

Operating Manual

AMAZONE

Top-mounted seed drills

AD-P 303 Super

AD-P 403 Super



MG3372
BAG0061-2 10.14

Please read this operating
manual before first putting in-
to operation.
Keep it in a safe place for fu-
ture 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. Stark.

Identification data

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

Machine ident. no.:
(10-digit)

Type:

AD-P 03 Super

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

Manufacturer's address

AMAZONEN-WERKE

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Spare part orders

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

Please send orders to your AMAZONE specialist retailer.

Formalities of the operating manual

Document number: MG3372

Compilation date: 10.14

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

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

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

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

User evaluation

Dear Reader,

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

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1 User Information

The User Information section provides information on how to use 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.
- should be kept in a safe place for future use.

1.1 Locations in the operating manual

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

1.2 Diagrams used

Instructions for action and reactions

Work to be carried out by the operator is shown in the form of numbered instructions. Always keep to the order of the handling instructions. The reaction to the handling instructions is given by an arrow. Example:

1. Instruction for action 1
- Reaction of the machine to handling instruction 1
2. Instruction for action 2

Lists

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

- Point 1
- Point 2

Item numbers in diagrams

Numbers in round brackets refer to 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.

Obligations of the user

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

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

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

General safety instructions

Risks in handling the machine

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

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

Only use the machine

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

Eliminate any faults immediately which could impair safety.

Guarantee and liability

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

- Improper use of the machine.
- Improper installation, commissioning, operation and maintenance of the machine.
- Operation of the machine with defective safety equipment or improperly attached or non-functioning safety equipment.
- Non-compliance with the instructions in the operating manual regarding commissioning, operation and maintenance.
- Independently-executed construction changes to the machine.
- Insufficient monitoring of machine parts that are subject to wear.
- Improperly executed repairs.
- Catastrophic events as a result of the impact of foreign objects or force majeure.

2.2 Representation of safety symbols

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



DANGER

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

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



WARNING

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

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



CAUTION

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



IMPORTANT

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

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



NOTE

Indicates handling tips and particularly useful information.

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

2.3 Organisational measures

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

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



The operating manual

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

Check all the available safety equipment regularly.

2.4 Safety and protection equipment

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

Faulty safety equipment

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

2.5 Informal safety measures

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

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

2.6 Training of personnel

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

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

| Activity \ People | Person specially trained for the activity ¹⁾ | Trained person ²⁾ | Person with specialist training (specialist workshop) ³⁾ |
|---------------------------------------|---|------------------------------|---|
| Loading/Transport | X | X | X |
| Putting into operation | — | 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 have also been informed about the necessary safety equipment and safety 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 that has been assigned to them and detect possible dangers.

Comment:

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



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



2.7 Safety measures in normal operation

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

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

2.8 Dangers from residual energy

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

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

2.9 Maintenance and repair work, fault elimination

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

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

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

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

2.10 Structural 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 being crushed, cut, caught, drawn in or struck if supporting parts break.

It is forbidden to:

- drill holes in the frame or on the chassis.
- increase the size of existing holes on the frame or the chassis.
- weld support parts.



2.10.1 Spare and wear parts and auxiliary materials

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

Use only genuine AMAZONE spare and wear parts or parts approved 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 symbols and other labels on the machine



Always keep all the warning symbols of the machine clean and in a clearly legible condition. Replace illegible warning pictograms. You can obtain the warning symbols from your dealer using the order number (e.g. MD075).

Warning symbols - structure

Warning symbols mark hazardous areas on the machine and warn against residual dangers. At these points, there are permanent or unexpected dangers.

A warning symbol consists of two parts:



Field 1

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

Field 2

is a symbol showing how to avoid the danger.

Warning symbols - explanation

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

1. A description of the danger.
For example: Risk of cutting or severing!
2. The consequence of non-observance of the risk-avoidance instructions.
For example: Causes serious injuries to fingers or hands.
3. Instructions for avoiding the danger.
For example: Do not touch machine parts until they have come to a complete stop.

General safety instructions

Order number and explanation

Warning symbols

MD076

Danger of hands or arms being drawn in and/or caught by moving parts involved in the power transmission!

This danger can result in extremely serious injuries resulting in the loss of limbs.

Never open or remove safety equipment,

- as long as the tractor engine is running with a connected PTO shaft / hydraulic system / electronic system
- or the ground wheel drive is moving.



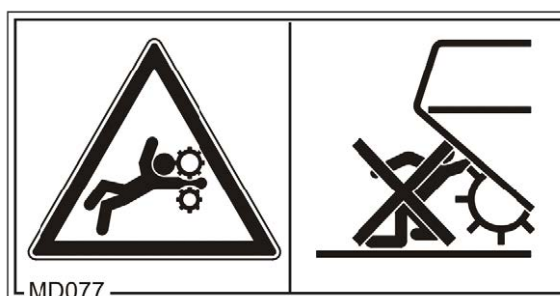
MD077

Risk of arms being caught or drawn into the machine, caused by accessible, moving parts involved in the work process.

This danger can result in extremely serious and potentially fatal injuries.

Never reach into the danger area,

- as long as the tractor engine is running with a connected PTO shaft / hydraulic system / electronic system
- or the ground wheel drive is moving.

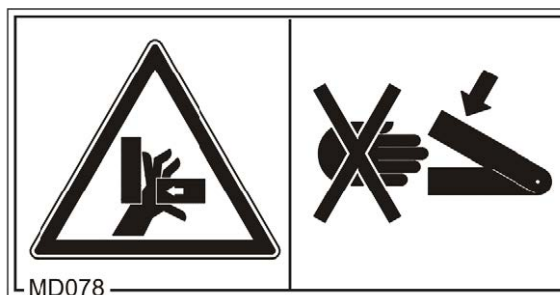


MD078

Risk of fingers or hands being crushed by accessible moving parts of the machine.

This danger can result in extremely serious injuries resulting in the loss of limbs.

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



MD082

Risk of falling when riding the machine on treads or platforms.

This danger can result in extremely serious and potentially fatal injuries.

It is prohibited to ride on the machine as a passenger or to climb onto machines while they are running. This ban also applies to machines with treads or platforms.

Ensure that no-one rides on the machine.



MD084

Risk of crushing the entire body due to standing in the swivel area when machine parts are being lowered.

This danger can result in extremely serious and potentially fatal injuries.

- It is forbidden to stand in the swivel area of the machine when machine parts are being lowered.
- Direct persons away from the swivel area of any machine parts which can be lowered before you lower the parts.

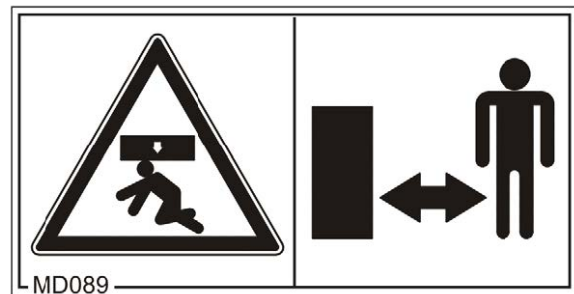


MD089

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

This danger can result in extremely serious and potentially fatal injuries.

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



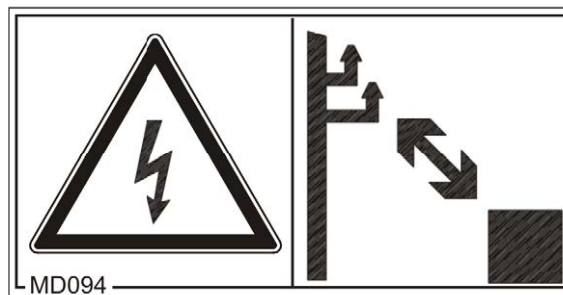
General safety instructions

MD094

Danger from electric shock or burns due to unintentional contact with electric transmission lines or from approaching high-voltage transmission lines without authorisation.

These dangers can cause extremely serious and potentially fatal injuries.

Maintain an adequate safety distance from transmission lines carrying high voltage.

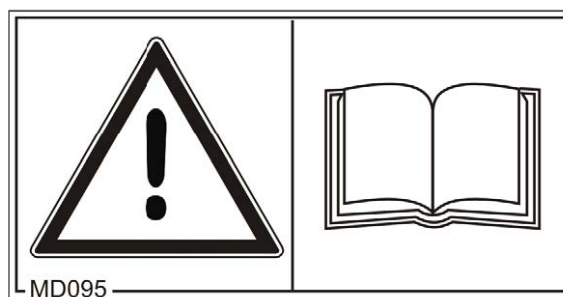


| Nominal voltage | Safety distance from transmission lines |
|-----------------|---|
|-----------------|---|

| | |
|-----------------------|-----|
| up to 1 kV | 1 m |
| over 1 up to 110 kV | 3 m |
| over 110 up to 220 kV | 4 m |
| over 220 up to 380 kV | 5 m |

MD095

Read and understand the operating manual safety information before starting the machine.

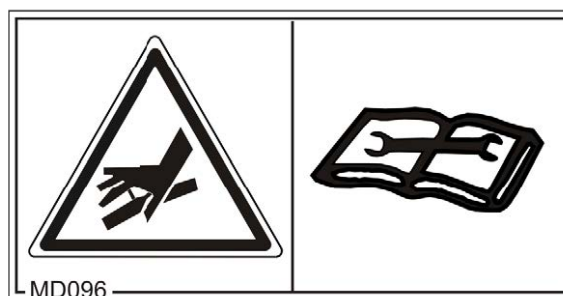


MD096

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

This can inflict serious injuries with potentially fatal consequences if hydraulic fluid escaping at high pressure passes through the skin and into the body.

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



MD102

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

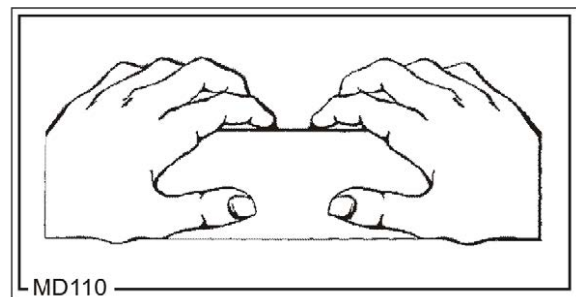
These dangers can cause extremely serious and potentially fatal injuries.

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



MD110

This pictogram identifies parts of the machine that serve as a handle.

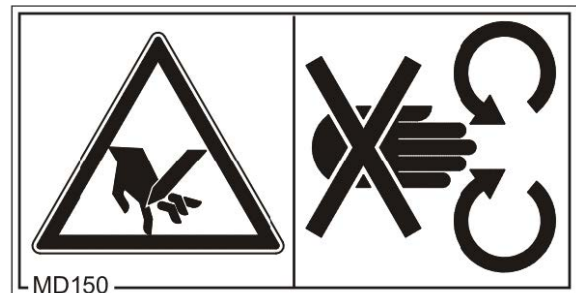


MD150

Risk of cutting or severing of fingers/hand through direct contact with moving parts involved in the working process.

This danger can result in extremely serious injuries resulting in the loss of limbs.

Never open or remove safety equipment from moving parts that are involved in the working process whilst the engine of the tractor is running with the PTO shaft / hydraulic system / electronic system connected.



General safety instructions

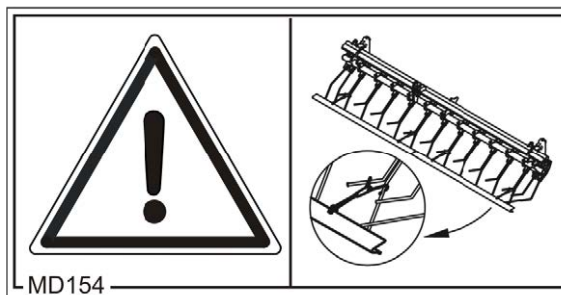
MD154

Danger of cuts for other road users caused by transport with unguarded, sharp harrow tines of the seed harrow.

This danger can result in extremely serious and potentially fatal injuries.

Transportation without a correctly fitted road safety bar is forbidden.

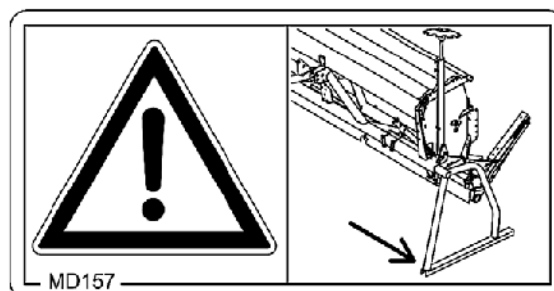
Install the road safety bar provided before starting transportation.



MD157

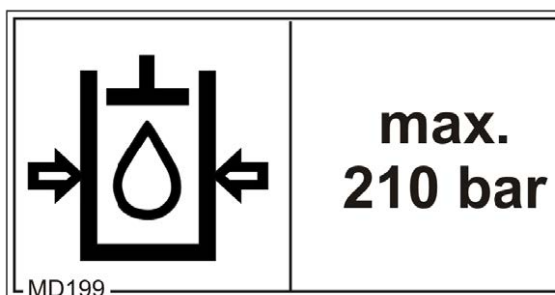
The stability of the machine is guaranteed only if the empty machine is supported on the parking supports.

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



MD199

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



Warning symbols

The following illustrations show the locations of the warning symbols on the machine.





Fig. 3



Fig. 4



Fig. 5

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 symbols.

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

2.16 Safety information for the operator



WARNING

Risk of crushing, cutting, being trapped or drawn in, or impact through inadequate roadworthiness 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 attached or hitched machine.

Connecting and disconnecting the machine

- Only connect and transport the machine with tractors suitable for the task.
- When connecting machines to the tractor 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 moving towards the machine!

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

- Before connecting the machine to or disconnecting the machine

from the tractor's three-point hydraulic system, secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is prevented!

- When coupling and uncoupling 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 nip and shear points in the vicinity 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.
 - must not chafe against other parts.
- The release ropes for quick action couplings must hang loosely and may not release themselves when lowered.
- Also ensure that uncoupled 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 of being caught by drive shafts.
- Only start up the machine if all the safety equipment has been attached and is in the safety position!
- Comply with the maximum load of the connected machine and the approved axle and drawbar loads of the tractor. If necessary, drive only with a partially filled supply 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 if you are sure that there is no one within a sufficient safety distance from the machine!
- Secure the tractor against unintentional start-up and rolling before you leave the tractor.
For this:
 - Lower the machine onto the ground.
 - Apply the tractor parking brake.
 - Switch off the tractor engine.
 - Remove the ignition key.

Transporting the machine

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

and the approved axle and drawbar loads of the tractor.

- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected machine).
- Check the brake power before moving off.
- When turning corners with the machine connected, take the broad load and balance weight of the machine into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the machine is fixed to the three-point hydraulic system or lower links of the tractor.
- Before moving off, move all the swivel machine parts to the transport position.
- Before moving off, secure all the swivel machine parts in the transport position against risky position changes. Use the transport locks intended for this.
- Before transporting, secure the operating lever of the three-point hydraulic system against the unintentional raising or lowering of the connected/hitched machine.
- Check that the transport equipment, e.g. lighting, warning equipment and protective equipment, is correctly mounted on the machine.
- Before transportation, carry out a visual check that the upper and lower link pins are firmly fixed with the lynch pin against unintentional release.
- Adjust your forward 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 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 controlled or
 - are designed to require a floating position or pressure position
- Before working on the hydraulic system
 - lower the machine.
 - depressurise the hydraulic system.
 - switch off the tractor engine.
 - apply the tractor parking brake.
 - take out the ignition key.
- Have the hydraulic hose lines checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose lines if damaged or worn. Only use our original AMAZONE hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose connections made from thermoplastics, other guide values may be decisive.
- Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.

Escaping high-pressure fluid (hydraulic fluid) may pass through the skin and ingress into the body, causing serious injuries.
If you are injured by hydraulic fluid, contact a doctor immediately.
Risk 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 - first connect the positive terminal and then connect the negative terminal. When disconnecting the battery, disconnect the negative terminal first, followed by the positive terminal.
- Always place the appropriate cover over the positive battery terminal. If there is accidental earth contact, there is a risk of explosion.
- 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 mark.

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.
- When travelling on public roads,
 - the operating lever for the tractor lower links must be secured against lowering
 - the on-board computer must be switched off.
- 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 empty tractor weight, in order to ensure sufficient steering power. If necessary, use front weights.
- Repair, maintenance and cleaning work or rectifying malfunctions must always only be carried out with
 - the ignition key removed
 - the on-board computer switched off.
- Leave safety devices attached and always position them in the protective position.

2.16.5 Operation of the seed drill

- Observe the permissible filling quantities of the hopper (hopper capacity).
- Use the steps and the loading board only when filling the hopper. It is forbidden to ride on the machine during operation.
- During the calibration test, note the danger points from rotating and oscillating machine parts.
- Before transportation, remove the track discs of the tramline marker.
- Do not place any parts in the hopper.
- Lock the track marker (construction-dependent) in the transport position before transportation.

2.16.6 Cleaning, maintenance and repairs

- Only carry out cleaning, maintenance and repair work on the machine when:
 - the on-board computer is switched off
 - the drive is switched off
 - the tractor engine is at a standstill
 - the ignition key has been removed.
- 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

The pictogram (Fig. 6) marks the location at which the chain for lifting the machine with a crane is to be secured.

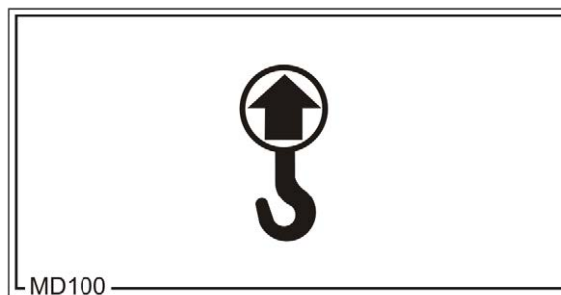
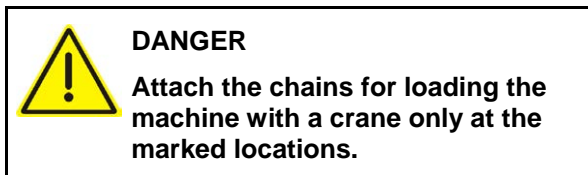



Fig. 6



DANGER

Compliance with this information guarantees your safety:

- Load the machine only with the hopper empty.
- Please pay attention to the required tensile strength of the chain.
- Do not walk under suspended loads.
- Lash the machine down on the transport vehicle in accordance with regulations.

Attach the crane hooks to the three eyes (Fig. 7) in the hopper, for loading

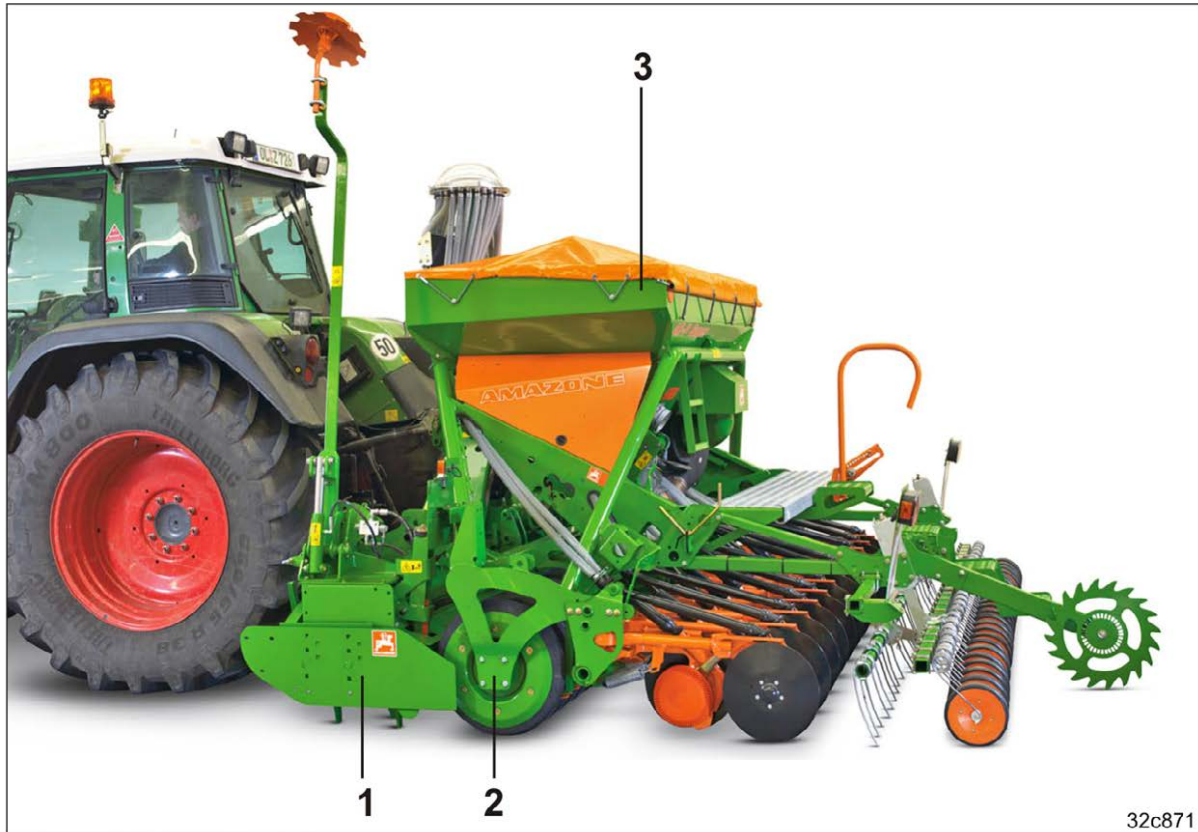
- the solo machines, e.g. AD-P 303 Super
- the combination, consisting of cultivator, roller and seed drill



Fig. 7

4 Product description

4.1 Overview of subassemblies



32c871

Fig. 8

Fig. 8/...

- (1) Cultivator; rotary cultivator or rotary harrow as required
- (2) Roller; wedge ring roller or tooth packer roller as required
- (3) AD-P Super top-mounted seed drill

4.2 Assemblies of the machine

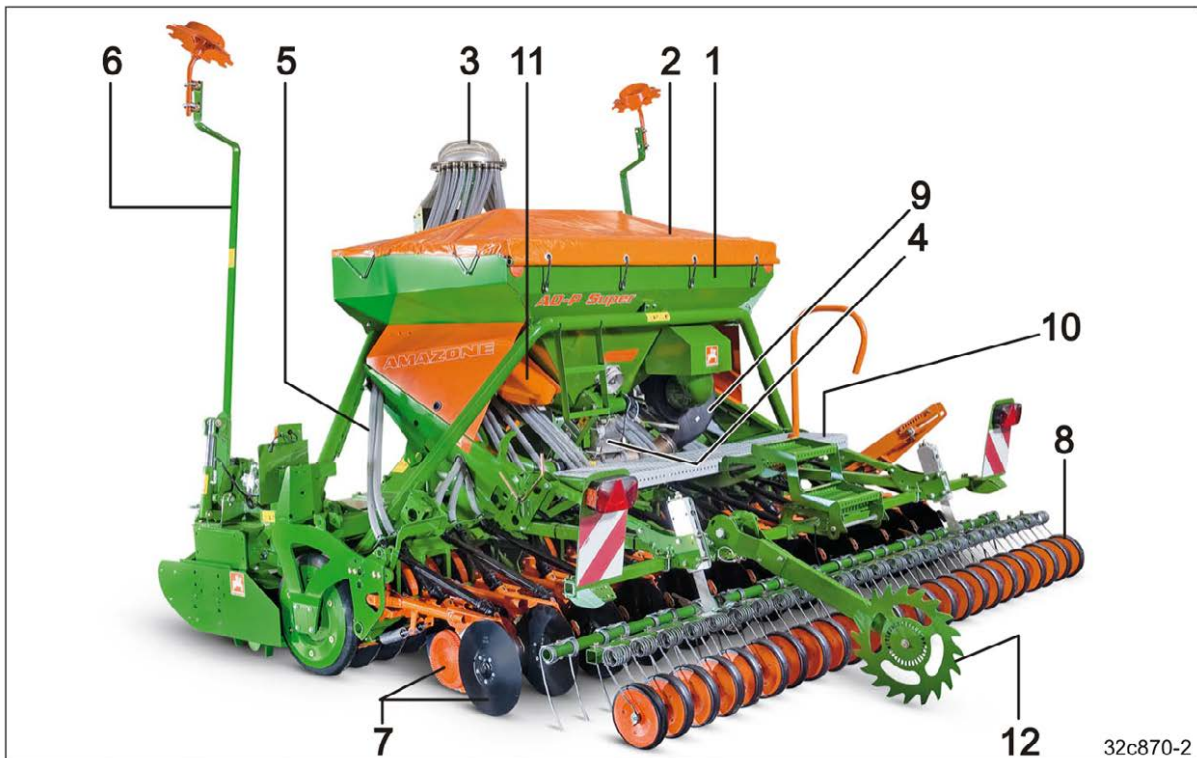


Fig. 9

Fig. 9/...

