

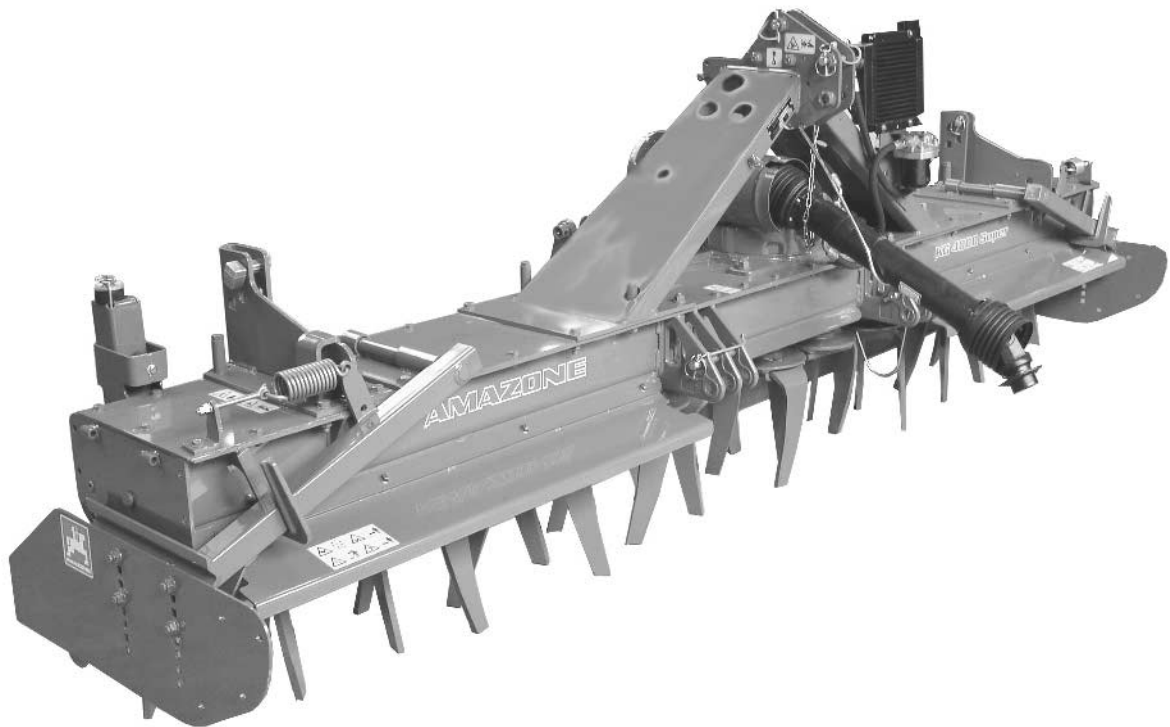
Operating Manual

AMAZONE

KG 3000 KG 4000 KG 4500

Super / Special

Rotary Cultivator



MG 1468
BAG0032.1 07.07
Printed in Germany



**Before starting operation,
please carefully read and ad-
here to this operator's manual
and safety advice.
Keep it in a safe place for fu-
ture use!**



Reading the instruction

manual and adhering 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 should 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 good success one should go into the mind of a thing, make himself familiar with every part of the machine and to get acquainted with its handling. Only in this way, would you be satisfied both with the machine as also with yourself. To achieve this is the purpose of this instruction manual.

Leipzig-Plagwitz 1872. Rud. Sark.



Identification data

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

Machine identification number:
(ten-digit)

Type:

KG Super/Special

Year of manufacture:

Basic weight (kg):

Approved total weight (kg):

Maximum load (kg):

Manufacturer's address

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Spare part orders

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Fax: + 49 (0)5405 501-106
E-mail: et@amazone.de
Online spare parts' catalogue: www.amazone.de
When ordering spare parts, always specify the (ten-digit) machine identification number.

Formalities of the operating manual

Document number: MG 1468

Compilation date: 07.07

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Preface

Preface

Dear Customer,

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

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

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

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

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

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

User evaluation

Dear Reader,

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

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1 User Information

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

1.1 Purpose of the document

This operating manual

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

1.2 Locations in the operating manual

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

1.3 Diagrams used

Handling instructions and reactions

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

Example:

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

Lists

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

Example:

- Point 1
- Point 2

Number items in diagrams

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

Example (Fig. 3/6)

- Figure 3
- Item 6

2 General Safety Instructions

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

2.1 Obligations and liability

Comply with the instructions in the operating manual

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

Obligations of the operator

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

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

The operator is obliged

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

If you still have queries, please contact the manufacturer.

Obligations of the user

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

- To comply with the basic workplace safety instructions and accident prevention regulations.
- To read and understand the section "General safety information" of this operating manual.
- To read the section "Warning symbols and other labels on the machine" (page 16) of this operating manual and to follow the safety instructions represented by the warning symbols when operating the machine.
- To get to know the machine.
- To read the sections of this operating manual, important for carrying out your work.

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

General Safety Instructions

Risks in handling the machine

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

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

Only use the machine

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

Eliminate any faults immediately, which could impair safety.

Guarantee and liability

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

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

2.2 Representation of safety symbols

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



DANGER

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

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



WARNING

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

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



CAUTION

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



IMPORTANT

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

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



NOTE

Indicates handling tips and particularly useful information.

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

2.3 Organisational measures

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

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



The operation manual

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

Check all the available safety equipment regularly.

2.4 Safety and protection equipment

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

Faulty safety equipment

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

2.5 Informal safety measures

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

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

2.6 User training

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

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

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

Legend:

X.. permitted

--..not permitted

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

Comment:

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



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

2.7 Safety measures in normal operation

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

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

2.8 Dangers from residual energy

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

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

2.9 Maintenance and repair work, fault elimination

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

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

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

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

2.10 Constructive changes

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

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

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



WARNING

Risk of contusions, cuts, dragging, catching or knocks from support parts.

It is forbidden to:

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

2.10.1 Spare and wear parts and aids

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

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

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

2.11 Cleaning and disposal

Handle and dispose of any materials used carefully, in particular

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

2.12 User workstation

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

2.13 Warning pictograms and other signs on the machine



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

Warning pictograms - structure

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

A warning pictogram consists of two fields:



Field 1

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

Field 2

is a pictogram showing how to avoid the danger.

Warning pictograms - explanation

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

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

Order number and explanation

Warning pictograms

MD 075

Danger from cutting or cutting off finger and hand caused by rotating machine parts!

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

Never ever reach into the danger area as long as the tractor engine is running with engaged PTO shaft / coupled hydraulic drive.

Only touch the machine parts when they have come to a full standstill.



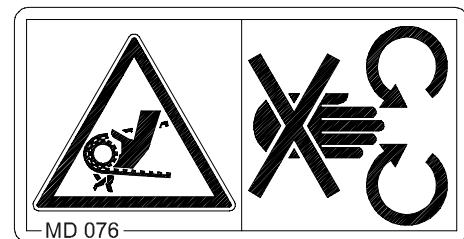
MD 076

Danger from dragging or catching hand or arm through driven unprotected chain- or belt drive!

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

Never ever open or remove guards from chain- or belt drives,

- as long as the tractor engine is running with engaged PTO shaft / coupled hydraulic drive
- or the ground wheel drive is still moving.

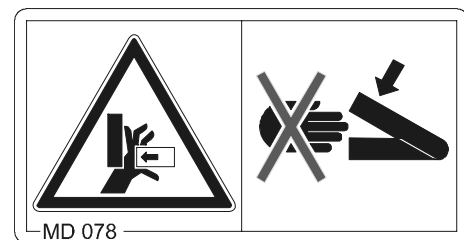


MD 078

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

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

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

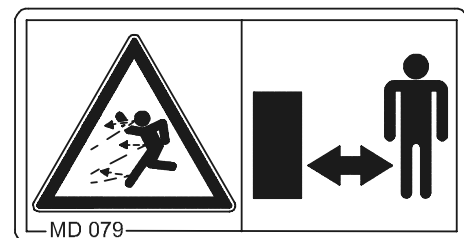


MD 079

Danger from parts thrown out of the machine or foreign particles!

This danger will cause serious injuries anywhere on the body.

Ensure that people maintain a sufficient safety distance from the danger area of the machine as long as the tractor engine is running.



General Safety Instructions

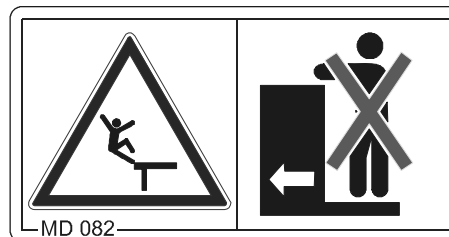
MD 082

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

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

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

Ensure that no-one rides with the machine.

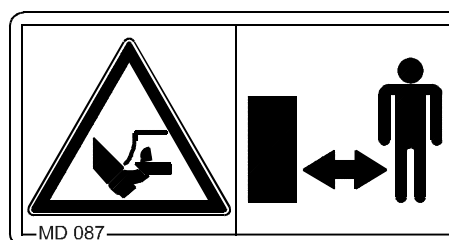


MD 087

Danger from cutting or cutting off toes or foot by driven tools!

This danger will cause serious injuries with the loss of parts of the body such as toes or foot.

Keep a safe distance from the danger area as long as the tractor engine is running with engaged PTO shaft / hydraulic drive.



MD 089

Danger!

Risk of contusions over the whole body in the danger area beneath suspended loads / machine parts!

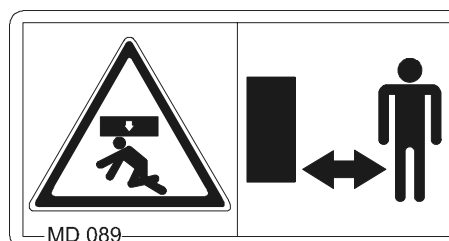
This danger will cause serious injuries anywhere on the body or death.

