

Operating Manual

AMAZONE

Top-mounted seed drills

AD - 253 Special AD - 303 Special

AD - 303 Super AD - 353 Super

AD - 403 Super



MG3908
BAH0008-5 09.10



Please read this operating
manual before first
commissioning.
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: AD03

Year of manufacture: _____

Basic weight (kg): _____

Approved total weight (kg): _____

Maximum load (kg): _____

Manufacturer's address

AMAZONEN-WERKE
H. DREYER GmbH & Co. KG
Postfach 51
D-49202 Hasbergen
Tel.: + 49 (0)5405 501-0
Fax: + 49 (0)5405 501-234
E-mail: amazone@amazone.de

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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Compilation date: 09.10

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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.

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen

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

Fax: + 49 (0)5405 501-234

E-mail: amazone@amazone.de

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1 User Information

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

1.1 Purpose of the document

This operating manual

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

1.2 Locations in the operating manual

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

1.3 Diagrams used

Handling instructions and reactions

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

1. Handling instruction 1
→ 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" on page 17 of this operating manual and to follow the safety instructions of the warning symbols when operating the machine.
- To get to know the machine.
- To read the sections of this operating manual, important for carrying out your work.

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

Risks in handling the machine

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

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

Only use the machine

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

Eliminate any faults immediately, which could impair safety.

Guarantee and liability

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

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

2.2 Representation of safety symbols

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

**DANGER**

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

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

**WARNING**

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

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

**CAUTION**

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

**IMPORTANT**

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

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

**NOTE**

Indicates handling tips and particularly useful information.

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

2.3 Organisational measures

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

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



The operation manual

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

Check all the available safety equipment regularly.

2.4 Safety and protection equipment

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

Faulty safety equipment

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

2.5 Informal safety measures

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

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

2.6 User training

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

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

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

Legend: X..permitted --..not permitted

- ¹⁾ A person who can assume a specific task and who can carry out this task for an appropriately qualified company.
- ²⁾ A person shall be considered as having been instructed, if they have been instructed in the tasks they have to carry out and in the possible risks in the case of improper behaviour and also have been informed about the necessary protective equipment and measures.
- ³⁾ People with specialist technical training shall be considered as a specialist. Due to their specialist training and their knowledge of the appropriate regulations, they can evaluate the work with which they have been charged and detect possible dangers.

Comment:

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



Only a specialist workshop may carry out maintenance and repair work on the machine, if 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 appropriate 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 non-compliance with the danger protection instructions.

For example: causes serious injuries to fingers or hands.

3. Instructions for avoiding the danger.

For example: only touch machine parts when they have come to a complete standstill.

Order number and explanation

Warning pictograms

MD 076

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

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

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

- as long as the tractor engine is running with the cardan shaft connected / hydraulic drive engaged
- or the ground wheel drive is moving.



MD 078

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

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

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



MD 082

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

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

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

Ensure that no-one rides with the machine.

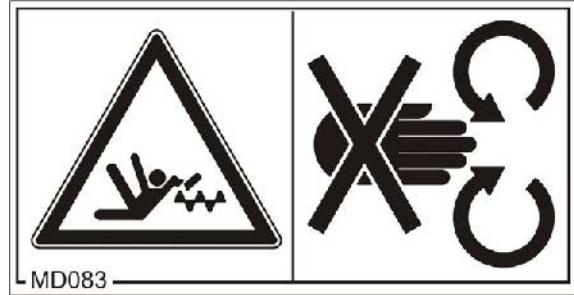


MD 083

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

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

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



MD 084

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

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

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

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



MD 089

Danger

Risk of crushing of whole body in the danger area of suspended loads/machine parts

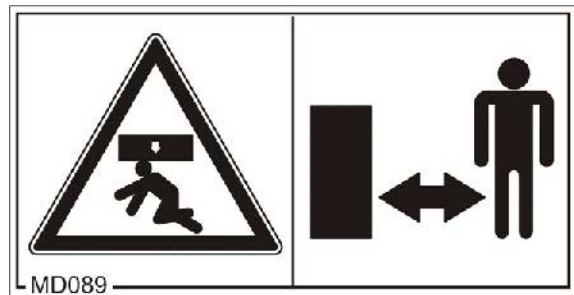
This danger will cause serious injuries anywhere on the body or death.

The presence of persons under suspended loads/machine parts is prohibited.

Maintain a sufficient safety clearance between you and any suspended loads/machine parts.

Ensure that all personnel maintain a sufficient safety clearance from suspended loads/machine parts.

Direct persons out of the danger area of suspended loads/machine parts.



General Safety Instructions

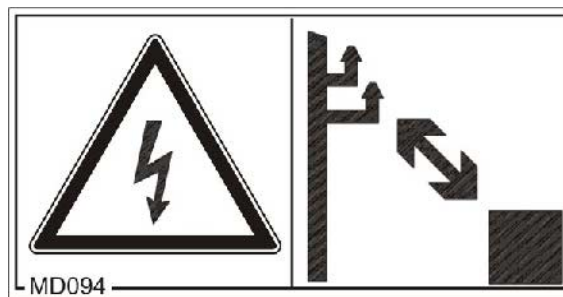
MD 094

Electrical hazard!

Will cause serious injuries anywhere on the body or death.

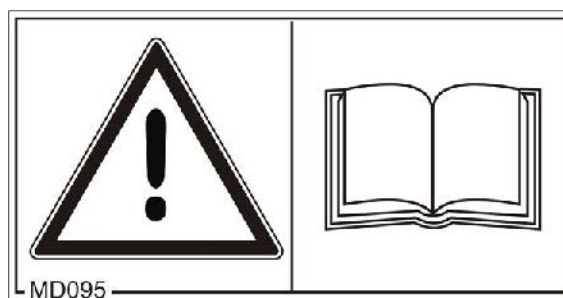
Maintain a sufficient distance from electrical overhead cables when swinging any parts of the machine in and out.

The minimum safety distance of 5.0 m to a 220 to 380 volt overhead cable must always be ensured.



MD 095

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



MD 096

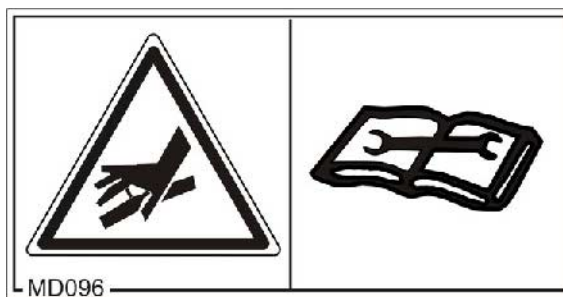
Danger of infection to the whole body from liquids escaping at a high pressure (hydraulic fluid)!

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

Never attempt to plug leaks in hydraulic 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.



MD 097

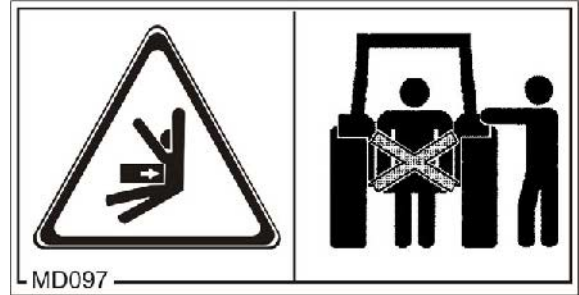
Danger of crushing your torso in the stroke range of the three-point suspension due to the narrowing spaces when the three-point hydraulic system is actuated!

This danger causes extremely serious injuries and even death.

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

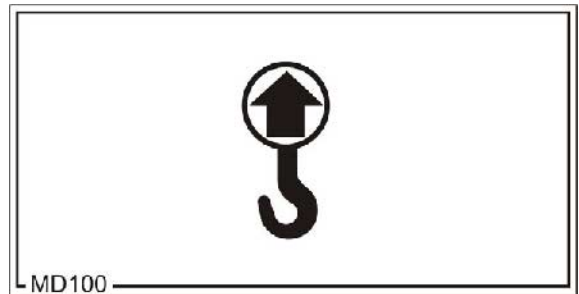
Only actuate the operator controls for the tractor's three-point hydraulic system

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



MD 100

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



MD 102

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

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

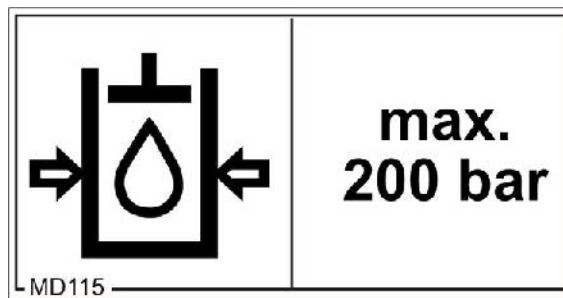
- Secure the tractor and the machine against unintentional start-up and rolling before any intervention in the machine.
- Depending on the type of intervention, read and understand the information in the appropriate sections of the operating manual.



General Safety Instructions

MD 115

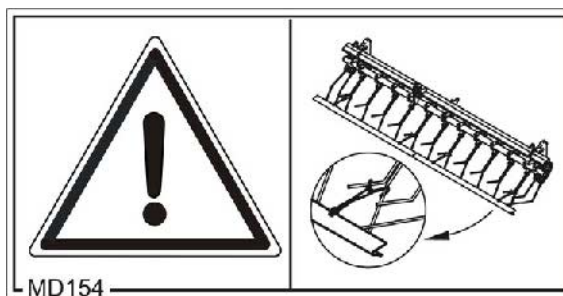
The maximum operating pressure of the hydraulic system is 200 bars.



MD 154

During transportation, risk of stabbing injuries to other road users from uncovered, sharp spring tines of the exact harrow pointing backwards!

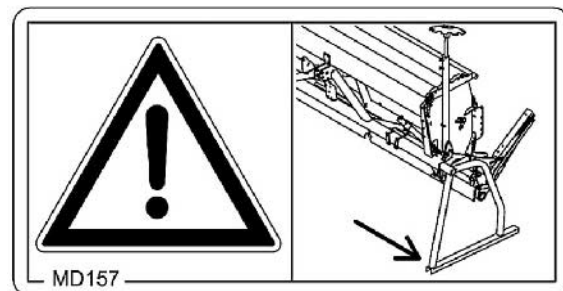
Transportation without a correctly fitted transport guard rail is forbidden.



MD 157

The stability of the machine is guaranteed only if the empty machine is supported on the parking supports.

Always set the empty machine down so that it is stable, on a horizontal parking area with a firm base.



2.13.1 Positioning of warning pictograms and other labels

Warning pictograms

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

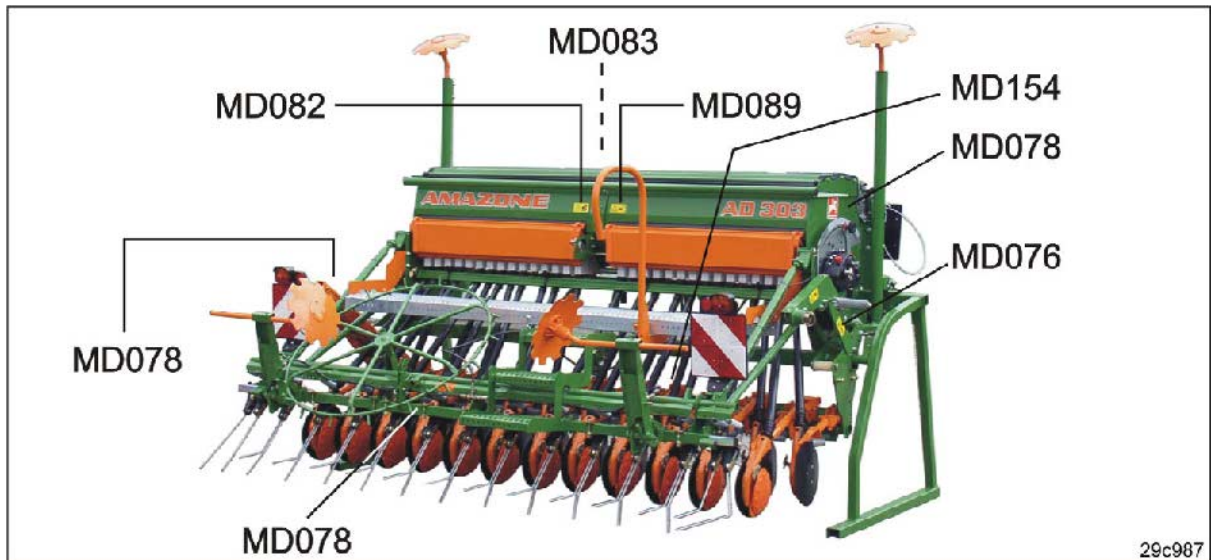


Fig. 1

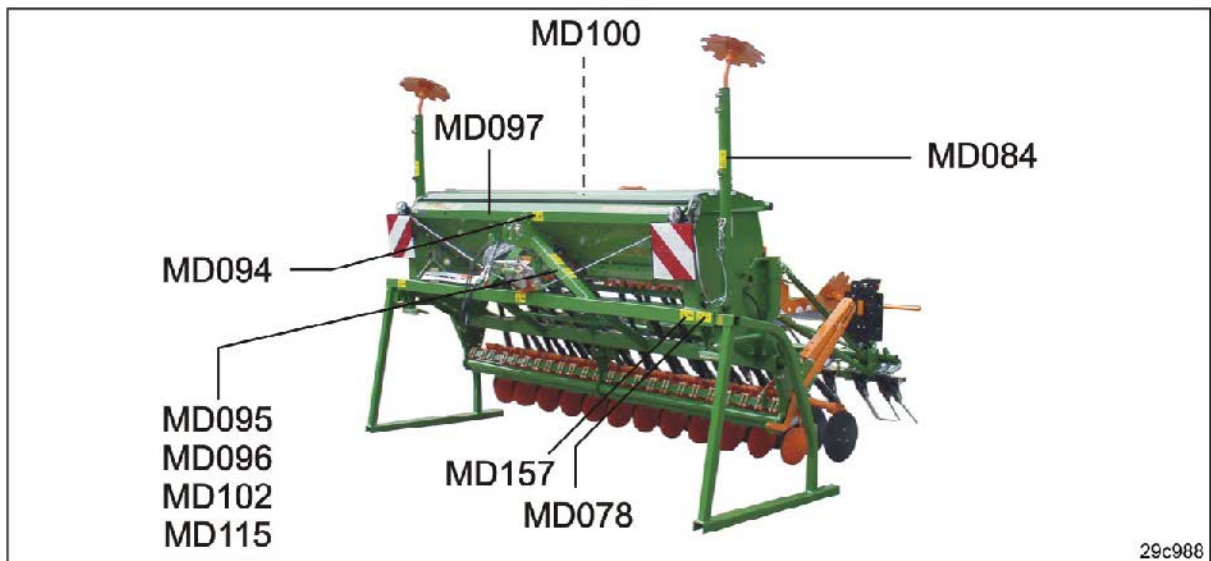


Fig. 2

2.14 Dangers if the safety information is not observed

Non-compliance with the safety information

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

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

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

2.15 Safety-conscious working

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

Comply with the accident prevention instructions on the warning pictograms.

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

2.16 Safety information for users



WARNING

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

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

2.16.1 General safety and accident prevention information

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

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

Connecting and disconnecting the machine

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



General Safety Instructions

- 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 parking brake
 - Switch off the tractor engine
 - Remove the ignition key.

Machine transportation

- Comply with the national road traffic regulations when using public highways.
- Before moving off, check:
 - The correct connection of the supply lines
 - The lighting system for damage, function and cleanliness
 - The brake and hydraulic system for visible damage
 - That the parking brake is 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 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 2004/108/EEC in the appropriate version and carry the CE label.

2.16.4 Attached tools

- When tools are attached, the attachment categories of the tractor and the machine must always coincide or be matched to one another.
- Take note of the manufacturer's instructions
- Before attaching machines to or removing them from the three-point suspension, shift the operating equipment to a position in which unintended raising or lowering is impossible.
- There is a risk of crushing or shearing injury around the three-point linkage.
- The machine may only be transported and towed by the tractors intended for this purpose.
- There is a risk of injury when machines are coupled to and uncoupled from the tractor.
- Do not step between tractor and machine when operating the external control for the three-point attachment!
- There is a risk of crushing and shearing injury when operating the support devices.
- When devices are attached 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.
- Observe the maximum payload of the attached devices and the permissible axle loads of the tractor.
- Always ensure that the tractor lower links are adequately locked against sideways movement before transporting the machine.
- The operating lever for the tractor lower links must be secured against lowering when the machine is being towed on the road.
- Shift all equipment into the transport position before travelling on the road.
- Any devices and ballast weights attached to a tractor influence the driving behaviour and the steering and braking power of the tractor.
- The front tractor axle must always be loaded with at least 20% of the tractor's empty weight to ensure sufficient steering capability. If necessary, use front weights.
- Only ever carry out any servicing, maintenance or cleaning operations or remedy malfunctions with the ignition key removed.
- Leave safety devices attached and always position them in the protective position.

2.16.5 Operation of the seed drill

- Observe the permissible fill levels of the seed box (capacity of the seed box).
- Only use the steps and the platform when filling the seed box. 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 box.
- Before transportation, lock the marker (construction-dependent) in the transport position.

2.16.6 Cleaning, maintenance and repairs

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

3 Loading and unloading

**DANGER**

Do not stand under a machine that has been hoisted by a crane.

For loading, suspend the AD Super/Special top-mounted seed drills from a crane hook with the seed box lid open.

Hook the crane hook into one of the two cut-outs (Fig. 3/1) depending on the equipment and centre of gravity of the top-mounted seed drill.

The seed hopper may not be full.

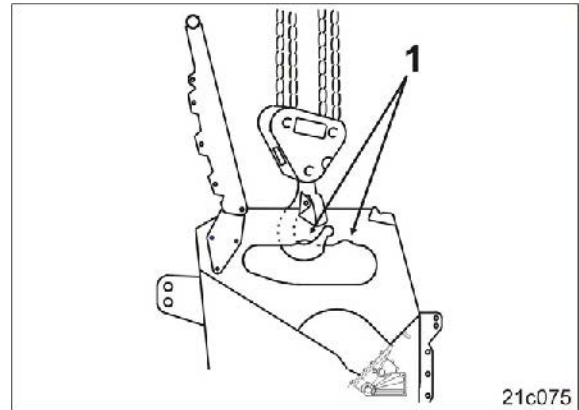


Fig. 3

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

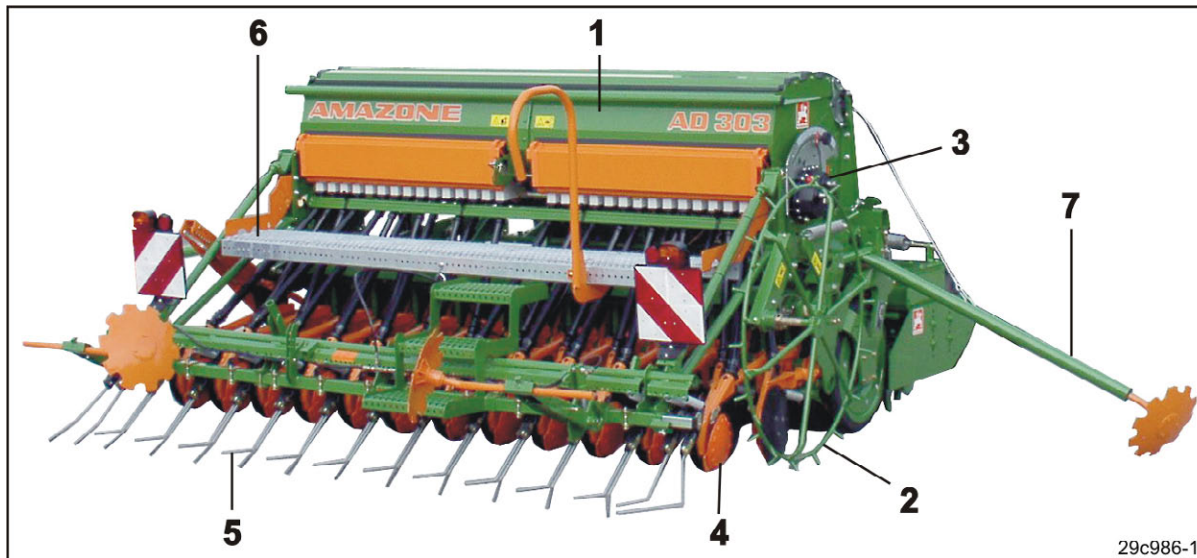


Fig. 4

Fig. 4/...

- | | |
|-----------------------------------|---|
| (1) Seed box | (4) Coulter (WS coulter or RoTeC coulter) |
| (2) Star wheel | (5) Exact harrow |
| (3) Vario gearbox with gear lever | (6) Loading board |
| | (7) Track marker |

4.1 Overview of subassemblies

Fig. 5/...

- (1) Track marker shuttle valve

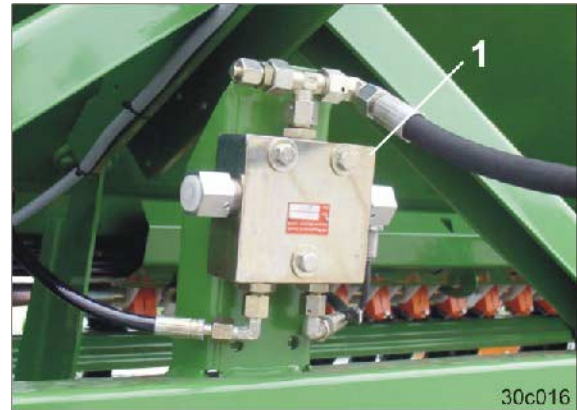


Fig. 5

Fig. 6/...

- (1) Seed wheel (normal and fine seed metering wheel)
- (2) Seed shaft
- (3) Seed wheel housing
- (4) Shutoff gate
- (5) Bottom flap
- (6) Bottom flap shaft

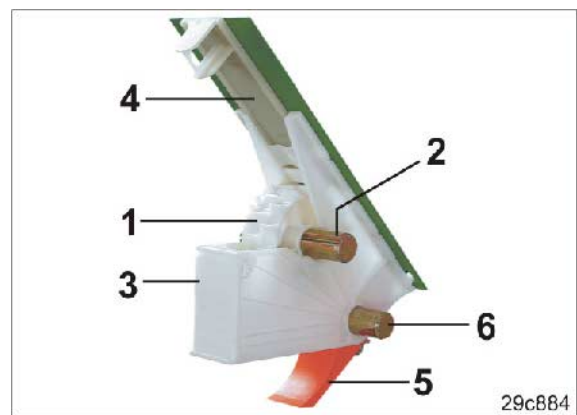


Fig. 6

Fig. 7/...

- (1) Lay shaft for tramline selection
- (2) Lay shaft bearing
- (3) Wrap spring clutch
- (4) Spur gear



Fig. 7

Fig. 8/...

- (1) Calibrating crank



Fig. 8

Product description

Fig. 9/...

- (1) Fill level indicator ¹⁾
- (2) Control box

¹⁾ **AMALOG⁺ / AMATRON⁺** incorporate a digital fill level indicator

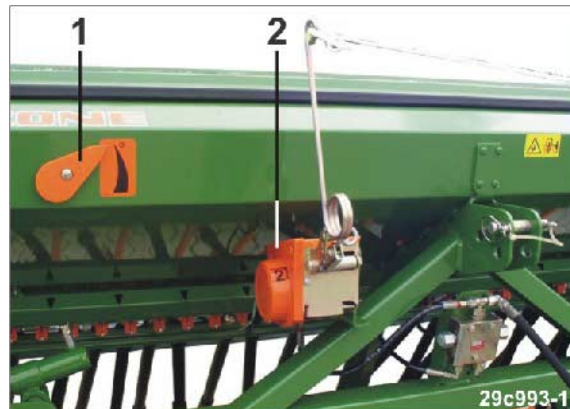


Fig. 9

Fig. 10/...

- (1) Agitator shaft



Fig. 10

Fig. 11/...

- (1) Rapeseed insert



Fig. 11

Fig. 12/...

- (1) WS coulter



Fig. 12

Fig. 13/...

RoTeC coulters



Fig. 13

Fig. 14/...

(1) Tramline marker



Fig. 14

Fig. 15/...

AMACO electronic hectare counter


Fig. 15

Fig. 16/...

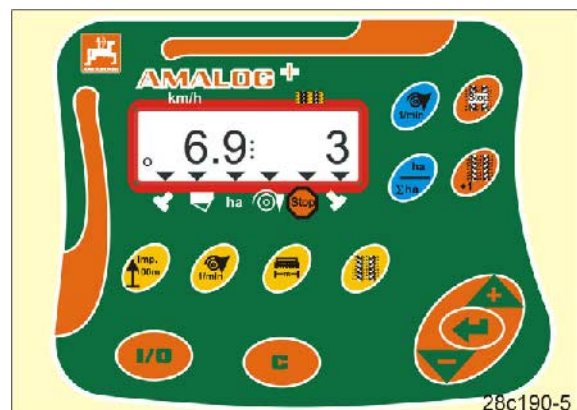
AMALOG⁺ operator terminal


Fig. 16

Product description

Fig. 17/...

Operator terminal **AMATRON⁺**



Fig. 17

Fig. 18/...

(1) Drag tine harrow

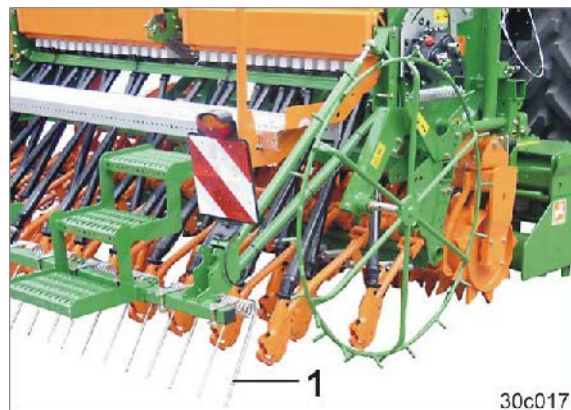


Fig. 18

Fig. 19/...

Band sowing shoe I

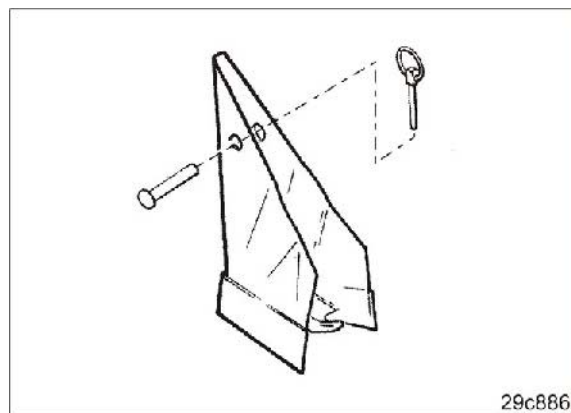


Fig. 19

Fig. 20/...

