spread rates [kg/ha] (spread rate) (Fig. 47/1).
- The inner white scale for the amount of fertilizer [kg] collected during the calibration test (collected amount) (Fig. 47/2).
- The center coloured scale with the shutter slide positions (Position) (Fig. 47/3).

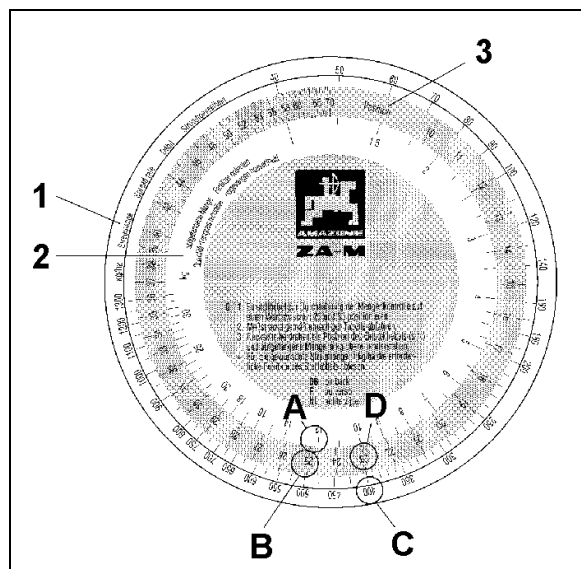


Fig. 47

- The table for determining the required test distance [m]. (Fig. 48).

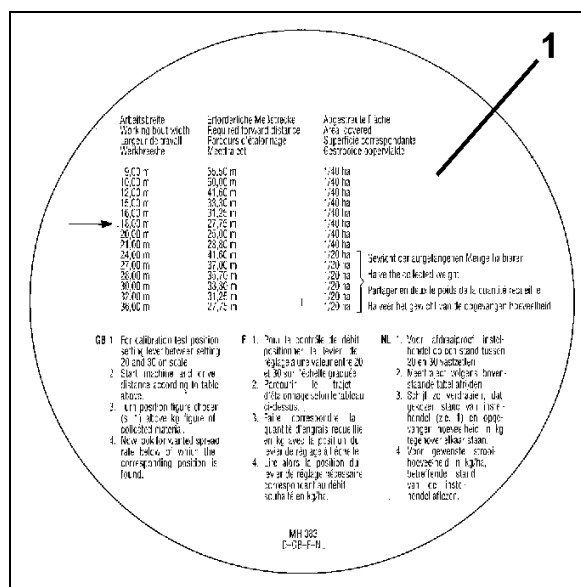


Fig. 48

Example:

Working width: **18 m**
 Spread rate: **400 kg/ha**
 Speed of operation: **10 km/h**
 Shutter slide position: **?**

1. Set on the left hand setting lever a mean shutter slide position, e. g. **25.25**.
2. For the desired working width **18 m** read off table (**Fig. 48/1**) the required test distance **27,75 m**.



At the spread rate check the area spread is

- for working widths up to 23 m 1/40 ha.
- for working widths up to 24 m 1/20 ha.

3. Carefully measure a test distance in the field. Mark beginning and end of the test distance.
4. Convert the broadcaster to the spread rate check.
5. Carry out a calibration test.
 - 5.1 Carefully drive test distance from beginning to end mark under field conditions, e. g. with the intended constant forward speed of **10 km/h** and a PTO shaft speed of **540 min⁻¹** (unless otherwise stated for the working width setting in the setting chart). Open the left hand shutter exactly on the beginning of the test distance and shut it at the end point.
 - 5.2 Weigh the collected amount of fertilizer, e. g. **12,5 kg**.



For working widths of more than 24 m halve the collected amount of fertilizer (e.g. 25 kg = 25 kg/2 = 12,5 kg) and determine the shutter slide position with this figure.

6. Take the calculating disc rule. On scale (Fig. 47/2) for collected quantity [kg] look for figure **12,5** (Fig. 47/A) and align with the chosen shutter slide position (Position) **25** (Fig. 47/B) on the coloured scale (Fig. 47/3).
7. Look for desired spread rate **400 kg/ha** (Fig. 47/C) and read off the required shutter slide position (Position) **23** (Fig. 47/D).
8. Set the shutter slide position (Position) **23**.



We recommend to carry out a fresh spread rate check with this shutter slide position.

8.3 Checking the spread rate



For **ZA-M** with onboard computer, please refer to the instruction manual for the on-board computer.

A spread rate check is recommended with every change of fertilizer.

Carry out the **spread rate check** (calibration test) with the PTO shaft engaged by **driving down a test distance** or **stationary**.

Driving a test distance is the more accurate method, because hereby the actual forward speed of the tractor is directly considered.

If the forward speed of the tractor in the field is exactly known, the spread rate check can also be carried out stationary.



- The multiplier for the total quantity considers the one-sided spread rate check..
- At high fertilizer application rates per hectare halve the test distance and double the multiplier because the capacity of the collecting bucket is limited..
- Carry out spread rate checks with approximately half filled hopper.

8.3.1 Arrangements for the spread rate check

1. Swivel downwards the guard tube center part (if guard tube installed).
2. Set the required shutter slide position for the desired spread rate on the left hand side hopper tip.
3. Remove the left hand spreading disc.
 - 3.1 Unscrew the thumb nut (Fig. 49/1) for fixing the left hand spreading disc and pull the spreading disc off the gear box shaft.
 - 3.2 Screw thumb nut again in gear box shaft (to avoid any fertilizer dropping into the threaded hole).
4. Hang the calibration bucket (Fig. 49/2) with its handle (Fig. 49/3) into the rear retainer and the front retainer (Fig. 49/4 und Fig. 49/5) on the frame

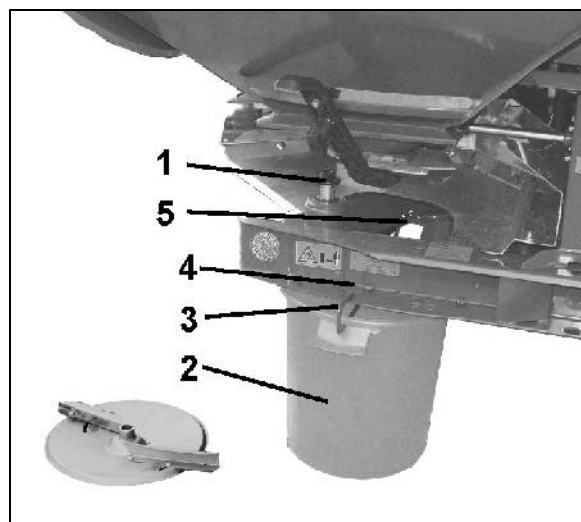


Fig. 49

8.3.2 Spread rate check by driving a test distance

Example:

Kind of fertilizer: CAN 27 % BASF (white)

Working width: 24 m

Speed of operation: 10 km/h

Spread rate: 350 kg/ha

Shutter slide position according to setting chart: 43

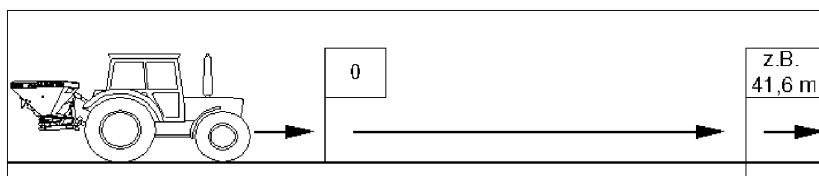
1. From the following table you may take the required test distance **41.6 m** and the multiplier **20** for the desired working width **24 m**.



Calculate test distances for working widths not shown in the table accordingly.

Adjustments

Working width [m]	Required forward distance [m]	Area covered [ha]	Multiplier for the total spread rate
9,00	55,50	1/40	40
10,00	50,00	1/40	40
12,00	41,60	1/40	40
15,00	33,30	1/40	40
16,00	31,25	1/40	40
18,00	27,75	1/40	40
20,00	25,00	1/40	40
21,00	23,80	1/40	40
24,00	41,60	1/20	20
27,00	37,00	1/20	20
28,00	35,70	1/20	20
30,00	33,30	1/20	20
32,00	31,25	1/20	20
36,00	27,75	1/20	20



- Carefully measure the test distance in the field. Mark beginning and end of the test distance (Fig. 7.15).
- Set shutter slide position **43**.
- Hang in collecting bucket.
- Set the PTO shaft speed **540 min⁻¹** (unless otherwise stated for working width setting in the setting chart).
- Carefully drive test distance from beginning to end under field conditions, e. g.
 - with half filled hopper,
 - intended constant operational speed **10 km/h** and
 - the PTO shaft speed required for the working width.
- Open the left hand shutter exactly on the beginning of the test distance and shut at the end point.
- Weigh the collected fertilizer [kg] **e.g. 17,5 kg**.
- From the collected amount of fertilizer [kg] the actual set spread rate [kg/ha] can be calculated.

$$\text{Spread rate} = \frac{\text{Collected fertilizer quantity [17,5kg]} \times \text{multiplier 20}}{\text{ha}} = 350\text{kg/ha}$$



In case the actual and the desired spread rate deviate, correct the shutter slide position accordingly. If necessary, repeat the calibration test.

After having determined the exact shutter slide position for the left hand hopper tip, set the right hand setting lever on the same shutter position.