- | | |
|--|--|
| (1) Hopper | (8) Roller harrow, exact harrow as required |
| (2) Swivelling cover | (9) Blower fan |
| (3) Distributor head | (10) Loading board |
| (4) Dosing unit | (11) Calibration trough |
| (5) Seed hoses | (12) Roller feeler (required for electr. dosing drive for distance measurement) |
| (6) Track marker (secured to cultivator) | |
| (7) RoTeC control coulter | |

Fig. 10

AMALOG+ control terminal (optional)



Fig. 10

Fig. 11/...

AMADRILL+ control terminal (optional)



Fig. 11

Fig. 12

AMATRON 3 control terminal (optional)



Fig. 12

Fig. 13/...

- (1) Seed dosing unit
- (2) Injector sluice

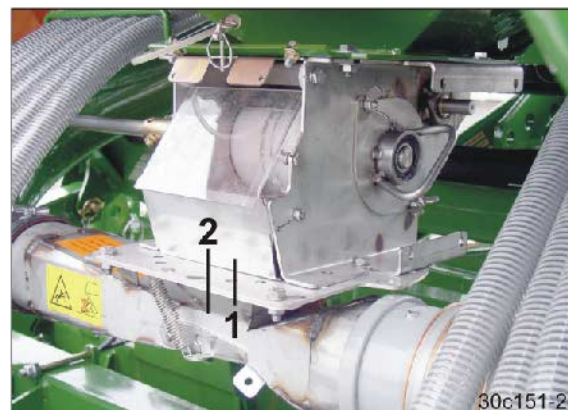


Fig. 13

Product description

Fig. 14/...

- (1) Electric motor
(with "full dosing", the electric motor drives
the seed dosing roller)



Fig. 14

Fig. 15/...

- (1) Level sensor
(view without charging sieve)



Fig. 15

Fig. 16

RoTeC control coultter



Fig. 16

Fig. 17

Tramline marker



Fig. 17

4.3 Safety and protection equipment

Fig. 18/...

- (1) Chain guard on Vario gearbox

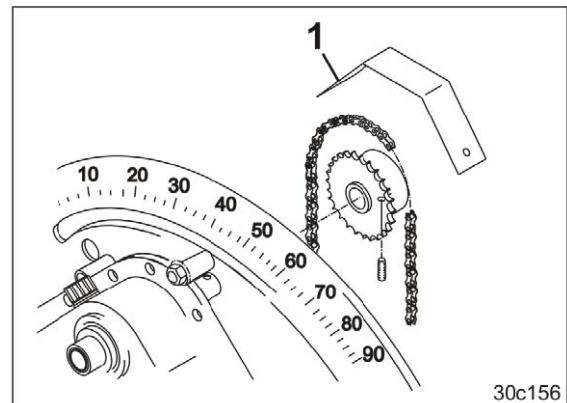


Fig. 18

Fig. 19/...

- (1) Securing by riveting prevents the charging sieves from being removed with the dosing roller running (with full dosing)



Fig. 19

Fig. 20/...

- (1) Positioning pin secured with lynch pin for safe transport of track marker
- (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).

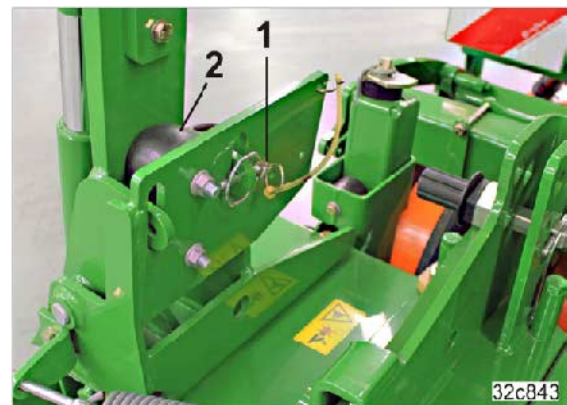


Fig. 20

Fig. 21/...

- (1) Road safety bar for exact harrow

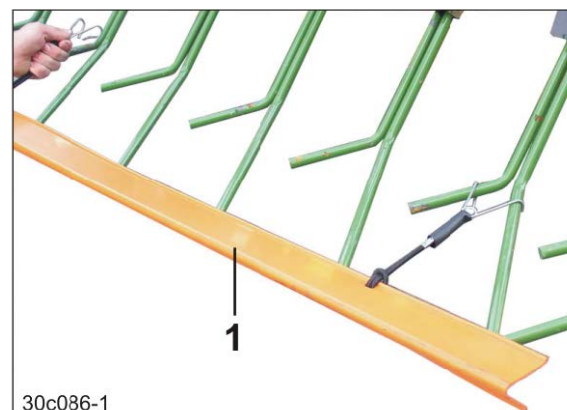


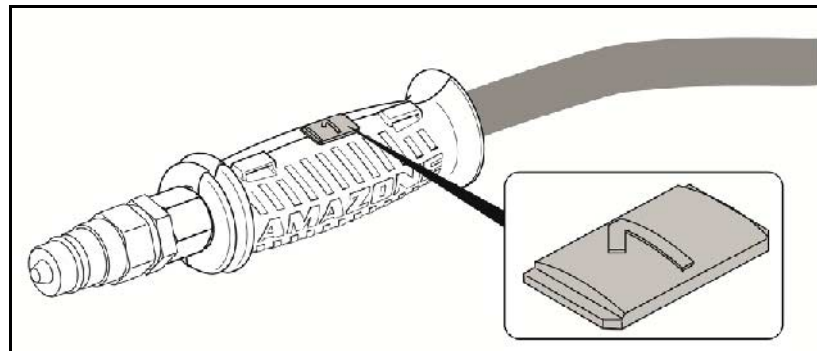
Fig. 21

4.4 Overview – Supply lines between the tractor and the machine

4.4.1 Hydraulic connections




- All hydraulic hose lines are equipped with grips.



















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



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

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

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

| Marking | | Function | | | Tractor control unit | |
|---------|---|---|---|------------------------------|----------------------|---|
| yellow |  |  | Track marker / Pre-emergence marker | move into working position | double acting |  |
| |  | | | move into headlands position | | |
| blue |  |  | Coulters pres- sure / Exact harrow | increase | double acting |  |
| |  | | | decrease | | |
| green |  |  | Coulters lift | lower | double acting |  |
| |  | | | raise | | |
| natural |  |  | Star wheel lift | | single-acting |  |
| red |  | Hydraulic fan motor (Pressure line with priority) | | | single-acting |  |
| red |  | Pressure-free return flow | | | | |

4.4.2 Data cable

| Designation | Function |
|-------------------|----------------------------------|
| Machine connector | Connection for on-board computer |

4.4.3 Power connection for road transportation

| Designation | Function |
|--------------|------------------------------|
| Plug (7-pin) | Road traffic lighting system |

4.5 Transportation equipment

Fig. 22/...

- (1) 2 rear-facing warning boards
- (2) 1 licence plate holder (optional)

only machines with exact harrow:

- (3) Road safety bar, two-part



Fig. 22

Fig. 23/...

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

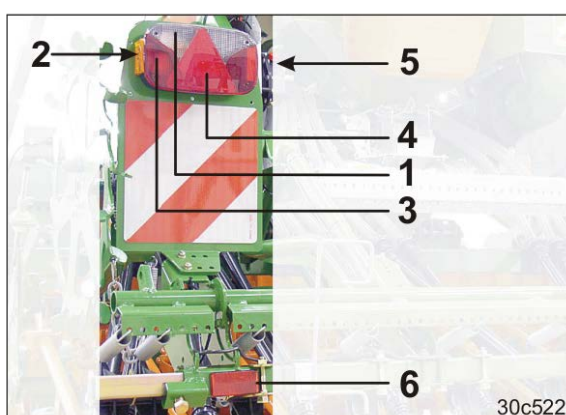


Fig. 23

Fig. 24/...

- (1) 2 forwards-facing warning signs



Fig. 24

Fig. 25/...

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

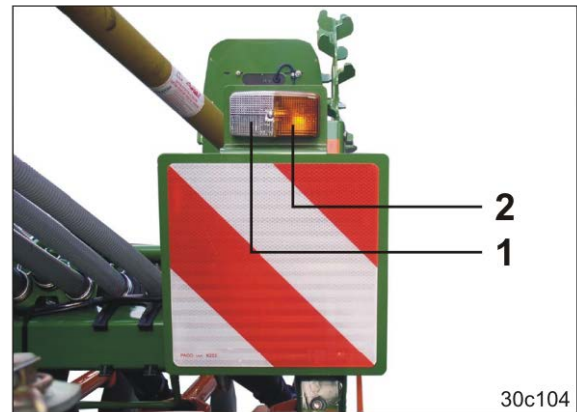


Fig. 25

4.6 Intended use

The machine

- is designed for metering and placing certain commercially available seeds during agricultural work
- is mounted on a permitted AMAZONE cultivator
- is coupled to the tractor three-point hitch together with the cultivator and is operated by an additional person.

Slopes can be travelled

- along the contours
direction of travel to the left: 10 %
direction of travel to the right: 10 %
- along the gradient
uphill: 10 %
downhill: 10 %

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.

For any damage resulting from improper use:

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

4.7 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 objects ejected by the machine
- by tools rising or lowering 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 symbols 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:

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

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

Danger points exist

- between the tractor and the machine, particularly during coupling and uncoupling operations
- in the area of moving parts
- on the machine while it is moving
- under raised, unsecured machines or machine parts
- in the area of the swivelling track markers.

4.8 Rating plate and CE mark

The figure shows the arrangement of the rating plate and the CE mark on the machine.

The CE mark indicates compliance with the stipulations of the valid EU directives.



Fig. 26

The rating plate and the CE mark indicate:

- (1) Machine ID no.
- (2) Type
- (3) Basic weight kg
- (4) Max. load kg
- (5) Factory
- (6) Model year
- (7) Year of construction



Fig. 27

4.9 Technical data

| | | AD-P 303 Super | AD-P 403 Super |
|------------------------------------|--------|----------------|----------------|
| Working width | [m] | 3.00 | 4.00 |
| Transport width | [m] | 3.03 | 4.03 |
| Number of sowing units | | 24/18 | 32/24 |
| Row spacing | [cm] | 12.5/16.6 | 12.5/16.6 |
| Hopper capacity | [l] | 1500 | 1500 |
| Hopper content with extension | [l] | 2000 | 2000 |
| Filling height (without extension) | [m] | 2.03 | 2.03 |
| Overall height | [m] | 2.67 | 2.67 |
| Working speed | [km/h] | 6 to 12 | 6 to 12 |
| Blower fan drive | | hydraulic | hydraulic |

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

The technical data in this section are needed to calculate the tractor weights and tractor axle loads (see Seite 87).

Distance "d"

| | | |
|----------------------|-------|--|
| Distance "d": | 0.9 m | Distance between the centre of the lower link ball and the centre of gravity of the rear machine combination |
|----------------------|-------|--|

Product description

Total weight (G_H)

Permissible total weight (G_H)

of the rear machine combination is the sum of the weights (see Fig. 28) of the

- basic weight of seed drill with roller
- basic weight of coulter set
- basic weight of harrow
- payload of the seed drill
- basic weight of cultivator.

| Seed drill | | AD-P 303 Super | AD-P 403 Super |
|---|------|------------------|------------------|
| Seed drill with tooth packer roller dia. 600 mm | [kg] | 1120 | 1345 |
| Seed drill with wedge ring roller dia. 580 mm (12.5 cm) | [kg] | 1110 | 1315 |
| RoTeC control coulter (12.5 cm) | [kg] | 192 | 256 |
| RoTeC+ control coulter (12.5 cm) | [kg] | 285 | 380 |
| Exact harrow | [kg] | 97 | 125 |
| Roller harrow (12.5 cm) | [kg] | 98 | 121 |
| Payload without extension | [kg] | 1400 | 1400 |
| Payload with extension | [kg] | 1800 | 1800 |
| Cultivator | | KE/KG 3000 Super | KE/KG 4000 Super |
| Basic weight of KE Super | [kg] | 990 | 1250 |
| Basic weight of KG Super | [kg] | 1230 | 1530 |
| Total weight (intermediate total) | [kg] | | |
| Coupling parts (= 10% of total weight) | [kg] | | |
| Total weight (G_H) = Total weight + coupling parts | [kg] | | |

Fig. 28

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-P 303 Super | from 80 kW (110 bhp) upwards |
| AD-P 403 Super | from 100 kW (140 bhp) upwards |

Electrical system

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

Hydraulic system

| | |
|-----------------------------|---|
| Maximum operating pressure: | 210 bar |
| Tractor pump capacity: | at least 80 l/min at 150 bar |
| Machine hydraulic fluid: | Gearbox/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 units: | Depending on configuration (see section "Overview – Supply lines between the tractor and the machine", Seite 42). |

4.11 Noise production data

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

Measuring unit: OPTAC SLM 5.

The sound pressure level is primarily dependent on the vehicle used.

5 Structure and function

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

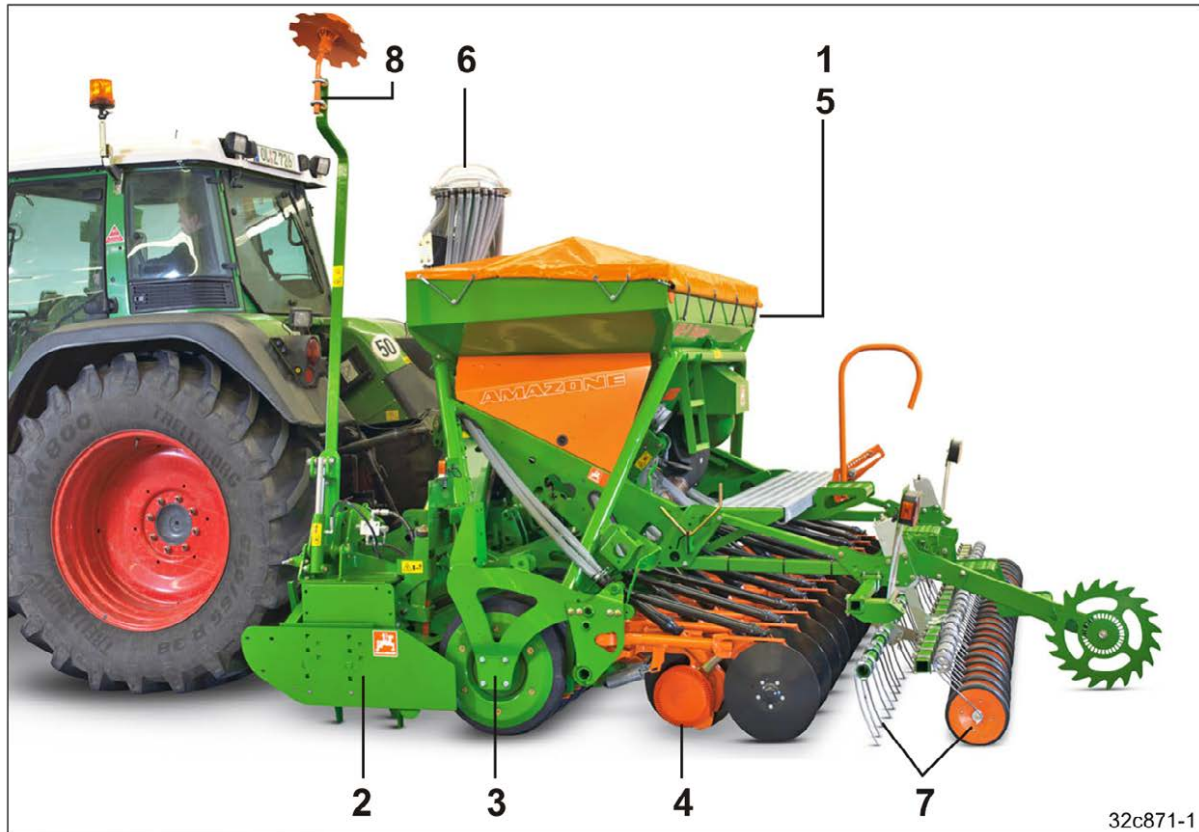


Fig. 29

The AD-P pneumatic top-mounted seed drill (Fig. 29/1) is used as part of a cultivation combination with

- AMAZONE rotary cultivator (Fig. 29/2), AMAZONE rotary harrow (as required) and
- AMAZONE wedge ring roller (Fig. 29/3), AMAZONE tooth packer roller (as required).

This cultivation combination optimises loosening of the soil, recompacting and precise drilling in a single operation. Mulch sowing is possible with the rotary cultivator (Fig. 29/2) in combination with the RoTeC control coulters (Fig. 29/4).

The AD-P pneumatic top-mounted seed drill allows precise seed placement, even placement depth and coverage of the seed and a track-free, well-structured field after tilling.

The seed is carried along in the hopper (Fig. 29/5).

The metered seed volume passes from the seed dosing unit, which is driven by a electric motor or optionally by a star wheel, into the air stream generated by the blower fan.

The air stream conveys the seed to the distributor head (Fig. 29/6), which distributes the seed uniformly onto all the coulters (Fig. 29/4).

The seed is embedded in the soil secured in strips by the wedge rings (Fig. 29/3). The tooth packer roller can be used as required.

The seed is covered with loose soil by the roller harrow (Fig. 29/7). The exact harrow can be used as required.

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

5.1 AMALOG+ on-board computer (optional)

The AMALOG+ on-board computer consists of

- the control terminal
- the basic equipment (cable and fastening material).



Fig. 30

The AMALOG+ on-board computer

- is intended for entering machine-specific data before beginning work
- measures the covered part area [ha]
- stores the total area cultivated [ha]
- indicates the travel speed [km/h]
- controls the electrically operated tramline control and the hydraulically operated tramline marker
- indicates the tramline number
- monitors the tramline control in the distributor head
- monitors the blower fan speed
- indicates the position of the hydraulically operated track markers
- triggers an alarm if the seed level in the seed box falls below the set minimum fill level. Digital fill level monitoring (optional) is required.

Rotary cultivator operation

The AMALOG+

- monitors the function of the overload clutch.
Acoustic alarm in event of tool carrier standstill.

5.2 AMADRILL+ on-board computer (optional)

The AMADRILL+ on-board computer consists of

- the control terminal
- the basic equipment (cable and fastening material).



Fig. 31

The AMADRILL+ on-board computer

- is intended for entering machine-specific data before beginning work
- measures the covered part area [ha]
- stores the total area cultivated [ha]
- indicates the travel speed [km/h]
- controls the electrically operated tramline control and the hydraulically operated tramline marker
- indicates the tramline number
- monitors the tramline control in the distributor head
- monitors the blower fan speed
- indicates the position of the hydraulically operated track markers
- triggers an alarm if the seed level in the seed box falls below the set minimum fill level. Digital fill level monitoring (optional) is required.
- adjusts the sowing rate to the working speed. Vario gearbox with electronic seed rate setting (optional) is required.

Rotary cultivator operation

The AMADRILL+

- monitors the function of the overload clutch. Acoustic alarm in event of tool carrier standstill.

5.3 AMATRON 3 on-board computer (optional)

The AMATRON 3 is an operating terminal for fertiliser spreaders, field sprayers and seed drills.

The AMATRON 3 consists of

- the control terminal
- the basic equipment (cable and fastening material)
- the job computer on the machine.



Fig. 32

The AMATRON 3 serves

- to input machine-specific data
- to input job-related data
- to monitor and control machine functions
 - track marker actuation
 - tramline control
- to change the sowing rate during sowing
 - adjustment of sowing rate to working speed
 - adjustment of sowing rate to different soils.

The AMATRON 3 indicates

- the current travel speed [km/h]
- the current spread rate [kg/ha]
- the current hopper content [kg]
- the remaining distance [m] until the hopper is empty
- the track marker working position
- the position of the tramline counter and the tramline marker
- the blower fan speed.

For a commenced order, the AMATRON 3 stores

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

The AMATRON 3 issues an alarm

- if the seed level in the hopper falls below the set minimum fill level (optional).

The AMATRON 3 operating manual describes the operation of the on-board computer on the machine.

Rotary cultivator operation

The AMATRON 3

- monitors the function of the overload clutch.
Acoustic alarm in event of tool carrier standstill.

5.4 Hopper and loading board

The hopper is equipped with a swivelling cover (Fig. 33/1), which is sealed against dust and water.

The hopper is filled from the loading board (Fig. 33/2) at the rear of the seed drill.



Fig. 33

5.4.1 Digital fill level monitoring (optional)

A level sensor (Fig. 34/1) monitors the seed level in the hopper.

If the seed level reaches the level sensor, the on-board computer receives an impulse and a warning message appears. An alarm signal sounds at the same time. This alarm signal is intended to remind the tractor driver to fill up the seeds again.

The height of the level sensor is adjustable.



Fig. 34

5.5 Dosing

The hopper has a dosing unit.

The seed is metered by a dosing roller in the dosing unit. The speed of the dosing roller determines the sowing rate.

The dosing roller (Fig. 35/1) can be replaced.

The seed falls into the injector sluice (Fig. 35/2) and is directed by the air flow to the distributor head and then to the coulters.

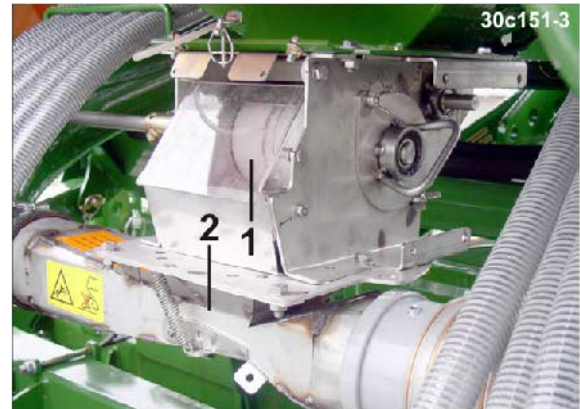


Fig. 35

The dosing roller can be driven

- by the star wheel (Fig. 36/1) via the Vario gearbox (star wheel drive)



Fig. 36

- by an electric motor (full dosing) (Fig. 37/1).

The on-board computer determines the working speed using the impulses from the star wheel or from a roller feeler.



Fig. 37

Structure and function

Star wheel drive

The sowing rate (speed of dosing roller)

- can be adjusted on the Vario gearbox
- is set by the on-board computer on the basis of the calibration test and the working speed if equipped with the Vario gearbox with electronic seed rate adjustment.

Full dosing

The sowing rate (speed of dosing roller)

is set by the on-board computer on the basis of the calibration test and the working speed.

The speed of the dosing roller

- determines the sowing rate.
The higher the speed of the electric motor, the greater the sowing rate.
- automatically adjusts to changing working speeds.

As soon as the roller feeler stops, for example when turning at the end of a field, the electric motor switches off and the dosing roller comes to a halt.

5.5.1 Dosing rollers

The dosing roller selection is dependent on the

- gain size
- spread rate.

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

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

With the calibration test, check whether the selected dosing roller achieves the spread rate.

