

Operating Manual

AMAZONE

Cirrus

3002 / 4002 / 6002



MG3994
BAH0049-1 09.14

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

en



Reading the instruction

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

Leipzig-Plagwitz 1872. Rud. Sark.

Identification data

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

Machine identification number:
(ten-digit)

Type:

Cirrus

Year of manufacture:

Basic weight (kg):

Approved total weight (kg):

Maximum load (kg):

Manufacturer's address

AMAZONEN-WERKE

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Spare part orders

Spare parts lists are freely accessible in the spare parts portal at www.amazone.de.

Please send orders to your AMAZONE dealer.

Formalities of the operating manual

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Foreword

Foreword

Dear Customer,

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

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

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

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

Should you have 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 the traction vehicle.
- Keep it in a safe place for future use.

1.2 Locations in the operating manual

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

1.3 Diagrams used

Handling instructions and reactions

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

1. Handling instruction 1
→ 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 been trained in working with/on the machine.
- Have read and understood this operating manual.

The operator is obliged

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

If you still have queries, please contact the manufacturer.

Duties of the operator

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 section "General safety information" of this operating manual.
- To read the section "Warning pictograms and other signs on the machine", 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).

General Safety Instructions

Risks in handling the machine

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

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

Only use the machine

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

Eliminate any faults immediately which could impair safety.

Guarantee and liability

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

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

2.2 Representation of safety symbols

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



DANGER

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

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



WARNING

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

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



CAUTION

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



IMPORTANT

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

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



NOTE

Indicates handling tips and particularly useful information.

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

2.3 Organisational measures

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

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



The operation manual

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

Check all the available safety equipment regularly.

2.4 Safety and protection equipment

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

Faulty safety equipment

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

2.5 Informal safety measures

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

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

2.6 User training

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

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

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

Legend: X..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 also have been informed about the necessary protective equipment and measures.

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

Comment:

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



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

MD076

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

- while the tractor engine is running with hydraulic drive engaged
- or the ground wheel drive is moving.

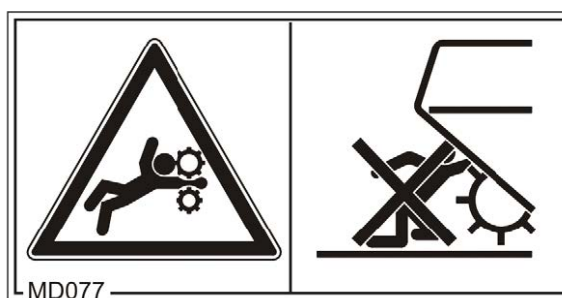


MD077

Danger of catching and pulling arms through motorised feed rollers!

This danger would cause extremely serious injuries with the loss of body parts on arms.

Never reach into the feed rollers while the tractor engine is running with the hydraulic system connected.

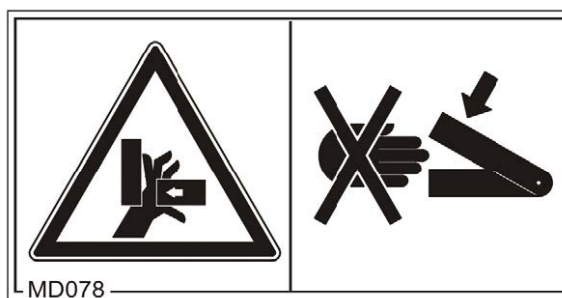


MD078

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 while the tractor engine is running with the hydraulic system connected.

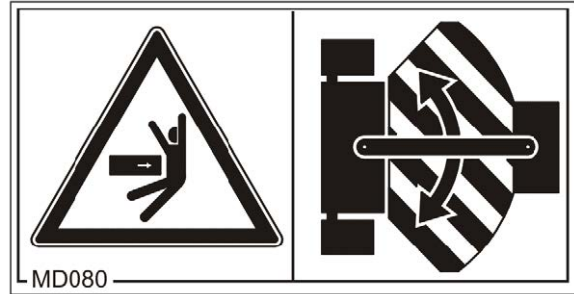


MD080

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.



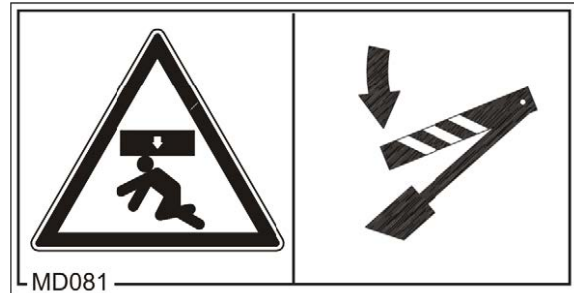
MD081

Danger of getting crushed for the whole body by machine parts that are raised by lifting cylinders and unintentionally lowered!

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

Secure the machine parts raised by the lifting cylinder against unintentional lowering before you enter the danger zone under raised machine parts.

To do so, use the mechanical lifting cylinder support or the hydraulic blocking device.



MD082

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.



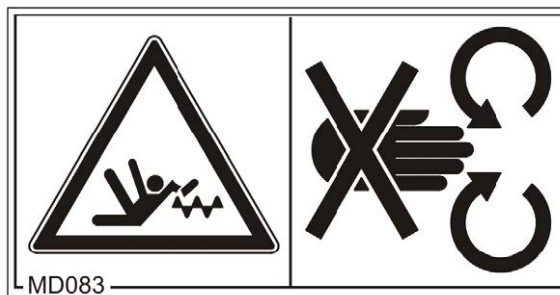
General Safety Instructions

MD083

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 hydraulic drive engaged.



MD084

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.

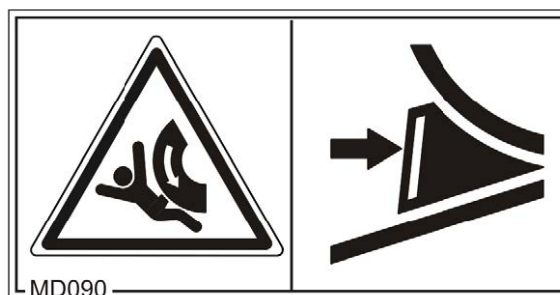


MD090

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).

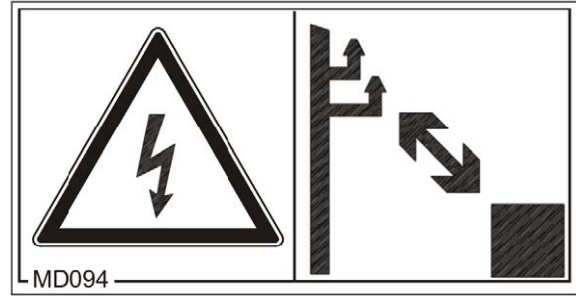


MD094

Danger of electric shock due to unintentionally touching electrical overhead transmission cables!

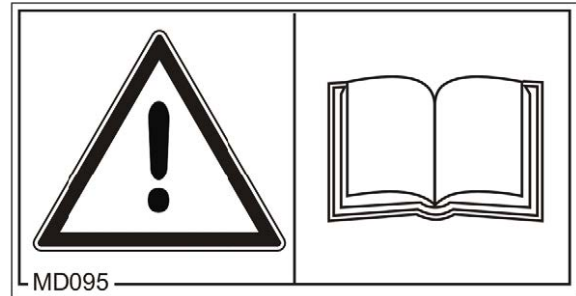
This danger will cause serious injuries anywhere on the body or death.

Maintain a sufficient distance from electrical overhead cables when swinging any parts of the machine in and out.



MD095

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



MD096

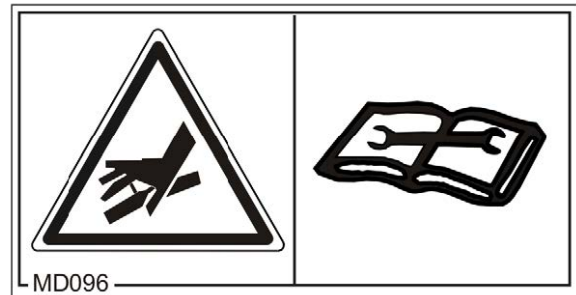
Danger of infection to the whole body from liquids escaping at a high pressure (hydraulic fluid)!

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 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.



General Safety Instructions

MD097

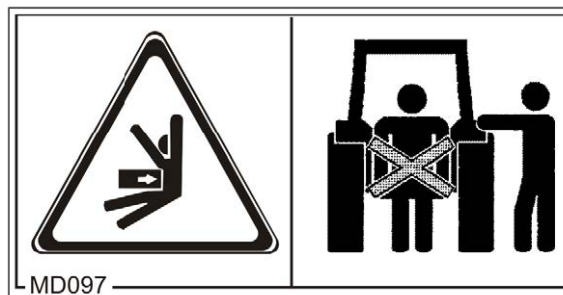
Danger of crushing your torso in the stroke range of the three-point suspension due to the narrowing spaces when the three-point hydraulic system is actuated!

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 hydraulics are actuated.

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

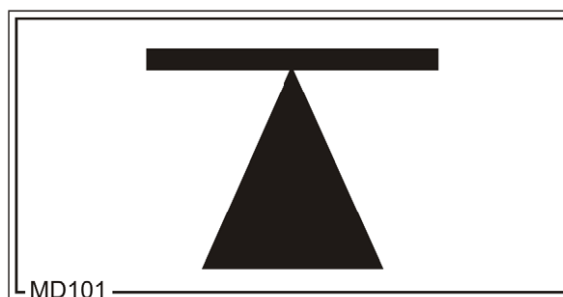
- from the intended workstation.
- if you are outside of the danger area between the tractor and the machine.



MD097

MD101

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



MD101

MD102

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

MD104

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

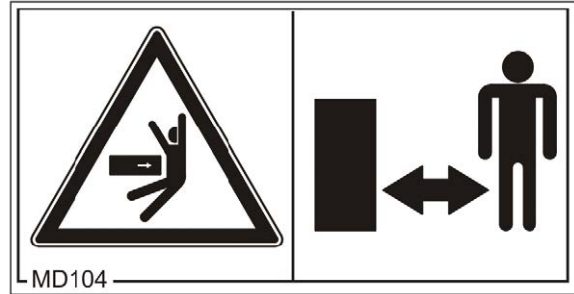
This danger will cause serious injuries to the torso or death.

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.



MD104

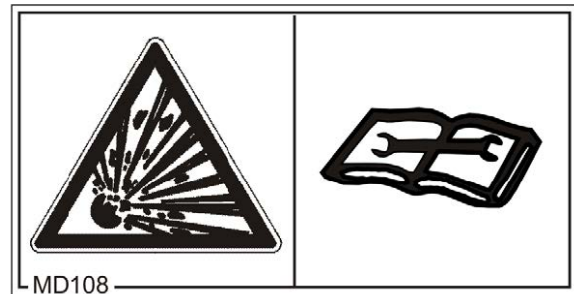
MD108

Danger from accumulators under gas or oil pressure!

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.

Prior to all work on the hydraulic system read and take heed of the directions in the operating manual.

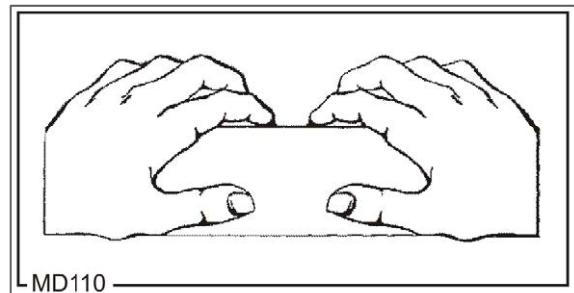
If you are injured by hydraulic fluid, contact a doctor immediately.



MD108

MD110

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



MD110

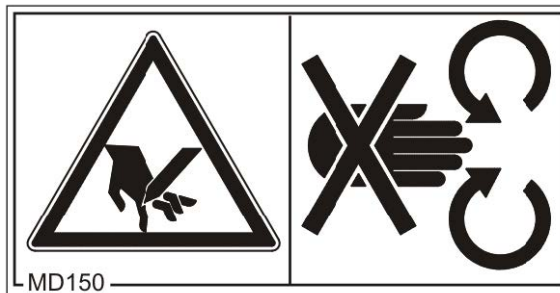
General Safety Instructions

MD150

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.

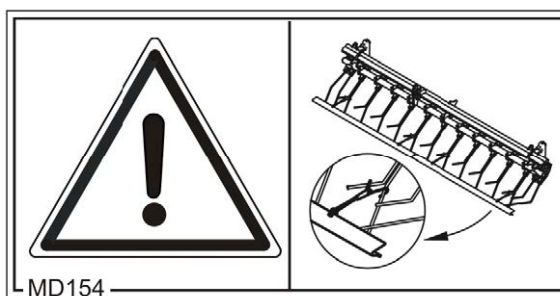
Never open or remove guard devices from driven machine parts when the tractor engine is running with the PTO shaft connected / hydraulic drive engaged.



MD154

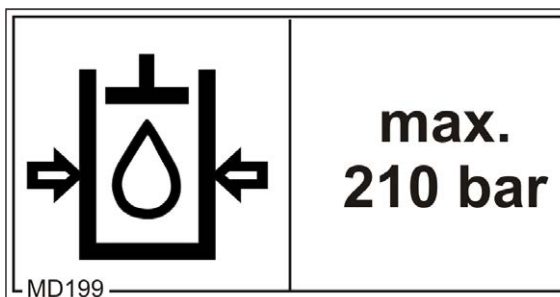
Risk of stabbing other road users during transportation from uncovered, sharp spring tines of the exact harrow pointing backwards!

Transportation without a correctly fitted transport guard rail is forbidden.



MD199

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



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.

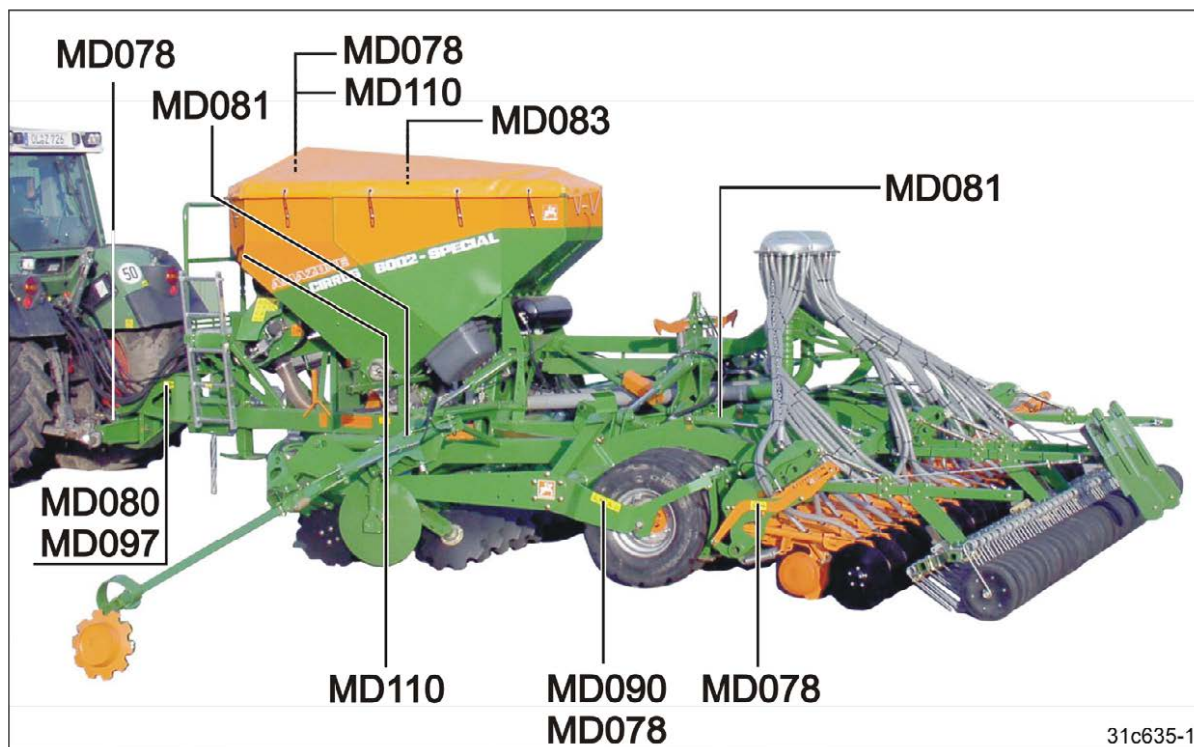


Fig. 1

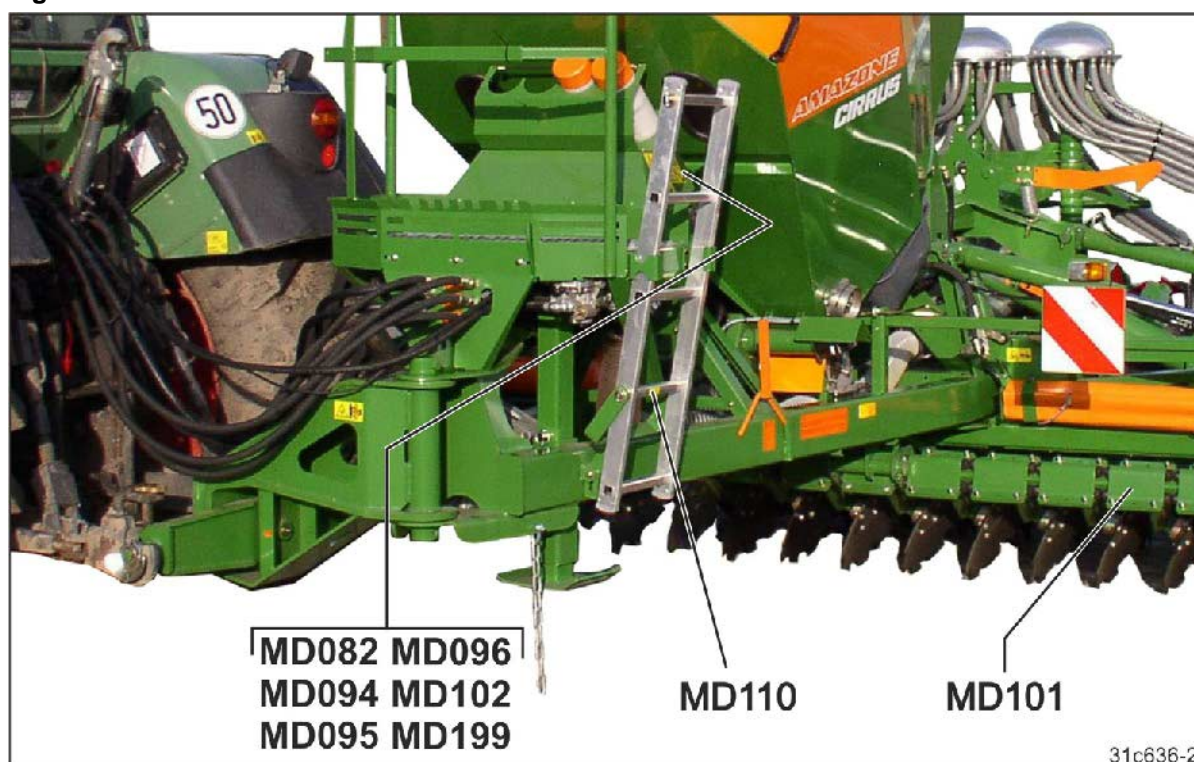


Fig. 2



Fig. 3



Fig. 4

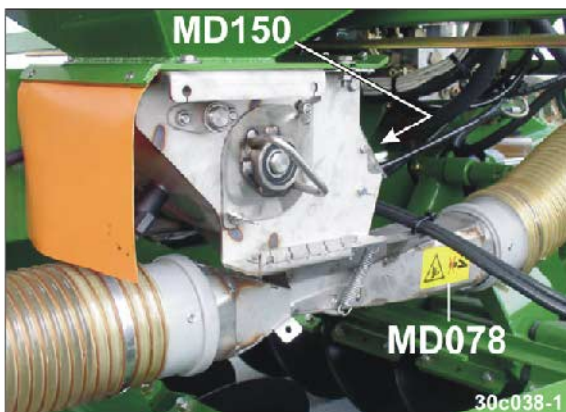


Fig. 5



Fig. 6



Fig. 7



Fig. 8

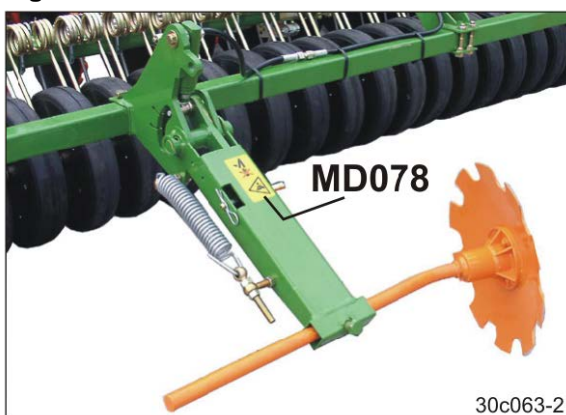


Fig. 9



Fig. 10

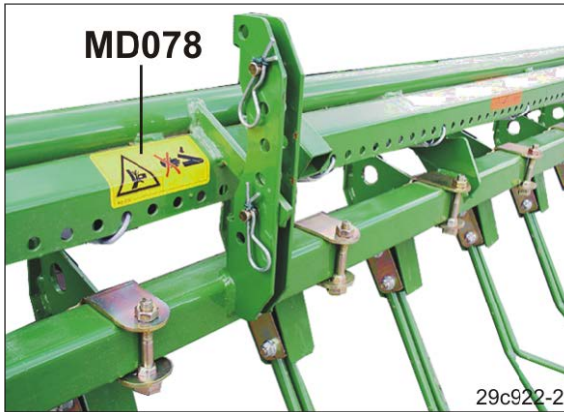


Fig. 11



Fig. 12

The following illustrations show warning symbols that are located only on the folding machines.



Fig. 13

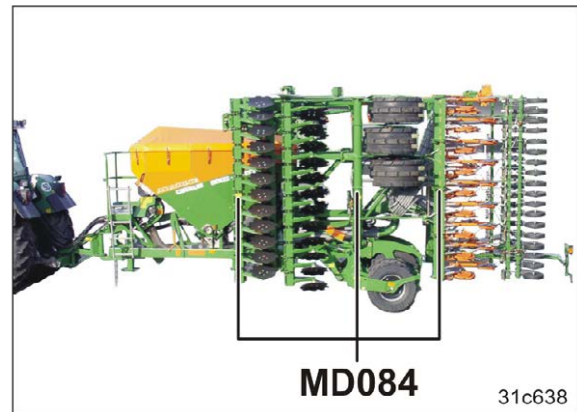


Fig. 14

2.14 Dangers if the safety information is not observed

Nonobservance of the safety information

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

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

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

2.15 Safety-conscious working

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

Comply with the accident prevention instructions on the warning pictograms.

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

2.16 Safety information for users



WARNING

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

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

2.16.1 General safety and accident prevention information

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

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

Connecting and disconnecting the machine

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

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

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

three-point hydraulic system.

- 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 give without tension, bending or rubbing on all movements when travelling round corners.
 - May not scour other parts.
- The release ropes for quick action couplings must hang loosely and may not release themselves when lowered.
- Also ensure that uncoupled machines are stable!

Use of the machine

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

the approved axle and support loads of the tractor.

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

2.16.2 Hydraulic system

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

2.16.4 Universal joint shaft operation

- You must install or remove the PTO shaft only after you have done all of the following:
 - Switched off the universal joint shaft
 - Switched off the tractor engine
 - Applied the parking brake
 - The ignition key has been removed
- Before switching on the universal joint shaft, check that the selected universal joint shaft speed of the tractor matches the permitted drive speed of the machine.
- Instruct everyone to leave the danger area of the machine before switching on the universal joint shaft.
- Never switch on the universal joint shaft when the tractor engine is not running.
- **WARNING** After the universal joint shaft is switched off, there is a risk of injury from the continued rotation of freewheeling machine parts.
Stay clear of the machine during this time. You must only start work on the machine once all machine parts are at a complete standstill.

2.16.5 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.

2.16.6 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.

Compressed air brake 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 tank 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 empty 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 tank if:
 - The air tank can be moved in the tensioning belts
 - The air tank is damaged
 - The type plate on the air tank 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.

2.16.7 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.
- Comply with the prescribed 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!

2.16.8 Operation of the seed drill

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

2.16.9 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

Loading and unloading with a tractor



WARNING

There is a risk of an accident when the tractor is unsuitable and the machine brake system is not connected to the tractor or is filled.



- Correctly couple the machine to the tractor, before loading the machine onto a transport vehicle or unloading it from a transport vehicle.
- You may only couple and transport the machine with a tractor for loading and unloading, as long as the tractor fulfils the power requirements.
- Compressed air brake system:
Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar!

Connect the Cirrus to a suitable tractor for loading onto or unloading off a transport vehicle.

Make the following connections on the tractor

- all service brake connections
- all hydraulic connections
- the free return line of the hydraulic fan connection.

Connection of the control terminal AMATRON 3 is not required.



Fig. 15



WARNING

A marshalling person is required for the loading and unloading.

3.1 Loading the Cirrus

1. Put the Cirrus in its transport position.
2. Raise the Cirrus via the integrated running gear up to a middle position.
3. Push the Cirrus carefully backwards onto the transport vehicle.
A marshalling person is required for loading.



Fig. 16

4. Lower the Cirrus fully as soon as the Cirrus has reached its transport position on the transport vehicle.



Fig. 17

5. Secure the Cirrus in compliance with regulations.

Bear in mind that the Cirrus has no parking brake.

Additionally clamp the booms of the foldable machines at the lugs (Fig. 18/1).

6. Disconnect the tractor from the machine.



Fig. 18

3.2 Unloading the Cirrus

1. Couple the Cirrus to the tractor.
2. Remove the transport securing device.
3. Raise the Cirrus via the integrated running gear up to a middle position and pull it carefully off the transport vehicle.
A marshalling person is required for unloading.
4. After unloading uncouple the machine from the tractor.



Fig. 19

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.

Main assemblies of the machine

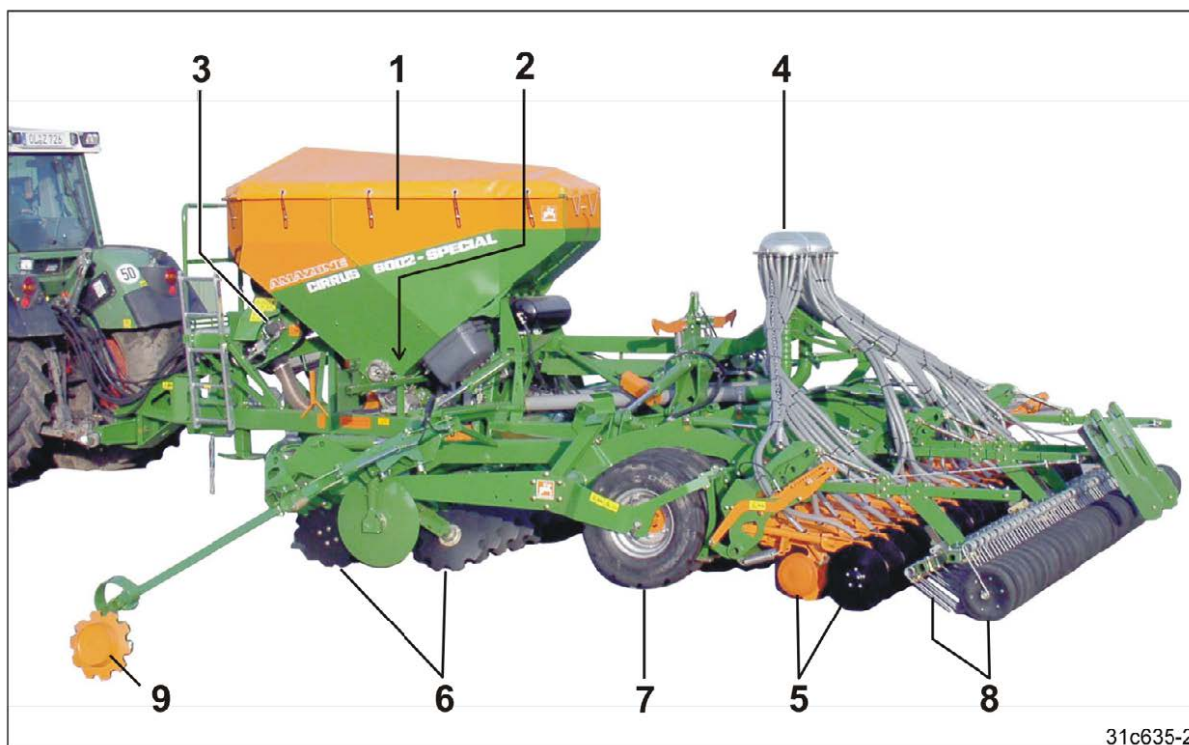


Fig. 20

Fig. 20/...

- | | |
|---------------------------|--|
| (1) Seed hopper | (5) RoTeC+ Coulter |
| (2) Central dosing | (6) Two-row disc array |
| (3) Blower fan | (7) Tapered tyres with integrated running gear |
| (4) Seed distributor head | (8) Roller harrow |
| | (9) Track marker |

4.1 Overview of subassemblies

Fig. 21/...

AMATRON 3 operator terminal



Fig. 21

Fig. 22/...