8.3.2.1 Conversion of the required test distance for working widths not shown in the setting table

Working widths up to 21 m Multiplier 40

Required test distance at desired working width [m] =	500
	working width [m]

Working widths from 24 m Multiplier 20

Required test distance at desired working width [m] =	1000
	working width [m]

8.3.3 Stationary spread rate check

Example:

Kind of fertilizer: KAS 27% BASF (weiß)
Working width: 24 m
Speed of operation: 10 km/h
Spread rate: 350 kg/ha
Shutter slide position according to 43
setting table:

- Please take from the following table the required time **14.98 sec.** which is necessary to drive the required test distance **41.6 m** for the desired working width **24 m** and the desired forward speed **10 km/h** as well as the multiplier **20** for the spread rate conversion



Convert times for working widths or forward speeds not mentioned in the table

Working width [m]	Required test distance	Multiplier for the total spread rate	Required time [sec.] to drive the test distance at working speed of [km/h]		
			8	10	12
9,00	55,50	40	24,97	19,98	16,65
10,00	50,00	40	22,5	18	15
12,00	41,60	40	18,72	14,98	12,48
15,00	33,30	40	14,98	11,99	9,99
16,00	31,25	40	14,06	11,25	9,37
18,00	27,75	40	12,49	9,99	8,32
20,00	25,00	40	11,25	9	7,5
21,00	23,80	40	10,71	8,57	7,14
24,00	41,60	20	18,72	14,98	12,48
27,00	37,00	20	16,65	13,32	11,1
28,00	35,70	20	16,06	12,85	10,71
30,00	33,30	20	14,98	11,99	9,99
32,00	31,25	20	14,06	11,25	9,37
36,00	27,75	20	12,49	9,99	8,32

Table 1

Adjustments

2. Set shutter slide position **43**.
3. Hag in collecting bucket.
4. Set the PTO shaft speed of **540 R.P.M.** (unless otherwise stated for the working width setting in the setting table).
5. Open the left hand shutter for exactly **14.98 sec**.
6. Weigh the collected amount of fertilizer [kg] **e.g. 17,5 kg**.
7. Calculate the actually set spread rate [kg/ha] from the collected fertiliser amount [kg].

Spread rate=	$\frac{\text{Collected fertiliser [17,5kg]} \times \text{multiplier 20}}{\text{ha}} = 350\text{kg/ha}$	
--------------	--	--



In case the actual and the desired spread rate deviate, correct the shutter position accordingly. If necessary, repeat the calibration test.

8. After having determined the exact shutter position for the left hand hopper tip, set the right hand setting lever on the same setting figure

Conversion of the required measuring time for working widths (measuring distances) or speeds of operation not shown in the table

Required calibration time [sec.] at desired working width	=	$\frac{\text{Test distance [m]}}{\text{Working speed [km/h]}} \times 3,6$
---	---	---

8.4 Setting the shutter slide position with the aid of the calibration device (special option)



When determining the shutter slide position with the aid of the calibration device, make use of the calculation disc rule provided with this special option! (On the centre, colored scale you will find position „K“.)



WARNING

When determining the shutter slide position, both shutters of the opening should be closed and the PTO shaft disengaged!

Working width: **18 m**
Desired spread rate: **400 kg/ha**
Desired forward speed: **10 km/h**
Shutter slide position: **?**

1. By using the handle (Fig. 51/1) hook the collecting bucket (Fig. 51/2) on to the outlet chute (Fig. 51/3). Let the collecting bucket catch into the clamping device (Fig. 51/4 u. Fig. 50/1).
2. Entirely open the side shutters (Fig. 51/5) of the outlet chute for approx. 5 sec. by using the rope (Fig. 51/6) (to ensure an even fertilizer flow). Then pour the collected fertilizer back into the spreader.
3. Take from table (Table 1, on page 79) for the desired working width **18 m** the required test distance of **27,75 m** for **1/40 ha** area to be spread.
4. Carefully measure the test distance in the field. Mark beginning and end of the test distance
5. Carefully drive test distance from beginning to end mark under field conditions, e.g. with half filled hopper, intended constant operational speed (**10 km/h**) and a PTO shaft speed of **540 R.P.M.** (unless otherwise stated for the working width setting in the setting chart). When doing so, entirely open at the measure distance starting point the side shutters of the outlet chute from the tractor cab with the aid of the rope (pull until stop) and close the shutters on the measure distance end.
6. Weigh collected fertilizer quantity, e. g. **17,5 kg**.

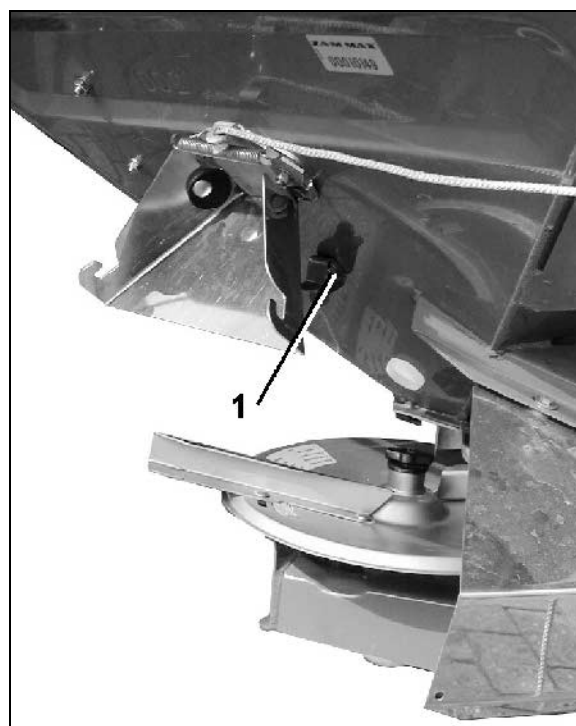


Fig. 50

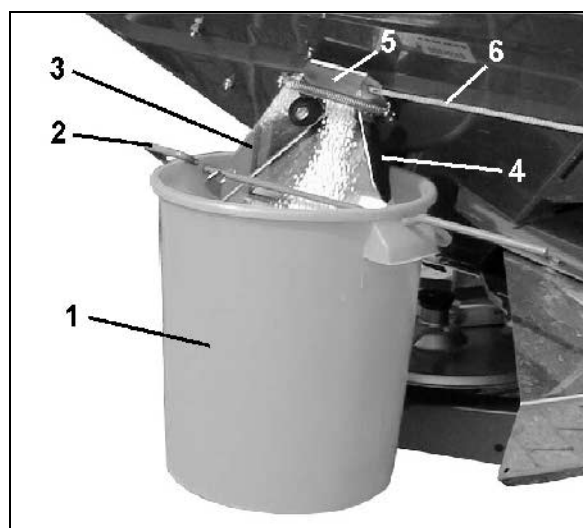


Fig. 51



For working widths of more than 24 m halve the collected amount of fertilizer (e.g. 25 kg: $25 \text{ kg}/2 = 12,5 \text{ kg}$) and determine the shutter slide position with this figure.

- Take the calculating disc rule **for the calibration device**. Find on the scale (Fig. 53/2) for the collected material [kg] the figure "**17,5**" (Fig. 53/A) and align with position "**K**" (Fig. 53/B) on the coloured scale (Fig. 53/3).
- Look for the wanted spread rate (**400 kg/ha**) (Fig. 53/C) on the scale for the spread rate (Fig. 53/1) and read off the required shutter slide position "**23**" (Fig. 53/D).
- Set shutter slide position "23".

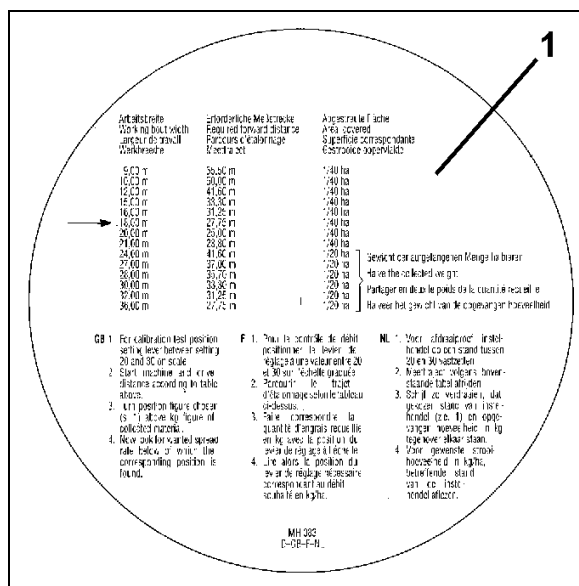


Fig. 52

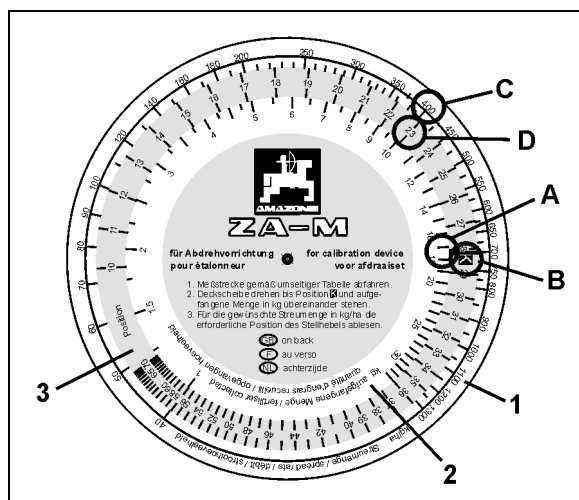


Fig. 53

8.5 Setting the working width

The working width (distance between the tramlines) are adjustable within the working widths of the relevant Omnia-Set (OM) spreading disc pairs (when spreading urea, however, deviations might occur).

Choose the suitable spreading disc for the desired working width..

Working width:	Spreading discs
10 – 12m	OM 10 – 12
10 – 16m	OM 10 – 16
18 – 24m	OM 18 – 24
24 – 36m	OM 24 - 36

The **working width** (distance between the tramlines) for **normal fertilising** is set with the aid of varying **spreading vane** positions.

The spreading properties of the fertiliser have a great influence on the working width and the fertiliser lateral distribution.

The main influences on the spreading behaviour of the fertiliser are:

- grain size,
- bulk density,
- surface condition,
- humidity..

We therefore recommend to use well granulated fertilisers of renown fertiliser manufacturers and the checking of the pre-set working width with the mobile fertiliser test kit.

