

Operating Manual

AMAZONE

Large area seed drill

Citan Z 12000



MG3165
BAH0022-1 01.09



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



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. Sark.



Identification data

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

Machine identification number:
(ten-digit)

Type:

Citan Z 12000

Permissible system pressure in
bar:

Maximum 200 bar

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

Manufacturer's address

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Spare part orders

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E-mail: et@amazone.de

Online spare parts catalogue: www.amazone.de

When ordering spare parts, please always specify the number of your machine.

Formalities of the operating manual

Document number: MG3165

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Foreword

Foreword

Dear Customer,

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

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

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

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

Should you have problems or queries, please consult this operating manual or give us a call.

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

User evaluation

Dear Reader,

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

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1 User Information

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

1.1 Purpose of the document

This operating manual

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

1.2 Locations in the operating manual

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

1.3 Diagrams used

Handling instructions and reactions

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

1. Handling instruction 1
→ Reaction of the machine to handling instruction 1
2. Handling instruction 2

Lists

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

- Point 1
- Point 2

Number items in diagrams

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

Example: (Fig. 3/6)

- Figure 3
- Item 6

2 General Safety Instructions

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

2.1 Obligations and liability

Comply with the instructions in the operating manual

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

Obligations of the operator

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

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

The operator is obliged

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

Obligations of the user

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

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

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

Risks in handling the machine

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

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

Only use the machine

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

Eliminate any faults immediately which could impair safety.

Guarantee and liability

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

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

2.2 Representation of safety symbols

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

**DANGER**

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

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

**WARNING**

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

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

**CAUTION**

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

**IMPORTANT**

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

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

**NOTE**

Indicates handling tips and particularly useful information.

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

2.3 Organisational measures

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

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



The operating manual

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

Check all the available safety equipment regularly.

2.4 Safety and protection equipment

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

Faulty safety equipment

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

2.5 Informal safety measures

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

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

2.6 Training of personnel

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

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

Activity \ People	Person specially trained for the activity ¹⁾	Trained person ²⁾	Person with specialist training (specialist workshop) ³⁾
Loading/Transport	X	X	X
Commissioning	—	X	—
Set-up, tool installation	—	—	X
Operation	—	X	—
Maintenance	—	—	X
Troubleshooting and fault elimination	—	X	X
Disposal	X	—	—

Legend: X..allowed —..not allowed

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

²⁾ A person shall be considered as having been instructed, if they have been instructed in the tasks they have to carry out and in the possible risks in the case of improper behaviour and have been informed about the necessary protective equipment and measures.

³⁾ People with specialist technical training shall be considered as a specialist. Due to their specialist training and their knowledge of the appropriate regulations, they can evaluate the work with which they have been charged and detect possible dangers.

Comment:

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



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

2.7 Safety measures in normal operation

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

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

2.8 Dangers from residual energy

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

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

2.9 Maintenance and repair work, fault elimination

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

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

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

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

2.10 Constructive changes

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

Any expansion or modification work shall require the written approval of **AMAZONEN-WERKE**. Only use the modification and accessory parts released by **AMAZONEN-WERKE** so that the operating permit, 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 contusions, cuts, dragging, catching or knocks from support parts.

It is forbidden to:

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

2.10.1 Spare and wear parts and aids

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

Use only genuine **AMAZONE** spare and wear parts or the parts cleared by **AMAZONEN-WERKE** so that the operating permit retains its validity in accordance with national and international regulations. The use of wear and spare parts from third parties does not guarantee that they have been constructed in a way as to meet the requirements placed on them.

AMAZONEN-WERKE accepts no liability for damage arising from the use of non-released spare parts, wear parts or auxiliary materials.

2.11 Cleaning and disposal

Handle and dispose of any materials used carefully, in particular

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

2.12 User workstation

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

2.13 Warning pictograms and other signs on the machine



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

Warning pictograms - structure

Warning pictograms indicate dangers on the machine and warn against residual dangers. At these points, there are permanent or unexpected dangers.

A warning pictogram consists of two fields:



Field 1

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

Field 2

is a pictogram showing how to avoid the danger.

Warning pictograms - explanation

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

1. A description of the danger.
For example: danger of cutting!
2. The consequence of nonobservance of the danger protection instructions.
For example: causes serious injuries to fingers or hands.
3. Instructions for avoiding the danger.
For example: only touch machine parts when they have come to a complete standstill.

Order number and explanation

Warning pictograms

MD 076

Danger of your hand or arm being drawn in or caught by a power driven, unprotected chain or belt drive!

This hazard can cause extremely serious injuries with the loss of parts of the hand or arm.

Never open or remove the guard devices on chains or belt drives if

- The tractor engine is running with the PTO shaft connected / hydraulic drive engaged
- or the ground wheel drive is moving.



MD 078

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

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

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

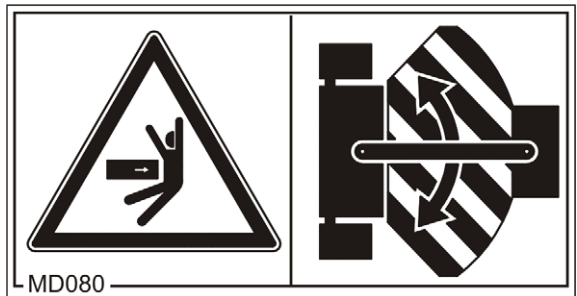


MD 080

Risk of contusions to torso in the bend area of the drawbar due to sudden steering movements!

This danger will cause serious injuries to the torso or death.

It is forbidden to stand in the danger area between the tractor and the machine for as long as the tractor engine is running and the tractor is unprotected against unintentional rolling.



General Safety Instructions

MD 082

Danger of falling from treads and platforms when riding on the machine!

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

It is forbidden to ride on the machine and/or climb the running machine. This ban also applies to machines with treads or platforms.

Ensure that no one rides with the machine.

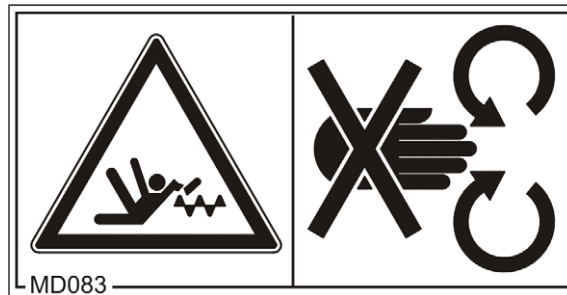


MD 083

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

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

Never open or remove guard devices from driven machine elements when the tractor engine is running with the PTO shaft connected / hydraulic drive engaged.



MD 084

Risk of contusions over the whole body from machine parts moving down from above!

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

It is forbidden to stand in the swivel area of moving machine parts.

Instruct people to leave the swivel area of moving machine parts before the machine parts move down.

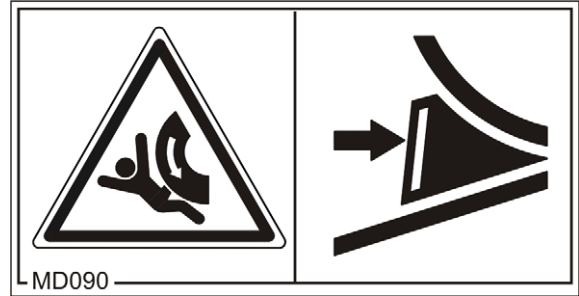


MD 090

Risk of contusions from unintentional rolling of the uncoupled, unsecured machine!

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

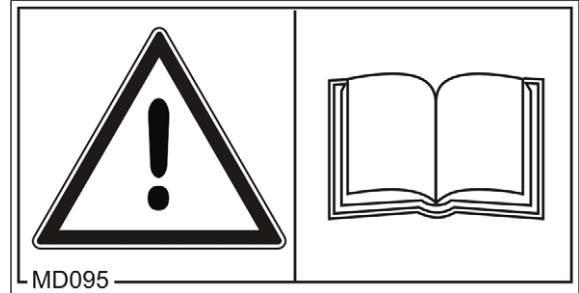
Secure the machine against unintentional rolling, before uncoupling the machine from the tractor. For this, use the tractor parking brake and/or the wheel chock(s).



MD090

MD 095

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



MD095

MD 096

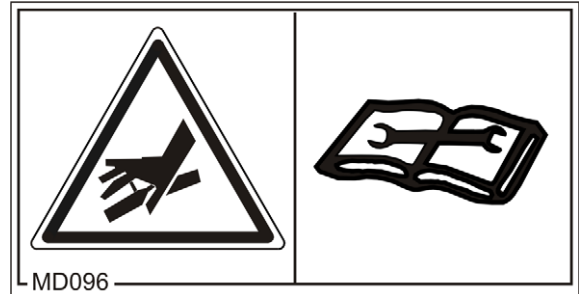
Danger of infection to the whole body from liquids escaping at a high pressure (hydraulic fluid)!

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

Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.

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

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



MD096

General Safety Instructions

MD 097

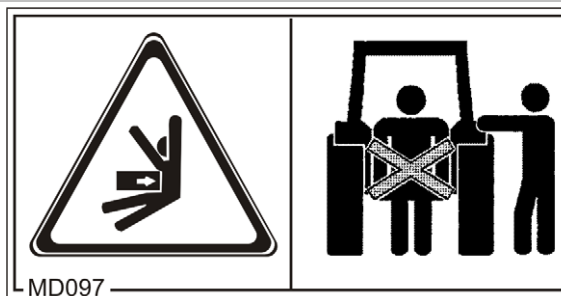
Danger of crushing your torso in the stroke range of the three-point suspension due to the narrowing spaces when the three-point hydraulic system is actuated!

This danger causes extremely serious injuries and even death.

Personnel are prohibited from entering the stroke area of the three-point suspension when the three-point hydraulic system is actuated.

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

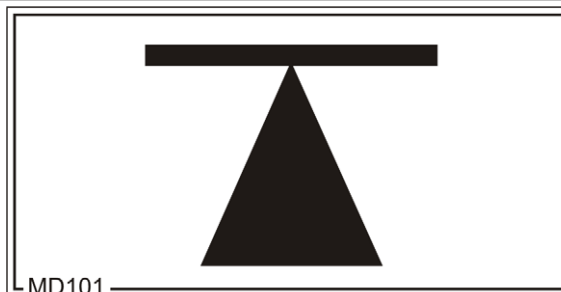
- from the intended workstation.
- if you are outside of the danger area between the tractor and the machine.



MD097

MD 101

This pictogram shows application points for lifting gear (jack).



MD101

MD 102

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

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

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



MD102

MD 104

Danger of your torso getting crushed by laterally swivelling machine parts!

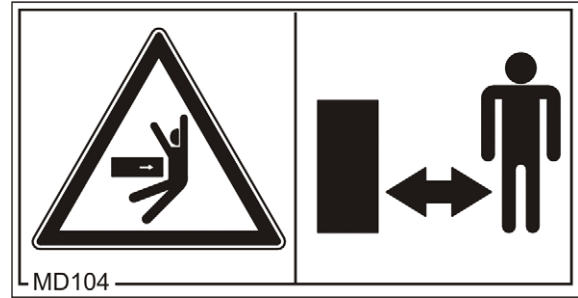
This danger will cause serious injuries to the torso or death.

Maintain a sufficient safety distance between you and any moving machinery parts.

It is forbidden to stand in the swivel area of moving machine parts.

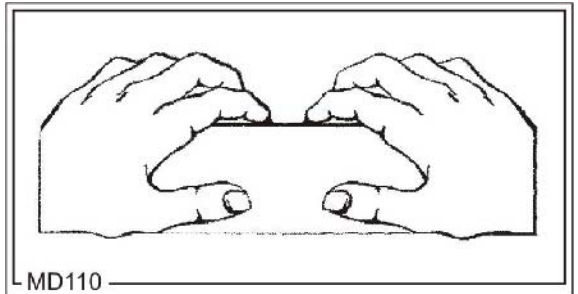
Ensure that all personnel maintain a sufficient safety distance from moving machine parts.

Instruct personnel to leave the swivelling area of any moving machine parts before you swivel the machine parts.



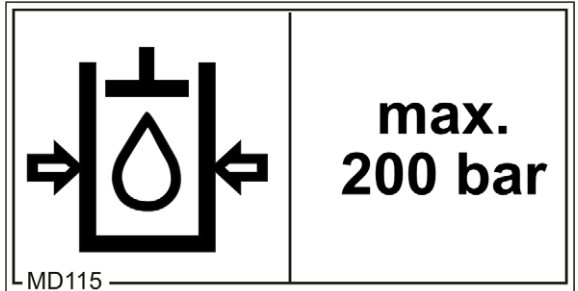
MD 110

This pictogram shows the machine parts that serve as a holding point.



MD 115

The maximum operating pressure of the hydraulic system is 200 bar.



MD 150

Danger of cutting or cutting off fingers or hand by unprotected driven parts of the machine!

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

Never open or remove guard devices from driven machine parts when the tractor engine is running with the PTO shaft connected / hydraulic drive engaged.



2.13.1 Positioning of warning pictograms and other labels

Warning pictograms

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

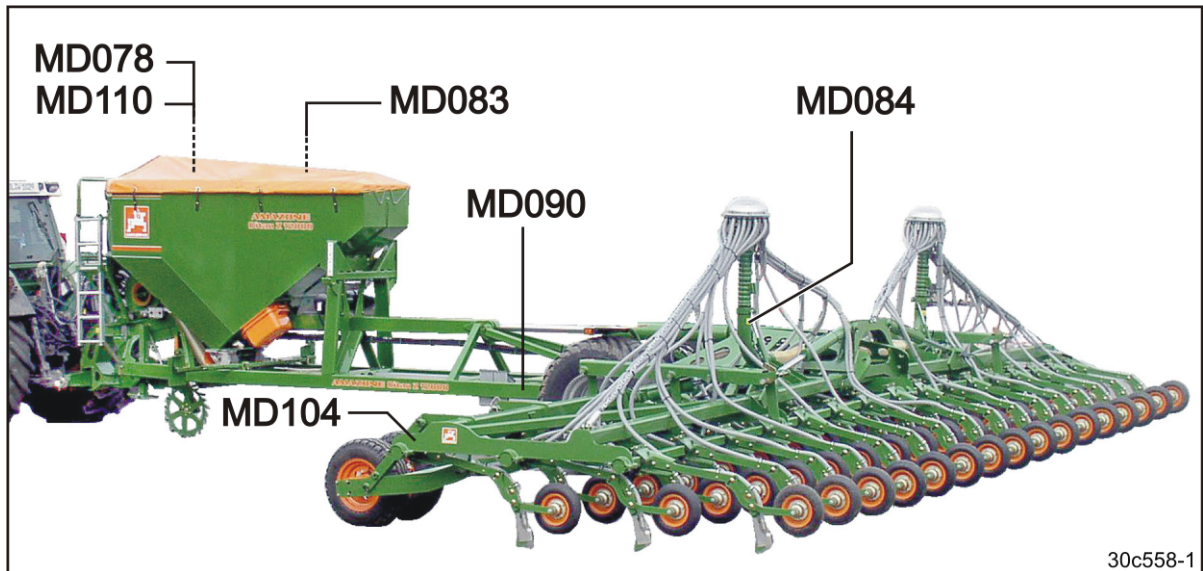


Fig. 1

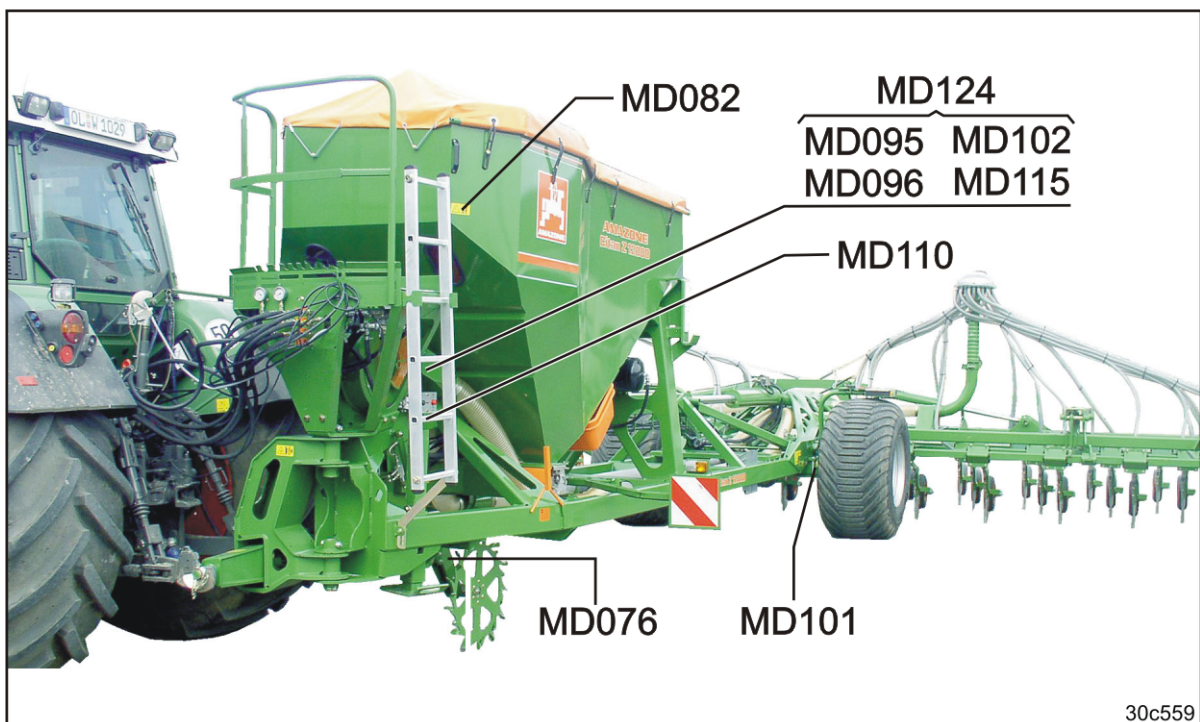


Fig. 2

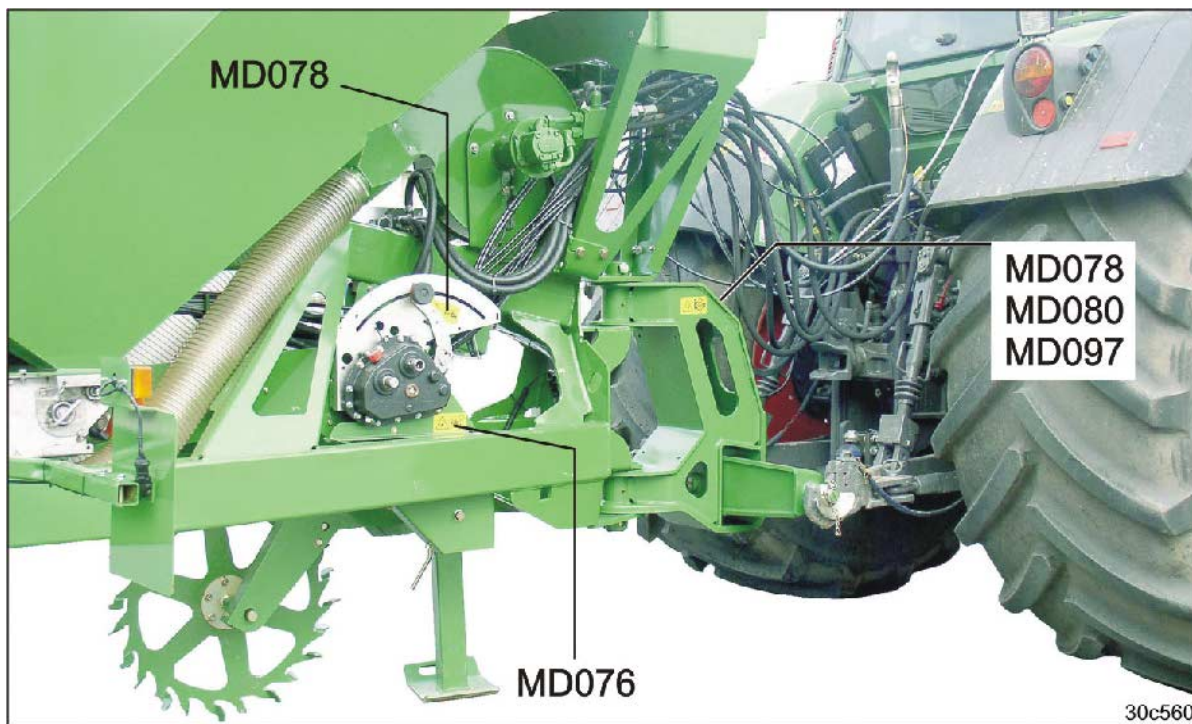


Fig. 3

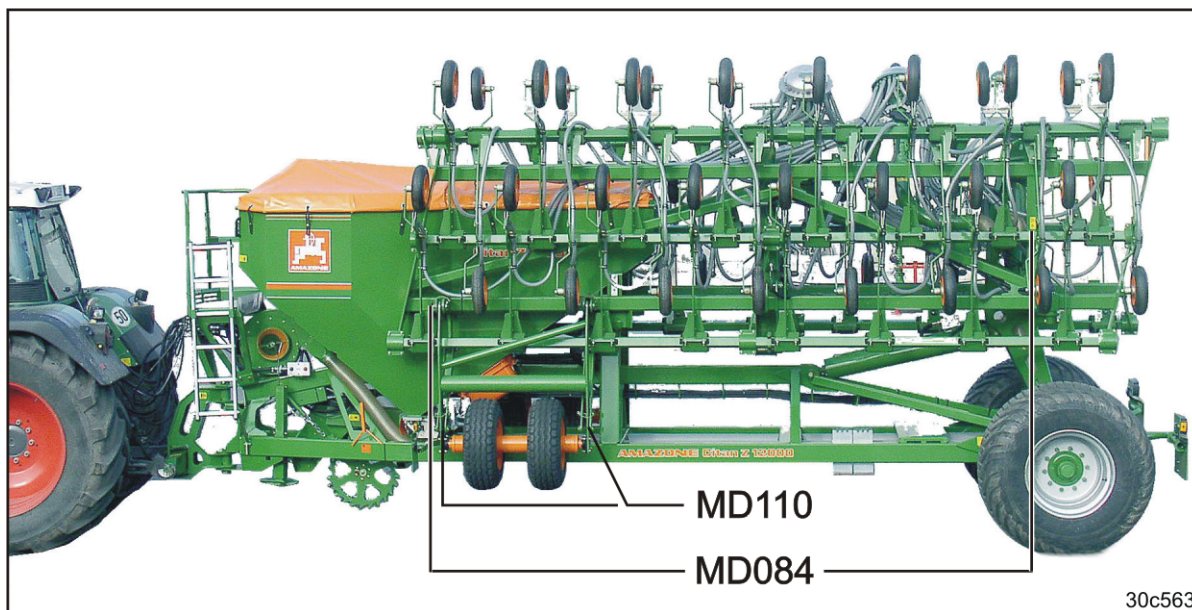


Fig. 4

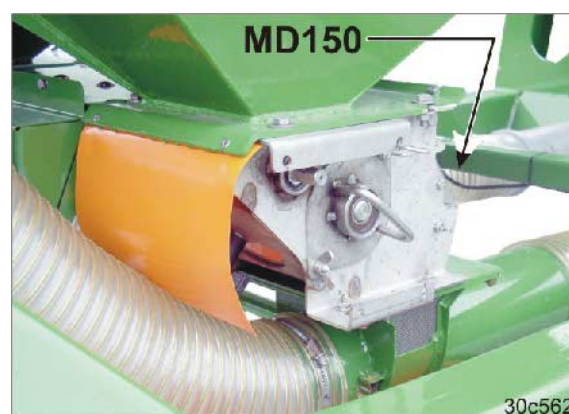


Fig. 5

2.14 Dangers if the safety information is not observed

Nonobservance of the safety information

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

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

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

2.15 Safety-conscious working

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

Comply with the accident prevention instructions on the warning pictograms.

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

2.16 Safety information for users



WARNING

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

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

2.16.1 General safety and accident prevention information

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

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

Connecting and disconnecting the machine

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

Any helpers may only act as guides standing next to the vehicles, and may only move between the vehicles when both are at a standstill.

- Secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is impossible, before connecting the machine to or disconnecting the machine from the tractor's

three-point hydraulic system.

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

Use of the machine

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

Machine transportation

- Comply with the national road traffic regulations when using public highways.
- Before moving off, check:
 - The correct connection of the supply lines.
 - The lighting system for damage, function and cleanliness.
 - The brake and hydraulic system for visible damage.
 - That the tractor parking brake is released completely.
 - The function of the brake system.
- Ensure that the tractor has sufficient steering and braking power.
Any machines and front/rear weights connected to the tractor influence the driving behaviour and the steering and braking power of the tractor.
- If necessary, use front weights.
The front tractor axle must always be loaded with at least 20% of the empty tractor weight, in order to ensure sufficient steering power.
- Always fix the front or rear weights to the intended fixing points according to regulations.
- Comply with the maximum payload of the connected machine

and the approved axle and drawbar loads of the tractor.

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

2.16.2 Hydraulic system

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

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

2.16.3 Electrical system

- When working on the electrical system, always disconnect the battery (negative terminal).
- Only use the prescribed fuses. If fuses are used that are too highly rated, the electrical system will be destroyed – danger 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 danger of explosion!
- Danger of explosion! Avoid the production of sparks and naked flames in the vicinity of the battery!
- The machine can be equipped with electronic components, the function of which may be influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed.
 - In the case of retrofitting of electrical units and/or components on the machine, with a connection to the on-board power supply, the user must check whether the installation might cause faults on the vehicle electronics or other components.
 - Ensure that the retrofitted electrical and electronic components comply with the EMC directive 89/336/EEC in the appropriate version and carry the CE mark.

2.16.4 Attached machines

- Comply with the approved combination options for the attachment equipment on the tractor and the machine drawbar.
Only couple approved combinations of vehicles (tractor and attached machine).
- In the case of single axle machines, observe the maximum permitted drawbar load of the tractor on the attachment equipment.
- Ensure that the tractor has sufficient steering and braking power.
Machines connected to a tractor can influence your driving behaviour, as well as the steering and braking power of the tractor, in particular in the case of single axle machines with the drawbar load on the tractor.
- Only a specialist workshop may adjust the height of the drawbar on yoke bars with a drawbar load.

