

# Operating manual

## **AMAZONE**

### Precision airplanter

**ED 3000 [-C]**

**ED 4500 [-C]**

**ED 6000 [-C]**

**ED 4500-2 [-2C]**

**ED 6000-2 [-2C/-2FC]**



33c168

MG5226

BAH0078.5 03.2019

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

**en**



# Reading the instruction

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

---

*Leipzig-Plagwitz 1872. Rud. Sack.*

---

**Identification data**

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Please insert the identification data of the implement. The identification data are arranged on the rating plate.

Implement ID No.:  
(10-digit)

Type:

ED3

Permissible system pressure (bar): Maximum 210 bar

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

---

**Manufacturer's address**

---

AMAZONEN-WERKE

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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 GmbH & Co. KG. We thank you for your trust in our products

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

Before initial operation, read and observe 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 implement.

Please ensure that all the implement operators have read this operating manual before they put the implement into operation.

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 implement.

## 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 operating manuals. Send us your suggestions by fax.

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# 1 User information

---

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

## 1.1 Purpose of the document

---

This operating manual

- describes the operation and maintenance of the implement.
- provides important information on safe and efficient handling of the implement.
- is a component part of the implement and should always be kept with the implement or the towing vehicle.
- must be kept 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 in the direction of travel.

## 1.3 Diagrams

---

### Instructions and responses

---

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

Example:

1. Instruction 1
- Reaction of the implement to handling instruction 1
2. Instruction 2

### Lists

---

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

Example:

- Point 1
- Point 2

### Item numbers in diagrams

---

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

- Example (Fig. 3/6):
- Figure 3
  - Item 6

## 2 General safety instructions

---

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

### 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 implement operation.

#### Obligations of the operator

---

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

- are aware of the basic workplace safety information and accident prevention regulations.
- have been instructed in working with/on the implement.
- have read and understood this operating manual.

The operator is obliged

- to keep all the warning symbols on the implement in a legible state.
- to replace damaged warning symbols.

#### Obligations of the user

---

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

- to comply with the basic workplace safety instructions and accident prevention regulations.
- to read and understand the section "General safety information" of this operating manual.
- to read the section "Warning symbols and other labels on the implement", Seite 18 of this operating manual and to follow the safety instructions of the warning symbols when operating the implement.
- to get to know the implement.
- to read the sections of this operating manual, important for carrying out your work.

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

### Risks in handling the implement

---

The implement has been constructed to the state-of-the art and the recognised rules of safety. However, operating the implement may cause risks and restrictions to

- the health and safety of the user or third persons.
- the implement itself.
- other property.

Only use the implement

- 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 property will be excluded if they can be traced back to one or more of the following causes:

- Improper use of the implement
- Improper installation, commissioning, operation and maintenance of the implement
- Operation of the implement 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
- Unauthorised design changes to the implement
- Insufficient monitoring of implement parts which are subject to wear
- Improperly executed repairs
- Disasters due to the effects of foreign objects and force majeure.

## 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 severity of the risk, and carries the following meaning:



### **DANGER**

Indicates a direct threat at high risk which will result in death or most serious bodily harm (loss of limbs or long-term harm), should it not be prevented.

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 implement handling.

Non-compliance with these instructions can cause faults on the implement or disturbance to the environment.



### **NOTE**

Indicates handling tips and particularly useful information.

These instructions will help you to use all the functions of your implement in the best way possible.

## 2.3 Organisational measures

---

The operator must provide the necessary personal protective equipment as per the information provided by the manufacturer of the crop protection agent to be used, such as:

- Safety glasses
- Protective shoes
- Chemical-resistant overalls
- Skin protection agents etc.



The operation manual

- must always be kept at the place at which the implement is operated,
- must always be easily accessible for the user and maintenance personnel.

Check all the available safety equipment regularly.

## 2.4 Safety and protective equipment

---

Before starting up the implement each time, all the safety and protection equipment must be properly attached and fully functional. Check all 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 you should comply with the statutory road traffic regulations.

## 2.6 User training

Only trained and instructed persons should be allowed to work with/on the implement. The responsibilities of the operating and maintenance personnel must be clearly defined.

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

Person Job	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
Start-up	—	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> Persons with specialised technical training shall be considered as a specialist. Due to their specialist training and their knowledge of the appropriate regulations, they can evaluate the work with which they have been charged and detect possible dangers.

Comment:

A qualification equivalent to specialist training can be obtained from several years' experience in the relevant field.



Only a specialist workshop may carry out maintenance and repair work on the implement, if such work is additionally marked "Workshop". 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 implement in a way which is both appropriate and safe.



## **2.7 Safety measures in normal operation**

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

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

## **2.8 Danger from residual energy**

---

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

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 assemblies to lifting gear when carrying out replacement work.

Check loosened threaded connections for tightness. When the maintenance work is completed, check the functioning of the safety devices.

## 2.10 Design changes

You may make no changes, expansions or modifications to the implement without the authorisation of AMAZONEN-WERKE. This also applies when welding support parts.

Any expansion or conversion work shall require the written approval of AMAZONEN-WERKE. Only use modification and accessory parts approved by AMAZONEN-WERKE so that the type approval, for example, remains valid in accordance with 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 crushing, cutting, being trapped or drawn in, or impact through the failure of support parts.**

It is strictly 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 on load-bearing parts.

### 2.10.1 Spare and wear parts and aids

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

Only use genuine AMAZONE spare and wear parts, or those approved by AMAZONEN-WERKE, so that the type approval remains valid according to the national and international regulations. If you use wear and spare parts from third parties, there is no guarantee that they have been designed and manufactured in such a way as to meet the requirements placed on them.

AMAZONEN-WERKE shall accept no liability for damage caused by the use of non-approved 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 implement may be operated by only one person sitting in the driver's seat of the tractor.

## 2.13 Warning symbols and other labels on the implement



Always keep all the warning symbols of the implement clean and in a legible state. Replace illegible warning symbols. You can obtain the warning symbols from your dealer using the order number (e.g. MD 075).

### Warning symbols – structure

Warning pictograms indicate danger areas on the implement and warn of residual dangers. Permanent or unexpected dangers exist in these areas.

A warning symbol consists of two fields:



#### Field 1

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

#### Field 2

is a symbol showing how to avoid the danger.

### Warning symbols – explanation

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

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

## Order number and explanation

## Warning symbols

## MD 076

**Risk of drawing-in/entrapment for hand or arm due to moving force-transmission parts!**

This hazard can cause the most severe injuries with loss of body parts.

Never open or remove protective equipment,

- while the tractor engine is running with the universal joint shaft or hydraulic/electronic system connected.
- if the ground wheel drive is moving.



## MD 078

**Risk of crushing for fingers or hands, caused by accessible, moving parts of the implement!**

This risk can cause the most serious injuries with the loss of body parts.

Never reach into the hazardous area while the engine of the tractor with connected universal joint shaft/hydraulics/electronic system is running.



## MD 082

**Risk of falling caused by riding on the step surfaces or platforms!**

This risk can cause the most serious injuries with potentially fatal injuries.

It is forbidden to carry persons on the implement or to climb on running implements. This prohibition also applies to implements with step surfaces or platforms.

Ensure that nobody is riding on the implement.



## MD 084

**Risk of crushing the entire body due to standing in the swivel range when implement parts are being lowered.**

Causes serious, potentially fatal injuries anywhere on the body.

- It is forbidden to stand in the swivel range of the implement when implement parts are being lowered.
- Instruct personnel to leave the swivel range of any implement parts which can be lowered before you lower the parts.



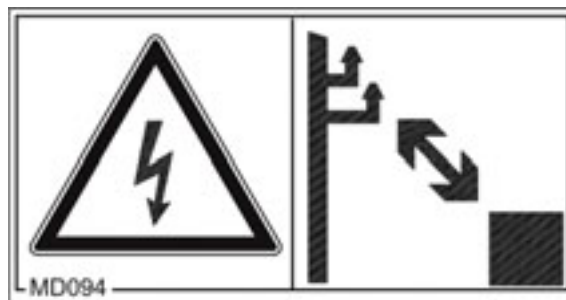
## General safety instructions

### MD 094

**Risk of electric shock or burns from accidentally touching overhead power lines or by coming within the prohibited distance of high voltage overhead power lines.**

These dangers can cause extremely serious and potentially fatal injuries.

Maintain a sufficient distance from live electrical overhead cables.



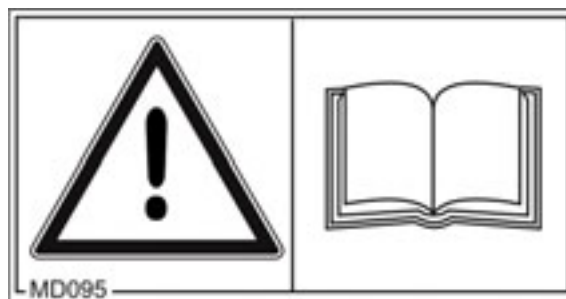
#### Rated voltage

#### Safety distance from transmission lines

up to 1 kV	1 m
over 1 up to 110 kV	2 m
over 110 up to 220 kV	3 m
over 220 up to 380 kV	4 m

### MD 095

Read and follow the operating instructions and safety information before starting up the implement.



### 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 instructions in the operating manual before carrying out any maintenance or repair 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 by entering/remaining in the lifting area of the three-point linkage when the three-point hydraulic system is operated!**

Causes serious, potentially fatal injuries anywhere on the body.

- Personnel are prohibited from standing in the lifting area of the three-point linkage when the three-point hydraulic system is operated.
- Actuate the operating controls for the tractor's three-point hydraulic system
  - Only from the designated workstation.
  - Never when you are standing in the lifting area between the tractor and implement.



### MD 102

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

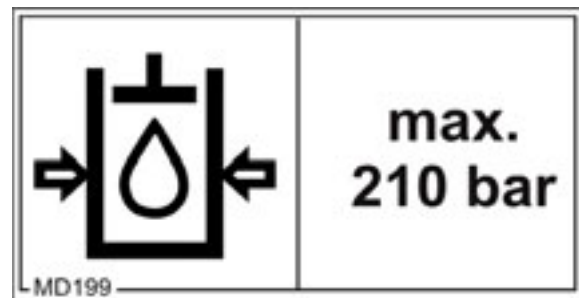
These dangers can cause extremely serious and potentially fatal injuries.

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



### MD 199

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



### 2.13.1 Positions of warning symbols and other labels

## Warning symbols

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

### Precision airplanter ED 3000-[C] and ED 4500-[C]



**Fig. 1**



**Fig. 2**



Precision airplanters ED 4500-2 [2C] and ED 6000-2 [2C]



Fig. 3

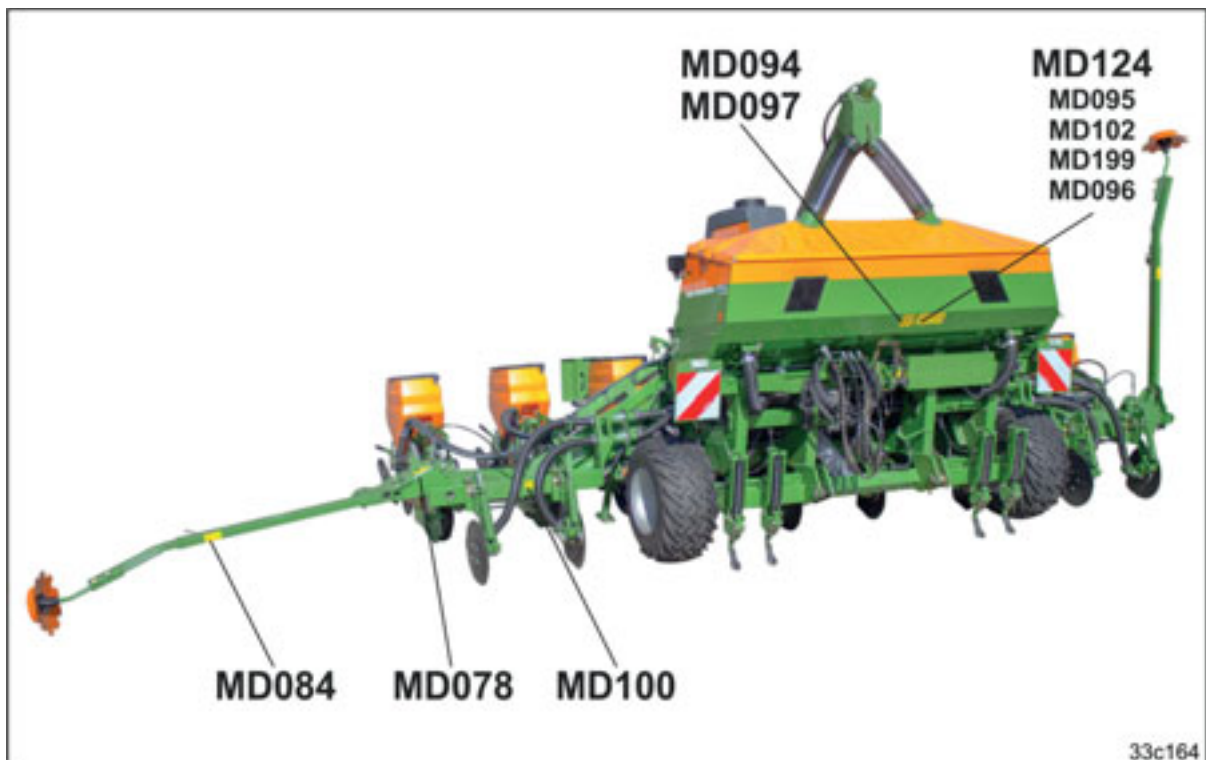


Fig. 4

Precision airplanter ED 6000-[C]

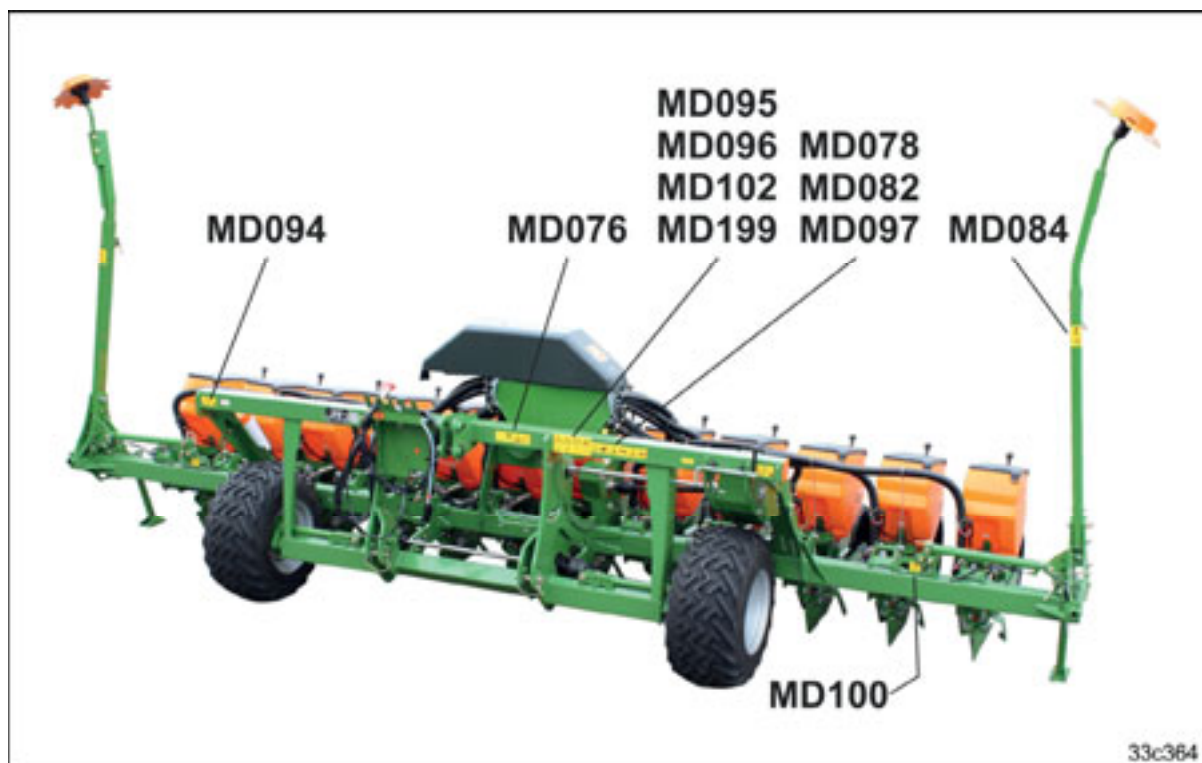


Fig. 5



Fig. 6

## Dangers in case of non-observance of the safety instructions

---

Non-compliance with the safety information

- can pose both a danger to people and to the environment and implement.
- can lead to the loss of all warranty claims.

In particular, non-compliance with the safety information could pose the following risks:

- Risk to people from working in an unsafe working environment.
- Failure of important implement functions.
- Failure of prescribed methods of maintenance and repair.
- Risk to people through mechanical and chemical influences.
- Risk to the environment through leakage of hydraulic fluid.

## 2.14 Safety-conscious working

---

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

Comply with the accident prevention instructions on the warning symbols.

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

## 2.15 Safety information for users



### WARNING

**Risk of crushing, cutting, being trapped or drawn in, or impact through inadequate roadworthiness and operational safety.**

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



### CAUTION

**Switch off the on board computer**

- before road transport.
- before adjustment, maintenance and repair work.

Risk of accident due to unintended movements of the metering unit or other implement components caused by radar pulses.

### 2.15.1 General safety instructions and accident prevention instructions

- In addition to these instructions, also comply with the generally valid national and safety and accident prevention regulations!
- The warning symbols attached on the implement provide important instructions for safe operation of the implement. Compliance with these instructions is essential for your safety!
- Before moving off and starting up the implement, check the immediate area of the implement (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 implement.

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 or coupled implement.

### Coupling and uncoupling the implement

- Only connect and transport the implement with tractors suitable for the task.
- When coupling implements to the tractor's three-point hydraulic system, the attachment categories of the tractor and the implement must always be the same!
- Connect the implement to the prescribed equipment in accordance with the specifications.

- When coupling implements to the front or the rear of the tractor, the following may not be exceeded:
  - The permissible total tractor weight
  - The permissible tractor axle loads
  - The permissible load capacities of the tractor tyres
- Secure the tractor and the implement against unintentional rolling before coupling or uncoupling the implement.
- It is forbidden for people to stand between the implement to be coupled and the tractor while the tractor is moving towards the implement.

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.

- Before connecting the implement to or disconnecting the implement from the tractor's three-point hydraulic system, secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is prevented.
- When coupling and uncoupling implements, 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 implement to the tractor or uncoupling it from the tractor! There are nip and shear points in the area of the coupling point between the tractor and the implement.
- It is forbidden to stand between the tractor and the implement when actuating the three-point hydraulic system.
- Coupled supply lines:
  - must give without tension, bending or rubbing on all movements when travelling round corners.
  - must not chafe against other parts.
- The release ropes for quick action couplings must hang loosely and may not release themselves when lowered.
- Also ensure that uncoupled implements are stable!

### Use of the implement

---

- 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 implement is already in operation!
- Wear tight-fitting clothing! There is an increased risk of loose clothing getting caught or entangled on drive shafts!
- Only place the implement in service after all protective devices have been attached and are in protective position!
- Comply with the maximum load of the connected implement and the permissible axle and drawbar loads of the tractor. If necessary, drive only with a partially filled hopper.
- It is forbidden to stand in the working area of the implement.
- It is forbidden to stand in the turning and swivel range of the implement.
- There are crushing and shearing hazards on implement parts actuated by external force (e.g. hydraulically)!
- Only actuate implement parts actuated by external force if personal are maintaining an adequate safety distance to the implement!
- Secure the tractor against unintentional start-up and rolling, before you leave the tractor.

For this purpose:

- Lower the implement onto the ground.
  - o Apply the tractor parking brake.
  - o Switch off the tractor engine.
  - o Remove the ignition key.

### Implement transportation

---

- When using public roads, national road traffic regulations must be observed.
- Before moving off, check:
  - the correct connection of the supply lines,
  - the lighting system for damage, function and cleanliness,
  - that the brake and hydraulic equipment shows no visible signs of defect,
  - o that the tractor parking brake is released completely.
  - o the function of the brake system.
- Ensure that the tractor has sufficient steering and braking power.

Any implements 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 tractor front 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 implement and the permissible axle and drawbar loads of the tractor.
- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected implement).
- Check the brake power before moving off.
- When turning corners with the implement coupled, take the wide sweep and centrifugal mass of the implement into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the implement is fixed to the three-point hydraulic system or lower links of the tractor.
- Before road transport, move all the swivel implement parts to the transport position.
- Before road transport, secure all the swivel implement parts in the transport position against risky position changes. Use the transport locks intended for this.
- Before road transport, secure the operating lever of the three-point hydraulic system against unintentional raising or lowering of the coupled implement.
- Check that the transport equipment, e.g. lighting, warning equipment and protective equipment, is correctly mounted on the implement.
- Before road transport, carry out a visual check that the top and lower link pins are firmly fixed with the linch pin against unintentional release.
- Adjust your forward speed to the prevailing conditions.
- Before driving downhill, switch to a low gear.
- Before road transport, always switch off the independent wheel braking (lock the pedals).



### 2.15.2 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 depressurized on both the implement and tractor sides.
- It is forbidden to block the operator controls on the tractor which are used for hydraulic and electrical movements of components, e.g. folding, swivelling and pushing movements. The movement must stop automatically when you release the appropriate control. This does not apply to equipment movements that:
  - are continuous or
  - are automatically locked or
  - require a float position or pressure position due to their function.
- Before working on the hydraulic system,
  - Lower the implement.
  - Depressurise the hydraulic system.
  - Switch off the tractor engine.
  - Apply the tractor parking brake.
  - Take out the ignition key.
- Have the hydraulic hose lines checked for proper functioning by a specialist at least once a year.
- Replace the hydraulic hose lines if they are 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 aging, 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 lines made of 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.  
Risk of infection.
- When searching for leakage points, use suitable aids, to avoid the serious risk of infection.

### 2.15.3 Electrical system

---

- When working on the electrical system, always disconnect the battery (negative terminal).
- Only use the prescribed fuses. If fuses are used that are too highly rated, the electrical system will be destroyed – 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. If there is accidental earth contact, there is a risk of explosion
- Risk of explosion: avoid the production of sparks or the presence of naked flames in the vicinity of the battery.
- The implement may be equipped with electronic components whose function is influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not observed.
  - In the case of retrofitting electrical units and/or components on the implement, with a connection to the on-board power supply, the operator is responsible for checking whether the installation might cause faults on the vehicle electronics or other components.
  - Ensure that the retrofitted electrical and electronic components comply with the EMC directive 2004/108/EEC in the appropriate version and carry the CE mark.

## 2.15.4 Mounted implements

---

- When attaching to the three-point linkage, the attachment categories on tractor and implement must be compatible or an adapter must be used!
- Take note of the manufacturer's instructions.
- Before attaching implements to or removing them from the three-point suspension, shift the operating equipment to a position in which unintended raising or lowering is impossible.
- There is a danger of crushing or shearing injury around the three-point linkage.
- Do not step between tractor and implement when operating the external control for the three-point attachment!
- The implement may be transported and towed only by the tractors intended for this purpose.
- There is a risk of injury when implements are coupled to and uncoupled from the tractor.
- There is a danger of crushing and shearing injury when operating the support devices.
- When mounting implements at the front or rear of a tractor, do not exceed
  - The permissible total tractor weight
  - The permissible tractor axle loads
  - The approved load capacities of the tractor tyres
- Observe the max. working load of the mounted implement and the permissible axle loads of the tractor!
- Always ensure that the tractor lower links are adequately locked against sideways movement before transporting the implement.
- The operating lever for the tractor lower links must be secured against lowering when the implement is being towed on the road.
- Shift all equipment into the transport position before travelling on the road.
- Any mounted implements and ballast weights affect the handling, steering and braking of the tractor!
- The front tractor axle must always be loaded with at least 20 % of the empty tractor weight, in order to ensure sufficient steering power. Apply front weights if necessary!
- Only ever carry out any servicing, maintenance or cleaning operations or remedy malfunctions with the ignition key removed.
- Leave safety devices attached and always position them in the protective position.

### 2.15.5 PTO shaft operation

- Use only the universal joint shafts prescribed by the AMAZONEN-WERKE factories, equipped with the proper safety devices.
- Also read and follow the operating manual from the universal joint shaft manufacturer.
- The protective tube and universal joint shaft guard must be undamaged, and the shield of the tractor and implement PTO shaft must be attached and be in proper working condition.
- Work is prohibited while the safety devices are damaged.
- You can attach and detach the universal joint shaft only when
  - the PTO shaft is switched off.
  - the tractor engine is switched off.
  - the parking brake is engaged.
  - the ignition key has been removed.
- Always ensure that the universal joint shaft is installed and secured correctly.
- When using wide-angle universal joint shafts, always install the wide angle joint at the pivot point between the tractor and implement.
- Secure the universal joint shaft guard by attaching the chain(s) to prevent movement.
- Observe the prescribed pipe overlaps for universal joint shafts in transport and working positions. (Observe the operating manual of the universal joint shaft manufacturer.)
- When turning corners, observe the permitted bending and displacement of the universal joint shaft.
- Before switching on the PTO shaft, check that the selected PTO shaft speed of the tractor matches the permitted drive speed of the implement.
- Instruct everyone to leave the danger area of the implement before switching on the PTO shaft.
- While work is being carried out with the PTO shaft, there must be no one in the area of the PTO or universal joint shaft while it is turning.
- Never switch on the PTO shaft while the tractor engine is turned off.
- Always switch off the PTO shaft whenever excessive bending occurs or it is not needed.
- **WARNING!** After the PTO shaft is switched off, there is a danger of injury from the continued rotation of freewheeling implement parts.  
Do not approach the implement too closely during this time. You must only start work on the implement once all implement parts are at a complete standstill!
- Secure the tractor and implement against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on PTO shaft-driven implements or universal joint shafts.

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

### 2.15.6 Operation of the seed drill

---

- Comply with the permitted filling volumes of the seed hopper (seed hopper content).
- When filling the seed hopper, only use the ladder and the loading board.  
It is forbidden to ride on the implement during operation.
- During the calibration test, note the danger points from rotating and oscillating implement parts.
- Before road transport, remove the thrust collars of the tramline marker.
- Do not place any parts in the seed hopper.
- Lock the track marker (construction-dependent) in the transport position before road transport.

### 2.15.7 Cleaning, maintenance and repair

---

- Only carry out cleaning, maintenance and repair work on the implement when:
  - the drive is switched off.
  - the tractor engine is at a standstill.
  - the ignition key has been removed.
  - the implement plug has been disconnected from the on-board computer!
- Regularly check the nuts and bolts for a firm seat and retighten them as necessary.
- Secure the raised implement and/or raised implement parts against unintentional lowering before performing any cleaning, maintenance or repair work on the implement!
- 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 implements.
- Spare parts must meet at least the specified technical requirements of AMAZONEN-WERKE! This is ensured through the use of genuine AMAZONE spare parts!

### 3 Loading and unloading

**DANGER**

Never stand underneath implements lifted by a crane.

**DANGER**

Only attach the lifting gear at the marked positions. Do not stand under suspended loads.

The pictogram (Fig. 7) marks the location at which the lifting gear is to be attached to the implement.

1. Attach straps at the marked positions.
2. Place the implement on the transport vehicle and lash it down as prescribed.

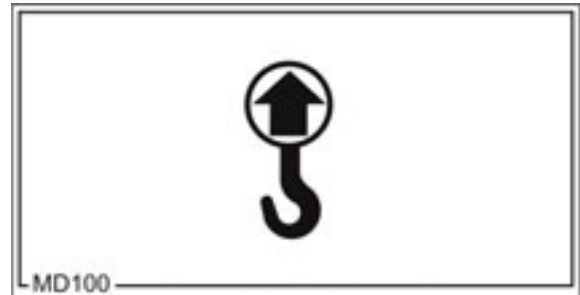


Fig. 7

The (Fig. 8) symbol marks the lashing points on the implement.

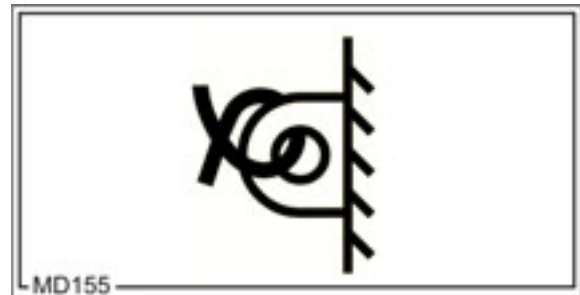


Fig. 8

## 3.1 ED 3000 [-C] / ED 4500 [-C]

The precision airplanters ED 3000 and ED 4500 are loaded with a crane (Fig. 9).

Fasten the transport straps to both sides on the brackets of the track marker and the parking supports.

Secure the implement in accordance with the regulations to the transport vehicle.



Fig. 9

## 3.2 ED 4500-2 [-2C] / 6000-2 [-2C/-2FC]

Fold in the precision airplanters ED 4500-2 and ED 6000-2 and load as follows with a crane. Fasten the transport straps (Fig. 10) to the eyelets on the implement.



Fig. 10



### 3.3 ED 6000 [-C]

To load the ED 6000 precision airplanter, hang the belt on the crane using a lifting beam.



Fig. 11

Fasten the transport straps (Fig. 11) on both sides to the eyelets on the implement and the top link attachment (Fig. 12). Load the implement on the transport vehicle.



Fig. 12

Secure the implement correctly to the transport vehicle (Fig. 13/1).



Fig. 13

## 4 Product overview

This section provides a comprehensive overview of the implement's design. If possible, read the product overview when actually standing at the implement. This helps you to understand the implement better.



Fig. 14

Precision airplanters place the individual seed grains into the soil at equal, adjustable distances. In each row, one seeding unit works with its own seed hopper (Fig. 14/1). The seed is sucked into the holes of the rotating singling discs. A suction fan (Fig. 14/2) produces the required vacuum. The exhaust air is discharged near the ground with an exhaust kit (optional). At the lowest point of the singling disc, the vacuum is released and the seed grain falls into the seed furrow produced by the seeding coulter (Fig. 14/3). As an option, the seed can be pressed down by the press roller (Fig. 14/4) after being placed before it is evenly covered with soil by the V press rollers (Fig. 14/5).

The singling discs can be driven either by a ground wheel drive or a hydraulic drive. If a ground wheel drive is used, the speed of the singling discs is set using the setting gearbox and the secondary gears. Gearbox speed changes alter the spacing of the grains in the soil. Individual seeding units can be switched off electronically, e.g. using the AMASCAN + on-board computer (optional) or an ISOBUS terminal (optional).

The suction fan (Fig. 14/2) is driven by the tractor PTO shaft or by a hydraulic motor. Track markers (optional)

(Fig. 14/6) mark the field connection run either at the centre of the tractor in the tractor track. For under root fertilising (optional), precision airplanters are equipped with fertiliser coulters (Fig. 14/7) that generally deposit the fertiliser 6 cm (adjustable) beside the seeding coulters (Fig. 14/3) in the soil. The fertiliser placement depth is adjustable. The fertiliser is stored in the fertiliser hopper (Fig. 14/8) or in the front tank. Using the fertiliser filling auger (Fig. 14/9, optional), the rear-mounted fertiliser hopper can be easily filled.

## 4.1 Implement overview



Fig. 15

Fig. 15/...

- (1) Seeding unit
- (2) Blower fan
- (3) Track marker
- (4) 900/1100 litre fertiliser hopper (optional)
- (5) Fertiliser filling auger (optional)
- (6) Micropellet spreader (optional)

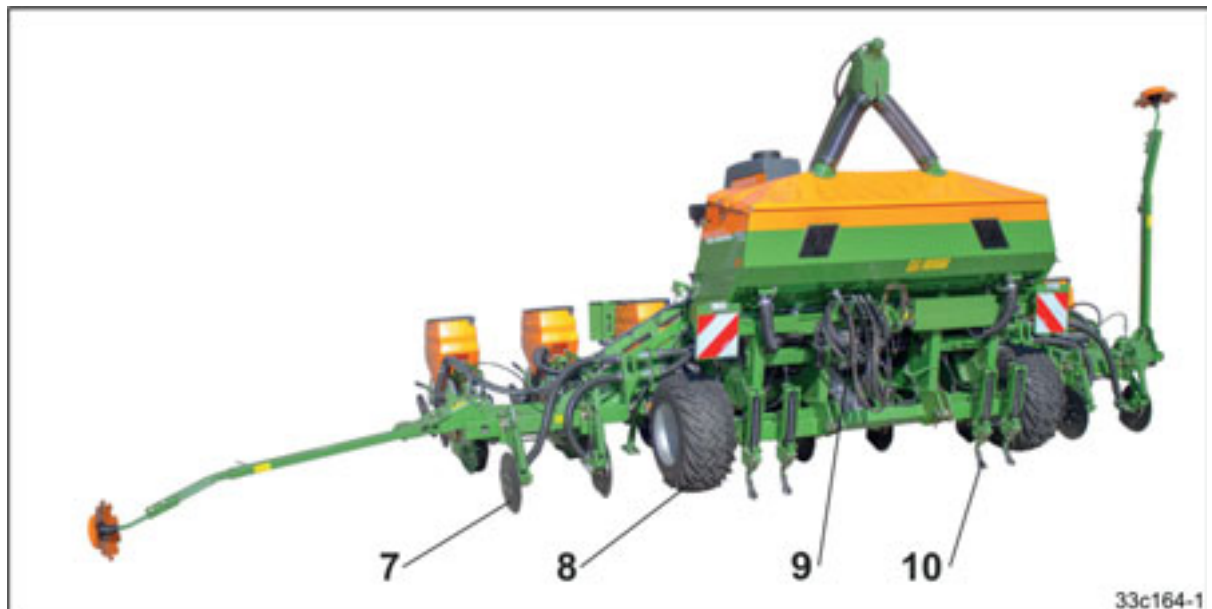


Fig. 16

Fig. 16/...

- (7) Fertiliser coulter (optional)
- (8) Running gear wheels (drive wheels optional)
- (9) Supply lines
- (10) Wheel mark eradicator (optional)

## 4.2 Seeding units

### 4.2.1 Classic seeding unit

The classic seeding unit is used for seeding in ploughed soil. The crank (Fig. 17/2) is used to adjust the seed placement depth. Depending on the equipment, the maximum seed placement depth is up to 13 cm.

If the desired placement depth is not reached, the seeding unit can be additionally loaded with a lever (Fig. 17/3) that adjusts the spring pressure. The adjustable, fore-running closers (Fig. 17/7) close the seed furrow.

The trailing farm flex tyres (Fig. 19, optional) or the rubber V-press rollers (Fig. 20, optional)

- guide the seeding unit to the depth.
- press down the seed furrow.

Fig. 17/...

- (1) Seed hopper
- (2) Adjusting the seed placement depth
- (3) Adjustment of the coulter pressure
- (4) Seed housing
- (5) Seeding coulter
- (6) Farm flex tyres (optional)
- (7) Closers (optional)



Fig. 17

The intermediate press roller (Fig. 18/1) (optional) presses the seed in.

Improved soil coverage means that more moisture is available for germination.



Fig. 18



The specifications of the seed placement depth are reference values. They depend on different factors, such as the

- Soil type (light to heavy, dry to wet)
- Forward speed
- Load level
- Condition of the seedbed.

Fig. 19/...

(1) Farm flex tyres (optional)

Diameter	Placement depth:
370 mm	~ 13 cm
500 mm	~ 11 cm



**Fig. 19**

Fig. 20/...

(1) Rubber V-press rollers (360x25) (optional)

Diameter	Placement depth:
360 mm	~ 8 cm



**Fig. 20**



## 4.2.2 Contour seeding unit

The contour seeding unit is used for seeding in ploughed or mulched soil. The maximum seed placement depth is 8.8 cm. The seed placement depth is adjusted using a crank (Fig. 22/2) and displayed on a scale.

If the desired placement depth is not reached, the seeding unit can be additionally loaded by adjusting the spring.

The contour seeding unit is supported by the leading carrier roller (Fig. 21/1) located on one side (both sides as an option) and the trailing V-press roller (Fig. 21/2).

The rollers are connected to each other with the depth adjustment crank (Fig. 21/3) and form a tandem. The contour seeding unit can therefore adapt itself to the level of the surface (Fig. 21).

The large double discs clear the organic remains of plants from fields in front of the seeding coulter.

The rubber V-press roller (optional, 360x25 or 360x50) is suitable for plough and mulch seeding and

- maintains the seed placement depth in conjunction with the front carrier roller
- closes the seed furrow.
- press down the seed furrow.

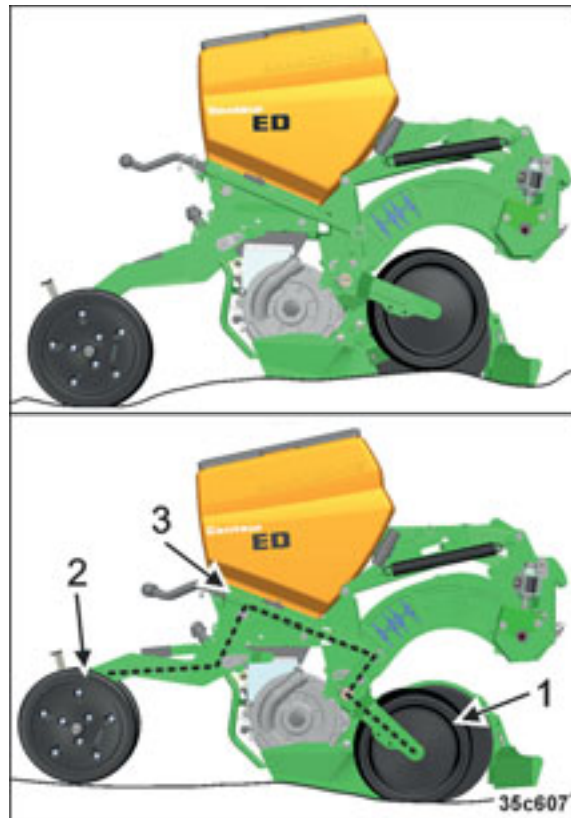


Fig. 21

Fig. 22/...

- (1) Seed hopper
- (2) Adjusting the seed placement depth
- (3) Seed housing
- (4) V press roller (optional)
- (5) Press roller (optional)
- (6) Coulter tip
- (7) Carrier roller, leading
- (8) Star clearer (optional)

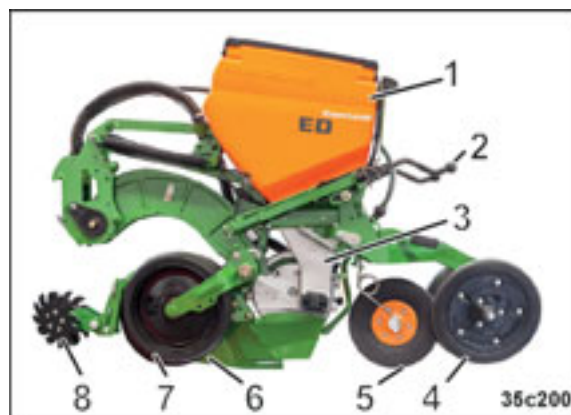


Fig. 22

The star clearers (Fig. 23/1) allow the seeding unit to run smoothly on soils with large amounts of crop residues. The star clearers should only move plant residues to the side.



With crop residues, there is the risk that the seed does not have contact with the soil.



Fig. 23

The clod clearer (Fig. 192/1) allows the seeding unit to run smoothly on ground with rough surface structures. The clod clearer should only clear the large clods off to the side.

Do not position the clod clearers too deeply. If the clod clearer causes complete earth movement, this has a negative impact when closing the seed furrows.

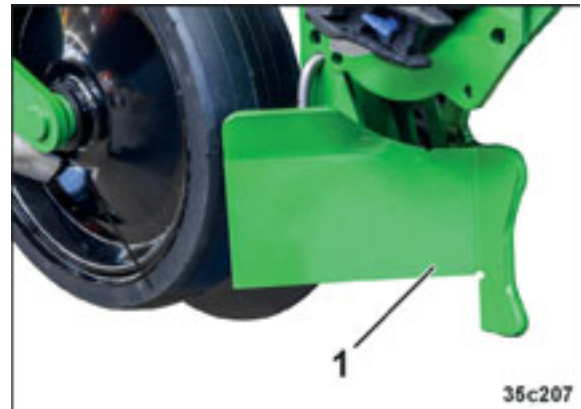


Fig. 24

The V-press roller (optional 380x57, Fig. 25/1) increases the ground contact pressure beside the seed furrow using a special rubber profile with an integrated wire rope.



Fig. 25

The trailing 370 mm farm flex tyres (optional, Fig. 26/1) press down on the seed furrow.



Fig. 26

## Product overview

The adjustable, fore-running closers (Fig. 27/1) close the seed furrow. They are suited for seeding in plough furrows.

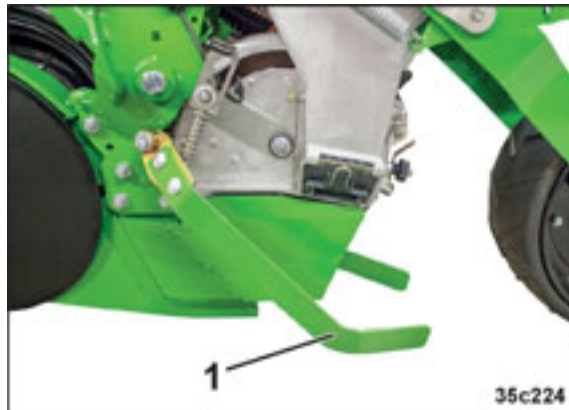


Fig. 27

Disc closers (optional, Fig. 28/1) close the seed furrow and are suitable for use behind a plough as well as for seeding in mulch. The trailing rollers close the seed furrow and press down on the soil.

The disc closers cannot be combined with the press roller.

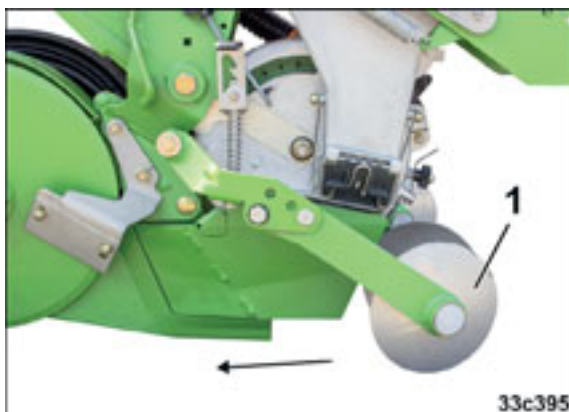


Fig. 28

The intermediate press rollers (Fig. 29/1 or Fig. 30/1) (optional) press down the seed.

Improved soil coverage means that more moisture is available for germination.

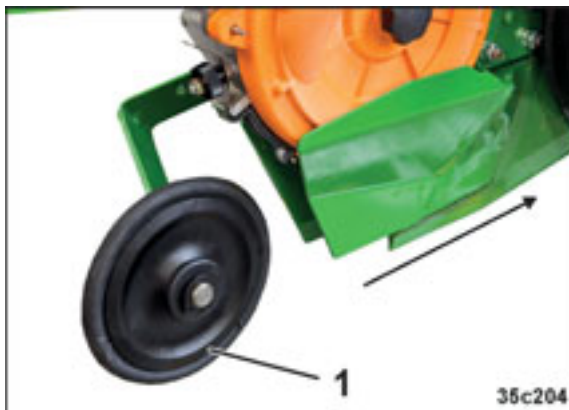


Fig. 29

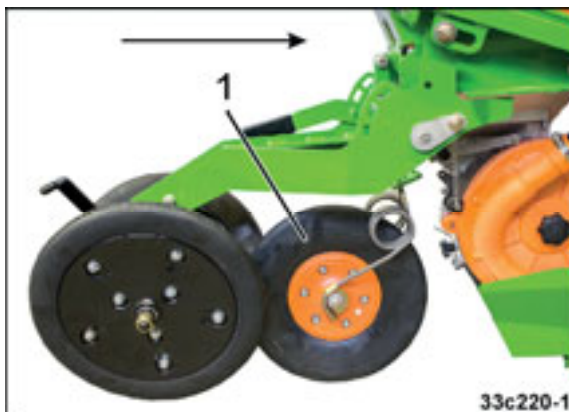


Fig. 30



### 4.3 Seed dosing

At a set row spacing, seeding is desired at a certain number "grains per m<sup>2</sup>" or "grains per hectare".

The required grain spacing is calculated from this, and is set by adjusting the speed of the singling discs.

With a mechanical drive:

- on the setting gearbox (Fig. 31/1) in 18 steps,
- on the secondary gearbox (Fig. 31/2) in 3 steps.



Fig. 31

With a hydraulic drive (Fig. 32/1):

- on the control terminal/on-board computer.



Fig. 32

The seed flows from the seed hopper through the feed opening (Fig. 33/1) in the seed hopper area (Fig. 33/2) of the singling disc.

The seed hopper area must not overflow nor must it contain too little seed.

Using the reduction flap (Fig. 33/3), the correct opening size can be set.

A fan creates a vacuum behind the holes (Fig. 33/4) of the rotating singling disc. The grains are then sucked out of the seed hopper area into the holes (Fig. 33/4) through the air slots (Fig. 34/1) of the suction kidneys.



Fig. 33

## Product overview

At the lowest point of the singling disc (Fig. 34/2) the vacuum is released and the seed grain falls into the seed furrow created by the seeding coulter.



Fig. 34

An ejector (Fig. 35/1) releases any broken grains which could block up the holes of the singling disc.

If several seeds are sucked into a hole at the same time, an adjustable scraper (5 positions, Fig. 35/2) carefully wipes off the excess seed grains which then fall back into the seed hopper area (Fig. 35/3).



Fig. 35

The seed fan (Fig. 36/1) creates a vacuum which sucks the seed grains into the holes of the singling discs.

The seed fan is driven

- by the tractor PTO shaft, or
- by a hydraulic motor.



Fig. 36

Depending on the implement equipment, the vacuum is displayed

- on a pressure gauge (Fig. 37/1)
- on the ISOBUS control terminal.

displayed.

Changing the speed of the suction fan causes a change to the vacuum.



Fig. 37

The holes of the singling discs (Fig. 38) are designed to match the seed properties (size, shape and weight). The singling discs should therefore be changed as appropriate.

The marking on the singling discs shows the number of holes, the hole diameter, and the colour of the singling disc, e.g. 30/5.0 green:

30 holes/diameter 5.0 mm, colour green.



Fig. 38

## 4.4 Fertiliser system (optional)

The implements can be equipped with a fertiliser system.

### 4.4.1 Fertiliser system with hopper at the rear

Fig. 39/..

- (1) 900 or 1100 litre fertiliser hopper

Depending on the equipment, the fertiliser metering is either mechanically (ground wheel drive) or electrically driven.

- (2) Fertiliser filling auger



Fig. 39

Fig. 40/..