8.5.1 Setting the spreading vane positions

The spreading vane position depends on

- the working width and
- the kind of fertilizer.

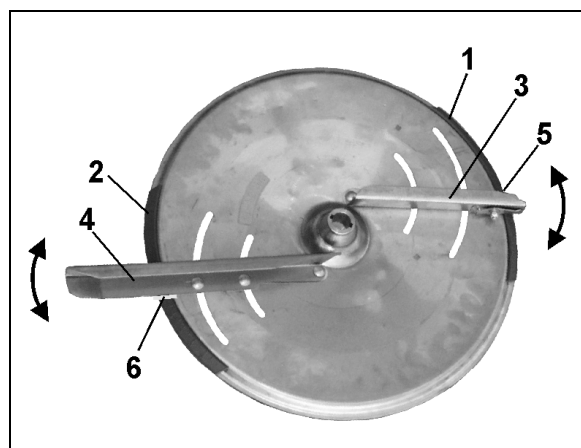


Fig. 54



- The scale (Fig. 54/1) with the figure from 5 to 28 refers to the shorter spreading vane (Fig. 54/3) and the scale (Fig. 54/2) with the figures from 35 to 55 refers to the longer spreading vane (Fig. 54/4)..
- Swivelling the spreading vanes to a higher figure on the scale (Fig. 54/1 or Fig. 54/2)) results in an increase of the working width..
- The shorter spreading vane distributes the fertilizer mainly in the spread pattern center, while the longer vane mainly spreads onto the outer range..

Set spreading vanes on spreading discs as follows:

1. Slacken thumb nut beneath the spreading disc.

For slackening the thumb nut turn the spreading disc until the thumb nut can be slackened without any difficulty.

2. Read off the setting chart the required **spreading vane position**.
3. Look for the scale figure for the position of the **short spreading vane** on scale (Fig. 54/1).
4. Swivel the read off edge (Fig. 54/5) of the **short** vane (Fig. 54/3) on to the scale figure and **retighten the thumb nut firmly**.
5. Look for the scale figure for the position of the **long** spreading vane on scale (Fig. 54/2).
6. Swivel the read off edge (Fig. 54/6) of the **long** vane (Fig. 54/4) on to the scale figure and **retighten the thumb nut firmly**.

Kind of fertilizer	Blade position at working width of			
	10m	12m	15m	16m
KAS 27%N granuliert → Group of fertilizer 1	20/50	20/50	20/50	20/50

Example:

Kind of fertilizer: KAS 27%N granuliert
→ **Group of fertiliser 1**

Desired working width: **12m**

Spreading vane position: **20** (short spreading vane)
50 (long spreading vane).

8.5.2 Checking the working width with the mobile test kit (option)

The setting values of the setting chart have to be considered as **guide values** only, as the spreading properties of the kinds of fertilizer vary. It is recommended to check the set working widths of the fertilizer spreader with the mobile test kit (Fig. 55) (option).

For further details, please refer to the instruction manual "**Mobile test kit**".



Fig. 55

8.6 Eco-border and normal-border spreading


Eco-border spreading according to fertilizer application decree (Fig. 56):

The adjacent area is a road or a water.

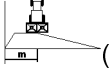
According to fertilizer decree

- no fertilizer may be thrown beyond the border.
- eroding and washing off (e. g. in surface water) must be prevented.

In order to avoid an over-fertilizing inside the field, the spread rate thrown towards the boundary must be reduced. This results in only a little over-fertilizing in front the field's boundary.

- manual shutter actuation: Reduce the shutter position at the border side by the positions indicated in the setting chart (graduation marks).
- electric shutter actuation: Press key  – 10% on the on-board computer.

The eco-border spreading corresponds to the requirements of the fertilizer application decree.

Symbol for eco-border spreading:  (no fertilizer may be thrown beyond the boundary)

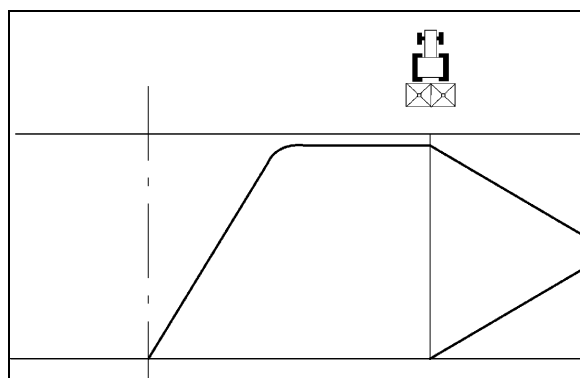


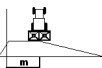
Fig. 56

Adjustments

Normal-border spreading (Fig. 57):

The adjacent area is an arable field. A small amount of fertilizer being thrown beyond the field's border may be tolerated.

The fertilizer distribution inside the field is still near the rated quantity at the field's border. A small amount of fertilizer will be thrown beyond the field's border.



Symbol for normal-border spreading:
(at least 80 % of the spread rate set until the field's border)

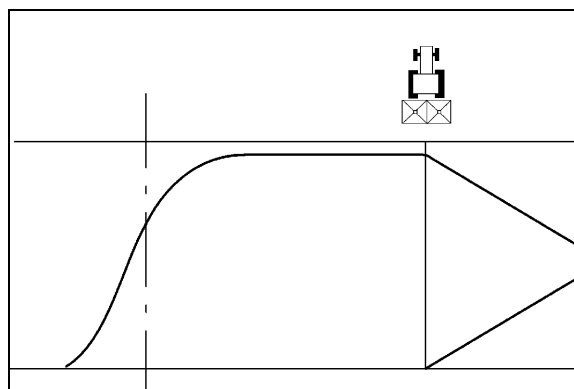


Fig. 57



The spread patterns might deviate from the illustrated spread patterns.

8.6.1 Boundary and side spreading with border spreading system **Limiter M**

The setting of the limiter depends on the track width of the tractor, the type of fertilizer and whether it is intended to carry out normal-border or eco-border spreading. Read off the figure to be set from the spread rate table (Fig. 58).



The figures given in the spread rate table are standard values depending on the spreading behaviour of the fertilizer to be spread. If necessary, re-adjust the Limiter.

Limiter M		928597													
		OM 10-12/OM 10-16				OM 18-24				OM 24-36					
		5	6	7,5	8	9	10	10,5	12	12	13,5	14	15	16	18
KAS/ CAN/ AN		15	13	12	10	13	12	11	10	11	10	9	8	7	5
NPK		12	10	8	7	8	6	4	2	2	1	0	0	0	0
DAP		13	11	9	8	8	7	6	6	6	6	5	-	-	-
MAP		5	7	4	4	4	3	3	2	2	1	0	-	-	-
Hamstoff		12	11	9	8	7	5	4	3	3	2	1	0	0	0
Urea		9	7	4	3	3	2	1	0	0	0	0	0	0	0
Urée															
P															
K															
PK															
MgO															

Fig. 58

1. Boundary/side spacing (half the working width)
2. Boundary spreading
3. Side spreading
4. used spreading discs.

For setting the figures move the border spread deflector on the guide bracket.

1. To do this, slacken the clamping lever (Fig. 59/1).

If the pivoting range of the clamping handle is not sufficient, lift the handle, turn the handle backwards and lower it again.

2. Move the boundary spread deflector on the guide rail (Fig. 60/1) until the pointer (Fig. 60/2) shows the value to be set following the spread rate table (Fig. 58).
3. Arrest the clamping lever again.

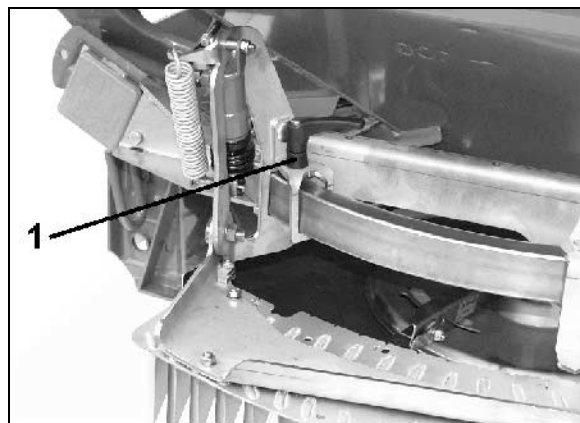


Fig. 59

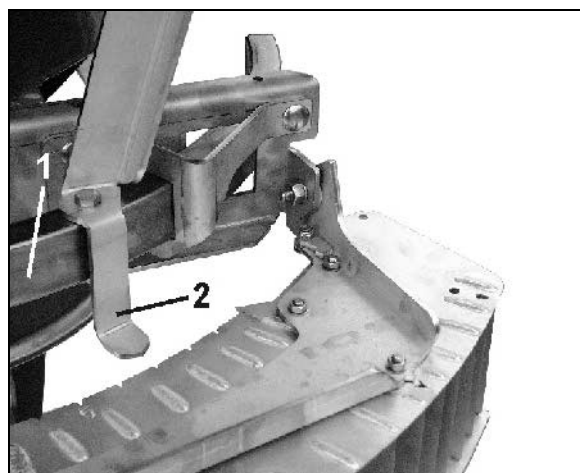


Fig. 60

For late top dressing the boundary spread deflector is brought into a medium high position (Fig. 61).

To do this, lower the border spread deflector.



Fig. 61

Adjustments

You will find each one setting bar (Fig. 62/1) on the left hand and right hand edge on the upper side of the boundary spread deflector.

1. Slacken the nuts of the setting bar.
2. Lift the deflector by hand.
3. Shift the setting bars until the stop and tighten the bars firmly.
4. Lower the deflector.

