

Operating manual

AMAZONE

Soil tillage implement

Rotary cultivator

KG 4001-2

KG 5001-2

KG 6001-2



MG4372
BAH0060-5 12.17

**Please read and follow this
operating manual before putting
the machine into operation.**

**Keep it in a safe place
for future use!**

en



READING THE INSTRUCTION

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

Leipzig-Plagwitz 1872. Rud. Sack.

Identification data

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

Implement ID No.:
(10-digit)

Type:

KG 4/5/6001-2

Permissible system pressure (bar):

Maximum 210 bar

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

Manufacturer's address

AMAZONEN-WERKE

H. DREYER SE & Co. KG

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D-49202 Hasbergen, Germany

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E-mail: amazone@amazone.de

Spare part orders

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

Please send orders to your AMAZONE dealer.

Formalities of the operating manual

Document number: MG4372

Compilation date: 12.17

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

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

Before initial operation, read and observe this operating manual, and particularly the safety information. Only after careful reading will you be able to benefit from the full scope of your newly purchased implement.

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

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

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

User evaluation

Dear Reader

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

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1 User information

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

1.1 Purpose of the document

This operating manual

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

1.2 Locations in the operating manual

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

1.3 Diagrams

Instructions and responses

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

Example:

1. Instruction 1
- Implement response to instruction 1
2. Instruction 2

Lists

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

Example:

- Point 1
- Point 2

Item numbers in diagrams

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

Example: (Fig. 3/6)

- Figure 3
- Item 6

2 General safety instructions

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

2.1 Obligations and liability

Comply with the instructions in the operating manual

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

Obligations of the operator

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

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

The operator is obliged

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

If you still have queries, please contact the manufacturer.

Obligations of the user

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

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

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

General safety instructions

Risks in handling the implement

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

- the health and safety of the user or third parties,
- the implement,
- other property.

Only use the implement

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

Eliminate any faults immediately which could impair safety.

Guarantee and liability

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

- Improper use of the implement.
- Improper installation, commissioning, operation and maintenance of the implement.
- Operation of the implement with defective safety equipment or improperly attached or non-functioning safety equipment.
- Non-compliance with the instructions in the operating manual regarding commissioning, operation and maintenance.
- Unauthorised design changes to the implement.
- Insufficient monitoring of implement parts which are subject to wear.
- Improperly executed repairs.
- Disasters due to the effects of foreign objects and force majeure.

2.2 Representation of safety symbols

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



DANGER

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

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



WARNING

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

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



CAUTION

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



IMPORTANT

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

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



NOTE

Indicates handling tips and particularly useful information.

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

2.3 Organisational measures

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

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



The operating manual

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

Check all the available safety equipment regularly.

2.4 Safety and protective equipment

Before starting up the implement each time, all the safety and protection equipment must be properly attached and fully functional. Check all safety and protection equipment regularly.

Faulty safety equipment

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

2.5 Informal safety measures

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

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

2.6 User training

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

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

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

Legend: X..permitted —..not permitted

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

Comment:

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



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



2.7 Safety measures in normal operation

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

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

2.8 Danger from residual energy

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

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

2.9 Maintenance and repair work, fault elimination

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

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

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

Check all the bolted connections for tightness. On completion of the maintenance work, check the function of the safety devices.

2.10 Design changes

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

Any expansion or modification work shall require the written approval of AMAZONEN-WERKE. Only use modification and accessory parts approved by AMAZONEN-WERKE so that the type approval, for example, remains valid in accordance with national and international regulations.

Vehicles with an official type approval or with equipment connected to a vehicle with a valid type approval or approval for road transport according to the German road traffic regulations must be in the state specified by the approval.



WARNING

Risk of crushing, cutting, being trapped or drawn in, or impact through the failure of support parts.

It is strictly forbidden to

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



2.10.1 Spare and wear parts and aids

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

Use only genuine AMAZONE spare and wear parts or the parts cleared by AMAZONEN-WERKE so that the operating permit retains its validity in accordance with national and international regulations. If you use wear and spare parts from third parties, there is no guarantee that they have been designed and manufactured in such a way as to meet the requirements placed on them.

AMAZONEN-WERKE shall accept no liability for damage caused by the use of non-approved spare and wear parts or aids.

2.11 Cleaning and disposal

Handle and dispose of any materials used carefully, in particular

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

2.12 User workstation

The implement must be operated by only one person from the driver's seat of the tractor.

2.13 Warning symbols and other labels on the implement



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

Warning symbols – structure

Warning symbols indicate danger areas on the implement and warn against residual dangers. At these points, there are permanent or unexpected dangers.

A warning symbol consists of two fields:



Field 1

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

Field 2

is a symbol showing how to avoid the danger.

Warning symbols – explanation

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

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

Order number and explanation

Warning symbols

MD 075

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

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

- Never reach into the danger area when the tractor engine is running with the universal joint shaft or hydraulic/electrical system connected.
- Wait until all moving parts of the implement are at a standstill before reaching into the danger area.



MD 076

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

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

Never open or remove protective equipment,

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



MD 078

Risk of crushing of fingers/hand by accessible, moving parts of the implement!

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

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

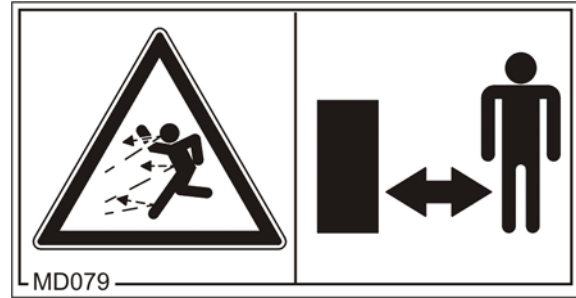


MD 079

Risk of materials or foreign objects being flung away from or out of the implement when entering or remaining in the danger area of the implement!

These dangers can inflict severe injuries on all parts of the body.

- Stay well clear of the danger area of the implement.
- Ensure that all persons maintain a sufficient safety distance from the danger area of the implement as long as the tractor engine is running.



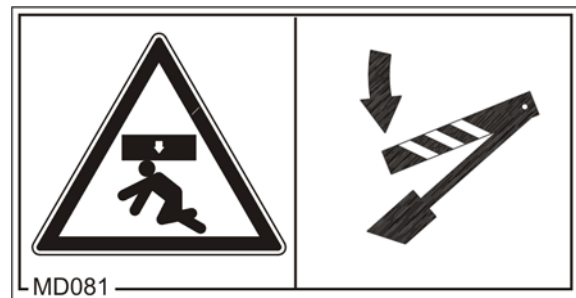
MD 081

Risk of crushing the entire body due to necessary periods spent under unsecured machine parts raised by lifting cylinders.

Causes serious, potentially fatal injuries anywhere on the body.

Secure the lifting cylinder against inadvertent lowering before entering the danger zone beneath the raised implement components.

To do this, use the mechanical support device or the hydraulic locking device for the lifting cylinder.



MD 082

Risk of falling when riding the implement on treads or platforms!

Causes serious, potentially fatal injuries anywhere on the body.

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

Make sure that nobody is riding on the implement.



General safety instructions

MD 084

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

Causes serious, potentially fatal injuries anywhere on the body.

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



MD 086

Risk of crushing the entire body due to necessary periods spent under raised, unsecured machine parts.

Causes serious, potentially fatal injuries anywhere on the body.

Before spending time in the danger area underneath raised implement parts, secure the raised parts to prevent them from being accidentally lowered.

To do this, use the mechanical support device or the hydraulic locking device.

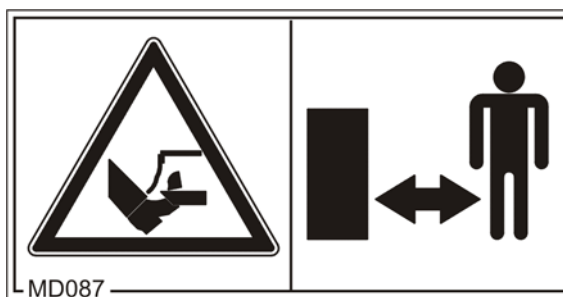


MD 087

Risk of cutting or severing of toes or feet through direct contact with moving parts involved in the working process!

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

Stay well clear of the danger area when the tractor engine is running with the universal joint shaft or hydraulic/electrical system connected.

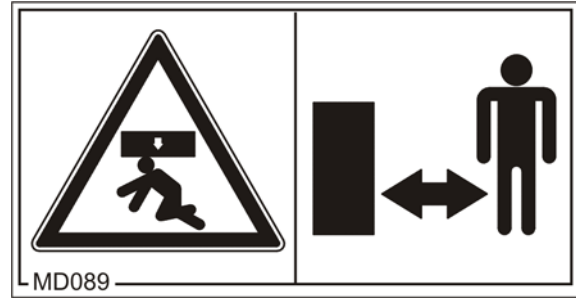


MD 089

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

Causes serious, potentially fatal injuries anywhere on the body.

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

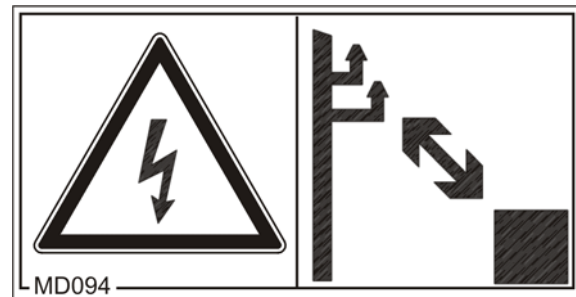


MD 094

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

These dangers can cause extremely serious and potentially fatal injuries.

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



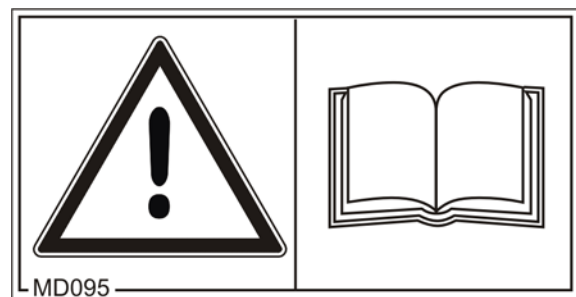
Rated voltage

Safety distance from transmission lines

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

MD 095

Read and follow the operating manual and safety information before starting up the implement!

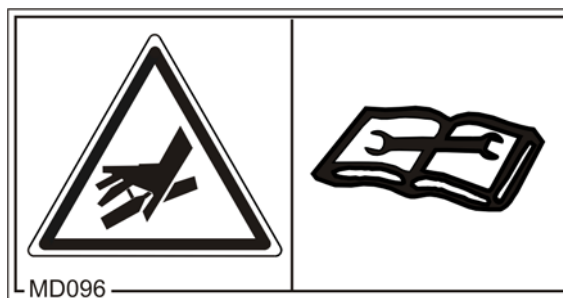


MD 096

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

This danger may cause serious injuries, perhaps even resulting in death, if escaping high-pressure hydraulic fluid passes through the skin and into the body.

- Never attempt to plug leaks in hydraulic hose lines with 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.

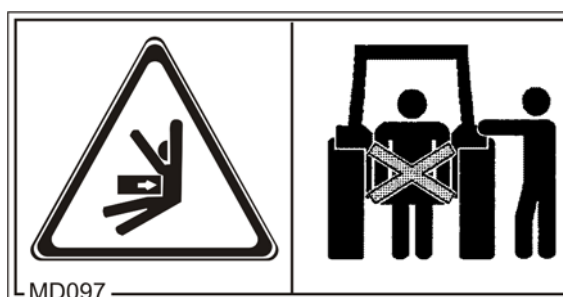


MD 097

Risk of crushing the entire body by entering/remaining in the lifting area of the three-point linkage when the three-point hydraulic system is operated!

Causes serious, potentially fatal injuries anywhere on the body.

- Personnel are prohibited from standing in the lifting area of the three-point linkage when the three-point hydraulic system is operated.
- Actuate the operating controls for the tractor's three-point hydraulic system
 - only from the designated workstation.
 - under no circumstances if you are in the lifting area between the tractor and implement.



MD 102

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

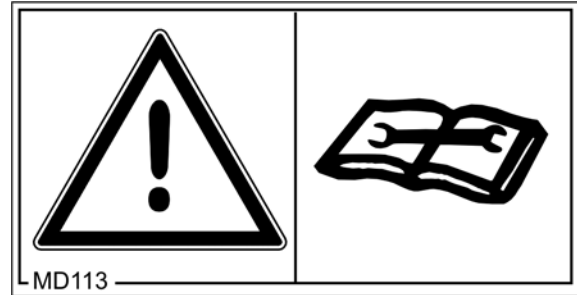
These dangers can cause extremely serious and potentially fatal injuries.

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

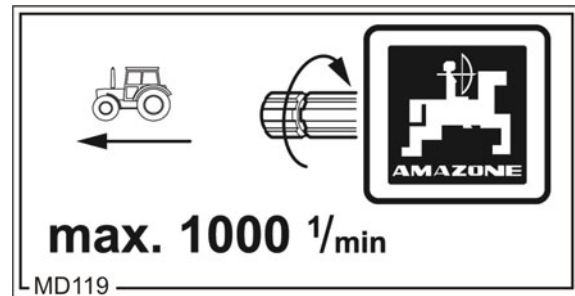


MD 113

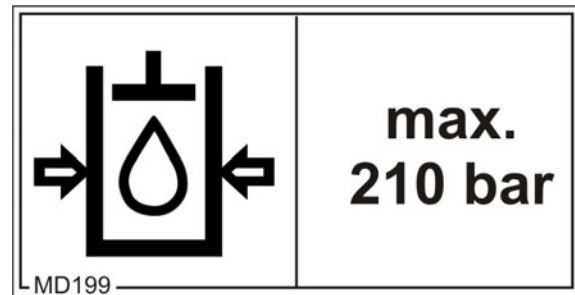
Study and observe the instructions for cleaning, servicing and maintaining in the appropriate chapter of the operating manual.

**MD 119**

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

**MD 199**

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



2.13.1 Positions of warning symbols and other labels

Warning symbols

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

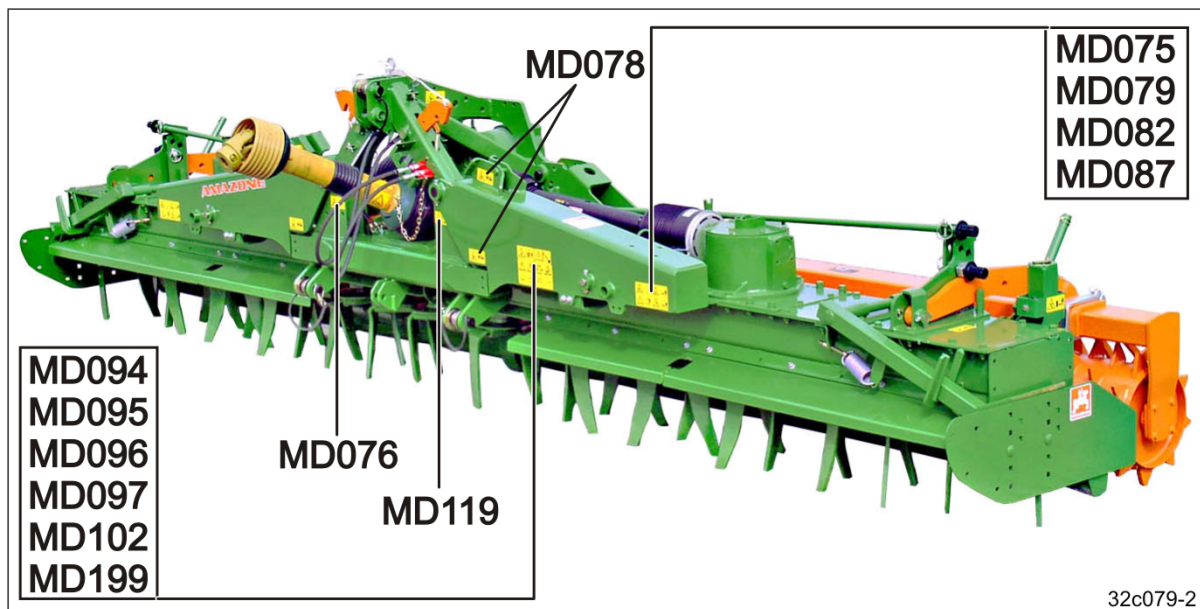


Fig. 1

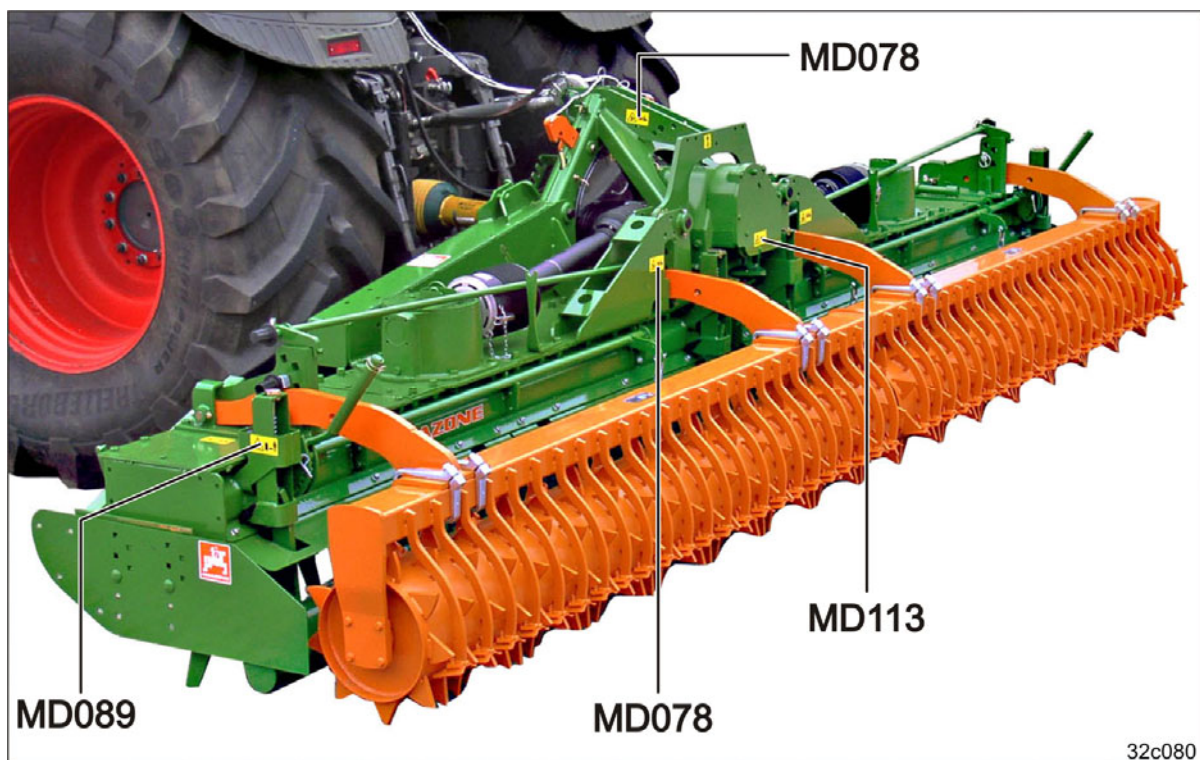


Fig. 2



Fig. 3

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

Non-compliance with the safety information

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

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

- 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 the environment through leakage of hydraulic fluid.

2.15 Safety-conscious working

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

Comply with the accident prevention instructions on the warning symbols.

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

2.16 Safety information for users



WARNING

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

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

2.16.1 General safety instructions and accident prevention instructions

- In addition to these instructions, also comply with the generally valid national and safety and accident prevention regulations!
- The warning and information signs attached on the implement provide important instructions for safe operation of the implement. Compliance with these instructions is essential for your safety!
- Before moving off and starting up the implement, check the immediate area of the implement (children). Ensure that you can see clearly.
- It is forbidden to ride on the implement or use it as a means of transport!
- Drive in such a way that you always have full control over the tractor with the attached implement.
In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected or coupled implement.

Coupling and uncoupling the implement

- Only connect and transport the implement with tractors suitable for the task.
- When coupling implements to the tractor's three-point hydraulic system, the attachment categories of the tractor and the implement must always be the same!
- Connect the implement to the prescribed equipment in accordance with the specifications.
- When coupling implements to the front or the rear of the tractor, the following may not be exceeded:
 - The permissible total tractor weight
 - The permissible tractor axle loads
 - The permissible load capacities of the tractor tyres
- Secure the tractor and the implement against unintentional rolling before coupling or uncoupling the implement.
- It is forbidden for people to stand between the implement to be coupled and the tractor while the tractor is approaching the implement.
Any helpers may only act as guides standing next to the vehicles, and may only move between the vehicles when both are at a standstill.

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

Use of the implement

- Before starting work, ensure that you understand all the equipment and actuation elements of the implement and their function. There is no time for this when the implement is already in operation!
- Wear tight-fitting clothing! There is an increased risk of loose clothing getting caught or entangled on drive shafts!
- Only place the implement in service after all protective devices have been attached and are in protective position!
- Comply with the maximum load of the connected implement and the permissible axle and drawbar loads of the tractor. If necessary, drive only with a partially filled hopper.
- It is forbidden to stand in the working area of the implement.
- It is forbidden to stand in the turning and swivel range of the implement.
- There are crushing and shearing hazards on implement parts actuated by external force (e.g. hydraulically)!
- Only actuate implement parts actuated by external force if personal are maintaining an adequate safety distance to the implement!
- Secure the tractor against unintentional start-up and rolling, before you leave the tractor.
For this:
 - Lower the implement onto the ground.
 - Apply the parking brake.
 - Switch off the tractor engine.
 - Remove the ignition key.

Implement transportation

- When using public roads, national road traffic regulations must be observed.
- Before moving off, check:
 - the correct connection of the supply lines,
 - the lighting system for damage, function and cleanliness,
 - that the brake and hydraulic equipment shows no visible signs of defect,
 - that the parking brake is completely released,
 - the functioning of the brake system.
- Ensure that the tractor has sufficient steering and braking power. Any implements and front/rear weights connected to the tractor influence the driving behaviour and the steering and braking power of the tractor.
- If necessary, use front weights.
The front tractor axle must always be loaded with at least 20 % of the empty tractor weight, in order to ensure sufficient steering power.
- Always fix the front or rear weights to the intended fixing points according to regulations.

