

# Operating Manual

## **AMAZONE**

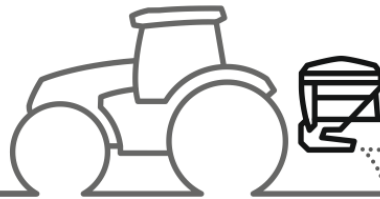
**ZA-X 603**

**ZA-X 903**

**ZA-X 1403**

**ZA-XW 503**

Fertiliser spreaders



MG7693  
BAG0235.5 01.24  
Printed in Germany

SmartLearning



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

en\_US



# *Reading the instruction*

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

---

*Leipzig-Plagwitz 1872. Rud. Sark.*

---

**Identification data**

---

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

Machine identification number:  
(ten-digit)

Type: ZA-X

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

---

**Manufacturer's address**

---

AMAZONEN-WERKE

H. DREYER SE & Co. KG

Postfach 51

D-49202 Hasbergen

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

E-mail: [amazone@amazone.de](mailto:amazone@amazone.de)

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**Spare part orders**

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Spare parts lists are freely accessible in the spare parts portal at [www.amazone.de](http://www.amazone.de).

Please send orders to your AMAZONE dealer.

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**Formalities of the operating manual**

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## Foreword

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## Foreword

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Dear Customer,

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

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

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

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

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

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

## User evaluation

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Dear Reader,

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

AMAZONEN-WERKE

H. DREYER SE & Co. KG

Postfach 51

D-49202 Hasbergen

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

E-mail: [amazone@amazone.de](mailto:amazone@amazone.de)



<b>1</b>	<b>User Information .....</b>	<b>8</b>
1.1	Purpose of the document.....	8
1.2	Locations in the operating manual .....	8
1.3	Diagrams used .....	8
<b>2</b>	<b>General safety instructions.....</b>	<b>9</b>
2.1	Obligations and liability .....	9
2.2	Representation of safety symbols.....	11
2.3	Organisational measures .....	12
2.4	Safety and protection equipment .....	12
2.5	Informal safety measures.....	12
2.6	User training.....	13
2.7	Safety measures in normal operation .....	14
2.8	Dangers from residual energy.....	14
2.9	Maintenance and repair work, fault elimination .....	14
2.10	Constructive changes .....	14
2.10.1	Spare and wear parts and aids .....	15
2.11	Cleaning and disposal.....	15
2.12	User workstation .....	15
2.13	Warning pictograms and other signs on the machine .....	16
2.13.1	Positions of warning pictograms and other labels .....	17
2.14	Dangers if the safety information is not observed.....	22
2.15	Safety-conscious working .....	22
2.16	Safety information for users.....	23
2.16.1	General safety and accident prevention information .....	23
2.16.2	Hydraulic system.....	26
2.16.3	Electrical system .....	27
2.16.4	Universal joint shaft operation.....	27
2.16.5	Fertiliser spreader operation .....	29
2.16.6	Cleaning, maintenance and repairs .....	29
<b>3</b>	<b>Loading and unloading .....</b>	<b>30</b>
<b>4</b>	<b>Product description .....</b>	<b>30</b>
4.1	Overview of subassemblies .....	31
4.2	Safety and protection equipment .....	32
4.3	Supply lines between the tractor and the machine .....	32
4.4	Transportation equipment.....	32
4.5	Intended use .....	33
4.6	Danger areas and danger points .....	34
4.7	Rating plate .....	34
4.8	Technical data .....	35
4.9	Necessary tractor equipment.....	36
4.10	Noise production data .....	36
<b>5</b>	<b>Structure and function .....</b>	<b>37</b>
5.1	Function .....	37
5.2	Guard and function screens in the hopper (protective device) .....	38
5.3	Guard tube (protective device).....	39
5.4	PTO shaft.....	40
5.4.1	Coupling the PTO shaft.....	42
5.4.2	Uncoupling the PTO shaft.....	42
5.4.3	PTO shaft with friction clutch (optional) .....	43
5.5	Hydraulic connections.....	44
5.5.1	Coupling the hydraulic hose lines .....	45

## Table of Contents

5.5.2	Uncoupling the hydraulic hose lines.....	45
5.6	Spreading discs.....	46
5.7	Agitator.....	46
5.8	Slider.....	47
5.9	Two-way control.....	48
5.10	Three-way control (optional).....	49
5.11	3-point attachment frame.....	50
5.12	Boundary spreading/side spreading.....	51
5.13	Calibration kit (optional).....	52
5.14	Transport and parking device (removable, optional).....	53
5.15	Coupling device.....	54
5.16	Hopper cover (optional).....	54
5.17	Hopper extensions (optional).....	55
5.18	Row spreading attachment for specialised crops.....	56
5.19	Setting chart.....	60
5.20	EasyCheck (option).....	62
5.21	Mobile test rig (option).....	62
<b>6</b>	<b>Commissioning.....</b>	<b>63</b>
6.1	Checking the suitability of the tractor.....	64
6.1.1	Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast.....	64
6.2	Adjusting the length of the PTO shaft to the tractor.....	68
6.3	Securing the tractor / machine against unintentional start-up and rolling.....	70
<b>7</b>	<b>Coupling and uncoupling the machine.....</b>	<b>71</b>
7.1	Coupling the machine.....	71
7.2	Uncoupling the machine.....	74
<b>8</b>	<b>Adjustments.....</b>	<b>75</b>
8.1	Adjusting the mounting height.....	76
8.1.1	Late topdressing.....	77
8.2	Setting the spread rate.....	78
8.2.1	Setting the slider position using the setting lever.....	78
8.2.2	Setting the spread rate according to the setting chart.....	79
8.2.3	Determining the slider position using the calibration kit (optional).....	80
8.3	Setting the working width.....	83
8.3.1	Adjusting the spreading vane positions.....	84
8.4	Checking the working width using the mobile fertiliser test rig (optional).....	86
8.5	Boundary, ditch and side spreading.....	87
8.5.1	Boundary spreading with limiter X (optional).....	88
8.5.2	Boundary and side spreading with the Tele-Quick border spreading vane.....	91
8.5.3	Setting and installing the Tele-Quick border spreading vane.....	91
8.5.4	Boundary spreading with border spread deflector (optional).....	94
8.6	Switching the agitator head on and off.....	95
<b>9</b>	<b>Transportation.....</b>	<b>96</b>
<b>10</b>	<b>Use of the machine.....</b>	<b>98</b>
10.1	Filling the centrifugal broadcaster.....	100
10.2	Spreading operation.....	101
10.2.1	Complete discharging.....	104
10.3	Recommendation for working in headlands.....	105
10.4	Notes for spreading slug pellets (e.g. Mesurol).....	106
10.4.1	Spread rate check with the machine at a standstill.....	107
<b>11</b>	<b>Faults.....</b>	<b>109</b>

11.1	Faults, causes and remedies .....	109
<b>12</b>	<b>Cleaning, maintenance and repairs.....</b>	<b>110</b>
12.1	Cleaning .....	110
12.2	Lubrication instructions .....	111
12.3	Maintenance plan – Overview.....	112
12.4	Removing the PTO shaft.....	113
12.5	Shear-off safety devices for PTO shafts .....	113
12.6	Ventilate the friction clutch .....	113
12.7	Gearbox .....	114
12.8	Replacing the spreading vanes and swivel blades .....	114
12.8.1	Replacing the spreading vanes .....	115
12.8.2	Replacing the swivel blades.....	117
12.9	Check the clearances between the agitator finger/hopper wall and spreading vane/feed plates.....	118
12.10	Checking and correcting the basic setting of the sliders .....	118
12.11	Hydraulic system.....	121
12.11.1	Labelling of hydraulic hose lines .....	122
12.11.2	Maintenance intervals .....	122
12.11.3	Inspection criteria for hydraulic hose lines .....	122
12.11.4	Installation and removal of hydraulic hose lines .....	123
12.12	Electric lighting system .....	124
12.13	Upper and lower link pins check .....	124
12.14	Hydraulic diagram .....	125
12.15	Bolt tightening torques .....	126

# 1 User Information

---

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

## 1.1 Purpose of the document

---

This operating manual

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

## 1.2 Locations in the operating manual

---

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

## 1.3 Diagrams used

---

### Handling instructions and reactions

---

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

Example:

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

### Lists

---

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

Example:

- Point 1
- Point 2

### Number items in diagrams

---

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

Example: (Fig. 3/6)

- Figure 3
- Item 6

## 2 General safety instructions

---

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

### 2.1 Obligations and liability

---

#### Comply with the instructions in the operating manual

---

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

#### Obligations of the operator

---

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

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

The operator is obliged

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

If you still have queries, please contact the manufacturer.

#### Obligations of the user

---

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

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

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

## General safety instructions

---

### Risks in handling the machine

---

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

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

Only use the machine

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

Eliminate any faults immediately which could impair safety.

### Guarantee and liability

---

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

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

## 2.2 Representation of safety symbols

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



### **DANGER**

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

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



### **WARNING**

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

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



### **CAUTION**

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



### **IMPORTANT**

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

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



### **NOTE**

Indicates handling tips and particularly useful information.

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

### 2.3 Organisational measures

---

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

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



The operating manual

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

Check all the available safety equipment regularly.

### 2.4 Safety and protection equipment

---

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

#### Faulty safety equipment

---

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

### 2.5 Informal safety measures

---

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

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



## 2.6 User training

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

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

Activity \ People	Person specially trained for the activity <sup>1)</sup>	Trained person <sup>2)</sup>	Person with specialist training (specialist workshop) <sup>3)</sup>
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

- <sup>1)</sup> A person who can assume a specific task and who can carry out this task for an appropriately qualified company.
- <sup>2)</sup> Instructed persons are those who have been instructed in their assigned tasks and in the possible risks in the case of improper behaviour, have been trained if necessary, and have been informed about the necessary protective equipment and measures.
- <sup>3)</sup> People with specialist technical training will be considered specialists. Due to their specialist training and their knowledge of the appropriate regulations, they can evaluate the work with which they have been charged and detect possible dangers.

Comment:

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



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

## 2.7 Safety measures in normal operation

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

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

## 2.8 Dangers from residual energy

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

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

## 2.9 Maintenance and repair work, fault elimination

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

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

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

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

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

## 2.10 Constructive changes

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

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

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



### **WARNING**

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

It is forbidden to:

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

### **2.10.1 Spare and wear parts and aids**

---

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

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

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

### **2.11 Cleaning and disposal**

---

Handle and dispose of any materials used carefully, in particular

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

### **2.12 User workstation**

---

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

## 2.13 Warning pictograms and other signs on the machine



Always keep all the warning pictograms of the machine clean and in a legible state. Replace illegible warning pictograms. You can obtain the warning pictograms from your dealer using the order number (e.g. 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 non-compliance with the danger protection instructions.  
For example: causes serious injuries to fingers or hands.
3. Instructions for avoiding the danger.  
For example: only touch machine parts when they have come to a complete standstill.

## Warning pictograms

A detailed diagram of a machine's internal components, specifically a rotating assembly. Four safety labels are shown with callout lines pointing to specific parts:
 

- L-M0071**: Points to a rotating shaft. The label contains two warning symbols: a hand being struck by a rotating part and a hand being caught in a pinch point.
- L-M0079**: Points to a rotating disc. The label contains a warning symbol of a hand being struck by a rotating part and a symbol of a person standing next to a vertical barrier with a double-headed arrow, indicating a restricted area.
- L-M0081**: Points to a rotating component. The label contains a warning symbol of a hand being struck by a rotating part and a "STOP" symbol with a circular arrow indicating a stop point.
- L-M0082**: Points to a rotating component. The label contains a warning symbol of a hand being struck by a rotating part and a "STOP" symbol with a circular arrow indicating a stop point.

A detailed diagram of a machine, likely a press or punch, with various safety labels and icons. The machine is shown from a top-down perspective. Labels include:

- SAFETY**: Located at the top left, pointing to a warning icon (a hand being struck by a falling object).
- SAFETY**: Located at the top right, pointing to a warning icon (a hand being struck by a moving part).
- SAFETY**: Located on the right side, pointing to a warning icon (a hand being struck by a moving part).
- SAFETY**: Located on the right side, pointing to a warning icon (a hand being struck by a moving part).
- SAFETY**: Located at the bottom left, pointing to a warning icon (a hand being struck by a moving part).
- SAFETY**: Located at the bottom center, pointing to a warning icon (a hand being struck by a moving part).
- SAFETY**: Located at the bottom right, pointing to a warning icon (a hand being struck by a moving part).
- STOP**: Located at the bottom right, pointing to a red stop sign icon.

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Order number and explanation

Warning pictograms

MD 075

**Risk of cutting or severing fingers and hands owing to accessible moving parts involved in the work process!**

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

- Never reach into the danger area when the tractor engine is running with PTO shaft / hydraulic system / electronic system connected.
- Wait for complete standstill of all moving parts of the machine before reaching into the danger area.



MD 078

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

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

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

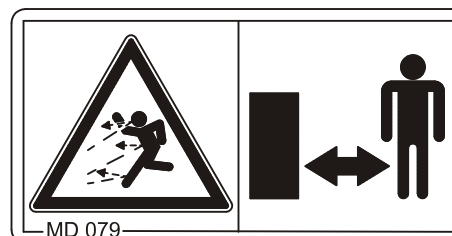


MD 079

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

These dangers can cause extremely serious to any part of the body.

- Keep a sufficient safety distance from the machine danger area.
- Ensure that bystanders maintain a sufficient safety distance from the machine danger area as long as the tractor engine is running.



Order number and explanation

Warning pictograms

**MD 082**

**Danger from falling when travelling on tread surfaces or platforms!**

This danger can cause extremely serious and potentially fatal injuries.

It is forbidden to ride on the machine or climb the running machine. This also applies to machines with tread surfaces or platforms.

Make sure that nobody is riding on the machine.

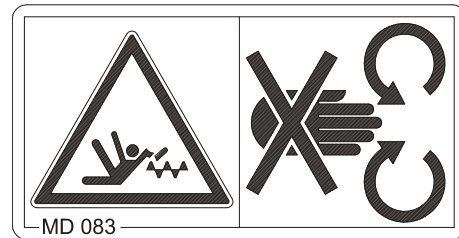


**MD 083**

**Danger of pulling in or entrapment for arms owing to moving parts involved in the work process!**

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

Never open or remove safety equipment while the tractor engine is running with PTO shaft / hydraulic system / electronic system connected.

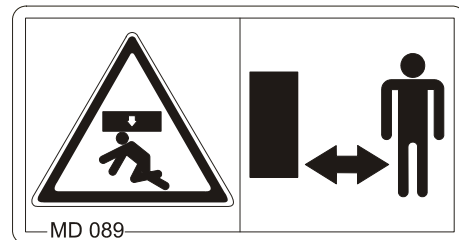


**MD 089**

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

This danger can cause extremely serious and potentially fatal injuries.

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



**MD 095**

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



Order number and explanation

Warning pictograms

**MD 096**

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

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

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

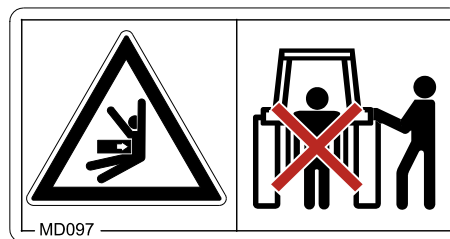


**MD 097**

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

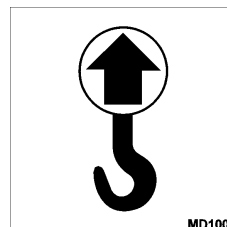
This danger can cause extremely serious and potentially fatal injuries.

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



**MD 100**

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





## Order number and explanation

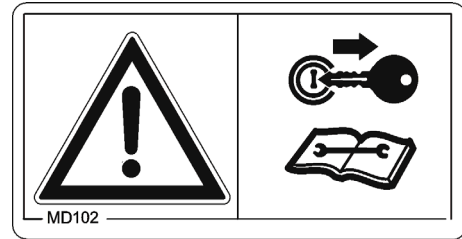
## Warning pictograms

## MD 102

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

These dangers can cause extremely serious and potentially fatal injuries.

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



## MD 106

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

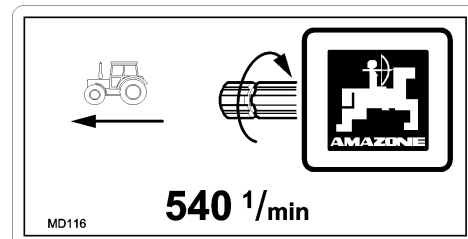
This danger can cause extremely serious and potentially fatal injuries.

Engage the locking device to prevent accidental lowering of suspended loads or raised machine components before entering the danger area



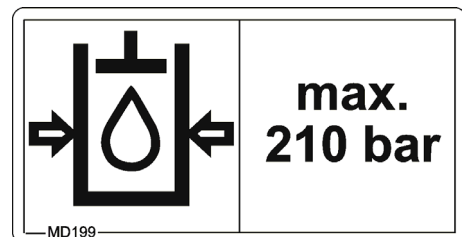
## MD 116

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



## MD 199

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



## 2.14 Dangers if the safety information is not observed

---

Non-compliance with the safety information

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

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

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

## 2.15 Safety-conscious working

---

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

Comply with the accident prevention instructions on the warning pictograms.

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

## 2.16 Safety information for users



### WARNING

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

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

### 2.16.1 General safety and accident prevention information

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

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

### Connecting and disconnecting the machine

- Only connect and transport the machine with tractors suitable for the task.
- When connecting machines to the tractor's three-point hydraulic system, the attachment categories of the tractor and the machine must always be the same!
- Connect the machine to the prescribed equipment in accordance with the specifications.
- When coupling machines to the front or the rear of the tractor, the following may not be exceeded:
  - The approved total tractor weight
  - The approved tractor axle loads
  - The approved load capacities of the tractor tyres
- Secure the tractor and the machine against unintentional rolling, before coupling or uncoupling the machine.
- It is forbidden for people to stand between the machine to be coupled and the tractor, whilst the tractor is moving towards the machine!

Any helpers may only act as guides standing next to the vehicles, and may only move between the vehicles when both are at a standstill.
- Secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is impossible, before connecting the machine to or disconnecting the machine from the tractor's three-point hydraulic system.



## General safety instructions

---

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

## Use of the machine

---

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

---

## Machine transportation

---

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

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

## 2.16.2 Hydraulic system

---

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

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

### 2.16.3 Electrical system

---

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

### 2.16.4 Universal joint shaft operation

---

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

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



### 2.16.5 Fertiliser spreader operation

---

- Stay clear of the working area! Danger from flying fertiliser particles. Direct persons away from the throwing range of the fertiliser spreader. Do not walk or stand close to rotating spreading discs.
- Fill the fertiliser spreader only when the tractor engine is shut off, the ignition key is pulled and the sliders are closed.
- Do not place any foreign objects in the hopper.
- While carrying out the spread rate check, beware of danger points from rotating machine parts.
- Never unhitch a fertiliser spreader or roll it while it is full (tipping hazard).
- For side spreading at field edges, bodies of water or roads, use side spreading devices.
- Before each use, ensure that the attachment parts are properly fitted, particularly those for attaching the spreading discs and spreading vanes.

### 2.16.6 Cleaning, maintenance and repairs

---

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

### 3 Loading and unloading



#### WARNING

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

- It is essential to use the marked lashing points for securing load supporting devices if you are loading or unloading the machine with lifting gear.
- Use load supporting devices with a load bearing capacity of at least 661 lb / 300 kg.
- Never enter the area below the raised machine.

#### Loading using a lifting crane:

There is one attachment point each at the front and rear of the hopper (Fig. 5/1).