It is forbidden to stand beneath suspended loads / machine parts.

Keep a safe distance from suspended loads / machine parts.

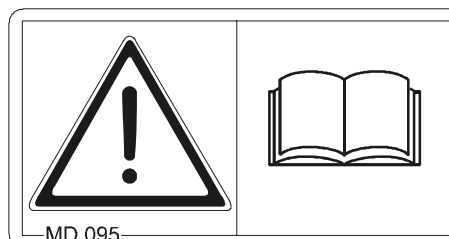
Ensure that people maintain a sufficient safety distance from suspended loads / machine parts.

Instruct people to leave the danger area beneath suspended loads / machine parts.



MD 095

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



MD 096

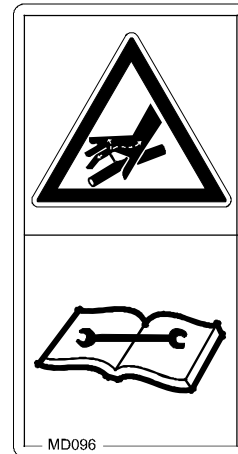
Danger of infection to the whole body from liquids escaping at a high pressure (hydraulic fluid)!

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

Never try to bung leaking hydraulic lines with your hand or with your fingers.

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

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



MD 097

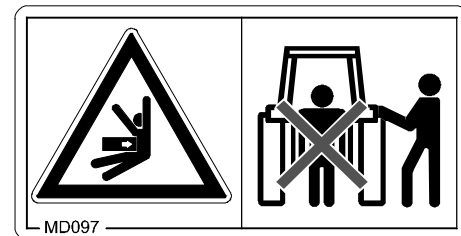
Risk of contusions for the body within the lifting area of the three point linkage by narrowing spaces due to the actuation of the three point hydraulics!

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

It is forbidden to stay within the lifting area of the three point linkage whilst actuating the three point hydraulic system.

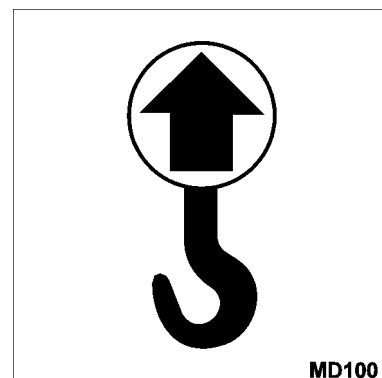
Actuate the setting parts for the three point hydraulics of the tractor

- only from the intended work place.
- never when staying within the danger area between tractor und machine.



MD 100

This pictogram identifies the points for fastening loading aids when loading the machine.

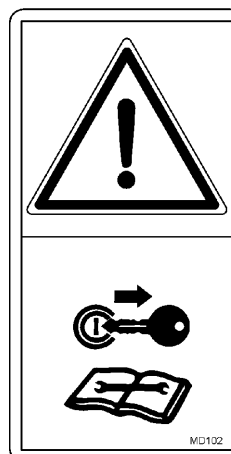


MD 102

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

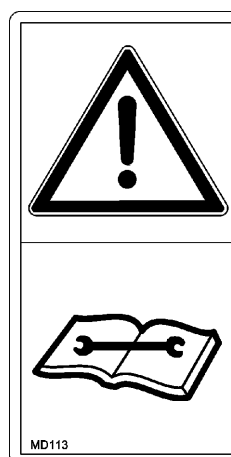
This danger will cause serious injuries anywhere on the body or death.

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



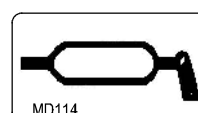
MD 113

Read and adhere to the hints for cleaning, maintenance and repair work in the relevant chapters in the instruction manual



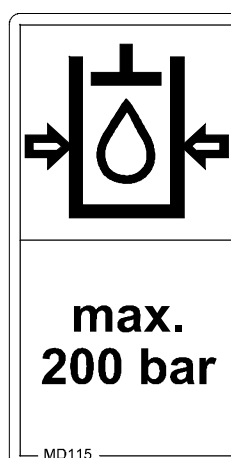
MD 114

This pictogram indicates a lubrication point



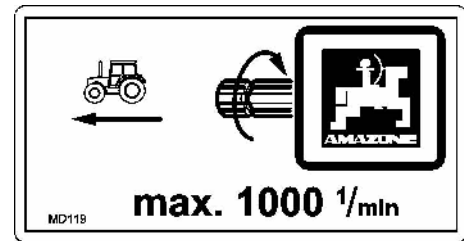
MD 115

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



MD 119

Nominal rev. speed (max. 1000 1/min) and sense of rotation of the drive shaft on the implement side.



2.13.1 Positioning of warning pictograms and other labels

Warning pictograms

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

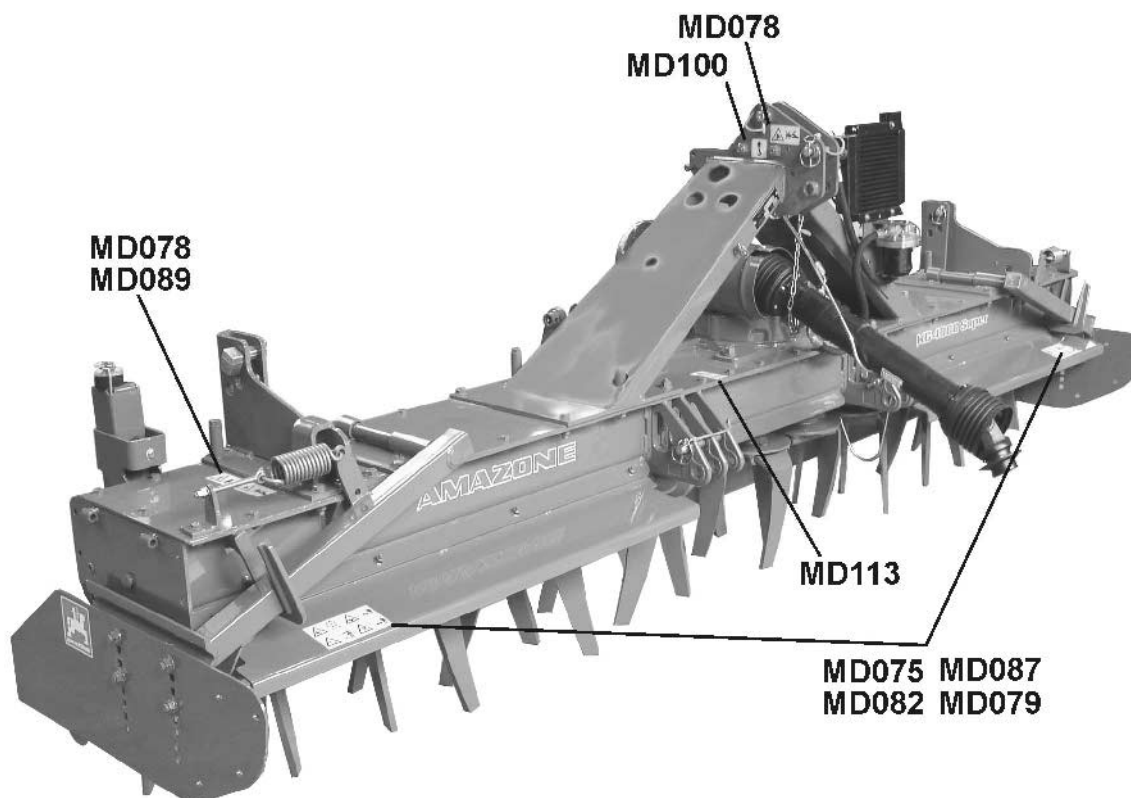


Fig. 1

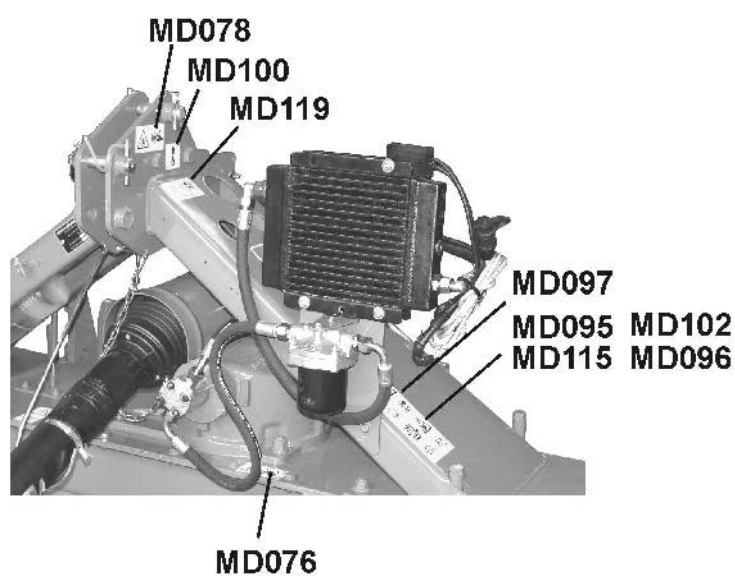


Fig. 2

2.14 Dangers if the safety information is not observed

Non observance of the safety information

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

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

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

2.15 Safety-conscious working

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

Comply with the accident prevention instructions on the warning pictograms.

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

2.16 Safety information for users



WARNING

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

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

2.16.1 General safety and accident prevention information

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

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

Connecting and disconnecting the machine

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

Any helpers may only act as guides standing next to the vehicles, and may only move between the vehicles when both are at a standstill.
- Secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is impossible, before connecting the machine to or disconnecting the machine from the tractor's three-point hydraulic system.