Band sowing shoe II

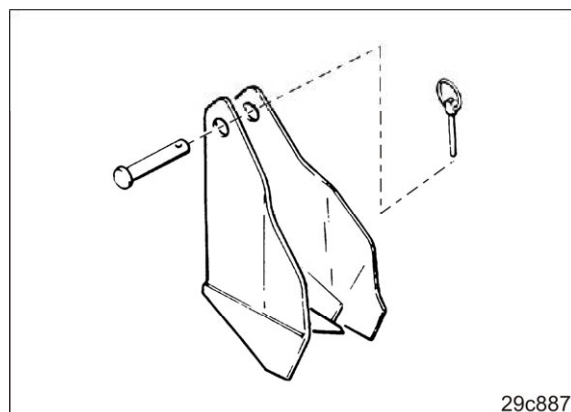


Fig. 20

4.2 Safety and protection equipment

Fig. 21/...

- (1) Lynch pin,
for fastening the track markers
- (2) Rubber buffer (visual indicator)
The track marker is not vertical, i.e. the
track marker has not been secured with the
lynch pin (above).



Fig. 21

Fig. 22/...

- (1) Chain guard

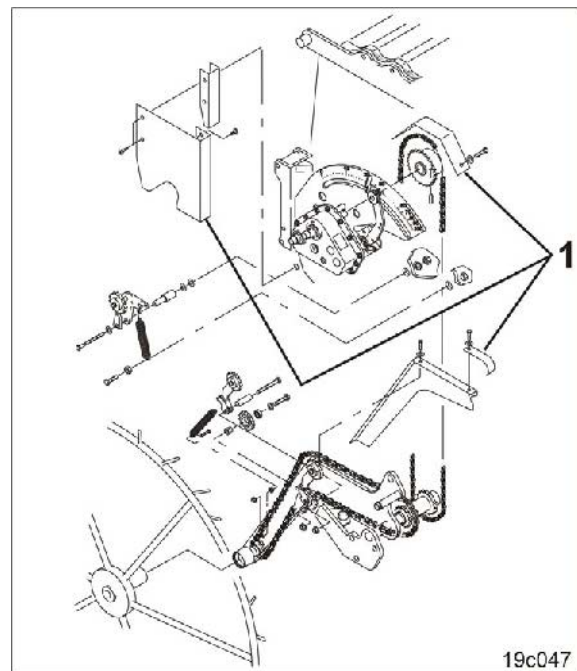


Fig. 22

4.3 Overview – Supply lines between the tractor and the machine



Fig. 23

Fig. 23/..	Designation		Marking	Function
(1)	Hydraulic line 1	Delivery/ return flow	1 cable tie, yellow	<ul style="list-style-type: none"> Track marker left Track marker right Control box Tramline marking
(2)	Hydraulic line 2	Delivery/ return flow	1 cable tie, blue	<ul style="list-style-type: none"> Coulter pressure adjustment Exact harrow pressure adjustment Seed rate remote adjustment
(3)	Hydraulic line 3	Delivery/ return flow	1 cable tie, white	<ul style="list-style-type: none"> Star wheel raised position
(4)	Plug (7-pin) for the road traffic lighting system			
(5)	Machine plug <ul style="list-style-type: none"> AMACO AMALOG⁺ AMATRON⁺ 			

4.4 Transportation equipment

Fig. 24/...

- (1) 2 rear-facing turn signals
- (2) 1 lighting for licence plate
- 1 licence plate holder (option)
- (3) 2 red reflectors
- (4) 2 brake and tail lamps
- (5) 2 warning boards pointing to the rear
- (6) 2 reflectors, yellow

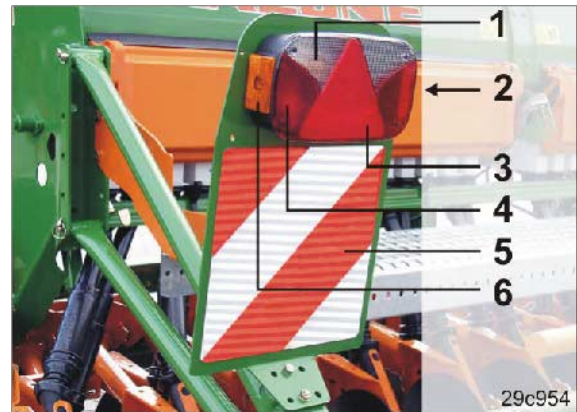


Fig. 24

Fig. 25/...

- (1) 1 road safety bar



Fig. 25

Fig. 26/...

- (1) 2 side lights pointing forwards
- (2) 2 forwards-facing turn signals
- (3) 2 warning boards pointing forwards



Fig. 26

4.5 Intended use

The machine

- is designed for metering and placing certain customary seeds.
- is coupled to the tractor using the tractor three-point hitch 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 %

The intended use also includes:

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

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

In case of damage resulting from improper use:

- it is the operator who 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 cardan shaft / hydraulic system.
- as long as the tractor and machine are not protected against unintentional start-up and running.

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

Danger points exist:

- in the area of the swivelling track markers.

4.7 Nameplate and CE labelling

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

The nameplate shows:

- Mach. ident. no.
- Type
- Year of manufacture
- Factory
- Basic weight, kg
- Maximum load, kg



Fig. 27

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



Fig. 28

4.8 Technical data

Top-mounted seed drills			AD-253 Special	AD-303 Special	AD-303 Super	AD-353 Super	AD-403 Super
Working width	[m]		2,50	3,00	3,00	3,50	4,00
Transport width	[m]		2,56	3,06	3,06	3,50	4,25
Empty weight ¹⁾ (with WS coulters)	[kg]		632	668	761	904	1047
Empty weight ¹⁾ (with RoTeC coulters)	[kg]		675	747	840	996	1153
Seed box capacity	without extension	[l]	360	450	600	715	830
	with extension	[l]	—	710 ²⁾ 850 ³⁾	860 ²⁾ 1000 ³⁾	1200	1380
WS coulters	number of rows		20	24	24	28	32
	row spacing	[cm]	12,5	12,5	12,5	12,5	12,5
RoTeC coulters	number of rows		20	24 / 30	24 / 30	28	32
	row spacing	[cm]	12,5	12,5 / 10,0	12,5 / 10,0	12,5	12,5
Working speed	[km/h]		6 to 10				
Minimum fluid flow rate	[l/min]		10				
Maximum working pressure (hydraulics)	[bars]		200				
Electrical system	[V]		12 (7-pin)				
Transmission/hydraulic fluid			Transmission/hydraulic fluid Utto SAE 80W API GL4				

¹⁾ Top-mounted seed drill (row spacing 12.5 cm) with mechanical coulters pressure adjustment, exact harrow, track markers and tramline control.

²⁾ with 260-3 seed box extension

³⁾ with 400-3 seed box extension

4.8.1 Technical data for the calculation of tractor weights and tractor axle loads

Combination installed on tractor	Total weight G_H (see on page 80)	Distance d (see on page 80)
Rotary harrow KE 253-140 / PW 500 / AD-253 SPECIAL 1)		
with full seed box	2090 kg	932 mm
Rotary cultivator KG 303 / KW 580 / AD-303 SUPER 2)		
with full seed box (without seed box extension)	2990 kg	914 mm
with full seed box (with 260-3 seed box extension)	3210 kg	928 mm
with full seed box (with 400-3 seed box extension)	3320 kg	933 mm
Rotary cultivator KG 353 / KW 580 / AD-353 SUPER 2)		
with full seed box (without seed box extension)	3450 kg	927 mm
with full seed box (with 400-3 seed box extension)	3840 kg	943 mm
Rotary cultivator KG 403 / KW 580 / AD-403 SUPER 2)		
with full seed box (without seed box extension)	3900 kg	938 mm
with full seed box (with 550-4 seed box extension)	4350 kg	953 mm

¹⁾ Pack top seed drill with WS coulters, row spacing 12.5 cm; with mechanical coulter pressure adjustment, exact harrow, loading board, track marker and tramline control.

²⁾ Pack top seed drill with RoTeC coulters, row spacing 12.5 cm; with mechanical coulter pressure adjustment, exact harrow, loading board, track marker and tramline control.

4.9 Conformity

	Directives / standards
The machine fulfils the	<ul style="list-style-type: none"> • Machines directive 06/42/EG • EMC directive 04/108/EG

4.10 Necessary tractor equipment

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

Tractor engine power

AD-253 ¹⁾	from 55 kW (75 bhp)
AD-303 Special AD-303 Super ¹⁾	from 66 kW (90 bhp) upwards
AD-353 Super ¹⁾	from 73 kW (100 bhp) upwards
AD-403 Super ¹⁾	from 88 kW (120 bhp) upwards
¹⁾ with AMAZONE rotary cultivator and wedge ring roller KW 520	

Electrical system

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

Hydraulic system

Maximum operating pressure:	200 bars
Tractor pump power:	at least 80 l/min at 150 bars
Machine hydraulic fluid:	transmission/hydraulic fluid Utto SAE 80W API GL4 The machine hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.
Control unit 1:	simple control unit
Control unit 2:	simple control unit
Control unit 3:	simple control unit

5 Structure and function

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

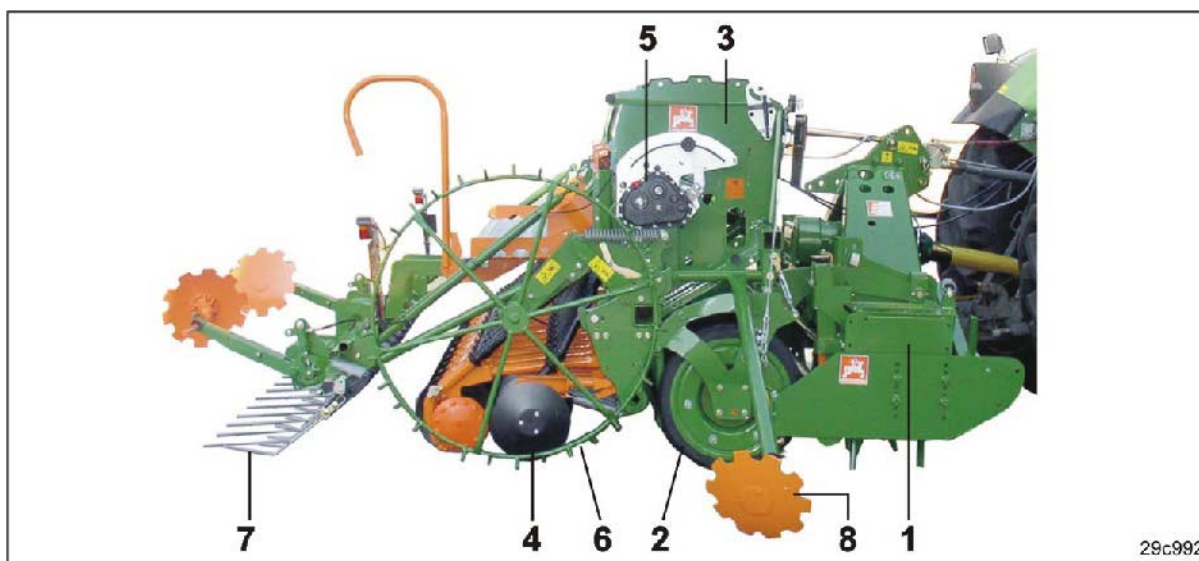


Fig. 29

The AMAZONE top-mounted seed drill AD 03 is used as part of a cultivation combination with soil tillage implements:

- AMAZONE rotary cultivator (Fig. 29/1) or
- AMAZONE rotary harrow

and wedge ring roller (Fig. 29/2) or tooth packer roller.

This cultivation combination optimises loosening of the soil, recompact and precise drilling in a single operation.

The top-mounted seed drill AD 03 allows precise seed placement, even placement depth and coverage of the seed and well-structured field after tilling.

The seed is carried along in the seed box (Fig. 29/3).

The seed, dosed in the seed wheel housings by the seed wheels, falls into the sowing furrow created by the coulters (Fig. 29/4). The seed wheels are driven by the star wheel (Fig. 29/5) through the Vario gearbox (Fig. 29/6).

The seed is covered with loose soil by the exact harrow (Fig. 29/7) or drag tine harrow.

The field connection run is marked in the centre of the tractor by the track markers (Fig. 29/8).

The RoTeC coulters (Fig. 29/4) make mulch drilling possible, even in fields with a lot of stubble and plant trash. The seed furrow is formed and the coulter is guided through the soil by the sowing disc on the one side and the robust cast seed shoe on the other side. The elastic plastic disc prevents the soil sticking to the sowing disc and helps to form the sowing furrow. The high coulter pressure and the support provided by the plastic disc cover ensure a steady coulter ride and hence a precise seed planting depth.



When crossing slopes in the contour line and line of the slope (see "Intended use", on page 42), note that the seed in the seed box could slip so much that the seed wheels are completely or partially starved of seed.

5.1 Hydraulic hose lines



WARNING

Danger of infection from escaping hydraulic fluid at high pressure!

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

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

5.1.1 Coupling the hydraulic hose lines



WARNING

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

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



- Check the compatibility of the hydraulic fluids before connecting the machine to the hydraulic system of the tractor.
Do not mix any mineral oils with biological oils.
- Observe the maximum approved hydraulic fluid pressure of 200 bars.
- 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. 30

5.1.2 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.



Fig. 31

5.2 Seed box and loading board (option)

The seed box is equipped with a single-piece lid (Fig. 32/1), sealed against dust and water. The top-mounted seed drill is filled from the rear.

The top-mounted seed drill can be filled comfortably from the loading board (Fig. 32/2).



Fig. 32

5.2.1 Fill level indicator (option)

The fill level indicator (Fig. 33/1) shows the fill level in the seed box, even when the seed box lid is closed.

Top up the seed in good time, before the fill level indicator reaches the "0" mark.



Never run the seed box down to empty, to prevent differing seeding rates as a consequence of uneven distribution of seed in the seed box.



Fig. 33

5.2.2 Digital fill level monitoring (option)

The on-board computers **AMALOG⁺** and **AMATRON⁺** sound an alarm when the level falls below the minimum level specified for the seed box.

A fill level sensor (Fig. 34/1) monitors the level of seed in the seed box.

When the level of seed falls to the level of the sensor, the on-board computer display shows a warning message. An alarm is sounded at the same time. This alarm signal is intended to remind the tractor driver to fill up the seeds again.

The height of the fill level sensor in the seed box is adjustable. The residual seed volume can be set, at which the warning message and the alarm signal is to be emitted.



Fig. 34

5.2.3 Rapeseed insert (option)

The rapeseed insert (Fig. 35/1) reduces the capacity of the seed box.

The rapeseed insert is used when sowing seeds such as rapeseed that are sowed at low seed densities.

The agitator shaft must not rotate when the rapeseed insert is fitted in the seed box.



Fig. 35



Reconnect the agitator shaft to the drive once the rapeseed insert has been removed.

Seed blockages may arise in the seed box, with the consequence of a faulty sowing pattern, especially when sowing seeds with chaff and with the agitator shaft not rotating.

5.3 Adjusting the sowing rate

The sowing rate required is set using the lever (Fig. 36/1) of the Vario gearbox.

Adjusting the lever changes the sowing rate. The higher the number the gearbox lever points to on the scale (Fig. 36/2), the greater the sowing rate.

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

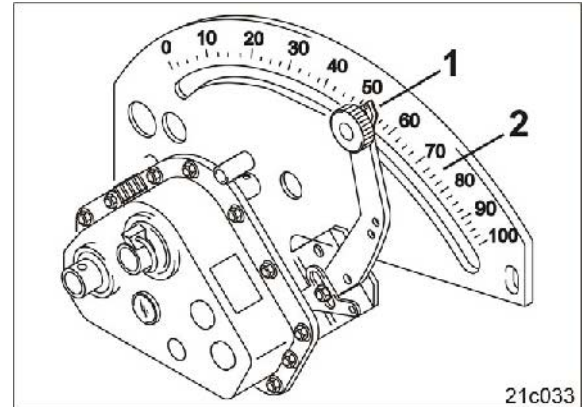


Fig. 36

Hydraulically activated remote sowing rate adjustment (option)

The sowing rate is set using a hydraulic cylinder which is connected to control unit 2, together with the hydraulic coulters pressure adjustment (option) and the hydraulic exact harrow pressure adjustment (option).

The coulters and exact harrow pressures are automatically increased when the sowing rate is increased.

The sowing rate can be adapted to the soil during drilling in the event of a change from normal soil to heavy soil and vice versa.

The increased sowing rate is to be set on the sowing rate remote adjustment control lever (Fig. 37/1).

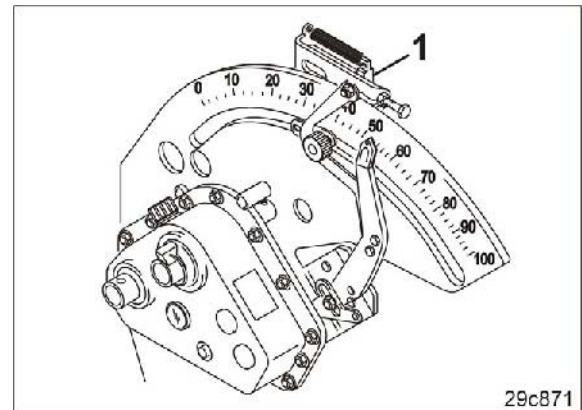


Fig. 37

Electronic sowing rate adjustment (option)

An electric setting motor (Fig. 38/1), controlled by the **AMATRON⁺**, sets the gearbox lever to the desired sowing quantity.

The **AMATRON⁺** regulates the gearbox setting on the basis of the calibration test.

The **AMATRON⁺** display shows the scale setting of the lever (Fig. 38/2).

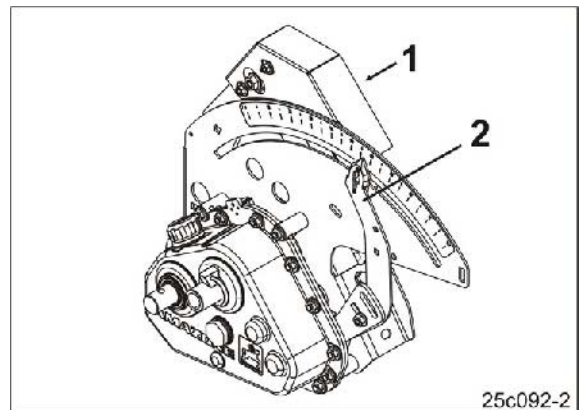


Fig. 38

5.3.1 Seed wheel drive

The star wheel (Fig. 39/1) drives the seed wheels in the seed housings via the Vario gearbox.

The rotational drive speed of the seed wheels

- determines the sowing rate
- can be adjusted on the Vario gearbox.

The distance covered is measured via the star wheel. AMACO, **AMALOG⁺** and **AMATRON⁺** need this data to calculate the area covered (hectare counter) and the travel speed.

If the soil is to be cultivated without drilling, raise the star wheel and latch it in place (optionally, this can be done hydraulically).



Fig. 39

5.3.2 Seed dosing

The seed is dosed in the seed wheel housings (Fig. 40/1) by the seed wheels (Fig. 40/2) or bean seed wheels.

The seed wheels transport the seed for sowing to the edge of the bottom flaps (Fig. 40/3).

The metered seed passes through the seed tubes to the sowing coulters.

Depending on the seed to be sowed, the following must be adjusted

- the seed wheels (normal, fine, or bean seed wheel)
- the shutoff gates
- the bottom flaps
- the agitator shaft.

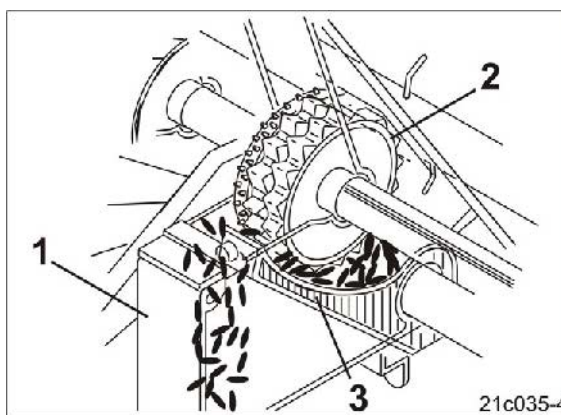


Fig. 40



Refer to the table (Fig. 41, on page 55) for the setting values.

If your seed is not listed in the table, please use the values for another seed of a similar grain size and grain shape.

5.3.3 Setting values table

Seed	Seed wheel	Shut-off gate position	Bottom flap position		Agitator shaft
			1000 grain weight		
			below	above	
			6g (rapeseed) 50g (wheat)		
Rye	Normal seed wheel	open	1	2	driven
Triticale	Normal seed wheel	open	1	2	driven
Barley	Normal seed wheel	open	1	2	driven
Wheat	Normal seed wheel	open	1	2	driven
Spelt wheat	Normal seed wheel	open	2		driven
Oats	Normal seed wheel	open	2		driven
Rapeseed	Fine seed metering wheel	¾ open	1	2	stopped
Caraway	Fine seed metering wheel	¾ open	1		stopped
Mustard/radish	Fine seed metering wheel	¾ open	1		stopped
Phacelia	Normal seed wheel	¾ open	1		driven
Phacelia	Fine seed metering wheel	¾ open	1		driven
Turnips	Fine seed metering wheel	¾ open	1		stopped
Grass	Normal seed wheel	open	2		driven
Beans, small (1000 grain weight below 400g)	Normal seed wheel	¾ open	4		driven
Beans, large (1000 grain weight up to 600g)	Bean seed wheel	¾ open	3		driven
Beans, large (1000 grain weight over 600g)	Bean seed wheel	¾ open	4		driven
Peas (1000 grain weight below 440g)	Normal seed wheel	¾ open	4		driven
Peas (1000 grain weight above 440g)	Bean seed wheel	¾ open	4		driven
Flax (dressed)	Normal seed wheel	¾ open	1		driven
Millet	Normal seed wheel	¾ open	1		driven
Lupins	Normal seed wheel	¾ open	4		driven
Alfalfa	Normal seed wheel	¾ open	1		driven
Alfalfa	Fine seed metering wheel	¾ open	1		driven
Linseed (wet dressed)	Normal seed wheel	¾ open	1		stopped
Linseed (wet dressed)	Fine seed metering wheel	¾ open	1		stopped
Red clover	Fine seed metering wheel	¾ open	1		stopped
Soy	Normal seed wheel	¾ open	4		driven
Sunflowers	Normal seed wheel	¾ open	2		driven
Vetches	Normal seed wheel	¾ open	2		driven
Rice	Normal seed wheel	open	3		driven

Fig. 41

5.3.4 Seed wheel (normal and fine seed metering wheel)

The seed wheels comprise

- a normal seed wheel (Fig. 42/1) and
- a fine seed metering wheel (Fig. 42/2).

For sowing

- with the normal sowing wheel, the normal and the fine seed metering wheel are coupled and the two turn together
- with the fine seed metering wheel, the connection between the normal sowing wheel and the fine seed metering wheel is broken

Make the same settings on all seed wheels.

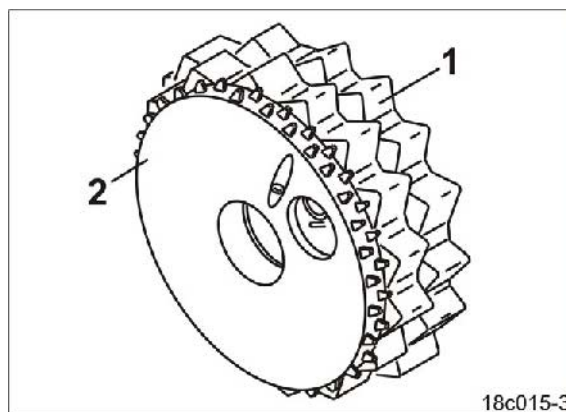


Fig. 42

5.3.5 Bean seed wheel (option)

Large beans are sown with bean seed wheels (Fig. 43) (see "Sowing beans", on page 59).

So as not to harm the beans, they are transported by bean seed wheels with elastic cams made from high quality plastic. The elastic cams on the bean seed wheel are sufficiently long that they reach as far as the bottom flaps to provide a uniform feed of seed.

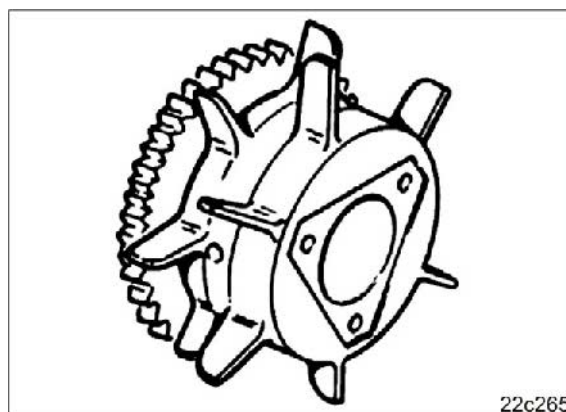


Fig. 43

5.3.6 Bottom flaps

The clearance between the seed wheel and the bottom flap (Fig. 44/1) is determined by the size of the seed and is set with the bottom flap lever (Fig. 44/2).

The bottom flap lever can lock into place in one of 8 holes.

The bottom flap is mounted on springs and can move out of the way of foreign bodies in the seed.

The bottom flaps open to allow the seed wheel housings to be emptied. To do so, swing the bottom flap lever downwards past the group of holes.

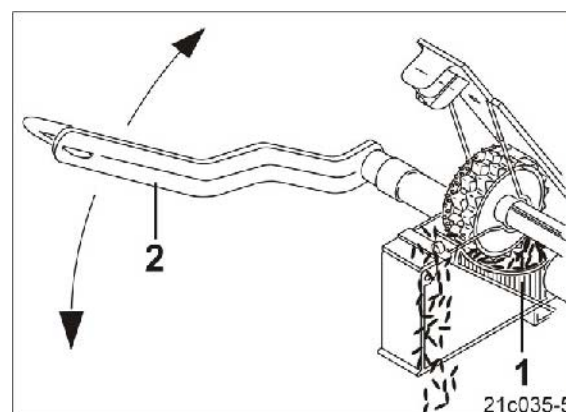


Fig. 44

5.3.7 Agitator shaft

The agitator shaft (Fig. 45/1) in the seed box prevents the build up of seed blockages and hence faulty sowing.

The agitator shaft must be disabled when sowing certain seeds, e.g. rapeseed, so that the intensive agitation action of the agitator shaft does not cause the rapeseed to stick together.



Fig. 45



Reconnect the agitator shaft to the drive after sowing.

Seed blockages may arise in the seed box, with the consequence of a faulty sowing pattern, when sowing seeds with chaff and with the agitator shaft not rotating.

5.3.8 Sowing peas

Sowing with normal seed metering wheels:

Sow peas with a 1000 grain weight below 440 with the normal seed metering wheels. Do not exceed the max. working speed of 6 km/h.

Sowing with bean seed wheels:

Sow peas with a 1000 grain weight above 440 only with the bean seed wheels.