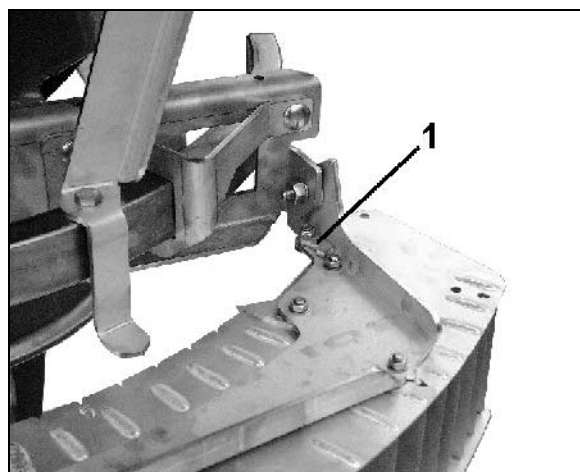


Fig. 62

8.6.2 Boundary and side spreading with border spreading disc Tele-Set

For boundary spreading (according to the draft of fertilizer application decree) (Fig. 56) or **spreading to field sides** (beside owned, equally to be treated areas) (Fig. 57) **exchange** the **left hand "Omnia-Set"** spreading disc (left hand side border spreading - normal case), seen in driving direction, **for** the corresponding border spreading disc **"Tele-Set"**. For right hand border spreading a special border spreading disc is available on request.

The border spreading disc "Tele-Set" creates a spread pattern with a spreading fan steeply dropping off towards the fields' side. When not in use the border spreading disc "Tele-Set" or the spreading disc "Omnia-Set" should be fixed to the side of the machine (Fig. 63).

The swivel able telescopic vanes allow to adjust the throwing width of the fertiliser towards the "field border".



Fig. 63

Setting the border spreading disc according to fertilizer decree

Setting the border spreading discs

- TS 5 – 9
- TS 10 – 14
- TS 15 – 18

is done by the telescopic vanes (Fig. 64/1) according to the data given in the setting chart, depending on kind of fertilizer to be spread and the distance of the first track from the field's side as follows:

Distance to the border	Border spreading disc
5 - 9 m	TS 5 – 9
10 - 14 m	TS 10 – 14
15 - 18 m	TS 15 – 18

1. After having slackened the corresponding thumb nut, swivel the telescopic blades (Fig. 64/1) on the spreading within the range of the scale (Fig. 64/2) Read off figure on the reading line (Fig. 64/3) and re-tighten thumb nut.

Function: Swivelling telescopic vane on higher setting figure on the scale:

→ **Spreading width wider, steeper drop off at the side.**

2. After slackening the nut (Fig. 64/5) set outer vane part (Fig. 64/4) on a higher letter value on the scale (Fig. 64/6) Read off the position of the vane outer part on the reading line (Fig. 64/7) on the scale.

Function: Setting vane outer part in direction of a higher value on the scale:

→ **Spreading width wider, shallower drop off at the sides.**

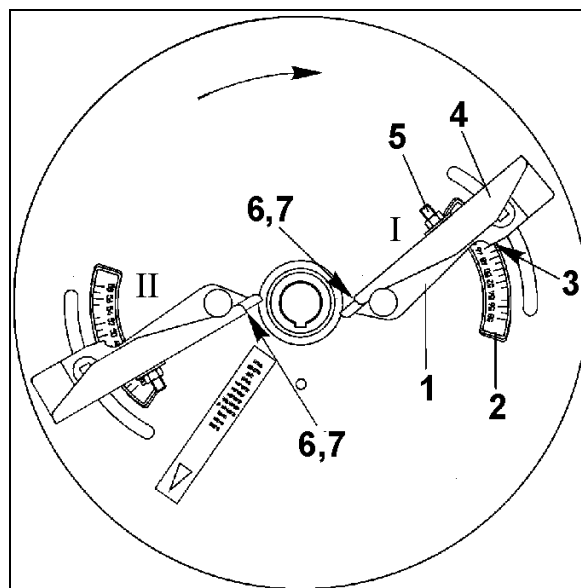


Fig. 64

For setting the telescopic vanes the kinds of fertilizer can be divided into 6 groups:

Group I:

granular material with good flowing properties with a bulk density of approx. 1,0 kg/l, e.g. CAN, NP- and NPK-types.

Group II:

prilled material with good flowing properties with a bulk density up to approx. 1,0 kg/l, e. g. CAN, NP- and NPK-types.

Group III:

granular, coarse material with mean flowing properties with a bulk density above 1.5 kg/l, e. g. phosphate- and potash-types.

Group IV:

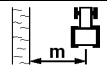




granular, coarse material with mean flowing properties with a bulk density less than 1.5 kg/l, e. g. DAP-, MAP-types.

Group V:

Urea granular with a bulk density of up to approx. 0,8 kg/l.

Group VI:

Urea prilled with a bulk density of up to approx. 0,8 kg/l.

Kind of fertilizer	Vane					
		5	6	7,5	8	9
CAN - and NPK-types granular material	I	 B47	 C48	C49	C49	D50
	II	 D45	 E45	E42	E42	F46

Excerpt from the setting chart TS 5-9

Adjustments

1. Example:

Distance of the first tramline to the field's border:
9 m (**TS 5-9**)

Kind of fertilizer : CAN 27 % N granular, BASF
(white), (Group I)

Taken from setting chart or table above: **D 50/ F 46**

1. Set reading line (Fig. 65/7) of vane "I" to letter value "**D**" and fix outer vane part.
Swivel vane "I" to figure "**50**" and fix.
2. Set reading line (Fig. 65/7) of vane "II" to figure value "**F**" and fix outer vane part.
Swivel vane "II" to figure "**46**" and fix.

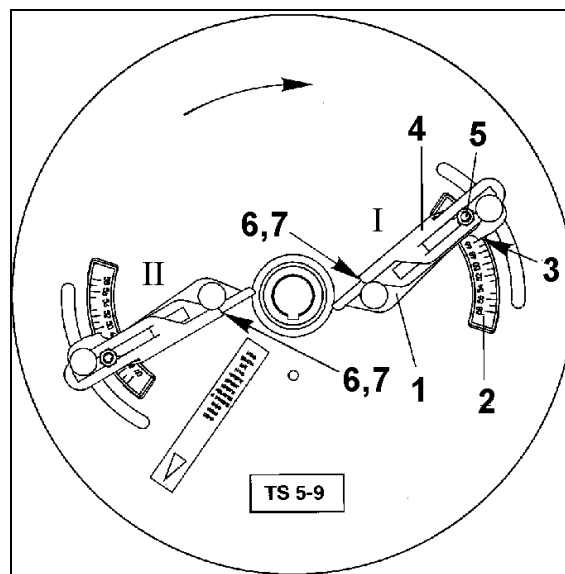



Fig. 65

Kind of fertilizer	Vane			
		15	16	18
CAN - and NPK- types granular material	I	B 51	C 52	C 53
	II	E 42	F 42	H 42

Excerpt from the setting chart TS 5-9

2. Example:

Distance from first tramline to the field's border:
15 m (**TS 15-18**)

Kind of fertilizer : CAN 27 % N granular, BASF
(white), (Group I)

Taken from setting chart or table above: **B 51/ E 42**

1. Set reading line (Fig. 66/7) of blade "I" to letter value "**B**" and fix outer vane part.
Swivel vane "I" to figure "**51**" and fix.
2. Set reading line (Fig. 66/7) of blade "II" to figure value "**E**" and fix outer vane part.
Swivel vane "II" to figure "**42**" and fix.

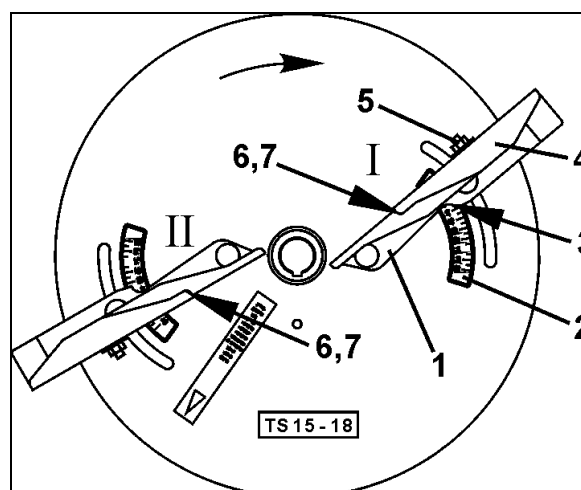


Fig. 66

Characteristic features at border spreading with 5 or 6 m distance of the first tramline to the field's border



At some kinds of fertilizer reduce the PTO-shaft speed from 540 min⁻¹ to 400 min⁻¹, as otherwise the "Omnia-Set" disc fitted on the broadcaster's field side will throw approx. 8 m beyond the tractor center towards the field's side (i.e. 2 to 3 m beyond the field's border) (please note relevant hints in the setting chart).

8.6.3 Exceptions at border spreading (tramline center does not correspond to half the working width from the field's side)

Here choose shutter position (setting lever position) for setting the spread rate in dependence of the various working widths (tramline distances). At the field's side also swivel backwards the shutter position for 2 to 6 scale lines.

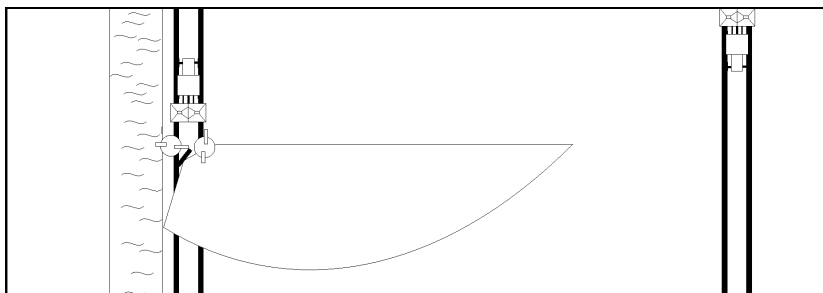


Fig. 67

Example:

Spacing between the tramlines: **24 m** (corresponds to 24 m working width)

Distance of the first tramline

from the left hand field side: **8 m** (corresponds to 16 m working width)

Kind of fertilizer : CAN 27 % N granular, BASF

Forward speed: 10 km/h.