2.16.5 Brake system

- Only specialist workshops or recognised brake service may carry out adjustment and repair work on the brake system.
- Have the brake system checked regularly.
- If there are any functional faults in the brake system, stop the tractor immediately. Have any malfunctions rectified immediately.
- Before performing any work on the braking system, park the machine safely and secure the machine against unintentional lowering and rolling away (wheel chocks)!
- Be particularly careful when carrying out any welding, burning or drilling work in the area of the brake lines.
- After carrying out any adjusting and repair work on the brake system, always carry out a brake test.

Pneumatic braking system

- Before coupling the machine, clean any dirt on the sealing rings on the hose couplings of the supply and brake lines.
- Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar.
- Drain the air reservoir every day.
- Before driving without the machine, lock the hose couplings on the tractor.
- Hang the hose couplings of the machine supply and brake lines in the appropriate idle couplings.
- When filling up or replacing the brake fluid, use the prescribed fluid. When replacing the brake fluid, comply with the appropriate regulations.
- Do not make any changes to the specified settings on the brake valves!
- Replace the air reservoir if:
 - The air reservoir can be moved in the tensioning belts.
 - The air reservoir is damaged.
 - The rating plate on the air reservoir is rusty, loose or missing.

Hydraulic braking system for export machines

- Hydraulic brake systems are not approved in Germany.
- When filling up or replacing the brake fluid, use the prescribed hydraulic fluids. When replacing the hydraulic fluids, comply with the appropriate regulations.

2.16.6 Tyres

- Repair work on tyres and wheels may only be carried out by specialists with suitable installation tools.
- Check the air pressure at regular intervals.
- Inflate tyres to the specified air pressure. If the air pressure in the tyres is too high, then there is a risk of explosions!
- Park the machine in a safe place and lock the machine against unintentional falling and rolling (parking brake, wheel chocks), before carrying out work on the tyres.
- Tighten or retighten all the fixing screws and nuts in accordance with the specifications of **AMAZONEN-WERKE!**

2.16.7 Operation of the seed drill

- Observe the permissible filling quantity of the seed hopper.
- Only use the steps and the platform when filling the seed hopper.
It is forbidden to ride on the machine during operation!
- During the calibration test, note the danger points from rotating and oscillating machine parts.
- Do not place any parts in the seed hopper.

2.16.8 Cleaning, maintenance and repairs

- Only carry out cleaning, maintenance and repair work on the machine when:
 - The drive is switched off.
 - The tractor engine is at a standstill.
 - The ignition key has been removed.
 - The machine's connector 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 machine and/or raised machine parts against unintentional lowering before performing any cleaning, maintenance or repair work on the machine!
- When replacing work tools with blades, use suitable tools and gloves.
- Dispose of oils, greases and filters in the appropriate way.
- Disconnect the cable to the tractor generator and battery, before carrying out electrical welding work on the tractor and on attached machines.
- Spare parts must meet at least the specified technical requirements of **AMAZONEN-WERKE**! This is ensured through the use of original **AMAZONE** spare parts.

3 Loading and unloading

**DANGER**

It is forbidden to transport the machine on a transport vehicle.

The permitted transport height of 4.0 m is exceeded when loading the machine onto a transport vehicle.

4 Product description

This section:

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

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

4.1 Overview of subassemblies

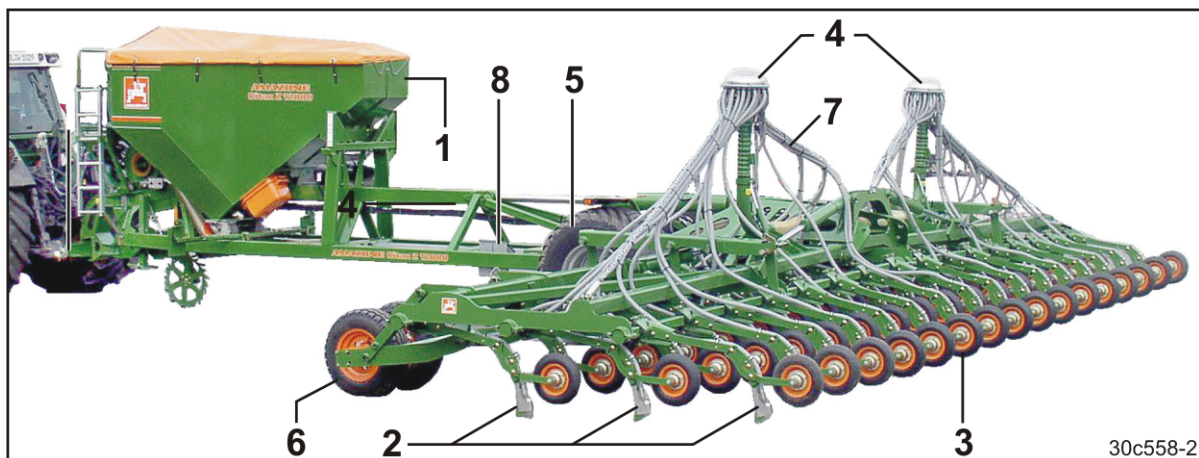


Fig. 6

- | | |
|----------------------------------------------------------------------------------|--------------------|
| (1) Seed hopper | (5) Running gear |
| (2) Chisel | (6) Support wheels |
| (3) Press roller (for maintaining the coulter depth and closing the seed furrow) | (7) Seed hoses |
| (4) Seed distributor head | (8) Wheel chocks |

Fig. 7/...

AMALOG⁺ operator terminal



Fig. 7

Fig. 8/...

- (1) Tensioned crosspiece
- (2) Sustainer, extendable

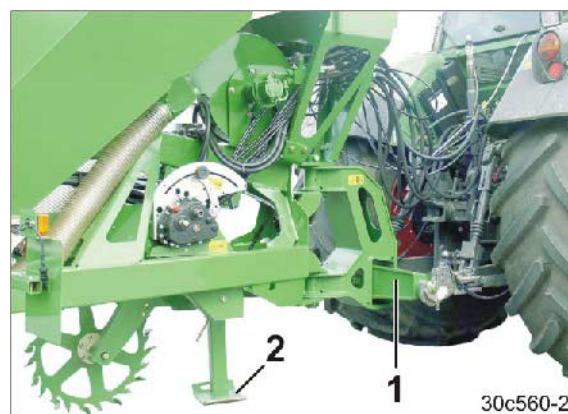


Fig. 8

Fig. 9/...

- (1) Mounting for supply lines

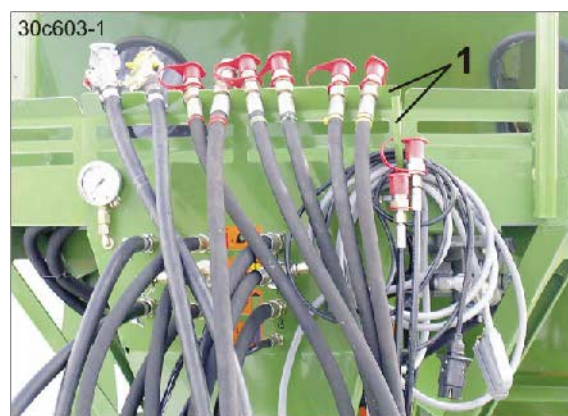


Fig. 9

Product description

Fig. 10/...

- (1) Star wheel
- (2) Loading board with ladder
- (3) Holding point

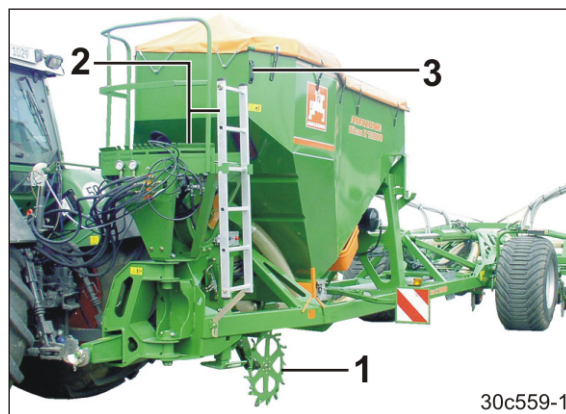


Fig. 10

Fig. 11/...

Chisel

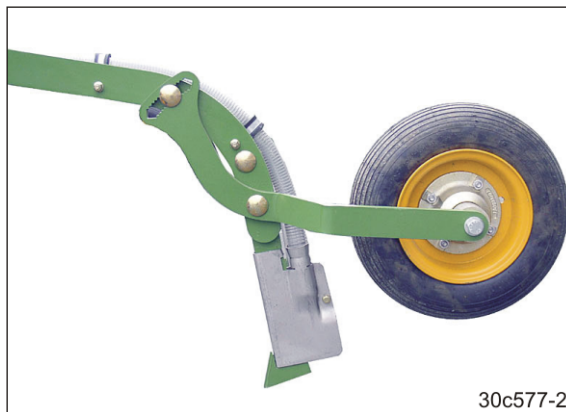


Fig. 11

Fig. 12/...

- (1) Swivelable hopper cover
- (2) Cover hook

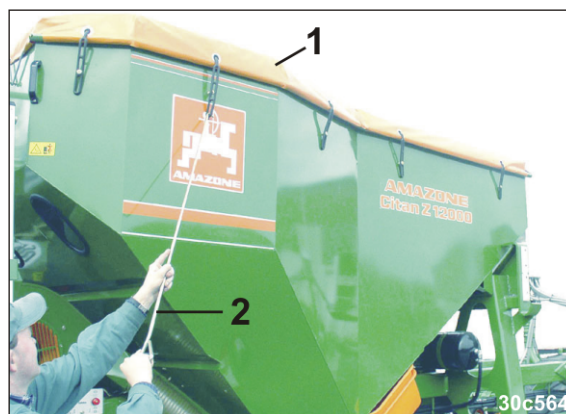


Fig. 12

Fig. 13/...

- (1) Blower fan for conveying seed



Fig. 13

Fig. 14/...

- (1) Vario gearbox

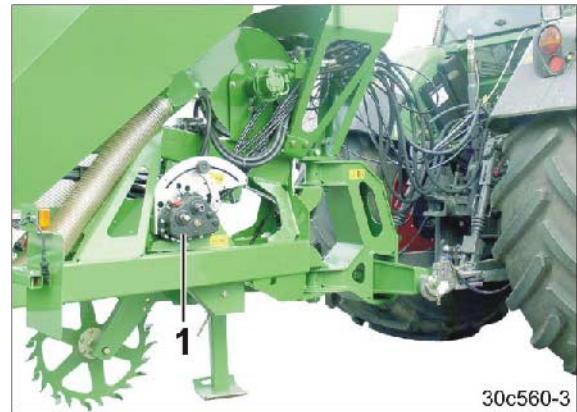


Fig. 14

Fig. 15/...

- (1) Calibration crank (in transport bracket)
- (2) Seed dosing unit with dosing roller
- (3) Injector sluice
- (4) Calibration trough (in mounting for calibration test)

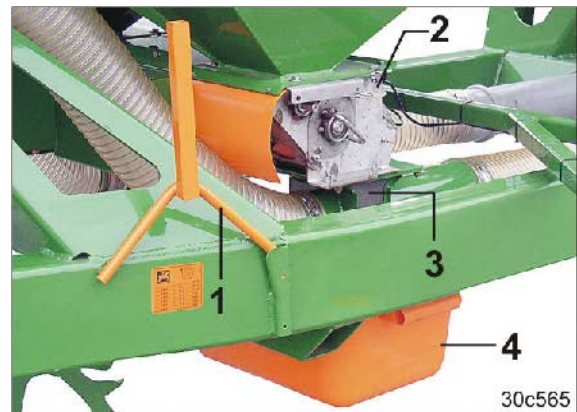


Fig. 15

Fig. 16/...

- (1) Level sensor
(The charging sieve, which is folded up for clarification, remains closed during adjustment tasks.)



Fig. 16

Fig. 17/...

- (1) Brake valve with release valve



Fig. 17

4.2 Safety and protection equipment

Fig. 18/...

- (1) Fan guard



Fig. 18

Fig. 19/...

- (1) Charging sieve
(serves as a guard screen in the hopper)



Fig. 19

Fig. 20/...

- (1) Catch hook
(for locking the machine extension arms during transport)



Fig. 20

4.3 Overview – Supply lines between the tractor and the machine

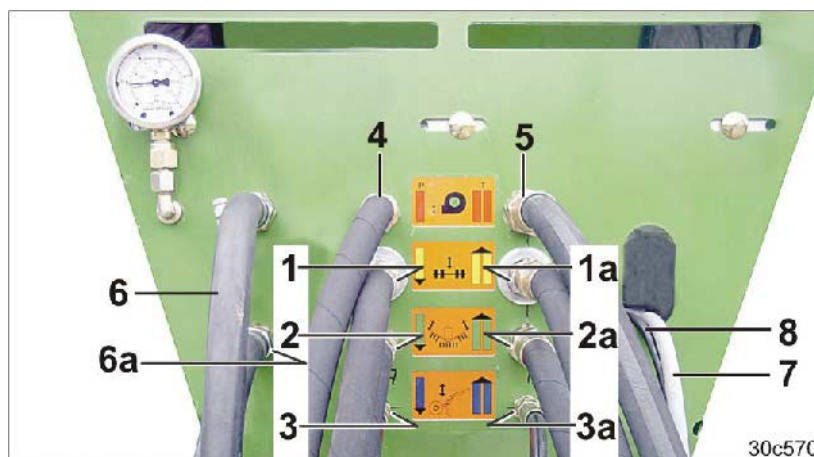


Fig. 21

Tractor side		Machine side (Citan Z)			
		Fig. 21/...	Running direction	Marking	Function
Tractor control unit	1 Double-acting	(1)	Feed line	1 cable tie, yellow	Multifunction <ul style="list-style-type: none"> Lifting / lowering the rear frame Lowering / lifting the star wheel
		(1a)	Return line	2 cable ties, yellow	
	2 Double-acting	(2)	Feed line	1 cable tie, green	Folding the machine wings
		(2a)	Return line	2 cable ties, green	
	3 Double-acting	(3)	Feed line	1 cable tie, blue	Coulter pressure adjustment
		(3a)	Return line	2 cable tie, blue	
	4 Single-acting or double-acting	(4)	Feed line ¹⁾	1 cable tie, red	Hydraulic fan motor
	Pressureless line	(5)	Return line ²⁾	2 cable ties, red	

¹⁾ Pressure hose with priority

²⁾ Pressureless hose (see section "Installation regulations for the hydraulic fan drive connection", on page 88).

Fig. 21/...	Designation	Marking	Function
(6)	Brake line (optional)	Yellow	Dual-circuit pneumatic braking system
(6a)	Supply line (optional)	Red	
(7)	Machine connector		On-board computer AMALOG⁺
(8)	Plug (7-pin)		Road traffic lighting system
No Fig.	Hydraulic brake line (see section 7.1.4, on page 96)		Hydraulic braking system ¹⁾

¹⁾ not permitted in Germany and some other EU countries

4.4 Transportation equipment

Fig. 22/...

- (1) 2 rear-facing warning signs
- (2) 1 speed sign

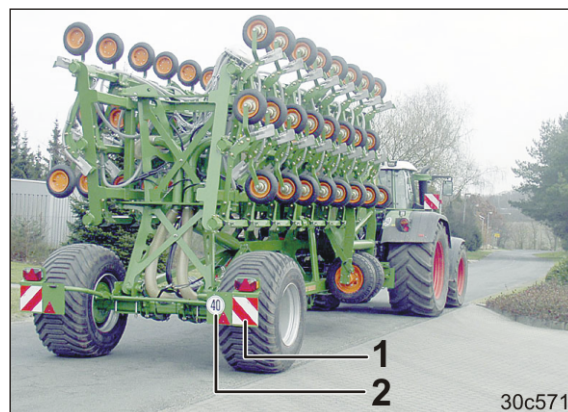


Fig. 22

Fig. 23/...

- (1) 2 rear-facing turn indicators
- (2) 2 reflectors, yellow.
- (3) 2 brake and rear lights
- (4) 2 red reflectors
- (5) 1 light for licence plate
- (6) 2 reflectors, triangular

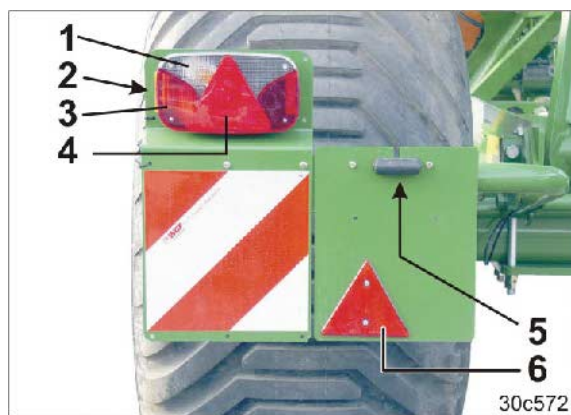


Fig. 23

Fig. 24/...

- (1) 2 forwards-facing warning signs



Fig. 24

Fig. 25/...

- (1) 2 limiting lights pointing forwards
- (2) 2 forwards-facing turn indicators

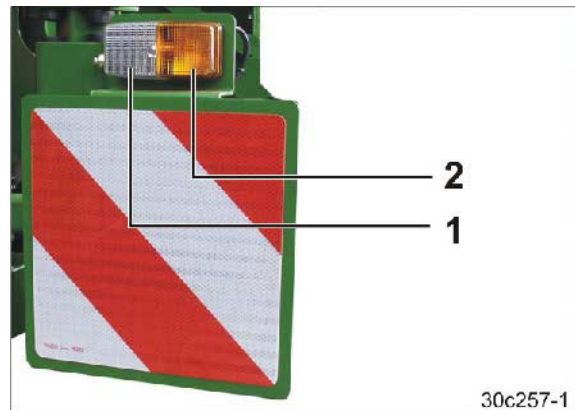


Fig. 25

Fig. 26/...

- (1) 2 x 4 spotlights, yellow,
(laterally with a max. spacing of 3 m)

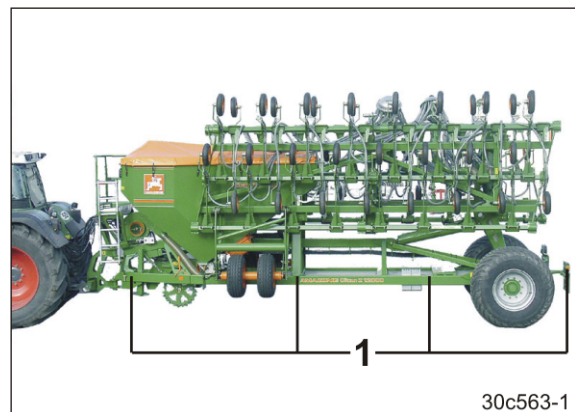


Fig. 26

4.5 Intended use

The machine

- Is designed for metering and placing customary seeds.
- Is coupled to a tractor using the lower tractor links and is operated by an additional person.

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 comprises:

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

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

For any damage resulting from improper use:

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

4.6 Danger area and danger points

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

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

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

No one may stand in the machine danger area:

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

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

Danger points exist:

- Between the tractor and the machine, especially when coupling and uncoupling and when loading the seed hopper.
- In the area of moving parts.
- In the area of the swivelling machine extension arms.
- Underneath raised, unsecured machines or parts of machines.

4.7 Rating plate and CE mark

The following illustrations show the arrangement of the rating plate (Fig. 27/1) and of the CE mark (Fig. 27/2).

The rating plate shows:

- Vehicle ID No.
(Machine ID No.)
- Type
- Year of manufacture
- Basic weight, kg
- Perm. total weight, kg
- Perm. axle load, front / support load, kg
- Perm. axle load, kg
- Permissible system pressure, bar
- Factory

The CE mark (Fig. 28) on the machine signals compliance with the stipulations of the valid EU directives.



Fig. 27



Fig. 28

4.8 Technical Data

Citan Z		12000
Working width	[m]	12.0
Row spacing of the coulter	[cm]	25
Number of sowing units		48
Contents of the seed hopper	[l]	5000
Payload (on field)	[kg]	5000
Working speed	[km/h]	8
Power requirement (from)	[kW/bhp]	170 / 230
Oil flow rate (minimum)	[l/min]	80
Max. hydraulic working pressure	[bar]	200
Electrical system	[V]	12 (7-pin)
Transmission/hydraulic fluid		Transmission/hydraulic fluid Utto SAE 80W API GL4
Coupling point category		Cat. III Cat. IV (optional) Cat. V (optional)
Tyres		700/55-26.5
Continuous acoustic pressure level	[dB(A)]	74
Total length (in working position)	[mm]	11500
Total height (in working position)	[mm]	3300
Maximum drawbar load with full seed hopper (on the field)	[kg]	5000
Service brake system (optional) ¹⁾ (connection to tractor)		Dual-circuit pneumatic braking system

¹⁾ Operation without a brake system is not permitted in Germany and in some other countries.



Product description

Road transport data (only with an empty seed hopper!)

Large area seed drill			Citan Z 12000
Total width (in transport position)		[m]	3.0
Total length (in transport position)		[m]	8.5
Total height (in transport position)		[m]	4.0
Empty weight (basic weight)		[kg]	7800
Permissible total weight		[kg]	8000
Maximum load for road travel		[kg]	200
Rear perm. axle load		[kg]	8000
Perm. drawbar load (F_H) when driving on the road (see rating plate)		[kg]	2000
Permissible max. speed	without a brake system ¹⁾	[km/h]	25
	with a brake system	[km/h]	40

¹⁾ Operation without a brake system is not permitted in Germany and in some other countries.

4.9 Conformity

Directives / standards

The machine fulfils the:

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

4.10 Necessary tractor equipment

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

Tractor engine power

Citan Z 12000 From 170 kW (230 bhp) upwards

Electrical system

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

Hydraulic system

Maximum operating pressure: 200 bar

Tractor pump capacity: At least 80 l/min at 150 bar

Machine hydraulic fluid: Transmission/hydraulic fluid Utto SAE 80W API GL4

The machine hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.

Control unit 1: Double-acting control unit

Control unit 2: Double-acting control unit

Control unit 3: Double-acting control unit

Control unit 4:

- 1 single-acting or double-acting control unit with priority control for the feed line
- 1 unpressurised return flow with a large plug coupling (DN 16) for the pressure-free oil return flow. In the return flow the banking-up pressure must be 10 bar at the maximum.

Service brake system

- Dual-circuit pneumatic braking system:
 - 1 hose coupling (red) for the supply line
 - 1 hose coupling (yellow) for the brake line

4.11 Noise production data

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

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.

5 Structure and function

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

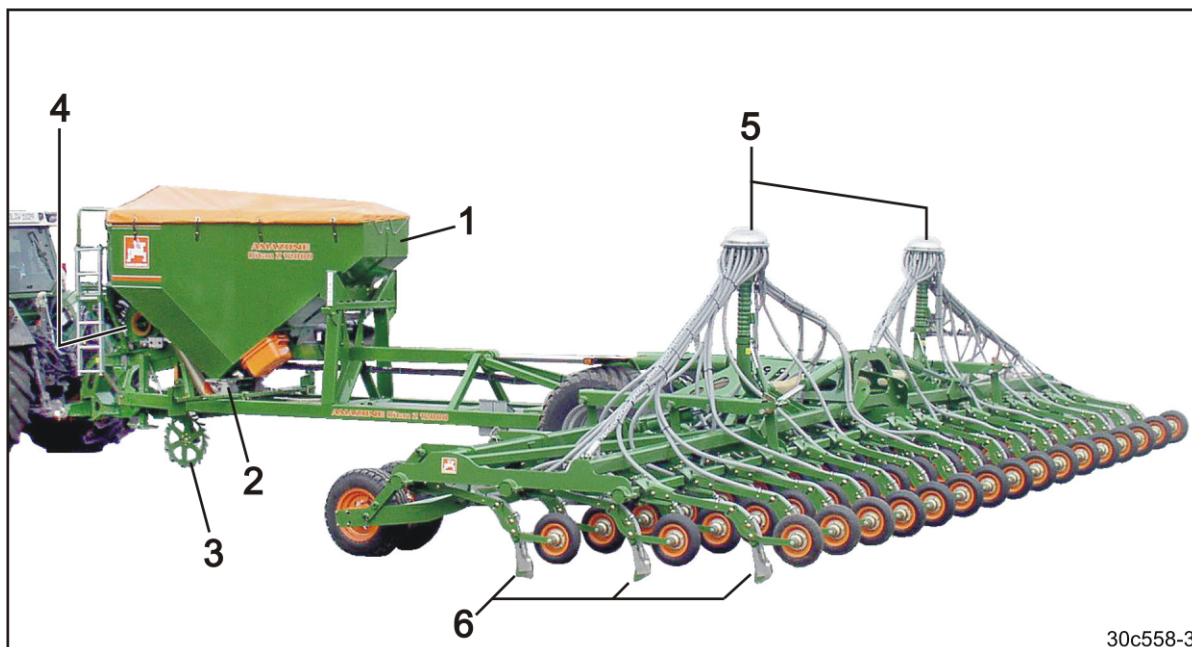


Fig. 29

The **Citan Z** enables direct sowing.

The seed is carried in the seed hopper (Fig. 29/1).

The pre-set seed volume passes from the seed dosing unit (Fig. 29/2), which is driven by a star wheel (Fig. 29/3), into the air stream generated by the fan (Fig. 29/4).

The air stream conveys the seed to the distributor head (Fig. 29/5), which distributes the seed uniformly onto all the chisels (Fig. 29/6).

For seed placement, the "on grip" chisels push into the soil. Thereby the chisels, supported by the trailing press rollers, keep the seed placement depth constant. The seed placement depth is adjustable.

The chisel optimises sowing accuracy, area efficiency and service life.

The machine can be folded up to a transport width of 3 m.

5.1 Hydraulic hose lines



WARNING

Danger of infection from escaping hydraulic fluid at high pressure!

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

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

5.1.1 Coupling the hydraulic hose lines



WARNING

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

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



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

1. Swivel the actuation lever on the spool valve on the tractor to float position (neutral position).
2. Clean the hydraulic connectors of the hydraulic hose lines before you couple the hydraulic hose lines to the tractor.
3. Connect the hydraulic hose line(s) to the tractor control unit(s).



Fig. 30

5.1.2 Uncoupling the hydraulic hose lines

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

**Fig. 31**

5.2 Dual-circuit pneumatic braking system

The dual-circuit pneumatic braking system operates on two brake cylinders, which actuate the brake shoes in the brake drums.