- (1) Radar
- (2) Wheel chocks

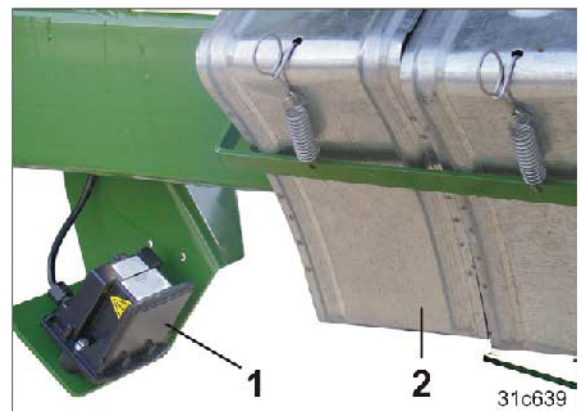


Fig. 22

Fig. 23/...

- (1) Electrohydraulic control blocks
- (2) Hydraulic accumulator with nitrogen filling for pretensioning the outswung machine extension arms

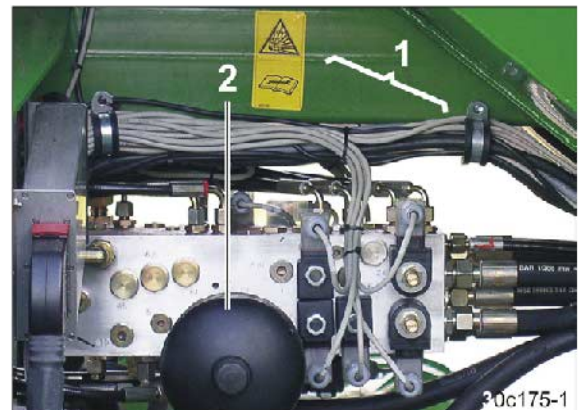


Fig. 23

Fig. 24/...

- (1) Draw rail
- (2) Sustainer, extendable



Fig. 24

Product description

Fig. 25/...

- (1) Mounting for supply lines
- (2) Roller holder for stowing
 - o of the operating manual
 - o of the dosing rollers
 - o of the digital scales.

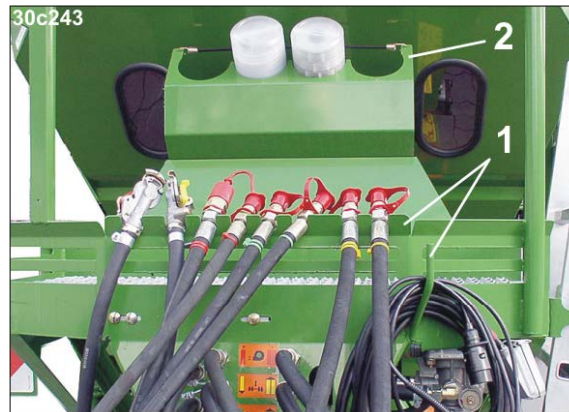


Fig. 25

Fig. 26/...

- (1) Loading board with ladder
- (2) Holding point

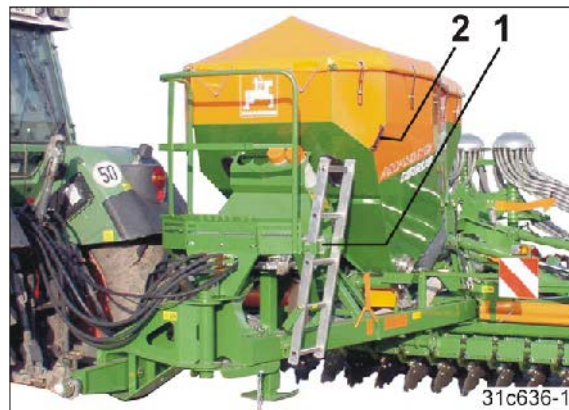


Fig. 26

Fig. 27/...

- (1) Swivel cover
- (2) Cover hook



Fig. 27

Fig. 28/...

- (1) Crank for exact harrow adjustment
- (2) Seed doser
- (3) Electric motor (when fitting the "full dosing", in each case, an electric motor powers a seed dosing unit)
- (4) Injector housing
- (5) Calibration trough (in mounting for calibration test)

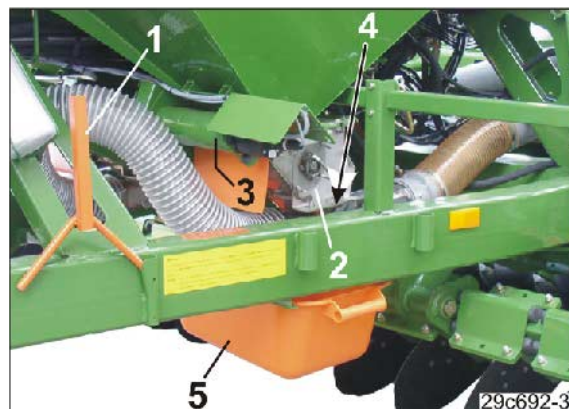


Fig. 28

Fig. 29/...

- (1) Sieve grate
- (2) Level sensor

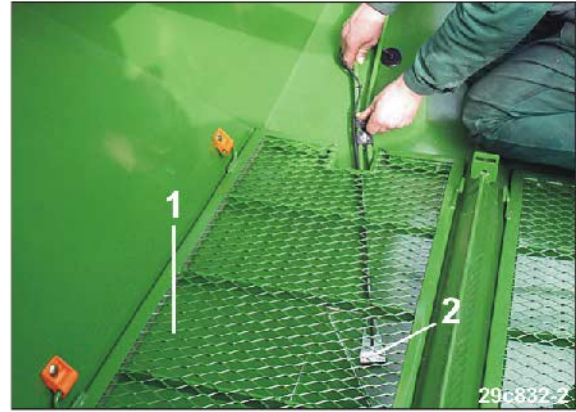


Fig. 29

Fig. 30/...

- (1) RoTeC coulter
- (2) RoTeC+ coulter



Fig. 30

Fig. 31/...

Tramline marker

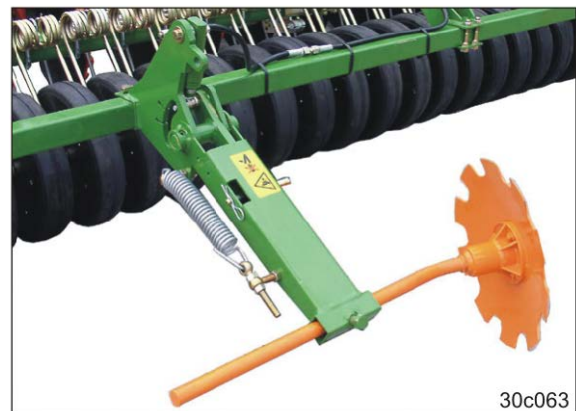


Fig. 31

Fig. 32/...

- (1) Brake valve with release valve (viewed from below)



Fig. 32

4.2 Safety and protection equipment

Fig. 33/...

- (1) Fan guard



Fig. 33

Fig. 34/...

- (1) Sieve grate lock
(for full dosing)



Fig. 34

Fig. 35/...

- (1) Dosing window lock.
Interruption of the roller drive when the dosing window is opened (Fig. 35/2) with full dosing.

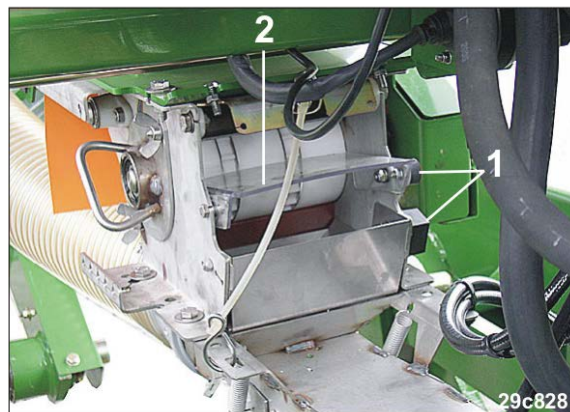


Fig. 35

Fig. 36/...

- (1) Spacer for safeguarding the axle rocker prior to servicing work.



Fig. 36

4.3 Overview – Supply lines between the tractor and the machine

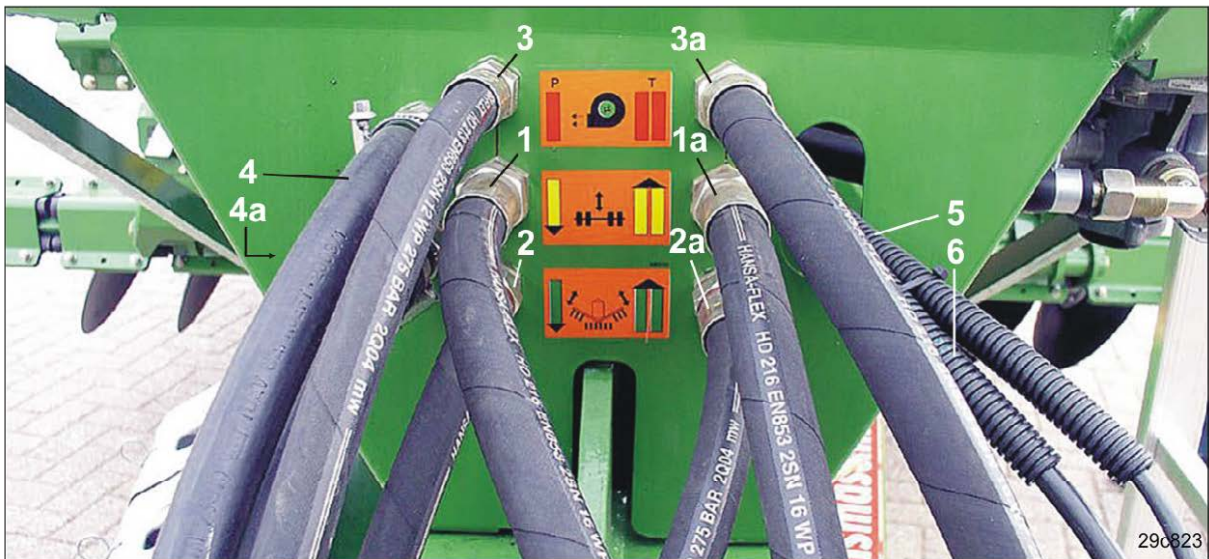


Fig. 37

Fig. 37/...	Designation		Marking
(1)	Hydraulic line 1		yellow
(1a)			
(2)	Hydraulic line 2		green
(2a)			
(3)	Hydraulic line 3	Pressure line with priority	red
(3a)		Pressureless line	
(4)	Brake line (compressed air)		yellow
(4a)	Supply line (compressed air)		red
(5)	Plug (7-pin) for the road traffic lighting system		
(6)	Implement plug for on-board computer AMATRON 3		
No Fig.	Hydraulic brake line ¹⁾		

¹⁾ not permitted in Germany and some other EU countries

4.4 Transportation equipment

Fig. 38/...

- (1) 2 rear-facing warning boards
- (2) 1 speed sign
- (3) Licence plate holder
- (4) Protective curtain



Fig. 38

Fig. 39/...

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

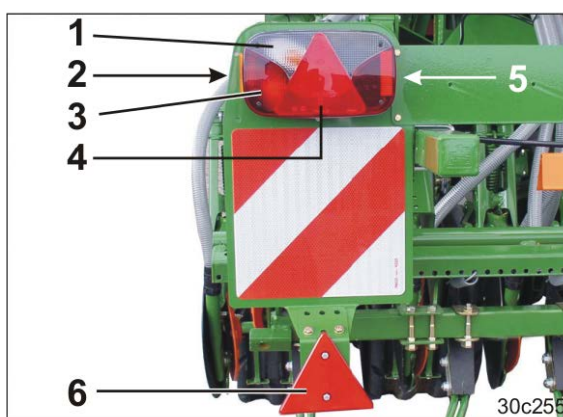


Fig. 39

Fig. 40/...

Cirrus 3002 with exact harrow:

- (1) Transport safety bar, two-part

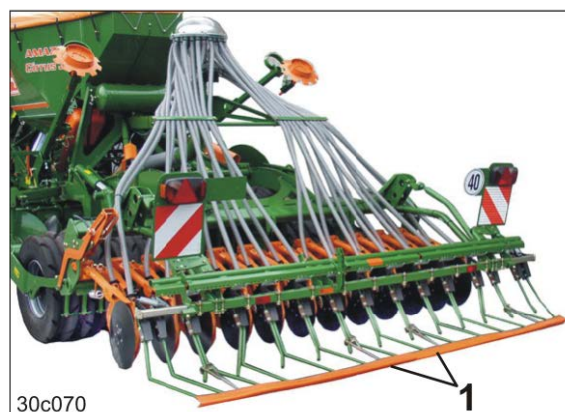


Fig. 40

Fig. 41/...

Cirrus 4/6002 with exact harrow:

- (1) Transport safety bar, two-part



Fig. 41

Fig. 42/...

- (1) 2 forwards-facing warning boards



Fig. 42

Fig. 43/...

- (1) 2 side lights pointing forwards
- (2) 2 forwards-facing turn signals

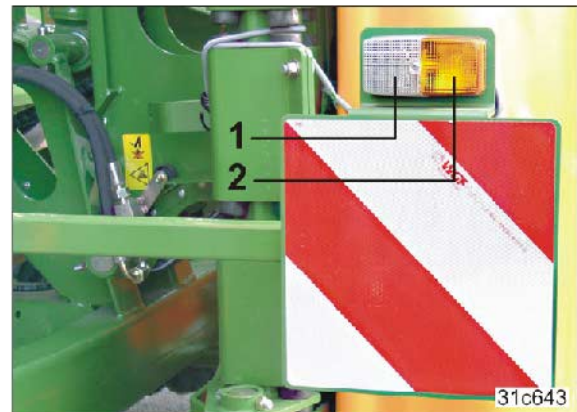


Fig. 43

Fig. 44/...

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

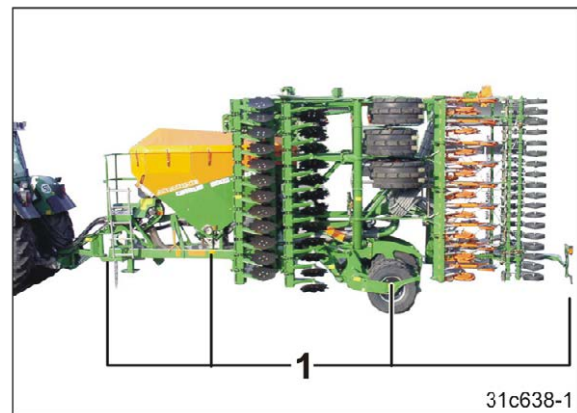


Fig. 44

4.5 Intended use

The machine

- is constructed for the seedbed preparation of agriculturally used arable land and for the dosing and output of commonly available seeds.
- This is coupled to the tractor using the lower tractor line 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.
- Execution of inspection and maintenance work.
- Exclusive use of original AMAZONE spare parts.

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

For any damage resulting from improper use:

- the operator bears the sole responsibility,
- AMAZONEN-WERKE 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:

- in the area of the swivelling machine extension arm
- in the area of the swivelling track marker
- in the area of the swivelling tapered ring tyres.

4.7 Type plate and CE labelling

The following illustrations show the arrangement of the type plate (Fig. 45/1) and of the CE labelling (Fig. 45/2).

The type plate shows:

- Mach. ident. no.
- Type
- Permissible system pressure, bar
- Year of manufacture
- Factory
- Power output, kW
- Basic weight, kg
- Perm. laden weight, kg
- Perm. axle load, kg
- Perm. axle load, front / support load, kg.



Fig. 45

4.8 Technical data

Cirrus			3002	4002	6002
Working width		[m]	3.0	4.0	6.0
Total length ¹⁾		[m]	7,59	8,09	8,09
Fill level	without extension	[m]	2350	2350	2500
	with extension		2540	2540	2690
Hopper volume	without extension	[l]	2200	2200	3000
	with extension		2800	2800	3600
Full load (on field)	without extension	[kg]	1800	1800	2400
	with extension		2300	2300	2900
Number of sowing units / Row spacing [cm]			24 / 12,5	32 / 12,5	48 / 12,5
			18 / 16,0	24 / 16,0	36 / 16,0
Continuous acoustic pressure level		[dB(A)]	74	74	74
Working speed		[km/h]	12 to 16	12 to 16	12 to 16
Power requirement (from)		[kW/bhp]	90/120	110/150	147/200
Oil flow rate (minimum).		[l/min]	80	80	80
Max. hydraulic working pressure		[bar]	210	210	210
Coupling point category		Category	III	III	III
Number of tapered ring tyres			6	8	12
Maximum drawbar load with full seed hopper (on the field)	without extension	[kg]	2200	2500	2800
	with extension		2500	2800	3100
Transport running gear			Integrated with 4 running wheels		
Transmission/hydraulic fluid			Transmission/hydraulic fluid Utto SAE 80W API GL4		
Electrical system		[V]	12 (7-pin)		
Service brake system (connection to tractor)			Dual-circuit pneumatic braking system or hydraulic braking system ²⁾		
Effective brake in the integrated running gear			Hydraulically acting		

¹⁾ with exact harrow, without tramline marker

²⁾ Not allowed in Germany and in several other countries.



Product description

Road transport data (only with an empty seed hopper)

Cirrus		3002	4002	6002
Transport width	[m]	3.0		
Overall height in transport position (folded in from 4 m working width upwards)	[mm]	2700	2700	3700
Empty weight (basic weight)				
Running gear tyre without polyurethane filling	[kg]	3900	5890	7600
with polyurethane filling	[kg]	4300	6290	8000
Permissible total weight				
Running gear tyre without polyurethane filling	[kg]	4200	6200	8000
with polyurethane filling	[kg]	4600	6600	8400
Permissible axle load				
Running gear tyre without polyurethane filling	[kg]	3500	5500	6900
with polyurethane filling	[kg]	3900	5900	7300
Perm. drawbar load (F_H) when driving on the road (see rating plate)	[kg]	1100	1500	2000
Maximum payload for transport journeys	[kg]	220		
Perm. maximum speed on all non-public roads, public roads and public ways.	[km/h]	40		

4.9 Necessary tractor equipment

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

Tractor engine power

Cirrus 3002	from 90 kW (120 bhp) upwards
Cirrus 4002	from 110 kW (150 bhp) upwards
Cirrus 6002	from 147 kW (200 bhp) upwards

Electrical system

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

Hydraulic system

Maximum operating pressure: 210 bar

Tractor pump power: 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 *yellow*: Double-acting control unit

Control unit *green*: Double-acting control unit

Control unit *red*:

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

Operational brake system

- Dual-circuit service braking system:
 - 1 hose coupling (red) for the supply line
 - 1 hose coupling (yellow) for the brake line
- Hydraulic braking system: 1 hydraulic coupling in accordance with ISO 5676



The hydraulic braking system is not allowed in Germany and several other EU countries!

4.10 Noise production data

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

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.

5 Structure and function

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

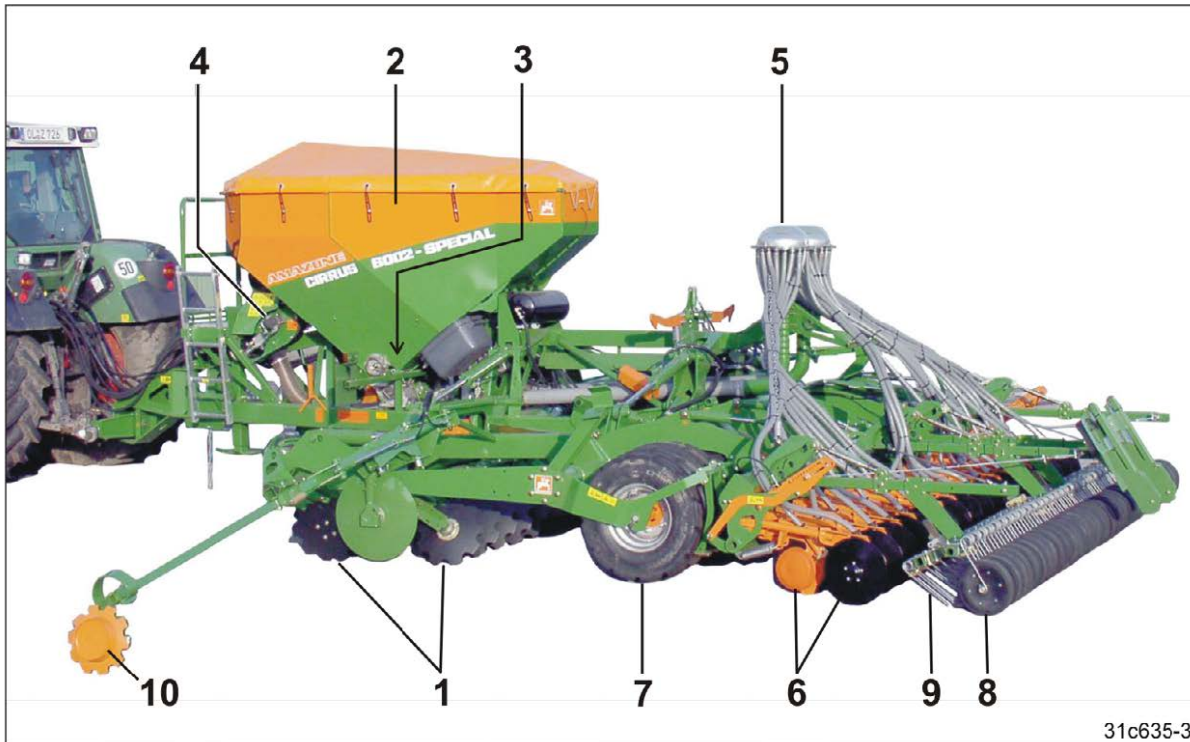


Fig. 46

The Cirrus Special allows sowing with or without previous soil cultivation in a single work process.

With the disc array (Fig. 46/1) mulch seeding and conventional plough seeding is possible.

The seed is carried in the seed hopper (Fig. 46/2).

The preset seed volume passes from the seed doser (Fig. 46/3), which is driven by an electric motor, into the air stream generated by the blower fan (Fig. 46/4).

The air stream conveys the seed to the distributor head (Fig. 46/5), which distributes the seed uniformly onto all the coulters (Fig. 46/6).

The seed is embedded into the strips in the soil, compacted in strips by the wedge ring tyres (Fig. 46/7), and covered with loose soil by the exact harrow. If required, the seed pressure roller beam (Fig. 46/8) with the adjustable drag tines (Fig. 46/9) can be used.

The field connection run is marked in the centre of the tractor by the track markers (Fig. 46/10).

Machines from a working width of 4 m upwards can be folded together to a transport width of 3 m.

5.1 Electrohydraulic control blocks

The hydraulic functions of the machine are actuated via the electrohydraulic control blocks.

Initially the desired hydraulic function has to be selected on the AMATRON 3 before the hydraulic function can be executed via the appropriate control unit.

This switching clear of the hydraulic functions in the AMATRON 3 allows operation of all hydraulic functions with only

- 2 tractor control units for the machine functions
- 1 tractor control unit for the blower fan.



Fig. 47

5.2 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.

5.2.1 Coupling the hydraulic hose lines



WARNING

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

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



- Check the compatibility of the hydraulic fluids before connecting the machine to the hydraulic system of the tractor.
Do not mix any mineral oils with biological oils.
- Observe the maximum approved hydraulic fluid pressure of 210 bar.
- Only couple clean hydraulic connectors.
- Push the hydraulic push-fit 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.

Structure and function

1. Swivel the actuation lever on the control 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. 48

5.2.2 Uncoupling the hydraulic hose lines

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



Fig. 49

5.3 Dual-circuit pneumatic service braking system



DANGER

The machine has no parking brake!

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



Compliance with the maintenance intervals is essential for the correct function of the two-line operating brake system.

Fig. 50/...

- (1) Supply line with hose coupling (red); fastened in compliance with regulations in the mounting.
- (2) Brake line with hose coupling (yellow); fastened in compliance with regulations in the mounting.



Fig. 50

Fig. 51/...

- (1) Line filter of the supply line
- (2) Line filter of the brake line
- (3) Trailer brake valve
- (4) Actuation knob for release valve
 - o push in up to the stop and the service brake is released [see danger notice, (Fig. 52), unterhalb]
 - o pull out up to the stop and the machine is braked by the supply pressure in the compressed air reservoir see danger notice (Fig. 52), unterhalb].

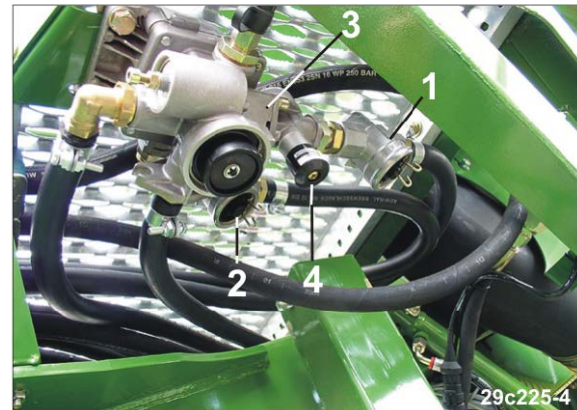


Fig. 51



DANGER

Press the actuation knob (Fig. 51/4) for the release valve only in the workshop to manoeuvre the machine with a suitable tractor without a connection facility for the pneumatic braking system. Bear in mind that the machine has no parking brake and when the actuation knob is pulled out the machine shows no braking effect with an empty compressed air reservoir.

Fig. 52

5.3.1 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 tank 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. Open the covers (Fig. 53/1) of the hose couplings on the tractor.
2. Check the sealing rings on the hose coupling for damage and cleanliness.
3. Clean the dirty sealing rings and replace any damaged sealing rings.
4. Fasten the hose coupling of the brake line (yellow) in compliance with regulations in the coupling marked yellow (Fig. 53/2) on the tractor.

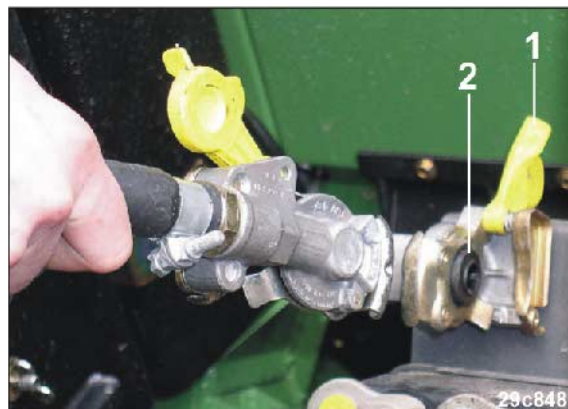


Fig. 53

5. Remove the hose coupling of the supply line (red) from the empty coupling.
 6. Check the sealing rings on the hose coupling for damage and cleanliness.
 7. Clean the dirty sealing rings and replace any damaged sealing rings.
 8. Fasten the hose coupling of the supply line (red) in the coupling marked red on the tractor in accordance with regulations.
- On coupling the supply line (red), the supply pressure coming from the tractor automatically pushes out the button for the release valve on the trailer brake valve.
9. Remove the wheel chocks.

5.3.2 Uncoupling the brake and supply lines



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 operating brake of the machine only moves into the brake position when the red hose coupling has been uncoupled.

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

1. Secure the machine against unintentionally rolling away. For this purpose, use the chocks.
2. Release the hose coupling (Fig. 54) of the supply line (red).
3. Release the hose coupling of the brake line (yellow).
4. Fasten the hose couplings in the empty coupling points.
5. Close the covers of the coupling heads on the tractor.



Fig. 54



DANGER

Use the wheel chocks!

Bear in mind that the machine has no parking brake and shows no braking effect if the compressed air reservoir is empty.

5.4 Hydraulic operating brake system

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

5.4.1 Coupling the hydraulic operating brake system



Only couple clean hydraulic couplings.

1. Remove the protective cap (Fig. 56/1).
2. If necessary, clean the hydraulic connectors (Fig. 55) and hydraulic connector socket.
3. Connect the hydraulic connector socket on the machine face with the hydraulic connector on the tractor face.



29c734

Fig. 55

5.4.2 Uncoupling the hydraulic operating brake system

1. Unlock the hydraulic connectors from the hydraulic sockets.
2. Secure the hydraulic connectors and hydraulic connector socket with protective caps (Fig. 56/1) against soiling.
3. Place the hydraulic hose line in the hose cabinet.



29c841

Fig. 56

5.5 Operator control terminal AMATRON 3

The AMATRON 3 consists of the operator control terminal (Fig. 57), the basic equipment (cable and fastening material) and the job computer on the machine.

The following are performed via the operator control terminal

- input of the machine-specific data
- input of the job-related data
- control of the machine to change the sowing rate during sowing operation (electronic seed rate adjustment is necessary)
- switching clear of the hydraulic functions before the hydraulic functions can be executed via the appropriate control unit
- monitoring of the seed drill during sowing operation.

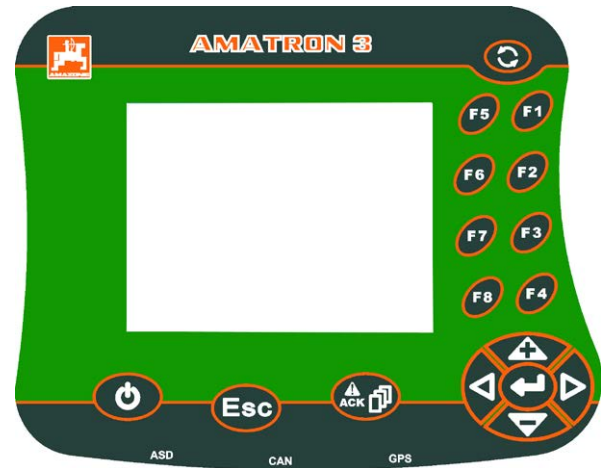


Fig. 57

The AMATRON 3 determines

- the instantaneous travel speed [km/h]
- the instantaneous sowing rate [kg/ha]
- the distance [m] remaining until the seed hopper is emptied of seed
- the actual seed hopper content [kg].