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

Use of the machine

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



Machine transportation

- When using public highways, 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
 - the brake and hydraulic system for visible damage
 - that the parking brake is released completely
 - the proper functioning of the braking system
- Ensure that the tractor has sufficient steering and braking power. Any machines and front/rear weights connected to the tractor influence the driving behaviour and the steering and braking power of the tractor.
- If necessary, use front weights.

The front tractor axle must always be loaded with at least 20% of the empty tractor weight, in order to ensure sufficient steering power.
- Always fix the front or rear weights to the intended fixing points according to regulations.
- Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor.
- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected machine).
- Check the brake power before moving off.
- When turning corners with the machine connected, take the broad load and balance weight of the machine into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the machine is fixed to the three-point hydraulic system or lower links of the tractor.
- Before moving off, move all the swivel machine parts to the transport position.
- Before moving off, secure all the swivel machine parts in the transport position against risky position changes. Use the transport locks intended for this.
- Before moving off, secure the operating lever of the three-point hydraulic system against unintentional raising or lowering of the connected machine.
- Check that the transport equipment, e.g. lighting, warning equipment and protective equipment, is correctly mounted on the machine.
- Before transportation, carry out a visual check that the upper and lower link bolts are firmly fixed with the lynch pin against unintentional release.
- Adjust your driving speed to the prevailing conditions.
- Before driving downhill, switch to a low gear.
- Before moving off, always switch off the independent wheel braking (lock the pedals).

2.16.2 Hydraulic system

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

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

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

2.16.3 Electrical system

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

2.16.4 Operation with PTO shafts

- Only use PTO shafts which are designed for the implement by the manufacturer and which are equipped with all legally requested guards!
- Please also observe the operator's manual of the PTO shaft manufacturer.
- Guard tube and guard cone of the PTO shaft must not be damaged and the guard of the tractor- and implement universal joint shaft must be fitted and in a proper condition.
- Working with damaged guards is prohibited.
- Fit and remove the PTO shaft only when
 - the PTO shaft is stopped
 - engine is stopped
 - parking brake is applied
 - ignition key is removed
- Ensure correct fitting and securing of the PTO support!
- When using wide angle PTO shaft always attach the wide angle joint on to the pivot point!
- Prevent PTO guard from spinning by fixing the provided chain to a nearby static part!
- On PTO shafts always ensure the tube has sufficient overlap in transport- and operating position. (Observe instruction manual of the PTO shaft manufacturer)
- When travelling in curves mind the permissible angling and sliding length!
- Prior to switching on the universal joint shaft ensure that the chosen universal joint shaft speed of the tractor coincides with the permissible drive speed of the implement.
- Prior to switching on the universal joint shaft advise people to leave the danger area of the machine.
- When operating the universal joint shaft no person is allowed to stay within the area of the rotating universal joint shaft or of the PTO shaft.
- Never switch on the tractor PTO while the engine is stopped!
- Always stop PTO when it is not needed or when the shaft is in an adverse position!
- **WARNING! Danger of injury!** After switching off the PTO the mounted implement may continue to run by its dynamic masses! During this period never come too close to the implement. Begin work on the implement only after it has come to a full standstill!
- Secure the tractor and the machine against unintentional start-up and rolling before carrying out any cleaning, greasing or setting work on universal joint shaft driven implements or PTO shafts.
- Deposit removed PTO shaft on the provided carrier!
- When travelling in curves mind the permissible angling and sliding length!
- When using the ground-related PTO take note that the PTO speed is related to the forward speed and that the sense of rotation reverses when backing up!

2.16.5 Cleaning, maintenance and repairs

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

3 Loading and unloading

Loading with a hoist crane:



Danger!

- When loading the machine with a hoist crane use the indicated points for fixing the lifting straps!
- Never stand underneath unsecured loads.
- The minimum tensile strength of the lifting belt must exceed the total weight of the machine (see technical data).

- For loading the **KG without roller** use a crane hook as illustrated in Fig. 3/1.
- For loading the **KG with roller** use a crane hook as illustrated in Fig. 3/2.

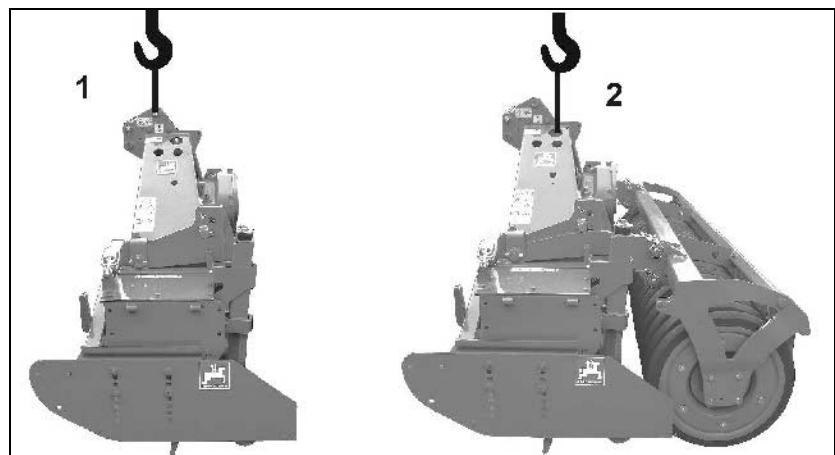


Fig. 3

4 Product description

This chapter

- provides you with a comprehensive survey about the design of the machine.
- provides the descriptions of the individual components and parts.

Read this chapter when standing at the machine. In this way you will get optimally acquainted to the machine.

4.1 Overview – components

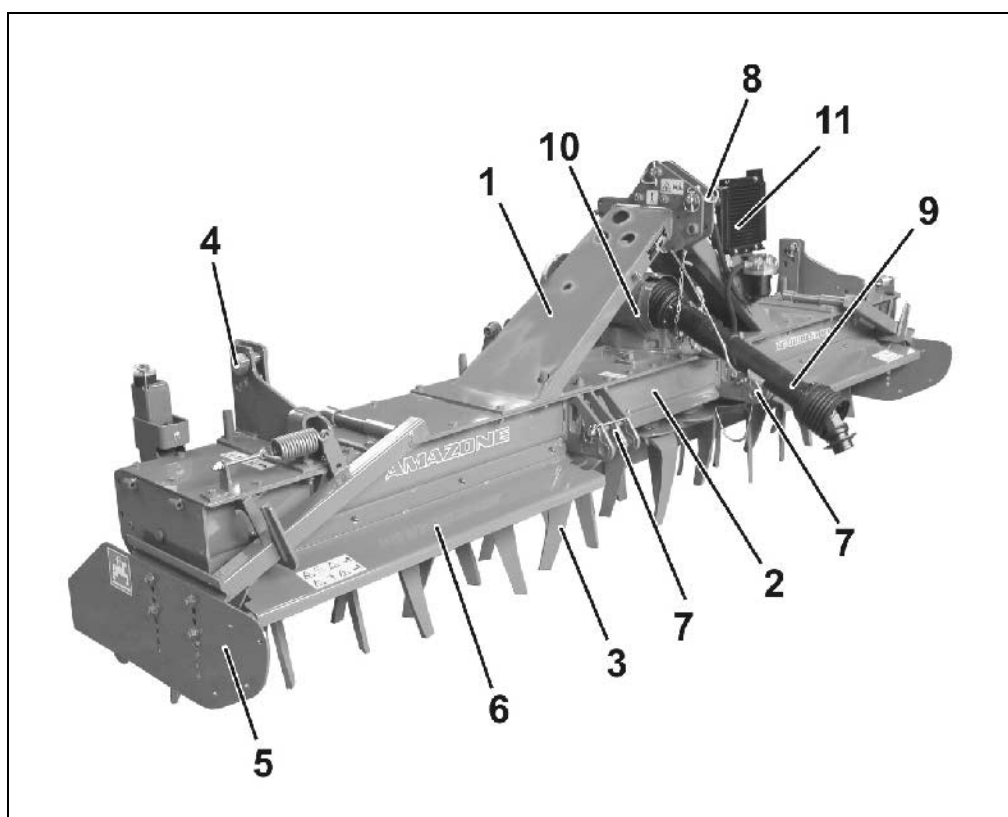


Fig. 4

- | | |
|--|---------------------------------------|
| (1) Frame | (7) Lower link fixing points |
| (2) Oil trough | (8) Top link fixing points |
| (3) Tines | (9) PTO shaft |
| (4) Eccentric pin for setting the tine depth | (10) Implement side PTO shaft guard |
| (5) Side guide plates | (11) Oil cooler for gear oil (option) |
| (6) Tool guard plate | |

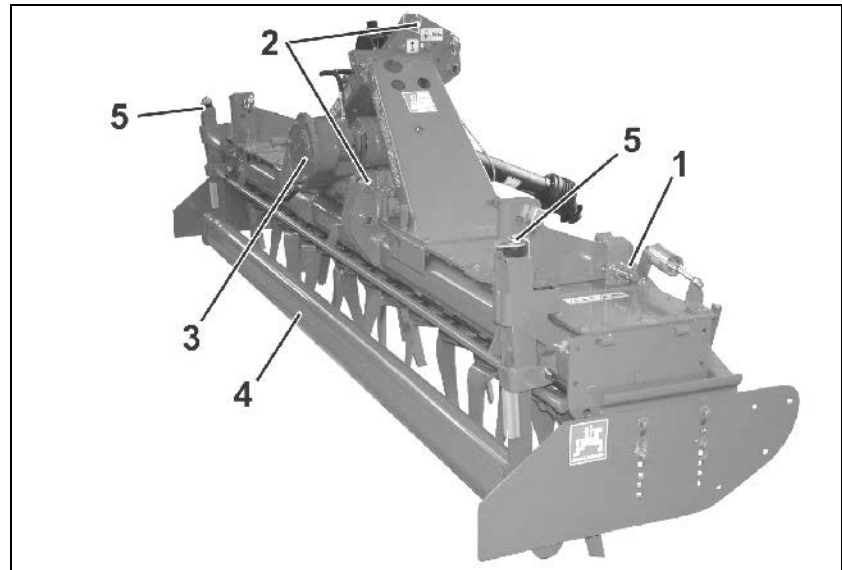


Fig. 5

- (1) Fixing points for the carrying arms of the roller
- (2) Fixing points for the "Liftpack" system
- (3) Exchange gear main gearbox
- (4) Levelling bar
- (5) Height adjustment of the levelling bar

4.2 Safety and guard devices

- PTO shaft guard on the gearbox
- Tool guard plate
- PTO shaft all around guard
- Levelling bar
- Rollers
- Side guide plates

4.3 Supply lines between the tractor and the machine

For option oil cooler only / Liftpack system:

- Hydraulic hose lines
- Electric cable for oil cooler

4.4 Designated use of the machine

The Rotary cultivator **KG Super / Special**

- is designed for the usual soil tillage of arable fields.
- is coupled to the tractor via the tractor three point linkage and operated by one operator.
- must only be operated with fitted levelling bar and following roller.