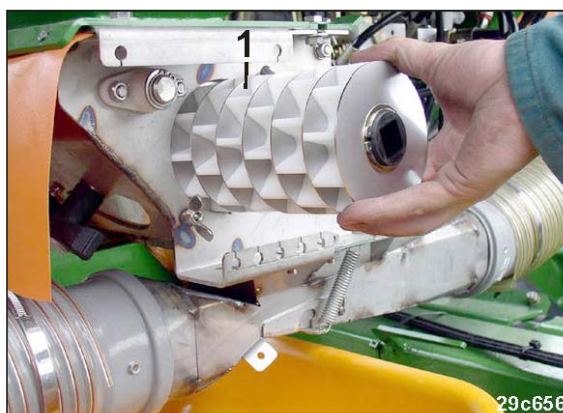


Fig. 38

5.5.2 Overview of dosing rollers







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

Fig. 39



For sowing particularly large seeds, e.g. beans, the chambers (Fig. 40/1) of the dosing roller can be enlarged by repositioning the wheels and the plates.

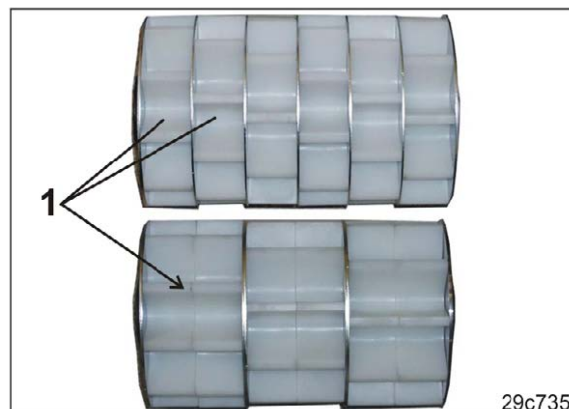


Fig. 40

Dosing wheel without chambers (order no. 969904)



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



Fig. 41

5.5.3 Table Seed dosing rollers

| Seed | Dosing rollers | | | | | |
|---------------------------------------|---------------------|--------------------|---------------------|---------------------|---------------------|---------------------|
| | 7.5 cm ³ | 20 cm ³ | 120 cm ³ | 210 cm ³ | 600 cm ³ | 700 cm ³ |
| Beans | | | | | | X |
| Spelt wheat | | | | | X | |
| Peas | | | | | | X |
| Flax (dressed) | | X | X | X | | |
| Barley | | | | X | X | |
| Grass seed | | | | X | | |
| Oats | | | | | X | |
| Millet | | | X | X | | |
| Lupins | | | X | X | | |
| Alfalfa | | X | X | X | | |
| Maize | | | X | | | |
| Poppy seed | X | | | | | |
| Linseed (for oil) (moist dressing) | | X | | | | |
| Fodder radish | | X | X | X | | |
| Phacelia | | X | X | | | |
| Rapeseed | | X | | | | |
| Rye | | | | X | X | |
| Red clover | | X | X | | | |
| Mustard | | X | X | X | | |
| Soya | | | | | X | X |
| Sunflowers | | | X | X | | |
| Turnips | | X | | | | |
| Wheat | | | | X | X | |
| Vetches | | | | X | | |



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

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

5.5.4 Seed rate adjustment at Vario gearbox

The sowing rate required is set using the gearbox lever (Fig. 42/1) of the Vario gearbox.

Adjusting the gearbox lever changes the sowing rate. The higher the number the gearbox lever points to on the scale (Fig. 42/2), the greater the sowing rate.

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

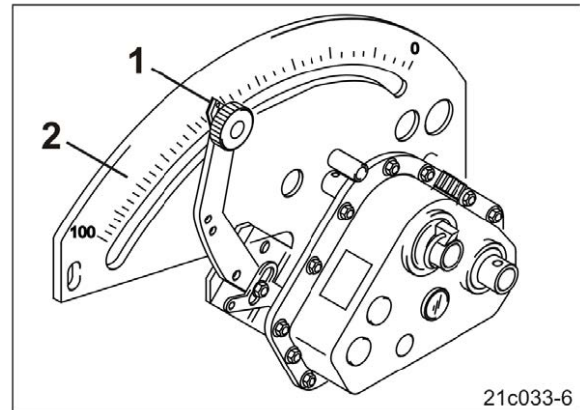


Fig. 42

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. 43/1) for all sowing rates over 30 kg/ha
- an inner white scale (Fig. 43/2) for all sowing rates below 30 kg/ha
- a coloured scale (Fig. 43/3) with all gearbox settings from 1 to 100.

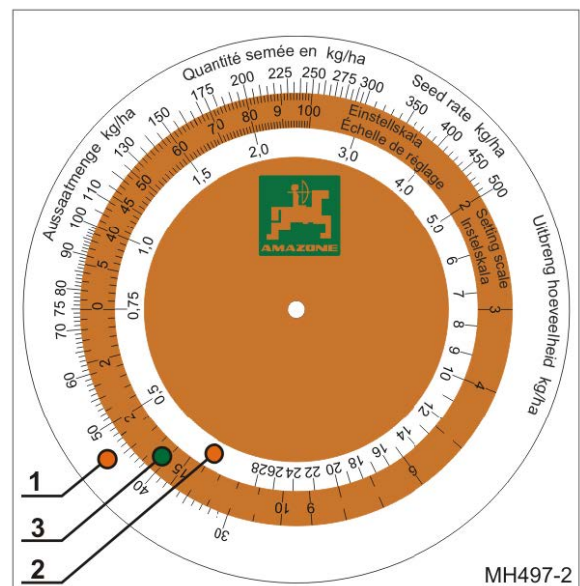


Fig. 43

5.5.5 Seed rate remote control, hydraulic on the Vario gearbox (optional)

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 gearbox lever of the Vario gearbox is adjusted by a hydraulic cylinder.

The increased sowing rate is to be set on the sowing rate remote adjustment control lever (Fig. 44/1).



Fig. 44

Depending on the equipment and the setting, when tractor control unit 2 is actuated there is a simultaneous increase in

- the sowing rate
- the coulter pressure
- the exact harrow pressure.

5.5.6 Seed rate setting, electronic on the Vario gearbox (optional)

An electric setting motor (Fig. 45/1), controlled by the on-board computer, sets the gearbox lever (Fig. 45/2) to the desired sowing rate.

With the values from the first calibration test, the on-board computer calculates the required setting and automatically sets the gearbox lever. This setting must be checked with an additional calibration test.

The on-board computer indicates the scale setting of the gearbox lever.

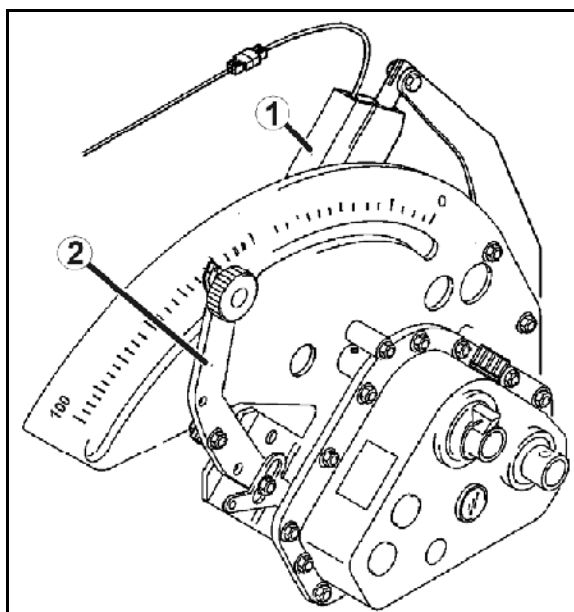


Fig. 45

5.5.7 Seed rate adjustment with full dosing (optional)

With machines with full dosing an electric motor (Fig. 46/1) drives each dosing roller. The machines do not have Vario gearboxes.

The rotational drive speed of the dosing roller is determined by the working speed and the preset sowing rate. A roller feeler determines the working speed and the distance covered.

The sowing rate is adjusted in the on-board computer. Each setting must be checked with a calibration test.



Fig. 46

The rotational drive speed of the dosing roller

- determines the sowing rate. The higher the rotational drive speed of the electric motor, the greater the sowing rate.
- automatically adjusts to changing working speeds.



The machine has a chain drive with which the sowing rate setting range can be changed.

The chain wheels in the chain drive need to be switched to change the range [see section "Switch the chain wheels in chain drive (specialist workshop)", Seite 175].

Seed predosing

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

The run time of the seed predosing is adjustable.

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

Start-up ramp

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

As soon as the machine is lowered to the operational position after turning, the seed is metered into the delivery line. The "start-up ramp" compensates for system-specific seed rate reductions during the acceleration phase of the machine. The factory settings can be adapted.

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

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

Example

Values that can be set in the on-board computer

probable
working speed: 10 km/h
starting speed: 50 %
time required to reach
working speed: 8 seconds

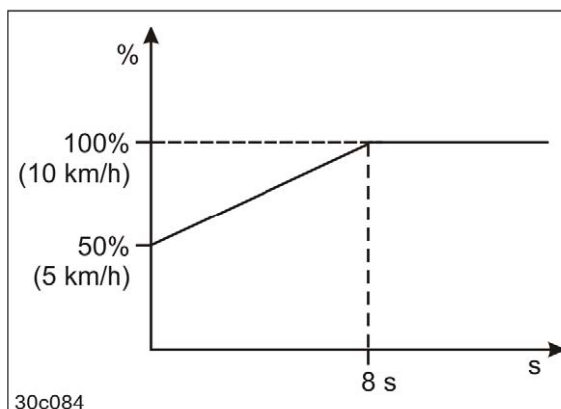


Fig. 47

5.5.8 Calibration test

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

Always carry out a calibration test

- when the seed type is changed
- if the seed type is identical, but the grain size, grain shape, specific weight and dressing are different
- after changing the dosing rollers
- if the actual sowing rate does not correspond to the sowing rate that was determined by the calibration test.

The seed drops into the calibration trough during the calibration test (Fig. 48).

For transportation, the calibration trough is secured with a lynch pin (Fig. 48/1) in the transport bracket.



Fig. 48

5.6 Blower fan

The blower fan (Fig. 49/1) generates the air current that carries the seed from the injector sluice to the sowing coulters.

The blower fan is driven by a hydraulic motor (Fig. 49/2) that is connected to the on-board hydraulic system of the tractor.

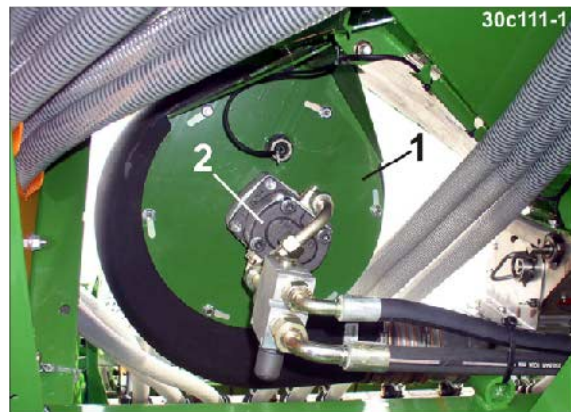


Fig. 49

The blower fan speed is indicated

- by the on-board computer if the blower fan is driven by a hydraulic motor
- indirectly by a pressure gauge (Fig. 50) if the machine has no on-board computer or is equipped with a belt drive.



Fig. 50

The on-board computer monitors the blower fan speed. If the blower fan speed deviates by more than 10% from the target speed, an acoustic signal is issued along with a screen display. It is possible to set the percentage deviation.

5.6.1 Blower fan with hydraulic drive

The hydraulic motor (Fig. 51/2) drives the blower fan (Fig. 51/1).

The blower fan generates an air current that carries the seed from the injector sluice to the coulters. The blower fan speed determines the air volume of the air current.

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

Please refer to the table (Fig. 52, unterhalb) for the required fan speed.

The blower fan speed can be regulated

- via the tractor's flow control valve
or (if not present)
- via the pressure relief valve (Fig. 51/3) of the hydraulic motor.

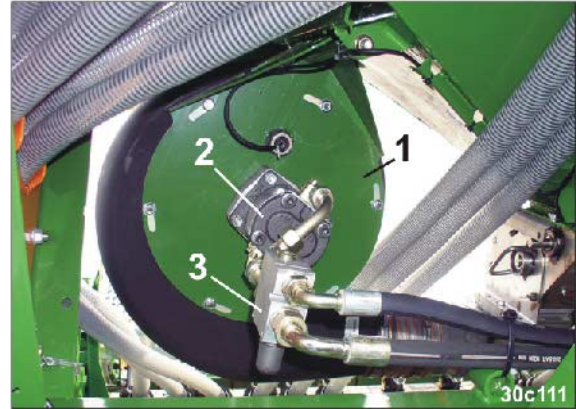


Fig. 51

The blower fan speed (rpm) is dependent on

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

Example:

- AD-P 403
- Cereal seed

required
blower fan speed: 3800 rpm.




| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  max. 4000 1/min </div> <div style="text-align: center;">   </div> </div> | | |
|--|-------|-------|
| 3,0 / 3,5 m | 2800 | 3500 |
| 4,0 / 4,5 m | 3000 | 3800 |
| 5,0 / 6,0 m | 3200 | 3900 |
| 8,0 / 9,0 / 12,0 m | 3200 | 3900 |
| ME752 | 1/min | 1/min |
| 1 | 2 | 3 |

Fig. 52

Structure and function

The blower fan speed is as a rule displayed by the on-board computer.

Machines without an on-board computer have a pressure gauge (Fig. 53).

The blower fan speed is set correctly when the pressure gauge pointer during work

- is in the green area (Fig. 53/1) for grains and pulses
- is in the green area (Fig. 53/2) for fine seeds (e.g. rape or grass seed).



Fig. 53



Outside the specified green areas, there may be inaccuracy with regard to distribution of the seed, which could damage the blower fan.

5.7 Distributor head

In the distributor head (Fig. 54), the seed is distributed uniformly over all the sowing coulters.

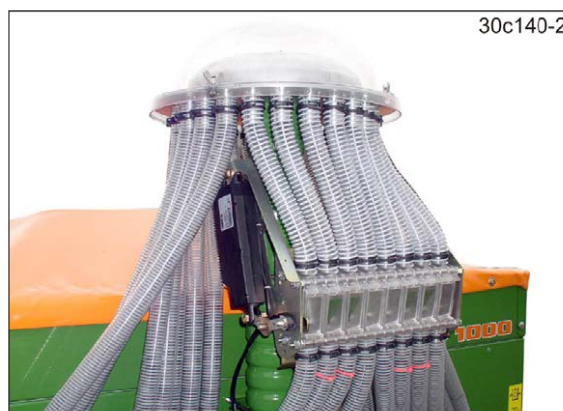


Fig. 54

5.8 Star wheel / Impulse wheel

Via the Vario gearbox, the star wheel (Fig. 55/1) drives the dosing roller in the seed dosing unit.

The star wheel can have three settings

- Transport position
- Working position
- Calibration position

The star wheel can also be raised hydraulically, as required.



Fig. 55

Machines with full dosing have an impulse wheel (Fig. 56/1).

The impulse wheel can have two settings

- Transport position
- Working position



Fig. 56

Structure and function

The on-board computer requires the impulses from the mounted wheel over a calibration distance of 100 m

- to calculate the forward speed
- to calculate the area cultivated (hectare counter)
- to adjust the spread rate.

The value Impulses/100 m is the number of impulses received by the on-board computer during the measuring travel of the wheel.

Calibrate the star wheel or impulse wheel as described in the on-board computer operating manual

- before initial use
- in event of different soils (slippage)
- in event of deviation between the seed quantity determined in the calibration test and the seed quantity output in the field
- in event of deviation between the indicated and the actually cultivated area.

The theoretical calibration value (see table in Fig. 57) is only a guide value and does not take the place of the calibration run.

| AD-P 03 Super | Theoretical calibration value |
|------------------------------------|-------------------------------|
| with star wheel and Vario gearbox | 1575 |
| with impulse wheel and full dosing | 1230 |

Fig. 57



Put the star wheel and impulse wheel in transportation position if the soil is to be worked without sowing.

5.9 RoTeC and RoTeC+ control coulters (optional equipment)

Seed drills with RoTeC (Fig. 58/1) and RoTeC+ control coulters (Fig. 58/2) are suitable for conventional sowing and mulch sowing.

The flexible depth guide disc (Fig. 58/4)

- limits the seed planting depth
- cleans the rear side of the sowing disc (Fig. 58/3)
- improves the drive of the steel disc by gripping the soil.

To limit the planting depth, the depth guide disc can be set to three positions by actuating the handle (Fig. 58/5) or the depth guide disc can be removed.

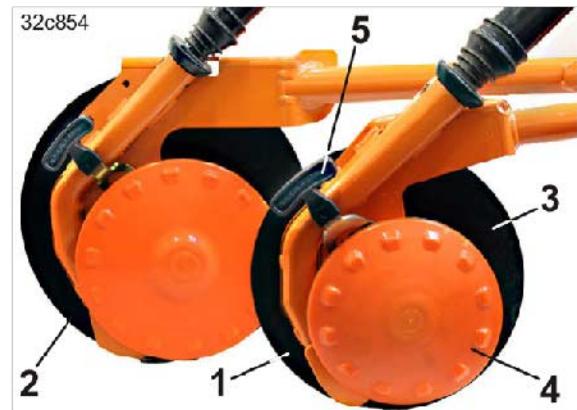


Fig. 58

The sowing disc (Fig. 58/3), which slopes slightly in the direction of travel, does not move much soil at fast travel speeds. The RoTeC+ control coulters can be used on larger areas to achieve even greater working speeds.

The steady coulters ride and the precise seed placement result from the high coulters pressure and the support of the coulters on the depth guide disc.

Very shallow sowing, e.g. on particularly light sandy soils, is made possible by the depth control roller (Fig. 59), which can be fitted in place of the depth guide disc as required.



Fig. 59

5.10 Coulter pressure

The planting depth depends on

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

The coulter pressure is adjusted centrally by means of the calibration crank or hydraulically.

5.10.1 Coulter pressure (adjusted with the calibration crank)

The coulter pressure is set centrally with the calibration crank (Fig. 60/1).



Fig. 60

5.10.2 Coulter pressure adjustment, hydraulic (optional)

The coulter 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. 61/1) in an adjuster segment act as the stop for the hydraulic cylinder.

If pressure is applied at the tractor control unit, the coulter pressure increases and the stop is in contact with the upper pin. In the floating position the stop is in contact with the lower bolt.

The numbers on the scale (Fig. 61/2) are provided for guidance. The higher the number, the greater the coulter pressure.

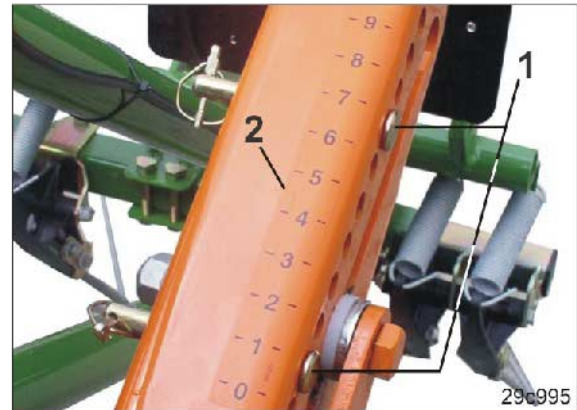


Fig. 61

When the control unit is actuated, depending on equipment and setting there is a simultaneous increase in

- the sowing rate
- the coulter pressure
- the exact harrow pressure.

The coulter pressure display (Fig. 62/1) is visible from the tractor cab.

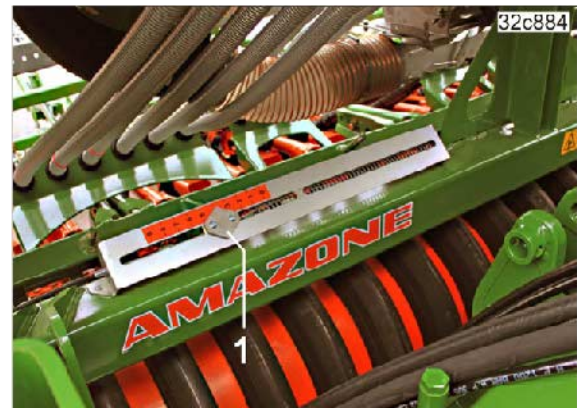


Fig. 62

5.11 Exact harrow (optional equipment)

The exact harrow (Fig. 63/1) evenly covers the seeds deposited in the sowing furrows with loose earth and smoothes the ground.

The following are adjustable

- the exact harrow tine setting
 - by adjusting screws of exact harrow holder
 - via a spindle (optional)
- the exact harrow pressure mechanically or hydraulically

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

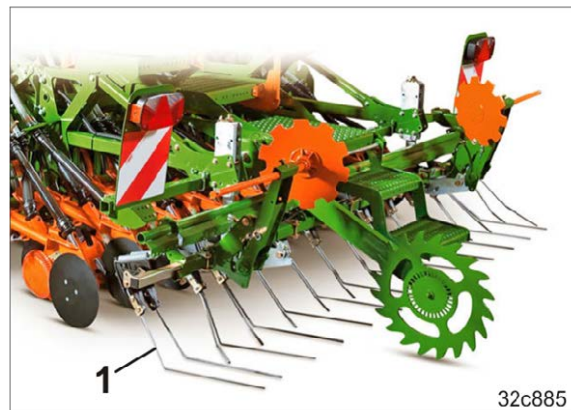


Fig. 63

5.11.1 Exact harrow tine position

Exact harrow tine position

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

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

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

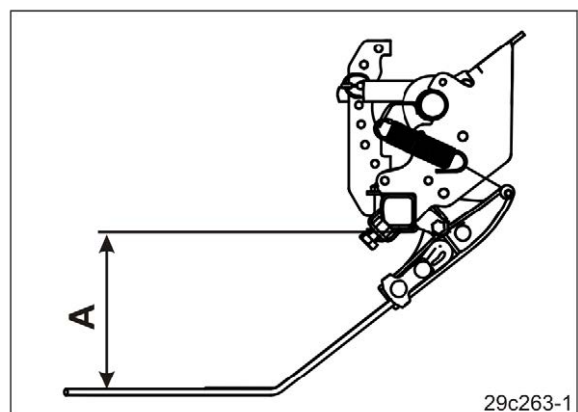


Fig. 64

5.11.2 Exact harrow pressure adjustment

The exact harrow pressure is generated by tension springs that are tensioned using a lever (Fig. 65/1).

The lever is in contact with a bolt (Fig. 65/2) in the adjuster segment. The higher the pin is inserted in the group of holes, the greater the exact harrow pressure.

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

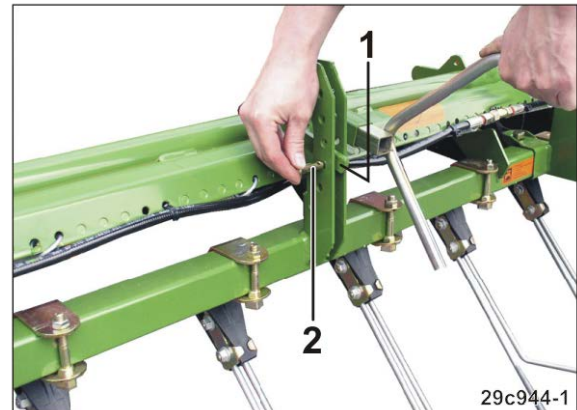


Fig. 65

5.11.3 Hydr. exact harrow pressure adjustment (optional)

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.

The exact harrow pressure is centrally adjusted with a hydraulic cylinder connected with the hydr. coulter pressure adjustment (optional) to control unit 2.

When the coulter pressure rises, the exact harrow pressure automatically increases and the sowing rate increases (only with hydr. seed rate remote control).

Two pins (Fig. 66/1) in an adjuster segment act as the stop for the lever (Fig. 66/2). If pressure is applied at control unit 2, the exact harrow pressure increases and the lever is in contact with the upper pin. In the floating position the lever is in contact with the lower pin.

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



Fig. 66

5.12 Roller harrow (optional equipment)

The roller harrow consists of

- the harrow tines (Fig. 67/1)
- the press rollers (Fig. 67/2).

The harrow tines close the seed furrows.