The tractor must also be equipped with a dual-circuit pneumatic braking system.

The dual-circuit pneumatic braking system has:

- A supply line (Fig. 32/1) with coupling head (red).
- A brake line (Fig. 32/2) with coupling head (yellow).

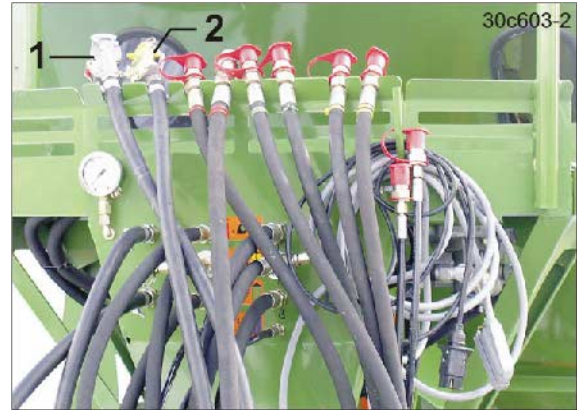


Fig. 32

- A trailer brake valve (Fig. 33/1)



Fig. 33

When operating the tractor brake pedal and the tractor parking brake, the service brake system responds to the machine.

When detaching the supply line (red) from the tractor, the service brake system automatically acts on the machine like a parking brake.

When coupling the supply line (red) to the tractor, the parking brake automatically releases, as soon as the operating pressure has built up and the tractor's parking brake has released.



Compliance with the maintenance intervals is essential for the correct function of the brake system.

5.2.1 Coupling the brake and supply lines



WARNING

Risk of contusions, cuts, dragging, catching or knocks from incorrectly functioning brake system.

- When coupling the brake and supply line, ensure that:
 - The sealing rings of the hose couplings are clean.
 - The sealing rings of the hose couplings form a proper seal.
- Always replace damaged seals immediately.
- Drain the air reservoir before the first journey each day.
- Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar.



WARNING

Risk of contusions, cuts, dragging, catching or knocks from unintentionally rolling machine with the operating brake released!

Always couple the hose coupling of the brake line (yellow) first, followed by the hose coupling of the supply line (red).

The operating brake of the machine moves out of the brake position immediately the red hose coupling has been coupled.

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Open the covers (Fig. 34/1) of the hose couplings on the tractor.
3. Check the sealing rings on the hose coupling for damage and cleanliness.
4. Clean the dirty sealing rings and replace any damaged sealing rings.
5. Fasten the hose coupling of the brake line (yellow) in compliance with regulations in the coupling marked yellow (Fig. 34/2) on the tractor.

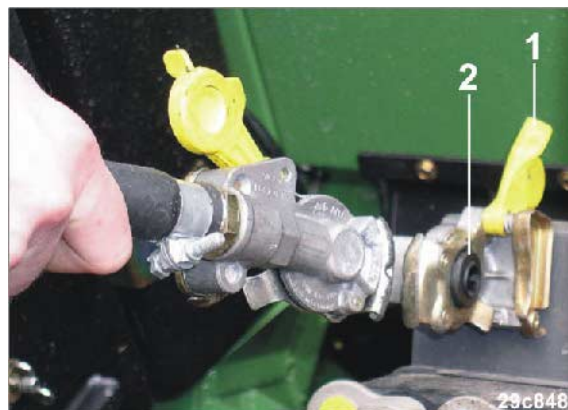


Fig. 34

6. Remove the hose coupling of the supply line (red) from the idle coupling.
 7. Check the sealing rings on the hose coupling for damage and cleanliness.
 8. Clean the dirty sealing rings and replace any damaged sealing rings.
 9. Fasten the hose coupling of the supply line (red) in the coupling marked red on the tractor in accordance with regulations.
- The black button gets pushed out when coupling the supply line (red).
- If the tractor parking brake
- o Is applied, then the machine's service brake is also applied.
 - o Is released, then the machine's service brake is also released.


DANGER

In an emergency, pull the red button (Fig. 35/1) to brake the machine.

The machine has no braking effect if the tractor parking brake is released when the supply line (red) is connected.



Fig. 35

5.2.2 Uncoupling the supply and brake lines



DANGER

First secure the machine with the wheel chocks before you uncouple the machine from the tractor!



WARNING

Risk of contusions, cuts, dragging, catching or knocks from unintentionally rolling machine with the operating brake released!

Always uncouple the hose coupling of the supply line (red) first followed by the hose coupling of the brake line (yellow).

The service brake of the machine moves into the braking position when the supply line (red) is uncoupled from the tractor.

Always keep to this order, as otherwise the service brake system will trip and may set the unbraked machine moving.

1. Secure the machine against unintentionally rolling away. For this, use the tractor parking brake and the wheel chocks.
2. Release the hose coupling (Fig. 36) of the supply line (red).
3. Release the hose coupling of the brake line (yellow).
4. Fasten the hose couplings in the idle coupling points.
5. Close the covers of the coupling heads on the tractor.



Fig. 36

5.2.3 Control elements of the dual-circuit pneumatic braking system



DANGER

Never release the parking brake of the uncoupled machine on a slope.

The machine is automatically braked after releasing the supply line (red).

If the machine must be manoeuvred (on a level surface only) after being uncoupled from the tractor, e.g. during a stay in a specialist workshop, you can actuate the dual-circuit pneumatic braking system with the control elements (Fig. 37).

To do so, the compressed air tank must be filled. If the compressed air tank is empty, the parking brake cannot be released using the control elements.

To release the parking brake:

Push in the black button (Fig. 37/1), e.g. for manoeuvring the uncoupled machine on a level surface.

To apply the parking brake:

Pull the black button (Fig. 37/1).



Do not actuate the red button (Fig. 37/2). It is always pulled out.



Fig. 37



When coupling the supply line (red) to the tractor, the parking brake automatically releases and the black button (Fig. 37/1) is automatically pulled out of the fitting, as soon as the operating pressure has built up.

5.3 Hydraulic service brake system

To control the hydraulic service brake system, the tractor requires hydraulic braking equipment.

5.3.1 Coupling the hydraulic service brake system



Only couple clean hydraulic couplings.

1. Remove the protective cap (Fig. 39/1).
2. If necessary, clean the hydraulic connectors (Fig. 38) and hydraulic socket.
3. Connect the hydraulic socket on the machine face with the hydraulic connector on the tractor face.



Fig. 38

5.3.2 Uncoupling the hydraulic service brake system

1. Unlock the hydraulic connectors from the hydraulic sockets.
2. Secure the hydraulic connectors and hydraulic socket with protective caps (Fig. 39/1) against soiling.
3. Place the hydraulic hose line in the holder for the supply lines.

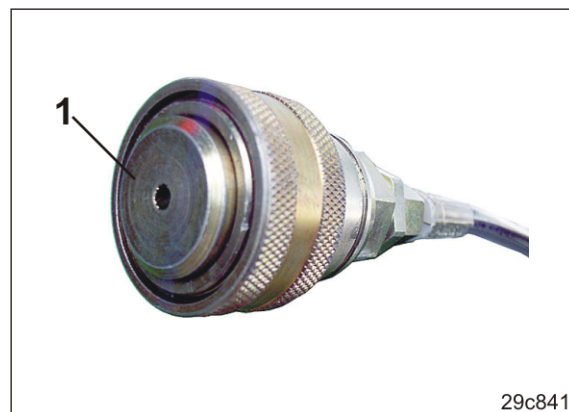


Fig. 39

5.4 Operating terminal **AMALOG⁺**

The **AMALOG⁺** consists of the operator control terminal (Fig. 40), the basic equipment (cable and fastening material) and the job computer on the machine.

Secure the operating terminal in the tractor cab using the operating manual **AMALOG⁺**.



Fig. 40

The **AMALOG⁺** (Fig. 40)

- Is intended for entering machine-specific data before beginning work.
- Measures the covered part area [ha].
- Saves the total area cultivated [ha].
- Indicates the travel speed [km/h].
- Triggers an alarm when the set minimum seed volume in the seed hopper is reached.
- Indicates the current blower fan speed.
- Triggers an alarm if the blower fan speed deviates from the target value.

5.5 Frame and machine extension arms

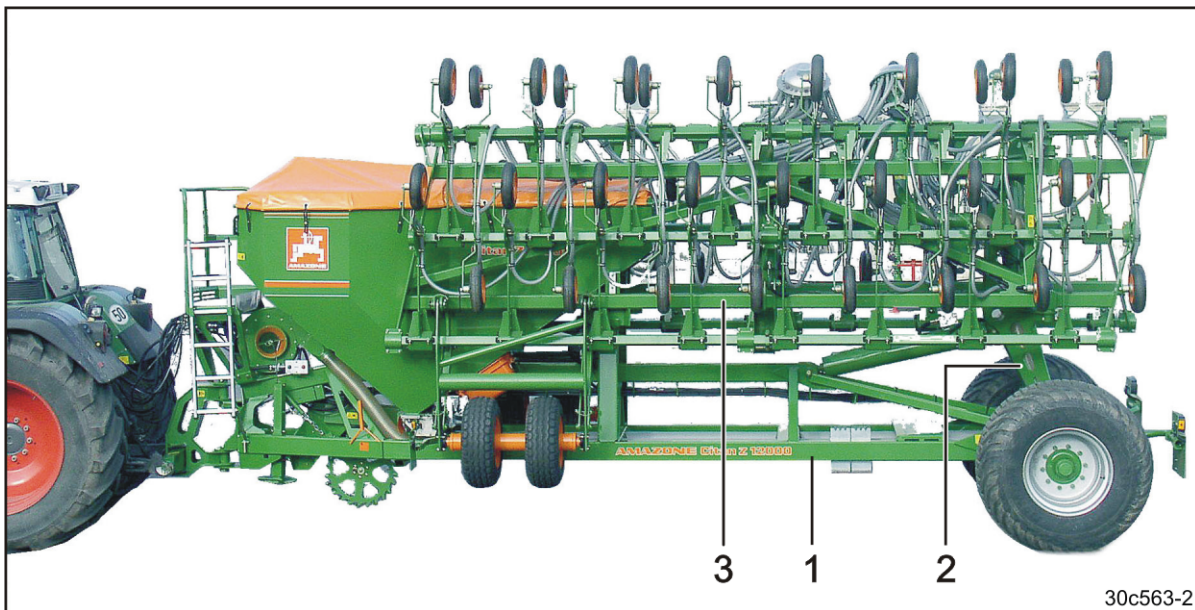


Fig. 41

The machine has

- A main frame (Fig. 41/1) with integrated running gear and seed hopper.
- A foldable rear frame (Fig. 41/2).
 - Which raises the coulter before turning at the end of the field.
 - Which is nearly vertical before the machine extension arms are folded in.
- Two machine extension arms which can be folded in for transport (Fig. 41/3).

5.6 Seed hopper

The seed hopper (Fig. 42/1) is well accessible for filling, calibrating and residue draining.

The shape of the seed hopper ensures an unobstructed view of the tools during the work.

The full area opening of the seed hopper enables rapid filling.



Fig. 42

The hopper cover (Fig. 43/1) protects the seed being carried from rainwater.

The rubber loops (Fig. 43/2) secure the hopper cover against unintentional opening during travel.

The cover hook (Fig. 43/3) is intended for releasing and attaching the rubber loops.

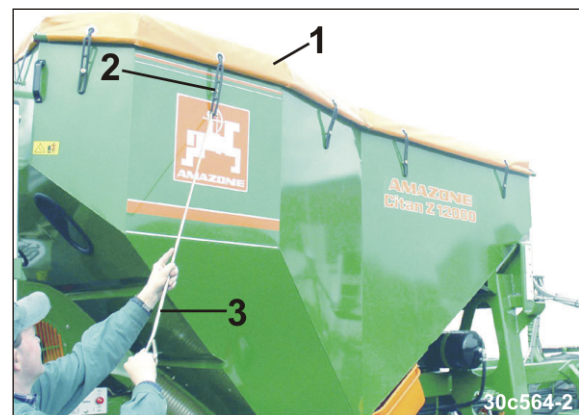


Fig. 43

When not in use, the cover hook (Fig. 44/1) remains inserted in the holder (Fig. 44/2) of the stand.



Fig. 44

5.6.1 Digital fill level monitoring (optional)

The level sensors monitor the seed level in the seed hopper. The number of level sensors equals the number of dosing units.

If the seed level reaches a level sensor,

- The control character marks (Fig. 45/1) the fill level symbol in the **AMALOG⁺**.
- An alarm signal sounds.
This alarm signal is intended to remind the tractor driver to fill up the seeds again.

The residual seed volume should be large enough to avoid fluctuations in the spread rate.

The height of the level sensor can be adjusted (Fig. 46/1) in the seed hopper. The residual seed volume can be set, at which the warning message and the alarm signal is to be emitted.

You can only adjust the height of the level sensor when the seed hopper is empty.

A level sensor is installed above each seed dosing unit. Fasten the level sensors at the same height.

The guard screen not visible in the figure (Fig. 46) is folded up for illustration. Do not fold up the guard screen for adjusting the level sensor.

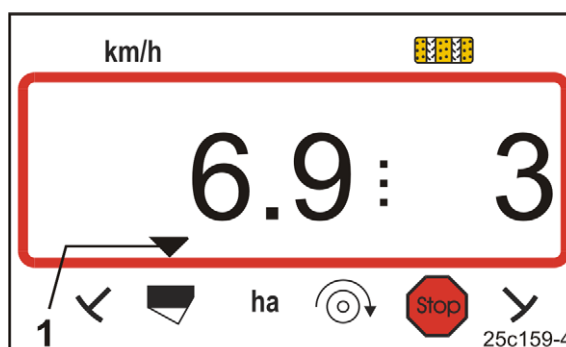


Fig. 45



Fig. 46



The level sensor must not rest against the hopper wall!

5.7 Seed dosing and injector sluice

The dosing unit (Fig. 47/1) doses the required seed volume.

Each dosing unit is equipped with a dosing roller (see section "Dosing rollers", on page 66). The dosing roller is driven by the star wheel via the Vario gearbox.

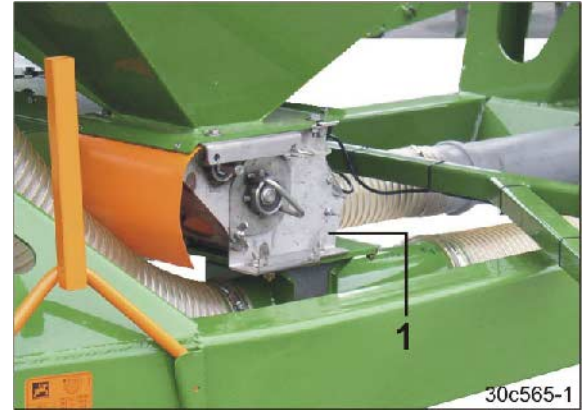


Fig. 47

The seed falls out of the dosing unit into the injector sluice (Fig. 48) and is directed by the air flow to the distributor head and then to the coulters.

For the calibration test and for emptying, the seed falls through an opening in the floor of the injector sluice. A slide element closes the opening. The slide element is actuated with a lever (Fig. 48/1). Ensure that the lever engages when opening and closing.

The machine has two injector sluices.

The opening in the floor of the injector sluice is closed when

- The lever (Fig. 48/1) of the left injector sluice points in the direction of travel to the left.
- The lever of the right injector sluice points in the direction of travel to the right.

Note:

The left-side injector sluice is pictured.

Lever position (Fig. 48/1): Closed

Lever position (Fig. 48/2): Open

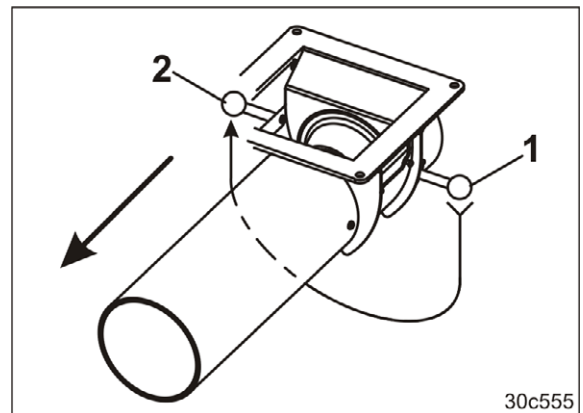


Fig. 48

5.7.1 Dosing rollers

The seed dosing unit is equipped with an exchangeable dosing roller. The dosing roller selection is dependent on

- The seed type.
- The spread rate.

The dosing rollers are used on the basis of the table (section 5.7.2, on page 67):

- Fine dosing roller (Fig. 49/1) for fine seeds.
- Medium dosing roller (option, Fig. 49/2) for medium-sized seeds with medium spread rates.
- Coarse dosing roller (Fig. 49/3) for coarse seeds and high spread rates.

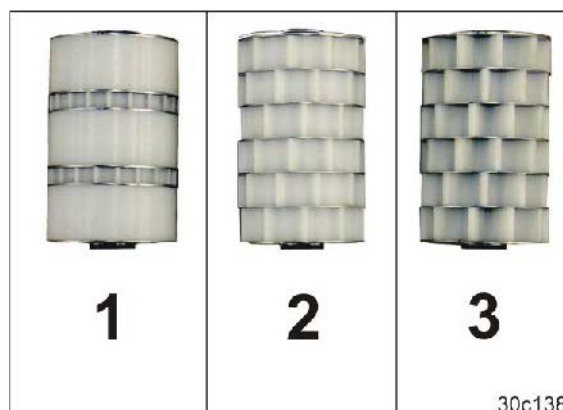


Fig. 49

For sowing particularly large seeds, e.g. beans, the chambers (Fig. 50/1) of the coarse dosing roller can be enlarged by repositioning the wheels and the plates.

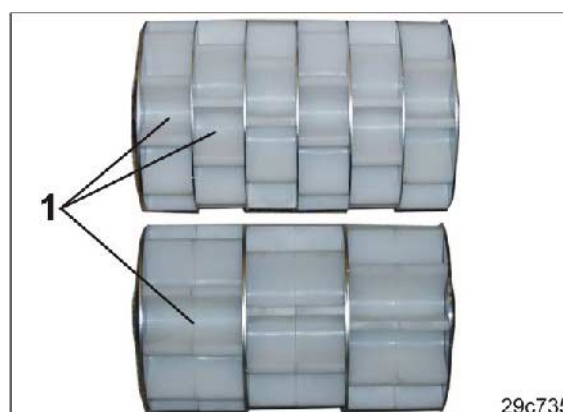


Fig. 50

5.7.2 Table Seed dosing rollers

Seed	Dosing roller	Seed	Dosing roller
Spelt wheat	Coarse dosing roller	Rapeseed	Fine dosing roller
Oats	Coarse dosing roller	Caraway	Fine dosing roller
Rye	Coarse dosing roller or medium dosing roller	Red clover	Fine dosing roller
Summer barley	Coarse dosing roller	Mustard	Medium dosing roller or fine dosing roller
Winter barley	Coarse dosing roller	Soya	Medium dosing roller
Wheat	Coarse dosing roller or medium dosing roller	Sunflowers	Medium dosing roller
Beans	Coarse dosing roller	Turnips	Fine dosing roller
Peas	Coarse dosing roller	Vetches	Medium dosing roller
Flax (dressed)	Medium dosing roller or fine dosing roller		
Grass seed	Medium dosing roller		
Millet	Medium dosing roller		
Lupins	Medium dosing roller		
Lucerne	Medium dosing roller or fine dosing roller		
Linseed (wet dressed)	Medium dosing roller or fine dosing roller		
Fodder radish	Medium dosing roller or fine dosing roller		
Phacelia	Medium dosing roller or fine dosing roller		

Fig. 51



The requisite dosing roller is dependent on the seed type and spread rate, see the table (Fig. 51, above).

For seed not listed in the table select the dosing roller of one of the seed types listed in the table of a similar grain size.

5.7.3 Seed rate adjustment at Vario gearbox

The sowing rate required is set using the gearbox lever (Fig. 52/1) of the Vario gearbox.

Adjusting the gearbox lever changes the sowing rate. The higher the number the gearbox lever points to on the scale (Fig. 52/2), the greater the sowing rate.

Carry out a calibration test to determine whether the gearbox lever is correctly set and whether the sowing rate is correct in later sowing.

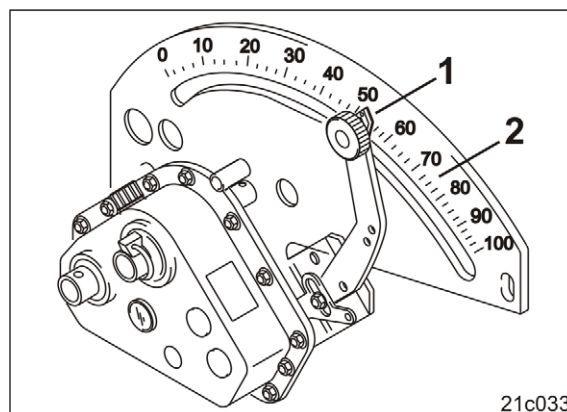


Fig. 52

A number of calibration tests are often necessary to determine the correct gearbox setting.

The gearbox setting can be calculated from the values of the first calibration test using the calculating disc rule. Always check the value determined on the calculating disc rule with a further calibration test.

The calculating disc rule has three scales

- An outer white scale (Fig. 53/1) for all sowing rates over 30 kg/ha.
- An inner white scale (Fig. 53/2) for all sowing rates below 30 kg/ha.
- A coloured scale (Fig. 53/3) with all gearbox settings from 1 to 100.

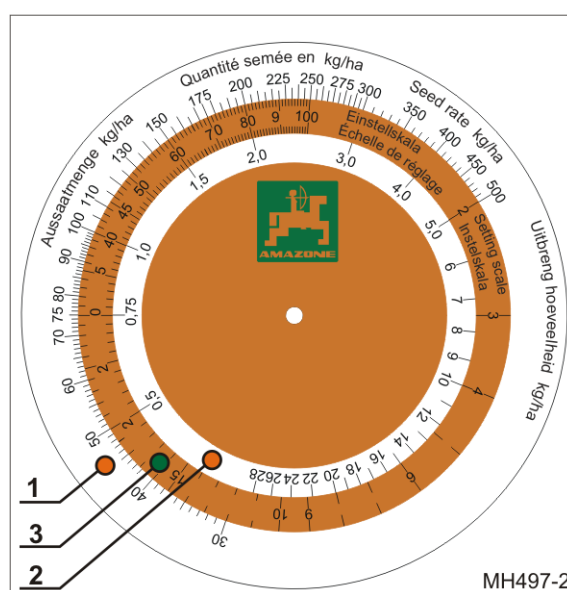


Fig. 53

5.7.4 Calibration test

The calibration test checks whether the pre-set and actual sowing rates are equivalent.

Always carry out a calibration test:

- When the seed type is changed.
- If the seed type is identical, but grain size, grain shape, specific weight and dressing are different.
- After exchanging the dosing rollers.
- If the actual sowing rate does not match the sowing rate that was measured by the calibration test.

The seed incurred in the calibration test drops into the calibration troughs.

The number of calibration troughs equals the number of dosing units.

The calibration troughs are nested for transport and fastened to the rear wall of the hopper secured with a lynch pin (Fig. 54/1).



Fig. 54

The calibration crank (Fig. 55/1) is in the parking position in the transport bracket.



Fig. 55

5.8 Blower fan

The hydraulic motor (Fig. 56/2) drives the blower fan (Fig. 56/1) and generates an air current. The air current conveys the seed from the injector sluice to the coulters.

The blower fan speed determines the air volume of the air current.

The higher the blower fan speed, the greater is the air volume generated.

Please refer to the table (Fig. 58, on page 71) for the requisite blower fan speed.

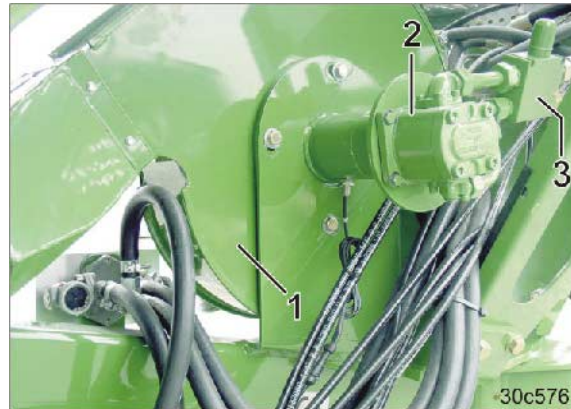


Fig. 56

The blower fan speed can be regulated:

- Via the tractor's flow control valve or (if not present)
- Via the pressure relief valve (Fig. 56/3) of the hydraulic motor.

The **AMALOG⁺** (Fig. 57) indicates the blower fan speed and triggers an alarm if there is deviation.

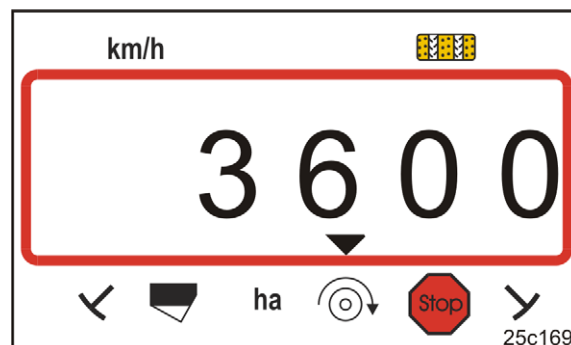


Fig. 57

The blower fan speed (rpm) is dependent on

- The machine working width (1).
- The seed.
 - Fine seed types (2), e.g. rape or grass seed.
 - Grain and pulses (3).

Example:

Citan Z 12000

- Working width 12.0 m (1).
- Cereal seed (3).

Required blower fan speed: 3900 rpm.





<div>  <p>max. 4000 1/min</p> </div>				
				
3,0 / 3,5 m			2800	3500
4,0 / 4,5 m			3000	3800
5,0 / 6,0 m			3200	3900
8,0 / 9,0 / 12,0 m			3200	3900
ME752			1/min	1/min
1			2	3

Fig. 58



DANGER

Do not exceed the maximum blower fan speed of 4000 rpm.



The blower fan speed alters until the hydraulic fluid has reached its working temperature.

On initial operation correct the blower fan speed up to attainment of the working temperature.

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

5.8.1 Distributor head

In the distributor head (Fig. 59/1) the seed is distributed uniformly over all the sowing coulters.

A seed dosing unit always supplies one distributor head.