Once a job has been started, the AMATRON 3 stores

- the day and total seed volume output [kg]
- the day and total area cultivated [ha]
- the day and total sowing time [h]
- the average performance [ha/h].

For communication purposes the AMATRON 3 includes

- the menu "Work"
- the main menu with 4 submenus
 - the menu "Job"
 - the menu "Seed drill calibration"
 - the menu "Machine data"
 - the menu "Setup".

the menu "Work"

- indicates the requisite data for sowing operation
- is for the purpose of operating the seed drill during the work.

In the menu "Job"

- the sowing rate is entered
- jobs are created and the data determined from up to 20 processed jobs is stored
- the desired job is started.

In the menu "Seed drill calibration"

- the sowing rate entered is checked by way of a calibration test and the transmission setting is corrected as necessary (optional).

In the menu "Machine data"

- the machine-specific settings are entered, selected or determined via a calibration process.

In the menu "Setup"

- the input and output of diagnostic data and the selection and input of basic machine data is performed. These jobs are reserved exclusively for customer service personnel.

5.6 Roller holder

The roller holder (Fig. 58/1) contains

- the pack with operating manual
- the dosing rollers in parking position
- the scales for the calibration test.



Fig. 58

5.7 Seed hopper

The seed hopper (Fig. 59/1) 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 allows rapid filling.

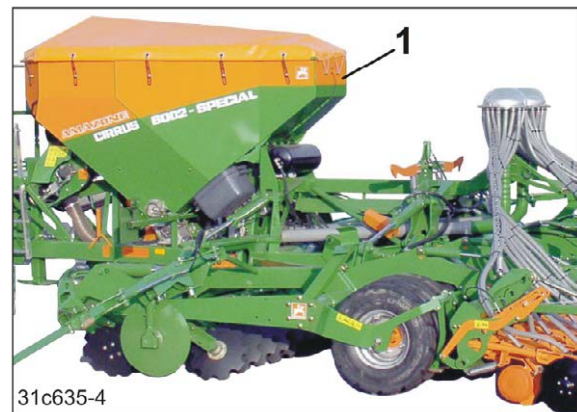


Fig. 59

5.7.1 Digital fill level monitoring (optional)

The level sensors monitor the seed level in the seed hopper.

When the seed level reaches the level sensor a warning signal appears (Fig. 60) on the AMA-TRON 3 display and an alarm signal sounds simultaneously. This alarm signal is intended to remind the tractor driver to fill up the seeds again.



Fig. 60

The height of the level sensor can be adjusted (Fig. 61/1) 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.



Fig. 61

5.8 Seed dosing

In the seed dosing unit (Fig. 62/1) the seed is dosed by a dosing roller.

The dosing roller is driven by an electric motor (full dosing).

The seed falls into the injector sluice (Fig. 62/2) and is directed by the air flow to the distributor head and then to the coulters.

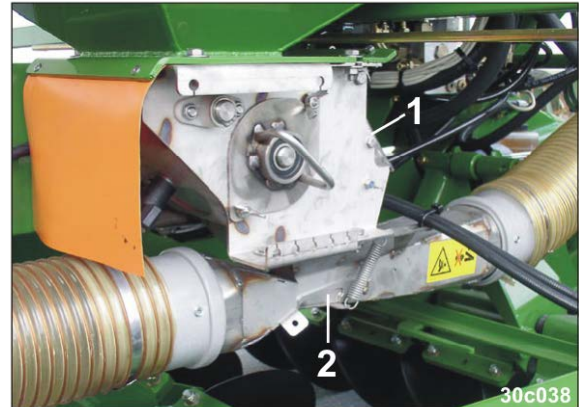


Fig. 62

The dosing roller selection (Fig. 63/1) is dependent on the

- Grain size
- Spread rate.

You can choose between dosing rollers with various sizes of chambers or various volumes.

You must select a dosing roller volume that is not too large but that is sufficient to spread the required quantity (kg/ha).

Use a calibration test to check whether the selected dosing roller reaches the spread rate.

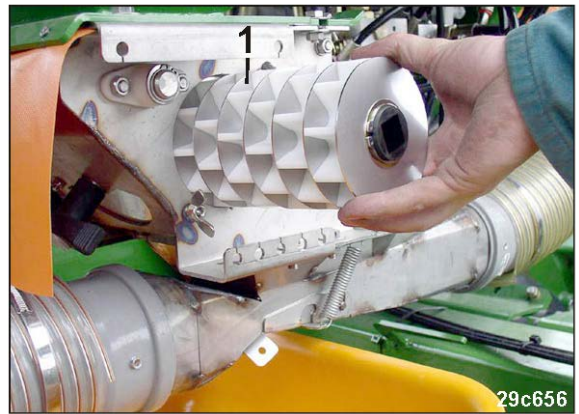


Fig. 63

5.8.1 Table: Dosing rollers



Dosing rollers			
Order no.	976731	961457	967777
Volume [cm ³]	7.5	20	120
			
Order no.	961456	961454	967774
Volume [cm ³]	210	600	700
			

Fig. 64



For sowing particularly large seeds (e.g. beans), the chambers (Fig. 65/1) of the dosing roller can be enlarged by repositioning the wheels and the plates.

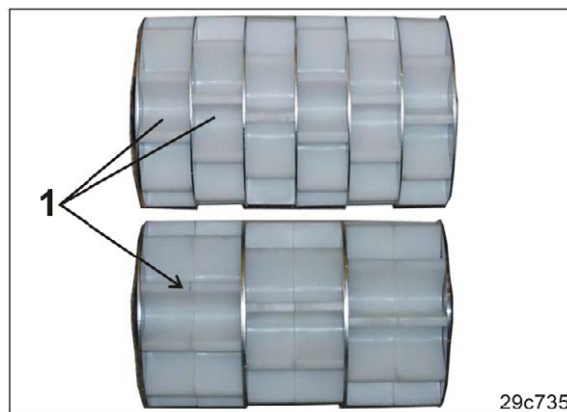


Fig. 65

Dosing wheel without chambers (order no. 969904)



The volume of some dosing rollers can be modified by repositioning/removing the existing wheels and inserting dosing wheels without chambers.



Fig. 66

5.8.2 Table Seed dosing rollers

Seed	Dosing rollers					
	7.5 cm³	20 cm³	120 cm³	210 cm³	600 cm³	700 cm³
Beans						X
Spelt wheat					X	
Peas						X
Flax (dressed)		X	X	X		
Barley				X	X	
Grass seed				X		
Oats					X	
Millet			X	X		
Lupins			X	X		
Alfalfa		X	X	X		
Maize			X			
Poppy seed	X					
Oil linen (moist dressing)		X				
Fodder radish		X	X	X		
Phacelia		X	X			
Rapeseed		X				
Rye				X	X	
Red clover		X	X			
Mustard		X	X	X		
Soy					X	X
Sunflowers			X	X		
Turnips		X				
Wheat				X	X	
Vetches				X		



The dosing roller that is required depends on the seed and the spread rate.

For seed not listed in the table, select the dosing roller for a seed type of a similar grain size.

5.8.3 Seed rate adjustment with full dosing (optional)

With machines with full dosing one electric motor (Fig. 67/1) each drives a dosing roller.

The rotational drive speed of the dosing roller is determined by the working speed and the preset sowing rate.

Enter the required seed quantity in the AMATRON 3.

The AMATRON 3 uses this value and the adjusted machine working width to calculate the theoretical number of rotations of the electric motor or the dosing roller.

For machines that have several electric motors, the speed of all of the electric motors is the same.



Fig. 67

Run the first calibration test and enter the weight of the collected seed quantity in the AMATRON 3.

Using this value, the AMATRON 3 calculates the number of rotations of the electric motor that are required for the field work later on.

A second calibration test is essential. The required seed quantity is usually applied during the second calibration test. If this is not the case, repeat the calibration test until the required seed quantity is reached.

Always carry out a calibration test:

- during the initial operation
- when the seed type is changed
- if the seed type is identical, but the grain size, grain shape, specific weight and dressing are different
- after replacing the dosing roller
- if the tank takes more/less time than expected to empty. The actual spread rate then does not correspond to the spread rate that was determined during the calibration test.

The speed of the dosing roller is determined by the spread rate that is set in the AMATRON 3 and the working speed. The higher the speed of the dosing roller, the greater the spread rate.

The speed of the dosing roller automatically adapts to the changing working speed.

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

The number of calibration troughs is equal to the number of seed dosers.

The calibration troughs are nested for transport and fastened to the rear wall of the hopper secured with a linch pin (Fig. 68/1).



Fig. 68

Seed predosing

The seed rate predosing, which doses the seeds in the air flow, can be cut in before the machine starts up.

The run time of the seed predosing is adjustable.

Seed predosing is used when corners are to be sowed which can only be reached when the machine is reversed.

Start-up ramp

The "start-up ramp" is adjustable, allowing the seed rate to be adapted to the machine acceleration after turning.

After turning and actuating the control unit *yellow*, the machine goes to its operational position. Seed is dosed into the delivery line. In order to compensate system-specific reductions in seed rate during the acceleration phase, the start-up ramp can be cut in.

For this purpose, the probable working speed set in the calibration menu is used. The starting speed and the time until the probable working speed is reached can be set as a percentage of the probable working speed.

This time and the percentage value depend on the respective tractor acceleration and prevent the dosing of insufficient seed during the acceleration phase.

Example

Values adjustable in the AMATRON 3

Probable
working speed: 10 km/h
Starting speed: 50 %
Time to achieve working speed: 8 seconds

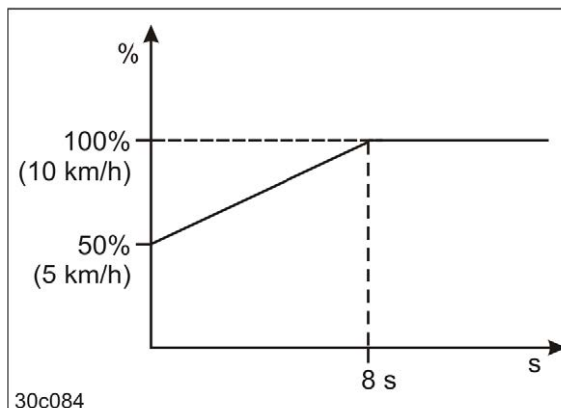



Fig. 69

5.8.4 Increasing sowing rate, coulter pressure and harrow pressure

The sowing rate is increased during the work by entry in the AMATRON 3.

If the coulter pressure and harrow pressure are also to be increased,

the coulter pressure button  in the AMATRON 3 must be selected. Actuating the control valve 2 then increases the coulter pressure and the harrow pressure. Individual functions can be cut out by repositioning the pins.

It is necessary to equip the machine with

- the hydr. coulter pressure adjustment
- the hydr. exact harrow pressure adjustment.

5.9 Blower fan



DANGER

Do not exceed the maximum fan speed of 4000 rpm.



Clean the dirty blower fan intake guard screen so that the air can flow through unhindered.

If the required quantity of air is not reached, this may cause faults in the seed distribution.



Clean the blower fan if deposits have formed. Deposits lead to an imbalance and to damage to bearings.



Check the seed placement when you commence work and then at regular intervals and, at the latest, when refilling the seed hopper on all coulters.

Contaminated seed conveyor routes may cause incorrect sowing.

The blower fan (Fig. 70/1) that creates the air current is driven by a hydraulic motor (Fig. 70/2).

The air current conveys the seeds from the injector sluice to the coulters.

The blower fan speed determines the air volume of the air current. The faster the blower fan speed, the greater the air volume that is generated.

AMATRON 3 displays the current blower fan speed and sets off an alarm if there is a deviation.

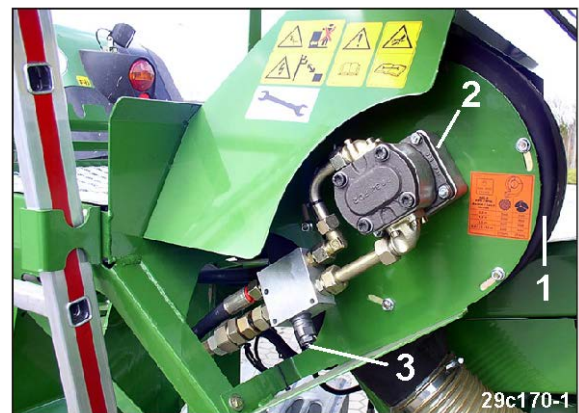


Fig. 70

The hydraulic motor (Fig. 70/2) can be driven by

- the tractor hydraulics
- a hydraulic pump that is attached to the tractor's universal joint shaft.

5.9.1 Connecting the blower fan to the tractor hydraulics



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 blower 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.

The required blower fan speed can be found in the table (Fig. 71, unterhalb). The blower fan speed depends on the machine working width and on the seed.

The blower fan speed can be regulated:

- at the tractor flow control valve
or (if not present)
- via the pressure relief valve (Fig. 70/3) of the hydraulic motor.

The blower fan speed (rpm) is dependent on

- the working width of the machine (1).
- the seed
 - fine seeds (2),
e.g. rape or grass seed
 - grain and
pulses (3).

Example:

Cirrus 4002

- Working width 4.0 m (1)
- Cereal seed (3)

Required blower fan speed: 3800 rpm





<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  max. 4000 1/min </div> <div style="text-align: center;">    </div> </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. 71

5.9.2 Connecting the blower fan to the tractor's universal joint shaft

A hydraulic pump (Fig. 72/1) is plugged onto the tractor's universal joint shaft and drives the hydraulic motor of the blower fan.

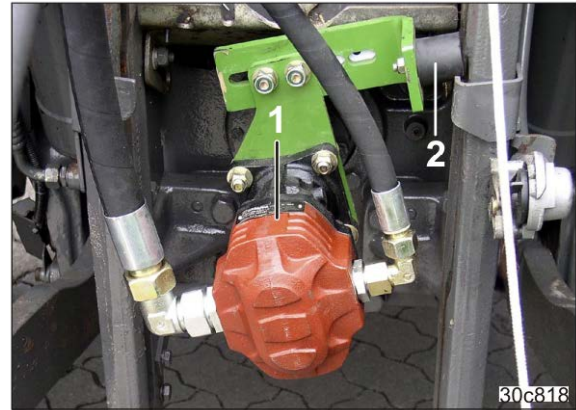


Fig. 72

Set the speed of the tractor's universal joint shaft to 1000 rpm.

Tractor universal joint shaft speed: 1000 rpm.

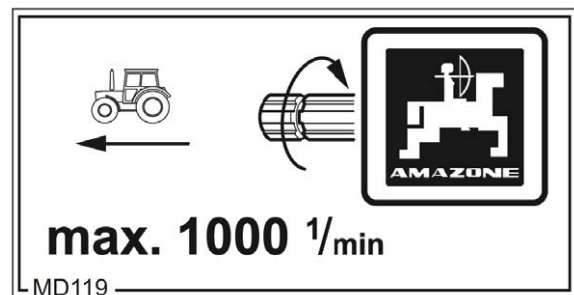


Fig. 73



DANGER

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

If required, reduce the universal joint shaft speed in order to reduce the blower fan speed.

5.10 Distributor head

In the distributor head (Fig. 74/1) the seed is distributed uniformly over all the seed coulters. The number of distributor heads depends on the machine working width. A seed doser always supplies one distributor head.



Fig. 74

5.11 Radar

The radar measures the distance covered.

AMATRON 3 uses this data to determine

- the travel speed
- the worked area (hectare counter)
- the speed of the electric motor that drives the dosing roller.

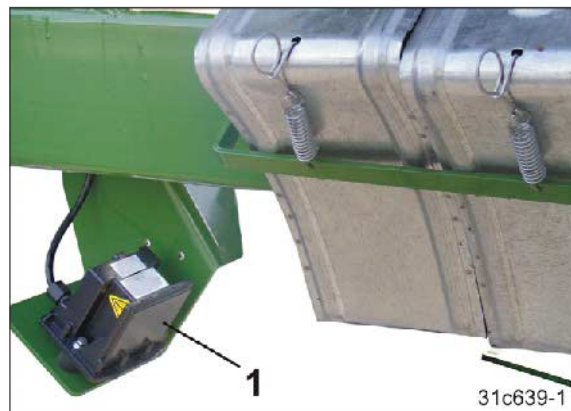


Fig. 75

5.12 Tapered ring tyres

The tapered ring tyres (Fig. 76/1)

- are arranged adjacent to each other
- secure the cultivated soil in strips in which the seed is placed
- form the integrated running gear for transport journeys

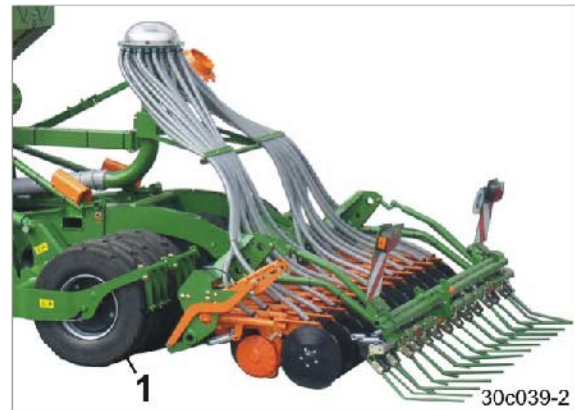


Fig. 76

The turning procedure occurs, as required

- on the axle
- on the roller

Turning the Cirrus 3002 is only possible on the axle.

Turning on the axle

The integrated running gear raises the machine.

Turning on the roller

The machine turns on all tapered ring tyres with raised coulter frame and raised disc array.

5.13 Seed planting

The tapered ring tyres (Fig. 77/1) produce highly compacted strips in which the coulters lay the seed.

The strips have soil zones of differing compactness.

Zone ①: highly compact soil in which the coulters place the seed.

Zone ②: medium compactness.

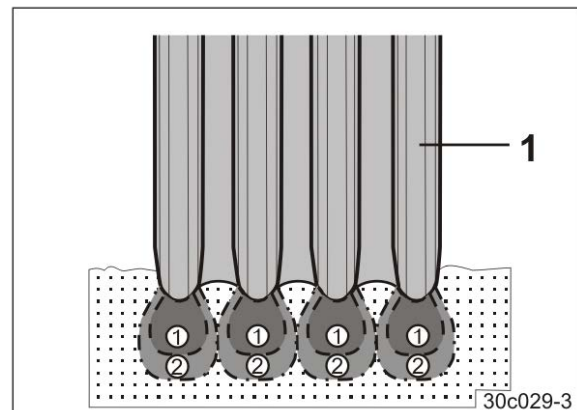


Fig. 77

5.13.1 RoTeC and RoTeC+ coulter

The RoTeC coulter (Fig. 78/1) and the RoTeC+ coulter (Fig. 78/2)

- form a sowing slit in the soil compacted in strips by the tapered ring tyres.
- deposit the seed in the sowing slit.

The flexible plastic disc (Fig. 78/3)

- limits the seed planting depth
- cleans the rear side of the sowing disc (Fig. 78/4)
- improves the drive of the sowing disc by gripping the soil.

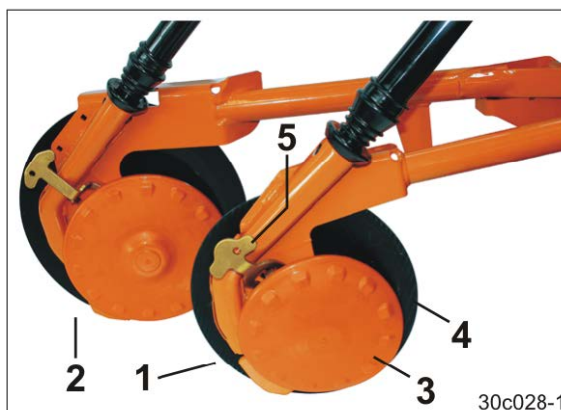


Fig. 78

The RoTeC and RoTeC+ coulters are used for ploughing and mulch sowing.

Also on fields with large quantities of straw and plant remains, mulch sowing is possible with RoTeC and RoTeC+ coulters.

At high travel speeds, the sowing disc (Fig. 78/4), which is inclined with respect to the direction of travel, shifts little soil.

The steady coulter ride and the precise seed placement result from the high coulter pressure and the support of the coulter on the plastic disc.

The flat sowing disc (Fig. 79) allows very shallow sowing, e.g. in particularly light sandy soils.



Fig. 79

The plastic disc can be fitted in three positions or it can be removed to limit the seed placement depth (Fig. 80/1 - 4).

The plastic disc can be adjusted or removed without the need for tools by using the handle (Fig. 78/5).

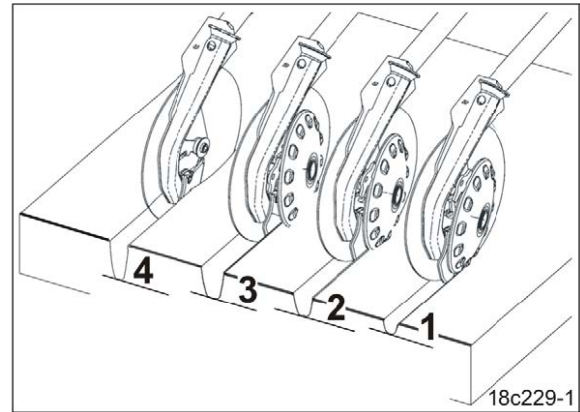


Fig. 80

5.13.2 Coulter pressure



The seed planting depth depends on three factors

- the condition of the soil
- the coulter pressure
- the travel speed

With the hydr. coulter pressure adjustment, the coulter pressure can be preset for two types of soil. This means that the coulter pressure can be adjusted to the soil during the work, e.g. in event of a change from normal soil to heavy soil and vice versa.

Two pins (Fig. 81/1) in an adjusting segment limit the hydraulic cylinder. With increased coulter pressure, the stop (Fig. 81/2) of the hydraulic cylinder is at the top pin.

The numbers on the scale (Fig. 81/3) are provided for guidance. The higher the number, the greater the coulter pressure.

The foldable machines are equipped with two adjusting segments.

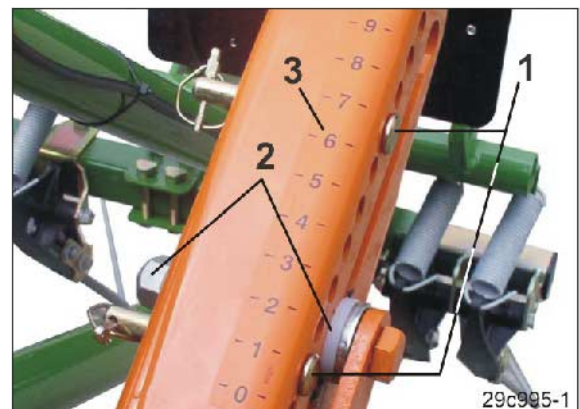


Fig. 81

5.14 Exact harrow

The exact harrow (Fig. 82/1) covers the seeds deposited in the sowing furrows with loose earth and smooths the ground.

The following are adjustable

- The exact harrow position
- The exact harrow pressure.
The exact harrow pressure determines the working intensity of the exact harrow and is independent of the soil type.

Set the exact harrow pressure so that no earth bank remains on the field after seed covering.

The draw springs that create the exact harrow pressure are pretensioned by a lever (Fig. 83/1).

The lever (Fig. 83/1) is applied in the adjusting segment by way of a bolt (Fig. 83/2).

The higher the bolt is inserted in the group of holes, the greater is the harrow pressure.

For hydraulic exact harrow adjustment the second bolt (Fig. 83/3) is inserted as a stop above the lever (Fig. 83/1) in the adjusting segment.

The harrow pressure is increased as soon as the hydraulic cylinder applies pressure and the lever contacts the top pin.



Fig. 82

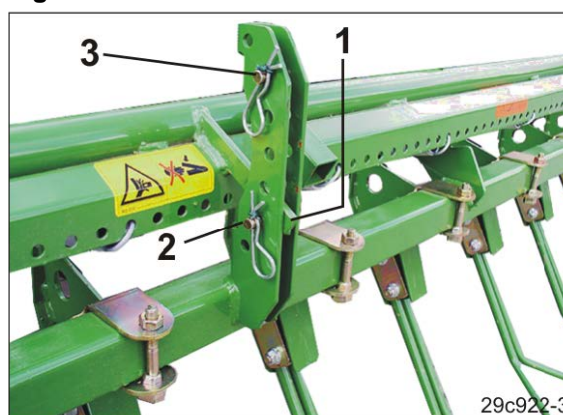


Fig. 83

5.15 Roller harrow (optional)

The roller harrow consists of

- Harrow tines (Fig. 84/1)
- Press rollers (Fig. 84/2).

The harrow tines close the seed furrows.

The press rollers press the seeds into the furrows. Better soil contact means more humidity is available for germination. Voids are closed and obstruct snails' access to the seed.

The following are adjustable

- the working depth of the harrow tines
- the angle of the harrow tines
- the roller pressure

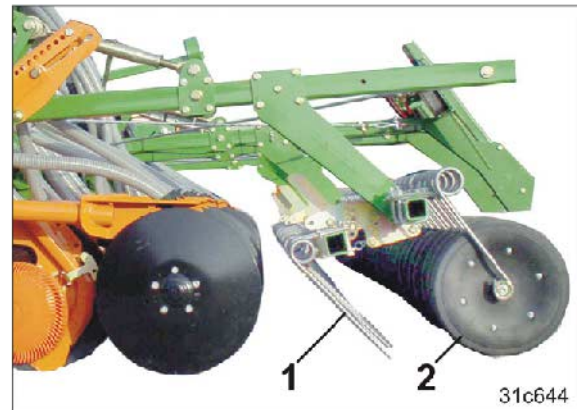


Fig. 84

5.16 Two-row disc array

The discs, which are set obliquely to the direction of travel (Fig. 85/1), prepare the seedbed.

The following are adjustable

- the working intensity of the discs over the working depth of the disc array
- the length of the outer discs for adaptation to varying soil conditions
- the two outside hollow discs (Fig. 85/2) in vertical direction.

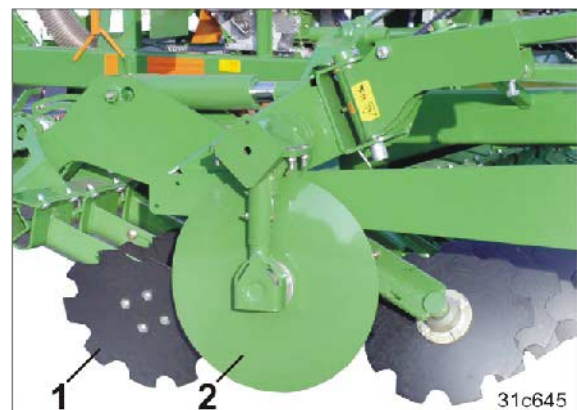


Fig. 85

Correctly set outer discs and outside hollow discs prevent the cultivated soil from egressing laterally from the working area of the machine.

The elastic rubber sprung suspension of the individual discs enables

- adaptation to soil unevenness
- evasion by the discs when hard obstacles are encountered, e.g. stones. This protects the individual discs against damage.

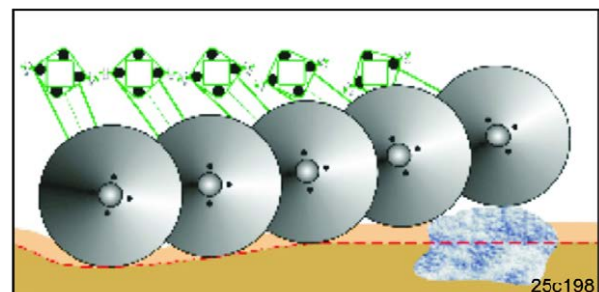


Fig. 86

Structure and function

The numbers on the scale (Fig. 87/1) are for the purpose of orientation for setting different disc working depths. The higher the number, the greater the disc working depth.



Fig. 87

The scale (Fig. 88/1) of the Cirrus 3002 is located on the loading plate.

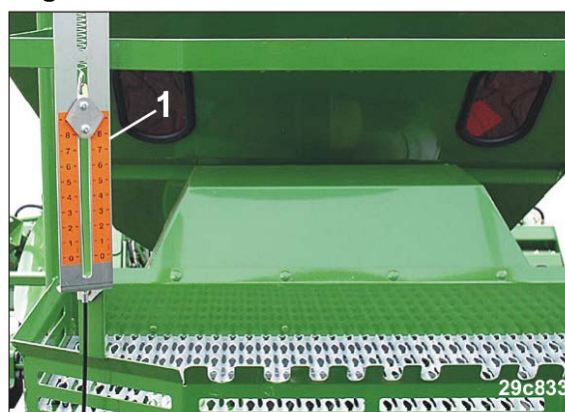


Fig. 88

5.17 Track loosener (optional)

If the function of the disc array is not sufficient to eliminate the tracks of the tractor, the track looseners (Fig. 89) are used.

The track looseners are adjustable horizontally and vertically.



Raise the wheel mark eradicators after working on the field to avoid damaging the wheel mark eradicators.

Place the wheel mark eradicators in the operational position only when in the field.



Fig. 89

5.18 Markers

The hydraulically-actuated track markers dig into the ground alternately on the left and the right of the machine.

In so doing, the active track marker creates a mark. This mark serves as an orientation aid for the next run after turning.

On the next run, the tractor driver drives over the centre of the mark.