The press rollers press the seed to the bottom of the furrows. The better soil contact means more humidity is available for germination. Cavities are closed off, making it harder for snails to get at the seed in the event of snail infestation.

The following are adjustable

- the angle of the harrow tines
- the working depth of the harrow tines
- the roller contact pressure to the soil.



Fig. 67

5.13 Track markers

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

Here, the active track marker (Fig. 68/1) 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.

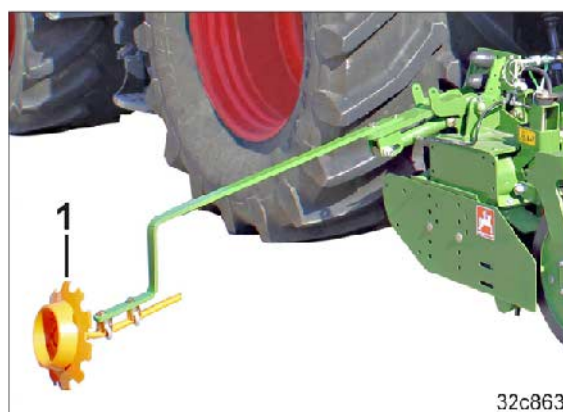


Fig. 68

It is possible to set:

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

Raise the active track marker in the field before passing obstacles. If the track marker still strikes against a solid obstacle, a bolt shears off and the track marker deviates around the obstacle.

We recommend carrying replacement shear bolts (see section "Shearing of the track marker boom", Seite 159) along with you in the tractor.

5.14 Creating tramlines (Option)

The tramline control allows tramlines to be created at preselected intervals on the field. To set the different tramline distances appropriate tramline rhythms have to be entered into the on-board computer.

When creating the tramlines

- the tramline control in the flap box (Fig. 69/1) blocks the seed feeding lines to the seed lines (Fig. 69/2) of the tramline coulter
- the tramline coulters do not deposit any seeds in the soil
- the seed is returned by the tramline coulter to the hopper.

Seed supply to the tramline coulters is interrupted as soon as the electric motor (Fig. 69/3) closes the appropriate seed tubes in the flap box.

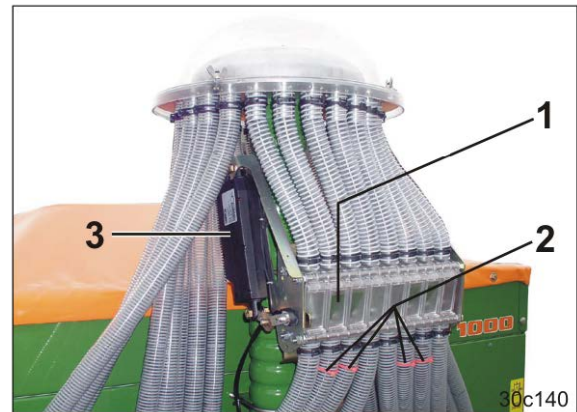


Fig. 69

Upon creating a tramline the tramline counter indicates the number "0" on the on-board computer.

A sensor checks whether the flaps that open and close the seed tubes to the tramline coulters are working properly.

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

The tramline control allows tramlines to be created at preselected intervals on the field.

Tramlines are seed-free tracks (Fig. 70/A) for fertilising and plant care machines used later.

The tramline spacing (Fig. 70/b) corresponds to the working width of the cultivation machines (Fig. 70/B), e.g. fertiliser spread and/or sprayer, which are used on sown fields.

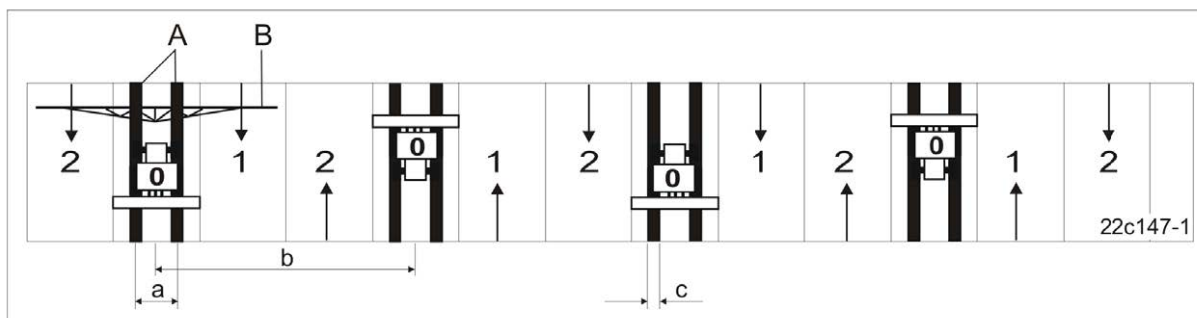


Fig. 70

To set the different tramline spacings (Fig. 70/b) the appropriate tramline rhythm must be entered in the on-board computer.

The figure (Fig. 70) shows the tramline rhythm 3. During the work the field runs are numbered consecutively (tramline counter) and displayed in the on-board computer.

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

Upon creating a tramline the tramline counter indicates the number "0" on the on-board computer.

The required tramline rhythm (see table Fig. 71) is derived from the required tramline spacing and the working width of the seed drill. Additional tramline rhythms can be found in the operating manual for the on-board computer¹⁾.

The track width (Fig. 70/a) of the tramline corresponds to that of the cultivating tractor and is adjustable (see section "Adjusting the track width of the cultivating tractor", Seite 172).

The track width (Fig. 70/c) of the tramline increases with an increasing number of tramline coulters fitted next to each other.

| Tramline rhythm | Seed drill working width | | |
|-----------------|--|-------|-------|
| | 3.0 m | 3.5 m | 4.0 m |
| | Tramline spacing (working width of the fertiliser spreader and field sprayer) | | |
| 3 | 9 m | | 12 m |
| 4 | 12 m | | 16 m |
| 5 | 15 m | | 20 m |
| 6 | 18 m | 21 m | 24 m |
| 7 | 21 m | | 28 m |
| 8 | 24 m | 28 m | 32 m |
| 9 | 27 m | | 36 m |
| 2 plus | 12 m | | 16 m |
| 6 plus | 18 m | 21 m | 24 m |

Fig. 71

5.14.1 Examples for creating tramlines

The creation of tramlines is shown in Fig. 72 using various examples:

A = Working width of the seed drill

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

C = Tramline rhythm

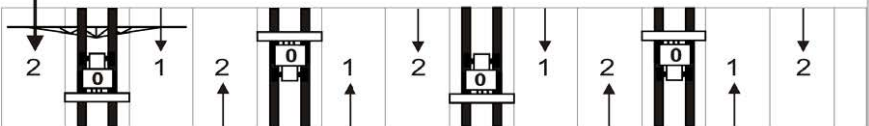
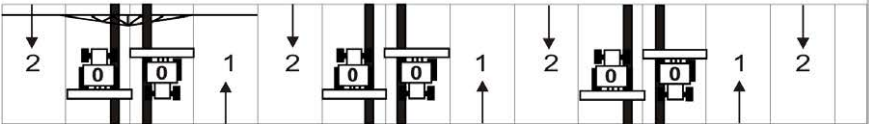
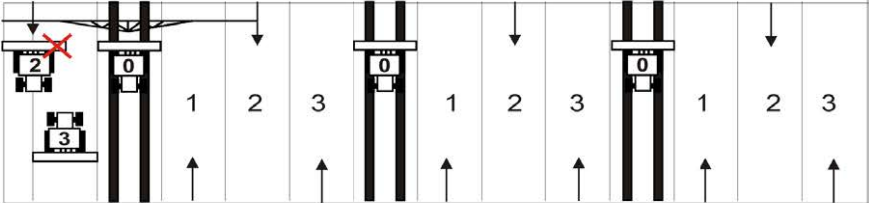
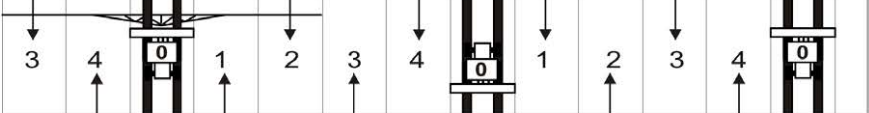
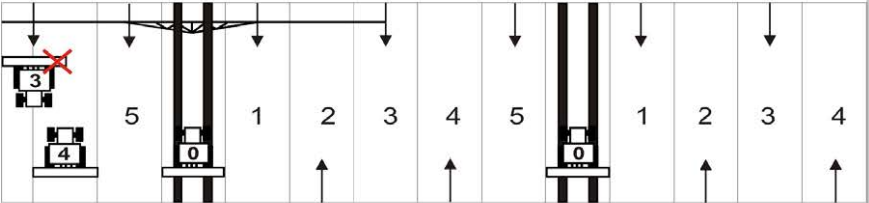
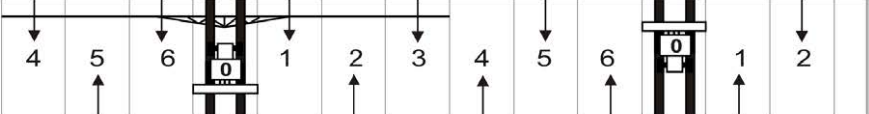
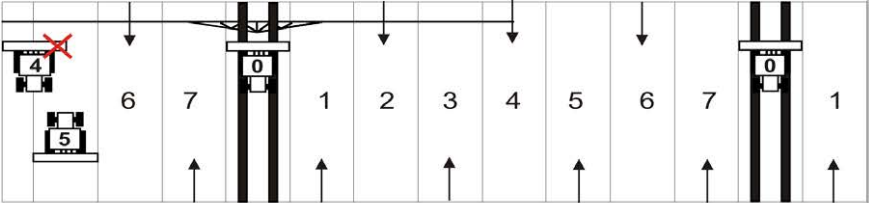
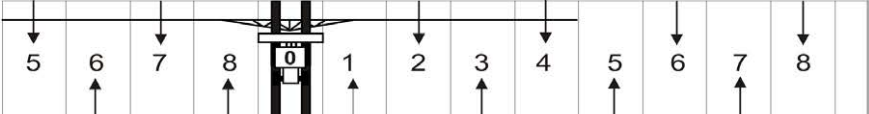
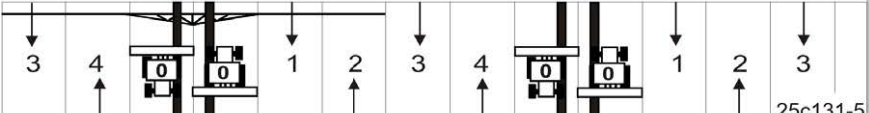
D = Tramline counter (during work the field runs are number consecutively and displayed on the on-board computer).

Example:

Working width of seed drill:3 m

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

1. Look for the following in the table (Fig. 72):
in column A, the seed drills working width (3 m) and
in column B, the tramline spacing (18 m).
2. On the same line in column "C" take the reading for the tramline rhythm (tramline rhythm 3).
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).
This value must be entered in the on-board computer immediately before the first field run.

| A | B | C | D |
|---|--|-----------|--|
| | | | START DÉPART |
| 3,0 m 4,0 m 6,0 m 8,0 m 9,0 m | 9 m 12 m 18 m 24 m 27 m | 3 |  |
| 2,5 m 3,0 m 4,0 m 4,5 m 6,0 m 8,0 m 9,0 m | 10 m 12 m 16 m 18 m 24 m 32 m 36 m | 2 |  |
| 2,5 m 3,0 m 4,0 m 4,5 m 6,0 m 8,0 m 9,0 m | 10 m 12 m 16 m 18 m 24 m 32 m 36 m | 4 |  |
| 3,0 m 4,0 m 6,0 m 8,0 m | 15 m 20 m 30 m 40 m | 5 |  |
| 2,5 m 3,0 m 3,5 m 4,0 m 4,5 m 6,0 m 8,0 m | 15 m 18 m 21 m 24 m 27 m 36 m 48 m | 6 |  |
| 3,00 m 3,43 m 4,00 m 6,00 m | 21 m 24 m 28 m 42 m | 7 |  |
| 2,5 m 3,0 m 3,5 m 4,0 m | 20 m 24 m 28 m 32 m | 8 |  |
| 3,0 m 4,0 m | 27 m 36 m | 9 |  |
| 2,5 m 3,0 m 3,5 m 4,0 m 4,5 m 6,0 m 8,0 m | 15 m 18 m 21 m 24 m 27 m 36 m 48 m | 21 |  |

25c131-5

Fig. 72

5.14.2 Tramline rhythm 4, 6 and 8

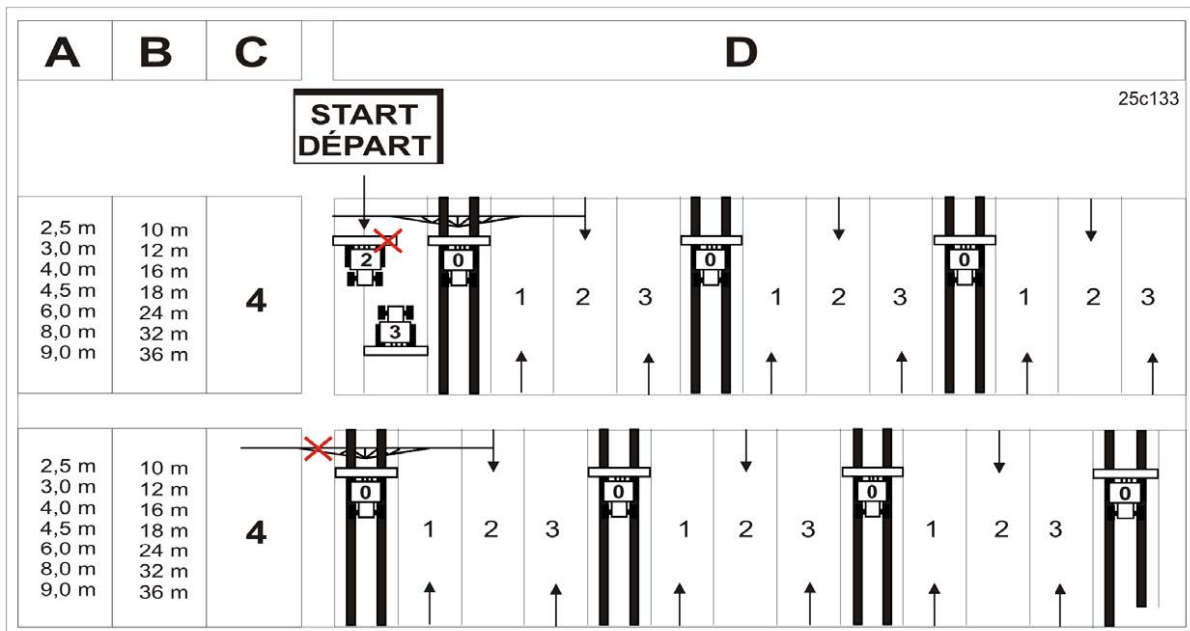


Fig. 73

Figure (Fig. 72) shows examples for creating tramlines with the tramline rhythm 4, 6 and 8.

The work of the seed drill at half working width (partial width) during the first field run is shown.

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. 73).

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

After the first field run, restore the full machine working width.

5.14.3 Tramline control 2 and 21

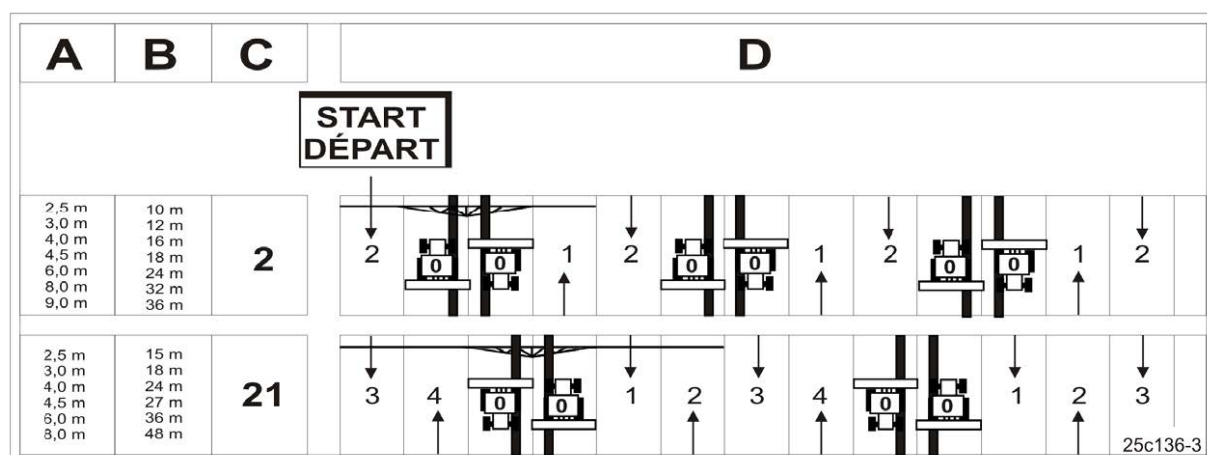


Fig. 74

(Fig. 72) shows examples of creating tramlines with tramline control 2 and 21.

When tramlines are created with the tramline control 2 and 21 (Fig. 74), tramlines are created during the trips forward and backward over the field.

On machines with

- tramline control 2, the seed feed to the tramline coulters may only be interrupted on the right side and
- on machines with tramline control 21, the seed feed to the tramline coulters may only be interrupted on the left side.

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

5.14.4 Working with half working width (partial width)

The installation of an insert (Fig. 75/1) in the distributor head interrupts the seed supply to the coulters of one machine half.



Halve the sowing rate when working with half a working width.

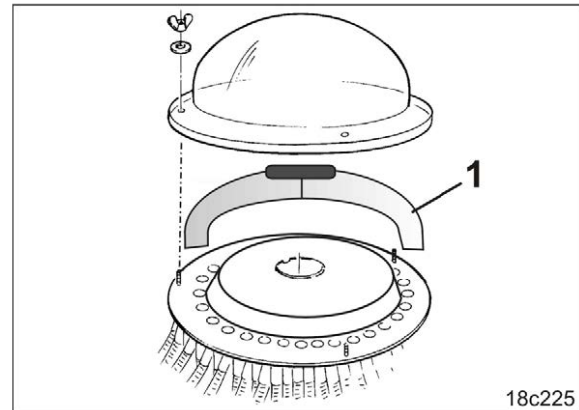


Fig. 75

5.14.5 Tramline marker (optional)

When tramlines are being created, the track discs (Fig. 76) lower automatically and mark the tramline that has just been created. Due to this the tramlines already become visible before the seed has been sown.

The following are adjustable

- the track width of the tramline (Fig. 70/a)
- the working intensity of the track discs.

The track discs are raised if no tramline is created.



Fig. 76

6 Commissioning

This section contains information

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



- Before operating the machine for the first time, the operator must have read and understood the operating manual.
- Take heed of section "Safety information for the operator", from Seite 28 onwards on
 - coupling and uncoupling the machine
 - transporting the machine
 - using the machine.
- Only couple and transport the machine 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

Danger of crushing, shearing, cutting, or being caught and drawn in 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 controlled or
- require a float position or pressure position due to their function.

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

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

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

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

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



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

- tractor's empty weight
- ballast weight and
- total weight of the attached machine or 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

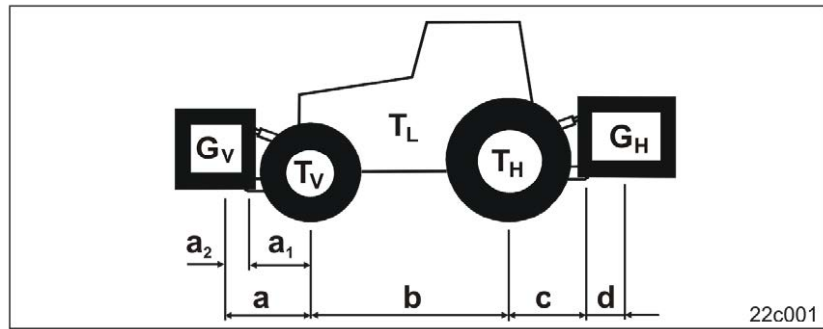


Fig. 77

| | | | |
|-------|------|--|---|
| T_L | [kg] | Tractor empty weight | See tractor operating manual or vehicle documentation |
| T_V | [kg] | Front axle load of the unladen tractor | |
| T_H | [kg] | Rear axle load of the unladen tractor | |
| G_H | [kg] | Total weight of rear-mounted machine or rear ballast | See section "Technical data for the calculation of tractor weights and tractor axle loads", Seite 49, or rear ballast |
| 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-mounted machine or front weight (centre of gravity distance) | See technical data of front-mounted machine 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 section "Technical data for the calculation of tractor weights and tractor axle loads", Seite 49, or rear ballast |

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 (see 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 (see 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 (see 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 (see section 6.1.1.7).

6.1.1.6 Tractor tyre load-bearing capacity

Enter the double value (two tyres) of the approved load capacity (see, for example, tyre manufacturer's documentation) in the table (see section 6.1.1.7).

6.1.1.7 Table

| | Actual value according to calculation | Permissible value according to tractor instruction manual | Double approved load capacity (two tyres) |
|------------------------------|---------------------------------------|---|---|
| Minimum ballast front / rear | / kg | -- | -- |
| Total weight | kg | ≤ kg | -- |
| Front axle load | kg | ≤ kg | ≤ kg |
| Rear axle load | kg | ≤ kg | ≤ kg |



- 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, being trapped or drawn in, or 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 permissible 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 repair work
 - while the machine is being driven
 - as long as the tractor engine is running with a connected PTO shaft / hydraulic system
 - if the ignition key is inserted in the tractor and the tractor engine can be started unintentionally with the PTO shaft / hydraulic system connected
 - if the tractor and machine are not secured with their respective tractor parking brake against unintentional rolling
 - if moving parts are not blocked to prevent unintentional movement.

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

1. Only park the tractor with the machine on firm flat ground.
2. Lower the raised, unsecured machine / raised, unsecured parts of the machine.
→ This is how to prevent unintentional lowering:
3. Shut down the tractor engine.
4. Remove the ignition key.
5. Apply the tractor parking brake.

6.3 Installation regulations for the hydraulic fan drive connection

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

- Connect the hydraulic coupling of the pressure hose (Fig. 78/5) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling of the return line (Fig. 78/6) only to an unpressurised tractor connection with direct access to the hydraulic fluid tank (Fig. 78/4).
In order that the banking-up pressure of 10 bar is not exceeded, do not connect the return line to a tractor control unit.
- For retrofitting of the tractor return line hose, use only piping with DN 16, e.g. 20 id. x 2.0 mm with a short return path to the hydraulic fluid tank.

For operating all of the hydraulic functions the capacity of the hydraulic pump should be at least 80 l/min. at 150 bar.

Fig. 78/...

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

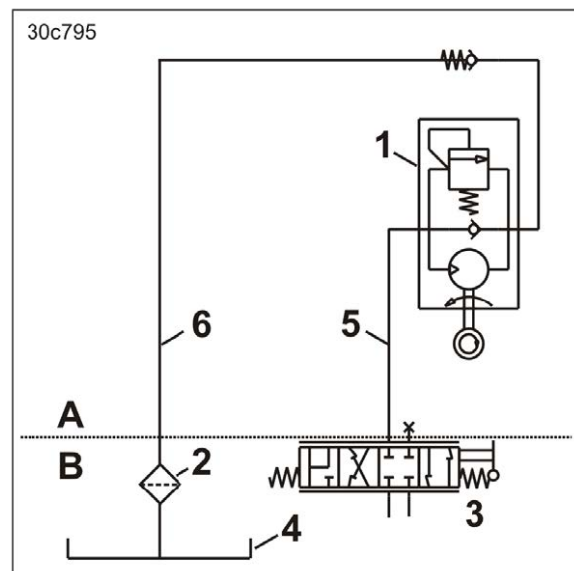


Fig. 78



The hydraulic fluid must not overheat.

High oil flow rates in conjunction with small oil tanks encourage rapid heating-up of the hydraulic fluid. The capacity of the tractor's oil tank (Fig. 78/4) should be at least twice the oil flow rate. If the hydraulic fluid heats up excessively, the installation of an oil cooler is required at a specialist workshop.