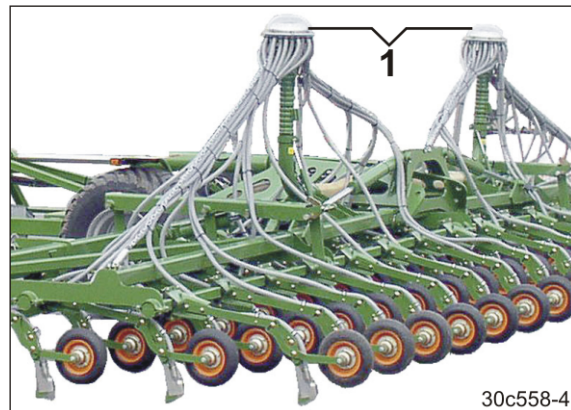


Fig. 59

5.9 Star wheel

The star wheel (Fig. 60/1) drives the dosing rollers via the Vario gearbox.

The distance covered is measured via the star wheel. The **AMALOG+** requires this data to calculate the drive speed and area cultivated (hectare counter).



Fig. 60

The star wheel controls the creation of the tramlines.

The tramline counter indexes approx. 5 seconds after each upswing of the star wheel, e.g. before turning at the end of the field.

5.10 Chisel and coulter pressure

The chisel optimises sowing accuracy, area efficiency and long service life.

For seed placement, the "on grip" chisels (Fig. 61/1) push into the soil. Thereby the chisels, supported by the trailing press rollers (Fig. 61/2), keep the adjustable seed placement depth constant.

Adjusting the trailing press rollers (Fig. 61/2) by one tooth in the toothed segment (Fig. 61/3) corresponds to a change of placement depth by approx. 10 mm.

The maximum placement depth is 8 cm.

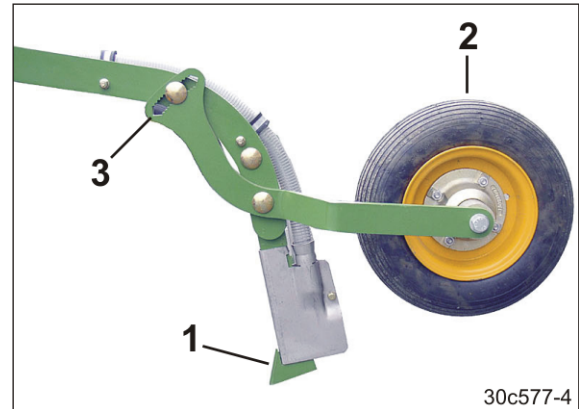


Fig. 61



The seed planting depth depends on these factors:

- The position of the trailing press roller.
- The condition of the soil.
- The coulter pressure.
- Working speed.

Coulter pressure

Decrease the coulter pressure on light soils so that the trailing press roller (Fig. 61/2) does not penetrate too deeply into the soil.

Increase the coulter pressure on heavy soils to the press the seed furrow through the trailing press roller.

Fig. 62

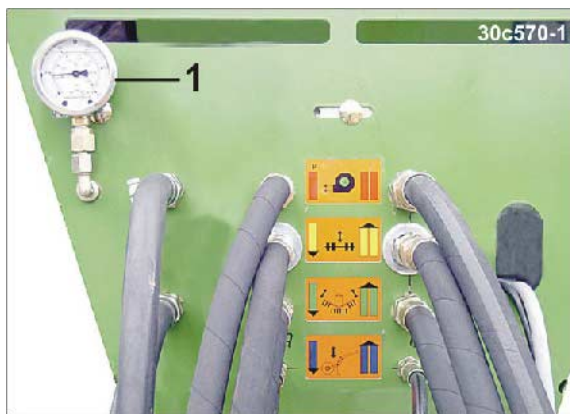


Fig. 63



Fig. 64

The coulters pressure is displayed

- By the pressure gauge (Fig. 63/1).
- On the coulters pressure scale.

Adjust the required coulters pressure (see Fig. 62) using tractor control unit 3.

Individual coulters can, e.g. in the packed tractor track, work with increased coulters pressure (optional).

Coulters with increased coulters pressure are recognisable by a second bearing plate (Fig. 65/2) that is screwed to the adjusting rail next to the coulters bearing (Fig. 65/1) and a plate (Fig. 65/3) that joins both bearing plates.

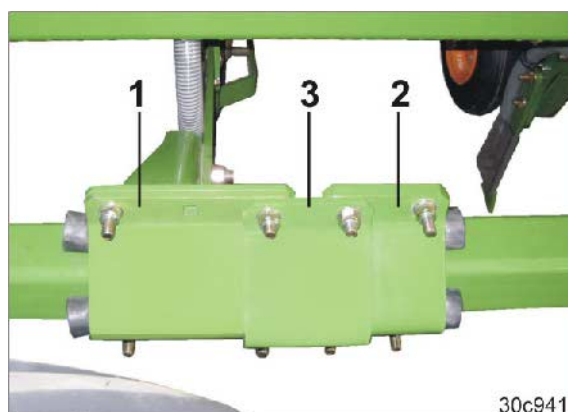


Fig. 65

5.11 Creation of tramlines

The tramline control allows the creation of tramlines at preselected intervals on the field. To set the different tramline distances, appropriate tramline rhythms have to be entered into the on-board computer¹⁾.

¹⁾ **AMALOG+**

When creating the tramlines:

- The tramline control on the distributor head uses shutters (Fig. 66/1) to block the seed feeding lines to the seed lines (Fig. 66/2) of the tramline coulter.
- The tramline coulter does not deposit any seeds on the ground.

Seed supply to the tramline coulter is interrupted as soon as the electric motor (Fig. 66/3) closes the appropriate seed tubes (Fig. 66/2) in the distributor head.

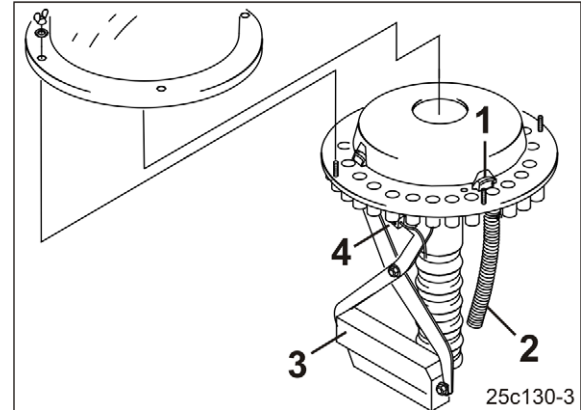


Fig. 66

Upon creating a tramline, the tramline counter indicates the number "0" on the on-board computer¹⁾.

A sensor (Fig. 66/4) checks whether the shutters (Fig. 66/1), which open the and close the seed tubes (Fig. 66/2), are working properly.

If the setting is wrong, the on-board computer¹⁾ emits an alarm.

¹⁾ **AMALOG+**

The tramline control allows the creation of tramlines at preselected intervals on the field.

Tramlines are seed-free tracks (Fig. 67/A) for fertilising and plant care machines used later.

The tramline spacing (Fig. 67/b) corresponds to the working width of the care machines (Fig. 67/B), e.g. fertiliser spreader and/or field sprayer, which are used on sown fields.

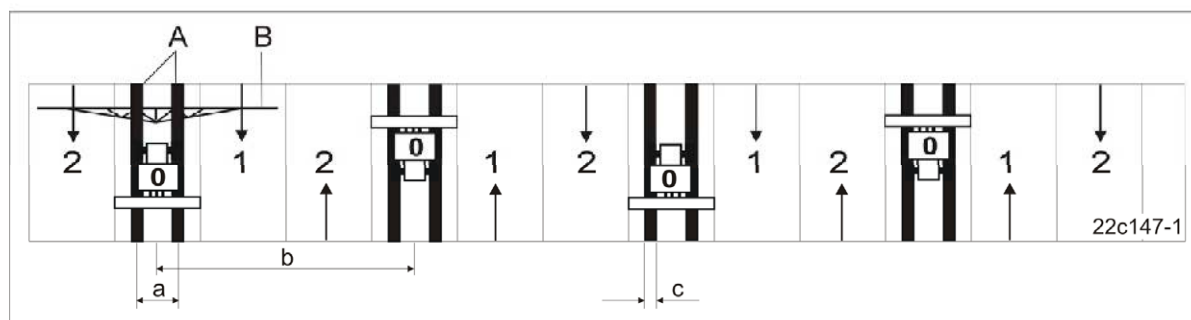


Fig. 67

To set the different tramline spacings (Fig. 67/b), appropriate tramline rhythms must be entered on the on-board computer¹⁾.

The figure (Fig. 67) shows the tramline rhythm 3. During work, the field runs are numbered consecutively (tramline counter) and displayed on the on-board computer¹⁾.

In tramline rhythm 3, the tramline counter shows the field runs in the following order: 2-0-1-2-0-1-2-0-1...etc.

Upon creating a tramline, the tramline counter indicates the number "0" on the on-board computer¹⁾.

The required tramline rhythm (see table Fig. 68) is derived from the required tramline spacing and the working width of the seed drill. Further tramline rhythms can be seen in the operating manual of the on-board computer¹⁾.

The track width (Fig. 67/a) of the tramline corresponds to that of the cultivating tractor and is adjustable [see chapter "Setting the tramline to the track width of the cultivating tractor", on page 165].

The track width (Fig. 67/c) of the tramline increases with an increasing number of tramline coulters fitted next to each other.

¹⁾ **AMALOG+**

Tramline rhythm	Seed drill working width	
	9.0 m	12.0 m
	Tramline spacing (working width of the fertiliser spreader and field sprayer)	
1	18 m	24 m
3	27 m	36 m
4	36 m	48 m

Fig. 68

5.11.1 Examples for creating tramlines

The creation of tramlines is shown in Figure (Fig. 69) using various examples:

A = Working width of the seed drill.

B = Tramline spacing
(= working width of fertiliser spreader / field sprayer).

C = Tramline rhythm (input on the on-board computer¹⁾).

D = Tramline counter (during work, the field runs are numbered consecutively and displayed on the on-board computer¹⁾).

Perform any inputs and outputs with the aid of the operating manual of the on-board computer¹⁾.

Example:

Working width
of seed drill: 12 m.

Working width,
fertiliser spreader or
field sprayer: 36 m = 36 m tramline spacing.

1. In the adjacent table (Fig. 69) look for the following:
in column A the seed drill's working width (12 m) and
in column B the tramline spacing (36 m).
2. On the same line in column "C", take the reading for the tramline rhythm (tramline rhythm 3) and enter this on the on-board computer¹⁾.
3. On the same line in column "D" under the inscription "START", take the reading of the tramline counter for the first field run (tramline counter 2) and enter it on the on-board computer¹⁾. Input this value directly before commencing the first field run.

¹⁾ **AMALOG+**

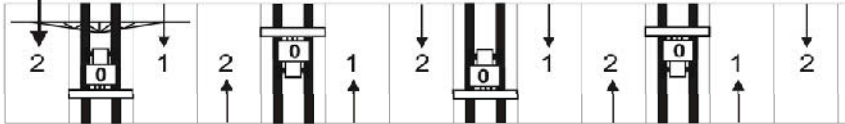
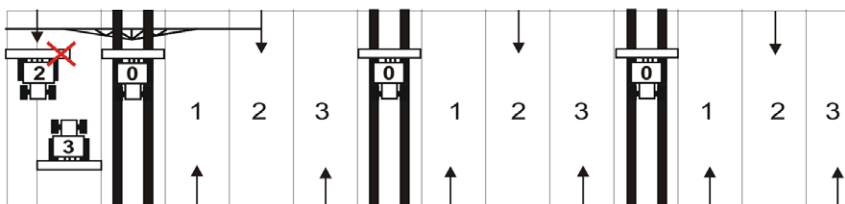
A	B	C	D											
			<div>START DÉPART</div> <div>25c131-4</div>											
9,0 m 12,0 m	27,0 m 36,0 m	3												
9,0 m 12,0 m	36,0 m 48,0 m	4												

Fig. 69

5.11.2 Tramline rhythm 4

Figure (Fig. 69) shows examples for creating tramlines with tramline rhythm 4.

It shows work with the seed drill at half width (part width section) during the first field run.

During work with part width section switched off, the drive of the appropriate dosing roller is interrupted (see section "Half-sided switching off (part width section)", on page 79).

Another option for creating tramlines with tramline rhythm 4 is to begin with the full working width and the creation of a tramline (see Fig. 70).

In this case, the care machine works at half working width during the first field run.

After the first field run, reset the full machine working width!

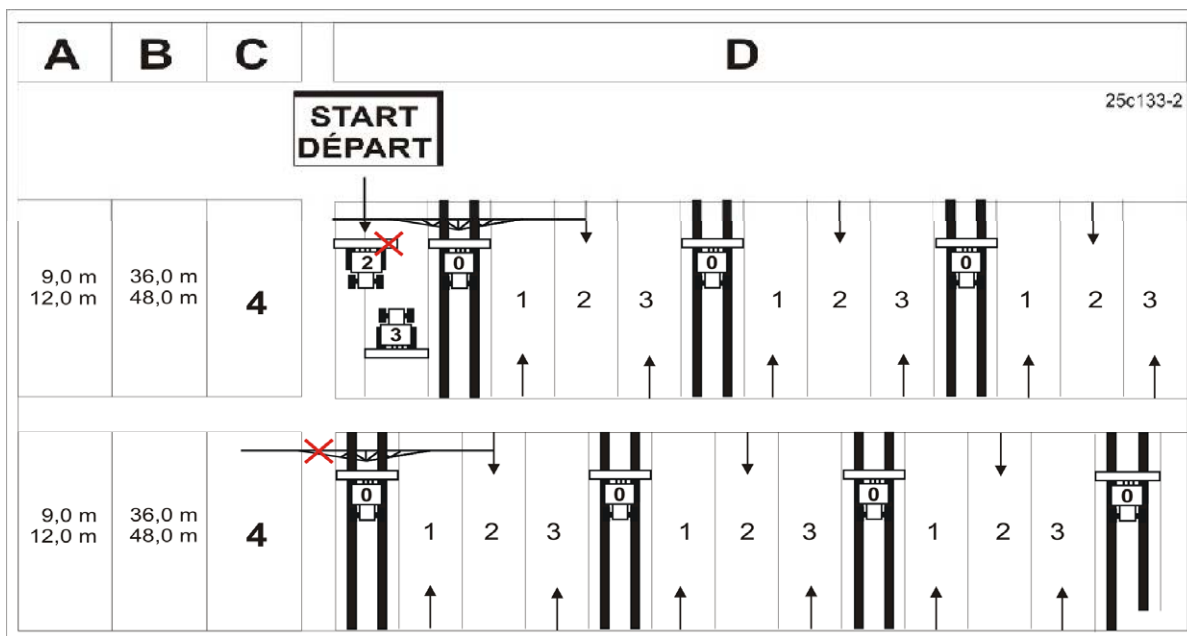


Fig. 70

5.11.3 Half-sided switching off (part width section)

With certain tramline rhythms it is necessary to start the sowing operation at the start of the field initially only at half the working width (part width section).

The seed supply to the coulters of the machines can be cut out on one side by means of two distributor heads (Fig. 71/1).

On seed drills with two distributor heads

- One distributor head supplies seed to the sowing coulters of one half of the machine.
- The seed dosing of one half of the machine (part width section) can be switched off (see section "Half-sided switching off", on page 112).

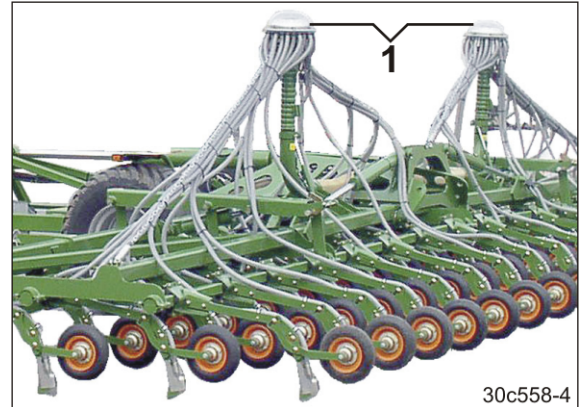


Fig. 71

6 Commissioning

This section contains information

- On initial operation of your machine.
- On checking how you may attach the machine to your tractor.



- Before operating the machine for the first time the operator must have read and understood the operating manual.
- Take heed of section "Safety information for users", from on page 28 onwards on
 - connecting and disconnecting the machine
 - transporting the machine
 - using the machine
- Only couple and transport the machine to/with a tractor which is suitable for the task.
- The tractor and machine must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.



WARNING

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

Do not block the operator controls on the tractor which are used for hydraulic and electrical movements of components, e.g. folding, swivelling and pushing movements. The movement must stop automatically when you release the appropriate control. This does not apply to equipment movements that:

- are continuous or
- are automatically locked or
- due to their function require a float position or pressure position.

6.1 Checking the suitability of the tractor



WARNING

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

- Check the suitability of your tractor before you attach or hitch the machine to the tractor.
You may only connect the machine to tractors suitable for the purpose.
- Carry out a brake test to check whether the tractor achieves the required braking delay with the machine connected.

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

- The permissible total weight
- The approved axle loads
- The approved drawbar load at the tractor coupling point
- The load capacity of the installed tyres
- The approved trailer load must be sufficient

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

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

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

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



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

- tractor's empty weight
- ballast weight and
- total weight of the attached machine or drawbar load of the hitched machine.



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 approved total weight, then a survey by an officially recognised motor traffic expert can, with the approval of the tractor manufacturer, be used as a basis for the responsible authority to issue an exceptional approval according to § 70 of the German Regulations Authorising the Use of Vehicles for Road Traffic and the required approval according to § 29, paragraph 3 of the German Road Traffic Regulations.

6.1.1.1 Data required for the calculation (hitched machine)

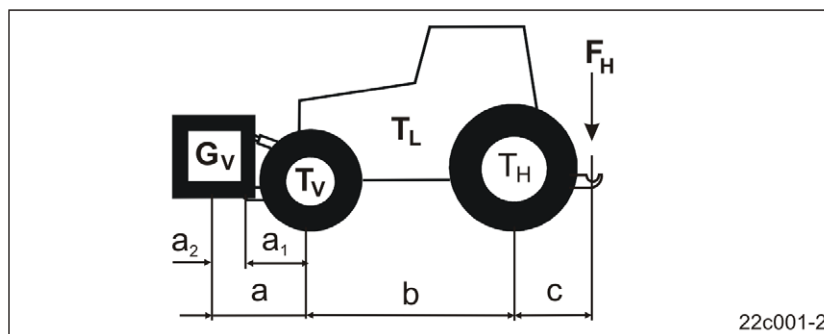


Fig. 72

T_L	[kg]	Tractor empty weight	See tractor operating manual or vehicle documentation.
T_V	[kg]	Front axle load of the unladen tractor	
T_H	[kg]	Rear axle load of the unladen tractor	
G_V	[kg]	Front weight (if available)	See front weight in technical data, or weigh.
F_H	[kg]	Maximum drawbar load	See section "Technical Data", on page 49.
a	[m]	Distance between the centre of gravity of the front machine mounting or the front weight and the centre of the front axle (total $a_1 + a_2$)	See technical data of tractor and front machine mounting or front weight or measurement.
a_1	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement.
a_2	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front-mounted machine or front weight (centre of gravity distance)	See technical data of front machine mounting or front weight or measurement.
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement.
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement.

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

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

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

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

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

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

6.1.1.4 Calculation of the actual total weight of the combined tractor and machine

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

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

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

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

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

6.1.1.6 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 6.1.1.7).

6.1.1.7 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 actually calculated values must be less than or equal to (≤) the permissible values!


WARNING

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

It is forbidden to couple the machine to the tractor used as the basis for calculation, if

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



You must use a front weight, which is equal to at least the required minimum front ballast ($G_{V \min}$).

6.1.2 Requirements for tractor operation with attached machines

**WARNING**

Risk of breakage during operation of components through un-approved combinations of connecting equipment!

Ensure:

- that the connection device on the tractor has a sufficient permissible drawbar load for the drawbar load actually in question
- that the axle loads and weights of the tractor altered by the drawbar load are within the approved limits. If necessary, weigh them.
- that the static actual rear axle load of the tractor does not exceed the permissible rear axle load
- that the permissible total weight of the tractor is complied with
- that the approved load capacities of the tractor tyres are not exceeded.

6.1.3 Machines without their own brake system

The machine is not permitted in Germany or in several other countries without its own brake system.

**WARNING**

Risk of contusions, cuts, dragging, catching or knocks from insufficient tractor brake power.

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

If the machine does not possess its own brake system:

- Then the actual tractor weight must be greater than or equal to (\geq) the actual weight of the connected machine.
- The maximum forward speed is 25 km/h.

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



WARNING

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

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

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

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

- While the machine is being driven.
- As long as the tractor engine is running with a connected hydraulic system.
- If the ignition key is inserted in the tractor and the tractor engine can be started unintentionally with the hydraulic system connected.
- If the tractor and machine have not each been prevented from unintentionally rolling away by applying their parking brakes and/or securing them with wheel chocks.
- If moving parts are not blocked against unintentional movement.

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

1. Park the tractor with the machine on firm flat ground only.
 2. Lower any raised, unsecured machine 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.
 6. Secure the machine with wheel chocks against unintentionally rolling away.

6.3 Installation regulations for the hydraulic fan drive connection

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

- Connect the hydraulic coupling of the pressure hose (Fig. 73/5) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling of the return flow hose (Fig. 73/6) only to an unpressurised tractor connection with direct access to the hydraulic fluid tank (Fig. 73/4).
In order that the banking-up pressure of 10 bar is not exceeded, do not connect the return flow hose to a tractor control unit.
- For retrofitting of the tractor return flow hose, use only piping with DN 16, e.g. 20 id. x 2.0 mm with a short return path to the hydraulic fluid tank.

The output of the tractor's hydraulic pump must be at least 80 l/min. at 150 bar.

Fig. 73/...

- (A) On the machine face
(B) On the tractor face
- (1) Hydraulic fan motor
 $N_{max.} = 4000 \text{ rpm.}$
 - (2) Filter
 - (3) Single-acting or double-acting control unit
with priority
 - (4) Hydraulic fluid tank
 - (5) Feed line:
pressure hose with priority
(marking: 1 cable tie, red)
 - (6) Return line:
unpressurised line with "large" plug coupling
(marking: 2 cable ties, red)

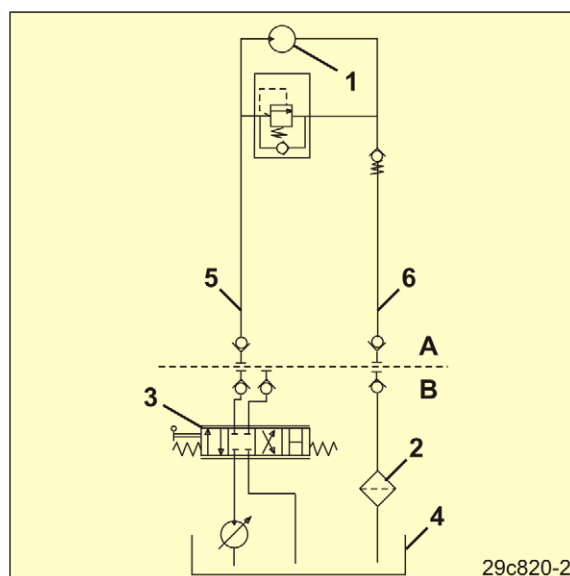


Fig. 73



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. 73/4) 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.

7 Coupling and uncoupling the machine



When coupling and uncoupling the machine take heed of the section "Safety information for users", on page 28.



WARNING

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

Secure the tractor and machine against unintentional start-up and rolling away before entering the danger area between the tractor and machine to couple or uncouple the machine. On this subject see section 6.2, on page 87.



WARNING

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

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

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

7.1 Coupling the machine



WARNING

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

You may only connect the machine to tractors suitable for the purpose. On this subject see the section "Checking the suitability of the tractor", on page 81.



WARNING

Risk of contusions when coupling the machine and standing between the tractor and the machine!

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

Any helpers may only act as guides standing next to the tractor and the machine, and may only move between the vehicles when both are at a standstill.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks when the machine unexpectedly releases from the tractor!

- Use the intended equipment to connect the tractor and the machine in the proper way.
- When coupling the machine to the tractor's three-point hydraulic system, ensure that the linkage categories of the tractor and the machine are the same.



WARNING

Risk of energy supply failure between the tractor and the machine through damaged supply lines!

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

- Must give slightly without tension, bending or rubbing on all movements of the connected machine.
- May not scour other parts.



DANGER

If the tractor has been separated from the machine, always

- Secure the machine with the service parking brake as well as 2 wheel chocks.
- Always secure the machine with 4 wheel chocks if it has no brake system!



DANGER

The lower link of the tractor must not have any lateral play so that the machine always runs centrally behind the tractor and does not knock back and forth!



CAUTION

Do not make any machine connections until the tractor and machine are coupled, the tractor motor is shut down, the tractor parking brake applied and the ignition key removed!

Do not connect the supply line (red) of the service brake to the tractor until the tractor motor is shut down, the tractor parking brake is applied and the ignition key is removed!



The machine can be coupled or uncoupled whether it is folded in or out.

**WARNING**

Do not remove the wheel chocks until the machine is connected to the tractor's lower links and the tractor parking brake is applied.

1. Verify that the machine is secured with wheel chocks (Fig. 74/1).

**Fig. 74**

2. Fasten each ball sleeve (Fig. 75/1) with collecting tray above the lower link pins (cat. III) of the drawbar and secure them with a clip pin.

The balls sleeves are dependent on the tractor type (see tractor operating manual).

**Fig. 75****CAUTION**

Danger of getting crushed in the area of the moving tensioned crosspiece.

3. Open the tractor lower link securing device, i.e. it must be ready for coupling.
 4. Align the lower link hooks so that they are flush with the hinging points of the machine.
 5. Direct people out of the danger area between the tractor and machine before you approach the machine with the tractor.
 6. Drive the tractor in reverse up to the machine so that the lower link hooks of the tractor automatically pick up the ball sleeves of the machine.
→ The lower link hooks lock automatically.
 7. Check whether the securing device of the tractor's lower link locking system is closed and secured (see tractor's operating manual).
 8. Lift the tractor's lower link until the sustainer (Fig. 76/1) is free of the ground.
 9. Secure the tractor against unintentional starting and unintentional rolling away.
 10. Check whether the universal joint shaft of the tractor is switched off.
 11. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
 12. Connect the supply lines to the tractor (see section 7.1.1 to 7.1.3, from on page 94).
13. Hold the sustainer (Fig. 76/1) tight and remove the positioning bolt (Fig. 76/2).
 14. Push up the sustainer by the handle (Fig. 76/1) and position it with the positioning bolt.
 15. Secure the positioning bolt with the lynch pin provided.