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

2.16.2 Mounted implements

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

2.16.3 Hydraulic system

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

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

If you are injured by hydraulic fluid, contact a doctor immediately. Risk of infection.
- When searching for leakage points, use suitable aids, to avoid the serious risk of infection.

2.16.4 Electrical system

- When working on the electrical system, always disconnect the battery (negative terminal).
- Only use the prescribed fuses. If fuses are used that are too highly rated, the electrical system will be destroyed – risk of fire
- Ensure that the battery is connected correctly – firstly connect the positive terminal and then connect the negative terminal. When disconnecting the battery, disconnect the negative terminal first, followed by the positive terminal.
- Always place the appropriate cover over the positive battery terminal. If there is accidental earth contact, there is a risk of explosion
- Risk of explosion: avoid the production of sparks or the presence of naked flames in the vicinity of the battery.
- The implement may be equipped with electronic components whose function is influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed.
 - In the case of retrofitting electrical units and/or components on the implement, with a connection to the on-board power supply, the operator is responsible for checking whether the installation might cause faults on the vehicle electronics or other components.
 - Ensure that the retrofitted electrical and electronic components comply with the EMC directive 89/336/EEC in the appropriate version and carry the CE mark.

2.16.5 PTO shaft operation

- Use only the universal joint shafts prescribed by the AMAZONEN-WERKE factories, equipped with the proper safety devices.
- Also read and follow the operating manual from the universal joint shaft manufacturer.
- The protective tube and universal joint shaft guard must be undamaged, and the shield of the tractor and implement PTO shaft must be attached and be in proper working condition.
- Work is prohibited while the safety devices are damaged.
- You can attach and detach the universal joint shaft only when
 - the PTO shaft is switched off.
 - the tractor engine is switched off.
 - the parking brake has been applied.
 - the ignition key has been removed.
- Always ensure that the universal joint shaft is installed and secured correctly.
- When using wide-angle universal joint shafts, always install the wide angle joint at the pivot point between the tractor and implement.
- Secure the universal joint shaft guard by attaching the chain(s) to prevent movement.


- Observe the prescribed pipe overlaps for universal joint shafts in transport and working positions. (Read and follow the operating manual from the universal joint shaft manufacturer.)
- When turning corners, observe the permitted bending and displacement of the universal joint shaft.
- Before switching on the PTO shaft, check that the selected PTO shaft speed of the tractor matches the permitted drive speed of the implement.
- Instruct everyone to leave the danger area of the implement before switching on the PTO shaft.
- While work is being carried out with the PTO shaft, there must be no one in the area of the PTO or universal joint shaft while it is turning.
- Never switch on the PTO shaft while the tractor engine is turned off.
- Always switch off the PTO shaft whenever excessive bending occurs or it is not needed.
- **WARNING!** After the PTO shaft is switched off, there is a danger of injury from the continued rotation of freewheeling implement parts.
Do not approach the implement too closely during this time. You must only start work on the implement once all implement parts are at a complete standstill!
- Secure the tractor and implement against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on PTO shaft-driven implements or universal joint shafts.
- After uncoupling the universal joint shaft, place it on the holder provided.
- After removing the universal joint shaft, attach the protective sleeve to the PTO shaft stub.
- When using the travel-dependent PTO shaft, note that the PTO shaft speed depends on the drive speed, and that the direction of rotation reverses when you drive in reverse.

2.16.6 Cleaning, maintenance and repair

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

3 Loading and unloading

The pictogram marks the location at which the lifting gear is to be secured to the implement.



DANGER

Only attach the lifting gear at the marked location.

Do not stand under suspended loads.

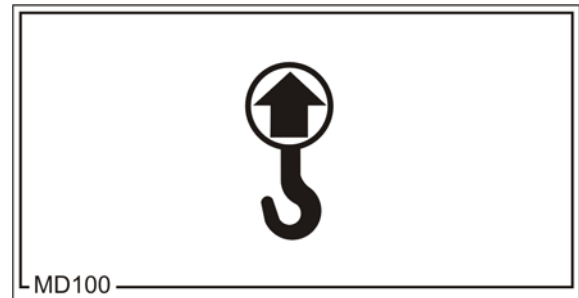



Fig. 4



CAUTION

Always load the implement in folded-out position.

Risk of accident from tilting due to the high centre of gravity.

Loading the implement

1. Unfold the implement.
2. Disconnect the seeding rail from the cultivator.
3. Attach the lifting gear at the marked location.
4. Place the implement on the transport vehicle and lash it down as prescribed.



Fig. 5

4 Product description

This section:

- provides a comprehensive overview of the implement structure.
- provides the names of the individual modules and controls.

If possible, read this section when actually at the implement. This helps you to understand the implement better.

4.1 Overview of assembly groups

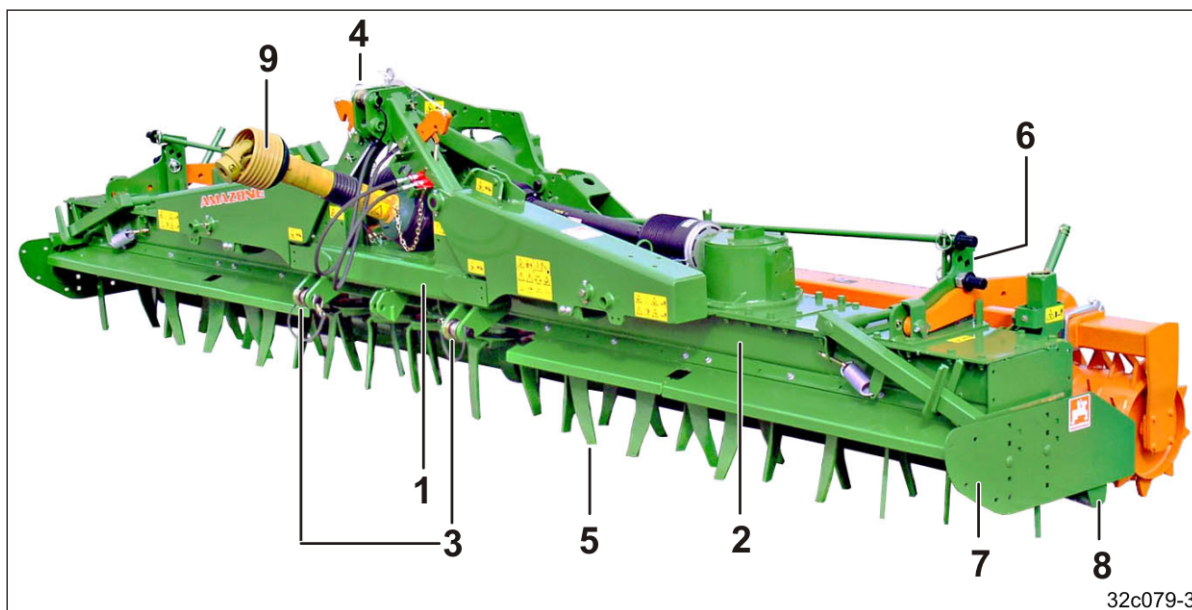


Fig. 6

- | | |
|--------------------------------|---|
| (1) Implement frame | (6) Segment for adjusting the working depth |
| (2) Implement boom | (7) Side panel |
| (3) Lower link coupling points | (8) Levelling board |
| (4) Upper link coupling point | (9) Universal joint shaft |
| (5) Tool tines | |

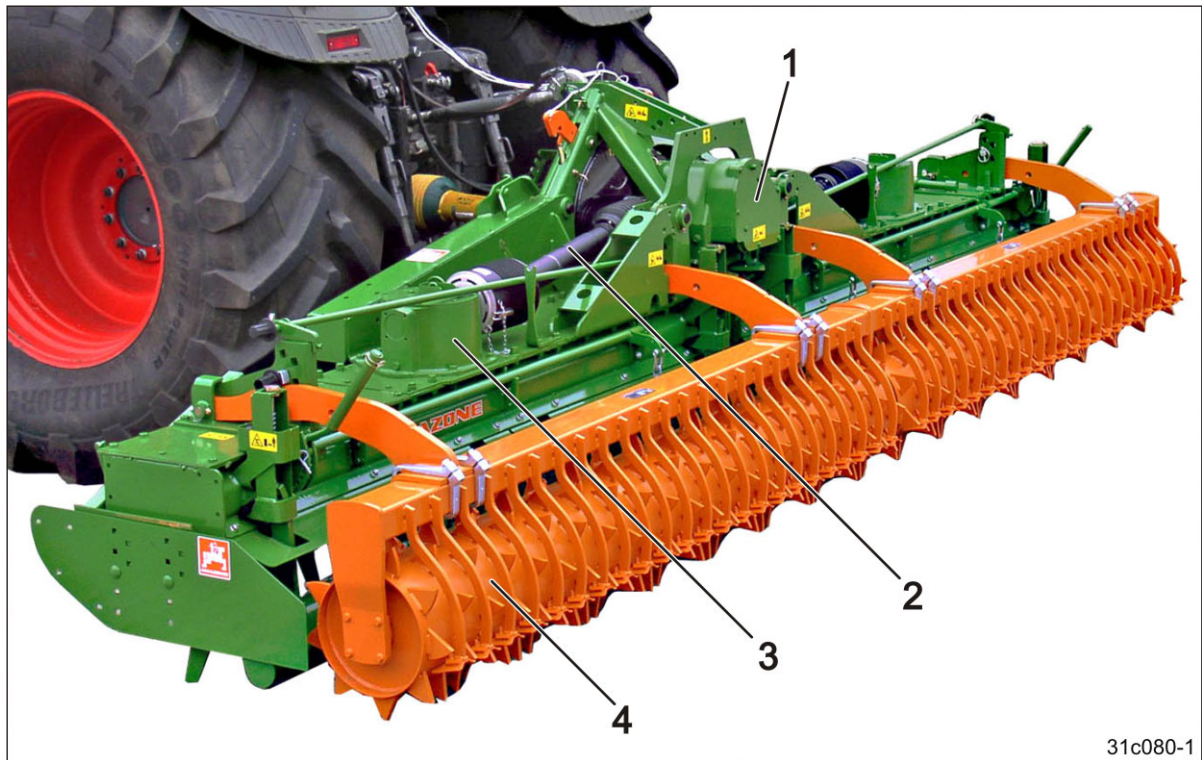


Fig. 7

- | | |
|--|---------------------|
| (1) Two-gear gearbox
with exchange gear stage | (3) Angular gearbox |
| (2) Universal joint shaft with overload clutch | (4) Trailing roller |

4.2 Safety and protective equipment

Fig. 8/...

Universal joint shaft guard

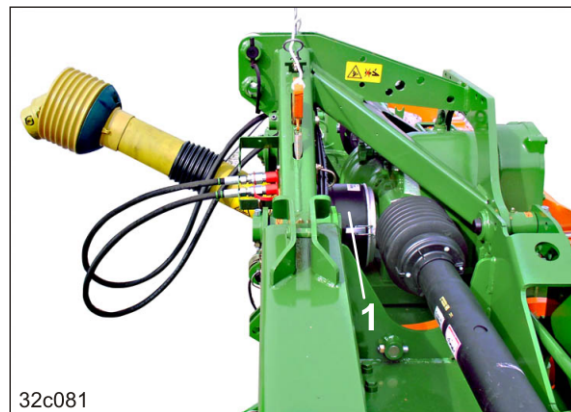


Fig. 8

Fig. 9/...

- (1) Tool guard plate
- (2) Levelling board
- (3) Side panel
- (4) Roller, trailing

The above-mentioned components serve as tool protection; use of the implement without these components is not permitted.

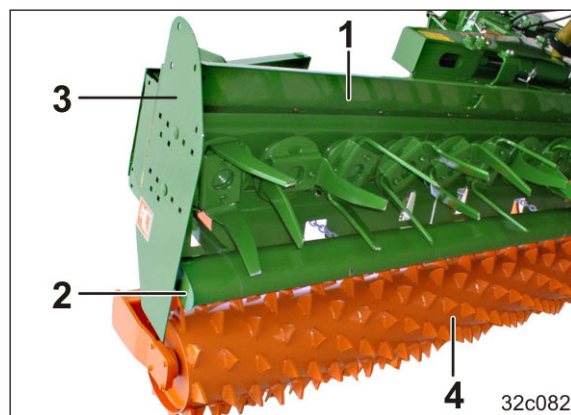


Fig. 9

Fig. 9/...

- (1) Mechanical transport locking mechanism



Fig. 10

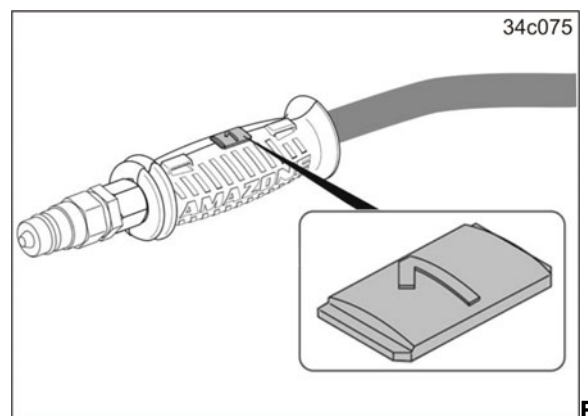
4.3 Overview – Supply lines between the tractor and the implement

Power supply cable

Designation	Function
Plug (7-pin)	Road traffic lighting system (optional)
Plug for tractor socket	Oil cooler fan (optional)

Hydraulic hose lines

All hydraulic hose lines have handles with coloured markings and a code number or code letter to assign the respective hydraulic function to the pressure line of a tractor control unit!



ig. 11

The function of the tractor control unit is represented symbolically:




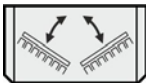








Latched, for a permanent oil circulation



When the button is pressed, as long as the function is active



Float position, free oil flow in the control unit

Hydraulic hose		Implement functions		Note	Tractor control unit	
Marking					Function / Designation	
Green		Implement booms 	Unfolding		Double acting	
			Fold in			
Yellow		Track markers (optional, on the seed drill)	Unfolding		Double acting	
			Folding			
Blue		Working depth (optional)	Shallower		Double acting	
			Deeper			

4.4 Transportation equipment

Fig. 12/...

- (1) 2 rear-facing turn indicators
- (2) 2 reflectors, yellow.
- (3) 2 brake and rear lights
- (4) 2 red reflectors
- (5) 2 rear-facing warning signs
- (6) 2 side-facing warning signs (not permitted in Germany)

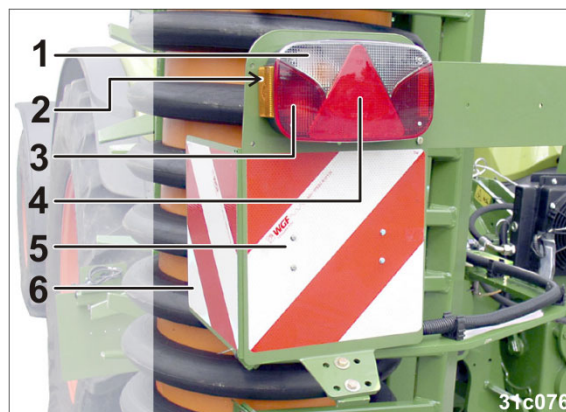


Fig. 12

Fig. 13/...

- (1) 2 forwards-facing warning signs
- (2) 2 forwards-facing limiting lights
- (3) 2 forwards-facing turn indicators



Fig. 13

4.5 Proper use

The soil tillage implement

- has been designed for conventional soil tillage on agricultural crop lands.
- is coupled to the tractor using the tractor three-point hitch attachment and is controlled by an operator.
- may be used only with the levelling board fitted and the trailing roller in place.
This also applies if the soil tillage implement is part of a seeding combination.

Slopes can be travelled

- Along the contours

Direction of travel to left	20 %
Direction of travel to right	20 %
- Along the gradient

Up the slope	20 %
Down the slope	20 %

"Intended use" also covers:

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

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

For any damage resulting from improper use

- the operator bears the sole responsibility.
- AMAZONEN-WERKE accepts no liability.

4.6 Danger areas and danger points

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

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

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

No-one may stand in the implement danger area:

- as long as the tractor engine is running with the universal joint shaft/hydraulic system connected.
- as long as the tractor and implement are not protected against unintentional start-up and running.

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

Danger points exist:

- between the tractor and the implement, particularly during coupling and uncoupling operations.
- in the area of moving parts.
- by climbing onto the implement.
- underneath raised, unsecured implements or parts of implements.

4.7 Rating plate and CE marking

Machine rating plate

The following information is specified on the rating plate and the CE mark:

- (1) Implement number
- (2) Vehicle identification number
- (3) Product
- (4) Permissible technical implement weight
- (5) Model year
- (6) Year of manufacture



Fig. 14

4.8 Noise production data

The workplace-related emission value (acoustic pressure level) is 72 dB(A), measured in operating condition at the ear of the tractor driver with the cabin closed.

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.

4.9 Technical data

Rotary cultivator		KG 4001-2	KG 5001-2	KG 6001-2
Working width	[m]	4.00	5.00	6.00
Transport width	[m]	3.00	3.00	3.00
Attachment category		Cat. 3 / Cat. 4N	Cat. 3 / Cat. 4N	Cat. 3 / Cat. 4N
Number of rotors		14	16	20
Tool tines		Grip Super	Grip Super	Grip Super
Length of the tool tines	[cm]	30	30	30
Working depth, max.	[cm]	20	20	20

4.9.1 Data for the calculation of tractor weights and tractor axle loads

Rotary cultivator			KG 4001-2	KG 5001-2	KG 6001-2
Basic weight		KG	2345	2620	2855
Roller	SW 520	KG	340	420	500
	PW 500	KG	548	654	752
	PW 600	KG	—	—	1214
	KW 580	KG	—	—	1100
	CDW 550	KG	—	—	1422
Carrying arms	SW 520	KG	136	136	136
	PW 500	KG	136	136	136
	PW 600	KG	—	—	64
	KW 580	KG	—	—	64
	CDW 550	KG	—	—	74
Total weight G_H: KG-2 + roller + carrying arms		KG			
Distance d		[m]	0.89	0.89	0.89

4.10 Necessary tractor equipment

For the implement to be operated as intended, the tractor must fulfil the following requirements:

Implement type	Tractor engine power
KG 4001-2:	from 88 kW (120 bhp) upwards
KG 5001-2:	from 110 kW (150 bhp) upwards
KG 6001-2:	from 132 kW (180 bhp) upwards

Electrical equipment	Battery voltage	12 V (volts)
	Lighting socket	7-pin (optional)
Hydraulic system	Tractor control units	see section 4.3, Seite 39
	Maximum approved operating pressure	210 bar
	Tractor pump capacity	At least 80 l/min at 150 bar
	Hydraulic oil for supplying the implement	Transmission fluid/hydraulic fluid Otto SAE 80W API GL4 The implement hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.
Tractor PTO shaft connection	Speed (optionally)	1000 rpm, 750 rpm or 540 rpm
	Direction of rotation (as seen in the direction of travel)	Clockwise

4.11 Gearbox – Transmission fluids and filling quantities

Gear oil

- for two-gear gearboxes
- for angular gearboxes

Manufacturer	Transmission fluid (synthetic oil)	Manufacturer	Transmission fluid (synthetic oil)
Mobile	Glygoyle 30 SNR 130563	Castrol	Tribol 800 / 220
Mobile	Glygoyle HE 220	Fuchs	RENOLIN PG 220
ARAL	DEGOL GS 220	Fuchs Lubritech	GEARMASTER PGP 220
BP	Enersyn SG-XP 220	Klüber	Klübersynth GH 6-220
Castrol	Alphasyn PG 220	OMV	OMV gear PG 220
Castrol	Optiflex A 220		

Fig. 15



The gearbox is filled with Mobil Glygoyle 30 SNR 130563 synthetic oil at the factory.

- All transmission fluid types listed in the table (Fig. 15) can be used instead of Glygoyle 30 transmission fluid.
Important! If oil types are mixed, warranty claims cannot be accepted.
- Add new, clean transmission fluid only.
- Do not use any other gear oil varieties than those listed in the table (Fig. 15).

Filling quantities

Gearbox	Filling quantity
Two-gear gearbox	10.8 litres (without oil cooler)
	12.3 litres (with oil cooler)
Angular gearbox	6.0 litres

4.12 Spur gear trough – oils and filling quantities

Spur gear trough gear oil

Spur gear trough gear oil:	Gear oil CLP/CKC 460 DIN 51517, Part 3 / ISO 12925
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Oils that comply with this standard can be topped up or used to replace the existing oil in the spur gear trough. Only fill with new and clean gear oil.

The following table lists several gear oil types that comply with the standard. The spur gear trough is filled with gear oil Wintershall ERSOLAN 460 in the factory.

Manufacturer	Description
Wintershall	ERSOLAN 460
Agip	Blasia 460
ARAL	Degol BG 460
Autol	Precis GEP 460
Avia	Avilub RSX 460
BP	Energol GR-XP 460
Castrol	Alpha SP 460
DEA	Falcon CLP 460
ESSO	Spartan EP 460
FINA	Giran 460
Fuchs	Renep Compound 110
Mobil	Mobilgear 600 XP 460
Shell	Omala 460
OMV	OMV Gear HST 460

Spur gear trough filling quantities

Implement type	Total filling quantity (2 spur gear troughs)
KG 4001-2	36 litres
KG 5001-2	42 litres
KG 6001-2	50 litres

5 Layout and function

The implement is used on agricultural land for tilling the soil

- As a stand-alone machine with trailing roller
- As part of a cultivation combination (Avant) with trailing roller and
 - mounted seeding rail (PSKW or PSPW)
 - front tank (FRS or FPS).

For road transport, the rotary cultivator is folded up to a transport width of 3.0 m.



Fig. 16

KG rotary cultivator have tool tines in the forward position

- For seedbed preparation
 - Without pre-tilling (mulch seeding).
Straw and other organic matter is mulched close to the surface.
 - After chisel cultivators or deep looseners
 - After the plough
- For stubble cultivation
 - For ploughing up grassland.