- (1) Fill level mark

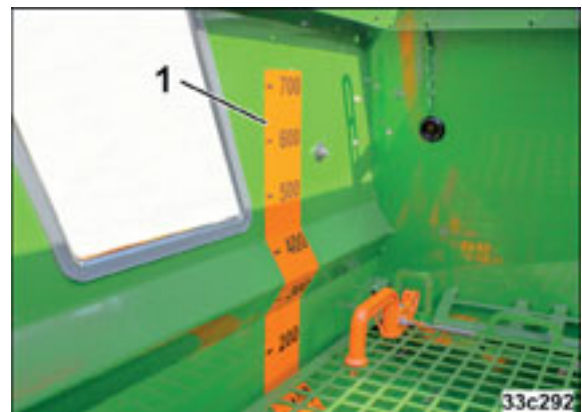


Fig. 40

#### 4.4.2 Fertiliser system with container at the front addition

Fig. 41/...

- (1) Front tank
- (2) Hopper cover
- (3) Conveyor section
- (4) Parking support
- (5) Metering unit
- (6) Folding loading board

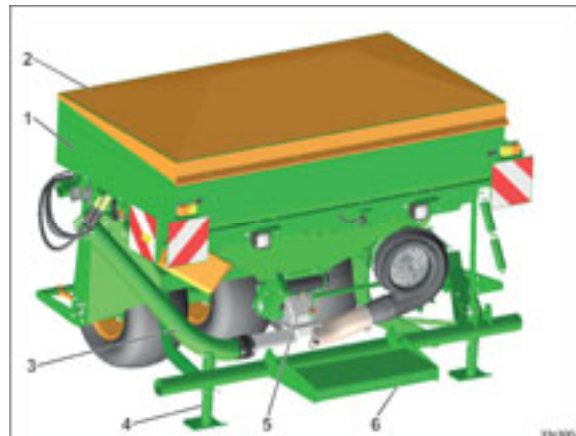


Fig. 41

#### 4.4.3 Fertiliser weighing system (optional, with rear hopper)

Fig. 42/...

- (1) When the button on the right side of the weighing terminal is pressed
  - briefly – for scrolling in the menu.
  - longer (2-3 seconds) – executing and confirming.



Fig. 42



- When switching on the power supply, the weighing terminal displays the current weight of the tank content.
- For displaying the correct tank volume, the empty implement must be balanced first.



#### 4.4.4 Under root fertilising

The fertiliser placement depth and the distance between the fertiliser coulters and the seeding coulters is adjustable.

The fertiliser coulters deflect around obstacles.

The dragged fertiliser coulters (Fig. 43) are used

- on ploughed soils.



Fig. 43

The single disc fertiliser coulters (Fig. 44) are used

- on ploughed soils,
- for mulch seeding.



Fig. 44

#### 4.4.5 Fertiliser line monitoring (optional)

The fertiliser line monitoring establishes the connection between the metering housing or the distributor head and the coulters.

Each monitored fertiliser line is equipped with a sensor (Fig. 45/1). If the fertiliser flow should be interrupted, a warning is issued.

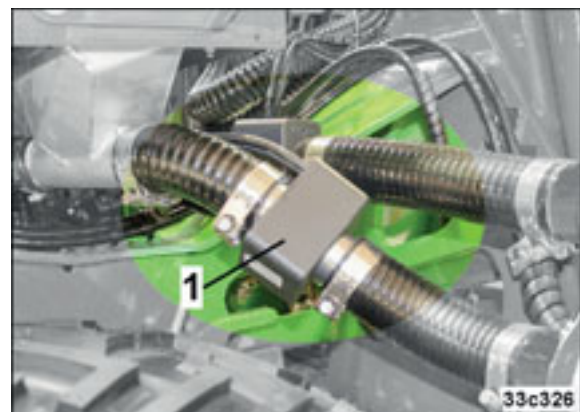


Fig. 45

#### The fertiliser line monitoring in combination with air separators.



If there is blockage at one of the coulters, the air escapes with the fertiliser through the air separator. The fertiliser line monitoring is not triggered. There is no warning message.

The warning message is only triggered if the seed line is blocked between the sensor and the air separator.

## 4.5 Threaded cartridge

Fig. 46/...

### 1. Threaded cartridge

To store the operating manuals

Depending on the implement equipment, the threaded cartridge is located on the seed hopper.



Fig. 46

## 4.6 Micropellet spreader (optional)



### **Danger!**

**When handling crop protection agents, wear a protective suit, breathing protection, gloves and safety goggles.**

**Fill and empty the tank in a well ventilated area.**

**Do not breathe in the product dust.**

**In the event of skin contact, wash the area of skin thoroughly.**

Fig. 47/...

- (1) Micropellet hopper
- (2) Metering unit with metering roller
- (3) Loading board with folded ladder



For the operation of the micropellet spreader, observe the corresponding supplement with the operating manual.



Fig. 47

Fig. 48/...

- (1) Feed hose (coultter connection)



Fig. 48

## 4.7 Wheel mark eradicator (optional)

The wheel mark eradicators (Fig. 49/1) can be adjusted horizontally and vertically.

The design of the wheel mark eradicator tools (Fig. 49/2) depends on the implement type and field of use.



Fig. 49

Fig. 50/...

- (1) Narrow coulter
- (2) Heart-shaped coulter (optional)
- (3) Wing coulter (optional)

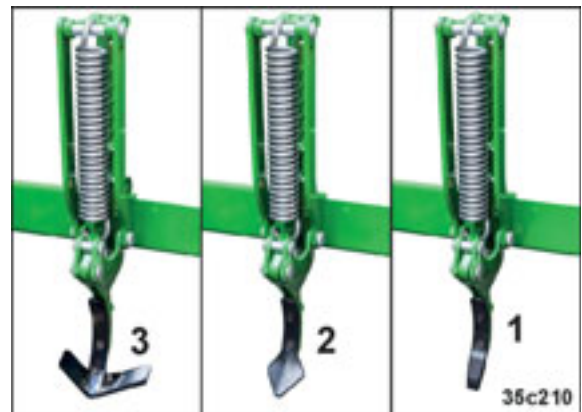


Fig. 50

## 4.8 Electronic monitoring and operation (optional)

The precision airplanter is electronically monitored or controlled using an on-board computer. Different control terminals are available for the different requirements:

- AMASCAN <sup>+</sup>,
  - Monitoring function
  - Simple implement control (optional)
- ISOBUS terminal (e.g. AMATRON or the tractor terminal)
  - Monitoring function
  - ISOBUS implement control
  - Camera application (optional)



Observe the corresponding operating manual when using the implement with the control terminal!

### 4.8.1 Joystick

Fig. 51/...

- (1) AMASTICK
- (2) AMAPILOT

The joysticks offer a convenient control option for ISOBUS control terminals.



Fig. 51



## 4.9 Supply lines between the tractor and the implement

Fig. 52/.

Supply line in parking position

- Hydraulic hose lines
- Depending on the equipment
- Parking position computer cable
- Parking position ISOBUS plug

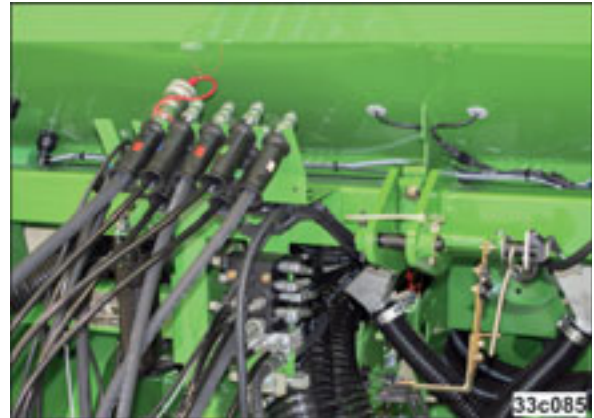


Fig. 52

## 4.10 Radar (optional)

The radar (Fig. 53, option with AMASCAN +) is used to detect the working speed.

The working speed is calculated using the data

- the worked area (hectare counter)
- the required speed for the speed of the metering roller(s)



Fig. 53

## 4.11 Work lights (optional)

The work lights (Fig. 54/1) is used to improve the illumination of the work area.



Fig. 54

The supply hopper interior lighting (Fig. 55/1) is used for a better view inside the supply hopper.



Fig. 55

## 4.12 Camera system (option)

The camera (Fig. 56/1) at the rear of the implement makes the area hidden by the hopper visible. The large monitor in the tractor cab displays the work performed by the implement tools and the filling funnel for the fertiliser filling auger.

Make sure nobody is standing between the supply vehicle and filling funnel during manoeuvring.



Fig. 56

### 4.13 Track markers (optional)

The hydraulically-actuated track markers (Fig. 57/1) dig into the ground alternately on the left and the right of the implement.

In doing so, the active track marker creates a mark. This mark serves as a reference for driving the next bout after turning at the headland.

After turning, the tractor driver drives either with the mark in the centre, or with the front wheel on the marking.

The following are adjustable:

- the length of the track marker.
- the working intensity of the track marker, depending on the type of soil.

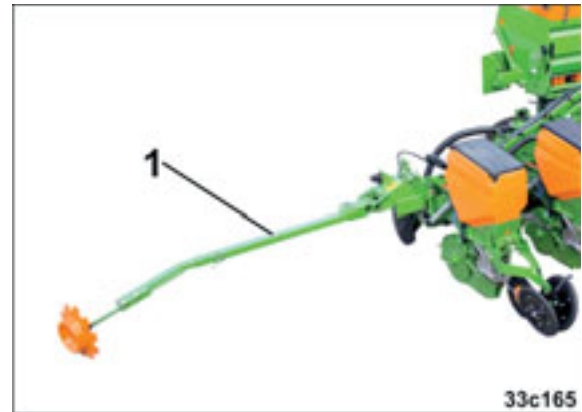


Fig. 57

### 4.14 Transportation equipment (optional)

Fig. 58/...

- (1) 2 rear-facing warning signs
- (2) 2 brake and rear lights
- (3) 2 rear-facing turn signals
- (4) 2 reflectors, red
- (5) 2 reflectors, yellow
- (6) 2 side-facing warning signs

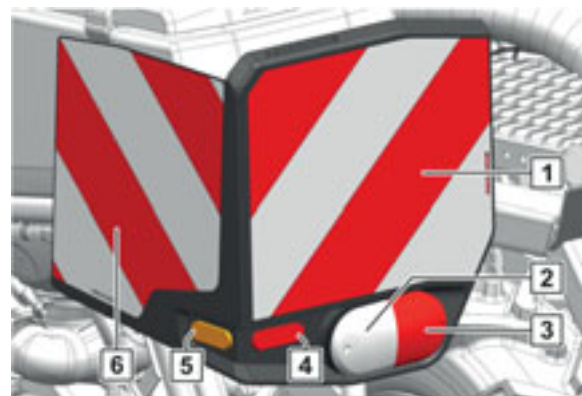


Fig. 58

Fig. 59/...

- (1) 2 forwards-facing side lights
- (2) 2 forwards-facing warning signs



Fig. 59

## 4.15 Safety and protective equipment

Fig. 60/...

(1) PTO shaft guard



Fig. 60

Fig. 61/...

(1) Blower fan cover



Fig. 61

Fig. 62/...

(1) Blower fan guard



Fig. 62



Fig. 63/...

- (1) Drive guard with hydraulic seed metering drive

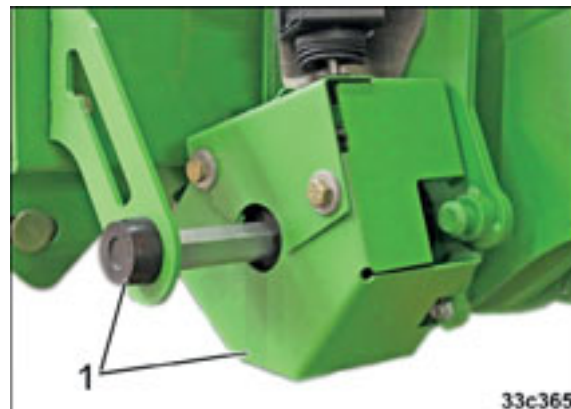


Fig. 63

Fig. 64/...

- (1) Drive guard with ground wheel drive



Fig. 64

Fig. 65/...

- (1) Drive guard with electrical fertiliser metering drive



Fig. 65

Fig. 66/...

- (1) Drive guard with mechanical fertiliser metering drive



Fig. 66

Fig. 67/...

- (1) Transport lock, implement boom

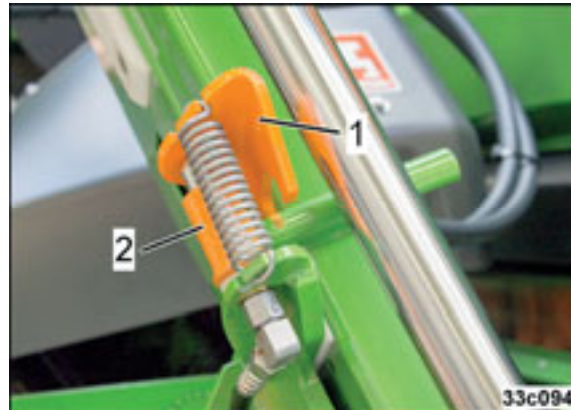


Fig. 67

Fig. 67/...

- (1) Working position lock, implement boom

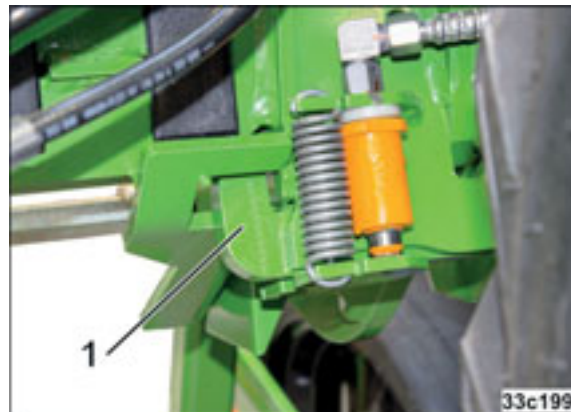


Fig. 68

Fig. 69/...

- (1) Ascent for filling the hopper. Depending on the equipment, the implement also has an ascent on the side.
- (2) Loading board with integrated storage compartment (depending on the equipment of the implement, the position of the storage compartment may vary).



Fig. 69

Fig. 70/...

The storage compartment contains

- (1) the digital scales for the calibration test
- (2) the collection bucket
- implement-specific tools



Fig. 70

Fig. 71/...

- (1) Sieve locking mechanism in the fertiliser hopper
- (2) Unlocking tool

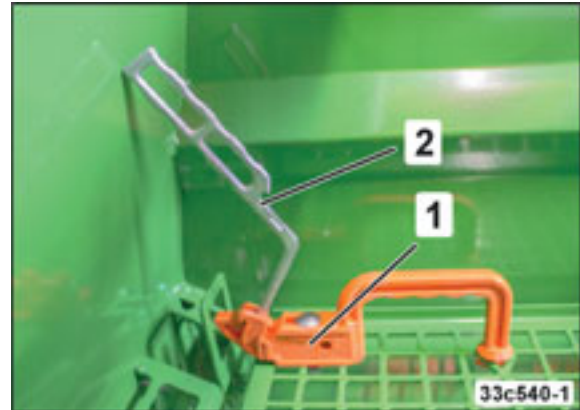


Fig. 71

#### 4.16 EnviroSafe

In some countries, pneumatic seed drills that are to be used for the seeding of maize treated with methiocarb must be designed with drift-reducing equipment.

Compared to unmodified seed drills, these types of implement achieve at least 90 % reduced drift of the exhaust air.

The Julius-Kühn Institute tests and confirms this with the JKI certification. Ask your local importer/implement dealer about the legal guidelines.



The EnviroSafe conversion kits are to be installed according to the enclosed mounting instructions.

Fig. 72/...

- (1) Exhaust air guide
- (2) Exhaust discharge near the soil



Fig. 72

## 4.17 Intended use

---

The implement

- is designed for metering and placing certain commercially-available types of seeds and fertilisers
- is coupled to the tractor via the three-point link and operated by one operator.

Slopes can be travelled

- Along the contours
  - Direction of travel to left      10 %
  - Direction of travel to right    10 %
- Along the gradient
  - Up the slope                      10 %
  - Down the slope                 10 %

"Intended use" also covers:

- Compliance with all the instructions in this operating manual.
- Adherence of inspection and maintenance work.
- Exclusive use of genuine 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.



## 4.18 Danger areas and danger points

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

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

Within the implement danger area, there are danger points with permanent or unexpected risks. Warning symbols indicate these danger points and warn against residual dangers, which cannot be eliminated for construction reasons. Here, the special safety regulations from the corresponding section are applicable.

No-one may remain in the danger area of the implement while

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

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

Danger points exist:

- between the tractor and the implement, particularly during coupling and uncoupling operations.
- where there are moving components.
- in the area of the swivelling implement sections.
- in the area of the swivelling track marker.
- underneath raised, unsecured implements or parts of implements.
- when unfolding/folding the implement sections near overhead power lines.
- by climbing onto the implement.

## 4.19 Rating plate and CE mark

The CE mark (Fig. 73/2) on the implement indicates compliance with the stipulations of the applicable EU directives.

The rating plate (Fig. 73/1) shows:

- Implement ID No.
- Type
- Perm. Total weight [kg]
- Model year
- Basic weight [kg]
- Factory

The following illustrations show the arrangement of the rating plate and the CE mark on the implement (Fig. 74).



Fig. 73



Fig. 74

## 4.20 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 cab closed.

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.

## 4.21 Technical Specifications

Precision airplanter		ED 3000 [-C]		ED 4500 [-C]		ED 6000 [-C]	
Seeding units		Classic	Contour	Classic	Contour	Classic	Contour
Possible tyres		10.0/75-15		10.0/75-15 31x15.5/15		31x15.5/15	
Transport width (also see table Seite 66)	[m]	3.00		4.00 - 4.35		2.40 - 2.60 (see Seite 175)	
Transport length	[m]	2.40 - 2.60		2.40 - 2.60		6.00 (see Seite 175)	
Number of seeding units in standard version (row spacing 75 cm)		4		6		8	
Max. number of seeding units with/without under root fertilising		6/6	6/6	12/9-12 <sup>1</sup>	8/6	12/9-12 <sup>1</sup>	
Fertiliser hopper capacity	[l]	900		900 / 1100		1100	
Fertiliser hopper filling height	[m]	1.78					
Empty weight without row fertiliser applicator from	[kg]	1210	1200	1470	1460	1600	1900
Empty weight with row fertiliser applicator from	[kg]	1810	1800	2145	2135	1912	2210

<sup>1</sup> only in combination with front tank

Precision airplanter		ED 4500-2 [-2C]		ED 6000-2 [-2C]		ED 6000-2FC	
Seeding units		Classic	Contour	Classic	Contour	Classic	Contour
Possible tyres		10.0/75-15 31x15.5/15		31x15.5/15		31x15.5/15	
Transport width (also see table Seite 66)	[m]	3.00		3.00 - 3.25		3.00 - 3.25	
Transport length	[m]	2.80 - 3.00		2.90 - 3.10		2.90 - 3.10	
Number of seeding units in stand- ard version (row spacing 75 cm)		6		8		8	
Max. number of seeding units with/without under root fertilising		7/6		12/9-12 <sup>1</sup>		12/9-12 <sup>1</sup>	
Fertiliser hopper capacity	[l]	900 / 1100		1100		FPU/FRU: 1500 / 2000	
Fertiliser hopper filling height	[m]	1.78				1.91	
Empty weight without row fertiliser applicator from	[kg]	1690	1680	2075	2030	2390	2350
Empty weight with row fertiliser applicator from	[kg]	2355	2345	2805	2760	2790	2750
Front hopper tare weight	[kg]	-		-		FRU 104: 590 FPU 104: 1135	

<sup>1</sup> only in combination with front tank

Precision airplanter		All types
Drive (seed)		Chain wheel drive 54 steps/hydraulic drive (optional)
Grain spacing (also see tables, Seite 107)	[cm]	2.1 to 259.5 depending on the singling disc used
Blower fan drive		Universal joint shaft with free wheel: universal joint shaft speed 540 rpm, 710 rpm or 1000 rpm, hydraulic drive (optional)
Singling discs		Plastic singling discs for maize, beans, peas, soya beans, sunflowers, etc.

## 4.21.1 Implement weights

Technical data serves for calculating the tractor weights and tractor axle loads (see Seite 70).

### 4.21.1.1 Rigid implements

			Total weight $G_H$	Distance $d$
<b>ED 3000</b> without fertiliser hopper	4-row	Classic	1200 kg	890 mm
		Contour	1210 kg	1080 mm
	5-row	Classic	1260 kg	940 mm
		Contour	1300 kg	1130 mm
	6-row	Classic	1320 kg	990 mm
		Contour	1390 kg	1190 mm
<b>ED 3000-C</b> 900 litre fertiliser hopper	4-row	Classic	1810 kg	750 mm
		Contour	1800 kg	910 mm
	5-row	Classic	1870 kg	790 mm
		Contour	1890 kg	960 mm
	6-row	Classic	1930 kg	830 mm
		Contour	1980 kg	1010 mm
<b>ED 4500</b> without fertiliser hopper	6-row	Classic	1470 kg	950 mm
		Contour	1460 kg	1160 mm
	7-row	Classic	1530 kg	980 mm
		Contour	1550 kg	1190 mm
	8-row	Classic	1590 kg	1010 mm
		Contour	1640 kg	1230 mm
<b>ED 4500-C</b> with fertiliser hopper	6-row	Classic	2145 kg	740 mm
		Contour	2135 kg	880 mm
<b>ED 6000</b> without fertiliser hopper	8-row	Classic	1360 kg	890 mm
		Contour	1540 kg	1080 mm
	12-row	Classic	1600 kg	970 mm
		Contour	1900 kg	1180 mm
<b>ED 6000-C</b> 1100 litre fertiliser hopper	8-row	Classic	1912 kg	730 mm
		Contour	2210 kg	870 mm

#### 4.21.1.2 Folding implements

			Total weight $G_H$	Distance $d$
<b>ED 4500-2</b> without fertiliser hopper	6-row	Classic	1690 kg	920 mm
		Contour	1680 kg	880 mm
	7-row	Classic	1750 kg	950 mm
		Contour	1770 kg	910 mm
<b>ED 4500-2C</b> with fertiliser hopper	6-row	Classic	2355 kg	740 mm
		Contour	2345 kg	880 mm
	7-row	Classic	2415 kg	760 mm
		Contour	2435 kg	910 mm
<b>ED 6000-2</b> without fertiliser hopper	8-row	Classic	2075 kg	890 mm
		Contour	2030 kg	1080 mm
	9-row	Classic	2135 kg	910 mm
		Contour	2120 kg	1100 mm
	12-row	Classic	2315 kg	970 mm
		Contour	2390 kg	1180 mm
<b>ED 6000-2C</b> 1100 litre fertiliser hopper	8-row	Classic	2805 kg	730 mm
		Contour	2760 kg	870 mm
	9-row	Classic	2865 kg	750 mm
		Contour	2850 kg	900 mm
<b>ED 6000-2FC</b> Row fertiliser attachment kit for front tank	8-row	Classic	2790 kg	860 mm
		Contour	2750 kg	1050 mm
	12-row	Classic	3030 kg	950 mm
		Contour	3110 kg	1160 mm

#### 4.21.1.3 Front tank FRU/FPU 104

		Total weight $G_v$	Distance $a_2$
Front tank FRU for row fertiliser attachment kit	FRU 104 (without attachment)	2150 kg	0.9 m
Front tank FPU for row fertiliser attachment kit	FPU 104 (without attachment)	2675 kg	0.85 m

## 4.21.2 Row spacing



It is not possible to subsequently convert the number of rows!

No. of rows	x	Row spacing	with classic seeding units				with contour seeding units			
			Number of seeding units	Row application of fertiliser possible	Working width (m)	Transport width (m)	Number of seeding units	Row application of fertiliser possible	Working width (m)	Transport width (m)
ED 3000 [-C]										
4	x	80	4	Yes	3.20	3.00	2 right / 2 left	Yes	3.20	3.00
4	x	75	4	Yes	3.00	3.00	2 right / 2 left	Yes	3.00	3.00
4	x	70	4	Yes	2.80	3.00	2 right / 2 left	Yes	2.80	3.00
5	x	60	5	Yes	3.00	3.00	3 right / 2 left	Yes	3.00	3.00
6	x	50	6	Yes	3.00	3.00	3 right / 3 left	Yes	3.00	3.00
6	x	45	6	Yes	2.70	3.00	3 right / 3 left	Yes	2.70	3.00
ED 4500 [-C]										
6	x	80	6	Yes	4.80	4.31	3 right / 3 left	Yes	4.80	4.32
6	x	75	6	Yes	4.50	4.06	3 right / 3 left	Yes	4.50	4.07
6	x	70	6	Yes	4.20	4.00	3 right / 3 left	Yes	4.20	4.00
7	x	60	7	Yes	4.20	3.20	4 right / 3 left	Yes	4.20	3.00
8	x	50	8	No	4.00	4.00	4 right / 4 left	No	4.00	4.00
8	x	45	8	No	4.05	4.00	4 right / 4 left	No	4.05	4.00
ED 4500-2 [-2C]										
6	x	80	6	Yes	4.80	3.00	3 right / 3 left	Yes	4.80	3.00
6	x	75	6	Yes	4.50	3.00	3 right / 3 left	Yes	4.50	3.00
6	x	70	6	Yes	4.20	3.00	3 right / 3 left	Yes	4.20	3.00
7	x	60	7	Yes	4.20	3.20	4 right / 3 left	Yes	4.20	3.00
ED 6000-C [-2 /-2C /-2FC]										
6	x	90	6	Yes	5.40	6.00 (6000-C)	3 right / 3 left	Yes	5.40	6.00 (6000-C)
8	x	80	8	Yes	6.40	3.25	4 right / 4 left	Yes	6.40	3.25
8	x	75	8	Yes	6.00	3.00	4 right / 4 left	Yes	6.00	3.00
8	x	70	8	with rear tank (1)	5.60	3.10	4 right / 4 left	with rear tank (1)	5.60	3.10
8	x	70	8	with front tank	5.60	3.10	4 right / 4 left	with front tank	5.60	3.10
9	x	60	9	No	5.40	3.25	5 right / 4 left	No	5.40	3.25
12	x	45	12	with front tank	5.40	3.00	6 right / 6 left	with front tank	5.40	3.00
12	x	45	12	No	5.40	3.00	6 right / 6 left	with front tank	5.40	3.00
12	x	50	12	with front tank	6.00	3.25	6 right / 6 left	No	6.00	3.25
12	x	50	12	No	6.00	3.25	6 right / 6 left	No	6.00	3.25

Fig. 75

(1)



### Warning

A deep placement setting of the fertiliser coulters causes collisions when folding in!

See section 9.10.2, page 191

## 4.22 Necessary tractor equipment

For operation of the implement in compliance with the intended use the tractor must fulfil the following requirements.

Tractor power	Engine power (without fertiliser system)	ED 3000	from 44 kW (60 bhp) upwards
		ED 4500 [-2]	from 55 kW (75 bhp) upwards
		ED 6000 [-2]	from 66 kW (90 bhp) upwards
	Engine power (with fertiliser system)	ED 3000-C	from 55 kW (75 bhp) upwards
		ED 4500-C [-2C]	starting at 66 kW (90 HP)
		ED 6000-C [-2C / 2FC]	from 88 kW (120 bhp) upwards



### Observe the lifting power requirement!

For more information, see section "Implement weights", starting at page 64

Hydraulic system	Tractor control units	See section "Supply lines between the tractor and the implement", Seite 53
	Hydraulic oil	51524 HLP68 (depending on the configuration, 5 - 8 litres)  The implement hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.
	Arbeitsdruck	210 bar
	Tractor pump capacity:	
	Implement operation with hydraulic fan drive Implement operation with hydraulic fan & metering shaft drive	At least 80 l/min. at 150 bar  At least 100 l/min. at 150 bar
Electrical sys-	Socket for the road traffic lights	12 V (7-pin)
	Basic tractor equipment for control terminal	12V at 65 A

## 4.23 Access to the Info Portal



Using the illustrated QR code, you can directly access the AMAZONE homepage. You can access the Info Portal via the Service area. More information for download is available here.



www.amazone.de

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Fig. 76

## 5 Start-up

This section contains information

- on initial operation of your implement.
- on checking how you may mount the implement to your tractor.



- Before operating the implement for the first time the operator must have read and understood the operating manual.
- Take heed of section "Safety information for users", from Seite 26 onwards on
  - Coupling and uncoupling the implement
  - Implement transportation
  - Use of the implement
- Only couple and transport the implement to/with a tractor which is suitable for the task.
- The tractor and implement 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 float position or pressure position due to their function.



## 5.1 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 you attach or hitch the implement to the tractor.  
You may only connect the implement to tractors suitable for the purpose.
- Carry out a brake test to check whether the tractor achieves the required braking deceleration also with the implement attached.

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

- The permissible total weight
- The permissible axle loads
- The permissible drawbar load at the tractor coupling point
- The load capacity of the installed tyres
- The permissible 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 implement connected.

### 5.1.1 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

- tractor empty weight,
- ballast weight and
- total weight of the attached implement or drawbar load of the hitched implement.



#### **This notice applies only to 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.

### 5.1.1.1 Data required for the calculation (attached implement)

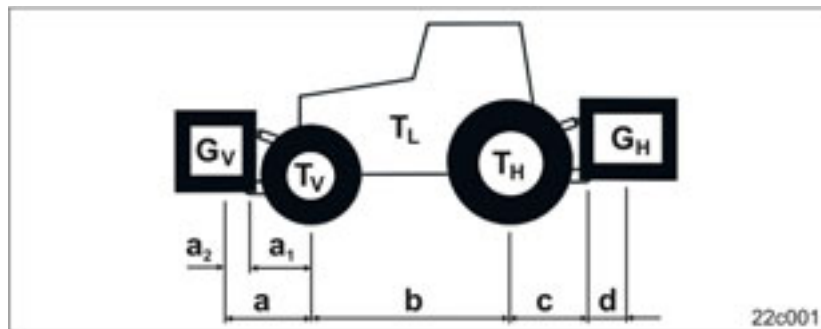


Fig. 77

$T_L$	[kg]	Tractor empty weight	See tractor operating manual or vehicle documentation
$T_V$	[kg]	Front axle load of the empty tractor	
$T_H$	[kg]	Rear axle load of the empty tractor	
$G_H$	[kg]	Total weight of rear-mounted implement or rear ballast	see section "Implement weights", starting at page 64
$G_V$	[kg]	Total weight of front-mounted implement or front ballast	see section "Implement weights", starting at page 64
$a$	[m]	Distance between the centre of gravity of the front mounting implement or the front weight and the centre of the front axle (total $a_1 + a_2$ )	See technical data of tractor and front implement mounting or front weight or measurement
$a_1$	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement
$a_2$	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front-mounted implement or front ballast (centre of gravity distance)	See technical data of front implement mounting or front weight or measurement
$b$	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
$c$	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement
$d$	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the rear-mounted implement or rear ballast (centre of gravity distance)	see section "Implement weights", starting at page 64

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

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

Enter the numeric value for the calculated minimum ballast  $G_{V \min}$ , required on the front side of the tractor, in the table (section 5.1.1.7).

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

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

Enter the numeric value for the calculated actual front axle load and the approved tractor front axle load specified in the tractor operating manual in the table (section 5.1.1.7).

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

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

Enter the numeric value for the calculated actual total weight and the approved total tractor weight specified in the tractor operating manual in the table (section 5.1.1.7).

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

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

Enter the numeric value for the calculated actual rear axle load and the approved tractor rear axle load specified in the tractor operating manual in the table (section 5.1.1.7).

#### 5.1.1.6 Tractor tyre load capacity

Enter the double value (two tyres) of the approved load capacity (see, for example, tyre manufacturer's documentation) in the table (section 5.1.1.7).

### 5.1.1.7 Table

	Actual value according to calculation	Approved value according to tractor operating manual	Double approved load capacity (two tyres)
Minimum ballast front/rear	<div style="border: 1px solid black; padding: 5px; display: inline-block;">/ kg</div>	--	--
Total weight	<div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	--
Front axle load	<div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>
Rear axle load	<div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; display: inline-block;">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 ( ≤ ) the permissible values!



#### WARNING

**Risk of contusions, cutting, catching, drawing in and impact through insufficient stability and insufficient tractor steering and brake power.**

It is forbidden to couple 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 ( $G_V$ ), 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 ( $G_H$ ), you must use ballast weights in addition to the rear-mounted implement.

## 5.2 Installation/adjustment of the supplied components

For the installation or adjustment of the supplied components, secure the tractor/implement against unintentional start-up and rolling.



### WARNING

**Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact when making interventions in the implement, through**

- unintentional lowering of the unsecured implement when it is raised via the three-point hydraulic system of the tractor.
- unintentional lowering of raised, unsecured parts of the implement.
- Unintentional start-up and rolling of the tractor-implement combination.

**Secure the tractor and the implement against unintentional start-up and rolling before any intervention in the implement.**

**It is forbidden to make any intervention in the implement, such as installation, adjustment, troubleshooting, cleaning, maintenance and repairs**

- while the implement is being driven.
- when the tractor's engine is running and the tractor's PTO shaft/hydraulic system is connected.
- if the ignition key is inserted in the tractor when the tractor's PTO shaft/hydraulic system is connected and the tractor engine could be started unintentionally.
- if the tractor and implement have not each been prevented from unintentionally rolling away by applying their parking brakes and/or securing them with wheel chocks.
- if moving parts are not blocked against unintentional movement.
- When carrying out such work, in particular, there is a high risk of contact with unsecured components.

1. Park the tractor and the implement on solid, level ground only.
2. Lower any raised, unsecured implement/raised, unsecured implement parts.

→ This is how to prevent unintentional falling.

3. Shut down the tractor engine.
4. Remove the ignition key.
5. Apply the tractor parking brake.

## 5.2.1 Adjust the PTO shaft to the tractor



Prior to the first coupling to the tractor and when changing the tractor adjust the PTO shaft length. In this regard, observe the operating manual of the PTO shaft manufacturer.



### WARNING

#### Danger due to

- **damaged and/or destroyed, flying parts for the operator/third persons may occur if the universal joint shaft is up-ended or pulls apart while the implement coupled to the tractor is being raised/lowered because the length of the universal joint shaft has not been adjusted properly.**
- **being caught and drawn in if the universal joint shaft is installed incorrectly or if unauthorised structural changes are made.**

Have the length of the universal joint shaft checked by a specialist workshop in all implement situations and, if necessary, adjusted before coupling the universal joint shaft to your tractor for the first time. When adjusting the universal joint shaft, it is mandatory to observe the operating manual supplied by the universal joint shaft manufacturer.



### WARNING

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

Only a specialist workshop may make structural changes to the universal joint shaft. In doing so, the operating manual from the universal joint shaft manufacturer must be observed.

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

Structural changes to the universal joint shaft that are not described in the operating manual from the universal joint shaft manufacturer are not permitted.



### WARNING

**Danger of crushing between the rear of the tractor and the implement when raising and lowering the implement to determine the shortest and longest operating position of the universal joint shaft.**

Actuate the operating controls for the tractor's three-point hydraulic system

- only from the designated workstation.
- never if you are inside of the danger area between the tractor and the implement.



**WARNING****Danger of crushing from unintentional**

- **rolling of the tractor and the coupled implement!**
- **lowering of the raised implement!**

Secure the tractor and implement against unintentional starting and unintentional rolling and safeguard the raised implement against unintentional lowering before entering the danger zone between the tractor and the raised implement in order to adjust the universal joint shaft.



The shortest length of the universal joint shaft is when the universal joint shaft is positioned horizontally. The longest length of the universal joint shaft is when the implement is completely raised.

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

In doing so, actuate the operating controls for the tractor's three-point hydraulic system at the rear of the tractor from the designated workstation.
4. Before entering the danger area between the tractor and implement, secure the raised implement against unintentional lowering by supporting it or hooking it to a crane.
5. Secure the tractor against unintentional starting before entering the danger area between the tractor and implement.
6. When determining the length and when shortening the universal joint shaft, observe the operating manual provided by the universal joint shaft manufacturer.
7. Reconnect the shortened halves of the universal joint shaft.
8. Grease the PTO shaft of the tractor and the input shaft of the gearbox before connecting the universal joint shaft.

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

### 5.3 Hydraulic drives



**The back pressure of 10 bar must not be exceeded. The installation regulations therefore have to be complied with when connecting the hydraulic fan connection.**



**The hydraulic fluid must not overheat.**

High oil flow rates in conjunction with small oil tanks encourage rapid heating-up of the hydraulic fluid. The capacity of the tractor's oil tank (Fig. 80/8) should be at least twice the oil flow rate. If the hydraulic fluid heats up excessively, the installation of an oil cooler is required at a specialist workshop.



**When back coupling with other hydraulic components of the tractor, there may be fluctuations in the fan speed.**

**Please contact your AMAZONE customer service.**

### 5.3.1.1 Installation regulations Profi control (optional)

#### Without "LS operation":

- Connect the pressure line (Fig. 79/2) to a single- or double-acting tractor control unit with priority.

#### With "LS operation":

- LS pressure line connection
- LS control line connection.

#### With and without "LS operation":

- Only connect the return line (Fig. 79/3) to an unpressurized tractor connection with direct access to the hydraulic fluid tank. Do not connect the return line to a tractor control unit to prevent the back pressure from exceeding 10 bar.

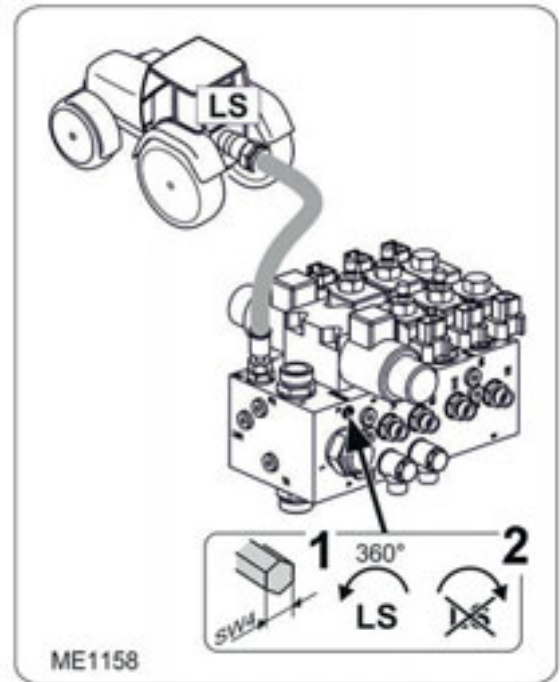
To install the tractor return line, use only pipes with at least DN 16, e.g. Ø 20 x 2.0 mm, with a short return path to the hydraulic fluid tank.

#### Switching between LS and circulation:

Profi controls with load sensing function are marked with a note.

Fig. 78/...

- (1) With "LS operation"
  - Screw out grub screw 2 (Fig. 78/1) by **one turn** counterclockwise.
- (2) Without "LS operation" (condition on delivery)
  - Screw in grub screw 2 (Fig. 78/2) clockwise (3 Nm).



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Fig. 78

Fig. 79/...

- (A) Implement side
- (B) Tractor side
- (1) Tractor control unit with priority, single-acting or double-acting
- (2) Hydraulic hose pressure line (handle no. 1, red)
- (3) Hydraulic pipe return flow line with large plug coupling (handle no. 2, red)
- (4) Oil filter on the implement side
- (5) Tractor hydraulic pump
- (6) Oil filter on the tractor side
- (7) Tractor hydraulic fluid tank
- (8) Electrohydraulic control block (Profi control)
- (9) Fold boom right side (valve K18)
- (10) Transport lock left side (valve K18)
- (11) Work lock right side (valve K17)
- (12) Track marker right side (valve K4)
- (13) Fold boom left side (valve K16)
- (14) Transport lock right side (valve K16)
- (15) Work lock left side (valve K15)
- (16) Track marker left side (valve K3)
- (17) Star wheel actuation (valve K1) (optional, only in combination with ISO-BUS)
- (18) Fertiliser filling auger (valve K9) (optional, only in combination with ISO-BUS)
- (19) Track width adjustment (valve K15/K16) (optional, only in combination with ISO-BUS)
- (LS) Load sensing control line connection (optional)

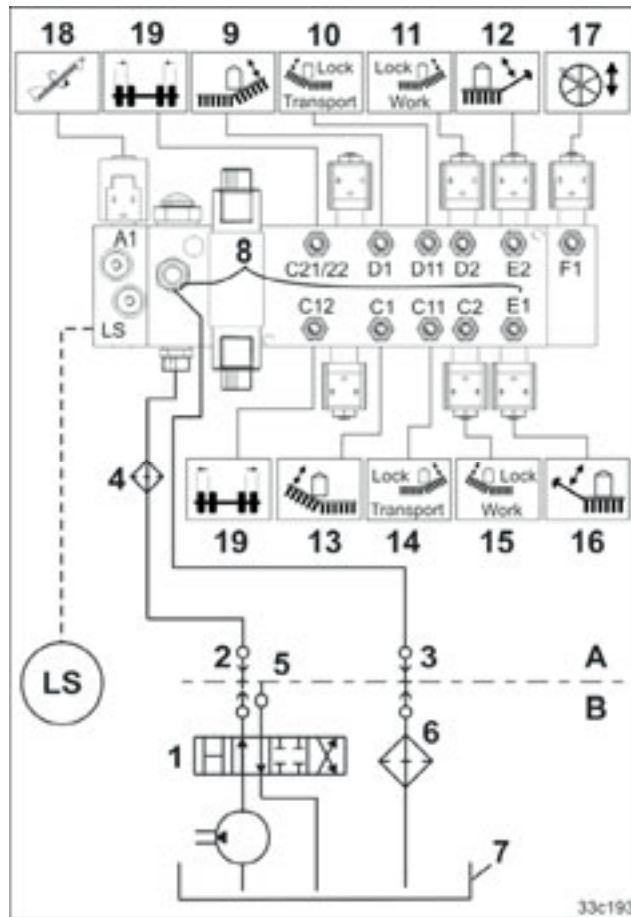


Fig. 79

### 5.3.1.2 Installation regulations for hydraulic fan drive connection (optional)

- Connect the hydraulic coupling of the pressure line (Fig. 80/5) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling of the return line (Fig. 80/6) only to an unpressurized tractor connection with direct access to the hydraulic fluid tank (Fig. 80/4).  
Do not connect the return line to a tractor control unit to prevent the back pressure from exceeding 10 bar.
- For retro-installation of the tractor return line, use only piping with ND 16, e.g. 20 id. x 2.0 mm with a short return path to the hydraulic fluid tank.

#### hydraulic fan drive: Fig. 80/...

- (A) Implement side  
(B) Tractor side
- (1) Tractor control unit with priority, single-acting or double-acting  
(2) Blower fan hydraulic motor  
(3) Hydraulic hose pressure line (handle no. 1, red)  
(4) Hydraulic hose return flow line with large plug coupling (handle no. 2, red)  
(5) Tractor hydraulic pump  
(6) Oil filter on the tractor side  
(7) Tractor hydraulic fluid tank

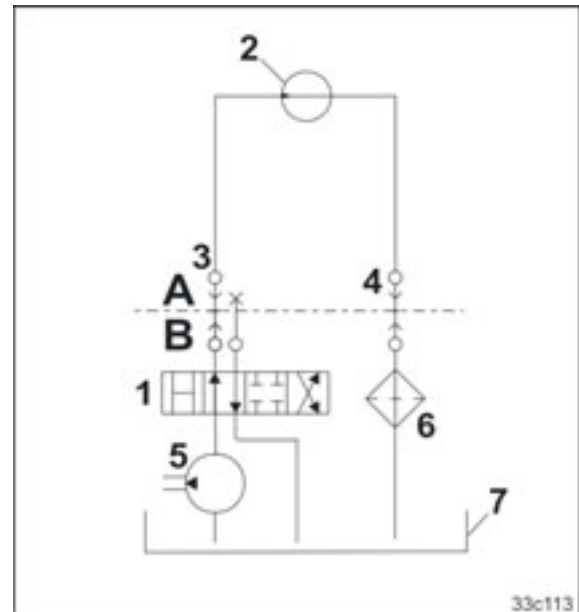


Fig. 80

#### Hydraulic fan & metering drive: Fig. 81/...

- (A) Implement side  
(B) Tractor side
- (1) Tractor control unit with priority, single-acting or double-acting  
(2) Blower fan hydraulic motor  
(3) Hydraulic hose pressure line (handle no. 1, red)  
(4) Hydraulic hose return flow line with large plug coupling (handle no. 2, red)  
(5) Tractor hydraulic pump  
(6) Oil filter on the tractor side  
(7) Tractor hydraulic fluid tank  
(8) Oil filter on the implement side  
(9) Leak oil line  
(10) Metering drive hydraulic motor

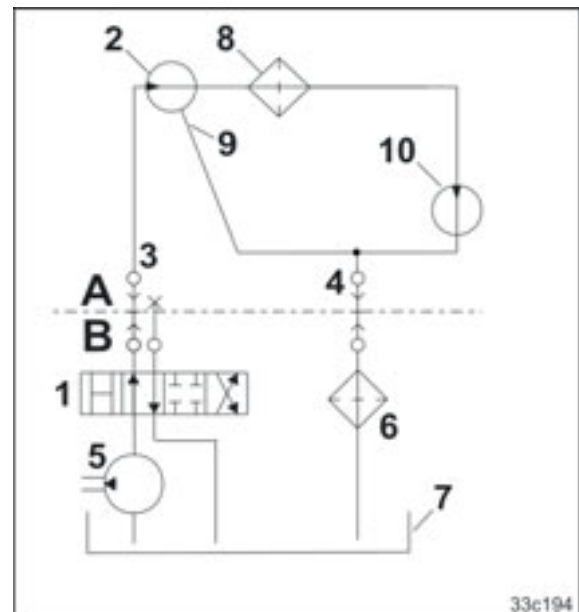


Fig. 81

### 5.3.1.3 Installation regulation for the hydraulic metering drive (optional)



The following section provides information for setting the hydraulic metering drive. This ensures that sufficient oil is supplied to the metering drive in any configuration.



#### Hydraulic metering drive

A minimum oil quantity of 25 l/min is required for the hydraulic metering drive.



#### Combination of hydraulic metering drive with hydraulic fan drive.

When the hydraulic metering drive is operated in combination with the hydraulic fan drive, an oil quantity of at least 35 l/min is required.

Set the fan speed according to section 7.9.2 (page 133). If the fan speed is set higher than 3000 rpm, there is a sufficient quantity of oil for the metering drive.