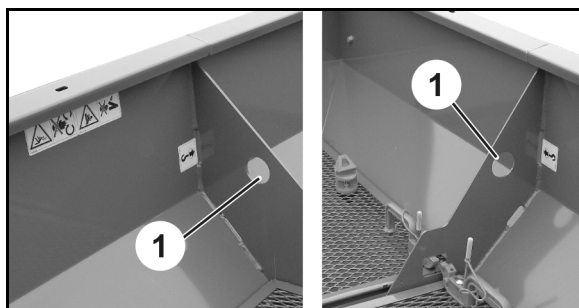


Fig. 5

### 4 Product description

This section:

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

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

## 4.1 Overview of subassemblies

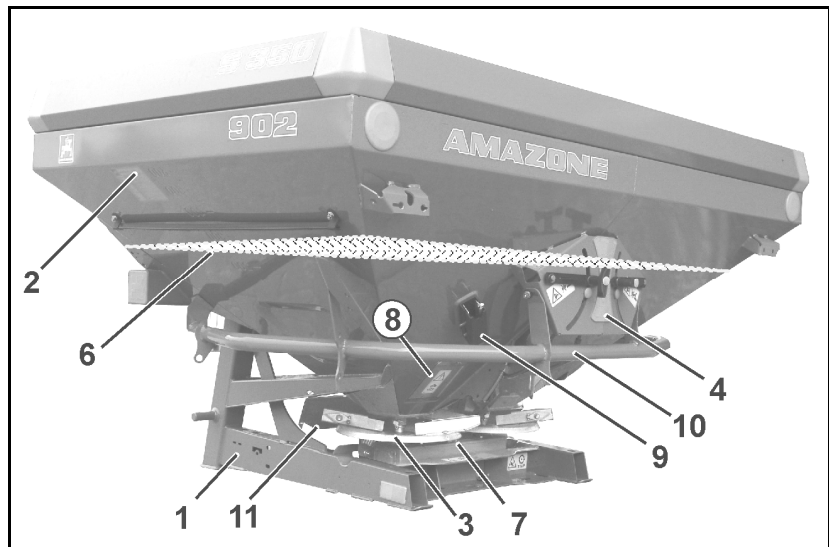


Fig. 6

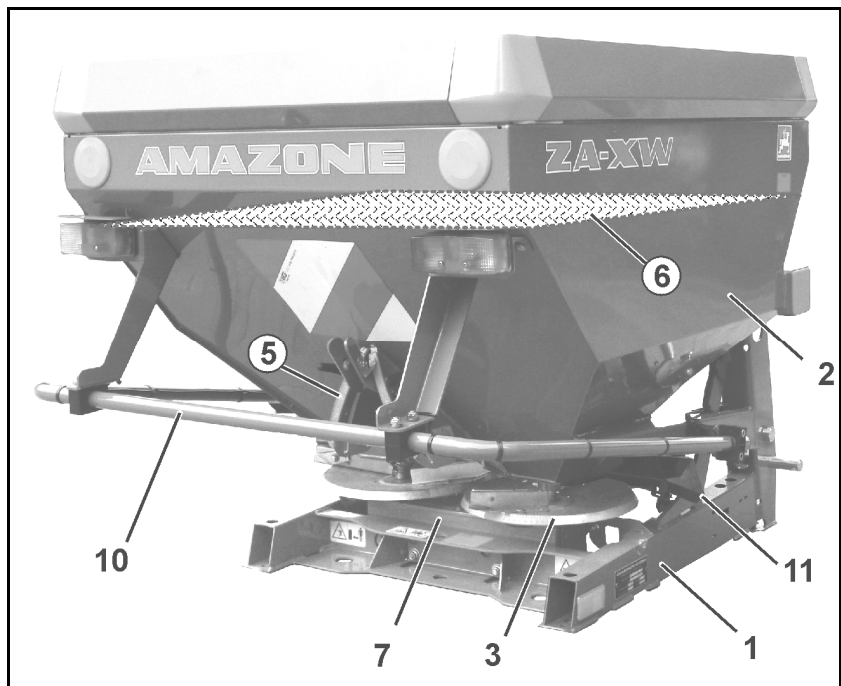


Fig. 7

Fig. 6 / Fig. 7:

- |  |   |
|--|---|
| (1) Frame  | (6) Guard screen in the hopper                            |
| (2) Hopper   | (7) Gearbox   |
| (3) Spreading discs                                    | (8) Quick emptying (not for ZA-XW 503 )                   |
| (4) Setting lever for rate slider ZA-X 903 / ZA-X 1403 | (9) Tele Quick border spreading vanes in parking position |
| (5) Setting lever for rate slider ZA-X 603 / ZA-XW 503 | (10) Guard tube   |
|  | (11) Deflector plate                                      |

## 4.2 Safety and protection equipment

- Guard tube
- PTO shaft guard
- Guard screen in the hopper
- Safety symbols (warning pictograms)

## 4.3 Supply lines between the tractor and the machine

Supply lines in parking position:

Fig. 8/...

- (1) Two-way control
- (2) Cable with connection for lighting
- (3) Hydraulic hose lines

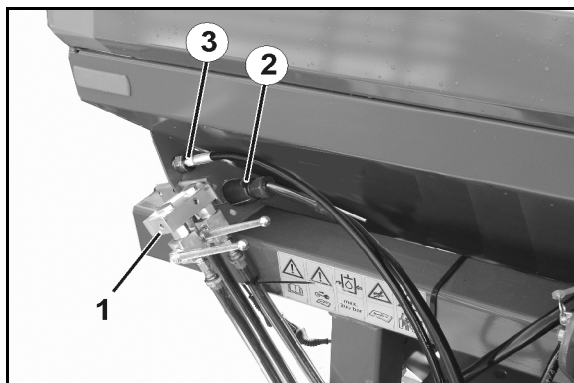


Fig. 8

## 4.4 Transportation equipment

ZA-X: Fig. 9/...

- (1) Rear lights, brake lights and turn indicators
  - (2) Licence plate holder with lighting
- required if the tractor lighting and licence plate are covered
- (3) Rear warning signs
  - (4) Side reflectors Without illustration: Front lighting system, required for the hopper extension L800:

- 2 front warning signs
- Left and right limiting lights

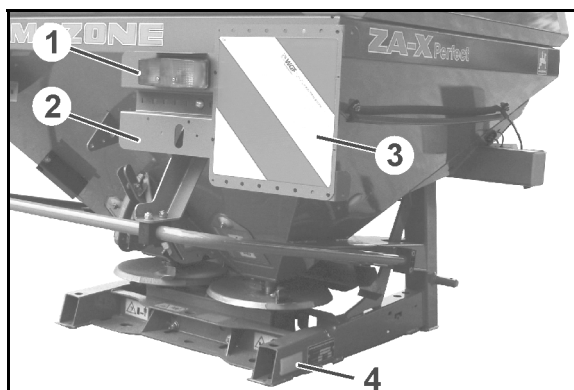


Fig. 9

ZA-XW: Fig. 10/...

- (1) Rear lights, brake lights and turn indicators.
- (2) Rear warning sign



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

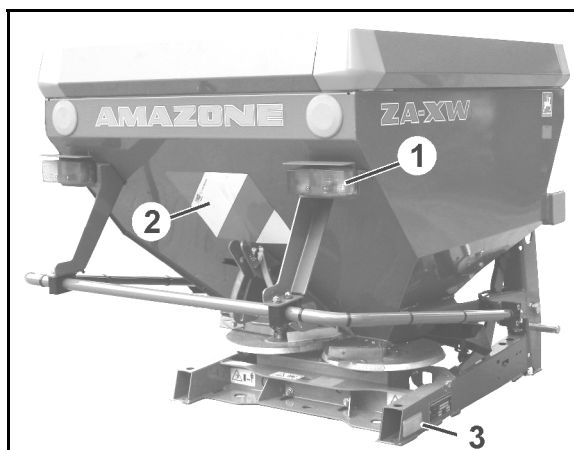


Fig. 10

## 4.5 Intended use

The AMAZONE fertiliser spreader ZA-X / ZA-XW

- is designed exclusively for conventional agricultural applications and is suitable for spreading dry, granuled, prilled and crystalline fertiliser, seed and slug pellets.
- is attached to the tractor's three-point hydraulic system and operated by one person.
- must only be mounted on a transport frame approved by AMAZONEN-Werke.
- Sloping terrain can be travelled as follows:
  - Along the contours

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

Up the slope	15 %
Down the slope	15 %

The intended use also includes:

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

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

For any damage resulting from improper use:

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

## 4.6 Danger areas and danger points

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

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

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

No-one may stand in the machine danger area:

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

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

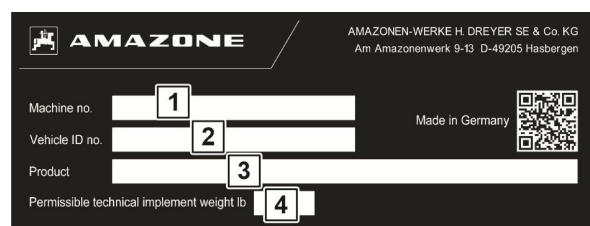
Danger points exist:

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

## 4.7 Rating plate

### Machine rating plate

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



The image shows a machine rating plate for an Amazone implement. It features the Amazone logo and company information: AMAZONEN-WERKE H. DREYER SE & Co. KG, Am Amazonenwerk 9-13 D-49205 Hasbergen. The plate includes fields for Machine no., Vehicle ID no., Product, and Permissible technical implement weight lb, each with a numbered box (1-4) indicating the required information. A QR code is also present, and it states 'Made in Germany'.

## 4.8 Technical data

	ZA-X 603	+S 250	<b>ZA-X 903</b>	+ S 350	+ L 800	ZA-X 1403	+S 350	ZA-XW 503	+S 200
Hopper capacity	136 gal	190 gal	200 gal	265 gal	375 gal	310 gal	375 gal	110 gal	155 gal
	620 l	870 l	900 l	1200 l	1700 l	1400 l	1700 l	500 l	700 l
Payload	2205 lb	2205 lb	3970 lb	3970 lb	3970 lb	3970 lb	3970 lb	2205 lb	2205 lb
	1000 kg	1000 kg	1800 kg	1800 kg	1800 kg	1800 kg	1800 kg	1000 kg	1000 kg
Basic weight (kg)	467 lb	520 lb	547 lb	622 lb	657 lb	606 lb	681 lb	428 lb	478 lb
	212 kg	236 kg	248 kg	282 kg	298 kg	275 kg	309 kg	194 kg	217 kg
Filling height (m)	3 ft	3,5 ft	3,2 ft	3,6 ft	4,1 ft	3,8 ft	4,3 ft	3 ft	3,5 ft
	0,91 m	1,05 m	0,97m	1,11 m	1,25 m	1,16 m	1,30 m	0,93 m	1,07 m
Filling width (m)	4,6 ft	4,5 ft	6,3 ft	6,2 ft	8,1 ft	6,3 ft	6,2 ft	3 ft	2,9 ft
	1,40 m	1,37 m	1,91 m	1,88 m	2,48 m	1,91 m	1,88 m	0,90 m	0,87 m
Overall width (m)	4,9 ft	5 ft	6,6 ft	6,8 ft	8,3 ft	6,6 ft	6,8 ft	3,4 ft	3,5 ft
	1,50 m	1,55 m	2,02 m	2,07 m	2,52 m	2,02 m	2,07 m	1,03 m	1,08 m
Overall length (m)	4 ft	4,2 ft	4,3 ft	4,5 ft	4,5 ft	4,3 ft	4,5 ft	4 ft	4,2 ft
	1,23 m	1,28 m	1,30 m	1,35 m	1,35 m	1,30 m	1,35 m	1,23 m	1,28 m
Working width (m)	33-60 ft /10-18 m								
Distance from centre of gravity d (m)	1,9 ft	1,9 ft		1,9 ft		1,9 ft		2 ft	
(See pageSeite 64)	0.59 m	0.59 m		0.59 m		0.59 m		0.61 m	
Permitted mounting category	Cat. 1 Cat. 2N Cat. 2	Cat. 2		Cat. 2		Cat. 2		Cat. 1 Cat. 2N Cat. 2	

<b>ZA-X</b>		
Drive	Gear ratio	PTO shaft speed : Spreading disc speed 1 : 1.33
	Spreader disc speed	Standard speed 720 rpm. Maximum permissible speed 870 rpm
	Universal joint shaft speed	Standard speed 540 rpm. Maximum permissible speed 650 rpm

## **4.9 Necessary tractor equipment**

---

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

### **Tractor engine power**

---

Hopper capacity:

600 l	from 37 kW (50 bhp) upwards
900 l	from 44 kW (60 bhp) upwards
1400 l	from 59 kW (80 bhp) upwards
1700 l	from 74 kW (100 bhp) upwards

### **Electrical system**

---

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

### **Hydraulic system**

---

Maximum operating pressure:	• 3046 psi / 210 bar
Tractor pump power:	• At least 3,96 gpm at 2176 psi // 15l/min at 150 bar
Implement hydraulic fluid:	• HLP68 DIN 51524  The implement hydraulic fluid is suitable for the combined hydraulic fluid circuits of all standard tractor brands.
Control unit:	• One single-acting control unit

### **Universal joint shaft**

---

Required speed:	• 540 rpm
Direction of rotation:	• Clockwise, viewed from rear toward the tractor.

### **Three-point attachment**

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

## **4.10 Noise production data**

---

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

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.



## 5 Structure and function

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

### 5.1 Function

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

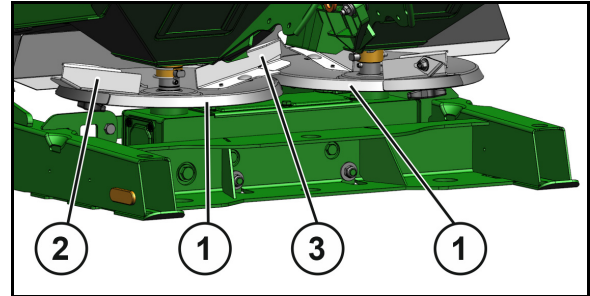


Fig. 11

The product slides down along the hopper walls to the outlet opening (1). The agitator heads (2) in the hopper tips can be disengaged and ensure uniform fertiliser flow to the spreading discs.

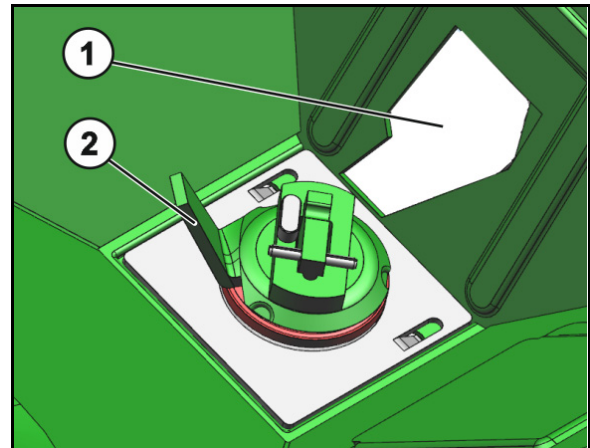


Fig. 12

The fertiliser is fed out along the spreading vane and discharged by the spreading discs moving at a speed of 720 rpm.

During this process, the drive rev. speed of the PTO shaft is 540 rpm.

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

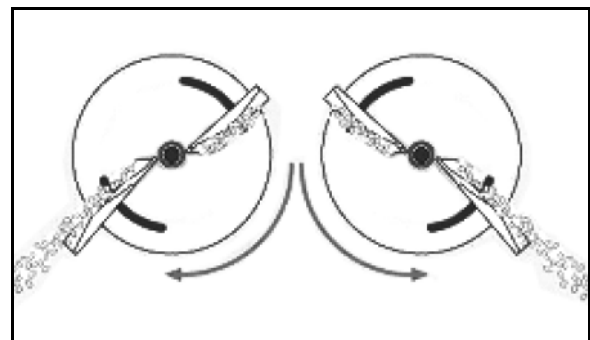


Fig. 13

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

The guard and function screens cover the entire hopper and serve

- as protection against accidental contact with the rotating agitator heads.
- to protect against foreign particles and fertiliser clods.

ZA-X 603 and ZA-XW have a screwed-on guard screen.

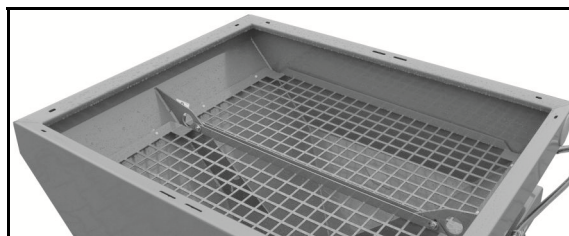


Fig. 14

ZA-X 903 and ZA-X 1403 have a foldable guard screen.

Fig. 15/...

- (1) Guard and function screen
- (2) Handle with guard screen lock
- (3) Lock for opened guard screen

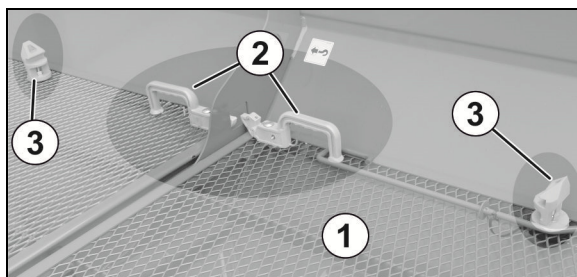


Fig. 15

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

Unlocking tool in:

Fig. 16/1: Parking position

Fig. 17/1: Unlock position for folding up the guard screen

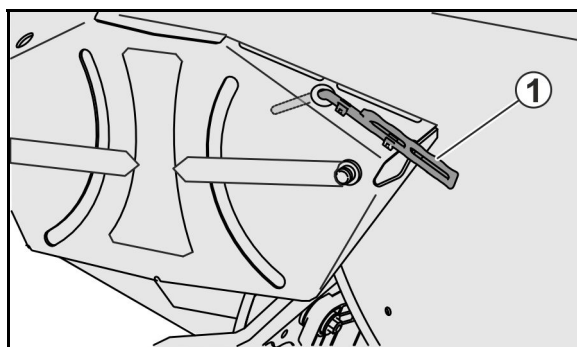


Fig. 16

**Opening the guard screen:**

1. Move the unlocking tool from parking position into unlock position.
  2. Raise the handle and rotate the unlock tool on the handle (Fig. 17).
- Safety guard lock unlocked.
3. Swing up guard screen until the lock on the edge of the hopper engages (Fig. 18).
  4. Move the unlocking tool into parking position.

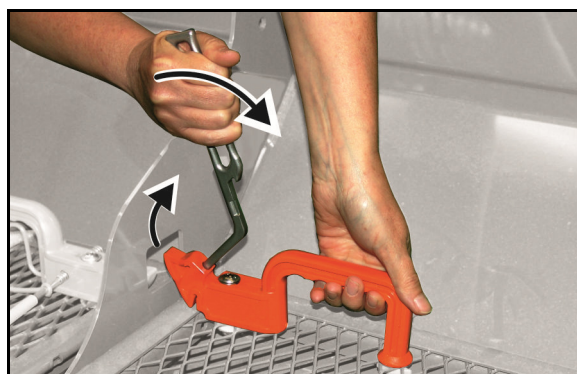


Fig. 17



- Before closing the guard screen, push down the lock (Fig. 18).
- The guard screen locks automatically once closed.

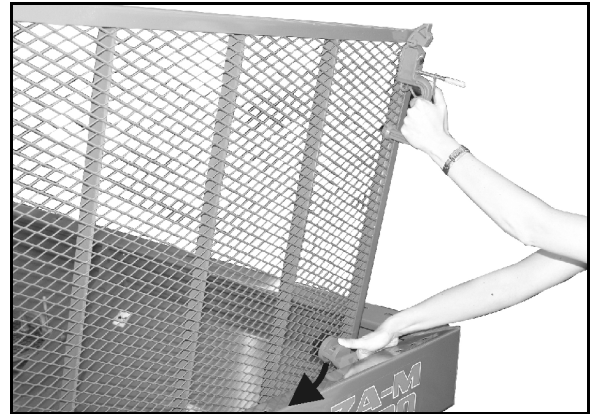


Fig. 18

### 5.3 Guard tube (protective device)

Serves as a bumper for the prevention of accidents when the spreading discs are in operation.

Fig. 19/1:

- for ZA-X 903 / 1403



Fig. 19

Fig. 20/1:

- for ZA-X 603 / ZA-XW



Fig. 20

## 5.4 PTO shaft

The PTO shaft transmits power between the tractor and machine.

- Standard PTO shaft (28 in / 710 mm)

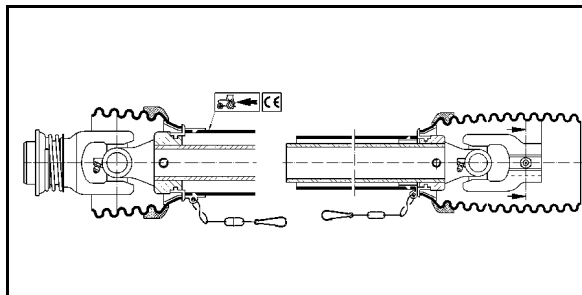


Fig. 21

Fig. 22:

- PTO shaft with friction clutch (optional, 30 in / 760 mm)

Always attach the friction clutch on the machine side.

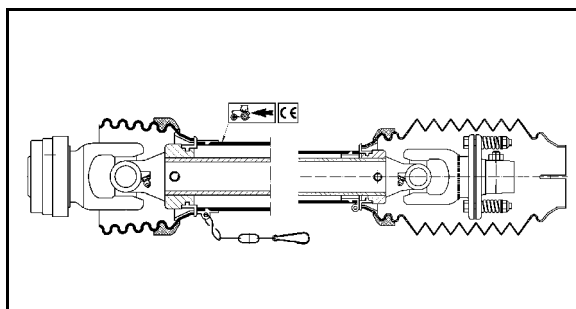


Fig. 22



### WARNING

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

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



### WARNING

**Danger from being entangled and drawn in by unguarded PTO shaft or damaged safety devices!**

- Never use the PTO shaft if the safety device is missing or damaged, or without correctly using the supporting chain.
- Before each use, check that all safety devices of the PTO shaft are installed and fully functional.
- Attach the supporting chains (does not apply to PTO shaft with full guard) in such a way as to ensure sufficient swivelling range in all operating positions. Supporting chains must not become caught on machine or tractor parts.
- Have any damaged or missing parts of the PTO shaft replaced immediately with OEM parts from the PTO shaft manufacturer. Note that only a specialist workshop may repair a PTO shaft.

**WARNING**

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

These risks pose serious injuries or death.

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

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



- Use only the provided PTO shaft or one of the same type.
- Read and follow the operating manual for the PTO shaft. Correct use and maintenance of the PTO shaft prevents serious accidents.
- When coupling the PTO shaft, observe the operating manual from the PTO shaft manufacturer.
- Ensure sufficient clearance in the swivelling range of the PTO shaft. Insufficient clearance causes damage to the PTO shaft.
- Observe the permitted drive rev. speed of the machine.
- If the PTO shaft has an overload or freewheel clutch, you must always install the clutch on the machine side.
- Observe the correct installation position of the PTO shaft. The tractor symbol on the protective tube of the PTO shaft identifies the tractor-side connection of the PTO shaft.
- Before switching on the universal joint shaft, read and follow the safety precautions for universal joint shaft operation in the chapter entitled "Safety information for the user", page 27.

### 5.4.1 Coupling the PTO shaft

1. Clean and grease the universal joint shaft on the tractor and the gearbox input shaft of the machine.
2. Couple the tractor to the machine.
3. Secure the tractor against unintentional starting and unintentional rolling away.
4. Check whether the universal joint shaft is switched off.
5. Couple the PTO shaft to the universal joint shaft of the tractor. When coupling the PTO shaft, observe the instructions of the PTO shaft manufacturer and the permitted drive rev. speed of the machine.  
The tractor symbol on the protective tube of the PTO shaft identifies the tractor-side connection of the PTO shaft.
6. Secure the PTO shaft guard using the supporting chain(s) to prevent movement.
  - 6.1 Fasten the supporting chain(s) so that it is as perpendicular to the PTO shaft as possible.
  - 6.2 Attach the supporting chain(s) in a way that ensures sufficient swivelling range of the PTO shaft in all operating positions. Supporting chains must not become caught on machine or tractor parts.