On-grip tines in the forward position have a sifting effect:

- Coarse particles of soil are transported further than fine particles of soil.
- The fine earth is concentrated in the lower area of the tilled zone; the large particles of soil remain at the surface and protect against capping.

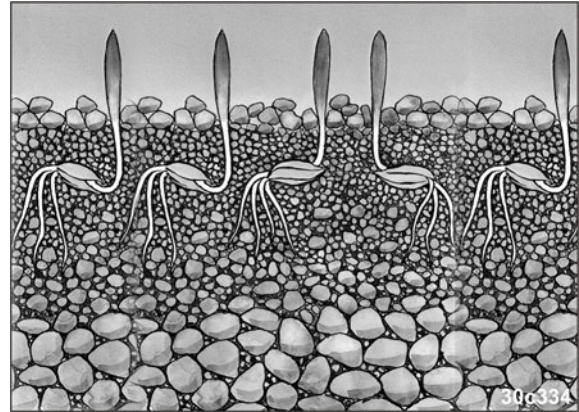


Fig. 17

5.1 Threaded cartridge

The threaded cartridge (**Fig. 18/1**) contains

- the operating manual,
- the ratchet to operate the levelling board.



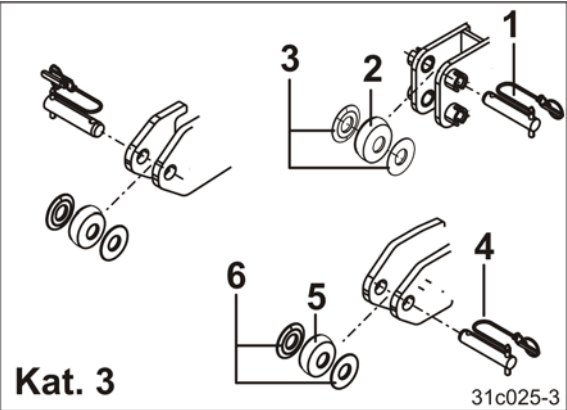
Fig. 18

5.2 Attachment category



The ball sleeves are tractor accessories.

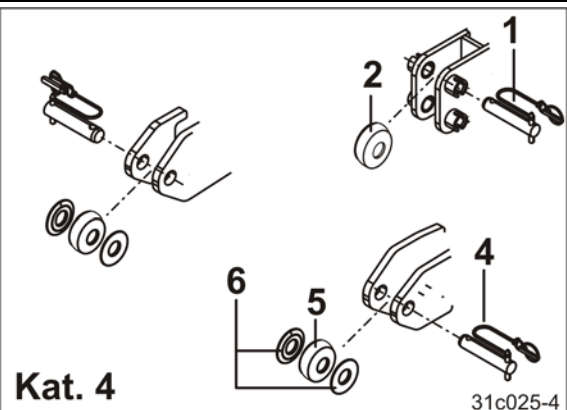
5.2.1 Coupling elements, tractor mount Cat. 3

Fig. 19/...	Designation	 <p>Kat. 3</p> <p>Fig. 19</p>
1	Upper link pin dia. 31.7 mm	
2	Upper link ball sleeve Cat. 3 (tractor accessory)	
3	Washer Cat. 3 (6.5 mm thick)	
4	Lower link pin dia. 36.6 mm	
5	Lower link ball sleeve Cat. 3 (tractor accessory)	
6	Washer Cat. 3 (13.5 mm thick)	

5.2.2 Coupling elements, attachment category Cat. 4N



The ball sleeves can only be used with Cat. 3 pins!

Fig. 20/...	Designation	 <p>Kat. 4</p> <p>Fig. 20</p>
1	Upper link pin dia. 31.7 mm	
2	Upper link ball sleeve Cat. 4 (tractor accessory)	
4	Lower link pin dia. 36.6 mm	
5	Lower link ball sleeve Cat. 4 (tractor accessory)	
6	Washer Cat. 4 (6.5 mm thick)	

5.2.3 Adapter frame Cat. 5 (optional)

The adapter frame enables use on the K 700. A special universal joint shaft is required for the drive.

Fig. 21/...

1. Adapter frame Cat. 5

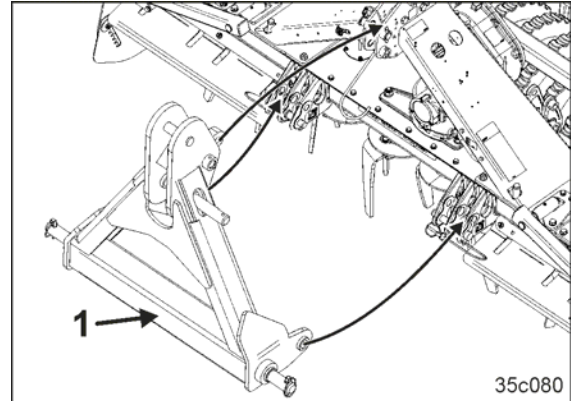


Fig. 21

5.3 Three-point extension frame (optional)

The three-point extension frame (Fig. 22/1) is used to:

- Increase the distance between the tractor and the implement.
- Secure the wheel mark eradicators.

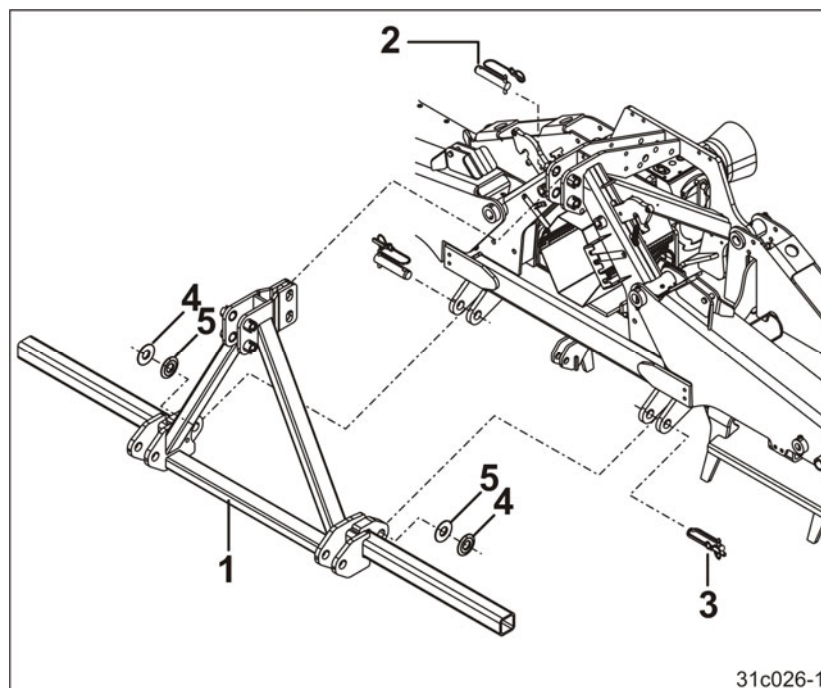


Fig. 22

Three-point extension for rotary cultivators				
Fig. 22/...	Designation	Diameter [mm]	Attachment category	Pieces
1	Upper link extension	—	—	1
2	Upper link pin	Ø 31.7	Cat. 3	1
3	Lower link pin	Ø 36.6	Cat. 3	2
4	Spacer discs	Ø 90 mm x 6.5 mm	—	2
5	Spacer discs	Ø 100 mm x 13.5 mm	—	2



The three-point extension frame has the same mount categories as the rotary cultivator.

5.4 Tractor wheel mark eradicator (optional)

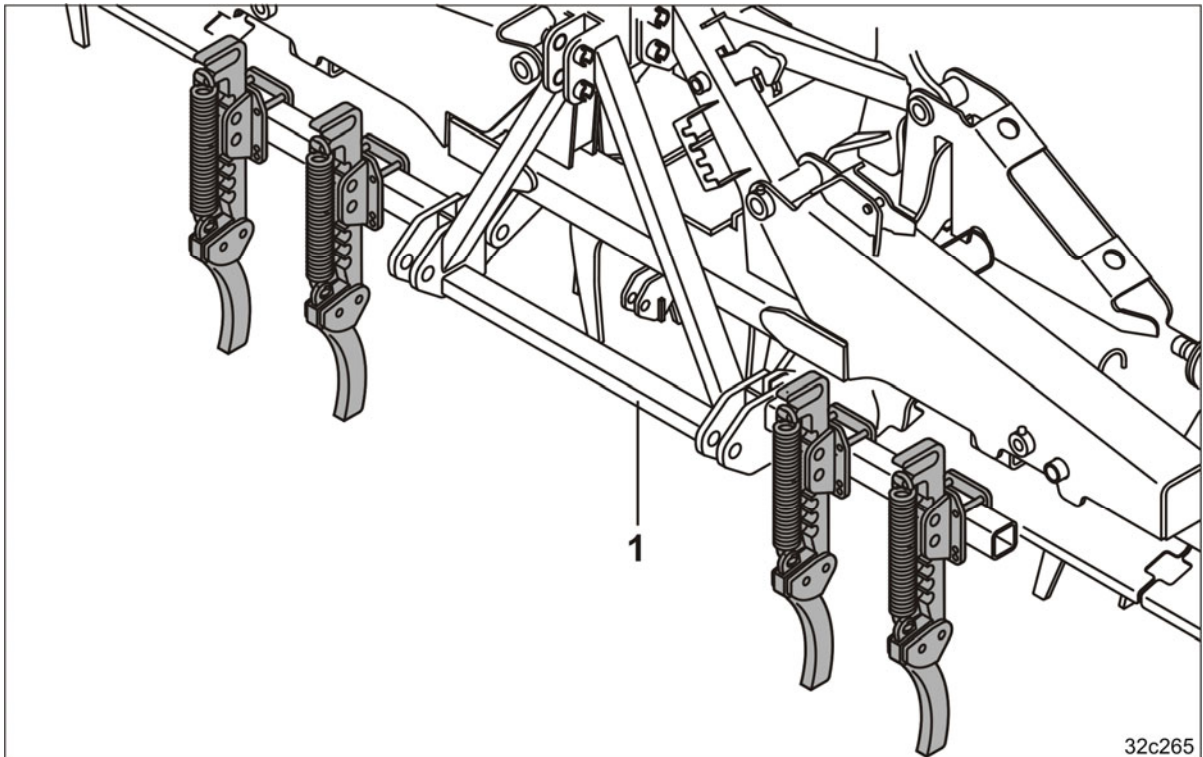


Fig. 23

The tractor wheels can leave deep tracks on the field.

The three-point extension frame (Fig. 23/1) serves to secure the horizontally and vertically adjustable tractor wheel mark eradicator.

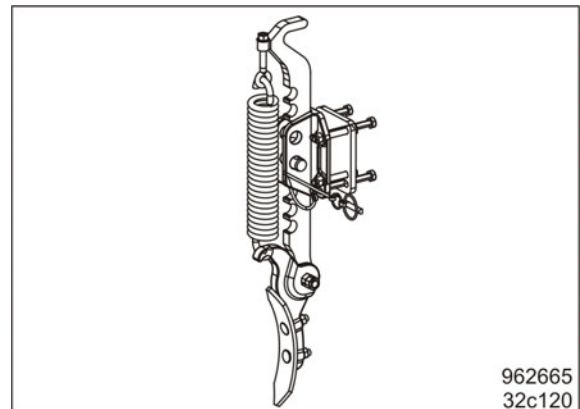


Fig. 24

The soil tillage implement can be used with a shallower working depth if the deep tracks are eliminated by the wheel mark eradicators.

- Wheel mark eradicator, spring suspended (Fig. 24)
- Wheel mark eradicator, rigid (Fig. 25)

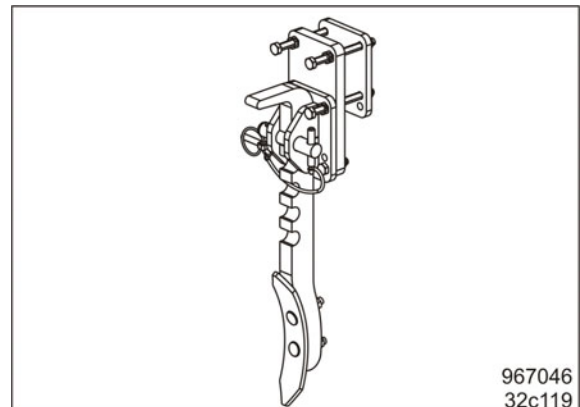


Fig. 25

5.5 Rollers

The rollers serve to

- support the soil tillage implement and maintain the working depth.
- protect the rotating tools.

Only use the rotary cultivator with the rollers specified in the section "Technical Data".

Soil tillage implement	KG 4001-2	KG 5001-2	KG 6001-2
Cage roller	2x SW 2000-520	2x SW 2500-520	2x SW 3000-520
Tooth packer roller	2x PW 2000-500	2x PW 2500-500	2x PW 3000-500
	—	—	2x PW 3000-600
Wedge ring roller Row spacing 12.5 cm	2x KW 2000-580/125	2x KW 2500-580/125	2x KW 3000-580/125
Wedge ring roller Row spacing 16.6 cm	—	—	2x KW 3000-580/166
Cracker disc roller	—	—	CDW 6000-2-550

5.5.1 Cage roller SW

- SW520
- The cage roller can be used where lighter reconsolidation of the soil is required.
- Disposes of a very good self-propulsion.

Field of application

The SW cage roller is used on light soils

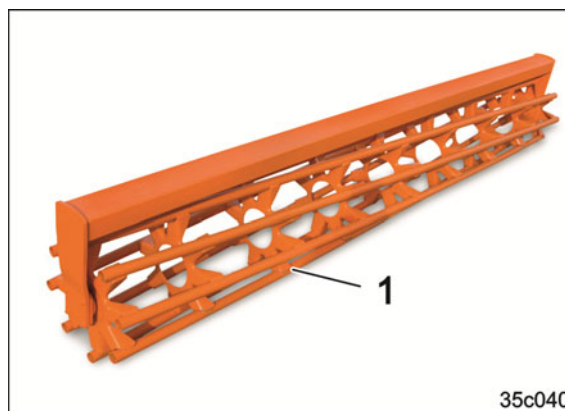


Fig. 26

5.5.2 Tooth packer roller PW

- PW500
- PW600

Field of application

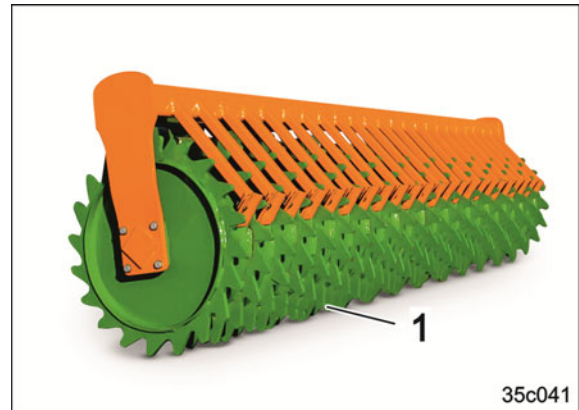
Use the tooth packer roller PW on light to heavy soils.

Mode of operation

The tooth packer roller compacts the soil uniformly over the entire working width.

Cleaning

Adjustable, carbide-coated scrapers clean the roller.



35c041

Fig. 27

5.5.3 Wedge ring roller KW

- KW580

Field of application

Use the wedge ring roller KW on medium to heavy soils.

Mode of operation

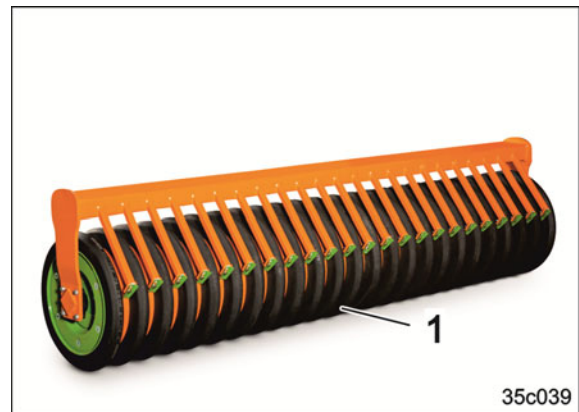
The wedge rings compact the soil in strips.

In combination with a seeding rail, the seed is embedded in the compacted soil. Good soil coverage means that more humidity is available for germination.

The loose soil between the wedge rings is used to close the furrows.

Cleaning

Adjustable, carbide-coated scrapers clean the roller.



35c039

Fig. 28

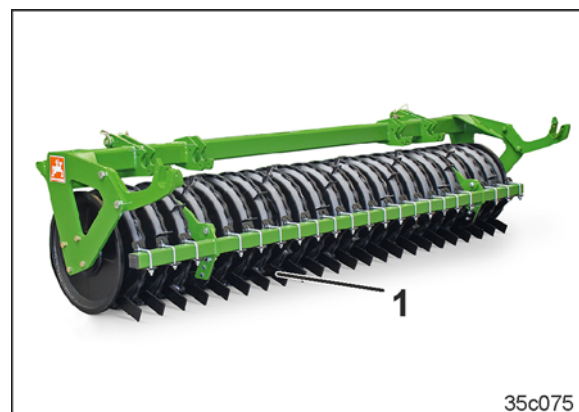
5.5.4 CDW cracker disc roller

Field of application

The CDW cracker disc roller is used on medium to heavy soils.

Mode of operation

The steel packer rings of the cracker disc roller (Fig. 29/1) consolidate the soil in strips. In combination with a seed drill, the seed is embedded in the compacted soil. The integrated cross bars of the steel packer rings provide additional traction for the roller. The cracker disc roller has a spring-suspended cutting rail.



35c075

Fig. 29

Layout and function

Two adjuster segments (Fig. 30/3) with integrated springs are used to adjust the cutting rail (Fig. 30/4). During operation, the blades can avoid obstacles in the soil by deflecting upwards.

Upon delivery, the cutting rail is adjusted such that the ends of the blades are flush with the edges of the roller.

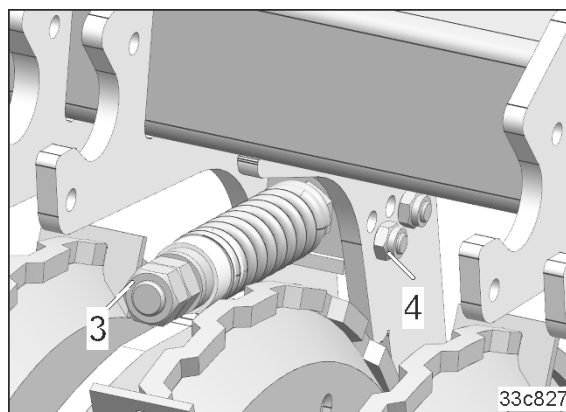


Fig. 30

5.6 Drive

The universal joint shaft (Fig. 31/1) transmits the drive force of the tractor PTO shaft to the two-gear gearbox (Fig. 31/2).

Two angular gearboxes (Fig. 31/3) drive the tool carriers. Each angular gearbox is connected via a universal joint shaft (Fig. 31/4) to the gearbox.

If the implement encounters a fixed obstacle, the tool carriers may come to a stop. To prevent damage to the gearbox, the implement is equipped with two ratchet clutches.

The ratchet clutches are fitted on the input shafts of the angular gearbox under the all-round protective cover (Fig. 31/5).

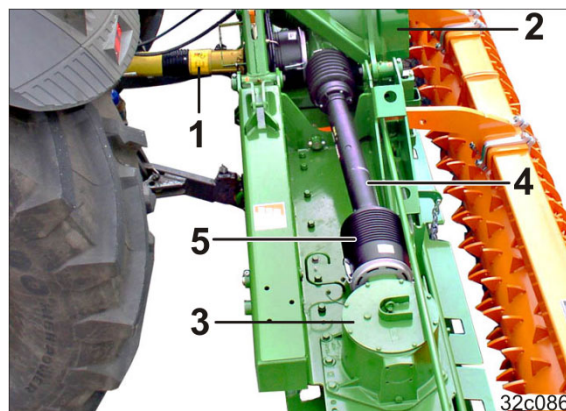


Fig. 31

5.6.1 Gearbox/tractor PTO shaft speed/tine speed

Different soils require that the tine speed be adjusted in order to attain the desired fine seedbed. The implement gearbox makes this adjustment possible.

Never select a higher tine speed than is absolutely necessary. If the tine speed is increased, the power requirement and tine wear increase disproportionately.

Selecting the right tine speed lowers wear costs and increases area efficiency.

Always set the tractor PTO shaft speed to 1000 rpm. Lower tractor PTO shaft speeds lead to higher torques at the universal joint shaft and can cause rapid wear of the overload clutch.

5.7 Two-gear gearbox

The tine speed can be adjusted by

- switching the gears with the gear lever (Fig. 32/1) in the two-gear gearbox
- switching the gear wheels in the two-gear gearbox

The table (below) shows the tine speeds and gear wheel pairings and gear lever positions.

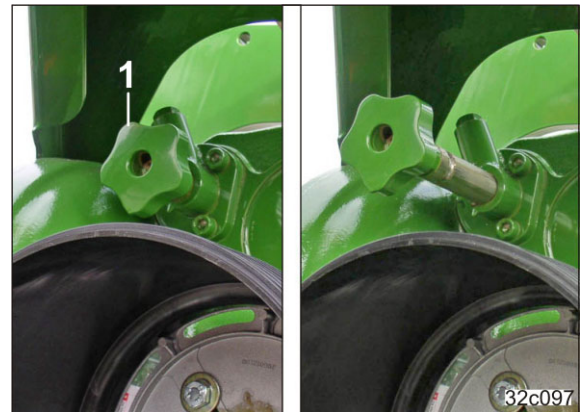


Fig. 32

Speed table

Two-gear gearbox

1: Gear wheel pairing

The gearbox is fitted with the following as standard

Gear wheel A: 23 teeth

Gear wheel B: 24 teeth

2: Gearbox shift position

3: Tine speed [rpm] at

Tractor PTO shaft speed 1000 rpm

Tractor PTO shaft speed 750 rpm

Tractor PTO shaft speed 540 rpm

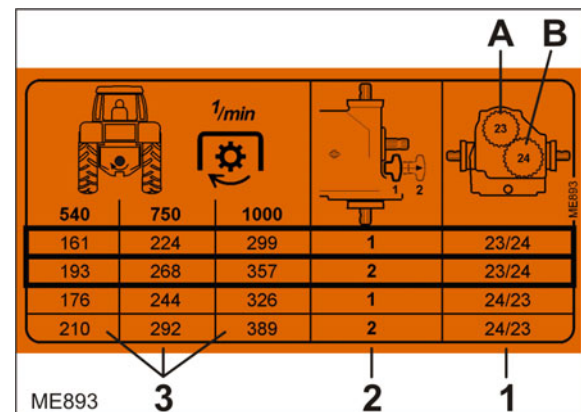
Example:

Gear wheel pairing A/B:23/24

Gearbox shift position: 1

Tractor PTO shaft speed:1000 rpm

Tine speed:299 rpm



540	750	1000	1/min	A	B
161	224	299	1	23	24
193	268	357	2	24	23
176	244	326	1	23	24
210	292	389	2	24	23

ME893

Fig. 33

5.8 Oil cooler (optional)

The oil cooler (Fig. 34/1) cools the transmission fluid.