#### Hydraulic metering drive: Fig. 82/...

- (A) Implement side
- (B) Tractor side
- (1) Tractor control unit with priority, single-acting or double-acting
- (2) Oil filter on the implement side
- (3) Hydraulic hose pressure line (handle no. 1, red)
- (4) Hydraulic hose return flow line with large plug coupling (handle no. 2, red)
- (5) Tractor hydraulic pump
- (6) Oil filter on the tractor side
- (7) Tractor hydraulic fluid tank
- (8) Metering drive hydraulic motor

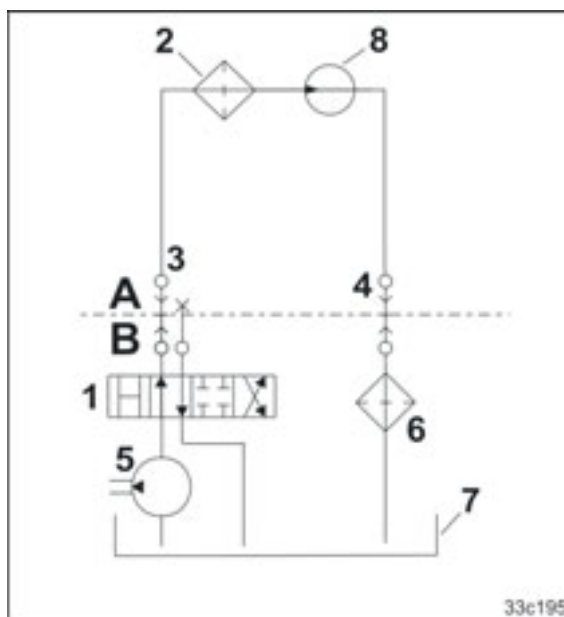


Fig. 82



### 5.3.2 Initial installation of the control terminal (optional)

The initial installation of the control terminal (Fig. 83) in the tractor cabin can be taken from the respective operating instructions.



Fig. 83

### 5.3.3 Initial installation of the working position sensor (optional)

Install the potentiometer (Fig. 84/1a) together with the digital sensor (Fig. 84/2a, optional) as shown in Fig. 84.

The potentiometer is connected to the control lever (Fig. 84/1b). The control lever is attached to the top link (Fig. 84/3). The length can be adjusted (Fig. 84/4).

The digital sensor is switched with the magnet (Fig. 84/2b).

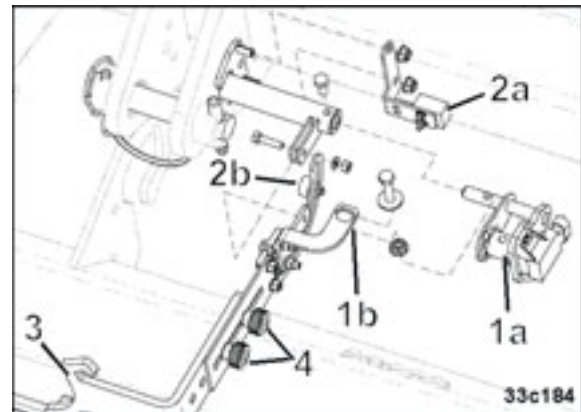


Fig. 84

### 5.3.4 Initial installation of the clod clearer (optional with contour seeding unit)

1. Screw in the guide bolts (Fig. 85/1).



Fig. 85

2. Hang the clod clearer (Fig. 86/1) on the guide bolts (Fig. 85/1), secure with a pin (Fig. 86/2) and secure with a linch pin.

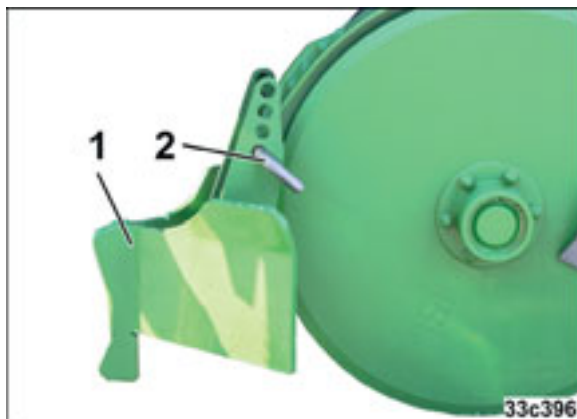


Fig. 86

## 6 Coupling and uncoupling the implement



When coupling and uncoupling the implement take heed of the section "Safety information for users", Seite 26.



### CAUTION

#### Switch off the on-board computer:

- before road transport.
- before adjustment, maintenance and repair work.

Risk of accident due to unintended movements of the metering unit or other implement components caused by radar pulses.



### WARNING

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

Secure the tractor and implement to prevent unintentional starting and rolling before entering the danger area between the tractor and implement to couple or uncouple the implement. For more information, see section 5.2, Seite 73.



### WARNING

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

Actuate the operating controls for the tractor's three-point hydraulic system

- from the workplace provided.
- if you are outside of the danger area between the tractor and the implement.



### 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 implement to tractors suitable for the purpose. On this subject see the section "Checking the suitability of the tractor", Seite 69.

**WARNING****Risk of contusions when coupling the implement and standing between the tractor and the implement!**

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

Any helpers may only act as guides standing next to the tractor and the implement, 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 implement unexpectedly releases from the tractor!**

- Use the intended equipment to connect the tractor and the implement in the proper way.
- When coupling the implement to the tractor's three-point hydraulic system, it is vital to ensure that the tractor mount categories of the tractor and the implement are the same.  
Refit the cat. II top link and lower link pins of the implement to be cat. III using reducing sleeves if your tractor has a cat. III three-point hydraulic system.
- Only use the upper and lower link pins provided for coupling the implement.
- Check the upper and lower link pins for visible defects whenever the implement is coupled. Replace the top and lower link pins if there are clear signs of wear.
- Use a lynch pin on each of the top and lower link pins in the pivot points on the three-point frame attachment to secure them against unintentional release.

**WARNING****Risk of energy supply failure between the tractor and the implement through damaged power lines!**

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

- must give slightly without tension, bending or rubbing on all movements of the connected implement.
- must not chafe against other parts.

**WARNING**

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

Check the lower and top link pins for any obvious defects whenever the implement is coupled. Replace the pins if there are clear signs of wear.

**DANGER**

**Only install/remove the universal joint shaft with the drive shaft turned off, the hand brake applied, the engine switched off and the ignition key removed.**

**If you are caught up in a rotating shaft, it can cause serious injury or even death.**

**Always ensure that the universal joint shaft is installed and secured correctly.**

## 6.1 Coupling the front tank

Couple and uncouple the front tank (Fig. 87/1) to the tractor based on the front tank's operating manual.



Fig. 87



Create a conducting connection of the front tank's wiring harness (implement plug) to the tractor ground (danger of static charging).

## 6.2 Coupling the implement

1. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.
2. Clean and grease the PTO shaft connections on the implement and tractor sides.
3. Insert the universal joint shaft half equipped with a freewheel (Fig. 88/1) onto the PTO shaft connection of the implement, and secure it according to the instructions (see the universal joint shaft manufacturer's operating instructions).

Only use approved universal joint shafts

- o W2200, 1210 mm 1 3/8, 6-part with freewheel (Fig. 88/1) or
- o W2200, 1610 mm 8x32x38 with freewheel (for tractors meeting the Russian design).

The freewheel permits the fan to run on when the universal joint shaft is switched off.

In the direction of travel, the universal joint shaft turns to the right (clockwise).

4. Support the universal joint shaft on the universal joint shaft support (Fig. 88/2)
5. The implement is fitted with category II lower and top link pins. Fit the lower and upper link pins with ball bushings. The ball bushings depend on the type of tractor (see tractor's operating manual).

It is imperative to adapt the category II top and lower pins of the implement using the reducing sleeves to category III if your tractor has a hydraulic three-point category III system.

6. Secure the upper and lower link pins

The anti-twist device (Fig. 89/1) on the pins is only required for the ED 6000-C.

7. Direct people out of the danger area between the tractor and implement before you approach the implement with the tractor.



**Fig. 88**



**Fig. 89**



8. First connect the supply lines (see section 6.5, Seite 91 and section 6.7, Seite 97) before coupling the implement to the tractor.
  - 8.1 Drive the tractor towards the implement leaving a gap (approx. 25 cm) between the tractor and the implement.
  - 8.2 Secure the tractor against unintentional starting and rolling away.
  - 8.3 Check that the tractor's PTO shaft is switched off.
  - 8.4 Connect the supply lines to the tractor.
    - o Make the hydraulic connections (see section 6.5, from Seite 91).
    - o Make the electrical connections (see section "Electrical connections", Seite 97)
9. Align the lower link hooks so that they are flush with the lower pivot points of the implement
10. Open the tractor lower link locking device,
11. Drive the tractor further backwards towards the implement so that the lower link hooks of the tractor automatically take up the lower bearing sleeves of the lower pivot point of the implement.
  - The lower link hooks lock automatically.



The tractor lower links must be able to swing vertically during work.

12. Couple the top link with the top pivot point from the tractor seat using the top link hooks.
  - The top link hook locks automatically.
13. Visually check that the top and lower link hooks are correctly locked.

## Coupling and uncoupling the implement

14. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.
15. Attach and properly secure the universal joint shaft halves into the PTO shaft connection of the tractor.
16. Fasten the safety chains (Fig. 90/1) of the universal joint shaft protective pipes
  - o to the implement (see Fig. 90)
  - o to the tractor.
17. Follow the installation instructions of the universal joint shaft manufacturer fastened to the universal joint shaft.
18. Connect the sensor actuation (Fig. 91/2) to the top link.



Fig. 90

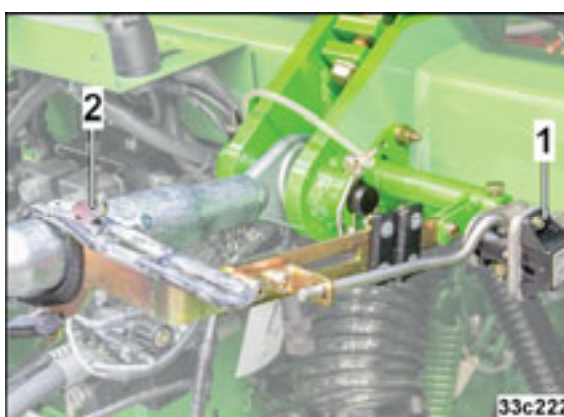


Fig. 91

### 6.2.1 Combination possibilities with other AMAZONE implements

Operation in combination with active soil tillage implement.

Fig. 92/...

- (1) Active soil tillage implement
- (2) Piggy-back 3.1
- (3) ED 3000-C



To operate an implement combination, observe the operating manual for the soil tillage implement.



Fig. 92

### 6.3 Uncoupling the implement



#### WARNING

**Danger of being crushed, cut, caught, drawn in or struck through insufficient stability and possible tilting of the uncoupled implement!**

Set the empty implement down on a level parking area with a firm base.



#### DANGER

**While pulling the tractor forwards no personnel are allowed to be between the tractor and the implement!**



When uncoupling the implement, there must always be enough free space in front of the implement that the tractor can be aligned with the implement again during recoupling.

1. Place the empty implement on a level parking surface with solid ground.
2. Switch off the control terminal (if installed).
3. Put the stands into support position
4. Switch off the universal joint shaft and apply the hand brake
5. Uncouple the implement from the tractor.
  - 5.1 Relieve the top links.
  - 5.2 Unlock and uncouple the top link hooks from the tractor seat.
  - 5.3 Relieve the lower links.
  - 5.4 Unlock and uncouple the lower link hooks from the tractor seat.
  - 5.5 Drive the tractor approx. 25 cm forwards.
    - This will allow more clearance between tractor and implement and give better access for uncoupling the supply lines.
6. Secure the tractor and implement against unintentional starting and rolling away.
7. Depressurize the tractor's hydraulic system.
  - 7.1 Uncouple the supply lines.
  - 7.2 Close the hydraulic connectors with the protective caps.
  - 7.3 Fasten the supply lines in their respective parking sockets.
8. Uncouple the universal joint shaft halves on the tractor side. Support the universal joint shaft on the universal joint shaft support (Fig. 88/2).

## 6.4 Supports



### DANGER

**Park the implement only with an empty fertiliser hopper and on a level surface with solid ground.**

Before pinning the support legs, apply the hand brake, switch off the tractor engine, and remove the ignition key.

### Support position:

Pin the support leg (Fig. 93/1) with a pin (Fig. 93/2) and secure with an R clip.

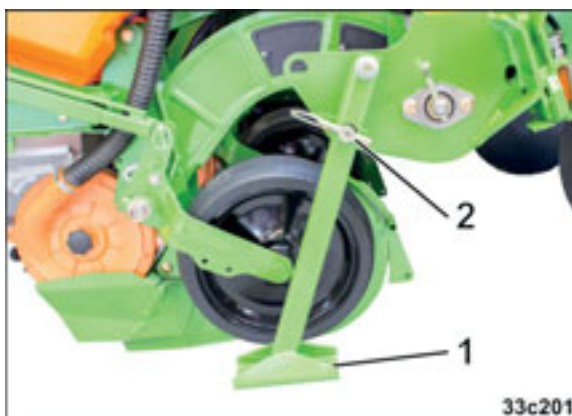


Fig. 93

### Transport position:

Pin the support leg (Fig. 94/1) with a pin (Fig. 94/2) and secure with an R clip.

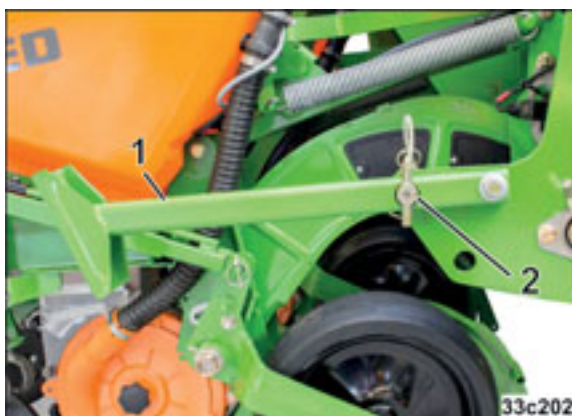


Fig. 94

## 6.5 Coupling the hydraulic hose lines



### WARNING

**Risk of being crushed, cut, caught, drawn in or struck due to faulty hydraulic functions when the hydraulic hose lines are connected incorrectly!**

When coupling the hydraulic hose lines, observe the coloured markings with the code number or code letters on the hydraulic plugs.



**Refer to the tractor's operating manual for coupling the hydraulic connections.**



- Observe the maximum permitted hydraulic fluid pressure of 210 bar.
- Only couple clean hydraulic connections. Minor oil contamination with particles can cause a failure of the hydraulic system.
- Insert the hydraulic connections into the hydraulic sleeve until you feel the hydraulic connection lock in.
- Check the coupling points of the hydraulic hose lines for proper fit and sealing.
- Check the supply lines. The supply lines
  - must easily give way to all movements in bends without tensioning, kinking or rubbing.
  - may not chafe against other parts.

## Coupling and uncoupling the implement

All hydraulic hose lines are equipped with handles. Coloured markings with a code number or code letter have been applied to the handles to assign the respective hydraulic function to the pressure line of a tractor control unit!

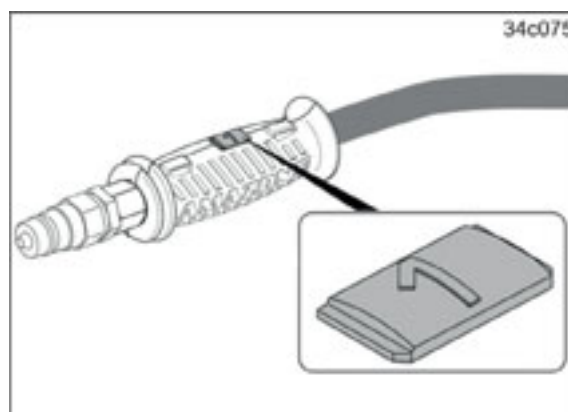





Fig. 95

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

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

1. Swivel the operating lever on the tractor control unit to the float position or neutral position

2. Clean the hydraulic connections

Minor oil contamination with particles can cause a failure of the hydraulic system.























3. Couple the hydraulic hose lines with the tractor control units



Fig. 96



## 6.5.1 Standard circuit

Marking		Function			Tractor control unit <sup>3)</sup>	
Yellow			Track markers	Raising	Single-acting	
green			Left section	Folding out	Double acting	
				Folding in		
Blue			Right boom	Folding out	Double acting	
				Folding in		
Beige			Fertiliser filling auger	switch on	Single-acting	
			Only for FRU/FPU: Star wheel actuation	Raising	Double acting	
				Lowering		
Red			Blower fan hydraulic motor <sup>1)</sup>	switch on	Single-acting	
Red		Pressure relief through unpressurized return line <sup>2)</sup>				

<sup>1)</sup> Pressure line with priority

<sup>2)</sup> Unpressurized line: see section "Installation regulations for hydraulic fan drive connection (optional)", Seite 79.

<sup>3)</sup> Actuation of the respective valves, see section "Coupling the hydraulic hose lines", Seite 91.



Tractors with constant pressure hydraulic systems are only partially suited to operate hydraulic motors. Observe of the recommendations of the tractor manufacturer.

### 6.5.2 Comfortcontrol

If there are fewer tractor control units available than are required, two implement functions can be assigned to one tractor control unit.



#### **DANGER**

**Risk of mixing up the functions!**

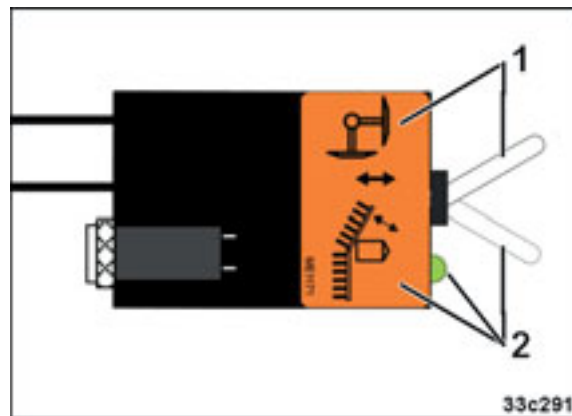
**Before actuating the tractor control unit, check the switch position of the control unit (Fig. 97).**



Depending on the implement equipment, the function is selected via the control terminal. Observe the respective operating instructions!











Select the functions with switch (Fig. 97) and then actuate the tractor control unit.

- If the valve (Fig. 97/1) is not actuated, the "Fold track marker" function is active.
- If the switch (Fig. 97/2) is actuated, the "Fold boom on the right" function is active.













**Fig. 97**

### 6.5.3 Profi control

Marking		Function			Tractor control unit <sup>3)</sup>	
beige			Only for FRU/FPU: Star wheel actuation	Raising	Double acting	
				Lowering		
Red		Profi control without load-sensing function		switch on	Single-acting	
			fan hydraulic motor <sup>1)</sup>	switch on	Single-acting	
		Pressure relief through unpressurized return line <sup>2)</sup>				

- <sup>1)</sup> Pressure line with priority, in combination with hydraulic metering shaft drive, always requires its own control unit.
- <sup>2)</sup> Depressurized line: see section "Installation regulations for hydraulic fan drive connection (optional)", Seite 79].
- <sup>3)</sup> Actuation of the respective valves, see section "Coupling the hydraulic hose lines", Seite 91.

### 6.5.4 Profi control with load-sensing function

Marking		Function			Tractor control unit <sup>3)</sup>	
beige			Only for FRU/FPU: Star wheel actuation	Raising	Double acting	
				Lowering		
Red		Profi control with load-sensing function		switch on	Single-acting	
			Blower fan hydraulic motor <sup>1)</sup>		Single-acting	
		LS control line			"LS"	
		Pressure relief through unpressurized return line <sup>2)</sup>				

- <sup>1)</sup> Pressure line with priority, in combination with hydraulic metering shaft drive, always requires its own control unit.
- <sup>2)</sup> Depressurized line: see section "Installation regulations for hydraulic fan drive connection (optional)", Seite 79].
- <sup>3)</sup> Actuation of the respective valves, see section "Coupling the hydraulic hose lines", Seite 91.

## 6.6 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the tractor control unit into float position (neutral position).
2. Release the hydraulic connectors from the hydraulic sockets.
3. Protect the hydraulic sockets from soiling by fitting the dust caps



Fig. 98

4. Place the hydraulic pipe lines in the hose cabinet.



Fig. 99

## 6.7 Electrical connections

Fig. 100/...

Road traffic lighting system, (7-pin) connector (optional)



Fig. 100

Fig. 101/...

Control terminal / on-board computer implement plug (optional)

- ISOBUS data cable (AMATRON 3, CCI 100, tractor terminal)
- AMASCAN+ data cable (not shown)
- Rear-view camera data cable (not shown)



Fig. 101

## 6.8 Connecting the pressure gauge

Connect the pressure gauge (Fig. 102/1) to the hose (Fig. 102/2).



Fig. 102

## 7 Settings



### WARNING

Danger of crushing, shearing, cutting, being caught or drawn in, winding and knocks through:

- unintentional falling of the implement raised using the tractor's three-point hydraulic system.
- unintentional lowering of raised, unsecured implement parts.
- unintentional start-up and rolling of the tractor-implement combination.
- **Secure the implement with suitable supports to prevent unintentional lowering!**

Secure the tractor and the uncoupled implement against unintentional start-up and rolling before you make any adjustments to the implement, for this see section 5.2, Seite 73.



### DANGER

Before adjustment tasks (unless otherwise specified):

- Unfold the implement booms.
- Switch off the tractor's PTO shaft.
- Wait until the tractor's PTO shaft stops moving
- Apply the tractor's parking brake.
- Switch off the tractor's engine.
- Remove the ignition key.



## 7.1 Adjust the row spacing



Adjust the row spacing to the target value by moving the units (see section 4.21.2, Seite 66).

1. Raise the implement and secure with suitable supports.
2. Unscrew the nuts (Fig. 103/1).
3. The seeding units (Fig. 103/2) can be adjusted to the target value by sliding the seeding units on the clamping rail (Fig. 103/3).
4. Tighten the nuts (Fig. 103/1).



Fig. 103

5. Adjust a distance of 55 mm between the furrow former of the seeding unit and the furrow former of the fertiliser coulters by moving the fertiliser coulters. The permissible deviation is +/- 5 mm.
6. Unscrew the nuts (Fig. 104/1).
7. Adjust the fertiliser coulters by sliding them on the clamping rail (Fig. 104/2).
8. Tighten the nuts (Fig. 104/1).



Fig. 104

### ME 677

Check that the nuts (Fig. 103/2, Fig. 104/1) are firmly seated after 10 operating hours (tightening torque 200 Nm).



## 7.2 Hydraulic track width adjustment (optional)



### WARNING

The permitted transport width must not be exceeded.



Only actuate the hydraulic track width adjustment when the implement is raised and only operate in fully extended position.

Do not perform track width adjustments during operation.

1. The running gear wheels are hydraulically actuated (Fig. 105/1) during the folding process.
  - 1.1 Put the stop tap in lever position A (Fig. 106/A).
  - 1.2 In working position, lock the track width adjustment. Put the stop tap in lever position B (Fig. 106/B).



Fig. 105

2. To deactivate the track width adjustment, put the stop tap (Fig. 106/2) in position (Fig. 106/B).

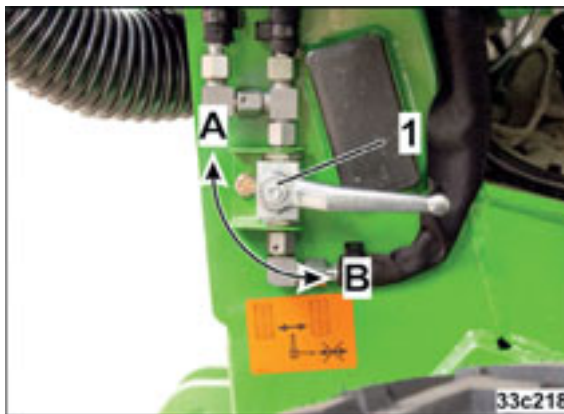


Fig. 106

### 7.3 Calibration of the working position sensors

The working position sensors detect the implement position on the three-point hydraulic system. To do so, the control lever (Fig. 107/2) must be connected to the top link (Fig. 107/1). The length can be adjusted by loosening the knurled screws and sliding to the desired length (Fig. 107/3).

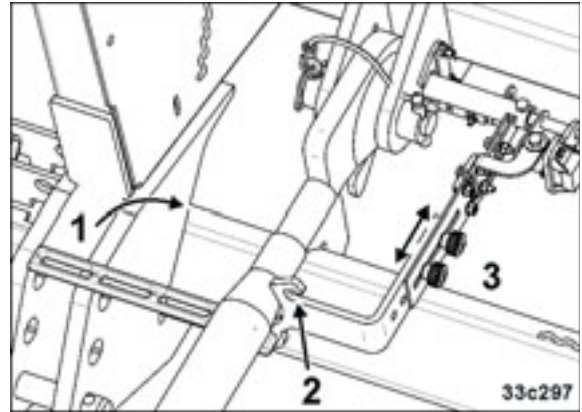


Fig. 107



To calibrate the potentiometer, observe the software operating manual.



If the implement is equipped with fertiliser line monitoring or an independent micropellet spreader, the digital working position sensor (Fig. 109/2) is required in addition to the analogue working position sensor.

Move the switch point of the digital sensor to the desired position by loosening the nut (Fig. 109/1) and moving the magnets. Adjust the distance between the sensor and the magnet to 4-10 mm (Fig. 109/2) by moving the sensor towards the magnet.

### 7.3.1 Implement-specific working position sensors

#### ED Super (ISOBUS):

- The potentiometer (Fig. 108/1) delivers the signal for switching the integrated metering drives and the implement monitoring on and off.
- The digital sensor (Fig. 109/2) delivers the signal for switching the independent micropellet spreader (optional) and the fertiliser line monitoring (optional) on and off.

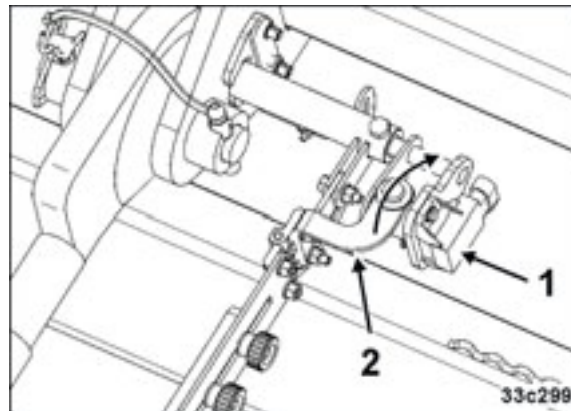


Fig. 108

#### ED Special (ISOBUS):

- The potentiometer (Fig. 108/1) delivers the signal for switching the integrated micropellet spreader and the implement monitoring on and off.
- The digital sensor (Fig. 109/2) delivers the signal for switching the independent micropellet spreader (optional) and the fertiliser line monitoring (optional) on and off.

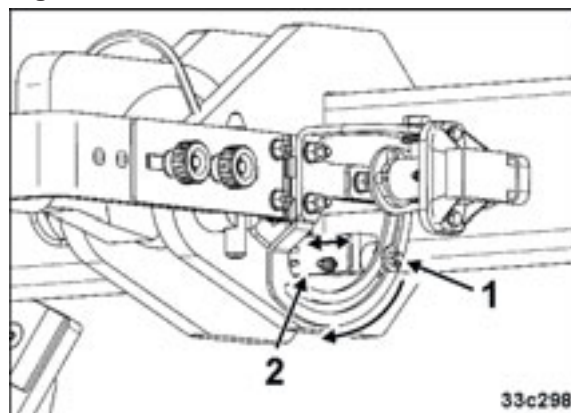


Fig. 109

#### ED Special:

- No potentiometer available. The working position is determined using the speed. This is also used to switch the micropellet spreaders (optional).
- The digital sensor (Fig. 109/2) delivers the signal for switching the the fertiliser line monitoring (optional) on and off.

## 7.4 Switching off the seeding units

The seeding units can be switched off for maintenance purposes or to create tramlines.



**The fertiliser metering is not deactivated with this.**

If no fertiliser should be spread, the fertiliser supply to the corresponding fertiliser coulters must be interrupted.

Shutter slide position:

Fig. 211/A = closed



Fig. 110

### 7.4.1 Switching off the seeding units mechanically

With a hydraulic seeding unit drive, remove the protective panel (Fig. 111/2):

1. Loosen the bolts (Fig. 111/1)
2. Swivel the protective panel to the side (Fig. 112/1)
3. Using pliers, pull out the shear pin (Fig. 112/2) from the coupling.
4. Insert the shear pin when it is not being used into the hole (Fig. 112/3) on the coupling flange.
5. Fold in the protective panel and tighten the bolts (Fig. 111/1).



Fig. 111

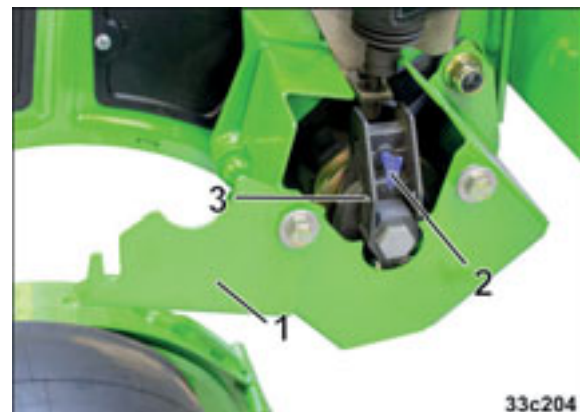


Fig. 112



## 7.4.2 Switching off the seeding units electronically (optional)

For the automatic creation of tramlines, the seeding units can be switched off electronically.



For the electronic shutoff of the seeding units on the control terminal, observe the corresponding operating manual!



**The fertiliser metering is not deactivated with this.**

If no fertiliser should be spread, the fertiliser supply to the corresponding fertiliser coulters must be interrupted.

Shutter slide position:  
Fig. 211/A = closed

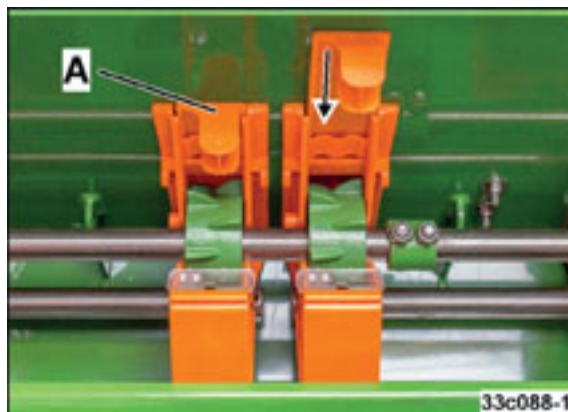


Fig. 113

## 7.5 Adjusting the grain spacing (mechanical drive)



### **DANGER**

**Before performing adjustment work**

- **Unfold the implement booms.**
- **Switch off the tractor's PTO shaft.**
- **Wait until the tractor's PTO shaft stops moving**
- **Apply the tractor's parking brake.**
- **Switch off the tractor's engine.**
- **Remove the ignition key.**

The goal is the seeding of a certain number of "grains per m<sup>2</sup>" or "grains per hectare" with a set row spacing and with the specified singling disc.



For high spreading rates, a hydraulic drive is necessary for certain crop types (e.g. soy). To obtain constant high placement accuracy, the working speed may have to be reduced.

### 7.5.1 Determining the grain spacing (tabular)

Find the required grain spacing from the tables from Seite 107.

#### Example:

Singling discs: 30 bore holes  
 Row spacing: 75 cm  
 Desired number of grains per hectare: 95000

Look for the example value (underlined in black) in the table (Fig. 114) and read off the grain spacing: 13.9 cm.


Singling discs with 30 boreholes								
	Grain distance a (cm)	Grain/m	Row spacing					
			80 cm	75 cm	70 cm	60 cm	50 cm	45 cm
			Number of grains per hectare					
Y	6.1	16.4	204918	218579	234204	273224	327869	364299
	6.6	15.2	189394	202020	216462	252525	303030	336700
	7.1	14.1	176056	187793	201218	234742	281690	312989
	7.5	13.3	166667	177778	190487	222222	266667	296296
	8.0	12.5	156250	166667	178581	208333	250000	277778
	8.5	11.8	147059	156863	168077	196078	235294	261438
	8.7	11.5	143678	153257	164213	191571	229885	255428
	9.3	10.8	134409	143369	153618	179211	215054	238949
	10.0	10.0	125000	133333	142864	166667	200000	222222
	10.7	9.3	116822	124611	133519	155763	186916	207684
	11.3	8.8	110619	117994	126429	147493	176991	196657
	12.0	8.3	104167	111111	119054	138889	166667	185185
	12.2	8.2	102459	109290	117103	136612	163934	182149
	13.1	7.6	95420	101781	109057	127226	152672	169635
	13.9	7.2	89928	<u>95923</u>	102780	119904	143885	159872
	14.8	6.8	84459	90090	96530	112613	135135	150150
	15.7	6.4	79618	84926	90997	106157	127389	141543

Fig. 114


#### Singling discs with 5 boreholes




For large row widths, a singling disc with 15 holes can be produced by drilling open the pre-shaped holes.




# Settings

	Grain distance a (cm)	Grain/m	Row spacing						
			90 cm	80 cm	75 cm	70 cm	60 cm	50 cm	45 cm
			Number of grains per hectare						
Y	36.7	2.7	30315	34104	36377	38976	45472	54566	60629
	39.5	2.5	28149	31668	33779	36192	42224	50669	56298
	42.3	2.4	26273	29557	31527	33779	39409	47291	52545
	45.1	2.2	24631	27709	29557	31668	36946	44335	49261
	47.9	2.1	23182	26079	27818	29805	34773	41727	46363
	50.8	2.0	21894	24631	26273	28149	32841	39409	43788
	51.7	1.9	21473	24157	25767	27608	32209	38651	42946
	55.7	1.8	19939	22431	23927	25636	29909	35890	39878
	59.7	1.7	18610	20936	22332	23927	27915	33498	37219
	63.7	1.6	17447	19627	20936	22431	26170	31404	34893
	67.7	1.5	16421	18473	19704	21112	24631	29557	32841
	71.6	1.4	15508	17447	18610	19939	23262	27915	31016
	72.9	1.4	15248	17153	18297	19604	22871	27445	30495
	78.1	1.3	14231	16010	17077	18297	21346	25616	28462
	83.3	1.2	13342	15009	16010	17153	20012	24015	26683
	88.5	1.1	12557	14126	15068	16144	18835	22602	25113
X	93.7	1.1	11859	13342	14231	15247	17789	21346	23718
	62.8	1.6	17684	19894	21220	22736	26525	31830	35367
	67.7	1.5	16421	18473	19704	21112	24631	29557	32841
	72.5	1.4	15326	17241	18391	19704	22989	27586	30651
	77.3	1.3	14368	16164	17241	18473	21552	25862	28736
	82.2	1.2	13523	15213	16227	17386	20284	24341	27045
	87.0	1.1	12772	14368	15326	16420	19157	22989	25543
	88.7	1.1	12526	14092	15031	16105	18789	22546	25052
	95.5	1.0	11631	13085	13957	14954	17447	20936	23262
	102.4	1.0	10856	12213	13027	13957	16284	19540	21711
	109.2	0.9	10177	11449	12213	13085	15266	18319	20354
	116.0	0.9	9579	10776	11494	12315	14368	17241	19157
	122.8	0.8	9047	10177	10856	11631	13570	16284	18093
	124.9	0.8	8895	10006	10673	11436	13342	16010	17789
	133.8	0.7	8302	9339	9962	10673	12452	14943	16603
	142.8	0.7	7783	8755	9339	10006	11674	14009	15565
Z	151.7	0.7	7325	8240	8790	9418	10987	13185	14650
	160.6	0.6	6918	7783	8301	8894	10377	12452	13836
	101.5	1.0	10947	12315	13136	14075	16420	19704	21894
	109.3	0.9	10165	11436	12198	13069	15247	18297	20330
	117.1	0.9	9488	10673	11385	12198	14231	17077	18975
	124.9	0.8	8895	10006	10673	11436	13342	16010	17789
	132.7	0.8	8371	9418	10045	10763	12557	15068	16742
	140.5	0.7	7906	8894	9487	10165	11859	14231	15812
	143.3	0.7	7754	8723	9305	9970	11631	13957	15508
	154.3	0.6	7200	8100	8640	9257	10800	12960	14400
	165.3	0.6	6720	7560	8064	8640	10080	12096	13440
	176.4	0.6	6300	7088	7560	8100	9450	11340	12600
	187.4	0.5	5930	6671	7115	7624	8894	10673	11859
	198.4	0.5	5600	6300	6720	7200	8400	10080	11200
	201.8	0.5	5506	6194	6607	7079	8259	9911	11012
	216.2	0.5	5139	5781	6167	6607	7708	9250	10278
	230.6	0.4	4818	5420	5781	6194	7227	8672	9636
	245.0	0.4	4535	5101	5441	5830	6802	8162	9069
	259.5	0.4	4283	4818	5139	5506	6424	7708	8565

## Singling discs with 15 boreholes

	Grain distance a (cm)	Grain/m	Row spacing						
			90 cm	80 cm	75 cm	70 cm	60 cm	50 cm	45 cm
			Number of grains per hectare						
Y	12.2	8.2	91075	102459	109290	117103	136612	163934	182149
	13.2	7.6	84175	94697	101010	108231	126263	151515	168350
	14.2	7.0	78248	88028	93897	100609	117371	140845	156495
	15.0	6.7	74074	83333	88889	95243	111111	133333	148148
	16.0	6.3	69445	78125	83333	89290	104167	125000	138889
	17.0	5.9	65360	73529	78431	84038	98039	117647	130719
	17.2	5.8	64600	72674	77519	83061	96899	116279	129199
	18.6	5.4	59737	67204	71685	76809	89606	107527	119474
	20.0	5.0	55556	62500	66667	71433	83333	100000	111111
	21.4	4.7	51921	58411	62305	66759	77882	93458	103842
	22.6	4.4	49164	55310	58997	63214	73746	88496	98328
	24.0	4.2	46297	52083	55556	59527	69444	83333	92593
	24.4	4.1	45538	51230	54645	58551	68306	81967	91075
	26.2	3.8	42409	47710	50891	54529	63613	76336	84818
	27.8	3.6	39968	44964	47962	51391	59952	71942	79936
	29.6	3.4	37538	42230	45045	48265	56306	67568	75075
	31.4	3.2	35386	39809	42463	45499	53079	63694	70771
X	21.0	4.8	52910	59524	63492	68031	79365	95238	105820
	22.6	4.4	49164	55310	58997	63214	73746	88496	98328
	24.2	4.1	45914	51653	55096	59035	68871	82645	91827
	25.8	3.9	43067	48450	51680	55374	64599	77519	86133
	27.4	3.6	40552	45620	48662	52141	60827	72993	81103
	29.0	3.4	38314	43103	45977	49264	57471	68966	76628
	29.6	3.4	37538	42230	45045	48265	56306	67568	75075
	32.0	3.1	34722	39063	41667	44646	52083	62500	69444
	34.2	2.9	32489	36550	38986	41773	48733	58480	64977
	36.6	2.7	30358	34153	36430	39034	45537	54645	60716
	38.4	2.6	28935	32552	34722	37204	43403	52083	57870
	41.0	2.4	27101	30488	32520	34845	40650	48780	54201
	41.8	2.4	26582	29904	31898	34178	39872	47847	53163
	44.8	2.2	24802	27902	29762	31890	37202	44643	49603
	47.8	2.1	23245	26151	27894	29888	34868	41841	46490
	50.8	2.0	21873	24606	26247	28123	32808	39370	43745
	53.8	1.9	20653	23234	24783	26555	30979	37175	41305
Z	33.9	3.0	32762	36857	39315	42125	49143	58973	65524
	36.6	2.8	30398	34197	36477	39085	45597	54716	60796
	39.0	2.5	28489	32050	34187	36631	42734	51280	56978
	41.6	2.4	26685	30020	32021	34310	40026	48032	53369
	44.3	2.2	25095	28232	30114	32267	37642	45170	50189
	46.9	2.1	23684	26644	28421	30453	35525	42631	47367
	47.9	2.1	23218	26119	27861	29853	34826	41791	46435
	51.6	1.9	21523	24213	25827	27673	32284	38741	43046
	55.2	1.8	20127	22643	24152	25879	30190	36229	40254
	59.2	1.7	18781	21128	22537	24148	28171	33806	37562
	62.7	1.6	17710	19923	21251	22770	26564	31877	35419
	66.1	1.5	16802	18901	20161	21602	25202	30242	33603
	67.5	1.5	16473	18532	19767	21180	24709	29651	32946
	72.4	1.4	15358	17277	18429	19746	23036	27644	30715
	77.2	1.3	14384	16182	17260	18494	21575	25890	28767
	82.0	1.2	13557	15252	16269	17432	20335	24403	27114
	86.9	1.2	12792	14391	15350	16447	19189	23026	25584


## Singling discs with 30 boreholes

	Grain distance a (cm)	Grain/m	Row spacing						
			90 cm	80 cm	75 cm	70 cm	60 cm	50 cm	45 cm
			Number of grains per hectare						
Y	6.1	16.4	182150	204918	218579	234204	273224	327869	364299
	6.6	15.2	168350	189394	202020	216462	252525	303030	336700
	7.1	14.1	156495	176056	187793	201218	234742	281690	312989
	7.5	13.3	148148	166667	177778	190487	222222	266667	296296
	8.0	12.5	138889	156250	166667	178581	208333	250000	277778
	8.5	11.8	130719	147059	156863	168077	196078	235294	261438
	8.7	11.5	127714	143678	153257	164213	191571	229885	255428
	9.3	10.8	119475	134409	143369	153618	179211	215054	238949
	10.0	10.0	111111	125000	133333	142864	166667	200000	222222
	10.7	9.3	103842	116822	124611	133519	155763	186916	207684
	11.3	8.8	98329	110619	117994	126429	147493	176991	196657
	12.0	8.3	92593	104167	111111	119054	138889	166667	185185
	12.2	8.2	91075	102459	109290	117103	136612	163934	182149
	13.1	7.6	84818	95420	101781	109057	127226	152672	169635
	13.9	7.2	79936	89928	95923	102780	119904	143885	159872
X	14.8	6.8	75075	84459	90090	96530	112613	135135	150150
	15.7	6.4	70772	79618	84926	90997	106157	127389	141543
	10.5	9.5	105820	119048	126984	136062	158730	190476	211640
	11.3	8.8	98329	110619	117994	126429	147493	176991	196657
	12.1	8.3	91828	103306	110193	118070	137741	165289	183655
	12.9	7.8	86133	96899	103359	110748	129199	155039	172265
	13.7	7.3	81103	91241	97324	104281	121655	145985	162206
	14.5	6.9	76629	86207	91954	98527	114943	137931	153257
	14.8	6.8	75075	84459	90090	96530	112613	135135	150150
	16.0	6.3	69445	78125	83333	89290	104167	125000	138889
	17.1	5.8	64978	73099	77973	83547	97466	116959	129955
	18.3	5.5	60717	68306	72860	78068	91075	109290	121433
	19.4	5.2	57274	64433	68729	73642	85911	103093	114548
	20.5	4.9	54201	60976	65041	69691	81301	97561	108401
	20.9	4.8	53163	59809	63796	68357	79745	95694	106326
Z	22.4	4.5	49603	55804	59524	63779	74405	89286	99206
	23.9	4.2	46490	52301	55788	59776	69735	83682	92980
	25.4	3.9	43745	49213	52493	56246	65617	78740	87489
	26.9	3.7	41305	46468	49566	53109	61958	74349	82610
	17.0	5.9	65525	73715	78630	84251	98287	117944	131050
	18.3	5.5	60797	68396	72956	78171	91195	109433	121593
	19.5	5.1	56978	64100	68373	73261	85467	102560	113956
	20.8	4.8	53369	60040	64042	68620	80053	96064	106737
	22.1	4.6	50190	56462	60227	64532	75284	90340	100379
	23.5	4.2	47368	53288	56841	60904	71050	85261	94735
	23.9	4.1	46435	52240	55721	59704	69652	83583	92870
	25.8	3.8	43046	48426	51655	55348	64568	77482	86091
	27.6	3.6	40254	45286	48305	51758	60381	72457	80508
	29.6	3.4	37562	42257	45074	48296	56343	67611	75123
	31.4	3.2	35419	39847	42502	45540	53128	63754	70837
	33.1	3.0	33603	37803	40323	43206	50403	60484	67205
	33.7	3.0	32945	37063	39535	42361	49418	59302	65890
	36.2	2.8	30715	34554	36857	39492	46072	55286	61429
	38.6	2.5	28767	32363	34520	36988	43150	51780	57534
	41.0	2.4	27114	30503	32536	34862	40670	48805	54228
	43.4	2.3	25585	28783	30702	32897	38376	46052	51169


## Singling discs with 45 boreholes

	Grain distance a (cm)	Grain/m	Row spacing						
			90 cm	80 cm	75 cm	70 cm	60 cm	50 cm	45 cm
			Number of grains per hectare						
Y	4.1	24.4	271003	304878	325203	348450	406504	487805	542005
	4.4	22.7	252526	284091	303030	324692	378788	454545	505051
	4.7	21.3	236407	265957	283688	303968	354610	425532	472813
	5.0	20.0	222222	250000	266667	285730	333333	400000	444444
	5.3	18.9	209644	235849	251572	269556	314465	377358	419287
	5.6	17.9	198413	223214	238095	255115	297619	357143	396825
	5.7	17.5	194932	219298	233918	250640	292398	350877	389864
	6.2	16.1	179212	201613	215054	230427	268817	322581	358423
	6.6	15.2	168350	189394	202020	216462	252525	303030	336700
	7.1	14.1	156495	176056	187793	201218	234742	281690	312989
	7.6	13.2	146199	164474	175439	187980	219298	263158	292398
	8.0	12.5	138889	156250	166667	178581	208333	250000	277778
	8.2	12.2	135502	152439	162602	174226	203252	243902	271003
	8.7	11.5	127714	143678	153257	164213	191571	229885	255428
	9.3	10.8	119475	134409	143369	153618	179211	215054	238949
	9.9	10.1	112234	126263	134680	144308	168350	202020	224467
	10.4	9.6	106838	120192	128205	137370	160256	192308	213675
X	7.0	14.3	158730	178571	190476	204092	238095	285714	317460
	7.5	13.3	148148	166667	177778	190487	222222	266667	296296
	8.1	12.3	137174	154321	164609	176376	205761	246914	274348
	8.6	11.6	129199	145349	155039	166122	193798	232558	258398
	9.1	11.0	122100	137363	146520	156994	183150	219780	244200
	9.7	10.3	114548	128866	137457	147283	171821	206186	229095
	9.9	10.1	112234	126263	134680	144308	168350	202020	224467
	10.7	9.3	103842	116822	124611	133519	155763	186916	207684
	11.4	8.8	97466	109649	116959	125320	146199	175439	194932
	12.2	8.2	91075	102459	109290	117103	136612	163934	182149
	12.9	7.8	86133	96899	103359	110748	129199	155039	172265
	13.7	7.3	81103	91241	97324	104281	121655	145985	162206
	13.9	7.2	79936	89928	95923	102780	119904	143885	159872
	14.9	6.7	74571	83893	89485	95882	111857	134228	149142
	15.9	6.3	69881	78616	83857	89852	104822	125786	139762
	16.9	5.9	65746	73964	78895	84535	98619	118343	131492
	17.9	5.6	62073	69832	74488	79813	93110	111732	124146
Z	11.3	8.8	98287	110573	117944	126375	147431	176917	196574
	12.2	8.3	91430	102858	109716	117559	137145	164574	182859
	13.1	7.6	84852	95459	101822	109101	127278	152734	169704
	13.6	7.3	81906	92145	98287	105313	122859	147431	163812
	14.7	6.8	75606	85056	90726	97212	113409	136090	151211
	15.6	6.4	71051	79932	85261	91356	106577	127892	142102
	16.0	6.3	69379	78051	83255	89207	104068	124882	138758
	17.2	5.8	64451	72507	77341	82870	96676	116011	128901
	18.4	5.4	60485	68045	72581	77770	90726	108872	120969
	19.7	5.1	56433	63487	67719	72560	84649	101579	112865
	20.8	4.8	53369	60040	64042	68620	80053	96064	106737
	22.1	4.6	50190	56462	60227	64532	75284	90340	100379
	22.4	4.5	49557	55751	59467	63718	74335	89202	99113
	24.0	4.1	46253	52035	55504	59472	69379	83255	92505
	25.7	3.9	43203	48604	51844	55550	64805	77765	86406
	27.3	3.6	40671	45754	48805	52294	61005	73207	81341
	28.9	3.5	38419	43221	46102	49398	57628	69154	76837