Desired spread rate: 300 kg/ha

Determine the shutter position for the desired spread rate according to the setting chart and consider the various working widths.

Shutter position: right hand (24 m working width) = 41 (310 kg/ha)

left hand (16 m working width) = 34 (300 kg/ha) - 3 = 31

Vane position: right hand OM 18-24 from setting chart: **24 m** working width: **68/87**

left hand TS 5 - 9 from setting chart **8 m** distance of the first tramline to the field's side: **C 49/ E 42**

9 Transportation



- Comply with the chapter "Safety information for the user", from Page 27 when moving.
- Before moving off, check:
 - The correct connection of the supply lines
 - The lighting system for damage, function and cleanliness
 - The brake and hydraulic system for visible damage
 - That the parking brake is released completely.
 - The function of the brake system.



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 bolts are firmly fixed with the lynch pin against unintentional release.



WARNING

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

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



WARNING

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

These risks pose serious injuries or death.

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



WARNING

Risk of falling from the machine if riding against regulations!

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

Instruct people to leave the loading site before approaching the machine.

**CAUTION**

Hitching device for operating implements and two axle trailers, provided that:

- the forward speed of 25 km/h is not exceeded,
- the trailer is equipped with a run on brake or a brake system which can be actuated by the driver of the towing vehicle,
- the permissible total weight of the trailer does not exceed 1.25 times the total weight of the towing vehicle, however, max. 5 tons.

**WARNING**

- **For road transport only lift the centrifugal broadcaster until the upper edge of the rear lights is in max. 900 mm above the road surface.**
- **For road transport secure the machine from unintentional lowering.**
- **When lifting the centrifugal broadcaster the front axle of the tractor is differently released, depending on the size of the tractor. Observe the maintenance of the required tractor front axle load (20 % of the tractor's empty weight).**

10 Use of the machine



When using the machine, observe the information in the Chapters

- "Warning pictograms and other signs on the machine" and
- "Safety information for the user", on Page 25 ff.

Observing this information is important for your safety.



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 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

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

Before machine use, carry out a visual check that the upper and lower link bolts are firmly fixed with the lynch pin against unintentional release.



WARNING

Risk of contusions, catching or knocks from damaged components or foreign bodies thrown out of the machine!

Observe the approved machine drive speed before switching on the power take-off shaft of the tractor.

**WARNING**

Risk of catching and trapping and danger from flinging foreign particles within the danger zone of the driven PTO shaft.

- Prior to any operation check the safety devices and guards of the PTO shaft for proper function and completeness.
Care for immediate replacement of damaged safety devices and guards by a specialist workshop.
- Ensure that the PTO shaft guard is secured from spinning with the aid of the fixing chain.
- Ensure a sufficiently safe distance towards the driven PTO shaft.
- Advise people to leave the danger zone of the driven PTO shaft.
- In case of danger immediately stop the tractor engine.

**CAUTION**

Danger from breakage during operation when the overload clutch is actuated.

Immediately switch off the universal joint shaft of the tractor when the overload coupling is actuated.

In this way you will avoid damage on the overload coupling.

**CAUTION**

Risk of PTO shaft breakage through not allowed angling of the driven PTO shaft.

When lifting the machine observe the permissible anglings of the driven PTO shaft. Not allowed anglings of the driven PTO shaft will result in an increased, early wear or the direct damage of the PTO shaft.

Immediately switch off the universal joint shaft of the tractor if the lifted machine runs unsteadily.

**WARNING**

Risk of contusions, drawing in and catching during machine operation without the intended protective equipment!

Only ever start up the machine when the protective equipment is fully installed.

**WARNING**

Risk of contusions catching and knocks from objects thrown out of the machine when running!

Instruct people to leave the danger area of the machine before switching on the power take-off shaft.



WARNING

- **Never ever reach into the area of the rotating agitator spiral.**
- **By no means poke in the fertiliser whilst the agitator spiral is running.**
- **Never ever climb the hopper whilst the agitator spiral is rotating.**
- **Use the guard tube (safety device) for**
 - **ZA-M 1200 / 1500** with OM 24-36
 - **ZA-M 900** with OM 18-24 or OM 24-36

Accident prevention!

- **Replace worn spreading discs and swivel blades early enough. Danger from flinging swivel vanes and parts broken off the spreading discs.**



In case of leaking control valves and/or prolonged standstills, e.g. during transport travel, the closing of the block tap will prevent the automatic opening of the closed shutters.



- At new machines check the bolts for firm seating after 3 – 4 hopper fillings. If necessary retighten the bolts.
- Only use well granulated fertilisers and kinds which are listed up in the setting chart. In case the fertiliser is not exactly known re-check the fertiliser lateral distribution for the pre-set working width with the aid of the mobile fertiliser test kit.
- When spreading mixed fertilisers bear in mind that
 - the individual kinds may show different spreading properties.
 - The demixing of the individual kinds is possible.
- After any operation remove fertiliser possibly sticking to the spreading discs.

10.1 Filling the spreader



- Before filling ensure that there are no residue or foreign particles in the hopper.
- Before filling the spreader attach the guard screen to sort out foreign particles.
- When filling the spreader ensure that there are no foreign particles in the fertiliser
- Observe the permissible payload of the spreader (please refer to technical data) and the axle loads of the tractor!



CAUTION

When lifting the fertiliser broadcaster the front axle load of the tractor is relieved by different amounts depending on the size of the tractor.

When filling the centrifugal broadcaster always check that the necessary front axle load of the tractor (20 % of the tractor's net weight, please also refer to the instruction manual of the vehicle manufacturer) is maintained. If necessary apply front weights!



Before filling the hopper the shutters must be closed!



CAUTION

Strictly follow the safety advice of the fertiliser manufacturer.

10.2 Spreading operation



For **ZA-M** with onboard computer, please refer to the instruction manual for the on-board computer.

- The fertiliser spreader has been coupled onto the tractor and the hydraulic hoses are connected.
- All settings are made.

1. Engage the universal joint shaft at low tractor engine speed.



Only open the shutter when the prescribed universal joint shaft speed has been reached.

2. Open shutter slide hydraulically and start driving.
3. For border spreading lower Limiter hydraulically
4. After spreading operation has been finished:
 - 4.1 Close shutters.
 - 4.2 Disengage universal joint shaft at low tractor engine speed.



WARNING

Do not approach rotating spreading discs. Danger of injury. Danger from fertilizer particles being thrown around.

Advice people to leave the danger area!



CAUTION

When spreading at field sides ensure that by uncontrolled fertiliser granules

- no persons are endangered or pestered,
- no objects are damaged.

If necessary reduce the tractor universal joint shaft rev. speed, reduce the spread rate or set the Limiter accordingly.



- If the implement is transported over longer distances with filled hopper, ensure a correct spread rate when starting the spreading operation!
- Maintain a constant spreading disc rev. speed and forward speed!
- The technical condition of the spreading vanes essentially influences the even lateral fertilizer distribution in the field (creation of stripes).



- If in spite of an equal shutter position an uneven emptying of the two hopper tips is noted, check the main shutter position..
- The life span of the spreading vanes depends on the kinds of fertilizer used, the operation times and quantities spread..
- With some spreading materials, as Kieserite, Excello-granules and magnesium sulphate an increased wear on the spreading blades may occur (more wear resistant spreading vanes are available as an option).

**CAUTION**

Before commencing any operation with the fertiliser spreader ensure that all safety devices are present and fitted in the correct position.

10.3 Exchanging the spreading discs



WARNING

Secure the tractor/machine from unintentional start-up and unintentional rolling.

1. Fold upwards the guard tube (Fig. 68).
2. Remove the thumb nut (Fig. 69/1).
3. Turn the spreading disc until the disc hole \varnothing 8 mm faces to the implement centre. (Fig. 70/1).
4. Pull off the spreading disc from the gearbox shaft.
5. Set up other spreading disc.
6. Fix spreading disc by tightening the thumb nut.



- When setting up spreading discs do not mix up "left hand" and "right hand". The spreading discs are labelled accordingly.
- The right hand side gearbox shaft is provided with a shear pin. Here always set up the right hand spreading disc with the two keys.



On broadcasters with job computer control the shutter slides should be fully opened for changing the spreading discs.



CAUTION

When fitting the spreading discs OM 24-36 provide the spreader with the guard tube (accident prevention).



Fig. 68

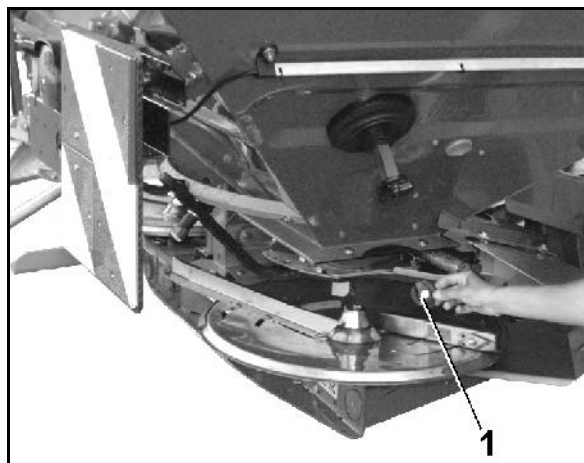


Fig. 69

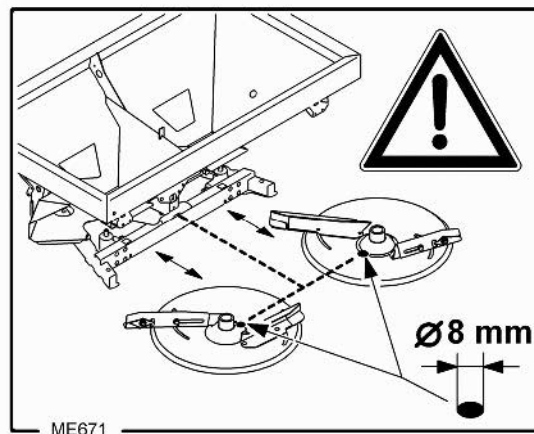


Fig. 70

10.4 Recommendations for broadcasting on the headlands

Precondition for an accurate broadcasting at field borders or field sides is the correct creating of tramlines. By using the deflector **Limiter** or **border spreading disc** the first tramline (Fig. 71/T1) is usually always created in a distance of half the tramline spacing to the field side. In the same way, such a tramline is created on the headlands. As a check a further tramline (broken line) on the headlands is very helpful – with full spacing of one working width

Drive along the field in the first tramline bout

- to the right (Limiter fitted lefthand side)
- to the left (Limiter fitted right hand side)

After this course round the field disengage Limiter (fold upwards).