Peas with the shape and size as shown in the figure (Fig. 46) have a good flow rate. The agitator shaft may come to a stop during sowing:

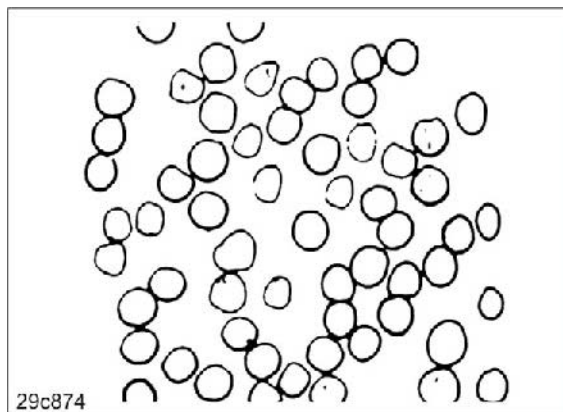


Fig. 46

When sowing square-shaped peas with the shape and size as shown in the figure (Fig. 47); the agitator shaft must keep turning.

Otherwise, the peas have a poor flow and tend towards bridging in the seed box.



Fig. 47



In exceptional cases, peas that have been treated with certain grades of dressing and have an unfavourable shape are not ejected from the seed wheel but return to the seed box.

One remedy is to fit fine seed metering wheel brushes (Fig. 48/1) on all seed wheel housings.



Fig. 48

5.3.9 Sowing beans

Sowing beans up to a 1000 grain weight of approximately 400 g

Beans up to a 1000 grain weight of approximately 400 g, of the shape and size illustrated in (Fig. 49) can be sown with normal seed wheels without problem.

The agitator shaft must be running during sowing.



Fig. 49

Sowing beans with a 1000 grain weight over 400 g

The seed drill must be fitted with the bean seed wheel for placing large beans (1000 grain weight over 400 g), of the shape and size illustrated in (Fig. 50).

The agitator shaft must be running during sowing.

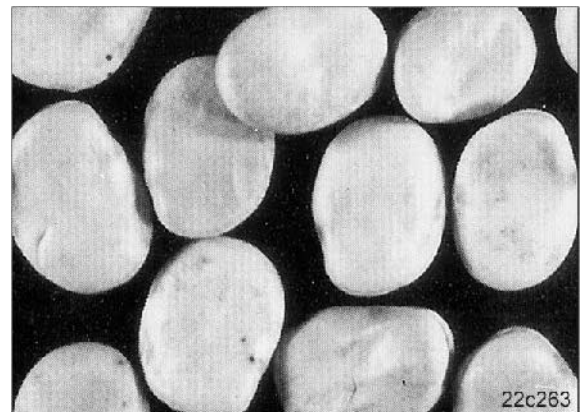


Fig. 50

5.3.10 Calibration trays

The seed drops into the calibration trays (Fig. 51/1) in the calibration test.

The calibration trays protect the seed elements against water and dust during sowing.



Fig. 51

5.3.11 Calculating disc rule

The desired sowing rate is set on the Vario gearbox.

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

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

The calculating disc rule has three scales

- an outer white scale (Fig. 52/1) for all sowing rates over 30 kg/ha
- an inner white scale (Fig. 52/2) for all sowing rates below 30 kg/ha
- a coloured scale (Fig. 52/3) with all gearbox settings from 1 to 100.

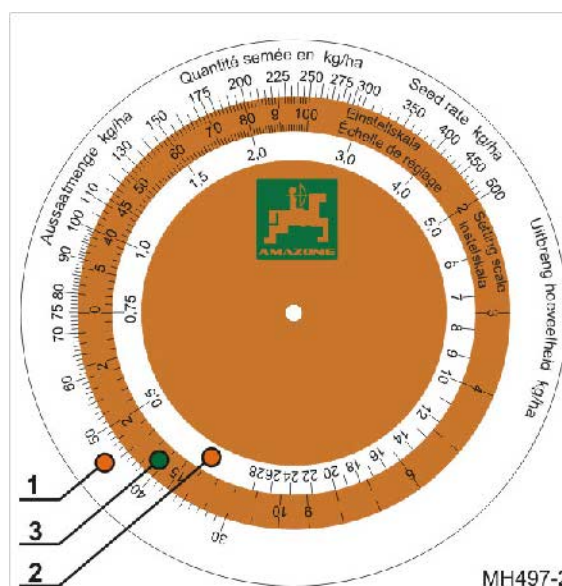


Fig. 52

5.4 Operator terminal **AMALOG⁺** (option)

The on board computer **AMALOG⁺** shows

- as an hectare counter
 - the total area covered (ha)
 - the subarea covered (ha)
- the rhythm and counter of the tramline selection
- the active track marker.

The on board computer **AMALOG⁺** issues an alarm

- if the seed level in the seed box falls below the set minimum level ¹⁾
- if tramlines ²⁾
 - have been incorrectly created
 - have been sown.
- if the tramline marker ²⁾
 - is marking sown rows
 - is not marking tramlines.

¹⁾ Fill level sensor required.

²⁾ Monitoring of tramline selection required.

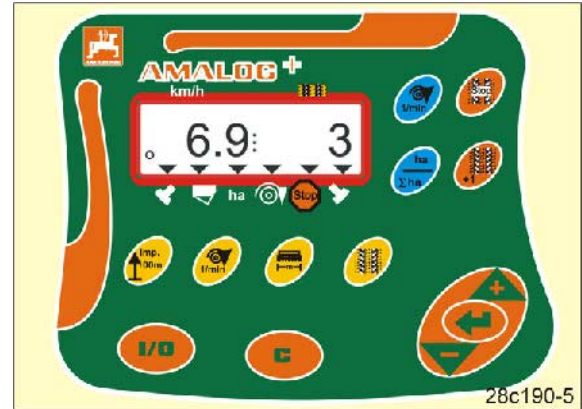


Fig. 53

5.5 Operator terminal **AMATRON⁺** (option)

The **AMATRON⁺** consists of the operator control terminal (Fig. 54), the basic equipment (cable and fastening material) and the job computer on the machine.

The **AMATRON⁺** includes the functions of the **AMALOG⁺** and additionally contains

- input of the machine-specific data
- input of the job-related data
- control of the Vario gearbox for varying the sowing rate during sowing operations ¹⁾
- monitoring of the top-mounted seed drill during sowing operation.

¹⁾ Vario gearbox with electronic sowing rate adjustment required.



Fig. 54

The **AMATRON⁺** determines

- the momentary drive speed [kph]
- the momentary sowing rate [kg/ha]
- the distance [m] remaining until the seed box is emptied of seed
- the actual seed box content [kg].

For a commenced order the **AMATRON⁺** stores

- the daily and total quantity of seed spread [kg]
- the daily and total area cultivated [ha]
- the daily and total sowing time [h]
- the average work performance [ha/h].

5.6 WS coulter

Use your seed drill with WS coulters (Fig. 55) for conventional drilling.

A guide hopper (Fig. 55/1) delivers the seed immediately behind the coulter tip (Fig. 55/2). A precise and uniform planting depth is achieved.

The hinged coulter support (Fig. 55/3) prevents the coulter outlet clogging when the seed drill is set down.



Fig. 55

5.6.1 Band sowing shoe (option)

The WS coulters can be equipped with band sowing shoes. Band sowing improves the competition conditions for the growing wheat plants. The precondition is a well-tilled seed bed.

The exact harrow is required to cover the seed.

Band sowing shoe I (Fig. 56) is particularly well-suited to heavy soil.

The wedge-shaped shoe opens the band furrow.

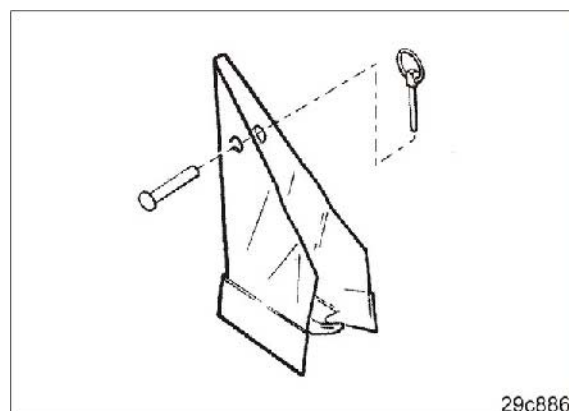


Fig. 56

Band sowing shoe II (Fig. 57) is particularly well-suited to light to medium soils.

The inclined sole compresses the planting area and reduces the planting depth.

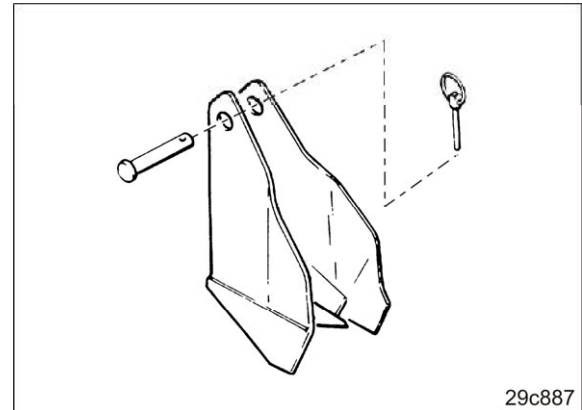


Fig. 57

5.7 RoTeC coulters

Use your top-mounted seed drill with RoTeC coulters

- for conventional drilling or
- mulch drilling.

The RoTeC coulters are suited for mulch drilling, even in fields with a lot of stubble and trash.

The flexible plastic disc (Fig. 58/1)

- limits the seed planting depth
- cleans the reverse side of the sowing disc
- improves the drive of the sowing disc by gripping the soil with its naps.

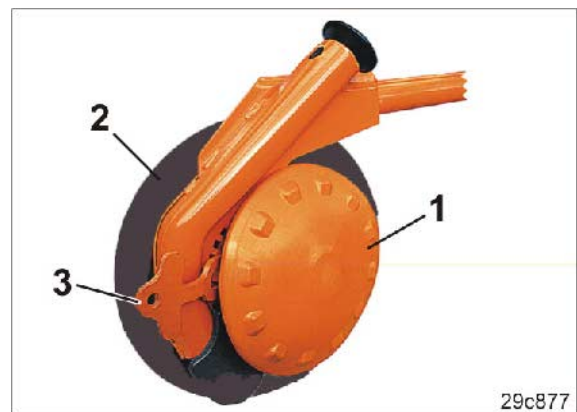


Fig. 58

At high forward speeds, the sowing disc (Fig. 58/2), which is inclined at only 7° to the direction of travel, shifts little soil.

The steady coulter ride and the precise seed placement result from the high coulter pressure (up to 30 kg) and the support of the coulter on the plastic disc.

The flat sowing disc (Fig. 59) allows very shallow sowing, e.g. in particularly light sandy soils.



Fig. 59

Structure and function

The plastic disc can be fitted in three positions or it can be removed to limit the seed placement depth (Fig. 60/1 - 4).

The plastic disc can be adjusted or removed without the need for tools by using the handle (Fig. 58/3).

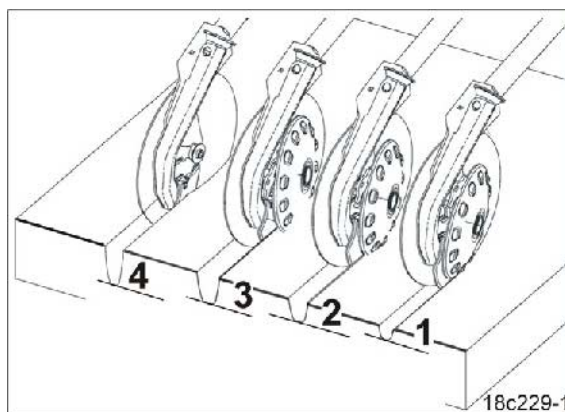


Fig. 60

5.7.1 Seed press roller (option)

The seed press roller (Fig. 61/1) presses the seed into the bottom of the furrow. Better soil coverage means that more humidity is available for germination. Cavities are closed off, making it harder for snails to get to the seed in case of snail infestation.

The roll contact pressure can be adjusted to 3 different settings.

The exact harrow is positioned further back.

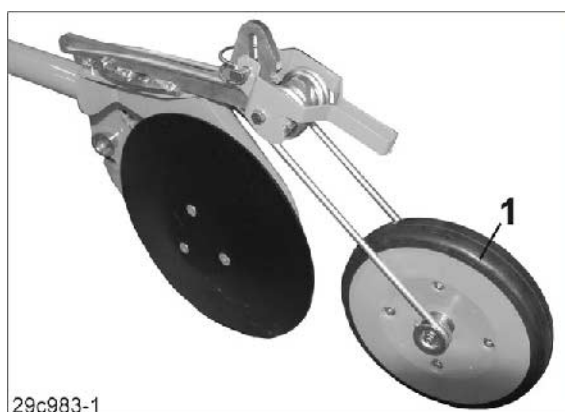


Fig. 61

5.8 Coulter pressure

The seed planting depth is dependent on

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

The coulter pressure is adjusted centrally.

Central coulter pressure adjustment

The coulter pressure is set centrally with an adjuster spindle (Fig. 62) set.



Fig. 62

Hydraulic coulters pressure adjustment (option)

The coulters pressure is set centrally using a hydraulic cylinder that is connected to control unit 2, together with the hydraulic sowing rate adjustment (option) and the hydraulic exact harrow pressure adjustment (option).

The coulters and exact harrow pressures are automatically increased when the sowing rate is increased.

The coulters pressure can be adapted to the soil during drilling in the event of a change from normal soil to heavy soil and vice versa.

Two bolts (Fig. 63/1) in an adjuster segment act as the stop for the hydraulic cylinder. If pressure is applied at control unit 2, the coulters pressure increases and the stop is in contact with the upper bolt. In the floating position the stop is in contact with the lower bolt.

The numbers on the scale (Fig. 63/2) are provided for guidance. The higher the number, the greater the coulters pressure.

While working, the tractor driver reads the coulters pressure from a second scale (Fig. 64/1).

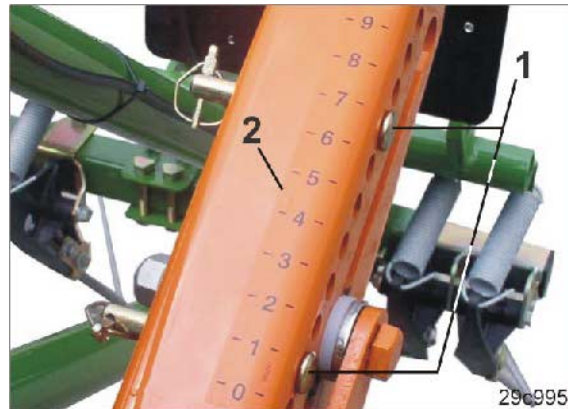


Fig. 63

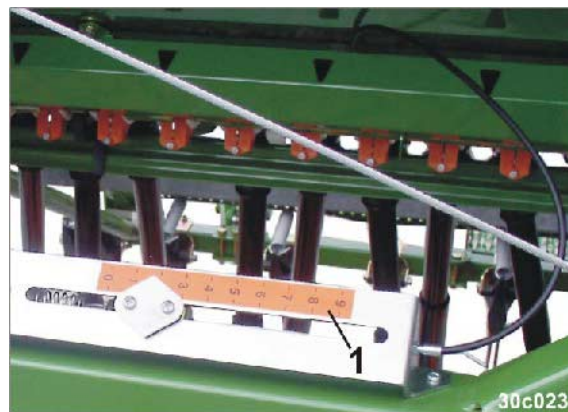


Fig. 64

5.9 Exact harrow (option)

The exact harrow (Fig. 65/1) covers the seeds deposited in the sowing furrows with loose earth and smoothes the ground.

The following are adjustable

- the position of the spring tines
- the exact harrow pressure.

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

Adjust the exact harrow pressure so that all seed rows are evenly covered with earth.



Fig. 65

Central exact harrow pressure adjustment

The exact harrow pressure is generated by tension springs that are tensioned centrally using a lever (Fig. 66/1).

The lever is in contact with a bolt (Fig. 66/2) in the adjuster segment. The higher the bolt is inserted in the group of holes, the greater the exact harrow pressure.



Fig. 66

Hydraulic exact harrow pressure adjustment (option)

The exact harrow pressure is set centrally using a hydraulic cylinder which is connected to control unit 2, together with the hydraulic sowing rate adjustment (option) and the hydraulic coulter pressure adjustment (option).

The coulter and exact harrow pressures are automatically increased when the sowing rate is increased.

The exact harrow pressure can be adapted to the soil during drilling in the event of a change from normal soil to heavy soil and vice versa.

Two bolts (Fig. 67/1) in an adjuster segment act as the stop for the lever (Fig. 67/2). If pressure is applied at control unit 2, the exact harrow pressure increases and the lever is in contact with the upper bolt. In the floating position the lever is in contact with the lower bolt.

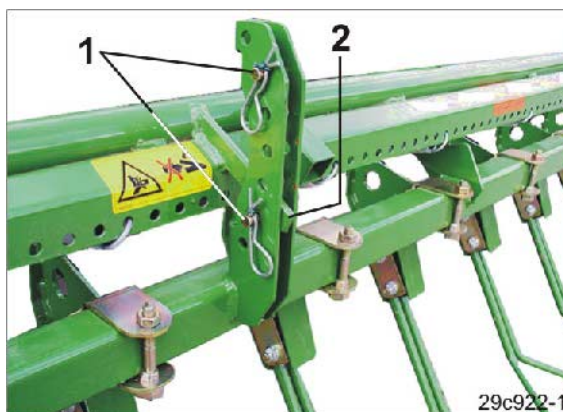


Fig. 67

5.10 Drag tine harrow (option)

The drag tine harrow (Fig. 68/1) covers the seed placed in the sowing furrow with loose soil.

The drag tine harrow is used on ploughed soils.

The drag tine harrow is mounted on the top-mounted seed drill by means of a parallelogram frame.



Fig. 68

5.11 Markers

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

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

After turning, the tractor driver drives over the centre of the mark.

It is possible to set:

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



Fig. 69

The track markers are activated when control unit 1 is operated on the top-mounted seed drills:

- For the AD 03 Special, using the hydraulic marker change over (Fig. 70/1)
- For the AD 03 Super, using the two hydraulic cylinders (Fig. 71/1).

The active track marker is

- shifted to the working position at the start of work
- raised at the end of the field
- automatically lowered after turning.



Fig. 70



Fig. 71

Raise the active track marker in the field before passing obstacles.
(Then correct the setting of the seed wheel tramline selection).

The track markers on the AD Super top-mounted seed drill are fitted with shear bolts. If the track marker strikes against a solid obstacle, a bolt shears and the track marker deviates around the obstacle. We recommend carrying shear bolts (see "Shearing of the track marker boom", on page 143) along with you in the tractor.



Correct the setting for the seed wheel tramline selection after operating control unit 1 a number of times.

5.12 Hectare counter AMACO (optional)

Briefly pressing the ha key causes the AMACO electronic hectare counter to show the area covered in the display.

The machine-specific data is entered using the ha key and the F key.



Fig. 72

5.13 Tramline selection (option)

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

Tramlines are seed-free tracks (Fig. 73/A) for fertilising and plant care machines used later.

The tramline spacing (Fig. 73/b) corresponds to the working width of the care machines (Fig. 73/B), e.g. fertiliser spread and/or sprayer, which are used on sown fields.

To create different tramline spacings (Fig. 73/b)

- the appropriate tramline rhythm must be selected on the **AMALOG⁺** or **AMATRON⁺**
- the control box must be equipped with the corresponding pitch wheel (see "Setting the tramline rhythm", on page 124).

The required tramline rhythm (see table Fig. 74) is derived from the required tramline spacing and the working width of the seed drill. Further tramline rhythms may be found in the **AMALOG⁺** or **AMATRON⁺** operating instructions.

The track (Fig. 73/a) of the tramline corresponds to that of the cultivating tractor and is adjustable (see "Setting the tramline spacing and track width/wheelmark spacing (specialist workshop)", on page 156).

The track width (Fig. 73/c) of the tramline increases with an increasing number of tramline coulters fitted next to each other.

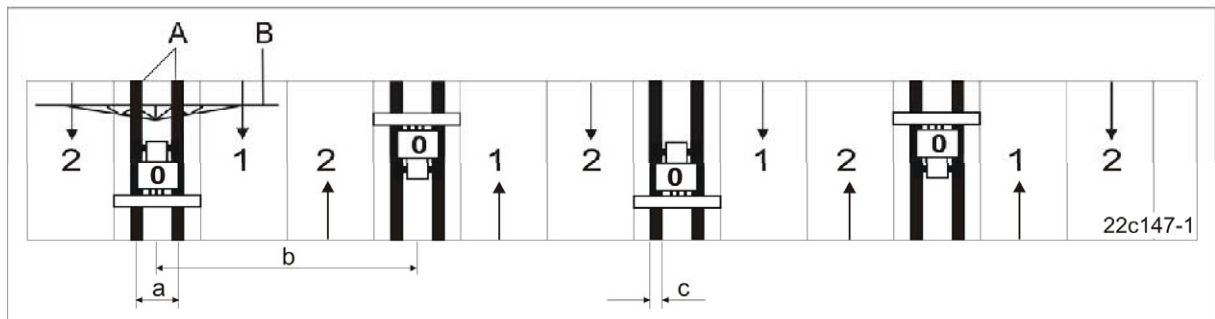


Fig. 73

When a tramline is created, the tramline counter indicates the number "0"

- in the control box
- on the **AMALOG⁺**
- on the **AMATRON⁺**.

The **AMALOG⁺** or the **AMATRON⁺** sound an alarm if the lay shaft that drives the tramline seed wheels is not working properly. Seed shaft monitoring (option) is required

Tramline rhythm	Seed drill working width			
	2.50 m	3.0 m	3.50 m	4.0 m
	Tramline spacing (working width of the fertiliser spreader and field sprayer)			
3	—	9 m	—	12 m
4	10 m	12 m	—	16 m
5	—	15m	—	20 m
6	15m	18m	21m	24 m
7	—	21m	24 m ¹⁾	28 m
8	20 m	24 m	28 m	32 m
9	—	27m	—	36 m
2 plus	10 m	12 m	—	16 m
6 plus	15m	18m	21m	24 m

¹⁾ Change of seed drill working width from 3.50 m to 3.43 m by repositioning the two outer coulters and the two outer rings of the wedge ring roller.

Fig. 74

5.13.1 Examples for creating tramlines

The creation of tramlines is shown in Figure (Fig. 75) using various examples:

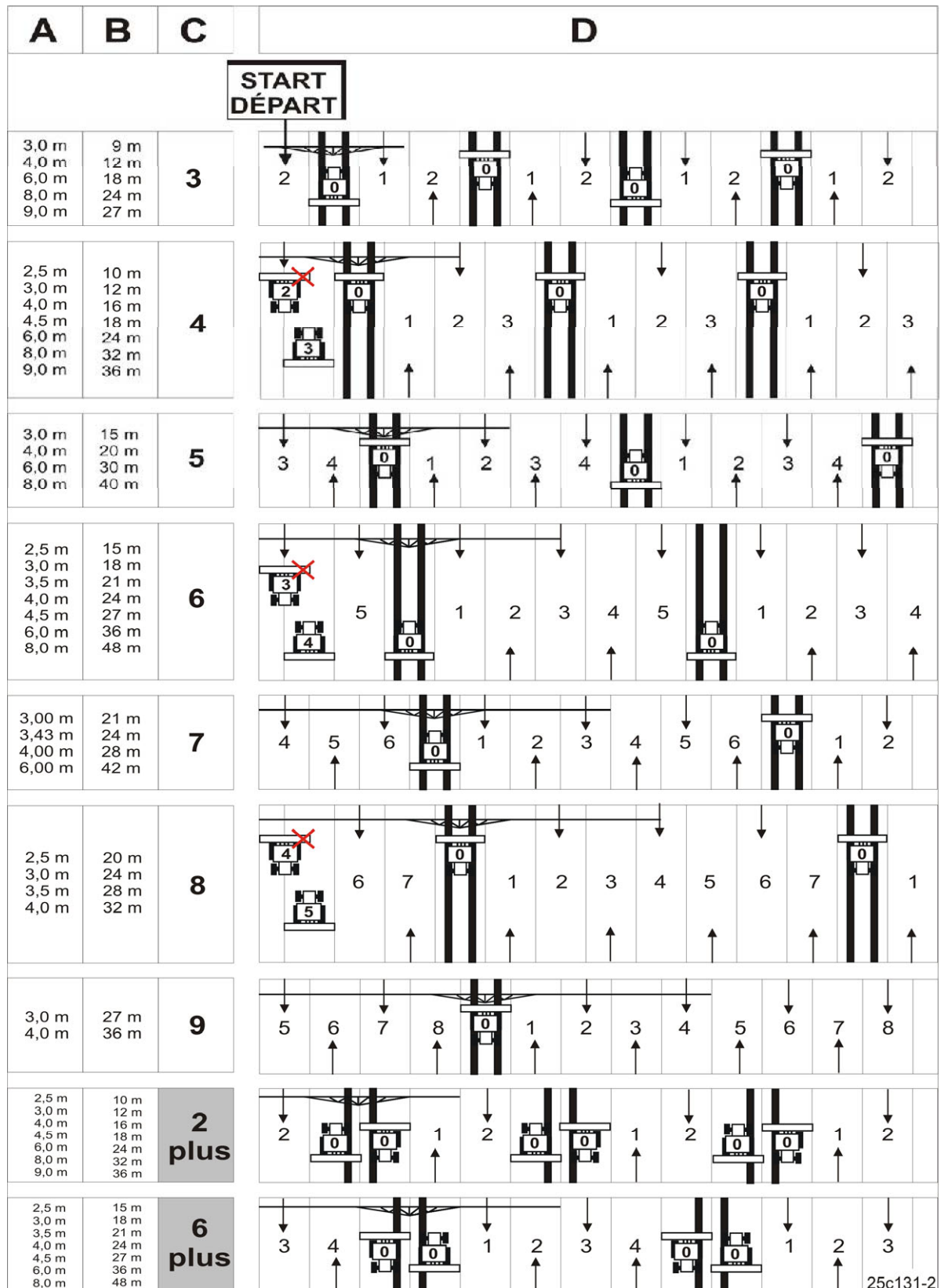
- A = Working width of the seed drill
- B = Tramline spacing (= working width of fertiliser spreader / field sprayer)
- C = Tramline rhythm
- D = Tramline counter (the field runs are numbered consecutively and displayed during the work).

Example:

Working width of seed drill: 3 m

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

- Look in the table (Fig. 75) for the following:
in column A the seed drill's working width (3 m) and
in column B the tramline spacing (18 m).
- On the same line in column "C" take the reading for the tramline rhythm (tramline rhythm 3).
- On the same line in column "D" under the "START" heading take the reading of the tramline counter for the first field run (tramline counter 2).
Do not set this value until immediately before commencing the first field run.
 - o on the **AMALOG⁺**
 - o on the **AMATRON⁺**
 - o in the control box.



25c131-2

Fig. 75

5.13.2 Tramline rhythm 4, 6 and 8

Figure (Fig. 75) 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.

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. 76).