### 5.4.2 Uncoupling the PTO shaft



#### CAUTION

#### **Danger from burns on hot components of the PTO shaft!**

This danger can cause minor to serious injuries to the hands.

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



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

1. Switch off the universal joint shaft.
2. Lower the machine onto the ground.
3. Secure the tractor and machine against unintentional starting and unintentional rolling away.
4. Pull the PTO shaft off of the universal joint shaft of the tractor.
5. Place the PTO shaft in the holder provided (Fig. 23/1).



**Fig. 23**



### 5.4.3 PTO shaft with friction clutch (optional)

The PTO shaft with friction coupling is recommended in the event of frequent shearing of the shear bolt between the connection fork and gearbox flange bush and for tractors with hard-mesh universal joint shaft coupling.

**Function and maintenance:** Transient peak torques of approx. 400 Nm or more—which can occur when the universal joint shaft is switched on, for example—are limited by the friction clutch. The friction clutch prevents damage to the PTO shaft and gearbox elements. Therefore, proper function of the friction clutch must be ensured at all times. Thermal distortion of the friction lining prevents the friction clutch from activating.

#### Installing:

1. Use an extractor to pull the flange bushing (Fig. 24/1) from the gearbox input shaft.
2. Clean the gearbox input shaft (Fig. 25/1).
3. Take the PTO shaft apart.
4. Remove the locking screw (Fig. 25/6).
5. Turn the PTO shaft guard (Fig. 25/2) into installation position (Fig. 25/7).
6. Withdraw the guard half.
7. Release the lock nut (Fig. 25/3) in the connecting fork of the friction clutch (so that the setscrew no longer protrudes beyond the lock nut), unscrew the hexagon socket setscrew (Fig. 25/4) and check that the connecting fork can be easily fitted on the gearbox shaft.
8. Push the greased connection fork onto the gearbox input shaft as far as it will go.



Make sure the feather key (Fig. 25/5) is fully covered!

9. Secure the PTO shaft against axial movement. Firmly tighten the setscrew with a hexagon socket wrench and lock with nut (Fig. 25/3).
10. Refit and lock the guard half and insert the PTO shaft halves into each other.
11. Secure the PTO shaft guard against rotation by attaching the chain to the machine.

#### Removing:

1. Release the PTO shaft guard and remove toward the rear.
2. Unscrew the lock nuts (Fig. 25/3) in the connection fork from the friction clutch. Remove the setscrew (Fig. 25/4).
3. Pry the connection fork off of the gearbox input shaft using a flat bar.

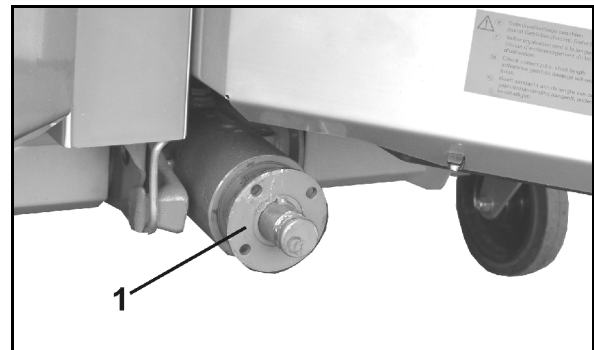


Fig. 24

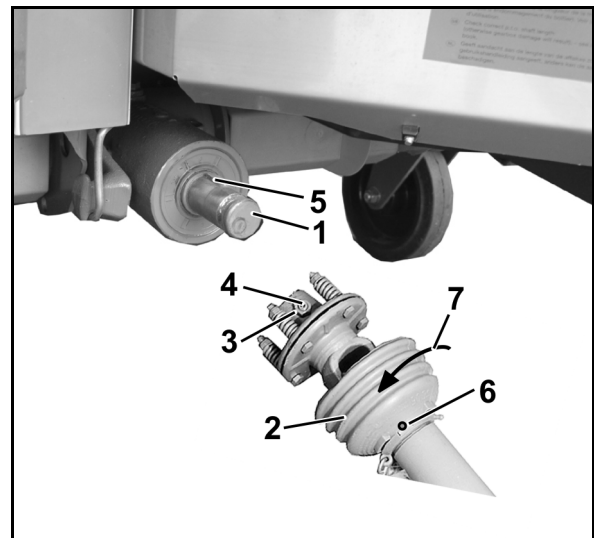
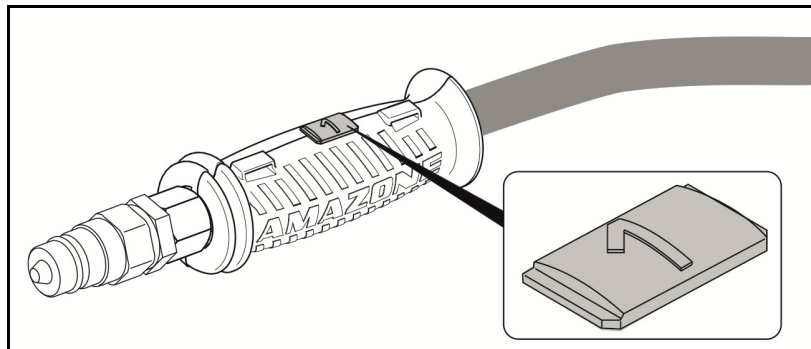


Fig. 25

## 5.5 Hydraulic connections




- All hydraulic hose lines are equipped with grips.








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



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

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

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

Marking		Function			Tractor control unit	
yellow			Left slider	Operation via the 2-way control	single-acting	
green			Right slider			
blue			Limiter (optional)	Operation via the 3-way control		



### WARNING

**Danger of infection from escaping hydraulic fluid at high pressure!**

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

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



### 5.5.1 Coupling the hydraulic hose lines



#### WARNING

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

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



- 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 210 bars.
- 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 tractor control unit on the tractor to float position (neutral position).
2. Clean the hydraulic connector for the hydraulic hose lines before connecting them to the tractor.
3. Connect the hydraulic hose line(s) to the tractor control unit(s).

### 5.5.2 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the control unit on the tractor to float position (neutral position).
2. Unlock the hydraulic connectors from the hydraulic sockets.
3. Protect the hydraulic connector and hydraulic socket against soiling using the dust protection caps.
4. Place the hydraulic hose lines in the hose cabinet (Fig. 26).



Fig. 26

## 5.6 Spreading discs

As seen in the direction of travel:

- Left spreading disc (Fig. 27/1) with mark **L**.
- Right spreading disc (Fig. 27/2) with mark **R**.

Spreading vane:

- Long (Fig. 27/3) - Adjustment scale with values from **30** to **50**.
- Short (Fig. 27/4) - Adjustment scale with values from **0** to **20**.

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

The working width of the spreading discs can be adjusted infinitely by swivelling the spreading vanes.

By swivelling the swivel blades of the **short** spreading vanes upwards (Fig. 28/1), you can reconfigure the machine for late-season top-dressing without the need for tools. Configure the settings using the information in the setting chart. You can easily check the configured working width using the mobile fertiliser test rig (optional).

The spreading discs and agitators are driven by the PTO shaft via the gearbox.

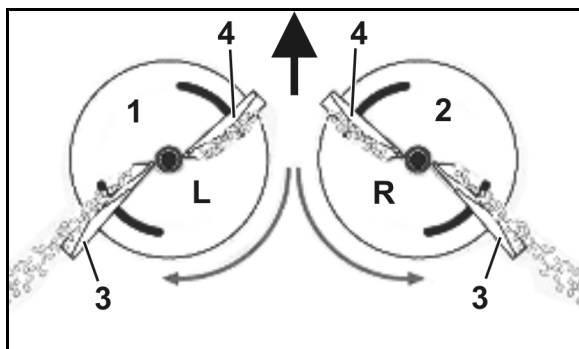


Fig. 27

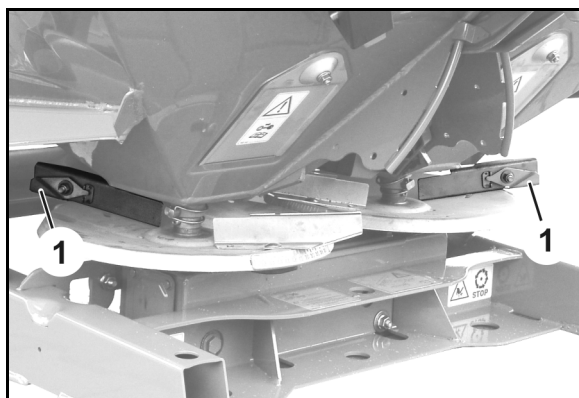


Fig. 28

## 5.7 Agitator

Depending on the specifications of the setting chart, the agitator heads (Fig. 29/1) in the hopper tips can be disengaged

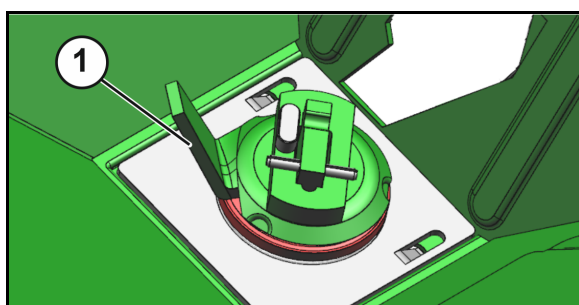


Fig. 29

## 5.8 Slider

Fig. 30/...

- (1) Slider
- (2) Outlet opening

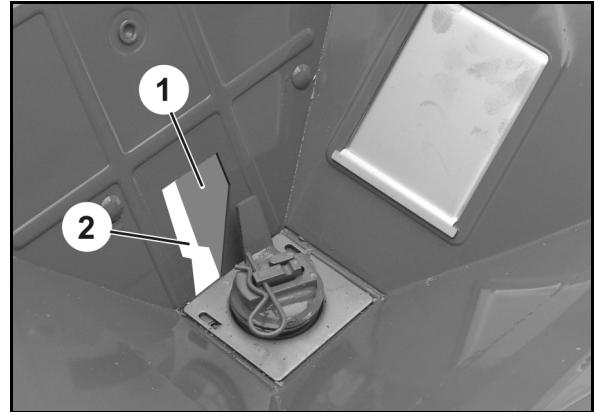


Fig. 30

Spread rate setting is carried out manually via the setting levers (Fig. 31/1, Fig. 32/1) by setting the outlet openings to different widths.

The setting levers serve as the stop for the open sliders.

**Take the respective slider position required from the setting chart. The slider position is read from the scale (Fig. 31/2 Fig. 32/2).**

The sliders are closed using hydraulic cylinders and opened using tension springs.

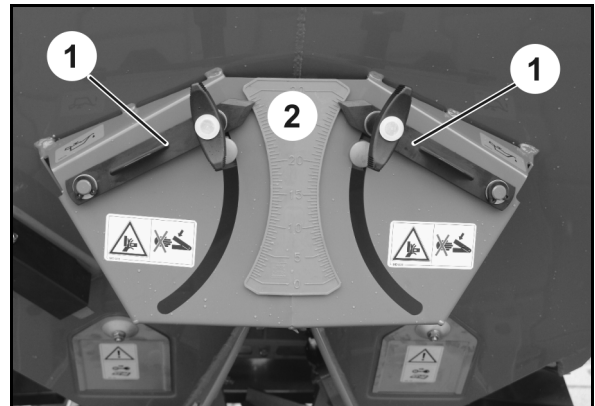


Fig. 31

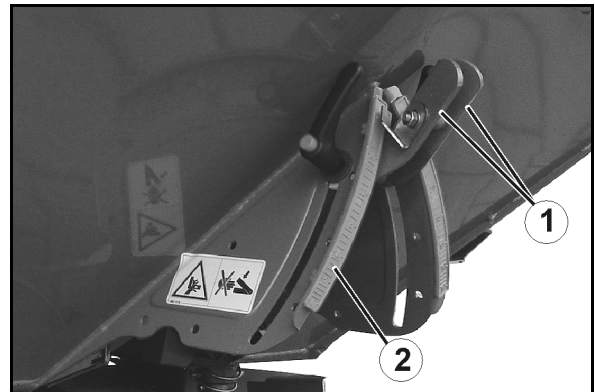
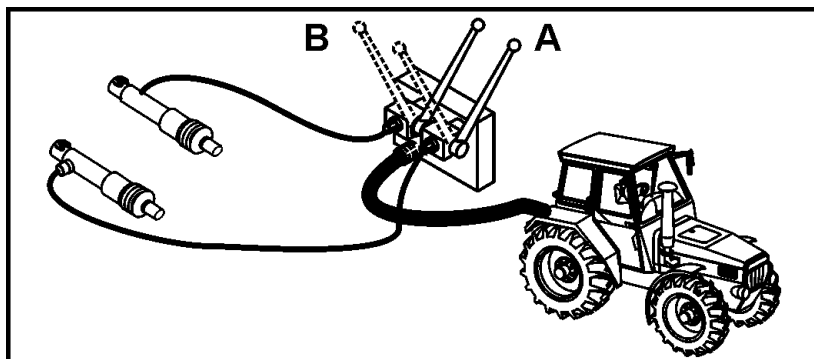


Fig. 32

## 5.9 Two-way control

The hydraulic opening and closing of the sliders is controlled via the two-way control.



**Fig. 33**

The two-way control

- is connected on the tractor side to a single-acting control unit
- allows separate actuation of the two slide gates.

**A** → Ball valves closed

**B** → Ball valves open

- Left slider → Hose marking *yellow*
- Right slider → Hose marking *green*



### Open both sliders

Both sliders are closed, lever in Position A!

1. Set both levers to Position B.
2. Actuate tractor control unit (relieve load).

→ Open both sliders.

### Open slider on one side

Both sliders are closed, lever in Position A!

1. Set lever for desired slider to Position B.
2. Actuate tractor control unit (relieve load).

→ Desired slider opens.

### Close slider on one side

Both sliders are open, lever in Position B!

1. Move lever for remaining open slider to Position A.
2. Operate tractor control unit.

→ Desired slider closes.

### Changing from single-sided to double-sided spreading

One slider is open, lever in Position B.

One slider is closed, lever in Position A!

1. Lever for closed slider in Position B.
2. Actuate tractor control unit (relieve load).

→ Slider opens.

### Installing the holder of the two-way control on the tractor

1. Drill two holes ( $\varnothing$  12 mm) for the fastening screws at a suitable location.
2. Install the holder using the fastening screws.

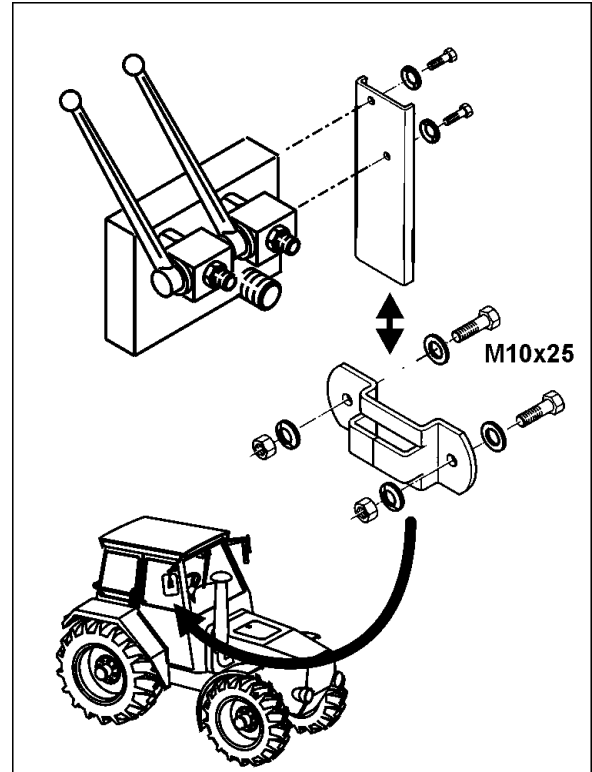


Fig. 34

### 5.10 Three-way control (optional)

The three-way control is required for hydraulic individual slider actuation and using the **Limiter X** for tractors with only one single-acting hydraulic connection.

- **Limiter X** → Hose identification *blue*

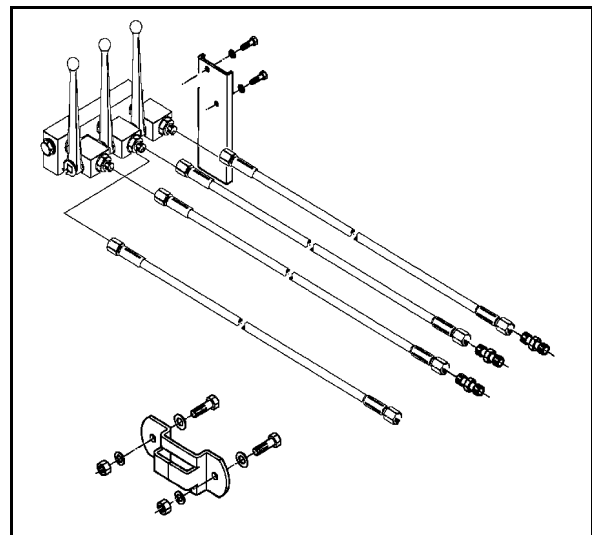


Fig. 35

## 5.11 3-point attachment frame

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

ZA-X 903 /1403

Fig. 36/...

- (1) Upper coupling point with switchable upper link pin for Category 1 / Category 2
- (2) Lower coupling points Category 2

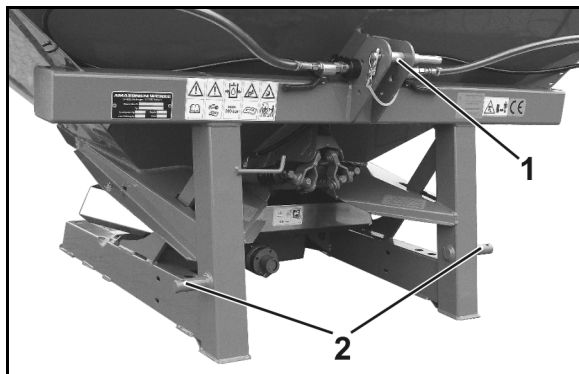


Fig. 36

ZA-X 603, ZA-XW

Fig. 37/...

- (1) Upper coupling point with switchable upper link pin for Category 1 / Category 2
- (2) Lower coupling points Category 2
- (3) Lower coupling points Category 1

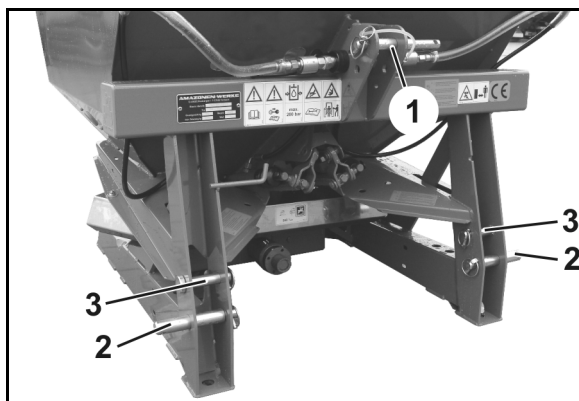


Fig. 37



### WARNING

**Risk of accidents if the connection between machine and tractor separates!**

Lower link pin installed on one side: use ball sleeves with integrated mount for linch pins.

## 5.12 Boundary spreading/side spreading

### Limiter X (optional)

Only for ZA-X 903 and ZA-X 1403.

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

Fig. 38/...

(1) Border spread deflector

### Locking block (optional)

For convenient operation of the Limiter X; prevents unintentional lowering of the border spread deflector when the tractor control unit is not tightly sealed (separate double-acting control unit required).

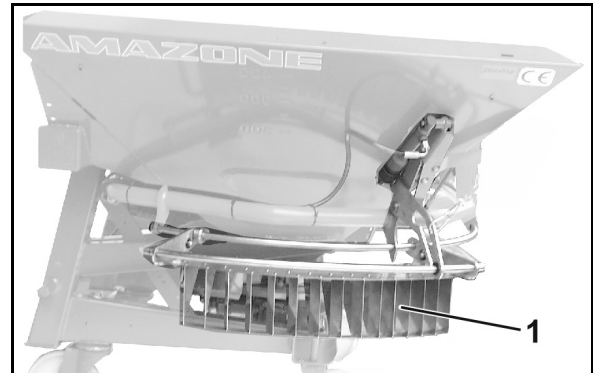


Fig. 38

### Tele-Quick border spreading vanes

For left-side boundary spreading.

The Tele-Quick border spreading vane allows spreading along field borders, as specified in the fertiliser ordinance.



Fig. 39

### Border spread deflector (optional)

If the first tramline is placed directly at the field border, the border spread deflector (optional) can be used for one-sided spreading at the field border.

#### Installing:

Fasten the frame member (Fig. 40/2) of the border spread deflector (Fig. 40/1) with the four fastening screws (Fig. 40/3) on the roof plate of the centrifugal broadcaster.

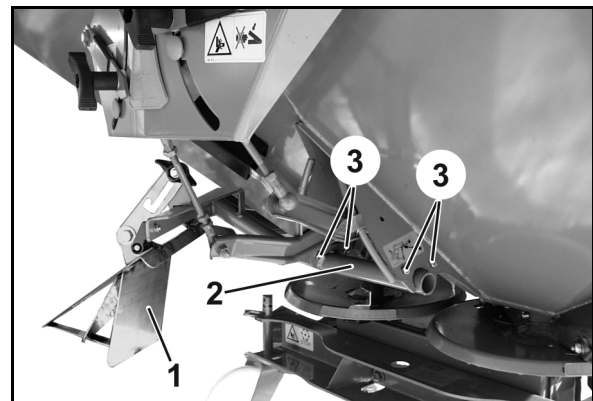


Fig. 40



### 5.13 Calibration kit (optional)

The calibration kit is used to determine the slider position for the desired spread rate using a nomogram.