As centrifugal broadcasters also throw the fertilizer to the rear, the following has strictly to be noted for an accurate distribution on the headlands:

Open and close shutter in different distance to the field's side when driving up (tramlines T1, T2 etc.) and down (tramline T3, etc.).

Open the shutter when "driving up" approx. **on point P1** (Fig. 72), when the spreader is in line with the 2nd tramline on the headlands (broken line).

Close the shutter when "driving down" **on point P2** (Fig. 72), when the spreader is in line with the 1st tramline on the headlands.



Proceeding as described above prevents fertilizer losses, over- or under fertilising and thus is an environment friendly working method.

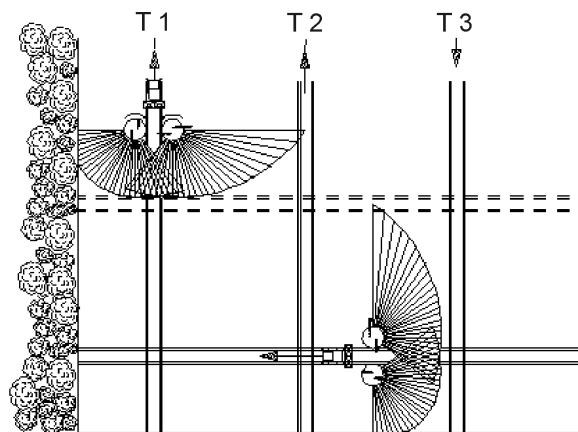


Fig. 71

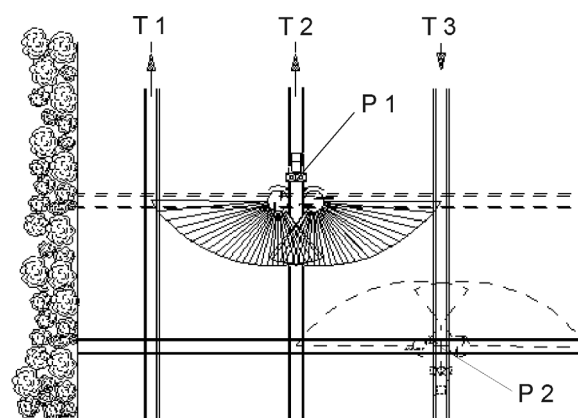


Fig. 72

10.5 Advice for spreading slug pellets (e.g. Mesurol)

In standard execution the fertilizer spreader **ZA-M** can also be used for wide spreading of slug pellets. Slug pellets (e. g. Mesurol) have a granular shape or similar and is spread in relatively small rates (e. g. 3 kg/ha).



CAUTION

When filling the centrifugal broadcaster avoid inhaling the dust and direct contact with your hands (wear protective gloves). After application clean your hands and all parts of the skin having been in contact with the dust thoroughly with water and soap.

In general regarding handling slug pellets, we refer to the advice of the manufacturer and to the general protective measures for handling pesticides (code of practice by the health and safety board).

- When spreading slug pellets take care that the shutter openings are always covered with spreading material and that the spreading discs are driven with a constant speed. A residue of approx. 0.7 kg per hopper tip cannot be spread as declined. For emptying the spreader open shutter and collect spreading material dropping out (e. g. on a canvass).
- For green manure seed, grain and slug pellets (option) take the details for setting your spreader from the specific setting chart. These values may only be considered as guide values. Before starting to operate conduct a spread rate check.



Because of the small spreading rate it is recommended to at least triple the required test distance. Hereby the multiplier reduces on a third of the indicated value (e. g. for the working width 9 m: multiplier 40 : 3 = 13.3).

- Slug pellets must **not** be mixed with fertilizer or other materials in order to possibly work with the spreader in another setting range.

10.5.1 Combination matrix for centrifugal broadcasters for spreading slug pellets

Typ **AMAZONE ZA-M**

	Execution			Discs				Choice of matching options			
	ZA-M 900	ZA-M 1200	ZA-M 1500	DM 10-12	DM 10-16	DM 18-24	DM 24-36	S 350	S 500	L 1000	Amatron ⁺
24	X			X				X			X
25	X				X			X			X
26	X					X		X			X
27		X				X			X	X	X
28		X					X		X	X	X
29			X			X			X	X	X
30			X				X		X	X	X

11 Faults



WARNING

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

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

Secure the tractor and the machine against unintentional start-up and rolling, before eliminating faults on the machine. See Page 65.

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

11.1 Faults, causes and remedy

Fault	Cause	Remedy
Uneven lateral fertiliser distribution	Fertiliser is sticking to the spreading discs and spreading vanes	Clean spreading discs and spreading vanes.
	Shutters do not open entirely.	
Too much fertiliser behind the spreader	Prescribed spreading disc speed is not achieved	Increase tractor engine speed
	Spreading discs or outlets defect or worn.	Check spreading vanes and outlets. Immediately replace defect or worn parts.
	The spreading properties of your fertiliser deviate from the properties of the fertiliser that has been tested when creating the setting chart.	Call the AMAZONE fertiliser service department. ☎ +49 5405-501111 or +49 5405-501164 Mondays till Fridays 🕒 8.00 until 13.00 o' clock
Too much fertiliser is in the overlapping area	Prescribed spreading disc speed is exceeded	Reduce the tractor engine speed.
	The spreading properties of your fertiliser deviate from the properties of the fertiliser which we have tested when creating the setting chart.	Call the AMAZONE fertiliser service department. ☎ +49 5405-501111 or +49 5405-501164 Mondays till Fridays 🕒 8.00 until 13.00 o' clock
Uneven emptying of the two hopper sides at the same shutter position	Bridging of fertiliser	Clean spreading discs and spreading vanes
	Clip pin in the agitator spiral sheared off due to overload	Replace the "R"-clip
	Shutter basic position different	Check the shutter basic setting

Faults, causes and remedy for ZA-M with Comfort-equipment

Fault	Cause	Remedy
Hydraulic arms do not open and shut	Oil supply on the tractor has not been switched on	Switch on oil supply on the tractor
	Power supply for the valve block has been interrupted	Check cable, plug and contacts
	Oil filter is dirty.	Exchange/clean filter. (See on page 111).
	The solenoid valves is dirty.	Flush the solenoid valve to clean them from pollution. (See on page 111).
On a tractor with constant current system (gear pump) the hydraulic oil is getting too hot	System converting bolt on the spreader valve block has not been screwed out to the stop (factory setting)	Screw out the system converting bolt on the spreader valve block to the stop (See page. 104)
	Defective plug couplings	Check plug couplings. If necessary repair or replace
	Defective tractor control unit	Check tractor control unit, repair if necessary or replace
On a tractor with a constant pressure system (possibly on older John Deere tractors) the hydraulic oil is getting too hot	System converting bolt on the spreader valve block has not been screwed in to the stop (contrary to the factory setting)	Screw in the system converting bolt on the spreader valve block to the stop.
	Defective plug couplings.	Check plug couplings. If necessary repair or replace.
	Defective tractor control unit.	Check tractor control unit, repair if necessary or replace.
On a tractor with load-sensing system and oil decrease via the tractor control unit the hydraulic oil is getting too hot	System converting bolt on the spreader valve block has not been screwed out to the stop (factory setting)	Screw out the system converting bolt on the spreader valve block to the stop.
	Oil volume on the tractor control unit has not been sufficiently reduced	Reduce the oil volume on the tractor control unit
	Defective plug couplings	Check plug couplings. If necessary repair or replace
	Defective tractor control unit	Check tractor control unit, repair if necessary or replace
On a tractor with load-sensing system and a direct oil reduction and control cable the hydraulic oil is getting too hot	System converting bolt on the spreader valve block has not been screwed in to the stop (contrary to the factory setting)	Screw in the system converting bolt on the spreader valve block to the stop.
	Defective plug couplings	Check plug couplings. If necessary repair or replace

11.2 Failure of electronics

In case of trouble on the on-board computer or the electric setting motors which cannot be remedied immediately, operation can be continued (see operator's manual for on-board computer).

12 Cleaning, maintenance and repairs



WARNING

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

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

Secure the tractor and machine against unintentional start-up and rolling, before carrying out cleaning, maintenance or repair work on the machine when coupling or decoupling the machine. See also Page 65.



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.

12.1 Cleaning



- Pay particular attention to the brake, air and hydraulic hose lines.
- Never treat brake, air and hydraulic hose lines with benzene, benzol, petroleum or mineral oils.
- After cleaning, grease the machine, in particular after cleaning with a high pressure cleaner / steam jet or lip soluble agents.
- Observe the statutory requirement for the handling and disposal 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.
 - Always maintain a minimum jet distance of 300 mm between the high pressure cleaning or steam jet cleaning nozzle and the machine.
 - Comply with safety regulations when working with high pressure cleaners.


CAUTION

Clean, grease or adjust the centrifugal broadcaster or the universal joint shaft only after the PTO shaft and engine have been stopped and the ignition key is removed.


WARNING

After disengaging the PTO shaft the mounted implement may still continue to run by its dynamic masses. Begin any work only when the implement has come to a full standstill.