Fig. 76



Check the route of the supply lines.

The supply lines

- must easily give way to all movements in bends without tensioning, kinking or rubbing
- may not scour other parts.

16. Check the function of the braking and lighting system.
17. Stow the wheel chocks in the mountings and secure them with spring tensioners (Fig. 77/1).
18. Before commencing a run, perform a braking test.



Fig. 77

7.1.1 Connecting the hydraulic joints



Clean the hydraulic couplings before connecting them to the tractor. Minor oil impurities from particles can cause a failure of the hydraulic system.

Tractor side		Machine side (Citan Z)				
		Fig. 21/...	Running di- rection	Marking	Function	
Tractor control unit	1 Double-acting	Hydraulic line	(1)	Feed line	1 cable tie, yellow	Multifunction <ul style="list-style-type: none">Lifting / lowering the rear frameLowering / lifting the star wheel
			(1a)	Return line	2 cable ties, yellow	
	2 Double-acting		(2)	Feed line	1 cable tie, green	Folding the machine wings
			(2a)	Return line	2 cable ties, green	
	3 Double-acting		(3)	Feed line	1 cable tie, blue	Coulter pressure adjustment
			(3a)	Return line	2 cable tie, blue	
	4 Single-acting or double-acting		(4)	Feed line ¹⁾	1 cable tie, red	Hydraulic fan motor
			(5)	Return line ²⁾	2 cable ties, red	
Pressureless line						

¹⁾ Pressure hose with priority

²⁾ Pressureless hose (see section "Installation regulations for the hydraulic fan drive connection", on page 88).



- During work the tractor control unit 1 is actuated more frequently than any other control units. Assign the connections of control unit 1 to an easily reachable control unit in the tractor cab.
- Tractors with constant pressure hydraulic systems are designed only conditionally for the operation of hydraulic motors. Take heed of the recommendations of the tractor manufacturer.

7.1.2 Connecting the electrical connections

Connection/function	Installation information
Plug (7-pin) for the road traffic lighting system	
Machine connector AMALOG⁺	Connect the plugs to the terminal as described in the AMALOG⁺ operating manual.

7.1.3 Connecting the dual-circuit pneumatic braking system

Couple the brake and supply lines up to the tractor (see section "Coupling the brake and supply lines", on page 56).

Tractor connection		Function
Connection	Marking	
Brake line	Yellow	Dual-circuit pneumatic braking system
Supply line	Red	



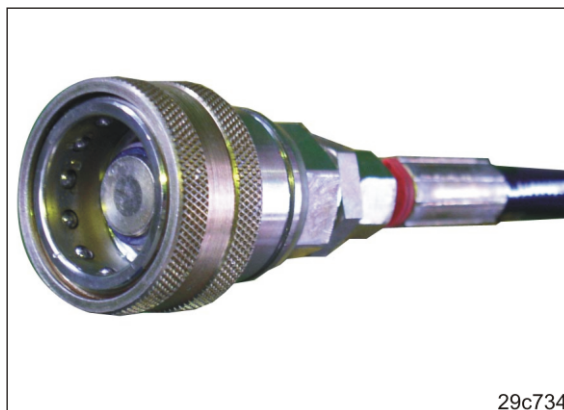
Couple to the tractor

- first of all the yellow coupling head (brake line),
- then the red coupling head (supply line).

7.1.4 Connecting the hydraulic service brake system

Required on the tractor face is a hydraulic braking device that drives the hydraulic braking system of the Cirrus (not allowed in Germany and several other EU countries).

Connect the hydraulic brake connection (Fig. 78) to the tractor's hydraulic brake connection.



29c734

Fig. 78



Check the hydraulic joint for cleanliness before coupling.



DANGER

Check the routing of the brake line. The brake line must not chafe on foreign parts.

7.2 Uncoupling the machine



WARNING

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

Set the empty machine down on a horizontal parking area with a firm base.



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

1. Align the tractor and machine so that they are straight on a horizontal parking surface with a firm substrate.
2. Fold the machine completely in or out.
3. Switch off the **AMALOG⁺**.
 - 3.1 Press the (Fig. 79/1) button.
4. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

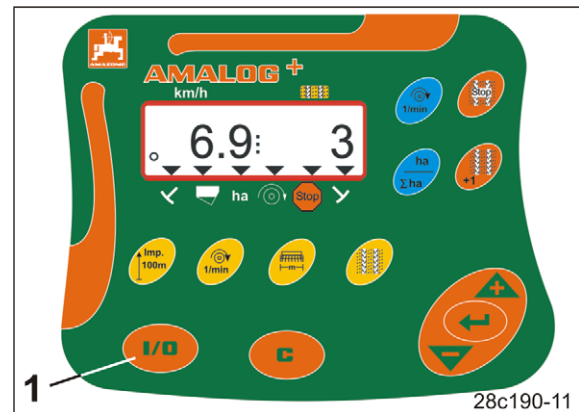


Fig. 79

5. Hold the sustainer (Fig. 80/1) tight and remove the positioning bolt (Fig. 80/2).
6. Lower the sustainer and pin it with the positioning bolt provided.
7. Secure the positioning bolt with the lynch pin provided.



Fig. 80

Coupling and uncoupling the machine

8. Remove the wheel chocks from the transport bracket(s).
 - 8.1 Release the spring pins (Fig. 81/1) and remove the wheel chocks from the transport bracket.
 - 8.2 Repeat the procedure for the second transport bracket (if fitted).



Fig. 81

9. Secure the machine tyre with two wheel chocks (Fig. 82/1).
- 9.1 Repeat the procedure for the second machine tyre if the machine has no brake system.



Fig. 82

10. Uncouple the supply and brake lines from the tractor (see section "Uncoupling the supply and brake lines", on page 58).



When uncoupling the pneumatic brake lines first of all disconnect the red hose coupling (supply line) and then the yellow hose coupling (brake line) from the tractor!

11. Uncouple all supply lines from the tractor.
12. Close the hydraulic connectors with protective caps.
13. Place the supply lines in the hose cabinet (Fig. 83).



Fig. 83

14. Set the machine down on the sustainer.

**WARNING**

Park the machine on a horizontal, firm substrate only!

Ensure that the sustainer does not sink into the ground. If the sustainer does sink into the ground, it will be impossible to recouple the machine!

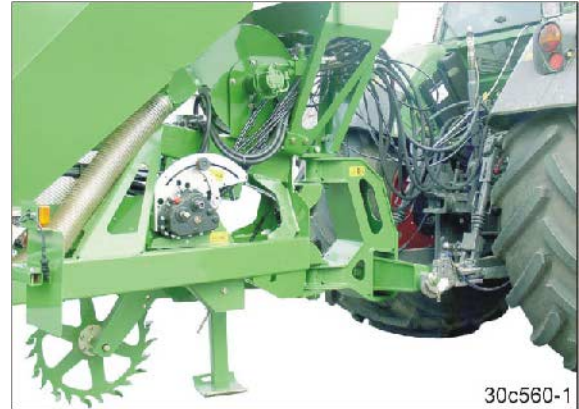


Fig. 84

15. Open the securing device (Fig. 85) of the tractor's lower link (see tractor operating manual).
16. Uncouple the tractor's lower link.
17. Pull the tractor forwards.

**DANGER**

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



Fig. 85

**CAUTION**

Danger of getting crushed in the area of the moving tensioned crosspiece.

8 Settings



WARNING

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

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

Secure the tractor and the machine against unintentional starting and rolling away before you make any adjustments to the machine. On this subject see section 6.2, on page 87.



DANGER

Before adjustment tasks (if not described otherwise)

- Fold out the machine extension arms (see section 10.1, on page 118).
- Apply the tractor parking brake.
- Switch off the tractor engine.
- Remove the ignition key.

8.1 Setting the level sensor

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Climb the steps (Fig. 86) into the seed hopper.



Fig. 86

3. Release the wing nuts (Fig. 87/1).
4. Set the height of the level sensor (Fig. 87/2).
5. Tighten the wing nuts.
6. Repeat for setting the second level sensor (if present).

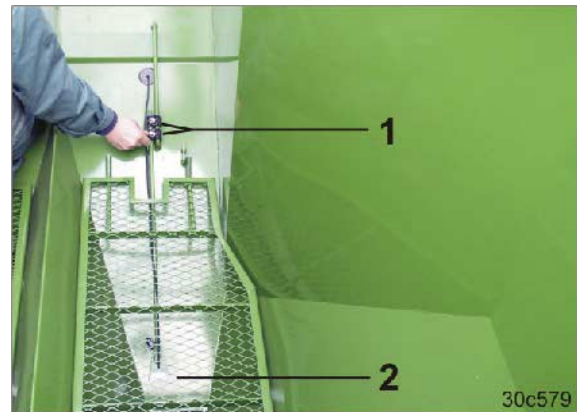


Fig. 87



Increase the residual seed volume which triggers the alarm:

- the coarser the seeds
- the greater the sowing rate
- the greater the working width.

8.1.1 Installing/removing the dosing roller

1. Remove the lynch pin (Fig. 88/2).
(only when the hopper is full is it necessary to seal the hopper with the shutter (Fig. 88/1)).



The dosing roller can be replaced more easily if the hopper is empty.

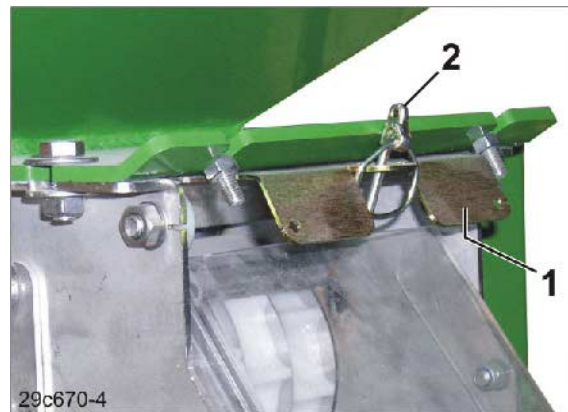


Fig. 88

2. Push the shutter (Fig. 89/1) into the dosing unit up to the stop.
- The shutter seals the hopper. Fertiliser cannot pour out inadvertently when the dosing roller is replaced.

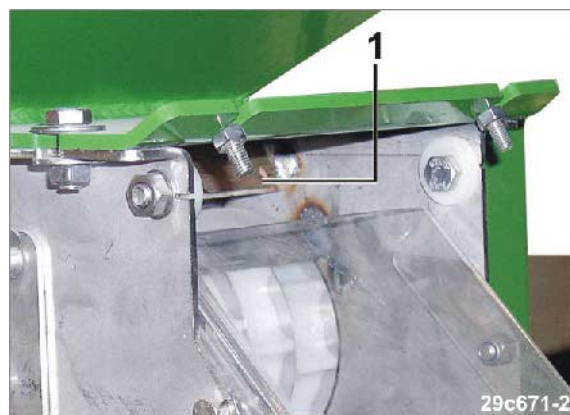


Fig. 89

3. Slacken but do not unscrew the two winged nuts (Fig. 90/1).
4. Turn the bearing cover and pull it off.

**Fig. 90**

5. Pull the dosing roller out of the dosing unit.



Install the dosing roller in the reverse sequence.

**Fig. 91**

Equip all the dosing units on the machine with the same dosing roller. Open all the shutters (Fig. 88/1) and secure them [lynch pins (Fig. 88/2)].

8.2 Setting the sowing rate with a calibration test

1. Fill the seed hopper with at least 200 kg of seed (correspondingly less for fine seed) (see section "Filling the seed hopper", on page 124).
2. Fold out the machine into the working position (see section "Folding the machine extension arms out/in", on page 118).
3. Push a calibration trough into the holders under each dosing unit.
4. Open all injector sluice flaps (see section "Seed dosing and injector sluice", on page 65).



Fig. 92

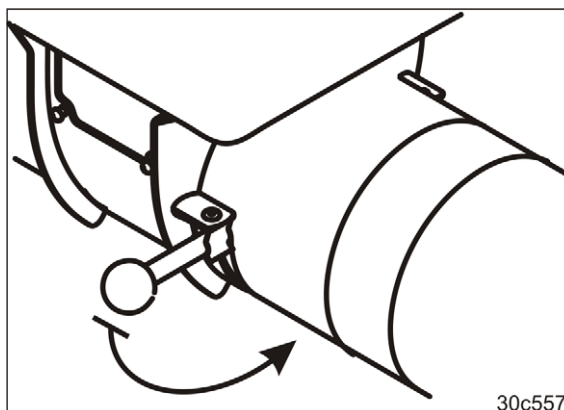


Fig. 93

1. Undo the locking button (Fig. 94/1).
2. Consult the table (Fig. 95, below) for the gearbox setting value for the first calibration test.
3. Set the pointer (Fig. 94/2) of the gearbox lever from below to the gearbox setting value.
4. Tighten the locking button.

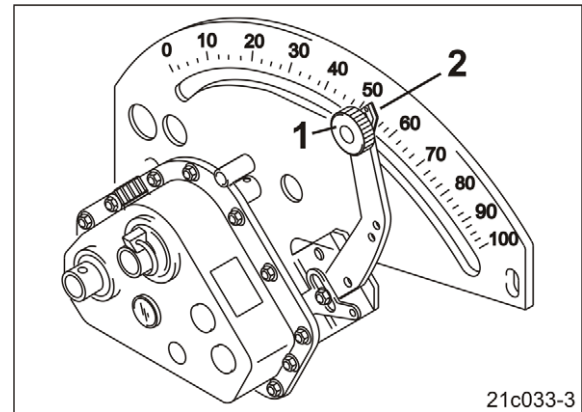


Fig. 94

Gearbox setting values for the first calibration test

Sowing with the coarse dosing roller: Gearbox setting "50"

Sowing with the medium dosing roller: Gearbox setting "50"

Sowing with the fine dosing roller: Gearbox setting "15"

Fig. 95

5. Push the calibration crank handle (Fig. 96/1) onto the star wheel (Fig. 96/2).
6. Turn the star wheel with the calibration crank handle anti-clockwise until all chambers of the dosing roller(s) are filled with seed and a uniform seed stream flows into the calibration trough(s).
7. Close the injector sluice flaps (Fig. 93/1).
8. Empty the calibration trough(s) and push them back under the dosing units.

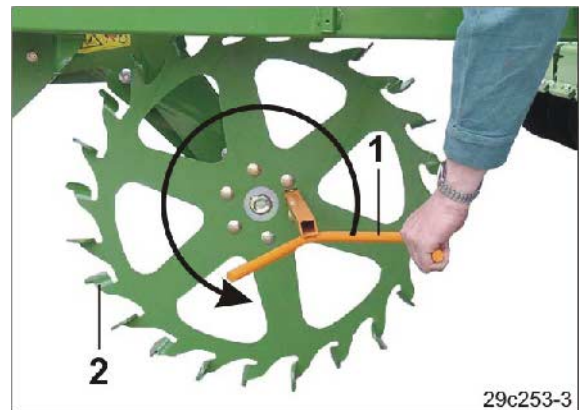


Fig. 96

9. Open the injector sluice flap(s) (Fig. 93/1).
10. Turn the star wheel anticlockwise the number of crank turns specified in the table (Fig. 97).

Settings

The number of crank turns on the star wheel depends on the seed drill working width (1).

The number of wheel revolutions (2) relates to an area of

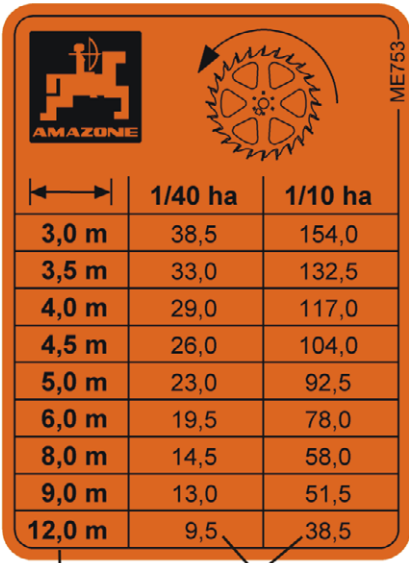
- 1/40 ha (250 m²) or
- 1/10 ha (1000 m²).

A calibration test for 1/40 ha is usual. In the case of very small sowing rates, e.g. when sowing rapeseed, it is recommended that the calibration test for 1/10 ha be performed.

Example

Working width: 12.0 m

Number of crank turns
to 1/40 ha: 9.5



	1/40 ha	1/10 ha
3,0 m	38,5	154,0
3,5 m	33,0	132,5
4,0 m	29,0	117,0
4,5 m	26,0	104,0
5,0 m	23,0	92,5
6,0 m	19,5	78,0
8,0 m	14,5	58,0
9,0 m	13,0	51,5
12,0 m	9,5	38,5

1 points to the working width column, 2 points to the 1/40 ha column.

Fig. 97

11. Weigh the volume of seed caught in the calibration troughs (taking the container weight into consideration) and multiply
 - o by a factor of 40 (for 1/40 ha) or
 - o by a factor of 10 (for 1/10 ha).



Check the accuracy of the scales display.

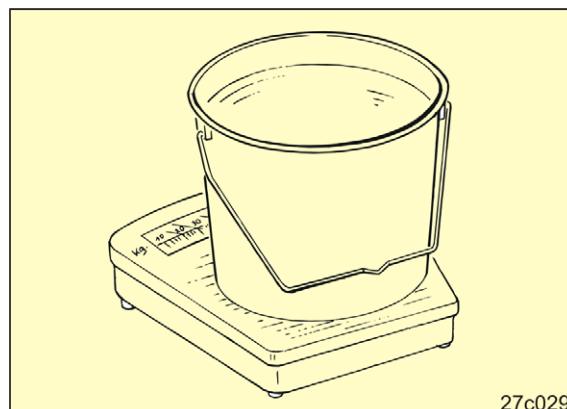


Fig. 98

Calibrating on 1/40 ha:

$$\text{Sowing rate [kg/ha]} = \text{calibrated seed quantity [kg/ha]} \times 40$$

Calibrating on 1/10 ha:

$$\text{Sowing rate [kg/ha]} = \text{calibrated seed quantity [kg/ha]} \times 10$$

Example:

calibrated seed quantity: 3.2 kg on 1/40 ha

$$\text{Sowing rate [kg/ha]} = 3.2 \text{ [kg/ha]} \times 40 = 128 \text{ [kg/ha]}$$



The desired spread rate is not generally achieved in 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 spread rate calculated from that (see section "Determining the gearbox setting using the calculating disc rule", on page 108).

12. Repeat the calibration test until the desired spread rate is achieved.
13. Secure the calibration trough(s) on the seed hopper.
14. Close the injector sluice flap(s).
15. Clip the calibration crank into its transport bracket.

8.2.1 Determining the gearbox setting using the calculating disc rule

Example:

Calibration test values

Calculated spread rate:	175 kg/ha
Gearbox setting:	70
Desired sowing rate:	125 kg/ha.

- Line up the values from the calibration test
 - Calculated spread rate 175 kg/ha (Fig. 99/A)
 - Gearbox setting 70 (Fig. 99/B)
 opposite one another on the calculating disc rule.
 - Read the gearbox setting for the desired spread rate of 125 kg/ha (Fig. 99/C) from the calculating disc rule.
- Gearbox setting 50 (Fig. 99/D).
- Set the gearbox lever to the value read from the disc.
 - Check the gearbox setting with another calibration test (see "8.2", on page 104).

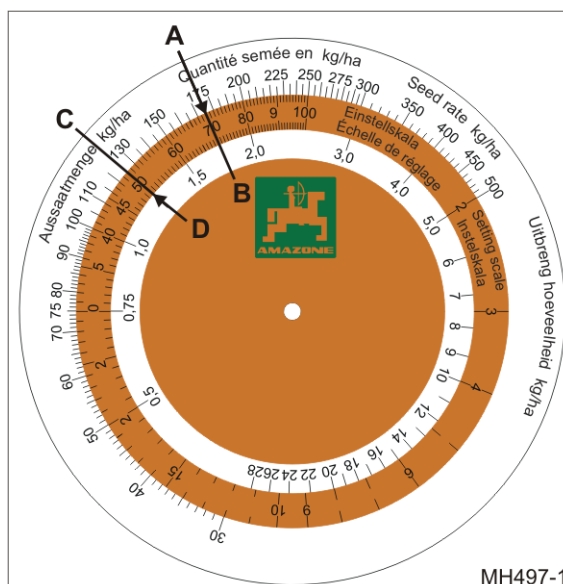


Fig. 99

8.3 Adjusting blower fan speed



Refer to the operating manual **AMALOG⁺** to adjust the alarm, which will be triggered if the blower fan speed deviates from the set value.

1. Remove the protective cap (Fig. 100/2) on the pressure relief valve (Fig. 100/1) of the hydraulic fan motor.
2. Release the lock nut.
3. Adjust the blower fan speed as described in section 8.3.1 or section 8.3.2.

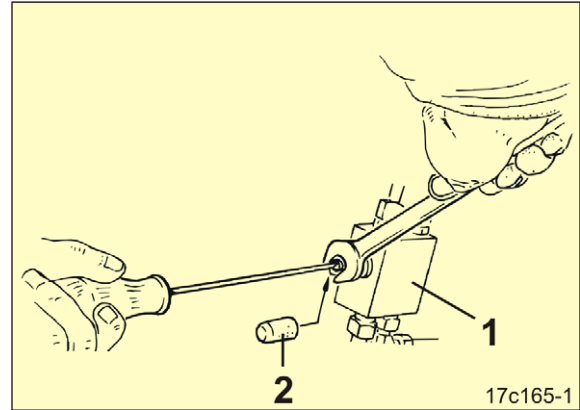


Fig. 100

8.3.1 Setting the blower fan speed via the flow control valve of the tractor

4. Close the pressure relief valve (Fig. 100/1).
To do so, turn the screwdriver clockwise.
5. Open the pressure relief valve by half a turn.
To do so, turn the screwdriver anti-clockwise by half a turn.
6. Set the requisite blower fan speed on the flow control valve of the tractor.
7. Tighten the lock nut.
8. Put on the protective cap.

8.3.2 Adjusting the blower fan speed on the machine's pressure relief valve

4. Set the blower fan speed with a screwdriver on the pressure relief valve (Fig. 100/1).

Blower fan speed

Turning clockwise: increases the fan speed.

Turning to the left: reduces the fan speed.

5. Tighten the lock nut.
6. Put on the protective cap.

8.4 Adjusting the planting depth

1. Loosen two nuts (Fig. 101/1).
2. Set the distance "A" by adjusting the press roller in the toothed segment (Fig. 101/2).
3. Securely tighten both nuts.

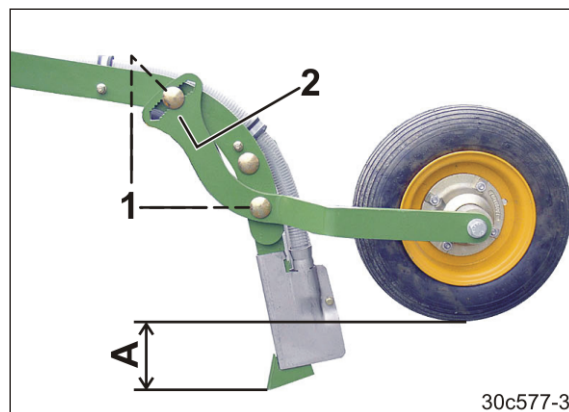


Fig. 101

4. Check the placement depth of the first sowing unit and correct if necessary (see section "Checking the planting depth", on page 129).
5. Set all sowing units to the value of the first sowing unit and check the placement depths.



Check the planting depth of the seed after every adjustment (see "Checking the planting depth", on **page 129**).



Check the coulter pressure and adjust if necessary.

8.5 Setting the tramline rhythm/counter

1. Refer to the table (Fig. 68, on page 76) for the required tramline rhythm and enter it into the on-board computer ¹⁾.
2. Refer to the figure (Fig. 69, on page 77) for the tramline counter for the first field run and enter it on the on-board computer ¹⁾.

¹⁾ see operating manual **AMALOG+**



The tramline counter is coupled with the operating position sensor on the star wheel. Each time the machine or the star wheel is raised, the tramline counter switches up a number.



Pressing the STOP button before raising the star wheel prevents the tramline counter from advancing.

8.6 Half-sided switching off

1. Fold out the machine extension arms (see section "Folding the machine extension arms out/in", on page 118).
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

**DANGER**

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

3. Remove one of the two lynch pins (Fig. 102/1).

Switch off the right side of the machine:
remove the right lynch pin.

Switch off the left side of the machine:
remove the left lynch pin.

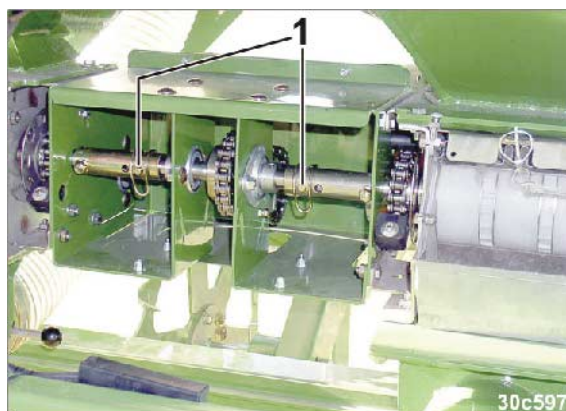


Fig. 102



Do not forget to switch on the side of the machine again after turning at the end of the field.

9 Transportation

When driving on public roads and ways the tractor and machine 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).

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 journeys take heed of the section "Safety information for users", on page 28.
- Before moving off, check:
 - That the supply lines are connected correctly.
 - The lighting system for damage, function and cleanliness.
 - The brake and hydraulic system for visible damage.
 - That the brake system functions properly.
 - That the tractor parking brake is released completely.



WARNING

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

- On folding machines, check that the transport locks are locked correctly.
- Secure the machine against unintentional movements before starting transportation.



WARNING

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

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

**WARNING**

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

These risks pose serious injuries or death.