## Singling discs with 60 boreholes

	Grain distance a (cm)	Grain/m	Row spacing						
			90 cm	80 cm	75 cm	70 cm	60 cm	50 cm	45 cm
			Number of grains per hectare						
Y	3.1	32.8	364299	409836	437158	468409	546448	655738	728597
	3.3	30.3	336701	378788	404040	432923	505051	606061	673401
	3.6	28.2	312989	352113	375587	402436	469484	563380	625978
	3.8	26.7	296297	333333	355556	380973	444444	533333	592593
	4.0	25.0	277778	312500	333333	357162	416667	500000	555556
	4.3	23.5	261438	294118	313725	336152	392157	470588	522876
	4.4	23.0	255428	287356	306513	328424	383142	459770	510856
	4.7	21.5	238949	268817	286738	307236	358423	430108	477897
	5.0	20.0	222222	250000	266667	285730	333333	400000	444444
	5.4	18.7	207685	233645	249221	267037	311526	373832	415369
	5.7	17.7	196657	221239	235988	252858	294985	353982	393314
	6.0	16.7	185185	208333	222222	238108	277778	333333	370370
	6.1	16.4	182150	204918	218579	234204	273224	327869	364299
	6.6	15.3	169636	190840	203562	218114	254453	305344	339271
	7.0	14.4	159872	179856	191847	205561	239808	287770	319744
	7.4	13.5	150150	168919	180180	193060	225225	270270	300300
	7.9	12.7	141543	159236	169851	181993	212314	254777	283086
X	5.3	19.0	211640	238095	253968	272123	317460	380952	423280
	5.7	17.7	196657	221239	235988	252858	294985	353982	393314
	6.1	16.5	183655	206612	220386	236141	275482	330579	367309
	6.5	15.5	172266	193798	206718	221495	258398	310078	344531
	6.9	14.6	162206	182482	194647	208562	243309	291971	324412
	7.3	13.8	153257	172414	183908	197055	229885	275862	306513
	7.4	13.5	150150	168919	180180	193060	225225	270270	300300
	8.0	12.5	138889	156250	166667	178581	208333	250000	277778
	8.6	11.7	129955	146199	155945	167093	194932	233918	259909
	9.2	10.9	121433	136612	145719	156136	182149	218579	242866
	9.7	10.3	114548	128866	137457	147283	171821	206186	229095
	10.3	9.8	108401	121951	130081	139380	162602	195122	216802
	10.5	9.6	106327	119617	127592	136713	159490	191388	212653
	11.2	8.9	99207	111607	119048	127558	148810	178571	198413
	12.0	8.4	92980	104603	111576	119552	139470	167364	185960
	12.7	7.9	87489	98425	104987	112492	131234	157480	174978
	13.5	7.4	82611	92937	99133	106220	123916	148699	165221
Z	8.5	11.8	131050	147431	157259	168501	196574	235889	262099
	9.1	10.9	121592	136791	145911	156342	182388	218866	243184
	9.8	10.2	113408	127584	136090	145819	170112	204135	226816
	10.5	9.6	106256	119539	127507	136622	159384	191261	212512
	11.1	9.0	99953	112447	119943	128517	149929	179916	199906
	11.8	8.5	94356	106150	113227	121321	141533	169840	188711
	12.0	8.4	92870	104478	111444	119411	139305	167165	185739
	12.9	7.7	86091	96852	103309	110694	129137	154963	172182
	13.8	7.2	80235	90264	96281	103164	120352	144421	160469
	14.8	6.8	75124	84515	90149	96593	112686	135223	150248
	15.7	6.4	70626	79453	84750	90808	105938	127125	141251
	16.6	6.1	67014	75391	80417	86166	100521	120625	134028
	16.9	5.9	65891	74127	79069	84721	98836	118604	131781
	18.1	5.5	61430	69108	73715	78985	92145	110573	122859
	19.3	5.2	57534	64726	69041	73976	86301	103561	115068
	21.5	4.7	51730	58197	62077	66515	77595	93114	103460
	21.9	4.6	50838	57193	61005	65366	76257	91509	101676

## Singling discs with 80 boreholes

	Grain distance a (cm)	Grain/m	Row spacing						
			90 cm	80 cm	75 cm	70 cm	60 cm	50 cm	45 cm
			Number of grains per hectare						
Y	2.4	43.4	481783	542005	578140	619468	722674	867209	963565
	2.5	40.4	448934	505051	538721	577232	673401	808081	897868
	2.7	37.9	420278	472813	504334	540387	630418	756501	840556
	2.8	35.6	395062	444444	474074	507964	592593	711111	790124
	3.0	33.5	372700	419287	447240	479212	559050	670860	745399
	3.2	31.7	352734	396826	423280	453539	529100	634921	705468
	3.3	31.2	346546	389863	415854	445582	519818	623781	693091
	3.5	28.7	318598	358423	382318	409649	477897	573476	637196
	3.7	26.9	299290	336700	359147	384820	448934	538721	598579
	4.1	25.1	278213	312989	333855	357721	417319	500782	556425
	4.3	23.4	259909	292397	311891	334187	389863	467836	519818
	4.5	22.2	246914	277778	296296	317477	370371	444444	493828
	4.6	21.7	240891	271003	289069	309733	361337	433604	481782
	5.0	20.4	227047	255428	272456	291932	340571	408684	454094
	5.3	19.1	212399	238948	254878	273099	318598	382318	424797
	5.6	18.0	199526	224467	239431	256547	299289	359147	399052
	5.9	17.1	189934	213676	227920	244213	284900	341880	379867
X	3.9	25.4	282187	317460	338624	362831	423280	507937	564374
	4.3	23.7	263375	296296	316050	338643	395061	474074	526749
	4.6	22.0	243866	274348	292638	313557	365798	438957	487731
	4.8	20.7	229687	258398	275625	295328	344531	413436	459374
	5.1	19.6	218266	245549	261919	280643	327399	392879	436532
	5.5	18.3	203640	229095	244368	261837	305460	366552	407280
	5.6	18.0	199526	224467	239431	256547	299289	359147	399052
	6.1	16.6	184609	207684	221530	237366	276912	332295	369217
	6.4	15.6	173273	194932	207927	222791	259909	311891	346546
	6.9	14.6	161911	182149	194292	208181	242866	291439	323821
	7.3	13.8	153125	172265	183749	196884	229687	275625	306250
	7.8	13.0	144183	162206	173020	185388	216275	259530	288366
	7.9	12.8	142109	159872	170531	182721	213163	255796	284217
	8.4	11.9	132571	149142	159085	170458	198857	238628	265142
	9.0	11.2	124234	139763	149080	159737	186350	223620	248467
	9.6	10.5	116882	131492	140259	150285	175324	210388	233764
	10.1	10.0	110353	124147	132423	141890	165529	198635	220705
Z	6.4	15.7	174733	196573	209679	224668	262099	314518	349465
	6.9	14.7	162542	182860	195050	208993	243812	292576	325084
	7.4	13.6	150848	169704	181019	193959	226272	271527	301696
	7.7	13.2	145610	163812	174732	187223	218415	262099	291220
	8.2	12.1	134410	151211	161292	172821	201614	241937	268819
	8.8	11.3	126313	142101	151576	162412	189468	227363	252626
	9.0	11.1	123341	138758	148009	158589	185011	222013	246681
	9.8	10.3	114579	128901	137494	147324	171868	206242	229157
	10.4	9.7	107528	120969	129033	138257	161292	193549	215055
	11.1	9.1	100325	112865	120390	128996	150488	180585	200650
	11.8	8.5	94878	106737	113853	121992	142316	170779	189755
	12.5	8.0	89225	100379	107070	114724	133837	160605	178450
	12.6	7.9	88101	99113	105721	113278	132150	158580	176201
	13.6	7.4	82227	92505	98672	105725	123340	148009	164454
	14.5	6.8	76806	86406	92166	98755	115208	138250	153611
	15.4	6.5	72303	81341	86764	92966	108455	130146	144606
	16.3	6.1	68299	76836	81959	87818	102450	122939	136598

## Singling discs with 90 boreholes

	Grain distance a (cm)	Grain/m	Row spacing						
			90 cm	80 cm	75 cm	70 cm	60 cm	50 cm	45 cm
			Number of grains per hectare						
Y	2.1	48.8	542006	609756	650407	696902	813008	975610	1084011
	2.2	45.5	505051	568182	606061	649386	757576	909091	1010101
	2.4	42.6	472813	531915	567376	607935	709220	851064	945626
	2.5	40.0	444445	500000	533333	571459	666667	800000	888889
	2.7	37.7	419287	471698	503145	539113	628931	754717	838574
	2.8	35.7	396826	446429	476190	510231	595238	714286	793651
	2.9	35.1	389864	438596	467836	501280	584795	701754	779727
	3.1	32.3	358423	403226	430108	460855	537634	645161	716846
	3.3	30.3	336701	378788	404040	432923	505051	606061	673401
	3.6	28.2	312989	352113	375587	402436	469484	563380	625978
	3.8	26.3	292398	328947	350877	375960	438596	526316	584795
	4.0	25.0	277778	312500	333333	357162	416667	500000	555556
	4.1	24.4	271003	304878	325203	348450	406504	487805	542005
	4.4	23.0	255428	287356	306513	328424	383142	459770	510856
	4.7	21.5	238949	268817	286738	307236	358423	430108	477897
	5.0	20.2	224467	252525	269360	288615	336700	404040	448934
	5.2	19.2	213675	240385	256410	274740	320513	384615	427350
X	3.5	28.6	317461	357143	380952	408185	476190	571429	634921
	3.8	26.7	296297	333333	355556	380973	444444	533333	592593
	4.1	24.7	274349	308642	329218	352752	411523	493827	548697
	4.3	23.3	258398	290698	310078	332244	387597	465116	516796
	4.5	22.1	245550	276243	294659	315723	368324	441989	491099
	4.9	20.6	229095	257732	274914	294567	343643	412371	458190
	5.0	20.2	224467	252525	269360	288615	336700	404040	448934
	5.4	18.7	207685	233645	249221	267037	311526	373832	415369
	5.7	17.5	194932	219298	233918	250640	292398	350877	389864
	6.1	16.4	182150	204918	218579	234204	273224	327869	364299
	6.5	15.5	172266	193798	206718	221495	258398	310078	344531
	6.9	14.6	162206	182482	194647	208562	243309	291971	324412
	7.0	14.4	159872	179856	191847	205561	239808	287770	319744
	7.5	13.4	149143	167785	178971	191765	223714	268456	298285
	8.0	12.6	139763	157233	167715	179704	209644	251572	279525
	8.5	11.8	131493	147929	157791	169071	197239	236686	262985
	9.0	11.2	124147	139665	148976	159626	186220	223464	248293
Z	5.7	17.7	196574	221145	235889	252752	294861	353833	393148
	6.1	16.5	182860	205717	219431	235117	274289	329148	365720
	6.6	15.3	169704	190917	203646	218204	254556	305468	339408
	6.8	14.8	163812	184288	196574	210626	245717	294861	327623
	7.3	13.6	151211	170112	181453	194424	226816	272179	302421
	7.8	12.7	142102	159864	170523	182713	213152	255783	284204
	8.0	12.5	138758	156103	166510	178413	208137	249765	277516
	8.7	11.6	128901	145014	154681	165739	193351	232022	257802
	9.2	10.9	120969	136090	145162	155539	181453	217743	241937
	9.9	10.2	112866	126973	135439	145121	169299	203158	225731
	10.5	9.6	106737	120079	128085	137241	160106	192126	213474
	11.1	9.0	100378	112926	120454	129065	150567	180681	200756
	11.2	8.9	99113	111502	118936	127438	148669	178403	198226
	12.1	8.3	92506	104068	111006	118941	138758	166510	185011
	12.9	7.7	86406	97207	103687	111099	129609	155531	172812
	13.7	7.3	81341	91509	97609	104587	122012	146414	162682
	14.5	6.9	76837	86441	92204	98795	115256	138306	153673



## 7.5.2 Determining the grain spacing (calculated)

$$\text{Grain spacing } a \text{ [cm]} = \frac{100 \text{ (conversion factor [m] in [cm])}}{\frac{\text{Grains}}{\text{m}^2} \times \text{Row spacing [m]}}$$

### Example:

Number of boreholes of the singling disc: 30 bore holes

$$\text{Desired "number of grains per hectare": } 95000 \frac{\text{Grains}}{\text{ha}} = 9.5 \frac{\text{Grains}}{\text{m}^2}$$

Selected row spacing: 0.75 m

$$\text{Grain spacing } a \text{ [cm]} = \frac{100}{9.5 \frac{\text{Grains}}{\text{m}^2} \times 0.75 \text{ m}} = 14.04 \text{ cm}$$

With the values (30 boreholes/14.04 cm), go to the table (Figure Fig. 115) and read the nearest value:  
Grain distance a = 13.9 cm.

### 7.5.3 Determining the chain wheel pairs for the setting and secondary gearboxes



The setting values represent reference values. The soil properties and/or the gearbox settings influence the slip on the drive wheels (see section "Seed rSeed application amountate", as of page 196).

At high spreading rates (grain spacing  $\leq 4$  cm, marked fields, see Fig. 115/1), there can be multiples or gaps on the bore holes of the singling disc.

To obtain constant high placement accuracy, the working speed may have to be reduced.

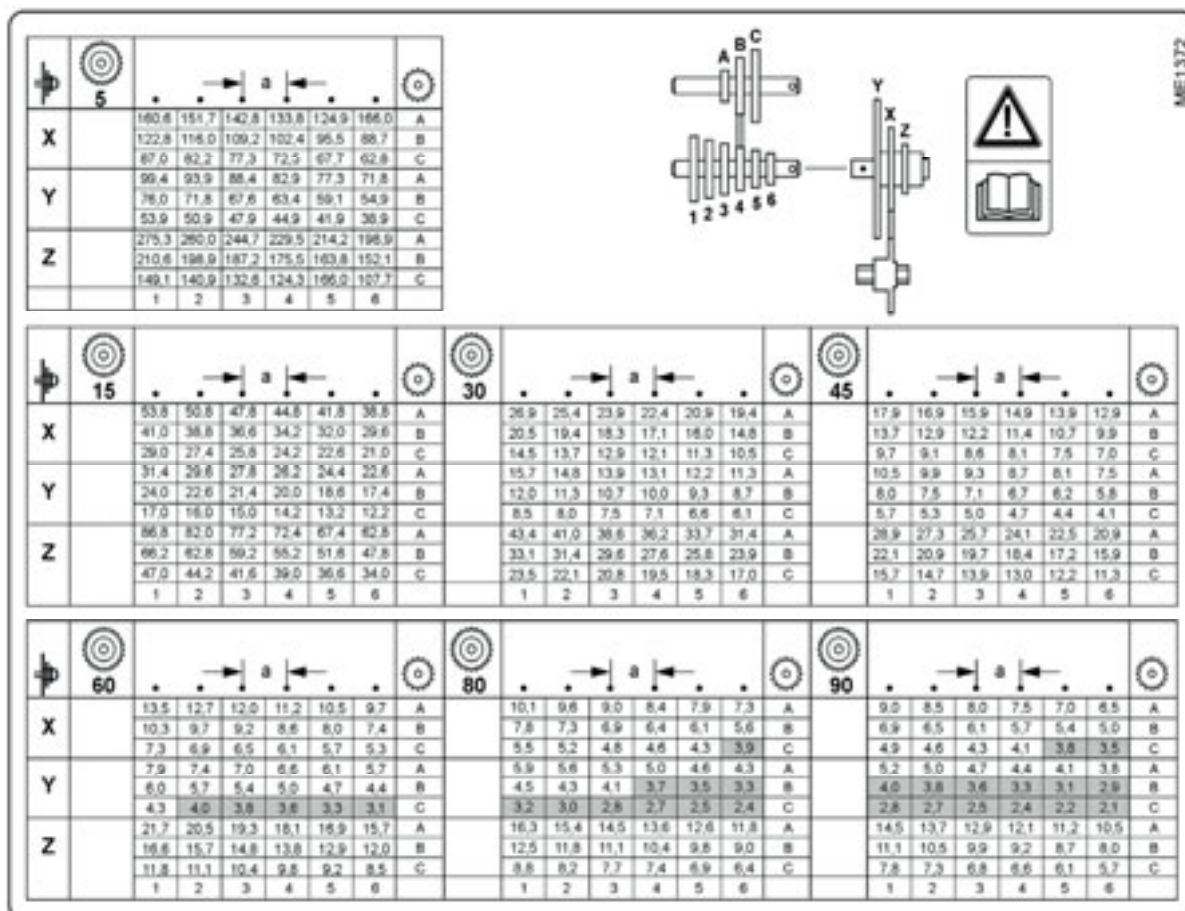


Fig. 115

### Example:

#### Singling discs: 30 boreholes

Grain spacing a: 13.9 cm

The gear ratio can be taken from the table (as seen in Fig. 116):

Chain wheel pairing in the setting gearbox: A – 3

Chain wheel pairing in the secondary gearbox: Y

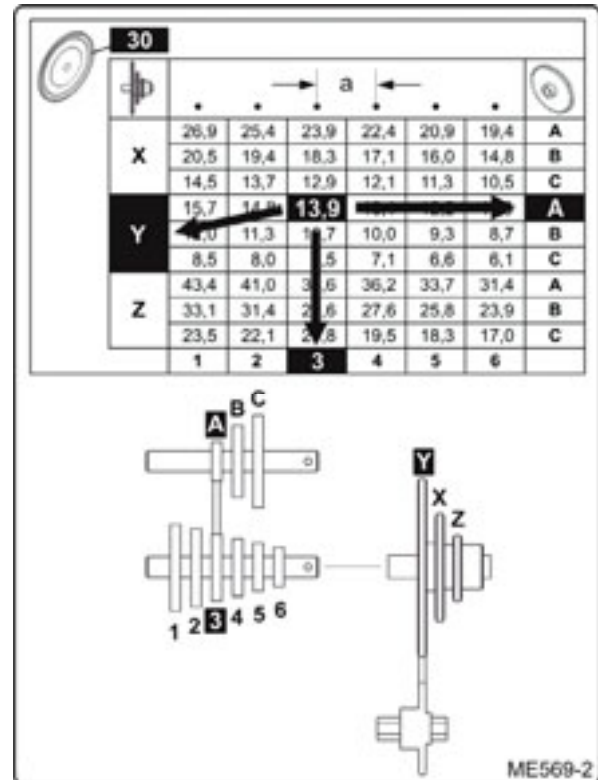


Fig. 116

### 7.5.4 Adjusting the grain spacing in the setting gearbox

1. Raise the implement and secure with suitable supports.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. For the ED 3000 [C], ED 4500, ED 4500-2 [C], position the track marker vertically and lock it (see section "Track marker transport lock – ED 3000 [-C] / ED 4500 [-C/-2/-2C]", Seite 186).
4. Remove the hooks (Fig. 117/1) from the holder.
5. Open the gearbox cover (Fig. 117/2).



Fig. 117



Fig. 118

## Settings

6. Insert the calibration crank (Fig. 119/1) into the chain tensioner of the setting gearbox.



Fig. 119



### CAUTION

The spring pressure which is applied to the calibration crank is very large.

7. Release the tension of the chain tensioner using the calibration crank (Fig. 120).
8. Press the calibration crank (Fig. 119/2) so far that the pin (Fig. 121/1) engages into the recess (Fig. 121/2).



Fig. 120

9. If required, undo the linkage (Fig. 121/3) so that more chain length can be adjusted.



Fig. 121

10. Place the roller chain (Fig. 122/7) onto the correct chain wheels using the hook (Fig. 117/1).
- Setting value, see section "Determining the chain wheel pairs for the setting and secondary gearboxes", Seite 114.

#### Example:

Chain cog pairing A – 3.

The roller chain connects the chain cog (Fig. 122/A) and the chain cog (Fig. 122/3).

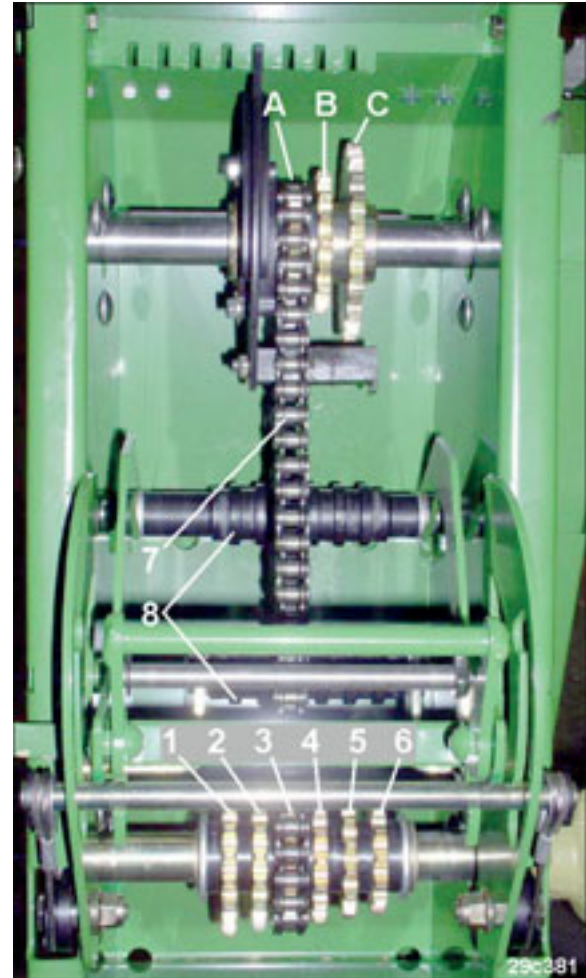


Fig. 122

11. Place the roller chain on one of the chain wheels "A", "B" or "C".
  - 11.1 Turn the locking washer (Fig. 123/1) against the direction of travel. The plastic block (Fig. 123/2) lifts the roller chain off of the chain wheel.
  - 11.2 Place the roller chain on the correct chain wheel.
  - 11.3 Slide the securing disc (Fig. 123/1) so far that the roller chain is aligned and turn it back on the axial securing device.

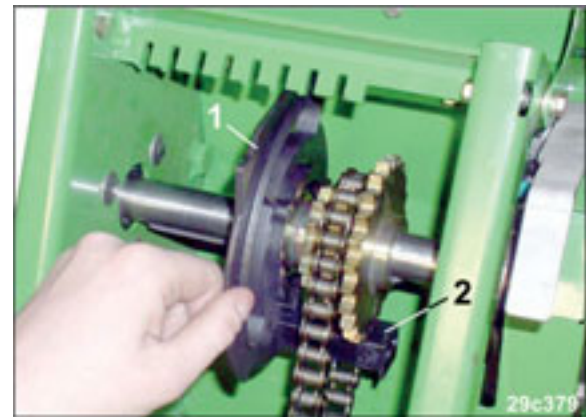


Fig. 123



The roller chain must be aligned and run on the guides of both rollers (Fig. 122/8).

If required, slide the chain cogs A to C as shown in figure (Fig. 123), on the shaft.



**CAUTION**

The large spring pressure acts immediately after loosening the bolts on the calibration crank.

12. Insert the calibration crank into the link and press in the direction of the arrow (Fig. 124/1) until the pin comes out of the notches (Fig. 124/2).
13. Slowly reduce the spring pressure using the calibration crank (Fig. 124/3).
14. Clip the calibration crank into its transport bracket.
15. Close the gearbox cover (Fig. 118).
16. Fasten the hook-bolts (Fig. 117) on the gearbox cover.



Fig. 124



After tensioning, check the alignment of the roller chain!

### 7.5.5 Adjusting the grain spacing in the secondary gearbox

1. Raise the implement and secure with suitable supports.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Open the loading step (Fig. 125/1)



Fig. 125

4. Unscrew the wing nut (Fig. 126/1).
5. Remove the gearbox cover (Fig. 126/2).

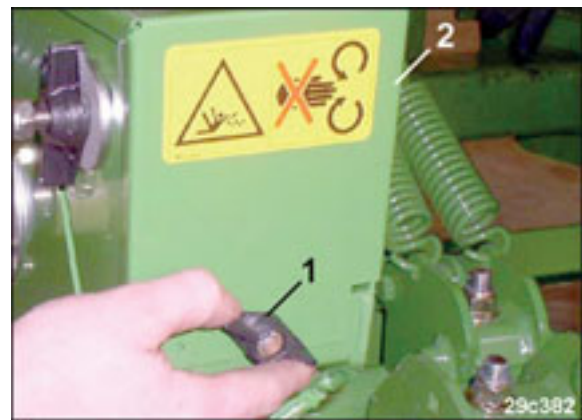


Fig. 126

6. Latch the lever (Fig. 127/1) in the groove (Fig. 127/2).
- The roller chain relaxes.

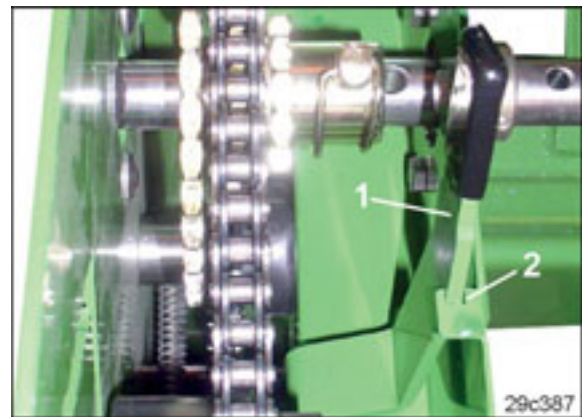


Fig. 127



## Settings

7. Loosen the wing nut (Fig. 128/1) and slide the chain tensioner to the back.



Fig. 128

8. Using the hook (Fig. 117/1) lay the roller chain (Fig. 129) onto the correct chain cog (X, Y, or Z).

Setting values, see section "Determining the chain wheel pairs for the setting and secondary gearboxes", Seite 114.

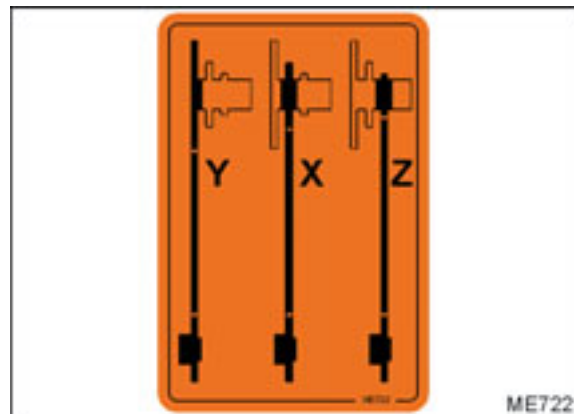


Fig. 129

9. Slide the chain cog accordingly if the roller chain is not aligned.

After every adjustment, secure the chain wheel axially with a linch pin (Fig. 130/1).

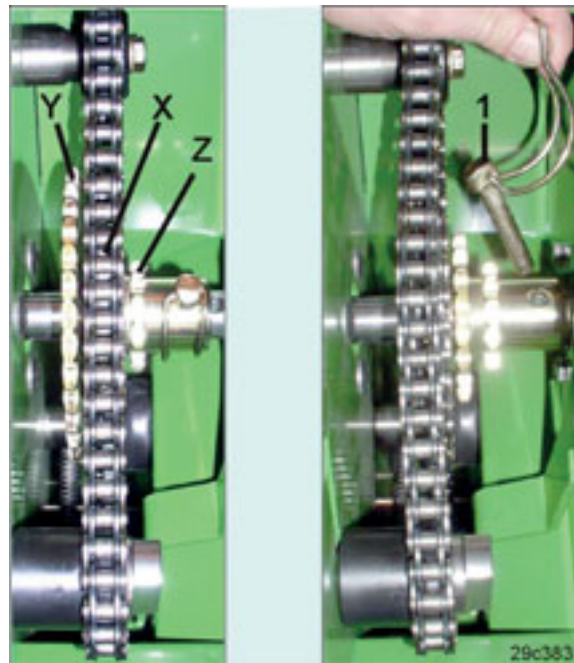


Fig. 130

10. Tension the roller chain.  
For this, slide the wing nut to the stop in the direction of the arrow and then back to the next notch (Fig. 131/1). Allow the chain tensioner to latch into the notch.
11. Tighten up the wing nut.
12. Release the lever (Fig. 127/1) out of the groove (Fig. 127/2).
13. Close the gearbox cover and fasten with the wing nut (Fig. 126/1).

**Fig. 131**

## 7.6 Adjusting the grain spacing (hydraulic drive)



To set the grain spacing using the control terminal, observe the corresponding operating manual!



At high spreading rates (grain spacing  $\leq 4$  cm), there can be multiples or gaps on the bore holes of the singling disc.

To obtain constant high placement accuracy, the working speed may have to be reduced.

## 7.7 Adjusting the seeding unit settings for the seed



This setting influences the occupancy of the seed grains in the holes of the singling discs.

Multiple occupancy and gaps in the holes of the singling disc are detected by the opto-sensors after working speed has been reached. The control terminal issues an alarm.

The table values are reference values that can change due to the shape and size of the grains.

# Seeding unit setting data

Seed	Thousand grain weight TGW	the singling disc			Ejector		Position	
		Description	Colour	Order no.	Colour	Order no.	Scraper bar	Reducing
Maize	< 220 g (11 kg / 50000 K)	30/4.5	beige	966888	Black	926240	1/2	2
	220 to 250 g (11 to 12.5 kg / 50000 G)	30/5	green	910777	Black	926240	2/3	2
		30/5.4	purple	214186				
	250 to 280 g (12.5 to 14 kg / 50000 G)	30/5	green	910777	Black	926240	3/4	2/1
		30/5.4	purple	214186				
	280 to 320 g (14 to 16.0 kg / 50000 G)	30/5	green	910777	Black	926240	4/5	1
		30/5.4	purple	214186				
	> 320 g	30/5.8	beige	910790	Black	926240	3/4	1
Peas		60/5	Dark grey	924211	Black	926240	3	2
Beans	< 400 g						5	2
Field (broad) beans		45/6	Red	910792	Black	926240	5	1
Small beans		60/2.5	Black	924213	Black	926240	2	1
Sunflowers	< 70 g	30/2.2	Blue	919552	Yellow	926241	1	2
	70 g to 85 g	30/2.5	brown	910794	Black	926240	1	2
	85 g to 95 g	30/2.8	Yellow	920489	Black	926240	1	2
	> 95 g	30/3	Pink	927123	Black	926240	1	2
Soya beans	< 100 g	60/4 or 80/4	Orange Or Technical grey	924212 or 215048	Black	926240	1/2	2
	100 to 150 g						2/3	2
	150 to 200 g						3/4	2
	200 to 250 g						4/5	1
	> 250 g						5	1
Cotton		60/3.2	Light green	915673	Black	926240	3	2
Sorghum		60/2.2	Bordeaux red	919553	Yellow	926241	1	2
Sorghum for generating biogas		60/2.5	Black	924213	Yellow	926241	1	2
Sugar beet (pelleted)	< 70 g	30/2.2	Blue	919552	Yellow	926241	3	3
	> 70 g	15/2.2	Turquoise	919903	Yellow	926241	3	3
Beet (plain seed)		30/1.8	Yellow	913688	Yellow	926241	1	2
		90/1.5	white	206551	Yellow	926241	1	2
Water melons		30/1.8	Yellow	913688	Yellow	926241	1	2
		90/1.5	white	206551	Yellow	926241	1	2
Rapeseed		90/1.2	white	920051	Red	925912	3	3
		90/0.8	white	206552	Red	925912	3	3
Pumpkin	180-220	5/3.7	Opal green	215943	Black	926240	1/5	0(*)

(\*) : Parking position

## 7.7.1 Determining grain size

Using the multi-placement tester, the singling can be adapted to the seed.



Fig. 132

1. By placing the seed on the comparison holes (Fig. 133/1), the optimum hole diameter can be determined.



Fig. 133

## 7.7.2 Checking the placement depth and grain spacing

Changing soils have an effect on the seed placement depth and the grain spacing. Therefore, regularly check:

- after each adjustment of the seed placement depth,
- when changing from a light to heavy soil, and vice-versa.

1. Spread seed for approx. 30 m at working speed.
2. Expose the grains at several points using the multi-placement tester (optional). Use the read-off edge to remove the earth in layers.
3. Place the multi-placement tester (Fig. 134) horizontally on the ground
4. Place the pointer (Fig. 134/1) on the seed grain and read off the placement depth from the scale (Fig. 134/2).
5. Measure the grain spacing with the ruler.

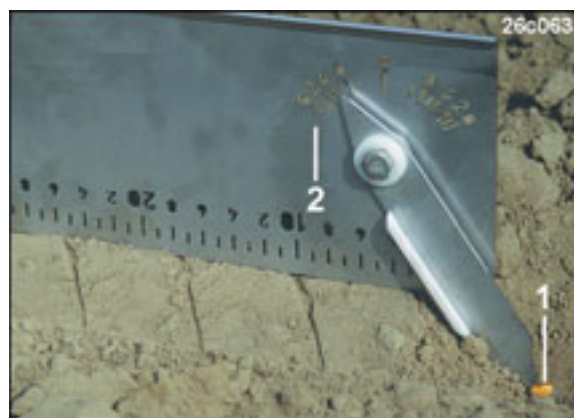


Fig. 134

## 7.7.3 Check the scraper position and the reduction flap position

1. Fill the seed hopper (see section "Filling and emptying the seed hopper", Seite 178).
  2. Switch on the fan (see section "Blower fan speed", Seite 131).
  3. Turn the drive wheel and thereby the singling discs with the calibration crank.
  4. A second person checks if every hole (Fig. 135/1) is filled with a grain.
5. If there are gaps, set the lever (Fig. 136/A) of the scraper in a groove with a higher number.
  6. If there is double occupancy, set the lever (Fig. 136/A) in a groove with a lower number.
  7. Gaps and double occupancy can also occur if the reduction flap (Fig. 139/2, Seite 127) is set incorrectly.
- If seed emerges out of the housing opening (Fig. 135), reduce the feed opening size by adjusting the reduction flap to the next higher position number (Fig. 139/2, Seite 127).



Fig. 135

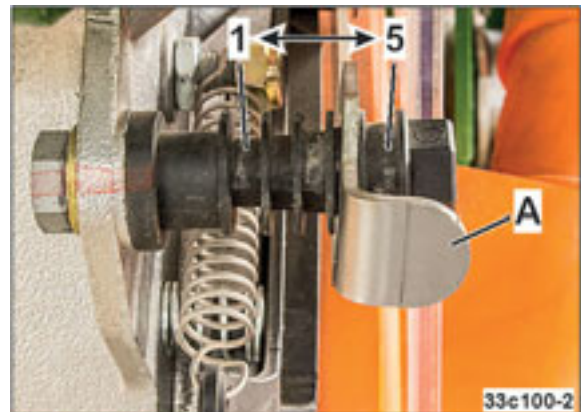


Fig. 136



The spring-loaded lever (Fig. 136/A) must move freely and, after it has been moved out, move back into its starting position.



Check the adjustments in the field after a short distance has been driven.

Determine any double occupancy or gaps by exposing the seed on the field. Gaps are shown on the control terminal.

## 7.7.4 Opto-sensor

To monitor the seeding unit, each and every seed grain generates an impulse as soon as it passes by the opto-sensor (Fig. 137/1) on the singling disc.



When seeding rapeseed, determining the application rate is only possible to a limited extent!

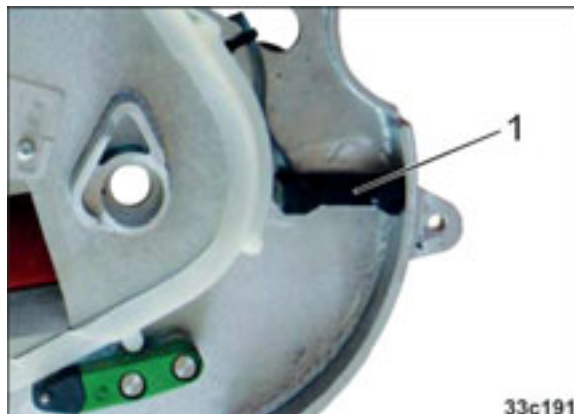


Fig. 137

## 7.7.5 Adjusting the scraper

The scraper positions 1 to 5 can be seen on the adjusting lever (Fig. 138/A).

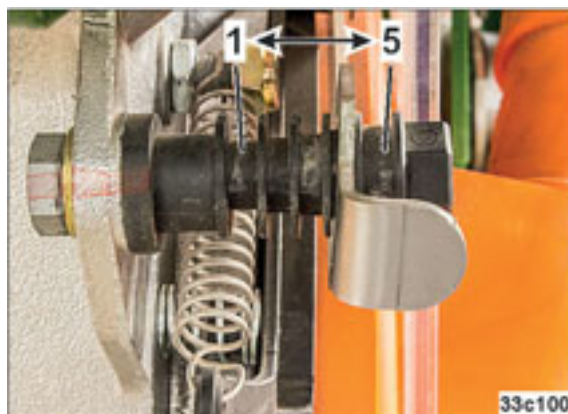


Fig. 138



## 7.7.6 Set the reduction flap



Condition of the reduction flap on delivery: Position 1

To adjust the seed inflow, adjust the position of the reduction flap (Fig. 139/2):

1. Undo the fixing bolts (Fig. 139/1),
2. Slide the reduction flap (Fig. 139/2) to its new position:
  - 2.1 Increase inflow (Fig. 139/3)
  - 2.2 Reduce inflow (Fig. 139/4)
3. Tighten up the fixing bolts (Fig. 139/1).



Fig. 139

With particularly sticky or blunt seed, the seed flow can be interrupted due to bridging.

Using the optional seed feed (Fig. 140/1) improves the flow of seed to the singling disc.

More information via Customer Service / Dealers.



Fig. 140

## Parking the reduction flap

To deactivate the reduction flap's function (Fig. 141/2), change the adjustment.

1. Undo and remove the fixing bolts (Fig. 141/1),
2. Turn the reduction flap (Fig. 141/2) upwards and set it in the upper position (Fig. 141/3),
3. Insert and tighten up the fixing bolts (Fig. 141/1).

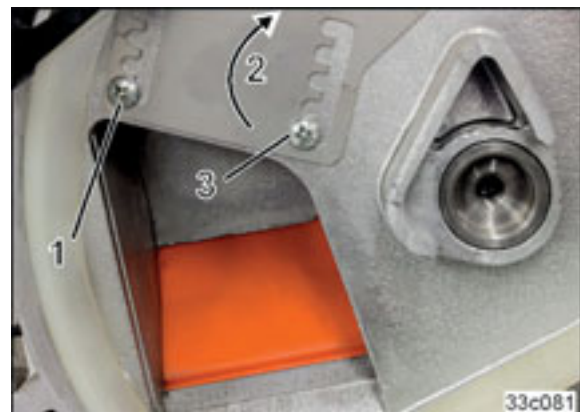


Fig. 141

### 7.7.7 Changing the singling disc and ejector

1. Lift up the implement and secure it using suitable supports.
2. Release the nut (Fig. 142/1).
3. Swivel the seeding coulter (Fig. 142/2) downwards.
4. Release the nut (Fig. 142/3).

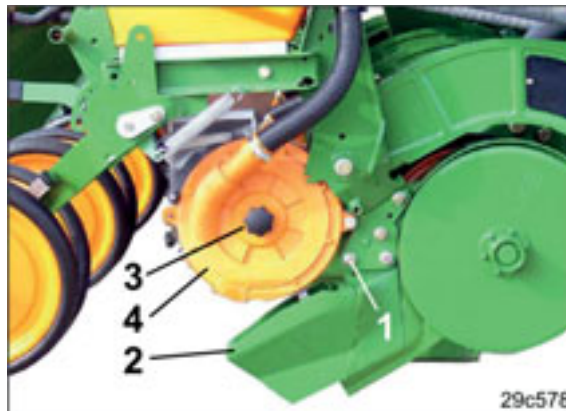


Fig. 142

5. Pull off the suction lid (Fig. 142/4) together with the singling disc (Fig. 143/1) from the seed housing.
6. If required, change the singling disc.



Fig. 143

7. If required, change the ejector (Fig. 144/1).



Fig. 144

**Important**

The naps (Fig. 143/2) point towards the seeding housing and constantly stir the seed to ensure good occupancy.

### 7.7.8 Close the seed housing

Close the suction cover (Fig. 145/1):

1. Hand tighten the nut (Fig. 145/2),
2. Swivel the coulter (Fig. 145/3) upwards,
3. Tighten up the nut (Fig. 145/4).

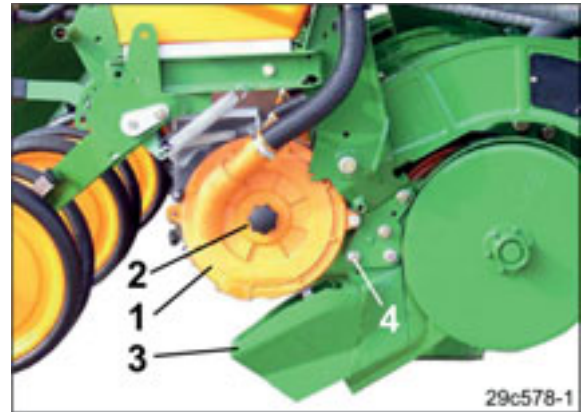


Fig. 145

4. Carefully pull on the lever (Fig. 146/1) and check to see if the lever returns to its starting position after it has been pulled out,
5. Check the setting of the first seeding unit (see section "Check the scraper position and the reduction flap position", Seite 124),
6. Set all seeding units to match the value of the first seeding unit.

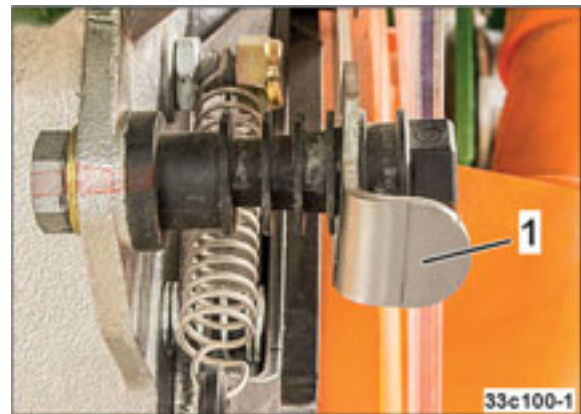


Fig. 146

## 7.8 Coulter tips

When changing from maize seed (Fig. 147) to beet / turnip seed (Fig. 148), the coulter tips on the contour seeding unit should be exchanged. (see section "Checking the coulter tips", Seite 225).

Coulter tip (hard metal, optional) for the Contour seeding unit for the seeding of maize, beans, sunflower, peas, cotton and sorghum.

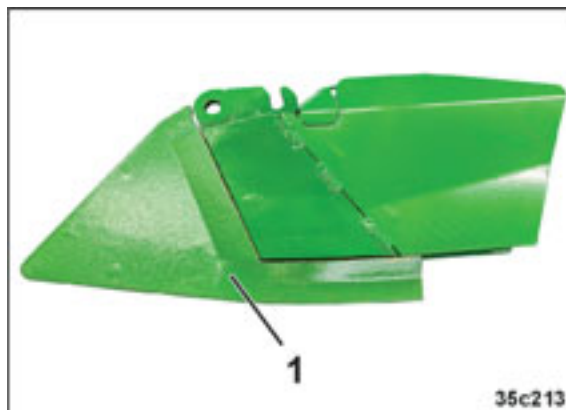


Fig. 147

Coulter tip for the Contour seeding unit for the seeding of sugar beets, turnips, watermelon and rapeseed.

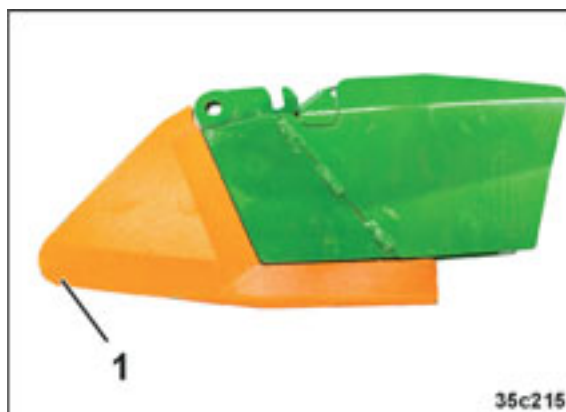


Fig. 148

Coulter tip (hard metal, optional) for the Classic seeding unit for the seeding of maize, beans, sunflower, peas, cotton and sorghum.

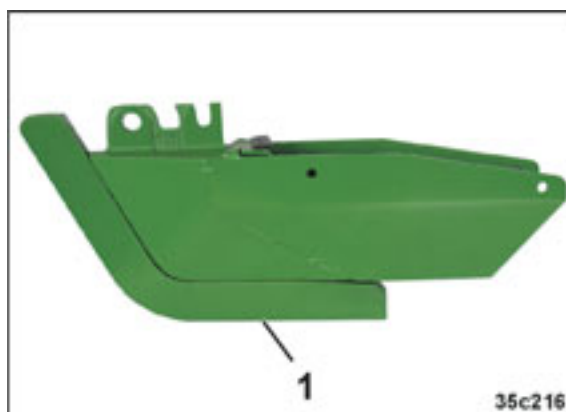


Fig. 149

## 7.9 Blower fan speed

Notes for setting the fan speed on the front tank (see section "Adjusting the fan speed on the front tank", Seite 134).

Make sure that the fan speed remains in the specified green scale area



- to avoid double filling/gaps in the seed on the singling discs
- to avoid increased wear on the fan.
- When using the red singling disc for field/broad beans (see table, Seite 122) increase the fan speed until the pointer of the pressure gauge (Fig. 150) is just before the red area.
- The compressed air fan and the suction fan have the same speed. The pressure gauge (Fig. 150) shows the vacuum of the suction fan. If the speed of the suction fan is set correctly, the air pressure of the compressed air fan can be too high and the fertiliser is then blown out of the fertiliser furrow.

Depending on the equipment, a pressure gauge (Fig. 150/1) or the control terminal in the tractor cab displays the vacuum in the suction fan. The fan speed of the suction fan is properly set when the value is between 65 and 80 mbar. This is when the pointer of the pressure gauge is standing in the middle of the green scale area (Fig. 150/2).

The setting of the fan speed is done

- with the PTO shaft drive (see section "PTO fan drive", Seite 132)
- with the hydraulic drive (see section "Hydraulic fan drive", Seite 133).



Fig. 150

Adjustment of the air intake opening with the shutter (Fig. 151/1):

1. If the fertiliser is blown out of the fertiliser furrow, reduce the size of the air intake opening of the compressed air fan.
2. Open the shutter more widely to increase the air pressure.