- After use clean the machine with a normal jet of water (greased implements only on washing bays with oil traps).
- Clean outlet openings and shutters especially carefully.
- Treat dry machine with an anticorrosive agent. (Only use biologically degradable protective agents).
- Park machines with opened shutters

12.2 Lubrication regulations



Lubricate all the lubricating nipples (keep the seals clean).

Lubricate / grease the machine at the specified intervals.

The lubrication points on the machine are indicated with the film (Fig. 73).

Carefully clean the lubrication point and grease press before greasing, so that no dirt can be pressed into the bearing. Completely press out the soiled grease in the bearings and replace it with new grease.

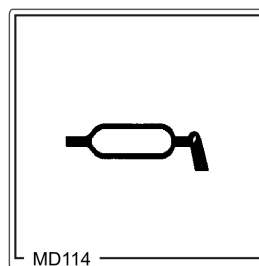


Fig. 73



- Grease shutter guides after every operation.!
- Also grease the threads of the T-bolts for the shutter lever locking as well as their washers, so that the clamping connection remains functioning.

12.2.1 Lubricants



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

Company	Lubricant designation	
	Normale Einsatz-Bedingungen	Extreme Einsatz-Bedingungen
ARAL	Aralub HL 2	Aralub HLP 2
FINA	Marson L2	Marson EPL-2
ESSO	Beacon 2	Beacon EP 2
SHELL	Ratinax A	Tetinax AM

12.2.2 Greasing the PTO shaft

During winter time grease the guard tubes to avoid freezing.

Also observe the fitting and maintenance advice attached to the PTO shaft of the PTO shaft manufacturer.

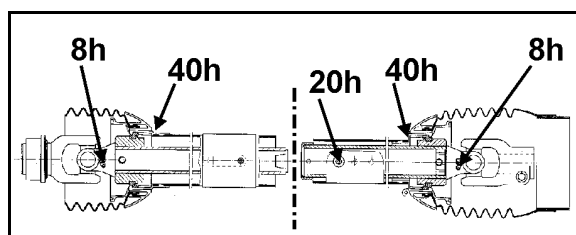


Fig. 74

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..

Daily

Component	Maintenance work	see page	Specialist workshop
Spreading vanes	• Status test	112	

Every 50 operating hours

Component	Maintenance work	see page	Specialist workshop
Hydraulic system	• Status test	113	X
Shear off safety device agitator shaft drive	• check	110	
Hydraulic oil filter (Comfort-equipment)	• check	111	X

As necessary

Component	Maintenance work	see page	Specialist workshop
Solenoid valves (Comfort-equipment)	• clean	111	X
Spreading vanes	• exchange	112	
Shutter basic position	• check	113	X
Electric light kit	• check and replace if necessary	117	

Every six months

Component	Maintenance work	see page	Specialist workshop
PTO shaft with friction clutch	• vent the friction clutch	110	X

12.4 Shear off safety for PTO shafts and agitator shaft drive

The separately supplied **bolts 8 x 30, DIN 931, 8.8** are **exchange bolts** (Fig. 75/4) **for fixing the PTO shaft yoke on the flange** of the gearbox input shaft. Always apply grease when fitting the PTO shaft to the gearbox input shaft.

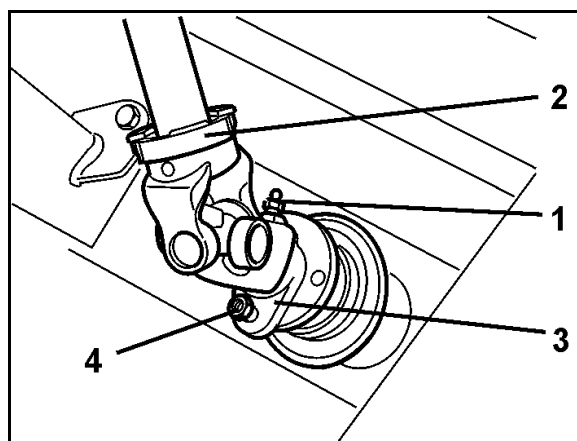


Fig. 75

Agitator spiral clip (Fig. 76/1) serve as shear off safety for the agitator shaft.

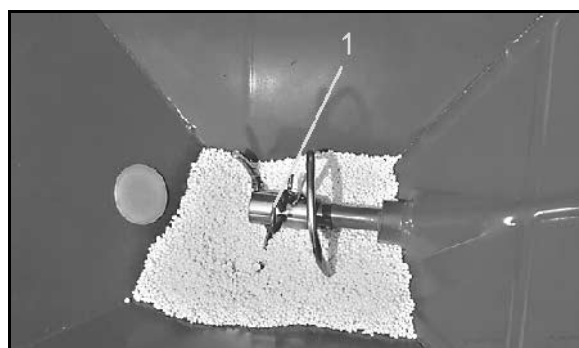


Fig. 76

12.5 Venting the friction clutch

Vent the friction clutch after a longer period of standstill or before the first operation as follows

1. Dismantle friction clutch from gearbox input shaft.
2. Relief springs (Fig. 77/6) by slackening the nuts (Fig. 77/7).
3. Fully turn the clutch by hand. Hereby any baking by rust or humidity between the friction linings will be loosened.
4. Tighten nuts that much, that the pressure springs have the indicated fitting length of **a = 26,5 mm**.
5. Push friction clutch onto gearbox input shaft and fix. The friction clutch is now ready for operation again.
6. High air humidity, strong pollution or cleaning the machine with a high pressure cleaner increase the danger of baking of the friction linings.

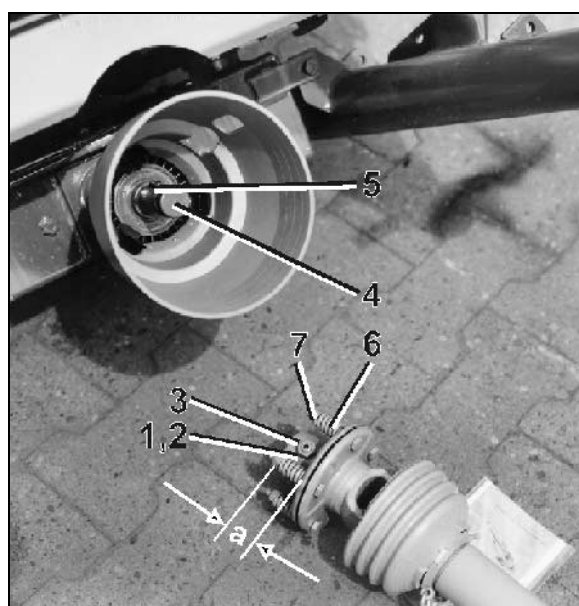


Fig. 77

12.6 Check of the hydraulic oil filter

For **ZA-M** with Comfort equipment:

During operation the function of the hydraulic oil filter (Fig. 78/1) can be checked on the control block. Indication in the check window (Fig. 78/2):

- Green filter functions properly
- Red exchange filter / clean

For removal of the filter twist off the filter cover and take out filter.

Prior to this relief the hydraulic system from pressure.

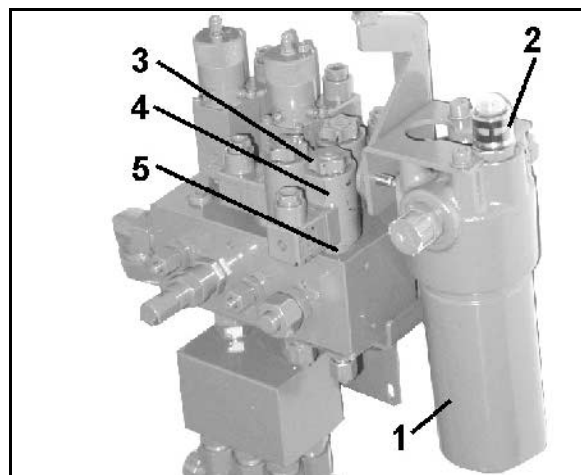


Fig. 78

12.7 Cleaning the solenoid valves

For **ZA-M** with Comfort equipment:

Flush the solenoid valve to clean them from pollution. This might become necessary when deposits prevent an entire opening or closing of the shutters.

- Unscrew solenoid cap (Fig. 78/3)
- Remove magnet coil (Fig. 78/4)

Screw out the valve rod (Fig. 78/5) with valve seat and clean with compressed air or hydraulic oil.

Prior to this relief the hydraulic system from pressure.

12.8 Input- and angular gearbox

Under normal conditions input- and angular gearbox are maintenance-free. The gearboxes are supplied with sufficient gear oil by the manufacturer. A refilling of oil usually is not necessary. External symptoms, e. g. fresh oil spots on the parking place or on machine parts and/or loud noise development, however, indicate an oil leakage of the gearbox housing. Search for reason, care for remedy and fill in oil

Oil quantity:

Input gearbox: **0,4 l SAE 90 gear oil**

Angular gearbox: **each 0,15 l SAE 90 gear oil**

12.9 Exchanging of the spreading vanes and swivel blades



The technical condition of the spreading vanes incl. their swivel blades essentially influences the even lateral fertilizer distribution in the field (creation of stripes).



- The spreading vanes have been manufactured from especially wear resistant and non corrosive steel. However it is indicated that the spreading vanes and their swivel blades are wearing parts.
- Exchange spreading vanes or swivel blades immediately when breakage due to wear is noticeable.

12.9.1 Exchanging spreading vanes

1. Slacken self-locking nut (Fig. 79/1).
2. Remove washer (Fig. 79/2) and flat mushroom head bolt (Fig. 79/3).
3. Slacken thumb nut (Fig. 79/4) and exchange spreading vanes.
4. Fitting the spreading vanes is done in vice versa order.

Tighten the self locking nut (Fig. 79/1) in such a way, that the spreading vane can be swivelled by hand.



Note the correct fitting of the spreading vanes. The open side of the U-shaped spreading vane shows into sense of rotation (Fig. 79/5).