The transmission fluid flows through an oil filter (Fig. 34/2).

The fan in the oil cooler is connected to the tractor socket. Every 20 minutes, the fan changes its direction of rotation for approx. 40 seconds. This eliminates any dirt from the radiator fins.

The gear shaft drives the oil pump (Fig. 35/2).

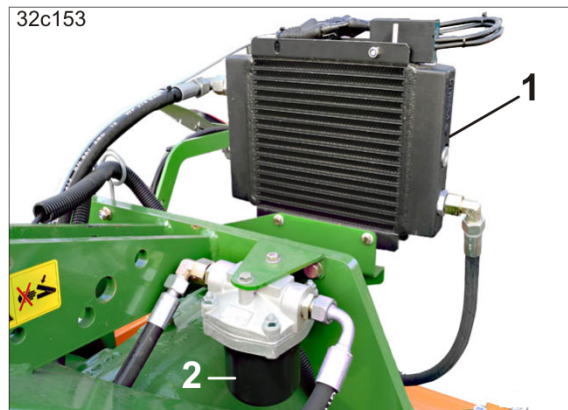


Fig. 34

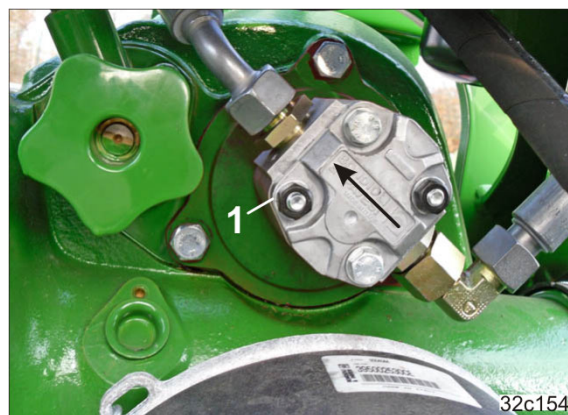


Fig. 35

5.9 Universal joint shafts

The drive force of the tractor PTO shaft is transmitted via the universal joint shaft to the implement gearbox. The universal joint shaft type depends on the implement type.

Soil tillage implement	Universal joint shaft	Number
Rotary cultivator KG 4000-2 KG 5000-2 KG 6000-2	Bondioli & Pavesi GW W30/30-SFT-SH 1 3/8 inch, 6-part (tractor side), 810 mm	EJ611
	Bondioli & Pavesi GW W30/30-SFT-SH 1 3/8 inch, 21-part (tractor side), 810 mm	EJ613
	Bondioli & Pavesi GW W30/30-SFT-SH 1 3/4 inch, 6-part (tractor side), 810 mm	EJ614
	Bondioli & Pavesi GW W30/30-SFT-SH 1 3/4 inch, 20-part (tractor side), 810 mm	EJ615
<ul style="list-style-type: none"> Solo operation with 3-point extension frame 	Bondioli & Pavesi GW W30/30-SFT-SH 1 3/4 inch, 6-part (tractor side), 1010 mm	EJ616
	Bondioli & Pavesi GW W30/30-SFT-SH 1 3/4 inch, 20-part (tractor side), 1010 mm	EJ617

5.10 Electronic drive monitor (optional)

If the implement encounters a fixed obstacle, the tool carriers may come to a stop.

Overload clutches on the input shafts of the angular gearboxes prevent damage to the gearboxes.

If the tool carriers come to a stop, the on-board computer issues an alarm via

- a notification on the display screen
- an acoustic signal.

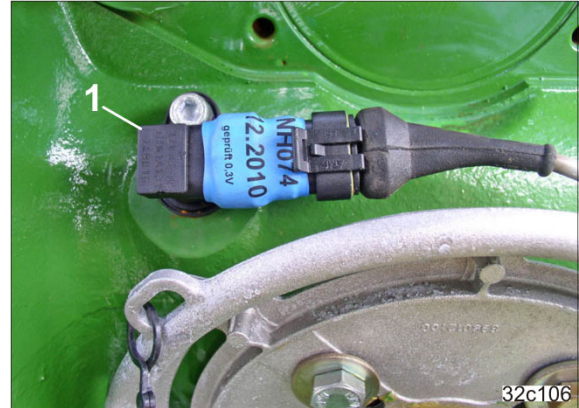


Fig. 36

The gearbox stop is detected by sensors mounted on the gearbox

- on the two-gear gearbox (Fig. 36)
- on the two angular gearboxes (Fig. 37).



Fig. 37

Layout and function

The electronic drive monitor is connected to the on-board computer.

Solo operation:

- AMALOG+



Fig. 38

Solo operation:

- AMADRILL+

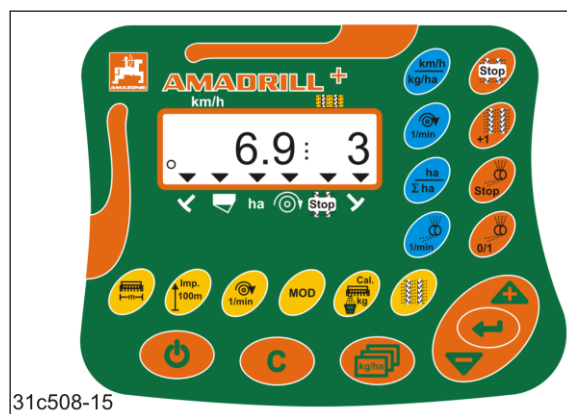


Fig. 39

Seeding combination operation:

- AMATRON+

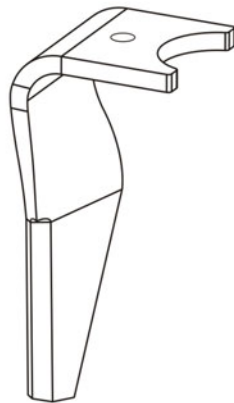


Fig. 40

5.11 Tool tines

Soil tillage implement		Tool tines	Length of the tool tines
Rotary cultivator	KG 4000-2 KG 5000-2 KG 6000-2	KG grip/drag	33 cm
		KG grip Super	33 cm
		KG grip Special HD	33 cm
		Potato tines	40 cm

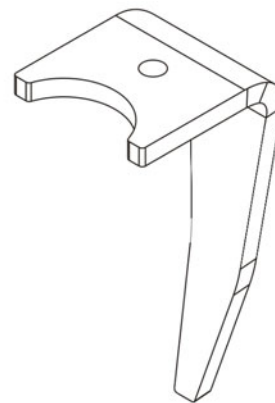
**Tool tines
KG drag (anticlockwise)**



962338
31c208-1

Fig. 41

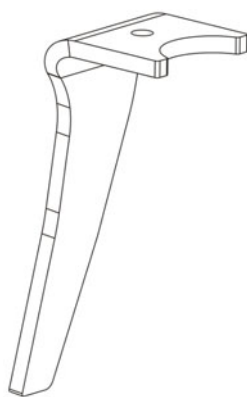
**Tool tines
KG grip Special (HD) (anticlockwise)**



967496
31c210-1

Fig. 42

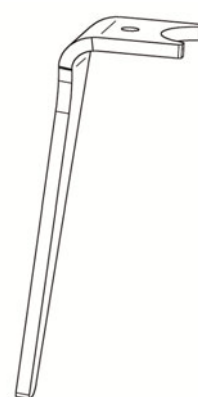
**Tool tines
KG grip Super (anticlockwise)**



967496
31c209-1

Fig. 43

**Tool tines
Potato tines (anticlockwise)**



35c043

Fig. 44

5.11.1 Tool tine minimum length

The tool tines are subject to wear. Replace the tines

- once they reach the minimum length $L = 150 \text{ mm}$.
- before they reach the minimum length when working at great working depths, in order to prevent damage/wear to the tool carriers.

If the tines fall below the minimum length prescribed by the manufacturer, claims due to rock damage shall not be accepted.

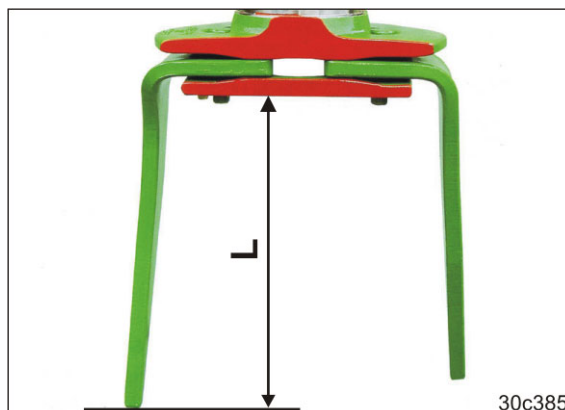


Fig. 45

5.11.2 Stone release

The tool tines (Fig. 46/1) are fastened to the sockets (Fig. 46/2) of the tool carriers.

The sockets are shaped in such a way that the tool tines have a spring action and can avoid rocks and other obstacles.

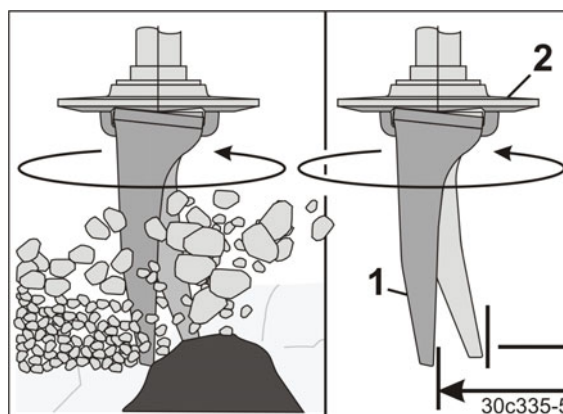


Fig. 46

5.12 Working depth of the soil tillage implement

The soil tillage implement is supported by the roller. This ensures that the working depth is precisely maintained.

5.12.1 Mechanical adjustment of the working depth

The working depth is adjusted by relocating the depth setting pin (Fig. 47/2) in the adjuster segment.

The rotary cultivator is equipped with 4 adjuster segments. Two adjuster segments in the outer section (Fig. 47/1) and two adjuster segments (Fig. 48) in the centre of the implement.

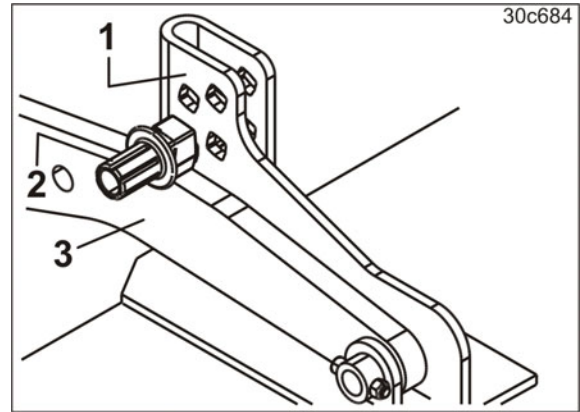


Fig. 47

In the centre of the implement, the eccentric pin (Fig. 48/1) is fastened to an operating rod.

During adjustment tasks in the centre of the implement, the operator stands next to the implement.

Always secure the operating rod with a linch pin (Fig. 48/2).

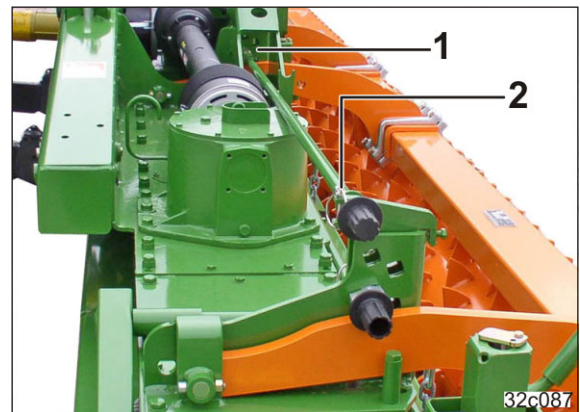


Fig. 48

5.12.2 Hydraulic adjustment of the working depth (optional)

The rotary cultivator is supported on the roller by the carrying arms and maintains a constant working depth.

Two hydraulic cylinders (Fig. 49/1) are connected to the tractor control unit (*blue*) for adjusting the working depth. The scale (Fig. 49/3) displays the set working depth.

The working depth (Fig. 49/2) can be adjusted hydraulically during operation.

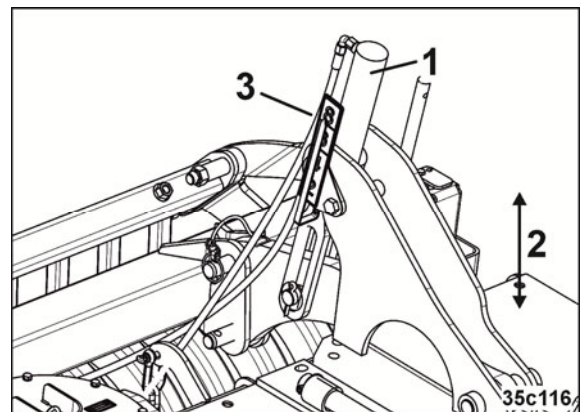


Fig. 49

5.13 Side panel

The side panel (Fig. 50/1) ensures that the tilled soil is guided in front of the roller and not thrown to the side.

The swivelling side panel moves over obstacles.

The dead weight of the side panel and a tension spring (Fig. 50/2) bring the side panel back to the working position.

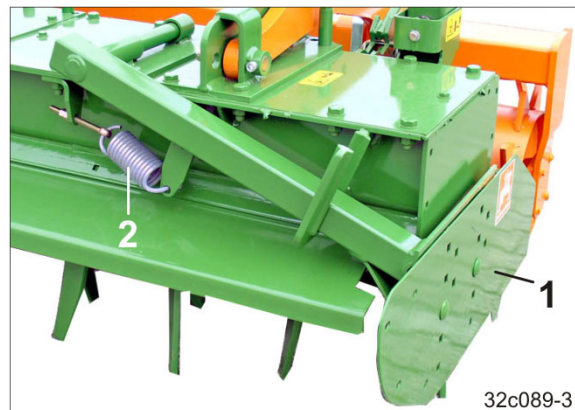


Fig. 50

5.13.1 Soil guiding angle bracket (optional)

Free-flowing soil can escape between the side panel and the roller, even when adjusted correctly. The soil guiding angle bracket (optional, Fig. 51/1) prevents the soil from escaping.

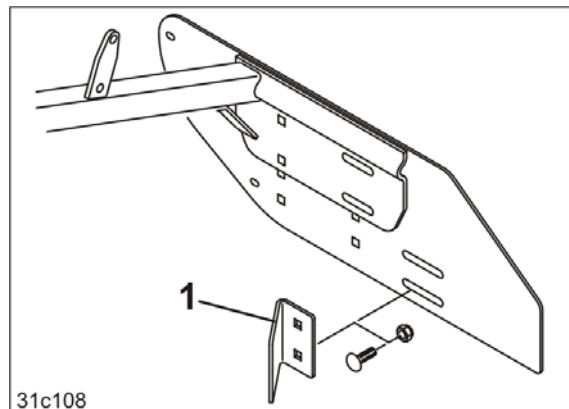


Fig. 51

5.14 Levelling board

The levelling board (Fig. 52/1)

- eliminates any ground undulations behind the implement.
- pulverises remaining clods on heavy soil.
- compacts loose soil.

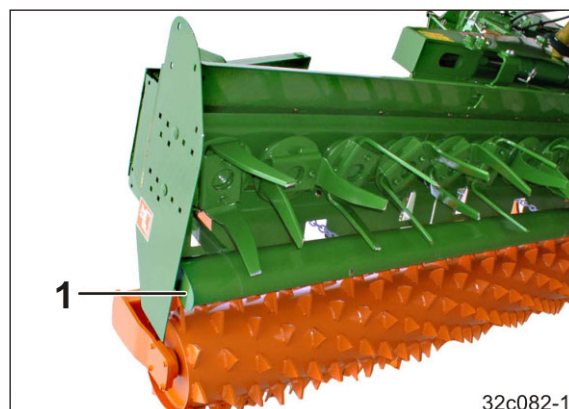


Fig. 52

The working height of the levelling board is adjustable. The adjustments must be made evenly across the entire working width.

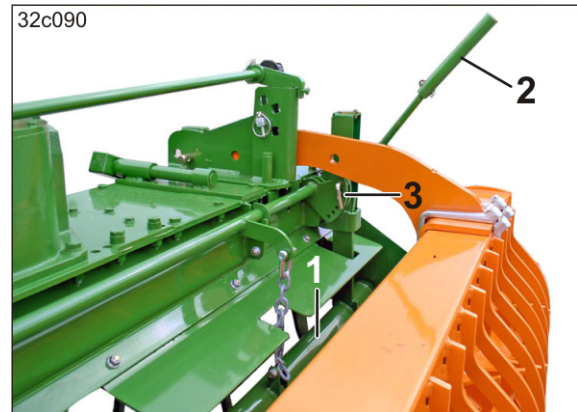


Fig. 53

5.15 Centre line eradicator (optional)

For design reasons, the tracks of the tines do not intersect in the centre of the implement. A raised centre line can remain there. This is remedied by the centre line eradicator (Fig. 54/1).

If the centre line eradicator is not required, detach the cultivator from the tractor and remove the centre line eradicator.

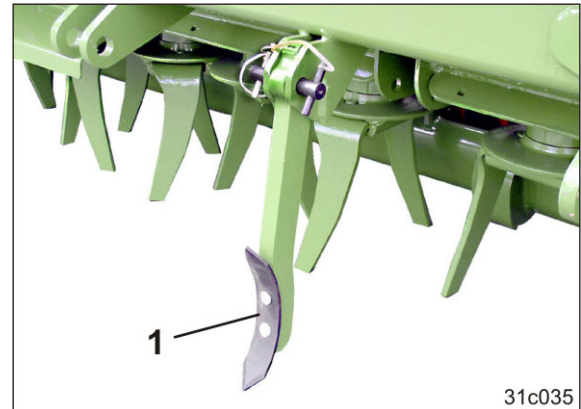


Fig. 54

5.16 Track markers (optional)

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

Here, the active track marker (Fig. 55/1) creates a mark. This mark serves the tractor driver as an orientation aid.

The tractor driver drives over the centre of the mark. The track markers are attached to the cultivator.

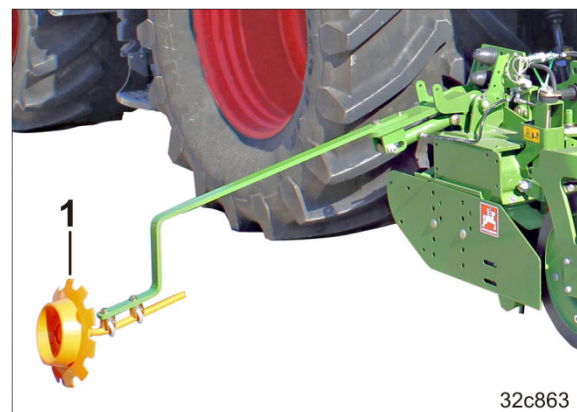


Fig. 55

Layout and function

Both track markers (Fig. 56/1) must be raised when turning at the end of the field.

Both track markers (Fig. 56/1) must be raised for transporting the implement. The track markers are hydraulically locked.

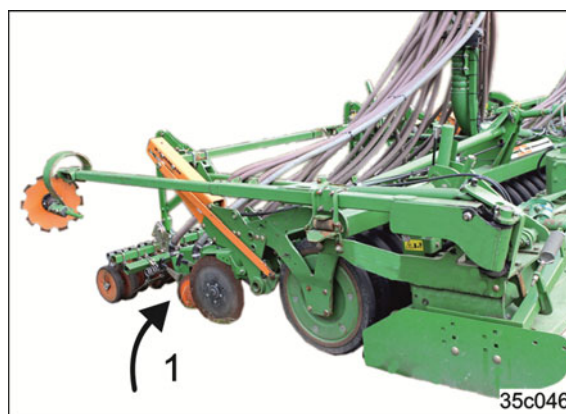


Fig. 56

5.17 Combination possibilities with other implements



Fig. 57

The cultivator can be combined with a pneumatic mounted seeding rail and a front tank (Fig. 57). How to connect the seeding combinations is described in the operating manual provided.

6 Initial commissioning

This section contains information

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



DANGER

Risk of crushing, cutting, being caught or drawn in and knocks!

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



- Before operating the implement for the first time the operator must have read and understood the operating manual.
- Follow the instructions given in the section "Safety information for the operator" when
 - Coupling and uncoupling the implement
 - Implement transportation
 - Use of the implement
- Only couple and transport the implement to/with a tractor which is suitable for the task.
- The tractor and implement must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.



DANGER

Risk 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 the appropriate control is released. This does not apply to equipment movements that:

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

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 hook up the implement.
You may only connect the implement to tractors suitable for the purpose.
- Carry out a brake test to check whether the tractor achieves the required braking delay with the implement connected.

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

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

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

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

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

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



This notice applies only to Germany:

If, having tried all possible alternatives, it is not possible to comply with the axle loads and/or the permissible total weight, then a survey by an officially recognised motor traffic expert can, with the approval of the tractor manufacturer, be used as a basis for the responsible authority to issue an exceptional approval according to § 70 of the German Regulations Authorising the Use of Vehicles for Road Traffic and the required approval according to § 29, paragraph 3 of the German Road Traffic Regulations.