Observe the maximum load of the attached machine and the permissible axle and drawbar loads of the tractor. Drive with an empty hopper only.

**WARNING**

Risk of falling from the machine if riding against regulations!

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

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

**DANGER**

Empty the hopper.

The brake system is designed for driving with an empty hopper only.

Put the machine in transport position after working on the field.



DANGER

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key!

1. Empty the hopper (see section "Emptying the seed hopper and/or dosing unit", on page 131).



Fig. 103

2. Close the hopper cover (Fig. 104/1).
3. Attach the rubber straps with the cover hooks (Fig. 104/2).



Fig. 104

4. Raise and lock the ladder (Fig. 105).



CAUTION

Danger of getting crushed. Hold the ladder only at the marked positions.



Fig. 105



Push up and lock the ladder (Fig. 105) after use.

The drawbar can damage the lowered ladder when the machine is turned.

Transportation

5. Fold in the machine extension arms (see section "Folding the machine extension arms out/in", on page 118).
6. Check the lighting system for operation (see section "Transportation equipment", on page 44).
7. Lock the tractor control unit.



Fig. 106



DANGER

Lock the tractor control units during transport!



The warning signs and yellow reflectors must be clean and undamaged.



- The maximum speed¹⁾ permitted, depending on the machine's equipment, is
 - 25 km/h (without brake system²⁾)
 - 40 km/h (with brake system).

In particular on bad roads and ways driving may only take place at a considerably lower speed than specified!
- Switch on the all round lighting (if available), which is subject to authorisation, prior to starting a journey and check operation.
- In bends take into consideration the wide sweep and the centrifugal mass of the machine.

¹⁾ The permissible maximum speed for attached work equipment differs in the various countries according to national traffic regulations. Ask your local importer / machine dealer about the maximum permissible speed on public roads.

²⁾ The machine is not permitted in Germany or in several other countries without its own braking system (see section 6.1.3).

10 Use of the machine



When using the machine, observe the information in the sections

- "Warning pictograms and other signs on the machine", as of on page 18 and
- "Safety information for users", on page 28.

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!

Observe the maximum load of the attached machine and the permissible axle and drawbar loads of the tractor. Drive with an empty seed hopper only.



WARNING

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

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



WARNING

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

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



Only actuate the tractor control units from inside the tractor cab!

10.1 Folding the machine extension arms out/in



DANGER

Before folding the machine extension arms out or in, instruct people to leave the swivel area of

- The machine extension arms.
- The rear frame.



Align the tractor and machine straight on a flat surface before you fold the machine extension arms out or in.

Drive the tractor in front of the machine at a slight angle. That way you have the catch hook (Fig. 108/1) for the machine extension arms better in view.

10.1.1 Folding out the machine extension arms

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Pin the support wheels into the working position (see Fig. 107).
 - 2.1 Pin and secure each support wheel pair with two bolts (lynch pins).

Working position: Pin bolts in hole (Fig. 107/1).

Transport position: Pin bolts in hole (Fig. 107/2).

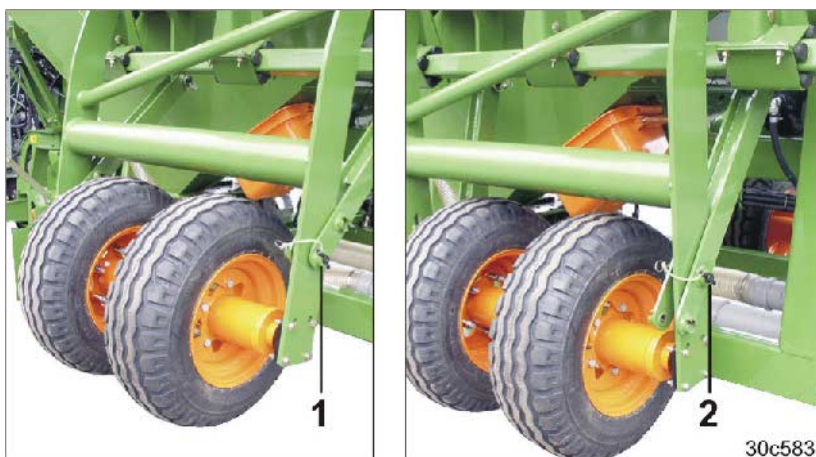


Fig. 107

3. Lift the machine extension arms out of the transport lock (Fig. 108/1).
- 3.1 Actuate control unit 1 until the machine extension arms are free of the transport lock (Fig. 108/1).



Fig. 108



Fig. 109

4. Fold out the machine extension arms.
 - 4.1 Actuate control unit 2 until the machine extension arms are fully folded out (see Fig. 109).
 - 4.2 Put tractor control unit 2 into the neutral position and operate it in the neutral position during the work.
5. Fold the rear frame (Fig. 110/1) into the working position.
 - 5.1 Actuate control unit 1 until the rear frame is folded out completely, i.e. the rear frame is in working position.
 - The star wheel is lowered when the rear frame is folded out.
 - 5.2 Put tractor control unit 1 into the neutral position and operate it in the neutral position during the work.

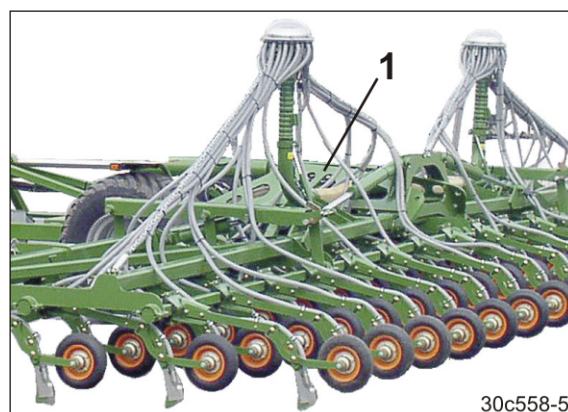


Fig. 110

10.1.2 Folding in the machine extension arms

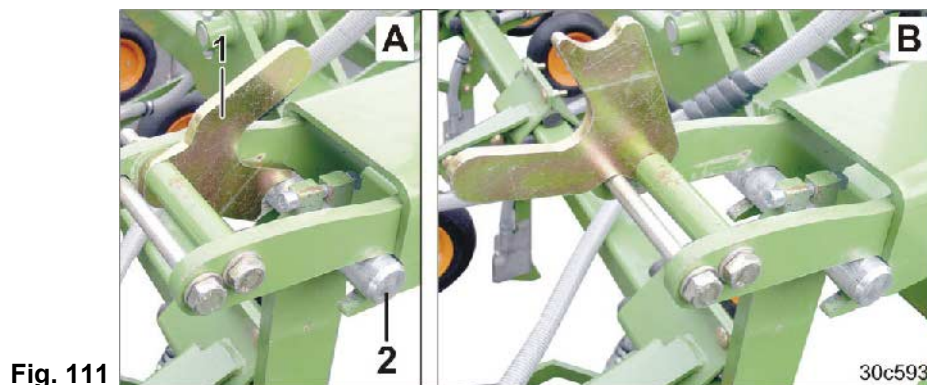


Fig. 111

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Swivel the lever (Fig. 111/1) as shown in Figure (Fig. 111/B).
3. The machine has two levers.
Repeat the operation as described.



The lever (Fig. 111/1) is applied to the bolt (Fig. 111/2) during work. When the machine is folded out, the lever is applied to the bolt automatically.

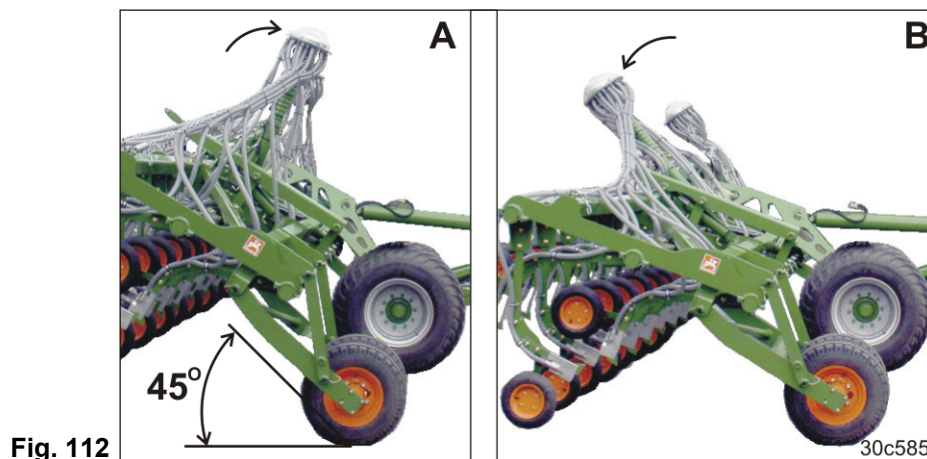


Fig. 112

4. Lift the rear frame approx. 45° (see Fig. 112/A).
 - 4.1 Actuate control unit 1 until the rear frame is lifted.
→ Pressing control unit 1 lifts the star wheel.
5. Actuate the control unit 2 until the distributor heads are folded in (see Fig. 112/B).



Fig. 113

6. Lift the rear frame to approx. 10° short of the vertical position (see Fig. 113).

6.1 Actuate control unit 1 until the rear frame is lifted.

7. Fold in the machine extension arms.

- 7.1 Actuate control unit 2 until the machine extension arms are applied to the sliding runners (Fig. 114/1) of the transport lock.



Beware of possible collisions with the machine.

Correct the tilt of the rear frame (see Fig. 113) if necessary.



Fig. 114

Use of the machine

- 7.1 Actuate control unit 1 until both machine extension arms are in the transport lock (Fig. 115)

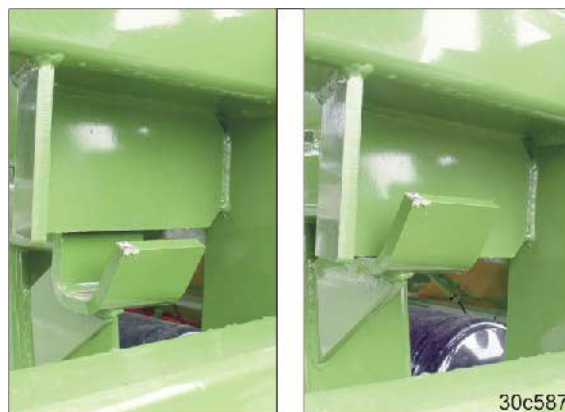


Fig. 115

and the rear carrier (Fig. 116/1) with the lighting fixtures and warning signs is folded into road transport position.



Fig. 116



The locking hooks (Fig. 115) form the mechanical transport lock of the machine extension arms.



DANGER

Check to ensure that the locking hooks (Fig. 115) fit correctly.

8. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
9. Pin the support wheels into the transport position (see Fig. 117).
 - 9.1 Pin and secure each support wheel pair with two bolts (lynch pins).

Working position: Pin bolts in hole (Fig. 117/1)

Transport position: Pin bolts in hole (Fig. 117/2)

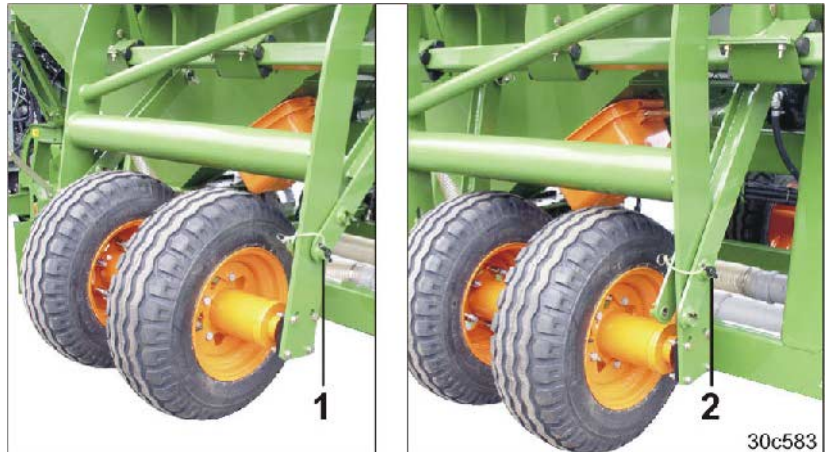


Fig. 117



The transport width is as follows:

- 3.40 m pinned in bore (Fig. 117/1)
- 3.00 m pinned in bore (Fig. 117/2).



DANGER

Support wheels pinned in working position extend into the traffic area during transport journeys and endanger other road users. Pin the support wheels according to the specifications before starting transportation.

10. Move the machine into a horizontal position by actuating the tractor lower links.



The machine requires sufficient ground clearance in all driving situations.



Fig. 118

10.2 Filling the seed hopper



DANGER

- Transport journeys on streets or roads are prohibited when the seed hopper is filled. The brake system is designed for an empty machine only.
- Observe the permissible fill levels and total weights.

1. Couple the machine to the tractor (see section "Coupling and uncoupling the machine", on page 89).
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



DANGER

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

3. Determine and fit the dosing roller(s) with the aid of the table (Fig. 51, on page 67) (see section. "Installing/removing the dosing roller", on page 102).

4. Release the rubber loops (Fig. 119/1) together with the cover hook (Fig. 119/2).



Fig. 119

5. Lift the ladders (Fig. 120) out of their locking devices and lower them to the stop.



CAUTION

Danger of getting crushed. Hold the ladder only at the marked positions.



Fig. 120

6. Climb on the loading board via the ladder.
7. Release the rubber loops on the end face.
8. Open the swivelable hopper cover.
9. If necessary, remove foreign bodies in the seed hopper.
10. Adjust the level sensor(s) in the seed hopper (see section "Setting the level sensor", on page 101).



Fig. 121

11. Load the hopper as follows:
 - o with sacked goods from a supply vehicle (see section "10.2.1", on page 126)
 - o with a filling auger from a supply vehicle (see section "10.2.2", on page 126)
 - o from bulk bags (see section "10.2.3", on page 127).

12. Switch the interior lighting of the seed hopper on and off for night-time working.

The interior lighting is coupled with the driving lights of the tractor.



Fig. 122

13. Close the swivelable hopper cover and secure it with rubber loops.
14. Push up the ladders (Fig. 120) and lock them in place.



Push up and lock the ladders (Fig. 120) after use.

The drawbar can damage the lowered ladder when the machine is turned!

10.2.1 Loading the seed hopper with sacked goods from a supply vehicle

1. Approach the open loading edge of the trailer with the machine.
2. Put the tractor on an extreme steering lock (approx. 90° to the machine).
3. Reverse onto the supply vehicle until the loading board is lying up against the supply vehicle with no gap, but is not touching the vehicle (marshalling person required).
4. Raise / lower the tractor's lower link until the loading board and the loading area of the trailer are level.
5. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
6. Fill the hopper from the loading board only and constantly ensure firm support when transporting the sacked goods.



Fig. 123



DANGER

Manoeuvring the machine requires a marshalling person.

Never stand between the supply vehicle and the machine.

Always hold tight when crossing the loading board and supply vehicle (danger of stumbling).

10.2.2 Loading the hopper with a filling auger

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Approach the machine carefully with the supply vehicle.
3. Load the hopper via the filling auger in consideration of the manufacturer's instructions.



Fig. 124



CAUTION

Never move between the supply vehicle and the machine.

10.2.3 Loading the seed hopper from bulk bags

1. Set the machine down on a flat surface.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Approach the machine carefully with the bulk bag.
4. Climb onto the loading board.
5. Unload the bulk bag into the hopper.



Fig. 125



DANGER

**Never move between the supply vehicle and the machine.
Never stand under suspended loads.**

10.3 Starting work



Fig. 126



DANGER

Direct people out of the danger area of the machine, in particular from the swivel zone of the machine wing and the rear frame.

Only actuate the tractor control units from inside the tractor cab!

1. Unfold the machine and star wheel into working position (see section "Folding the machine extension arms out/in", on page 118).



When lowering the rear frame, pull the machine forward slightly.

2. Actuate tractor control unit 4.
 - Switch on the blower fan.
3. Check the blower fan speed and correct if necessary (see section "Adjusting blower fan speed", on page 109).
4. Move the machine into a roughly horizontal position.
 - 4.1 Raise/lower the tractor's lower links.
5. Check the tramline rhythm/tramline counter and correct if necessary (see operating manual **AMALOG⁺**).
6. Start.
7. Check the placement depth of the seed and correct if necessary (see section "Checking the planting depth", on page 129):
 - o After 100 m:

- o After switching from light to heavy soil or vice-versa.

10.3.1 Checking the planting depth

1. Sow approximately 100 m at working speed.
2. Expose the seed at several points and check the placement depth.

10.4 During the work

Switching off the tramline counter (STOP key)

If the tramline counter is prevented from indexing when there is a work interruption, press the STOP button (see operating manual **AMALOG⁺**).

Visual inspection of the distributor heads

From time to time, check the distributor heads for impurities.



Contamination and seed remains can block up the distributor heads and have to be removed immediately [see section "Cleaning the distributor head", on **page 138**].

10.4.1 Turning at end of the field

Before turning at the end of the field

1. Slow down your travel speed.
2. Do not reduce the tractor's rotational speed too far so that the hydraulic functions continue without interruption at the headland.
3. Actuate tractor control unit 1 until both of the following are lifted completely:
 - o Coulter
 - o Star wheel
4. Turn over the combination.



Fig. 127

After turning at the end of the field

1. Actuate tractor control unit 1 until both of the following are lowered completely:
 - o Coulter
 - o Star wheel
 2. Actuate tractor control unit 1 for an additional 15 seconds and then put it into neutral position.
- During the work, operate tractor control unit 1 in neutral position.

10.5 End of work on the field



Only actuate the tractor control units from inside the tractor cab!

1. Switch off the fan.
2. Empty the seed hopper (see section 10.6, on page 131).



Seed residues left in the seed dosing units can swell or germinate, if the seed dosing unit is not completely emptied!

As a result, rotation of the dosing rollers is blocked and damage can be caused to the drive!

3. Put the Cirrus in the transport position (see section "10.1", on page 118).
4. Switch off the **AMALOG⁺**.

10.6 Emptying the seed hopper and/or dosing unit



DANGER

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

10.6.1 Emptying the seed hopper

1. Open the shutter (Fig. 128) and empty the seed into the calibration trough or a suitable hopper.



A commercially available hose (DN 140) can be fitted.

2. Empty the residue (see section Emptying the dosing unit, below).



Fig. 128

10.6.2 Emptying the dosing unit

1. Push a calibration trough into the mounting under the dosing unit.



Fig. 129



If you do not want to empty the hopper, close the shutters (Fig. 130/1) (see section "Installing/removing the dosing roller", on page 102) on all dosing units.



Fig. 130

2. Empty the residue from the hopper and dosing unit.

2.1 Turn the handle (Fig. 131/1).

→ The residue emptying flap opens to allow emptying of the hopper and dosing unit.

3. The machine has two dosing units. Repeat the operation as described.



Fig. 131

3. Open and empty both injector sluices (Fig. 132) (see section 5.7, on page 65).

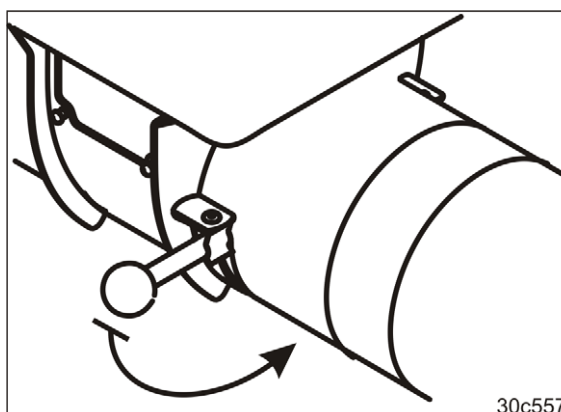


Fig. 132

4. Empty the dosing units and the dosing rollers completely.
 - 4.1 Turn the star wheel (Fig. 133) anti-clockwise with the calibration crank.
5. To completely clean the dosing unit, remove and reinstall the dosing roller (see section "Installing/removing the dosing roller", on page 102).



Fig. 133

6. Open the shutter(s) (Fig. 130/1) and secure (clip pin).
7. Close the residue emptying flap(s) (Fig. 131/1).
8. Close the injector sluice flap(s) (Fig. 132/1).
9. Secure the calibration trough(s) on the transport bracket (Fig. 54).
10. Clip the calibration crank into its transport bracket.

11 Faults



WARNING

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

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

Secure the tractor and the machine against unintentional start-up and rolling away, before you eliminate any faults on the machine. On this subject see section 6.2 on page 87.

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

11.1 Residual volume indicator

If the seed level reaches the level sensor,

- The control character marks (Fig. 134/1) the fill level symbol in the **AMALOG⁺**.
- An alarm signal sounds.

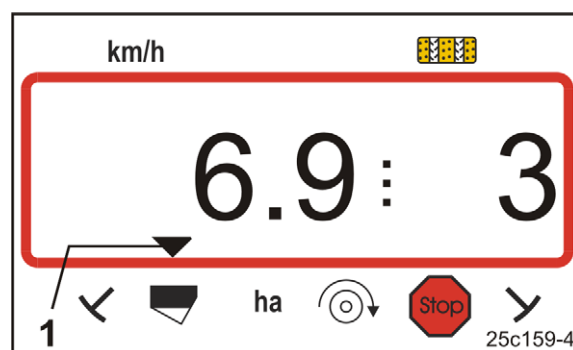


Fig. 134

11.2 Fault table

Fan sensor alarmed	Alarm limit wrongly set	Alter the alarm limit
	Oil volume too low or too high	Set the oil volume
	Fan sensor defective	Replace the fan sensor
Distance sensor (star wheel/Vario gearbox) not functioning	Distance sensor defective	Replace the distance sensor

12 Cleaning, maintenance and repairs



WARNING

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

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

Secure the tractor and machine against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on the machine. On this subject see on page 87.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through unprotected danger points!

- Mount protective equipment, which you removed when cleaning, maintaining and repairing the machine.
- Replace defective protective equipment with new equipment.



Danger

Carry out cleaning, maintenance and repair work (if not otherwise specified) only when

- The machine extension arms are folded out (see section 10.1, on page 118).
- The rear frame is lowered completely.
- The tractor parking brake is applied.
- The tractor universal joint shaft is shut off.
- The tractor engine is shut off.
- The ignition key has been removed.

12.1 Securing the connected machine

Before working on the machine, place the machine connected to the tractor on the sustainer (Fig. 135/1) to prevent unintentional lowering of the tractor's lower link.

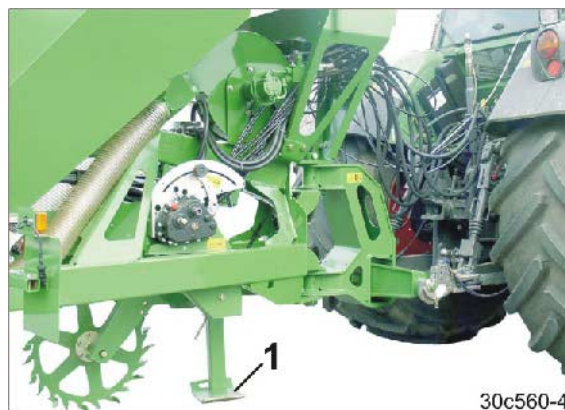


Fig. 135

12.2 Cleaning the machine



DANGER

Wear a face mask. Do not inhale toxic dressing dust when removing dressing dust by means of compressed air.



DANGER

Fold the machine in or out completely before cleaning it.

Never clean the machine if the rear frame and machine extension arms are not completely folded in or out.



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

**When cleaning with a high-pressure cleaner / steam jet, observe the following:**

- Do not clean any electrical components.
- Do not clean any chromed components.
- Never aim the cleaning jet from the nozzle of the high pressure cleaner / steam jet directly on lubrication and bearing points.
- Always maintain a minimum jet distance of 300 mm between the high pressure cleaning or steam jet cleaning nozzle and the machine.
- Comply with safety regulations when working with high pressure cleaners.

1. Fold the machine in or out completely before cleaning it (see section 10.1, on page 118).
Never clean the machine if the rear frame and machine extension arms are not completely folded in or out.
2. To clean, always place the machine connected to the tractor on the sustainer (Fig. 135/1).
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. Empty the seed hopper and dosing unit (see section "Emptying the seed hopper and/or dosing unit", on page 131).
5. Clean the distributor head [see section "Cleaning the distributor head", on page 138].
6. Clean the machine with water or with a high pressure cleaner.

12.2.1 Cleaning the distributor head (specialist workshop)

1. Fold out the machine extension arms (see section 10.1, on page 118).
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



DANGER

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

There is the risk of slipping on the path to the distributor head and in the area of the distributor head.

3. Slacken the winged nuts (Fig. 136/1) and remove the clean plastic flap (Fig. 136/2) from the distributor head.
4. Remove any impurities with a brush, and wipe out the distributor head and plastic cap with a dry cloth.
5. Clean impurities between the base plate (Fig. 136/A) with compressed air.
6. Install the plastic cap (Fig. 136/2).
7. Fix the plastic cap with winged nuts (Fig. 136/1).

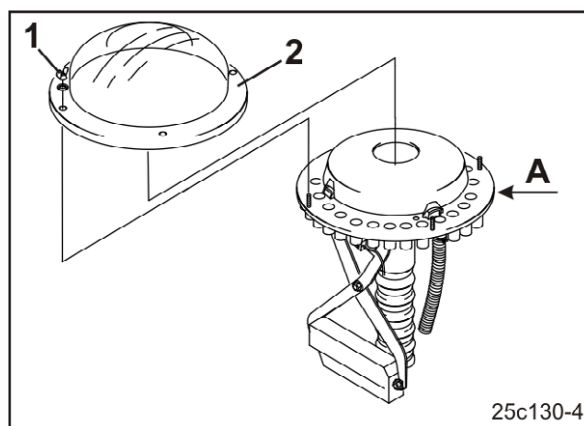


Fig. 136



Intensive cleaning requires the shutters to be removed in accordance with section "Setting the tramline to the track width of the cultivating tractor", on page 165.

12.3 Lubrication specifications



WARNING

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

The lubrication points on the machine are marked with a foil sticker (Fig. 137).

Carefully clean the lubrication nipple and grease gun before lubrication so that no dirt is pressed into the bearings. Press the dirty grease out of the bearings completely and replace it with new grease.