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

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

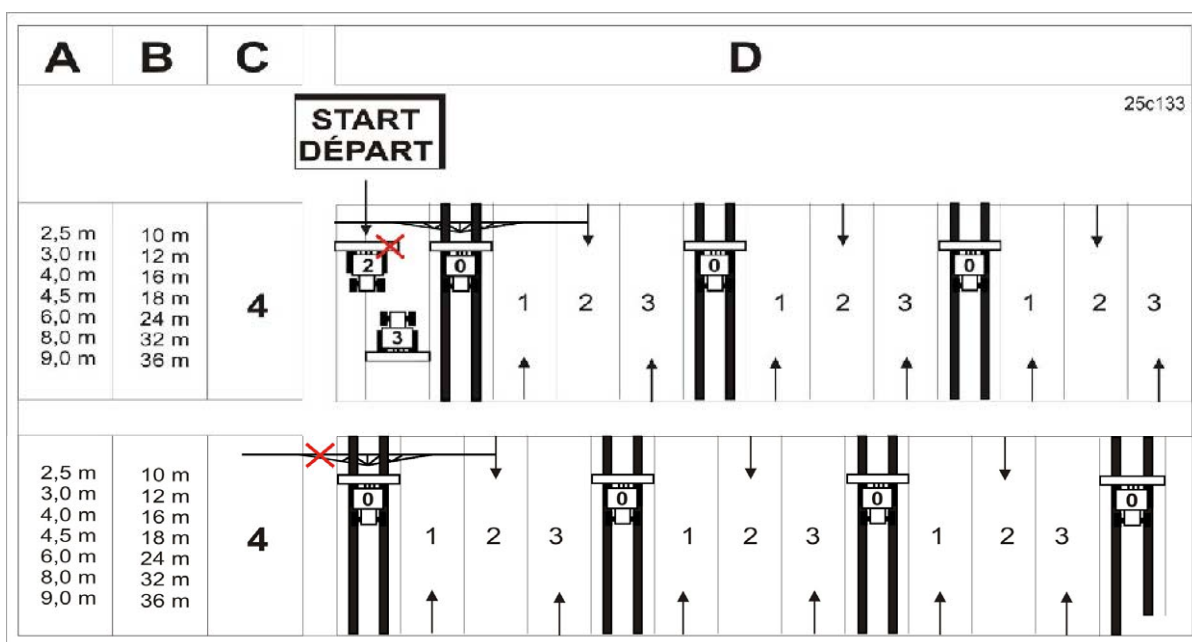


Fig. 76

5.13.3 Tramline rhythms 2 plus and 6 plus

Figure (Fig. 75) shows examples of tramlines created with tramline rhythms 2 plus and 6 plus.

Tramlines are created with the tramline rhythms 2 plus and 6 plus (Fig. 77) during the forward and backward trips over the field.

On machines with

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

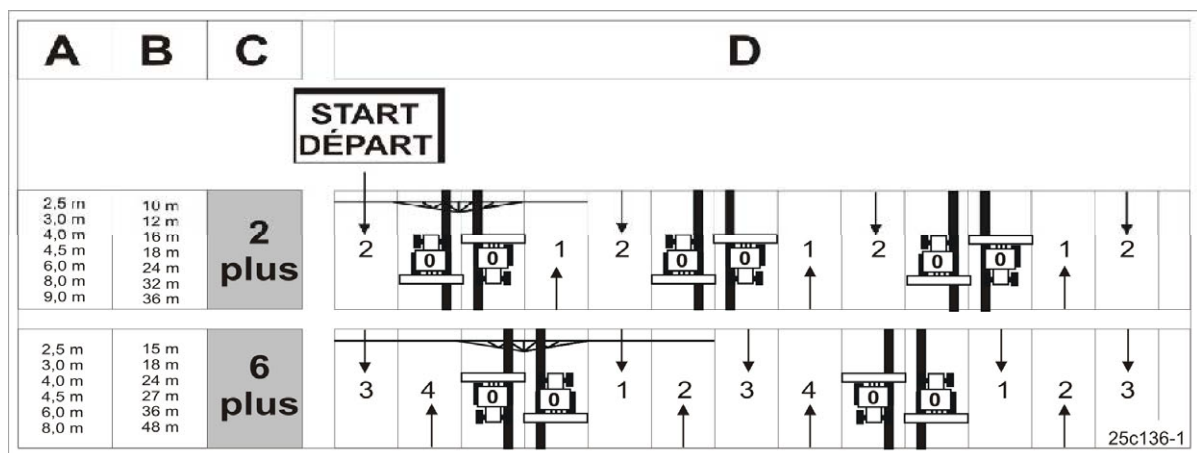


Fig. 77

5.13.4 Tramline control

Drive to the tramline seed wheels is controlled

- electronically through the **AMALOG⁺** or the **AMATRON⁺**
- hydraulically through the control box.

In any event, the drive to the lay shaft is engaged or disengaged through the wrap spring clutch.

The tramline seed wheels driven by the lay shaft are halted when tramlines are being created. The tramline coulters do not place any seeds in the soil.

Electronic operation

The wrap spring clutch (Fig. 78/1) is operated by a solenoid switch (Fig. 78/2) that is electronically controlled by the **AMALOG⁺** or **AMATRON⁺**.

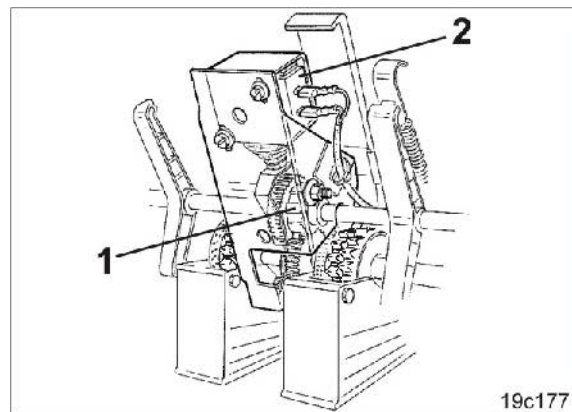


Fig. 78

Hydraulic operation

The wrap spring clutch (Fig. 79/1) is operated by a lever (Fig. 79/2) connected to the control box (Fig. 79/3).

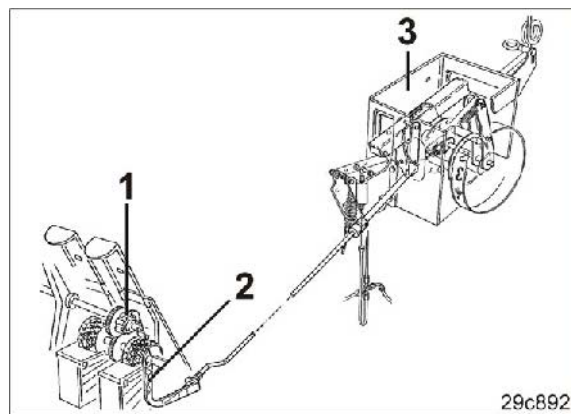


Fig. 79

Track and track width

Spur gears (Fig. 80/1) on the lay shaft (Fig. 80/2) drive the tramline seed wheels (Fig. 80/3).

Track

The wheelmark spacing (Fig. 73/a) is adjusted by moving the spur gears on the lay shaft (see "Setting the tramline spacing and track width/wheelmark spacing (specialist workshop)", on page 156).

Track width

The track width (Fig. 73/c) increases with an increasing number of tramline coulters fitted next to each other (see "Setting the tramline spacing and track width/wheelmark spacing (specialist workshop)", on page 156).

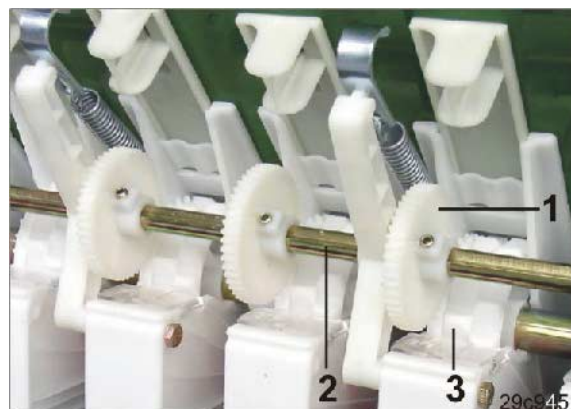


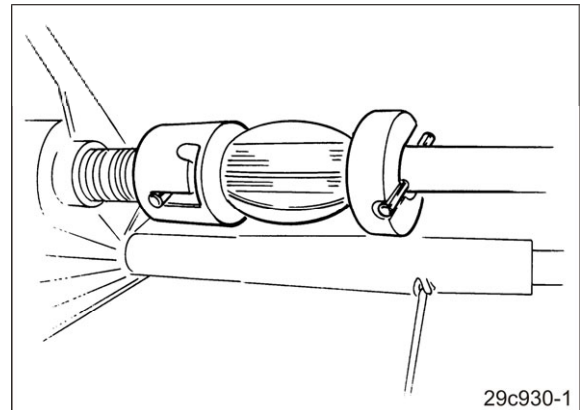
Fig. 80

5.13.5 Switching off the seed shaft on one half

The seed shaft disengage clutch (Fig. 81) can be used to disengage the left-hand half of the seed shaft and to interrupt the supply of seed to the coulters.



If the tramline seed wheels are also not intended to sow the seeds, the shutoff gates to the tramline seed wheels must be closed.



29c930-1

Fig. 81

5.13.6 Tramline marker (option)

When tramlines are being created, the track discs (Fig. 82) of the tramline marker lower automatically and mark the tramline that has just been created. The tramlines become visible on the field before the seed has been sown.

The following are adjustable

- the track of the tramline
- the working intensity of the track discs.



29c940-1

Fig. 82

The track discs (Fig. 83) are raised, if no tramline is created.



29c946

Fig. 83

6 Commissioning

This section contains information

- on initial operation of your machine
- on checking how you may connect the machine to your tractor.



- Before operating the machine for the first time the operator must have read and understood the operating manual.
- Take heed of section "Safety information for users", from on page 25 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 still achieves the required braking deceleration with the machine attached.

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 identification 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 dead-weight of the tractor.

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

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



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

- tractor's unladen 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 (attached machine)

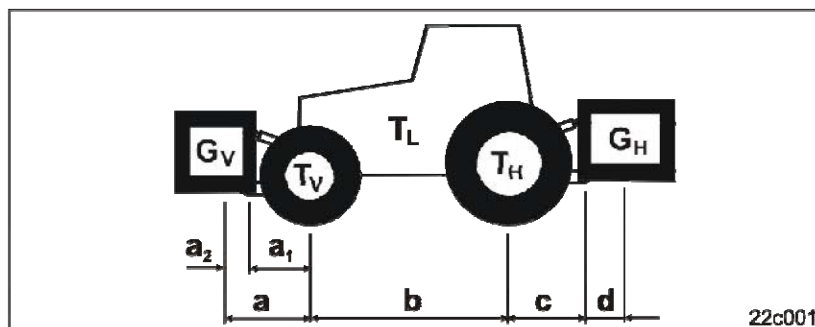


Fig. 84

T_L	[kg]	Empty tractor weight	See tractor operating manual or vehicle documentation
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of the empty tractor	
G_H	[kg]	Total weight of rear-mounted machine or rear ballast	See the section "Technical data for the calculation of tractor weights and tractor axle loads", on page 46 or rear weight
G_V	[kg]	Total weight of front-mounted machine or front ballast	See technical data for front-mounted machine or front ballast
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 machine mount or front weight (centre of gravity distance)	See technical data of front machine mounting or front weight or measurement
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement
d	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the rear-mounted machine or rear ballast (centre of gravity distance)	See the section "Technical data for the calculation of tractor weights and tractor axle loads", on page 46

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

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

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

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

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

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

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

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

Enter the numeric value for the calculated actual total weight and the approved total tractor weight specified in the tractor operating manual in the table (Section 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 Tractor tyre loadbearing 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 crushing, cutting, entrapment, drawing in and impact through insufficient stability of the tractor and insufficient tractor steering capability and braking 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 ($G_{V \min}$).



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

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 is not secured against unintentional rolling away by the applied parking brake
 - 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. Lower the raised, unsecured machine / raised, unsecured parts of the machine.
- This is how to prevent unintentional falling:
2. Shut down the tractor engine.
 3. Remove the ignition key.
 4. Apply the tractor's parking brake.

6.3 Initial fitting of the operating terminal

Fit the AMACO **AMALOG⁺** or **AMATRON⁺** operating terminal in the tractor cab following the instructions in the relevant operating manual.

6.4 Initial fitting of the exact harrow attachment parts for top-mounted seed drills with seed press rollers (specialised workshop)

1. Couple the machine up to the tractor (see "Coupling and uncoupling the machine", on page 88).
2. Screw the included parts to the top-mounted seed drill as shown in Figure (Fig. 85).

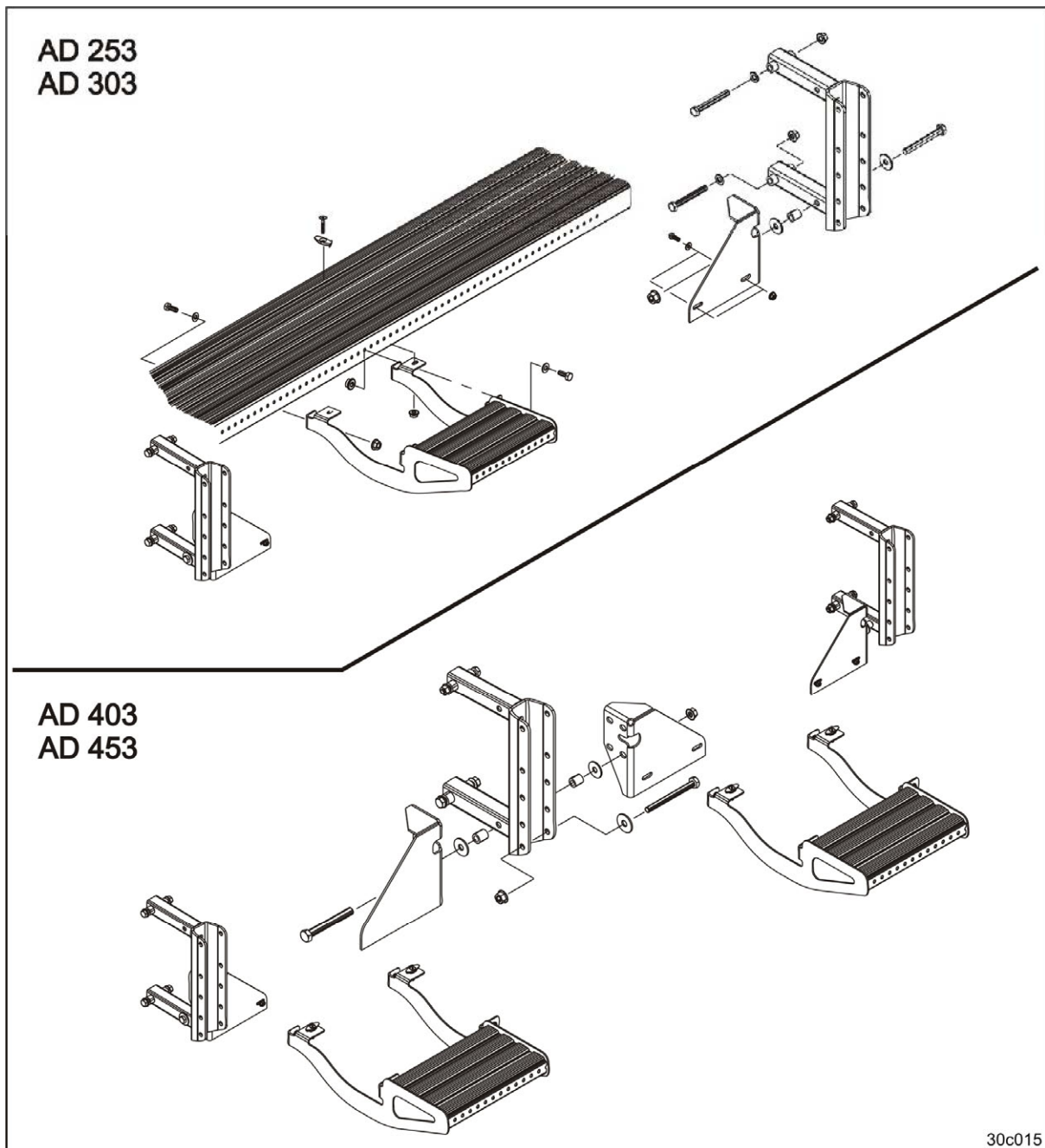


Fig. 85

6.5 Initial fitting of the exact harrow (specialist workshop)

1. Couple the machine up to the tractor (see "Coupling and uncoupling the machine", on page 88).
2. Attach holder tubes (Fig. 86/1) to the brackets using bolts (Fig. 86/2) and secure with lynch pins (Fig. 86/3).

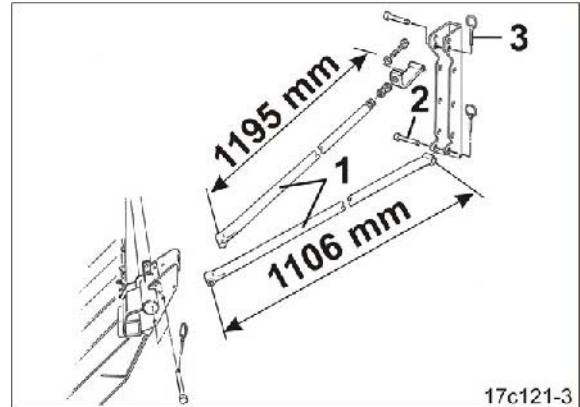


Fig. 86

3. Shift control valve 2 to the float position.
4. Connect the pre-assembled hydraulic hose (Fig. 87/1) to the hydraulic cylinder (Fig. 87/2).
5. Repeat the procedure for the second hydraulic cylinder (if fitted).



Route the hydraulic hose (Fig. 87/1) with a sufficiently large bend at the hinge points of the holder tubes on the exact harrow so that the hose is not torn away by the movement of the exact harrow.

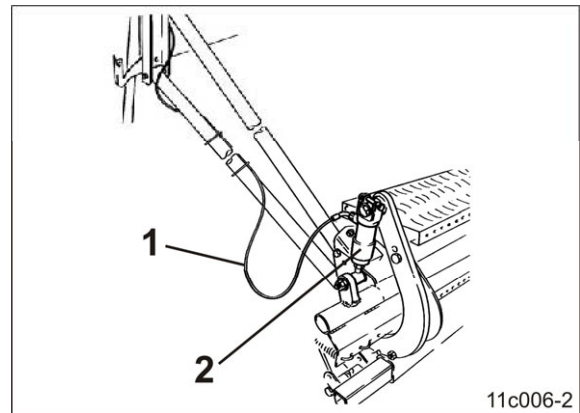


Fig. 87

6. Apply pressure to control valve 2 and check all unions for fluid leaks.

6.6 Initial fitting of the loading board (specialist workshop)

The safety step grate (Fig. 88/1) is already fastened to the machine.

1. Screw on the handrail (Fig. 88/2).
2. Fasten the step (Fig. 88/3) onto the harrow next to the handrail.

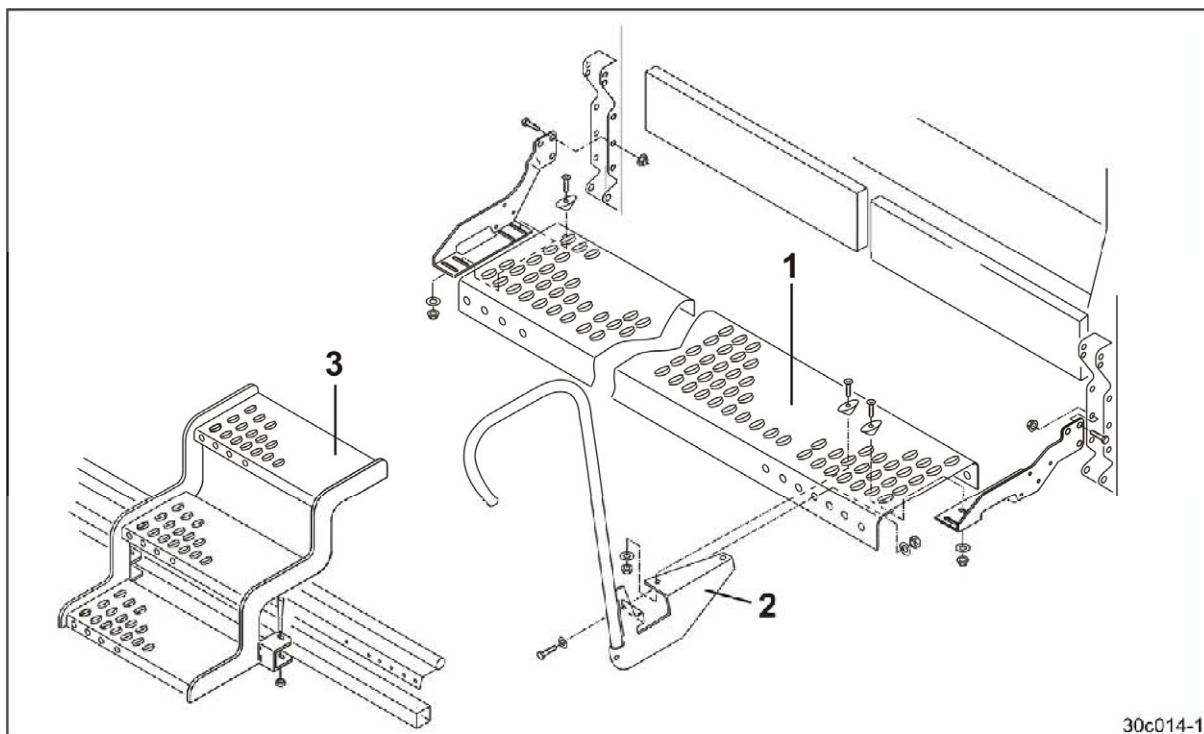


Fig. 88

6.7 Initial installation of mounts for the road safety bar

Screw two mounts (Fig. 89/1) to the exact harrow (Fig. 89/2).



During work, secure the road safety bars (Fig. 90/2) to the mounts (Fig. 90/1).

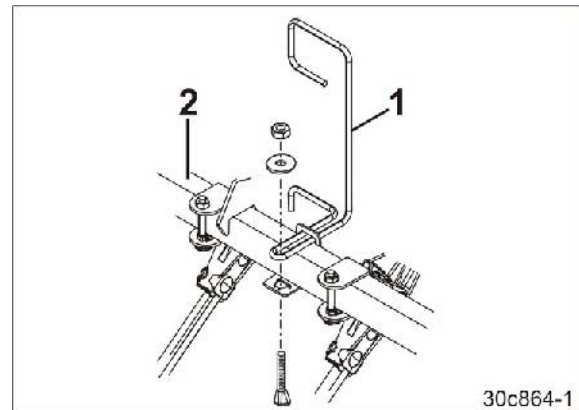


Fig. 89

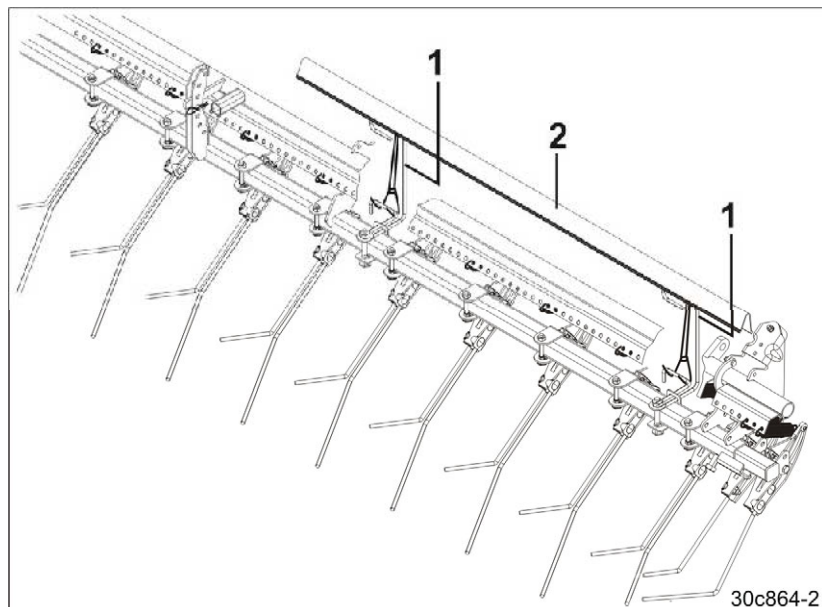


Fig. 90

7 Coupling and uncoupling the machine



When coupling and uncoupling the machine take heed of the section "Safety information for users", on page 25.



WARNING

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

Secure the tractor and machine against unintentional start-up and rolling away before entering the danger area between the tractor and machine to couple or uncouple the machine. See on page 83 in this regard.



WARNING

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

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

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

7.1 Coupling the machine



WARNING

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

You may only connect the machine to tractors suitable for the purpose. On this subject see the section "Checking the suitability of the tractor", on page 79.



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 machines in the proper way.
- Whenever you couple the machine, check the coupling parts, such as the top link bolt, for visible defects. Replace the coupling parts in the event of clearly visible wear.
- Secure the coupling parts such as the top link bolt, with a lynch pin so that they do not accidentally detach.

**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.

7.2 Mounting top-mounted seed drill on combinations with tooth packer roller PW 500 and wedge ring roller KW 520

The top-mounted seed drill is equipped with

- two hinging plates (Fig. 91/1) for use with the packer roller PW 500
- two carriers (Fig. 91/2) for use with the wedge ring roller KW 520.

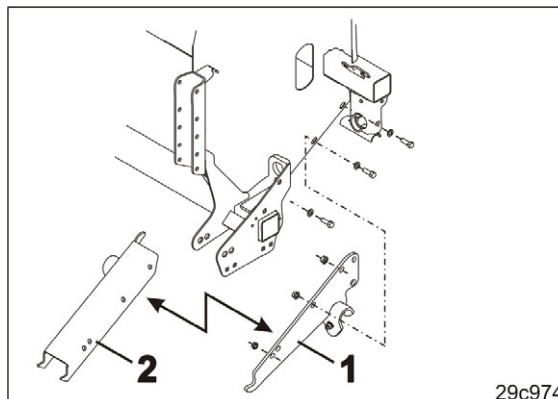


Fig. 91

The rollers PW 500 and KW 520 are equipped with two bearing brackets (Fig. 92/1).

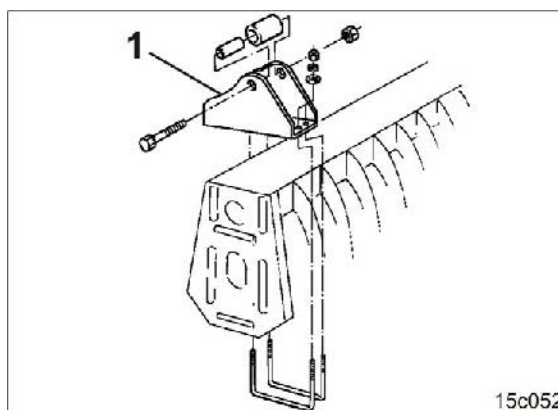


Fig. 92

1. Direct persons away from the danger area between the combination and the machine.
2. Drive the combination in reverse towards the top-mounted seed drill parked on the parking supports.
3. Use the catching sockets (Fig. 93/1) to catch the bearing bushes (Fig. 93/2).
4. Apply the handbrake, switch the tractor engine off and remove the ignition key.
5. Secure the connection using screws (Fig. 93/3).