#### Installing:

1. Remove the plastic plug (Fig. 41/1).
2. Mount the outlet chute (Fig. 42/1) using the fastening screws (Fig. 42/2).

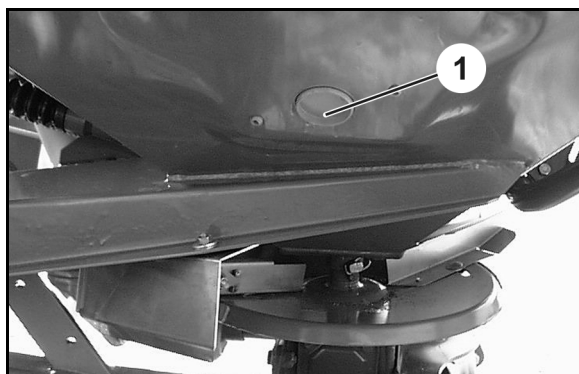


Fig. 41

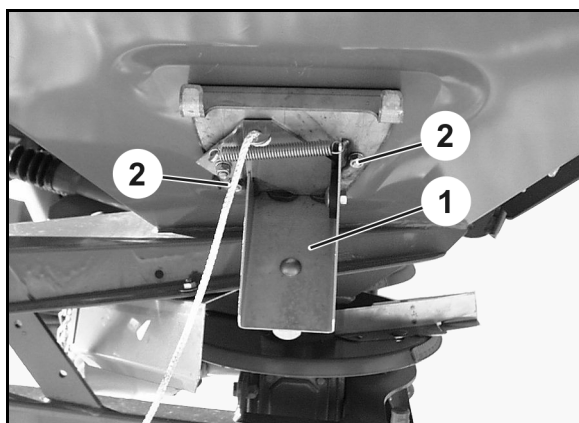


Fig. 42



## 5.14 Transport and parking device (removable, optional)

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

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



### WARNING

**Danger of injury due to the filled implement tipping.**

Couple and uncouple the implement only when it is empty.



### WARNING

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

#### Installation/removal of transportation device:

1. Couple the machine to the tractor.
2. Raise the machine with the tractor's hydraulic system.
3. Secure the machine against unintentional starting and unintentional rolling away.
4. Support the raised machine to prevent unintentional lowering.
5. Steerable brake rollers (Fig. 43/1), front
  - o Install and secure with clip pin (Fig. 43/2)
  - or
  - o Remove after taking out clip pin.



Clip pin in parking position (Fig. 44/1).

6. Rigid rollers (Fig. 45/1) at rear
  - o Mount and secure with safety splint (Fig. 45/2) in the central bore
  - or
  - o Remove after taking out safety splint.

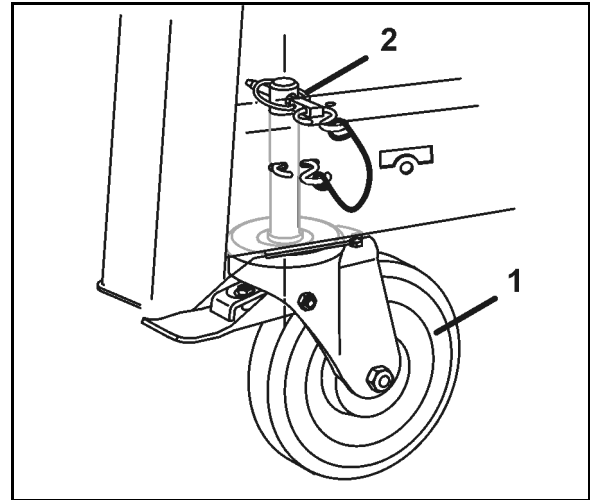


Fig. 43

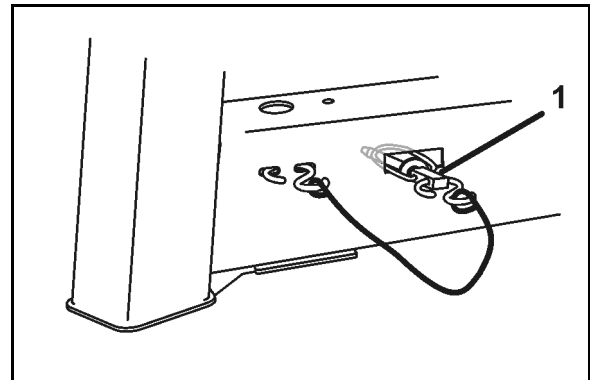


Fig. 44

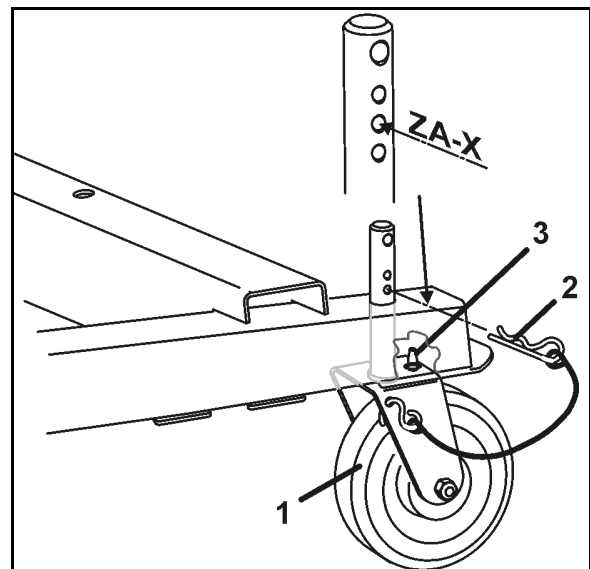


Fig. 45



When installing the rigid rollers ensure that the pin (Fig. 45/3) goes through the bore of the frame, thus holding the rollers in longitudinal direction.

## 5.15 Coupling device



### CAUTION

The coupling device is used to couple implements and double-axle trailer in the following cases:

- The forward speed does not exceed 16 mph / 25 km/h.
- The trailer has an overrun brake or a brake system that can be actuated by the driver of the tractor.
- The permissible total weight of the trailer does not exceed 1.25 times the permissible total weight of the motor tractor, but in all events is no more than 5 t.

Couple and secure the trailer between the attachment points (Fig. 47/1) using a bolt connection.

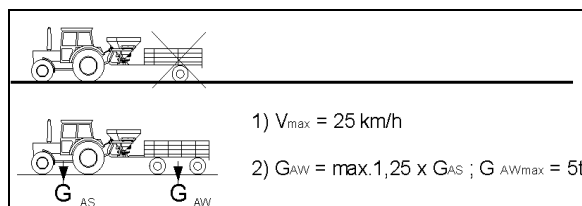


Fig. 46

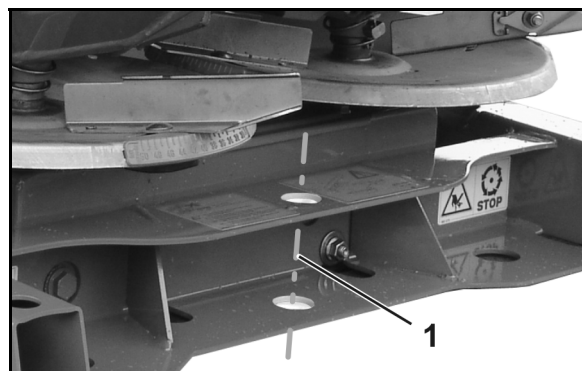


Fig. 47

## 5.16 Hopper cover (optional)

The hopper cover guarantees dry product even in wet weather.

### Hopper cover swivelable

The swivelable hopper cover is folded forwards for filling.

- ZA-X 903, 1403 (Fig. 48):
- (1) Hand lever for opening and closing
  - (2) Automatic lock



### CAUTION

To open and close the cover, grasp the hand lever by the handle only.

Hand pinch point!



Fig. 48

- ZA-X 603 (Fig. 49)

### Cover

- ZA-XW 503

The cover is pulled over the corners of the hopper and held in place using a rubber band.



Fig. 49

## 5.17 Hopper extensions (optional)

Fig. 50: Narrow hopper extensions:

- S200 for ZA-XW503
- S250 for ZA-X 603
- S350 for ZA-X 903 / 1403

Fig. 51: Wide hopper extensions:

- L800 for ZA-X 903

(See also Seite 35.)



Fig. 50



Fig. 51

## 5.18 Row spreading attachment for specialised crops

The 2-row spreading attachment (Fig. 52) for row and specialised crops can be retrofitted at any time.

The row spacing that can be spread can be set between 6,5 ft / 2 m and 20 ft / 6 m.

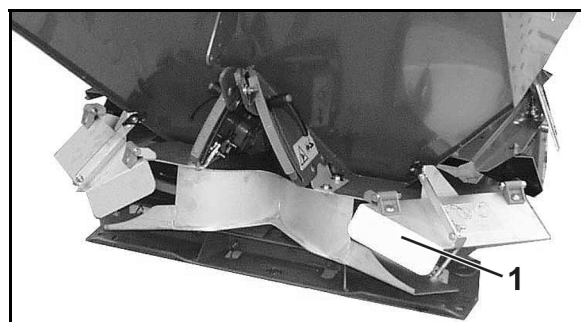


Fig. 52

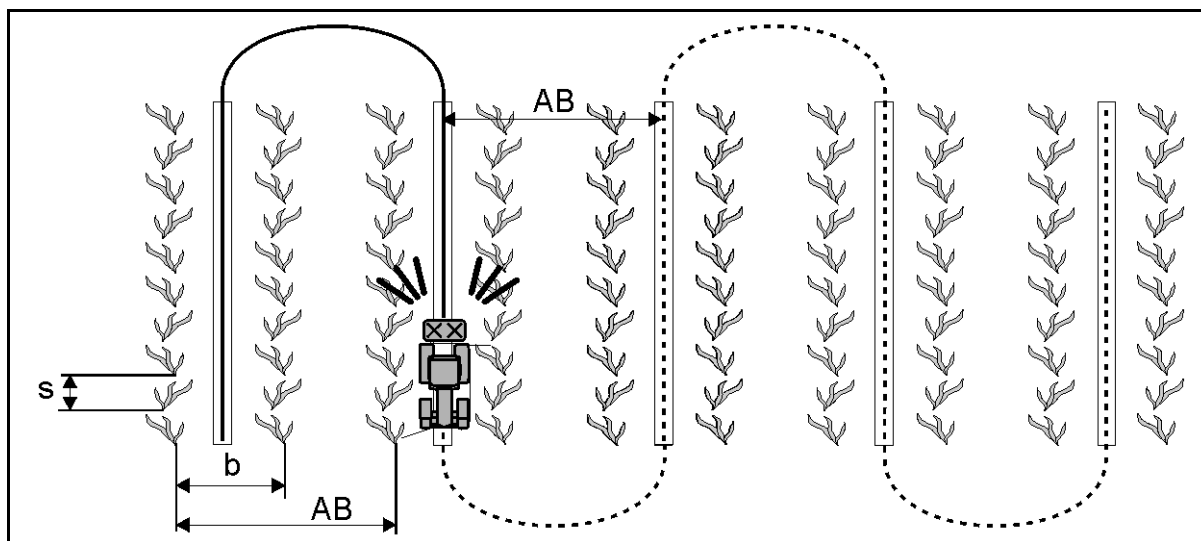
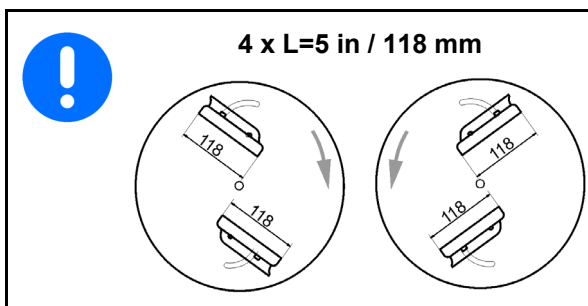


Fig. 53

### Setting chart for row spacings

Row spacing		Working width		Mounting height	Spreading disc speed	Position of the spreading vanes on the scale	Guide board position
6,5 ft	2 m	13 ft	4 m	50/50	450	0/30	2
10 ft	3 m	20 ft	6 m	80/80	540	6/36	2
13 ft	4 m	26 ft	8 m	80/80	540	6/36	3
16 ft	5 m	32 ft	10 m	80/80	540	10/41	4
20 ft	6 m	40 ft	12 m	80/80	540	14/45	5

### Conversion of spread rate in g/plant to lb/ac or kg/ha

$$\text{Application rate [lb/ac ][kg/ha]} = \frac{D \text{ [g/plant]}}{s \text{ [ft/m]} \times b \text{ [ft/m]}} \times 10$$

- D -        –    Amount of fertilizer per plant
- b         –    Distance of the rows
- AB        –    Working width = 2 x b
- s         –    Distance of the plants



### Spreading in rows of crops:

The setting chart for spread rates in kg/ha refers to a run between every second tramline (**Fehler! Verweisquelle konnte nicht gefunden werden.**).

### Using the setting chart

1. Convert the amount of fertilizer from g/plant to kg/ha.
2. In the setting chart, look for the desired spread rate in kg/ha in the columns for
  - o the working width
  - o the travel speed
 for the respective fertilizer.
3. Look for the shutter position in the same line to the left.

## Setting chart for spread rates

KAS 27% N gran. BASF; Hydro; DSM; Kemira; Agrolinz:	0,036 lb/in <sup>3</sup> l	1.02 kg/l
NP-and NPK types gran. BASF:	0,040 lb/in <sup>3</sup> l	1.10 kg/l
Hydro NPK varieties prills:	0,039 lb/in <sup>3</sup> l	1.08 kg/l
Kemistar Kemira NPK 20-7-10 + 3:	1,121 lb/in <sup>3</sup> l	31.03 kg/l

Slider position	Working width [ft] = 2 x s														
	4			6			9			10			12		
	mph			mph			mph			mph			mph		
	5	6	7	5	6	7	5	6	7	5	6	7	5	6	7
9	181	145	120	120	96	80	80	64	53	72	58	48	60	48	40
10	295	236	197	197	158	131	131	105	87	118	95	79	98	78	65
11	437	350	292	292	233	194	194	155	129	175	140	116	145	117	97
12	581	465	387	386	310	258	258	206	172	232	186	154	194	154	129
13				485	388	323	323	259	215	291	232	193	243	194	161
14				582	466	388	388	310	259	349	279	233	291	233	194
15				380	543	453	453	362	301	408	326	271	340	272	226
16							517	413	344	465	372	310	392	310	259
17										522	418	348	345	339	290
	Nominal quantity [lb/ac]														

Slider position	Working width [m] = 2 x s														
	4			6			9			10			12		
	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
9	203	162	135	135	108	90	90	72	60	81	65	54	67,5	54	45
10	331	265	221	221	177	147	147	118	98	132	106	88	110	88	73
11	490	392	327	327	261	218	218	174	145	196	157	130	163	131	109
12	651	521	434	433	347	289	289	231	193	260	208	173	217	173	145
13				544	435	362	362	290	241	326	261	217	272	217	181
14				652	522	435	435	348	290	391	313	261	326	261	217
15				762	609	508	508	406	338	457	365	304	381	305	254
16							579	463	386	521	417	348	439	348	290
17										585	468	390	387	380	325
	Nominal quantity [kg/ha]														

Calcium cyanamide 19.8% N Perika SKW:	0,91 lb/ac	1.02 kg/l
ESTA Kieserit gran. 25% MgO K+SA:	1,12 lb/ac	1.26 kg/l
Perika (Kst) 19.8% N Agroline:	0,91 lb/ac	1.02 kg/l

Slider position	Working width [m] = 2 x s														
	4			6			9			10			12		
	5	mph	7	5	mph	5	6	mph	5	6	mph	6	7	mph	6
8	133	107	89	89	71	59	59	47	40	80	64	54	66	54	45
9	228	182	152	152	121	102	102	81	68	91	73	61	76	61	51
10	370	296	247	247	197	165	165	131	110	148	114	99	123	99	55
11	553	443	367	367	294	245	245	196	163	220	177	147	184	147	122
12	727	582	485	485	388	323	323	259	233	291	233	194	247	194	161
13				611	489	407	407	326	271	367	294	244	305	244	203
14							570	455	379	497	410	342	427	342	285
15										585	468	390	488	390	326
16										658	526	438	549	438	366

#### Nominal quantity [lb/ac]

Calcium cyanamide 19.8% N Perika SKW:	1.02 kg/l
ESTA Kieserit gran. 25% MgO K+SA:	1.26 kg/l
Perika (Kst) 19.8% N Agroline:	1.02 kg/l

Slider position	Working width [m] = 2 x s														
	4			6			9			10			12		
	8	km/h	12	8	km/h	12	8	km/h	12	8	km/h	12	8	km/h	12
8	150	120	100	100	80	66	66	53	45	90	72	60	75	60	50
9	256	205	170	170	136	114	114	91	76	102	82	68	85	68	57
10	415	332	277	277	221	185	185	147	123	166	133	111	138	111	62
11	620	496	411	411	330	275	275	220	183	247	198	165	206	165	137
12	815	652	544	544	435	362	362	290	261	326	261	217	277	217	181
13				685	548	456	456	365	304	411	329	274	342	274	228
14							639	510	425	557	460	383	479	383	320
15										656	525	437	547	437	365
16										737	590	491	615	491	410

#### Nominal quantity [kg/ha]



To determine the slider position for spread rates or speeds not listed here, refer to the **ZA-X** setting chart.



As an alternative to the setting chart, you can also determine the shutter position using the calibration kit.

## 5.19 Setting chart

All commercially available types of fertiliser are spread in the AMAZONE spreading hall and the setting data determined in this manner are included in the setting chart. The types of fertiliser listed in the setting chart were in a perfect state when determining the values.



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

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

See [www.amazone.de](http://www.amazone.de) → Service & Support → Online Service

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




iOS



Android







### Contact partners in the respective countries:

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



## Excerpt from the setting chart

	Name of the fertiliser		
Representation of the fertiliser			
	Grain diameter in in / mm	Bulk density in lb/ in <sup>3</sup> / kg/l	Mounting height in in / cm




Implements with electric spread rate adjustment can enter the quantity factor as an initial value for the calibration factor when calibrating the fertiliser.

After identification of the fertiliser, read the settings from the setting table:

- Shutter position (for manual spread rate setting)
- Spreading vane position
- Setting for boundary spreading



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

- please refer to [www.amazone.de](http://www.amazone.de) → **Fertiliser Service** for the most up-to-date version of the setting chart,
- the **AMAZONE** Fertiliser Service will assist you over the telephone in assigning the fertilisers and setting recommendations.  
 +49 (0) 54 05 / 501 111
- please consult the contact partner in your country.

## 5.20 EasyCheck (option)

EasyCheck is the digital test rig to check the lateral distribution on the field.

EasyCheck consists of collection mats for fertiliser and the smartphone app to determine the fertiliser lateral distribution on the field.

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

Afterwards, the collection mats are photographed using the smartphone. The app checks the lateral distribution using the photos.

If necessary, changes to the settings are suggested.

Use the AMAZONE Website to download the following:

- EasyCheck app
- EasyCheck operating manual

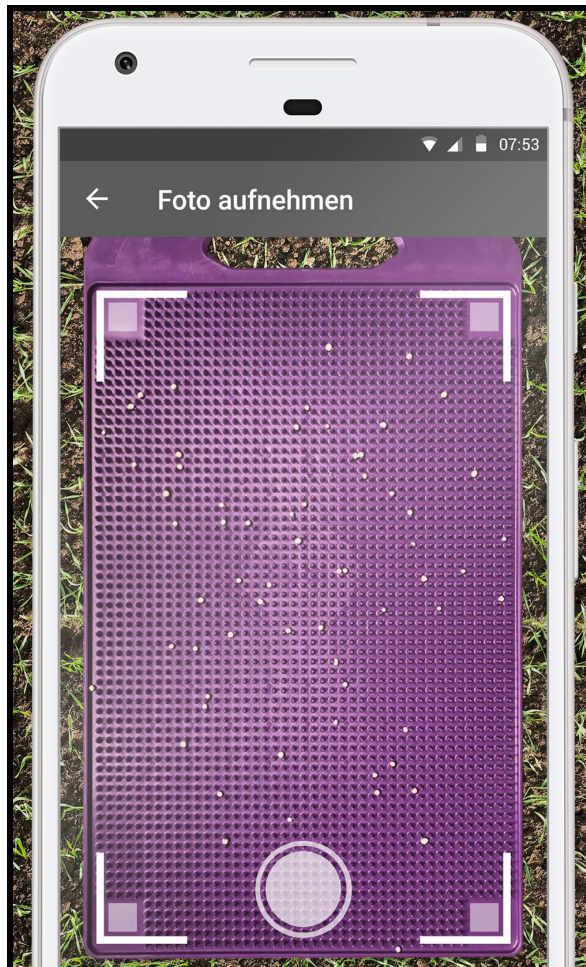


Fig. 54

## 5.21 Mobile test rig (option)

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

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

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

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

The evaluation is performed using:

- The calculation model in the mobile test rig operating manual.
- The implement software on the control terminal
- The EasyCheck app (AMAZONE Website)

Refer to the operating manual for the mobile test rig



Fig. 55

## 6 Commissioning

This section contains information

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



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



### 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 to equipment movements that:

- are continuous or
- are automatically locked or
- require a floating position or pressed position to function



Check that the spreading discs are installed correctly. Viewed in direction of travel: left spreading disc "L" and right spreading disc "R".