6.1.1.1 Data required for the calculation (attached implement)

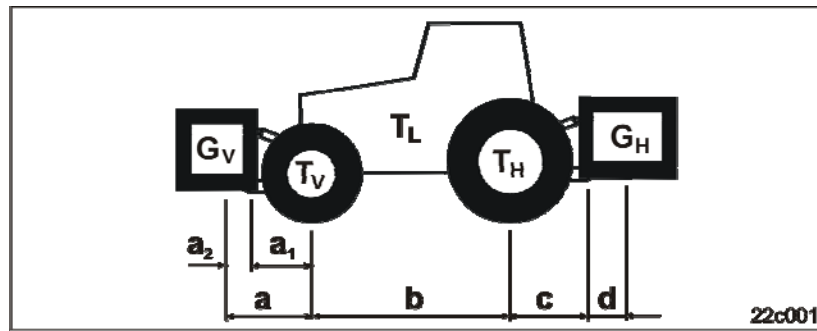


Fig. 58

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

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 following table.

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 following table.

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

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

Enter the numeric value for the calculated actual total weight and the approved total tractor weight specified in the tractor operating manual in the following table.

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 following table.

6.1.1.6 Tractor tyre load capacity

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

6.1.1.7 Table

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



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



WARNING

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

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

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



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

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



WARNING

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

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

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

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

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

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

→ This is how to prevent unintentional falling:

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

6.3 Attachment of the wheel mark eradicators

1. Mount the wheel mark eradicators (optional).
 - 1.1 Screw the wheel mark eradicator (Fig. 59/1) to the three-point extension frame using the clamping plate (Fig. 59/2).
 - 1.2 Pin the wheel mark eradicators right at the top with the positioning bolts (Fig. 59/3). The working depth is adjusted on the field.
 - 1.3 Secure the positioning bolt with a linch pin.

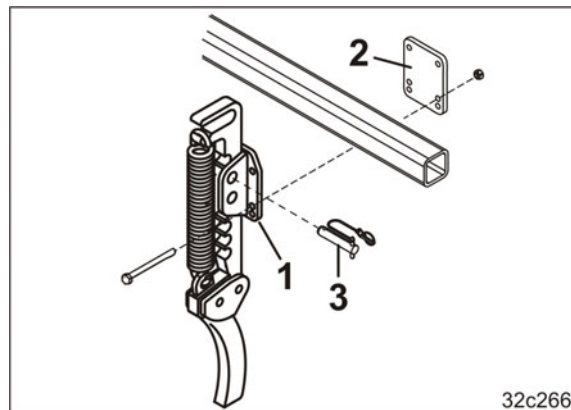


Fig. 59

6.4 Attaching the rollers (specialist workshop)



WARNING

Secure the roller against rolling away.

The pictogram (Fig. 61/1) shows the correct mounting of the clamps (Fig. 61/2).

1. Couple the implement to the tractor.
2. Raise the roller using a crane.
3. Carefully reverse the cultivator up to the roller.

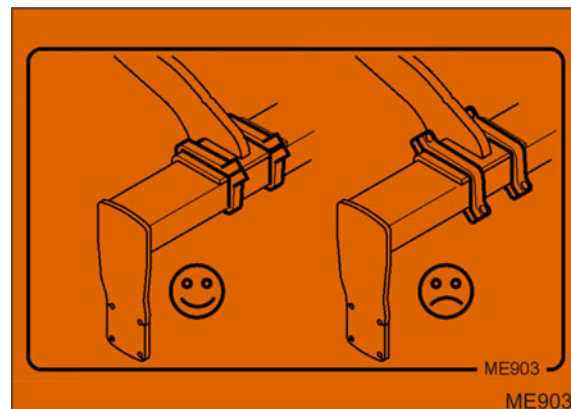


Fig. 60

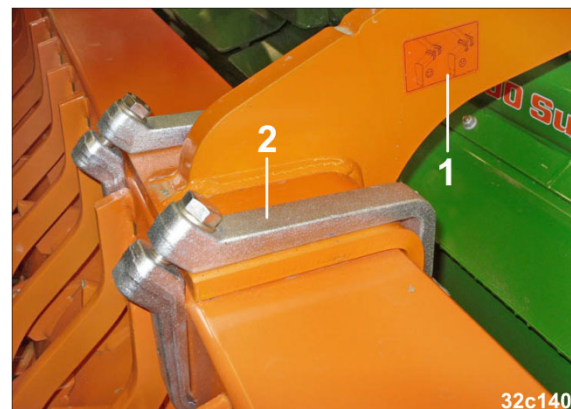


Fig. 61

4. Attach the roller carrying arm (Fig. 63/1) to the adjuster segment (Fig. 63/2) with a pin (Fig. 63/3). Secure the pin with a screw and nut (Fig. 63/4).
5. Plug the depth setting pin (Fig. 63/5) into the closest possible hole above the carrying arm and secure the depth setting pin using a linch pin (Fig. 63/6).
6. Fasten the second carrying arm to the second adjuster segment as described above.
7. Fasten the second roller to the cultivator as described.



Fig. 62

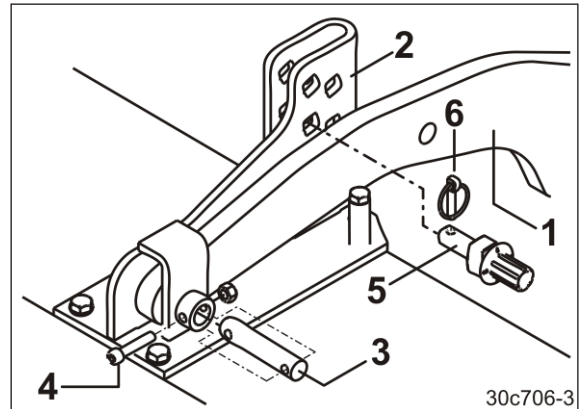


Fig. 63



Fixing the carrying arm as shown here is not permitted.

The holes in the adjuster segment are used only to fix the roller for transport on a freight vehicle, when delivering the implement ex works.

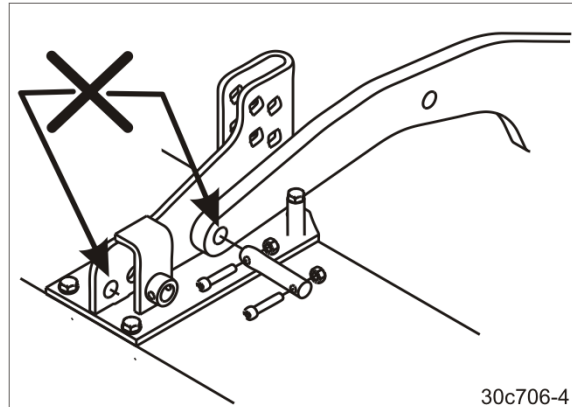


Fig. 64



Set the working depth of the tool tines on the field.

6.4.1 Adjusting the length of the universal joint shaft to the tractor (specialist workshop)



WARNING

Only a specialist workshop may make structural changes to the universal joint shaft.



WARNING

Danger of crushing from unintentional

- **Rolling of the tractor and the coupled implement!**
- **Lowering of the lifted implement!**

Secure the tractor and implement from unintentional starting and unintentional rolling and secure the implement from unintentional lowering before entering the danger zone between the tractor and lifted implement in order to adjust the universal joint shaft.

1. Couple the soil tillage implement to the tractor.
2. Secure the tractor and implement against unintentional start-up and rolling.
3. Clean and grease the following:
 - o The tractor PTO shaft.
 - o The gearbox input shaft of the implement.
4. Fix the two universal joint shaft halves to the tractor PTO shaft and the gearbox input shaft.
 - o Do not interconnect the universal joint shaft halves.
 - o Observe the operating manual from the universal joint shaft manufacturer.
5. Raise and lower the implement.
To do so, actuate the control valves at the rear of the tractor.
6. Before entering the danger area between the tractor and implement, secure the raised implement against unintentional lowering, by supporting it or hooking it to a crane.
7. Determine the shortest and longest operating position for the universal joint shaft by holding the universal joint shaft halves next to each other.
8. If necessary, have the universal joint shaft shortened in a specialist workshop. Observe the operating manual from the universal joint shaft manufacturer.

The safety devices and guards of the extended universal joint shaft must overlap by at least 50 mm.



WARNING

Never actuate the operating controls for the tractor's three-point hydraulic system while you are in the danger area between the tractor and implement.

6.5 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 implement and tractor sides.

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

6.5.1 Coupling the hydraulic hose lines



Check the compatibility of the hydraulic fluids.

Do not mix any mineral oils with biological oils.



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

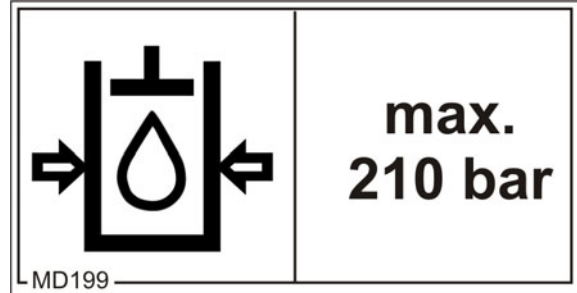


Fig. 65

1. Clean the hydraulic connector and hydraulic socket of the tractor control unit.
2. Set the tractor control unit to float position (neutral position).
3. Push the hydraulic connector into the hydraulic socket until the hydraulic connector perceivably locks.

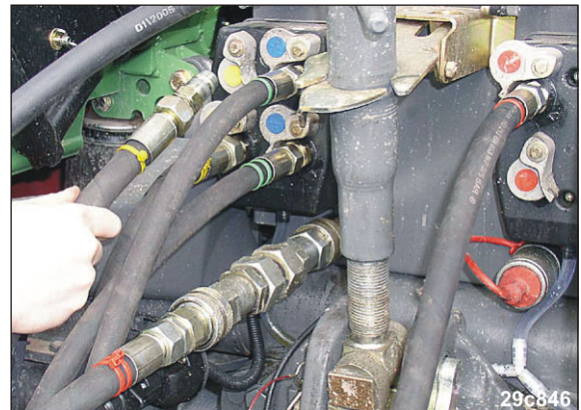


Fig. 66



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 connectors.

6.5.2 Uncoupling the hydraulic hose lines

1. Set the tractor control unit to float position (neutral position).
2. Unlock the hydraulic connector.
3. Push on the dust protection caps.



Fig. 67

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



Fig. 68

7 Coupling and uncoupling the implement



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



Danger

- **Secure the tractor and the implement against unintentional start-up and rolling before working on the implement.**
- **Direct people out of the danger area between the tractor and implement before you approach the implement with the tractor.**
- **Any helpers may only act as guides standing next to the tractor and the implement, and may only move between the vehicles when both are at a standstill.**
- **Never actuate the operating controls for the tractor's three-point hydraulic system while you are in the danger area between the tractor and implement.**



When handling the universal joint shaft, observe the following:

- Use only the provided universal joint shaft or one of the prescribed type.
- Read and follow the operating manual for the universal joint shaft supplied by the universal joint shaft manufacturer. Correct use and maintenance of the universal joint shaft prevents serious accidents.
- When coupling the universal joint shaft, observe the operating manual from the universal joint shaft manufacturer.
- The installation length of the universal joint shaft must be according to the specifications (see included operating manual from the universal joint shaft manufacturer). Have the universal joint shaft shortened by a specialist workshop if necessary.
- Ensure sufficient clearance in the swivelling area of the universal joint shaft. Insufficient clearance causes damage to the universal joint shaft.
- Observe the permitted drive rev. speed of the implement.
- Observe the correct installation position of the universal joint shaft. The tractor symbol on the protective tube of the universal joint shaft identifies the tractor-side connection of the universal joint shaft.
- Before switching on the tractor PTO shaft, read and follow the safety precautions for PTO shaft operation (see section "Safety information for the operator").



WARNING

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

- Use the intended equipment to connect the tractor and the implement in the proper way.
- When coupling the implement to the tractor's three-point hydraulic system, ensure that the tractor mount categories of the tractor and the implement are the same.
- Only use the upper and lower link pins provided for coupling the implement.
- Check the upper and lower link pins for visible defects whenever the implement is coupled. Replace the upper and lower link pins if there are clear signs of wear.
- Secure the upper link pin and the lower link pins against unintentional detachment using linch pins.



WARNING

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

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

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

7.1 Coupling the implement to the tractor



Adjust the length of the universal joint shaft to the tractor (see section "Adjusting the universal joint shaft to the tractor")

- before initial use.
- after fitting/removing the three-point hitch extension
- when using a different implement type.



DANGER

For your own safety, always observe the fundamental rules when handling universal joint shafts. If you identify any defects on a universal joint shaft, the universal joint shaft must not be used.

1. Secure the upper and lower link pins with linch pins.
2. Clean and grease the tractor PTO shaft and the gearbox input shaft.
3. Limit the lateral play of the tractor lower link, to prevent the connected implement from oscillating.



Fig. 69

4. Hold the centre line eradicator (Fig. 70/1) in place using a pin (Fig. 70/2) and secure with a linch pin.



First, fasten the centre line eradicator, then couple the implement to the tractor.

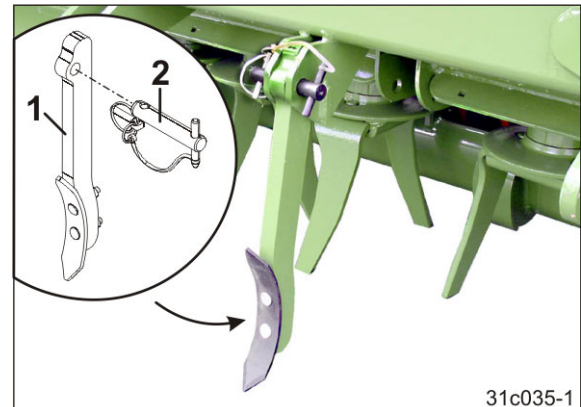


Fig. 70

Coupling and uncoupling the implement

5. Attach the three-point extension frame (optional, Fig. 71/1) to a crane and secure the rotary cultivator.
6. Secure the pins with linch pins.

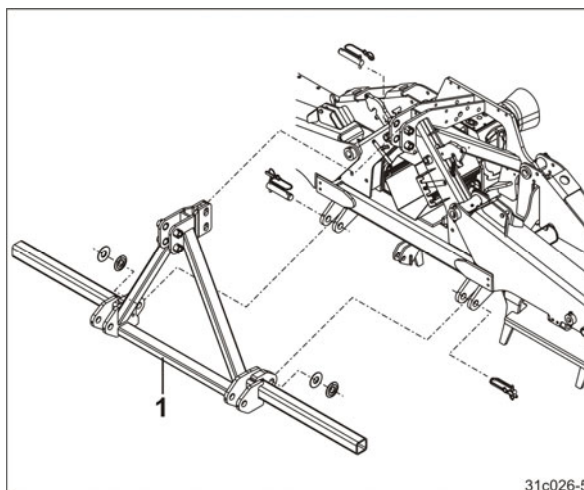


Fig. 71

7. Secure the implement-side universal joint shaft half on the gearbox input shaft.
Observe the operating manual from the universal joint shaft manufacturer.
8. Interconnect the two halves of the universal joint shaft.
9. Hook the universal joint shaft into the bracket (Fig. 72/1).

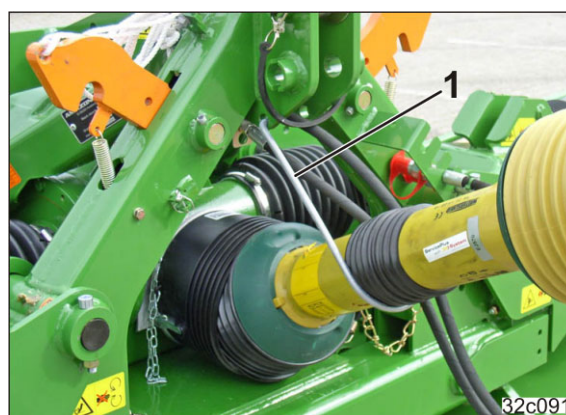


Fig. 72



Adjust the length of the universal joint shaft to the tractor (see section "Adjusting the universal joint shaft to the tractor")

- before initial use.
- before installing/removing the three-point extension frame.
- when using a different implement type.



DANGER

For your own safety, always observe the fundamental rules when handling universal joint shafts. If you identify any defects on a universal joint shaft, the universal joint shaft must not be used.

10. Instruct persons to get out of the danger area between the tractor and the implement.
11. Drive the tractor towards the implement, leaving a clearance of approx. 25 cm. The tractor lower links must be flush with the lower hinging points of the implement.
12. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.
13. Secure the universal joint shaft on the tractor PTO shaft.
Observe the operating manual from the universal joint shaft manufacturer.
14. Connect the supply lines to the tractor (see section "Overview – Supply lines between the tractor and implement").
15. Insert the connector (Fig. 74) of the oil cooler into the socket in the tractor cab.



Fig. 73



Fig. 74

16. Secure the universal joint shaft guard on the tractor and the implement using supporting chains so that they do not rotate.



Ensure that the universal joint shaft has a sufficient swivelling range in all operating conditions. The supporting chains must not become caught on implement or tractor parts.

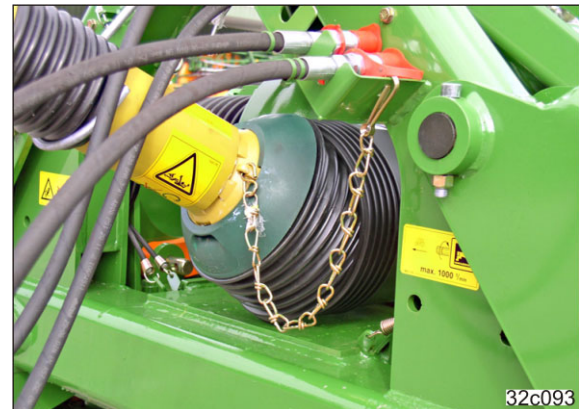


Fig. 75

17. Fasten the bracket to the transport bracket (Fig. 76/1) and secure it using a linch pin.
18. Instruct persons to get out of the danger area between the tractor and the implement.
19. Engage the lower hinging points (Fig. 77/1) of the implement using the tractor lower links. The lower link hooks lock automatically.
20. Fasten the tractor upper link (Fig. 77/2) to the implement. The upper link hook locks automatically.
The amount of lifting force required to lift



Fig. 76

Coupling and uncoupling the implement

the implement is at a minimum when the tractor upper link is horizontal.

21. Bring the soil tillage implement into a straight position by adjusting the upper link.
22. Secure the upper link against twisting.
23. Check that the upper and lower link hooks are locked correctly.



Fig. 77

7.2 Uncoupling the implement



WARNING

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

Park the implement in a level parking area on solid ground.



CAUTION

Avoid coming into contact with hot gearbox and universal joint shaft components.

Wear protective gloves.

1. Disengage the tractor PTO shaft.
Wait until the tool tines have come to a complete stop.
2. Park the implement on a level surface on solid ground.
Ensure that:
 - o the centre line eradicator (optional) can sink into loose soil.
 - o the tractor wheel mark eradicators (optional) can sink into loose soil. Or pin the tractor wheel mark eradicators right at the top.
3. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
4. Release the upper link. Adjust the upper link length accordingly.
5. Decouple the upper link hook, working from the tractor cab.

Coupling and uncoupling the implement

6. Decouple the lower link hooks, working from the tractor cab.
7. Pull the tractor forward approx. 25 cm. The clearance between tractor and implement provides convenient access for uncoupling the universal joint shaft and supply lines.
8. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
9. Uncouple the hydraulic hose lines.
10. Fasten the supply lines to the hose cabinet (Fig. 78).
11. Remove the universal joint shaft from the tractor PTO shaft (follow the instructions from the universal joint shaft manufacturer).
12. Hook the universal joint shaft into the bracket (Fig. 79/1).

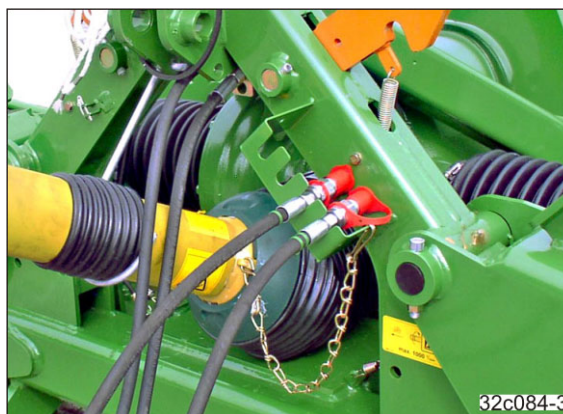


Fig. 78

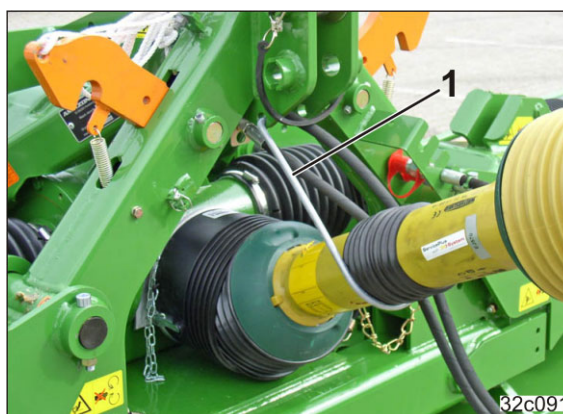


Fig. 79

8 Settings



DANGER

Carry out the adjustments only if the following apply:

- The tractor PTO shaft is disengaged (wait until the tool carriers have come to a complete stop).
- The implement has been lowered and folded out.
- The tractor parking brake is applied.
- The tractor engine is switched off.
- The ignition key is removed.



WARNING

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

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

Secure the tractor and the implement against unintentional starting and rolling away before you make any adjustments to the implement.

8.1 Adjusting the working depth of the rotary cultivator

The soil tillage implement is supported by the roller. This ensures that the working depth is precisely maintained.



Adjust the following to the new rotary cultivator working depth:

- side panels
- levelling board
- leading tyre packer.

8.1.1 Mechanical adjustment of the trailing roller



WARNING

Whenever you relocate the depth setting pin, secure it using a linch pin (Fig. 83/3).