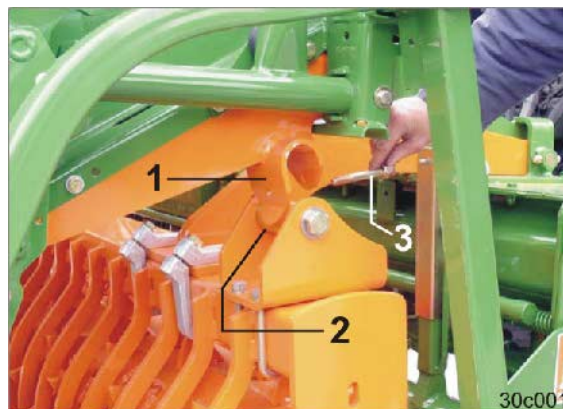


Fig. 93

6. Peg the top link (Fig. 94/1) using Cat. II top link bolts on the soil tillage implement and the top-mounted seed drill.
7. Secure the top link bolt (Fig. 94/2) using lynch pins.

**Fig. 94**

8. Raise the combination and remove the parking supports (Fig. 95/1).

**Fig. 95**

9. Lower the combination, pull the handbrake, apply the handbrake, switch the engine off and remove the ignition key.
10. Align the top-mounted seed drill until straight by adjusting the top link (Fig. 94/1).
11. Connect the supply lines
(see "Make the connections", on page 95).

7.3 Mounting top-mounted seed drill on combinations with tooth packer roller PW 600 and wedge ring roller KW 580

The top-mounted seed drill is equipped with

- two plastic covers (Fig. 96/1) and

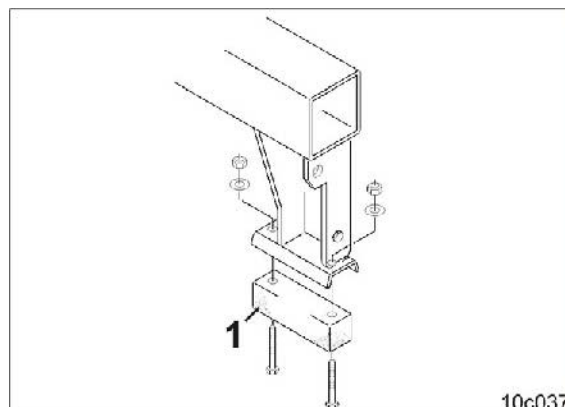


Fig. 96

- two bearing bushes (Fig. 97/1).

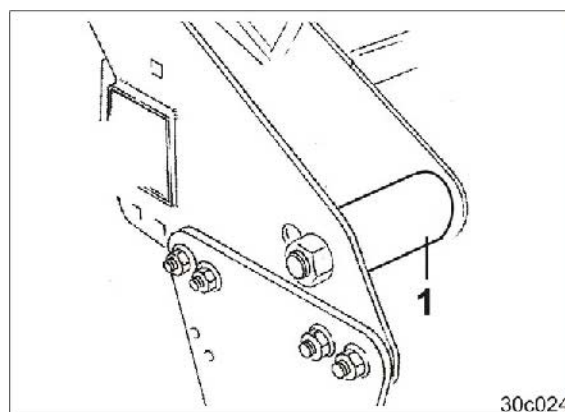


Fig. 97

The rollers PW 600 and KW 580 are equipped with catching sockets (Fig. 98/1).

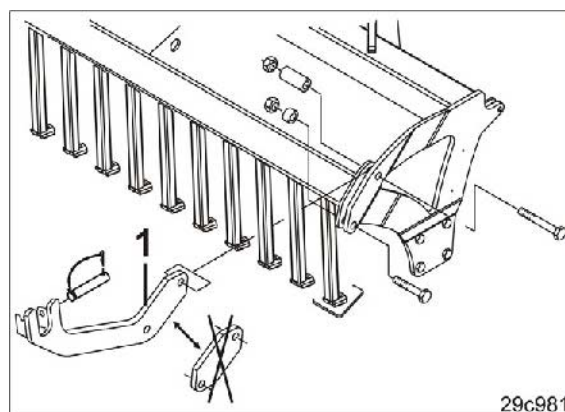


Fig. 98

1. Direct persons away from the danger area between the combination and the machine.
2. Drive the combination in reverse towards the top-mounted seed drill parked on the parking supports.
Carefully guide the catching sockets (Fig. 99/1) under the square tube (Fig. 99/2) of the top-mounted seed drill.



Fig. 99

3. Use the catching sockets (Fig. 100/1) to catch the bearing bushes (Fig. 100/2).
4. Pin the connections using bolts (Fig. 100/3) and secure them using spring pins.

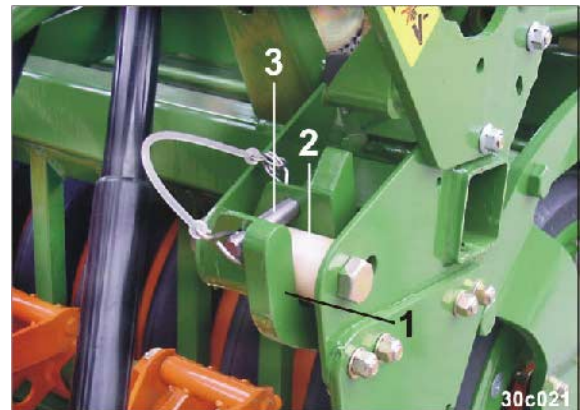


Fig. 100

5. Fasten the top-mounted seed drill to the roller using 2 turnbuckles (Fig. 101/1).
6. Secure each bolt (Fig. 101/2) using a lynch pin.
7. Tighten and secure the turnbuckles (counter nuts).



Fig. 101

8. Raise the combination and remove the parking supports (Fig. 102/1).



Fig. 102

Coupling and uncoupling the machine

9. Lower the combination onto the ground.
10. Apply the handbrake, switch the tractor engine off and remove the ignition key.
11. Peg out the top link (Fig. 103/1) using Cat. II top link bolts on the soil tillage implement and the top-mounted seed drill.
12. Secure the top link bolt (Fig. 103/2) using lynch pins.
13. Align the top-mounted seed drill until straight by adjusting the top link (Fig. 103/1).
14. Pull out the upper carrying arm bolt (Fig. 104/1).
- Adjust the top link (Fig. 103/1) if the carrying arm bolt does not detach.
15. Move the carrying arm bolt (Fig. 105/1) into parking position and secure it using a lynch pin.
16. Repeat the operation on the second carrying arm.



Fig. 103



Fig. 104



Fig. 105



The top-mounted seed drill can move freely in the parallelogram frame after the upper carrying arm bolt is removed.

17. Connect the supply lines (see "Make the connections", on page 95).

7.4 Make the connections

7.4.1 Connecting the hydraulic connections



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

Tractor control unit		Connection	Marking	Function
1	single action	Delivery/return flow	1 cable tie, yellow	<ul style="list-style-type: none"> Track marker left Track marker right Control box Tramline marking

Tractor control unit		Connection	Marking	Function
2	single action	Delivery/return flow	1 cable tie, blue	<ul style="list-style-type: none"> Coulter pressure adjustment Exact harrow pressure adjustment Seed rate remote adjustment

Tractor control unit		Connection	Marking	Function
3	single action	Delivery/return flow	1 cable tie, white	Star wheel raised position



During work, the control unit 1 is actuated more frequently than any other control units. Assign the connections of control unit 1 to an easily reachable control unit in the tractor cab.

7.4.2 Make the further connections

Connection/function	Installation information
Plug (7-pin) for the road traffic lighting system	
Machine plug <ul style="list-style-type: none"> • AMACO • AMALOG⁺ • AMATRON⁺ 	Plug the connectors into the operating terminal in the tractor cab as described in the relevant operating instructions.



Check the function of the lighting system.

Control box only:

Route the cable (Fig. 106/1) for operating the control lever (Fig. 106/2) into the tractor cab.

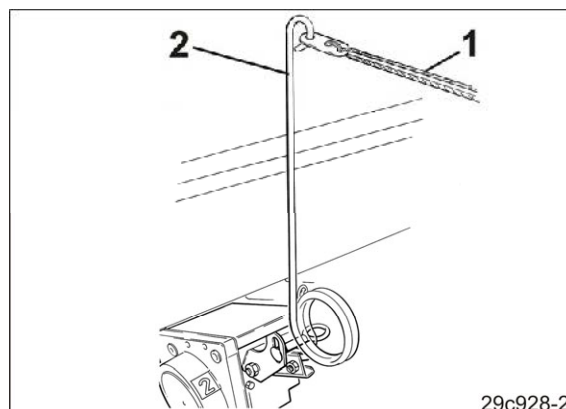


Fig. 106

7.5 Decoupling the top-mounted seed drill



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.

7.5.1 Decoupling top-mounted seed drill with tooth packer roller PW 500 and wedge ring roller KW 520

1. Raise the track marker and secure it using lynch pins (see "Securing the track markers for transport" on page 133).
2. Move the star wheel to transport position (see "Moving the star wheel", on page 134).
3. Empty the seed box (see "Emptying the seed box and seed wheel housing", on page 141).
4. Place the combination on the ground and move all control units to float position.
5. Apply the handbrake, switch the tractor engine off and remove the ignition key.
6. Decouple the supply lines of the seed drill.
7. Close the hydraulic connectors with protective caps.
8. Raise the combination and plug the parking supports (Fig. 95/1) into the square tubes of the top-mounted seed drill.
9. Remove the screws (Fig. 107/1) from both catching sockets.



Fig. 107

10. Lower the combination until the top-mounted seed drill rests on the parking supports (Fig. 95/1).
11. Apply the handbrake, switch the tractor engine off and remove the ignition key.

12. Remove the top link (Fig. 94/1).
13. Carefully raise the soil tillage implement and pull it forwards without touching the top-mounted seed drill.

7.5.2 Decoupling top-mounted seed drill with tooth packer roller PW 600 and wedge ring roller KW 580

1. Raise the track marker and secure it using lynch pins (see "Securing the track markers for transport" on page 133).
 2. Move the star wheel to transport position (see "Moving the star wheel", on page 134).
 3. Empty the seed box (see "Emptying the seed box and seed wheel housing", on page 141).
 4. Place the combination on the ground and move the control units to float position.
 5. Apply the handbrake, switch the tractor engine off and remove the ignition key.
 6. Decouple the supply lines of the seed drill.
 7. Close the hydraulic connectors with protective caps.
8. Pin the carrying arms using the upper carrying arm bolts (Fig. 108/1). Align the bores until superimposed by adjusting the top link (Fig. 103/1).
 9. Secure the carrying arm bolts using lynch pins.



Fig. 108

10. Remove the top link (Fig. 103/1).
11. Raise the combination and plug the parking supports (Fig. 102/1) into the square tubes of the top-mounted seed drill.

12. Remove the bolts (Fig. 109/1) from both catching hooks.

**Fig. 109**

13. Unscrew the counter nuts and relieve the tension of the turnbuckle (Fig. 110/1).
14. Remove both bolts (Fig. 110/2).
15. Repeat the operation on the second turnbuckle.

**Fig. 110**

16. Lower the combination onto the parking supports.
17. Lower the soil tillage implement and carefully bring it forward.

8 Settings



WARNING

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

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

Secure the tractor and attached machine against unintentional starting or rolling away before you make any adjustments to the machine; see 6.2, on page 83.

8.1 Setting the normal and fine seed metering wheel

1. Take the calibration trays off of the rear wall of the seed box.
2. Raise the star wheel (see "Moving the star wheel", on page 134).
3. Insert the calibration cranks (Fig. 111/1) into the square tube of the star wheel.



Fig. 111

4. Turn the star wheel clockwise until the holes (Fig. 112/1) in the fine seed metering wheel are visible.
5. Adjust the seed wheels according to the table (see Fig. 41, on page 55).

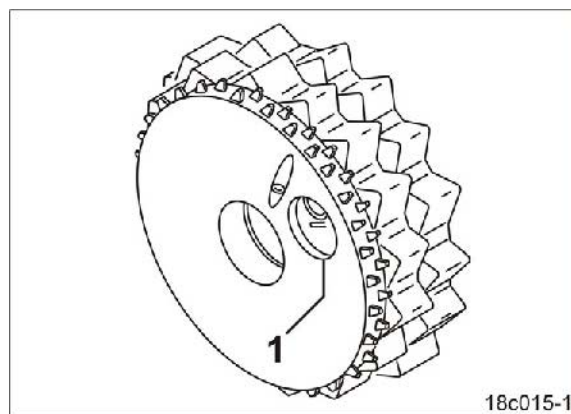


Fig. 112

Sowing with normal seed wheels

1. Turn the normal seed wheel on the seed shaft by hand until the pin (Fig. 113/1) is visible in the hole.

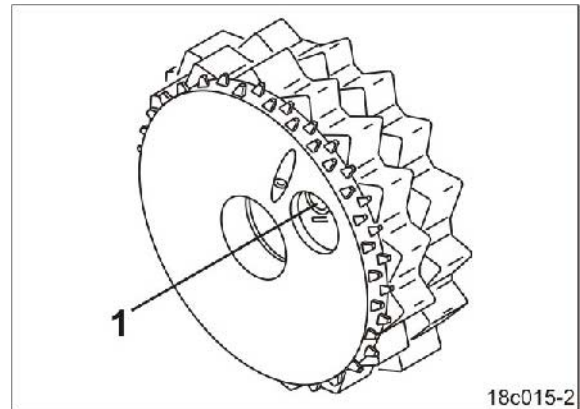


Fig. 113

2. Press the pin against the fine seed metering wheel with the key (Fig. 114/1) provided.
3. Check the connection.
4. Repeat the operation for all the seed wheels.

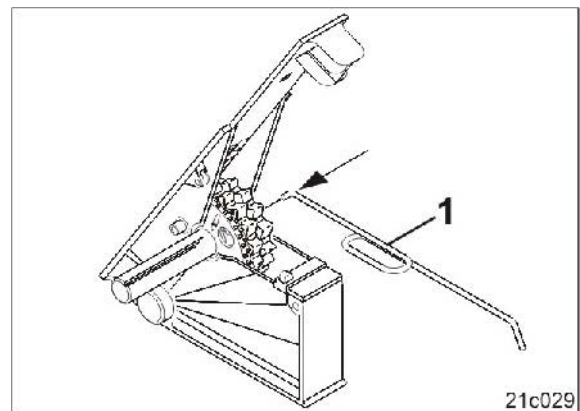


Fig. 114

Sowing with fine seed metering wheels

1. Using the key (Fig. 115/1) provided, press the pin behind the hole into the normal seed wheel as far as the stop.
2. Check that the normal seed wheel can turn freely on the seed shaft.
3. Repeat the operation for all the seed wheels.

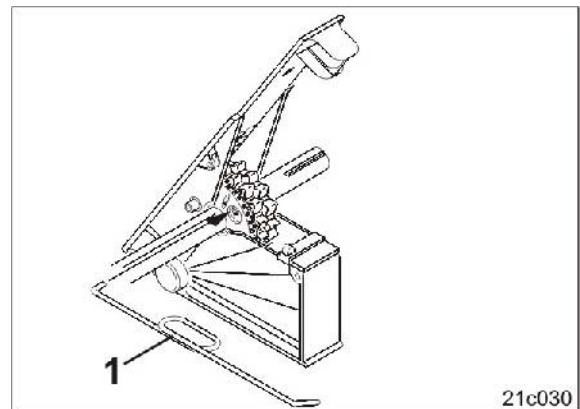


Fig. 115

Sowing with bean seed wheel (option)

The bean seed wheels can be

- swapped with the normal and fine seed metering wheels after removal of the seed shaft or
- mounted together with a second seed shaft.

The bean seed wheels must always be fitted in a specialist workshop (see "Fitting the bean seed wheels", on page 159).

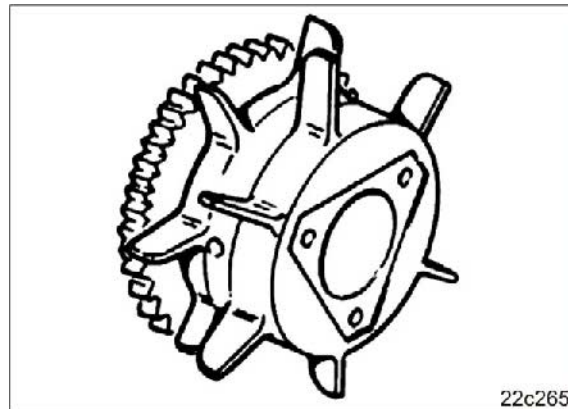


Fig. 116

8.2 Setting the shutoff gates

1. Take the calibration trays off of the rear wall of the seed box.

2. Set the shutoff gates (Fig. 117) to the value in the table (see Fig. 41, on page 55).

The shutoff gates (Fig. 117) latch into one of the three positions:

- | | | |
|----------|----------|-----------------|
| A | = | closed |
| B | = | 3/4 open |
| C | = | open |

3. Close the shutoff gates to the seed wheel housings that are not required.

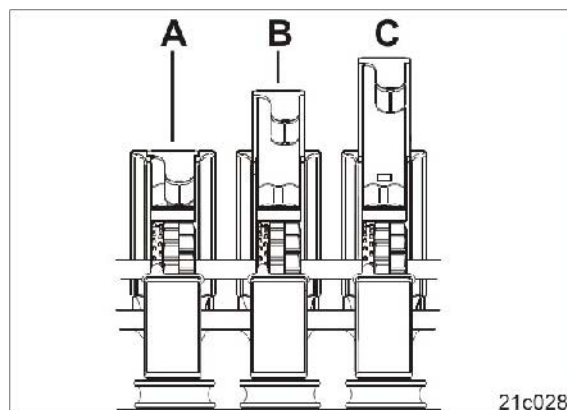


Fig. 117



This setting has an effect on the sowing rate.
Check the setting using a calibration test.

8.3 Setting the bottom flap position

1. Set the bottom flap lever (Fig. 118/1) to the value in the table (see Fig. 41, on page 55).

The bottom flap lever can lock into place in one of 8 holes.

To open the bottom flaps, swing the bottom flap lever downwards past the holes.

2. Secure the bottom flap lever using a lynch pin (Fig. 118/2).

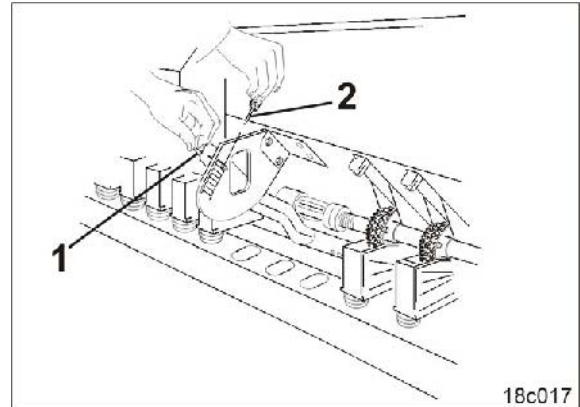


Fig. 118



This setting has an effect on the sowing rate.
Check the setting using a calibration test.



The basic setting for the bottom flaps is made as described in "Bottom flap basic setting", on page 149.

8.4 Setting the level sensor

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

1. Undo the butterfly nut (Fig. 119/1).
2. Adjust the height of the level sensor (Fig. 119/2) to the required seed volume.

AMALOG+ and **AMATRON+** issue an alarm when the level sensor is no longer covered with seed.

3. Tighten the butterfly nut (Fig. 119/1).

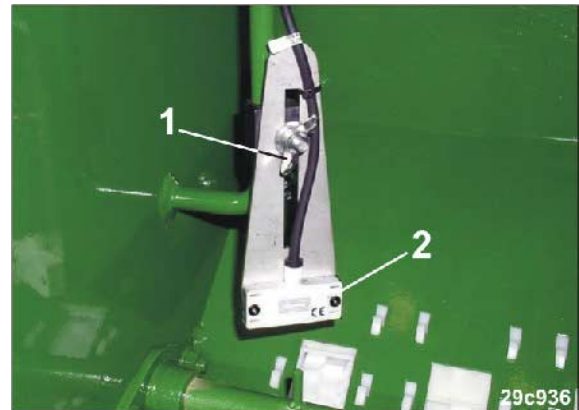


Fig. 119



Increase the residual seed volume, which triggered the alarm:

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

8.5 Agitator shaft drive

The agitator shaft is driven when the lynch pin (Fig. 120/1) is inserted in the bore in the gearbox hollow shaft.

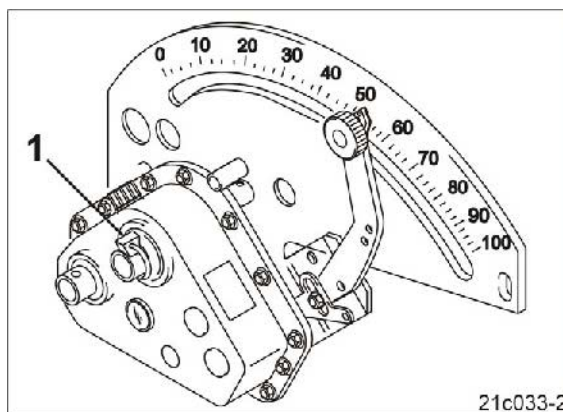


Fig. 120

The agitator shaft is halted when the lynch pin (Fig. 121/1) is inserted in the bore in the takeoff shaft.



This setting has an effect on the sowing rate.
Check the setting using a calibration test.

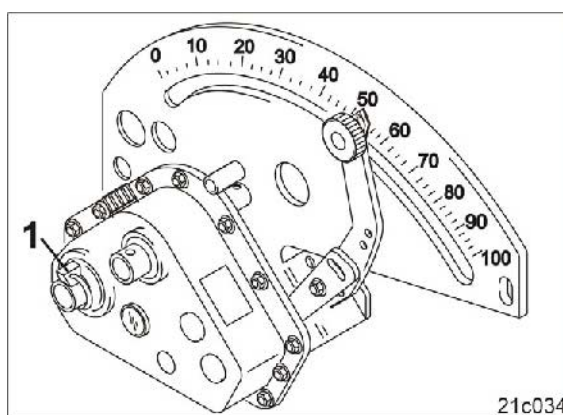


Fig. 121

8.6 Filling the seed box



DANGER

Connect the top-mounted seed drill to the soil tillage implement before filling the seed box.

Observe the permissible fill levels and total weights.

Empty the seed box before decoupling the top-mounted seed drill.

1. Open the seed box lid by the handle (Fig. 122/1).
2. Fill the seed box from the rear side of the top-mounted seed drill.



The seed drill can be filled comfortably from the loading board (Fig. 122/2, option).



Fig. 122



Do not place any heavy objects on the float (Fig. 123) for the fill level indicator when filling the seed box.

Make sure that the float is lying on the seed before closing the seed box lid.



Fig. 123

8.7 Setting the sowing rate with a calibration test

It is tested by means of the calibration test whether the preset and actual sowing rates are equivalent.

Always carry out a calibration test

- when the seed type is changed
- if the seed type is identical, but size grain, grain shape, specific weight and dressing are different
- after changing from the normal seed wheel to the fine seed metering wheel or bean seed wheel and vice versa
- after any adjustment of the
 - bottom flaps
 - shutoff gates
- after engaging or disengaging the agitator shaft.



Repeat the calibration test after approximately 2 ha.

1. Fill the seed box to at least 1/3 of capacity (correspondingly less for fine seeds) (see "Filling the seed box", on page 105).
2. Raise the star wheel and lock it in place.
3. Apply the handbrake, switch the tractor engine off and remove the ignition key.



CAUTION

Apply the handbrake, shut off the tractor motor and remove the ignition key.

4. Withdraw the spring-loaded lever (Fig. 124/1) from the latch by pulling it upwards.

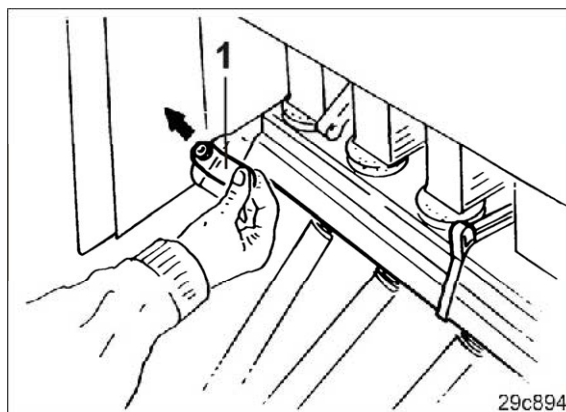


Fig. 124

5. Lower the hopper bar (Fig. 125/1).

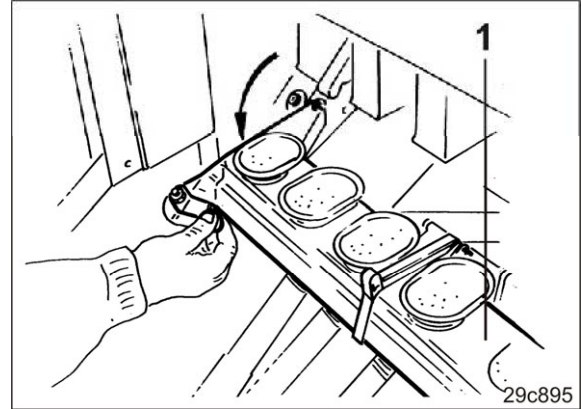


Fig. 125

6. Pull the calibration trays (Fig. 126) upwards out of their holders.



Fig. 126

7. Lower the calibration trays (Fig. 127) onto the funnel rail so that the seed cannot fall next to the calibration trays during the subsequent calibration test.



Fig. 127



The tramline counter may not show the number 0 during the calibration test

- in the **AMALOG⁺** display
- in the **AMATRON⁺** display
- in the control box window.

When 0 is shown, no seed is delivered by the tramline seed wheels.

Settings

8. Only seed drills with the control box:
 - 8.1 Pull the control lever (Fig. 128/1), once if the control box falls shows "0" (Fig. 128/2).

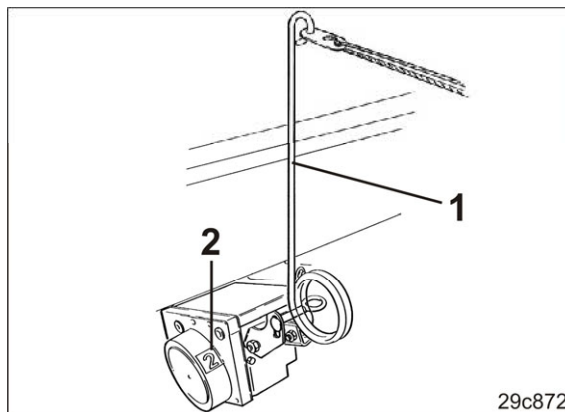


Fig. 128

9. Undo the locking button (Fig. 129/1).
10. Consult the table (Fig. 130, below) for the gearbox setting value for the first calibration test.
11. Set the pointer (Fig. 129/2) of the gearbox lever **from below** to the gearbox setting value.
12. Tighten the locking button.