Check that the scales on the spreading discs are installed correctly. The scales with values from **0** to **20** are assigned to the shorter spreading vanes and the scales with values from **30** to **50** are assigned 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 permissible total weight
- The approved axle loads
- The approved drawbar load at the tractor coupling point
- The load capacity of the installed tyres
- The approved trailer load must be sufficient

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

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

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

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



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

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



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

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

### 6.1.1.1 Data required for the calculation

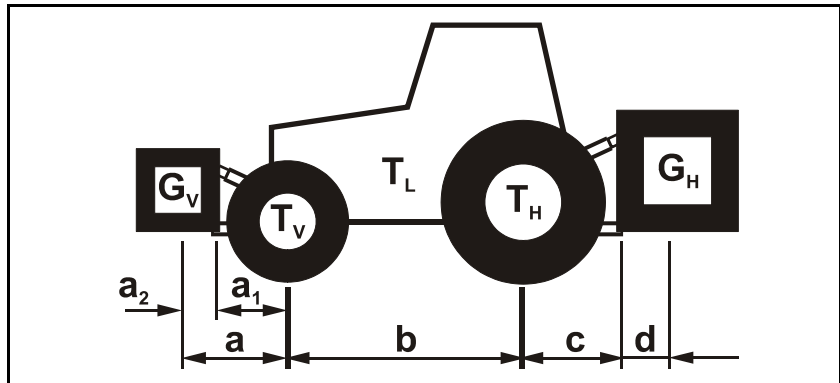


Fig. 56

$T_L$	lb [kg]	Base (empty) tractor weight	See tractor operator's manual or vehicle documentation
$T_v$	lb [kg]	Front axle load of the base tractor	
$T_H$	lb [kg]	Rear axle load of the base tractor	
$G_H$	lb [kg]	Total weight of rear-mounted implement or rear ballast	See technical data for implement or rear ballast
$G_v$	lb [kg]	Total weight of front-mounted implement or front ballast	See technical data for front-mounted implement or front ballast
$a$	ft [m]	Distance between the center of gravity of the front implement mounting or the front weight and the center of the front axle (total $a_1 + a_2$ )	See technical data of tractor and front implement mounting or front weight or measure
$a_1$	ft [m]	Distance from the center of the front axle to the center of the lower link connection	See tractor operator's manual or measure
$a_2$	ft [m]	Distance between the center of the lower link connection point and the center of gravity of the front implement mount or front weight (center of gravity distance)	See technical data of front implement mounting or front weight or measure
$b$	ft [m]	Tractor wheel base	See tractor operator's manual or vehicle documents or measure
$c$	ft [m]	Distance between the center of the rear axle and the center of the lower link connection	See tractor operator's manual or vehicle documents or measure
$d$	ft [m]	Distance between the center of the lower link connection point and the center of gravity of the rear-mounted implement or rear ballast (center of gravity distance)	See technical data of implement

## 6.1.1.2 Calculation of the required minimum ballasting at the front $G_{V \min}$ of the tractor for assurance of the steering capability

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

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

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

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

Enter the numeric value for the calculated actual front axle load and the approved tractor front axle load specified in the tractor operator's manual in the table (Section 6.1.1.7).

## 6.1.1.4 Calculation of the actual total weight of the combined tractor and implement

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

Enter the numeric value for the calculated actual total weight and the approved total tractor weight specified in the tractor operator's manual in the table (Section 6.1.1.7).

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

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

Enter the numeric value for the calculated actual rear axle load and the approved tractor rear axle load specified in the tractor operator's manual in the table (Section 6.1.1.7).

## 6.1.1.6 Tire load capacity

Enter the double value (two tires) of the approved load capacity (see, for example, tire manufacturer's documentation) in the table (Section 6.1.1.7).

**6.1.1.7 Table**

	Actual value according to calculation	Approved value according to tractor operator's manual	Double approved load capacity (two tires)
Minimum ballast front / rear	<div style="border: 1px solid black; padding: 5px; display: inline-block;">/ lb [kg]</div>	--	--
Total weight	<div style="border: 1px solid black; padding: 5px; display: inline-block;">lb [kg]</div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">lb [kg]</div>	--
Front axle load	<div style="border: 1px solid black; padding: 5px; display: inline-block;">lb [kg]</div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">lb [kg]</div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">lb [kg]</div>
Rear axle load	<div style="border: 1px solid black; padding: 5px; display: inline-block;">lb [kg]</div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">lb [kg]</div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">lb [kg]</div>



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


**WARNING**

**Risk of contusions, cutting, catching, drawing in and being knocked down through insufficient stability and insufficient tractor steering and/or brake power.**

It is prohibited to connect the implement to the tractor used as the basis for calculation if:

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



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



## 6.2 Adjusting the length of the PTO shaft to the tractor



### WARNING

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

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

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



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



### WARNING

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

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

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

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



### WARNING

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

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

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





### WARNING

#### Danger of crushing from unintentional:

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

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



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

1. Couple the tractor to the machine (do not connect the PTO shaft).
2. Apply the tractor's parking brake.
3. Determine the clearance height of the machine with the shortest and longest operating position for the PTO shaft.
  - 3.1 To do so, raise and lower the machine via the tractor's three-point hydraulic system.  
While doing so, actuate the manual controls for the tractor's three-point hydraulic system on the rear of the tractor, from the provided workstation.
4. Secure the machine, lifted in the measured clearance height, against unintentional lowering (for example, by supporting it or hooking it to a crane).
5. Secure the tractor from unintentional starting before entering the danger area between the tractor and machine.
6. When measuring the length and shortening the PTO shaft, read and follow the operating manual from the PTO shaft manufacturer.
7. Put the shortened halves of the PTO shaft back together.
8. Grease the universal joint shaft of the tractor and the gearbox input shaft before connecting the PTO shaft.  
The tractor symbol on the protective tube of the PTO shaft identifies the tractor-side connection of the PTO shaft.

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



### WARNING

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

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

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

1. Lower the raised, unsecured machine / raised, unsecured parts of the machine.
- This is how to prevent unintentional falling:
2. Shut down the tractor engine.
  3. Remove the ignition key.
  4. Apply the tractor's parking brake.
  5. Secure the machine against unintentional rolling (only attached machine)
    - On flat ground using the parking brake (if available) or wheel chocks.
    - On uneven ground or slopes using the parking brake and wheel chock.

## 7 Coupling and uncoupling the machine



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



### 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, before entering the danger area between the tractor and machine when coupling or decoupling the machine. See also Page 70.



### 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.



### CAUTION

**Do not couple or uncouple the fertiliser spreader while it is full. Tipping hazard!**

### 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. For this, see the chapter "Checking the suitability of the tractor", page 64.



### 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.  
Upgrade the category II upper link and lower link pins on the machine to category III using reducing sleeves if your tractor is equipped with category III three-point hydraulics.
- Only use the upper and lower link pins provided to couple up the machine.
- Check the upper and lower link pins for visible defects whenever the machine is coupled. Replace the upper and lower link pins in the event of clearly visible wear.
- Secure the upper link pin and lower link pin in the connecting points of the three-point attachment frame against unintentional detachment using a lynch pin.



### 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. Fasten the ball sleeves over the upper link pins and fasten the lower link pins in the pivot points of the three-point attachment frame.

→ Do not pin upper and lower links of category II using category I pins!

2. Secure the upper link pin and the lower link pin against unintentional detachment, using one lynch pin for each.



### WARNING

**If the lower link pins have one-sided bearings or are welded in, use ball sleeves with socket and integrated lynch pin.**

**Risk of accident when disconnecting the machine from the tractor!**

3. Direct people out of the danger area between the tractor and machine before you approach the machine with the tractor.
4. Couple the PTO shaft and supply lines before coupling the machine and the tractor.
  - 4.1 Drive the tractor up to the machine to leave a clearance of approximately 10 in / 25 cm between tractor and machine.
  - 4.2 Secure the tractor against unintentional starting and unintentional rolling away.
  - 4.3 Check whether the universal joint shaft of the tractor is switched off.
  - 4.4 Couple the PTO shaft and the supply lines to the tractor.
  - 4.5 Align the lower link hooks so that they are flush with the lower hinging points of the machine.
5. Now, reverse the tractor all the way to the machine so that the lower link hooks of the tractor automatically pick up the ball sleeves of the lower hinging points of the machine.
  - The lower link hooks lock automatically.
6. From the tractor seat, couple the upper link to the top attachment point of the three-point attachment frame using the upper link hook.
  - The upper link hooks lock automatically.
7. Perform a visual inspection to ensure that the upper and lower link hooks are correctly locked before reversing the tractor.

## 7.2 Uncoupling the machine



### **WARNING**

**Danger of injury due to the filled implement tipping.**

Couple and uncouple the implement only when it is empty.



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

1. Park the empty machine on a horizontal space with a hard surface.
2. Uncouple the machine from the tractor.
  - 2.1 Secure the machine against unintentionally rolling away.  
See page 70.
  - 2.2 Relieve the load from the upper link.
  - 2.3 Unlock and uncouple the upper link hooks from the tractor seat.
  - 2.4 Relieve the load from the lower link.
  - 2.5 Unlock and uncouple the lower link hooks from the tractor seat.
  - 2.6 Draw the tractor approximately 10 in / 25 cm forwards.  
→ The space created between the tractor and the machine allows better access for decoupling the PTO shaft and the supply lines.
  - 2.7 Secure the tractor and machine against unintentional starting and unintentional rolling away.
  - 2.8 Decouple the PTO shaft.
  - 2.9 Place the PTO shaft in the holder provided.
  - 2.10 Uncouple the supply lines.
  - 2.11 Fasten the supply lines in the corresponding parking sockets.

## 8 Adjustments



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

- "Warning pictograms and other labels on the machine" from page 17 and
- "Safety information for the operator" from page 23.

Observing this information is important for your safety.



### 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 70.



### WARNING

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

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

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

The spreading properties depend on the following factors:

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

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

## 8.1 Adjusting the mounting height



### WARNING

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

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



Set the exact mounting height of the machine in the field according to the information in the setting chart with the machine loaded. The measurement is taken at the front and rear of the spreading discs, each beginning at the ground surface (Fig. 57).

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

Installation dimension b smaller than a =

Extend length of the upper link

Installation dimension b greater than a =

Shorten length of the upper link

Standard mounting height:

a / b = 31 in / 80 cm

The mounting heights specified here in cm—usually horizontal 80/80—apply for normal fertilising.

For spring fertilising, if the plants have already grown to a height of 4-15 in / 10-40 cm, one-half of the growth height should be added to the specified mounting height (e.g. 80/80). Therefore, for a growth height of 12 in / 30 cm, set a mounting height of 95/95. For greater growth heights, configure the settings according to the specifications for late topdressing. For dense crops (rapeseed), set the centrifugal broadcaster with the specified mounting height (e.g. 80/80) above the crop. If the growth height makes this impossible, configure according to the specifications for late top dressing.

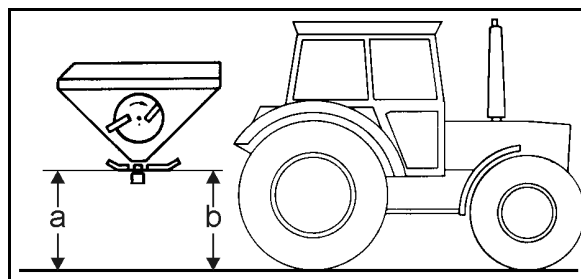


Fig. 57



### 8.1.1 Late topdressing

The shorter spreading vanes are equipped with swivel blades that can be pivoted up without using tools (Fig. 58/1) and allow late topdressing of grain up to a crop height of 3,3 ft / 1 m **without** additional accessories.

1. Switch off the universal joint shaft of the tractor (if necessary).
2. Wait until rotating spreading discs come to a complete standstill (if necessary) before swivelling the spreading vanes.
3. Swivel the swivel blades (Fig. 58/1) of the spreading vanes to the required position for normal fertilising or late top dressing.
  - Normal fertilising:
    - Swivel the swivel blades downward.
  - Late top dressing:
    - Swivel the swivel blades upward

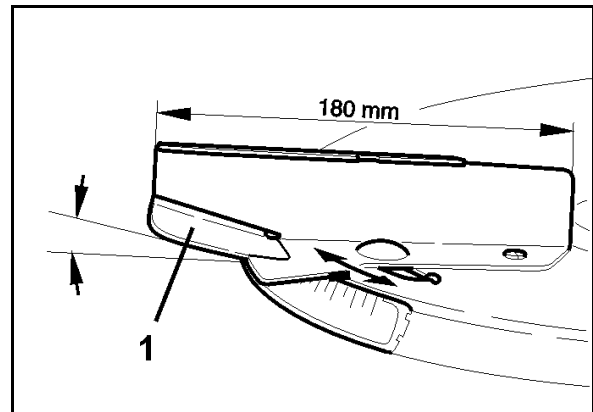


Fig. 58

#### Mounting height for late top dressing:

Using the tractor's three-point hydraulic system, set the mounting height of the spreader so that the distance between the grain tips and the spreading discs is approx. 2 in / 5 cm (Fig. 59).

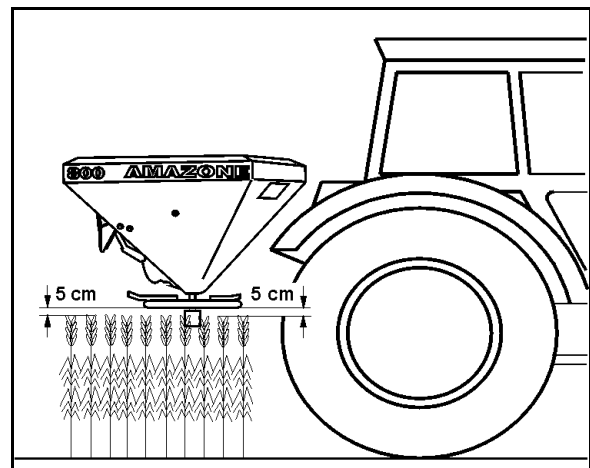


Fig. 59

## 8.2 Setting the spread rate



### CAUTION

Set the spread rate only when the machine is attached, the drive switched off and the sliders closed.

### 8.2.1 Setting the slider position using the setting lever

Determine the specific slider position required, either by taking it directly from the setting chart or by measuring it using the calibration kit (optional).

#### **ZA-X 903, 1403:**

1. Close the sliders hydraulically.
2. Undo the thumb nut (Fig. 60/1).
3. On the scale (Fig. 60/2), find the scale value for the slider position you have taken from the setting chart or determined using the calibration kit.
4. Set the read-off edge (Fig. 60/3) of the two setting levers (Fig. 60/4) to this scale value.
5. Retighten the thumb nuts (Fig. 60/1).

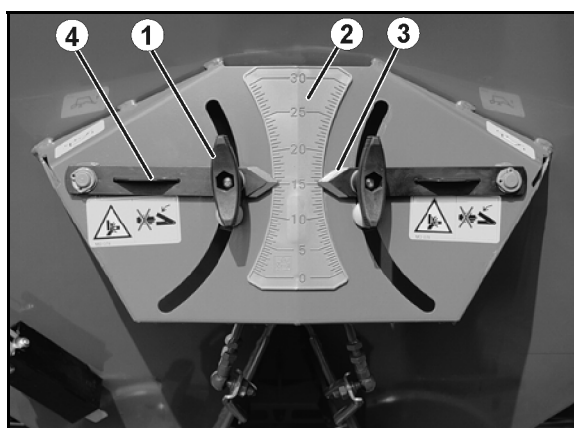


Fig. 60

#### **ZA-X 603, ZA-XW 503:**

1. Close the sliders hydraulically.
2. Unscrew the clamping lever (Fig. 61/2).
3. On the scale (Fig. 61/1), locate the scale value for the slider position you have taken from the setting chart or determined using the calibration kit.
4. Set the read-off edge (Fig. 61/4) of the needle (Fig. 61/3) to the scale value.
5. Retighten the clamping lever (Fig. 61/2).

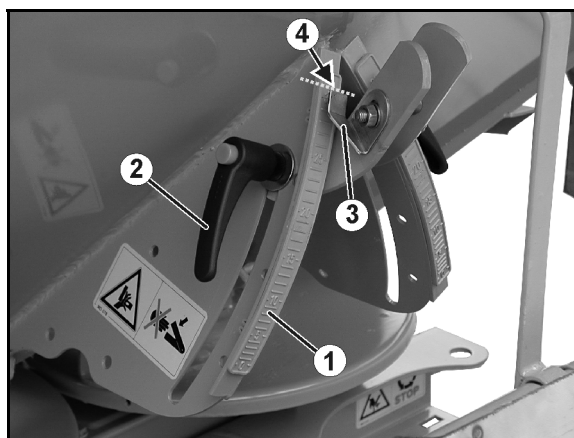


Fig. 61



Select identical slider positions for the left and right sliders!

## 8.2.2 Setting the spread rate according to the setting chart

Take the slider position directly from the setting chart, taking the following into account:

- The type of fertiliser to be spread.
- Working width [m].
- Working speed [km/h].
- Desired spread rate [kg/ha].



### WARNING

The settings listed in the setting chart are intended solely as guide numbers, as the spreading properties of the kinds of fertiliser can change, making it necessary to adjust the spread rates to be set. Therefore, we recommend carrying out a spread rate check before spreading begins.

### Excerpt from the setting chart



#### Name of fertiliser



0,15 in  
3,72 mm



0,04 lb/in<sup>3</sup>  
1 kg/l



Shutter position for rate setting																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
lb/ac Width		45		67	90		110		135		156		180		200		220		245		268		290		310		335		360		380		400		425		445		490		535		625		715		800		890																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Shutter position for rate setting																											
kg/ha Width		50	75	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	550	600	700	800	900	1000	
														↓													
12 m	km/h	8	9	9,5	10,5	11	11,5	12	12,5	13	13,5	14,5	15	→	16	16,5	17	18	18,5	19	19,5	21	22,5	25,5	28,5		
		10	9	10	10,5	11,5	12	13	13,5	14	15	15,5	16,5	17	18,5	18,5	19	20	21	21,5	22,5	24	26	30			
		12	9,5	10,5	11	12	13	13,5	14,5	15	16	17	17,5	18,5	19,5	20,5	21,5	22,5	23,5	24,5	25,5	27,5	30				

Tabel 1

#### Example:

Working width: 40 ft [12 m]  
 Working speed: 5 mph [8 km/h]  
 Desired spread rate: 310 lb/ac [350 kg/ha]  
 → Read off shutter position: **16**

## Adjustments

### 8.2.3 Determining the slider position using the calibration kit (optional)

The calibration kit is used to determine the shutter position for the desired spread rate **without setting chart** using a nomogram or a slide ruler.



When the slider position is being determined, both sliders of the outlet openings remain closed and the universal joint shaft remains switched off.



#### CAUTION

Finger cutting points on the slider of the calibration kit.

### Nomogram

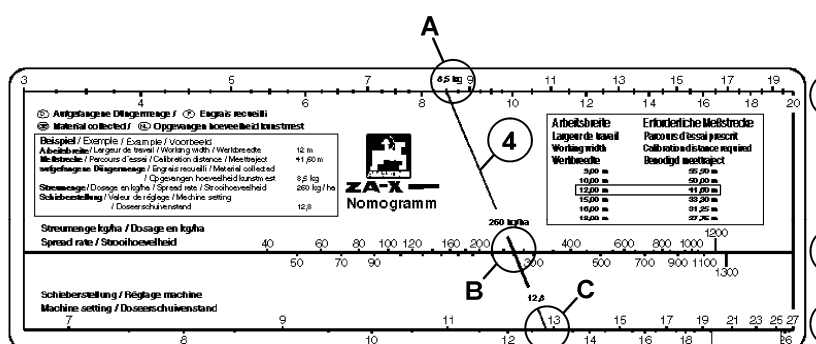


Fig. 62

This nomogram consists of the following:

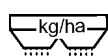
- (1) An **upper scale** (Fig. 62/1) for the **quantity of fertiliser caught** during the spread rate check, between 7 and 44 lb or 3 and 20 kg.
- (2) A **middle scale** (Fig. 62/2) for the desired **spread rate** between 36 and 1160 lb/ac or 40 and 1300 kg/ha.
- (3) A **lower scale** (Fig. 62/3) for the **slider position** from 7 to 27.

### Calculator disc rule

The calculator disc rule comprises:

- (1) The white scale on the outside with the spread rates [kg/ha] (spread rate).
- (2) The white scale on the inside for fertilizer collected during the spread rate check [kg] (amount collected).
- (3) The coloured scale in the middle with the shutter position (position).

Symbols on the calculator disc rule:



Spread rate



Spread rate collected



Shutter position

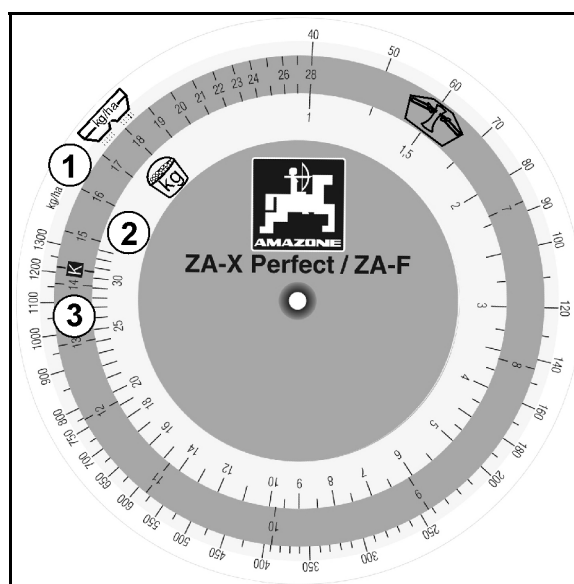


Fig. 63

### Example:

Desired working width: 40 ft [12 m]

Desired spread rate: 232 lb/ac [260 kg/ha]

Working speed: 5 mph [8 km/h]

1. Hook the collection bucket (Fig. 64/1) into the holder using the bracket (Fig. 64/2). Latch the collection bucket into the clamping device (Fig. 64/3).
2. Open the lateral slider (Fig. 64/4) of the outlet chute completely for approx. 5 sec. by pulling the rope (Fig. 64/5). This ensures uniform flow of fertiliser. Afterwards, pour the caught fertiliser back into the hopper of the spreader.
3. You can obtain the required calibration distance 136 ft (41.6 m) for the desired working width 40 ft (12 m) from the chart (Fig. 65) of the nomogram or the rear side of the calculator disc rule.