Fig. 90

It is possible to set:

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



Fig. 91

To pass obstacles the active track marker can be folded in and out on the field.

Before folding in the track marker, actuate the obstacle button (AMATRON 3) so that the tramline counter of the sowing wheel tramline control does not shift on or the automatic process is not initiated before the turning procedure.

If the track marker still encounters hard obstacles, the overload protection system of the hydraulic system responds and the hydraulic cylinder gives way to the obstacle and thus protects the track marker against damage.

After passing the obstacle the tractor driver folds the track marker out again by actuating the control unit.



Deactivate the obstacle button after the obstacle has been passed.

5.19 Creation of tramlines

The tramline selection 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 AMATRON 3.

When creating the tramlines:

- The tramline circuit on the distributor head uses sliders (Fig. 92/1) to block the seed feeding lines to the seed lines (Fig. 92/2) 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. 92/3) closes the appropriate seed tubes (Fig. 92/2) in the distributor head.

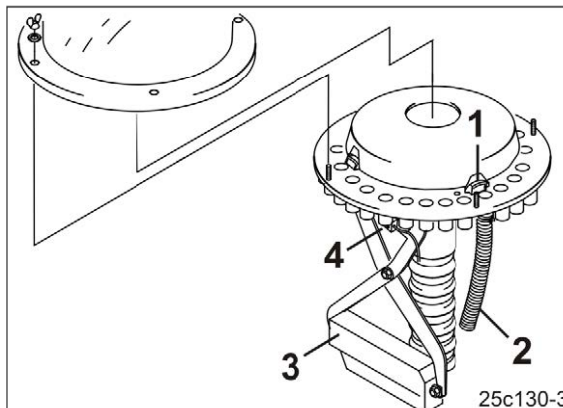


Fig. 92

When creating a tramline, the tramline counter shows the figure "0" in the AMATRON 3. The seed quantity reduced when creating a tramline is adjustable. It is necessary to equip the machine with electrical seed volume adjustment or full dosing.

A sensor (Fig. 92/4) checks whether the sliders (Fig. 92/1), which open the and close the seed line tubes (Fig. 92/2), are working properly.

If the setting is wrong, the AMATRON 3 emits an alarm.

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

Tramlines are seed-free tracks (Fig. 93/A) for fertilising and plant care machines used later.

The tramline spacing (Fig. 93/b) corresponds to the working width of the care machines (Fig. 93/B), e.g. fertiliser spread and/or sprayer, which are used on sown fields.

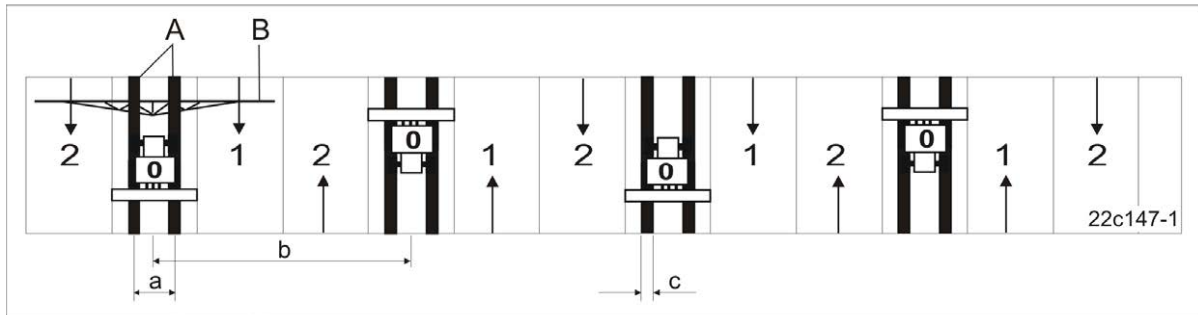


Fig. 93

To set the different tramline spacings (Fig. 93/b), appropriate tramline rhythms must be entered on the AMATRON 3.

The figure (Fig. 93) shows the tramline rhythm 3. During the work the field runs are numbered consecutively (tramline counter) and displayed in the AMATRON 3.

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 AMATRON 3.

The required tramline rhythm (see table Fig. 94) is derived from the required tramline spacing and the working width of the seed drill. Further tramline rhythms can be seen in the AMATRON 3 operating manual.

The wheelmark spacing (Fig. 93/a) of the tramline corresponds to that of the cultivating tractor and is adjustable.

The track width (Fig. 93/c) of the tramline increases with an increasing number of tramline coulters fitted next to each other.

Tramline rhythm	Seed drill working width		
	3.0 m	4.0 m	6.0m
	Tramline spacing (working width of the fertiliser spreader and field sprayer)		
1			12 m
3	9 m	12 m	18 m
4	12 m	16 m	24 m
5	15 m	20 m	30m
6	18 m	24 m	36 m
7	21 m	28 m	42m
8	24 m	32 m	
9		36 m	
2 plus	12 m	16 m	24 m
6 plus	18 m	24 m	36 m

Fig. 94

5.19.1 Examples for creating tramlines

The creation of tramlines is shown in Figure (Fig. 95) 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 AMATRON 3)
- D = Tramline counter (during work the field runs are number consecutively and displayed on the AMATRON 3).

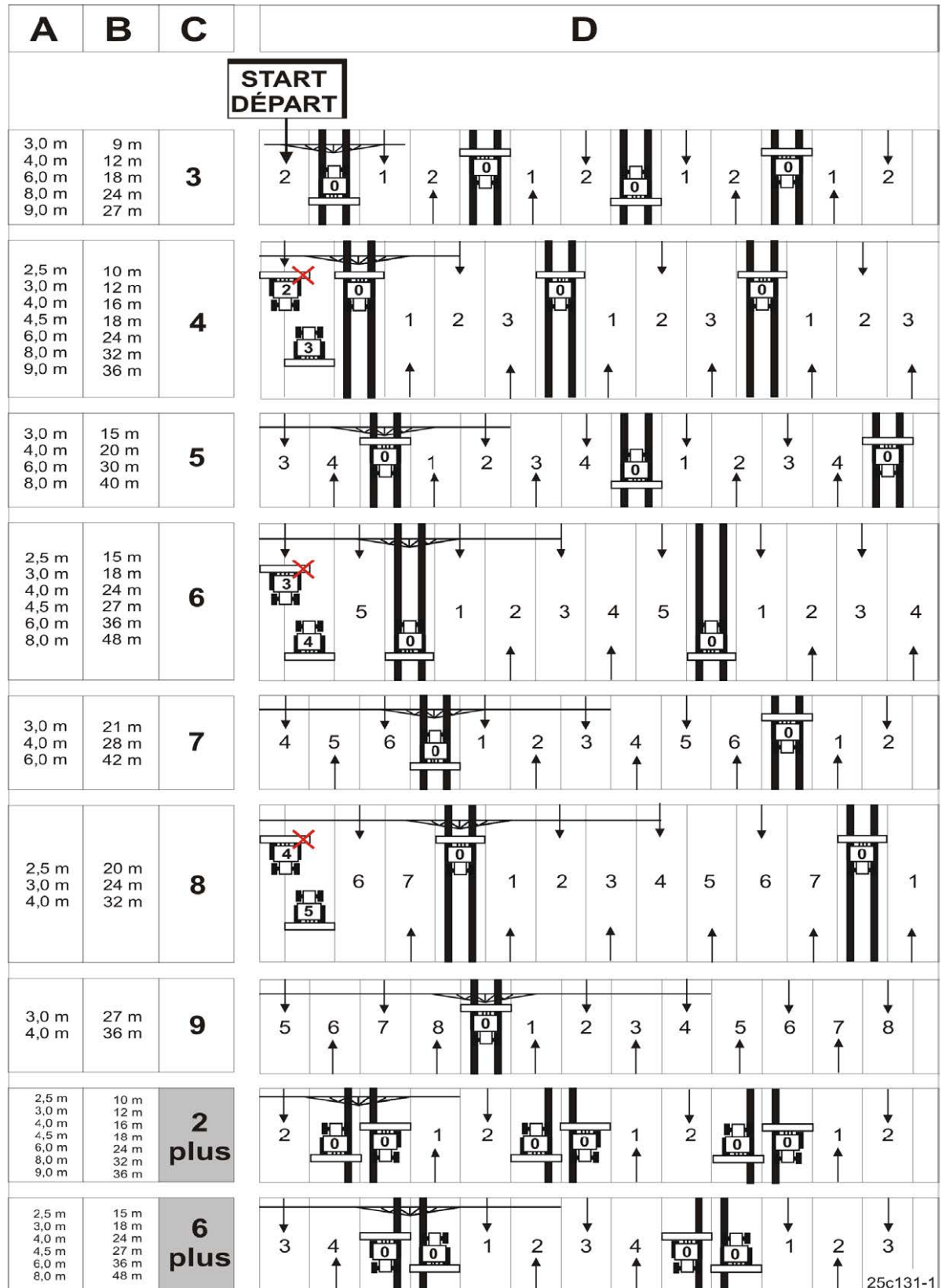
Perform any inputs and outputs with the aid of the AMATRON 3 operating manual.

Example:

Working width of seed drill: ... 6 m

Working width, fertiliser
spreader/field sprayer: 18m = 18m tramline spacing

1. In the adjacent table (Fig. 95) look for the following:
in column A the seed drill's working width (6 m) and
in column B the tramline spacing (18 m).
2. On the same line in column "C" take the reading for the tramline rhythm (tramline rhythm 3) and set this on the AMATRON 3.
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 this figure on the AMATRON 3. Input this value directly before commencing the first field trip.



25c131-1

Fig. 95

5.19.2 Tramline rhythm 4, 6 and 8

Figure (Fig. 95) shows examples for creating tramlines with the tramline rhythm 4, 6 and 8.

It shows work with the seed drill at half width (partial width) during the first field trip.

During work with partial width switched off, the drive of the appropriate dosing roller is interrupted. Please refer to the instruction manual for an exact description AMATRON 3.

On the Cirrus 3002/4002-2 it is not possible to switch a part of the width.

Another option for creating tramlines with the tramline rhythm 4, 6 and 8 is to begin with the full working width and the creation of a tramline (see Fig. 96).

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!

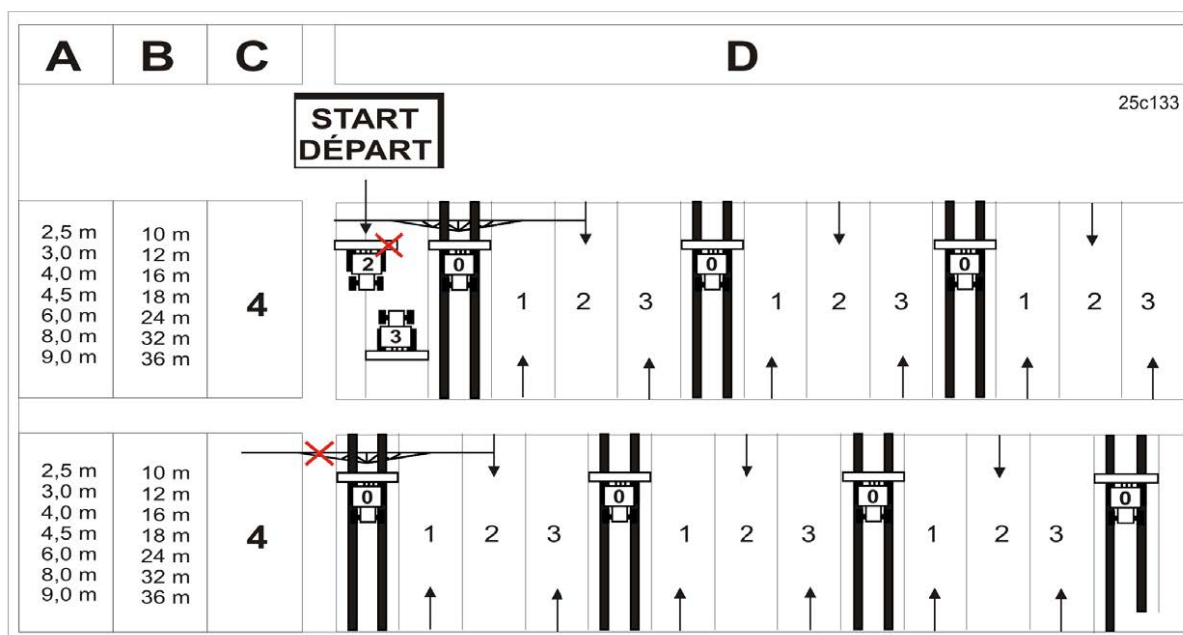


Fig. 96

5.19.3 Tramline rhythm 2 plus and 6 plus

Figure (Fig. 95) shows examples of tramline creation with tramline rhythms 2 plus and 6 plus.

When tramlines are created with the tramline rhythm 2 plus and 6 plus (Fig. 97), tramlines are created during the trips forward and backward over the field.

On machines with

- tramline rhythm 2 plus, the seed feed to the tramline coulters may only be interrupted on the left side.
- tramline rhythm 6 plus, the seed feed to the tramline coulters may only be interrupted on the left side.

the seed feed to the tramline coulters is interrupted.

Work always starts on the right hand edge of the field.

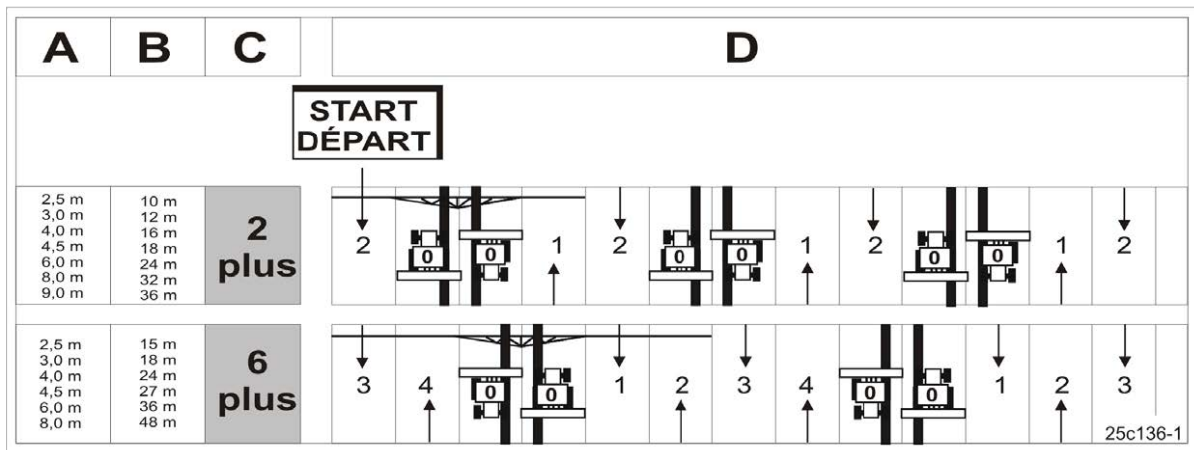


Fig. 97

5.19.4 Half-sided switching off (part width)

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).

The seed supply to the coulters of the machines can be cut out on one side by means of two distributor heads.

On seed drills with two distributor heads (Fig. 98)

- 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) can be switched off. To do this, switch off the required electric motor on the dosing unit.

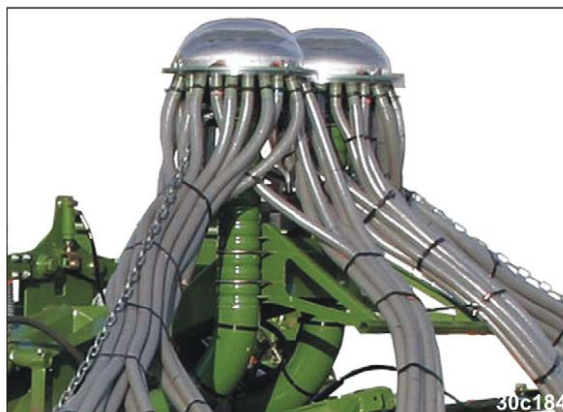


Fig. 98

5.19.5 Tramline marker (option)

When tramlines are being created, the track discs (Fig. 99) lower automatically and mark the tramline that has just been created. Due to this the tramlines already become visible before the seed has been sown.

It is possible to set:

- the wheelmark spacing of the tramline (Fig. 93/a)
- the working intensity of the track discs.

The track discs are raised if no tramline is created.

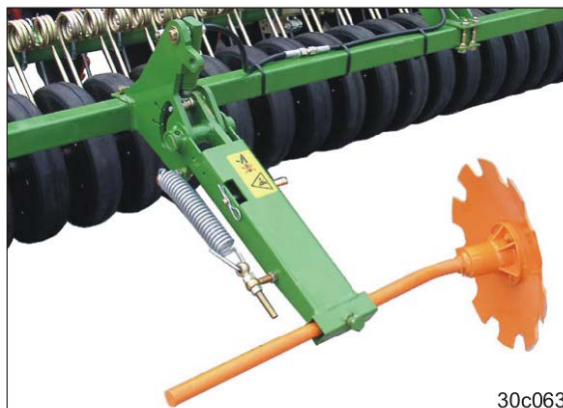


Fig. 99

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 Seite 31 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 approved total weight
- The approved axle loads
- The approved drawbar load at the tractor coupling point
- The load capacity of the installed tyres
- The approved trailer load must be sufficient

You can find this data on the type 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 approved 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 noseweight 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)

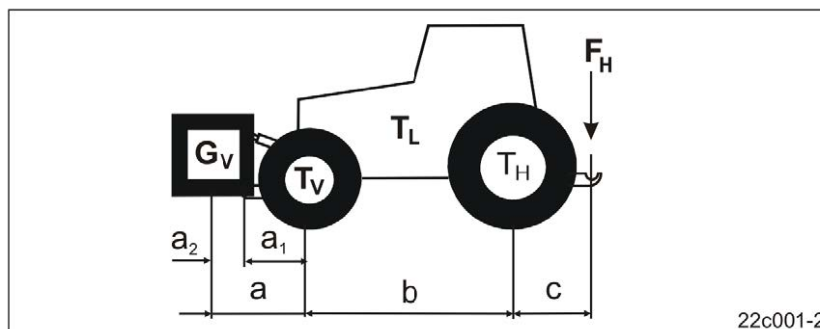


Fig. 100

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", Seite 55
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 ballast (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 instruction manual	Double approved load capacity (two tyres)
Minimum ballast front / rear	<div>/ kg</div>	--	--
Total weight	<div>kg</div>	<div>kg</div>	--
Front axle load	<div>kg</div>	<div>kg</div>	<div>kg</div>
Rear axle load	<div>kg</div>	<div>kg</div>	<div>kg</div>



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



WARNING

Risk of 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 unapproved combinations of connecting equipment!

Ensure:

- that the connection device on the tractor has a sufficient permissible noseweight for the noseweight 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



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 machines.
- The maximum movement 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 are not secured with chocks against unintentional rolling
 - 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 the raised, unsecured machine / raised, unsecured parts of the machine.
→ 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 line (Fig. 101/5) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling of the return line (Fig. 101/6) only to an unpressurised tractor connection with direct access to the hydraulic fluid tank (Fig. 101/4). In order that the banking-up pressure of 10 bar is not exceeded, do not connect the return line to a tractor control unit.
- For retro-installation of the tractor return line, use only piping with ND 16, e.g. 20 id. x 2.0 mm with a short return path to the hydraulic fluid tank.

To operate all of the hydraulic functions, the capacity of the hydraulic pump should be at least 80 l/min. at 150 bar.

Fig. 101/...

(A) On the machine face

(B) On the tractor face

(1) Hydraulic fan motor
N_{max.} = 4000 1 rpm

(2) Filter

(3) Single-acting or double-acting control unit
with priority

(4) Hydraulic fluid tank

(5) Feed line:
pressure line with priority
(marking: 1 cable tie, red)

(6) Return line:
unpressurised line with "large" push-fit coupling
(marking: 2 cable ties, red)

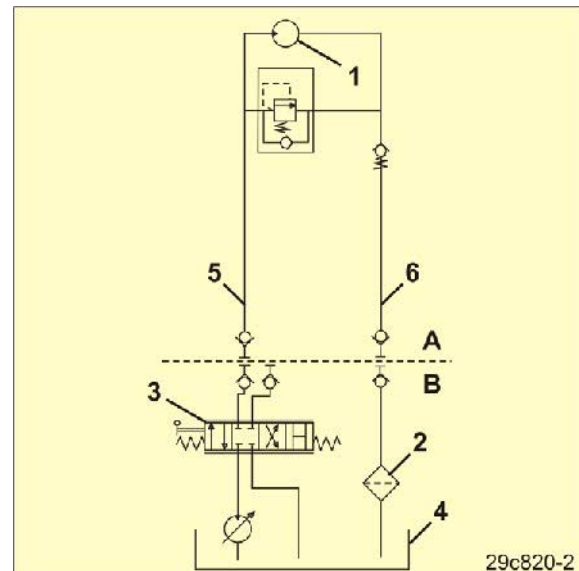


Fig. 101



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. 101/4) 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.

If a second hydraulic motor is driven besides the hydraulic fan motor, both motors have to be wired in parallel. If both motors are wired in series, the permissible oil pressure of 10 bar is always exceeded behind the first motor.

6.4 Initial installation of the AMATRON 3

Install the terminal (Fig. 102) of the AMATRON 3 in the tractor cab with the aid of the AMATRON 3 operating manual .



Fig. 102

7 Coupling and uncoupling the machine



When coupling and uncoupling the machine take heed of the section "Safety information for users", Seite 31.



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.



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.



WARNING

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

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

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



WARNING

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

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



WARNING

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

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

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



DANGER

When separated from the tractor the machine must always be secured by means of 4 wheel chocks because the Cirrus has no parking brake!



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 Cirrus can be coupled or uncoupled whether it is folded in or out (except Cirrus 3002).

Always retract the integrated running gear beforehand (lower the machine). When the machine is uncoupled and the running gear is extended (machine raised) the pressure in the supply line can increase so much that later coupling to the tractor becomes impossible.



WARNING

If the Cirrus is parked uncoupled from the tractor with a full compressed air tank, the compressed air of the compressed air tank acts on the brakes and the wheels are then blocked.

The compressed air in the compressed air tank and hence the braking force will drop continuously until there is a complete brake failure, if the compressed air tank is not refilled. The Cirrus must therefore be parked only with wheel chocks.

The brakes are released immediately with a full compressed air tank when the supply line (red) is connected to the tractor. Before connection of the supply line (red) the Cirrus must therefore be connected to the tractor's lower links and the tractor parking brake must be applied. The wheel chocks must also not be removed until the Cirrus is connected to the tractor's lower links and the tractor parking brake is applied.

Coupling the machine:

1. Check whether the Cirrus is secured with 2 x 2 wheel chocks (1 Fig. 103) on each side of the machine under the outer tapered ring tyres.



Fig. 103

2. Secure a ball (Fig. 104/1) with trap bowl above the lower link pin (cat. III) of the draw bar and secure it with a clip pin.

The balls of the lower linkage are dependent on the tractor type (see tractor operating manual).

Cirrus 3002 and Cirrus 4002-2 can be equipped with lower link pins (cat. II).



Fig. 104



CAUTION

Danger of getting crushed in the area of the moving draw rail.

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 linking 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 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. 105/1) is free of the ground.
9. Secure the tractor against unintentional starting and unintentional rolling away.
10. Check whether the PTO 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.
13. Hold the sustainer (Fig. 105/1) tight and remove the positioning bolt (Fig. 105/2).
14. Push up the sustainer by the handle (Fig. 105/1) and position it with the positioning bolt.
15. Secure the positioning bolt with a linch pin.

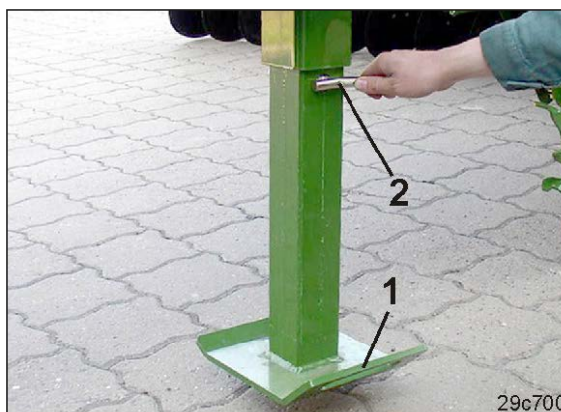


Fig. 105



Check the route of the supply lines.

The power 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. 106/1).
18. Before commencing a run, perform a braking test.

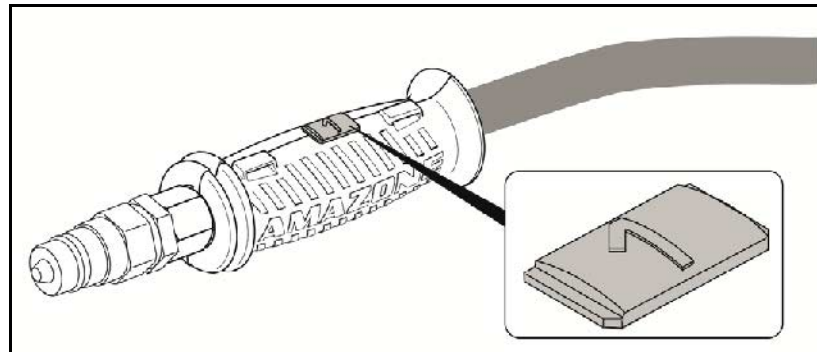


Fig. 106

7.1.1 Hydraulic connections




- All hydraulic hose lines are equipped with grips.







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



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

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

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

Marking		Function			Tractor control unit	
yellow	1	Pre-selection via switch tap	Running gear / track marker / pre-emergence marker	Put in working position	Double-acting	
	2			Put headlands position		
yellow	1	Pre-selection via switch tap	Turning on the roller	Lowering the coulters frame/ disc array	Double-acting	
	2			Lifting the coulters frame / disc array		
green	1	Pre-selection via switch tap	machine extension arms	Fold out	Double-acting	
	2			Fold in		
green	1		exact harrow coulters pressure	Increase	Double-acting	
	2			Decrease		
green	1		Disc array depth adjustment	Increase	Double-acting	
	2			Decrease		
red	1		Hydraulic fan motor		Single-acting	
red	T		Pressure-free return flow			

7.1.2 Connecting the electrical connections

Connection/function	Installation information
Plug (7-pin) for the road traffic lighting system	
AMATRON 3 machine plug	Connect the plugs to the terminal as described in the AMATRON 3 operating manual.

7.1.3 Connecting the pneumatic service brake system

Tractor connection		Function
Connection	Marking	
Brake line	Yellow	Pneumatic braking system
Supply line	Red	



Couple to the tractor

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

Make sure that they engage correctly!

The brake is released immediately from braked position (braked position possible only if the compressed air tank is full) when the red hose coupling is coupled.

Before coupling the brake line or supply line ensure that the

- hose couplings are clean
- the sealing rings of the hose couplings are in perfect condition
- the seals are clean and undamaged.

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. 107) to the tractor's hydraulic brake connection.



29c734

Fig. 107



Check the hydraulic connection 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.

Uncoupling the machine:

1. Align the tractor and machine straight and park the empty machine on a horizontal parking surface with a firm base.
2. Retract the integrated running gear (lower the machine). Here the machine can be coupled or uncoupled.
3. Press the button (switch off Fig. 108/1) (AMATRON 3).
4. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
5. Release the spring pins (Fig. 109/1) and remove the 4 wheel chocks from the mountings at the front of the machine.

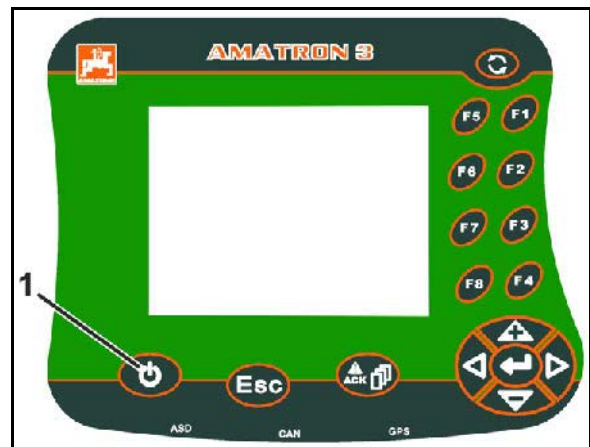


Fig. 108



Fig. 109

Coupling and uncoupling the machine

6. Secure the Cirrus on each side of the machine by placing 2 wheel chocks each (Fig. 110/1) under the outer tapered ring tyres.



DANGER

Always secure the machine with 4 wheel chocks before you uncouple the machine from the tractor! The wheel chocks replace the machine's parking brake!



Fig. 110

7. Uncouple all supply lines between the tractor and the machine.



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!



Fig. 111

8. Seal the hydraulic connectors and hose couplings of the supply line and brake line with protective caps.
9. Fasten all supply lines to the mountings (Fig. 111).
10. Hold the sustainer (Fig. 112/1) tight and remove the positioning bolt (Fig. 112/2).
11. Lower the sustainer and position it with the positioning bolt.
12. Secure the positioning bolt with the linch pin.