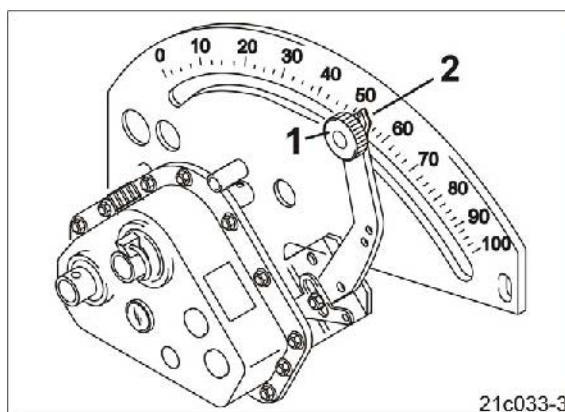


Fig. 129

Gearbox setting values for the first calibration test

Sowing with normal seed wheels:	gearbox setting "50"
Sowing with fine seed metering wheels:	gearbox setting "15"
Sowing with bean seed wheels:	gearbox setting "50"

Fig. 130



Setting the gearbox lever

- on seed drills with hydraulic remote sowing rate adjustment (see 8.7.1, on page 112)
- on seed drills with **AMATRON⁺** and electronic sowing rate adjustment (see **AMATRON⁺** operating instructions)

13. Take the calibrating crank (Fig. 131/1) from its holder beneath the seed box.



Fig. 131

14. Insert the calibration cranks into the square tube of the star wheel.



Fig. 132

15. Turn the star wheel until the seed falls out of all seed housings into the calibration trays (Fig. 133/1).
16. Fill the calibration trays twice by turning calibrating crank (about 200 rotations of the crank are sufficient for fine seeds).



The calibration test sets up the same conditions as will be found in the later operations in the field.

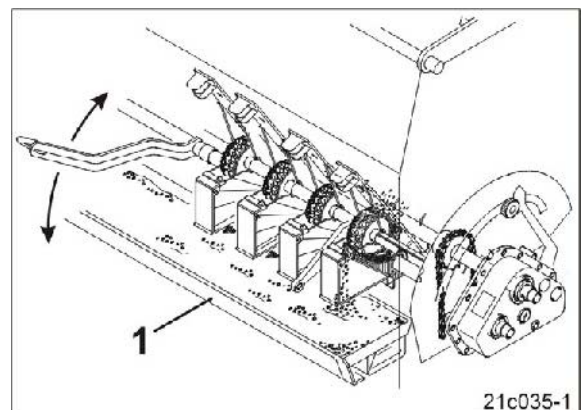


Fig. 133

17. Empty the calibration trays into the seed box and place on the hopper bar again.

18. Turn the star wheel (Fig. 134) clockwise for the number of crank revolutions specified in the table (Fig. 135)¹⁾.

¹⁾ see **AMATRON+** operating instructions for seed drills with **AMATRON+** and electronic sowing rate setting



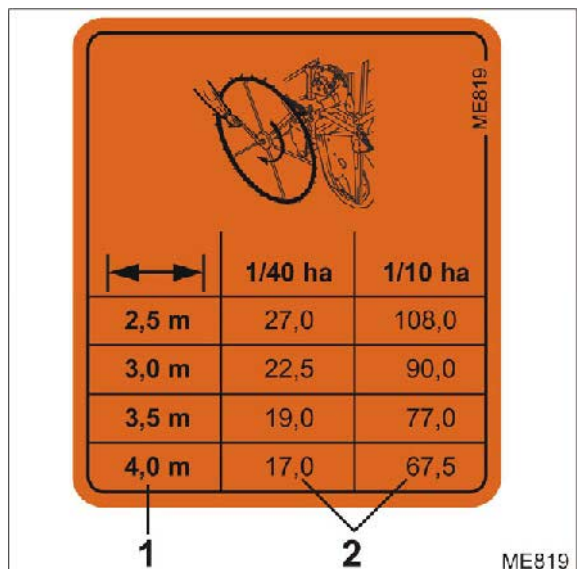
Fig. 134

The number of crank turns at the star wheel depends on the working width of the seed drill (Fig. 135/1).

The number of wheel revolutions (Fig. 135/2) relates to an area of

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

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



	1/40 ha	1/10 ha
2,5 m	27,0	108,0
3,0 m	22,5	90,0
3,5 m	19,0	77,0
4,0 m	17,0	67,5

Fig. 135

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



Check the accuracy of the scale display.

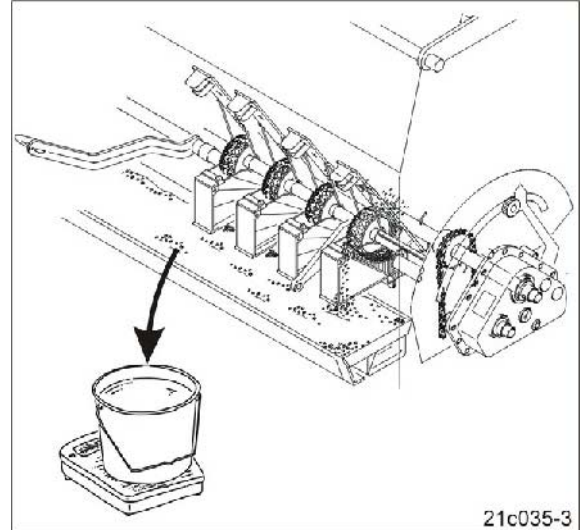


Fig. 136

Calibrating on 1/40 ha:

$$\text{Sowing rate [kg/ha]} = \text{volume of seed in test [kg/ha]} \times 40$$

Calibrating on 1/10 ha:

$$\text{Sowing rate [kg/ha]} = \text{volume of seed in test [kg/ha]} \times 10$$

Example:

Volume of seed in test: 3.2 kg on 1/40 ha

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



The desired sowing rate is not generally achieved in the first calibration test. The correct gearbox setting can be determined using the calculating disc rule with the values from the first calibration test and the sowing rate calculated from that (see "Determining the gearbox setting using the calculating disc rule", on page 114).

Settings

20. Repeat the calibration test until the desired sowing rate is achieved.
21. Fasten the calibration trays to the seed box (see Fig. 137).
22. Push the hopper bar upwards and latch.
23. Clip the calibrating crank into its transport bracket.



Fig. 137

8.7.1 Setting the hydraulic sowing rate adjustment



WARNING

Direct persons away from the area of the Vario gearbox, coulter pressure and exact harrow pressure adjustment.

Setting the normal sowing rate

1. Shift control valve 2 to the float position.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Undo the locking button (Fig. 138/1).
4. Consult the table (Fig. 130, on page 108) for the gearbox setting value.
5. Set the pointer (Fig. 138/2) of the gearbox lever from below to the gearbox setting value.
6. Tighten the locking button.
7. Determine the gearbox setting required for the desired sowing rate (see "Setting the sowing rate with a calibration test", on page 106).

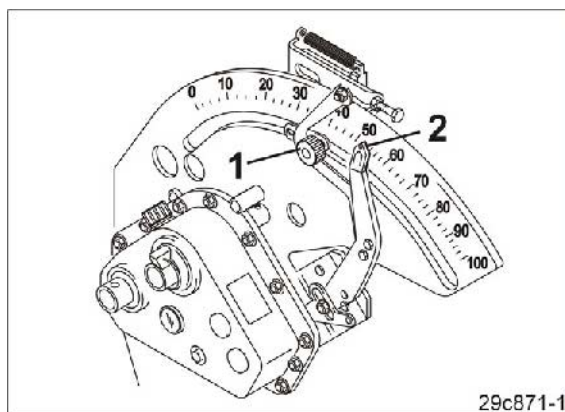


Fig. 138

Setting the elevated sowing rate

1. Operate control valve 2.
- Apply pressure to the hydraulic cylinder.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Use the adjusting screw (Fig. 139/1) to set the pointer (Fig. 139/2) of the gearbox lever to the desired gearbox setting for the elevated sowing rate.

Unscrew adjusting screw (Fig. 139/1):
increase sowing rate.

Screw in adjusting screw (Fig. 139/1):
reduce sowing rate.

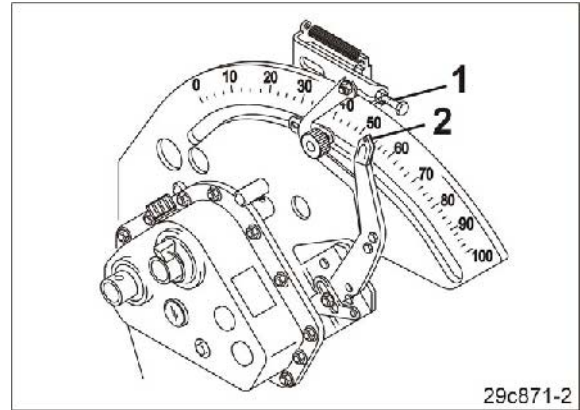


Fig. 139

4. Lock the adjusting screw.
5. Determine the elevated sowing rate with a calibration test (see "Setting the sowing rate with a calibration test", on page 106).
6. Shift control valve 2 to the float position.

Deselecting the elevated sowing rate

Operation of control valve 2 is intended to raise the coulter pressure and the exact harrow pressure, but not the sowing rate.

To do so, screw in the adjusting screw (Fig. 140/1) all the way and lock it.

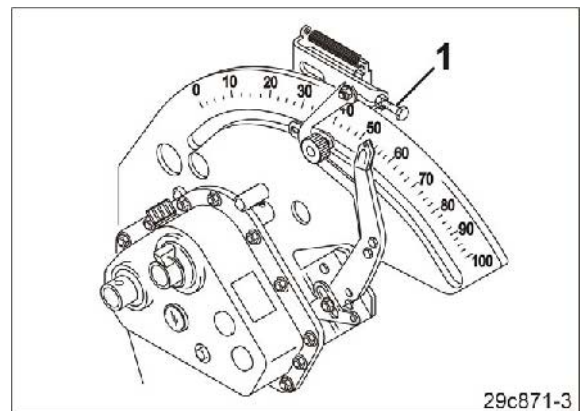


Fig. 140

8.7.2 Determining the gearbox setting using the calculating disc rule

Example:

Values from the calibration test

computed sowing rate: 175 kg/ha
gearbox setting: 70

Desired sowing rate: 125 kg/ha.

1. Line up the values from the calibration test
 - o computed sowing rate 175 kg/ha (Fig. 141/A)
 - o gearbox setting 70 (Fig. 141/B)
 opposite one another on the calculating disc rule.
 2. Read the gearbox setting for the desired sowing rate of 125 kg/ha (Fig. 141/C) from the calculating disc rule.
- Gearbox setting 50 (Fig. 141/D).
3. Set the gearbox lever to the value read from the disc.
 4. Check the gearbox setting by repeating the calibration test (see "Setting the sowing rate with a calibration test", on page 106).

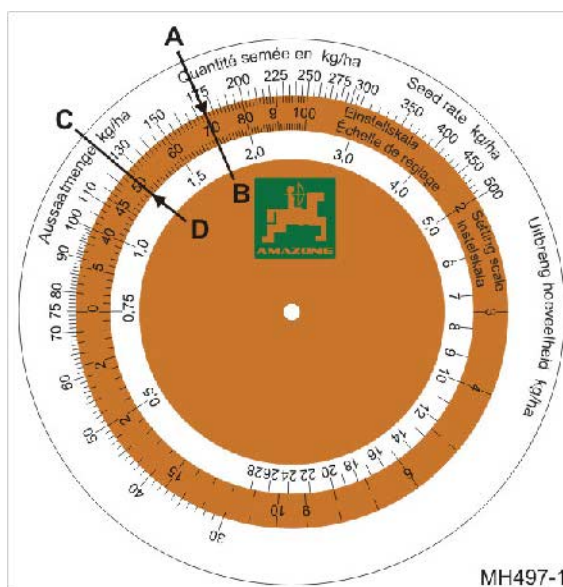


Fig. 141

8.8 Adjusting the marker



DANGER

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

Only adjust the track marker settings when the parking brake is applied, the engine switched off and the ignition key removed.

1. Position the machine on the field.
 2. Release both track markers (see "Securing the track markers for transport", on page 133).
 3. Direct people out of the danger area of the machine.
 4. Operate control unit 1.
- Lower one track marker.
5. Apply the handbrake, switch the tractor engine off and remove the ignition key.

6. Slacken the screws (Fig. 142/1).
7. Set the track marker to length "A" (see table "Fig. 144", on page 116).
8. Turn the track marker disc to adjust the working intensity of the track markers so that they run roughly parallel to the direction of travel on light soil and are more attuned to grip on heavier soil.
9. Tighten the bolts.
10. Repeat the operation on the second screw.


Fig. 142

Only seed drills with marker change over:

11. Limit the working depth of the track marker discs to a depth of approximately 5 cm by swapping around the chain (Fig. 143/1).
12. Secure the chain using a lynch pin.
13. Repeat the operation on the second screw.


Fig. 143

Working width	Distance A ¹⁾
2,50 m	2,50 m
3,00 m	3,00 m
3,50 m	3,50 m
4,00 m	4,00 m

¹⁾ Distance from the centre of the machine to the contact area of the track marker disc

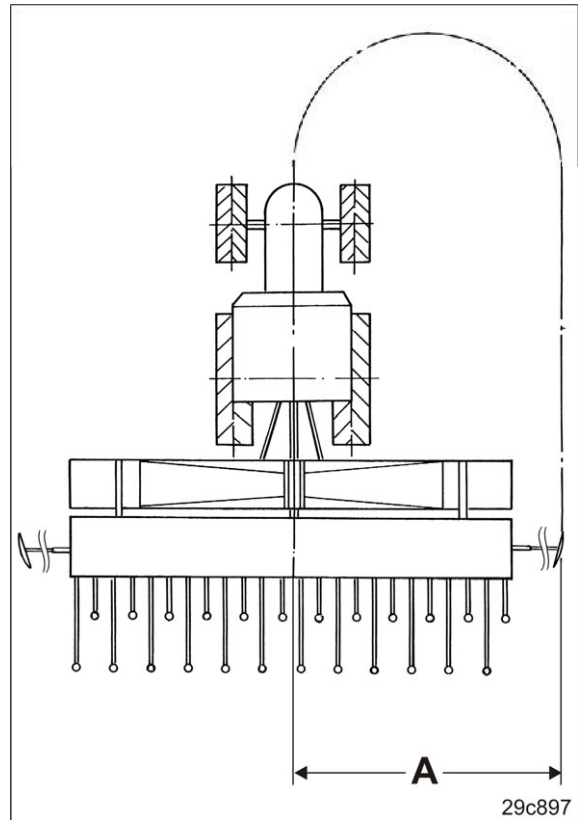


Fig. 144

8.9 Fastening the band sowing shoe to the WS coulter

Fix the band sowing shoe (Fig. 145/1) to the WS coulter with a bolt and secure with a lynch pin.

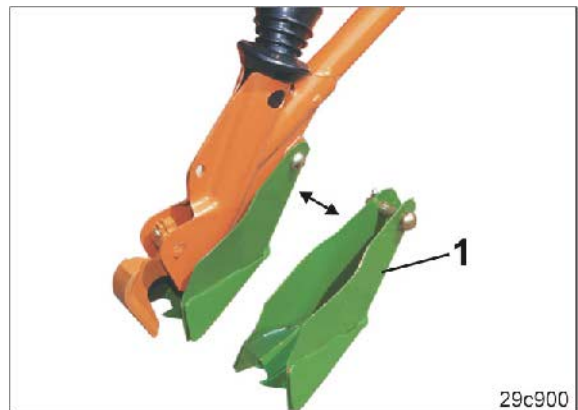


Fig. 145

8.10 Setting the coulter pressure



Check the planting depth of the seed after every adjustment (see "Checking the seed planting depth", on page 121).

8.10.1 Central coulter pressure adjustment

1. Place the calibrating crank (Fig. 146) on the adjusting spindle and set the coulter pressure.

Turning the calibrating crank

- anticlockwise causes shallower seed placement
- clockwise causes deeper seed placement.

2. Clip the calibrating crank into its transport bracket.



Fig. 146

8.10.2 Hydraulic coultter pressure adjustment



WARNING

Direct persons away from the area of the Vario gearbox, coultters and exact harrow.

Setting normal coultter pressure

1. Operate control valve 2.
- Apply pressure to the hydraulic cylinder.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Insert the bolt (Fig. 147/1) beneath the stop (Fig. 147/3) in one hole in the group and secure with a lynch pin (Fig. 147/2).

Each of the holes is identified with a number.

The higher the number on the hole, the greater the coultter pressure.

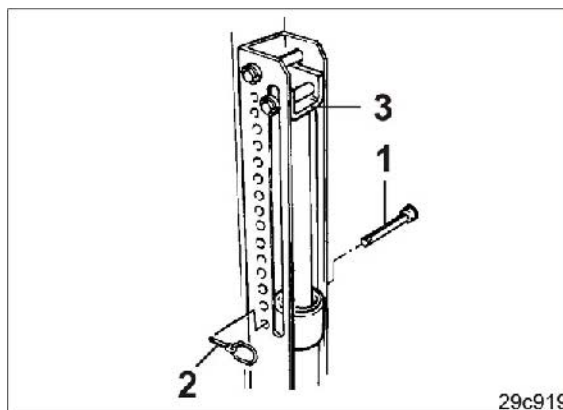


Fig. 147

4. Shift control valve 2 to the float position.

Setting elevated coultter pressure

1. Shift control valve 2 to the float position.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Insert the bolt (Fig. 148/1) above the stop (Fig. 148/3) in one hole in the group and secure with a lynch pin (Fig. 148/2).

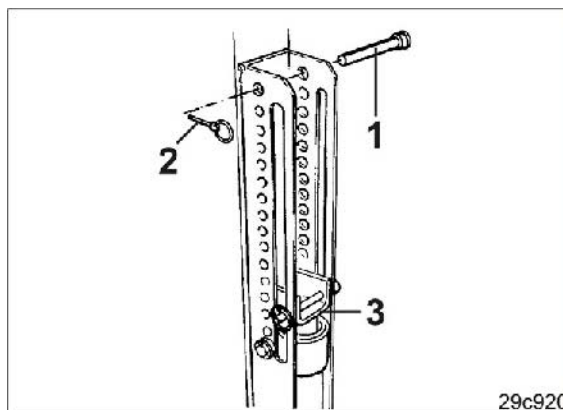


Fig. 148

8.10.3 Setting the RoTeC plastic discs

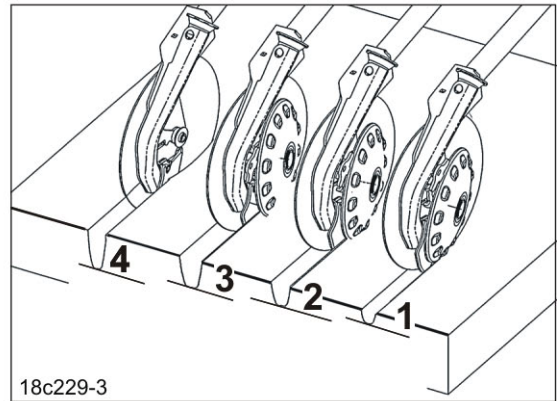
If it is not possible to achieve the desired planting depth as described in Chapter 8.10, on page 117 adjust all RoTeC plastic discs uniformly according to the table (Fig. 149).

Each plastic disc can lock into any of three positions on the RoTeC coulters or be removed from the RoTeC coulters completely.

After making adjustments to the discs, readjust the placement depth as described in Chapter 8.10, on page 117.



This adjustment influences the placement depth of the seed.
Check the placement depth of the seed every time you make new adjustments.



1	Lock position 1	Planting depth	approximately 2 cm
2	Lock position 2	Planting depth	approximately 3 cm
3	Lock position 3	Planting depth	approximately 4 cm
4	Sowing without plastic disc	Planting depth	> 4 cm

Fig. 149

Lock positions 1 to 3

1. Lock the handle (Fig. 150/1) into one of the 3 positions.



Fig. 150

Sowing without plastic disc

1. Turn the handle beyond the notches (Fig. 151/1) and remove the plastic disc from the RoTeC coulter.



Fig. 151

Installing the RoTeC plastic disc



Fasten the RoTeC plastic discs to the coulter according to their labels:

- "K" to the short coulter.
- "L" to 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.

8.10.4 Setting the seed press roller

1. Remove the lynch pin (Fig. 152/2).
2. Swing up the locking lever (Fig. 152/1).
3. Adjust the locking lever using the gear teeth (see table Fig. 153).
4. Push the locking lever down.
5. Lock the setting using the lynch pin (Fig. 152/2).

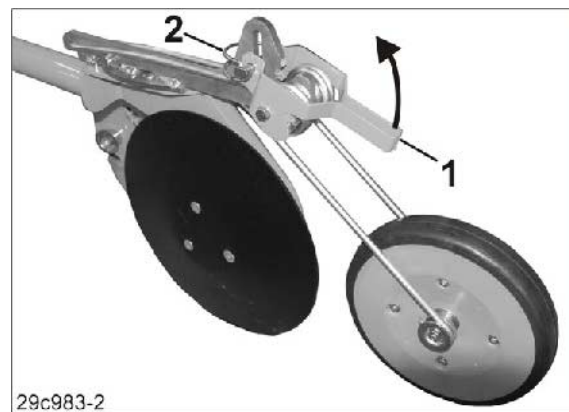


Fig. 152

Gear teeth	Pressure on the soil
Position A	No pressure
Position B	Medium pressure
Position C	Maximum pressure

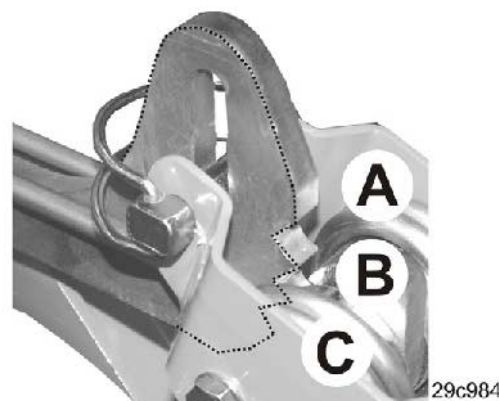


Fig. 153

8.10.5 Checking the seed planting depth

Check the seed planting depth

- after every coulter pressure adjustment
- after every adjustment of the RoTeC plastic discs
- on a change from light soil to heavy soil and vice versa

Checking the seed planting depth

1. Sow approximately 30 m at working speed.
2. Expose the seed at several locations.
3. Check the seed planting depth.

8.11 Adjusting the exact harrow



Check the results after any adjustment of the exact harrow.

8.11.1 Adjusting the spring tines

Adjust the tines by lengthening or shortening the holder tubes (Fig. 154/1).

1. Move the machine on the field to the working position.
2. Apply the parking brake, switch off the tractor engine and remove the ignition key.
3. Loosen the lock nuts (Fig. 154/2).
4. Set all holder tubes (Fig. 154/1) to the same length (see Fig. 155). To do so, turn all screws (Fig. 154/3) uniformly.
5. Tighten the lock nuts (Fig. 154/2) after completion of setting.
6. Check the working result of the exact harrow.



Fig. 154

The spring tines on the exact harrow should

- lie horizontally on the ground and
- have 5 - 8 cm free travel downwards.

The distance between the exact harrow frame and the ground is between 230 and 280 mm.

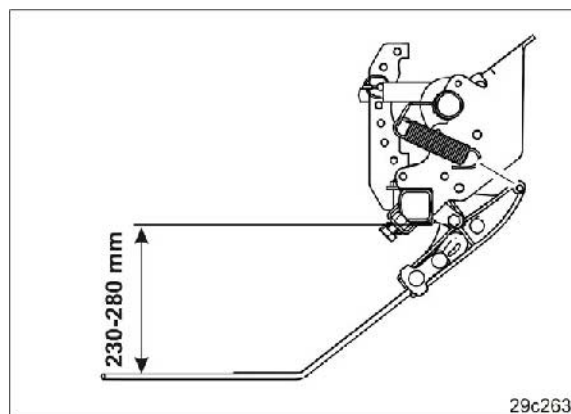


Fig. 155

8.11.2 Adjusting the exact harrow pressure

1. Tension the lever (Fig. 156/1) with the calibrating handle.
2. Insert the bolt (Fig. 156/2) into a boring under the lever.
3. Relieve the lever.
4. Secure the bolt with a safety splint.
5. Apply the same setting to all adjusting segments.



Fig. 156

8.11.3 Adjusting the exact harrow pressure hydraulically



WARNING

Direct persons away from the area of the Vario gearbox, coulters and exact harrow.

Setting normal exact harrow pressure

1. Operate control valve 2.
- Apply pressure to the hydraulic cylinder.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Insert the bolt (Fig. 157/1) in a hole beneath the lever (Fig. 157/2) and secure with a spring pin.
4. Shift control valve 2 to the float position.

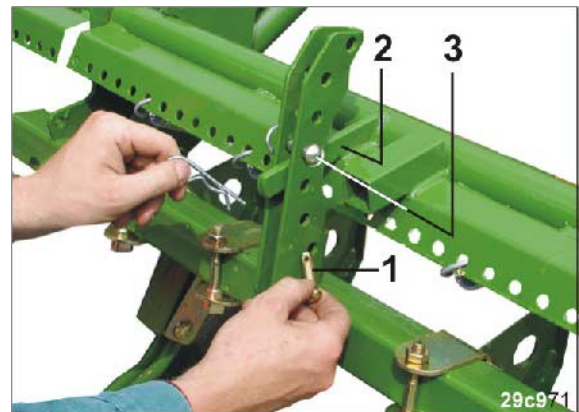


Fig. 157

Setting elevated exact harrow pressure

1. Shift control valve 2 to the float position.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Insert the second bolt (Fig. 157/3) in a hole above the lever (Fig. 157/2) and secure with a spring pin.

8.12 Setting the tramline rhythm

AMALOG⁺ and **AMATRON⁺** only:

Set the tramline rhythm as described in the **AMALOG⁺** or **AMATRON⁺** operating instructions.

Control box only:

To set a different tramline rhythm it is necessary to change over or swap the pitch wheel (Fig. 158/1) and the indicator wheel (Fig. 158/2) in the control box.

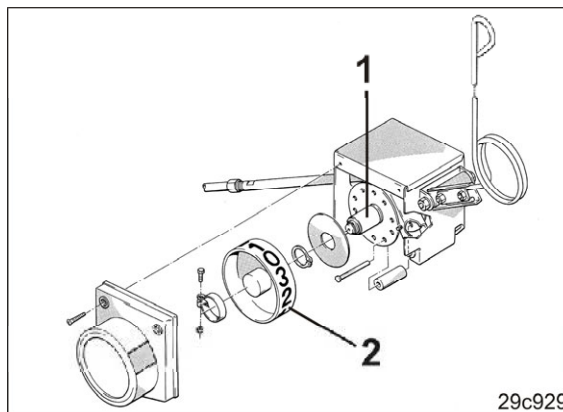


Fig. 158

Switching off seed wheel tramline selection (control box only)

Operation of control valve 1 is intended to execute the functions of the track markers but not those of the seed wheel tramline selection, nor those of the tramline marker.