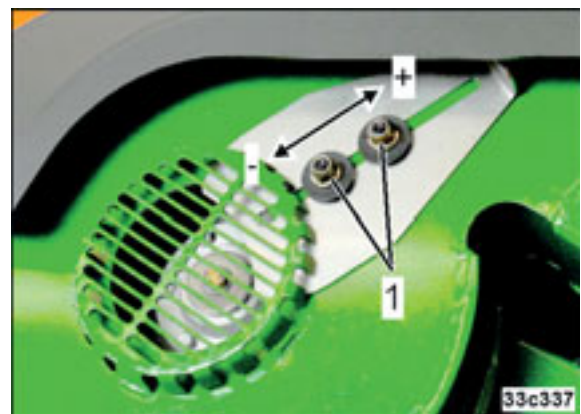


Fig. 151



### 7.9.1 PTO fan drive

The fan drive is set according to your requirements stated in the order, e.g. to 1000 rpm tractor PTO shaft speed. A sticker (Fig. 152) on the fan housing marks the permitted tractor PTO shaft speed.

If the permitted tractor PTO shaft speed is maintained, the pointer of the pressure gauge will be in the green scale area (Fig. 150/2) while working.

Small corrections can be made by making slight adjustments to the speed of the tractor's PTO shaft.




	540	rpm.
	710	rpm.
	1000	rpm.

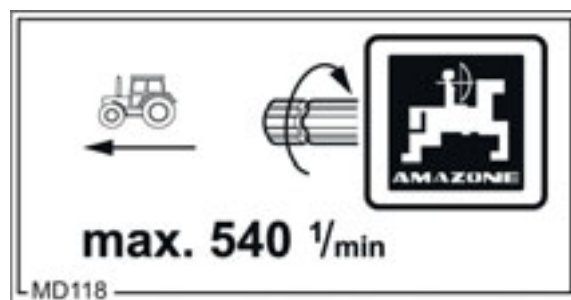
Fig. 152



Depending on the equipment, do not exceed the maximum PTO shaft speed!

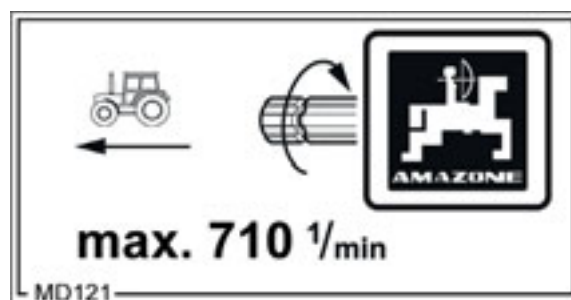
#### MD 118

Nominal speed (maximum 540 rpm) and direction of rotation of the drive shaft on the implement side.



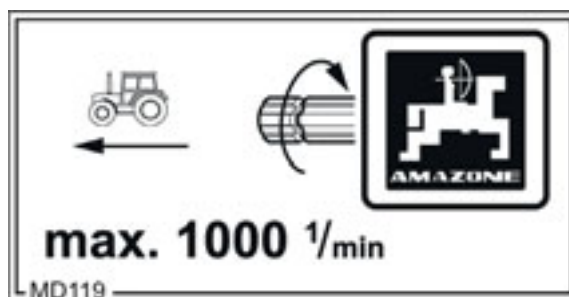
#### MD 121

Nominal speed (maximum 710 rpm) and direction of rotation of the drive shaft on the implement side.



#### MD 119

Nominal speed (maximum 1000 rpm) and direction of rotation of the drive shaft on the implement side.



## 7.9.2 Hydraulic fan drive (optional)



Only tractors with a load sensing system or a separate oil circuit are suitable to drive the fan hydraulically. On other tractors, you must first turn off the fan before you can lift up the implement at the end of the field.



The fan speed alters until the hydraulic fluid has reached its working temperature. On initial operation correct the fan speed up to attainment of the working temperature.

If the fan is put back into operation after a long stoppage period, the preset fan speed is not attained until the hydraulic fluid has heated up to working temperature.



The hydraulic fan drive can only be retrofitted with a PTO shaft speed of 1000 rpm!

### 7.9.2.1 Adjusting the fan speed on the tractor control unit

The fans can be driven by a hydraulic motor. Set the fan speed on the tractor control unit.

1. Fill all seed hoppers.
2. Start the tractor engine and run at high rpm.
3. First let the seeding units run up to speed and fill the singling discs with seed grains (see section "Check the scraper position and the reduction flap position", Seite 124).
4. Set the oil quantity (using the tractor operating manual) on the tractor control unit.
5. Check the fan speed using the vacuum value (see pressure gauge, Fig. 150 or control terminal).

The fan speed of the suction fan is correctly set when the values is between 65 and 80 mbar.

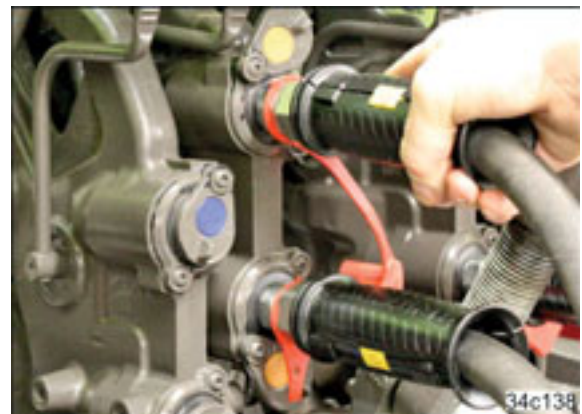


Fig. 153



## 7.9.2.2 Adjusting the fan speed on the front tank



### Important

Fan speeds of the compressed air fan on the front tank:

**Minimum fan speed: 3500 rpm**

**Maximum fan speed: 4000 rpm**

The combinations with front tanks have two fans:

- the exhaust fan on the precision airplanter
- the compressed air fan on the front tank.

Set the fan speed of the suction fan (see section "Blower fan speed", Seite 131).

Adjust the fan speed of the compressed air fan following the front tank's operating manual.



Fig. 154

## 7.10 Adjusting the track marker (optional)



### Danger

**It is forbidden to stand in the swivelling area of the track marker!**

Carry out the adjustments to the track marker only with the hand brake applied, the engine switched off and the ignition key removed.

### 7.10.1 Calculating the track marker length to mark a track in the centre of the tractor

Calculating the track marker width A (Fig. 155) measured from the centre of the implement to the contact surface of the track marker disc on the ground, this corresponds to the working width.

Track marker length A	=	Row spacing R [cm] x number of seeding units
--------------------------	---	--

#### Example:

Row spacing R: 45 cm

Number of seeding units: 7

Track marker length A 45 cm x 7

Track marker length A 315 cm

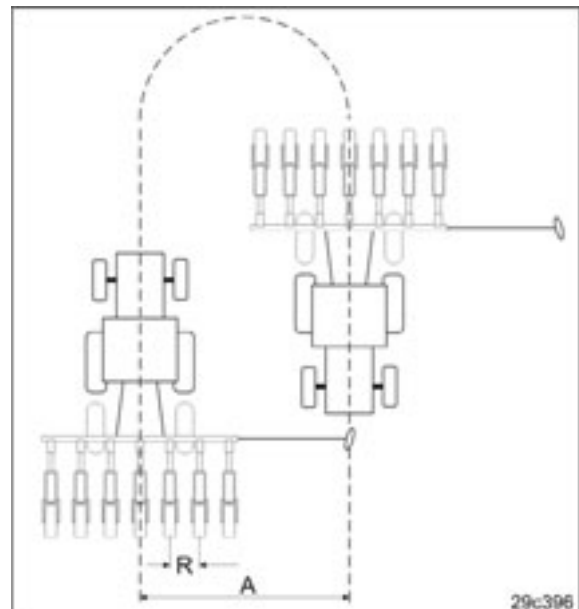


Fig. 155

### 7.10.2 Calculating the track marker length to mark a track in the tractor track

Calculating the working width A (Fig. 156) measured from the centre of the implement to the contact surface of the track marker disc on the ground with the coulters arranged symmetrically.

Track marker length A	=	Row spacing R [cm] x number of seeding units	$\frac{\text{Tractor track S [cm]}}{200}$
--------------------------	---	--	---

#### Example:

Row spacing R: 45 cm

Number of seeding units: 7

Tractor track width S: 150 cm

$$\text{Track marker length A} = 45 \times 7 \times \frac{150}{200}$$

$$\text{Track marker length A} = 236 \text{ cm}$$

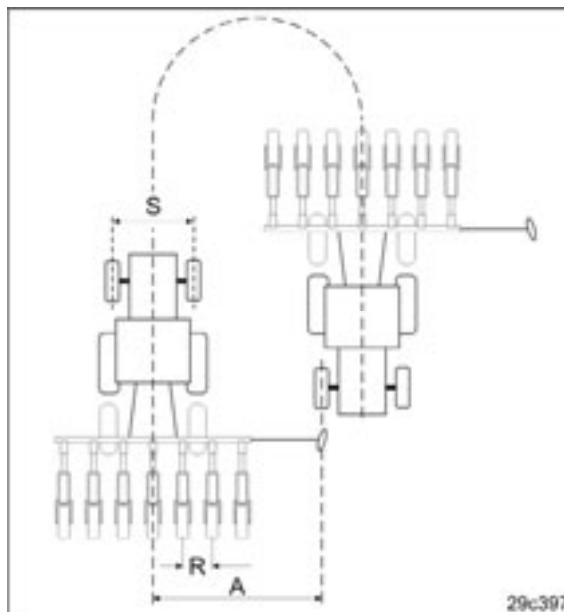


Fig. 156

### 7.10.3 Adjusting the working intensity of the track marker

1. Adjust the working intensity of the track marker by turning the track marker disc (Fig. 157/1).

The track marking disc runs roughly parallel with the direction of travel on light soils, and has more grip on heavy soils.

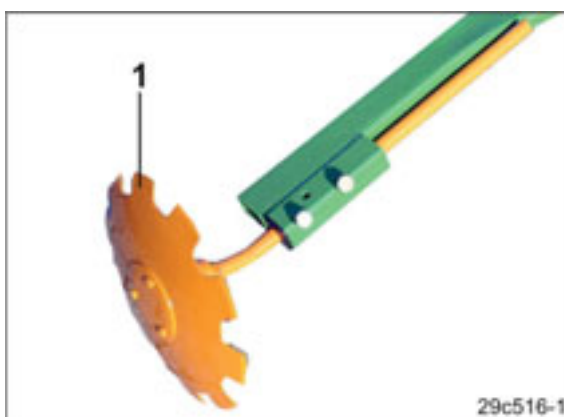


Fig. 157

#### 7.10.4 Adjusting the track marker - ED 3000 [-C] / ED 4500 [-C/-2/-2C]

The track markers mark a track at the centre of the tractor or in the tractor track.

1. Calculate the track marker length  
see section "Calculating the track marker length to mark a track in the centre of the tractor", Seite 135  
see section "Calculating the track marker length to mark a track in the tractor track", Seite 136.
2. Adjust the track marker length
3. Raise the implement on the field
4. Unlock the track markers (see section "Track marker transport lock – ED 3000 [-C] / ED 4500 [-C/-2/-2C]", Seite 186)
5. Fold out the track markers (see section "Track marker operation", Seite 186).
6. Apply the handbrake, switch the tractor engine off and remove the ignition key.
7. Pull out the spring-loaded pins (Fig. 159/1), swing them to the side and lock in place.
8. Pull out the boom tubing (Fig. 159/2) to the first or second hole.

Positioning the boom tubing (Fig. 159/2):

→ First hole: mark in the tractor-track

→ Second hole: mark in the at the centre of the tractor

9. Secure the boom tubing (Fig. 159/2) with the pin (Fig. 159/1)
10. Loosen the bolts (Fig. 159/3)
11. Adjust the track marker disc (Fig. 159/4) to the length "A"
12. Tighten the bolts (Fig. 159/3)



Fig. 158

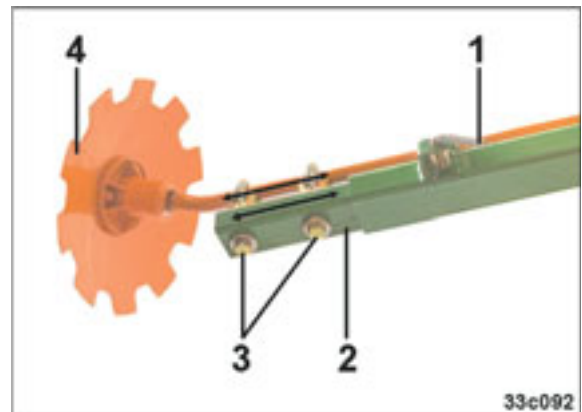


Fig. 159

## 7.10.5 Adjusting the track marker - ED 6000-2 [-2C/-2FC]

The track markers of the ED 6000-2C mark a track at the centre of the tractor or in the tractor track.

1. Calculate the track marker length  
see section "Calculating the track marker length to mark a track in the centre of the tractor", Seite 135  
see section "Calculating the track marker length to mark a track in the tractor track", Seite 136.
2. Adjust the track marker length
3. Raise the implement on the field.
4. Fold out the track markers.
5. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
6. Pull out the spring-loaded pins (Fig. 161/1), swing them to the side and lock in place.
7. Pull out the boom tubing (Fig. 161/2) to the first or second hole.

Positioning the boom tubing (Fig. 161/2):

- First hole: mark in the tractor track.
- Second hole: mark in the centre of the tractor

8. Secure the boom tubing (Fig. 161/2) with the spring-loaded pin (Fig. 161/1).
9. Unscrew the bolts (Fig. 162/1).
10. Adjust the track marker disc (Fig. 162/2) to the length "A"
11. Tighten the bolts (Fig. 162/1)



Fig. 160

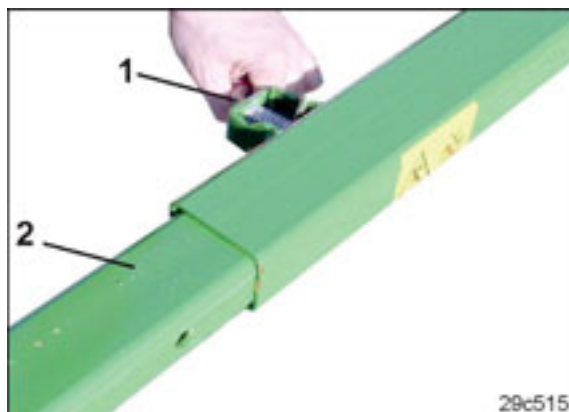


Fig. 161

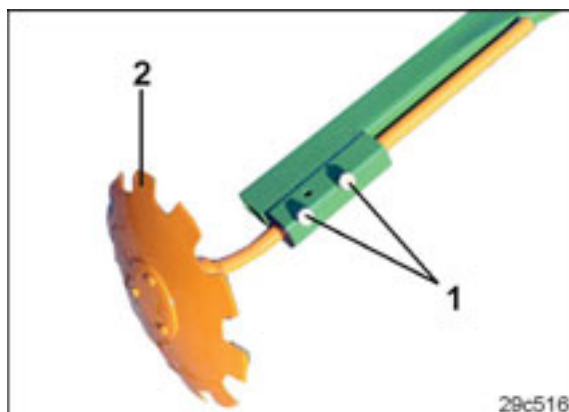


Fig. 162

12. Loosen the turnbuckle lock nut (Fig. 163/1).
13. Adjust the turnbuckle so that the track marker disc (Fig. 162/2) touches the ground.
14. Shorten the turnbuckle by one turn so that the working depth of the track marker disc is limited to approximately 5 cm.
15. Tighten up the turnbuckle lock nut (Fig. 163/1).



Fig. 163

## 7.11 Adjusting the wheel mark eradicator (optional)



### DANGER

**Traktor-Zapfwelle abschalten, Apply the tractor parking brake, switch off the engine and remove the ignition key.**



To prevent damage, the implement must not be put down on the wheel mark eradicators. Using the recessed grip, secure the wheel mark eradicators in the topmost position (see Fig. 165).

- Complaints shall not be accepted if damage is caused by putting the implement down on the wheel mark eradicators.



To prevent damage to the wheel mark eradicators, the overload safety may only be triggered by brief overloads. Permanent activation of the overload safety leads to increased wear. In this case, proceed as follows:

- reduce the working speed
- reduce the working depth
- use a coulter that is easy to pull (see Fig. 301, section "Changing the coulters (specialist workshop)", Seite 222).

### Horizontal adjustment

Loosen the bolts (Fig. 164/1), move the wheel mark eradicator horizontally to the desired position (Fig. 164/2) and clamp it back on with the bolts.

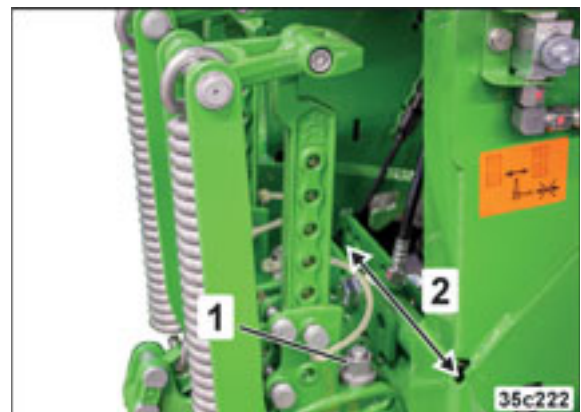


Fig. 164



### Vertical adjustment

The recessed grip (Fig. 165/3) serves to safely adjust the working depth.



The top locking pin (Fig. 165/1) may not be removed.

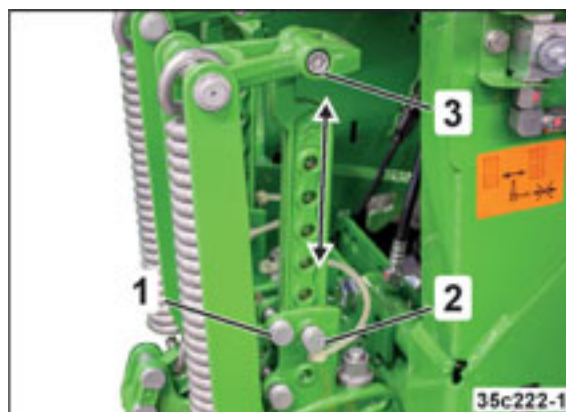


Fig. 165

Adjusting the working depth of the wheel mark eradicator:

1. Remove the linch pin
  2. Grab the wheel mark eradication by the recessed grip (Fig. 165/3)
  3. Remove the locking pins (Fig. 165/2)
  4. Using the recessed grip, move the wheel mark eradicator to the desired position and insert the locking pin
- The maximum working depth is 150 mm!
5. Secure the locking pin with a linch pin



Check the work results after each adjustment.

## 7.12 Adjusting the classic coulter



Position the implement frame horizontally by lengthening or shortening the top link.

### 7.12.1 Adjusting the seed placement depth



The specifications of the seed placement depth are reference values. They depend on different factors, such as the

- Soil type (light to heavy, dry to wet)
- Forward speed
- Load level
- Condition of the seedbed.

1. Bring the implement to the working position in the field (see section "Use of the implement", Seite 176).
2. Release the spring clip (Fig. 166/1). The spring clip secures the crank Fig. 166/2) from turning.
3. Using the crank (Fig. 166/2), adjust to the desired placement depth.

Turning the crank

→ to the right: increase the working depth

→ to the left: reduce the working depth



Fig. 166

4. Secure the crank (Fig. 166/2) with the clip (Fig. 166/1) to prevent it turning.
5. The placement depth is adjusted using the trailing farm flex tyres or the rubber V-press rollers (see (Fig. 167). Check the placement depth of the first seeding unit (see section "Checking the placement depth and grain spacing", Seite 124) and correct if needed.

If the desired seed placement depth is not reached, adjust the weight of the seeding unit (load) on the seeding coulters [see section "Adjusting the load level", Seite 142].

6. Adjust all the seeding units to the loading level and the crank setting of the first seeding unit. Read the crank setting from the scale (Fig. 166/3).
7. Finally, check the placement depth of all the seeding units (see section "Checking the placement depth and grain spacing", Seite 124).

Depth control	Placement depth
Farm flex tyres 370 mm	approx.: 13 cm
Farm flex tyres 500 mm	approx.: 11 cm
Rubber V press rollers 360X50	approx.: 8 cm

Fig. 167

## 7.12.2 Adjusting the load level



**Caution!**

**Risk of injury when releasing the spring-loaded lever.**

1. Lift up the implement on the tractor three-point hitch far enough so that the seeding units are clear of the ground.



Fig. 168

2. Insert the calibration crank (/1) into the setting lever of the first seeding unit (/1).
3. Unlock the setting lever with the calibration crank (/3).

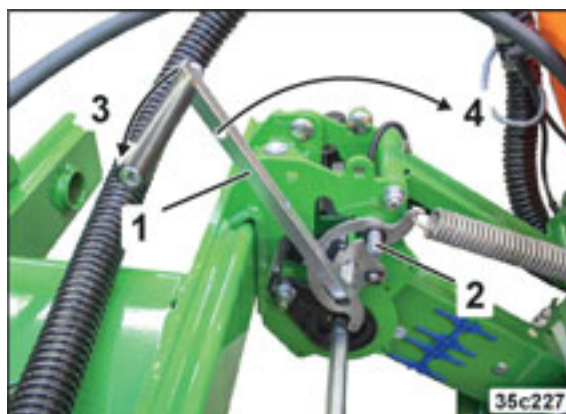


Fig. 169

4. Turn the setting lever to the desired load level (/4)

Lever position (Fig. 170/...)

(1)= Unloaded

(2)= Neutral

(3)= 50 % loaded

(4)= 100 % loaded

5. Ensure that the setting lever latches into the desired position (/2).
6. Adjust all the seeding units to the same load level as the first seeding unit.
7. Finally, check the placement depth of all the seeding units (see section "Checking the placement depth and grain spacing", Seite 124).

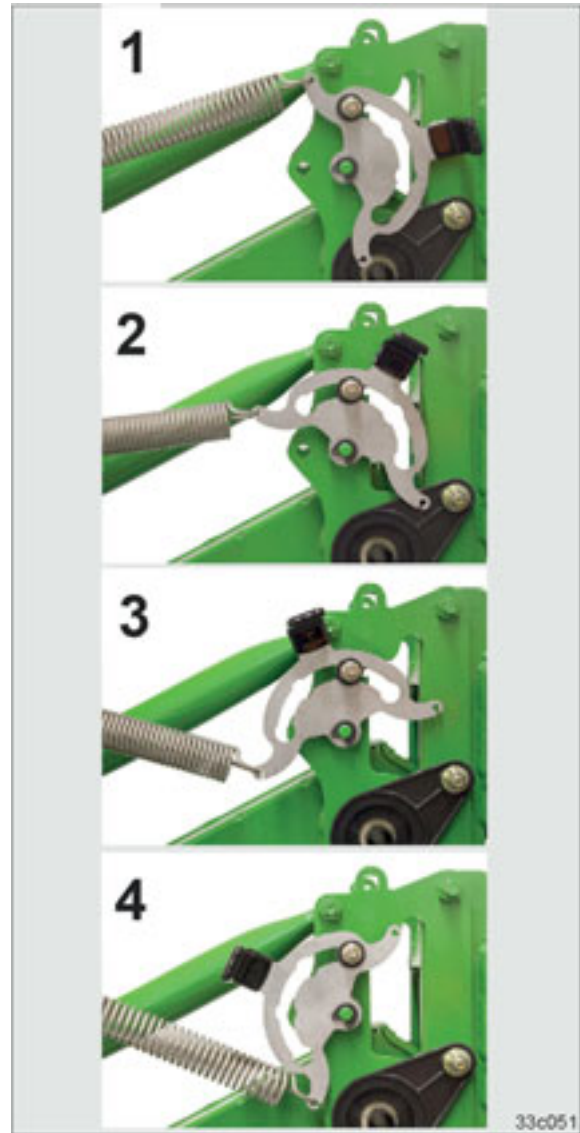


Fig. 170

## 7.12.3 Closing the seed furrow

Follow the implement at the start of work on the field and check the seed coverage.



Fig. 171

If the seed furrow is not closed, change the working intensity of the leading closers (Fig. 171/1) by hooking the springs (Fig. 172/1) in one of the notches A to C.

The highest working intensity is reached by hooking the spring in notch C.

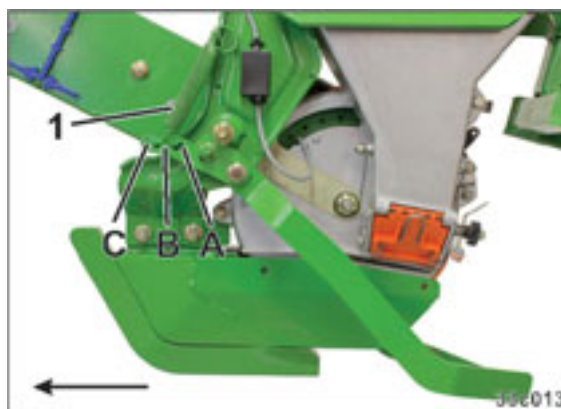


Fig. 172

The rubber V-press rollers or press rollers maintain the placement depth and close the seed furrow.

Depending on the soil conditions, the distance between the rubber V-press rollers can be adjusted to each so that the rubber V-press rollers run tightly alongside the seed furrow cut edge, breaking it and closing the seed furrow.

1. Unscrew the lock nut (Fig. 173/1)
2. Move the adjustment bushing (Fig. 173/2)
3. Tighten the lock nut (Fig. 173/1)



Fig. 173



Loosening of the bolts: To prevent the lock nuts (Fig. 185/1) from loosening themselves, they feature different threads.

- In direction of travel right: right hand thread
- In direction of travel left: left hand thread

### 7.12.4 Adjusting the intermediate press roller (optional)

The working intensity of the intermediate press roller (Fig. 174/1) increases the higher the pre-tensioning is set on the spring (Fig. 175).

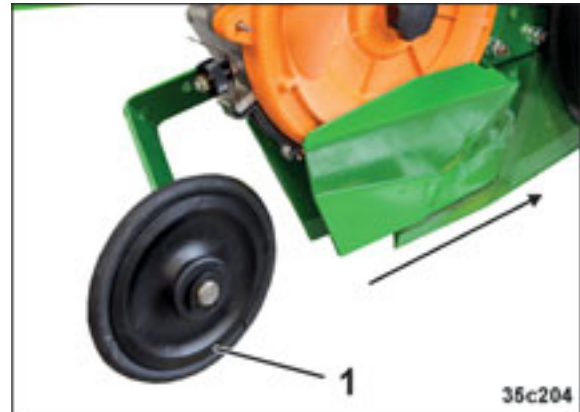


Fig. 174

Lever adjustment:

- 1 → High pre-tensioning
- 2 → Medium pre-tensioning
- 3 → Low pre-tensioning

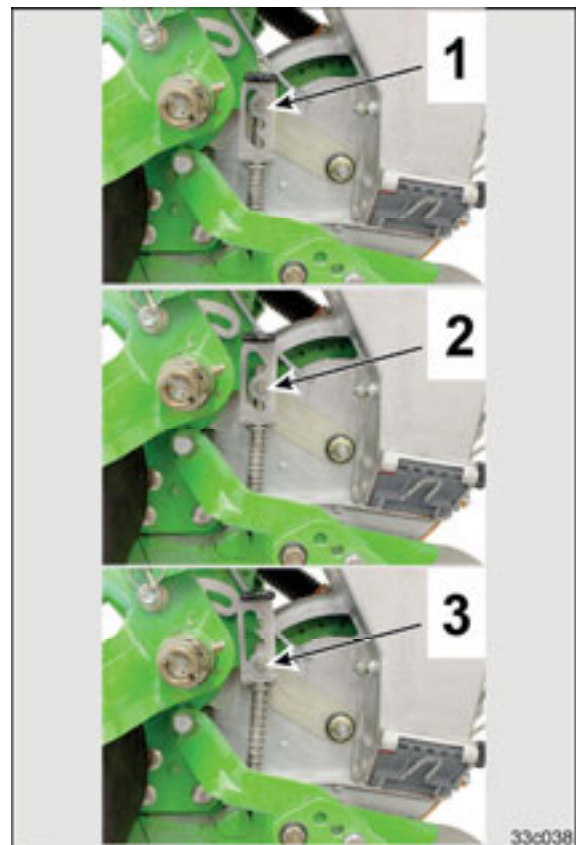


Fig. 175



## 7.13 Adjusting the contour coulter



Position the implement frame horizontally by lengthening or shortening the top link.

### 7.13.1 Adjusting the seed placement depth



The specifications of the seed placement depth are reference values. They depend on different factors, such as the

- Soil type (light to heavy, dry to wet)
- Forward speed
- Load level
- Condition of the seedbed.

1. Put the implement in the working position in the field (see section "Use of the implement", Seite 176).
2. Release the spring clip (Fig. 176/1). The spring clip secures the crank (Fig. 176/2) from turning.
3. Using the crank (Fig. 176/2), adjust to the desired placement depth.

#### Turning the crank

→ to the right: increase the working depth

→ to the left: reduce the working depth

The maximum placement depth is 8.8 cm!



Fig. 176

4. Secure the crank (Fig. 176/2) with the clip (Fig. 176/1) to prevent it turning.
5. Check the placement depth of the first seeding unit (see section "Checking the placement depth and grain spacing", Seite 124) and correct if needed.
6. If the desired seed placement depth cannot be reached, change the load on the seeding coulter [see section "Adjusting the load level", Seite 147].
7. Adjust all the seeding units to the loading level and the crank setting of the first seeding unit. Read the crank setting from the scale (Fig. 176/3).
8. Finally, check the placement depth of all the seeding units (see section "Checking the placement depth and grain spacing", Seite 124).

### 7.13.2 Adjusting the load level

1. Lift up the implement on the tractor three-point hitch far enough so that the seeding units are clear of the ground.
2. Insert the calibration crank (Fig. 177/1) into the square opening of the first seeding unit.



Fig. 177

3. Turn the calibration crank against the spring pressure and release the struts (Fig. 178/2) from the bolts (Fig. 178/3).
4. Relieve the strain on the draw springs (Fig. 178/4).
5. Hang both draw springs (Fig. 178/4) as shown in figures (Fig. 180 to Fig. 182).
6. Using the calibration crank, tension the springs and hang the struts (Fig. 178/2), as shown in figures (Fig. 180 to Fig. 182) on one bolt.
7. Perform the fine adjustment of the placement depth with the crank [see section 7.13.1]

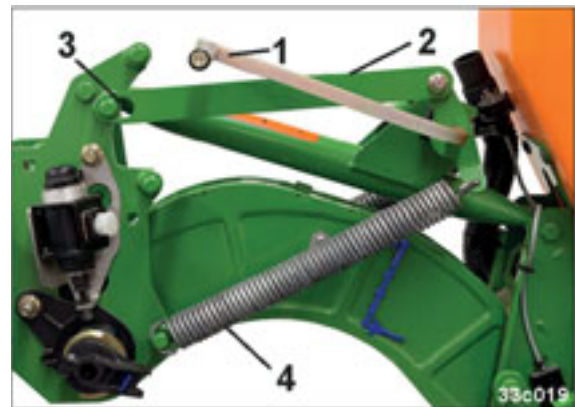


Fig. 178



The mounting diagrams of the three loading levels can be found on a sticker (Fig. 179) on the implement.

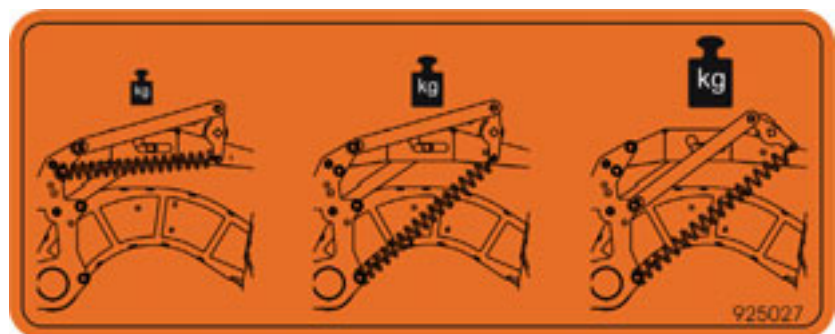


Fig. 179

## Settings

The attachment of the springs (Fig. 180/1) and the braces (Fig. 180/2) results in different load levels.

Fig. 180/...

(1) Load level 1

The lowest weight acts on the seeding coulter at loading level 1, and it then increases in steps.

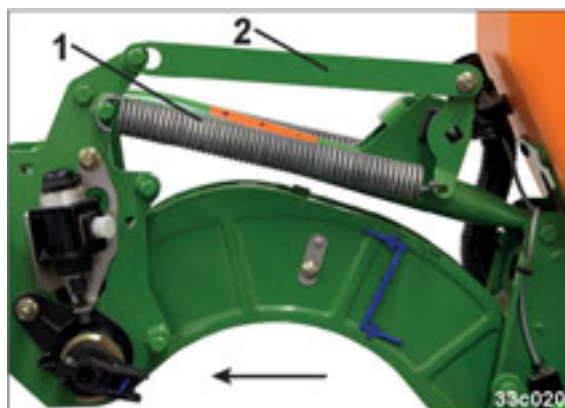


Fig. 180

Fig. 181/...

(1) Load level 2



Fig. 181

Fig. 182/...

(1) Load level 3

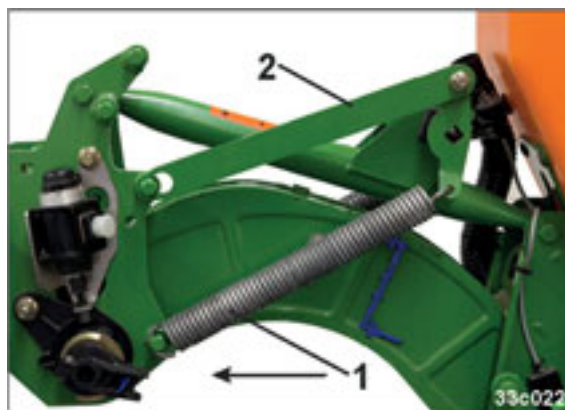


Fig. 182

### 7.13.3 Adjusting the load distribution of the press rollers

To adapt to the various soil properties and conditions, the load distribution between the carrier roller and press rollers can be adjusted.

If the seed furrow cannot be closed due to the hardness of the soil, more load should be applied to the rear farm flex tyres to break the furrow edges and to close the seed furrow. An even load distribution (50/50) between the press rollers is set at the factory.

The load distribution is carried out by repositioning the crank in the different crank mounting points (Fig. 183/a-d).

#### Position A:

##### Crank receptacle a and c (Fig. 183/A):

even weight distribution at the front and rear (factory setting).

#### Position B:

##### Crank receptacle a and c (Fig. 183/B):

weight distribution 30 % front, 70 % rear.

When working on very heavy soils. The trailing V-press roller is loaded.

#### Position C:

##### Crank receptacle a and d (Fig. 183/C):

weight distribution 70 % front, 30 % rear.

Mount the locating pin into the crank mounting point d.

To sow pressure-sensitive seed, e.g. turnips/beet. The trailing rubber V-press roller is loaded less strongly.

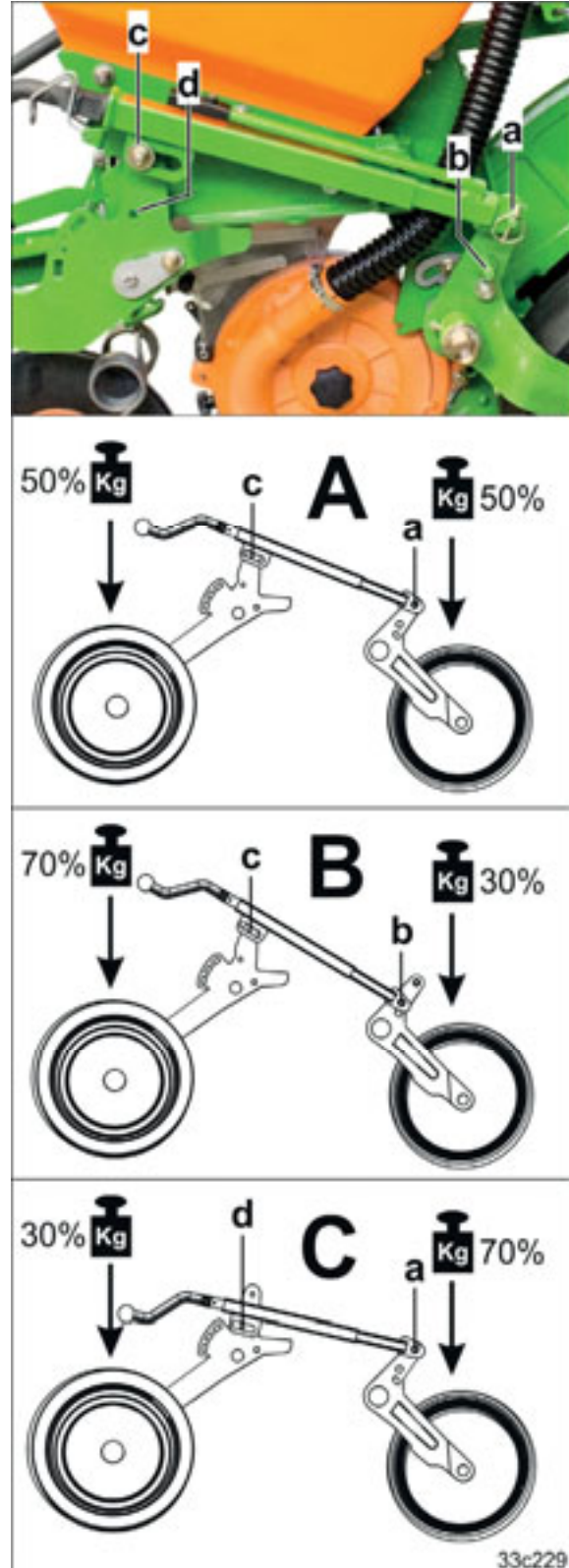


Fig. 183



## Settings

In each of the positions "A" to "C", the weight that is applied to the rear V-press roller (Fig. 184/1) can be changed with the lever (Fig. 184/2).

The higher the lever is inserted into the holder, the greater the force acting on the trailing press roller.

The lever locks into one of the three positions in the holder (Fig. 184/3).

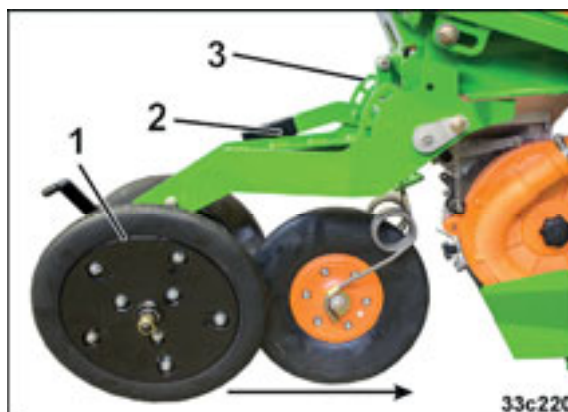


Fig. 184



On changing soils, the lever should always be fastened right at the top in the holder!

### 7.13.4 Closing the seed furrow

The rubber V-press rollers maintain the placement depth and close the seed furrow.

Depending on the soil conditions, the distance between the rubber V-press rollers can be adjusted to each so that the rubber V-press rollers run tightly alongside the seed furrow cut edge, breaking it and closing the seed furrow.

1. Unscrew the lock nut (Fig. 185/1)
2. Move the adjustment bushing (Fig. 185/2)
3. Tighten the lock nut (Fig. 185/1)



Fig. 185



Loosening of the bolts: To prevent the lock nuts (Fig. 185/1) from loosening themselves, they feature different threads.

- In direction of travel right: right hand thread
- In direction of travel left: left hand thread

If the seed furrow is not closed with the correct setting of the axial distance, the mode of action of the two press rollers inclined relative to each other can be infinitely adjusted using a lever (Fig. 186/2) after the bolted connection (Fig. 186/1) has been unscrewed. The shaped indicator element is used as an adjustment aid.

Lever adjustment:

- To the rear: increases the soil movement.
- To the front: reduces the soil movement.

If the possible settings for the rubber V-press rollers do not deliver the desired results, more load should be applied to the rubber V-press rollers [see section Adjusting the load distribution of the press rollers, Seite 149].



Fig. 186

### 7.13.5 Adjusting the closer/intermediate press roller (large) (optional)

The working intensity of the closer (Fig. 188/1), of the disc closer (Fig. 189/1) or the intermediate press roller (Fig. 190/1) increases the higher the pre-tensioning is set on the spring (Fig. 187).

Lever adjustment:

- 1 → High pre-tensioning
- 2 → Medium pre-tensioning
- 3 → Low pre-tensioning

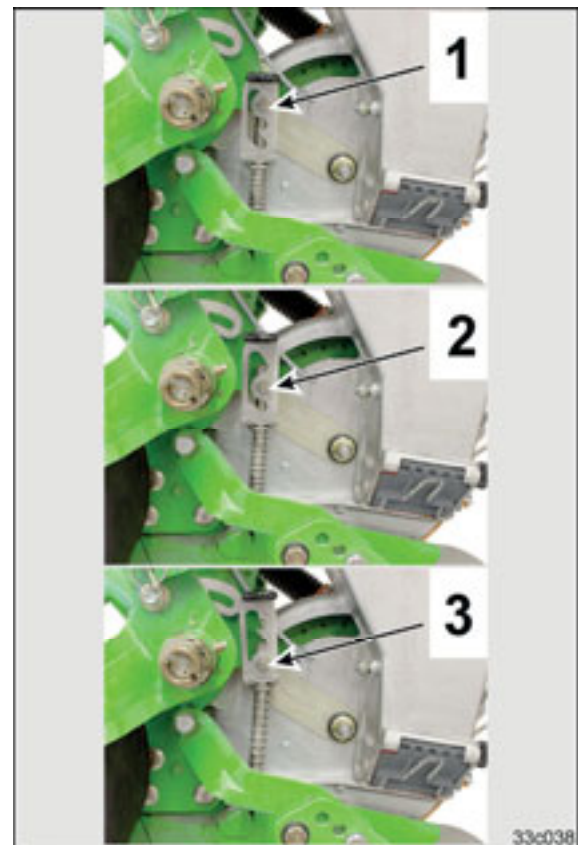


Fig. 187



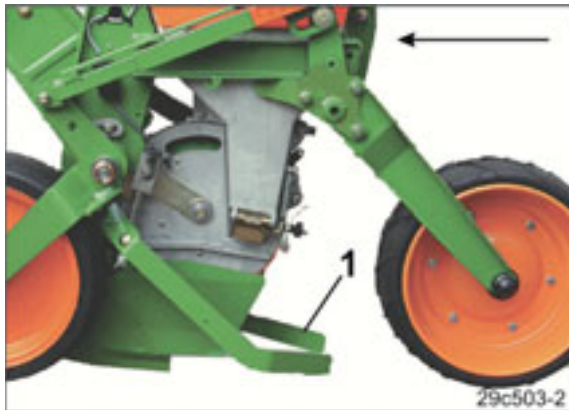


Fig. 188

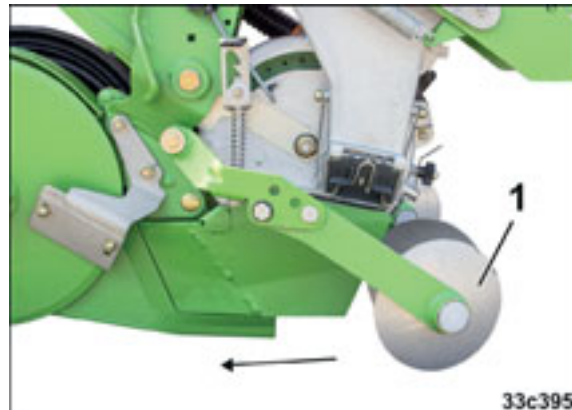


Fig. 189

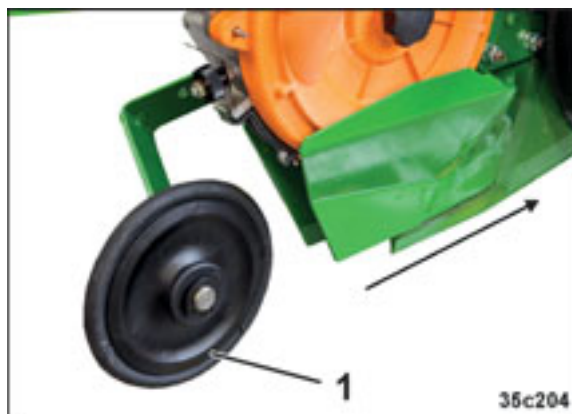


Fig. 190

### 7.13.6 Adjusting the intermediate press roller (large) (optional)

The working intensity of the large intermediate press roller (Fig. 191/1) increases the deeper the intermediate press roller bracket is adjusted (Fig. 191/2).

1. Release the linch pin (Fig. 191/3),
2. Move the intermediate press roller to the desired position (Fig. 191/4),
3. Secure the intermediate press roller holder with a linch pin (Fig. 191/3).

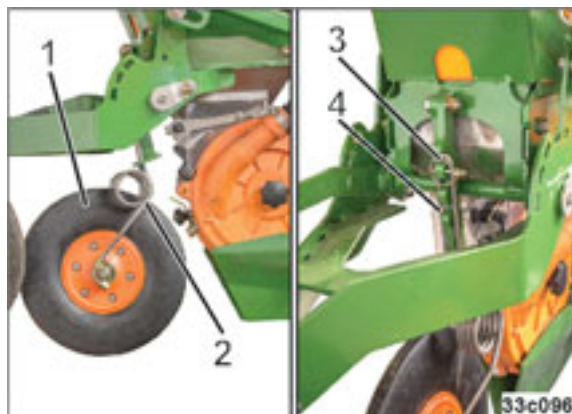


Fig. 191



When using the large intermediate press roller, no additional closers can be installed.

### 7.13.7 Adjusting the clod clearers (optional)

The clod clearer (Fig. 192/1) allows the seeding unit to run smoothly on ground with rough surface structures. Position the clod clearer (Fig. 192/1) in the adjuster segment with a pin (Fig. 192/2) and secure it with a linch pin.

- The clod clearers should only clear the large clods off to the side. Do not position the clod clearers too deeply.
- If the clod clearers cause complete earth movement, this has a negative impact when closing the seed furrows.
- Position the clod clearers right at the top if they are not needed.

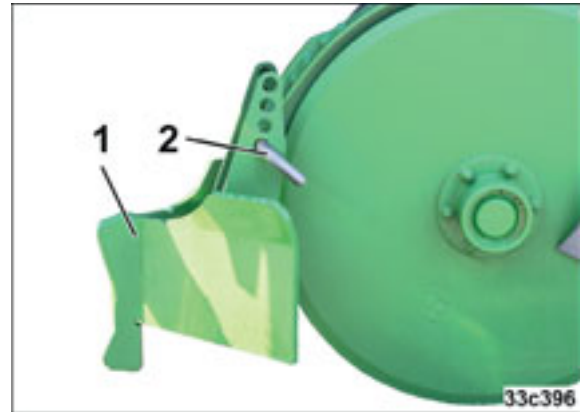


Fig. 192

### 7.13.8 Adjusting the star clearers (optional)

Position the star clearers in the adjuster segment with a pin (Fig. 193/2) and secure it with a linch pin (Fig. 193/1).