This also applies when the **KE 304** is operated as part of a combination (see on page 72).

Operating on slopes is possible under following conditions

- When operating across slopes
maximum angle of machine in the direction of travel to the left 20 %
maximum angle of machine in the direction of travel to the right 20 %
- When operating up and down hill
uphill 20 %
downhill 20 %

The declined use also includes:

- The declined use also includes:
- observing all hints in this operator's manual.
- adhering the service and maintenance work.
- the exclusive use of original -**AMAZONE**- spare parts.

Other use than that stipulated is prohibited and is no longer considered as designed use.

For damage resulting from not designed use

- the operator himself will carry the full risk,
- the manufacturer will not accept any responsibility.

4.5 Danger area and danger points

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

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

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

No-one may stand in the machine danger area:

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

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

Danger points exist:

- between the tractor and machine, especially when coupling and uncoupling.
- within the area of the rotating tines
- when climbing the machine
- underneath raised, unsecured machines or parts of machines.

4.6 Rating plate and CE marking

The following diagrams show the location of the rating plate and CE marking.

The rating plate shows:

- machine ID no.
- type
- permissible system pressure (bar)
- year of manufacture
- factory
- power output (kW)
- basic weight (kg):



Fig. 6

4.7 Technical data

KG		3000		4000		4500	
		Super	Special	Super	Special	Super	Special
Working width	[m]	3,00		4,00		4,50	
Transport width	[m]	3,00		4,00		4,50	
Total height	[m]	1,37		1,37		1,37	
Empty weight / Basic weight	[kg]	1175		1445		1520	
Weights of the rollers							
SW 420 [kg]	[kg]	207		-		-	
SW 520 [kg]	[kg]	218		288		-	
PW 420 [kg]	[kg]	365		-		-	
PW 500 [kg]	[kg]	444		564		621	
PW 600 [kg]	[kg]	671		873			
KW 520 [kg]	[kg]	464		-		-	
KW 580 [kg]	[kg]	614		844		924	
Distance centre of gravity d	[m]	0,55		0,55		0,55	
Number of rotors		10		14		16	
Length of tines	[cm]	33		33		33	
Max. working depth	[cm]	20		20		20	
Category of coupling points	cat.	II / III		II / III		II / III	



The total weight results from the sum of the basic weights of

- **KG**
- fitted rollers!

4.8 Conformity

The machine fulfils the:

Directives / standards

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

4.9 Necessary tractor equipment

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

Tractor engine power

KG Special	to 160 kW (220 HP)
KG Super	to 220 kW (300 HP)

4.10 Noise production data

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

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.

5 Structure and function

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

Operate the **AMAZONE KG Super /KG Special** rotary cultivator with following roller as

- solo machine
- as part of a till and drill combination with
 - **AMAZONE** - Pack Top seed drills
 - **AMAZONE** – Mounted seed drills.

KG are utilised for

- seed bed preparation after ploughing, usage of a rotary cultivator or a deep cultivator
- seed bed preparation without preparatory work
- Stubble working
- Ploughing up of grassland.

5.1 PTO shaft

The PTO shaft provides the power transmission between tractor and machine.

The **KG Super / Special** are equipped with a PTO shaft with ratchet clutch (Fig. 7/1).

Fit the ratchet clutch on the implement side.

The maximum torque is:

- **KG Super** : 2500 Nm,
- **KG Special** : 2200 Nm

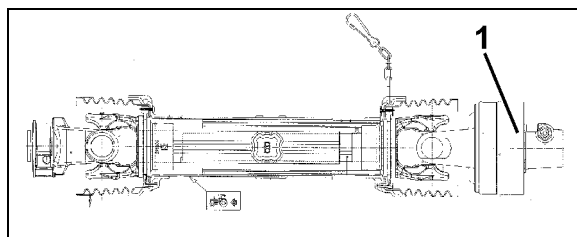


Fig. 7

Fig. 8/...

- (1) PTO shaft
- (2) Strap for PTO shaft
- (3) Fixing position for strap during operation with a safety lynch pin.
- (4) Fixing chain for PTO shaft guard.

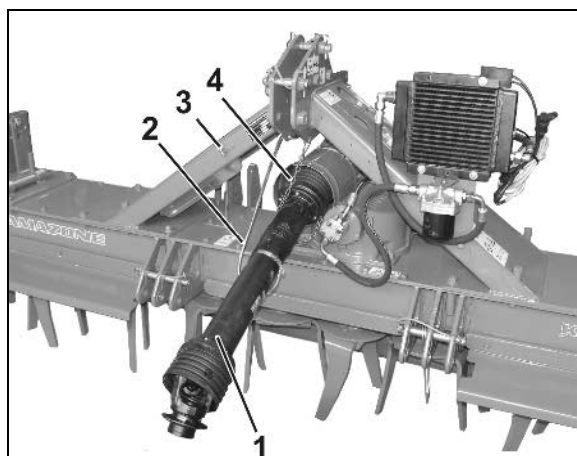


Fig. 8

**WARNING****Danger of contusion from unintentional start-up and unintentional rolling of tractor and machine.**

Only couple and uncouple the PTO shaft to and from the tractor when tractor and machine have been secured from unintentional start up and unintentional rolling.

**WARNING****Danger from catching and trapping from unsecured PTO shaft or damaged guards.**

- Never ever use the PTO shaft without guards or with defective guards or without correct use of the fixing chain.
- Prior to any operation ensure that all guards on the PTO shaft are fitted and of proper function.
- Hook in the fixing chains (does not apply for PTO shafts with all around guard) in such a way that sufficient movement is ensured in all operational positions. Ensure that the fixing chains do not get caught on components of the tractor or of the machine.
- Take care for the immediate replacement of damaged or missing parts of the PTO shaft by genuine parts of the PTO shaft manufacturer.

Bear in mind that only a specialist workshop is authorised to repair PTO shafts.

**WARNING****Danger from catching or trapping through unsecured parts of the PTO shaft within the range of the power transmission between tractor and driven machine!**

This danger will cause extremely serious injuries or even death.

Only operate with completely secured drive between tractor and driven machine.

- Ensure that the unsecured parts of the PTO shaft are always secured by a guard plate on the tractor and a guard cone on the machine.
- Ensure that the guard plate on the tractor and the guard cone on the machine and the safety devices and guards of the stretched PTO shaft always overlap by 50 mm. If not, you are not allowed to drive the machine via the PTO shaft.



- Only use the supplied PTO shaft and the supplied PTO shaft type.
- Read and adhere to the operator's manual of the PTO shaft. The appropriate use and maintenance of the PTO shaft will protect from severe accidents.
- When coupling the PTO shaft adhere to the operator's manual of the PTO shaft manufacturer.
- Ensure sufficient space within the swivel range of the PTO shaft. Insufficient space would cause damage on the PTO shaft.
- Observe the permissible drive rev. speed of the machine.
- In case the PTO shaft is equipped with an overload- or free-wheel coupling always mount the overload- or freewheel coupling on the implement side.
- Observe the correct positioning when fitting the PTO shaft. The tractor symbol on the guard tube of the PTO shaft identifies the tractor side connection of the PTO shaft.
- Before engaging the universal joint shaft read and adhere to the safety advice for universal joint shaft operation in the chapter "Safety information for the users", page 29.

5.1.1 Coupling the PTO shaft

1. Clean and grease the universal joint shaft on the tractor and the input shaft of the gearbox on the machine.
2. Couple tractor and machine.
3. Secure the tractor from unintentional start up and unintentional rolling.
4. Ensure that the PTO shaft is disengaged.
5. Couple the PTO shaft on to the universal joint shaft of the tractor. When doing this observe the hints of the PTO shaft manufacturer and the permissible drive rev. speed of the machine.
The tractor symbol on the guard tube of the PTO shaft identifies the tractor side connection of the PTO shaft.
6. Use the fixing chain(s) to secure the PTO shaft from spinning.
 - 6.1 Attach the fixing chain(s) as far as possible in an right angle to the PTO shaft.
 - 6.2 Attach the fixing chain(s) in such a way that the sufficient swivel range of the PTO shaft in all operational positions is ensured. Fixing chains must not get caught on components of the tractor or the machine.

5.1.2 Uncoupling the PTO shaft



CAUTION

Danger from getting burnt through hot components of the PTO shaft.

This danger will cause slight to severe injury of the hands.

Never touch hot components of the PTO shaft (especially no couplings).



- Deposit the uncoupled PTO shaft in the provided retainer. In this way you will protect the PTO shaft from damage and dirt.
Never ever use the fixing chain of the PTO shaft to hang up the uncoupled PTO shaft.
- Prior to any prolonged standstill clean and grease the PTO shaft.

1. Switching off the universal joint shaft.
2. Lower the machine onto the ground.
3. Secure tractor and machine against unintentional start up and unintentional rolling.
4. Pull the PTO shaft off the universal joint shaft of the tractor.
5. Deposit the PTO shaft into the provided retainer.