1. Shift control valve 1 to the float position.
2. Pull on the control lever (Fig. 159/1) of the control box if the number in the control box window (Fig. 159/2) is "0".
3. Undo clamping screw (Fig. 159/A) and push it down in the slotted hole before tightening it (see Fig. 159/B).

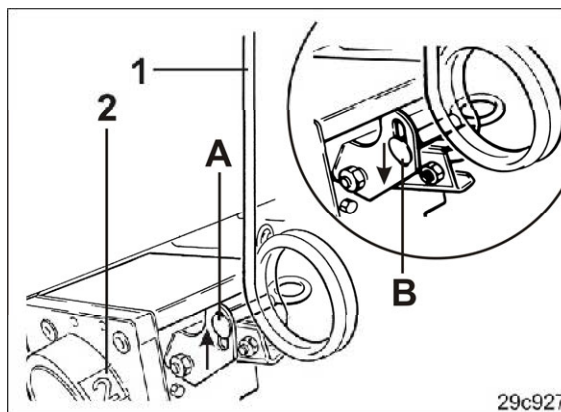


Fig. 159

The control box is locked and should not shift further when the control lever is pulled.



The number in the control box window (Fig. 159/2) must not be "0".
In the "0" position, tramlines are constantly created with seed wheel tramline selection switched off.

8.13 Disengaging the left-hand seed shaft half

1. Push the spring-loaded seed shaft clutch to the left against the spring and turn in the direction of the arrow.

Seed shaft driven	(see Fig. 160)
Left-hand seed shaft half disengaged	(see Fig. 161).

2. Close the shutoff gates in the tramline seed wheels on the left-hand seed shaft half.

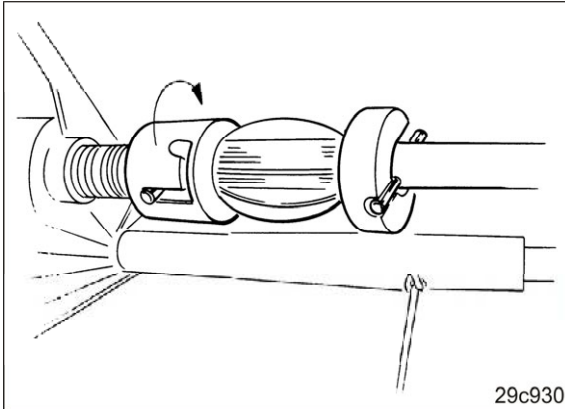


Fig. 160

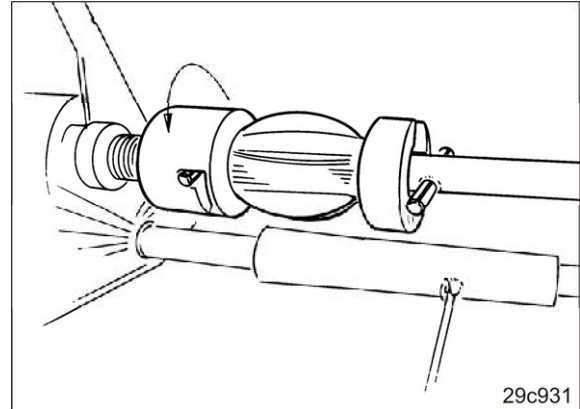


Fig. 161

8.14 Setting the tramline marker

1. Remove the bolt (Fig. 162/1).
The bolt is secured with a spring pin.



Fig. 162

2. Swing both the track disc carriers down.



Fig. 163

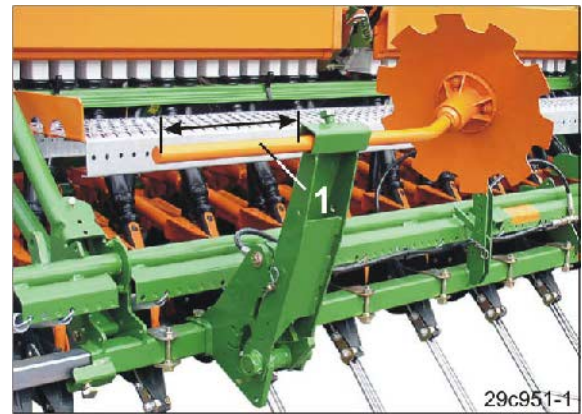
3. Direct people out of the danger area.
4. Set the tramline counter to "zero".



DANGER

Direct persons away from the area of the track markers, control box and tramline marker.

5. Actuate control unit 1 and lower the track discs.
6. Apply the handbrake, switch the engine off and remove the ignition key.
7. Undo the bolt (Fig. 164/1).
8. Set the track disc so that it marks the tramline created by the tramline coulters.
9. Adapt the operation to the soil by twisting the discs.
Set the discs roughly parallel with the direction of rotation on light soils and set more grip on heavy soils.
10. Tighten the bolt (Fig. 164/1) securely.
11. Set the second track disc in the same way.
12. Shorten the tubes protruding from the track disc carriers (Fig. 165/1) so that it is safe to stand on the step of the loading board.


Fig. 164

Fig. 165


When working with tramline rhythms 2 plus and 6 plus (see also section 5.13.3, on page 75) 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.

9 Transportation

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

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

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



- For transport journeys take heed of the section "Safety information for users", on page 27.
- Before moving off, check:
 - The correct connection of the supply lines
 - The lighting system for damage, function and cleanliness



WARNING

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

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

**WARNING**

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

These risks pose serious injuries or death.

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

**WARNING**

Risk of falling from the machine if riding against regulations!

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

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.

**WARNING**

Danger of cuts during transport journeys with the outer exact 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.

9.1 Moving the top-mounted seed drill into road transport position

1. Stop the machine on the field.
2. Move the track markers into transport position and secure them (see "Securing the track markers for transport" on page 133).



DANGER

Move the track markers into transport position and secure them before leaving the field or when driving on streets or roadways.



DANGER

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

3. Shift the tramline marker to the transport position.
 - 3.1 Fit both track disc carriers (Fig. 166/1) on the transport brackets (Fig. 166/2).
 - 3.2 Secure the bolt (Fig. 166/3) with spring pins (Fig. 166/4).
 - 3.3 Undo the securing bolts (Fig. 166/6).
 - 3.4 Pull the track discs (Fig. 166/5) out of the track disc carriers (Fig. 166/1) and carry them with you in a suitable stowing space.

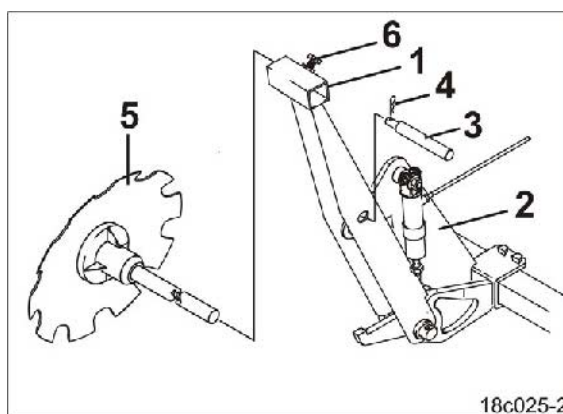
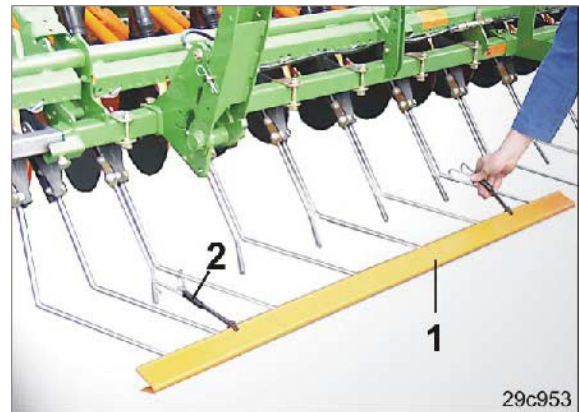


Fig. 166

4. Shift the AD303's exact harrow to the transport position.
 - 4.1 Unscrew the fastening screw and push the outer harrow element (Fig. 167/1) into the square tube.
 - 4.2 Tighten the fastening bolt and push the opposite outside harrow element to transport width (max. 3.0 m).


Fig. 167

5. Push the two-part transport securing bar (Fig. 168/1) over the tine tips of the exact harrow.
6. Fasten the transport securing bar with spring holders (Fig. 168/2) to the exact harrow.


Fig. 168

7. Switch off the **AMALOG⁺** or the **AMATRON⁺** (option).



Fig. 169

8. Move the star wheel to transport position (see "Moving the star wheel", on page 134).
9. Close the seed box lid
10. Check the lighting system for operability (see section "Transportation equipment", on page 41).

The warning boards must be clean and undamaged.



Lock the tractor's control units during transport!

Switch on the all round lighting (if present), which is subject to authorisation, prior to starting a journey and check for operability.

In bends take into consideration the wide sweep and the centrifugal mass of the machine.

9.1.1 Securing the track markers for transport

Seed drills with marker change over

1. Stop the machine on the field.
2. Raise the track marker, press it against the transport bracket and pin it using a lynch pin (Fig. 170/1).
3. Repeat the operation on the second track marker.

Hydraulically operated seed drills

1. Operate control valve 1.
- Fold in both track markers.
2. Apply the handbrake, switch the tractor engine off and remove the ignition key.
3. Press the track marker against the transport bracket and pin it using a lynch pin (Fig. 170/1).
4. Repeat the operation on the second screw.



Fig. 170



DANGER

Do not remove the lynch pins (Fig. 170/1) that secure the track markers until immediately before beginning work on the field.

Immediately after completing work on the field, secure the track markers using lynch pins.



During work, insert the lynch pin in the hole (Fig. 170/2) (parking position).



DANGER

Direct persons away from the danger area of the track marker before operating spool valve 1.



CAUTION

After removing the lynch pin (Fig. 170/1), carefully lower the track marker into working position (only for seed drills with marker change over).

9.1.2 Moving the star wheel into transport/working position

Moving the star wheel into transport position:

1. Raise the star wheel (optionally by operating control unit 3).
2. Swivel the bar (Fig. 171/1).
The star wheel is supported on the bar (not required with hydraulic star wheel raised position).



Fig. 171



WARNING

Direct persons away from the danger area before operating spool valve 3.

3. Fasten the star wheel of the AD 303 to the transport bracket.
 - 3.1 Remove the lynch pin (Fig. 172/1) and pull the star wheel off of the drive.



Fig. 172

- 3.2 Fasten the star wheel to the transport bracket (Fig. 173/1) and secure it using the lynch pin (Fig. 173/2).

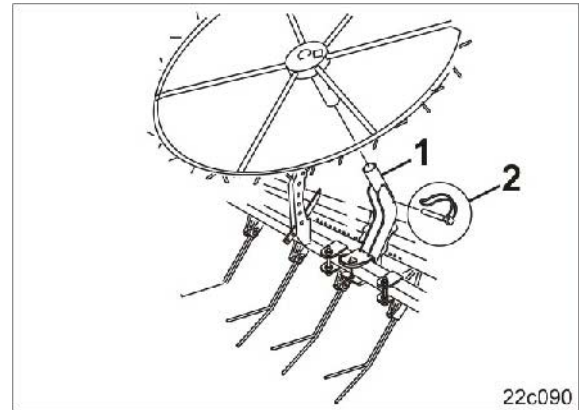


Fig. 173



Move the star wheel into working position by following the steps in reverse order.

9.2 Transporting the AD 403 Super



DANGER

Transport the AD 403 Super seed drills on a transport vehicle only.

Do not exceed a max. transport height of 4.0 m.

10 Use of the machine



- When using the machine, observe the information in the sections
- "Warning pictograms and other signs on the machine", as of on page 17 and
 - "Safety information for users", on page 25.

Observing this information is important for your safety.



WARNING

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

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



WARNING

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

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

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



WARNING

Risk of contusions, 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.

10.1 Preparing the machine for use

Inserting the star wheel into the holder of the drive

1. Move the star wheel to transport position and lower it (see "Moving the star wheel into transport/working position", on page 134).

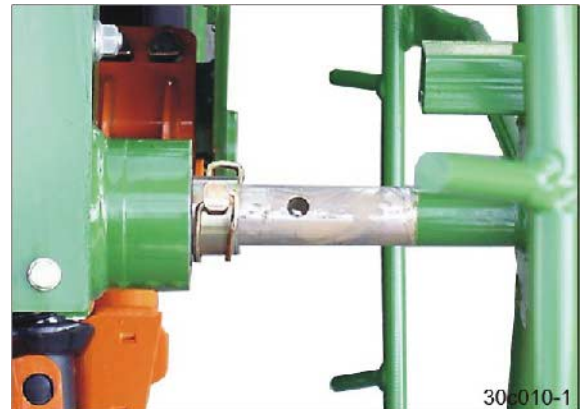


Fig. 174

Removing the road safety bar

1. Release the spring holders (Fig. 175/2) and remove the road safety bars (Fig. 175/1).

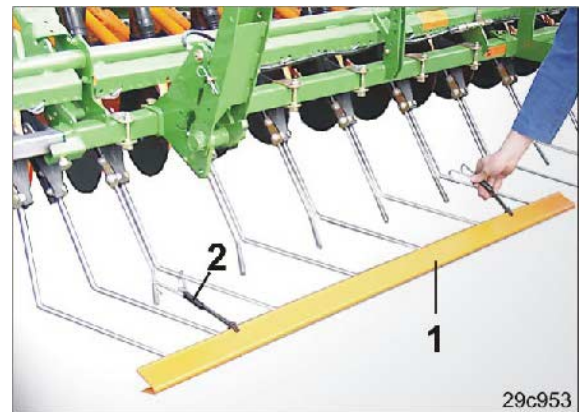


Fig. 175

2. Connect the road safety bars (Fig. 176/1) together and secure to the transport bracket (Fig. 176/2).

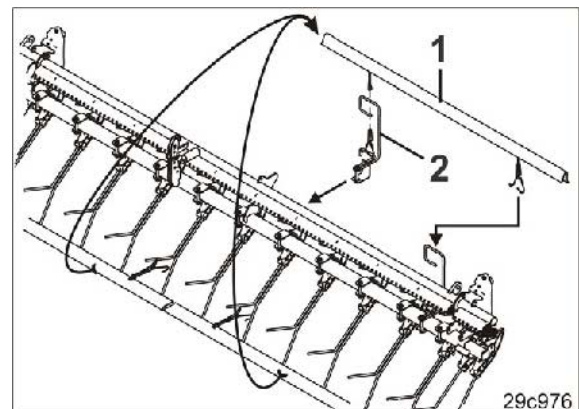


Fig. 176

Use of the machine

3. Undo the bolt and push the outside harrow element (Fig. 177/1) outwards.
4. Tighten the bolt.
5. Repeat the operation on the outside harrow element.



Fig. 177



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.

Unlocking the track markers

Unlock the track markers and lower them into working position (see "Securing the track markers for transport", on page 133)

Setting the tramline counter

1. Refer to the table (Fig. 75, on page 73) for the tramline counter of the first field run.
2. Set the correct tramline counter immediately before the first field run.

AMALOG⁺ and **AMATRON⁺** only:

Set the tramline counter as described in the **AMALOG⁺** or **AMATRON⁺** operating instructions.

Control box only:

3. Pull the cable (Fig. 178/1) repeatedly until the correct number appears in the control box window (Fig. 178/2).



CAUTION

Only operate the control lever by means of the cable in the tractor cab.

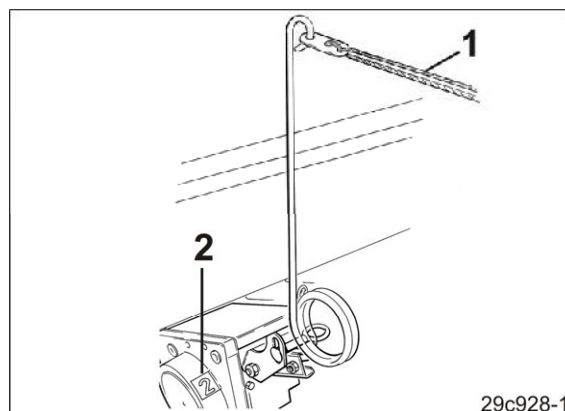


Fig. 178

10.2 Starting work

1. Move the machine to working position at the start of the field.
 2. Direct people out of the danger area.
 3. Operate control unit 1.
 - Lower the active track marker.
 - Advance the seed wheel tramline selection
 - Only if tramline display is "0":
 - o creation of tramlines
 - o lower the tramline marker
 4. Check the tramline counter and correct it as necessary.
 5. Start.
 6. After 30 m:
 - o Check the placement depth of the seed at several locations.
 - o Check the working intensity of the exact/drag tine harrow.
- Check the settings if necessary.



Fig. 179



WARNING

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



Check whether the correct tramline counter is being displayed.

10.3 During the work



Check the tramline counter after every unscheduled folding of the track markers, e.g. before an obstacle.



Dressed seed is extremely poisonous to birds!

The seed must be worked in fully and covered with earth.
When lifting out the coulters, ensure that the seed does not trickle out.

Remove spilt seed immediately.

10.4 Turning at end of the field

1. Operate control unit 1.
 - Raise the active track marker
 - Advance the tramline counter.
2. Operate the control unit for the tractor lower link.
 - Raise the combination.
3. Turn the combination.



The coulters and harrow must not come into contact with the soil during the turn.

4. Operate the control unit for the tractor lower link.
 - Lower the combination.
 5. Operate control unit 1 for at least 5 seconds so that all hydraulic functions are fully executed.
 - Lower the active track marker.
- only in switch position "0":
- Interruption of the lay shaft drive (tramlines)
 - Lower the track discs for the tramline marker.
6. Start the field run.

10.5 Emptying the seed box and seed wheel housing

1. Apply the handbrake, switch the tractor engine off and remove the ignition key.
2. Place calibration trays on the hopper bars (see "Setting the sowing rate with a calibration test", on page 106).



Fig. 180

3. Set the bottom flap lever to hole 1 (see "Setting the bottom flap", on page 103).
4. Open all shutoff gates (see "Setting the shutoff gates", on page 102).
5. To open the bottom flaps, swing the bottom flap lever (Fig. 181/1) downwards past the holes.

→ The seed flows into the calibration trays.

6. Set the bottom flap lever to hole 1 as soon as the calibration trays are filled.
7. Empty the calibration trays.

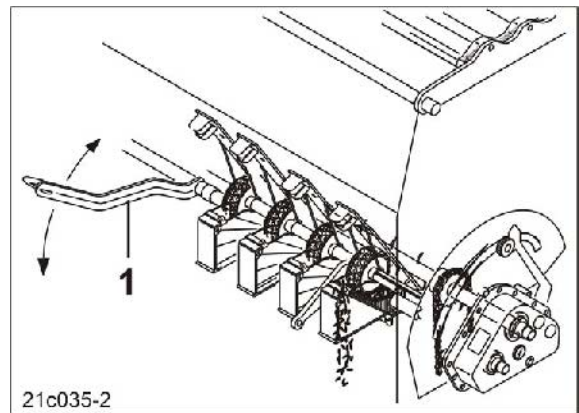


Fig. 181



DANGER

Dressing dust is toxic and must not be inhaled or come into contact with parts of the body.

When emptying seed boxes and seed housings or when removing dressing dust, e.g. with compressed air, wear a protective suit, protective mask, safety glasses and gloves.

8. Repeat the process until the seed box and the seed wheel housing are empty.
9. Turn the star wheel for the calibration test (see "Setting the sowing rate with a calibration test", on page 106) until the metering wheels have emptied completely.
10. Lock the bottom flap lever.
11. Fasten the calibration trays to the seed box.
12. Push the hopper bars upwards until you hear them latch.



Open the bottom flaps if the seed drill is not to be used for a lengthy period.

With the bottom flaps closed, there is a danger that mice will attempt to get into the seed box as even the empty seed box smells of wheat. If the bottom flaps are closed the mice may start chewing at the bottom flaps.

10.6 End of work on the field

Shift the machine to the transport position when the work is completed (see "Transportation", on page 128).

11 Faults



WARNING

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

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

Secure the tractor and the machine against unintentional start-up and rolling away, before you eliminate any faults on the machine. On this subject see section 6.2 on page 83

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

11.1 Shearing of the track marker boom

If the track marker of the AD 03 Super strikes against as solid obstacle, a bolt shears (Fig. 182/1) and the track marker folds backwards.

Only use M6 x 90 bolts in property class 8.8 as replacements (see online spare parts list).

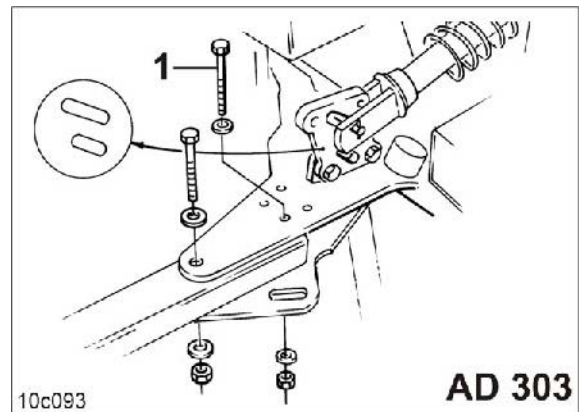


Fig. 182

AD 353 and AD 403 only:

Use hole "B" for the shear bolt.

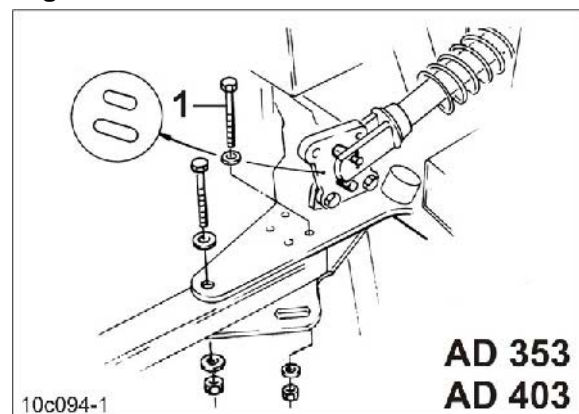


Fig. 183

11.2 Deviations between the preset and actual sowing rates

If you determine a discrepancy between the sowing rate set in the calibration test and the sowing rate in the field, note the following points:

- On new machines, the surface of the seed wheel housing, the bottom flaps and the seed wheel changes as a result of seed dressing deposits. This can influence the flow characteristics of the seed and hence the sowing rate.

After two or three seed box fillings, the seed dressing deposits will have solidified and an equilibrium condition will have been reached. The sowing rate will not then change any more.

- 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.
- There can be an uncontrolled release of seed (excess volumes) during sowing operations if the bottom flaps are set incorrectly. The basic setting of the bottom flaps must therefore be checked every six months or before each sowing season (see "Bottom flap basic setting", on page 149).
- The slippage of the star wheel can alter during work, e.g. when changing from light to heavy soil. The number of crank revolutions on the wheel for the determination of the gearbox setting must then be redetermined.

This is done by measuring an area of 250 m² in the field. The correspondence between machine working width and distance is as follows:

2.50 m working width	=	100.0 m distance
3.00 m working width	=	83.3 m distance
3.50 m working width	=	72.9 m distance
4.00 m working width	=	62.5 m distance

Count the number of wheel revolutions when travelling over the measured distance. Carry out a calibration test with the number of wheel revolutions determined (see "Setting the sowing rate with a calibration test", on page 106).

12 Cleaning, maintenance and repairs



WARNING

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

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

Secure the tractor and machine against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on the machine. On this subject see on page 83.



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.
- Never crawl under a raised, unsecured machine.

12.1 Cleaning



- Inspect the hydraulic hose lines with particular care.
- Never treat hydraulic hose lines with petrol, benzole, kerosene 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.



DANGER

Dressing dust is toxic and must not be inhaled or come into contact with parts of the body.

When emptying seed boxes and seed housings or when removing dressing dust, e.g. with compressed air, wear a protective suit, protective mask, safety glasses and gloves.

Clean 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.

12.1.1 Cleaning the machine

1. Empty the seed box and seed wheel housing (see 10.5, on page 141).
2. Clean the machine with water or with a high pressure cleaner.

12.1.2 Shutdown of the machine over a long period of time

1. Thoroughly clean and dry the RoTeC coulters.
2. To prevent rust conserve the coulters (Fig. 184) with an environmentally friendly anti-corrosion agent.



Fig. 184

12.2 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	Check and service the hydraulic hose lines. Recording of the inspection by the operator.	Section 12.6
		Check the oil level in the Vario gearbox	Section 12.3
After the first 10 operating hours	Specialist workshop	Check and service the hydraulic hose lines. Recording of the inspection by the operator.	Section 12.6
	Specialist workshop	Roller chain maintenance	Section 12.4
Daily at the end of work		Clean the machine (as required)	Section 12.1
Every week, at the latest every 50 operating hours	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.6
Every 2 weeks, at the latest every 100 operating hours		Check the oil level in the Vario gearbox	Section 12.3
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 12.6
	Specialist workshop	Bottom flap basic setting	Section 12.5
Every 6 months after the season	Specialist workshop	Roller chain maintenance	Section 12.4

12.3 Checking the oil level in the Vario gearbox

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

The oil level must be visible in the oil sight glass (Fig. 185/1).

There is no need to change the oil.

The oil filler neck (Fig. 185/2) is used to top up the Vario gearbox.

Refer to the table (Fig. 186) for the grade of transmission oil required.

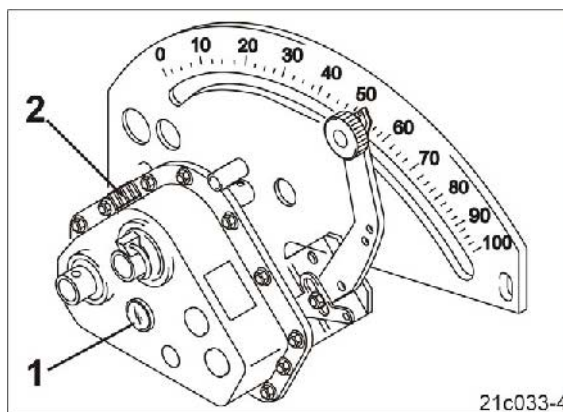


Fig. 185

Hydraulic fluid types and filling level of the Vario transmission	
Total filling level:	0.9 litres
Transmission fluid (alternatives):	Wintershall Wintal UG22 WTL-HM (ex-works)
	Fuchs Renolin MR5 VG22

Fig. 186

12.4 Roller chains and chain wheels

Clean all roller chains after the season

- cleaned (including the chain wheels and chain tensioner)
- checked
- lubricated with low-viscosity mineral oil (SAE30 or SAE40).