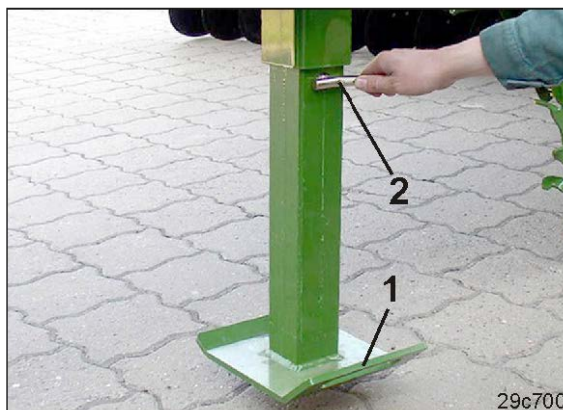


Fig. 112

13. Set the machine down on the sustainer.

**WARNING**

Set the machine down on a horizontal, firm base 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. 113

14. Open the securing device (Fig. 114) of the tractor's lower link (see tractor operating manual).
15. Uncouple the tractor's lower link.
16. Pull the tractor forwards.

**DANGER**

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



Fig. 114

**CAUTION**

Danger of getting crushed in the area of the moving draw rail.

7.3 Coupling the hydraulic pump (optional)



WARNING

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

Only couple/uncouple the hydraulic pump and tractor universal joint shaft if the tractor and machine are secured to prevent unintentional starting and rolling.

7.3.1 Connecting the hydraulic pump

1. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.
2. Clean and grease the tractor's universal joint shaft.
3. Couple the tractor and machine.
4. Secure the tractor against unintentional starting and unintentional rolling away.
5. Couple the hydraulic pump (Fig. 115/1) to the tractor's universal joint shaft.
The hydraulic pump is equipped with a QC fastener. Make sure that the QC fastener has engaged correctly.
6. Set the adjuster segment so that the buffer (Fig. 115/2) rests against it.



Fig. 115

7.3.2 Uncoupling the hydraulic pump

**DANGER**

- Switch off the tractor's universal joint shaft, apply the parking brake, shut down the tractor engine and remove the ignition key.
- The hydraulic pump contains hot components that may cause burns. Wear gloves.

1. Park the machine on level, solid ground.
2. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.

Wait until the universal joint shaft stops moving.

3. Remove the hydraulic pump from the tractor's universal joint shaft.

8 Settings



WARNING

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

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

Secure the tractor and the machine against unintentional start-up and rolling before making any adjustments to the machine.



DANGER

Before adjusting (unless otherwise described)

- Fold out the booms
- Lower the machine, i.e. move in the integrated running gear.

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. 116) into the seed hopper.

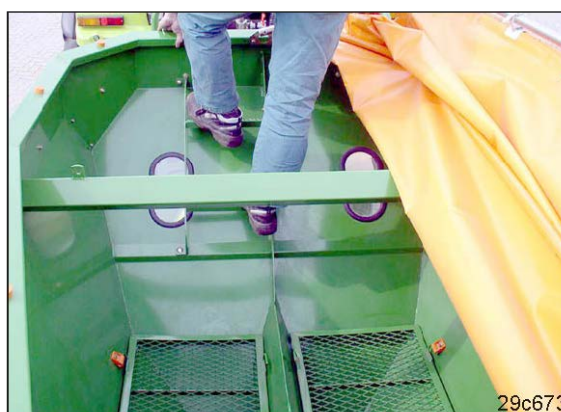


Fig. 116

3. Release the wing nuts (Fig. 117/2).
4. Adjust the height of the level sensor (Fig. 117/1) to the required seed volume.

AMATRON 3 emits an alarm when the level sensor is no longer covered with seed.

5. Tighten the wing nuts (Fig. 117/2).



Fig. 117

Only machines with two metering units:

6. Repeat the setting on the second level sensor.
Fasten the two level sensors at the same height in the seed hopper.



Increase the residual seed volume which triggers the alarm:

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

8.2 Inserting dosing roller in metering unit

1. Remove the clip pin (Fig. 118/2)
(only necessary when the seed hopper is full to seal the hopper with the slider (Fig. 118/1).



The dosing rollers can be replaced more easily, if the seed hopper is empty.

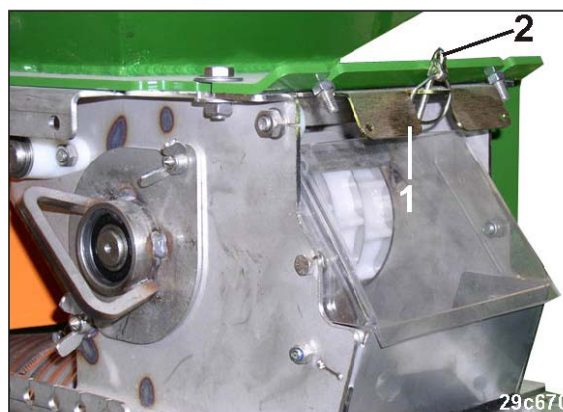


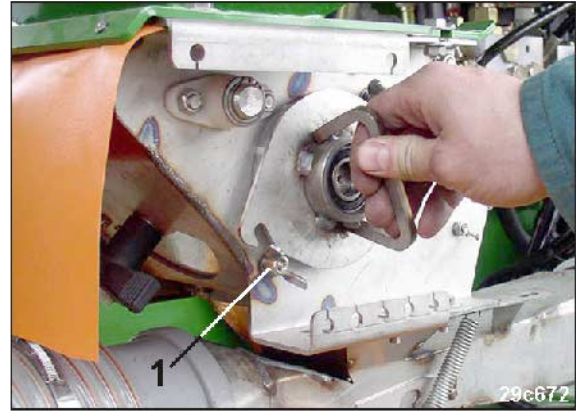
Fig. 118

2. Push the slider (Fig. 119/1) into the dosing unit up to the stop.
- The slider seals the seed hopper. Seed cannot pour out inadvertently when the dosing roller is replaced.

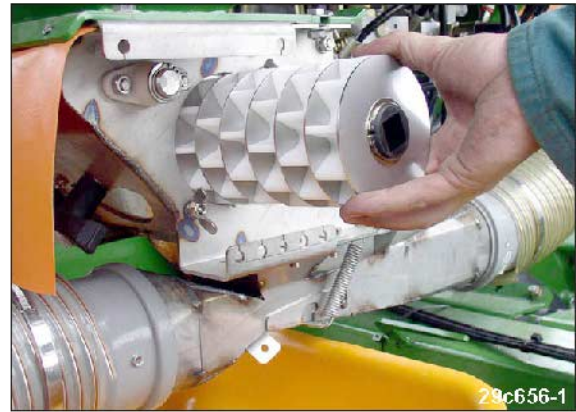


Fig. 119

3. Slacken but do not unscrew the two winged nuts (Fig. 120/1).
4. Turn the bearing cover and pull it off.

**Fig. 120**

5. Pull the dosing roller out of the seed doser.
6. Refer to table for the requisite dosing roller and install in the reverse order.

**Fig. 121**

7. Repeat the procedure for the second dosing unit (if fitted). Equip both seed dosing units with the same dosing roller.



Don't forget to open all sliders (Fig. 118/1).
Secure each slider with a linch pin (Fig. 118/2).

8.3 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).
2. Lower the machine fully by inserting the integrated running gear completely. Here the machine can be coupled or uncoupled.
3. Apply the handbrake, switch the tractor engine off and remove the ignition key.
4. Remove the calibration troughs from the transport mounting on the rear wall of the hopper.

The calibration troughs are nested for transport and fastened to the rear wall of the hopper secured with a linch pin (Fig. 122/1).



Fig. 122



CAUTION

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

5. Push a calibration trough into the mounting under each seed doser.



Fig. 123

6. Open the injector sluice flap (Fig. 124/1) on all seed dosing units.


CAUTION

Risk of contusions on opening and closing the injector sluice flap (Fig. 124/1)!

Hold the injector sluice flap only by the lug (Fig. 124/2), otherwise there is a danger of injury when the spring-loaded injector sluice flap snaps closed.

Never insert your hand between the injector sluice flap and the injector sluice!

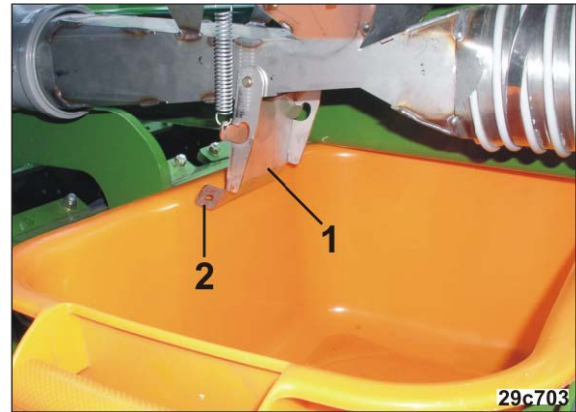


Fig. 124

1. Adjust the desired sowing rate in the AMATRON 3.
 - 1.1 Open the menu "Job".
 - 1.2 Select the job number.
 - 1.3 Enter the job name (optional).
 - 1.4 Enter job notes (optional).
 - 1.5 Enter the seed type.
 - 1.6 Enter the 1000 grain weight (required only with a grain meter).
 - 1.7 Enter the desired sowing rate.
 - 1.8 Start the job (press the "Start job" button).
 - 1.9 Adjust the sowing rate with calibration test as described in the operation manual AMATRON 3 (see section "Calibrating machines with electr. full dosing").



The number of engine revolutions for the calibration test until the signal tone sounds is governed by the sowing rate:

- 0 to 14.9 kg → Engine revolutions to 1/10 ha
- 15 to 29.9 kg → Engine revolutions to 1/20 ha
- from 30 kg → Engine revolutions to 1/40 ha.

2. Secure the calibration troughs on the seed hopper.
3. Close the injector sluice flaps with special care (see danger notice [Fig. 124]).

8.4 Adjusting blower fan speed



This adjustment is not required if the blower fan is driven by the tractor universal joint shaft.



Set the target blower fan speed (Fig. 71)

- via the tractor's flow control valve
- at the pressure relief valve of the blower fan hydraulic motor if the tractor does not have any flow control valve.

In the AMATRON 3, set:

- the target blower fan speed
- the deviation from the target blower fan speed (as a percentage) at which the alarm should be triggered.



Fig. 125

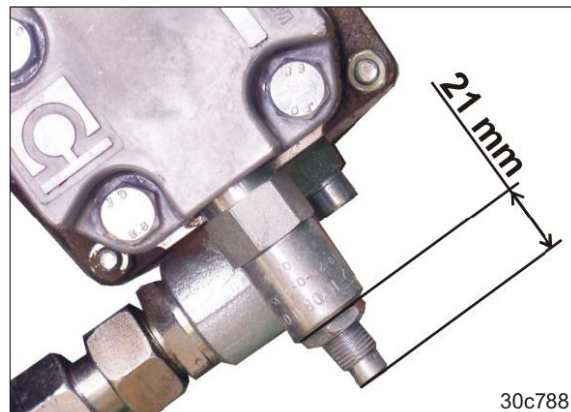


Fig. 126

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

1. Release the lock nut (Fig. 125/2).
2. Adjust the pressure relief valve (Fig. 125/1) to the factory-set dimension "21 mm" (Fig. 126).
 - 2.1 Turn the screw with the hexagon socket wrench (Fig. 125/3) accordingly.
3. Tighten the lock nut (Fig. 125/2).
4. Set the target blower fan speed on the flow control valve of the tractor.

8.4.2 Adjust the blower fan speed on the machine pressure limiting valve

1. Release the lock nut (Fig. 125/2).
2. Use the hexagon socket wrench to set the target blower fan speed on the pressure relief valve.

Ensure that this does not fall below "21 mm" (Fig. 126).

Blower fan speed

Turning clockwise: increases the target blower fan speed

Turning anti-clockwise: reduces the target blower fan speed.

3. Tighten the lock nut (Fig. 125/2).

8.4.3 Setting the fan speed monitoring on the AMATRON 3

Set the fan speed monitoring on the Machine Data menu (see AMATRON 3 operating manual)

- input the fan speed (rpm) that is to be monitored or
- adopt the current fan speed (rpm) during operation as the speed to be monitored.

8.4.3.1 Triggering of the alarm, if the fan speed differs from the setpoint

Setting of the alarm, if the fan speed differs from the setpoint in the Basic Data menu (see AMATRON 3 operating manual).


The gradual percentage deviation [± 10 (%)] from the setpoint has to be set.

8.5 Setting the coulter pressure



WARNING

Direct people out of the danger area.

1. Select the coulter button  on the AMATRON 3 and by actuating control unit *green*
 - o admit pressure to the hydraulic cylinder or
 - o put it in float position.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Insert one pin (Fig. 127/1) below and above the stop (Fig. 127/2) into the adjusting segment and secure with clip pins.

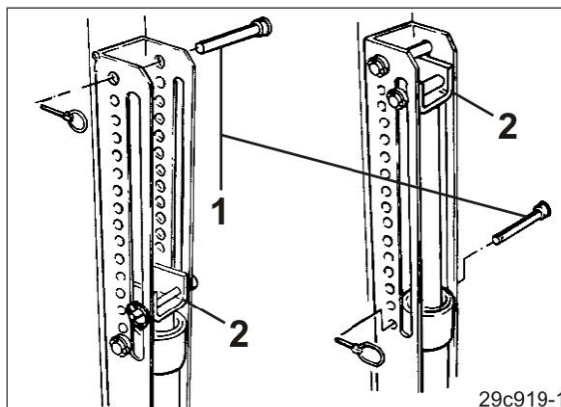


Fig. 127

Each of the holes is identified with a number.

The greater the number of holes into which the pin is inserted, the greater the coulter pressure.



This setting influences the planting depth of the seed.

Check the planting depth of the seed after every adjustment.

8.5.1 Setting the RoTeC plastic discs

If it is not possible to achieve the desired planting depth as described, adjust all RoTeC plastic discs evenly in accordance with the table (Fig. 128).

Thus the plastic disc can engage in three positions or be removed from the RoTeC coulter.

Then readjust the placement depth.



This setting influences the planting depth of the seed.
Check the planting depth of the seed after each adjustment.

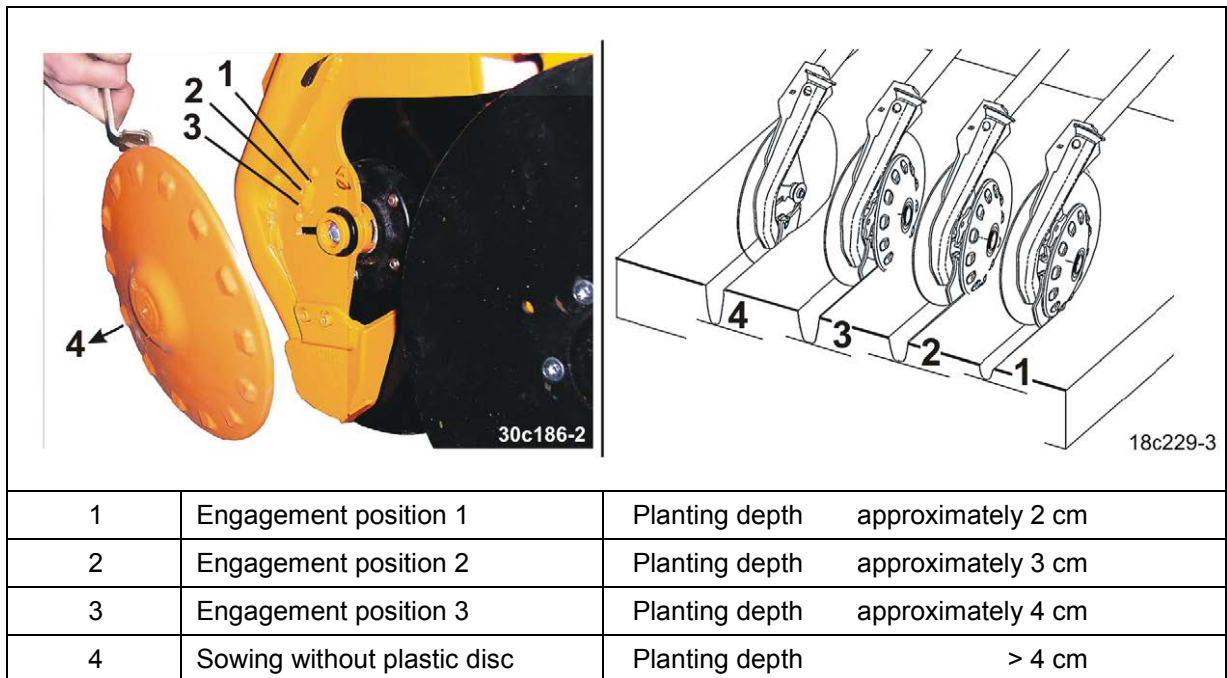


Fig. 128

Engagement position 1 to 3

1. Engage the handle (Fig. 129/1) in one of the 3 positions.



Fig. 129

Sowing without plastic disc

1. Turn the handle beyond the engagement catch (Fig. 130/1) and remove the plastic disc from the RoTeC coulter.

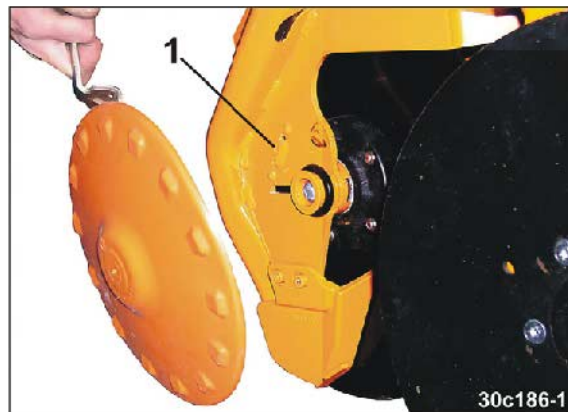


Fig. 130

Installing RoTeC plastic disc



Secure the RoTeC plastic disc with the designation

- "K" on the short coulter
- "L" on the long coulter.

1. Push the plastic disc from below against the catch on the RoTeC coulter.
The shoulder must grip in the slot.
2. Pull the handle to the rear and upwards beyond the notches.
A light blow on the centre of the disc helps to latch it into position.

8.6 Adjusting the exact harrow



Check the work results after each adjustment.

8.6.1 Adjusting the spring tines

Adjust the spring tines in accordance with Table (Fig. 132).

Adjustment is made by changing the distance "X" (Fig. 131) on all segments with the screw (Fig. 131/1).

1. Set the machine on the field to its working position.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Release the two lock nuts (Fig. 131/2).

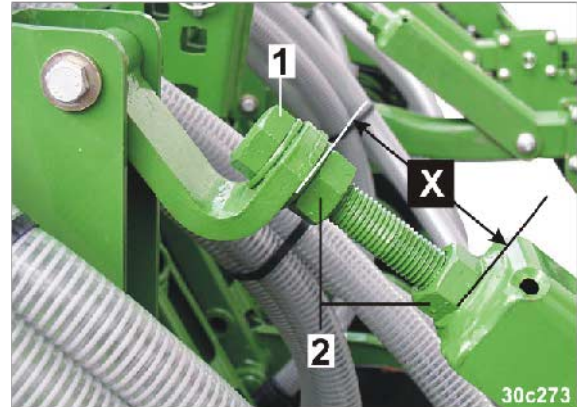


Fig. 131

4. Set the required distance "A".

Reduce distance "A": Increase distance "X".

Increase distance "A": Reduce distance "X".

5. Firmly tighten counter nuts (Fig. 131/2).
6. Apply the same setting to all segments.

Distance "A"	230 to 280 mm
--------------	---------------

When correctly set, the spring tines of the exact harrow should

- lie horizontally on the ground and
- have 5 - 8 cm free floating space beneath.

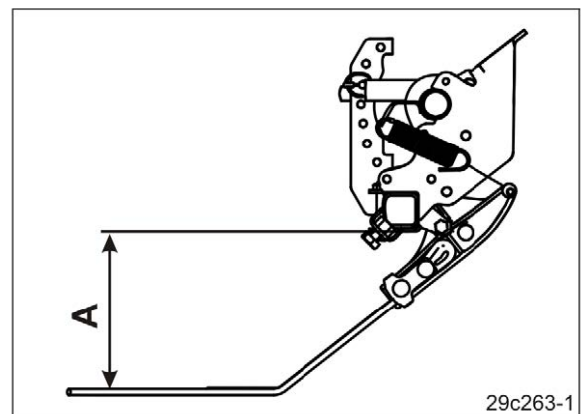


Fig. 132

8.6.2 Setting the exact harrow pressure

1. Tension the lever (Fig. 133/1) with the calibration crank.
2. Insert the bolt (Fig. 133/2) into a boring under the lever.
3. Relieve the lever.
4. Secure the bolt with a spring pin.
5. Apply the same setting to all adjusting segments.



Fig. 133

8.6.2.1 Setting the exact harrow pressure (hydraulic adjustment)



WARNING

Direct people out of the danger area.


1. Select the coulters button  on the AMATRON 3 and by actuating control unit *green*
 - o admit pressure to the hydraulic cylinder or
 - o put it in float position.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Insert one pin each (Fig. 134/1) under and over the lever into the adjusting segment and secure it with safety splints.



Fig. 134

8.7 Roller harrow



DANGER

Make adjustments only when the tractor parking brake is applied, the engine switched off and the ignition key removed.

8.7.1 Setting working depth and angle of harrow tines

1. Raise the machine above the integrated running gear only enough so that the harrow tines are immediately above the ground, but not touching it.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Hold the harrow tines beam by the carrier handle (Fig. 135/3).
4. Set the working depth of the harrow tines by positioning the carrying arm with the bolt (Fig. 135/1)
 - o in all segments
 - o in the same hole.

The deeper the pin is inserted in the adjusting segment, the greater the work depth.

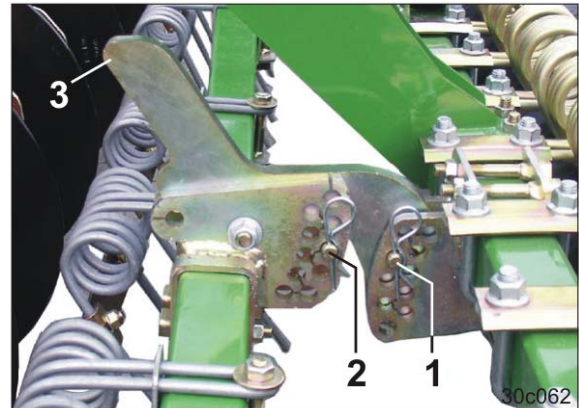


Fig. 135

5. After each repositioning, secure the pin with safety splint.

Settings

6. Change the angle of the times to the ground by repositioning the bolt (Fig. 136/2)
 - o in all segments
 - o in the same hole.

Ensure that the pin (Fig. 136/2) is positioned below the carrier (Fig. 136/3) in the adjusting segment.

The deeper the pin (Fig. 136/2) is inserted in the adjusting segment, the flatter the angle.

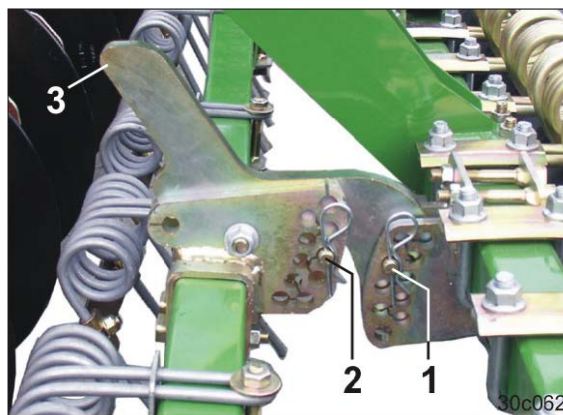


Fig. 136

7. After each repositioning, secure the pin (Fig. 136/2) with safety splint.
8. Move in the integrated running gear, i.e. lower the machine completely.

8.7.2 Adjusting roller pressure

The roller pressure is adjusted by changing the distance "X" (Fig. 137) on all segments with the screw (Fig. 137/1).

1. Set the machine on the field to its working position.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Release the two lock nuts (Fig. 137/2).

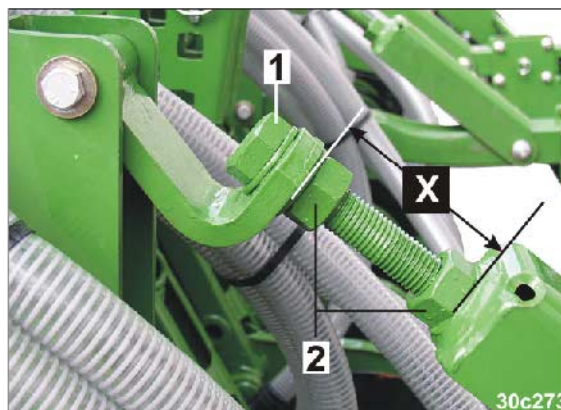


Fig. 137

4. Set the required distance "X".

Increase roller pressure: Increase distance "X"

Reduce roller pressure: Reduce distance "X"

5. Firmly tighten counter nuts (Fig. 137/2).
6. Apply the same setting to all segments.
7. Check the work results.



The maximum roller pressure of 35 kg per roll in working position must not be exceeded.

8.8 Adjusting the disc array (on the field)

8.8.1 Adjusting disc array working depth with machine setting "Turning on the axle"





Adjust the disc array working depth immediately before starting work on the field.

Correct the setting, if necessary without interruption during work.




DANGER

Direct people out of the danger area.

1. Select the  button (see operating manual AMATRON 3).
→ The symbol  appears on the display.
2. Actuate control unit *green* until the desired disc array working depth is reached.

The working depth of the discs array determines the working intensity.



When the symbol  disappears from the display, the disc array actuation is deactivated.

The disc array actuation is deactivated as soon as another selection is made, e.g. harrow pressure adjustment.

8.8.2 Adjusting disc array working depth with machine setting "Turning on the roller"



Turning the Cirrus 3002 on the roller is not possible.

1. Set the disc array working depth.
2. Leave the disc array in operational position and stop the tractor.
3. 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.

4. Release the wing nuts (Fig. 138/1).
5. Position the sensor (Fig. 138/2) and the magnet (Fig. 138/3) one above the other.
6. Tighten the wing nut by hand.

Pushing the sensor in the direction of the arrow increases the working depth of the disc array.

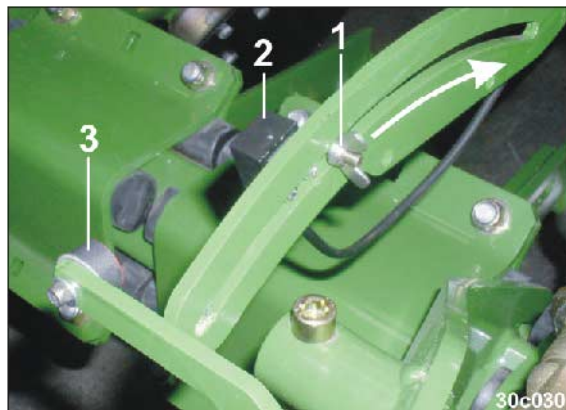


Fig. 138



The disc array

- is raised before turning at the end of the field, and always assumes the operational position set with the sensor after turning.
- can be adjusted during work.

8.8.3 Setting the length of the outer disc struts

In each disc row the length of the outer disc struts is adjustable.

Shorten the disc struts

- of the front row of discs, if the outer discs are conveying too much soil outwards.
- of the rear row of discs, if the outer discs are conveying too much soil inwards.

Firmly tighten the nuts after adjustment.



Fig. 139

8.8.4 Adjusting the outside hollow discs

Adjust the outside hollow discs (Fig. 140/1) so that they just contact the ground surface.

Tighten the screws (Fig. 140/2) firmly after adjustment.

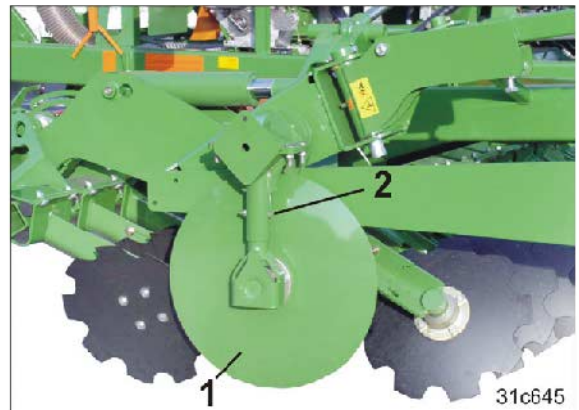


Fig. 140



CAUTION

Danger of getting crushed when adjusting the outside hollow discs.



The outside hollow discs of the Cirrus 3002 are folded inwards for transport.

8.9 Setting the wheel mark eradicator (on the field)

**DANGER**

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

To set the track loosener horizontally:

1. Release the screws (Fig. 141/1) and slide the track loosener horizontally.
2. Tighten the screws.

To set the track loosener vertically:

1. Hold the track loosener by the handle (Fig. 141/2).
2. Remove the bolt (Fig. 141/3).
3. Put the track loosener in vertical position, position it with the bolt and secure it with a linch pin.

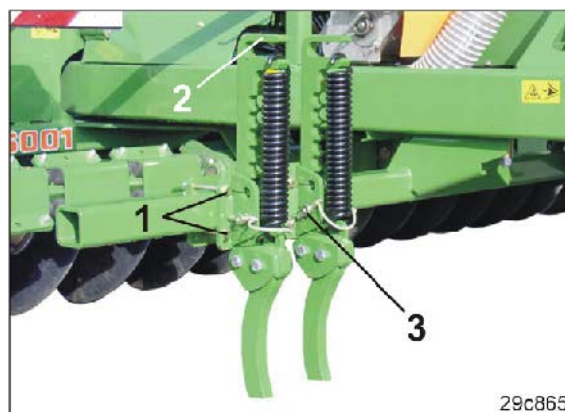


Fig. 141

8.10 Adjusting the track marker length and working intensity



DANGER

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

1. Direct people out of the danger area.
2. Fold out both track markers simultaneously on the field (see AMATRON 3 operating manual) and drive several metres.
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. Slacken the wedge bolt (Fig. 142/1).
5. Set the track marker length to distance "A" (see table, Fig. 143, unterhalb).
6. Tighten the wedge bolt (Fig. 142/1).