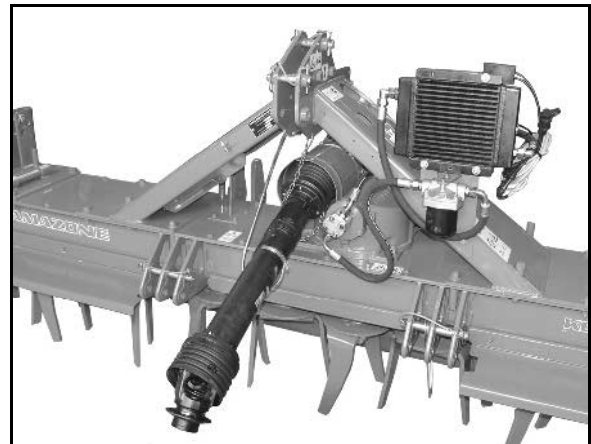


Fig. 9

5.2 Hydraulic system connections



WARNING

Danger of infection from escaping hydraulic fluid at high pressure!

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

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



All hydraulic hose lines are provided with coloured marking in order to assign each hydraulic function to the pressure line of a tractor control unit.

Tractor control valve		Function	Hose markings
1	Double action	Setting the working depth	• deeper
		(option)	• lower
2	Single action	Liftpack system	green

5.2.1 Coupling the hydraulic hose lines



WARNING

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

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



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

1. Set tractor control unit to open centre position (neutral position).
2. Before coupling, clean hydraulic plugs on hydraulic hose lines.
3. Couple hydraulic hose line(s) with the tractor control unit(s).

5.2.2 Uncoupling the hydraulic hose lines

1. Set tractor control unit to open centre position (neutral position).
2. Release hydraulic plug from the hydraulic sockets.
3. Protect the hydraulic plugs and hydraulic sockets from dirt by using the dust caps.
4. Fasten the hydraulic plugs in the empty coupling points.

5.3 Tines

The tines made from special hardened steel provide a smooth run of the soil tillage implement.

The long tines allow an excellent trash passage.

The round rotor heads prevent stones being trapped in between. The tines are slid into sockets (Fig. 10/2) and the sprung fixing allows the tines to give way to stones or other obstacles.

- **Tines "on grip" are better pulled into the soil.**
- **"Drag" tines press the clods downwards and leave a visually finer seed bed.**

The depth setting is carried out by inserting the carrying arms with the aid of the **AMAZONE**-eccentric pins (Fig. 11/1).

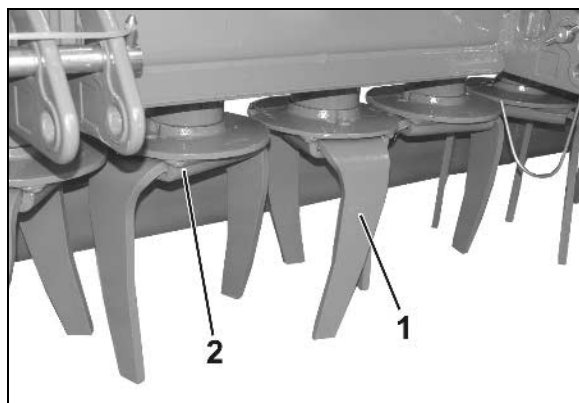


Fig. 10

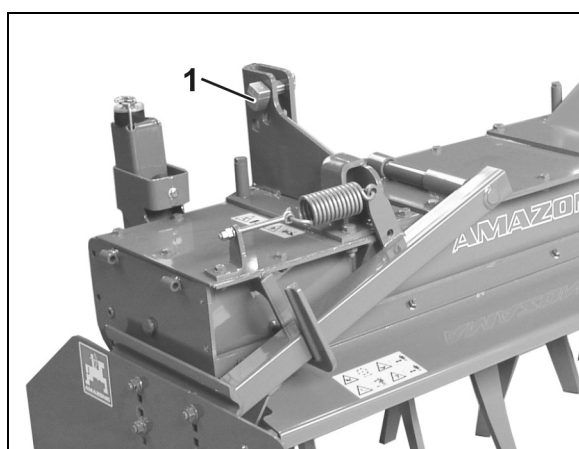


Fig. 11

5.3.1 Hydraulic depth setting (option)

The working depth of the rotary cultivator is hydraulically adjustable via a double acting tractor control valve. As guidance make use of (Fig. 12/1) with pointer (Fig. 12/2).

- low value→ shallower working depth
- high value→ deeper working depth

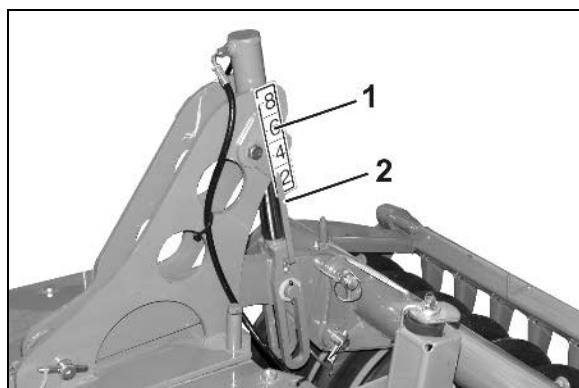


Fig. 12

5.4 Exchange gear main gearbox

The **AMAZONE KG Super/ Special** are provided with an exchange gear main gearbox with two spur gear wheels.

- Gearbox **KG Super** for a tractor capacity of up to 300HP.
- Gearbox **KG Special** for a tractor capacity of up to 220HP.

The gearbox ratio is adjustable by exchanging the gear wheel pairing.

Fig. 13/

- (1) Exchange gear main gearbox
- (2) Oil dip stick
- (3) Oil drain plug / connection for oil cooler
- (4) Connection oil cooler

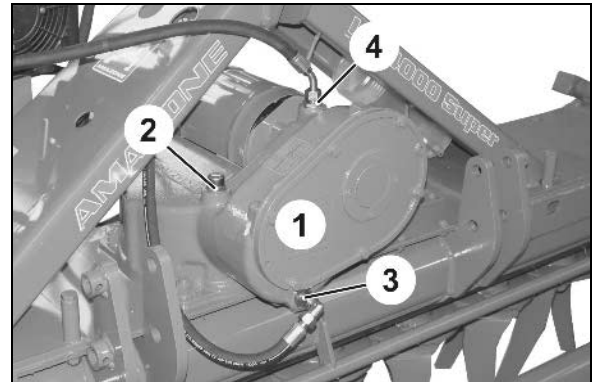


Fig. 13

5.5 Levelling rod

The levelling rod (Fig. 14/1) eliminates prevailing soil undulations, e.g. in front of the roller. Remaining clods on extremely heavy soils are crumbled.

The levelling rod eliminates the danger that, e.g. the tooth packer roller comes to a standstill on extremely loose, dry and light soils. The levelling rod pre-compacts loose soil and the slip of the tooth packer roller is reduced.

The height adjustment of the levelling bar is carried out via a ratchet with hex. nut (Fig. 14/2).

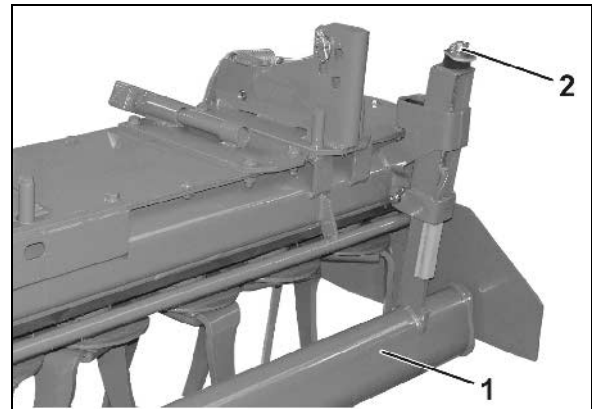


Fig. 14

5.6 Side guide plates

The side plates (Fig. 15/1) ensure that the tilled soil cannot escape laterally or from between the soil tillage implement and the packer roller. The flow of soil is guided towards the rear so that it falls directly under the roller.

- Spring suspended side plates (Fig. 15/1).

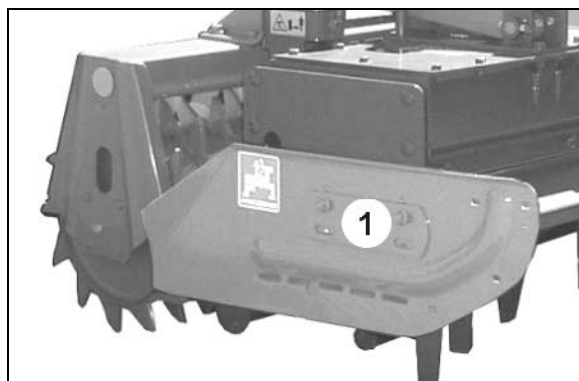


Fig. 15

- Swivellable side plates (Fig. 16/1).

The working depth of the side plates and the spring tension (only on machines with hinged side plates) must be adapted to the soil conditions so that the limitation of the soil flow from these plates becomes effective.

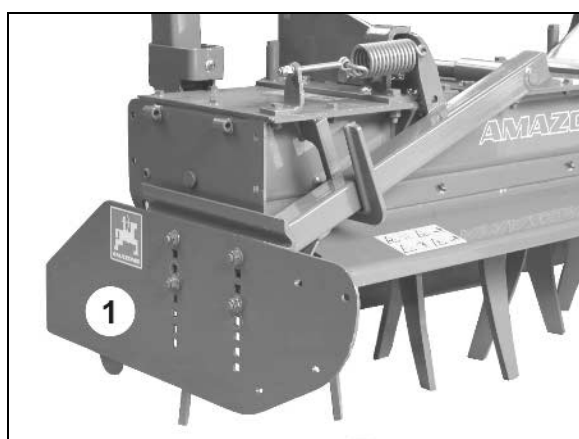


Fig. 16

5.7 Rollers

- **Cage roller SW**

Cage rollers create an open surface and can be combined with mounted seed drills.