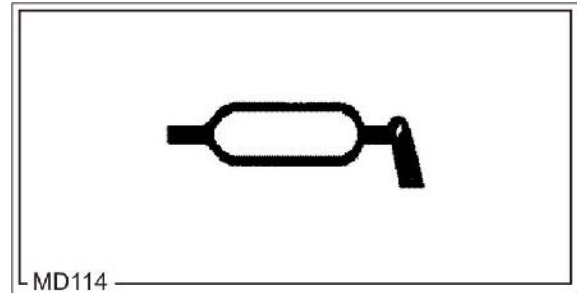


Fig. 137

Lubricants



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

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

12.3.1 Lubrication point overview

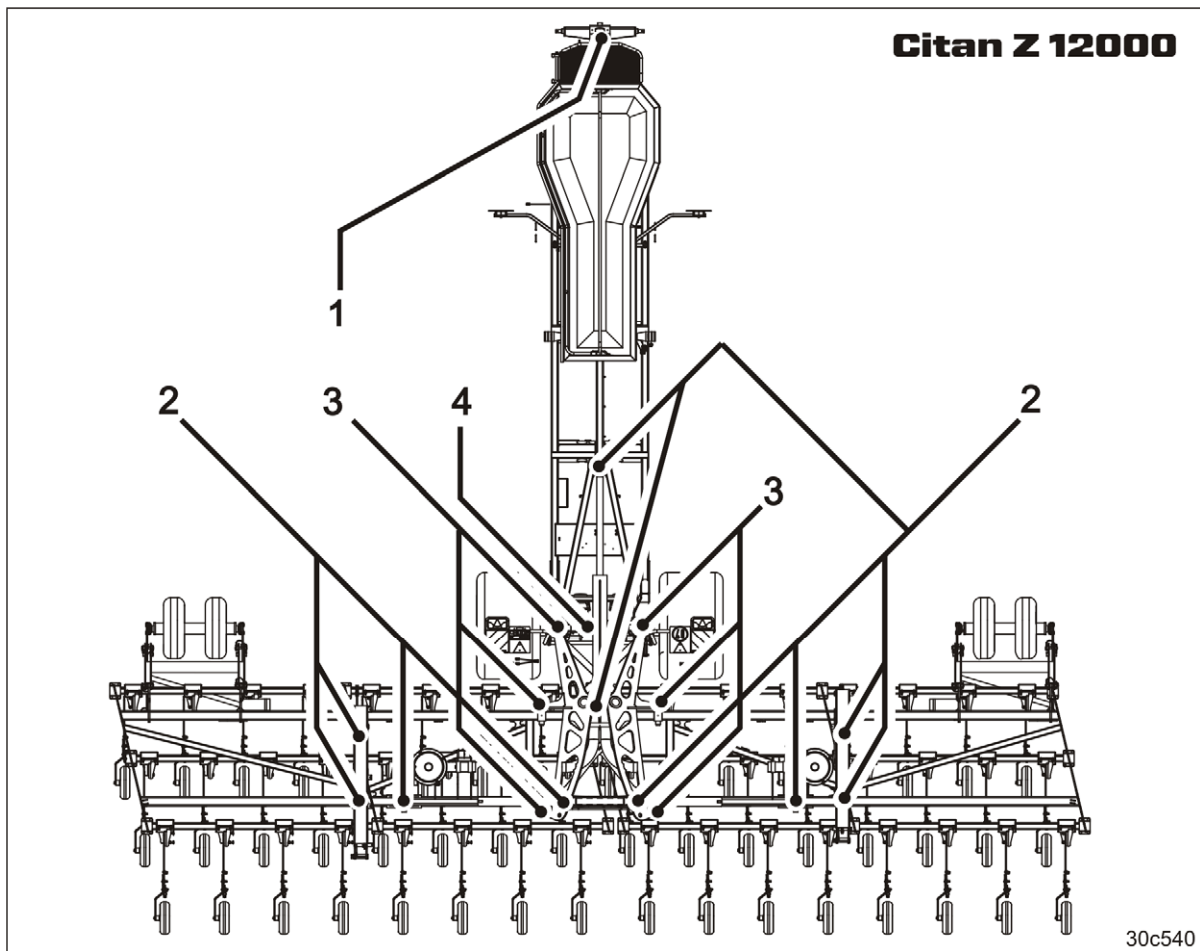


Fig. 138

Fig. 138/...	Assembly	Quantity	See figure	Lubrication interval [h]
1	Tensioned crosspiece	3	Fig. 139	25
2	Hydraulic cylinder pivot point	10	Fig. 140 to Fig. 143	25
3	Machine extension arm pivot point	6	Fig. 144 to Fig. 145	25
4	Axle		See section "12.4", on page 142	

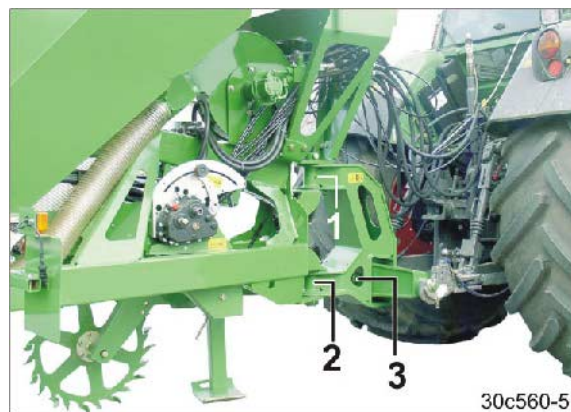


Fig. 139



Fig. 140

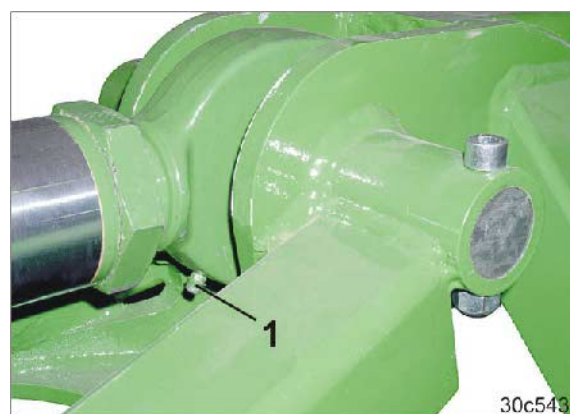


Fig. 141

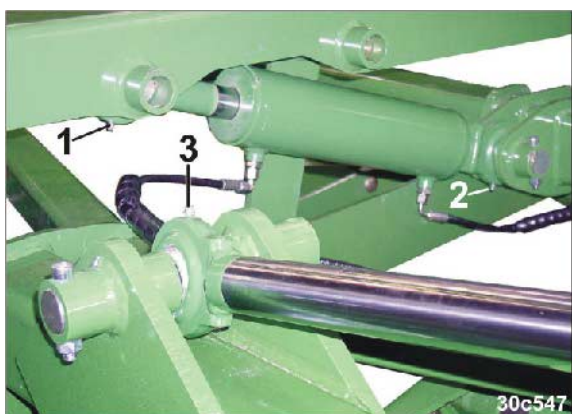


Fig. 142



Fig. 143



Fig. 144



Fig. 145

12.4 Maintenance schedule – overview



Carry out maintenance work when the first interval is reached.

The times, continuous services or maintenance intervals of any third party documentation shall have priority.

Before initial operation	Specialist workshop	Check and service the hydraulic hose lines. The inspection has to be recorded by the operator.	Section 12.4.9
		Checking the oil level in the Vario gearbox	Section 12.4.1
		Checking the inflation pressure of the running gear tyre	Section 12.4.3
		Checking the inflation pressure of the stabilising wheels	Section 12.4.4
		Checking the inflation pressure of the press rollers	Section 12.4.5
After the first 10 operating hours	Specialist workshop	Checking the tightening torques of the wheel nuts	Section 12.4.6
	Specialist workshop	Check and service the hydraulic hose lines. The inspection has to be recorded by the operator.	Section 12.4.9
After the first 20 operating hours	Specialist workshop	Verify that all bolted connections fit securely.	Section 12.6
10 operating hours after a wheel change	Specialist workshop	Checking the tightening torques of the wheel nuts	Section 12.4.6

Daily before starting work		Visual inspection of the dual-circuit pneumatic braking system	Section 12.4.16.1
		Draining the compressed air tank	Section 12.4.16.5
		Visual inspection of the lower link pins	Section 12.4.2
When the seed hopper is filled or hourly		Checking the planting depth	Section 10.3.1
		Check the seed hoses for impurities, clean if necessary.	
During the work		Check the distributor head(s) for impurities, clean if necessary (see section "Cleaning the distributor head").	Section 12.2.1
		Check the dosing units for impurities, clean if necessary (see section "Emptying the seed hopper and/or dosing unit").	Section 10.6
Daily at the end of work		Cleaning the machine (as required)	Section 12.2
Every week, at the latest every 50 operating hours	Specialist workshop	Check and service the hydraulic hose lines. The inspection has to be recorded by the operator.	Section 12.4.9
Before the season, then every 2 weeks		Checking the inflation pressure of the running gear tyre	Section 12.4.3
		Checking the inflation pressure of the stabilising wheels	Section 12.4.4
		Checking the inflation pressure of the press rollers	Section 12.4.5
		Checking the oil level in the Vario gearbox	Section 12.4.1
Every 200 operating hours	Specialist workshop	Lubricating the brake shaft bearings (specialist workshop)	Section 12.4.10

Cleaning, maintenance and repairs

Every 3 months, at the latest every 500 operating hours	Specialist workshop	Brake inspection (specialist workshop)	Section 12.4.16.2
		External inspection of the compressed air tank (dual-circuit pneumatic braking system)	Section 12.4.16.6
	Specialist workshop	Checking the pressure in the compressed air tank of the dual-circuit pneumatic braking system (specialist workshop)	Section 12.4.16.7
	Specialist workshop	Leak test of the dual-circuit pneumatic braking system (specialist workshop)	Section 12.4.16.8
	Specialist workshop	Cleaning the line filters of the dual-circuit pneumatic braking system (specialist workshop)	Section 12.4.16.9
Every 6 months before the season	Specialist workshop	Check and service the hydraulic hose lines. The inspection has to be recorded by the operator.	Section 12.4.9
Every 6 months after the season		Servicing roller chains and chain wheels	Section 12.4.7
		Servicing sowing shaft bearings	Section 12.4.8
Every 6 months, at the latest every 1000 operating hours	Specialist workshop	Lubricating the ECO Master automatic slack adjuster (specialist workshop)	Section 12.4.12
	Specialist workshop	Grease replacement of the wheel hub bearings (specialist workshop)	Section 12.4.11
	Specialist workshop	Adjusting the wheel brake on the slack adjuster (specialist workshop)	Section 12.4.13
	Specialist workshop	Function check on the automatic slack adjuster (specialist workshop)	Section 12.4.14
	Specialist workshop	Checking/adjusting the bearing clearance of the wheel hubs (specialist workshop)	Section 12.4.15
	Specialist workshop	Checking the brake drum for dirt (specialist workshop)	Section 12.4.16.3
	Specialist workshop	Brake lining inspection (specialist workshop)	Section 12.4.16.4
After every brake pad replacement	Specialist workshop	Lubricating the ECO Master automatic slack adjuster (specialist workshop)	Section 12.4.12

12.4.1 Checking the oil level in the Vario gearbox

1. Position the machine on a horizontal surface.
2. Check the oil level.

The oil level must be visible in the oil sight glass (Fig. 146/1).

There is no need to change the oil.

The oil filler neck (Fig. 146/2) is used to top up the Vario gearbox.

Refer to the table (Fig. 147) for the grade of transmission oil required.

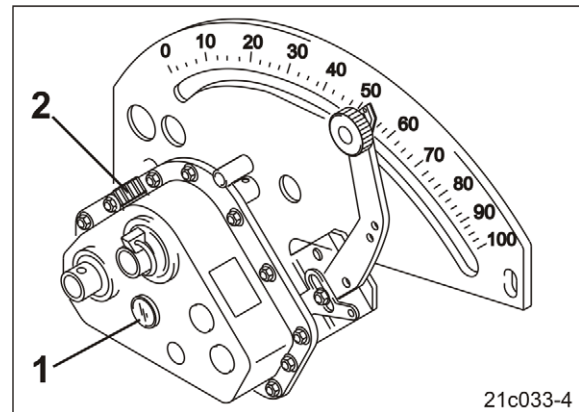


Fig. 146

Hydraulic fluid grades and fill level of the Vario gearbox

Total filling level:	0.9 litres
Transmission fluid (alternatives):	Wintershall Wintal UG22 WTL-HM (ex-works)
	Fuchs Renolin MR5 VG22

Fig. 147

12.4.2 Visual inspection of the lower link pins



WARNING

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

Check the lower link pin for conspicuous defects whenever the machine is coupled. Replace the drawbar, if there are any clear signs of wear to the lower link pin.

12.4.3 Checking the inflation pressure of the running gear tyre

Check compliance with specified tyre pressure (see table Fig. 148).



Observe inspection intervals (see section Maintenance schedule – overview, on page 142).

Tyres	Rated air pressure of tyres
700/55-26.5	1.8 bar



Fig. 148

12.4.4 Checking the inflation pressure of the stabilising wheels

Check compliance with specified tyre pressure (see table Fig. 149).



Observe inspection intervals (see section Maintenance schedule – overview, on page 142).

Tyres	Rated air pressure of tyres
400/50-15.5	3.5 bar



Fig. 149

12.4.5 Checking the inflation pressure of the press rollers

Check compliance with specified tyre pressure
(see table Fig. 150).



Observe inspection intervals
(see section Maintenance schedule – overview, on page 142).

Tyres	Rated air pressure of tyres
4.00–8 4PR	1.2 bar

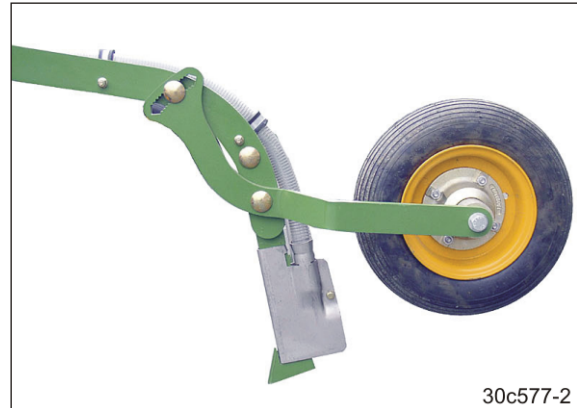


Fig. 150

12.4.6 Checking the tightening torques of the wheel nuts (specialist workshop)

Check compliance with tightening torques
(see table Fig. 151).



Observe inspection intervals
(see section Maintenance schedule – overview, on page 142).

	Wheel nuts	Tightening torque
(1)	M20x1.5 to 10.9	400 Nm



Fig. 151

12.4.7 Servicing roller chains and chain wheels

After the season make sure all roller chains are:

- Cleaned (including the chain wheels and chain tensioner).
- Checked.
- Lubricated with low-viscosity mineral oil (SAE30 or SAE40).

12.4.8 Servicing sowing shaft bearings

Lightly grease the seat of the sowing shaft bearing with a thin mineral oil (SAE 30 or SAE 40).



Fig. 152

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

12.4.9.1 Labelling hydraulic hose lines

The valve chest identification provides the following information:

Fig. 153/...

- (1) Manufacturer's marking on 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).

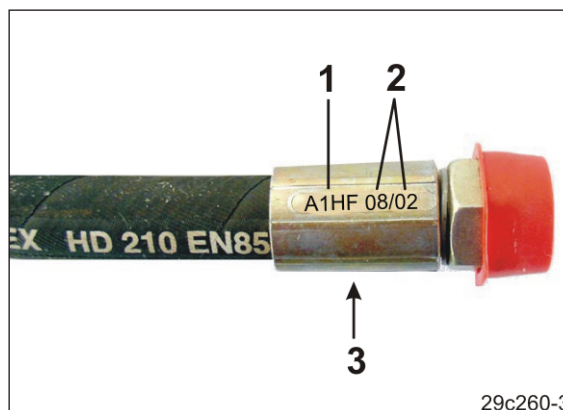


Fig. 153

12.4.9.2 Maintenance intervals

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

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

Before each start-up

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

12.4.9.3 Inspection criteria for hydraulic hose lines



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

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

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

- Installation requirements not complied with.
- Life span of 6 years has been exceeded.

The date of manufacture of the hydraulic hose line on the assembly is decisive for determining these six years. If the date of manufacture on the assembly is "2008", then the hose should not be used beyond February 2014. See also "Labelling of hydraulic hose lines".

12.4.9.4 Installation and removal of hydraulic hose lines



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

- **Only use original **AMAZONE** hydraulic hose lines!**
- Ensure cleanliness.
- You must always install the hydraulic hose lines so that, in all states of operation:
 - There is no tension, apart from the hose's own weight.
 - There is no possibility of jolting on short lengths.
 - Outer mechanical influences on the hydraulic hose lines are avoided.

Use appropriate arrangements and fixing to prevent any scouring of the hoses on components or on each other. If necessary, secure hydraulic hose lines using protective covers. Cover sharp-edged components.
 - The approved bending radii may not be exceeded.
- When connecting a hydraulic hose line to moving parts, the hose length must be appropriate so that the smallest approved bending radius is not undershot over the whole area of movement and/or the hydraulic hose line is not overtensioned.
- Fix the hydraulic hose lines to the intended fixing points. There, avoid hose clips, which impair the natural movement and length changes of the hose.
- It is forbidden to paint over hydraulic hose lines!

12.4.10 Lubricating the brake shaft bearings (specialist workshop)

Lubricate the brake shaft bearings (Fig. 154/1) on the outside and inside.

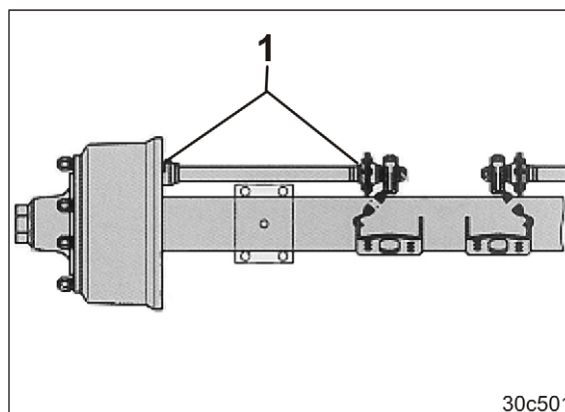


Fig. 154



Use only lithium-soap-based grease with a drop point above 190° C.



DANGER

Grease and oil must not get into the brake.

The cam bearing for the brake is, depending on the series, not sealed.

12.4.11 Grease replacement of the wheel hub bearings (specialist workshop)

Replacing the grease in the wheel hub bearings (Fig. 156/1):

1. Safely jack up the machine at the marked points (Fig. 155).

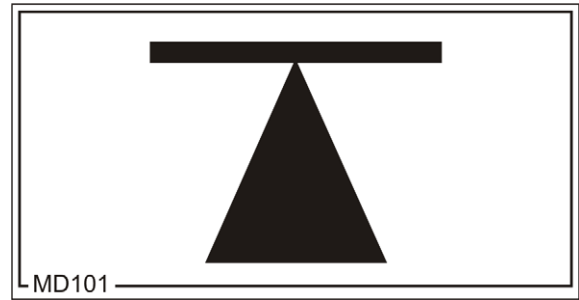


Fig. 155

2. Release the brake.
3. Remove the wheels and dust caps.
4. Remove the lynch pin and unscrew the axle nut.

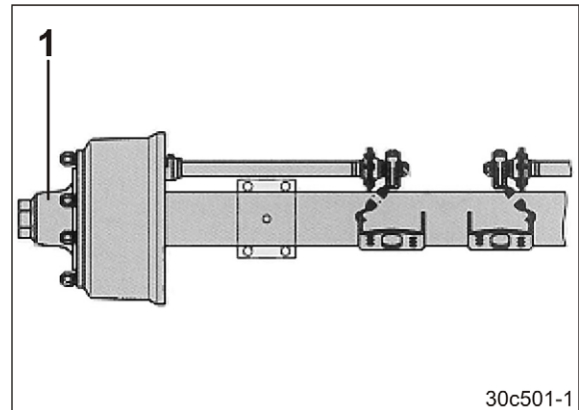


Fig. 156

5. Use a suitable puller tool to pull off the wheel hub with brake drum, tapered roller bearing and sealing elements from the stub axle.
6. Label removed wheel hubs and bearing cages, so that they are not mixed up when installed.
7. Check tapered roller bearing for wear, replace if necessary.
8. Clean the brake, check it for wear, make sure it is intact and functions and replace worn parts.
The inside of the brake must be kept free of lubrication and impurities.
9. Thoroughly clean the inside and outside of the wheel hubs. Remove old grease completely. Thoroughly clean bearings and seals (diesel oil) and check for reusability.
Before installing the bearings, lightly grease the bearing seats and install all parts in the reverse order. Carefully drive parts on to press fits with tube bushings without jamming or damaging them.
Grease the bearings, the wheel hub cavity between the bearings and the dust cap before installing them. The grease quantity should fill approx. a quarter to a third of the space in the installed hub.
10. Install the axle nut and adjust the bearings and brakes. Finally, carry out a function check and a corresponding test drive and eliminate any detected defects.

12.4.12 Lubricating the ECO Master automatic slack adjuster (specialist workshop)

Lubricating the ECO Master automatic slack adjuster (Fig. 157/1):

1. Remove the rubber sealing cap.
2. Grease (80g) until sufficiently fresh grease comes out at the setscrew.
3. Turn the setscrew back about one turn using a ring spanner. Manually actuate the brake lever several times. The automatic readjustment of the brakes must move easily. If necessary, repeat multiple times.
4. Install the sealing cap. Grease again.

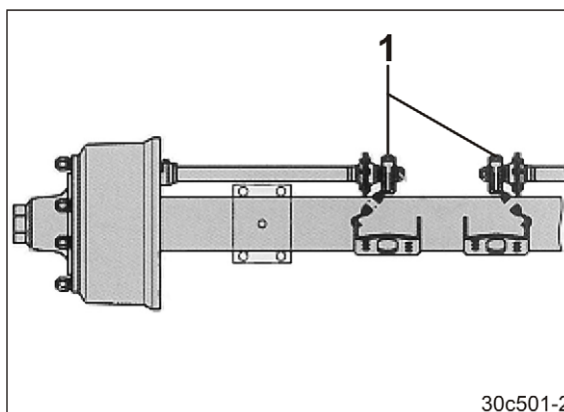


Fig. 157

12.4.13 Adjusting the wheel brake on the slack adjuster (specialist workshop)

Measuring the stroke of the long-stroke diaphragm cylinder push rod:

1. Manually actuate the slack adjuster (Fig. 158) in the push direction.
2. Measure the stroke (Fig. 158/a) of the long-stroke diaphragm cylinder push rod.

The stroke (Fig. 158/a) can be a maximum of 35 mm.

Readjust the wheel brake if the stroke is longer than 35 mm.

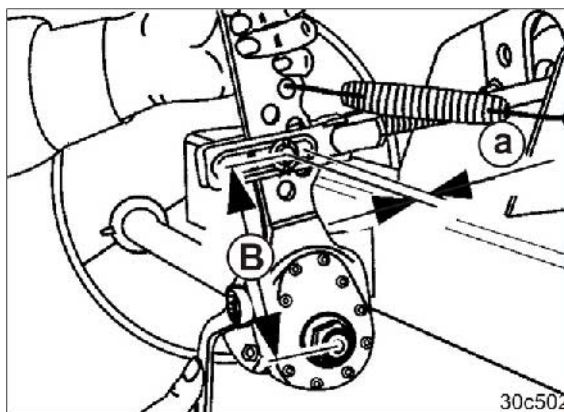


Fig. 158

Adjusting the wheel brake on the slack adjuster:

Adjust the wheel brake via the slack adjuster's hexagon nut (Fig. 159/1).

Adjust the stroke (Fig. 158/a) to 10-12% of the brake lever length (Fig. 158/B).

Example:

Lever length B = 150 mm
Stroke a = 15 – 18 mm.

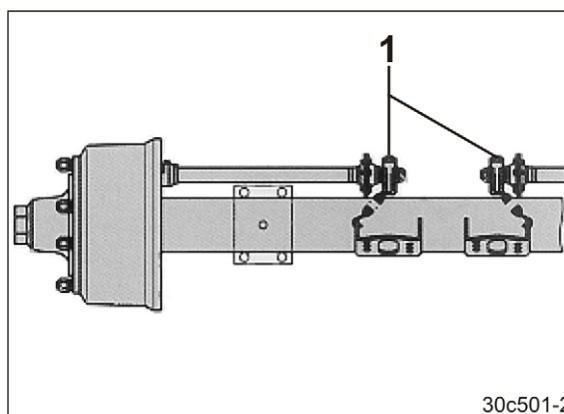


Fig. 159

12.4.14 Function check on the automatic slack adjuster (specialist workshop)

The default setting of the automatic slack adjuster (Fig. 160/1) is made the same as for the standard slack adjuster.

The required stroke is automatically adjusted to approx. 15° of cam rotation.

The ideal lever position (cannot be influenced due to the cylinder mounting) is approx. 15° in front of its perpendicularity to the actuation direction.

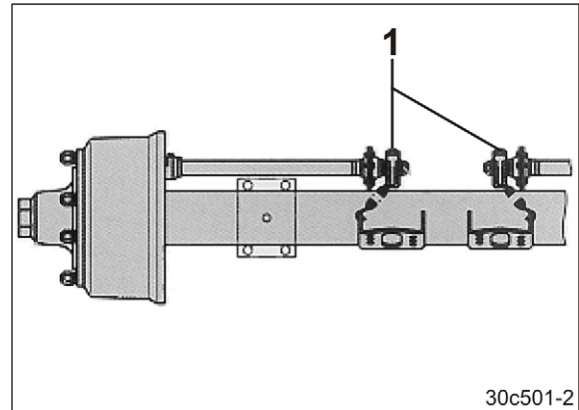


Fig. 160

Function check on the automatic slack adjuster:

1. Remove the rubber sealing cap.
2. Turn back the setscrew (arrow) approx. one ¼ turn anti-clockwise using a ring spanner.

The stroke must be at least 50 mm with a lever length of 150 mm.

3. Manually actuate the brake lever several times. When doing this,
 - o The automatic readjustment of the brakes must move easily.
 - o The gear coupling must audibly engage.
 - o The setscrew must turn clockwise a little during the return stroke.
4. Install the sealing cap.
5. Lubricating
Use only
BPW special long-term grease ECO Li91.