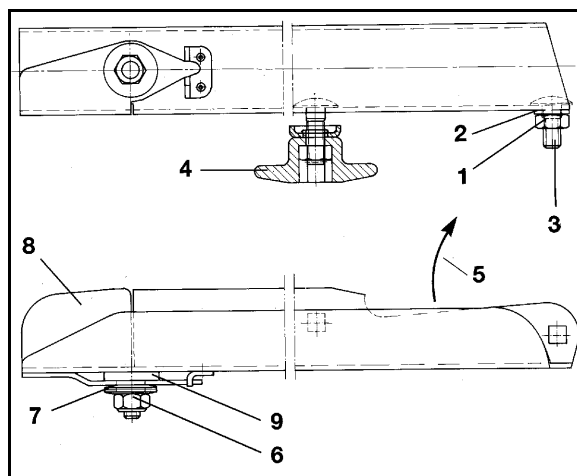


Fig. 79

12.9.2 Exchange of swivel blades

1. Slacken self locking nut (brass CuZn) (Fig. 80/6) and remove together with the spring washers (Fig. 80/7).
2. Exchange swivel blades (Fig. 80/8).



Observe the plastic washer (Fig. 80/9) between spreading vane and swivel blade.

3. Sandwich the plate springs alternately, do not stack.
4. Tighten the self locking nut (Fig. 80/6) with a torque of 6 – 7 Nm so that the swivel blade can still be swivelled by hand, however does not swivels upwards automatically.

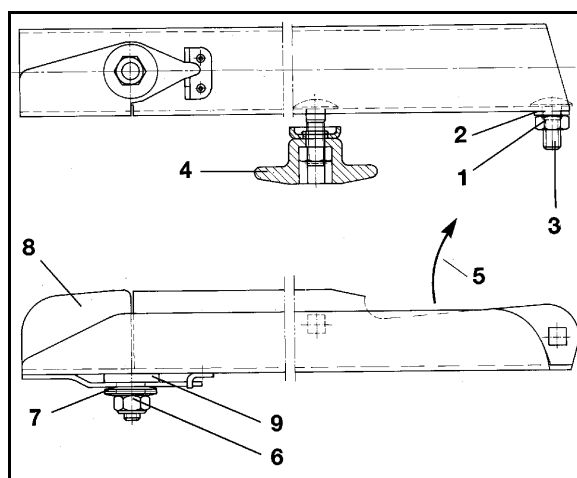


Fig. 80

12.10 Hydraulic system



WARNING

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

- Only a specialist workshop may carry out work on the hydraulic system.
- Depressurise the hydraulic system before carrying out work on the hydraulic system.
- When searching for leak points, always use suitable aids.
- Never try to bung leaking hydraulic lines with your hand or with your 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!



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

12.10.1 Labelling hydraulic hose lines

The assembly labelling provides the following information:

Fig. 81/...

- (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).

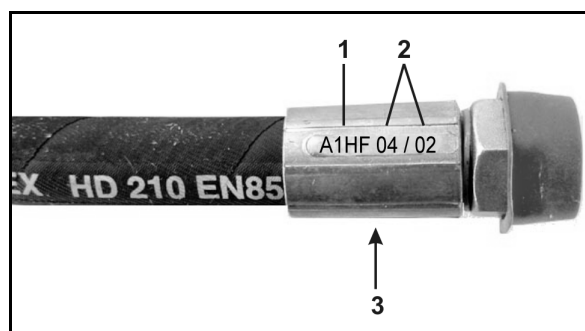


Fig. 81

12.10.2 Maintenance intervals

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

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

Before each start-up:

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

12.10.3 Inspection criteria for hydraulic hose lines



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

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

- Damage to the outer layer up to the ply (e.g. scouring points, cuts, cracks).
- Brittleness of the outer layer (crack formation of the hose material).
- Deformations which do not match the natural shape of the hose or the hose line. Both in a depressurised and pressurised state or when bent (e.g. layer separation, bubble formation, pinching, bends).
- Uptight 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".

12.10.4 Installation and removal of hydraulic hose lines



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

- Only use original **AMAZONE** hydraulic hose lines.
- Ensure cleanliness.
- You must always install the hydraulic lines so that, in all states of operation:
 - There is no tension, apart from the hose's own weight.
 - There is no possibility of jolting on short lengths.
 - Outer mechanical influences on the hydraulic hose lines are avoided.
Use appropriate arrangements and fixing to prevent any scouring of the hoses on components or on each other.
If necessary, secure hydraulic hose lines using protective covers. Cover sharp-edged components.
 - The approved bending radii may not be exceeded.
- When connecting a hydraulic hose line to moving parts, the hose length must be appropriate so that the smallest approved bending radius is not undershot over the whole area of movement and/or the hydraulic hose line is not over tensioned.
- Fix the hydraulic hose lines to the intended fixing points. There, avoid hose clips, which impair the natural movement and length changes of the hose.
- It is forbidden to paint over hydraulic hose lines!

12.11 Checking the basic setting of the shutter slides



ZA-M with job computer; please refer to the instruction manual **AMATRON⁺**

The space opened in the outlet opening (Fig. 82/1) by the shutters in shutter position „8“ has been set by the factory with a dead mandrill (pin Ø 12 mm).

This setting represents the basic setting of the shutter.

If at equal shutter slide position an uneven emptying of the two hopper tips is noticed, check shutter slide basic position as follows:



WARNING

When actuating the shutters do not reach into the hopper outlet opening!

1. Hydraulically open the shutter slide.
2. Open the spread rate shutter with the aid of the setting lever (Fig. 83/1).
3. Insert a pin of 12 mm Ø (shaft of a 12 mm drill) into the opening.
4. Swivel the setting lever on the scale (Fig. 83/3) until the stop on the pins.
5. Arrest the setting lever with the star knob (Fig. 83/2).
6. Slacken the hex. bolt (Fig. 83/6) Align the pointer (Fig. 83/5) with the scale figure „8“ and fix with the hex. bolt. The read-off edge of the pointer is (Fig. 83/4).
7. Remove pin.

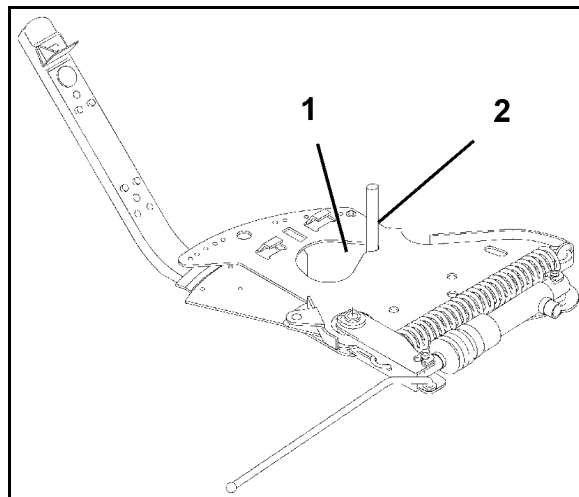


Fig. 82

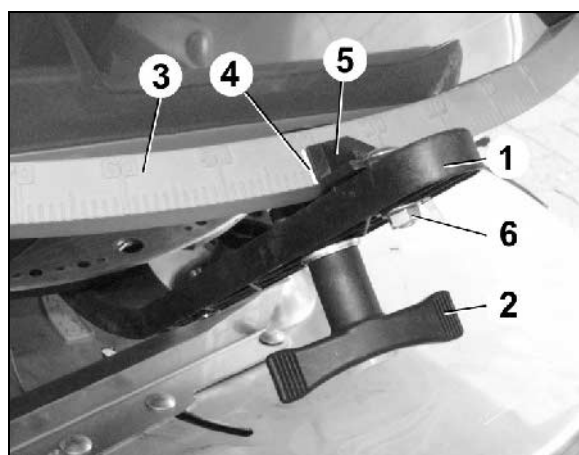


Fig. 83

12.12 Dismantling PTO shaft

1. Slacken tapered grease nipple in the connecting yoke of the PTO shaft – by opening under side of the protective cone.
2. Remove shear bolt between yoke flange and PTO shaft and flange of the gearbox input shaft.
3. With the aid of a flat bar push the connecting yoke off the gearbox input shaft from the rear through the slit in the protective cone rear wall (on the hopper under side).



When pushing the connecting yoke off the gearbox input shaft repeatedly slightly twist the PTO shaft.

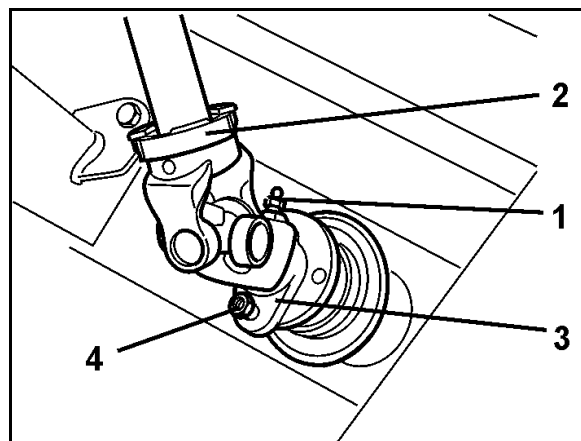


Fig. 84

12.13 Electric traffic light kit



WARNING

Replace defective bulbs immediately so that no other road users will be endangered.

Exchange of bulbs:

1. Remove the protecting glass.
2. Remove defective bulb.
3. Insert replacement bulb (observe the correct voltage and watt number).
4. Apply protecting glass and screw on.

12.14 Upper and lower link pins



WARNING

Danger from contusion, catching and knocks for persons in case the machine would unintentionally uncouple from the tractor.

At any coupling of the machine check the upper and lower link pins for visible defects. In case of clear signs of wear replace the upper and lower link pins.

12.15 Screw tightening torques

Thread	Width across flats [mm]	Tightening torques [Nm] depending on the quality of the nuts/bolts		
		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



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