The cage roller is not suited for combinations with Pack Top seed drills.

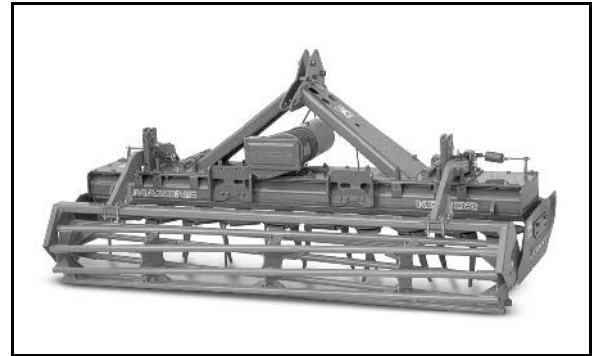


Fig. 17

- **Wedge ring roller**

The wedge ring roller operates blockage free at a band wise re-consolidation. The highest re-consolidation is achieved within the range of the seed embedding for an accurate seed placement. The surface remains open.

The roller is suited for medium and heavy soils and for all seed drills.

The roller is cleaned with the aid of hard metal coated scrapers.

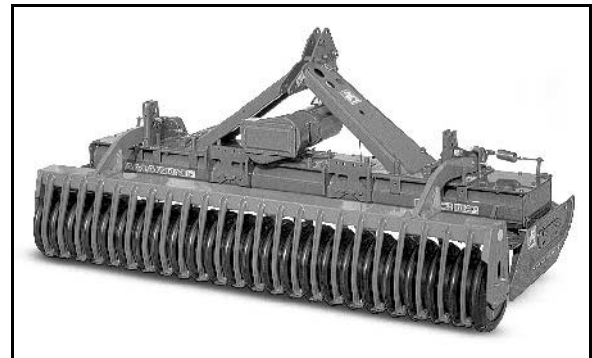


Fig. 18

- **Tooth packer rollers**

The tooth packer roller operates blockage-free at surface-related rolling. Area covering re-compaction. The roller is cleaned by hard metal coated scrapers.

The roller is suited for all seed drills and all kinds of soil.

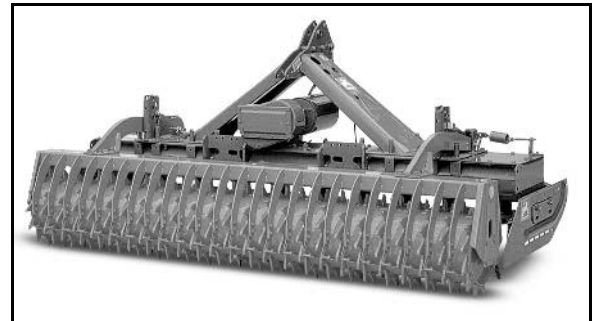


Fig. 19

5.8 Three point extension (Option)

The three point extension allows the increase of distance between tractor and machine.

Fitting:

Fit the three point extension to the upper (Fig. 20/1) and lower link points (Fig. 20/2), secure with the aid of each 2 pins and secure by using lynch pins.

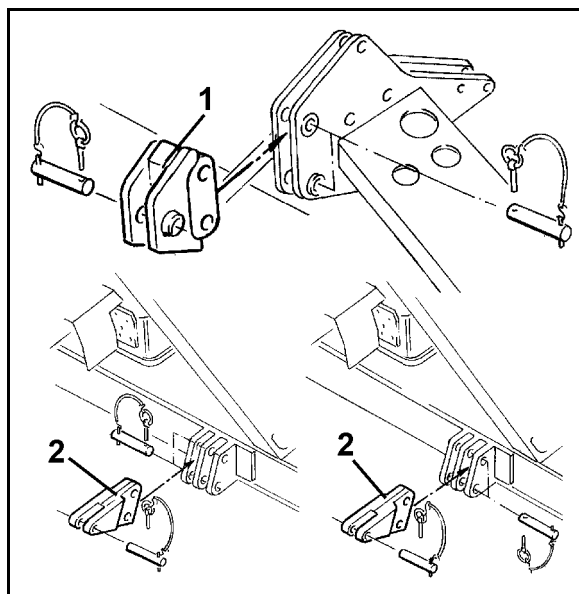


Fig. 20

5.9 Tractor wheel mark eradicators (Option)

Tractors with narrow tyres often leave deep wheel marks in the unpacked soil.

The soil tillage implement can be used at shallower working depths if these deep marks are first removed by the tractor wheel mark eradicators (Fig. 21).



When parking the soil tillage implement with the eradicator tines attached ensure that the machine stands on firm ground. The eradicator tines, however, should be pushed in loose soil to prevent them from being damaged!

Montage:

1. Replace the existing lid-fastening bolts by the supplied longer hex. Bolts.
2. Connect the support tube (Fig. 21/1) with the soil tillage implement by using two lid fastening bolts (Fig. 21/2).
3. Use clamping plates (Fig. 21/4) and bolts to affix the wheel mark eradicator (Fig. 21/3) on the carrying tube.

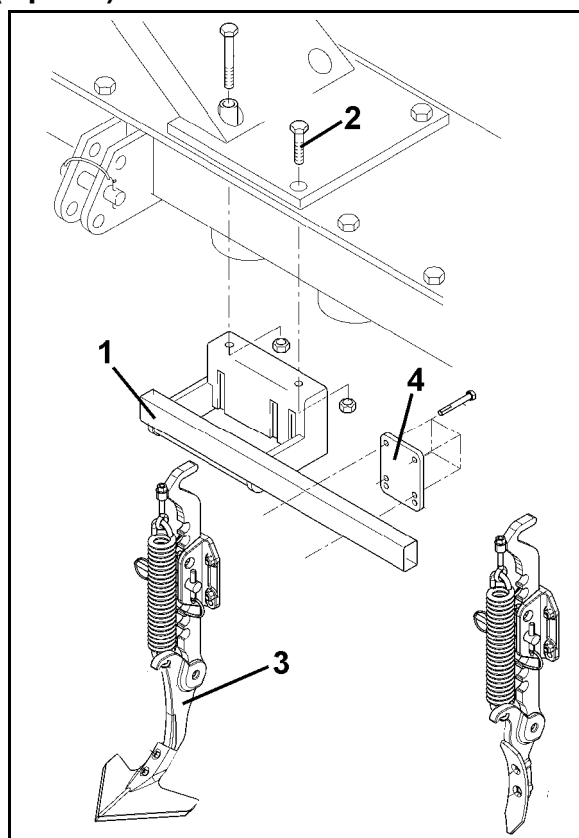


Fig. 21

6 Commissioning

This section contains information

- on operating your machine for the first time.
- on checking how you may connect the machine to your tractor.



- Before operating the machine for the first time the operator must have read and understood the operating manual.
- Follow the instructions given in the section "Safety instructions for the operator" on page 24 onwards when
 - connecting and disconnecting the machine,
 - transporting the machine and
 - using the machine
- Only couple and transport the machine to/with a tractor which is suitable for the task.
- The tractor and machine must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.



WARNING

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

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

- are continuous or
- are automatically locked or
- necessarily require an open centre or pressure position to operate correctly

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

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

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

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

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

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

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



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

- empty tractor weight
- ballast weight and
- machine's total weight when attached or supported weight when hitched.



This note only applies to Germany:

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

6.1.1.1 Data required for the calculation

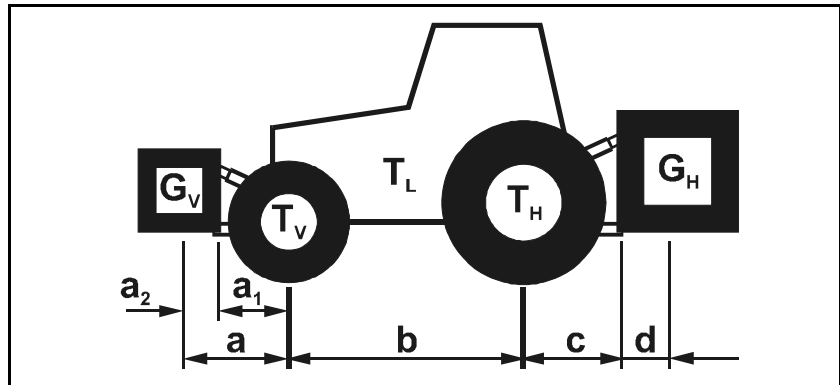


Fig. 22

T_L	[kg]	Tractor net weight	please see tractor Operator's manual / registration papers
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of empty tractor	
G_H	[kg]	Front weight (if existing)	please see technical data of the machine or rear ballast weight
G_V	[kg]	Support load with full hopper	please see technical data of the front mounted machine or front ballast weight
a	[m]	Distance between the centre of gravity of the front mounted machine or front weight and centre of the front axle (sum $a_1 + a_2$)	please see technical data of tractor and front mounted machine or front ballast weight or measure
a_1	[m]	Distance between centre of the front axle and the lower link joint	please see tractor Operator's manual or measure
a_2	[m]	Spacing between centre lower link ball and centre of gravity of the front mounted machine or front weight (point of gravity spacing)	please see technical data front mounted machine or front ballast weight or measure
b	[m]	Wheel base of tractor	please see tractor Operator's manual or vehicle registration papers or measure
c	[m]	Spacing between centre rear axle and centre lower link ball	please see tractor Operator's manual or vehicle registration papers or measure
d	[m]	Tractor net weight	please see technical data of the machine

6.1.1.2 Calculation of the minimum ballast front $G_{V \min}$ to ensure the steer ability

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

Enter into the table the figure for the determined minimum ballast weight $G_{V \min}$, which is required in the front of the tractor (see on page 53).