12.5 Bottom flap basic setting

1. Empty the seed box and seed wheel housing (see "Emptying the seed box and seed wheel housing", on page 141).
2. Check the bottom flaps (Fig. 187/1) for ease of movement.
3. Set the bottom flap adjuster lever to hole 1 and secure it there (see "Setting the bottom flap", on page 103).
4. Check that the specified distance "A" is observed in every seed wheel housing. Turn the seed wheel to be checked by hand on the seed shaft as you do this.

The distance "A" (Fig. 187) between the bottom flap and the seed wheel is 0.1 mm to 0.5 mm.

5. Set the specified distance using the setting screw (Fig. 187/2).

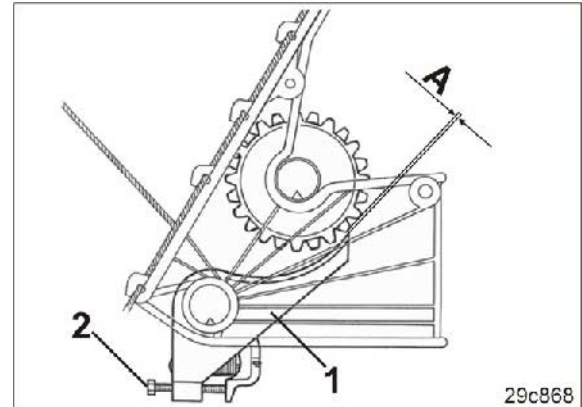


Fig. 187

12.6 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.

12.6.1.1 Labelling hydraulic hose lines

The assembly labelling provides the following information:

Fig. 188/...

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

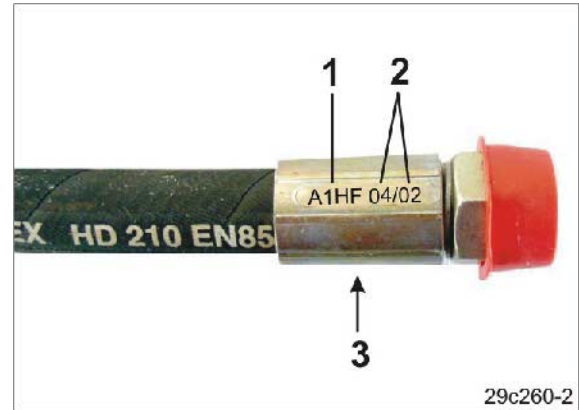


Fig. 188

12.6.1.2 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.

12.6.1.3 Inspection criteria for hydraulic hose lines



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

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

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

- Corrosion of assembly, reducing the function and tightness.
- Installation requirements not complied with.
- Life span of 6 years has been exceeded.

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

12.6.1.4 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!

12.7 Setting the marker change over (specialist workshop)

1. Operate control valve 1.
- Apply pressure to the hydraulic cylinder in the control mechanism.
2. Undo the lock nut on the bracket bolt.
3. Turn the piston (Fig. 189/1) of the hydraulic cylinder with an open-jawed spanner until the leaf springs (Fig. 189/2) in the control mechanism are heard to engage and a clearance of 1 to 2 mm is set between the leaf spring and the tooth.
4. Tighten the lock nut.
5. Check the operation of the control mechanism.

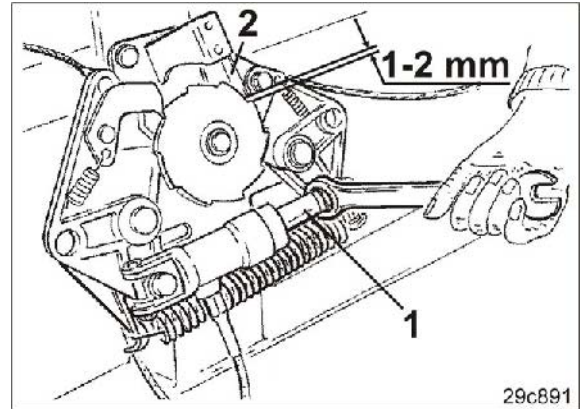


Fig. 189

12.8 Adjusting the tramline marker at the control box (specialist workshop)

1. Operate the control lever repeatedly until the number 1 appears in the control box window.
2. Undo the adjustment ring (Fig. 190/1).
3. Press the control valve lever (Fig. 190/1) backwards.
4. Fasten the adjustment ring.
5. Check the operation of the tramline marker.

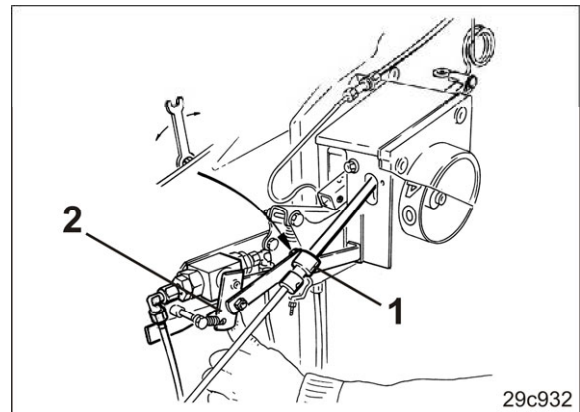


Fig. 190

12.9 Fitting the rapeseed insert



Switch off the agitator shaft before installing the rapeseed insert in the seed box.

1. Disengage the drive for the agitator shaft (see "Agitator shaft drive", on page 104).
2. Set the agitator pins (Fig. 191/2) of the agitator shaft vertically.
3. Fasten the rapeseed insert profiles (Fig. 191/1) in the seed box using clamps (Fig. 191/3) [see installation drawing (Fig. 192)].

The rapeseed insert profiles are supported on the agitator shaft.

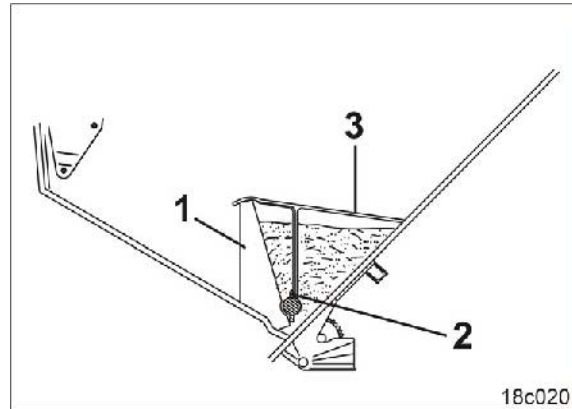
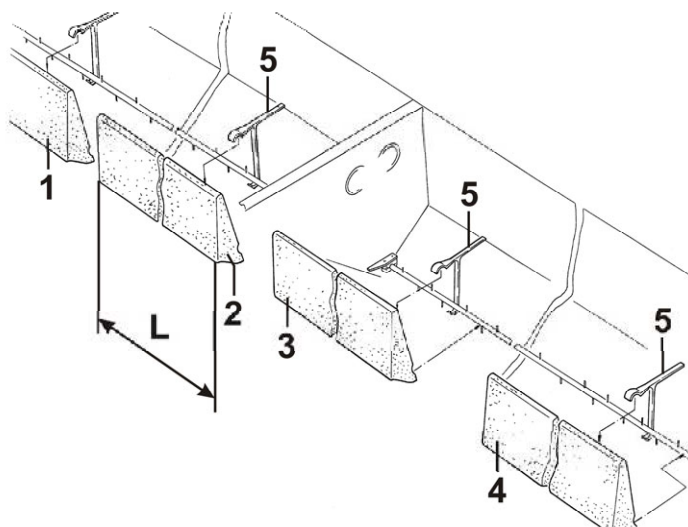


Fig. 191



29c937

			AD 253	AD 303	AD 353	AD 403
1	Profile length L	[mm]	1025	1025	—	1025
2		[mm]	-	255	—	755
3		[mm]	1025	1025	1025	1025
4		[mm]	-	255	—	755
5	Clamps	[number]	6	8	9	10

Fig. 192

12.10 Replacing the WS coulter tip

1. Push the naps (Fig. 193/1) on the hopper into the body of the coulter.
2. Pull the hopper out of the body of the coulter.
3. Remove the screw (Fig. 193/2) (screw tightening torque 45 Nm).
4. Lever the coulter tip (Fig. 193/3) out of the anchorage.
5. Fasten the new shear tip in the reverse sequence

During installation, make sure that the naps of the hopper engage in the recesses.

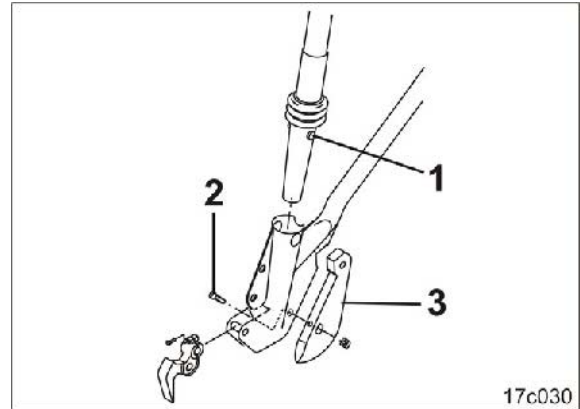


Fig. 193

12.11 Replacing the RoTeC coulter wear tip

1. Remove the plastic disc (Fig. 194/1) (see "Setting the RoTeC plastic discs", on page 119).
2. Unscrew the cylinder screw (Fig. 194/2) (screw tightening torque 30-35 Nm).
3. Replace the wear tip (Fig. 194/3) and install it in the reverse sequence.



The wear tip (Fig. 194/3) may not protrude over the edge of the sowing disc (Fig. 194/4). Replace the sowing disc if necessary.

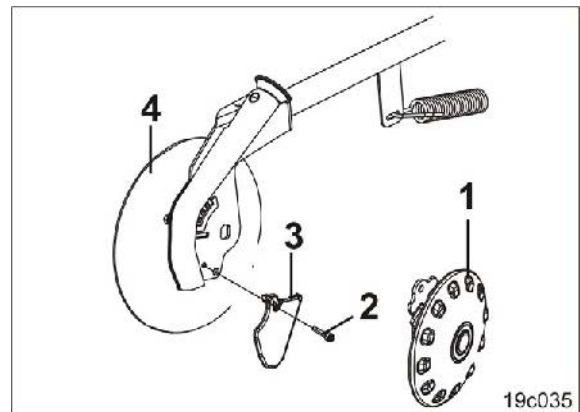


Fig. 194

12.12 Removing the seed press roller

1. Remove the lynch pin (Fig. 195/2).
2. Swing up the locking lever (Fig. 195/1).
3. Remove the seed press roller.

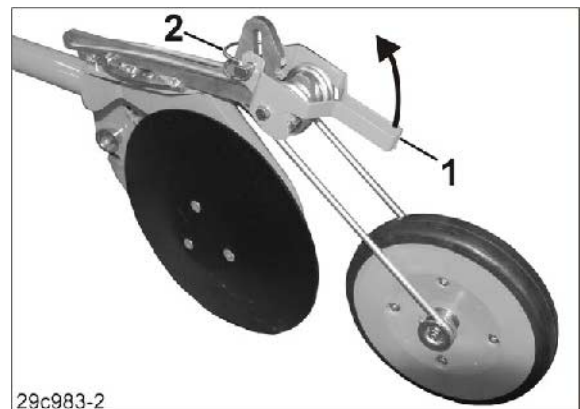


Fig. 195

12.13 Setting the tramline spacing and track width/wheelmark spacing (specialist workshop)



WARNING

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

1. Pull the calibration trays (Fig. 196) upwards out of their holders.



Fig. 196

2. Remove the tensioning springs (Fig. 197/1) from the lay shaft bearings (Fig. 197/2).

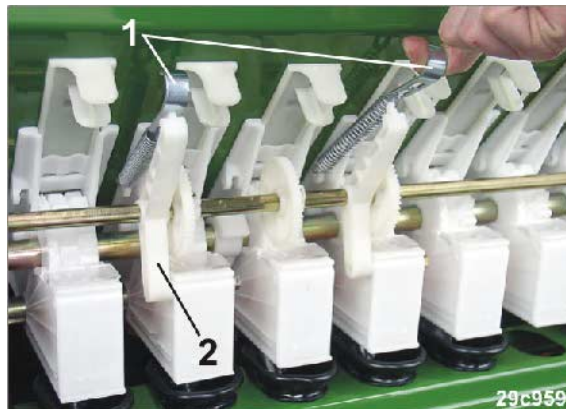


Fig. 197

3. Fold down the lay shaft (Fig. 198/1).



Fig. 198

- This pulls a bracket (Fig. 199/1), that secures the lay shaft axially, out of the recess in a seed wheel housing.



Fig. 199

The solenoid switch (where fitted) is folded down together with the lay shaft.



Fig. 200

4. Mark new tramline seed wheels by fitting the fine seed metering wheel brushes (Fig. 201/1) on the new tramline seed housing.

Track width

Disengage up to three—in exceptional cases 4 or 5—seed wheels to create a track.

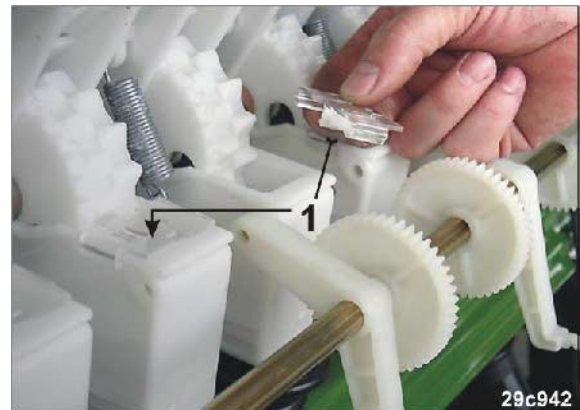


Fig. 201



Only fit seed drills with mechanism 2 with tramline seed wheels on the right-hand side of the seed drill.

The distance to the tramline seed wheels, measured from the extreme right-hand side of the seed drill makes half a cultivating tractor's track.

Only fit seed drills with mechanism 6-plus with tramline seed wheels on the left-hand side of the seed drill.

The distance to the tramline seed wheels, measured from the extreme left-hand side of the seed drill makes half a cultivating tractor's track.

Cleaning, maintenance and repairs

5. Unscrew the setscrews (Fig. 202/1) for the new tramline seed wheels until the new tramline seed wheels can be freely rotated on the seed shaft.

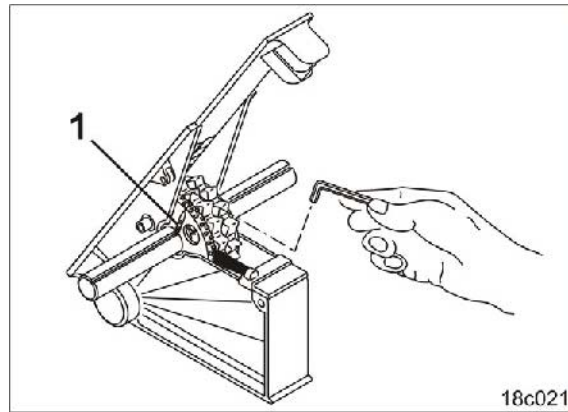


Fig. 202

6. Remove screws (Fig. 203/1).
7. Undo screws (Fig. 203/2).
8. Move the swivel bearing and drive pinion on the lay shaft.
9. Screw the swivel bearings to the new tramline seed housings.

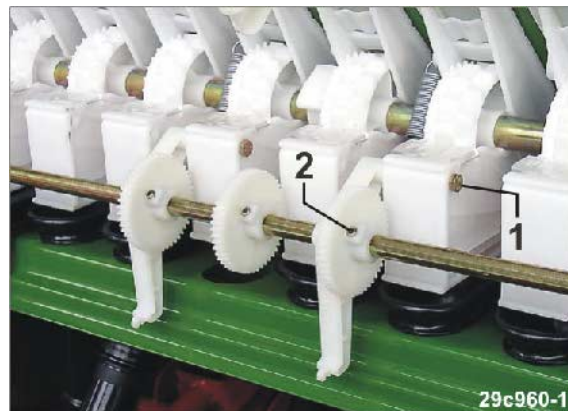


Fig. 203

10. Secure the old tramline seed wheels to the seed shaft.

Screw setscrew (Fig. 204/1) into the fine seed metering wheel until the seed wheel is driven by the seed shaft with a slight circumferential backlash (± 1 mm). Setscrews that have been overtightened distort the seed wheels.

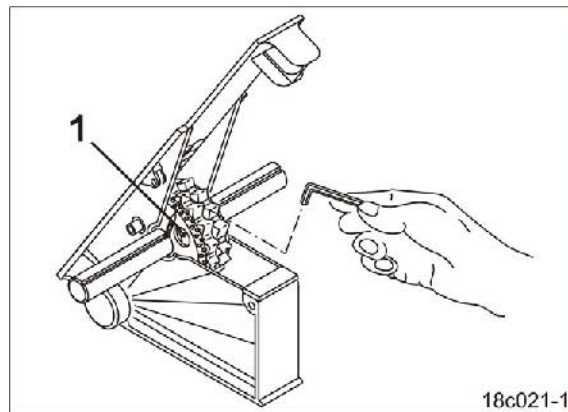


Fig. 204

11. Fold up the lay shaft.
 - As you do this, insert the bracket (Fig. 205/1) that secures the lay shaft axially into the recess in a seed wheel housing.
12. Secure the bracket axially with two adjustment rings (Fig. 205/2).

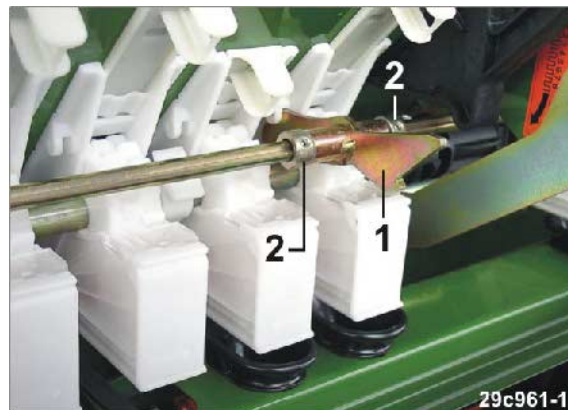


Fig. 205

13. Mesh the teeth (Fig. 206/1) of the drive pinion and the tramline fine seed metering wheels.
14. Fasten the drive pinions to the lay shaft using screws (Fig. 206/2).

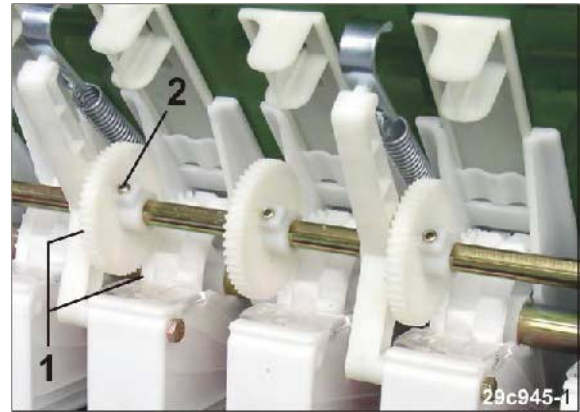


Fig. 206

15. Mesh the teeth (Fig. 207/1) of the wrap spring clutch and the seed shaft spur gear.
16. Hook the tensioning springs (Fig. 207/2) into the swivel bearings (Fig. 207/3).
17. Check the function of the seed wheel tramline shift.

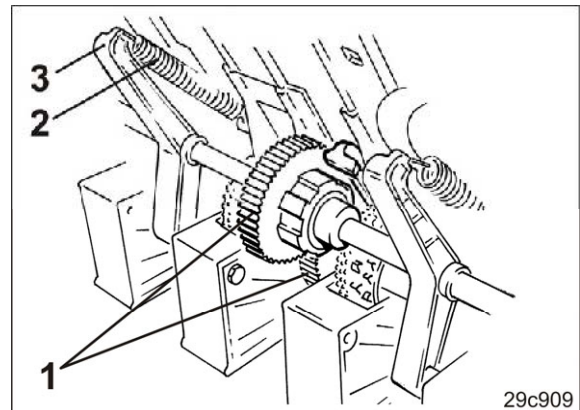


Fig. 207

12.14 Fitting the bean seed wheels (specialist workshop)

The bean seed wheels may be swapped individually for the seed wheels or together with a second seed shaft.

It is easier to fit if the bean seed wheels have been pre-assembled on a second seed shaft. Then it is only necessary to swap over the seed shafts.

1. Pull the calibration trays (Fig. 208) upwards out of their holders.



Fig. 208

2. Fold down the lay shaft (Fig. 199/1) for the seed wheel tramline selection (if fitted) (see "Setting the tramline spacing and track width/wheelmark spacing (specialist workshop)", on page 156).

3. Open the seed shaft bearings (Fig. 209/1).

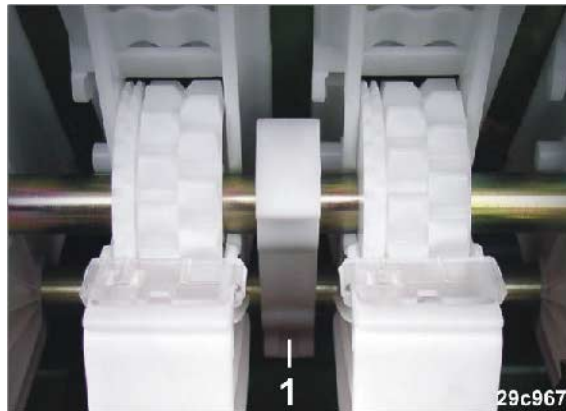


Fig. 209

4. Undo the screws (Fig. 210/1).
5. Move the socket joint on the seed shaft.
6. Lift out the seed shaft.



Do not remove the detent plate for the bottom flaps.

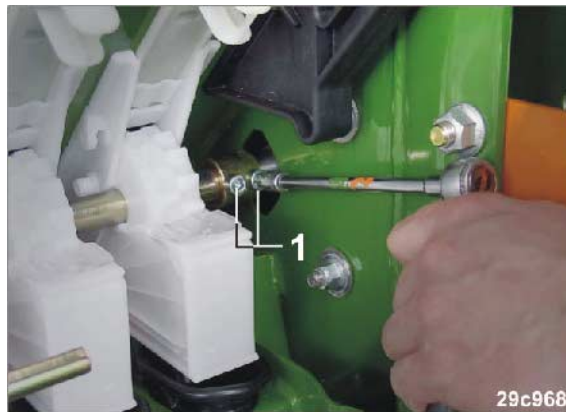


Fig. 210

7. The bean seed shaft is fitted in the reverse sequence.

Notes on installing the lay shaft

1. Fit the gear (Fig. 211/1) on the bean seed shaft.
2. Remove the triangular follower on the bean seed wheel on those bean seed wheels that will later be disengaged in order to create the tramlines.

The triangular followers on the other bean seed wheels engage in the recess in the seed shaft.



Fig. 211

3. Turn the axial lock (Fig. 212/1) so that the short arm is supported in the recess in the seed wheel housing.
4. Check the function of the seed wheel tram-line shift.



Fig. 212



If the seed drill is to be refitted with normal and fine seed metering wheels, turn the axial lock (Fig. 212/1) around and fit the long arm in the recess in the seed wheel housing.

12.15 Screw tightening torques

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

13 Hydraulic plans

13.1 AD03 Super / AD03 Special hydraulic system diagram

Fig. 213/...	Designation
T1	Tramline marking
T2	Control box
T3a	Track marker left
T3b	Track marker right
T4	Coulter pressure adjustment
T5	Exact harrow pressure adjustment
T6	Seed rate remote adjustment
T7	Star wheel raised position
T8	Track eradicator shuttle valve
T9	Tramline marker valve
T10	Control box
T11	1 x cable tie, yellow
T12	1 x cable tie, blue
T13	1 cable tie, white
T14	Tractor

All position specifications in direction of travel

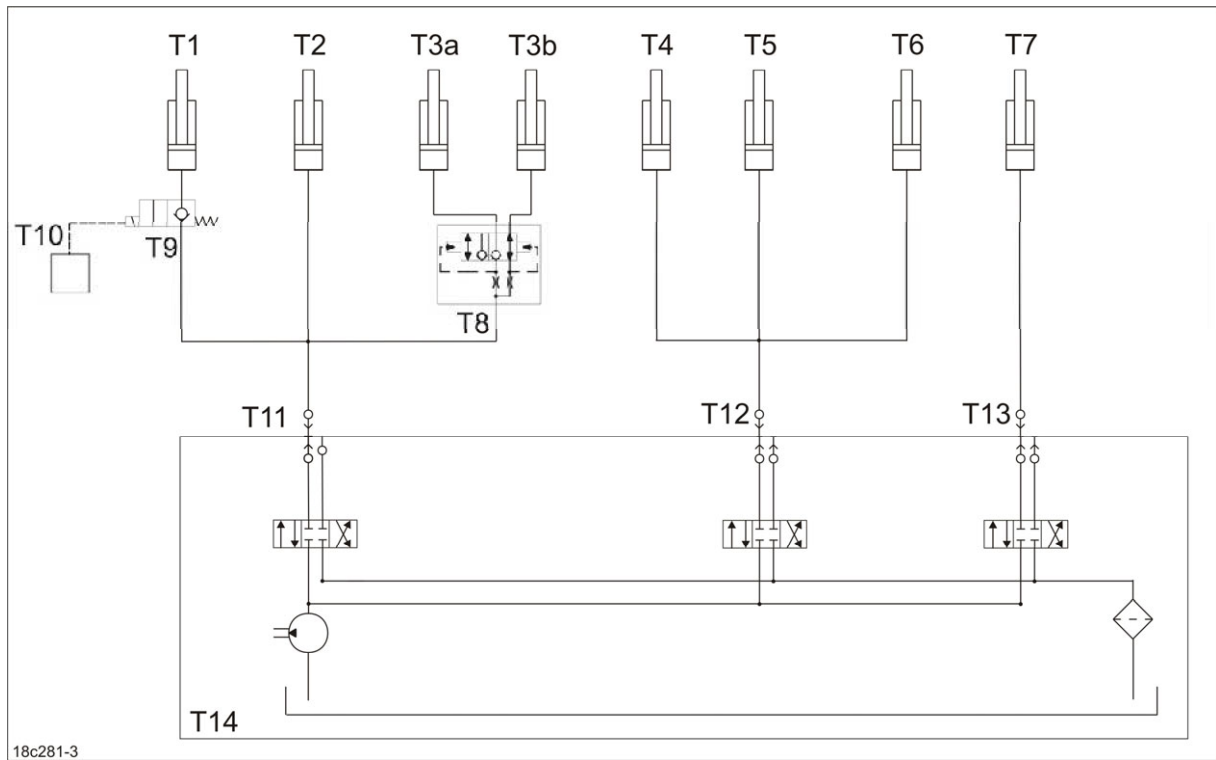


Fig. 213



AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen-Gaste
Germany

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

Fax: + 49 (0) 5405 501-234

e-mail: amazone@amazone.de

[http:// www.amazone.de](http://www.amazone.de)

Plants: D-27794 Hude • D-04249 Leipzig • F-57602 Forbach
Branches in England and France

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