- The star clearers should only move plant residues to the side. Do not position the star clearers too deep.
- If the star clearers cause complete earth movement, this has a negative impact when closing the seed furrows.
- Position the star clearers right at the top if they are not needed.

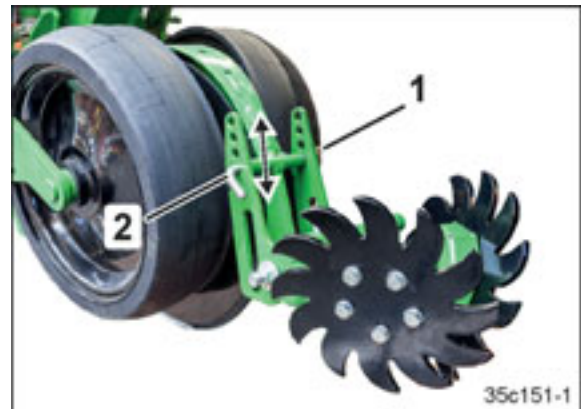


Fig. 193

### 7.13.9 Adjusting the scraper (optional)

To achieve a clean work pattern on the seeding coulters, check the setting of the scraper and adjust if necessary.

1. Unscrew the nuts (Fig. 194/1).
2. Adjust the distance from the scraper to the carrier roller to 1-2 mm (Fig. 194/2)
3. Tighten the nuts

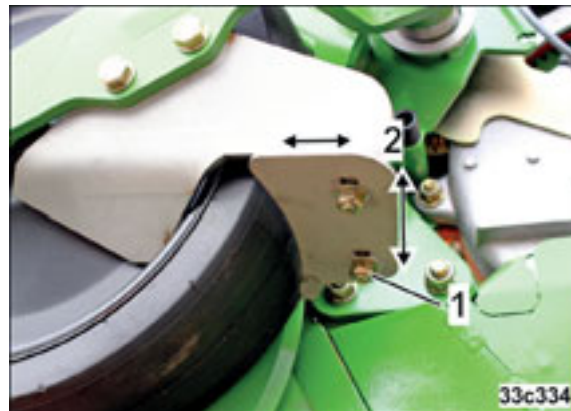


Fig. 194

1. Unscrew the nuts (Fig. 195/1).
2. Adjust the distance from the scraper to the cutter disc to 1-2 mm (Fig. 195/2)
3. Tighten the nuts

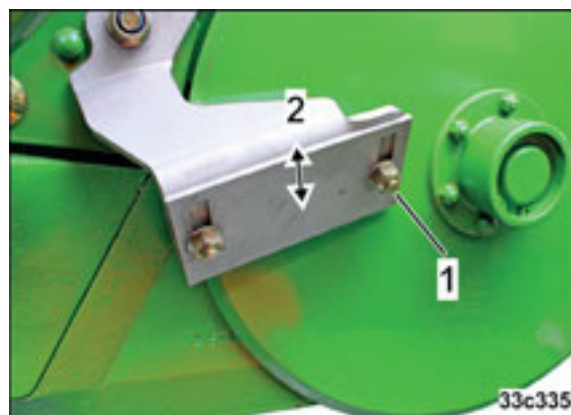


Fig. 195

## 7.14 Adjusting the fertiliser coulters



**The hoses to the fertiliser coulters must not hang down, so that no fertiliser can settle in the hose. If required, shorten the fertiliser hoses!**

Check that the nuts (Fig. 196/1) are firmly seated after 10 operating hours (tightening torque 200 Nm).



### Warning

A deep placement setting of the fertiliser coulters causes collisions when folding in!

See section 9.10.2, page 191

Loosen the nuts (Fig. 196/1) to move the fertiliser coulters horizontally. Then tighten the bolts/nuts and check for secure fit.

The distance to the seeding coulters is set at the factory to 55 mm +/- 5 mm.

Proceed as follows to adjust the placement depth:

1. Hold the fertiliser coulters in position by the handle, remove the R' clip and pin (Fig. 196/2)
2. Move the fertiliser coulters to the desired position using the handle
3. Secure the fertiliser coulters with the pin and R' clip (Fig. 196/2)



Fig. 196

### ME 677

Check that the nuts (Fig. 196/1) are firmly seated after 10 operating hours (tightening torque 200 Nm).



## 7.14.1 Adjusting the furrow former

To achieve a clean work pattern on the fertiliser coulters, check the setting of the furrow former and adjust if necessary:

1. Loosen the lock nut (Fig. 197/1)
2. Loosen the fixing bolts (Fig. 198/2)
3. To adjust, screw in the fixing bolts
4. Adjust the distance from the furrow former to the cutter disc to 1-2 mm (Fig. 198/3)
5. Tighten the lock nut

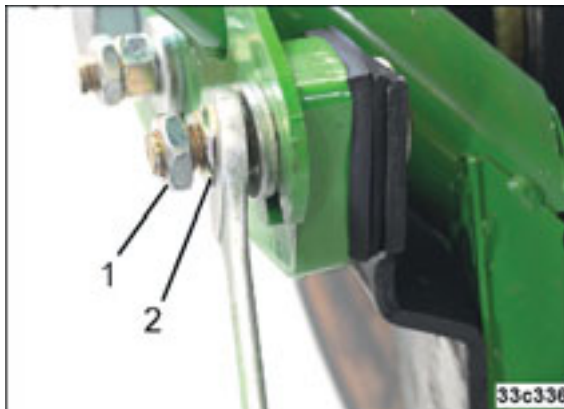


Fig. 197



If there is frequent blockage in the fertiliser coulters area, check the distance from the furrow former to the cutting disc and correct if necessary.

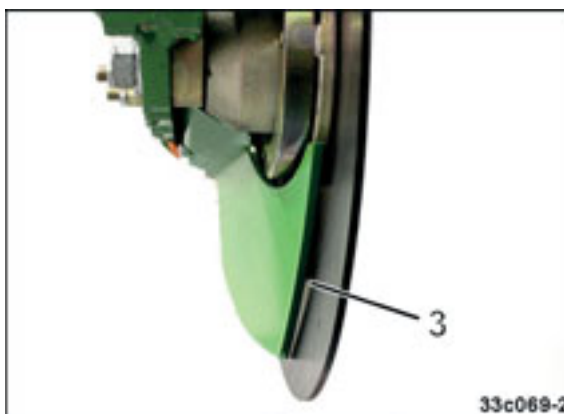


Fig. 198

## 7.15 Fertiliser hopper (900 and 1100 I)

Adjust the fill level sensor (Fig. 199/3) in the fertiliser hopper.

1. Loosen the union nuts (Fig. 199/1)
  2. Reposition the fill level sensor (Fig. 199/3) with the dust cap (Fig. 199/2)
  3. Tighten the union nuts
- The fill level sensor (Fig. 199/3) issues an alarm as soon as the sensor is no longer covered with fertiliser.

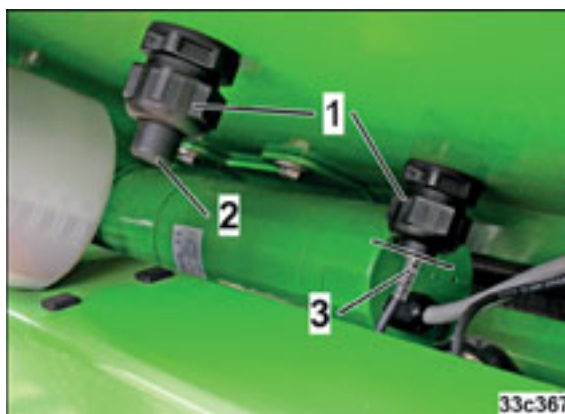


Fig. 199



4. Insert the fill level sensor into the holder until the cable output fits flush in the holder (Fig. 199/3).
- This ensures that the sensor head (Fig. 200/1) protrudes into the seed or fertiliser.
5. Fill the fertiliser hopper (see page 180)
  - o Manual access via the steps
  - o With the fertiliser filling auger
6. Close the fertiliser hopper tarpaulin



Fig. 200

## 7.16 Weighing system (optional)

When the button (Fig. 201/1) on the right side of the weighing terminal is pressed

- briefly – for scrolling in the menu
- longer (2-3 seconds) – for executing and confirming



Fig. 201



- When switching on the power supply, the weighing terminal displays the current weight of the tank content.
- For displaying the correct tank volume, the empty implement must be balanced first.



- When tared, the balance of the display is 0 kg with empty tank.
- Calibration is the balance of the correct change in weight of the display when changing the tank volume (for customer services only).



### 7.16.1 Taring the weighing equipment

When taring the implement, the weight with an empty hopper is set to 0 [kg] in the weighing terminal.

1. Empty hopper
2. Briefly press the  button  
→ Display **tArE**

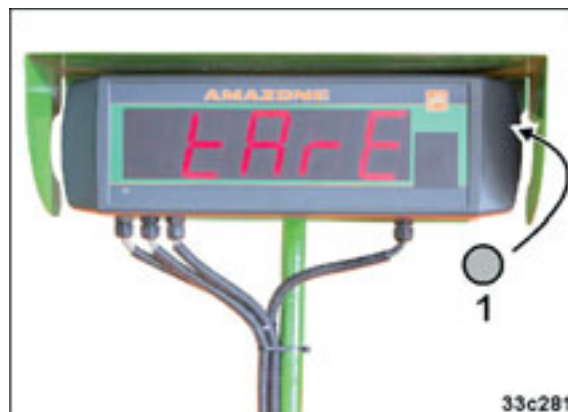


Fig. 202


3. Press the  button until the weighing terminal shows 0 [kg].  
→ Display **0 kg**  
→ Tare complete.



Fig. 203

## 7.16.2 Calibration of the weighing equipment (specialist workshop)

Calibration involves the comparison of changing hopper contents with the display on the weighing terminal.

The weighing equipment is calibrated upon implement delivery. Calibration should only be performed by Customer Service.




When calibrating, the measurement device is assigned with two values:


- The value 0 kg is assigned to the empty tank.
- Any value greater than 800 kg is assigned according to the filling weight.




**contr**

 – Adjustable in 15 steps or automatic adjustment for the lighting conditions.

Entries

 – Adjust the flashing digit

 – Switch to the next digit


**Full**

The calibration weight must be known


**cAbLE**

The display with designation left, middle or right indicates a cable break on the corresponding sensor.

### Scrolling in the menu

Briefly press the  key

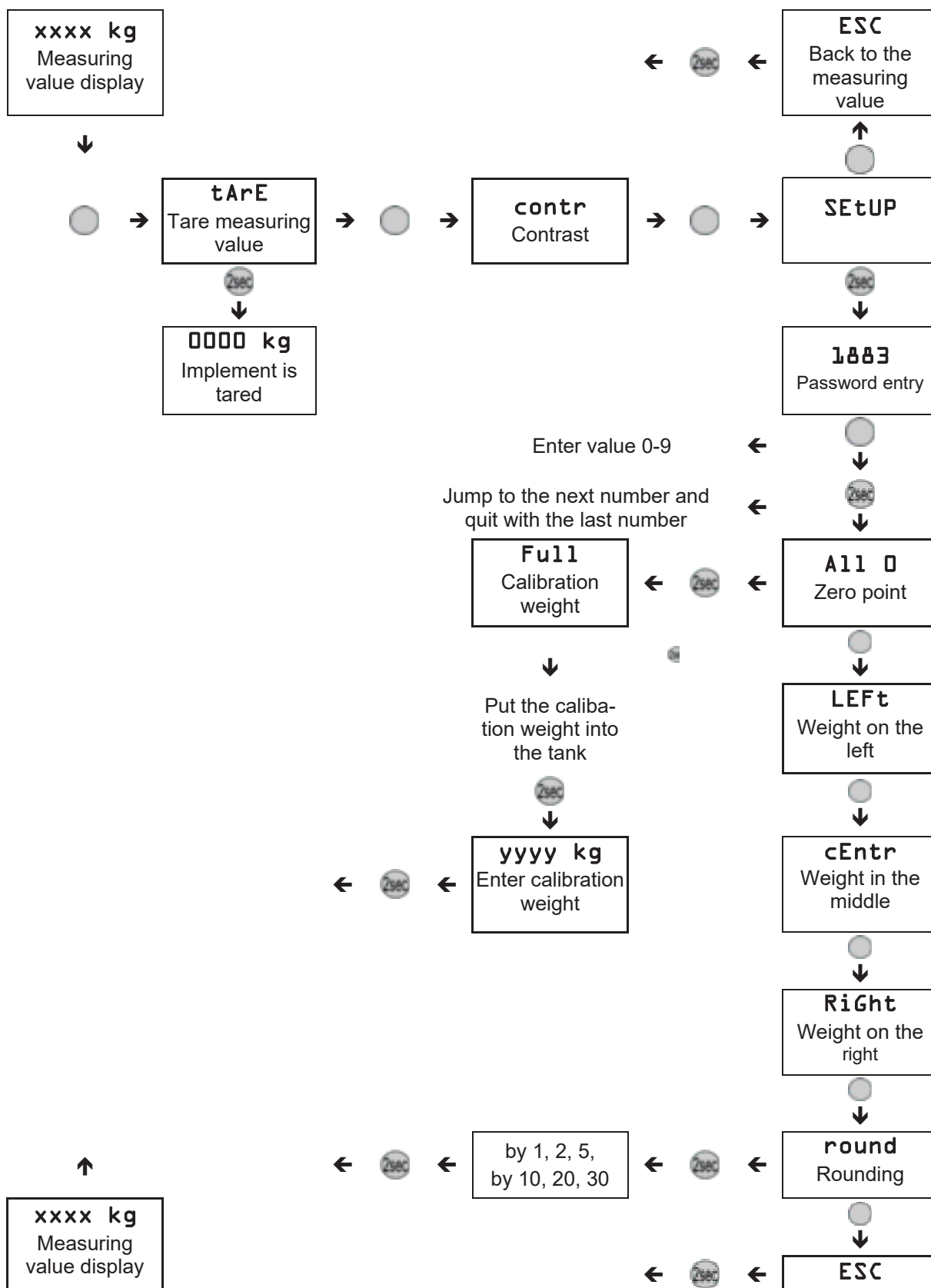
### Executing and confirming

Press the  key until the units lighting flashes (2-3 seconds).

→ Wait for rising of the unit lighting,

→ Let go of the button when the unit lighting flashes.

### 7.16.3 Menu layout



## 7.17 Adjusting the fertiliser rate with a calibration test (mechanical drive)



Depending on the fertiliser type, the maximum spread rate is  
~ 550 Kg/ha at a working speed of 8 km/h!



You can check if the desired fertiliser quantity is being spread using the calibration test. With a mechanical drive, the collecting buckets can be accessed on the right side.

### 7.17.1 Crank turns for common working widths

The working width is decisive for the number of crank turns.

Calculation of the working width (Fig. 205/1):

$$\text{Working width [m]} = \frac{\text{Number of seeding units x row spacing [cm]}}{100}$$

Fig. 204

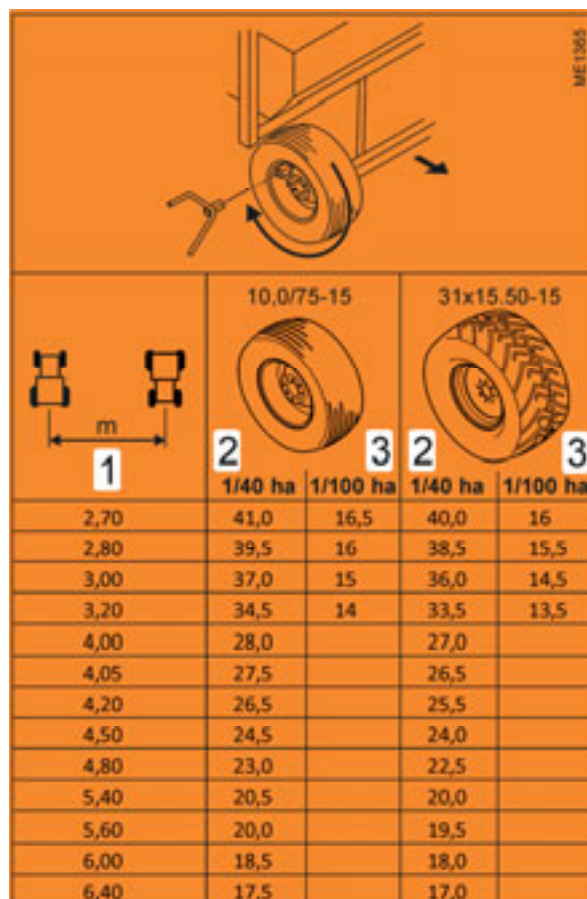
Fig. 205/...

- (1) Working width (see Fig. 204)
- (2) Number of crank turns for the calibration test

The listed number of crank turns are based on 1/40 [ha].

- (3) Number of crank turns for the calibration test

The listed number of crank turns are based on 1/100 [ha].



	10,0/75-15		31x15.50-15	
	2	3	2	3
	1/40 ha	1/100 ha	1/40 ha	1/100 ha
2,70	41,0	16,5	40,0	16
2,80	39,5	16	38,5	15,5
3,00	37,0	15	36,0	14,5
3,20	34,5	14	33,5	13,5
4,00	28,0		27,0	
4,05	27,5		26,5	
4,20	26,5		25,5	
4,50	24,5		24,0	
4,80	23,0		22,5	
5,40	20,5		20,0	
5,60	20,0		19,5	
6,00	18,5		18,0	
6,40	17,5		17,0	

Fig. 205

## 7.17.2 Crank turns for less common working widths

Calculation of the crank turns for working widths that are not shown in Fig. 204:

$$\text{Crank turns} = \frac{\text{Crank turns x number of seeding units x row spacing (table values)}}{\text{Number of seeding units x row spacing}}$$

**Fig. 206**

### Example:

#### Data to calculate the crank turns on the wheel

Number of seeding units:	4
Row spacing	70 cm
Tyres:	10.0/75-15
Crank turns:	calculate

#### Data from the table (Fig. 205)

Number of seeding units:	6
Row spacing	50 cm
Tyres:	10.0/75-15
Crank turns:	37

$$\text{Crank turns} = \frac{37 \times 6 \times 50 \text{ cm}}{4 \times 70 \text{ cm}} = 39.6$$

### 7.17.3 Determining the gearbox setting using the calculating disc rule

#### Example:

##### Values from the calibration test

calculated spread rate: 175 kg/ha

gearbox setting: 70

Required application rate: 125 kg/ha.

1. The values from the calibration test
    - o Calculated application rate 175 kg/ha (Fig. 207/A)
    - o Gearbox setting 70 (Fig. 207/B) opposite one another on the calculating disc rule.
  2. Read the gearbox setting for the desired seeding rate of 125 kg/ha (Fig. 207/C) from the calculating disc rule.
- Gearbox setting 50 (Fig. 207/D).
3. Set the gearbox lever to the value read from the disc.
  4. Check the gearbox setting by performing another calibration test.

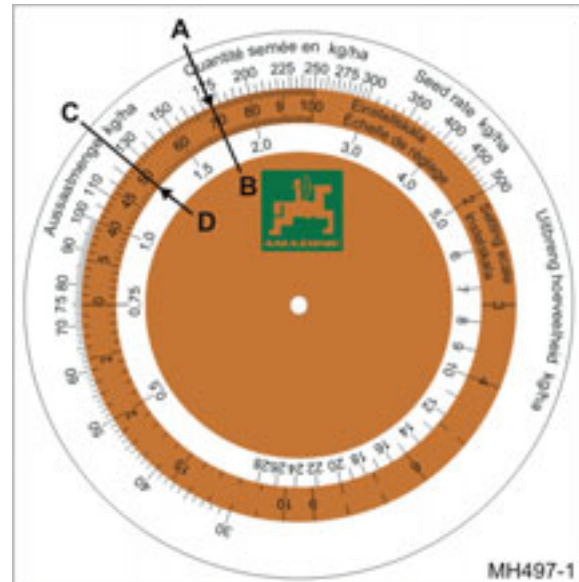


Fig. 207



The main setting and working range should preferably be set between the scale settings 20 and 80.

The range between 0.1 and 5 should be avoided. When metering, proceed with very small amounts of fertiliser as shown in Fig. 211 (see page 165).



#### 7.17.4 Perform a calibration test

1. Fill the fertiliser hopper at least 1/4 full with fertiliser.
2. Loosen the bolt (Fig. 208/2) with the wrench (Fig. 208/1)
3. Open the lid (Fig. 208/3)
4. Remove the collection bucket (Fig. 208/4)



Fig. 208

5. Put both collection buckets (Fig. 209/2) in the calibration position (Fig. 209/1)



Fig. 209

6. The active shutter slides are in position "A"

Shutter slide position:

→ Fig. 210/A =  $\frac{3}{4}$  open



Fig. 210



If very low quantities of fertiliser should be metered and the drive is difficult to adjust in the desired range, close one shutter slide per row.

Shutter slide position:

Fig. 211/A =  $\frac{3}{4}$  open

Fig. 211/B = closed

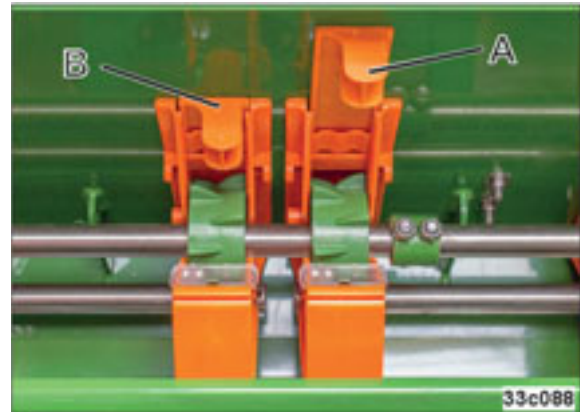


Fig. 211

7. Undo the locking knob (Fig. 212/1).
8. Set the indicator (Fig. 212/2) of the gearbox lever **from below** to the gearbox setting value "70".
9. Tighten the locking knob.



To put the fertiliser spreader out of use, it is sufficient to move the adjustment lever to the 0 position.



Fig. 212

10. Insert the calibration crank into the drive wheel (Fig. 213/1).
11. For filling the metering units, turn the wheel with the calibration crank to the right (Fig. 213/2) until fertiliser falls into all the collecting buckets.
12. Empty the collecting buckets (not into the fertiliser hopper with the fan running).
13. Position the collection buckets back under the metering units
14. Turn the drive wheel to the right by the number of crank turns specified in the table (Fig. 205). Monitor the fill level in the collection bucket



Fig. 213



Depending on the gearbox setting and the fertiliser type, the collection bucket can be completely filled before reaching the number of crank turns.

Monitor the fill level, if necessary, stop the calibration process and empty the bucket!

## Settings

15. Weigh the quantity of fertiliser collected in the calibration bucket:

- 15.1 Attachment point for the scale  
(Fig. 214/1)

- 15.2 Take account of the bucket weight  
(Fig. 214/2)

- 15.3 Multiply with the calibration factor.

Calibrated area	Calibration factor
1/40 ha	40
1/100 ha	100



Fig. 214



Check the scales to ensure the display is accurate.

### Calibrating on 1/40 ha:

Application rate [kg/ha] = Calibrated fertiliser quantity [kg/ha] x 40

### Example:

Calibrated fertiliser quantity: 4.38 kg on 1/40 ha

Fertiliser quantity [kg/ha]: 4.38 [kg/ha] x 40 = 175 [kg/ha]

16. The desired application rate is not generally achieved with the first calibration test. The correct gearbox setting can be determined using the calculating disc rule with the values from the first calibration test and the calculated application rate (see section "Determining the gearbox setting using the calculating disc rule", Seite 163).
17. Repeat the calibration test. In combination with ISOBUS monitoring of the fertiliser metering, the entries must now be carried out on the terminal. Observe the operating manual for the implement software!
18. Attach the calibration bucket(s) to the fertiliser hopper.
19. Insert the funnel rail in the fertiliser hopper and fasten.
20. Clip the calibration crank into its transport bracket.

## 7.18 Adjusting the fertilising rate using a calibration test (electric drive)



Depending on the fertiliser type, the maximum spread rate is ~ 550 Kg/ha at a working speed of 8 km/h!



You can check if the desired fertiliser quantity is being spread using the calibration test. With an electrical drive, the collecting buckets can be accessed on the left side.



To adjust and calibrate the fertiliser quantity using the control terminal, the corresponding operating manual must be observed!

1. Fill the fertiliser hopper to at least 1/4 with fertiliser.
2. Loosen the bolt (Fig. 215/1)
3. Swivel the cover (Fig. 273/2) to the side



Fig. 215

4. Remove the collecting buckets (Fig. 215/1) and move to the calibration position (Fig. 215/2).

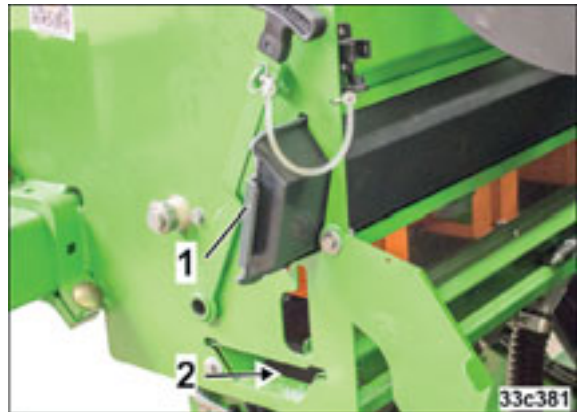


Fig. 216

## Settings

5. Hook in the second collecting bucket (Fig. 217/1) and move to the calibration position (Fig. 217/2).



Fig. 217

6. The active shutter slides are in position "A"
- Shutter slide position:

→ Fig. 218/A =  $\frac{3}{4}$  open



Fig. 218



If very low quantities of fertiliser should be metered and the drive is difficult to adjust in the desired range, close one shutter slide per row.

Shutter slide position:

Fig. 219/A =  $\frac{3}{4}$  open

Fig. 219/B = closed

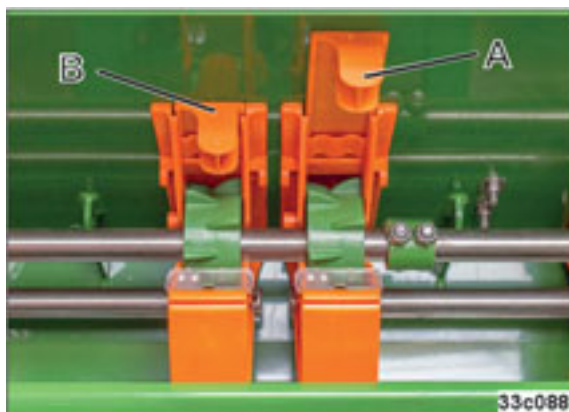


Fig. 219



7. For filling the metering cells, observe the operating manual for the implement software.
8. Empty the collection buckets (not into the fertiliser hopper with the fan running).
9. Reposition the collection buckets back under the metering units
10. Perform the calibration test with the button (Fig. 220/1) as explained in the operating manual for the implement software.
- Monitor the fill level in the collection buckets, if necessary, stop the calibration process and empty the weighing buckets (Fig. 221/2).
11. Weigh the metered quantity and enter on the control terminal.



Fig. 220



Fig. 221



## 7.19 Adjusting the micropellet quantity with a calibration test (optional)



To adjust and calibrate the micropellet quantity using the control terminal, the corresponding operating manual must be observed!

- ISOBUS-controlled micropellet spreader: implement software operating manual
- Independent micropellet spreader: micropellet spreader control terminal operating manual



### CAUTION

**Before opening the hopper cover, switch off the fan.**

When the fan is running and the cover is closed, the hopper is under pressure.

1. Fill the fertiliser hopper at least 1/4 full with fertiliser.
2. Open both locks (Fig. 222/1)
3. Open the lid (Fig. 222/2)
4. Take the collection bucket from the storage compartment
5. Place the collection bucket (Fig. 223/1) under the metering unit on the step (Fig. 223/2).
  - o If necessary, lift the step a little (Fig. 223/3)



Fig. 222

6. For filling the metering cells, observe the respective operating manual
7. Empty the collection bucket (not into the fertiliser hopper with the fan running).
8. Reposition the collection buckets back under the metering unit.
9. Carry out the calibration test as instructed in the operating manual:
  - 9.1 With an ISOBUS-controlled micropellet spreader, start the calibration process with the (Fig. 224/1) button

- Monitor the fill level in the collection buckets, if necessary, stop the calibration process and empty the weighing buckets (Fig. 221/2).



Fig. 223



Fig. 224

## 8 Transportation



When driving on public roads and ways the tractor and implement must comply with the national road traffic regulations (in Germany the StVZO and the StVO) and the accident prevention regulations (in Germany those of the industrial injury mutual insurance organisation).

In certain arrangements, the transport width is larger than listed in table ().

Apply for a special permit from your local authorities to transport your implement on public roads when the transport width is more than 3.0 m.

ED 4500 precision airplanters can only be carried on a transport vehicle.

If the precision airplanter is transported in combination with a front tank on the public roads, the front tank must also comply with the national road transport regulations (in Germany the StVZO and the StVO). Further information can be found in the front tank operating manual.

The vehicle keeper and driver are responsible for compliance with the statutory stipulations.

Furthermore, the instructions in this section have to be complied with prior to starting and during travel.



- For transport journey, observe of the section "Safety information for users", Seite 26.
- Before moving off, check:
  - that the supply lines are connected correctly.
  - the lighting system for damage, function and cleanliness.
  - whether the on-board computer is switched off
  - whether the work lights are switched off
  - the brake and hydraulic system for visible damage.
  - that the tractor parking brake is released completely.
  - the function of the brake system.
  - the drawbar and the connecting elements for visible defects.

**WARNING**

**Risk of contusions, cutting, catching, drawing in and knocks when making interventions in the implement through unintentional implement movements.**

- The implement can only be securely locked when it is raised. On folding implements, check that the transport locks are properly fastened.
- Secure the implement against unintentional movements before starting transportation.

**WARNING**

**Risk of crushing, cutting, being caught and/or drawn in, or impact 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 or coupled implement.
- Before road transport, fasten the side locking of the tractor lower link, so that the connected or coupled implement 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 implement and the approved axle and drawbar loads of the tractor. If necessary, drive only with an empty hopper.

**WARNING**

**Risk of falling when riding on the implement, contrary to instructions.**

It is forbidden to ride on the implement and/or climb the implement while it is running.

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

**DANGER**

**Switch off the tractor PTO shaft!**

## 8.1 Moving the implement in the transport position

1. Determine the transport width "B" and transport height "H" of the raised implement. To do this, take the transport width of the implement from table (), or measure the implement directly.
2. For the ED 4500, ED 4500-2 [C] and ED 6000-2 [C], insert and lock the track marker boom tubes (see section 7.10.4, Seite 137 and section 7.10.5, 138).
3. For the ED 3000 [C], ED 4500 [C] and ED 4500-2 [C], position the track marker vertically and lock it (see section "Track marker operation", Seite 186).
4. For the ED 3000 [C], screw in the track marker (see section "Adjusting the transport width – ED 3000[-C]", Seite 193).
5. Raise the fertiliser coulters (only on ED 6000-2C with 70 cm row spacing, see section "Collision of the fertiliser coulters - ED 6000-2C / [-2FC]", Seite 191).
6. Fold in and secure the implement booms (see section "Fold the implement booms", Seite 188).
7. Lock the hydraulic track width adjustment (see section "Hydraulic track width adjustment (optional)", Seite 100).
8. Switch off the control terminal.
9. Switch off the work lights.
  - 9.1 In combination with AMASCAN +, the hopper interior lighting is switched via the driving lights of the implement.
  - 9.2 In combination with ISOBUS, the hopper interior lighting is switched via the control terminal.
10. Check that the lighting system works.
11. The warning signs must be clean and undamaged.
12. Lift the implement up for road transport. The following distances must be observed
  - o Top of rear lamps to the road surface, max. 1550 mm
  - o Top of rear flood light to the road surface, max. 900 mm.
13. Lock the tractor control units.

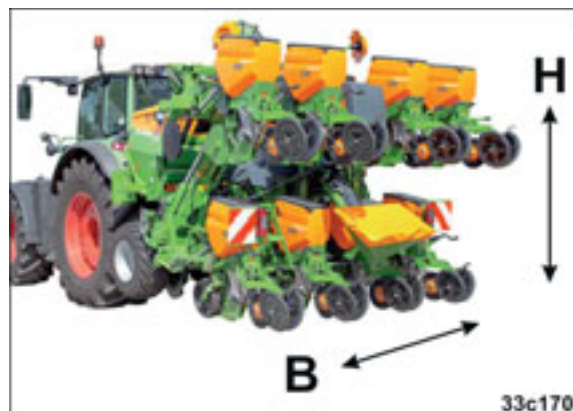


Fig. 225

## 8.2 Transporting an ED 6000-C with a transport vehicle



The implement ED 6000-C is not approved for road traffic and may only be transported on public roads with a transport vehicle.

The vehicle keeper and driver are responsible for compliance with the statutory stipulations.

- The track markers must be pegged at the latest outside of the field (see section "Track marker transport lock – ED 6000 [-C]", Seite 187).
- The lamps serve for position detection and are not approved for use on public roads.

## 8.3 Transport of an implement combination with a transport vehicle



When transporting implement combinations (see section "Combination possibilities with other AMAZONE implements", Seite 88), pay attention to the width of the loaded transport vehicle.

The vehicle keeper and driver are responsible for compliance with the statutory stipulations.



## 9 Use of the implement



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

- "Warning symbols and other labels on the implement", starting at Seite 18
- "Safety information for users", Seite 26.

Observing this information is important for your safety.



### **WARNING**

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

Comply with the maximum load of the connected implement and the approved axle and drawbar loads of the tractor.



### **WARNING**

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

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

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 or coupled implement.



### **WARNING**

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

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

**WARNING**

**Risk of being crushed, caught or struck by damaged components or foreign objects ejected by the implement!**

Before switching on, check to ensure that the tractor PTO shaft speed corresponds with the permitted drive rev. speed of the implement (see section "PTO fan drive", Seite 132).

**WARNING**

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

**CAUTION**

**Danger from failure when the overload clutch engages!**

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

This avoids damaging the overload clutch.

**DANGER**

**Risk of being crushed, caught or struck by objects ejected by the implement when it is driven!**

Instruct people to leave the danger area of the implement before you switch on the tractor universal joint shaft.

## 9.1 Filling and emptying the seed hopper



Before opening the seed hopper, the fan must be switched off. When working with pesticides, a face mask and gloves must always be worn.

Follow the instructions of the seed manufacturer.

### Filling the seed hopper



- Remove foreign bodies from the seed.
- Remove foreign bodies from the seed hopper.
- Do not fill the seed hopper with any damp or sticky seed.



If, due to grain shape and dressing, bridging occurs, the ability of the seed to slide can be improved by adding approximately 200 g of talcum powder to 100 kg of seed.

### Emptying the seed hopper and seed housing

1. Raise the implement to the point that the seeding coulters are clear of the ground.
2. Remove the linch pin and bolt (Fig. 226/1) and swing the intermediate press roller (optional) downwards.



Fig. 226



#### **WARNING**

Only hold the recoil spring on the handle (Fig. 227/2), otherwise there is a risk of injury.

3. Place a suitable collection bucket under the seeding unit,
4. Open the recoil springs (Fig. 227/2) and the flap (Fig. 227/1),  
Empty the seed hopper,
5. Close the flap (Fig. 227/1).

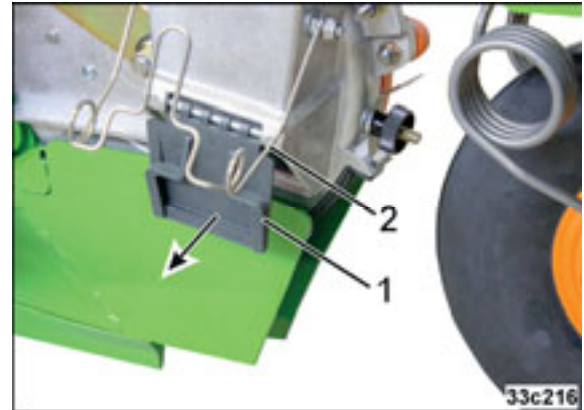


Fig. 227

To completely empty the seed housing:

6. Loosen the knurled nut (Fig. 228/1).
7. Swing the spring (Fig. 228/2) to the side.
8. Open the residue emptying flap (Fig. 228/3) and empty the seed housing.
9. Close the residue emptying flap and lock with the spring.
10. Tighten the knurled nut.



Fig. 228

## 9.2 Filling the fertiliser hopper



**Couple the implement to the tractor before filling the fertiliser hopper.**

**Empty the fertiliser hopper before uncoupling the implement from the tractor.**



Before opening the fertiliser hopper, the fan must be switched off. When working with fertilisers, a face mask and gloves must always be worn.

Follow the instructions of the fertiliser manufacturer.

1. Couple the precision airplanter to the tractor. Fold out the booms.
2. Set the implement down on a level surface.
3. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
4. Climb onto the loading board (Fig. 229)



Fig. 229

5. Open the fertiliser hopper tarpaulin (Fig. 230/1), which is secured with rubber straps (Fig. 230/2), and fill the fertiliser hopper.
6. Close the fertiliser hopper tarpaulin and secure with rubber straps (Fig. 230/1).

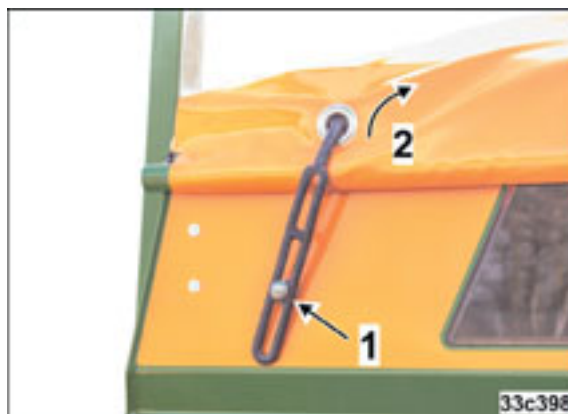


Fig. 230

### 9.3 Filling the fertiliser hopper with the fertiliser filling auger (optional)



#### DANGER

**Make sure nobody is standing between the supply vehicle and filling funnel during manoeuvring.**



The auger must run empty in all cases! If fertiliser remains in the fertiliser filling auger, it becomes so strongly compacted during seeding operations that the auger start-up will be blocked.

Switch off the hydraulic drive of the fertiliser filling auger and the tractor control valve after use.

1. Park the transport vehicle carrying the fertiliser on a level surface, apply the tractor parking brake, and switch off the tractor engine
2. Park the implement on a level surface, apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
3. Open the cover tarpaulin of the fertiliser filling auger (/1)



Fig. 231

4. Swivel out the filling chute (/1)



The fertiliser filling auger reaches its maximum capacity when a material cone is formed over the auger. If possible, let the fertiliser run directly into the funnel.

5. Apply the tractor parking brake and start up the tractor's engine.
6. Switch on the *beige* tractor control unit (32 l/min).



Fig. 232



## Use of the implement

7. Slowly switch on the hydraulic drive of the fertiliser filling auger on the stop cock (/1).

Fig. 233/...

- (1) Fertiliser filling auger switched on
- (2) Fertiliser filling auger switched off

Regulate the conveying speed with the stop valve. Set the speed of the fertiliser filling auger at 400 rpm. This corresponds to the set oil quantity of 32 l/min. at the tractor control valve.

3. Check the fill level using the viewing window.
4. When working at night, switch on the interior lighting (optional, Fig. 55/1) of the hopper:
  - 4.1 In combination with AMASCAN +, the hopper interior lighting is switched via the driving lights of the implement.
  - 4.2 In combination with ISOBUS, the hopper interior lighting is switched via the control terminal.
5. If the fill level rises above the edge of the viewing window, reduce the speed of the fertiliser filling auger.
6. Switch off the fertiliser filling auger as soon as the fertiliser hopper is filled.
7. Switch off the *beige* tractor control unit.

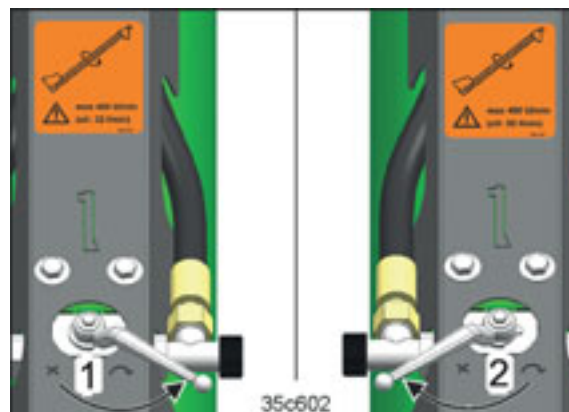


Fig. 233



If the fertiliser hopper is filled unevenly, check the setting of the switch-over flap of the fertiliser filling auger (see section 10.7, page 197).

8. Swivel in the filling chute (/1)
9. Close the cover tarpaulin of the fertiliser filling auger.

## 9.4 Filling the micropellet spreader (optional)



### CAUTION

**Before opening the hopper cover, switch off the fan.**

When the fan is running and the cover is closed, the hopper is under pressure.



Before opening the micropellet hopper, the fan must be switched off. When working with fertilisers and pesticides, a face mask and gloves must always be worn.

Follow the instructions of the micropellet manufacturer.

1. Park the implement on a level surface, apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
2. Unlock the pin (Fig. 234/1) and swivel the loading board down (Fig. 234/2).

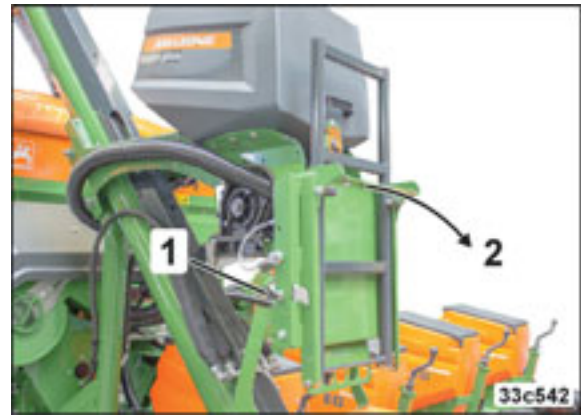


Fig. 234

3. Pull out the ladder (/1) and swivel it down (/2).



Fig. 235

4. Fill the micropellet spreader according to the operating instructions.
5. Fold up the ladder and loading board in the reverse sequence in parking position.



Fig. 236

## 9.5 Run in pulses per 100 m



For implements with a hydraulic drive for the seeding units, the calibration value "Pulses per 100 m" must be run in before starting work. See the operating manual for the implement software!

## 9.6 Work commencement



### DANGER

- Direct people out of the danger area of the implement, in particular from the swivel zone of the implement extension arms and the track markers.
- Actuate the tractor's control units only in the tractor cab.



Position the implement frame horizontally by lengthening or shortening the top link (Fig. 237/2).

1. Fold out the implement booms (see section "Fold the implement booms", Seite 188).
2. Set the precision airplanter down at the start of the field.
3. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.
4. Unlock the track markers:
  - 4.1 ED 3000-C / ED 4500-2 /-2C: see Track marker transport lock – ED 3000 [-C] / ED 4500 [-C/-2/-2C], Seite 186)
  - 4.2 ED 6000-C: see Track marker transport lock – ED 6000 [-C], Seite 187),
5. Put the tractor into operation
6. Put the track markers in working position (see section "Track marker operation", Seite 186),
7. Set the fan to the correct speed (see section "Blower fan speed", Seite 131).
8. Set the control unit for the tractor lower link to the float position and operate it during work in the float position.
9. Switch on the tractor PTO shaft.  
To avoid damage, only engage the PTO shaft slowly in neutral or at low tractor engine speed.
10. Drive off with the tractor.



Fig. 237



Avoid strong decelerating and accelerating to prevent placement errors in the distribution along the row.

The speed of the singling discs is regulated depending on the tractor speed. It is adjusted immediately with normal changes in speed.

---

**Check after the first 30 m, correct if necessary**

---

11. Seed placement depth and grain spacing  
(see section "Checking the placement depth and grain spacing", Seite 124).

## 9.7 Track marker operation



### DANGER

- It is forbidden to stand in the swivelling area of the track marker!
- When actuating the tractor control unit, depending on the switch position, one of the track markers folds out.
- There are crushing and shearing points between the track markers and the implement. Never reach into the crush area while folding the track marker in and out.



### Unlock both track markers before actuation

- Track marker transport lock – ED 3000 [-C] / ED 4500 [-C/-2/-2C], unterhalb
- Track marker transport lock – ED 6000 [-C], Seite 187

### Start of work or after turning at the end of the field:

Put the *yellow* tractor control unit in float position

→ The track markers lower.

### Before turning at the end of the field, or before an obstacle:

Apply pressure to the *yellow* tractor control unit

→ Both track markers are lifted up.

### 9.7.1 Track marker transport lock – ED 3000 [-C] / ED 4500 [-C/-2/-2C]

Press the track markers against the bracket (Fig. 238/1) and secure with a linch pin (Fig. 238/2).

If not in use, put the linch pin in the hole (Fig. 238/3) (parking position).



Fig. 238



- If the wrong track marker is lowered when the *yellow* tractor control unit is put in the float position, switch through the control unit several times.
- The automatic changer for implements with Profi control is only active when the implement in working position has reached a speed > 2 km/h.

## 9.7.2 Track marker transport lock – ED 6000 [-C]



Unload the locking pin to be able to remove it easily! To do so, apply pressure to the actuation cylinder of the track marker.

Press the track marker against the spring (Fig. 239/1), position with the pin (Fig. 239/3) and lock (Fig. 239/2).

When not in use, put the pin in parking position (Fig. 239/4) and lock (Fig. 239/2).

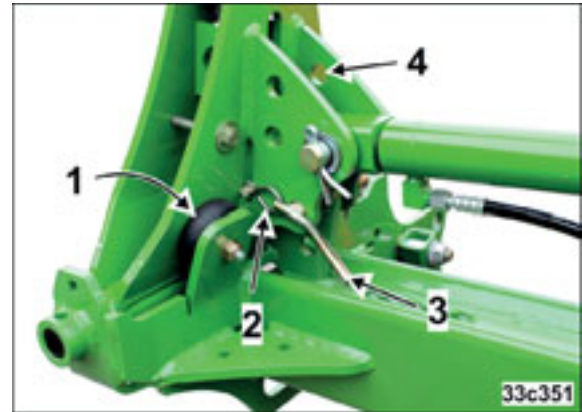


Fig. 239



If the wrong track marker is lowered when the *yellow* tractor control unit is put in the float position, switch through the control unit several times.



## 9.8 Fold the implement booms



### DANGER

- It is forbidden to stand within the swivelling range of the implement booms when the tractor control unit is actuated.
- There are crushing and shearing points between the implement booms and the implement. Never reach into the crush area.



- Park the tractor on a level surface and lift up the precision airplanter before folding the implement booms in and out.
- Actuate the tractor control unit without interruption until the implement booms are completely folded in or out.
- The implement can only be securely locked when it is raised. On folding implements, check that the transport locks are locked correctly.

The safety clips (Fig. 240/1) are the transport lock for the folded in implement booms.

To prevent unintentional unfolding, the implement boom sides are unlocked alternately (Fig. 240/2).