6.3.1 Initial fitting of road safety bar holders (specialist workshop)

Screw the two holders (Fig. 79/1) onto the exact harrow (Fig. 79/2).

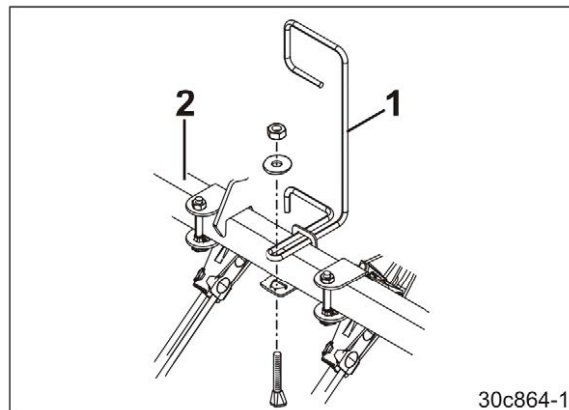


Fig. 79

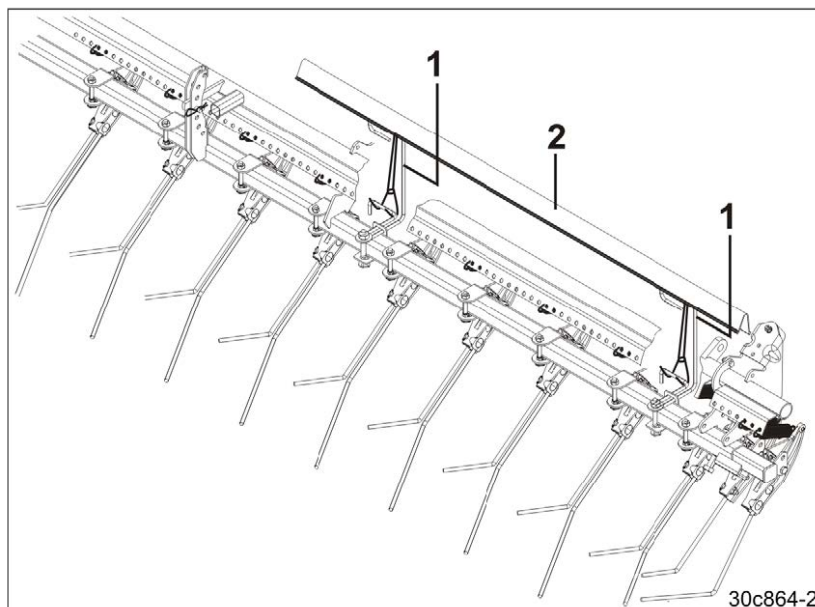


Fig. 80



During work, the road safety bars (Fig. 80/2) are secured to the holders (Fig. 80/1).

7 Coupling and uncoupling the machine



When coupling and uncoupling machines, follow the instructions given in the section "Safety instructions for the operator".



CAUTION

Switch off the on-board computer

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

Risk of accident due to unintentional movement of machine components when wheel is moved.



WARNING

Risk of contusions from unintentional start-up and rolling of the tractor and machine when coupling or uncoupling the machine!

Secure the tractor and the machine against unintentional start-up and rolling before entering the danger area between the tractor and the machine to couple or uncouple the machine.



WARNING

Danger of being crushed between the rear of the tractor and the machine when coupling and uncoupling the machine!

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

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

7.1 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.

7.1.1 Coupling the hydraulic hose lines



WARNING

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

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



- Check the compatibility of the hydraulic fluids before connecting the machine to the hydraulic system of the tractor.
Do not mix any mineral oils with biological oils.
- Observe the maximum approved hydraulic fluid pressure of 210 bar.
- Only couple clean hydraulic connectors.
- Push the hydraulic push-fit connector(s) into the hydraulic sockets until the hydraulic connector(s) perceivably lock(s).
- Check the coupling points of the hydraulic hose lines for a correct, tight seat.

1. Swivel the actuation lever on the tractor control unit 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. 81

7.1.2 Uncoupling the hydraulic hose lines

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



Fig. 82

7.2 Connecting top-mounted seed drill



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", Seite 85.



WARNING

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

Direct persons away from 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 pin, for visible defects. Replace the coupling parts in the event of clearly visible wear.
- Secure 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!

Check the routing of the supply lines when they are being coupled.
The supply lines

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



AMAZONE AD-P Super top-mounted seed drills may be optionally combined with

- AMAZONE tooth packer roller
- AMAZONE wedge ring roller
- and
- AMAZONE rotary cultivator KG
- AMAZONE rotary cultivator KX
- AMAZONE rotary harrow KE.

1. Couple the cultivator to the tractor (see cultivator operating manual).
2. Direct persons away from the danger area between the cultivator and the combination and the top-mounted seed drill.
3. Drive the soil tillage implement in reverse towards the combination of the top-mounted seed drill and the roller.
4. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.
5. Secure both carrying arms (Fig. 83/1), each with one lower link pin (Fig. 83/2) in the bottom hole. The top hole (Fig. 83/3) is not used.
6. Secure the lower link pins with cylinder screws and nuts.



Fig. 83

7. Secure the upper link with the upper link pin (Fig. 84/1).
8. Secure the upper link pin with the original clip pin.
9. Align the pack top seed drill in a straight position by extending or shortening the upper link.
10. Lock the adjusting facility of the upper link.



Fig. 84

Coupling and uncoupling the machine

11. Connect the track marker sensor cable (Fig. 88/1).
12. Connect the supply lines (see section "Overview – Supply lines between the tractor and the machine", Seite 42).



Fig. 85



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



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.



DANGER

When the tractor control units are actuated, several hydraulic cylinders could operate at the same time depending on the switch position.

Direct people out of the danger area.

Risk of injury from moving parts.



Due to the extremely compact design, components may damage the rear window of the tractor when the machine combination is raised.

7.2.1 Connecting the pressure gauge

Connect the hose to the pressure gauge and secure the pressure gauge in the tractor cabin.



Fig. 86

7.3 Uncoupling the top-mounted seed drill from the cultivator



DANGER

Empty the seed hopper before decoupling the top-mounted seed drill from the cultivator.



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.



DANGER

Reduce the coulter pressure of the pack top seed drill.

At full coulter pressure the pack top seed drill can tilt forwards after uncoupling the soil tillage implement.

1. Raise the track marker and secure it using lynch pins (see section "Moving the track marker to the working / transport position", Seite 131).
2. Move the star wheel to transport position (see section "Move the star wheel to the transport position", Seite 139).
3. Move the impulse wheel to transport position (see section "Moving the impulse wheel into transport/operational position", Seite 142).
4. Empty the hopper (see section "Emptying the hopper and/or seed dosing unit", Seite 155).
5. Park the combination on a level surface on solid ground.
6. Put all control units in float position.
7. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.

8. Uncouple all supply lines between the tractor and the machine.
9. Close the hydraulic connectors with protective caps.
10. Fasten the supply lines to the mountings (Fig. 87).
11. Disconnect the track marker sensor cable (Fig. 88/1).

**Fig. 87****Fig. 88**

Coupling and uncoupling the machine

12. Pull the bolts (Fig. 89/1) out of the carrying arms.



Fig. 89

13. Remove the upper link pin (Fig. 90/1) and put down the upper link.
14. Carefully pull the cultivator forwards.



Ensure that the supply lines do not get caught when pulling the cultivator forward.



Fig. 90



DANGER

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

8 Settings



WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through

- unintentional lowering 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 section 6.2, Seite 90.



DANGER

- Before adjustment work, place combination on a horizontal surface or set to operational position on the field (see section "Moving the machine from the transport position to the working position", Seite 149) and move all control units to float position.
- Before adjustment work, unless otherwise described, switch off the on-board computer, disengage the tractor's universal joint shaft, apply the tractor's parking brake, switch off the tractor's engine and remove the ignition key.

8.1 Setting the level sensor

1. Release the wing nuts (Fig. 91/2).
2. Open the charging sieves (only on machines without full dosing).
3. Adjust the height of the level sensor (Fig. 91/1) to the required seed volume using the handle (Fig. 91/3).
4. Tighten the wing nuts.

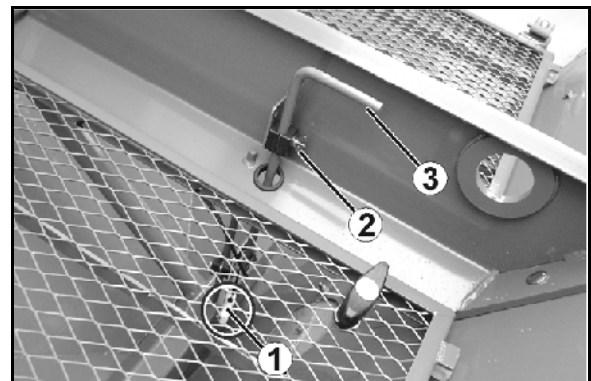


Fig. 91



Increase the residual seed volume, which triggered the alarm

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

8.2 Inserting the dosing roller into the dosing unit



DANGER

Switch off the on-board computer, turn off the tractor universal joint shaft, apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

1. Remove the lynch pin (Fig. 92/2)
(only necessary with full seed hopper to close the hopper with the slider) (Fig. 92/1).



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

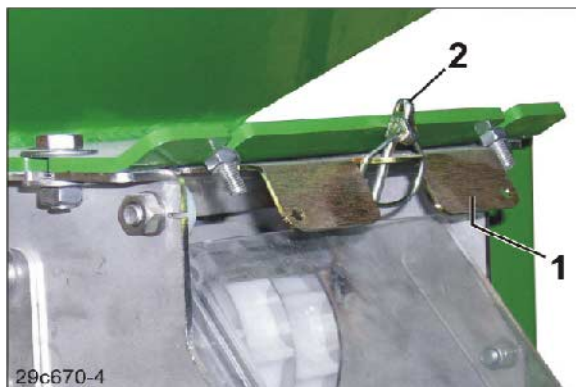


Fig. 92

2. Push the slider (Fig. 93/1) into the dosing unit up to the stop.
- The shutter seals the hopper. Seed cannot pour out inadvertently when the dosing roller is replaced.

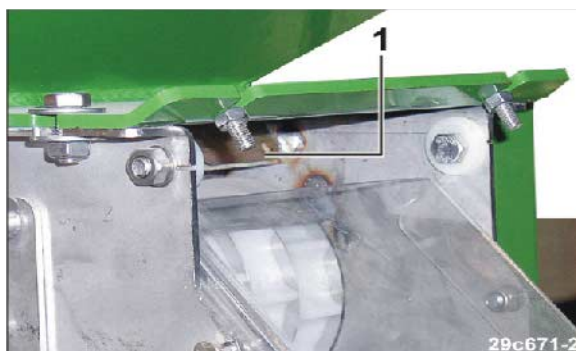


Fig. 93

3. Slacken but do not unscrew the two winged nuts (Fig. 94/1).
4. Turn the bearing cover and pull it off.


Fig. 94

5. Pull the dosing roller out of the seed dosing unit.
6. Refer to table (Table Seed dosing rollers, Seite 60) for the required dosing roller and install in the reverse order.


Fig. 95


Open the slider (Fig. 92/1).
Secure the slider with a lynch pin (Fig. 92/2).

8.3 Steps used with roller harrow

Step onto the loading board via the foldable steps.

The clip pin (Fig. 96/1) is inserted in the parking position.



Fig. 96

8.3.1 Moving the steps to transport and working position

Fold up the steps

- before starting work
- before transporting the machine on public roads.



Fig. 97

After folding them up, secure the steps with a clip pin (Fig. 98/1).



Fig. 98

8.4 Filling the hopper



DANGER

Connect the top-mounted seed drill to the cultivator before filling the hopper.

Observe the permissible fill levels and total weights.

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



WARNING

Risk of crushing in danger area under suspended loads / machine parts when filling the seed hopper, caused by unintentional lowering.

Always put the machine down on the ground before filling the hopper.



WARNING

Risk of crushing when filling the hopper using Big Bags.

Do not get into the seed hopper when filling is in progress.

Never stand under full Big Bags.

Always open Big Bags from a safe position next to the Big Bag.



WARNING

Risk of crushing, shearing, cutting, being caught or wound in by motorised machine parts when filling the seed hopper with an overhead loading screw.

Maintain an adequate safety distance from motorised machine parts if the seed hopper is being filled using an overhead loading screw.

1. Open the swivelling cover (Fig. 99/1).
2. Fill the hopper from the loading board (Fig. 99/2) on the rear of the seed drill.
3. Close the swivelling cover and secure it with rubber loops.



Fig. 99

8.5 Setting the sowing rate with a calibration test

1. Park the combination on a horizontal surface.
2. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.
3. Fill the seed hopper with at least 200 kg of seed (correspondingly less for fine seed) (see section "Filling the hopper", Seite 107).
4. Remove the calibration trough from the bracket.

The calibration trough is secured with a lynch pin (Fig. 100/1) in the transport bracket.



Fig. 100

5. Place the calibration trough under the injector sluice.
6. Open the injector sluice flap (Fig. 101/1).



Fig. 101



CAUTION

Risk of contusions on opening and closing the injector sluice flap (Fig. 101/1)!

Hold the injector sluice flap only by the lug (Fig. 101/2), as otherwise there is a danger of injury when the spring-loaded injector sluice flap snaps closed.

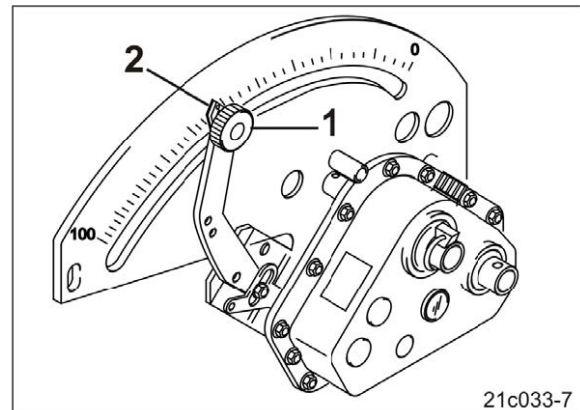
Never insert your hand between the injector sluice flap and the injector sluice!



Adjust the sowing rate with subsequent calibration test, depending on the machine equipment, as described in the following sections.

8.5.1 Adjusting sowing rate with calibration test on machines with Vario gearbox without seed rate remote control

1. Undo the locking knob (Fig. 102/1).
2. Consult the table (Fig. 103, unterhalb) for the gearbox setting value for the first calibration test.
3. Set the pointer (Fig. 102/2) of the gearbox lever **from below** to the gearbox setting value.
4. Tighten the locking knob.



21c033-7

Fig. 102




| Gearbox setting values for the first calibration test | 50 | 50 | 15 |
|--|--|---|--|
| Dosing roller |  |  |  |
| Volume [cm ³] | 20 | 210 | 600 |

Fig. 103

5. Move the star wheel to the calibration position (see Seite 140).
6. Remove the calibration crank (Fig. 104/1) from the transport bracket.

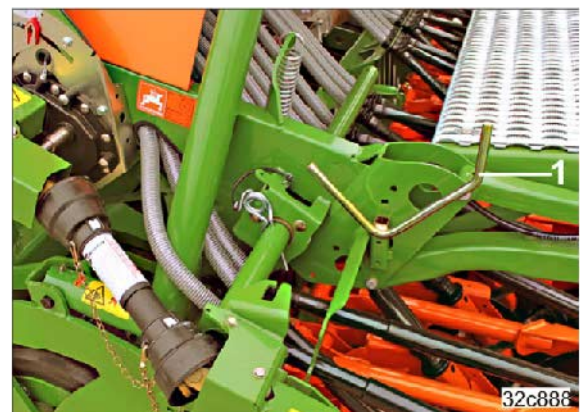


Fig. 104

Settings

7. Direct people out of the danger area.
→ When the star wheel is turned, the dosing roller in the dosing housing turns.
8. Insert the calibration crank (Fig. 105/1) in the holding fixture for the star wheel.
9. Turn the star wheel with the calibration crank handle counterclockwise until all chambers of the dosing roller are filled with seed and a uniform seed stream flows into the calibration trough.



Fig. 105

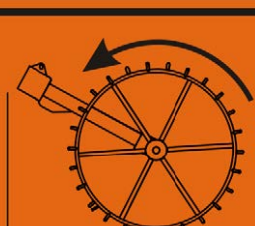
10. Close the injector sluice flap (Fig. 101/1) with special care (danger of crushing, see danger notice).
11. Empty the calibration trough and push it back under the seed dosing unit.
12. Open the injector sluice flap (Fig. 101/1).
13. Turn the star wheel anticlockwise the number of crank turns specified in the table (Fig. 106).

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

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

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

The usual area for the calibration test is 1/40 ha. With extremely small sowing rates, e.g. with rape, it is advisable to perform the calibration test for 1/10 ha.

| ME513 | | |
|-------|---|---------|
| |  | |
| | 1/40 ha | 1/10 ha |
| 3,0 m | 29,5 | 118,0 |
| 4,0 m | 22,0 | 89,0 |

1

2

Fig. 106

14. Weigh the volume of seed caught in the calibration trough (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.

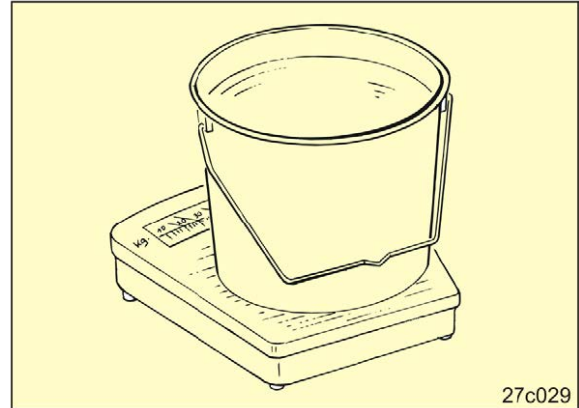


Fig. 107

Calibrating on 1/40 ha:

Sowing rate [kg/ha] = calibrated seed quantity [kg/ha] x 40

Calibrating on 1/10 ha:

Sowing rate [kg/ha] = calibrated seed quantity [kg/ha] x 10

Example:

Calibrated seed quantity: 3.2 kg on 1/40 ha

Sowing rate [kg/ha] = 3.2 [kg/ha] x 40 = 128 [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 section "Determining the gearbox setting using the calculating disc rule", Seite 112).

15. Repeat the calibration test until the desired sowing rate is achieved.
16. Secure the calibration trough to the hopper.
17. Close the injector sluice flap (Fig. 101/1) with special care (danger of crushing, see danger notice).
18. Move star wheel to working position (see Seite 140) or transport position (see Seite 139).
19. Clip the calibration crank into its transport bracket.

8.5.1.1 Determining the gearbox setting using the calculating disc rule

Example:

Calibration test values

Calculated 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. 108/A)
 - o Gearbox setting 70 (Fig. 108/B)
 opposite one another on the calculating disc rule.
 2. Read the gearbox setting for the desired sowing rate of 125 kg/ha (Fig. 108/C) from the calculating disc rule.
- Gearbox setting 50 (Fig. 108/D)
3. Set the gearbox lever to the value read from the disc.
 4. Check the gearbox setting by carrying out another calibration test (see "8.5.1", Seite 109).

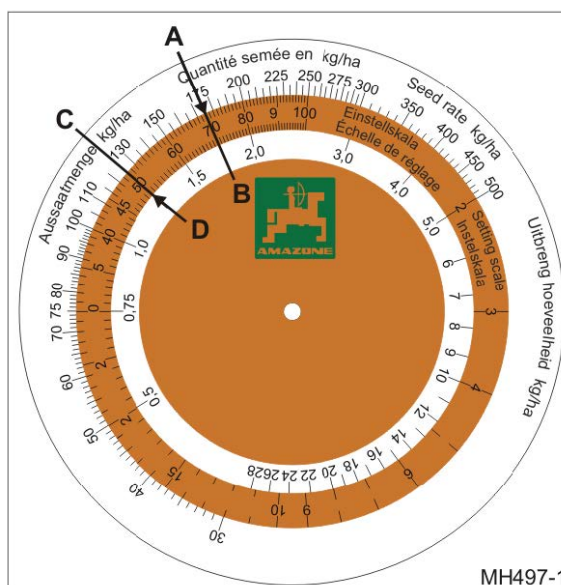


Fig. 108

8.5.2 Adjusting sowing rate with calibration test on machines with hydraulic seed rate remote control



WARNING

Direct people out of the danger area of the hydraulically operated components (Vario gearbox, coulters, exact harrow).

Setting the normal sowing rate

1. Move tractor control unit 2 to the float position.
2. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.
3. Undo the locking knob (Fig. 109/1).
4. Refer to the table (Fig. 103, Seite 109) for the gearbox setting for the first calibration test.
5. Set the pointer (Fig. 109/2) of the gearbox lever from below to the gearbox setting value.
6. Tighten the locking knob.
7. Determine the required gearbox setting for the desired sowing rate (see section "8.5.1", Seite 109).



Fig. 109

Settings

Setting the elevated sowing rate

1. Actuate tractor control unit 2.
- Apply pressure to the hydraulic cylinder.
2. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.
3. Use the adjusting screw (Fig. 110/1) to set the pointer (Fig. 110/2) of the gearbox lever to the desired gearbox setting for the elevated sowing rate.



Fig. 110

| | |
|--|---------------------------|
| Unscrew the adjusting screw (Fig. 110/1): | Increase the sowing rate. |
| Screw in the adjusting screw (Fig. 110/1): | Decrease the sowing rate. |

4. Lock the adjusting screw.
5. Determine the elevated sowing rate with a calibration test (see section "8.5.1", Seite 109).
6. Move tractor control unit 2 to the float position.

Deselecting the elevated sowing rate

Operation of tractor control unit 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. 111/1) all the way and lock it.

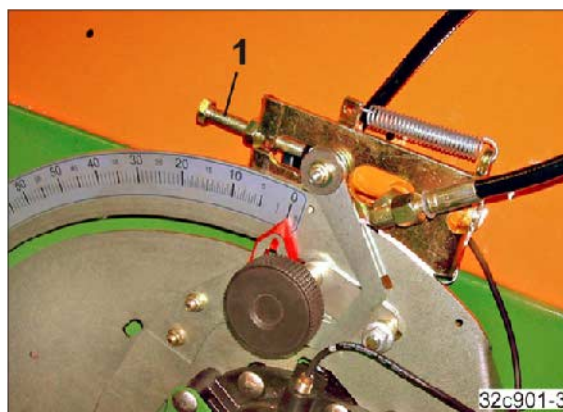


Fig. 111

8.5.3 Adjusting the sowing rate with calibration test on machines with Vario gearbox and with electronic seed rate adjustment

1. Enter the desired sowing rate in the on-board computer.
2. Move the star wheel to the calibration position (see Seite 140).
3. Remove the calibration crank (Fig. 112/1) from the transport bracket.



Fig. 112

4. Direct people out of the danger area. When the star wheel is turned, the dosing roller in the dosing housing turns.
5. Insert the calibration crank (Fig. 113/1) in the holding fixture for the star wheel.
6. Turn the star wheel with the calibration crank handle counterclockwise until all chambers of the dosing rollers are filled with seed and a uniform seed stream flows into the calibration troughs.
7. Close the injector sluice flap (Fig. 101/1) with special care (danger of crushing, see danger notice).



Fig. 113

8. Empty the calibration trough and push it back under the seed dosing unit.
9. Open the injector sluice flap (Fig. 101/1).
10. Adjust the sowing rate with calibration test as described in the on-board computer operating manual.



During the calibration test the on-board computer requests that the calibration crank handle be turned counterclockwise until a signal tone sounds.

The number of crank handle turns for the calibration test until the signal tone sounds is governed by the sowing rate:

0 to 14.9 kg → Crank turns to 1/10 ha

15 to 29.9 kg → Crank turns to 1/20 ha

from 30 kg → Crank turns to 1/40 ha

11. Secure the calibration trough to the hopper.
12. Close the injector sluice flap (Fig. 101/1) with special care (danger of crushing, see danger notice).
13. Move star wheel to working position (see Seite 140) or transport position (see Seite 139).
14. Clip the calibration crank into its transport bracket.