1. Unfold the implement booms on the field.
2. Lift the implement just enough for the depth setting pins (Fig. 80/2) to clear the carrying arms (Fig. 80/1).
3. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.

Wait until the tool carriers have come to a complete stop.

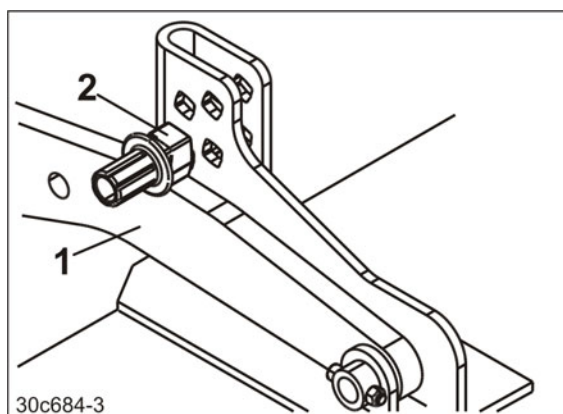


Fig. 80

4. Insert the depth setting pin in the desired position (Fig. 81/1)
 - o In both outer segments.
 - o In the same square hole.



DANGER

Touch the depth setting pins by the handle only.

Never reach between the carrying arm and the depth setting pins.

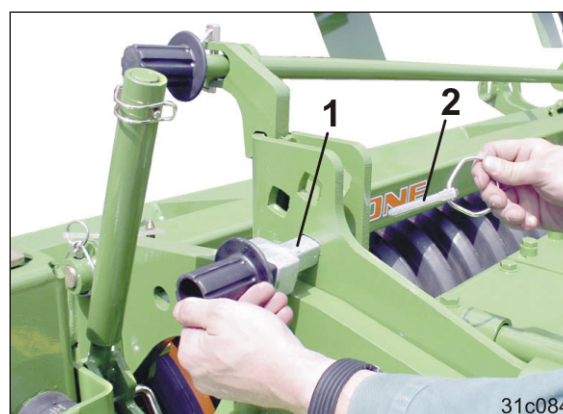


Fig. 81

5. Secure both depth setting pins using linch pins (Fig. 81/2).

6. Position the depth setting pins (Fig. 82/1):
 - o In both centre segments.
 - o In the same square hole.
 7. Secure both positioning rods using linch pins (Fig. 83/3).
- The adjustments may differ between the inner and outer sections. Make the adjustments so that the rotary cultivator is positioned horizontally with respect to the field surface during the work.

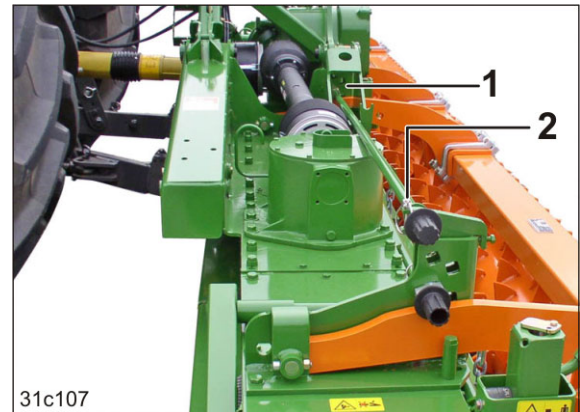


Fig. 82

8. A finer graduation of the working depth is achieved by turning the depth setting pin in the same square hole.
- The edges (Fig. 83/1) of the depth setting pins have different distances and are labelled with the numbers 1 to 4.

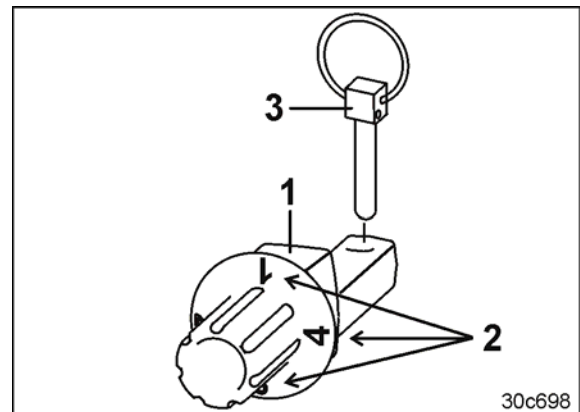


Fig. 83

The working depth increases

- The higher the depth setting pin (Fig. 47/2) is located in the adjuster segment.
 - The larger the number (Fig. 83/2) present at the carrying arm (Fig. 47/3).
9. Instruct any people in the area to stand at a minimum distance of 10.0 m from the implement.
 10. Lower the soil tillage implement.
- The carrying arms (Fig. 84/1) are supported by the depth setting pins (Fig. 84/2).

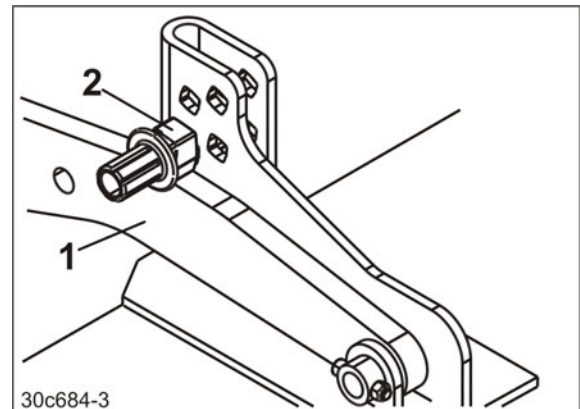


Fig. 84



You can position the depth setting pins in different holes in the centre and outer segments in order to attain optimum working results.

8.1.2 Hydraulic adjustment of the trailing roller

Two hydraulic cylinders (Fig. 85/1) are connected to the tractor control unit (*beige*) for adjusting the working depth. The scale (Fig. 85/3) displays the set working depth.

Actuation of the control unit (blue) adjusts the working depth (Fig. 85/2) of the rotary cultivator.

Lock the control unit (blue) after each adjustment.

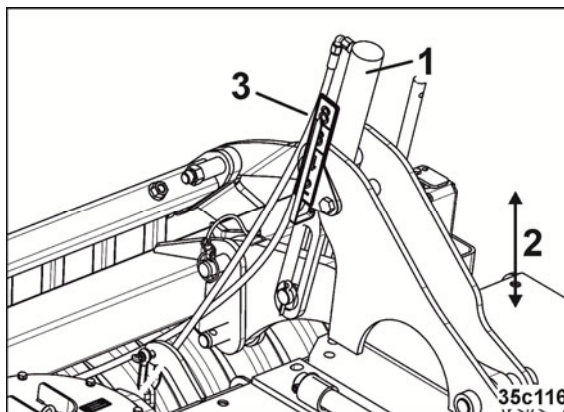


Fig. 85

8.1.3 Adjustment of the leading tyre packer

1. Unfold the implement booms on the field.
2. Lift the implement just enough for the depth setting pins (Fig. 80/2) to clear the carrying arms (Fig. 80/1).
3. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.

Wait until the tool carriers have come to a complete stop.

4. Position the leading tyre packer at the same height as the trailing roller (Fig. 80/2).
 - o In both outer segments.
 - o In the same square hole.

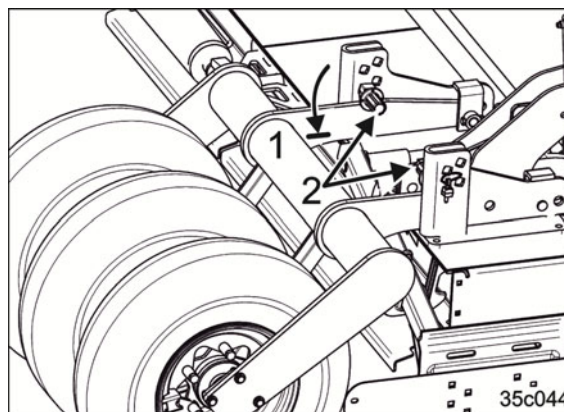



Fig. 86



DANGER

Touch the depth setting pins by the handle only.

Never reach between the carrying arm and the depth setting pins.

5. Secure both depth setting pins using linch pins (Fig. 81/2).

8.1.3.1 Parking the leading tyre packer



To prevent swinging of the tyre packer when the implement is folded, it is pegged in the lowest position during transport.

1. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.

Wait until the tool carriers have come to a complete stop.

2. Raise the implement until the carrying arms are resting on the lower stop (Fig. 80/1).
3. Insert the depth setting pin in the lowest position (Fig. 80/2).
 - o In both outer segments.
 - o In the same square hole.

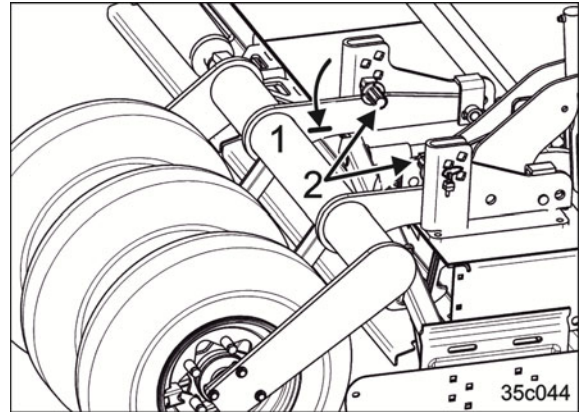


Fig. 87



DANGER

Touch the depth setting pins by the handle only.

Never reach between the carrying arm and the depth setting pins.

4. Secure both depth setting pins using linch pins (Fig. 81/2).

8.2 Adjusting the side panels

In order to restrict the soil stream effectively, the working depth of the side panels, the working depth of the soil tillage implement, and the spring tension must be adjusted to the soil conditions.

Vertical adjustment

The side panel is fastened with two round-head screws (Fig. 88/1) and can be adjusted vertically.

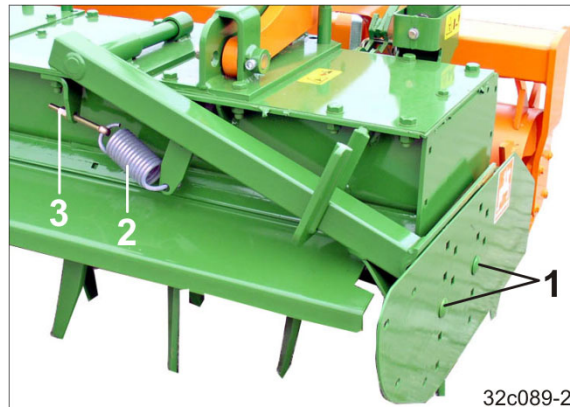


Fig. 88

- Screw on the side panels so that they slip through the soil at a maximum depth of 1 to 2 cm.
- If the field is covered with a lot of straw, fasten the side panels
 - o higher at the front than at the rear
 - o or right at the top.

The adjustable tension of the spring is adjusted at the factory for light and medium soils.

Adjust the spring tension as follows:

- Increase it on heavy soils.
- Decrease it when incorporating straw.

Adjusting the spring tension

1. Loosen the lock nut.
2. Adjust the tension of the spring (Fig. 88/1) by turning the nut (Fig. 88/2).
3. Tighten the lock nut.

8.3 Adjusting the tractor wheel mark eradicator

Vertical adjustment

Adjust the tractor wheel mark eradicator vertically, position it and secure the positioning bolt (Fig. 89/1) with a linch pin.

Horizontal adjustment

Adjust the tractor wheel mark eradicator horizontally and secure it with the screws (Fig. 89/2).

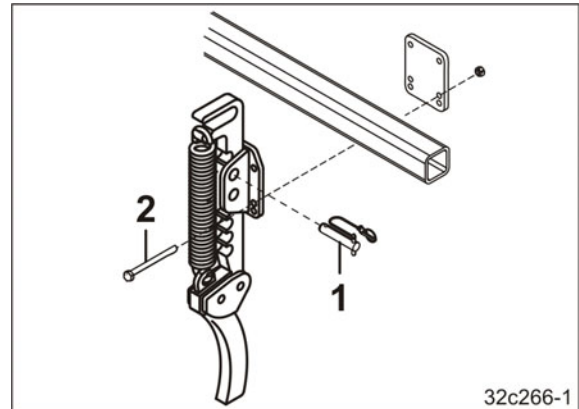


Fig. 89

8.4 Adjusting the levelling board

1. Attach the extension pipe (Fig. 90/1) to the lever (Fig. 90/2) in reversed position and secure it using the linch pin (Fig. 90/3).

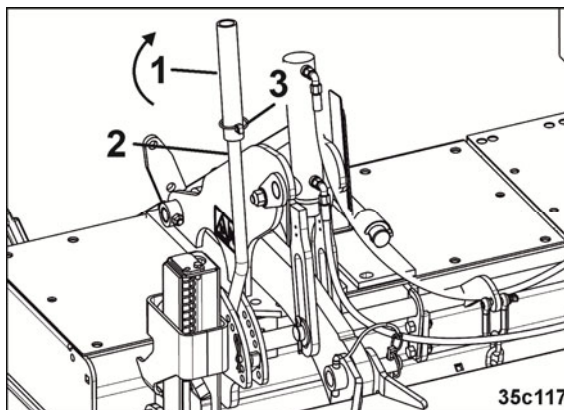


Fig. 90

2. Raise the levelling board (Fig. 90/6) to the desired height.

- For plough seeding, adjust the levelling board such that a small ridge of soil is always pushed ahead of the bar to level any undulations.
- For mulch seeding, adjust the levelling board high enough for crop residues to be able to pass underneath.
- When fastened right at the top, the levelling board has no function.

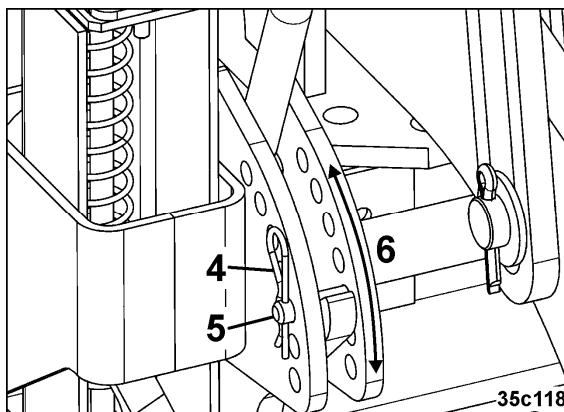


Fig. 91

3. Hold the levelling board in place using the pin (Fig. 90/5) and secure the pin using the spring cotter pin.
4. Carry out the same settings on all adjuster segments.

8.5 Adjusting the track marker

It is possible to set:

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

1. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
2. Loosen the bolt (Fig. 92/1).
3. Set the track marker length to length "A" [see table (Fig. 93)].
4. Tighten up the screws (Fig. 92/1).
5. Turn the track marker disc to adjust the working intensity of the track marker so that it runs roughly parallel to the direction of travel on light soils and is set more to grip on heavier soil.
6. Loosen the bolts (Fig. 92/2).
7. Move the track marker disc to the desired position.
8. Tighten up the screws (Fig. 92/2).

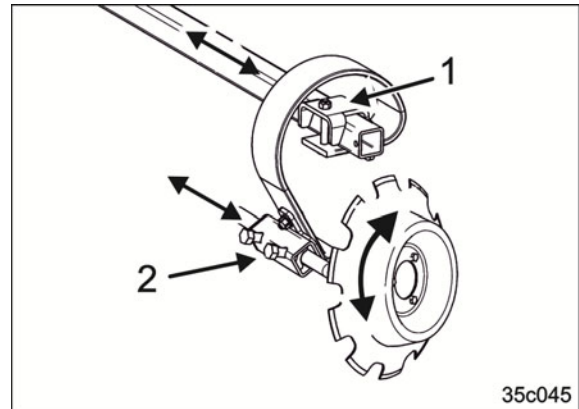


Fig. 92

Fig. 93/...

- Distance from the centre of the implement to the contact area of the track marker disc

Working width	Distance A
KG 4001-2	4.0 m
KG 5001-2	5.0 m
KG 6001-2	6.0 m

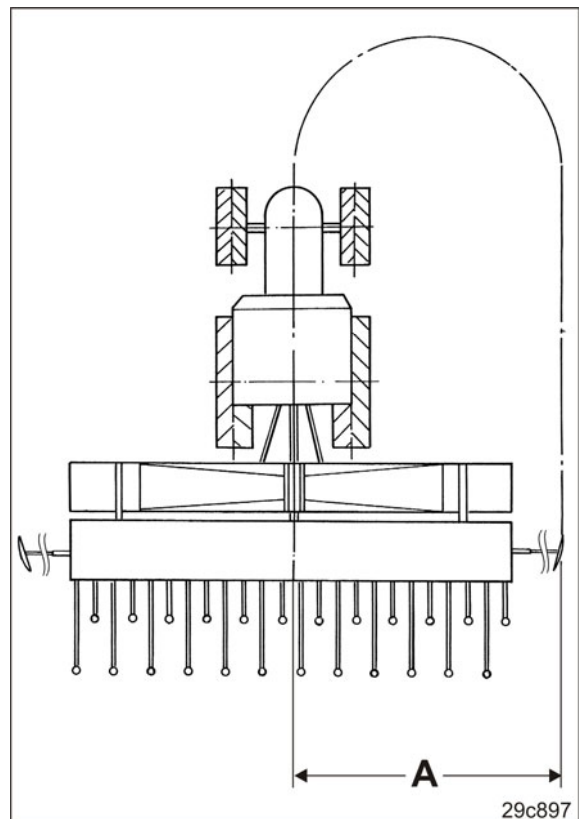


Fig. 93

8.6 Setting the speed of the tool tines



DANGER

- Carry out the adjustments only with the tractor PTO shaft disengaged, the engine shut off, the tractor parking brake applied and the ignition key removed!
- Wait until the tool carriers have come to a complete stop.
- Do not touch hot gearbox parts; wear gloves.

8.6.1 Gear lever adjustment

1. The gear lever (Fig. 94/1) serves to switch gears.

1st gear:

Press the gear lever into the gearbox housing as far as it will go.

2nd gear:

Pull the gear lever out of the gearbox housing as far as it will go.

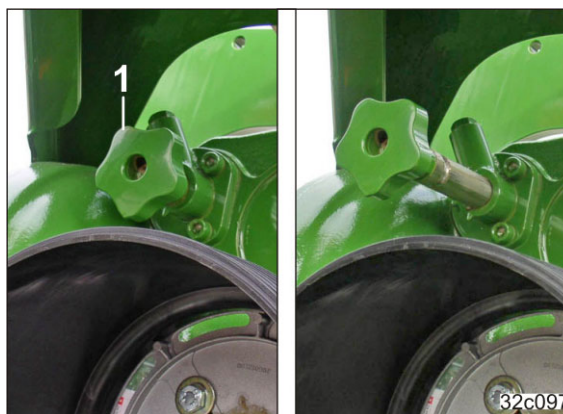


Fig. 94



Other speeds can be set by changing the spur gears in the two-gear gearbox (see section 12.3.1, page 96).

8.7 Adjusting the cutting rail (optional, only with cracker disc roller)

Two adjuster segments (Fig. 95) with integrated springs (Fig. 95/1) are used to adjust the cutting rail. During operation, the blades can avoid obstacles in the soil by deflecting upwards.

Upon delivery, the cutting rail is adjusted such that the ends of the blades are flush with the edges of the roller.

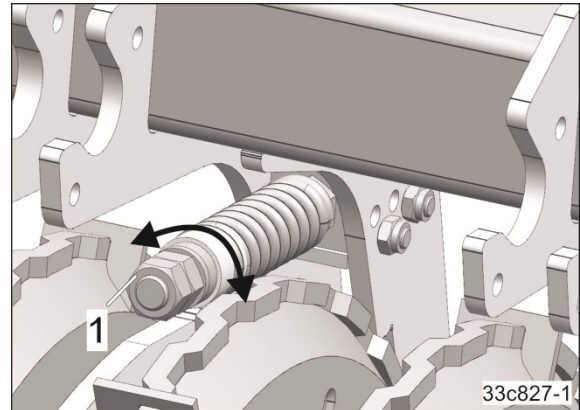


Fig. 95

8.7.1 Adjusting the spring force



Always perform the same settings on all adjuster segments.

1. Put the cutting rail in position A (see section "Adjusting the response", page 98).
2. Insert 1 to 2 spacer discs (Fig. 96/1) between the socket (Fig. 96/2) and hexagon nut (Fig. 96/3).



If the spring force changes, the position of the blades also changes.

Readjust the blades (see section "Readjusting worn blades", Seite 98).

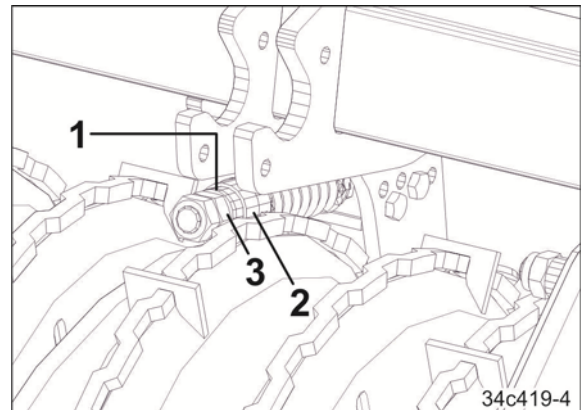


Fig. 96

8.7.2 Readjusting worn blades



Always perform the same settings on all adjuster segments.

1. Put the cutting rail in position A (see section "Adjusting the response", page 98).
2. Turn the hexagon nut (Fig. 97/1) on the spring package until the ends of the blades are flush again with the edges of the roller. Lock the hexagon nut.



Increase the spring force if the adjustment range is not sufficient. (see section "Adjusting the spring force", Seite 97).

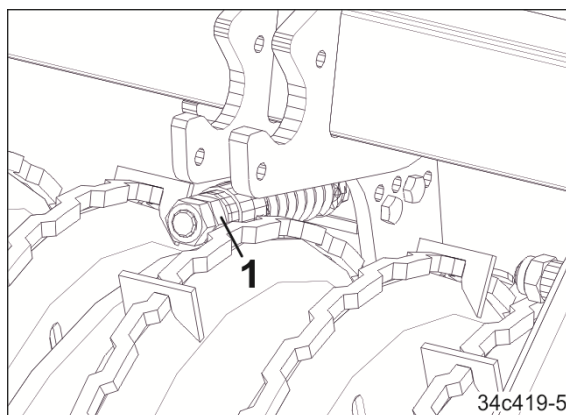


Fig. 97

8.7.3 Adjusting the response



Always perform the same settings on all adjuster segments.