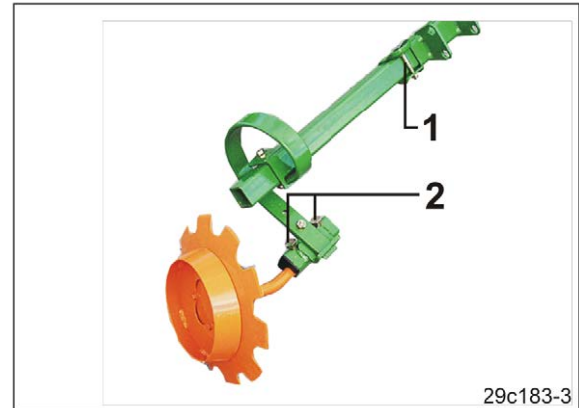


Fig. 142

7. Release both screws (Fig. 142/2).
8. Turn the track marker disc to adjust the working intensity of the track marker so that it runs roughly parallel to the direction of travel on light soil and is more attuned to grip on heavier soil.
9. Tighten the screws (Fig. 142/2).
10. Repeat the operation on the second track marker.

The table values specify the distance "A"

- from the centre of the machine
- up to the contact surface of the track marker disc.

	Distance "A"
Cirrus 3002	3.0 m
Cirrus 4002	4.0 m
Cirrus 6002	6.0m

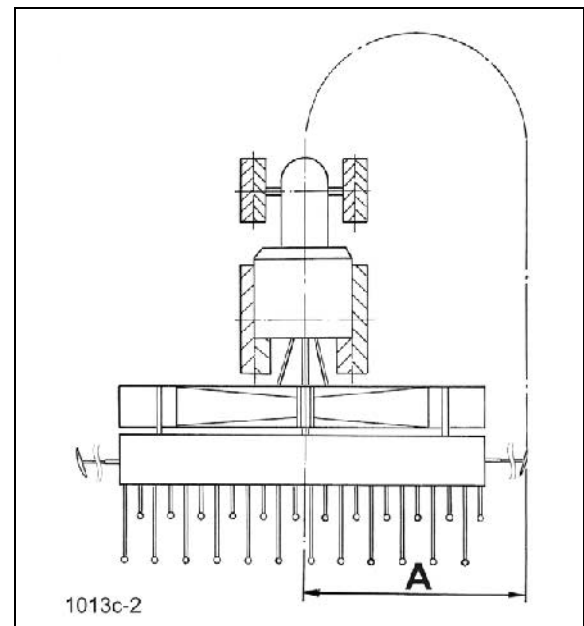


Fig. 143



Settings

8.10.1


8.10.2 ,Setting the tramlining rhythm/meter on the AMATRON 3

1. Select the tramlining rhythm.
2. Set the tramlining rhythm on the Machine Data menu (see AMATRON 3 operating manual).
3. Refer to Fig. (Fig. 95) for the tramline counter of the first field run.
4. Enter the tramline counter of the first field run in the Work menu (see AMATRON 3 operating manual).
5. Set seed volume reduction (%) when creating tramlines in the Machine Data menu (see AMATRON 3 operating manual).
6. Switch on/off the interval tramline switch in the Work menu (see AMATRON 3 operating manual).



The tramline counter counts up by one when the machine is lifted (see the Amatron + operating manual).

The counting is prevented by

- pressing the Stop button  before raising the machine or
- switching off the AMATRON 3.

8.11 Half-sided switching off

Machines with full dosing

For half-sided switching-off of the machines with full dosing please refer to the AMATRON 3 operating manual.

8.11.1 Moving the track disc carrier of the tramline marker to the operational/transport position

8.11.2 Move the track disc carrier from the transport to the operational position

1. Secure the track disc carrier (Fig. 144/1).
2. Remove the lynch pin (Fig. 144/2).
3. Withdraw the pin (Fig. 144/3).
4. Swivel the track disc carrier down.
5. Repeat the operation on the second track disc carrier.

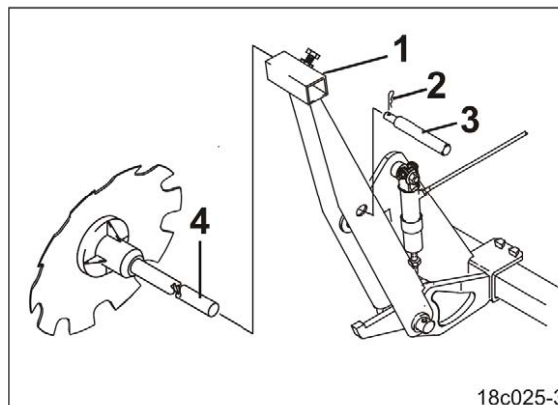


Fig. 144



DANGER

Direct people out of the danger area.

6. Set the tramline counter to "zero" (see AMATRON 3 operating manual).
7. Operate control unit *yellow*.
→ The track ring carriers are lowered to the operational position.
8. Apply the tractor parking brake, switch off the engine and remove the ignition key.
9. Insert the track discs (Fig. 144/4) into the track disc carriers.

10. Set the track discs so that they mark the tramline created by the tramline coulters.
11. Adapt the work intensity to the soil by turning the discs (position the discs on light soils roughly parallel to the direction of travel and on heavy soils more on in a forward position).
12. Tighten the screws (Fig. 145/1) firmly.

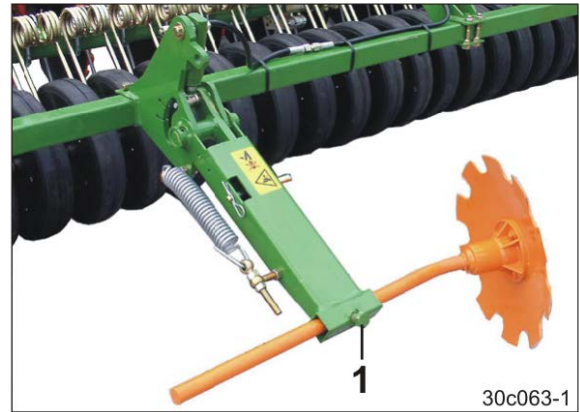


Fig. 145



When working with tramline rhythm 2 and tramline rhythm 6 plus fit only one of the two track marker discs.

The track width of the cultivation tractor is then scored on the field on a back and forth run.

8.11.3 Set the track disc carrier to transport position

Move the track disc carriers in reverse sequence (as described above) into the transport position.



During transport, store the track discs (Fig. 144/4) in a suitable storing space.

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", Seite 31.
- 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
 - The function of the brake system.



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.

Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor. Drive only with empty hopper.

**WARNING**

Risk of falling from the machine if riding against regulations!

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

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

**WARNING**

Risk of stabbing other road users during transportation from uncovered, sharp spring tines of the exact harrow on the central part of the machine pointing backwards!

Transportation without a correctly fitted transport guard rail is forbidden.

Moving the Cirrus to transport position on the field after work

1. Fold in both track markers (see AMATRON 3 operating manual).
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.

Cirrus 3002 only

3. Fit the lug (Fig. 146/1) on the journal (Fig. 146/2) of the marker and secure the connection with a clip pin (Fig. 146/3).



The marker secured with a lug cannot swivel during transport.

4. Repeat the operation on the second track marker.



Fig. 146



DANGER

Secure the marker before transport against unintended swiveling.



During the work, the lug (Fig. 147/1) is located on the bracket (Fig. 147/2) and is secured with the clip pin (Fig. 147/3).



Fig. 147

5. Put the right-hand outside hollow disc (Fig. 148/1) in transport position by shifting the lever (Fig. 148/2).


CAUTION

Danger of getting crushed.
Hold the side disc (Fig. 148/1) only by the lever (Fig. 148/2).

6. Secure the side disc in transport and operational position with a pin (Fig. 148/3) in the holes (Fig. 148/4).
7. After each repositioning, secure the pin with a clip pin.
8. Swivel the left-hand outside hollow disc (Fig. 149/1) to transport position.

The outside hollow disc is fastened in transport position and in operating position to the lug (Fig. 149/2), positioned with a bolt (Fig. 149/3) and secured with a linch pin.

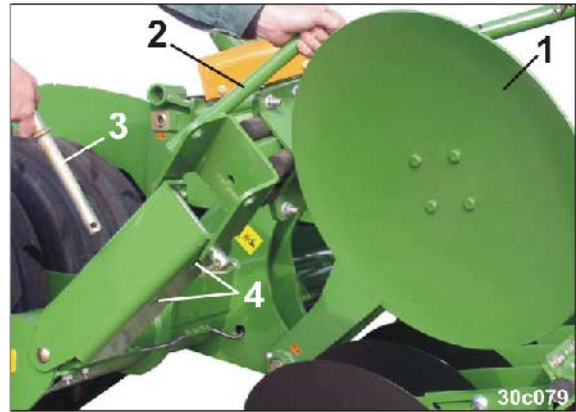


Fig. 148



Fig. 149


WARNING

Put the outside hollow discs in transport position prior to transport.

Otherwise the outside hollow discs extend laterally into the traffic area during transport journeys and endanger other road users.

In addition the permissible transport width of 3 m is exceeded.

Transportation

9. Release the screw.
10. Insert the outside harrow element (Fig. 150/1) to transport width (3.0 m).
11. Tighten the screw firmly.
12. Repeat the operation on the second outside harrow element.



Fig. 150



WARNING

Danger of cuts during transport journeys with the outer harrow elements extended!

Extended outer harrow elements extend laterally into the traffic area during transport journeys and endanger other road users. In addition the permissible transport width of 3 m is exceeded.

Push the outer harrow elements into the main tube of the exact harrow before you perform any transport journeys.

All types

13. Drain the seed hopper.



DANGER

Empty the seed hopper on the field.

Transport journeys on roads and ways are prohibited when the seed hopper is filled. The brake system is designed for an empty machine only.



Fig. 151

14. Close the hopper cover and secure it with rubber loops (Fig. 152/1) against unintentional opening during travel.

Use the cover hook (Fig. 152/2).



Fig. 152

When not in use the cover hook (Fig. 153/1) remains inserted in the transport mounting (Fig. 153/2) on the lighting beam.

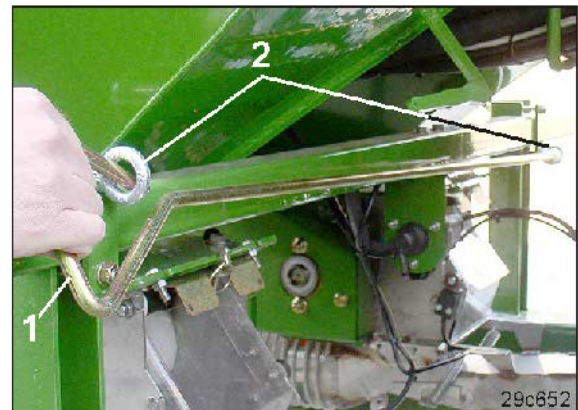


Fig. 153

Transportation

15. Lift up and lock the ladder (Fig. 154).



CAUTION

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



Fig. 154



Push the ladder (Fig. 154) up and lock it after each use or before transport and prior to working. This avoids damaging the ladder.

The draw bar can damage the lowered ladder when the machine is turned!

16. Move the track disc carrier (Fig. 155/1) to the transport position.
17. Pull the track discs (Fig. 155/2) out of the track disc carrier and carry them with you in a suitable stowing space.

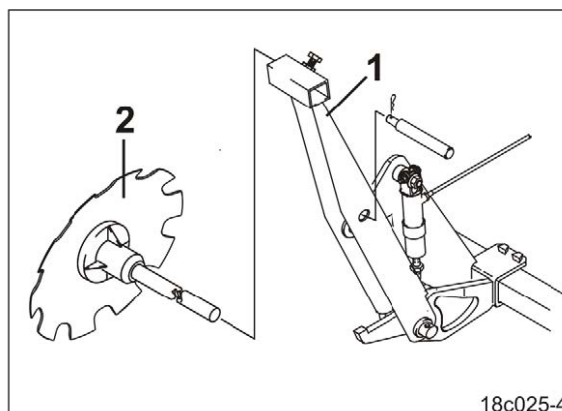
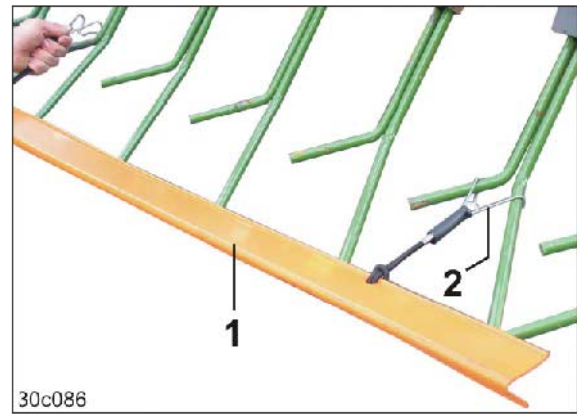


Fig. 155

18. Push the two-part transport securing bar (Fig. 156/1) over the tine tips of the exact harrow.
Install the road safety bars, starting from the middle of the machine, on the foldable machine.
19. Fasten the transport securing bar with spring holders (Fig. 156/2) to the exact harrow.
20. Fold in the machine's extension arm.
21. Block the tractor control units.

**Fig. 156****Fig. 157**

Lock the tractor's control units during transport!

Transportation

22. Switch off the AMATRON 3.
(see AMATRON 3 operating manual).



DANGER

Switch off the AMATRON 3 during transport.

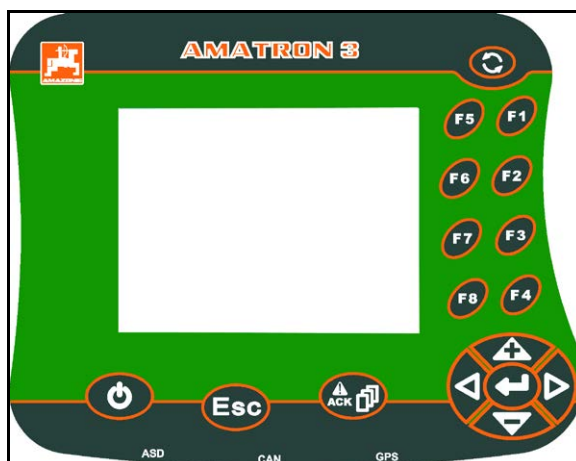


Fig. 158

Use the protective cover to cover the disc array that extends into traffic.



Fig. 159

23. Check the lighting system for operation.



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



Fig. 160



- The permissible maximum speed of the machine is 40 km/h ¹⁾. 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.

10 Use of the machine



- When using the machine, observe the information in the sections
- "Warning pictograms and other signs on the machine", Seite 19 and
 - "Safety information for users", Seite 31.

Observing this information is important for your safety.



WARNING

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

Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor. Drive only with empty hopper.



WARNING

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

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

In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the driver and the 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 arm in/out (except Cirrus 3002)



DANGER

Instruct people to leave the swivel area of machine's extension arm before you fold the machine's extension arm out or in.



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

Always raise the machine completely by moving the integrated running gear out fully before you fold the machine extension arm in or out.

Only when the machine is fully raised do the soil cultivating tools have sufficient ground clearance and are thus protected against damage.

10.1.1 Folding out the machine's extension arms

1. Switch on the AMATRON 3 (see AMATRON 3 operating manual).
2. Release the tractor parking brake and take your foot off the brake pedal.
Never leave the tractor cab with the parking brake released.
3. Raise the machine fully by moving the integrated running gear (Fig. 161/1) out completely.
 - 3.1 Actuate control unit *yellow* until the machine is fully raised.

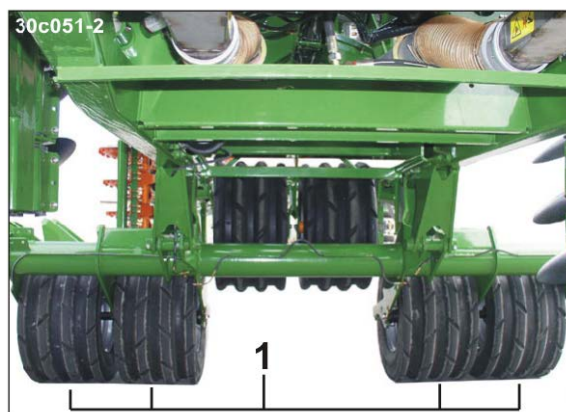



Fig. 161

4. Apply the tractor parking brake.
5. Call the Work menu on the AMATRON 3.
6. Press the shift key (key on the rear side of the AMATRON 3).
7. Press the  key.
 - The "Fold" menu appears on the display.
8. Select the "Unfold machine extension arm" submenu and follow the instructions on the display.



Follow the instructions on the display before you confirm the instructions in order to prevent any collisions of the machine components.

Use of the machine

9. Fold in the lighting (Fig. 162/1), position it with a pin (Fig. 162/2) and secure with a clip pin.



Fold in the lighting in order to prevent damage when folding out the machine extension arm.

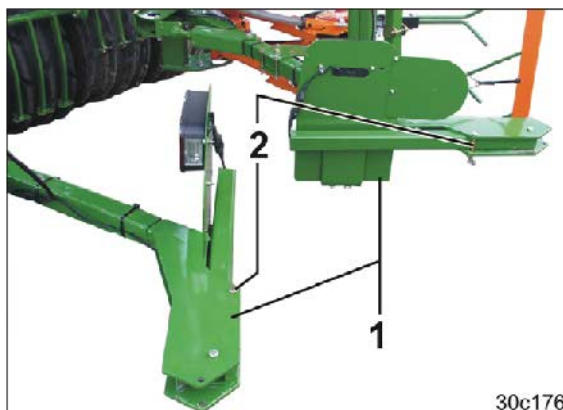


Fig. 162

10. Fold out the machine extension arms completely.

10.1 Actuate control unit *green* until the machine extension arms are fully folded out.

10.2 Actuate control unit *green* for a further 3 seconds so that the hydraulic accumulator (Fig. 221) is filled with hydraulic fluid.



Fig. 163



The locking hooks (Fig. 164/1) open automatically before folding out the machine's extension arm.

Position control unit *green* briefly on "Fold in" and then again on "Fold out", should the locking hooks not open.



Fig. 164

11. Exit the "Folding" menu.
12. Put the Cirrus in its working position.

10.1.2 Folding in the machine's extension arms

1. Release the tractor parking brake and take your foot off the brake pedal.
Never leave the tractor cab with the parking brake released.
2. Raise the machine fully by moving the integrated running gear (Fig. 165/1) out completely.
- 2.1 Actuate control unit *yellow* until the machine is fully raised.

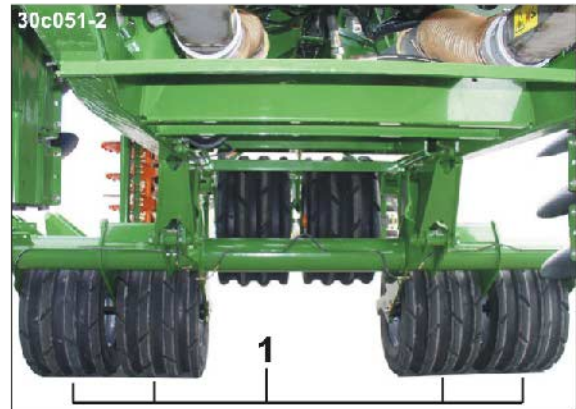



Fig. 165

3. Apply the tractor parking brake.
4. Call the Work menu on the AMATRON 3.
5. Press the shift key
(key on the rear side of the AMATRON 3).
6. Press the  key.
- The "Fold" menu appears on the display.
7. Select the "Fold in machine extension arm" submenu and follow the instructions on the display.



Follow the instructions on the display before you confirm the instructions in order to prevent any collisions of the machine components.



The disc array automatically moves to the transport position.

8. Fold in the machine's extension arms completely.
- 8.1 Actuate control unit *green* until the machine extension arms are fully folded in.
- 8.2 Switch off the AMATRON 3
(see AMATRON 3 operating manual).



Fig. 166



DANGER

Check whether the coulter frame has been folded in to transport width.

The locking hooks (Fig. 167/1) form the mechanical transport locking device and engage onto the locking spigot (Fig. 167/2).



DANGER

Check whether the bars (Fig. 167/1) are engaged properly after folding in the extension arms.



Fig. 167

9. Fold out the lighting (Fig. 168/1), position with pins (Fig. 168/2) and secure with clip pins.

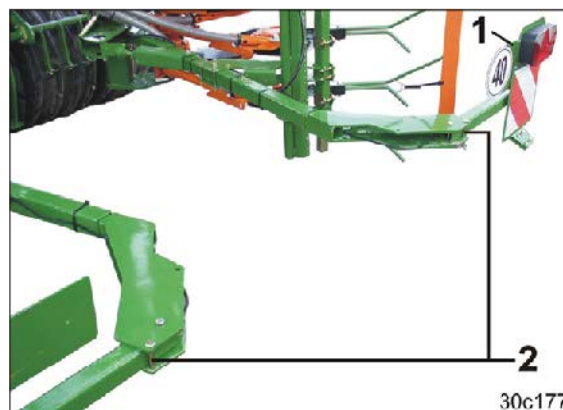


Fig. 168

10. Move in the integrated running gear until the machine is horizontal.

- 10.1 Actuate control unit *yellow* until the machine is in a horizontal position.



Ensure that the machine has sufficient ground clearance in all driving situations.



Fig. 169

10.2 Removing the transport safety bar

Remove the road safety bar before using the machine in the field

1. Release the spring holders (Fig. 170/2) and remove the road safety bar (Fig. 170/1).
2. Insert the two parts of the transport safety bar (Fig. 171/1) into each other and secure it on the transport bracket (Fig. 171/2) with the spring holders.

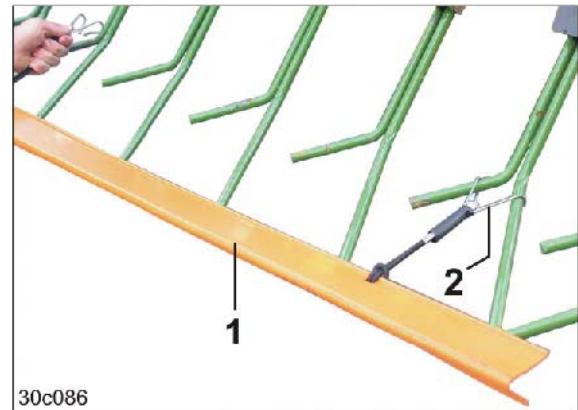


Fig. 170



Fig. 171

10.3 Secure the protective cover in the bracket

The foldable machines have a protective cover (2 pieces) to cover the disc arrays when driving on the road.

Before using the machine on the field, (Fig. 172)

- roll up the cover
- secure it in the bracket
- secure it using spring holders.



Fig. 172

10.4 Move the exact harrow into the working position

Only Cirrus 3002 with exact harrow

To drive on the road, the exact harrow is pushed inside itself so that the permitted transport width of 3.0 m is not exceeded.

Before using the machine on the field

1. Undo the bolt and push the outside harrow element (Fig. 173/1) outwards.
2. Tighten the bolt.
3. Repeat the operation on the second outside harrow element.

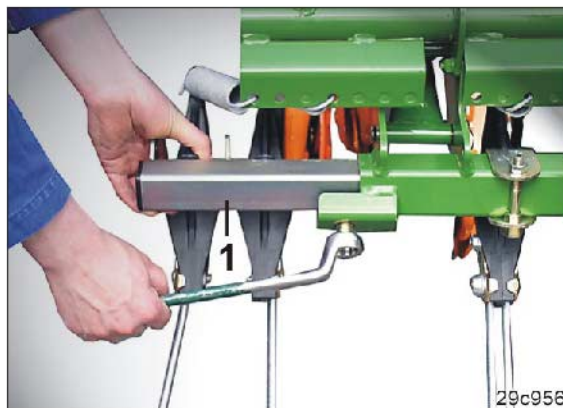


Fig. 173



The coulters on the seed drill force the soil outwards to different extents depending on the travel speed and condition of the soil. Push the outside harrow element further outwards at higher travel speeds.

Set the outside harrow elements such that the soil is guided back and a trackless seed bed is created.

Check the settings before starting work.

10.5 Filling the seed hopper



DANGER

Fill the seed hopper on the field only!

Transport journeys on roads and ways are prohibited when the seed hopper is filled. The brake system is designed only for an empty machine.

Before filling the seed hopper apply the tractor parking brake, switch off the tractor engine and remove the ignition key!

Observe the approved filling levels and total weights!

Filling the seed hopper:

1. Couple the Cirrus to the tractor.
2. Apply the tractor parking brake, switch off the engine and remove the ignition key.
3. Determine and fit the dosing roller(s).

4. Release the rubber loops (Fig. 174/1) together with the cover hook (Fig. 174/2).



Fig. 174

5. Lift the ladder (Fig. 175/) out of its locking device and lower it to the stop.



CAUTION

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



Fig. 175

6. Climb on the loading plate via the ladder.
7. Release the rubber loops on the end face.
8. Open the swivel cover.
9. If necessary, remove foreign bodies in the seed hopper.
10. Adjust the level sensor(s) in the seed hopper.



Fig. 176

11. Load the seed hopper
 - o with sacked merchandise from a supply vehicle
 - o with a filling auger from a supply vehicle
 - o from bulk bags.

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. 177

13. Close the swivel cover and secure it with rubber loops.
14. Pull the ladder (Fig. 175) up and lock it.



Push the ladder (Fig. 175) up and lock it after each use or before transport and prior to working. This avoids damaging the ladder.

The draw bar can damage the lowered ladder when the machine is turned!

10.5.1 Load the seed hopper with sacked merchandise from a supply vehicle

1. Approach the open loading edge of the trailer with the Cirrus.
2. Put the tractor on an extreme steering lock (approx. 90° to the machine).
3. Reverse onto the supply vehicle until the loading plate 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 plate 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 seed hopper from the loading plate only and constantly ensure firm support when transporting the sacked merchandise.



Fig. 178



DANGER

Manoeuvring the Cirrus requires a marshalling person.

Never stand between the supply vehicle and the machine.

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

10.5.2 Loading the seed 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 seed hopper via the filling auger in consideration of the manufacturer's instructions.



Fig. 179



CAUTION

Never move between the supply vehicle and the machine.

10.5.3 Loading the seed hopper from bulk bags

1. Set the Cirrus 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 plate.
5. Unload the bulk bag into the seed hopper.



Fig. 180



DANGER

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

10.5.4 Enter the filling volume on the AMATRON 3

If the eAMATRON 3xact filling volume is known, enter the filling volume on the AMATRON 3 (see AMATRON 3 operating manual).

It is then possible to input the amount (kg) remaining in the seed hopper in which the level alarm is to be triggered.

The AMATRON 3 triggers an alarm, if

- the theoretically calculated remaining amount is reached and the level sensor is logged off on the AMATRON 3 or
- the level sensor is no longer covered with seed.

10.6 Remove the transport safety catch of the track markers (only Cirrus 3002)

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Fit the lug (Fig. 181/1) on the clamp (Fig. 181/2) and secure with the clip pin (Fig. 181/3).
3. Repeat the operation on the second track marker.



Fig. 181

10.7 Work commencement



DANGER

- Direct everyone out of the danger area of the machine, in particular from the swivel zone of the machine extension arms and the track marker.
- Actuate the tractor's control units only in the tractor cab.

1. Extend the machine extension arms.



When lowering, pull the machine forward slightly.

2. Bring the blower fan to the nominal speed, depending on the equipment
 - o Operate control unit *red* or
 - o Switch on the tractor's universal joint shaft and bring the blower fan to the nominal speed.
3. Check the blower fan speed and correct it as necessary.



Information to be observed when working with the hydraulic pump that is driven by the universal joint shaft.

- Before switching on the universal joint shaft, observe the safety instructions that are relevant for operating the universal joint shaft.
- Observe the permissible drive speed of the tractor's universal joint shaft.
- In tractors equipped with a hydraulically or pneumatically switchable universal joint shaft, the universal joint shaft must only be switched on when the engine is idling in order to prevent damage to the hydraulic pump.

4. Actuate control unit *yellow* until the machine is lowered or, in other words, until the integrated running gear is completely retracted.

In addition to lowering the machine, actuating control unit *yellow* also affects the following hydraulic functions:

- Folding out the active (i.e. the one shown on the display) track marker (see the AMATRON 3 operating manual)
- Lowering the coulter frame (only with the machine setting "Turning on the roller")
- Lowering the disc array (only with the machine setting "Turning on the roller")
- Closing the seed line tubes in the distributor head if the tramline

- counter displays "0" on the AMATRON 3 display.
- Lowering the discs of the tramline marker if the tramline counter displays "0" on the AMATRON 3 display.
5. Lower/raise the tractor's lower link until the machine is approximately horizontal. As an orientation aid, there is a chain beside the draw rail.
 6. Check and, if required, correct the tramline rhythm on the AMATRON 3 display (see the AMATRON 3 operating manual).
 7. Check and, if required, correct the tramline counter on the AMATRON 3 display (see the AMATRON 3 operating manual).
 8. Actuate control unit *green* (only with the machine setting "Turning on the axle").
- Actuate control unit *green* until the required disc array working depth has been reached.
9. Start.