### Two-handed operation!

Actuate both boom folding devices simultaneously

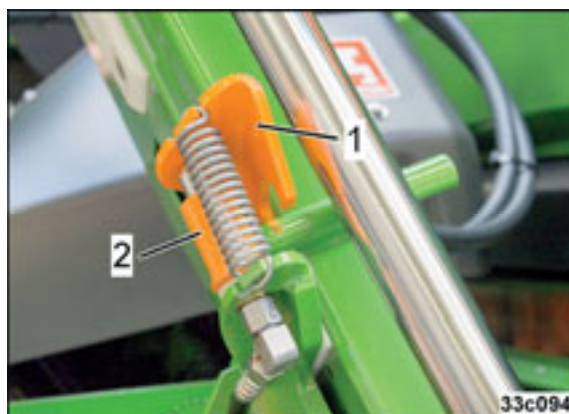


Fig. 240

Folding the implement booms:

1. Lift up the precision airplanter.
2. Actuate the *green* and *blue* tractor control units simultaneously until the implement booms are folded in. The track markers of the ED 6000-2 fold out together with the implement booms.

## 9.9 Turning at end of the field

During the turning procedure, the speed may drop so far that the display (pressure gauge, Fig. 241/1 or control terminal) shows the value 30 mbar.

Up to this speed, the grains do not fall from the singling discs.



Fig. 241



### Lifting out an implement with mechanical fan drive in combination with hydraulic metering drive:

When lifting the implement takes too long, the lifting gear needs more oil. Reduce the oil quantity for the hydraulic metering drive:

1. Use the implement and commence with seeding operation (see section "Work commencement", Seite 184).
2. Gradually reduce the oil quantity for the hydraulic metering drive until the target seed quantity drops (observe the display of the opto-sensor!)
3. Increase the oil quantity for the hydraulic metering drive by 10%.
4. Checking the grain spacing (see section "Checking the placement depth and grain spacing", Seite 124).
5. If the target seed quantity still drops (observe the display of the opto-sensor!), increase the oil quantity for the hydraulic metering drive by another 10%.

## 9.10 End of work in the field

### 9.10.1 Empty hopper

1. Empty the seed hopper.  
see section "Emptying the seed hopper and seed housing", Seite 178

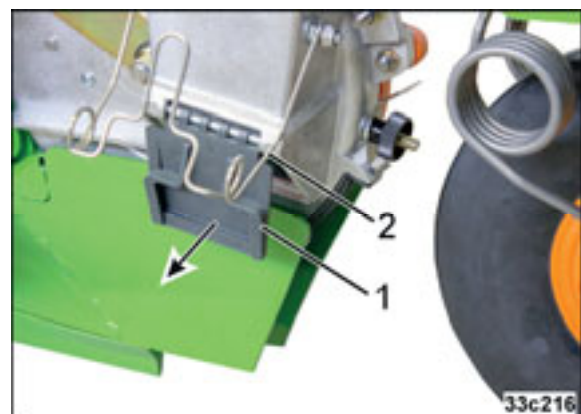
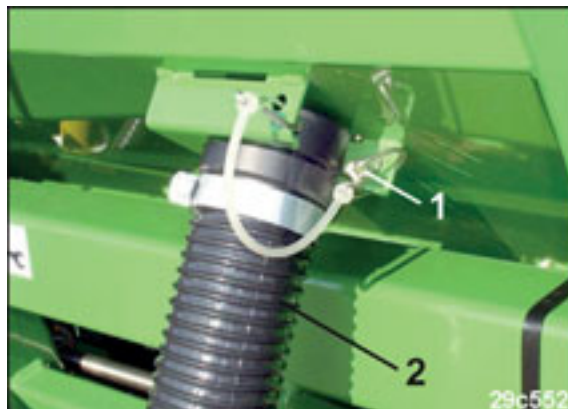


Fig. 242

## Use of the implement

2. To empty the fertiliser hopper, proceed as follows:
  - 2.1 Park the implement on a level surface.
  - 2.2 Apply the tractor parking brake, switch off the engine and remove the ignition key.
  - 2.3 Unlock the hose (Fig. 243/2) that is locked with a linch pin (Fig. 243/1).
  - 2.4 Guide the hose (Fig. 243/2) into a bucket (Fig. 244/2) and collect the residual quantity.
  - 2.5 To completely empty the hopper, put the collection bucket in the calibration position. (see Fig. 209, page 164)
  - 2.6 Put the bottom flap lever (Fig. 245/1) in the emptying position (Fig. 245/2).
  - 2.7 Remove the residual quantity and move the collection buckets into the parking position.
3. After the fertiliser hopper has been completely emptied, put the bottom flap lever (Fig. 246/1) back in the working position and lock with the linch pin (Fig. 246/2).



**Fig. 243**



**Fig. 244**



**Fig. 245**



**Fig. 246**

### 9.10.2 Collision of the fertiliser coulters - ED 6000-2C / [-2FC]



A deep placement setting of the fertiliser coulters on an ED 6000-2C / [-2FC] with 70 cm row spacing and mechanical seeding unit drive may cause a collision of the fertiliser coulters with the setting gearbox and fan housing when folding in.



A deep placement setting of the fertiliser coulters on an ED 6000-2C / [-2FC] with 60 cm row spacing may cause a collision of the fertiliser coulters with the fan housing when folding in.

Collision between the coulter disc and the setting gearbox (Fig. 247/1)

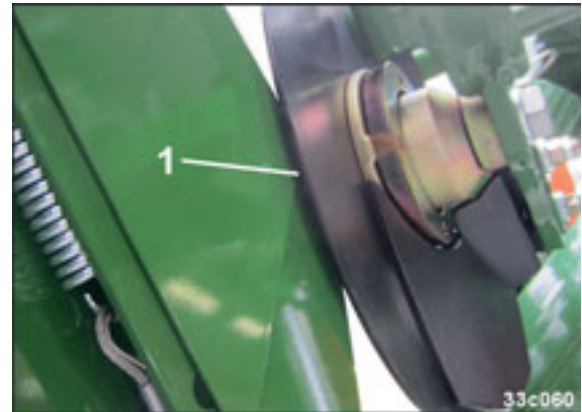


Fig. 247



**Before folding the implement, move the fertiliser coulter on row 2 and row 7 to the upper position!**

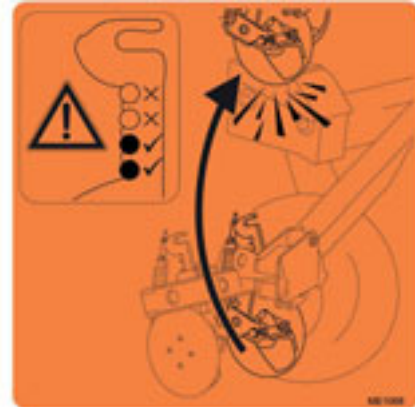


Fig. 248

1. Raise the implement on a level surface,
1. Remove the linch pin from the positioning pin,
2. Hold the fertiliser coulter on the handle, (Fig. 249/1)
3. Pull out the positioning pin, (Fig. 249/2)
4. Move the fertiliser coulter to the upper position, (Fig. 248)
5. Insert the positioning bolt and lock with the linch pin.



Fig. 249



### 9.10.3 Locking the track width adjustment



**For transport, lock the track width adjustment to prevent unintentional extending of the running gear.**

1. Put the stop tap (Fig. 250/2) in lever position (Fig. 250/B).

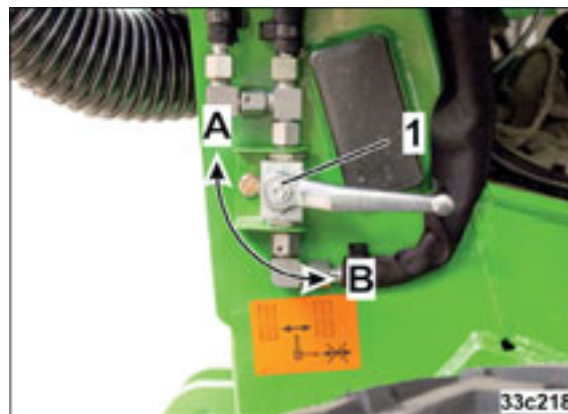


Fig. 250

### 9.10.4 Raising the wheel mark eradicators

After work is finished, fasten the wheel mark eradicators right at the top to avoid damage when setting the implement down.

(see section Adjusting the wheel mark eradicator (optional), page 139)

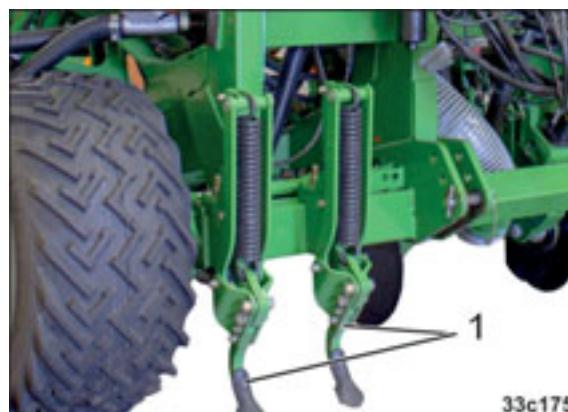


Fig. 251

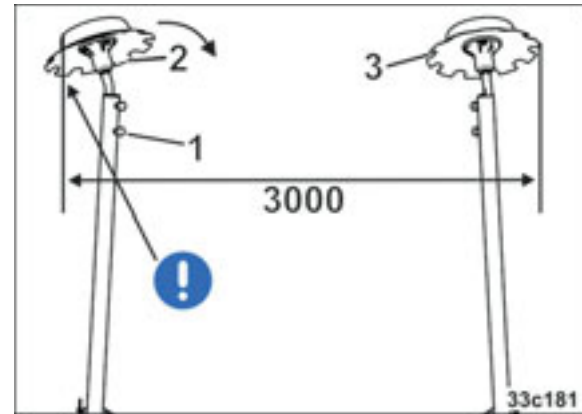
## 9.10.5 Adjusting the transport width – ED 3000[-C]



**The transport width depends on the position of the track marker discs. Determine the transport width by measurement.**

If a transport width of 3.0 m (Fig. 252) is exceeded, proceed as follows:

1. Set the implement down on a level surface.
2. Put the track markers in working position (see section "Track marker transport lock – ED 3000 [-C] / ED 4500 [-C/-2/-2C]", Seite 186),
3. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
4. Loosen the bolts (Fig. 252/1).
5. Turn the track marker discs (Fig. 252/2) into transport position (Fig. 252/3).
6. Tighten the bolts (Fig. 252/1).



**Fig. 252**



## 10 Faults



### WARNING

**Danger of crushing, shearing, cutting, being caught or drawn in, winding and knocks through:**

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

Secure the tractor and the implement against unintentional start-up and rolling, before you eliminate any faults on the implement. On this subject see section 5.2, Seite 73.

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

### 10.1 One singling disc stops

#### Fault:

A shear pin (Fig. 253/1) is damaged. This means that a singling disc does not turn.

#### Display:

The control terminal (optional) displays the fault.

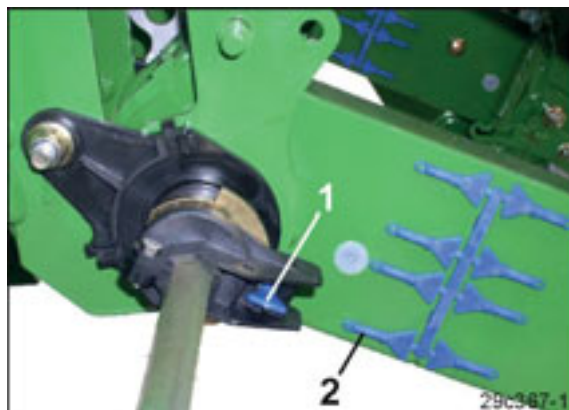


Fig. 253

#### Troubleshooting:

1. With a hydraulic seeding unit drive, open the protective panel.
  - 1.1 Loosen the bolt
  - 1.2 Swivel the protective panel to the side (Fig. 254/1)
2. To ensure that the seeding unit does not get blocked, check that the drive runs smoothly (Fig. 253/3).
3. Insert a replacement shear pin (Fig. 253/1) in the clutch. Replacement shear pins (Fig. 253/2) can be found on all of the seed housings.
4. Fold in the protective panel and tighten the bolts.

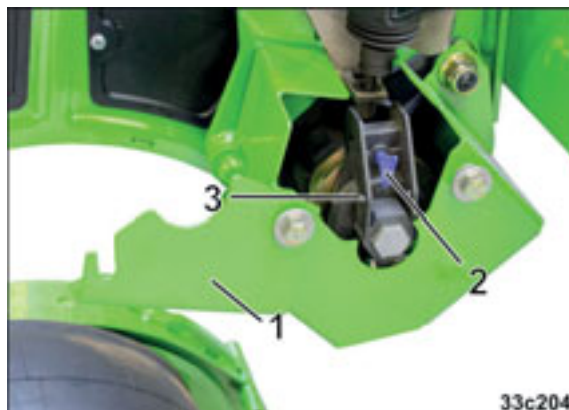


Fig. 254

## 10.2 Collision protection for the track marker boom

If the track marker strikes against a solid obstacle, a screw shears off and the track marker folds to the rear.

### 10.2.1 ED 3000 [-C] / ED 4500 [-C]

Fig. 255/...

#### (1) Shear bolt safety

Only use replacement bolts with a strength rating of 8.8 (see the accessories kit).

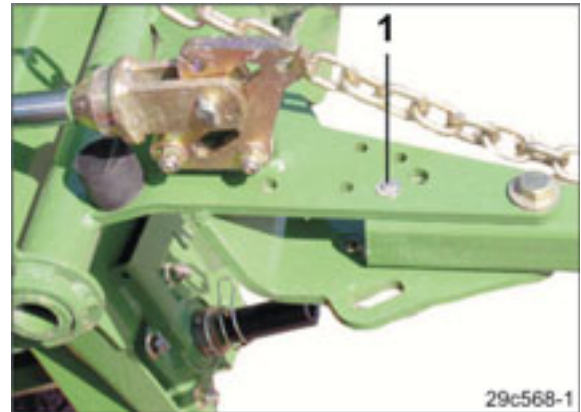


Fig. 255

### 10.2.2 ED 4500-2 [-2C] / ED 6000-2 [-2C/-2FC]

Fig. 256/...

#### 1. Shear bolt safety

#### 2. Spare bolts in the track marker bracket. Only use bolts with a strength rating of 8.8 as a replacement (see the online spare parts list).

#### 3. Stop bolt

When telescoping the section tube, prevents jamming due to pushing in too far.

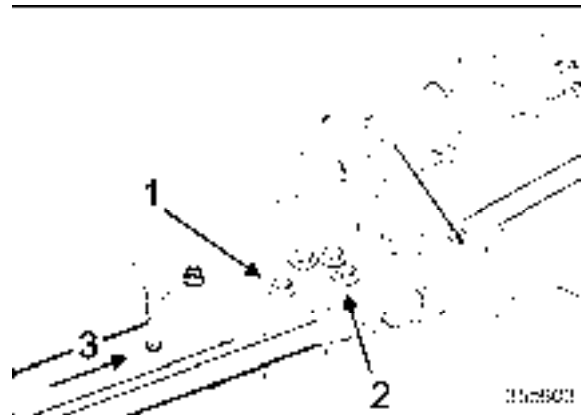


Fig. 256

### 10.2.3 ED 6000 [-C]

Fig. 257/...

#### 1. Shear bolt safety

#### 2. Spare bolts in the track marker bracket. Only use bolts with a strength rating of 8.8 as a replacement (see the online spare parts list).



Fig. 257

### 10.3 Track marker section folding on folded implement frames


	<b>Fault:</b> Track marker section folding on folded implement frames.
	<b>Error:</b> Pre-tension on the rubber block (Fig. 258/1) is too low
	<b>Remedy:</b> Adjust the pre-tension (Fig. 258/2 or Fig. 258/4)

Fig. 258/...

(1) Rubber block

1. Unscrew the nut and remove it
2. Adjust the spring pre-tension  
with vertical adjustment (Fig. 258/4)  
with horizontal adjustment (Fig. 258/2)  
(repositioning the washers (Fig. 258/3))
3. Fasten the rubber block with the nut




Fig. 258


### 10.4 Seed rSeed application amountate

The setting values only represent reference values.

**Check the tyre pressure before the season starts. Take the values from the table (section 10.19, page 214)**

	<b>Fault:</b> Application amount larger than the set value.
	<b>Error:</b> Slip of the drive wheels affected by the soil characteristics and/or gearbox setting
	<b>Correction:</b> By changing the step of the gearbox it is possible to compensate for this by choosing a narrower transmission range. If it is not possible to change the step any further, the working speed must be reduced.

### 10.5 Seed flow

	<b>Fault:</b> Bridging in the seed flow
	<b>Error:</b> Incorrect setting of the reduction flap
	<b>Correction:</b> Improve the flow of seed by increasing the opening of the reduction flap (section 7.7.3, page 124)

## 10.6 Fertiliser hopper fill level sensor



<b>Fault:</b>	The control terminal displays a fertiliser hopper fill level error.
<b>Error:</b>	Fill level too low
<b>Remedy:</b>	Check the setting of the fill level sensor (sect. 7.15, page 156) Refer to the operating manual of the control terminal

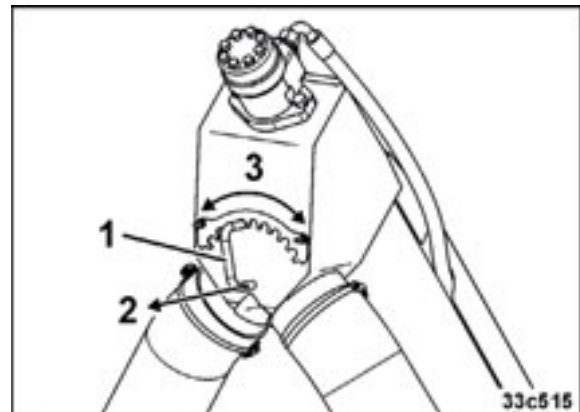
## 10.7 Switchover flap for the fertiliser filling auger (specialist workshop)

The fertiliser distribution of the fertiliser filling auger can be adjusted using the switchover flap (Fig. 259/1).




<b>Fault:</b>	Fertiliser hopper is filled unevenly
<b>Error:</b>	Switchover flap not properly adjusted
<b>Correction:</b>	See Fig. 259

1. Raise the implement and secure with suitable supports.
  2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
  3. Unlock the setting lever (/2)
  4. Move the setting lever to the desired position (/3)
- When the setting lever is in the end position, the corresponding outlet is completely closed.
5. Lock the setting lever (/2)



**Fig. 259**

## 10.8 Fertiliser metering shaft speed sensor

	<b>Fault:</b>	The control terminal displays a fertiliser metering speed error.
	<b>Error:</b>	Metering speed is too low (drive chain is torn or the gearbox is faulty)  Check the metering speed
	<b>Remedy:</b>	Refer to the operating manual of the control terminal  Check the sensor distance (Fig. 260/1)

Adjust the distance between the sensor and pulse wheel (Fig. 260/1) to 3 mm by turning the sensor screw connection.

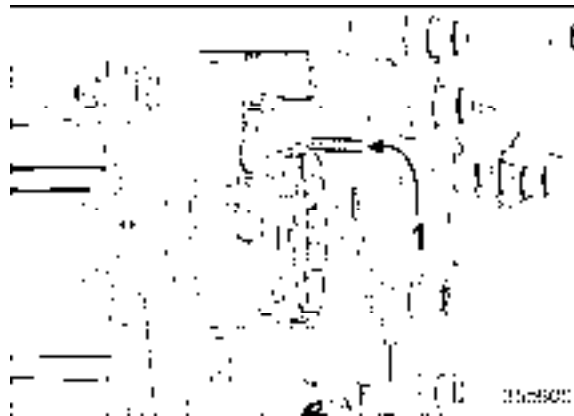



Fig. 260

## 10.9 Lighting

	<b>Fault:</b>	There is a malfunction with the lighting
		The light bulb is damaged
	<b>Error:</b>	The lighting supply line is damaged
	<b>Remedy:</b>	Replace the light bulb  The lighting supply lines can be replaced individually

## 10.10 Working position sensor

The drive for the singling or fertiliser metering does not start.

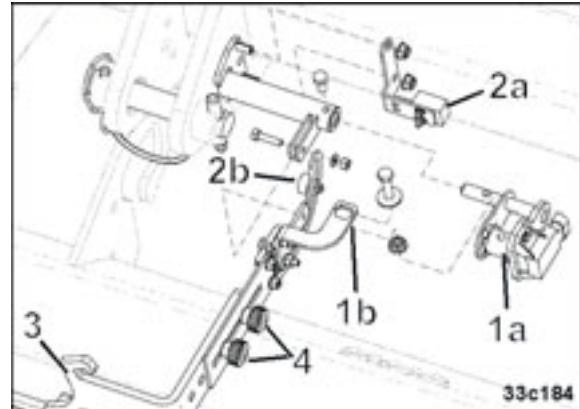


Fig. 261



**Fault:** The drive does not start.

**Error:** The working position sensor is maladjusted (Fig. 261/1/2)  
Check the switch points, correct if necessary.

**Remedy:** See software operating instructions.

## 10.11 Configuring the ISOBUS job computer

Upon delivery, the job computer has default settings.

After each replacement, before the initial operation of the computer, the settings for the specific implement must be entered.

- These settings cannot be made through the implement setup!
- The settings are entered with a configuration file that is installed with the software package.



Fig. 262



## 10.12 Boom lock

The implement booms are locked in the working position (see Fig. 263/1). If the booms do not fold in, check the locks. If the booms do not fold in, check the locks (Fig. 263/1).

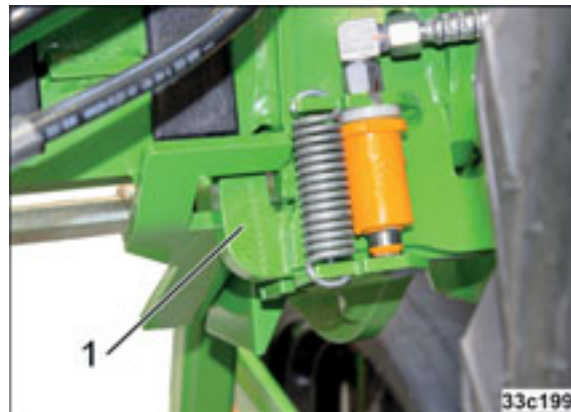


Fig. 263



<b>Fault:</b>	The booms cannot be folded
<b>Error:</b>	Locking mechanism defect (Fig. 263/1).
<b>Correc- tion:</b>	See Fig. 264, page 200

1. Connect the pressureless return flow
2. Check the back pressure (less than 10 bar)
3. Check that the lock operates smoothly (Fig. 264/1)
4. Check the oil supply (Fig. 264/2)
5. Check that the unlocking cylinder functions properly (Fig. 264/2)



Fig. 264

## 10.13 Comfort circuit



<b>Fault:</b>	The valves cannot be switched electrically
<b>Error:</b>	Check the fuse (Fig. 265/1)
<b>Correction:</b>	Replace the fuse or emergency activation

If the valve can no longer be switched electrically, check the fuse (Fig. 265/1).

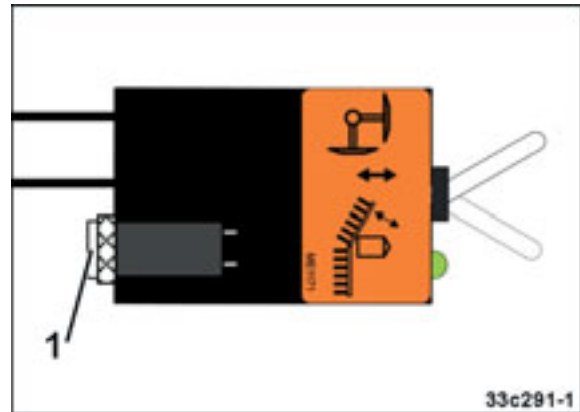


Fig. 265

### 10.13.1 Comfort circuit emergency activation

For manual actuation, pull the switch pin (Fig. 266/A) and turn ahead by one quarter turn (Fig. 266/B).



When the emergency switch is activated, the valve can no longer be electrically switched.

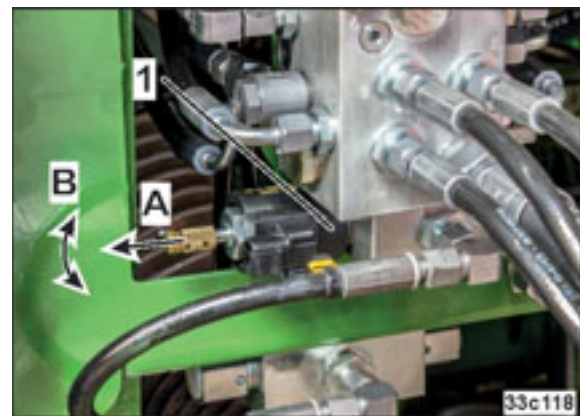


Fig. 266

## 10.14 Maintenance, repairs and servicing



### WARNING

**Danger of crushing, shearing, cutting, being caught or drawn in, winding and knocks through:**

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

Secure the tractor and implement against unintentional starting and unintentional rolling before you perform any cleaning, servicing or maintenance work on the implement, see Seite 73.

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



### WARNING

**Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through unprotected danger points.**

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



### Danger

**Carry out cleaning, maintenance or repair work (unless otherwise specified) only after the following conditions are fulfilled:**

- Folded out implement booms
- The implement is completely lowered.
- Tractor parking brake applied
- The tractor engine is switched off.
- The ignition key is removed.



When carrying out any maintenance, repair and care work, observe the section "Cleaning, maintenance and repair", Seite 34.

Thoroughly clean the implement prior to prolonged breaks of operation.



### DANGER

**All work identified by "authorised workshop" must only be carried out in an authorised workshop.**

## 10.15 Cleaning the implement



### **DANGER**

**Dressing dust is toxic and must not be inhaled or come into contact with body parts.**

When emptying the seed hopper and the singling device or when removing dressing dust, e.g. with compressed air, wear a protective suit, face mask, safety glasses and gloves.



### **DANGER**

**Fully extend or retract the implement before cleaning it.**

Never clean the implement with incompletely folded implement booms.



- Pay particular attention to the brake, air and hydraulic hose lines.
- Never treat brake, air and hydraulic hose lines with fuel, benzene, petroleum or mineral oils.
- After cleaning, grease the implement, in particular after cleaning with a high pressure cleaner/steam jet or liposoluble agents.
- Observe the legal regulations for handing and disposing of cleaning agents.



### **What should be observed when cleaning with a high-pressure cleaner/steam cleaner:**

- Do not clean any electrical components.
- Do not clean any chromed components.
- Never aim the cleaning jet from the nozzle of the high pressure cleaner/steam jet directly on lubrication points, bearings, rating plates, warning signs, and stickers.
- Always maintain a minimum jet distance of 300 mm between the high pressure cleaning or steam jet cleaning nozzle and the implement.
- 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.
- Completely dispose of fertiliser residue. Fertiliser residues harden up and can damage rotating components on the next use.

1. Empty the implement
  - Seed hopper and seed housing  
(see section "Emptying the seed hopper and seed housing", Seite 178)
  - 900 and 1100 litre fertiliser hoppers  
(see section "Fig. 14", Seite 38)
  - Front tank fertiliser hopper  
(see front tank operating manual).
2. Clean the implement with a jet of water, a high-pressure cleaner or with compressed air.

#### 10.15.1 Clean the suction air fan rotor

Dressing dust can be sucked in by the suction air blower, be deposited on the suction air fan rotor and cause the fan to become unbalanced. This can cause the air blower to be destroyed. Clean the suction air fan rotor regularly.

Clean the suction air fan rotor:

1. Remove the cap of a free suction connection.
2. Apply the tractor parking brake.
3. Switch on the suction fan (see section "Blower fan speed", Seite 131).
4. Put on safety glasses.
5. Position a water jet into the free suction connection and remove the deposits with the fan blower running.

**DANGER**

**Water will be ejected out of the fan exhaust during cleaning.**

Wear protective goggles.

**DANGER**

**Do not reach into the open suction connection.**

Do not hold the lance of the high-pressure cleaner in the opening of the suction connection.

### 10.15.2 Cleaning the fertiliser filling auger



#### DANGER

Cleaning and maintenance of the fertiliser filling auger may only be performed with the tractor engine switched off and the ignition key removed.

1. Unscrew the nuts (Fig. 267/1).
2. Place a suitable container under the supply tube.
3. Remove the cover (Fig. 267/2).

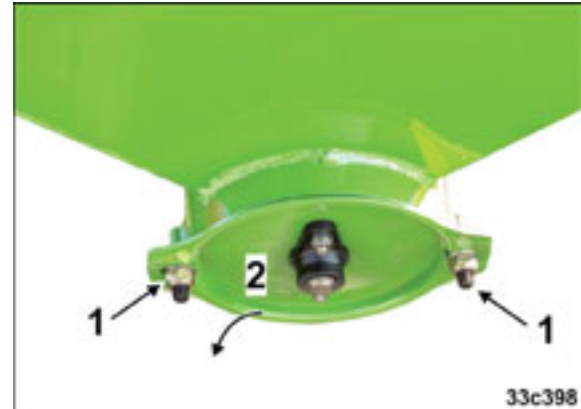


Fig. 267

4. Knock out the fertiliser residue from the supply tube.



Fig. 268

5. For intensive cleaning, clean the fertiliser filling auger thoroughly with a water jet.
  - 5.1 Unscrew the installation flap (Fig. 269/1),
  - 5.2 Clean the fertiliser filling auger with a water jet,
  - 5.3 Close the fertiliser filling auger in the reverse sequence.



Fig. 269



### 10.15.3 Cleaning the fertiliser hopper



#### DANGER

Cleaning and maintenance of the fertiliser hopper may only be done with the tractor engine switched off and the ignition key removed.



Before performing cleaning work, check whether the on-board computer is switched off.

The strut (Fig. 270/1) is used to position the cover deviation tarpaulin of the fertiliser hopper.

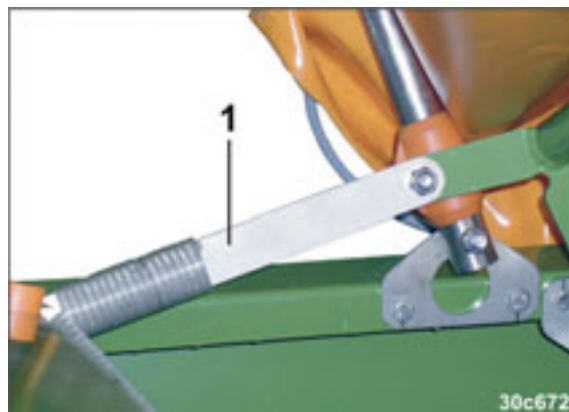


Fig. 270

To remove contamination under the protective screens, proceed as follows:

1. Take the unlocking tool (/1) from the parking position (/2).

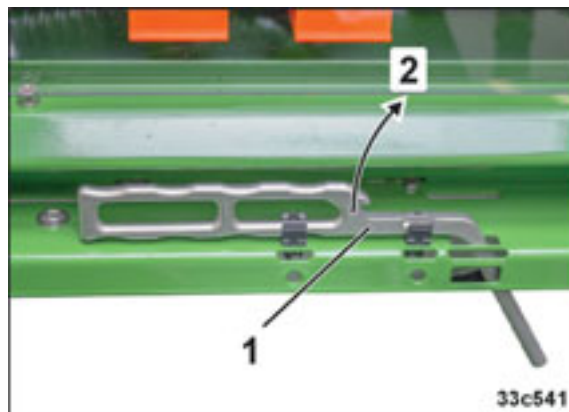


Fig. 271

2. Insert the unlocking tool into the safety catch (/1)
3. Unlock the safety catch (/2)
4. Open the protective screen upwards (/3)

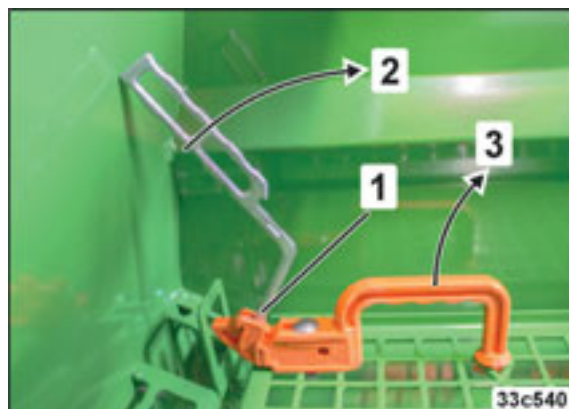
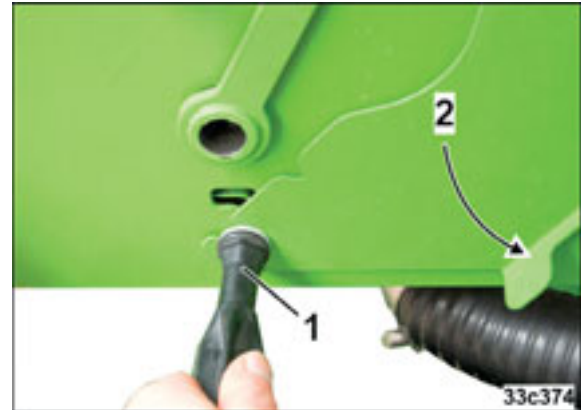


Fig. 272

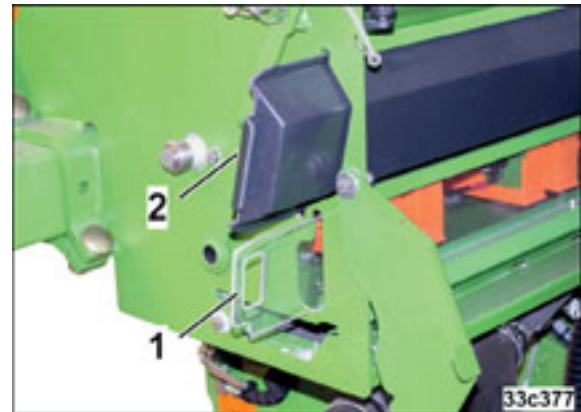
To remove contamination under the metering units, proceed as follows:

- (1) Loosen the nut (Fig. 273/1).
- (2) Swivel the cover (Fig. 273/2) to the side



**Fig. 273**

- (3) Pull out the handle guard (Fig. 274/1)
- (4) Pull out the collect bucket (Fig. 274/2)



**Fig. 274**

- (5) Swivel the handle guard (Fig. 275/1) downwards
- (6) For intensive cleaning, clean the funnel rail thoroughly with a water jet. (Fig. 276).
- (7) Reassemble in the inverse sequence.



Note: the handle of the first collecting bucket must hook into the second collecting bucket.



**Fig. 275**



**Fig. 276**

### 10.15.4 Shutdown of the implement over a long period of time



Completely remove all fertiliser residues. Fertiliser residues can harden and cause blockage in the feed hoses.

1. Thoroughly clean and dry the fertiliser coulters.
2. To prevent rust, protect the cutting discs with an environmentally friendly anti-corrosion agent.

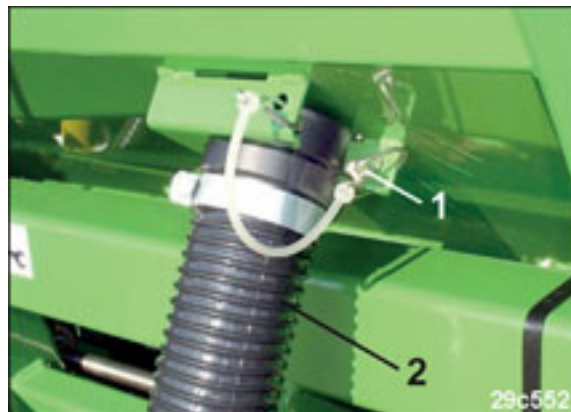


Fig. 277

3. To avoid accumulation of moisture, release the hose (Fig. 277/2) secured with a linch pin (Fig. 277/1) and put down on the ground (Fig. 278/1).

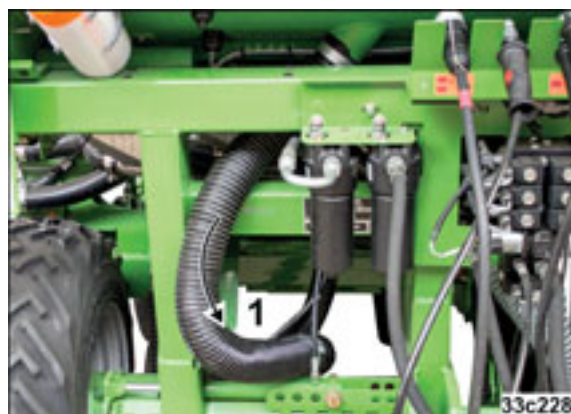


Fig. 278

4. To avoid deformation of the press rollers, move them into the parking position:
  - 4.1 Release the linch pin.
  - 4.2 Move the intermediate press roller holder into parking position (Fig. 279/1)
  - 4.3 Secure the intermediate press roller holder with a linch pin



Fig. 279

## 10.16 Lubrication specifications



### **DANGER**

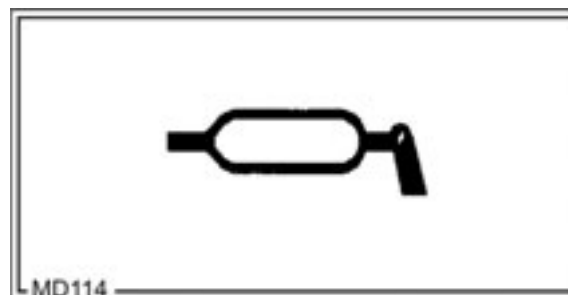
**Traktor-Zapfwelle abschalten, Apply the tractor parking brake, switch off the engine and remove the ignition key.**



Lubricate the implement in accordance with the specifications of the manufacturer.

Carefully clean the grease nipple and grease gun before lubrication so that no dirt is pressed into the bearings. Press the dirty grease completely into the bearings and replace it with new grease.

The lubrication points on the implement are marked with a foil sticker (Fig. 280).



**Fig. 280**

### 10.16.1 Lubricants



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



During the first hours of operation, the excess grease will be pressed out and a light oil film forms on the bearing.

<b>Company</b>	<b>Lubricant designation</b>
ARAL	Aralub HL2
FINA	Marson L2
ESSO	Beacon 2
SHELL	Ratinax A

### 10.16.1.1 Universal joint shaft lubrication points

Based on the maintenance plan (Fig. 281)

- Lubricate all PTO shafts
- Grease the protective tubes and profile tubes.

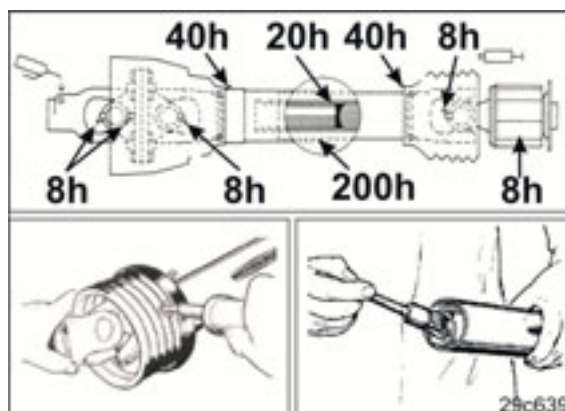


Fig. 281

### 10.16.2 Implement lubrication points

Figure	Type	Component	Number of grease nipples	Lubrication interval
Fig. 282/1	ED 3000 ED 4500 ED 4500-2	Flange bearing	4	50 h
Fig. 283/1	ED 4500-2 ED 6000-2	Boom	8	50 h
Fig. 283/1		Hydraulic cylinders	2	50 h
Fig. 284/1		Hydraulic cylinders	2	50 h
Fig. 284/2		Boom	2	50 h
Fig. 285/1	ED 3000 ED 4500 ED 6000	Track marker	2	50 h
Fig. 286/1	ED 6000-2	Flange bearing	2	50 h
Fig. 287/1	with Contour seeding unit	Support roller	max. 16	50 h
Fig. 288/1	with hydraulic singling drive	Speed sensor	1	50 h





Fig. 282



Fig. 283



Fig. 284



Fig. 285



Fig. 286

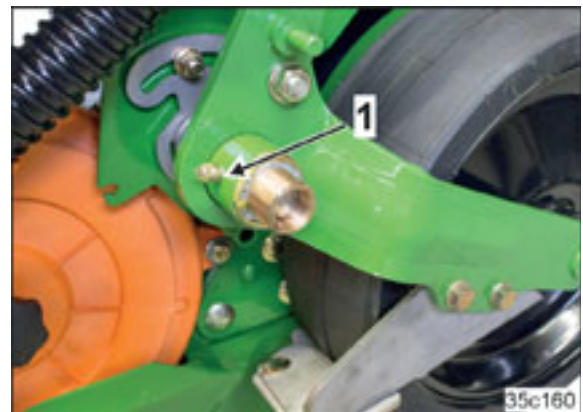


Fig. 287



Fig. 288



## 10.17 Maintenance schedule – overview



- Carry out maintenance work when the first interval is reached.
- The time intervals, operating hours or maintenance intervals specified in any external documentation that may be provided, take priority.
- Front tank maintenance intervals, see front tank operating manual.

### Before each start-up:

1. Check the hoses/tubes and connecting pieces for visible defects/leaky connections.
2. Repair any areas of chafing on hoses and tubes.
3. Replace any worn or damaged hose and tubes immediately.
4. Fix leaky connections immediately.

### Before commissioning

Component	Servicing work	See section	Specialist workshop
Wheels	Check tyre inflation pressure.	Section 10.19	
Hydraulic system	Check and perform maintenance on the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 10.22	X
Drive	Check the oil level in the setting gearbox (900 & 1100 l fertiliser hoppers).	Section 10.20	

### After the first 10 operating hours

Component	Servicing work	See section	Specialist workshop
Wheels	Check the wheel bolt tightening torques	Section 10.18	X
Hydraulic system	Check and perform maintenance on the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 10.22	X
Drive	Check the v-belt in the fan blower belt drive	Section 10.23	X
	Roller chain maintenance	Section 10.24	X
Tools	Check that the fastening nuts on the seed unit are tight	Section 7.1	
	Check that the fastening nuts on the fertiliser coulters are tight	Section 7.14	

**Daily at the end of work**

Component	Servicing work	See section	Specialist workshop
Wheels	Cleaning	Section 10.15	

**Every week, at least every 50 operating hours**

Hydraulic system	Check and perform maintenance on the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 10.22	X
Drive	Roller chain maintenance	Section 10.24	

**Every 2 weeks, at least every 100 operating hours**

Wheels	Check tyre inflation pressure.	Section 10.19	
Running gear wheels	Check the tyres for damage, e.g. cracks	Section 10.19	
Drive	Check the oil level in the setting gearbox 900 & 1100 l fertiliser hopper	Section 10.20	
Tools	Check/exchange the seeding coulter tips	Section 10.27	
	Check/replace towed fertiliser coulter tips	Section 10.29	

**Every 3 months, every 200 operating hours**

Drawbar, connecting elements	<ul style="list-style-type: none"> <li>Thorough visual inspection</li> <li>Check the drawbar bolted connection</li> <li>Check the tensioned crosspiece and the bearing of the tensioned crosspiece for wear</li> </ul>		X
------------------------------	--	--	---

**Every 6 months, before the season starts**

Hydraulic system	Check and perform maintenance on the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 10.22	X
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**Every 6 months, after the season ends**

Frame	Check the v-belt in the fan blower belt drive	Section 10.23	X
Tools	Check the seeding units	Section 10.26	
Drive	Cleaning the fan	Section 10.15.1	

## 10.18 Wheel bolt tightening torques

Tyres	Wheel bolt tightening torques
Tyres 10.0/75-15	350 Nm
Tyres 31 x 15.5/15 (Terra)	350 Nm

Fig. 289

## 10.19 Tyre inflation pressure

Tyres	Tyre inflation pressure
Tyres 10.0/75-15	2.5 bars
Tyres 31 x 15.5/15 (Terra)	2.5 bars

Fig. 290

## 10.20 Radar sensor tightening torques

Radar sensor	Tightening torque
Fig. 291/1	5.4 - 7.3 Nm
Fig. 291/2	3.0 - 3.5 Nm

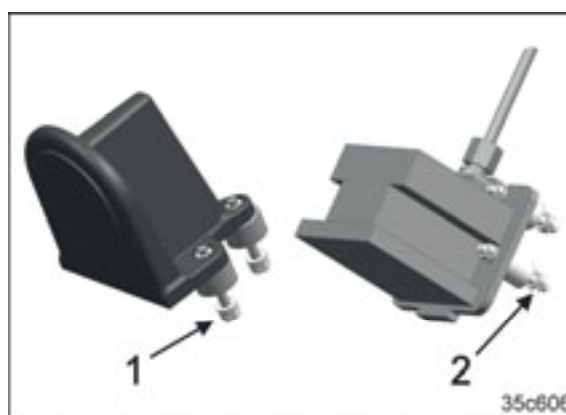


Fig. 291

## 10.21 Check the oil level in the setting gearbox (900 and 1100 I fertiliser hopper)

Check the oil level in the setting gearbox:

1. Position the implement on a horizontal surface.
  2. Check the oil level.
- The oil level should be visible in the oil sight glass (Fig. 292/1).
3. The oil filler neck (Fig. 292/2) serves to re-fill the gearbox oil
- There is no need to change the oil.

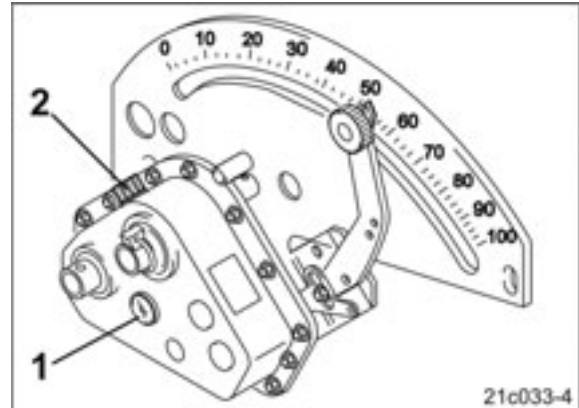


Fig. 292

<b>Total filling quantity:</b>	0.9 litres
<b>Gear oil (selectable):</b>	Wintershall Wintal UG22 WTL-HM (ex-works)
	Fuchs Renolin MR5 VG22

Fig. 293

## 10.22 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 hydraulic system of the tractor, ensure that the hydraulic system is depressurized on both the tractor side and the trailer.
- Ensure that the hydraulic hose lines are connected correctly.
- Regularly check all the hydraulic hose lines and couplings for damage and impurities.
- Have the hydraulic hose lines checked for proper functioning by a specialist at least once a year.
- Replace the hydraulic hose lines if they are damaged or worn. Use only genuine 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 aging, 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 lines made of thermoplastics, other guide values may be decisive.
- Dispose of old oil in compliance with regulations. 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.

## 10.22.1 Identification of hydraulic hose lines

The valve chest identification provides the following information:

Fig. 294/...

- (1) Label of the manufacturer of the hydraulic hose line (A1HF)
- (2) Date of manufacture of the hydraulic hose line (08/02 = year / month = February 2008)
- (3) Maximum approved operating pressure (210 BAR).