8.5.4 Adjusting sowing rate with calibration test on machines with full dosing

1. Adjust the desired sowing rate in the on-board computer.
 - 1.9 Adjust the sowing rate with calibration test as described in the on-board computer operating manual.



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

- | | | |
|---------------|---|------------------------|
| 0 to 14.9 kg | → | Crank turns to 1/10 ha |
| 15 to 29.9 kg | → | Crank turns to 1/20 ha |
| from 30 kg | → | Crank turns to 1/40 ha |

2. After the calibration test, secure the calibration trough to the hopper.
3. Close the injector sluice flaps (Fig. 101/1) with special care (danger of crushing, see danger notice).

8.6 Setting the blower fan speed for blower fans with hydraulic drive



DANGER

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



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

During initial start-up, correct the blower fan speed until the working temperature is reached.

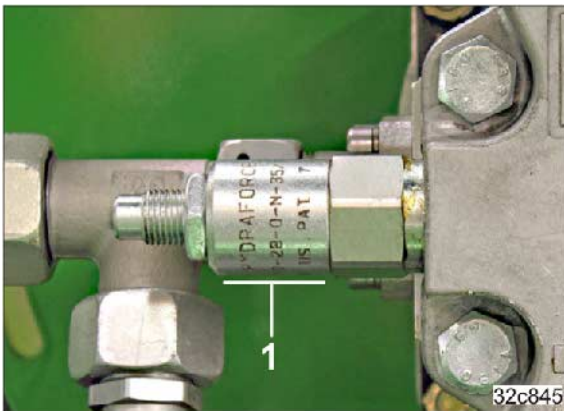
If the fan is put back into operation after a long stoppage period, the preset blower fan speed is not attained until the hydraulic fluid has heated up to working temperature.



Set the target blower fan speed

- via the tractor's flow control valve
- at the pressure relief valve of the blower fan hydraulic motor, if the tractor has no flow control valve.

Blower fans with hydraulic drive have a pressure relief valve installed in two versions:



Pressure relief valve with round outer contour (1)



Pressure relief valve with hexagon outer contour (1)

The following settings depend on the version of pressure relief valve.

8.6.1 Setting at the pressure relief valve with round outer contour



Fig. 114

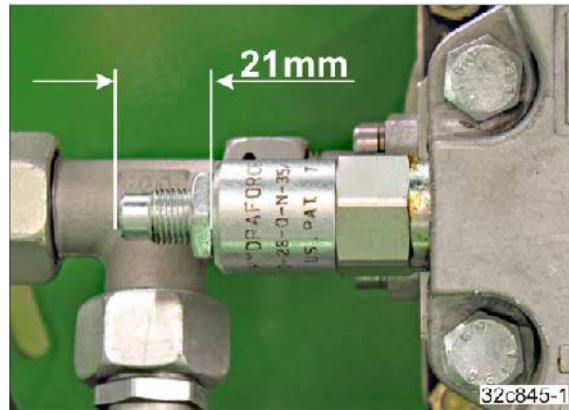


Fig. 115

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

1. Loosen the lock nut (Fig. 114).
2. Adjust the pressure relief valve to the factory-set dimension "21 mm" (Fig. 115).
 - 2.1 Turn the screw with the hexagon socket wrench accordingly.
3. Tighten the lock nut.
4. Set the target blower fan speed at the flow control valve of the tractor.

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

1. Loosen the lock nut (Fig. 114).
2. Use the hexagon socket wrench to set the target blower fan speed on the pressure relief valve. Do not exceed the maximum fan speed of 4000 rpm.

Blower fan speed

Turn to the right: Increase the target blower fan speed.

Turn to the left: Reduce the target blower fan speed.

3. Tighten the lock nut.

8.6.2 Setting at the pressure relief valve with hexagon outer contour



Fig. 116



Fig. 117

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

1. Loosen the lock nut (Fig. 116).
2. Screw in the screw (Fig. 117) with the hexagon socket wrench fully (clockwise).
3. Unscrew the screw (Fig. 117) with the hexagon socket wrench by 3 turns.
4. Tighten the lock nut.
5. Set the target blower fan speed at the flow control valve of the tractor.

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

1. Loosen the lock nut (Fig. 116).
2. Use the hexagon socket wrench to set the target blower fan speed on the pressure relief valve. Do not exceed the maximum fan speed of 4000 rpm.

Blower fan speed

Turn to the right: Increase the target blower fan speed.

Turn to the left: Reduce the target blower fan speed.

3. Tighten the lock nut.

8.7 Adjusting coulter pressure / seed placement depth



This setting influences the planting depth of the seed.

Check the planting depth every adjustment (see section "Checking the placement depth **of the seed**", Seite 150).

8.7.1 Setting the coulter pressure (mechanical coulter pressure adjustment)

1. Place the calibrating crank (Fig. 118/1) on the adjusting spindle and set the coulter pressure.

Turning the calibration crank

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

2. Clip the calibration crank into its transport bracket.



Fig. 118

8.7.2 Setting the coulter pressure (hydraulic coulter pressure adjustment)



WARNING

Direct people out of the danger area of the hydraulically operated components (Vario gearbox, coulters, exact harrow).

1. By actuating control unit 2
 - o apply pressure to the hydraulic cylinder or
 - o put the cylinder in the float position.
2. Apply the tractor parking brake, switch off the engine and remove the ignition key.
3. Insert one pin (Fig. 119/1) below and above the stop (Fig. 119/2) into the adjusting segment and secure with lynch pins.

Each of the holes is identified with a number.

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

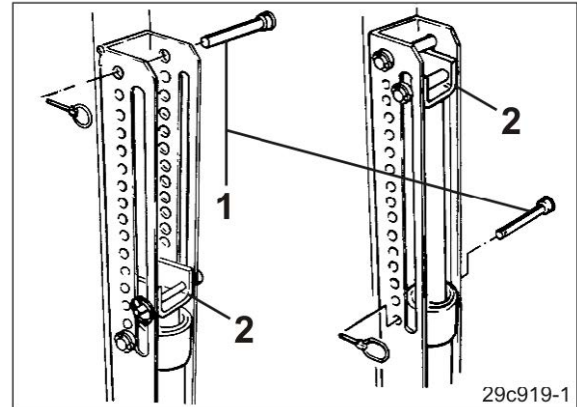


Fig. 119

8.7.3 Adjusting the depth guide discs



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

If the desired placement depth cannot be achieved by adjusting the coulter pressure, adjust all depth guide discs evenly.

Each depth guide disc can engage in three positions on the coulter or be removed from the coulter.

Then again set the placement depth by adjusting the coulter pressure.

| Engagement position | Placement depth |
|---------------------------------|-----------------|
| 1 | approx. 2 cm |
| 2 | approx. 3 cm |
| 3 | approx. 4 cm |
| Sowing without depth guide disc | > 4 cm |

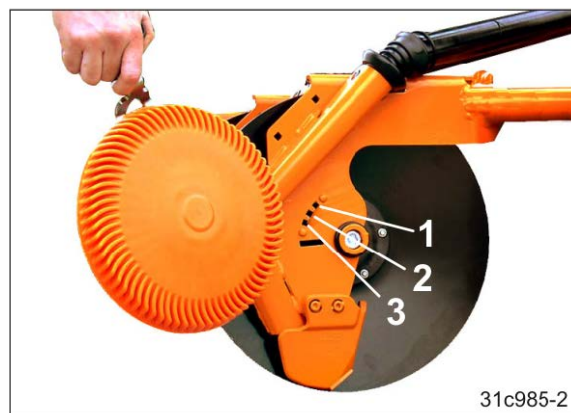


Fig. 120

Engagement position 1 to 3

1. Lock the handle (Fig. 121/1) into one of the 3 positions.



Fig. 121

Sowing without depth guide disc

1. Turn the handle beyond the engagement catch (Fig. 122/1) and remove the depth guide disc from the coulter.



Fig. 122

Fitting the depth guide disc



Secure the depth guide disc with the marking

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

1. Push the depth guide disc from below against the catch on the 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.

8.8 Adjusting the exact harrow

8.8.1 Exact harrow tine position

The exact harrow tine position is adjustable (see Table Fig. 64)

- by adjusting screws of exact harrow holder
- via a spindle (optional).

Setting exact harrow tine position by adjusting screws of exact harrow holder

1. Move the machine on the field to the working position.
2. Apply the tractor parking brake, switch off the engine and remove the ignition key.
3. Adjust the exact harrow tines in accordance with the figure (Fig. 64).

The exact harrow tines are set by uniformly adjusting all exact harrow holders (Fig. 123/1).

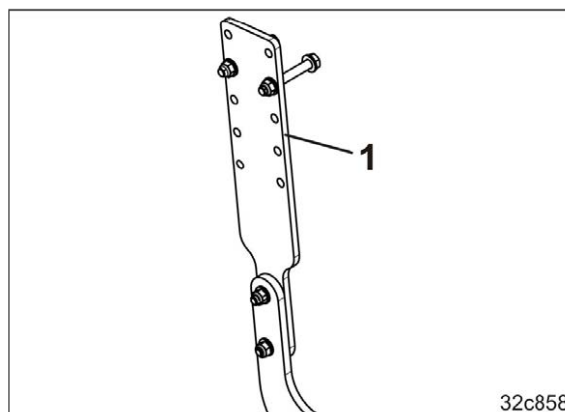


Fig. 123

Exact harrow tine setting by adjusting spindles (optional)

1. Move the machine on the field to the working position.
2. Apply the tractor parking brake, switch off the engine and remove the ignition key.
3. Adjust the exact harrow tines in accordance with the figure (Fig. 64).

The exact harrow tines are adjusted by turning the crank evenly (Fig. 124/) on all adjuster segments.



Fig. 124

| | |
|-------------------------------------|---------------------------------------|
| Direction of rotation to the right: | Distance A (Fig. 64) becomes larger. |
| Direction of rotation to the left: | Distance A (Fig. 64) becomes smaller. |

4. Secure the setting with a lynch pin (Fig. 125/1).



Fig. 125

8.8.2 Exact harrow pressure adjustment

1. Tension the lever (Fig. 126/1) with the calibration crank.
2. Insert the pin (Fig. 126/2) into a hole below the lever.
3. Relieve the lever.
4. Secure the bolt with a safety splint.
5. Apply the same setting to all adjusting segments.



Fig. 126

8.8.3 Exact harrow pressure adjustment (hydraulic)



WARNING

Direct people out of the danger area of the hydraulically operated components (Vario gearbox, coulters, 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. 127/1) in a hole beneath the lever (Fig. 127/2) and secure with a spring pin.
4. Shift control valve 2 to the float position.

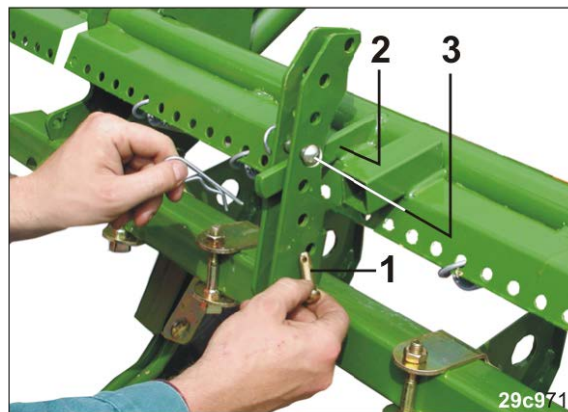


Fig. 127

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. 127/3) in a hole above the lever (Fig. 127/2) and secure with a spring pin.

8.8.4 Moving the exact harrow to the working / transport position

8.8.4.1 Move the exact harrow into the working position

The roller and the coulters force the soil outwards to different extents depending on the travel speed and condition of the soil.

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

The greater the travel speed, the further the square tubes (Fig. 128/1) have to be pushed outwards.

Secure the square tubes with the outer harrows using clamping screws after every adjustment.

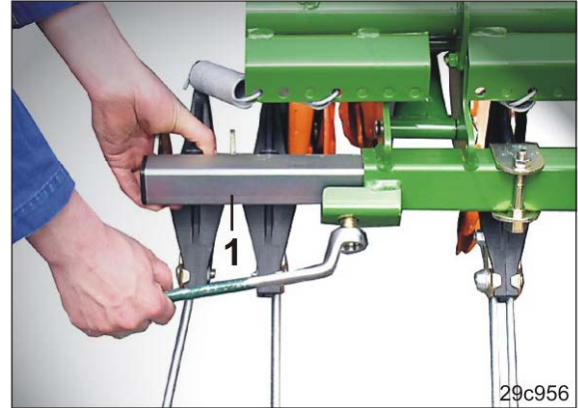


Fig. 128

8.8.4.2 Moving the exact harrow to transport position

Insert the square tube (Fig. 128/1) with the outer harrows into the exact harrow carrier tube as far as it will go and secure with the screw before transporting the equipment.

8.9 Adjusting the roller harrow

8.9.1 Setting harrow tines (roller harrow with upper guide bar)

To adjust the harrow tines, raise the machine so that the harrow tines are directly above the soil but not touching it.

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

8.9.1.1 Adjusting the angle of the harrow tines

1. The harrow tines are adjusted by inserting the tube clip (Fig. 129/1) below the guide bar (Fig. 129/2), in all segments, in the same hole.

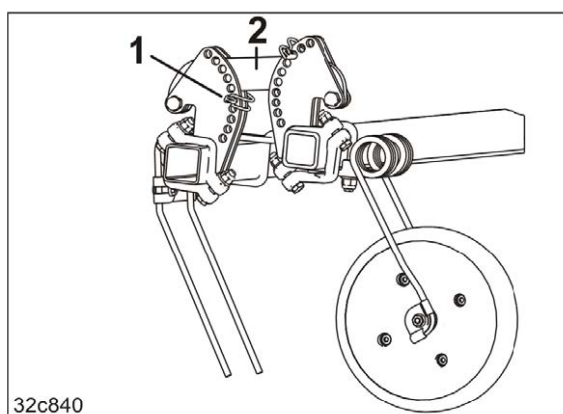


Fig. 129

8.9.1.2 Adjusting the working depth of the harrow tines

1. The working depth of the harrow tines are adjusted by inserting the tube clip (Fig. 130/1) above the guide bar (Fig. 130/2), in all segments, in the same hole.

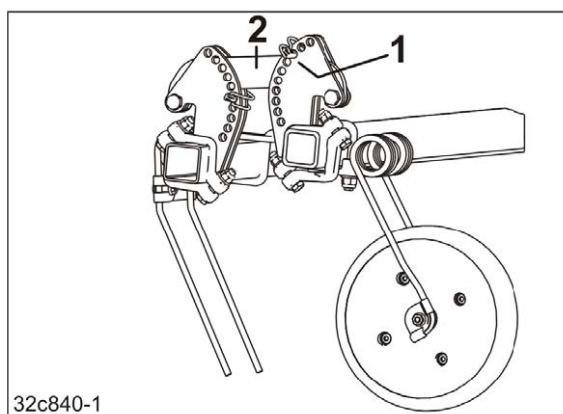


Fig. 130

8.9.2 Adjusting harrow tines (roller harrow with carrier handle)

To adjust the harrow tines, raise the machine so that the harrow tines are directly above the soil but not touching it.

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

8.9.2.1 Adjusting the angle of the harrow tines

1. Change the angle of the tines to the ground by repositioning the bolt (Fig. 131/1)
 - o in all segments
 - o in the same hole.

Make sure the pin (Fig. 131/1) underneath the carrying arm (Fig. 131/2) is pegged in the adjuster segment.

The deeper the pin (Fig. 131/1) is inserted in the adjuster segment, the flatter the angle.

2. After each repositioning, secure the pin (Fig. 131/1) with safety splint.

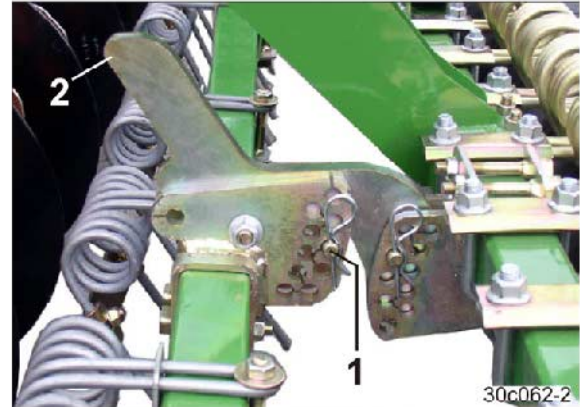


Fig. 131

8.9.2.2 Adjusting the working depth of the harrow tines

1. Hold the harrow tines beam by the carrier handle (Fig. 132/2).
2. Set the working depth of the harrow tines by positioning the carrying arm with the bolt (Fig. 132/1)
 - o in all segments
 - o in the same hole.

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

3. After each repositioning, secure the bolt with a safety splint.

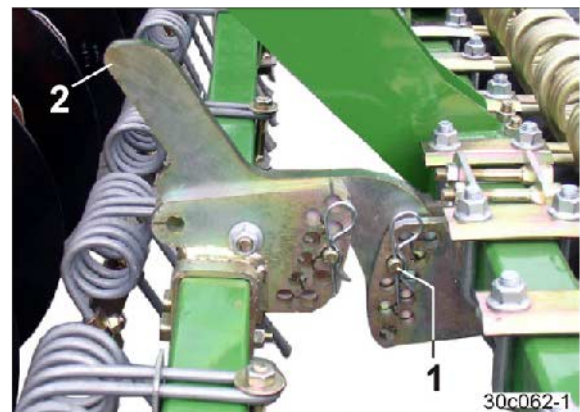


Fig. 132

8.9.3 Adjusting the roller contact pressure to the soil and checking

1. Move the machine on the field to the working position.
2. The roller pressure is adjusted by turning the cranks (Fig. 133) equally on all adjuster segments.

Direction of rotation to the left:
The roller contact pressure on the soil increases.

Direction of rotation to the right:
The roller contact pressure on the soil decreases.

To crank, use the ratchet provided if the adjuster segment has no crank. The ratchet is located in the cartridge together with the operating manual.

3. Secure the setting with a lynch pin (Fig. 134/1).



Fig. 133



Fig. 134

4. Check the roller contact pressure to the soil, e.g. with a spring balance (see Fig. 135).

| Roller diameter D [mm] | Roller contact pressure F [kg] |
|---------------------------|-----------------------------------|
| 250 mm | max. 20 kg |



The roller contact pressure "F" must not exceed the table value. Pressures greater than those specified could damage the machine.

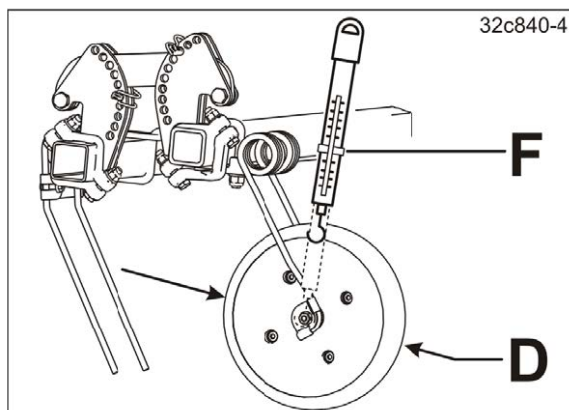


Fig. 135

8.10 Moving the track marker to the working / transport position



DANGER

Unsecured track markers could unintentionally move to the working position and cause serious injury.

Move the track markers immediately after work on the field to the transport position and secure with lynch pins.

Do not release the securing pin (lynch pin) until just before starting work in the field.



DANGER

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

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

8.10.1 Move track marker to working position

1. Position the machine on the field.
2. Unlock the two track markers.
 - 2.1 Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.
 - 2.2 Withdraw the lynch pin (Fig. 136/1) and insert in the parking position.

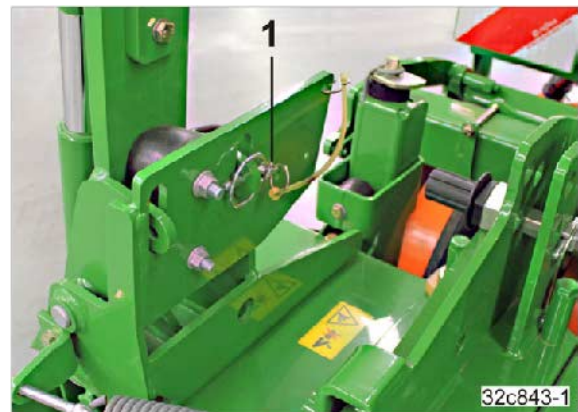


Fig. 136

Settings

3. Adjust the track marker length.

3.1 Direct people out of the swivel area of the track marker.

3.2 Actuate tractor control unit *yellow*.

→ One track marker swivels to the working position.

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

3.4 Release two screws (Fig. 137/1).

4.5 Set the track marker length to distance "A" (Fig. 138).

4.6 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.

4.7 Tighten screws (Fig. 137/1).

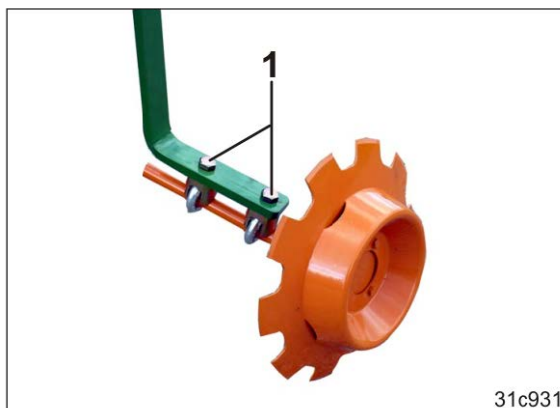


Fig. 137

| Working width | Distance A ¹⁾ |
|----------------|--------------------------|
| AD-P 303 Super | 3.0 m |
| AD-P 403 Super | 4.0 m |

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

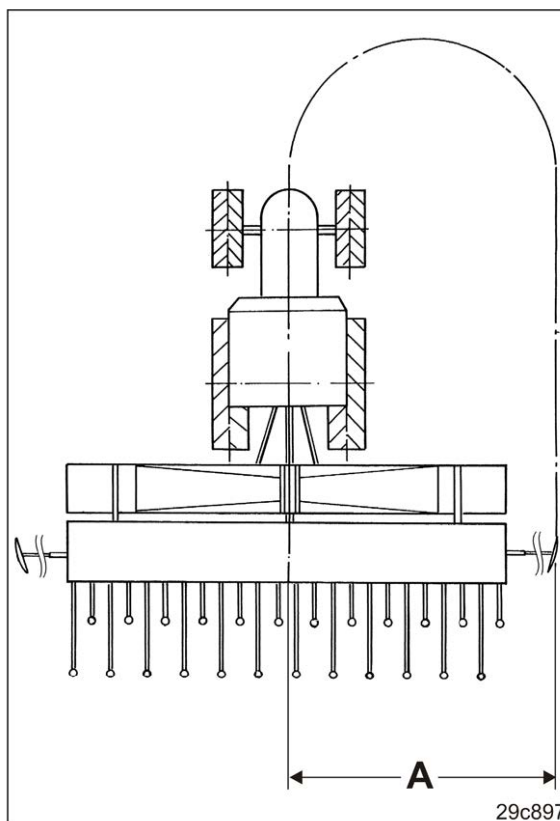


Fig. 138

8.10.2 Move track marker to transport position

1. Direct people out of the swivel area of the track marker.
2. Actuate tractor control unit *yellow*.
- Both track markers swivel to the transport position (see Fig. 139).
3. Apply the handbrake, switch the tractor engine off and remove the ignition key.