10.8 Checks

After 100 m check and correct as necessary the:

- Working intensity of the disc array
- Planting depth of the seed .
- Working intensity (depending on the equipment)
 - of the exact harrow,
 - of the drag tines
 - of the seed pressure rollers.

Check on a change from light soil to heavy soil and vice versa

- Planting depth of the seed.

10.8.1 Checking the seed planting depth

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

10.9 During the work

Changing the sowing rate

on machines with

- full dosing

During the work, the sowing rate (100%) in the work menu can be

- increased as a percentage (e.g. +10%) or
- reduced as a percentage (e.g. -10%) or
- reset to 100%.

The rate increment (e.g. 10 %), which has to be set prior to work commencement in the Machine Data menu, changes the sowing rate percentually. (see AMATRON 3 operating manual).

Changing hydr. exact harrow pressure

for machines with hydr. exact harrow pressure adjustment.

During work on changing soils, the exact harrow pressure can be increased on heavy soils (see operating manual AMATRON 3).

Switching off the tramline counter (STOP button)

If the tramline counter is prevented from indexing when there is a work interruption, press the STOP button in the Work menu (see AMATRON 3 operating manual).

Locking the track marker actuation

The track marker actuation can be locked in the Work menu (see AMATRON 3 operating manual).

Folding the track marker in before any obstructions

After pressing the Stop button, the track marker can be retracted (for example, before an obstacle) in order to prevent damage to the track marker when it meets the obstacle (see the AMATRON 3 operating manual).

If the Stop button is active

- the field continues to be sowed
- the machine, the coulter frame and the disc array are not raised.

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.

Seeding with difficult soil conditions

Mud holes can be passed through and seeded by partially or fully raising the disc array and the coulter frame. During this procedure, the star wheel remains in operational position (see operating manual AMATRON 3).

10.10 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 control unit *yellow*.
4. Turn the combination as soon as the machine or coulter frame is raised.



Fig. 182

After turning at the end of the field

1. Operate the control unit *yellow* for at least 5 seconds so that all hydraulic functions are fully executed after turning.
2. Start the field run as soon as the disc array touches the ground.



DANGER

After turning, if control unit *yellow* is actuated the opposite track marker is moved to the operational position.

10.10.1 Turning on the axle

Actuating control unit *yellow* before turning results in

- Raising of the machine via the integrated running gear
- Folding in of the active track marker
- Shifting on of the tramline counter
- Raising of the track disc of the pre-emergence marker.

10.10.2 Turning on the roller (except Cirrus 3002)

1. Press the Shift-key of the AMATRON 3 operator terminal and activate the symbol (Fig. 183).

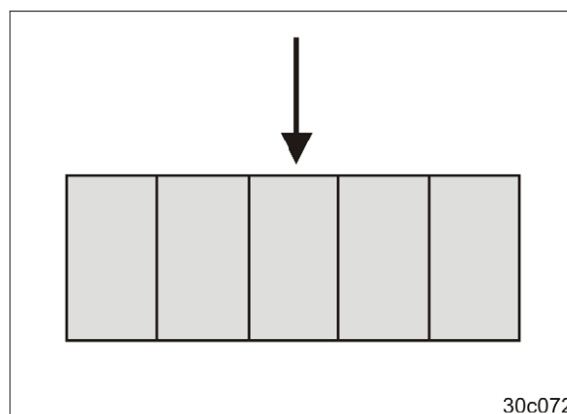


Fig. 183

Actuating control unit *yellow* before turning results in

- Raising of the coulter frame
- Raising of the disc array
- Folding in of the active track marker
- Shifting on of the tramline counter
- Raising of the track disc of the pre-emergence marker.

10.11 End of work on the field



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

1. Deactivate the symbol (Fig. 183) "Turning on the roller" that appears in the display (AMATRON 3) so that the machine can be raised above the integrated running gear.
 - 1.1 Press the Shift key (AMATRON 3)
 - The symbol (Fig. 183) is deleted.
2. Switch off the blower fan.



The tramline counter counts up by one when the machine is lifted (see the Amatron ⁺ operating manual).

The counting can be prevented by pressing the Stop button



3. Actuate control unit *yellow* until the following hydraulic functions are carried out:
 - o Raising of the machine via the integrated running gear
 - o Folding in of the active track marker
 - o Raising of the track disc of the tramline marker.
4. Empty the seed hopper.



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!

5. Move the machine into the transport position.

only Cirrus 3002:

6. Swivel the disc array to the transport position.
 - 6.1 Operate control unit *green*.

All types:

7. Switch off the AMATRON 3.

10.12 Emptying the hopper and/or dosing unit



DANGER

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



DANGER

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

10.12.1 Emptying the seed hopper

1. Open the slider (Fig. 184) and empty the seed into the calibration trough or a suitable hopper.



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

2. Empty the residual seed.



Fig. 184

10.12.2 Emptying the dosing unit

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



Fig. 185

The hopper should not be emptied:

2. Close the slider (Fig. 186/1).

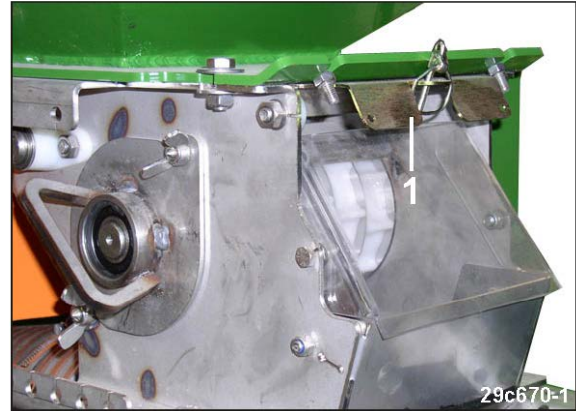


Fig. 186

2. Empty the hopper and dosing unit.
 - 2.1 Turn the handle (Fig. 187/1).
 - The residue emptying flap opens to allow emptying of the hopper and dosing unit.
3. Repeat the procedure on the second dosing unit (if fitted).

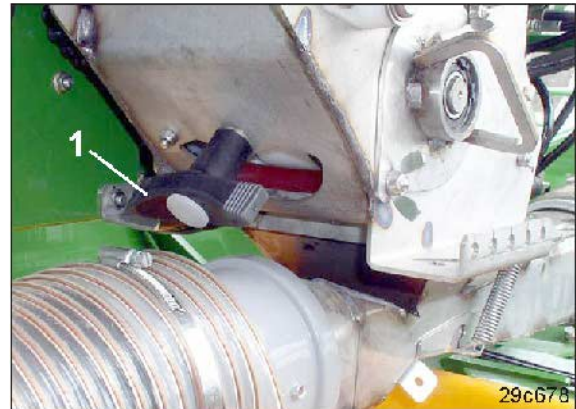


Fig. 187

3. Empty the injector sluice (Fig. 188/1).
 - 4.1 Open the injector sluice flap (Fig. 188/1).
 - Emptying the injector.
5. Repeat this procedure on the second injector sluice (if fitted).

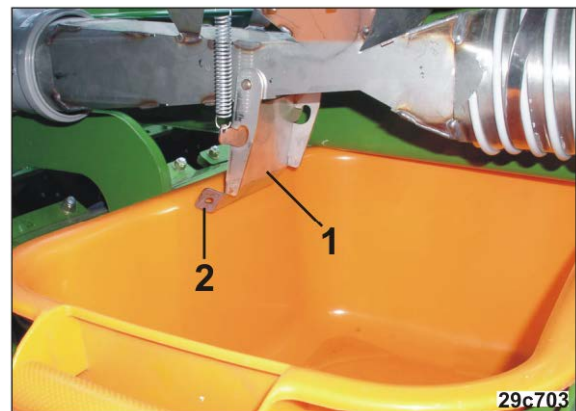


Fig. 188



CAUTION

Risk of contusions on opening and closing the injector sluice flap (Fig. 188/1)!

Hold the injector sluice flap only by the lug (Fig. 188/2), otherwise there is a danger of injury when the spring-loaded injector sluice flap snaps closed.

Never insert your hand between the injector sluice flap and the injector sluice!

6. Empty the dosing units and the dosing rollers completely.
 - 6.1 Run the electric motor briefly.
7. To completely clean the dosing unit, remove and refit the dosing

roller.

8. Open the slider(s) (Fig. 186/1) and secure (clip pin).
9. Close the residue emptying flap(s) (Fig. 187/1).
10. Close the injector sluice flap(s) (Fig. 188/1).
11. Secure the calibration trough(s) on the transport bracket.

11 Faults



WARNING

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

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

Secure the tractor and the machine against unintentional start-up and rolling before eliminating any faults on the machine.

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

11.1 Residual seed volume indicator

When volume drops below the residual seed volume, if the level sensor is correctly set, on the AMATRON 3 display a warning message (Fig. 189) appears with an acoustic signal.

The residual seed volume should be large enough to avoid fluctuations or gaps in the output rate.



29c214-GB

Fig. 189

11.2 Failure of the AMATRON 3 during work

If the Amatron ⁺ fails when work is in progress on the field, it will not be possible to continue the sowing operation. If it is not possible to eliminate the fault on-site, the machine can be folded in, moved into the road transport position and transported to the nearest workshop.

Transporting the machine to the nearest workshop after failure of the AMATRON 3



DANGER

- Actuate the tractor's control units only in the tractor cab.
- Before actuating the tractor's control units, direct any people out of the danger area.

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Take the two valve pins (Fig. 190/1) out of the valves and turn them through 45 degrees to lock.



Fig. 190



DANGER

- Only if the AMATRON 3 fails, fold the machine in emergency mode.
- After folding in the booms, check whether the locking hooks (Fig. 183/1) lock the booms.

3. Direct people out of the danger area.
4. Operate control unit *yellow*.
 - 4.1 Raise the machine fully by moving the integrated running gear out completely.
5. Press the manually operated valve 41
→ The coulter frame is lowered.
6. Operate control unit *green*.
 - 6.1 Fold in the machine.
7. Check whether the locking hooks (Fig. 167/1) lock the extension arm.
8. Put the machine in road transport position.
9. Go to the nearest repair workshop.



Fig. 191

**DANGER**

Go to the nearest repair workshop without delay.



After the repair, move both valve pins (Fig. 190/1) into their normal position.

11.3 Deviations between the preset and actual sowing rates

Possible causes that can lead to a deviation between the preset and actual sowing rates:

- In order to record the worked area and the required seed spread rate, the AMATRON 3 requires the radar impulses over a calibration distance of 100 m.

The field surfaces change during the work - for example, changing from dry, light ground to wet, heavy ground.

As a result, the calibration value "Imp./100 m" may change.

If there are differences between the preset and actual sowing rates, the calibration value "Imp./100 m" has to be re-determined by travelling a measured distance (see the AMATRON 3 operating manual).

- When seeding with moist dressed seeds, differences between the preset and actual sowing rates can come about, if there is a period of less than 1 week (2 weeks recommended) between the dressing and seeding.

- A defective or wrongly set dosing lip (Fig. 192/1) will cause dosing errors.

Set the dosing lip so that it is lying lightly up against the dosing roller (Fig. 192/2).

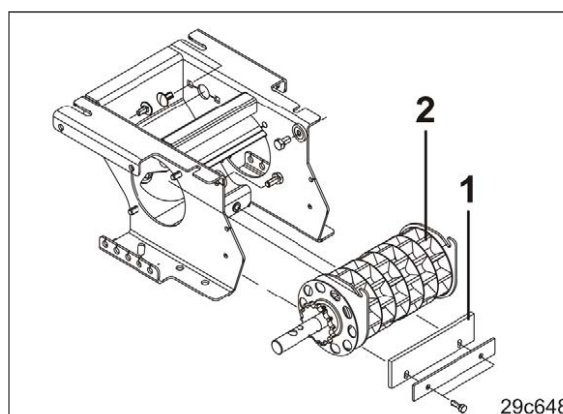


Fig. 192

11.4 Fault table

Fault	Possible cause	Remedy
Track marker not changing	Working position sensor defective	Replace the work position sensor
	Hydraulic valve jamming	Replace the hydraulic valve
Track marker switching too early or too late	Work position sensor wrongly set	Set the sensor
	Working position sensor defective	Replace the work position sensor
Tramline counter not working	Stop key actuated	Switch off the stop key
	Work position sensor wrongly set	Set the sensor
	Tramline rhythm wrong	Adjust tramline rhythm
	Working position sensor defective	Replace the work position sensor
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
Working position sensor not working	Working position sensor defective	Replace the working position sensor
Slide in the distributor head (tramlining control system) not functioning		Clean the distributor head
		Clean the control disc

12 Cleaning, maintenance and repairs



WARNING

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

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

Secure the tractor and machine to prevent unintentional starting and rolling away before performing any cleaning, servicing or maintenance work on the machine.



WARNING

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

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

12.1 Securing the connected machine

Before working on the machine, place the machine connected to the tractor on the sustainer (Fig. 193/1) to prevent unintentional lowering of the tractor's lower link.



Fig. 193

12.2 Securing the raised machine (workshop)



DANGER

Secure the machine raised above the integrated running gear with two spacers against unintended lowering before you work on the machine.

1. Direct people out of the danger area.
 2. Fold in the machine's extension arms.
 3. Remove the two spacers (Fig. 194/1) from the transport brackets.
- Each spacer is fixed with two bolts (Fig. 194/2), which are secured with linch pins.
4. Raise the machine fully by moving the integrated running gear out completely.



Fig. 194

5. Position the spacer (Fig. 195/1) on the extended piston rod of the hydraulic cylinder and secure the spacer with the previously released bolts (Fig. 195/2).
6. Secure the bolts with the previously released linch pins.
7. Repeat the procedure with the second spacer on the opposite side of the machine.
8. Fold out the machine extension arms and lower the machine completely.

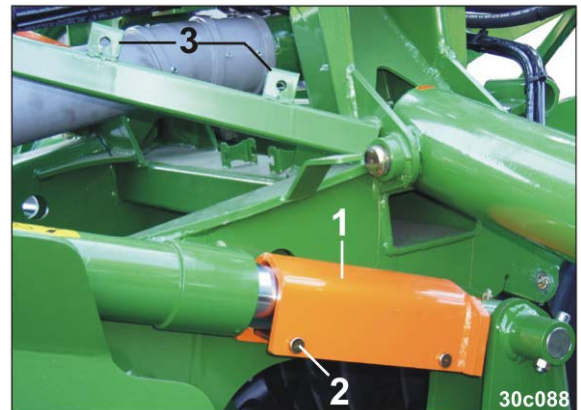


Fig. 195

After completion of the cleaning, maintenance and repair work

1. Remove both spacers (Fig. 195/1).
2. Lower the machine completely.
3. Fasten the spacers (see Fig. 194) to the transport mountings (Fig. 195/3).
4. Secure the bolts with the original linch pins.

12.3 Cleaning the machine



DANGER

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



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

Cleaning with a pressure cleaner / steam cleaner



Always observe the following points when using a high pressure cleaner / steam jet for cleaning:

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

Cleaning the machine:

1. To clean, always place the machine connected to the tractor on the sustainer (Fig. 112/1).
2. Fold the machine out and lower it fully by moving in the integrated running gear completely.
3. Empty the seed hopper and seed dosing unit.
4. Clean the distributor head.
5. Clean the machine with water or with a high-pressure cleaner.
6. If you raise the machine, secure the raised machine before you start the cleaning.

12.3.1 Cleaning the distributor head (workshop)

1. Fold out the machine's extension arm.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



WARNING

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

Before climbing on it, clean the path to the distributor head and the area of the distributor head (danger of slipping).

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

3. Slacken the winged nuts (Fig. 196/1) and remove the clean plastic flap (Fig. 196/2) 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. 196/A) with compressed air.
6. Install the plastic cap (Fig. 196/2).
7. Fix the plastic cap with winged nuts (Fig. 196/1).

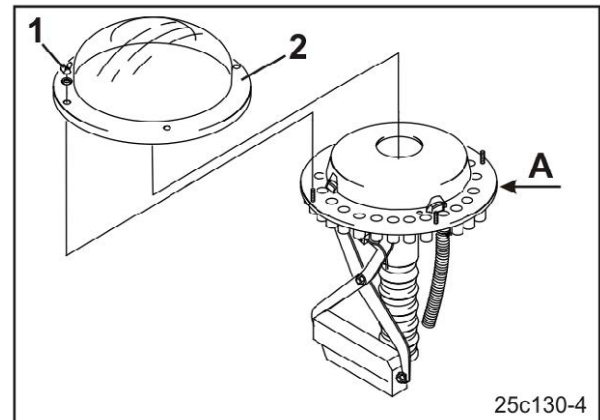


Fig. 196



Intensive cleaning requires the slides to be removed.

12.3.2 Shutdown of the machine over a long period of time

1. Do not raise the coulters, but set them down on a firm base.
2. Thoroughly clean and dry the coulter.
3. To prevent rust, conserve the sowing discs (Fig. 197) with an environmentally friendly anti-corrosion agent.



Fig. 197

12.4 Lubrication regulations



Lubricate the machine in accordance with the specifications of the manufacturer.

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

The lubrication points on the machine are marked with a foil sticker (Fig. 198).

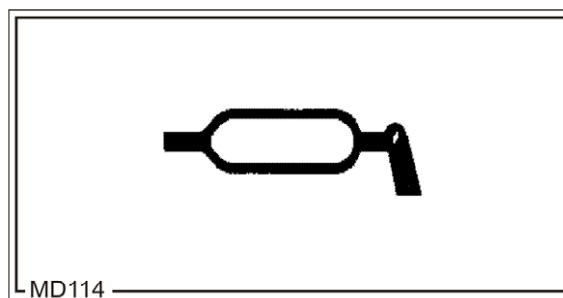


Fig. 198

12.4.1 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	Retinax A

12.4.2 Lubrication point overview

	Number of lubrication nipples			Lubrication interval
	Cirrus 3002	Cirrus 4002	Cirrus 6002	
Fig. 200/1	1	1	1	25 h
Fig. 200/2	1	1	1	25 h
Fig. 201/1	2	2	2	25 h
Fig. 201/2	2	2	2	25 h
Fig. 202/1	—	2	2	25 h
Fig. 203/1	—	2 ¹⁾	4 ¹⁾	25 h
Fig. 203/2	—	2 ¹⁾	4 ¹⁾	25 h
Fig. 203/3	—	4 ¹⁾	4 ¹⁾	25 h
Fig. 204/1	2	2 ¹⁾	2 ¹⁾	25 h
Fig. 204/2	2	2 ¹⁾	2 ¹⁾	25 h
Fig. 204/3	2	2 ¹⁾	2 ¹⁾	25 h
Fig. 204/4	2	2 ¹⁾	2 ¹⁾	— ²⁾
Fig. 204/5	2	2 ¹⁾	2 ¹⁾	— ²⁾
Fig. 204/6	—	2 ¹⁾	2 ¹⁾	25 h
¹⁾ Lubricate only with folded in, raised and secured machine (see section 0). ²⁾ regular lubrication not necessary.				

Fig. 199

12.4.2.1 Lubricating the lubrication nipples when the machine is folded out and lowered

1. Fold the machine extension arms out.
2. Lower the machine by moving in the integrated running gear completely.
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. For lubrication intervals, refer to the table (Fig. 199).



Fig. 200

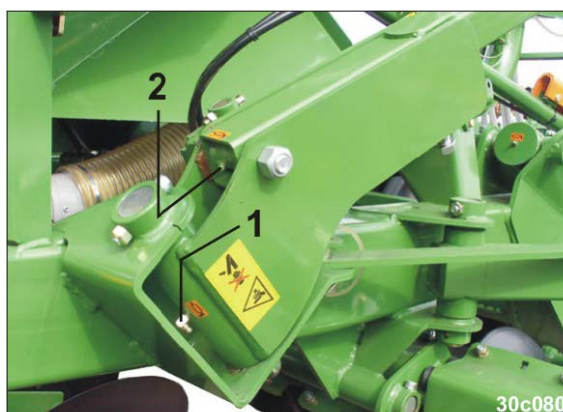


Fig. 201



Fig. 202

12.4.2.2 Lubricating the lubrication nipples when the machine is folded out and lowered

1. Fold the machine extension arm in.
2. Raise the machine by moving the integrated running gear out completely.
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. Secure the raised machine.
5. For lubrication intervals, refer to the table (Fig. 199).

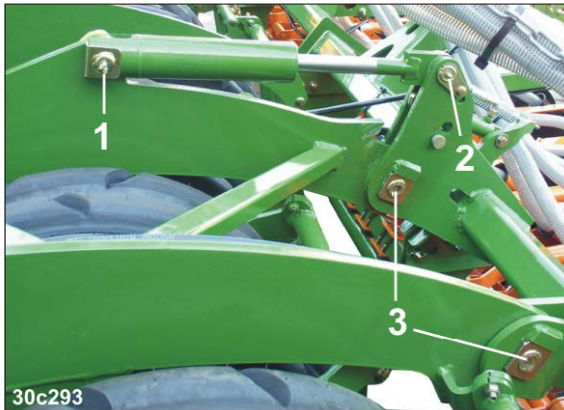


Fig. 203

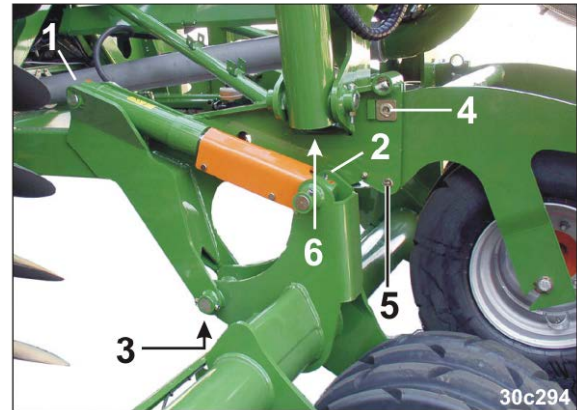


Fig. 204

12.5 Service plan – overview



Carry out maintenance work when the first interval is reached.

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

Before initial operation	Specialist workshop	Checking and service the hydraulic hose lines. Recording of the inspection by the operator.	Section 12.5.5
After the first 10 operating hours	Specialist workshop	Retighten wheel and hub screws (workshop)	Section 12.5.1
	Specialist workshop	Checking and service the hydraulic hose lines. Recording of the inspection by the operator.	Section 12.5.5
Daily before starting work		Draining the compressed air tank of the dual-circuit magnetic braking system	Section 12.5.7.1
When the seed hopper is filled or hourly		Check the seed placement	
		Checking the seed hoses for contamination	
		Checking the seed dosing unit for impurities, clean if necessary.	
During work		Checking distributor heads for impurities, clean if necessary	
Daily at the end of work		Emptying seed dosing unit	
		Clean the machine as required	
Every week, at the latest every 50 operating hours	Specialist workshop	Checking and servicing the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.5.5
		Checking the brake fluid level	Section 12.5.8.1

Before the season, then every 2 weeks	Specialist workshop	Checking tyre pressure (workshop)	Section 12.5.3
Every 3 months, at the latest every 500 operating hours	Specialist workshop	Checking the brake lining thickness (specialist workshop)	Section 12.5.8.4
		External testing of the compressed air tank of the dual-circuit pneumatic braking system	Section 12.5.7.2
	Specialist workshop	Checking the pressure in the compressed air tank of the dual-circuit pneumatic braking system (workshop)	Section 12.5.7.3
	Specialist workshop	Leak test of the dual-circuit pneumatic braking system (workshop)	Section 12.5.7.4
	Specialist workshop	Cleaning the line filter of the dual-circuit pneumatic braking system (workshop)	Section 12.5.7.5
Every 6 months before the season	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.5.5
	Specialist workshop	Checking the brake lining thickness (specialist workshop)	Section 12.5.8.4
Every 6 months after the season		Servicing roller chains and chain wheels	Section 12.5.4
		Servicing sowing shaft bearing	Section 12.5.2
Every 12 months	Specialist workshop	Checking the service brake system for safe operating condition (specialist workshop)	Section 12.5.6.1
	Specialist workshop	Brake check on the hydraulic part of the braking system (specialist workshop)	Section 12.5.8.3
Every 2 years	Specialist workshop	Changing the brake fluid (workshop)	Section 12.5.8.2

12.5.1 Retighten wheel and hub screws (workshop)

Tighten the wheel and hub screws and check tightening torques (see table Fig. 205).

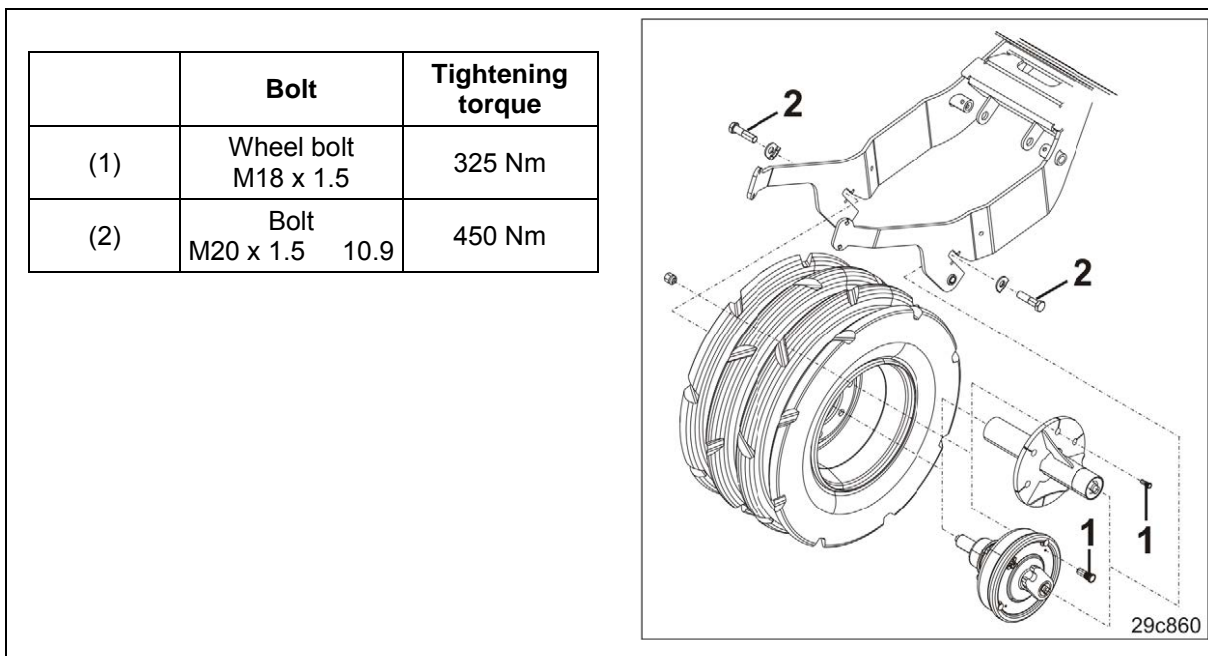


Fig. 205

12.5.2 Servicing sowing shaft bearing

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

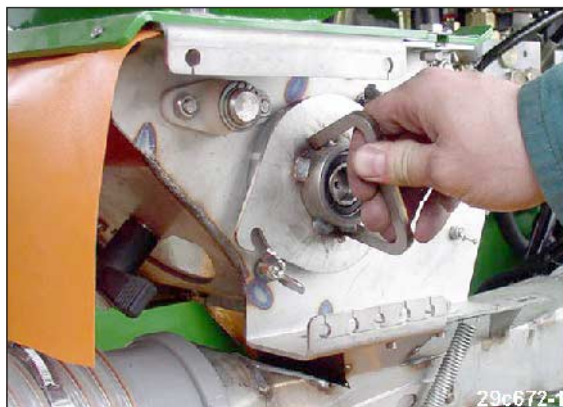


Fig. 206

12.5.3 Checking tyre pressure (workshop)

Check compliance with specified tyre pressure (see table Fig. 207).



Adhere to the inspection intervals (see section "Service plan – overview, Seite 184).
Insufficient pressure overloads the tyres and leads to failure.

Tyres	Tyre rated pressure
400/55-15.5 10 PR	3.5 bar
400/55-15.5 139A8	4.3 bar



For new tyres, the initial filling pressure is 0.3 bar above the tyre rated pressure.



Fig. 207



The running gear (Fig. 208/1) can be equipped with tyres filled with polyurethane (option) and need not be checked with regard to pressure. On account of their heavy weight, tyres filled with polyurethane must only be used on the running gear (Fig. 208/1).

The roller wheels (Fig. 208/2) can be subsequently fitted with a hose (see online spare parts list). Follow the manufacturer's installation instructions!

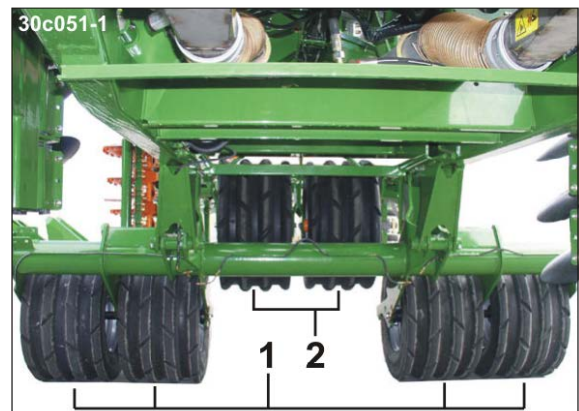


Fig. 208

12.5.4 Servicing roller chains and chain wheels

After the season make sure all roller chains are:

- (including the chain wheels and chain tensioner)
- check the condition
- lubricate with low-viscosity mineral oil (SAE30 or SAE40).

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

12.5.5.1 Labelling hydraulic hose lines

The assembly labelling provides the following information:

Fig. 209/...