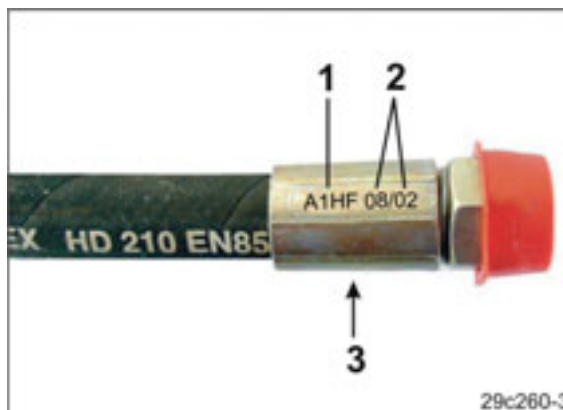


Fig. 294

### 10.22.2 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 the hydraulic hose lines for visible defects.
2. Repair any areas of chafing on the hydraulic hose lines and pipes.
3. Replace any worn or damaged hydraulic hose lines immediately.

### 10.22.3 Checking the hydraulic fluid filter

Fig. 295/...

1. Hydraulic fluid filter (control block)
  2. Hydraulic fluid filter (singling drive)
  3. Contamination indicator
- Green: Filter is working
  - Red: Replace filter



**CAUTION**

**Previously depressurize the hydraulic system.**



**Fig. 295**

To dismantle the filter, unscrew the filter lid and remove the filter.

After replacing the oil filter, press the contamination indicator back down.

→ Green ring is visible again



#### 10.22.4 Inspection criteria for hydraulic hose lines



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

**Replace hydraulic hose lines when finding any of the following inspection criteria 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. Both in a depressurized 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 plus six years is decisive. If the date of manufacture on the assembly is "2008", then the hose should not be used after February 2014. For more information, see "Identification of hydraulic hose lines".

### 10.22.5 Installing and removing hydraulic hose lines



When installing or removing hydraulic hose lines, be sure to observe the following instructions:

- Use only genuine AMAZONE hydraulic hose lines!
- Always ensure cleanliness.
- As a matter of principle, you must install the hydraulic hose lines such that, in all implement situations,
  - There is no tension, apart from the hose's own weight.
  - There is no possibility of compression for short lengths.
  - External mechanical effects 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 measured such that the smallest approved bending radius is not undershot over the whole range of movement and/or the hydraulic hose line is not over-tensioned.
- Attach the hydraulic hose lines onto the specified attachment points. There, avoid hose clips, which impair the natural movement and length changes of the hose.
- It is forbidden to paint hydraulic hose lines!

## 10.23 Check the V-belt in the fan blower belt drive (specialist workshop)

Check the V-belt in the fan blower belt drive (specialist workshop):

1. Change the V-belt (Fig. 296/1) if
  - o Damage
  - o Fraying
  - o Lateral cracks
  - o Rib break.

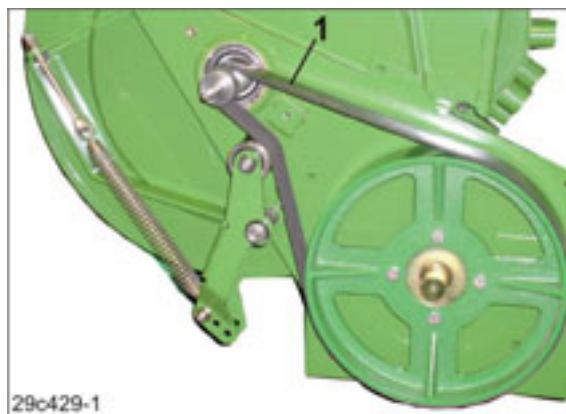


Fig. 296

Check the settings of the tensioning device (Fig. 297/1).



Fig. 297

## 10.24 Roller chains and chain cogs

The roller chain lubrication points on the implement are marked with a sticker.

On all roller chains, at the end of the planting season

1. Cleaning (including the chain cogs and the chain tensioner).
2. Condition checked.



Please observe the following points when lubricating the chains:

- Lubricate the chain links, especially in the area of deflection.
- Do not apply extra "top-up" lubrication to the chain with tough lubricants since the joints are "sealed" against re-lubrication and dirt particles increasingly accumulate on the chain.
- If possible, release the tension on the chain during the lubrication and move it in the links.
- Lubricate in doses, do not allow large quantities of the lubricant to drop from the chain.
- Clean the soiled chain with diesel, petrol or cleaning spirit using a brush.
- Use low-viscosity oils for the relubrication (SAE10 or SAE15).
- Do not use high-pressure cleaners.

## 10.25 Checking the wheel mark eradicators

The tractor wheel mark eradicators are subject to natural wear.

To avoid damage or wear being caused to the tool carriers, the tools may be worn to maximum 50 mm measured from the coulter tip (Fig. 298/1).

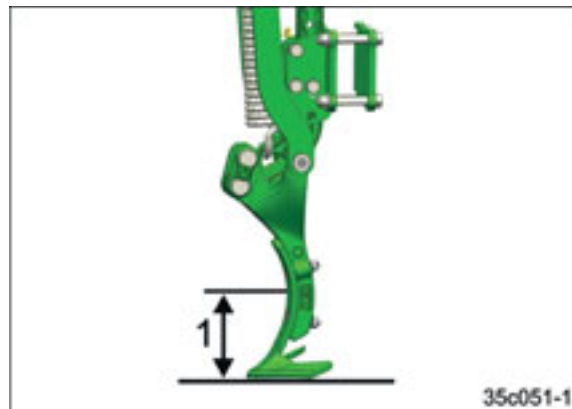


Fig. 298

Replace the coulters in due time:

1. Unscrew the nuts (Fig. 299/2)
2. Replace the wheel mark eradicator coulter tips (Fig. 299/1)
3. Tighten the nuts (Fig. 299/1)

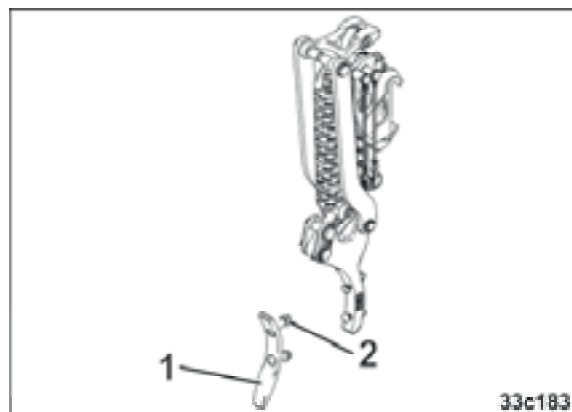


Fig. 299

### 10.25.1 Changing the coulters (specialist workshop)



#### CAUTION

Coulters are made of hardened material. If you use a hammer for the mounting/removal procedures, the ends may break off and cause considerable injury.



#### CAUTION

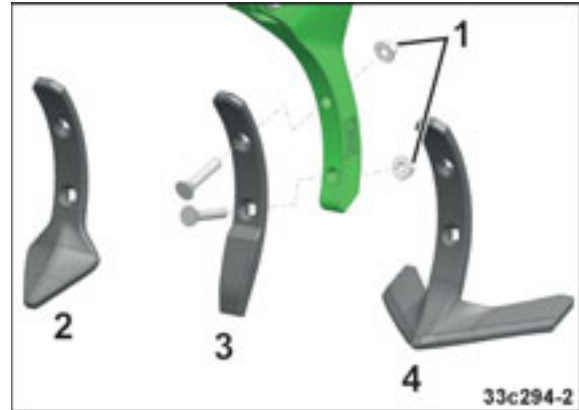
Take special care when changing coulters. Do not turn the screws on the square shaft.

**Risk of injury from sharp edges.**

1. Loosen the fastening nuts (Fig. 300/1).
2. Replace the worn coulters or adjust the coulters for the operating conditions.
3. Tighten the fastening nuts (Fig. 300/1).

When changing the coulters, observe:

- Mount the coulters parallel to the tool carrier without a gap.
- After 5 hours of use, check the bolt connection for tight fit.



**Fig. 300**



The pulling force requirement depends in the tools used.

Tool	Pulling force requirement
Wing coulters (Fig. 300/4)	large
Heart-shaped coulters (Fig. 300/2)	↓
Narrow coulters (Fig. 300/3)	Small

**Fig. 301**

### 10.25.2 Replacing the tension springs of the overload safety device (workshop work)



#### **CAUTION**

The overload safety on the tines consists of tension springs that are under high pretension. It is essential to use appropriate tools to install and remove the tension spring. You must use the suitable device to install and remove the tension springs in all cases.

**Otherwise, there is a risk of injury.**



**More information via Customer Service / Dealers.**



## 10.26 Check the seeding units

**Check the following functional parts and replace if needed:**

1. Singling disc (Fig. 302/1)
2. PE foam profile sealing (Fig. 302/2)
3. Suction cover with suction kidneys (Fig. 302/3)



**Fig. 302**

4. Sowing housing seal (Fig. 303/1).
5. Ejector tip (Fig. 303/2).



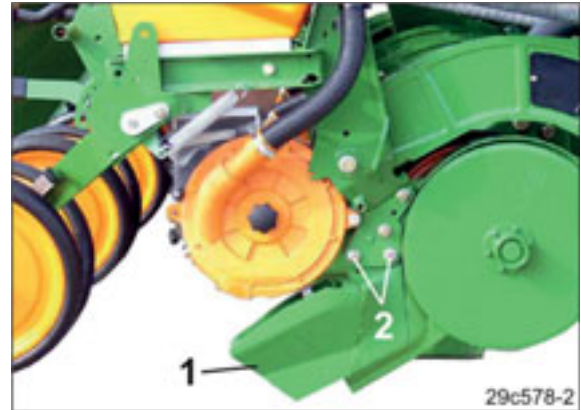
**Fig. 303**

## 10.27 Checking the coulter tips

The coulter tips form the furrow and are subject to natural wear.

Exchange the seeding coulter tips:

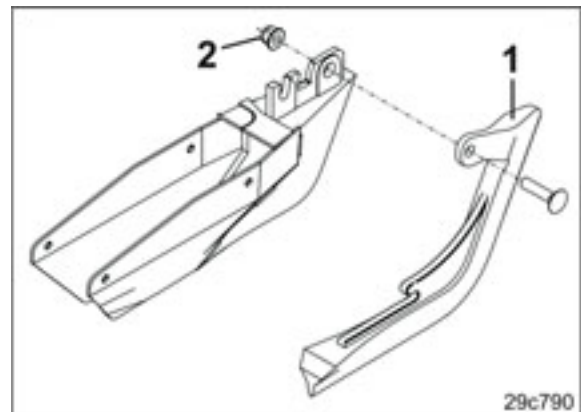
1. Raise the implement and secure with suitable supports.
2. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.
3. Loosen the nuts (Fig. 304/2) and swivel the seeding coulter (Fig. 304/1) downwards.



**Fig. 304**

Classic seeding coulter tip:

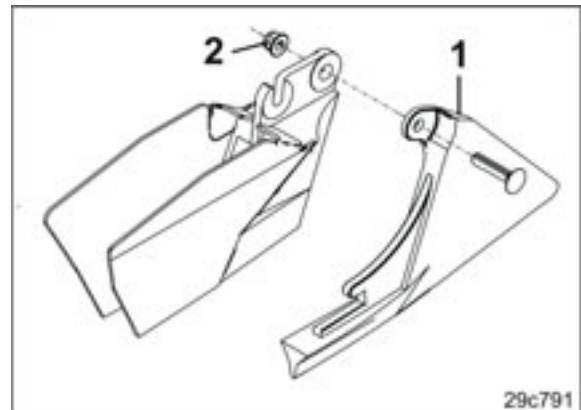
4. Loosen the nuts (Fig. 305/2) and exchange the seeding coulter tip (Fig. 305/1).



**Fig. 305**

Contour seeding coulter tip (maize or beet/tur-nips):

4. Loosen the nuts (Fig. 306/2) and exchange the contour seeding coulter tip (Fig. 306/1).



**Fig. 306**

## 10.28 Checking the support rollers



The carrier roller rests gently against the cutting disc.

→ The cutting disc is driven by the rotation of the carrier roller.

Position the support roller on the cutting disc:

1. Raise the implement and secure with suitable supports.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Remove the hollow dowel pin (Fig. 307/1) and change the distance between the carrier roller and the cutting disc:
  - 3.1 Screwing in the adjustment nut (Fig. 307/2) reduces the distance
  - 3.2 Screwing out the adjustment nut (Fig. 307/2) increases the distance
4. Lock the setting with the hollow dowel pin (Fig. 307/1)

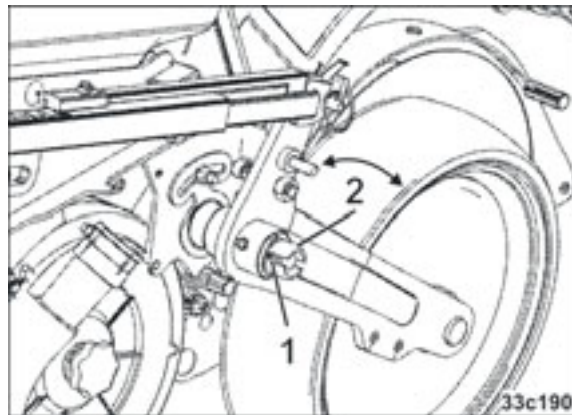


Fig. 307

## 10.29 Checking the fertiliser coulter tip

The coulter tips form the furrow and are subject to natural wear.

Replacing the coulter tips:

1. Raise the implement and secure with suitable supports.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Loosen the nut (Fig. 308/2) and exchange the coulter tip (Fig. 308/1).

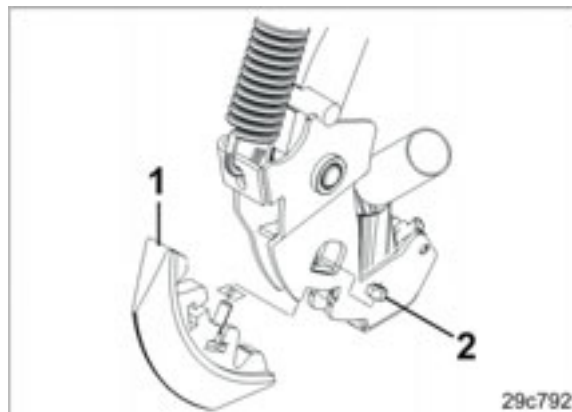


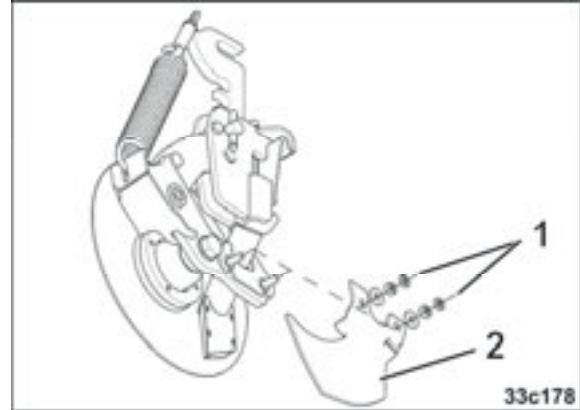
Fig. 308

## 10.30 Checking the disc coulter

### Checking/replacing the furrow former

Up to a disc diameter of 370 mm, only replace the furrow former.

1. Raise the implement and secure with suitable supports.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Unscrew the bolts of the furrow former attachment (Fig. 309/1).
4. Remove the furrow former (Fig. 309/2).
5. Attach the new furrow formers with four bolts.
6. Adjust the furrow former (see section "Adjusting the furrow former", Seite 156).

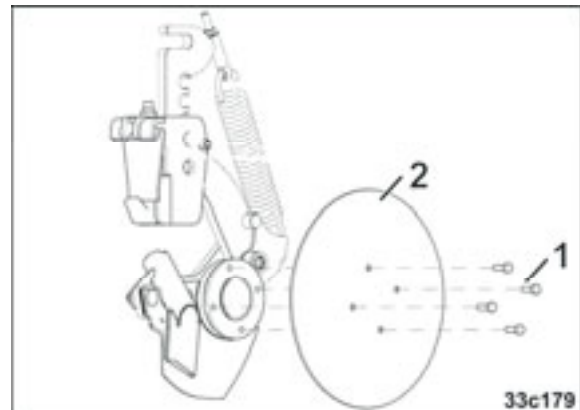


**Fig. 309**

### Checking/replacing the cutting disc

The minimum disc diameter for the disc is 360 mm.

1. Raise the implement and secure with suitable supports.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Loosen the bolts on the disc attachment (Fig. 310/1) and unscrew.
4. Remove the disc (Fig. 310/2).
5. Attach the new disc with four bolts.



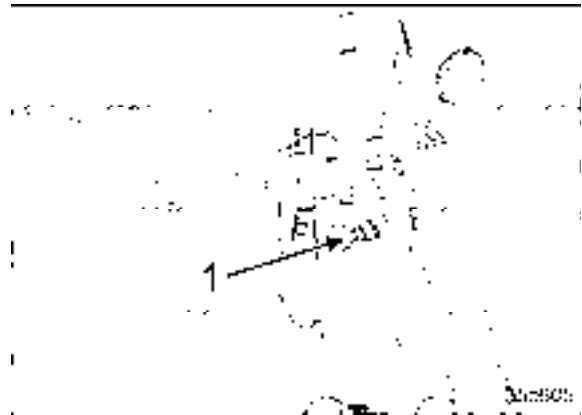
**Fig. 310**

#### 10.30.1 Locking bolt

Fig. 311/...

##### (1) Locking bolt

To prevent deformation of the coulter mounting bracket, the locking bolt must be tightened with a maximum torque of 10 Nm.



**Fig. 311**

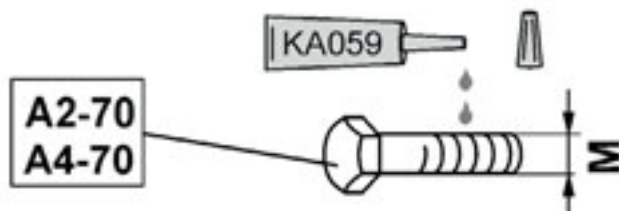
## 10.31 Screw tightening torques




tightening torques for the wheel bolts (see section "Wheel bolt tightening torques", Seite 214).



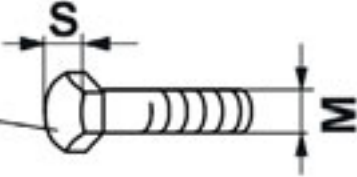

The specified tightening values represent reference values!



M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
 Nm	2.3	4.6	7.9	19.3	39	66	106	162	232	326	247	314



The table shows the permissible maximum values for bolted connections with a friction coefficient of  $\mu=0.12$  and does not include any other safety factors. The listed tightening values are to be considered as reference values!

<div>8.8</div> <div>10.9</div> <div>12.9</div>		$\mu=0,12$		
M	S	 Nm		
M 8	13	25	35	41
M 8x1		27	38	41
M 10	16 (17)	49	69	83
M 10x1		52	73	88
M 12	18 (19)	86	120	145
M 12x1.5		90	125	150
M 14	22	135	190	230
M 14x1,5		150	210	250
M 16	24	210	300	355
M 16x1,5		225	315	380
M 18	27	290	405	485
M 18x1,5		325	460	550
M 20	30	410	580	690
M 20x1,5		460	640	770
M 22	32	550	780	930
M 22x1,5		610	860	1050
M 24	36	710	1000	1200
M 24x2		780	1100	1300
M 27	41	1050	1500	1800
M 27x2		1150	1600	1950
M 30	46	1450	2000	2400
M 30x2		1600	2250	2700



## 11 Hydraulic diagram

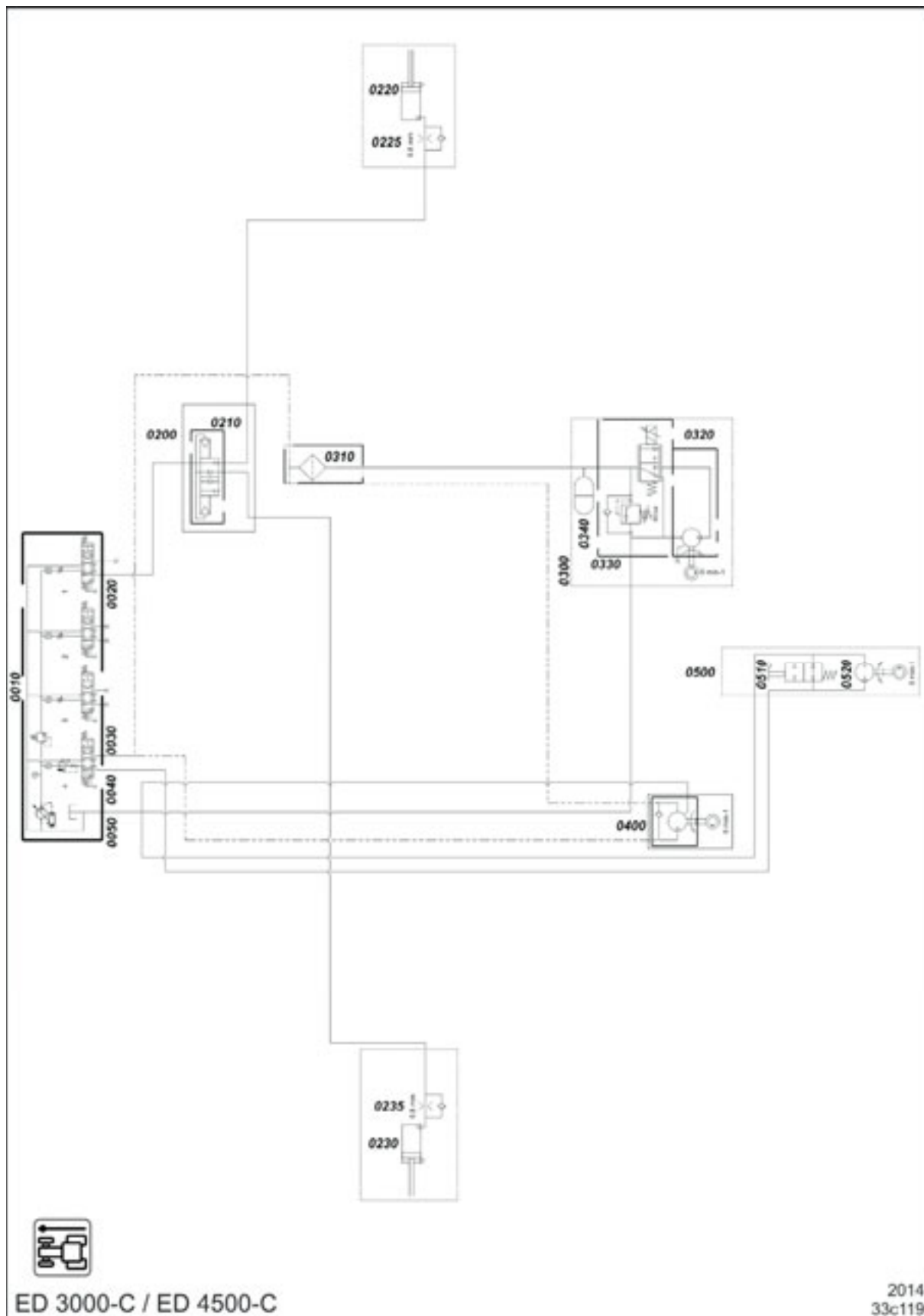


Fig. 312

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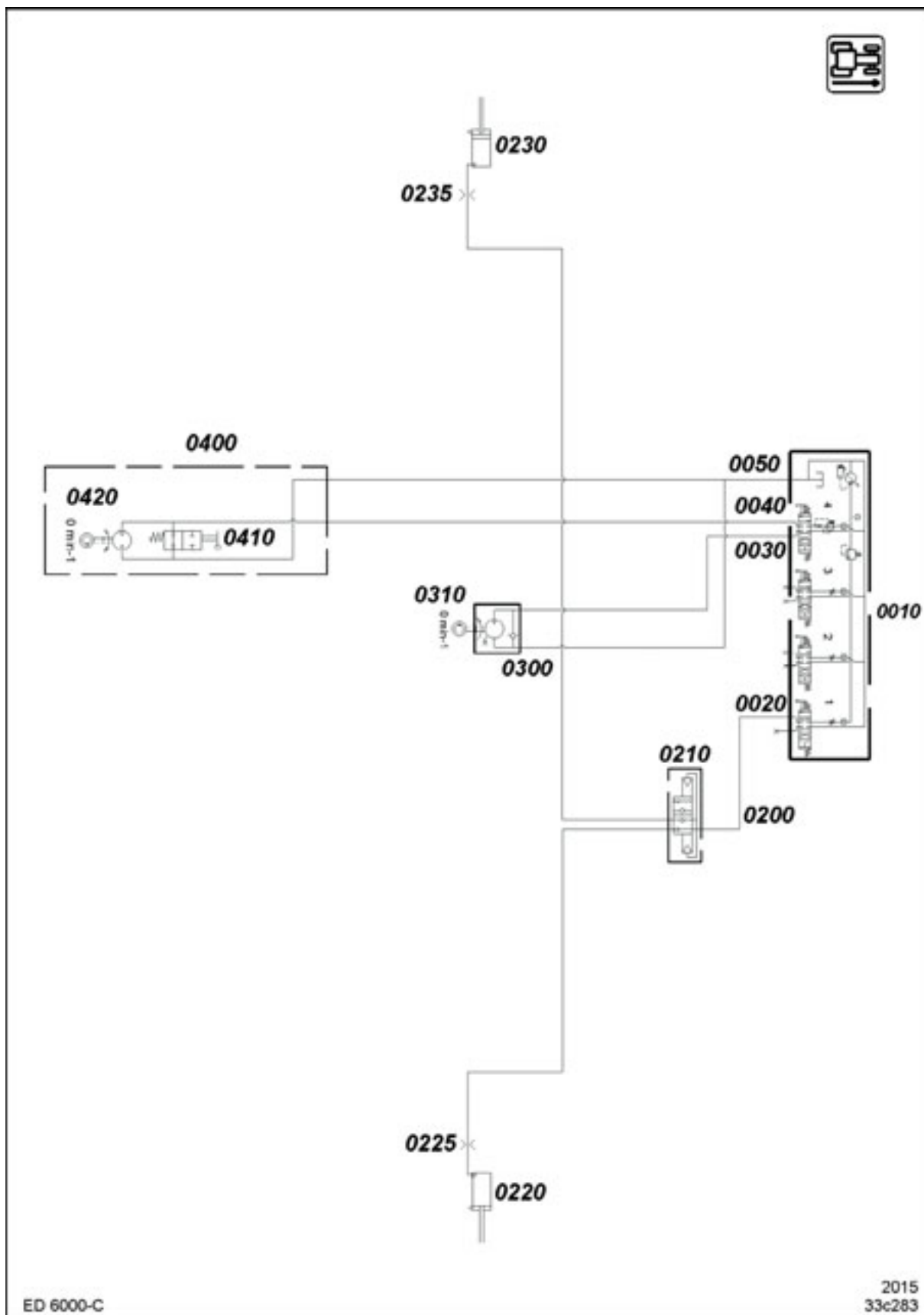


Fig. 313

## 11.2 ED 6000 [-C]

Fig. 313/...	Designation	Notification
10	Tractor hydraulics	
20	Marking on handle no. yellow 1	
30	Marking on handle no. red 1	
40	Marking on handle no. beige 1	
50	Marking on handle no. red 2	
200	Track marker	Option
210	Track marker shuttle valve	
220	Track marker right	
225	Throttle, right track marker	
230	Track marker left	
300	Blower fan drive	Optional equipment
310	Blower fan drive motor	
400	Fertiliser filling auger	Option
410	Ball valve, augur control	
420	Augur motor	

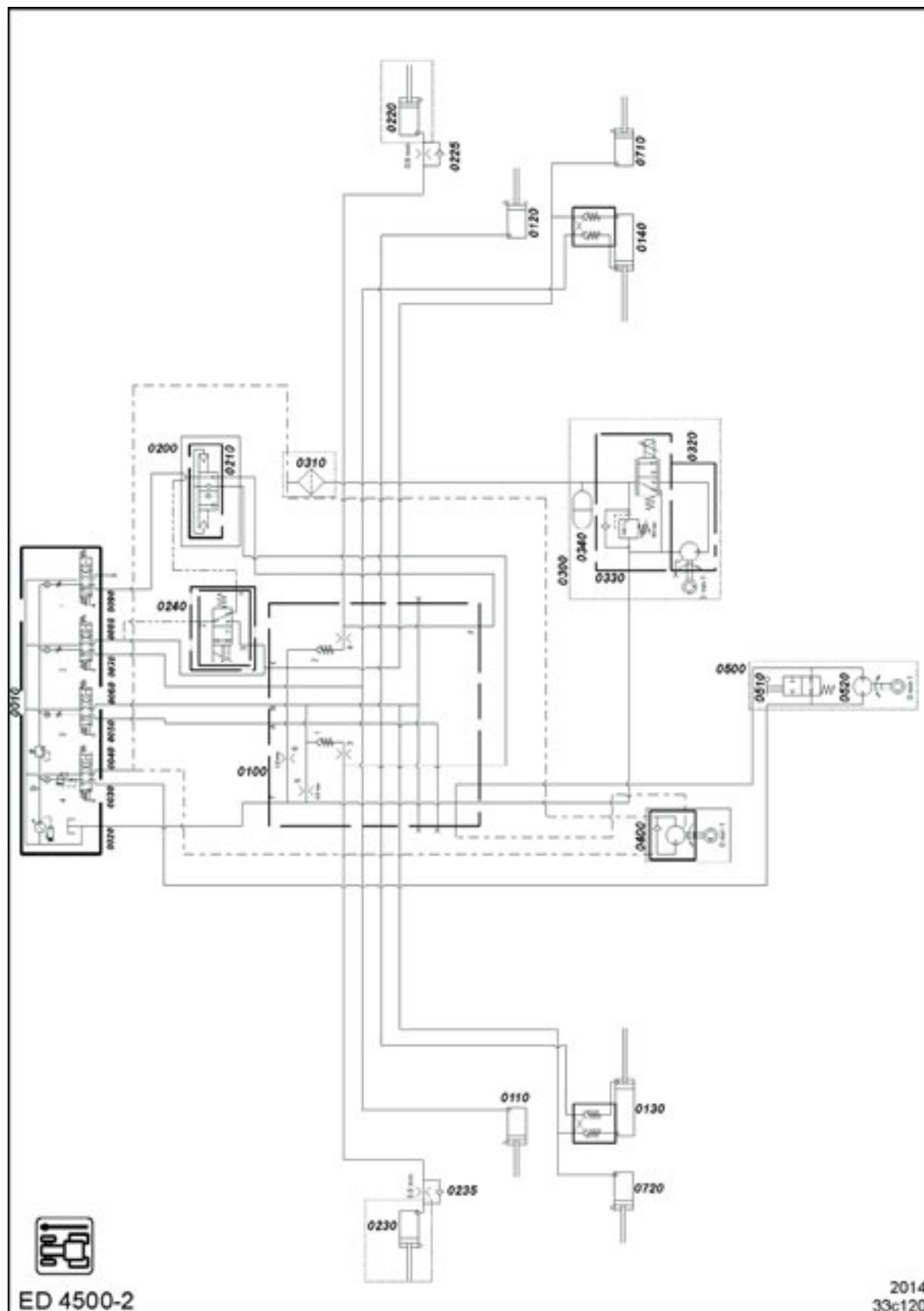


Fig. 314

### 11.3 ED 4500-2 [-2C]

Fig. 314/...	Designation	Note
10	Tractor hydraulics	
20	Marking handle no. T – red	
30	Marking handle no. 1 – beige	
40	Marking handle no. 1 – red	
50	Marking handle no. 1 - green	
60	Marking handle no. 2 – green	
70	Marking handle no. 1 - blue	
80	Marking handle no. 2 – blue	
90	Marking handle no. 1 – yellow	
100	Control block	
110	Transport lock, left side	
120	Transport lock, right side	
130	Left section	
140	Right section	
200	Track marker	Option
210	Track marker shuttle valve	
220	Track marker, right	
225	Track marker throttle	
230	Track marker, left	
235	Track marker throttle	
240	Track marker/flaps control valve on the right	Option
300	Lay shaft drive	Optional equipment
310	Suction filter	
320	Hydraulic motor	
330	Flow control valve	
340	Pressure reservoir	
400	Hydraulic blower drive	
500	Fertiliser filling auger	Option
510	Ball valve, auger control	
520	Augur motor	
710	Work locking device on the right	
720	Work locking device on the left	

All position specifications in direction of travel



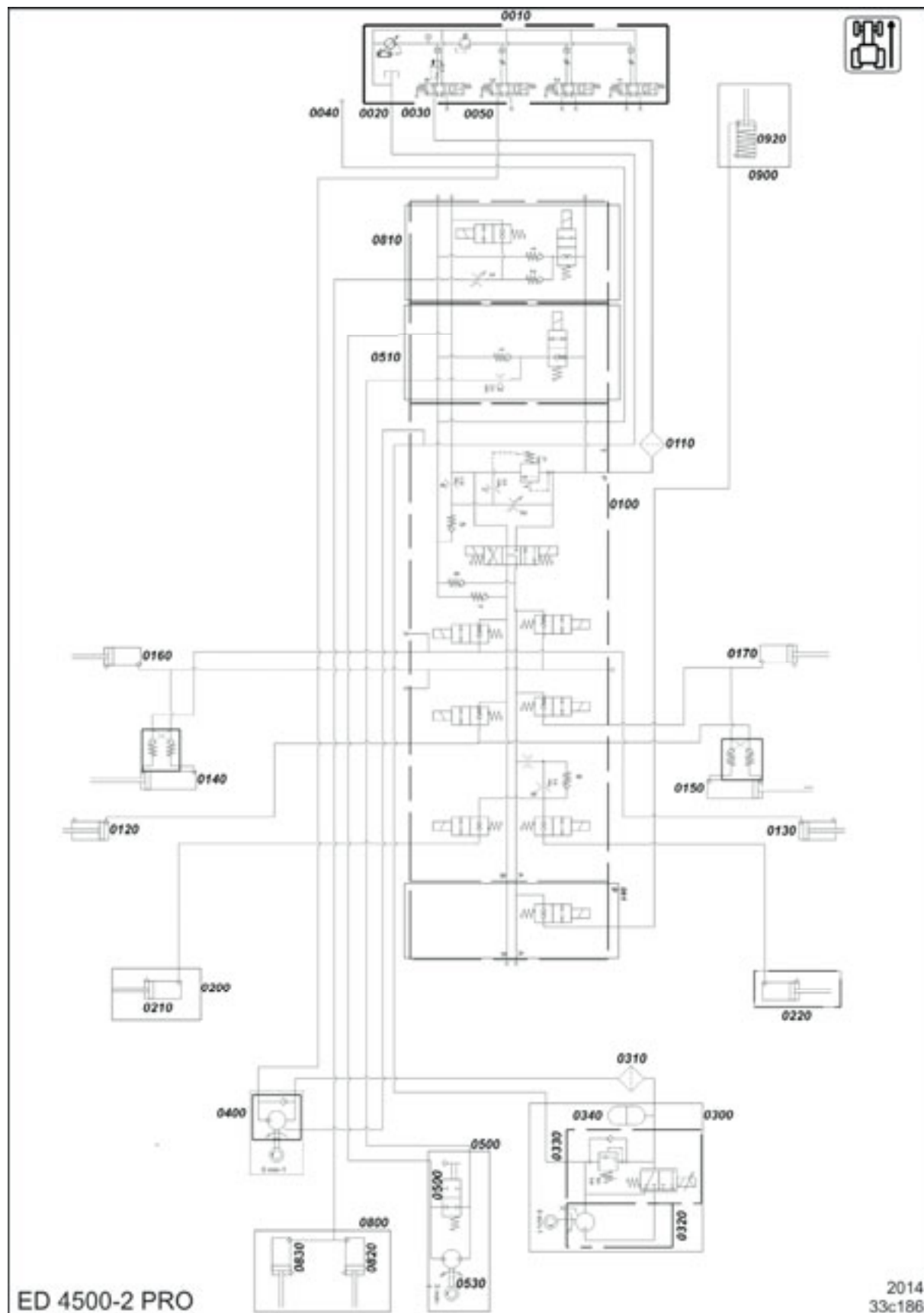


Fig. 315

## 11.4 ED 4500-2 [-2C] Profi control

Fig. 315/...	Designation	Note
10	Tractor hydraulics	
20	Marking handle no. T – red	
30	Marking handle no. P – red	
40	Marking handle no. LS – red	
50	Marking handle no. 1 – red	
100	ED Profi control block	
110	Pressure filter	
120	Transport lock, left side	
130	Transport lock, right side	
140	Left section	
150	Right section	
160	Work lock, left side	
170	Work lock, right side	
200	Track marker	Option
210	Track marker, left	
220	Track marker, right	
300	Lay shaft drive	Optional equipment
310	Suction filter	
320	Hydraulic motor	
330	Flow control valve	
340	Pressure reservoir	
400	Hydraulic blower drive	
500	Fertiliser filling auger	Option
510	ED auger control block	
520	Ball valve, auger control	
530	Augur motor	
800	Tramline marking	Option
810	ED tramline control block	
820	Tramline marking ri	
830	Tramline marking le	
900	Star wheel excavation	Option
910	ED star wheel control block	
920	Star wheel lift-out cylinder	

All position specifications in direction of travel

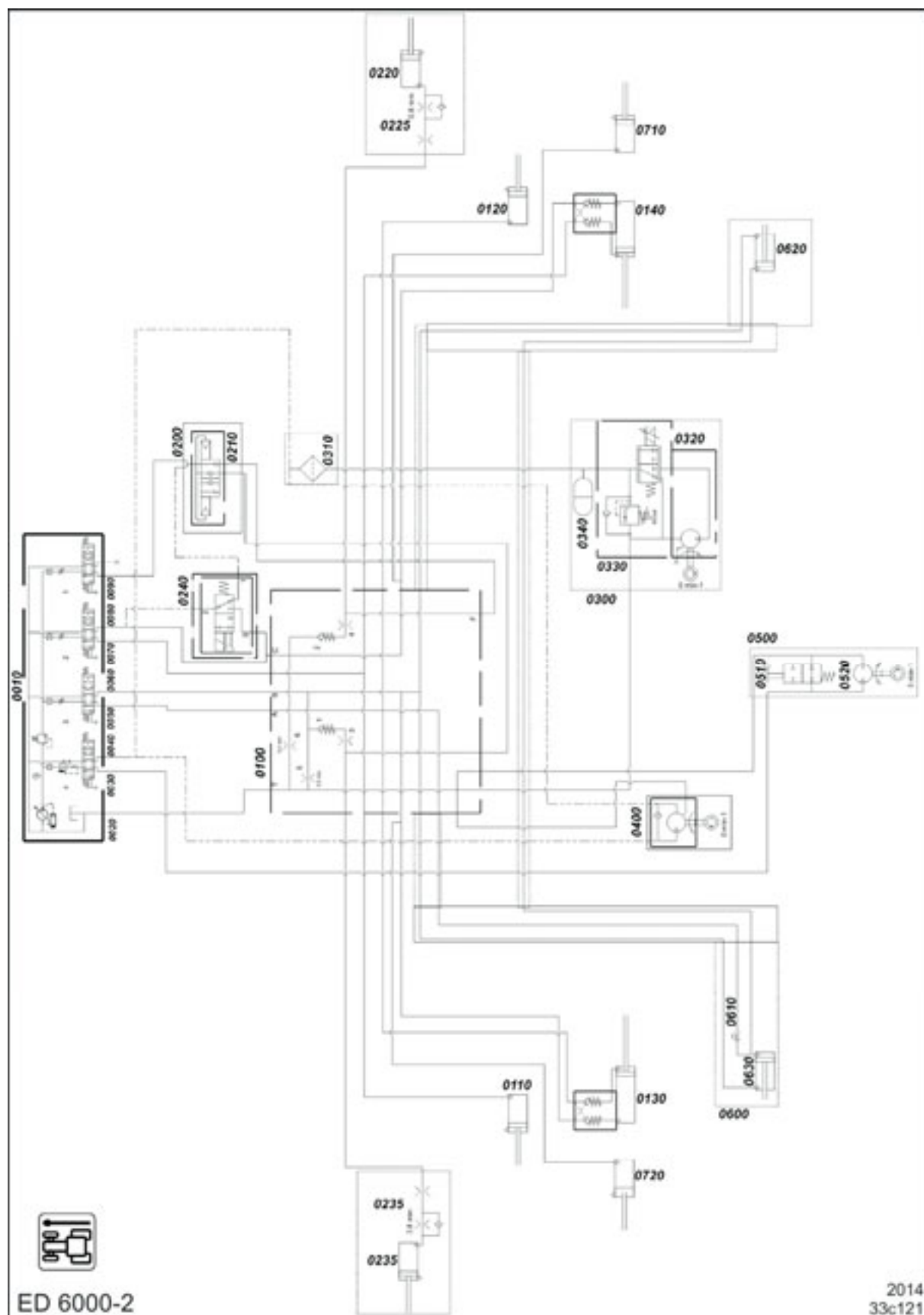


Fig. 316

## 11.5 ED 6000-2 [-2C/-2FC]

Fig. 316/...	Designation	Note
10	Tractor hydraulics	
20	Marking handle no. T – red	
30	Marking handle no. 1 – beige	
40	Marking handle no. 1 – red	
50	Marking handle no. 1 – green	
60	Marking handle no. 2 – green	
70	Marking handle no. 1 – blue	
80	Marking handle no. 2 – blue	
90	Marking handle no. 1 – yellow	
100	Control block	
110	Transport lock, left side	
120	Transport lock, right side	
130	Left section	
140	Right section	
200	Track marker	Option
210	Track marker shuttle valve	
215	Track marker lock	
220	Track marker, right	
225	Track marker throttle	
230	Track marker, left	
235	Track marker throttle	
240	Track marker/flaps control valve on the right	Option
300	Lay shaft drive	Optional equipment
310	Suction filter	
320	Hydraulic motor	
330	Flow control valve	
340	Pressure reservoir	
400	Hydraulic blower drive	
500	Fertiliser filling auger	Option
510	Ball valve, auger control	
520	Augur motor	
600	Track width adjustment	Option
610	Track width lock	
620	Right track width	
630	Left track width	
710	Work locking device on the left	
720	Work locking device on the right	

All position specifications in direction of travel

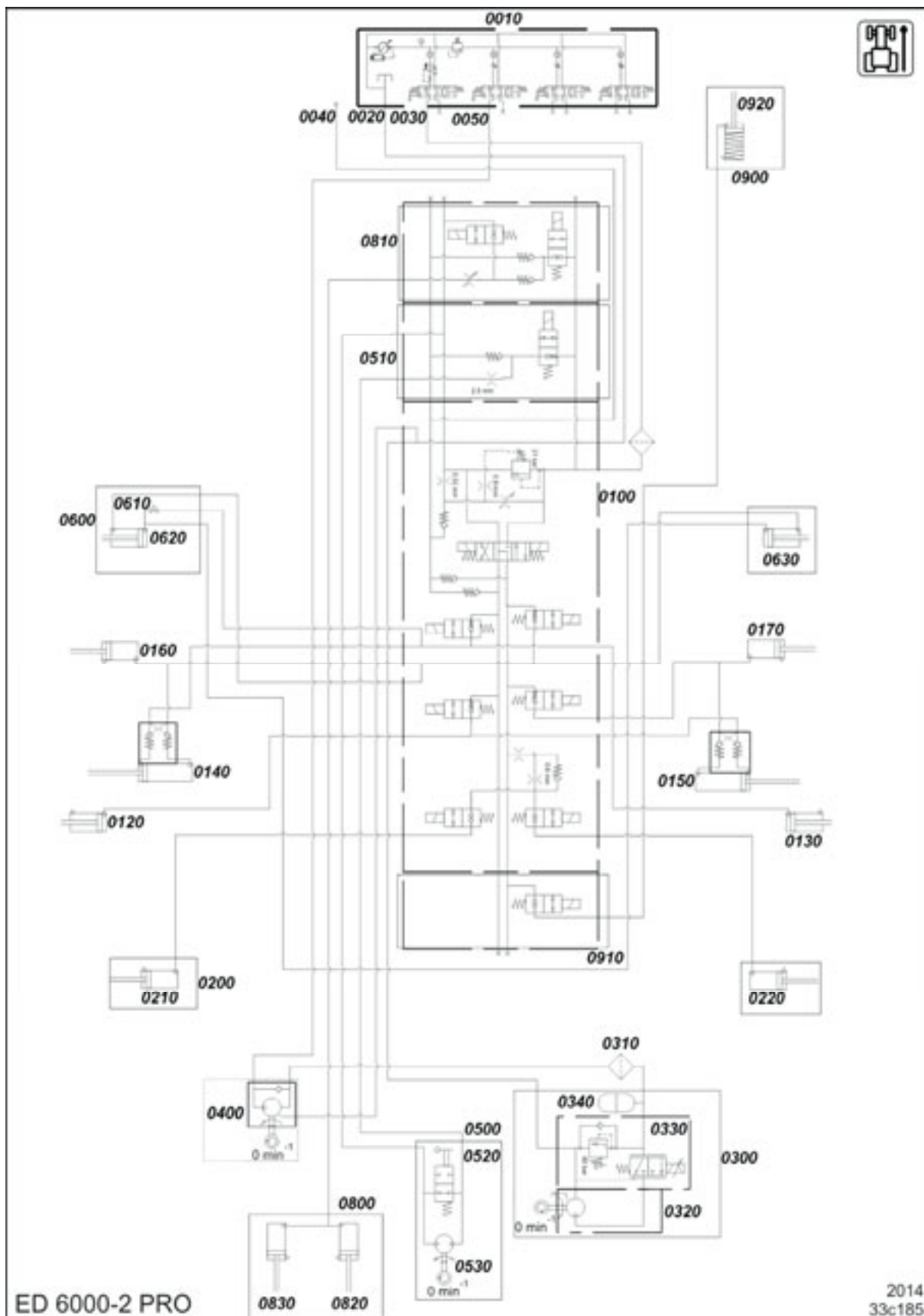


Fig. 317

## 11.6 ED 6000-2 [-2C/-2FC] Profi control

Fig. 317/...	Designation	Note
10	Tractor hydraulics	
20	Marking handle no. T – red	
30	Marking handle no. P – red	
40	Marking handle no. LS – red	
50	Marking handle no. 1 – red	
100	ED Profi control block	
110	Pressure filter	
120	Transport lock, left side	
130	Transport lock, right side	
140	Left section	
150	Right section	
160	Work lock, left side	
170	Work lock, right side	
200	Track marker	Option
210	Track marker, left	
220	Track marker, right	
300	Lay shaft drive	Optional equipment
310	Suction filter	
320	Hydraulic motor	
330	Flow control valve	
340	Pressure reservoir	
400	Hydraulic blower drive	
500	Fertiliser filling auger	Option
510	ED auger control block	
520	Ball valve, auger control	
530	Augur motor	
600	Hydraulic track width adjustment	Option
610	Left track width lock	
620	Left track width	
630	Right track width	
800	Tramline marking	Option
810	ED tramline control block	
820	Tramline marking ri	
830	Tramline marking le	
900	Star wheel excavation	Option
910	ED star wheel control block	
920	Star wheel lift-out cylinder	

All position specifications in direction of travel





**Space for your notes:**

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