Fig. 139

4. Secure both track marker booms with lynch pins (Fig. 140/1).

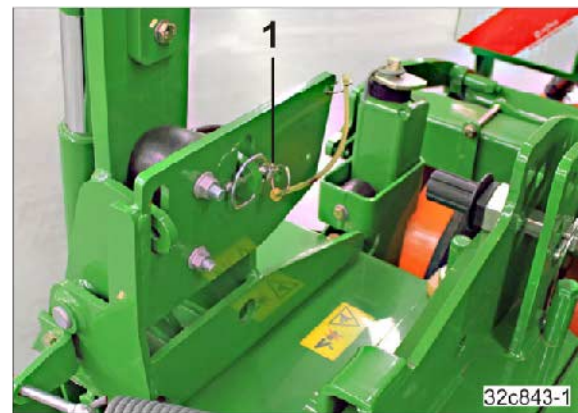


Fig. 140

8.11 Setting the tramline rhythm/counter on the on-board computer

1. Select the tramline rhythm (see table Fig. 71, Seite 79) and adjust in the on-board computer (see on-board computer operating manual).
2. Take the reading of the tramline counter for the first field run in the illustration (Fig. 72, Seite 80) and enter in the on-board computer (see on-board computer operating manual).



The tramline counter is coupled with the sensor on the track marker shuttle valve.

After a track marker is raised, the tramline counter shifts to the next number.

If you want to prevent the tramline counter shifting on when a track marker is raised, first press the STOP button (see operating manual for on-board computer) and then raise the track marker.

8.11.1 Half-sided switching off



DANGER

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

1. Remove the outer distributor cover (Fig. 141/1).
2. Fit the insert (Fig. 141/2) so that the seed supply of the respective coulter is interrupted.
3. Halve the sowing rate (see section "Setting the sowing rate with a calibration test", Seite 108).

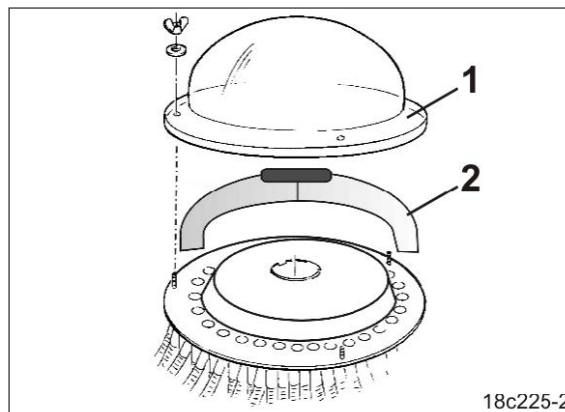


Fig. 141

8.12 Moving the tramline marker to the working / transport position



DANGER

Direct persons away from the swivel area of the tramline marker before operating spool valve 1.

8.12.1 Move the tramline marker to working position

1. Secure the track disc carrier (Fig. 142/1).
2. Remove the lynch pin (Fig. 142/2).
3. Withdraw the pin (Fig. 142/3).
4. Swivel the track disc carrier down.
5. Repeat the operation on the second track disc carrier.

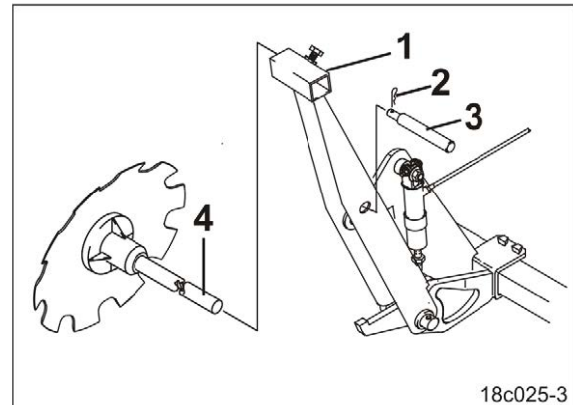


Fig. 142

6. Set the tramline counter to "zero" (see operating manual of the on-board computer ¹⁾).
7. Direct persons away from the swivel area of the tramline marker before operating tractor control unit *yellow*.
8. Actuate tractor control unit *yellow*.
- The track disc carriers are lowered to the working position.
9. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.
10. Insert the track discs (Fig. 142/4) into the track disc carriers.

Settings

11. Set the track discs so that they mark the tramline created by the tramline coulter.
12. Adapt the work intensity to the soil by turning the discs (position the discs on light soils roughly parallel to the direction of travel and on heavy soils more on in a forward position).
13. Tighten both screws (Fig. 143/1) firmly.



Fig. 143

8.12.2 Move the tramline marker to transport position

1. Direct persons away from the swivel area of the tramline marker before operating tractor control unit *yellow*.
 2. Actuate tractor control unit *yellow*.
- Raise the track disc carrier.

3. Secure the track disc carrier (Fig. 144/1) with the bolt (Fig. 144/2).
4. Secure the bolt with the lynch pin (Fig. 144/3).
5. The machine has two track disc carriers (Fig. 144/1). Secure the second track disc carrier as described.
6. Pull the track discs (Fig. 144/4) out of the track disc carriers.

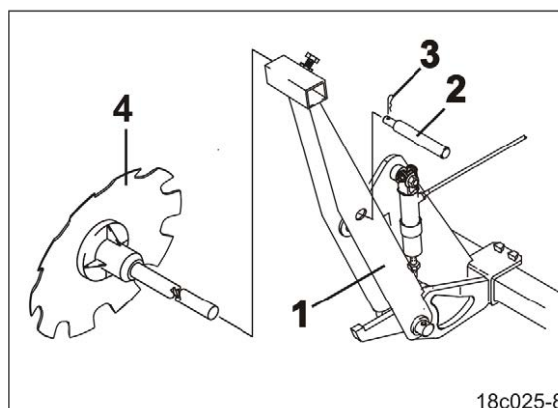


Fig. 144



DANGER

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

8.13 Road safety bar

8.13.1 Road safety bar in road transport position

1. Push the multi-part transport securing bar (Fig. 145/1) over the tine tips of the exact harrow.
2. Fasten the transport securing bars with spring holders (Fig. 145/2) to the exact harrow.

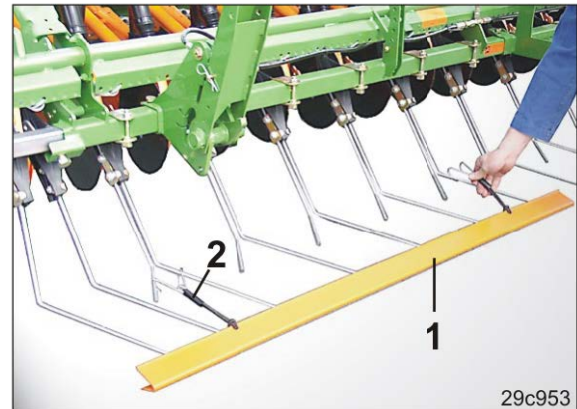


Fig. 145

8.13.2 Moving the road safety bar to parking position

1. Insert the multi-part transport safety bar components (Fig. 146/1) into each other and secure the bar on the transport bracket (Fig. 146/2) with the spring holders.



Fig. 146

8.14 Star wheel positions

Before adjusting the star wheel, pull out the safety splint.

The star wheel is secured with a safety splint.

- In transport position, the safety splint (Fig. 147/1) is inserted in the lug.



Fig. 147

- In working position, the safety splint (Fig. 148/1) is inserted in the star wheel arm.

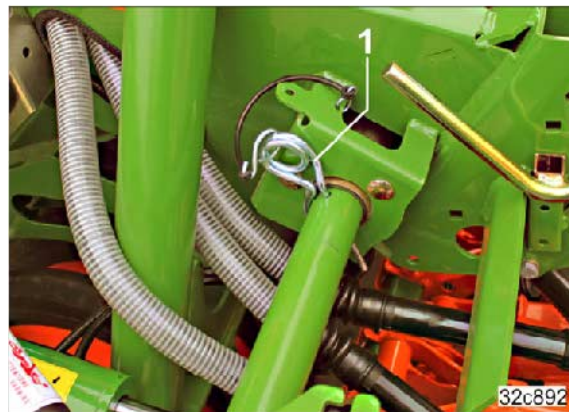


Fig. 148

8.14.1 Move the star wheel to the transport position

1. Push the star wheel into the transport bracket.

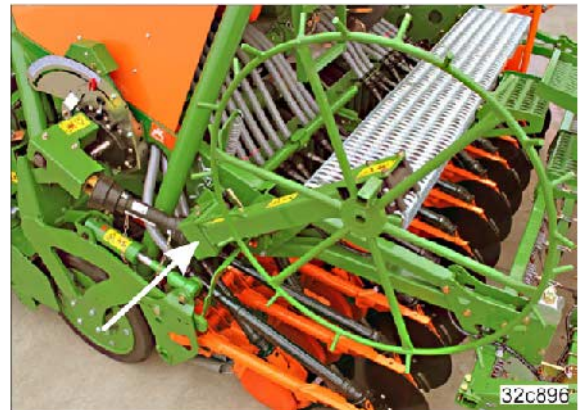


Fig. 149

2. Secure the star wheel with a safety splint (Fig. 150/2).



Fig. 150

8.14.2 Moving the star wheel to calibration position

1. Lift the star wheel by the handle (Fig. 151/1) and put down on the placement area (Fig. 151/2).



Fig. 151

In a raised position, the star wheel can be easily turned for the calibration test.



Fig. 152

8.14.3 Moving the star wheel to the operational position

1. Raise the star wheel out of the bracket and lower it.



Fig. 153

The follower must engage when doing so (see Fig. 154/1).



Fig. 154

2. Secure the star wheel with the safety splint (Fig. 155/1).



Fig. 155



The lower position of the star wheel can be limited.

A screw is used (Fig. 156/1) as a stop. Lock the screw after adjustment.



Fig. 156

8.15 Moving the impulse wheel into transport/operational position

8.15.1 Moving the impulse wheel to working position

The lever (Fig. 157/1) locks the raised impulse wheel in the transport position.

1. Hold the impulse wheel firmly.
2. Actuate the lever (Fig. 157/1).
3. Swivel the impulse wheel to the working position.



Fig. 157

In its operational position (Fig. 158/1), the impulse wheel is secured as a pendulum.



Fig. 158

8.15.2 Moving the impulse wheel to transport position

Raise the impulse wheel before transportation. The impulse wheel will engage on the spring-loaded lever (Fig. 159/1).



Fig. 159

9 Transportation



DANGER

Transporting the combination consisting of cultivator, roller and top-mounted seed drill over 3.0 m wide mounted on the tractor is not permitted on public roads and paths in Germany and some other countries.

Transport of a machine combination over 3.0 m wide is only permitted on a transport vehicle in these countries. Place and secure the combination consisting of cultivator, roller and top-mounted seed drill on the transport vehicle in accordance with regulations. Do not exceed the max. transport height of 4.0 m.

9.1 Putting the sowing combination (up to 30 m wide) in road transport position

1. Switch off the on board computer.
2. Move track marker to transport position Seite 133
3. Emptying the hopper Seite 155
4. Move the steps to the transport position Seite 106
5. Moving the exact harrow to transport position Seite 127
6. Road safety bar in road transport position Seite 137
7. Move the star wheel to the transport position Seite 138
8. Move the impulse wheel to the transport position..... Seite 142
9. Move the tramline marker to transport position..... Seite 135
10. Check that the lighting system including the warning signs
work properly and are clean..... Seite 44
11. Disable the tractor control units.
12. Observe the legal regulations and safety instructions in section 9.2 before and during transportation.

9.2 Legal regulations and safety

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.

Transport width / Transport height

In Germany and in many other countries, the transportation of a machine combination up to 3.0 m wide mounted on the tractor is permissible.

The max. transport height of 4.0 m must not be exceeded!

Max. permissible speed

The max. permissible speed¹⁾ is 40 km/h for tractors with mounted work equipment.

In particular on bad roads and ways driving may only take place at a considerably lower speed than specified!

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



Before starting a journey, read the section "Safety information for the operator" and check:

- that the permissible weight is not exceeded
- that the supply lines are connected correctly
- the lighting system for damage, function and cleanliness
- the warning signs and yellow reflectors must be clean and undamaged
- the hydraulic system for visible defects
- the tractor parking brake must be released completely.

**WARNING**

Risk of being crushed, cut, caught, drawn in or struck if the machine is unintentionally released from its attached or hitched position.

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

**DANGER**

Risk of personal injury from cutting and impacts caused by unintentional lowering of the track marker during transportation.

Perform a visual inspection before transportation to check whether the track markers are secured in the transport position with the original lynch pins to prevent unintentional lowering (see section "Moving the track marker to the **working / transport position**", Seite 131).

**DANGER**

The star wheel extends laterally into the traffic area and endangers other road users.

Insert the star wheel in the transport bracket and secure before transportation.

**WARNING**

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

- Drive in such a way that you always have full control over the tractor with the attached machine.
In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the attached or hitched 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.



WARNING

Risk of falling from the machine if riding against regulations!

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

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



DANGER

Switch off the on-board computer during transportation.



DANGER

Disable the tractor control units during transport!



WARNING

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 road safety bar is forbidden.

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

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

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



Switch on the rotating beacon light (if present) prior to starting a journey and check operation.

In Germany and some other countries the rotating beacon light is subject to authorisation.

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

10 Use of the machine

When using the machine, refer to

- the section "Warning symbols and other labels on the machine"
- the section "Safety instructions for the operator".

It is important to observe these sections in the interests of your safety.



WARNING

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



WARNING

Risk of crushing, being pulled in or caught during machine operation because of unprotected drive elements.

- Never start up the machine unless the safety equipment is fully installed.
- Do not work unless the drive between the star wheel and the dosing unit is fully protected.
- Never use the PTO shaft if the safety device is missing or damaged, or without correctly using the supporting chain.



WARNING

Risk of cutting and impacts when swivelling the track marker up and down.

Direct persons away from the swivel area of the track marker before operating the tractor control unit to swivel the track marker.



WARNING

Risk of slipping, stumbling or falling due to unauthorised climbing onto the machine and / or carrying persons on the machine, the loading board or the steps.

It is forbidden to ride on the machine and/or climb on the machine when it is in operation.

Instruct persons to get off the loading board before starting the machine.

10.1 Moving the machine from the transport position to the working position

1. Moving the road safety bar to parking position Seite 137
2. Move the exact harrow into the working position Seite 127
3. Move the tramline marker to working position Seite 135
4. Moving the star wheel to the operational position Seite 138
5. Moving the impulse wheel to working position Seite 142
6. Remove the track marker transport locks Seite 131
7. Refer to the table for the tramline counter of the first field run Seite 80
8. Set the tramline counter immediately before the first field run (see on-board computer operating manual).

10.2 Starting work

1. Move the machine to working position at the start of the field.
2. Check all machine settings (see section "Settings", Seite 103).
3. Instruct any people in the area to stand at a minimum distance of 20 m from the machine.
4. Operate the blower fan up to specified speed.
5. Operate control unit *yellow*.
- Lower the active track marker.
- Advance the seed wheel tramline selection.
- Only if tramline display is "0":
 - o create tramlines
 - o lower the tramline marker.
6. Immediately before the first field run, set the correct tramline counter (see operating manual for on-board computer).
7. Run the universal joint shaft of the cultivator up to operating speed (see cultivator operating manual).
8. Start off and lower the combination using the tractor's three-point hydraulic system.

10.3 Checks

Checks to be carried out

- after the first 100 m travelled at working speed
- on a change from light soil to heavy soil and vice versa
- after every coulter pressure adjustment
- after every adjustment of the coulter depth guide discs.

Check the following

- the placement depth of the seed (see section "Checking the placement depth of the seed", unterhalb)
- the working intensity (depending on equipment)
 - of the exact harrow
 - of the roller harrow.

10.3.1 Checking the placement depth of the seed

1. Cover approx. 100 m at working speed.
2. Expose the seed at a number of points, including the area of the outside coulters.
3. Check the seed placement depth.

10.4 During the work

10.4.1 Switching off the tramline counter (STOP button)

The shifting on of the tramline counter is prevented by actuating the STOP button of the on-board computer before folding in the active track marker before an obstacle.

When the Stop button is actuated

- the field continues to be sowed
- the tramline counter of the seed wheel tramline control does not shift on.



Deactivate the Stop button after the obstacle has been passed.

10.4.2 Checking the distributor head for impurities

Check the distributor head through the transparent distributor hood for impurities

- during work at regular intervals from the tractor cab
- after work with an intensive sight check from outside.



Impurities may block the distributor heads and must be removed immediately (see section "Cleaning the distributor head", Seite 163).

10.4.3 Soil tilling without seeding

If the soil is being tilled without seeding

- stop the flow of seed
 - raise the star wheel
 - switch off the electric motor (optional) that drives the dosing wheels
- raise the coulter as required (actuate tractor control unit *green*).



Fig. 160



If the coulters are used again, also lower the star wheel and switch on the electric motor (full dosing).

10.5 Turning at end of the field

Before turning at the end of the field

1. Operate control unit *yellow*.
 - 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 star wheel, coulter and harrow must not contact the ground during turning.

Raising the combination before turning at the end of the field interrupts the seed supply by stopping the dosing roller in the dosing unit. With the blower fan in operation, seed emerges from the coulters until the seed tubes are empty.

After turning at the end of the field

1. Operate the control unit for the tractor lower link.
 - Lower the combination.
2. Operate control unit *yellow* for at least 5 seconds so that all hydraulic functions are fully executed.
 - Lower the active track marker.only in switch position "0":
 - Divert the seed flow in the flap box back to the seed hopper (tramlines).
 - Lower the track discs of the tramline marker (optional).
3. Start the field run.



DANGER

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

10.6 End of work in the field

At the end of work put the machine in its transport position:

1. Switch off the blower fan.
2. If the tramline counter is to be prevented from shifting while the track marker is raised, press the STOP button (see operating manual for on-board computer).
3. Actuate control unit *yellow* until the track markers are folded in.
4. Secure the track markers in transport position (see section "Moving the track marker to the working / transport position", Seite 131).



DANGER

Move the track markers immediately after work on the field to the transport position and secure with lynch pins.

Unsecured track markers could unintentionally move to the working position and cause serious injury.

Do not release the securing pin (lynch pin) until just before starting work in the field.

5. Empty and clean the dosing unit after use (see section 10.7.2, Seite 155).



Empty and clean the dosing unit after use.

If the dosing unit is not emptied and cleaned,

- a tough to solid mass of seeds can form if water enters under the dosing roller. The dosing roller is severely obstructed and there may be deviations between the set and actual sowing rate.
- the seed remains can expand or germinate in the seed dosing units. As a result, rotation of the dosing rollers is blocked and damage can be caused to the drive.

The sticker (Fig. 161) is intended to remind the tractor driver to empty and clean the dosing unit once sowing is complete.



Make absolutely certain that the dosing unit is emptied and cleaned once sowing is complete (see section "10.7.2", Seite 155).

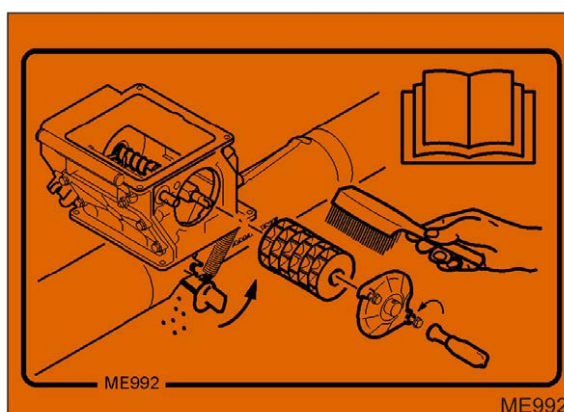


Fig. 161

6. Move the machine to transport position (see section "Transportation", Seite 143).

10.7 Emptying the hopper and/or seed dosing unit

10.7.1 Emptying the hopper

1. Apply the tractor parking brake, switch off the engine and remove the ignition key.
2. Open the shutter (Fig. 162) and empty the seed into the calibration trough or a suitable hopper.



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



Fig. 162

10.7.2 Emptying seed dosing unit



Seed remains in the seed dosing unit may swell or germinate if the seed dosing unit is not completely emptied!

This causes the rotation of the dosing roller to become blocked, which may result in damage to the drive!

1. Disengage the tractor's universal joint shaft, engage the parking brake, shut off the engine and remove the ignition key.



CAUTION

Risk of cutting or severing because of unintentional operation of the dosing roller when cleaning the seed dosing unit.

To prevent unintentional starting of the dosing roller

- switch off the on-board computer
- set down the star wheel on the ground.

Open the inspection flap on the seed dosing unit only for cleaning.

Use of the machine

2. Close the shutter (Fig. 163/1) only if the seed dosing unit and not the hopper is to be emptied (see section "Inserting the dosing roller into the dosing unit", Seite 104).

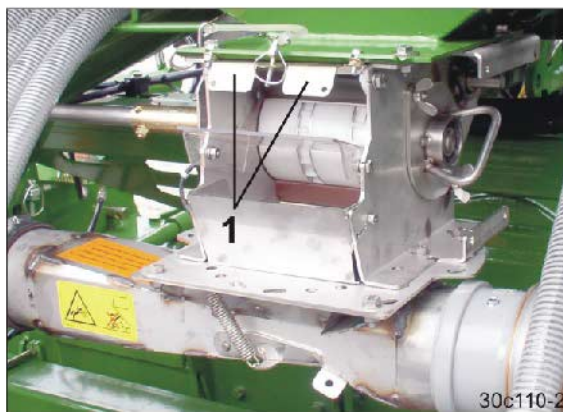


Fig. 163

3. Place the calibration trough under the seed dosing unit.
4. Open the injector sluice flap (Fig. 164/1) so that the remaining seed can flow into the calibration trough.



Fig. 164



CAUTION

Risk of contusions on opening and closing the injector sluice flap (Fig. 164/1)!

Hold the injector sluice flap only by the lug (Fig. 164/2), otherwise there is a danger of injury when the spring-loaded injector sluice flap snaps closed.

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

5. Open the residue emptying flap (Fig. 165/1) by turning the handle (Fig. 165/2).



Fig. 165

6. As in the calibration test, turn the star wheel anticlockwise with the calibration crank (Fig. 166/1) until the dosing roller and the seed dosing unit are completely emptied.

For full dosing, run the electric motor for a short while.



Fig. 166

7. For complete cleaning in the event of a seed change, for example, remove the dosing rollers (see section "Inserting the dosing roller into the dosing unit", Seite 104) and clean them together with the seed dosing unit.
8. Carefully close the residue emptying flap (Fig. 165/1) and injector sluice flap (Fig. 164/1) and secure the calibration trough on the transport bracket.
9. Move the star wheel to the transport position (see section "Move the star wheel to the transport position", Seite 139).
10. Withdraw the slider (Fig. 163/1) from the seed dosing unit (see section "Inserting the dosing roller into the dosing unit", Seite 104) and secure with a lynch pin.

11 Faults



WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through

- **unintentional lowering 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.**

Safeguard the tractor and the machine against unintentional start-up and rolling away, before you eliminate any faults on the machine. See section "Securing the tractor / machine against unintentional start-up and rolling", Seite 90).

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



CAUTION

Switch off the on-board computer

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

Risk of accident due to unintentional movement of machine components when wheel is moved.

11.1 Residual seed volume indicator

When volume drops below the residual seed volume, if the level sensor is correctly set, on the on-board computer display a warning message appears with an acoustic signal (see operating manual for on-board computer).

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

11.2 Shearing of the track marker boom

If the track marker strikes against a solid obstacle, a screw shears (Fig. 167/1) and the track marker folds backwards.

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



Fig. 167

11.3 Deviations between the preset and actual sowing rates

Possible causes and remedies of deviation between set and actual sowing rate:

- The slippage of the star wheel can alter during operation, e.g. when changing from light to heavy soil (see section "11.3.1", Seite 160).
- When sowing with moist dressed seeds, deviations between the preset and actual sowing rates may occur if there is a period of less than 1 week (2 weeks recommended) between the dressing and sowing.
- A defective or wrongly set dosing lip (Fig. 168/1) will cause dosing errors.

Set the dosing lip so that it is lying lightly up against the dosing roller (Fig. 168/2).