Position A

One bolt is inserted in hole (Fig. 99/1), the second bolt is inserted in hole (Fig. 99/4). The spring force is permanently acting on the cutting rail and the blades.

Position B

Repositioning of the bolt from hole (Fig. 99/4) to hole (Fig. 99/3) or (Fig. 99/5) causes only the net weight of the cutting rail to act on the blades. The spring force only comes into effect when the blades are raised and the clip strikes against the bolt in hole (Fig. 99/3) or (Fig. 99/5).

The spring force comes into effect

- only after the bolt is inserted in hole (Fig. 99/3).
- later if the bolt is inserted in hole (Fig. 99/5).

Position C

Repositioning the bolt from hole (Fig. 99/1) to hole (Fig. 99/2) causes the roller to work without the blades. Raise the cutting rail to reposition the bolt.

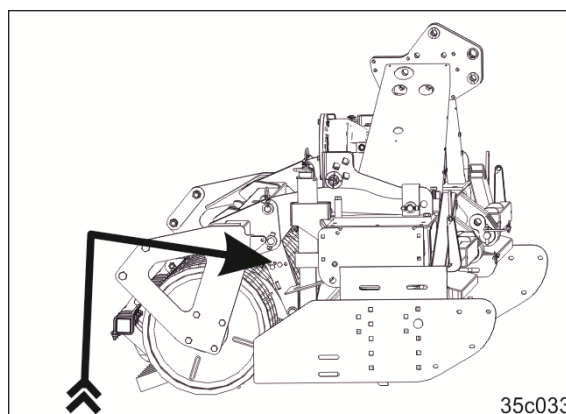


Fig. 98

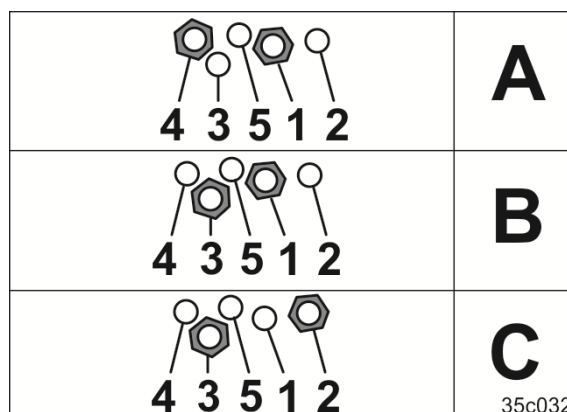


Fig. 99

8.8 Adjusting the roller scraper



To prevent damage to the roller sleeve, the carbide-coated scrapers must not touch the roller sleeve.

8.8.1 Wedge ring roller

1. Uncouple the seed drill.
2. Using the tractor hydraulics, lift the soil tillage implement just enough for the roller to clear the ground.
3. Support the soil tillage implement against unintentional lowering.
4. Loosen the bolt.
5. The distance between the scraper (Fig. 101/1) and the roller tube is 10 mm. Adjust worn scrapers to the correct dimension or replace.
6. Rotate the roller to check whether the distance is maintained at all points.

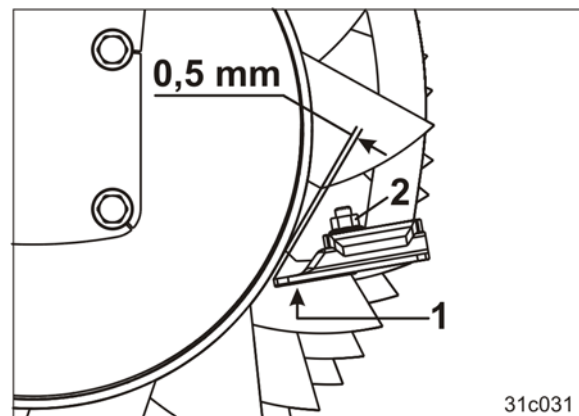


31c088

Fig. 100

8.8.2 Tooth packer roller

1. Uncouple the seed drill.
2. Using the tractor hydraulics, lift the soil tillage implement just enough for the roller to clear the ground.
3. Support the soil tillage implement against unintentional lowering.
4. Unscrew the screw (Fig. 101/2).
5. Screw on the scraper (Fig. 101/1) with a distance of 0.5 mm to the roller tube.
6. Rotate the roller to check whether the distance of 0.5 mm is maintained at all points.



31c031

Fig. 101

9 Transportation

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

In Germany and in many other countries, the maximum transport width of the implement combination mounted on the tractor is 3.0 m.

Transport of a implement combination over 3.0 m wide is only permitted on a transport vehicle. If the rotary cultivator is equipped with potato tines, the permissible transport width of 3.0 m is exceeded. The transport of a rotary cultivator with potato tines is only permitted on a transport vehicle.



DANGER

The transport of a rotary cultivator with potato tines is only permitted on a transport vehicle.

The maximum permitted speed¹⁾ is:

- 25 km/h for tractors with attached cultivator, trailing roller, seeding rail and front tank
- 40 km/h for tractors with attached cultivator and trailing roller

The implement must always be driven at much lower speeds than those specified when travelling on poor roads and unclassified roads in particular.

The maximum permitted speed for attached implements differs in the various countries according to national road traffic regulations. Ask your local importer/implement dealer about the maximum permitted speed for road travel.

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

1. Instruct any people in the area to stand at a minimum distance of 10.0 m from the implement.
2. Parking the leading tyre packer (see section 8.1.3.1, Seite 91)
3. Fold in the implement booms.



Fig. 102

4. Remove the pin, which is secured using a spring cotter pin.



Fig. 103

5. Swivel both booms of the lighting system into road transport position.
6. Position the booms of the lighting system using pins and spring cotter pins.



Fig. 104

7. Lock the tractor control unit.
8. Switch off the on board computer.
9. Check the lighting system for correct operation.
10. Switch on the warning beacon (if present), which is subject to authorisation, and check for correct function.



Fig. 105



DANGER

- Before transportation, carry out a visual check that the upper and lower link pins are secured with the original linch pins against unintentional release.
- Before transportation, fasten the side locking device of the tractor lower link so that the connected or coupled implement cannot swing back and forth.
- When turning corners, take into consideration the wide sweep and the centrifugal mass of the implement.
- Drive in such a way that you always have full control over the tractor with the attached implement. In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the influence of the mounted or attached implement.
- It is forbidden to ride on the implement as a passenger and/or to climb onto implements while they are running.



- Before transport, follow the instructions given in the section "Safety information for the operator".
- Before moving off, check:
 - that the permissible weight is not exceeded.
 - that the supply lines are connected correctly.
 - the lighting system for damage, function and cleanliness.
 - the brake and hydraulic system for visible damage.
- That the tractor parking brake is released completely.
- The warning signs and yellow reflectors must be clean and undamaged.
- Switch on the warning beacon (if present), which is subject to authorisation, prior to starting a journey and check for operability.



WARNING

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

- On folding implements, check that the transport locks are locked correctly.

10 Use of the implement



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

- Warning symbols and other labels on the implement.
- Safety information for the operator.



DANGER

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

Only operate the implement if

- all safety equipment is fully mounted.
- the side panel is mounted.
- the roller is coupled up.



DANGER

Danger of being entangled and drawn in by an unguarded universal joint shaft or damaged safety devices!

Work only when the drive between the tractor and driven implement is fully guarded, i.e.:

The tractor must be equipped with a shield, and the implement must be equipped with the standard universal joint shaft guard.

Whenever the implement is used, first check to ensure that the safety devices and guards of the universal joint shaft are fully intact and functional.

Danger of being entangled and drawn in

- by unguarded parts of the universal joint shaft.
- by damaged safety devices.
- by an unsecured universal joint shaft (supporting chain).

Have damaged safety devices and guards of the universal joint shaft replaced immediately by a specialist workshop.

- Maintain a sufficient safety clearance between you and the driven universal joint shaft.
- Direct people out of the danger area of the driven universal joint shaft.
- Shut down the tractor engine immediately in case of danger.



WARNING

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

Instruct people to leave the danger area of the implement before you switch on the PTO shaft.



DANGER

- Before transportation, carry out a visual check that the upper and lower link pins are secured with the original linch pins against unintentional release.
- Before transportation, fasten the side locking device of the tractor lower link so that the connected or coupled implement cannot swing back and forth.
- When turning corners, take into consideration the wide sweep and the centrifugal mass of the implement.
- Drive in such a way that you always have full control over the tractor with the attached implement. In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the influence of the mounted or attached implement.
- It is forbidden to ride on the implement as a passenger and/or to climb onto implements while they are running.



WARNING

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

Observe the permissible implement drive speed before switching on the tractor PTO shaft.



CAUTION

Danger from failure of the universal joint shaft in case of excessive bending of the driven universal joint shaft!

Observe the permitted bending of the driven universal joint shaft when lifting the implement. Excessive bending of the driven universal joint shaft causes increased, premature wear to or immediate destruction of the universal joint shaft.

Switch off the PTO shaft of the tractor immediately if the lifted implement makes a lot of noise while running.



CAUTION

Danger from failure during operation when the overload clutch engages!

Switch off the PTO shaft of the tractor immediately if the overload clutch engages. This avoids damaging the overload clutch.

10.1 Unfolding/folding the implement booms



DANGER

Make sure no persons are in the swivel range of the implement booms before folding the implement booms in and out.



Before folding in and out, raise the rotary cultivator so that the tool tines and the roller have sufficient ground clearance.



Before folding it in, switch off the tractor PTO shaft and do not switch it on again until the implement booms are extended completely.

The bars (Fig. 106/1) of the rotary cultivator form the mechanical transport locking mechanism. The cables (Fig. 106/2) are used to release the bars.

Operate the cables only from the tractor cab.



Fig. 106

10.1.1 Unfolding the implement booms

1. Raise the tractor lower links.
- Raise the rotary cultivator.
The tool tines and the roller need sufficient ground clearance for folding.
2. Open the bars (Fig. 107/1) by actuating the cables (Fig. 107/2) from the tractor seat.

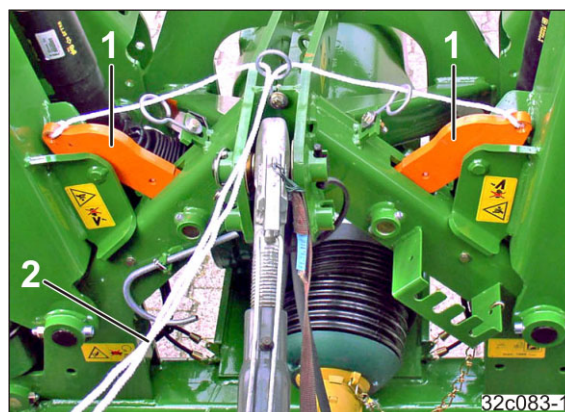


Fig. 107

3. Unfold the implement booms completely.
- Actuate control unit 1 until the implement booms are completely unfolded.
4. While working in the field, leave tractor control unit 1 in float position.



Fig. 108

10.1.2 Folding the implement booms

1. Switch off the tractor PTO shaft.
Wait until the tool carriers have come to a complete stop.
2. Raise the tractor lower links.
- Raise the rotary cultivator.
The tool tines and the roller need sufficient ground clearance for folding.
3. Fold in the implement booms completely.
- Actuate control unit 1 until the implement booms are fully folded in.



Fig. 109


DANGER

After the booms are folded in, check that both bars (Fig. 109/1) are engaged properly and the cables are relieved.

4. The inner carrying arms lock automatically. The locking element (Fig. 107/1) prevents collision of the distributor heads during sowing rail operation.

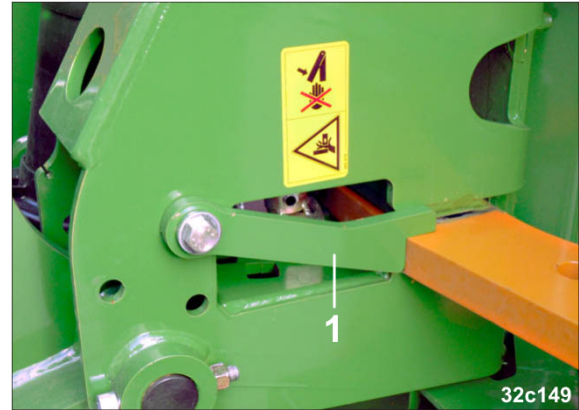


Fig. 110


DANGER

Check that the two bars are correctly positioned on the carrying arms after the booms are folded in.

The bars (Fig. 110/1) form the mechanical transport locking mechanism.

Fold in the machine extension arms on implements with hydraulic working depth adjustment

1. Apply pressure to the hydraulic cylinder of the working depth adjustment.
- The fork (Fig. 111/1) presses against the pin (Fig. 111/2) and fixes the carrying arms.



Fixing the carrying arms prevents the rollers and the seeding units from swinging back and forth when being transported.

2. Fold in the machine extension arms as described in the operating manual of the rotary cultivator.

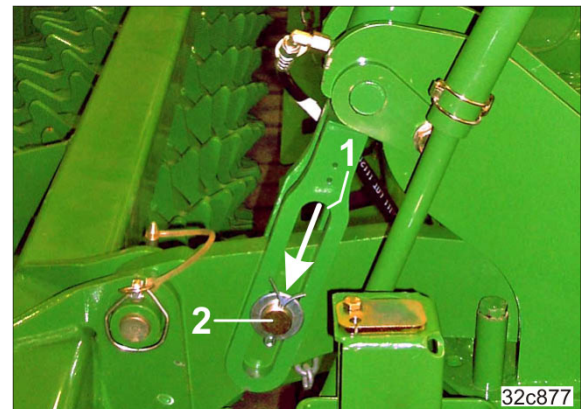


Fig. 111

10.2 Folding in the lighting system

1. Before working in the field, fold the booms of the lighting system (see Fig. 112).



Fig. 112

2. Position and secure the booms of the lighting system with pins and spring cotter pins.

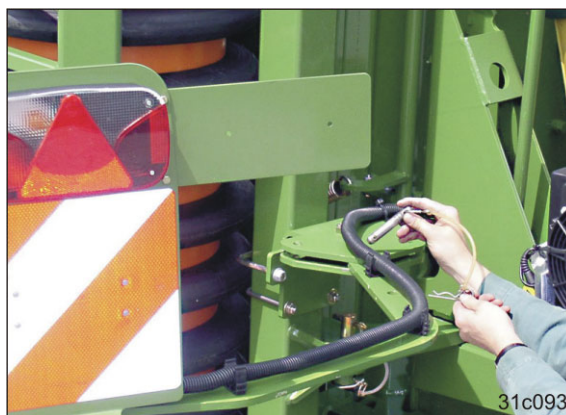


Fig. 113

10.3 On the field



DANGER

Instruct any people in the area to stand at a minimum distance of 10.0 m from the implement.

10.3.1 Work commencement

1. Unfold the implement booms on the field.
2. Lower the soil tillage implement until the tines are just above, but not yet touching, the soil.
3. Bring the tractor's PTO shaft up to the prescribed speed.
4. Start up the tractor and fully lower the soil tillage implement.



Fig. 114



Set the speed of the tractor PTO shaft to 1000 rpm.

Setting a lower PTO shaft speed leads to very high torques at the universal joint shaft and can cause rapid wear of the overload clutch.

10.3.2 During the work



In the event of tine wear, correct the following settings:

- Working depth of the cultivator
- Height adjustment of the side panels
- Height adjustment of the levelling board
- Height adjustment of the tractor wheel mark eradicator.

When working at great working depths, it is necessary to replace the tool tines with new ones even before they reach the minimum length in order to prevent damage or wear to the tool carriers.

Use of the implement

The working depth can be adjusted hydraulically during work.

Actuation of the control unit (*beige*) adjusts the working depth of the rotary cultivator.

Lock the control unit (*beige*) after each adjustment.

The scale (Fig. 115/2) displays the set working depth.



Fig. 115

Turning at end of the field

Before turning at the end of the field, raise the combination with the tractor hydraulics until the combination has sufficient ground clearance.



Fig. 116



Switch off the tractor PTO shaft when turning if the angle of the universal joint shaft becomes too large or the implement does not run smoothly when raised.

10.3.3 After use



When switching off the implement, ensure that the soil tillage implement is parked on firm ground.

To prevent damage

- the tines of the wheel mark eradicator should be able to penetrate loose earth.
- the centre line eradicator should be able to penetrate loose earth.

10.3.3.1 Moving the tractor wheel mark eradicator into transport position

To prevent damage, the tines of the wheel mark eradicators should be able to sink into loose soil or be pinned right at the top.

Vertical adjustment

Adjust the tractor wheel mark eradicator vertically in the topmost position (Fig. 117/2), and secure the positioning bolt (Fig. 117/1) with a linch pin.

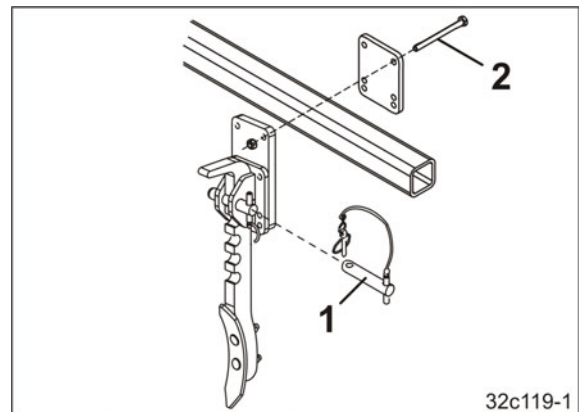


Fig. 117

10.3.3.2 Moving the track marker to transport position



DANGER

Secure the track markers immediately after work on the field (transport lock).

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

Only remove the transport lock for the track marker immediately before beginning field work.



WARNING

Direct people out of the danger area.

The hydraulic cylinder of the track marker and of the tramline marker can be actuated simultaneously.

1. Direct people out of the swivel area of the track marker.
 2. Actuate the tractor control unit (yellow).
- Swivel both track markers into transport position (see Fig. 118/1). Both track markers must be raised for transporting the implement. The track markers are hydraulically locked.

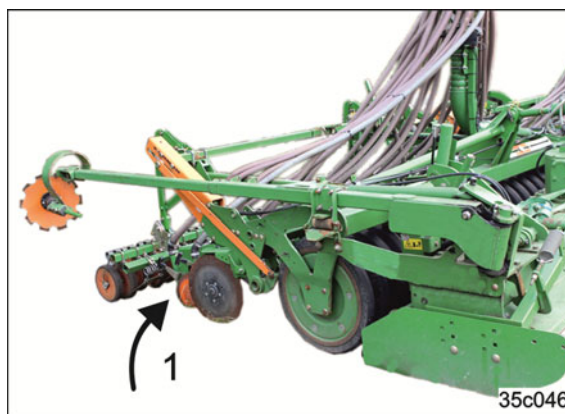


Fig. 118

11 Faults



WARNING

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

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

Secure the tractor and the implement against unintentional start-up and rolling away, before you eliminate any faults on the implement (see section "Securing the tractor/implement against unintentional start-up and rolling").

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

11.1 Initial use of the tooth packer roller



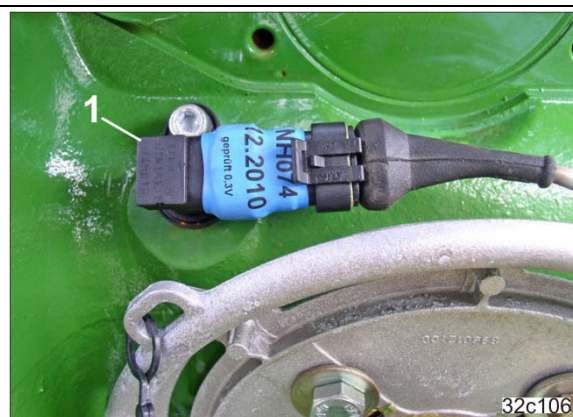
If the tooth packer roller rotates with difficulty when first used, e.g. because of areas glued by paint, do not adjust the scrapers of the tooth packer roller, but rather pull the roller over solid ground.

11.2 Hall sensor on the gearbox



The Hall sensor is magnetic.

In event of faults, unscrew the Hall sensor, free the contact surface from chippings and clean it.



Hall sensor (1) on two-speed manual gearbox

Fig. 119



Hall sensor (1) on an angular gearbox

Fig. 120

11.3 Tool tines stopping when work is in progress

If the implement encounters an obstacle, the tool carriers may come to a stop.

In order to prevent damage to the gearbox, install overload clutches on the gearbox input shafts of the angular gearboxes.

If the tool carriers come to a stop, stop driving and lower the tractor's PTO shaft speed (approx. 300 rpm) until you hear the ratchet clutch engage. Bring the PTO shaft back to its original speed and continue working.

If the tool carriers do not turn, rectify the malfunction:

1. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.
2. Wait until the tractor PTO shaft comes to a complete stop.
3. Remove the obstacle.
The ratchet clutch is now ready to be used again.

12 Cleaning, maintenance and repair

12.1 Safety first



WARNING

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

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

Secure the tractor and the implement against unintentional start-up and rolling before working on the implement.



WARNING

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

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



Danger

Carry out cleaning, maintenance or repair work (unless otherwise specified) only after the following conditions are fulfilled:

- The implement is completely lowered.
- The tractor parking brake is applied.
- The tractor PTO shaft is shut off.
- The tractor engine is switched off.
- The ignition key is removed.



CAUTION

Avoid coming into contact with hot components and transmission fluids.

Wear protective gloves.

12.2 Cleaning the implement



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

Cleaning with a high-pressure cleaner/steam cleaner



What should be observed when cleaning with a high-pressure cleaner/steam cleaner:

- Do not clean any electrical components.
- Do not clean any chromed components.
- Never aim the cleaning jet from the nozzle of the high pressure cleaner/steam jet directly on lubrication points, bearings, rating plates, warning signs, and stickers.
- Always maintain a minimum nozzle distance of 300 mm between the high pressure cleaner/steam jet cleaner nozzle and the implement.
- The set pressure of the high-pressure cleaner/steam jet must not exceed 120 bar.
- Comply with safety regulations when working with high pressure cleaners.