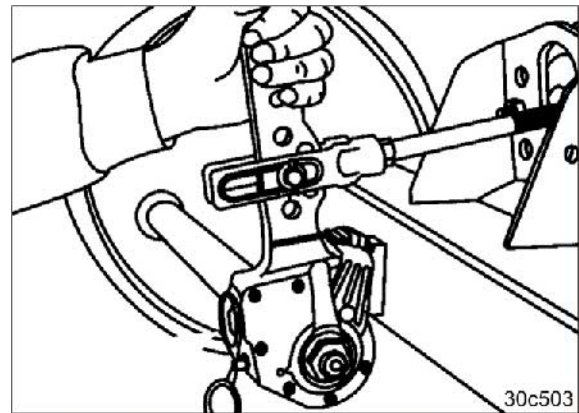


Fig. 161

12.4.15 Checking/adjusting the bearing clearance of the wheel hubs (specialist workshop)

Checking the bearing clearance of the wheel hubs:

1. Raise the axle until the tyres come free.
2. Release the brake.
3. Place two levers between the tyre and the floor and check the bearing clearance.
4. Adjust the bearing if there is a noticeable bearing clearance.

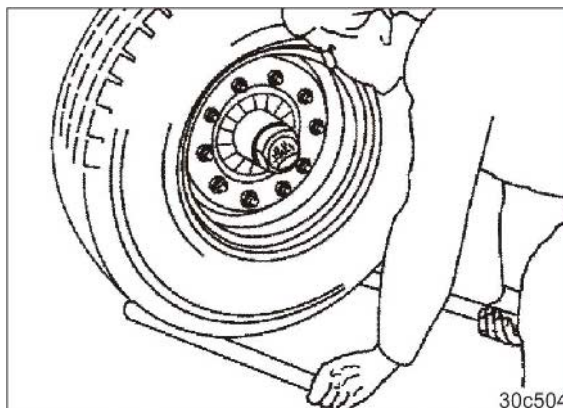


Fig. 162

Adjusting the bearing clearance of the wheel hubs:

1. Remove the dust or hub cap.
2. Remove the lynch pin from the axle nut.
3. Tighten the wheel nut by simultaneously turning the wheel until the run of the wheel hub is lightly braked.
4. Turn the axle nut back to the next possible lynch pin hole.
If there is congruence, to the next hole (max. 30°).
5. Replace the lynch pin with an identical one.
6. Insert the lynch pin and bend it up slightly.
7. Replenish the dust cap with some long-term grease and pound or screw it into in the wheel hub.

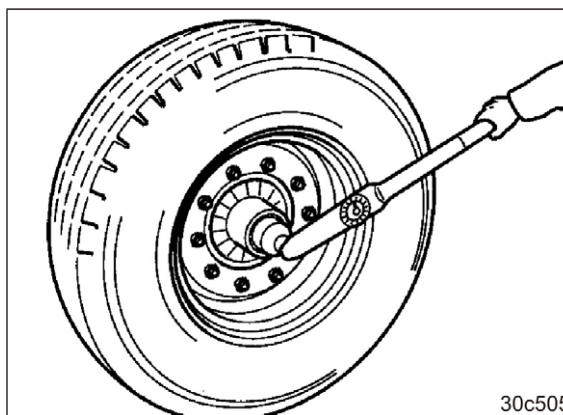


Fig. 163

12.4.16 Dual-circuit pneumatic braking system



For optimum brake performance with a minimum of wear, we recommend that the brakes on the tractor are balanced with those on the machine. After the service braking system has been run in for a suitable period, arrange for the brakes to be balanced by a specialist workshop.

To avoid problems with the brakes, adjust all vehicles in accordance with EC Guideline 71/320 EEC.



DANGER

- Only specialist workshops or recognised brake services may perform adjustment and repair work on the brake system.
- Regularly have the brake system inspected thoroughly (see section "Maintenance schedule – overview", on page 142).
- Be particularly careful with welding, burning and drilling work in the vicinity of brake lines!
- No welding or soldering may be performed on valve fittings or pipes. Any damaged parts must be replaced.
- Always perform a braking test after any adjusting or repair work on the braking system.
- For servicing and maintenance work on the braking system observe the section "Safety information for users", on page 28.

12.4.16.1 Visual inspection of the dual-circuit pneumatic braking system

Before beginning to drive, verify that the brake system meets the following criteria:

- Piping, hose lines and hose couplings must not be externally damaged or rusted.
- Hinges, e.g. on fork heads, must be properly secured, easy to move, and not worn out.
- Ropes and cables
 - o Must be properly routed.
 - o Must not have any visible cracks.
 - o Must not be knotted.
- Check the brake cylinder piston stroke.
The stroke of the brake cylinder may only be utilised up to 2/3. Otherwise readjust the brake (specialist workshop).
- Replace damaged dust covers.
- External inspection of the compressed air tank (see section "External inspection of the compressed air tank", on page 161).



If the visual inspection, function or action testing of the service brake system shows any signs of deficiencies, have a thorough inspection of all components performed immediately at a specialist workshop.

12.4.16.2 Brake inspection (specialist workshop)

Work that must be carried out every 3 months, at the latest every 500 operating hours¹⁾, in a specialist workshop:

- Check the safe operating condition of the service brake system.
- Check the wear of brake linings.
Replace the brake shoes when the remaining lining thickness is less than 2.0 mm (bonded linings). Use only original brake shoes with type-tested brake linings. When doing so, also replace the shoe return springs if necessary.
- Checking the pressure in the compressed air tank (see on page 162).
- Leak test of the dual-circuit pneumatic braking system (see on page 162).
- Cleaning the line filters of the dual-circuit pneumatic braking system (specialist workshop) (see on page 163)

¹⁾ This servicing interval is a recommendation. Depending on the deployment, e.g. constant driving on hilly terrain, this may have to be shortened.



CAUTION

Observe the legal regulations for all service work.

Only genuine spare parts may be used.

The brake valve settings laid down by the manufacturer must not be altered.



In Germany Section 57 of the regulation BGV D 29 of the industrial injuries mutual insurance organisation requires as follows: the keeper has to have vehicles tested as required, however at least once annually, by an expert as to their safe operating condition.

12.4.16.3 Checking the brake drum for dirt (specialist workshop)

1. Unscrew the two cover plates (Fig. 164/1) inside the brake drum.
2. Remove any dirt and plant residue.
3. Refit the cover plates.

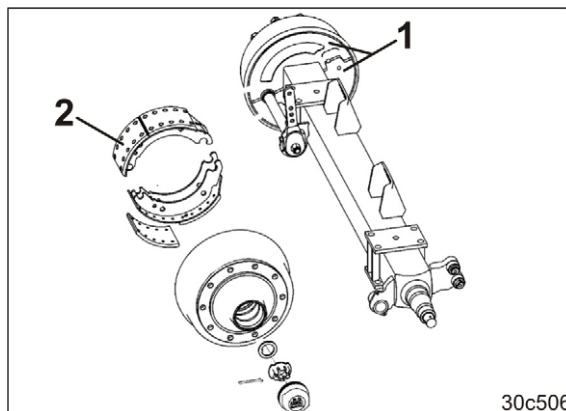


Fig. 164



CAUTION

Penetrating dirt may clog the brake linings (Fig. 164/2), which considerably reduces the braking power.

Risk of accident!

If there is dirt in the brake drum, the brake linings must be checked by a specialist workshop.

For this purpose, the wheel and brake drum must be detached.

12.4.16.4 Brake lining inspection (specialist workshop)

Replace the brake lining when the remaining lining thickness is

- 5 mm for riveted linings.
- 2 mm for bonded linings.

Remove the rubber plug (Fig. 165/1) in the inspection hole.

Then reinsert the rubber plug.

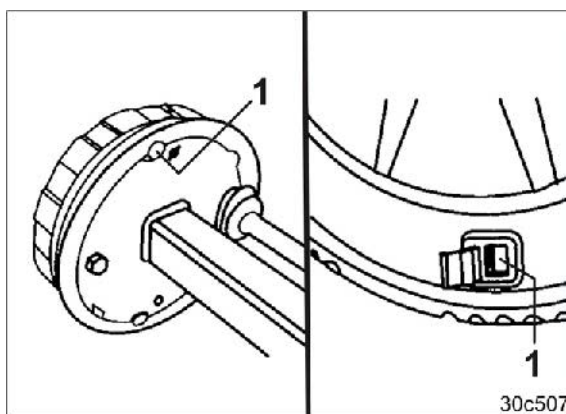


Fig. 165

12.4.16.5 Draining the compressed air tank (dual-circuit pneumatic braking system)

1. Run the tractor engine (approx. 3 mins.), until the compressed air tank (Fig. 166/1) has filled.
2. Switch off the tractor engine, apply the tractor parking brake and remove the ignition key.
3. Pull the drainage valve (Fig. 166/2) in a sideways direction by the ring until no more water escapes from the compressed air tank.
4. If the escaping water is dirty, let off air, unscrew the drainage valve from the compressed air tank and clean the compressed air tank.
5. Fit the drainage valve and check the compressed air tank for seal tightness (see section 12.4.16.8, on page 162).

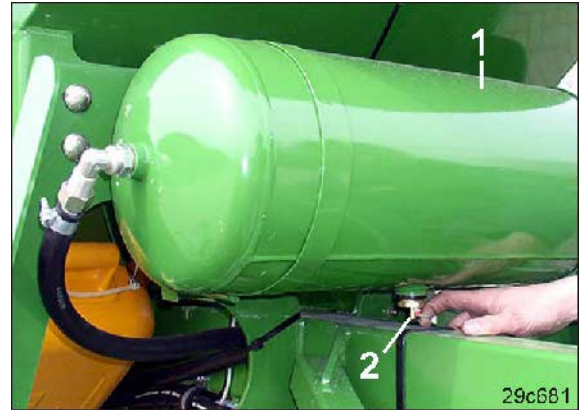


Fig. 166

12.4.16.6 External inspection of the compressed air tank (dual-circuit pneumatic braking system)

External testing of the compressed air tank (Fig. 167/1).

If the compressed air tank moves in the tensioning belts (Fig. 167/2)

→ tension or replace the compressed air tank

If the compressed air tank has any external corrosion damage or is damaged

→ replace the compressed air tank.

If the rating plate (Fig. 167/3) is rusty, loose or the rating plate is missing from the compressed air tank

→ replace the compressed air tank.

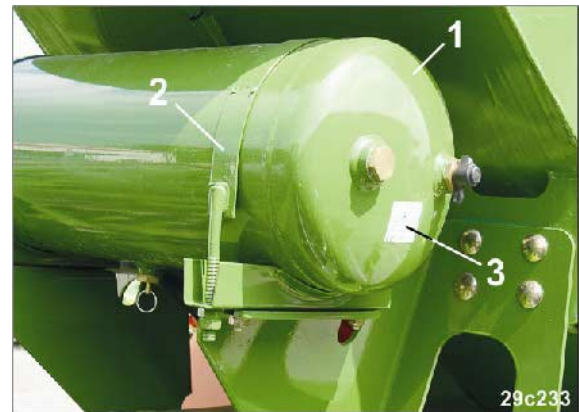


Fig. 167



The compressed air tank may be replaced in a specialist workshop only.

12.4.16.7 Checking the pressure in the compressed air tank of the dual-circuit pneumatic braking system (specialist workshop)

1. Connect a pressure gauge to the test connection on the compressed air tank.
2. Run the tractor engine (approx. 3 mins.) until the compressed air tank has filled.
3. Check whether the pressure gauge displays the setpoint range 6.0 to 8.1 bar.
4. If the reading drops below or exceeds the setpoint range, have the defective parts of the braking system replaced in a specialist workshop.

12.4.16.8 Leak test of the dual-circuit pneumatic braking system (specialist workshop)

- Test all connections, pipe, hose and screw unions for seal-tightness
- Eliminate any abrasion points on pipes and hoses
- Replace any porous and damaged hoses (specialist workshop)
- The dual-circuit pneumatic braking system is considered seal-tight if the pressure drop within 10 minutes with the engine shut down is no greater than 0.10 bar, i.e. about 0.6 bar per hour.
- If the values are not maintained, have the leakage sealed or the defective components of the brake system replaced at a specialist workshop.

12.4.16.9 Cleaning the line filters of the dual-circuit pneumatic braking system (specialist workshop)

The dual-circuit pneumatic braking system has:

- A brake line filter (Fig. 168/1).
- A supply line filter (Fig. 169/1).

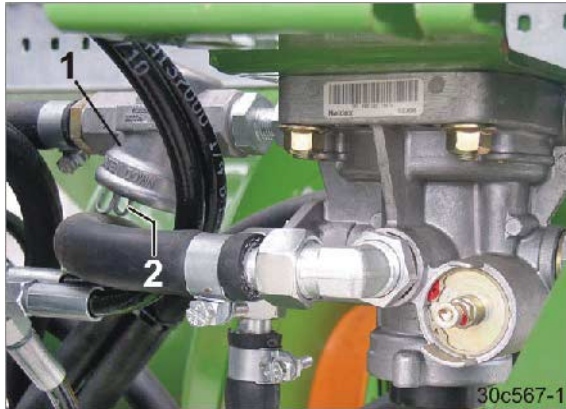


Fig. 168



Fig. 169

To clean the line filters:

1. Press the two lugs (Fig. 168/2) together and take out the closure piece complete with O-ring, pressure spring and filter insert.
2. Clean the filter insert with petrol or thinner (wash it) and dry with compressed air.
3. When reassembling in the reverse order, ensure that the O-ring does not jam in the guide slot.

12.5 Workshop adjustment and repair work

12.5.1 Setting the tramline to the track width (specialist workshop)



WARNING

The distributor head is located at the centre of the machine.

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

Before approaching, clean the path to the distributor head and the area of the distributor head (danger of slippage).

There is the risk of an accident on the path to the distributor head and in the area of the distributor head.

12.5.1.1 Setting the tramline to the track width of the cultivating tractor (specialist workshop)

When the machine is delivered or when buying a new cultivating tractor, check that the tramline is set to the track width (Fig. 170/a) of the cultivating tractor.

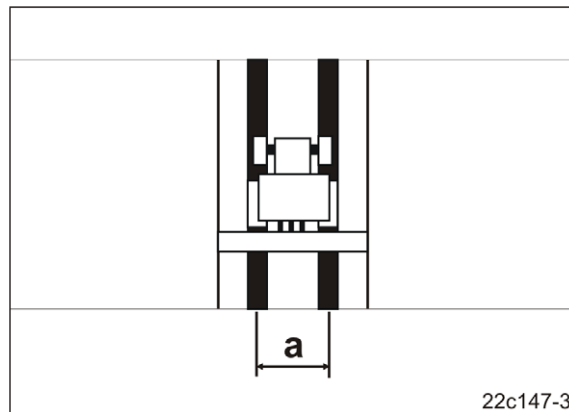


Fig. 170

The seed tubes (Fig. 171/1) of the tramline coulters must be fixed to the distributor head openings, which can be closed by the shutters (Fig. 171/2). If necessary, interchange the seed tubes.

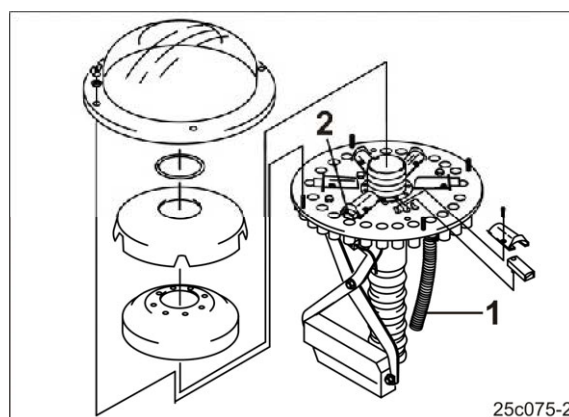


Fig. 171

12.5.1.2 Setting the tramline to the track width of the cultivating tractor (specialist workshop)

When the machine is delivered or when buying a new cultivating tractor, check that the tramline is set to the track width (Fig. 172/a) of the cultivating tractor.

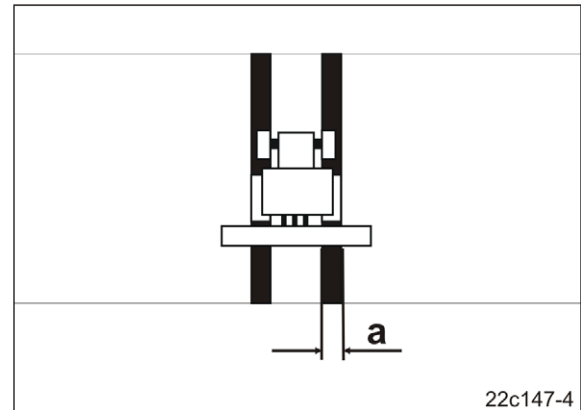


Fig. 172

The track width changes with the number of coulter not spreading seed when the tramlines are created.

Deactivate any non-required shutters (Fig. 171/2) (see on page 166). Deactivated shutters do not close the feed lines to the tramline coulter.

Always activate or deactivate pairs of shutters positioned opposite each other on the base plate.

Activating or deactivating shutters

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Set the tramline counter to "0" in the **AMATRON⁺**, as when creating tramlines.
3. Switch off the **AMATRON⁺**.
4. Remove the outer distributor cover (Fig. 173/1).
5. Remove the ring (Fig. 173/2).
6. Remove the inner distributor cover (Fig. 173/3).
7. Remove the foam insert (Fig. 173/4).
8. Slacken the screws (Fig. 174/1).
9. Remove the slider tunnel (Fig. 174/2).

Activating the shutters:

10. The shutters (Fig. 174/3) is in the guide, as shown in the diagram.

Deactivating the shutters:

11. Turn the shutters around (Fig. 174/3) and push them into the drill hole (Fig. 174/4).
12. Screw the slider tunnel (Fig. 174/2) onto the base plate.

13. Install the foam insert (Fig. 175/1).
14. Install the inner distributor cover (Fig. 175/2).
15. Install the ring (Fig. 175/3).
16. Install the outer distributor cover (Fig. 175/4).
17. Check the function of the tramline control.

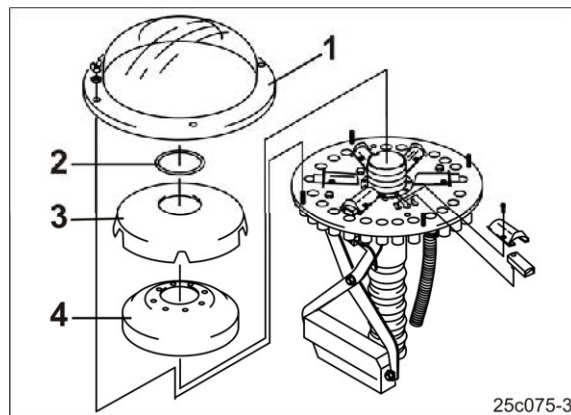


Fig. 173

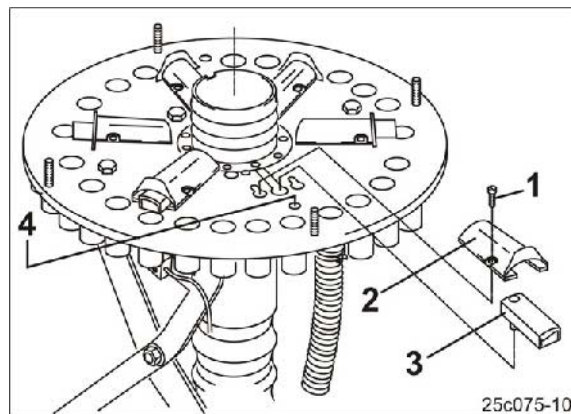


Fig. 174

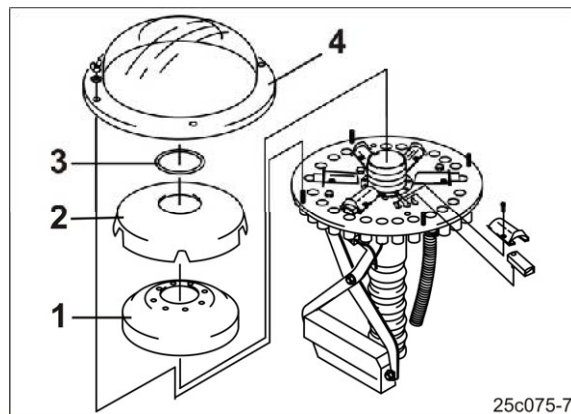


Fig. 175

12.6 Bolt tightening torques

Thread	Width across flats [mm]	Tightening torques [Nm] as a function of the bolt/nut grade		
		8.8	10.9	12.9
M 8	13	25	35	41
M 8x1		27	38	41
M 10	16 (17)	49	69	83
M 10x1		52	73	88
M 12	18 (19)	86	120	145
M 12x1.5		90	125	150
M 14	22	135	190	230
M 14x1.5		150	210	250
M 16	24	210	300	355
M 16x1.5		225	315	380
M 18	27	290	405	485
M 18x1.5		325	460	550
M 20	30	410	580	690
M 20x1.5		460	640	770
M 22	32	550	780	930
M 22x1.5		610	860	1050
M 24	36	710	1000	1200
M 24x2		780	1100	1300
M 27	41	1050	1500	1800
M 27x2		1150	1600	1950
M 30	46	1450	2000	2400
M 30x2		1600	2250	2700



Tightening torques of the wheel and hub bolts [see table (Fig. 151), on page 147].

13 Hydraulic diagram

13.1 Hydraulic diagram Citan Z 12000

Fig. 176/...	Designation	Article No.	Note
T01	Tractor		
T02	Coulter frame lifting	GA162	
T03	Star wheel lifting	934108	
T04	Star wheel locking block	GD050	
T05	Rapid traverse control block	GD446	
T06	Coulter pressure, right	GA163	
T07	Coulter pressure, left	GA163	
T08	Coulter pressure locking block	GD050	
T09	Folding, left	GA109	
T10	Folding, right	GA109	
T11	Frame load control block	GD447	
T12	Distributor folding, right	GA139	
T13	Distributor folding, left	GA139	
T14	Distributor folding locking block	GD050	
T15	Distributor folding control valve	911410	
T16	Lamp folding	934123	
T17	Lamp folding control valve	GD372	
T18	Screw-in throttle, 1mm	GD292	
T19	Unlockable non-return valve	GD279	
T20	Lamp folding non-return valve	GD431	
T21	Blower fan drive	959994	
T22	Non-return valve	GD277	
T23	Coulter pressure gauge	GD202	
T24	Extension arm pressure gauge	GD202	

All position specifications in direction of travel

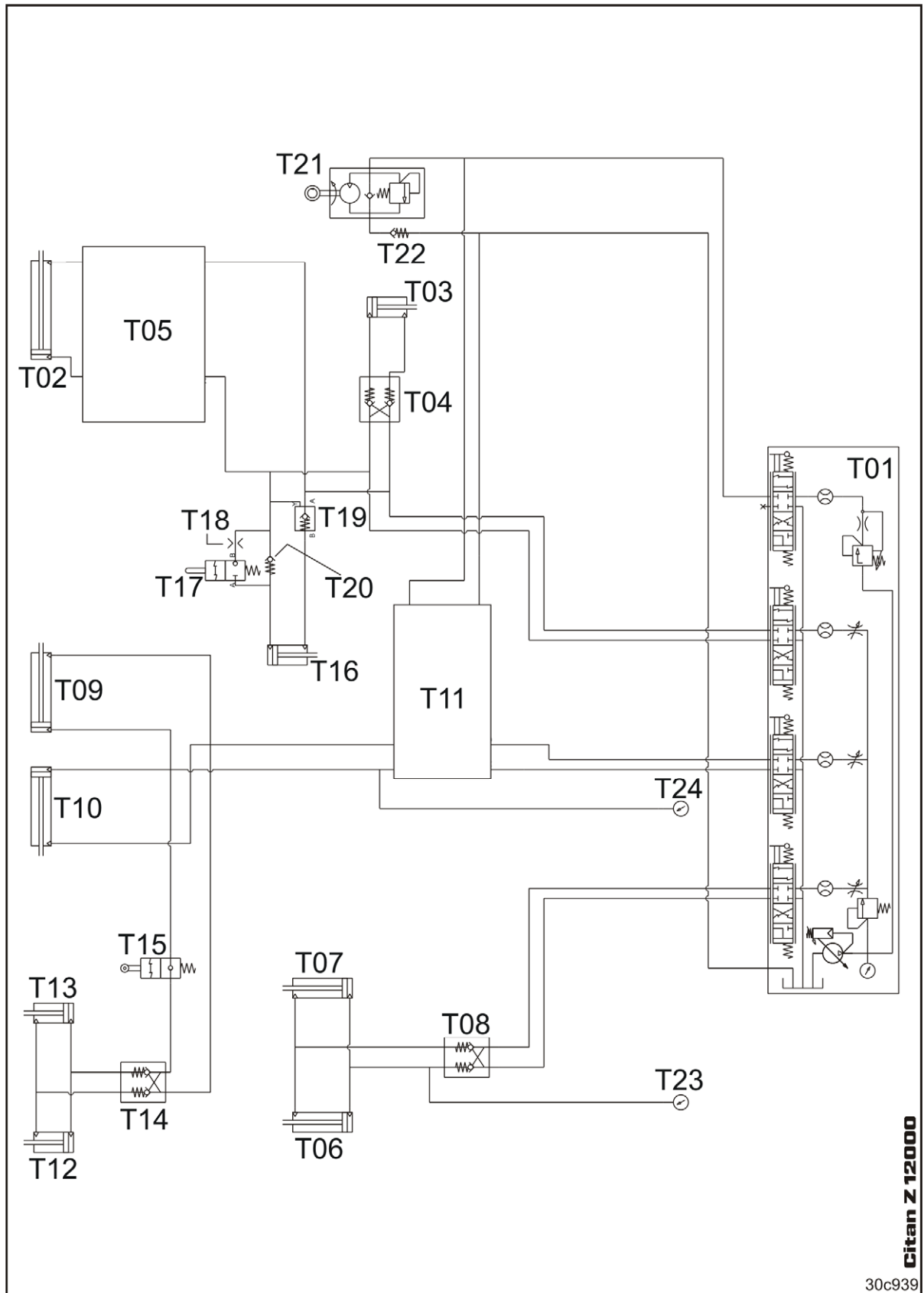


Fig. 176



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