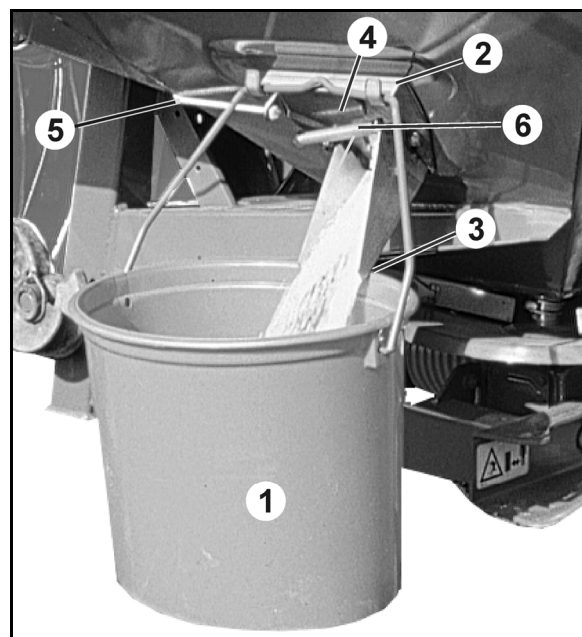


Fig. 64

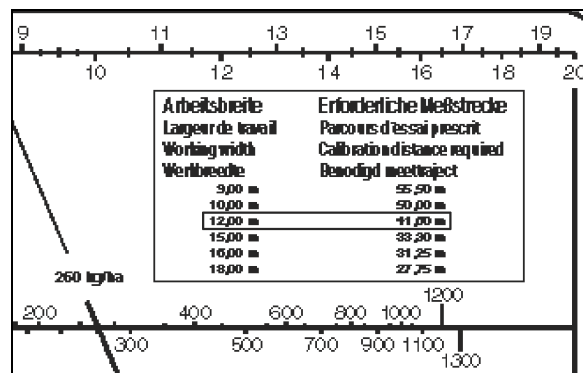


Fig. 65

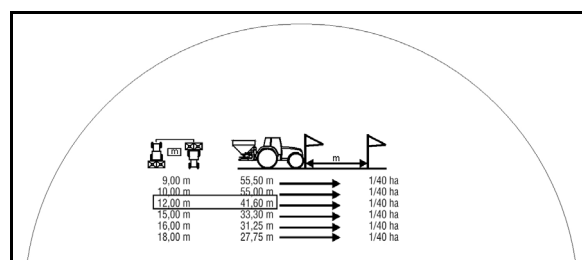




Fig. 66

### Symbols on the calculator disc rule:

	Working width ft [m]
	Calibration distance ft [m]

## Adjustments

4. On the field, measure the exact calibration distance. Mark the beginning and end points (Fig. 67).
5. Drive the exact calibration distance from the beginning to the end point under field conditions, i.e. with the specified constant working speed. While doing so, at the exact beginning point of the calibration distance, open the lateral slider (Fig. 64/4) of the outlet chute all the way using the rope (Fig. 64/5) (pull it as far as it will go) and close it at the end point (when you let go of the rope, the springs (Fig. 64/6) pull the lateral slider into closed position).
6. Weigh the fertiliser in the collection bucket.

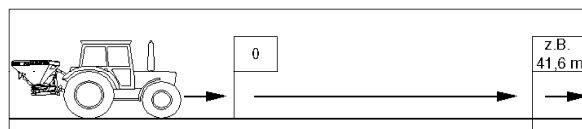


Fig. 67

### Nomogram:

7. Find the number 19 lb (**8.5 kg**), find the numeric value (**A**) on the upper scale (Fig. 68/1). For the desired spread rate 232 lb/ac (**260 kg/ha**) find the numeric value (**B**) on the middle scale (Fig. 68/2). Lay a straight connecting line through points **A** and **B**. On the bottom scale (Fig. 68/3), the extension of the connecting line shows the numeric value (**C**) for the required slider position, which here is **12.8**.

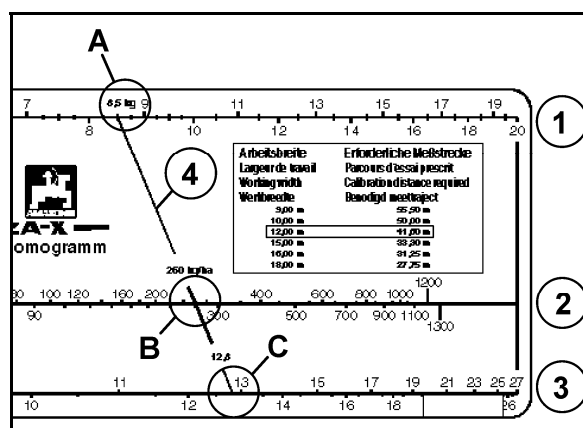


Fig. 68

### Calculator disc rule:

8. Look for the numerical value 8.5 (A) for the amount of fertilizer [kg] collected and compare with position K of the coloured scale.
9. Look for the desired spread rate 232 lb/ac (260 kg/ha) (B) on the scale and read-off the shutter position 12.8 (C) required.

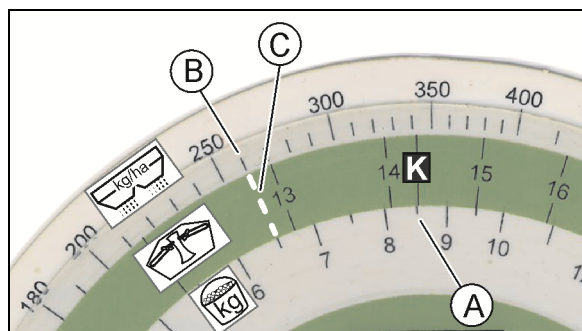


Fig. 69

### 8.3 Setting the working width



- The type of fertiliser and desired working width determine the setting of the pivotable spreading vanes.

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

- Working widths between 33 – 59 ft or 10 - 18 m can be set.



The primary factors that affect the spreading properties are:

- Granule size
- Bulk density
- Surface condition
- Humidity

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



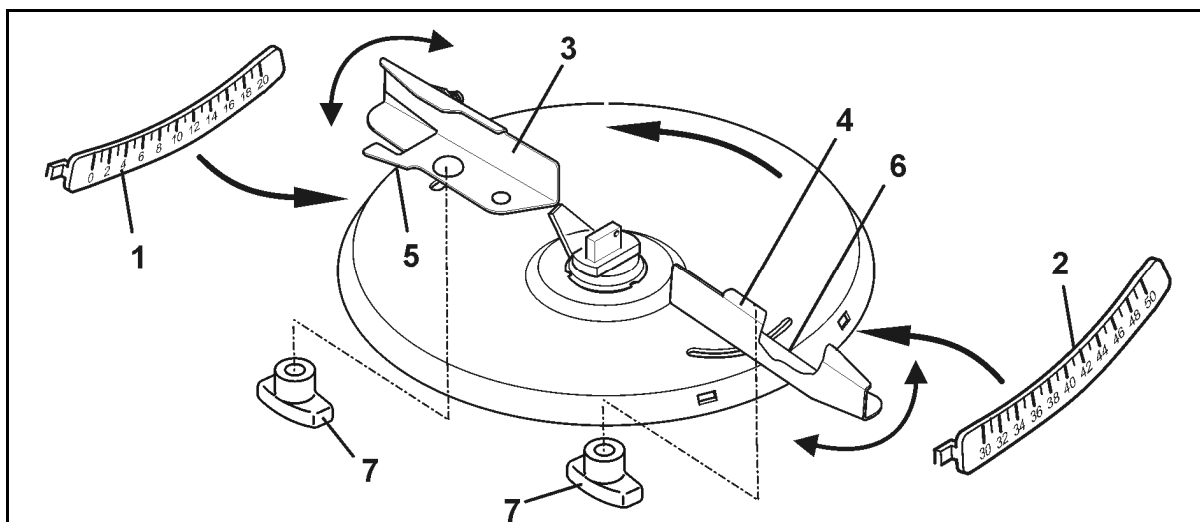
#### **WARNING**

**Danger of ejection of parts of the quick-release screw connection in event of incorrect tightening of the wing nut after the working width is set!**

After setting the working width, always check whether you have manually retightened the wing nut of the quick-release screw connection.



## 8.3.1 Adjusting the spreading vane positions



**Fig. 70**

- (1) Scale
- (2) Scale
- (3) Short spreading vane
- (4) Long spreading vane
- (5) Read-off edge
- (6) Read-off edge
- (7) Thumb nut

Two different scales, designed so as to make it impossible to confuse them, are arranged on each spreading disc for precision setting of the individual spreading vane positions.



The scales with values from **0 to 20** are assigned to the shorter spreading vanes and the scales with values from **30 to 50** are assigned to the longer spreading vanes.



- The working width is increased by swivelling the spreading vanes to a higher numeric value on the scale.
- The shorter spreading vanes primarily distribute the fertiliser in the centre of the spread pattern, while the longer vanes primarily distribute it to the outer area.



- When spreading mixed fertilisers, note the following:
  - Each variety may have different flight characteristics.
  - The individual varieties may separate.
- The recommended settings specified for lateral distribution (working width) pertain solely to weight distribution, not to nutrient supply.



## Adjust the spreading vanes as follows:

1. Switch off the tractor's universal joint shaft.
2. Secure the tractor against unintentional starting and rolling away, see the chapter "Securing the tractor against unintentional starting and rolling away", from page 70.
3. Wait until rotating spreading discs come to a complete standstill before adjusting the working width.
4. Set the desired working width by swivelling the short and long spreading vanes in one after the other.
  - 4.1 Turn the spreading disc so that the respective wing nut under the spreading disc can be released without problem.
  - 4.2 Release the respective wing nut.
  - 4.3 Refer to the setting chart for the short and long spreading vanes.
  - 4.4 Swivel the respective spreading vane so that you can read off the required setting on the scale on the read-off edge.
  - 4.5 Firmly retighten the respective wing nut by hand (without a tool).

## Excerpt from the setting chart



### Name of the fertiliser









0,15 in  
3.72 mm



0,04 lb/in<sup>3</sup>  
1, kg/ kg/l



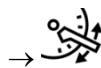
ZAX						
	10	5 / 38	720	9	15	15
	12	5 / 38	720	7	13	15

## Example:



Working width:

39 ft / 12 m



Vane position:

5 (short vane)  
38 (long vane).

### 8.4 Checking the working width using the mobile fertiliser test rig (optional)

The setting values of the setting chart are to be considered guideline values, as the spreading properties of the different kinds of fertiliser change.

We recommend checking the set working width of the centrifugal broadcaster using the mobile fertiliser test rig.

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



**Fig. 71**

## 8.5 Boundary, ditch and side spreading

### 1. Boundary spreading:

On the field boundary, there is a road, a field path or a field that belongs to someone else.

Only minimal quantities of fertilizer fall across the boundary.

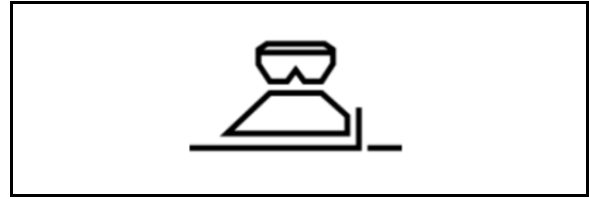


Fig. 72

### 2. Ditch spreading:

On the field boundary there is a body of water or a ditch.

Fertilizer must not fall closer than one meter before the boundary

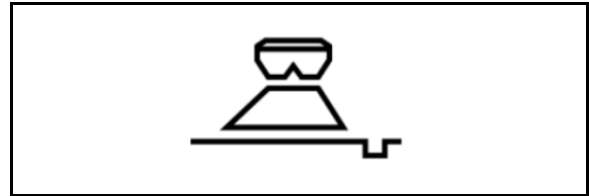


Fig. 73

### 3. Border spreading:

The adjacent field is an area used for agricultural purposes.

Minimal amounts of fertilizer fall across the boundary.

The fertilizer rate on the field edge is close to the target rate.



Fig. 74



#### Boundary spreading and ditch spreading:

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

- Tele-Quick border spreading vane: Reduce the border-side slider position by the positions specified in the setting chart (scale intervals).

## 8.5.1 Boundary spreading with limiter X (optional)



The Limiter X is used for left-side boundary spreading at half working width.

The setting of the Limiter X depends on the edge distance, type of fertiliser and whether boundary spreading or side spreading is being used.

- Read the value to be set from the setting chart (Fig. 75).
- The border spread deflector can be put into or taken out of operation hydraulically.



The values of the setting chart are to be understood as guide numbers, as the fertiliser conditions may vary. Readjust the Limiter X if necessary.

### Excerpt from the setting chart



Name of the fertiliser












0,15 in  
3.72 mm



0,04 lb/in<sup>3</sup>  
1, kg/ kg/l



ZAX						
						
	10	5 / 38	720	9	15	15
	12	5 / 38	720	7	13	15

## Stickers on the implement

















LIMITER X						
		10	12	15	16	18
KAS CAN AN NPK DAP MAP		9	7	5	3	1
		15	13	11	10	8
		15 450	15	13	12	11
		4	3	2	1	1
Harnstoff Urea Ur��a ��очевина		11	7	5	4	2
		13	11	8	7	5
		9	7	4	3	1
P K PK MgO		12	10	8	6	5
		14	12	10	9	8

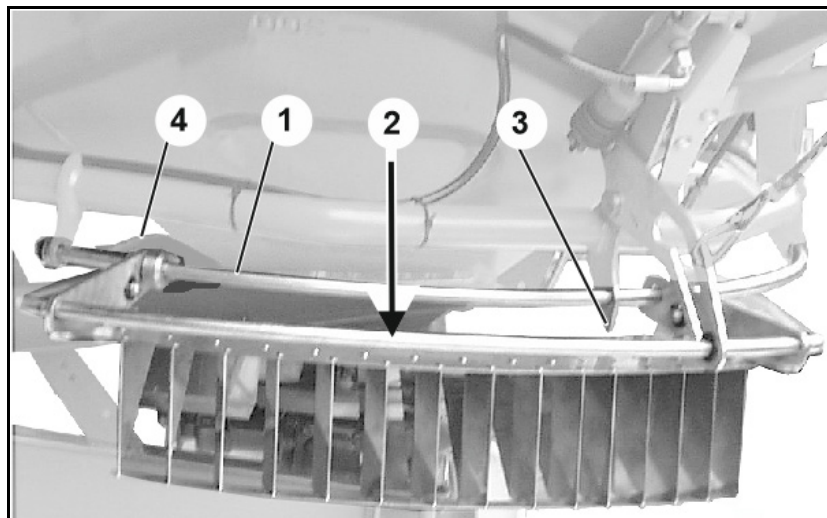
Fig. 75

	Working width
	Border spreading
	Boundary spreading
	Ditch spreading



If necessary, perform boundary spreading with reduced spreading disc speed (  15 ) / PTO shaft speed (  ):  
PTO shaft speed at 450 rpm = spreading disc speed 600 rpm

### Setting according to setting chart



**Fig. 76**

- Settings are configured by moving the border spread deflector on the guide bracket (Fig. 76/1).
  - The values to be read from the setting chart also appear on the border spread deflector (Fig. 76/2).
  - The tip of the cylinder holder serves as the indicator for the setting values (Fig. 76/3).
1. Release the rotary handle (Fig. 76/4).
  2. Move the border spread deflector on the guide bracket until the indicator is at the value to be set from the setting chart.
  3. Tighten the rotary handle.

### Procedure for boundary spreading/side spreading

1. Set the Limiter X according to the setting chart.
2. Lower the Limiter X hydraulically (move it into operational position).
3. Carry out boundary/side spreading.
4. Raise the Limiter X hydraulically (take it out of operation).

### 8.5.2 Boundary and side spreading with the Tele-Quick border spreading vane



The Tele-Quick border spreading vane is used for left-side boundary spreading at half working width.

The swivelling, telescope-like Tele-Quick border spreading vane allows the fertiliser throwing range of the fertiliser to be adjusted to the distance of the first track (tramline) from the field border.

Take the respective **vane position** directly from the **setting chart**, taking the following into account:

- The type of fertiliser to be spread.
- The distance [m] between the first tramline and the field border.



Fig. 77

### 8.5.3 Setting and installing the Tele-Quick border spreading vane

Excerpt from the setting chart



Name of the fertiliser














0,15 in  
3.72 mm



0,04 lb/in<sup>3</sup>  
1, kg/ kg/l



ZAX							
	10	5 / 38	720	Tele-Quick	<sub>1</sub> Tele-Quick	2	<sub>1</sub> Tele-Quick
				B50	B50		A49
	12	5 / 38	720	Tele-Quick	<sub>1</sub> Tele-Quick	2	<sub>1</sub> Tele-Quick
				D50	D50		B49

	Working width
	Border spreading
	Boundary spreading
	Ditch spreading



If necessary, perform boundary spreading with reduced spreading disc speed:

- 1 Tele-Quick - Spreading disc speed 535 rpm
- 2 Tele-Quick - Spreading disc speed 600 rpm
- 3 Tele-Quick - Spreading disc speed 670 rpm

### Example:

Ditch spreading 

Working width: 12 m

→ Distance from the first tramline to the field boundary: 20 ft / 6 m

- 1. Tele-Quick spreading vane position: B49.
- 2. Rate reduction: reduce the spread rate on the boundary side by 3 scale divisions.
- 3. Reduce the spreading disc speed: 535 rpm

## Procedure for adjustment

- 1. Remove the border spreading vane (Fig. 78/1) from the holder (Fig. 78/2).
  - 2. Remove the long spreading vane (Fig. 78/3) of the left spreading disc (Fig. 78/4).
- When not in use, secure the Tele-Quick border spreading vane or the long spreading vane in the holder.

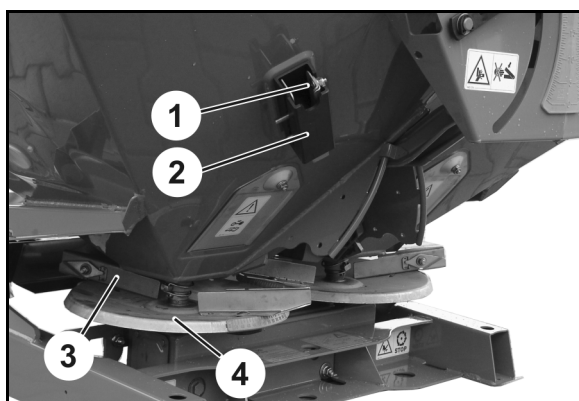


Fig. 78

- 3. Unscrew the screw connection of the outer section of the vane (Fig. 79/1) using the hexagon socket of the thumb nut (Fig. 79/2).
- 4. Set the read-off edge (Fig. 79/3) to the letter of the scale (Fig. 79/4) according to the setting chart and retighten the screw connection.

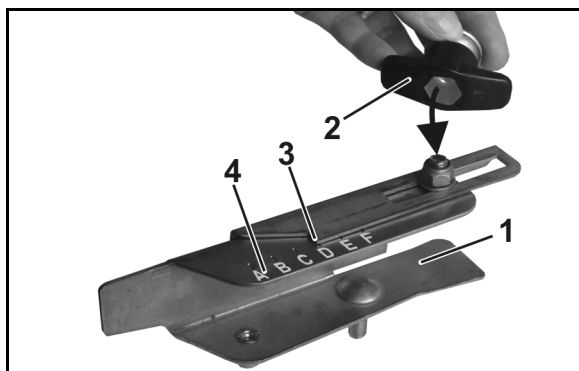


Fig. 79



5. Install the border spreading vane (Fig. 80/1) on the spreading disc using the thumb nut (Fig. 80/2).
6. Set the read-off edge (Fig. 80/3) to the number on the scale (Fig. 80/4) according to the setting chart and retighten the thumb nut (Fig. 80/2).

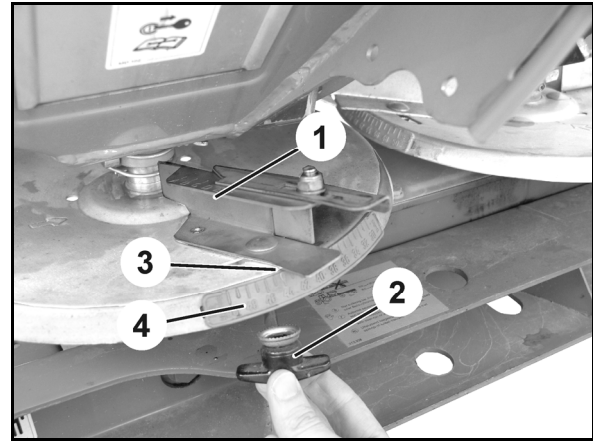


Fig. 80



- Set the border spreading vane to a higher **letter**.
  - Increase the throwing range
  - Flatter spreading flank
- Swivel the border spreading vane to a higher **number**.
  - Increase the throwing range
  - Steeper spreading flank

7. For **boundary spreading**, move the slider position of the setting lever (Fig. 81/1) on the left side of the machine back by two scale intervals (Fig. 81/2).



When finished boundary spreading, return the left slider back to its original position and replace the spreading vanes.

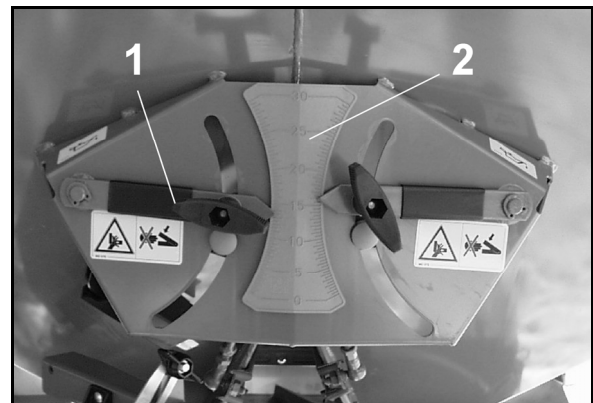


Fig. 81

## 8.5.4 Boundary spreading with border spread deflector (optional)

If the first tramline is placed in the first working path of the seed driller (for a 10 ft / 3 m seed driller, the distance between the first tramline and the field edge is 1.5 m), work with the **left** border spread deflector as follows:

1. Actuate tractor control unit 1.
- Close the left slider (Fig. 82/1).
2. Release the wing nuts (Fig. 82/2).
3. Swing the border spread deflector (Fig. 82/3) down from inoperative position to operating position (Fig. 83).
4. Tighten the winged nut (Fig. 82/2).
5. Switch off the left agitator head (refer to Seite 95).