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

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

Enter the figure for the calculated actual total front axle load and the permissible front axle load indicated in the operator's manual for the tractor into the table (see on page 53).

6.1.1.4 Calculation of the actual total weight of the combination tractor/mounted implement

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

Enter the figure for the calculated actual total weight and the permissible tractor total weight as indicated in the tractor-operator's manual into the table (see on page 53).

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

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

Enter the figure for the actual rear axle load and the permissible tractor rear axle load indicated in the tractor-operator's manual into the table (see on page 53).

6.1.1.6 Tyre carrying capacity

Enter double the value (two tyres) of the tyre carrying capacity (please refer e.g. to the documentation of the tyre manufacturer) into the table (see on page 53).

6.1.1.7 Table

	Actual value according to the calculation	Permissible value according to the tractor-operator's manual	Double the permissible tyre carrying capacity (two tyres)
Minimum ballast Front / rear	<div style="border: 1px solid black; padding: 5px; text-align: center;">/ kg</div>	--	--
Total weight	<div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	--
Front axle load	<div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>
Rear axle load	<div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 5px; text-align: center;">kg</div>



- Please take the permissible values for the tractor total weight, axle loads and tyre carrying capacity from the registration papers of your tractor.
- The actual calculated values must be smaller than /equal to (\leq) the permissible values!


WARNING

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

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

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



- Apply ballast to your tractor with the aid of a front or rear weight if the tractor axle load is exceeded only on one axle.
- Special cases:
 - If the required minimum front ballast weight ($G_{V \min}$) is not achieved with the weight of the front mounted machine (G_V), additional weights in addition to the front mounted machine are required!
 - If the required minimum rear ballast weight ($G_{H \min}$) is not achieved with the weight of the rear mounted machine (G_H) additional weights in addition to the rear mounted machine are required!

6.2 Matching the PTO shaft to the tractor



WARNING

Danger from defective and/or destroyed flinging components result if the PTO shaft upsets or is pulled apart due to improper matching of the PTO shaft length when lifting/lowering the machine coupled on to the tractor!

Prior to the initial coupling of the PTO shaft on to your tractor have the length of the PTO shaft in all operational conditions checked by a specialist workshop and match, if necessary.

In this way upsetting of the PTO shaft or insufficient profile overlapping is avoided.



This matching of the PTO shaft is only valid for the actual tractor type. Possibly you would have to repeat matching the PTO shaft if you couple the machine on to another tractor. When matching the PTO shaft, please implicitly adhere to the operator's manual of the PTO shaft manufacturer.



WARNING

Danger from dragging and catching due to incorrect fitting or unapproved constructive changes of the PTO shaft!

Only a specialist workshop is entitled to carry out constructional changes on the PTO shaft. For this the operator's manual of the PTO shaft manufacturer should be observed.

Matching of the PTO shaft length is permitted when the minimum profile overlapping is ensured.

Constructional changes on the PTO shaft are not permitted unless they are described in the operator's manual of the PTO shaft manufacturer.



WARNING

Risk of contusion between the rear of the tractor and the machine when lifting and lowering the machine to determine the shortest and longest operational position of the PTO shaft.

Actuate the setting levers for the three point hydraulic system of the tractor

- only from the intended workstation.
- never ever when staying within the danger zone between tractor and machine.



WARNING

Risk of contusion when

- **rolling the tractor and the coupled machine!**
- **lowering the lifted machine!**

Before entering the danger area between tractor and lifted machine in order to match the PTO shaft secure tractor and machine against unintentional start-up and unintentional rolling and the lifted machine against unintentional lifting.



The horizontal arrangement of the PTO shaft results in its shortest dimension. The longest dimension of the PTO shaft results at completely lifted machine.

1. Coupling tractor and machine (PTO shaft not fitted).
2. Apply the tractor's parking brake.
3. Determine the lifting height of the machine with the shortest and the longest operational position for the PTO shaft.
 - 3.1 To do this lift and lower the machine with the aid of the tractor's three point hydraulics.

Actuate the setting levers for the tractor's three point hydraulics on the rear of the tractor from the intended workplace.
4. Secure the raised machine in its determined lifting height against unintentional lowering (for example by supports or by hooking into a hoist crane).
5. Secure the tractor against unintentional start up before entering the danger area between tractor and machine.
6. When determining the length and when shortening the PTO shaft observe the operator's manual of the PTO shaft's manufacturer.
7. Re-insert the shortened PTO shaft halves.
8. Prior to connecting the PTO shaft grease the universal joint shaft of the tractor and the input shaft of the gearbox.

The tractor symbol on the guard tube identifies the tractor side connecting point of the PTO shaft.

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



WARNING

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

- **unintentional lowering of the machine when it is raised with the tractor's three-point hydraulic system and unsecured.**
- **unintentional lowering of parts of the machine when in a raised position and unsecured.**
- **Unintentional start-up and rolling of the tractor-machine combination.**
- Secure the tractor and the machine against unintentional start-up and rolling before any intervention in the machine.
- It is forbidden to make any intervention in the machine, such as installation, adjustment, troubleshooting, cleaning, maintenance and repairs
 - when the machine is being operated.
 - as long as the tractor engine is running with the Cardan shaft / hydraulic system connected.
 - if the ignition key is in the tractor and the tractor engine can be started unintentionally with the Cardan shaft / hydraulic system connected.
 - if the tractor and machine have not each been prevented from unintentionally rolling away by applying their parking brakes and/or securing them with wheel chocks
 - if moving parts are not blocked against unintentional movement.

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

1. Lowering machine and machine parts when raised and unsecured.

→ This is how to prevent unintentional falling:

2. Turn off the tractor engine.
3. Remove the ignition key.
4. Apply the tractor's parking brake.
5. Secure the machine against unintentional rolling away (hitched machine only)
 - in level terrain by applying the parking brake (if fitted) or by using wheel chocks.
 - in undulated terrain or on slopes by applying the parking brake and using wheel chocks.

6.4 Fitting the PTO shaft to the implement



Attach the PTO shaft only with the machine not fitted.

Before fitting the PTO shaft clean and grease the gearbox input shaft!

1. Remove the machine side PTO shaft guard (Fig. 23/1).
2. Put the PTO shaft on the gearbox input shaft and secure using threaded pins (Fig. 24/1).
3. Re-attach the machine side PTO shaft guard.

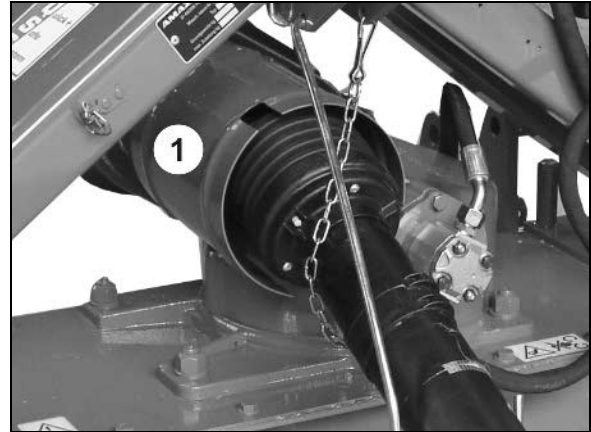


Fig. 23



Fitting the ratchet clutch on the implement side.

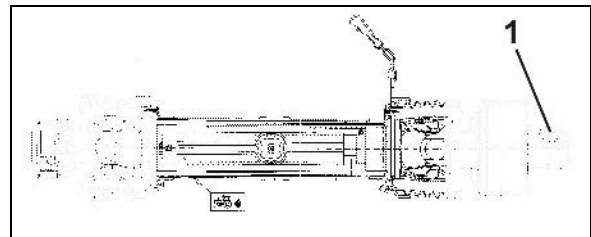


Fig. 24

7 Coupling and uncoupling the machine



When coupling and uncoupling machines, follow the instructions given in the section "Safety instructions for the operator" page 24.



WARNING

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

Secure the tractor and machine against unintentional start-up and rolling away before entering the danger area between the tractor and machine to couple or uncouple the machine. See page 56.



WARNING

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

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

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

7.1 Coupling the machine



WARNING

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

You may only connect the machine to tractors suitable for the purpose. See section "Checking tractor suitability", page 50.



WARNING

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

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

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



WARNING

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

- Use the intended equipment to connect the tractor and the machine in the proper way.
- When coupling the machine to the tractor's three-point hydraulic system, ensure that the attachment categories of the tractor and the machine are the same.
You must upgrade the machine's cat. II upper and lower links to cat. III with the aid of adapter sleeves if your tractor has a cat. III three-point hydraulic system.
- Only use the upper and lower link pins provided for coupling the machine.
- Visually check the upper and lower link pins for obvious defects whenever the machine is coupled. Replace upper and lower link pins if there are clear signs of wear.
- Use a lynch pin on each of the upper and lower link pins in the pivot points on the three-point frame attachment to secure them against unintentional release.



WARNING

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

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

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

1. Fix the ball sleeves above the upper and lower link pins in the linking points of the three point mounting frame.

Absolutely upgrade the lower link pins of cat. II with the aid of reduction sleeves (Fig. 26/1) to cat. III in case your tractor is equipped with a cat. III three point hydraulic system.



Insert the upper link pin on the three point mounting frame as far as possible in such a way that the coupled upper link is about in a horizontal position. The upper link in horizontal position requires the least lifting power for lifting the machine.