12.3 Adjustment work

12.3.1 Switching the gear wheels in the two-gear gearbox (specialist workshop)



DANGER

- Secure the tractor and the implement against unintentional start-up and unintentional moving.
- Avoid coming into contact with hot components and transmission fluids. Wear protective gloves.

1. Place the soil tillage implement on a firm, horizontal surface.
2. Release the cover screws.
[Do not release screws (Fig. 121/1)].
3. Remove the gearbox cover.

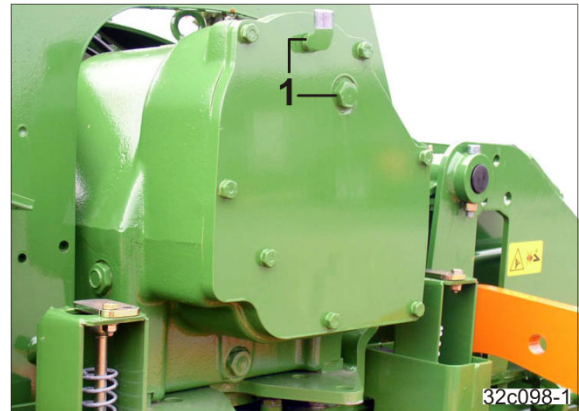


Fig. 121

4. Remove the retaining springs (Fig. 122/1).
5. Swap the gear wheels over.
6. Fit the retaining springs.
7. Check the oil level.
8. Screw on the gearbox cover with seal (O-ring).
9. Check the gearbox for leak points.

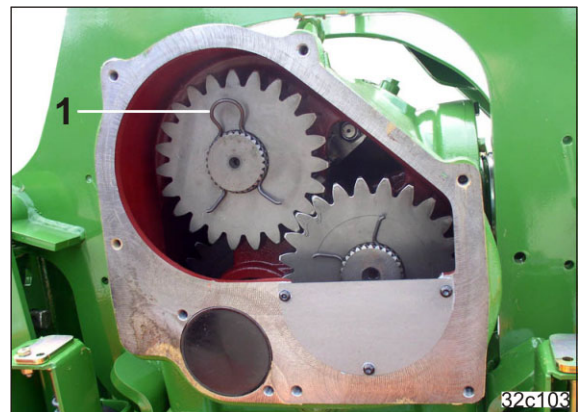


Fig. 122

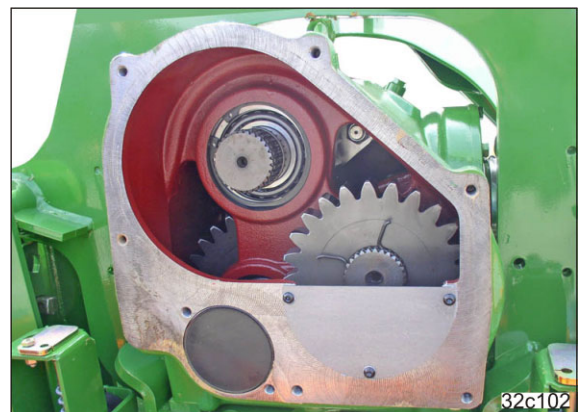


Fig. 123

12.3.2 Replacing the tool tines (specialist workshop)

1. Fold the implement booms.
2. Check that the two brackets engage correctly when the extension arms are folded in (see section "Folding the implement booms").
3. Remove the linch pin (Fig. 124/1).
4. Remove the pin (Fig. 124/2) from the tool carrier by striking it in an upwards direction.
5. Replace the tool tines (Fig. 124/3).
6. Fasten the tool tines using the pin and secure it using the linch pin.

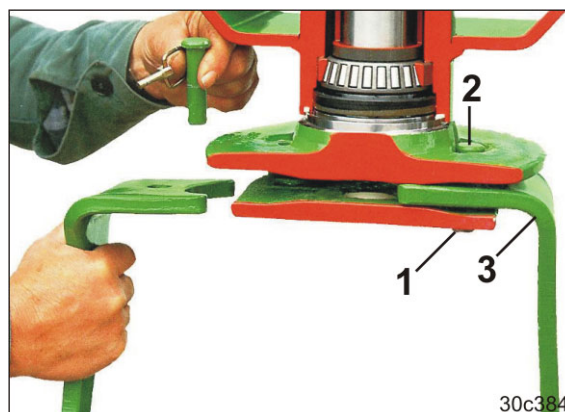


Fig. 124

Direction of rotation of tool tines

The implement is equipped with two varieties of tool tines (clockwise/anticlockwise).

Tool tines (1),
clockwise (see direction of the arrow).

Tool tines (2),
anticlockwise (see direction of the arrow).

Note:

The leftmost tool carrier, viewed in the direction of travel, always rotates clockwise.

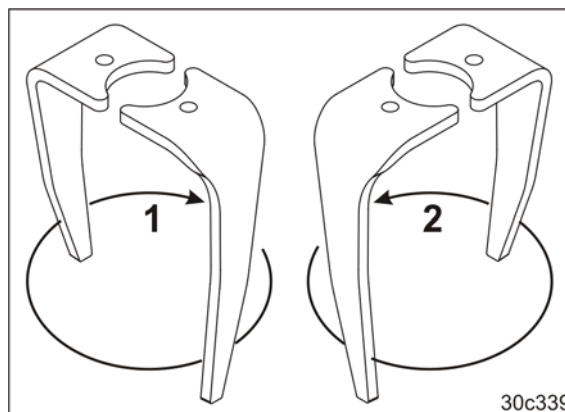


Fig. 125

12.4 Lubrication specifications



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

The pictogram indicates a lubrication point.

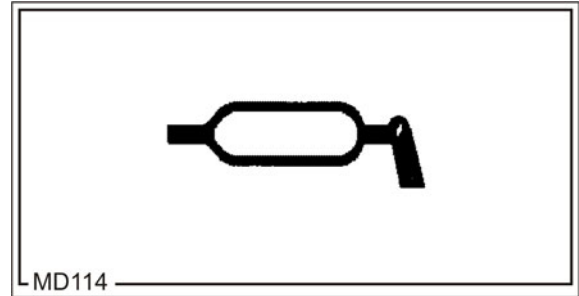


Fig. 126

12.4.1 Lubricants

Use only the lubricants specified in the table or another lithium-saponified multipurpose grease with EP additives.

Company	Lubricant designation
ARAL	Aralub HL2
FINA	Marson L2

Company	Lubricant designation
ESSO	Beacon 2
SHELL	Ratinax A

12.4.2 Greasing points – overview

Refer to the table (Fig. 127) for the lubrication points and lubrication intervals.

Lubrication points (see Figure)	Number of grease nipples	Lubrication interval	Please note
Fig. 128/1	1	50 h	Clean and lubricate the universal joint shafts, referring to the manufacturer's maintenance schedule.
Fig. 128/2	1	50 h	
Fig. 128/3	1	50 h	
Fig. 129/1	2	50 h	Grease the protective tubes and profile tubes.
Fig. 129/2	2	50 h	
Fig. 129/3	2	50 h	Greasing the protective tubes prevents them from freezing. Open the profile tube for lubrication.
Fig. 129/4	2	50 h	
Fig. 129/5	2	50 h	
Fig. 130/1	4	50 h	
Fig. 131/1	2	50 h	Only lubricate when the implement is folded in and secured.

Fig. 127

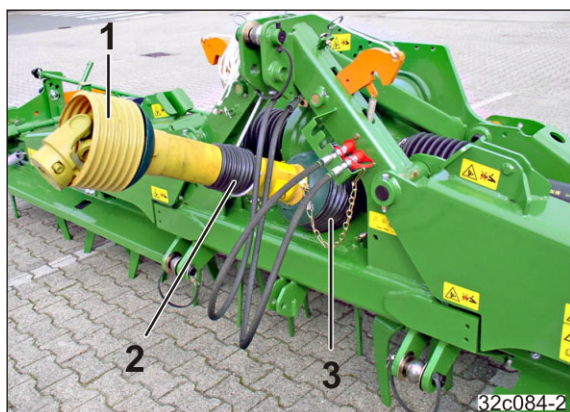


Fig. 128

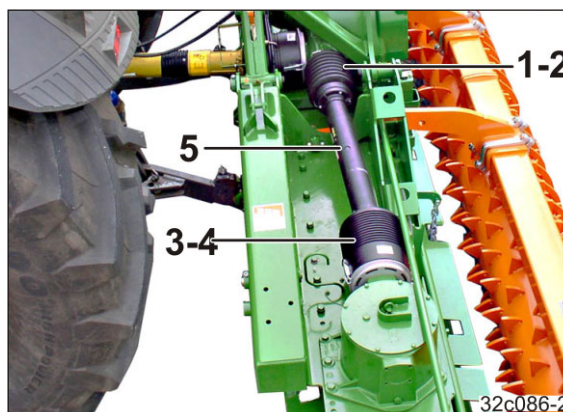


Fig. 129



Fig. 130



Fig. 131

12.5 Maintenance schedule – overview



Carry out maintenance work when the first interval is reached.

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

Initial operation	Before initial commissioning	Specialist workshop	Check the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 12.11
			Two-gear gearbox: Check the oil level	Section 12.6
			Two-gear gearbox: Check that the ventilation valve is secure.	
			Angular gearbox: Check the oil level	Section 12.7
			Angular gearbox: Check that the dipstick with ventilation is secure.	
			Spur gear trough: Check the oil level and ventilation	Section 12.8
	After the first 10 operating hours	Specialist workshop	Check the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 12.11
		Specialist workshop	Check all bolted connections for a secure fit.	Section 12.13
	After the first 50 operating hours	Specialist workshop	Two-gear gearbox: Changing transmission fluid	Section 12.6
		Specialist workshop	Angular gearbox: Changing transmission fluid	Section 12.7

Cleaning, maintenance and repair

<u>Before starting work</u> (daily)		Checking the upper and lower link pins	Section 12.9
		Check: Length of the tool tines	
<u>After completion of work</u> (daily)		Cleaning the implement (as required)	Section 12.2
<u>Each week</u> (at least every 50 operating hours)	Specialist workshop	Check the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 12.11
		Two-gear gearbox: Check the oil level	Section 12.6
		Angular gearbox: Check the oil level	Section 12.7
		Spur gear trough: Check the oil level	Section 12.8
<u>Every 500 operating hours</u>	Specialist workshop	Two-gear gearbox: Changing transmission fluid	Section 12.6
	Specialist workshop	Angular gearbox: Changing transmission fluid	Section 12.7
<u>Every 6 months</u> After the season	Specialist workshop	Checking/cleaning/lubricating the ratchet clutch	Section 12.10
<u>Every 6 months</u> Before the season	Specialist workshop	Check the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 12.11

12.6 Two-gear gearbox

Venting

The gearbox is equipped with a ventilation valve (Fig. 132/1). Ventilation must be ensured to prevent the gearbox from developing leaks.

Check the oil level

1. Park the implement on a level surface.

When the fill quantity is correct, the oil level is visible in the oil sight glass (Fig. 132/2).

2. If necessary, add transmission fluid through the opening in the breather (Fig. 132/1).

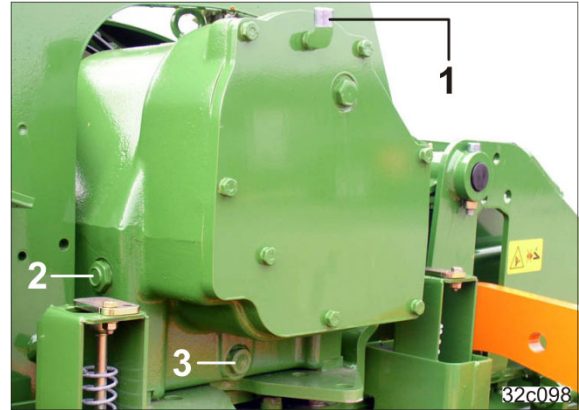


Fig. 132

Changing transmission fluid (specialist workshop)

1. Place a suitable container below the oil drain opening.
2. Unscrew the oil drain screw (Fig. 132/3).
3. Collect the transmission fluid and dispose of it properly.
4. Screw in the oil drain screw.
5. Refill with new transmission fluid (for oil types and fill quantities, see the section "Technical Data").
6. Screw in the breather.

12.7 Angular gearbox

Venting

The dipstick (Fig. 133/1) is equipped with a ventilation valve. Ventilation must be ensured to prevent the gearbox from developing leaks.

Check the oil level

1. Park the implement on a level surface.
2. Check the oil level with the dipstick.

At the correct fill level, the oil level reaches between the markings on the dipstick.

3. If necessary, top up the transmission fluid via the opening in the dipstick.

For oil type and fill quantity, see section "Technical Data".



Fig. 133

Changing transmission fluid

1. Place a suitable container below the oil drain opening.
2. Unscrew the oil drain screw (Fig. 133/2).
3. Collect the transmission fluid and dispose of it properly.
4. Screw in the oil drain screw.
5. Add new transmission fluid.
6. Screw in the dipstick.

12.8 Spur gear trough

Venting

The spur gear trough is equipped with a ventilation pipe (Fig. 134/1). Ventilation must be ensured to prevent the spur gear trough from developing leaks.

Check the oil level

1. Park the implement on a level surface.
2. Open the cover with the ventilation pipe (Fig. 134/1).

The spur gears in the spur gear trough must be halfway covered with transmission fluid.

3. If necessary, top up the transmission fluid.

For oil type and fill quantity, see section "Technical Data".

4. Check the second spur gear trough.

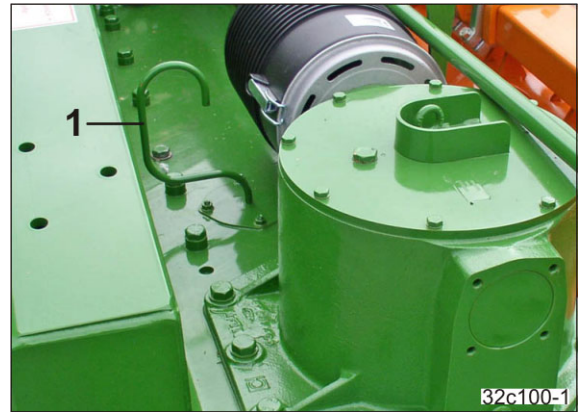


Fig. 134



No dirt must enter the spur gear trough.



Oil change is not necessary.

12.8.1 Changing the oil filter in the cooling kit (specialist workshop)

1. Remove the oil filter cartridge (Fig. 135/1).
 - 1.1 Undo the screws (Fig. 135/2).
 - 1.2 Carefully remove the oil filter cartridge.
Collect the escaping fluid.
2. Replace the oil filter in the oil filter cartridge.

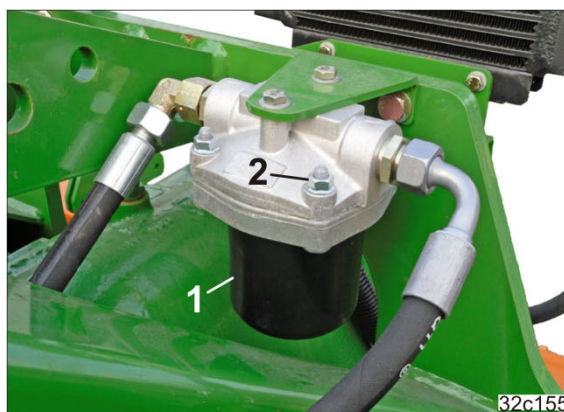


Fig. 135

12.9 Checking the upper and lower link pins

Check the upper and lower link pins for visible defects whenever the implement is coupled, and replace if worn.

12.10 Checking/cleaning/lubricating the ratchet clutch (specialist workshop)

When used under normal conditions, the ratchet clutch (Fig. 136/1) is maintenance-free.

If the clutch engages frequently, open the ratchet clutch, clean it and lubricate it with special grease (for more information, refer to the maintenance instructions of the universal joint shaft manufacturer).

Use special grease only:

- Agraset 116 or
- Agraset 117

Follow installation instructions when installing the ratchet clutch on the implement.

12.10.1 Installation instructions for the ratchet clutch

The two ratchet clutches must not be mixed up during installation [see Table (Fig. 136)].

The ratchet clutches (1) rotate in the direction of the arrow (2).

The ratchet clutches (1) are installed correctly if, when seen from above, the arrows (2) on the ratchet clutches point opposite to the direction of travel.



Fig. 136

12.11 Hydraulic system



WARNING

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

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

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

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



- When connecting the hydraulic hose lines to the hydraulic system of connected implements, 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 they are damaged or worn. Only use original AMAZONE hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural aging, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose lines made of thermoplastics, other guide values may be decisive.
- Dispose of old oil in compliance with regulations. If you have problems with disposal, contact your oil supplier.
- Keep hydraulic fluid out of the reach of children!
- Ensure that no hydraulic fluid enters the soil or waterways.

12.11.1 Labelling of hydraulic hose lines

The valve chest identification provides the following information:

Fig. 137/...

- (1) Manufacturer's marking on the hydraulic hose line (A1HF)
- (2) Date of manufacture of the hydraulic hose line (12/02 = year/month = February 2012)
- (3) Maximum approved operating pressure (210 BAR).

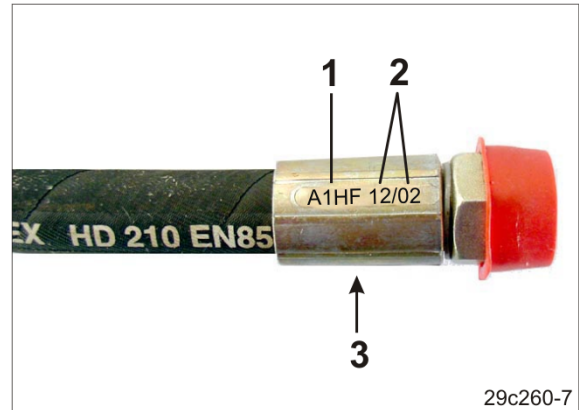


Fig. 137

12.11.2 Maintenance intervals

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

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

Before each start-up:

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

12.11.3 Inspection criteria for hydraulic hose lines



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

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

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

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

The date of manufacture of the hydraulic hose line on the assembly plus six years is decisive. If the date of manufacture on the assembly is "2012", then the hose should not be used after February 2018. For more information, see "Labelling of hydraulic hose lines".

12.11.4 Installation and removal of hydraulic hose lines



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

- Only use original AMAZONE hydraulic hose lines.
- Ensure cleanliness.
- You must always install the hydraulic hose lines so that, in all states of operation:
 - There is no tension, apart from the hose's own weight.
 - There is no possibility of compression for 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. There, avoid hose clips, which impair the natural movement and length changes of the hose.
- It is forbidden to paint over hydraulic hose lines!

12.12 Adjusting the speed of the implement booms during folding (specialist workshop)

A higher unfolding speed of the rotary cultivator than that set at the factory can cause damage to the implement. Therefore, make a correction only in exceptional cases with sufficient reason.

Using a hexagon socket wrench (Fig. 138/1), change the oil supply to a hydraulic cylinder at one throttle. The implement has 4 throttles.

1. Release the lock nut.
2. Make the adjustment [see Table (Fig. 138)].

Note:

Make the same adjustments on all four throttles.

3. Tighten the lock nut.
4. Check the settings with particular caution.

- **To increase the folding speed:**
Unscrew the hexagon socket head screw using a hexagon socket wrench (1) by a maximum of one-quarter turn.
- **To decrease the folding speed:**
Screw in the hexagon socket head screw using a hexagon socket wrench (1), by a maximum of one-quarter turn.



DANGER

- Observe the maximum adjustment distances (one-quarter turn).
- Make the same adjustments on all four throttles.
- Check the settings immediately and correct if necessary.

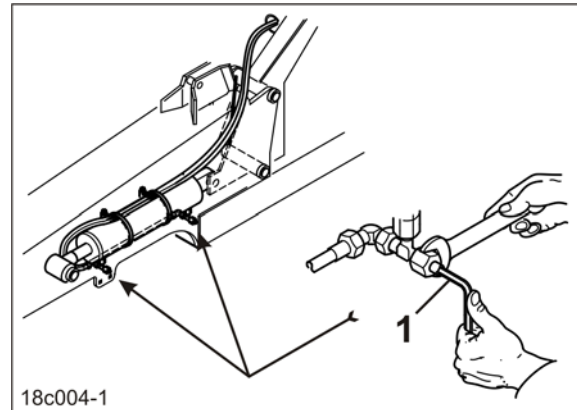


Fig. 138

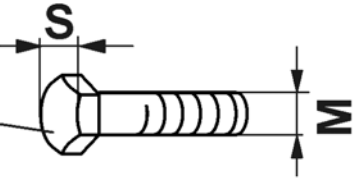
12.13 Screw tightening torques



Observe the specific data for tightening torques in the maintenance section.

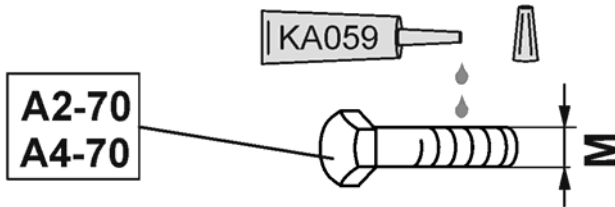



The table shows the permissible maximum values for bolted connections with a friction coefficient of $\mu=0.12$ and does not include any other safety factors. The listed tightening values are to be considered as reference values!

<div>8.8</div> <div>10.9</div> <div>12.9</div>		$\mu=0,12$		
M	S	Nm		
		8.8	10.9	12.9
M 8	13	25	36	42
M 8x1		27	38	41
M 10	16 (17)	48	71	83
M 10x1		52	73	88
M 12	18 (19)	84	123	144
M 12x1.5		90	125	150
M 14	22	133	195	229
M 14x1.5		150	210	250
M 16	24	206	302	354
M 16x1.5		225	315	380
M 18	27	295	421	492
M 18x1.5		325	460	550
M 20	30	415	592	692
M 20x1.5		460	640	770
M 22	32	567	807	945
M 22x1.5		610	860	1050
M 24	36	714	1017	1190
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



The specified tightening values represent reference values!



M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
 Nm	2.3	4.6	7.9	19.3	39	66	106	162	232	326	247	314



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