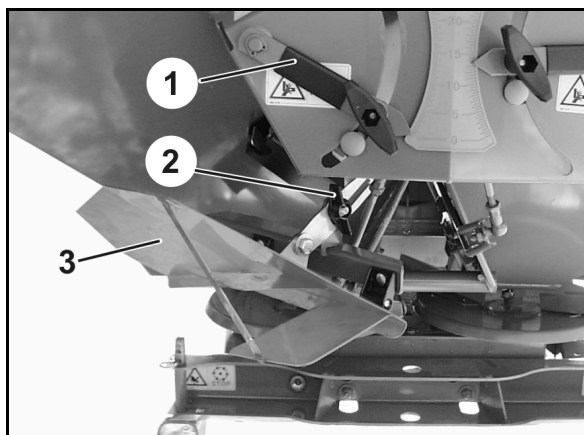


Fig. 82

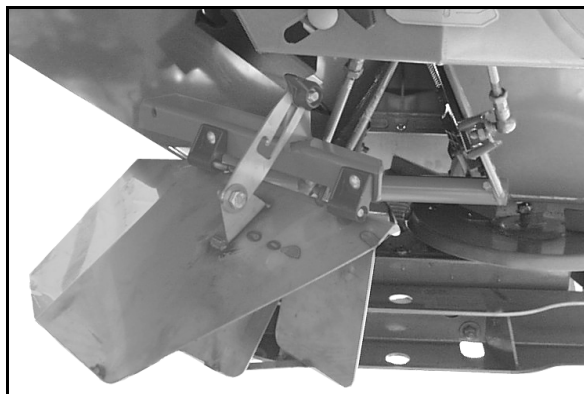


Fig. 83

## 8.6 Switching the agitator head on and off

To switch off the agitator head (Fig. 84/1), pull out the lynch pin (Fig. 84/2) below the corresponding hopper tip.



### WARNING

**When switching on the agitator head again, be absolutely certain that the agitator head finger (Fig. 84/3), when moving in the direction of rotation, does so ahead of the short vane (Fig. 84/4).**

Otherwise the clip pin does not lock correctly in its end position.

Fit clip pin only as shown.

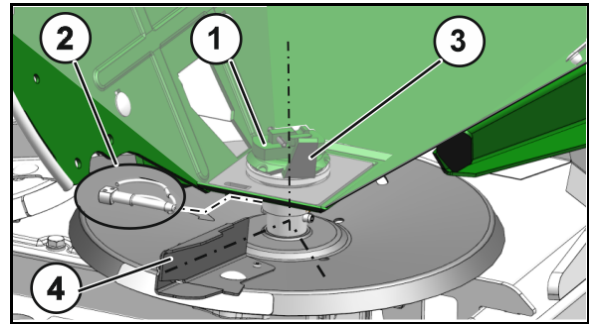


Fig. 84

## 9 Transportation



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



### WARNING

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

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



### WARNING

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

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



### WARNING

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

These risks pose serious injuries or death.

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



### WARNING

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

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



- During road transport, only lift the centrifugal broadcaster until the top edge of the reflector is no more than 59 in / 1500 mm above the road surface.
- Secure the machine against unintentional lowering before driving on the road!

**CAUTION**

**The coupling device is used to couple implements and double-axle trailer in the following cases:**

- The forward speed does not exceed 16 mph / 25 km/h.
- The trailer has an overrun brake or a brake system that can be actuated by the driver of the tractor.
- The permissible total weight of the trailer does not exceed 1.25 times the permissible total weight of the motor tractor, but in all events is no more than 5 t.

**CAUTION**

**Release of fertiliser during road transport due to unintended opening of the sliders.**

Before transportation, close both levers of the two-way control.

## 10 Use of the machine



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

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

Observing this information is important for your safety.



### WARNING

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

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



### WARNING

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

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



### WARNING

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

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

**WARNING**

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

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

**WARNING**

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

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



- For new machines, after 3-4 full hopper loads, check that the screws are tight and retighten if necessary.
- Use only fertiliser with the proper grain size, of the kinds listed in the setting chart. If you do not have accurate knowledge of the fertiliser, check the fertiliser lateral distribution for the set working width using the mobile fertiliser test rig.
- When spreading mixed fertilisers, note the following:
  - Each variety may have different flight characteristics.
  - The individual varieties may separate.
- After every use, remove any fertiliser clinging to the spreading vanes.

## 10.1 Filling the centrifugal broadcaster



### CAUTION

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



- Before filling the hopper, check that it is free of product residue and foreign particles.
- When using the spreader, use the guard screen to protect against foreign particles.
- Before filling, ensure that the fertiliser is free of foreign particles.
- Observe the permitted payload of the spreader (see technical data) and axle loads of the tractor.
- Fill the hopper only when the sliders are closed.



### CAUTION

**It is mandatory to observe the safety instructions from the fertiliser manufacturer.**



## 10.2 Spreading operation



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



### WARNING

#### **Danger of ejection of parts of the spreading vanes / swivel blades, caused by worn spreading vanes / swivel blades!**

Every day, at the start and end of spreading work, check all spreading vanes and swivel blades for visible damage/defects. Refer to the criteria for the replacement of wearing parts in the chapter "Replacing spreading vanes and swivel blades", page 115.



### WARNING

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

- Make sure that uninvolved persons are kept well clear of the danger area of the machine in the following situations:
  - Before you switch on the power for the spreading discs.
  - Before you open the sliders.
  - While the tractor engine is running.
- When spreading fertiliser at field edges in residential areas / along roads, take care not to endanger persons or damage objects. Maintain a sufficient safety distance and use the appropriate devices for boundary spreading and/or reduce the drive speed of the spreading discs.



### WARNING

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

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

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

**CAUTION**

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

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

This avoids damaging the overload clutch.

**CAUTION**

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

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

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

**WARNING**

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

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

**WARNING**

**Danger of being caught and drawn in with driven agitator!**

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

- The fertiliser spreader is coupled to the tractor and the hydraulic hoses are connected.
- The settings have been configured.

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



- Never open the two sliders until the required universal joint shaft speed has been reached.
- Set the universal joint shaft speed to **540** rpm unless indicated otherwise in the setting chart.
- While spreading, always observe the selected operational speeds indicated on the setting chart.
- Maintain a constant spreading disc speed.

2. Open both levers of the two-way control.
  3. Actuate tractor control unit (relieve load).
- Open both sliders  
and drive to the spreading area.
4. When you have finished spreading:
    - 4.1 Actuate tractor control unit.  
→ Close the slider.
    - 4.2 Close both levers of the two-way control.
    - 4.3 Uncouple the universal joint shaft at a low tractor engine speed.



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



- If, despite an identical slider position, you determine that the two hopper tips are not emptying uniformly, check the basic setting of the sliders.
- The service life of the spreading vanes depends on the kinds of fertiliser used, the operating times and the spread rates.

## 10.2.1 Complete discharging



### 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 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 70.

Not for **ZA-XW**.

The **ZA-X** is equipped with 2 emptying flaps (Fig. 85/1).

1. Place a collecting bucket behind the respective hopper tip.
  2. Unscrew the nuts (Fig. 85/2).
  3. Swing the emptying flaps down.
- Residual fertiliser is discharged via the emptying flap.
4. Swing up the emptying flap and fasten it in place using the nuts.

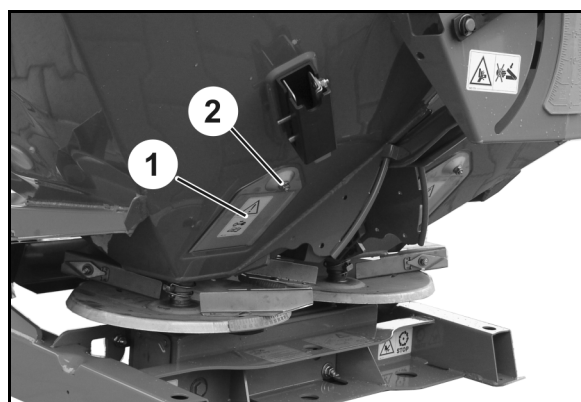


Fig. 85

### 10.3 Recommendation for working in headlands

Correctly laid tramlines correctly is the prerequisite for accurate work at field boundaries or edges.

When using the following machines:

- **Limiter** border spreading device
- **Tele-Quick** border spreading vanes

The first tramline (Fig. 86/T1) is generally placed at half the distance between the tramline to the edge of the field. A tramline of this type is laid in the same fashion in the headlands.

In each first tramline, drive clockwise around the field.

Once you have gone all the way around the field, return the border spreading device to inoperative position.

**On account of spreading towards the rear, for accurate distribution on headlands the following must be noted:**

Open and close the sliders for forward (tramlines T1, T2, etc.) and return trips (tramlines T3, etc.) at different distances to the field edge.

- Open the slide gate after entering the tramline at point P1 (Fig. 87), when the spreader discs are at distance X from the tramline of the headland.

$X = 1.5$  working widths

- Close the slide gate before leaving the tramline at point P2 (Fig. 87), when the spreader discs are located at the level of the first tramline of the headland.

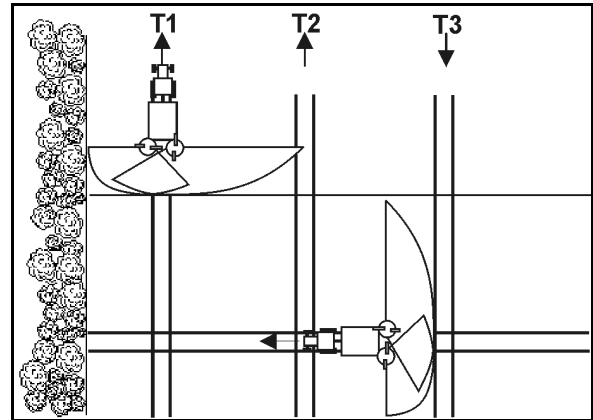


Fig. 86

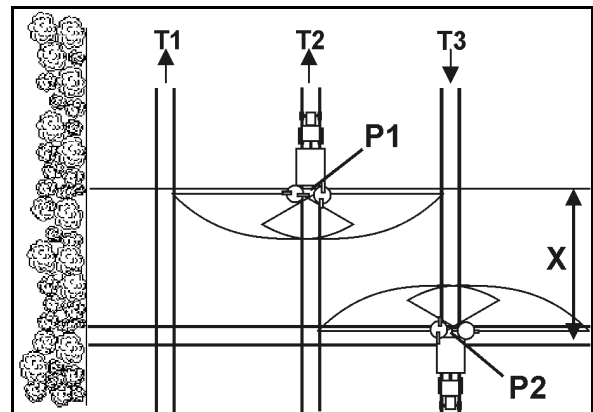


Fig. 87



Using the method just described prevents fertiliser loss and over or under-fertilising and thus is an environmentally friendly way of working.

## 10.4 Notes for spreading slug pellets (e.g. Mesurol)



### CAUTION

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



Before spreading slug pellets:

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



### CAUTION

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



### DANGER

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

For additional information on handling slug pellets, refer to the manufacturer's instructions and the general safety precautions for handling crop protection agents.

- When spreading slug pellets, ensure that the outlet opening are always covered with product and make sure to always drive at a constant speed. A residue of approx. 3 kg for each hopper tip remains, which is impossible to spread according to the intended use of the fertiliser. To empty the spreader, open the slider and catch the flow of product (using a tarp, for example).
- For the spreader settings, refer to the separate setting chart for green manure seed, grain and slug pellets (optional). This information can serve as guide numbers only. Carry out a spread rate check before use.



Before spreading kinds of seed (oilseeds) and slug pellets with a desired spread rate of less than 50 kg/ha, carry out a **spread rate check with the machine at a standstill** (see Seite 107).

- Slug pellets must **not** be mixed with fertiliser or other materials in an attempt to operate the spreader in a different setting range.

### 10.4.1 Spread rate check with the machine at a standstill

You can carry out a spread rate check with the machine at a standstill if you know the exact driving speed of the tractor on the field.

#### Example:

Product: **Slug pellets**  
 Working width: **33 ft [10 m]**  
 Working speed: **5 mph [8 km/h]**  
 Desired spread rate: **2,7 lb/ac [3 kg/ha]**

1. Take off the spreading vanes of the two spreading discs.
2. Wrap the catch tarp around the rear of the spreader.
3. Take the slider position directly from the setting chart, taking into account the respective working width and working speed and the desired spread rate. The setting chart specifies a **spread rate of 2,85 lb/ac / 3.2 kg/ha** and a slider **position of 6.0**.
4. Set the read-off edge of the thumb bolt to just below the scale value **6.0**.
5. From Table 2, first determine the time required, at the respective working width and working speed, to cover an area of **0.5 ha**. For the example given here, the time is **3 min. 45 sec.**

Table for converting the time required to cover an area of 1,3 ac / 0.5 ha

Working width		Working speed									
		4	6	5	8	6	10	7	12	9	14
ft	m	mph	km/h	mph	km/h	mph	km/h	mph	km/h	mph	km/h
20	6	8min. 20sec.		6min. 15sec.		5min.		4min. 10sec.		3min. 34sec.	
33	10	5min.		3min. 45sec.		3min.		2min. 30sec.		2min. 8.5sec.	
40	12	4min. 10sec.		3min. 7.5sec.		2min. 30sec.		2min. 5sec.		1min. 47sec.	
49	15	3min. 20sec.		2min. 30sec.		2min.		1min. 40sec.		1min. 26sec.	
53	16	3min. 7.5sec.		2min. 21sec.		1min. 53sec.		1min. 34sec.		1min. 20sec.	
59	18	2min. 47sec.		2min. 5sec.		1min., 40sec.		1min. 23sec.		1min. 11sec.	

Table 2

## Use of the machine

1. Drive the universal joint shaft at a speed of **540 rpm**.
2. Open both sliders for exactly **3 min. 45 sec.**
3. Weigh the quantity of product collected [kg] (for 1,3 ac / 0.5 ha), e.g. 3,3 lb / 1.5 kg.



Ensure that all spreading material is collected.

4. Convert the quantity of product collected [kg] to the spread rate [kg/ha].

**Quantity of product collected [lb/1,3 ac] x 2 = Spread rate [lb/ac]**

$$3,3/1,3ac \times 2 = 6,6 \text{ lb/ac}$$

**Quantity of product collected [kg/0.5ha] x 2 = Spread rate [kg/ha]**

$$1.5 \text{ kg}/0.5 \text{ ha} \times 2 = 3 \text{ kg/ha}$$



If deviations occur, correct the slider position accordingly and repeat the spread rate check.

## Converting the time required to cover 0.5 ha at working widths/working speeds that are not listed in the table

$$\text{Required time [sec.] for covering 0.5 ha at the desired working width} = \frac{5000}{\text{Working width ft [m] x working speed mph [km/h]}} \times 3.6$$



## 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 70.

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

### 11.1 Faults, causes and remedies

Fault	Cause	Remedy
Fertiliser lateral distribution not uniform	Fertiliser deposits on the spreading discs and the spreading vanes.	Clean the spreading discs and the spreading vanes.
	Sliders do not open all the way.	
Too much fertiliser in the tractor track	Prescribed spreading disc speed is <b>not</b> reached.	Increase tractor engine speed.
	Spreading vanes and outlets defective or worn.	Check the spreading vanes and outlets. Replaced defective or worn parts immediately.
	The spreading properties of your fertiliser differ from those of the one we tested when creating the setting chart.	Contact the AMAZONE Fertiliser Service. ☎ +49 5405 501111
Too much fertiliser in the overlap area	Prescribed spreading disc speed is exceeded.	Reduce tractor engine speed.
	The spreading properties of your fertiliser differ from those of the one we tested when creating the setting chart.	Contact the AMAZONE Fertiliser Service. ☎ +49 5405 501 - 111
Both hopper tips do not empty uniformly at the identical slider position	Bridging of fertiliser.	Eliminate cause of bridging.
	Basic settings of the sliders differ	Check basic settings of the sliders.
Spreading discs not rotating	Shear bolt on the PTO shaft has failed.	Replace shear bolt.

## 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 70.



### 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, benzole, petroleum or mineral oils.
- After cleaning, grease the machine, in particular after cleaning with a high pressure cleaner / steam jet or liposoluble agents.
- Observe the statutory requirement for the handling and removal of cleaning agents.

#### Cleaning with a high pressure cleaner / steam jet



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

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

## 12.2 Lubrication instructions



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

### Lubricants



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

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

### PTO shaft

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

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

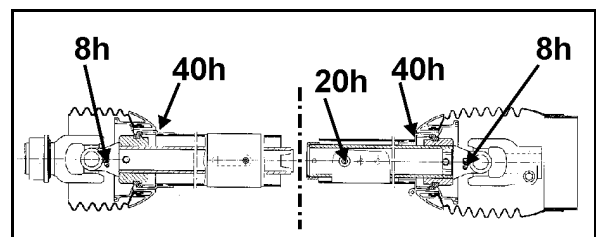


Fig. 88

## 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	Workshop work
Spreading vanes	<ul style="list-style-type: none"> <li>• Condition check</li> </ul>	115	

### Weekly / Every 50 operating hours

Component	Maintenance work	see page	Workshop work
Hydraulic system	<ul style="list-style-type: none"> <li>• Condition check</li> </ul>	121	X

### As necessary

Component	Maintenance work	see page	Workshop work
Spreading vanes	<ul style="list-style-type: none"> <li>• Replace</li> </ul>	115	
Basic setting of sliders	<ul style="list-style-type: none"> <li>• Check</li> </ul>	124	X
Electric lighting system	<ul style="list-style-type: none"> <li>• Check and replace if necessary</li> </ul>	124	
PTO shaft with friction clutch	<ul style="list-style-type: none"> <li>• Ventilate friction clutch</li> </ul>	113	X

## 12.4 Removing the PTO shaft

1. Move the PTO shaft guard into installation position (Fig. 89).
2. Remove the grease nipple (Fig. 90/1) in the connection fork (Fig. 90/3) of the PTO shaft (Fig. 90/2).
3. Remove the shear bolt (Fig. 90/4) between the fork flange of the PTO shaft and the flange of the gearbox input shaft.
4. Pry the connection fork off of the gearbox input shaft using a flat bar.



While prying the connection forks off of the gearbox input shaft, repeatedly turn the PTO shaft.

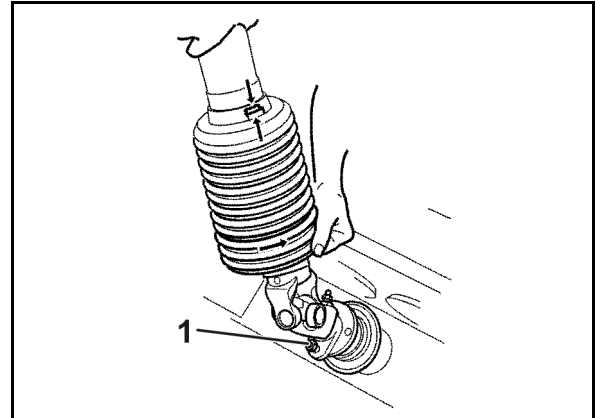


Fig. 89

## 12.5 Shear-off safety devices for PTO shafts

The separately packaged **screws** M8 x 30 A2-70, are **replacement shear bolts** (Fig. 89/1) for fastening the universal joint fork of the PTO shaft to the flange of the gearbox input shaft. Always use grease when fastening the PTO shaft to the gearbox input shaft.

Order number: 1362100 + DE537

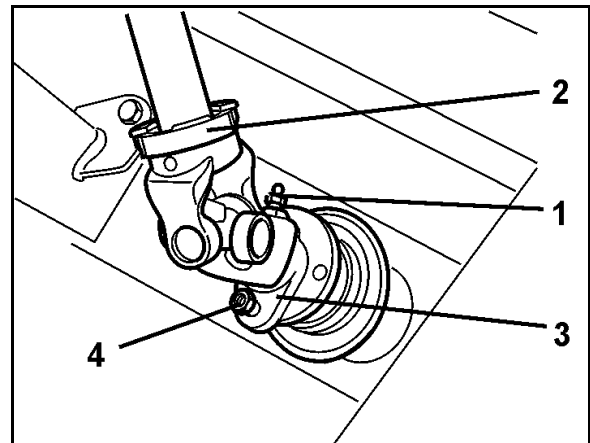


Fig. 90

## 12.6 Ventilate the friction clutch

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

1. Remove the friction clutch from the gearbox input shaft.
2. Relieve the springs (Fig. 91/1) by unscrewing the nuts (Fig. 91/2).
3. Crank the clutch by hand. This will eliminate distortion caused by rust or moisture between the friction surfaces.
4. Tighten the nuts until the pressure springs have the specified installation length of  $a = 1 \text{ in} / 26.5 \text{ mm}$ .
5. Push the friction clutch onto the gearbox input shaft and fasten it in place. The friction clutch is now ready to be used again.

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

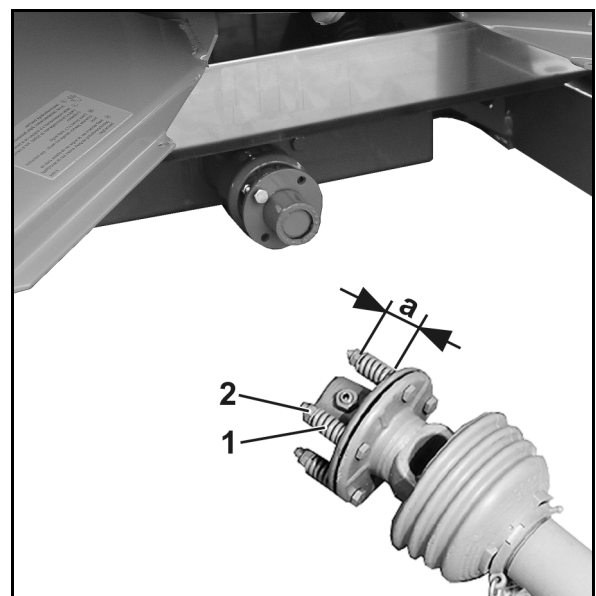


Fig. 91

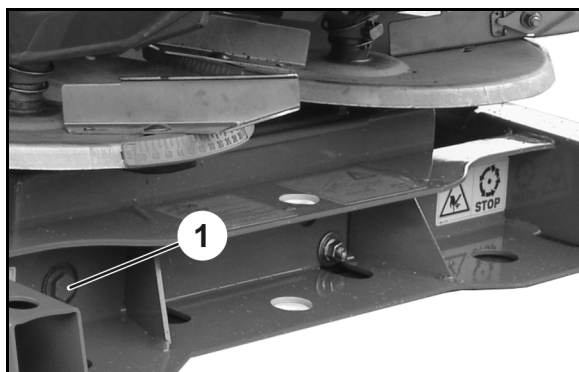
## 12.7 Gearbox

Used under normal conditions, the gearbox is maintenance-free. The gearbox is shipped from the factory with sufficient gear oil.