- (1) Manufacturer's marking on the hydraulic hose line (A1HF)
- (2) Date of manufacture of the hydraulic hose line (11/02 = Year / Month = February 2011)
- (3) Maximum approved operating pressure (210 BAR).

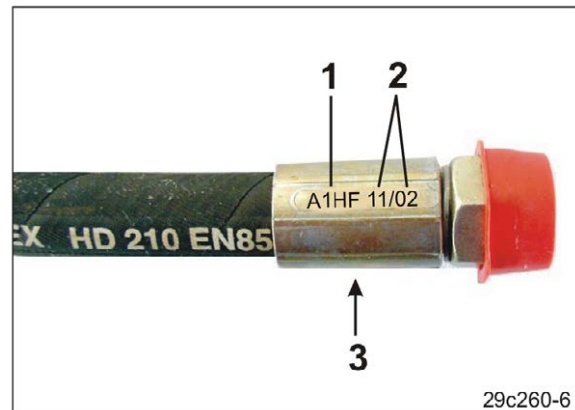


Fig. 209

12.5.5.2 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.

12.5.5.3 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 "2011", then the hose should not be used beyond February 2017. See also "Labelling of hydraulic hose lines".

12.5.5.4 Installation and removal of hydraulic hose lines



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

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

12.5.6 Service brake system: dual-circuit pneumatic braking system - hydraulic braking system

The Cirrus is equipped with a dual-circuit pneumatic braking system with a hydraulically actuated brake cylinder.

The dual-circuit pneumatic braking system does not actuate as normally a rod or brake cable connected to the brake shoe.

The dual-circuit pneumatic braking system acts on a hydraulic cylinder, which actuates the hydraulic brake cylinder of the brake shoes in the brake drum.



WARNING

The service brake system does not have a parking brake!

Always use wheel chocks before uncoupling the machine from the tractor.



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.



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.



DANGER

- **Only specialist workshops or recognised brake services may perform adjustment and repair work on the brake system.**
- **Have the brake system checked regularly.**
- **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", Seite 31.**

General visual check

Carry out a general visual check of the brake system. Observe and check 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
 - Must be properly run.
 - May not have any visible cracks.
 - May not be knotted.
- Check the piston stroke on the brake cylinders, and adjust as necessary.

12.5.6.1 Checking the service brake system for safe operating condition (specialist workshop)

Have the safe operating condition of the service brake system checked in a specialist workshop.

Piping, hose lines and hose couplings must not be externally damaged or rusted.



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.

12.5.7 Dual-circuit pneumatic braking system

12.5.7.1 Draining the compressed air tank of the dual-circuit magnetic braking system

1. Run the tractor engine (approx. 3 mins.), until the compressed air reservoir (Fig. 210/1) has filled.
2. Switch off the tractor engine, apply the tractor parking brake and remove the ignition key.
3. Pull the drain valve (Fig. 210/2) in a sideways direction by the ring until no more water escapes from the compressed air reservoir.
4. If the escaping water is dirty, let off air, unscrew the drainage valve from the compressed air reservoir and clean the compressed air reservoir.
5. Fit the drainage valve and check the compressed air reservoir for seal tightness.

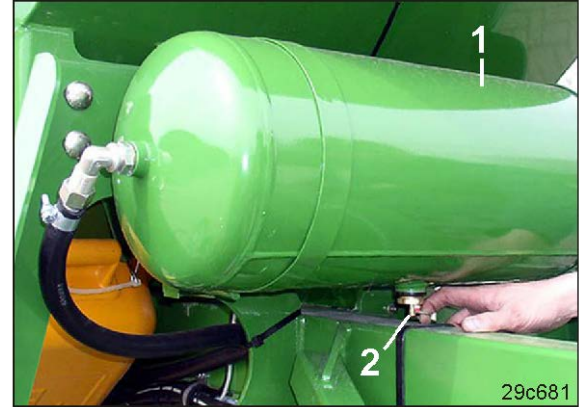


Fig. 210

12.5.7.2 External testing of the compressed air tank of the dual-circuit pneumatic braking system

External testing of the compressed air reservoir (Fig. 211/1).

If the compressed air reservoir moves in the tensioning bands (Fig. 211/2)

→ tension or replace the compressed air reservoir

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

→ replace the compressed air reservoir.

If the type plate (Fig. 211/3) is rusty, loose or the type plate is missing from the compressed air reservoir

→ replace the compressed air reservoir.

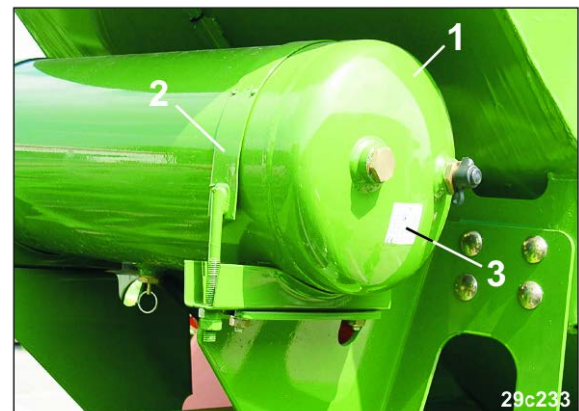


Fig. 211



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

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

1. Connect a pressure gauge to the test connection on the compressed air reservoir.
2. Run the tractor engine (approx. 3 mins.) until the compressed air reservoir 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.

12.5.7.4 Leak test of the dual-circuit pneumatic braking system (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 applies as being 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
- braking system replaced at a specialist workshop.

12.5.7.5 Cleaning the line filter of the dual-circuit pneumatic braking system (workshop)

The dual-circuit pneumatic braking system is equipped with two line filters (Fig. 212/1). Clean both line filters as described above.

To clean the line filters

1. Press the two lugs (Fig. 212/2) 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 re-assembling in the reverse order, ensure that the O-ring does not jam in the guide slot.

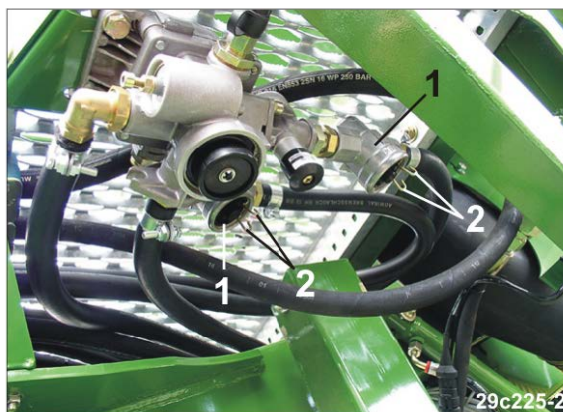


Fig. 212

12.5.8 Hydraulic braking system

12.5.8.1 Checking the brake fluid level

The equalising tank (Fig. 213) is filled in accordance with DOT 4 up to the "max." marking with brake fluid.

The brake fluid must be between the marks "max." and "min.".



If any brake fluid is lost, visit a specialist workshop!



Fig. 213

12.5.8.2 Changing the brake fluid (workshop)

If possible, change the brake fluid after the winter.



WARNING

Under no circumstances may drained brake fluid be reused.

Under no circumstances may drained brake fluid be poured away or put in the household waste, but must be collected separately from used oil and disposed of via authorised waste disposal companies.

When handling brake fluid observe the following:

- Brake fluid is corrosive and must therefore not come into contact with the paint on the machine. If necessary, wipe it off immediately and wash it off with plenty of water.
- Brake fluid is hygroscopic, i.e. it absorbs moisture from the air. Therefore store the brake fluid only in closed containers.
- Brake fluid that has already been used in the braking system must not be reused. Even when venting the braking system, use only new brake fluid.
- The requirements made of brake fluid are subject to the standard SAE J 1703 or the American safety statutes DOT 3 and DOT 4. Use only brake fluids in compliance with DOT 4.
- Brake fluid must never come into contact with mineral oil. Even small traces of mineral oil will render brake fluid unusable or cause a failure of the braking system. Plugs and collars on the braking system will be damaged, if they come into contact with agents that contain mineral oil. For cleaning purposes do not use any wiping cloths that contain mineral oils.

12.5.8.3 Brake check on the hydraulic part of the braking system (specialist workshop)

Brake check on the hydraulic part of the braking system:

- check all flexible brake hoses for wear
- check all brake lines for damage
- check all screw unions for seal tightness
- renew any worn or damaged parts.

12.5.8.4 Checking the brake lining thickness (specialist workshop)

The brake lining wear must be checked every 500 operating hours, at the latest before the start of the season.

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

Renew the brake shoes at a residual lining thickness of less than 1.5 mm (use only genuine brake shoes with type-tested brake linings). When doing so the shoe return springs may have to be renewed.

12.5.8.5 Venting the hydraulic braking system (workshop)

After each brake repair, for which the system has been opened, vent the brake system, because air may have entered the pressure lines.

At specialist workshops the brake is vented with a brake filling and venting device:

1. Remove the equalising tank screw union.
2. Fill the equalising tank up to the top edge.
3. Fit the venting muff to the equalising tank.
4. Connect the filling hose.
5. Open the stop valve of the filling union piece.
6. Vent the main cylinder.
7. Via the system's venting screws remove brake fluid until it flows out clear and bubble-free. To do so, the transparent venting hose, which leads to a collecting cylinder one-third filled with brake fluid, is pushed onto the venting valve to be vented.
8. After venting the complete brake system close the stop valve on the filling union piece.
9. Relieve the residual pressure coming from the filling device.
10. Close the last venting valve when the residual pressure coming from the filling device has dropped and the brake fluid level in the equalising tank has reached the "MAX" mark.
11. Remove the filling union piece.
12. Close the equalising tank.



Carefully open the venting valves so that they are not turned off. It is recommended that the valves be sprayed with a rust releasing agent for approx. 2 hours before venting.



Perform a safety check:

- Are the venting screws tightened?
- Has sufficient brake fluid been filled?
- Check all connections for seal-tightness.



After each brake repair apply the brakes on a road with little traffic. When doing this at least one emergency braking application must be performed.

Caution: when you do this pay attention to any traffic behind you!

12.6 Workshop settings and repair work

12.6.1 Adjusting the wheelmark spacing / 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.

12.6.1.1 Adjusting the wheelmark spacing of the cultivating tractor (specialist workshop)

When the machine is delivered or when buying a new tractor, check that the tramline is set to the wheel mark spacing (Fig. 214/a) of the tractor.

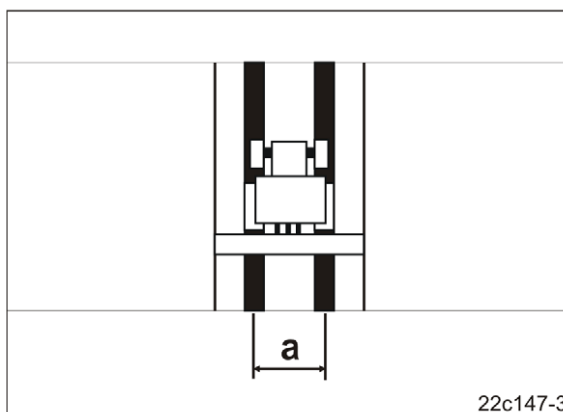


Fig. 214

The seed line tubes (Fig. 215/1) of the tramline coulters must be fixed to the distributor head openings, which can be closed by the sliders (Fig. 215/2).
If necessary, interchange the seed line tubes.

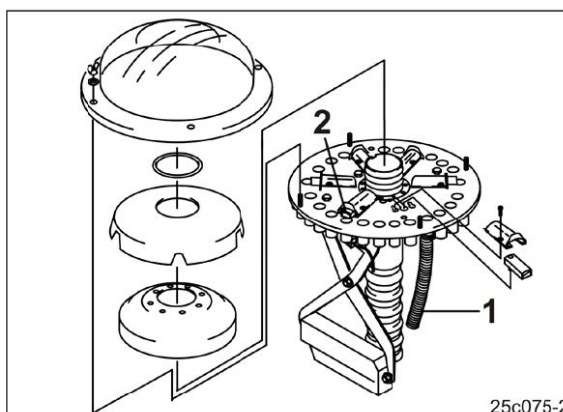


Fig. 215



Set the track discs of the tramline marker (if present) to the new track.

12.6.1.2 Adjusting the track width of the cultivating tractor (specialist workshop)

When the machine is delivered or when buying a new tractor, check that the tramline is set to the track width (Fig. 216/a) of the tractor.

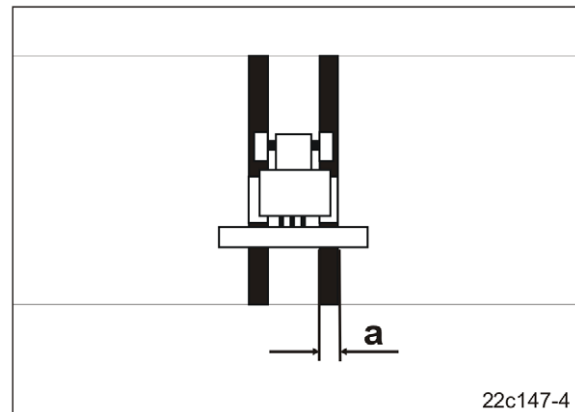


Fig. 216

The track changes with the number of coulters not outputting seed when the tramlines are created.

To create two tracks, in the distributor head it is possible to close the sliders (Fig. 215/2):

- for machines, Cirrus 3002/4002-2 up to 3 openings
- for machines, Cirrus 6002 up to 6 openings

Deactivate any non-required sliders (Fig. 215/2). Deactivated sliders do not close the feed lines to the tramline coulters.

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

Activating or deactivating sliders

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Set the tramline counter in the AMATRON 3 to "0" as for creating tramlines.
3. Switch off the AMATRON 3.
4. Remove the outer distributor cover (Fig. 217/1).
5. Remove the ring (Fig. 217/2).
6. Remove the inner distributor cover (Fig. 217/3).
7. Remove the foam insert (Fig. 217/4).
8. Slacken the screws (Fig. 218/1).
9. Remove the slider tunnel (Fig. 218/2).

Activating the sliders:

10. The slider (Fig. 218/3) is in the guide, as shown in the diagram.

Deactivating the sliders:

11. Turn the sliders around (Fig. 218/3) and push them into the drill hole (Fig. 218/4).
12. Screw the slider tunnel (Fig. 218/2) onto the base plate.

13. Install the foam insert (Fig. 219/1).
14. Install the inner distributor cover (Fig. 219/2).
15. Install the ring (Fig. 219/3).
16. Install the outer distributor cover (Fig. 219/4).
17. Check the function of the tramline circuit.

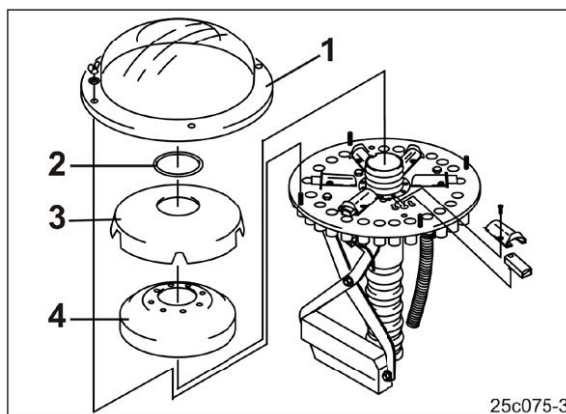


Fig. 217

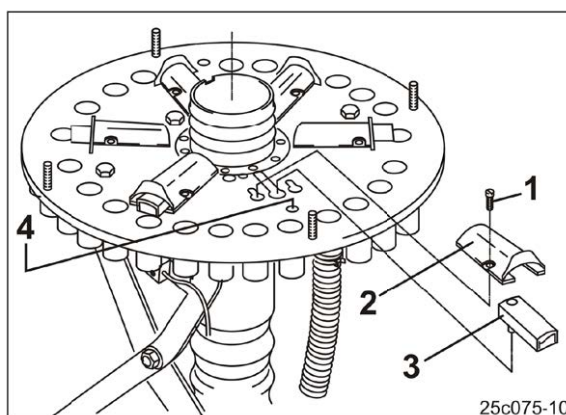


Fig. 218

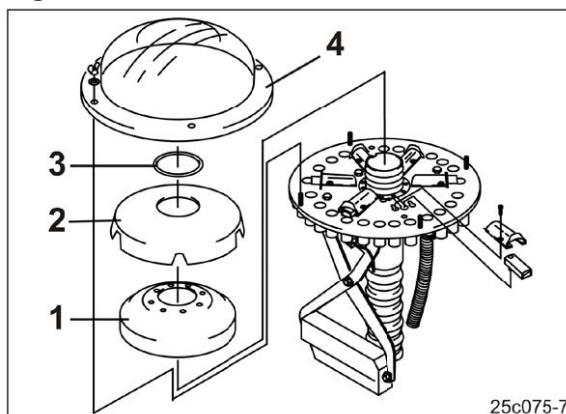


Fig. 219

12.6.2 10 operational hours after a wheel change (workshop)

Retighten wheel and hub screws (workshop), see section 12.5.1.

12.6.3 After brake repairs (workshop)

Venting the hydraulic braking system (workshop), see section 12.5.8.5.

12.6.4 Setting the track marker for correct fitting in the transport bracket (workshop)

When the track marker is folded in, the roller (Fig. 220/1) runs on the raceway (Fig. 220/2) into the mounting.

To set the track marker:

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Release the lock nut.
3. Adjust the screw (Fig. 220/3) until the roller (Fig. 220/1) of the track marker is running properly over the raceway (Fig. 220/2) into the mounting.
4. Tighten the lock nut.



Fig. 220



DANGER

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key before working on the track marker.

12.6.5 Repairs to the pressure tank (workshop)

Functional description of the pressure tank

For re-compaction of the soil the tapered ring tyres are subjected to the weight of the machine.

Part of the machine's weight is transmitted via the folding cylinders to the tapered ring tyres. As the hydraulic fluid is almost non-compressible, the pressure does not remain constant even when the folding cylinders are shut off, i.e. when the oil is cooling down. The folding cylinders retract by several millimetres. In order to compensate for the volume loss, during the folding out procedure oil is stored at a pressure of approx. 100 bar in a pressure tank filled with nitrogen (Fig. 221/1).

In the event of a repair observe the following:

The hydraulic system and the pressure tank connected to it (Fig. 221/1) are under a constant high pressure (approx. 100 bar).

Release of the hydraulic hose lines or the unscrewing or opening of the pressure tank in the event of a repair may be performed only in a specialist workshop with suitable auxiliary means.

For all work on the pressure tank and the hydraulic system connected to it observe the standard EN 982 (safety requirements for fluid systems).



Fig. 221



DANGER

The hydraulic system and the pressure tank connected to it are under a constant high pressure (approx. 100 bar).

12.6.6 Checking lock nut tightening torque after repairs to the machine extension arm (workshop)

Retighten the lock nuts (Fig. 222/1) and check tightening torques (see table Fig. 222).

	Lock nut (1)	Tightening torque
Cirrus 4002 Cirrus 6002	M 27 x 2	150 Nm




Fig. 222

12.6.7 Replacing the RoTeC coulter wear tip (workshop)

1. Remove the plastic disc (Fig. 223/1).
2. Release the cylinder screw (Fig. 223/2) (screw tightening torque 30-35 Nm).
3. Replace the wear tip (Fig. 223/3) and install in reverse sequence.



The wear tip (Fig. 223/3) must not project beyond the edge of the sowing disc (Fig. 223/4). If necessary, replace the sowing disc.

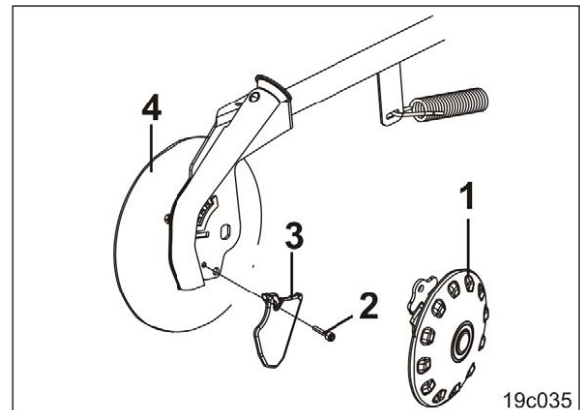


Fig. 223

12.7 Lower link pin



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 draw bar, if there are any clear signs of wear to the lower link pin.

12.8 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



For the tightening torques of the wheel and hub bolts, see section Retighten wheel and hub screws, Seite 186.

13 Hydraulic system diagrams

13.1 Hydraulic system diagram of the Cirrus 3002 Special

Fig. 224/...	Designation
T2	Pre-emergence marker
T5	Harrow pressure
T6	Coulter pressure
T9a	Running gear, left
T9b	Running gear, right
T10	Working position sensor
T11a	Track marker left
T11b	Track marker right
T12	Disc array adjustment
T14	Blower
T15	1 yellow
T16	2 yellow
T17	1 red
T18	2 red
T19	1 green
T20	2 green
T30	Tractor

All position specifications in direction of travel

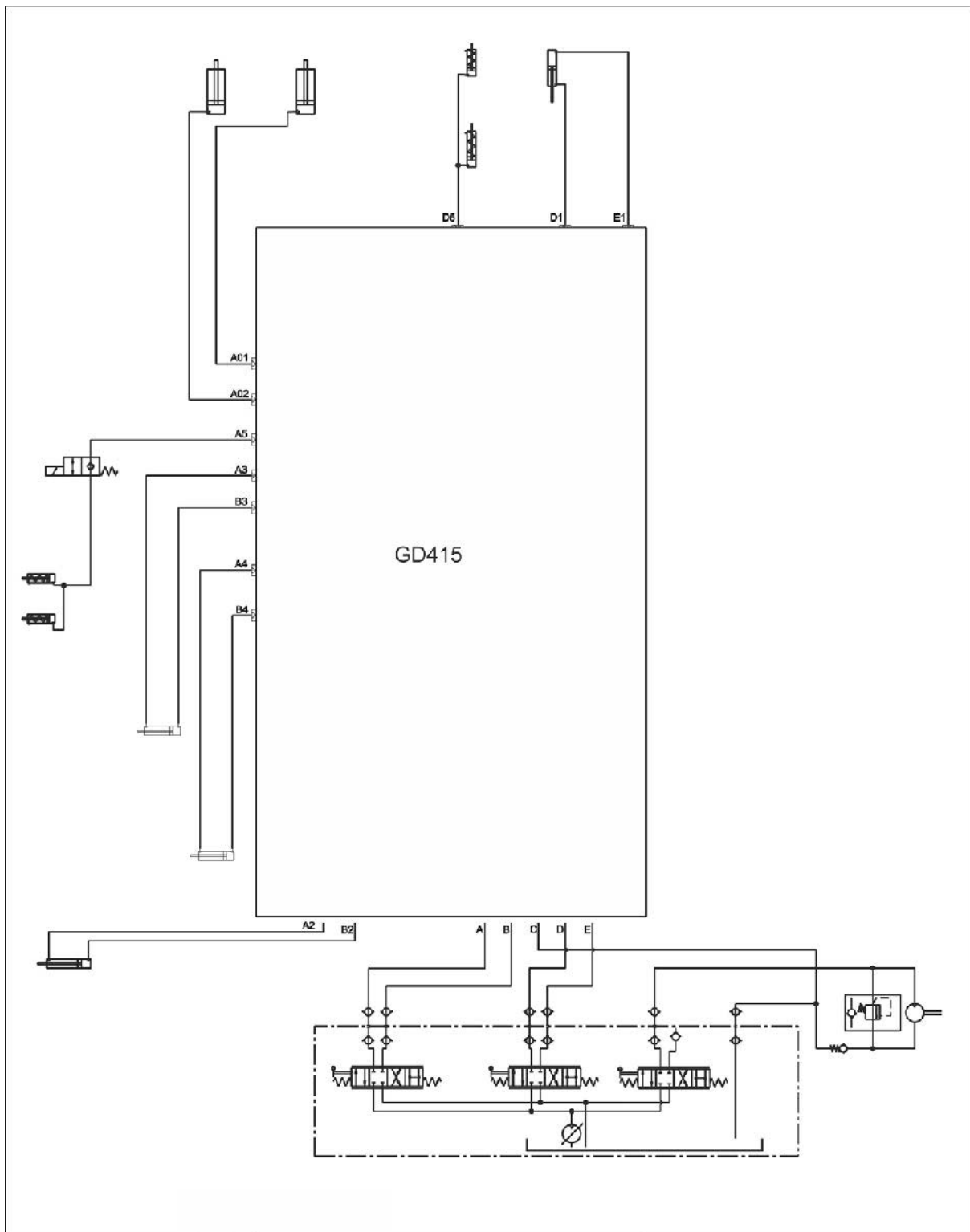


Fig. 224

13.2 Hydraulic system diagram of the Cirrus 4002 / 6002

Fig. 225/...	Designation
T1a	Coulter lift-out left
T1b	Coulter lift-out right
T2	Pre-emergence marker
T4a	Harrow pressure adjustment, left
T4b	Harrow pressure adjustment, right
T5a	Coulter pressure adjustment, left
T5b	Coulter pressure adjustment, right
T6a	Folding cylinder, rear left
T6b	Folding cylinder, rear right
T7	Folding frame securing device
T8a	Folding cylinder, front left
T8b	Folding cylinder, front right
T9a	Running gear, left
T9b	Running gear, right
T10	Working position sensor
T11a	Track marker left
T11b	Track marker right
T12	Disc array adjustment
T14	Blower
T15	1 yellow
T16	2 yellow
T17	1 red
T18	2 red
T19	1 green
T20	2 green
T22a	Coulter frame safety catch, left
T22b	Coulter frame safety catch, right
T30	Tractor

All position specifications in direction of travel

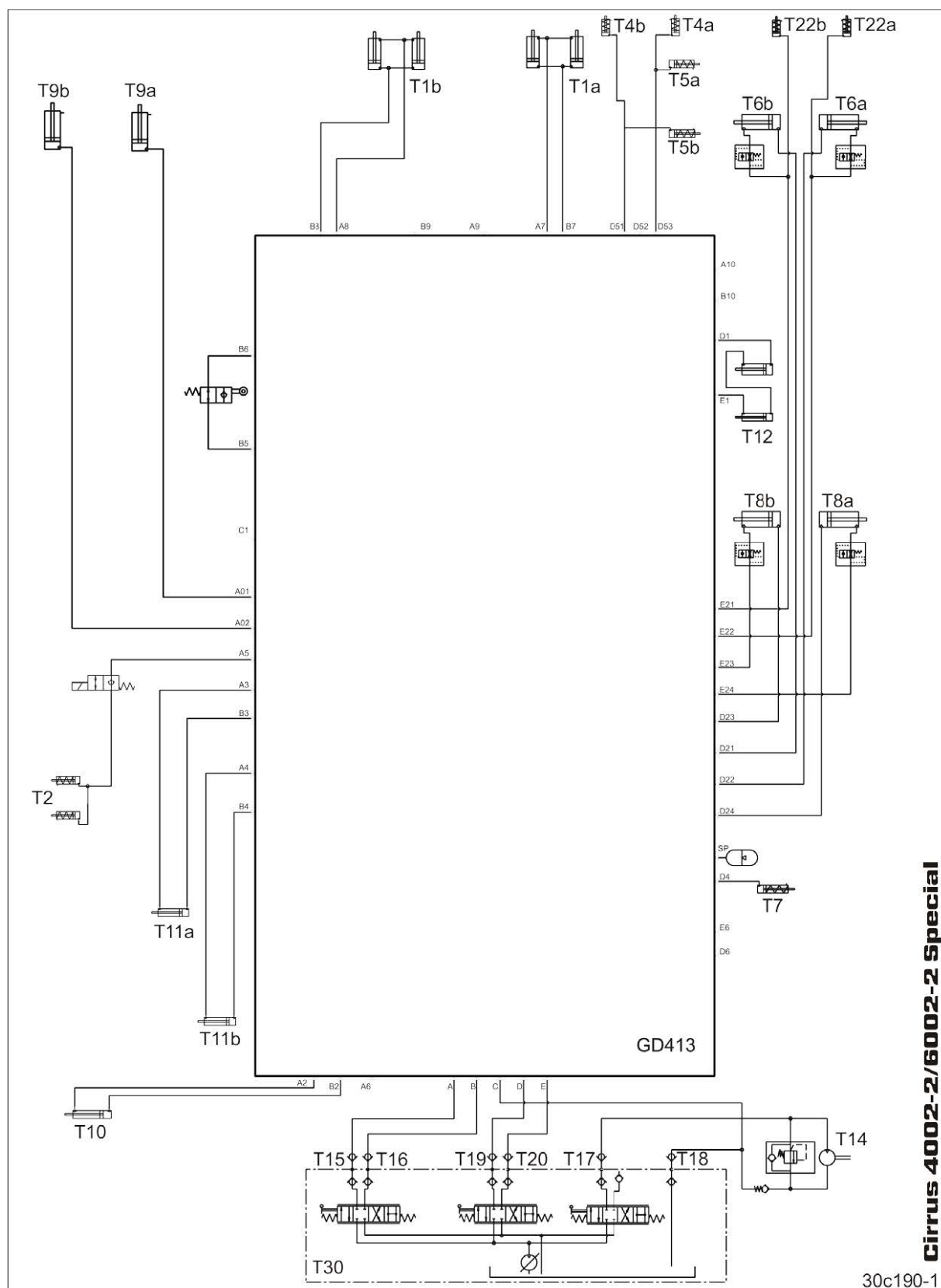


Fig. 225



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