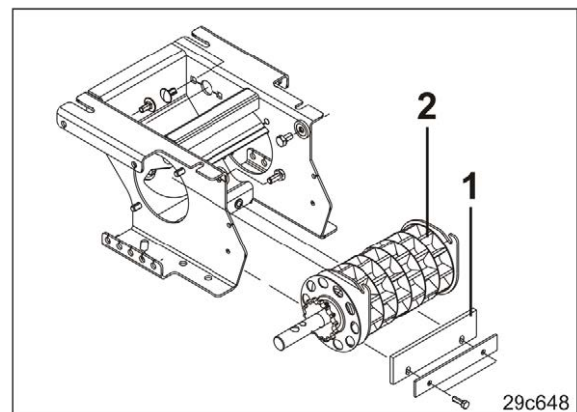


Fig. 168

11.3.1 Slippage of the star wheel

The slippage of the star wheel can alter during operation, e.g. when changing from light to heavy soil.

Only seed drills with Vario gearbox without electronic gearbox adjustment

The number of crank revolutions on the star wheel for the determination of the gearbox setting must then be redetermined.

Measure out 250 m² on 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 |
| 4.00 m working width = | 62.5 m distance |
| 4.50 m working width = | 55.5 m distance |
| 6.00 m working width = | 41.7 m distance |

Count the number of wheel revolutions when travelling over the measured distance.

Carry out the calibration test with the number of wheel revolutions determined (see section 8.5, Seite 108).

Only seed drills with Vario gearbox with electronic gearbox adjustment or full dosing

In order to record the worked area and the required seed spread rate, the on-board computer requires the drive wheel impulses over a calibration distance of 100 m.

If the slippage of the star wheel/roller feeler changes during the work, e.g. when changing from light to heavy soils, there is also a change in

- the calibration value "Imp./100 m"
- the number of crank turns on the star wheel/roller feeler to determine the gearbox setting.

If there is any deviation between the preset and actual sowing rates, the calibration value "Imp./100 m" must be re-determined by travelling a measured distance (see on-board computer operating manual).

12 Cleaning, maintenance and repairs

12.1 Safety



WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through

- **unintentional lowering 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 work on the machine (see section "Securing the tractor/machine against unintentional start-up and rolling").



CAUTION

Switch off the on-board computer

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

Risk of accident due to unintentional movement of machine components when wheel is moved.



WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through unprotected danger points.

- Mount protective equipment, which you removed when cleaning, maintaining and repairing the machine.
- Replace defective protective equipment with new equipment.
- Never crawl under a raised, unsecured machine.



WARNING

Risk of crushing, shearing, cutting, being caught, wound in, pulled in or trapped by the motorised, unprotected dosing roller and agitator shaft.

Never open or remove the safety equipment in the seed hopper when the dosing roller / agitator shaft are operating, or as long as the dosing roller / agitator shaft can be unintentionally operated.

12.2 Cleaning

**DANGER**

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

When emptying the hopper and dosing housing or when removing toxic dressing dust, e.g. with compressed air, wear a protective suit, protective mask, safety glasses and gloves.



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

Cleaning with a high-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.
- 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.

12.2.1 Cleaning the distributor head (specialist workshop)



WARNING

Risk of contact with or inhalation of toxic dressing dust when cleaning the distributor head with compressed air.

This can result in serious injury to the eyes and breathing organs.

Wear a breathing mask and safety glasses when cleaning the distributor head.

1. Wear a breathing mask and safety glasses.
2. Open the swivelling cover.
3. Climb into the hopper.



Fig. 169

The rung ladder (Fig. 170/1) is used for climbing into the hopper.



Fig. 170

4. Slacken the winged nuts (Fig. 171/1) and remove the clean plastic flap (Fig. 171/2) from the distributor head.
5. Remove any impurities with a brush, and wipe out the distributor head and plastic cap with a dry cloth.
6. Install the plastic cap (Fig. 171/2).
7. Fix the plastic cap with winged nuts (Fig. 171/1).

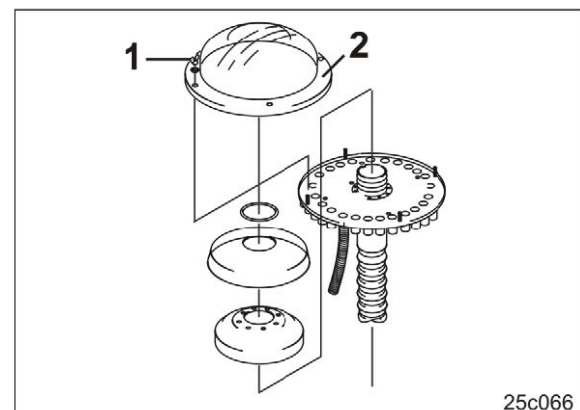


Fig. 171

12.2.2 Shutdown of the machine over a long period of time

1. Thoroughly clean and dry the RoTeC control coulters.
2. To prevent rust, conserve the sowing discs with an environment-friendly anti-corrosion agent.

12.3 Lubrication regulations



WARNING

Before lubricating,

- place the solo machine on the parking supports
- place the combination attached to the tractor on the ground.



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

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

The lubrication points on the machine are marked with a foil sticker (Fig. 172).

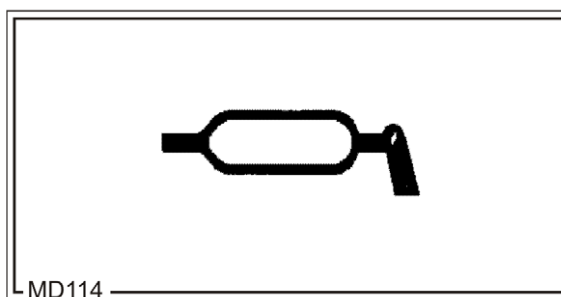


Fig. 172

12.3.1 Lubricants



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

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

12.3.2 Lubrication points – overview

| AD-P Super | Number of lubrication nipples | Lubrication interval | Note |
|------------|-------------------------------|----------------------|--|
| Fig. 173 | 6 | 8 h + 20 h | <ul style="list-style-type: none"> Lubricate the PTO shaft Grease the protective tubes and profile tubes |
| Fig. 174/1 | 2 | 25 h | Coulter lifting cylinder (optional) |

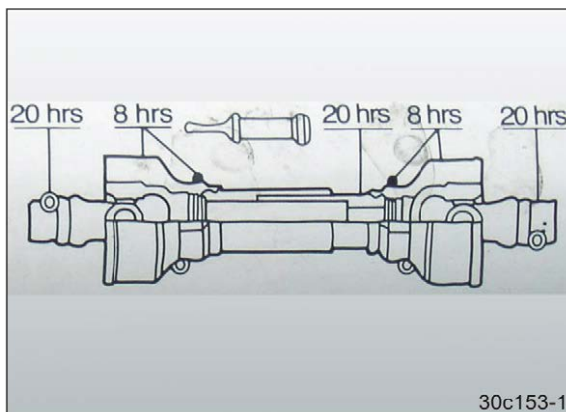


Fig. 173



Fig. 174

12.4 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.

| | | | | |
|-------------------|------------------------------------|---------------------|--|----------------|
| Initial operation | Before initial operation | Specialist workshop | Inspect and service the hydraulic hose lines. This inspection has to be recorded by the operator. | Section 12.4.5 |
| | | | Checking the oil level in the Vario gearbox | Section 12.4.3 |
| | After the first 10 operating hours | Specialist workshop | Inspect and service the hydraulic hose lines. This inspection has to be recorded by the operator. | Section 12.4.5 |
| | | Specialist workshop | Check that all screw connections are tight. | Section 12.6 |

| | | | |
|--|--|---|----------------|
| <u>Before starting work</u> (daily) | | Visual inspection of the upper and lower link pins | Section 12.4.1 |
| | | Inspection and elimination of defects on hoses, tubes and connectors | |
| <u>Hourly</u> (e.g. when refilling the seed hopper) | | Check <ul style="list-style-type: none"> the seed dosing unit the seed hoses the blower fan intake guard screen and eliminate dirt | |
| During the work | | Check the distributor head and eliminate dirt | |
| <u>After completion of work</u> (daily) | | Emptying seed dosing unit | Section 10.7.2 |
| | | Clean the machine (if required) | Section 12.2 |

| | | | |
|--|---------------------|--|----------------|
| Each week (at least every 50 operating hours) | Specialist workshop | Inspect and service the hydraulic hose lines. This inspection has to be recorded by the operator. | Section 12.4.5 |
| | | Checking the oil level in the Vario gearbox | Section 12.4.3 |
| At the end of the season Every 6 months | | Maintenance of roller chains and chain wheels | Section 12.4.4 |
| | | Servicing the sowing shaft bearing | Section 12.4.2 |

12.4.1 Visual inspection of the upper and lower link pins



WARNING

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

Check the upper and lower link pins for visible defects whenever the machine is coupled.

Replace the upper and lower link pins in the event of clearly visible wear.

12.4.2 Servicing the sowing shaft bearing

Lightly grease the seat of the sowing shaft bearing (Fig. 175/1) with a thin mineral oil (SAE 30 or SAE 40).



Fig. 175

12.4.3 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. 176/1).

There is no need to change the oil.



Fig. 176

The oil filler neck (Fig. 177/2) is used to top up the Vario gearbox.

Refer to the table (Fig. 178) for the grade of transmission oil required.



Fig. 177

| Hydraulic fluid grades and fill level of the Vario gearbox | |
|--|---|
| Total filling level | 0.9 litres |
| Transmission fluid (as required) | Wintershall Wintal UG22 WTL-HM (ex-works) |
| | Fuchs Renolin MR5 VG22 |

Fig. 178

12.4.4 Maintenance of roller chains and chain wheels

All roller chains should be

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

12.4.5 Inspection criteria for hydraulic hose lines

Have the hydraulic hose lines replaced by a specialist workshop if during inspection you note the following criteria:

- 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 de-pressurised 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 impaired); 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 valve chest is "2013", then the period of use ends in February 2019. For more information, see "Labelling of hydraulic hose lines".



WARNING

Risk of infection through the high-pressure hydraulic fluid of the hydraulic system entering the body.

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

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

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



- When connecting the hydraulic hose lines to the hydraulic system of connected machines, ensure that the hydraulic system is depressurised on both the drawing vehicle and the trailer.
- Ensure that the hydraulic hose lines are connected correctly.
- Regularly check all the hydraulic hose lines and couplings for damage and impurities.
- Have the hydraulic hose lines checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose lines if damaged or worn. Only use our 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.

12.4.5.1 Labelling hydraulic hose lines

The valve chest identification provides the following information:

Fig. 179/...

- (1) Manufacturer's marking on the hydraulic hose line (A1HF)
- (2) Date of manufacture of the hydraulic hose line (13/02 = Year / Month = February 2013)
- (3) Maximum approved operating pressure (210 BAR)

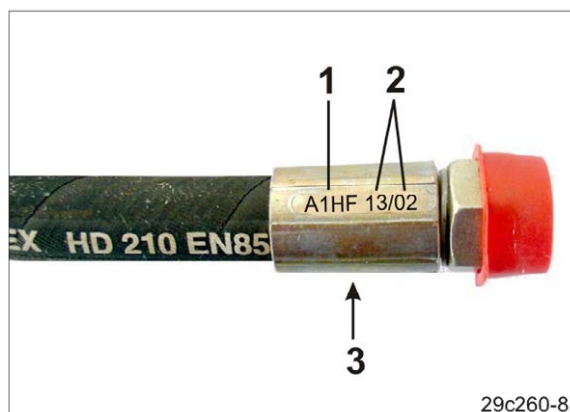


Fig. 179

12.4.5.2 Installation and removal of hydraulic hose lines



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

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

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

12.5 Specialist workshop adjustment work

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

When the machine is delivered or when buying a new cultivating tractor, check that the tramline is set to the track width (Fig. 180/a) of the cultivating tractor.

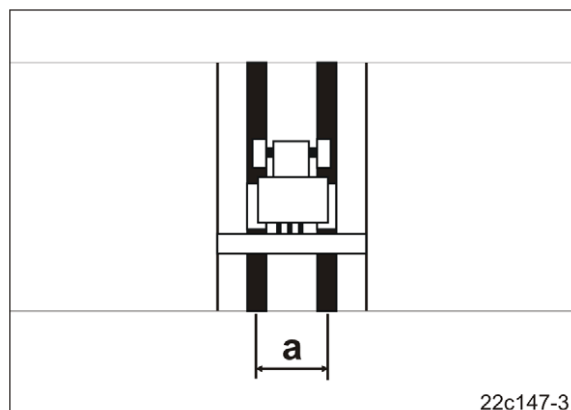


Fig. 180

When the track width is being set, replace the seed lines on the seed tubes.



Fig. 181

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

When the machine is delivered or when buying a new cultivating tractor, check that the tramline is set to the track width (Fig. 182/a) of the tractor.

With an increasing number of adjacent tramline coulters, the track (Fig. 182/a) becomes wider.

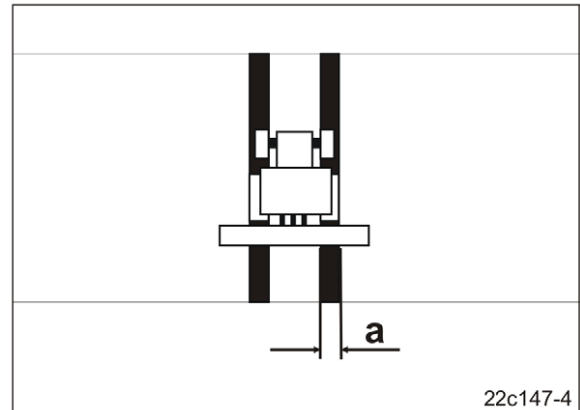


Fig. 182

Tramline coulters can be cut in by activating the flaps in the flap box (Fig. 183/1).

Activated flaps direct the seed back to the seed hopper when tramlines are created.

The flaps in the flap box can be activated or deactivated.

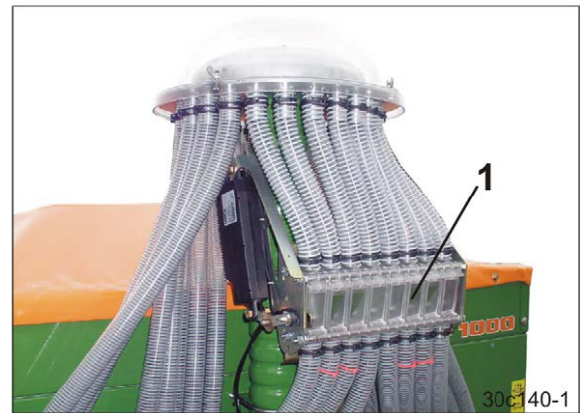


Fig. 183

Activating the flap



The counter of the tramline control must not be at "zero".

1. Shift on the counter of the tramline control in the on-board computer if the counter is at "zero".
2. Push up the assembly window (Fig. 184/1) and take out of the flap box from the front.
3. Press the flap (Fig. 184/2) against the stop (Fig. 184/3) and screw to the shaft. Do not tighten the hexagon socket head screw (Fig. 184/4) too tightly in order not to deform the flap.
4. Tighten the locking screw (Fig. 184/5) tension-free so that the flap can pass the screw head without obstruction.
5. Close the assembly window.

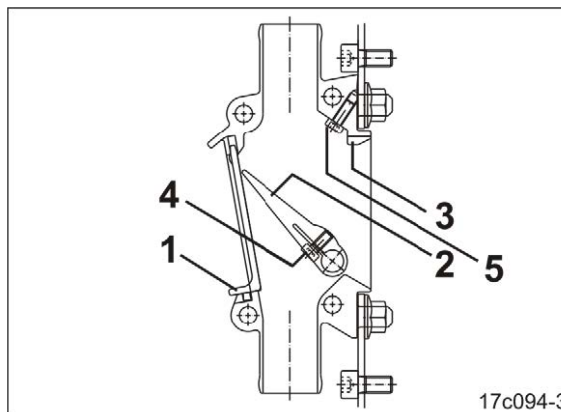


Fig. 184

Deactivating the flap



The counter of the tramline control must not be at "zero".

1. Shift on the counter of the tramline control in the on-board computer if the counter is at "zero".
2. Push up the assembly window (Fig. 185/1) and take out of the flap box from the front.
3. Press the flap (Fig. 185/2) against the stop (Fig. 185/3) and release the hexagon socket head screw (Fig. 185/4) enough to allow the flap to move freely on the shaft.
4. Unscrew the locking screw (Fig. 185/5) by approx. 5 mm to ensure that the deactivated flap cannot move and the opening to the seed hopper remains closed.
5. Close the assembly window.

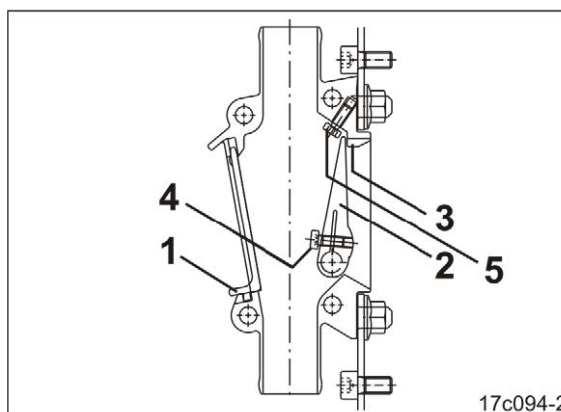


Fig. 185

12.5.3 Switch the chain wheels in chain drive (specialist workshop)

Only machines with full dosing

1. Remove the chain guard (Fig. 186/1).
2. Release the chain tensioner (Fig. 186/2).
3. Replace the chain wheels (see table Fig. 187).
4. Installation is in reverse sequence.

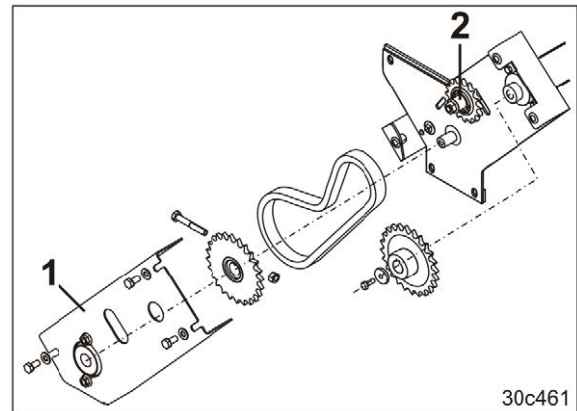


Fig. 186

| Sowing rate | Chain wheel (1) | Chain wheel (2) |
|-------------|-----------------|-----------------|
| normal | Z = 18 | Z = 24 |
| high | Z = 24 | Z = 18 |

Legend:

Chain wheel (1) on shaft of electric motor
Chain wheel (2) on sowing shaft

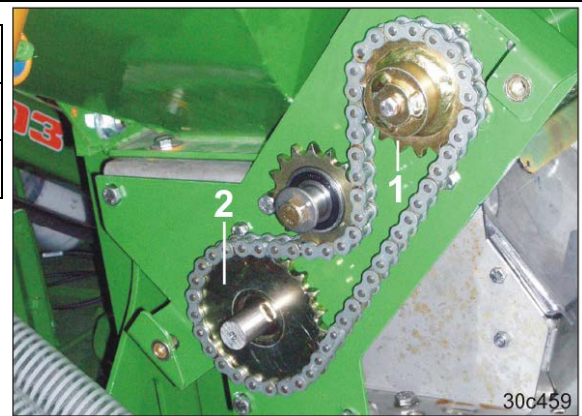


Fig. 187

12.6 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 system diagrams

13.1 Hydraulic system diagram AD-P 303/403 Super

| Fig. 188/... | Designation | Fig. 188/... | Designation |
|--------------|-------------------------------------|--------------|---|
| 0010 | Tractor hydraulics | 0110 | Tramline marker (optional) |
| 0020 | Tractor control unit <i>yellow</i> | 0120 | Track marker left |
| 0021 | 1 yellow | 0130 | Track marker right |
| 0030 | Tractor control unit <i>blue</i> | 0140 | Coulter pressure adjustment |
| 0031 | 1 blue | 0150 | Exact harrow pressure adjustment |
| 0040 | Tractor control unit <i>green</i> | 0160 | Seed rate remote control (at Vario gearbox) |
| 0041 | 1 green | 0180 | Coulter lift |
| 0042 | 1 green | 0190 | Coulter lift |
| 0050 | Tractor control unit <i>natural</i> | 0200 | Star wheel lift |
| 0051 | 1 neutral | 0210 | Blower fan drive (optional) at the tractor hydraulics |
| 0060 | Tractor control unit <i>red</i> | 0220 | Track eradicator shuttle valve |
| 0061 | 1 red | 0240 | Locking block |
| 0070 | Pressureless return flow | 0250 | Shut-off valve |
| 0071 | 2 red | | |
| | | 0260 | On-board computer without job computer |
| | | 0270 | On-board computer with job computer |

All position specifications in direction of travel

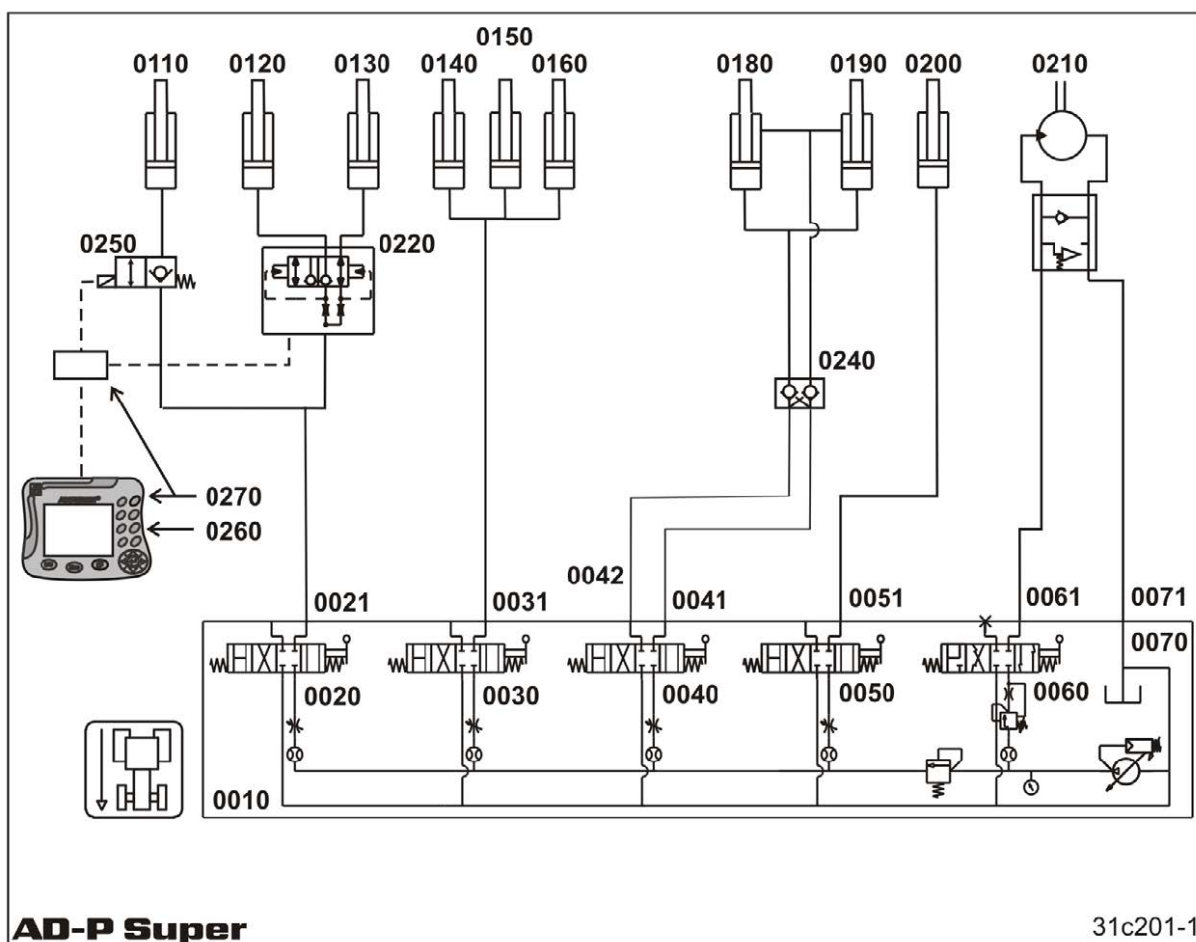


Fig. 188



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