It is usually not necessary to top up the oil.

However, obvious evidence such as new oil stains on the machine's parking space or on machine parts and/or loud noises indicate an oil leak from the gearbox.

1. Secure the machine by attaching it to a lifting crane.
  2. Tilt the machine towards the rear and prop it up.
  3. Slacken the drain plug (Fig. 92/1).
- Drain the oil.
4. Determine and eliminate the cause of the oil leak.
  5. Tilt the machine towards the front and prop it up.
  6. Add oil through the hole for the drain plug.
  7. Screw the drain screw in again.
  8. Put the spreader back down.



**Fig. 92**

**Oil filling quantity: 1.6 l SAE 90**



### **WARNING**

**Be especially careful when tilting the machine. Attach the machine to a lifting crane, thus securing it against tilting.**

**Risk of accident from tipping of the machine!**

## 12.8 Replacing the spreading vanes and swivel blades



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



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

### 12.8.1 Replacing the spreading vanes



#### WARNING

**Danger of ejection of spreading vanes caused by the unintentional release of fixing bolts and quick-release screw connections!**

- When replacing the spreading vanes, it is essential to replace used self-locking nuts of the fixing bolts with new ones. A used self-locking nut no longer has the required clamping force to produce a secure screw connection.
- Ensure that the open side of the disc spring is toward the spreading disc before tightening the wing nut. Only in this position can the disc spring pretension and secure the quick-release screw connection.



It is essential to ensure that the spreading vanes are installed correctly! The open side of the U-shaped spreading vane must be facing the direction of rotation.



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

- (1) Self-locking nut
- (2) Washer
- (3) Fixing bolt
- (4) Quick-release screw connection
- (5) Plate spring

1. Release and remove the fixing bolt.
2. Release and remove the quick-release screw connection.
3. Replace the spreading vane.
4. Replace the used self-locking nuts of the fixing bolts with new ones.
5. Apply the assembly paste (KA059) to the screw threads.
6. Secure each spreading vane with a fixing bolt, washer and an unused self-locking nut so that they can move on the spreading disc.
7. Tighten the self-locking nut with a tool to the extent that you can still just swivel the spreading vane by hand.
8. Install the respective quick-release bolted connection, consisting of a round-headed screw, plate spring and wing nut. Ensure that the open side of the spring plate is pointing towards the spreading disc.
9. Swivel the read-off edge of each spreading vane until it reaches the setting required for the desired working width.
10. Firmly tighten the respective wing nut of the quick-release screw connection by hand (without using a tool).

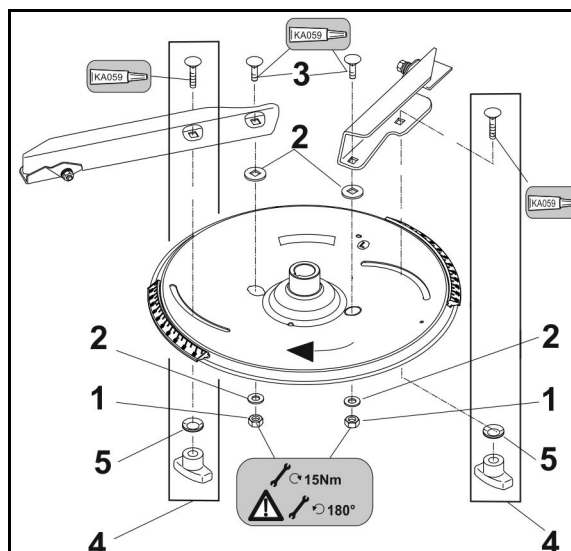


Fig. 93



## 12.8.2 Replacing the swivel blades



### WARNING

**Danger of ejection of spreading vanes caused by the unintentional release of fixing bolts and quick-release screw connections!**

- When replacing the spreading vanes, it is essential to replace used self-locking nuts of the fixing bolts with new ones. A used self-locking nut no longer has the required clamping force to produce a secure screw connection.
- Ensure that the open side of the disc spring is toward the spreading disc before tightening the wing nut. Only in this position can the disc spring pretension and secure the quick-release screw connection.



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

(1) Self-locking nut

(2) Plate spring

(3) Fixing bolt

(4) Plastic disc

1. Release the self-locking nut.
2. Remove the self-locking nuts, disc springs and swivel blades from the fixing bolts.
3. Ensure that the plastic disc remains on the fixing pin.
4. Apply the assembly paste (KA059) to the screw threads.
5. Mount the new swivel blade.
  - 5.1 Push the new swivel blade on to the fixing bolt.
  - 5.2 Push the plate springs alternately (do not stack) on the fixing pins.
  - 5.3 Secure the plastic disc, swivel blade and plate springs with an unused self-locking nut on the spreading vane so that they can be moved.
  - 5.4 Tighten the self-locking nut with a tool so that the swivel blade can still just be swivelled by hand but cannot swing upwards automatically.

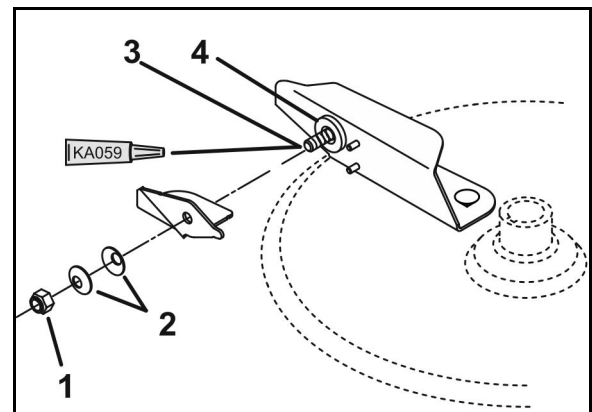


Fig. 94

## 12.9 Check the clearances between the agitator finger/hopper wall and spreading vane/feed plates

The clearance between the hopper wall (Fig. 95/1) and agitator head finger (Fig. 95/2) must be 0,24-0,28 in / 6-7 mm. Bend the tip of the agitator finger if necessary.

The clearance between the spreading vane (Fig. 95/3) and feed plate (Fig. 95/4) must be 0,20-0,28 in / 5-7 mm. If necessary, move the feed plate accordingly.



The agitator head finger (Fig. 95/2) must be positioned above the short vane (Fig. 95/3).

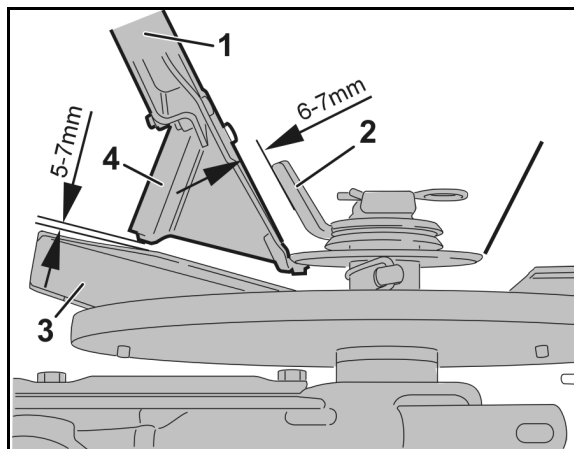


Fig. 95

## 12.10 Checking and correcting the basic setting of the sliders

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



Prerequisite:

- Round steel with a diameter of 0,8 in / 20 mm and a length of approx. 4 in / 10 cm.
- Two persons



**DANGER**

**Do not reach into the outlet opening while operating the slider!  
Danger of crushing!**

### Checking the basic settings of the sliders

1. Close the slider.
2. Set slider position 11 via the setting levers (Fig. 96/1).
3. Open the slider.

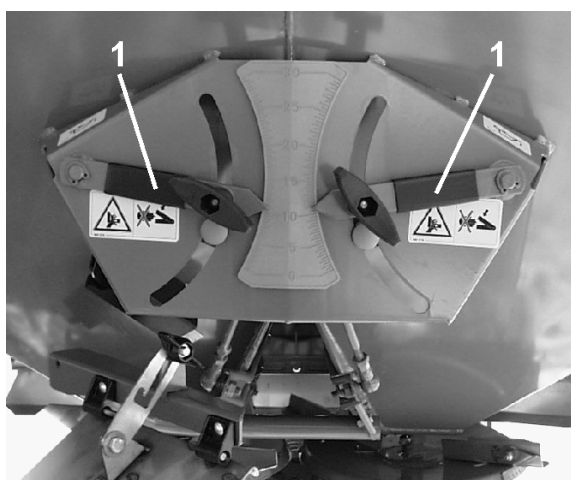
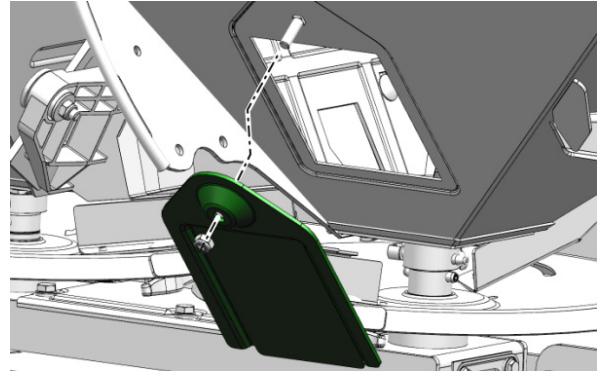


Fig. 96

4. Remove the maintenance flaps on the left and right.



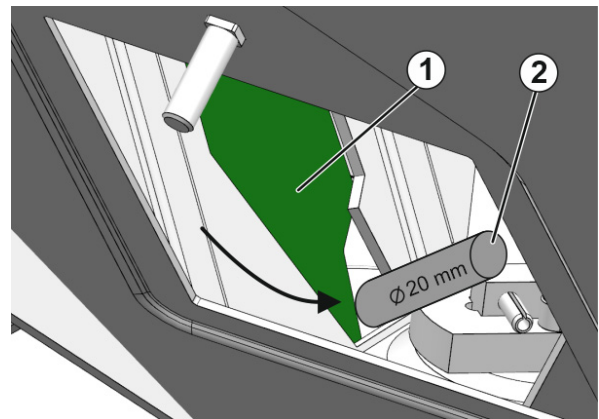
5. Through the right maintenance flap vertically relative to the shutter (1), insert the round steel (2) into the right and left shutter opening.

→ The round steel must fit precisely in the remaining shutter opening.



The round steel must touch the shutter opening (4) and must not rest on the bottom plate (3)!

6. If the respective shutter opening is too small or too big, correct the basic shutter setting.



## Shutter - Correcting the basic setting

1. Open shutter.
  2. Through the maintenance flap vertically relative to the shutter (1), insert the round steel (2) into the shutter opening.
  3. Close the corresponding shutter and lock it with the stop tap.
  4. Remove the round steel.
- The shutter is now resting on the round steel.

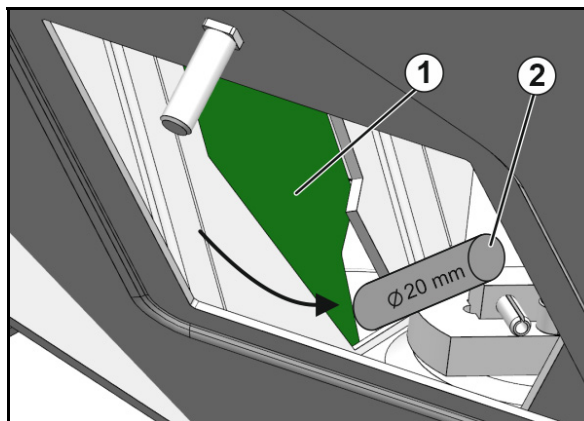


Fig. 97

5. After the thumb nut is unscrewed (Fig. 98/1), the setting lever (Fig. 98/2) must come to rest against the stop (Fig. 98/3).
- In this position, the read-off edge (Fig. 98/4) must display the value of "11" on the scale for the slider position.

**If this is not the case, modify the position of the stop (Fig. 98/3) by twisting the connecting rods (Fig. 98/5) accordingly:**

6. Adjust the slider position 11.
7. Unscrew the lock nuts (Fig. 98/6) of the connecting rods (Fig. 98/5).
8. Twist the connecting rod until the stop (Fig. 98/3) rests against the setting lever (Fig. 98/2).
9. Retighten the lock nuts.

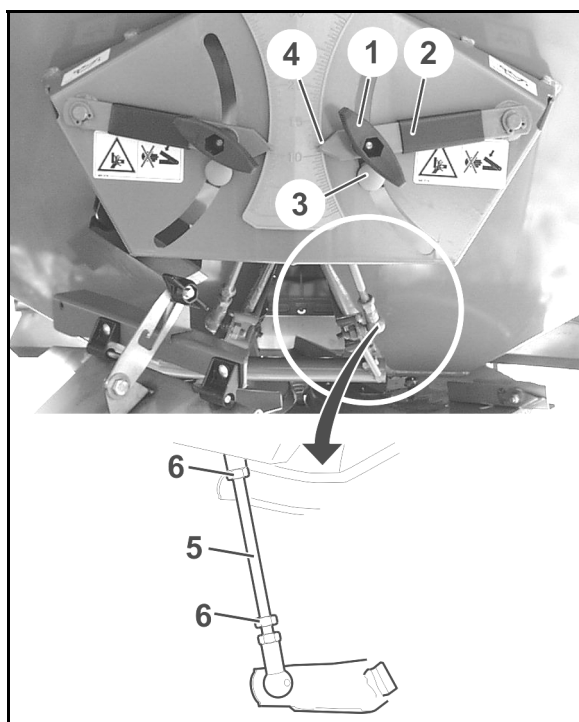


Fig. 98

## 12.11 Hydraulic system



### WARNING

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

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

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

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



- When connecting the hydraulic hose lines to the tractor hydraulic system, ensure that the hydraulic system is depressurised on both the tractor and the trailer.
- Ensure that the hydraulic hose lines are connected correctly.
- Regularly check all the hydraulic hose lines and couplings for damage and soiling.
- Have the hydraulic hose line checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose line if it is damaged or worn. Use only 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.

### 12.11.1 Labelling of hydraulic hose lines

The valve chest identification provides the following information:

Fig. 99/...

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

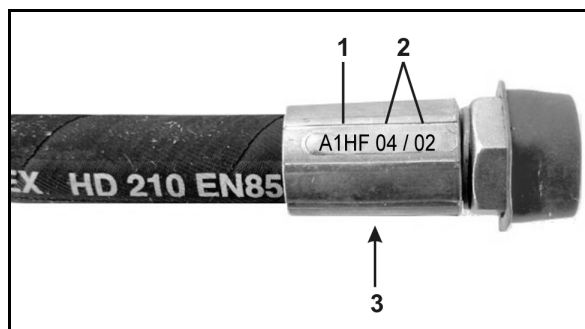


Fig. 99

### 12.11.2 Maintenance intervals

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

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

**Before each start-up:**

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

### 12.11.3 Inspection criteria for hydraulic hose lines



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

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

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

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

#### 12.11.4 Installation and removal of hydraulic hose lines



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

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

## 12.12 Electric lighting system



### **WARNING**

**Replace defective bulbs immediately so that you do not pose a hazard to other motorists and cyclists!**

#### **Replacement of light bulbs:**

1. Unscrew the sight glass.
2. Remove the defective bulb.
3. Insert the replacement bulb (ensure that the voltage and wattage are correct).
4. Insert and screw on the sight glass.

## 12.13 Upper and lower link pins check



### **DANGER!**

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

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

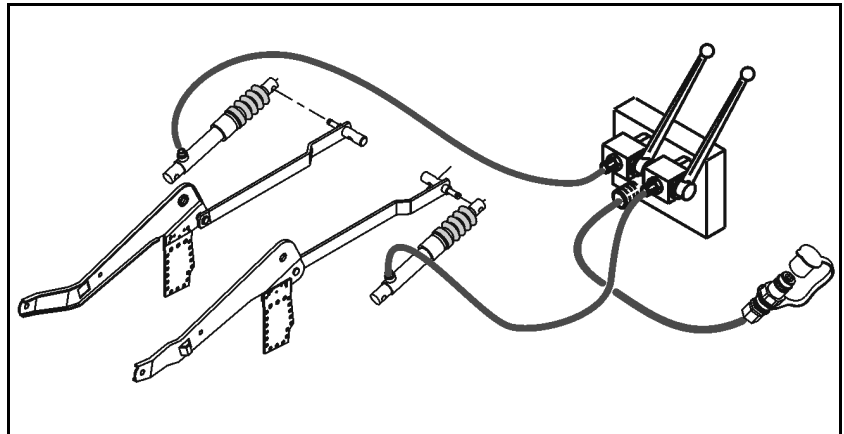
#### **Test criteria for top link pins and lower link pins:**

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

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

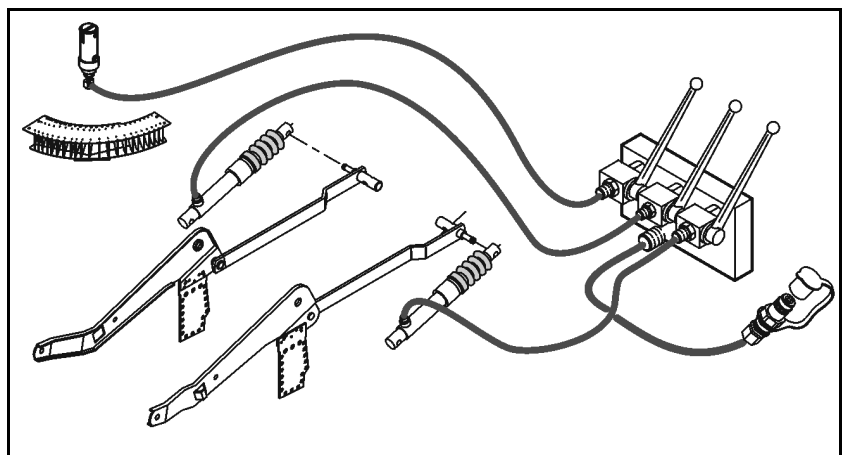


## 12.14 Hydraulic diagram



**Fig. 100**

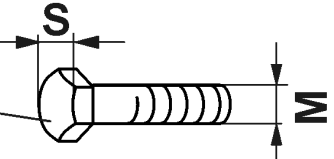
- (1) Connection to control unit
- (2) 2-way control
  - o Left slider → Hose marking *yellow*
  - o Right slider → Hose marking *green*

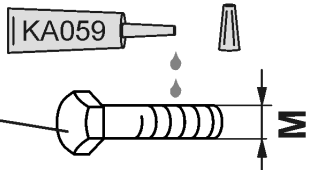


**Fig. 101**

- (1) Connection to control unit
- (2) 3-way control
  - o Left slider → Hose marking *yellow*
  - o Right slider → Hose marking *green*
  - o Limiter → Hose marking *blue*

## 12.15 Bolt tightening torques

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> <b>8.8</b>  <b>10.9</b>  <b>12.9</b> </div>  </div>				
M	S	ft lb [Nm]		
		8.8	10.9	12.9
M 8	13	18.5 [25]	25.8 [35]	30.2 [41]
M 8x1		19.9 [27]	28 [38]	30.2 [41]
M 10	16 (17)	36 [49]	51 [69]	61 [83]
M 10x1		38 [52]	54 [73]	65 [88]
M 12	18 (19)	63 [86]	89 [120]	107 [145]
M 12x1,5		66 [90]	92 [125]	111 [150]
M 14	22	100 [135]	140 [190]	170 [230]
M 14x1,5		111 [150]	155 [210]	184 [250]
M 16	24	155 [210]	221 [300]	262 [355]
M 16x1,5		166 [225]	232 [315]	280 [380]
M 18	27	214 [290]	299 [405]	358 [485]
M 18x1,5		240 [325]	339 [460]	406 [550]
M 20	30	302 [410]	428 [580]	509 [690]
M 20x1,5		339 [460]	472 [640]	568 [770]
M 22	32	406 [550]	575 [780]	686 [930]
M 22x1,5		450 [610]	634 [860]	774 [1050]
M 24	36	524 [710]	738 [1000]	885 [1200]
M 24x2		575 [780]	811 [1100]	959 [1300]
M 27	41	774 [1050]	1106 [1500]	1328 [1800]
M 27x2		848 [1150]	1180 [1600]	1438 [1950]
M 30	46	1070 [1450]	1475 [2000]	1770 [2400]
M 30x2		1180 [1600]	1660 [2250]	1991 [2700]

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> <b>A2-70</b>  <b>A4-70</b> </div>  </div>												
M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
ft lbs Nm	1.8 [2.4]	3.6 [4.9]	6,2 [8,4]	15.2 [20,6]	30 [40,7]	52 [70,5]	83 [112]	128 [174]	178 [242]	252 [342]	347 [470]	434 [589]



Coated screws have different tightening torques.

Note special information for tightening torques in chapter Maintenance





# **AMAZONEN-WERKE**

## **H. DREYER SE & Co. KG**

Postfach 51  
D-49202 Hasbergen-Gaste  
Germany

Tel.: + 49 (0) 5405 501-0  
e-mail: [amazone@amazone.de](mailto:amazone@amazone.de)  
<http://www.amazone.de>

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