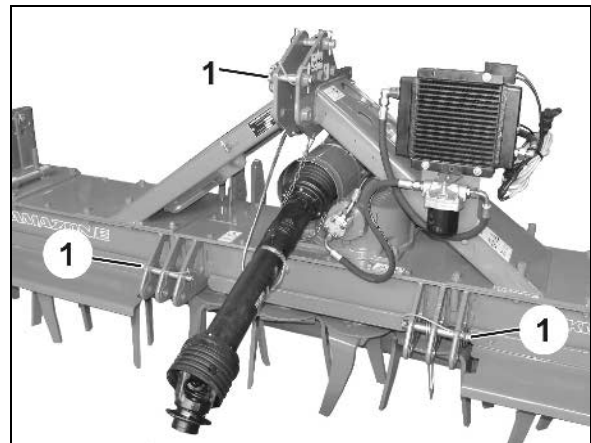


Fig. 25

2. Secure the upper and lower link pins with the folding plug against unintentional release.
3. Instruct people to leave the danger area between the tractor and the machine before you approach the machine.
4. Couple the power lines before coupling the machine and the tractor.
 - 4.1 In the tractor, approach the machine in such a way that there is a space of approximately 25 cm between the tractor and the machine.
 - 4.2. Secure the tractor against unintentional start-up and rolling.
 - 4.3 Check that the power take-off shaft of the tractor is switched off.
 - 4.4 Couple the PTO shaft and the supply lines to the tractor.
 - 4.5 Align the lower link hook in such a way that the lower link points of the machine are in alignment.
5. Now, drive the tractor further backwards towards the machine so that the lower link hooks automatically accept the ball sockets at the lower steering points of the machine.

→ The lower link hooks lock automatically..
6. From the tractor seat couple the upper link with the aid of the upper link hook to the upper link point of the three point mounting frame.

→ The upper link hook automatically locks.
7. Before start-up carry out a visual check to ensure that the upper and lower link hooks are properly locked.

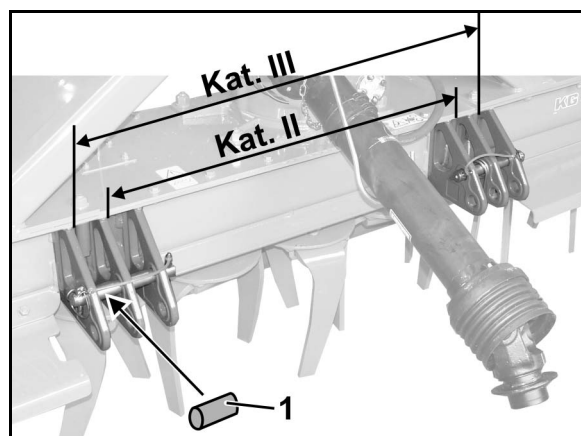


Fig. 26

7.2 Uncoupling the machine



WARNING

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

Park the empty machine on level ground with a hard surface.



When uncoupling the machine, always ensure sufficient space in front of the machine, in order to align the tractor with the machine if necessary.

1. Park the machine on level ground with a hard surface.
2. Uncouple the machine from the tractor.
 - 2.1 Secure the machine against unintentional rolling. See Page 56.
 - 2.2 Relief the upper link.
 - 2.3 From the tractor seat, unlock and uncouple the upper link hook.
 - 2.4 Relief the lower link.
 - 2.5 From the tractor seat, unlock and decouple the lower link hooks.
 - 2.6 Move the tractor approximately 25 cm forward.
 - The space created between the tractor and the machine allows better access for decoupling the turbine shaft and the power lines.
 - 2.7 Secure the tractor and machine against unintentional start-up and rolling.
 - 2.8 Uncouple the PTO shaft.
 - 2.9 Deposit the PTO shaft in the retainer.
 - 2.10 Uncouple the power lines.
 - 2.11 Fix the power lines in the appropriate parking sockets.

8 Adjustments



WARNING

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

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

Secure the tractor and the machine against unintentional start-up and rolling, before making adjustments to the machine. See Page 56.

8.1 Setting the working depth of the tines

During operation the soil tillage implement is supported by the roller and thus always maintains an accurate working depth.

To set the working depth briefly lift the soil tillage implement with the aid of the tractor's hydraulic and insert the depth setting pins (Fig. 27/1) into the desired hole of the quadrant setting block (Fig. 27/2) above the mounting arms (Fig. 27/3) and secure using lynch pins (Fig. 27/4).

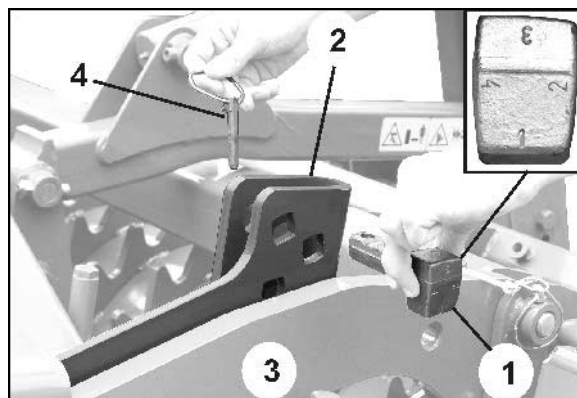


Fig. 27



Caution!

For the re-inserting procedure hold the depth setting pin (Fig. 27/1) only in such a way that your hand will never reach between pin and carrying arm.

The depth setting pins have an eccentric square head, the sides of which are at different distances to the centre of the pins. These sides are marked with the figures "1 - 2 - 3 - 4" (see Fig. 27). Ensure that the depth setting pins (Fig. 27/1) rest on all mounting arms (Fig. 27/2) with equal sides or with equal marking (figure).



The higher the depth-setting pins are inserted into the adjustment blocks and the higher the numbers on the sides resting against the mounting arms, the deeper the working depth will be.

The different distances due to the square head of the depth-setting pin allow "fine tuning" of the depth setting of the soil tillage implement, even between the individual square holes in the adjustment block.



Caution!

Always secure the depth setting pins using lynch pins (Fig. 27/3) after every adjustment.



If the working depth is adjusted, check whether the side plates have to be adapted to the new working depth.

8.2 Setting the Levelling rod

For the conventional sowing operation set the levelling bar in such a way that always a small ridge of soil is bulldozed to level any undulations. For mulch sowing operation the levelling bar can be located in the upper most position.

Ensure even height setting on both sides of the levelling rod.

For your guidance use the scale (Fig. 28/1) with reading edge (Fig. 28/2)!

Setting the height of the levelling bar:

Set the levelling rod by using the provided tool (Fig. 29/1) in such a way that the earth ridges cover the levelling rod half way.

After setting, secure each spindle by using a hinge pin (Fig. 30/1) and secure by using a lynch pin (Fig. 30/2) to prevent the levelling rod moving out of place during operation.

- **Putting out of operation:**

Crank the levelling rod upwards if not needed.

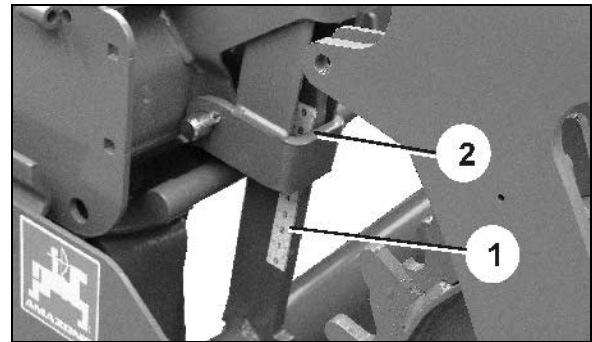


Fig. 28



Fig. 29

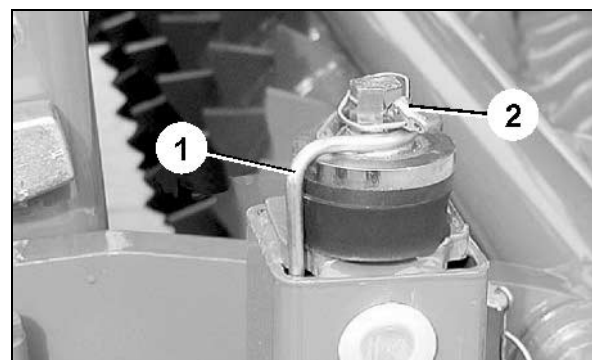


Fig. 30

8.3 Setting the working depth of the side plates

When the seed bed is prepared after ploughing bolt on the side plates (Fig. 31/1) in such a way that they move through the soil at a maximum depth of 1 to 2 cm.

This setting can also be used for incorporating straw with the rotary cultivator. If, under unfavourable conditions, the side plates push the straw together, the side plates should be set at an angle, e.g. the front higher than the back or all the way up.

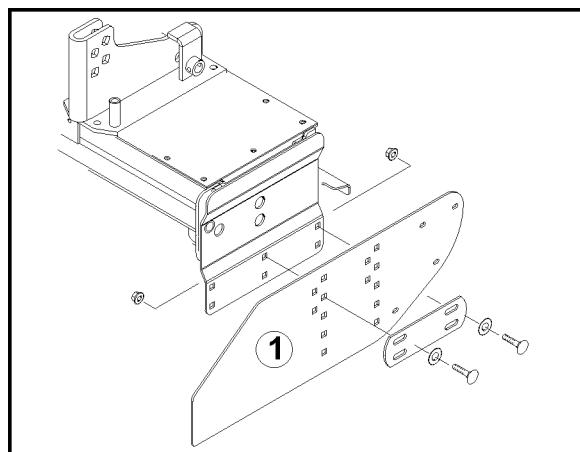


Fig. 31

8.3.1 Adapting the side guide plates to the soil conditions

The hinged side plates can move upwards to avoid obstacles. The side plate's own mass and a strong tensioning spring (Fig. 32/1) return the side plate to its working position. The tensioning spring has been set at the factory for the use on light to medium soils. The spring tension must be increased on heavy soils and decreased for incorporating straw.

The spring tension can be adjusted using the tensioning bolt (Fig. 32/4). Before every adjustment, slacken the counter nut (Fig. 32/5) and retighten firmly when finished.

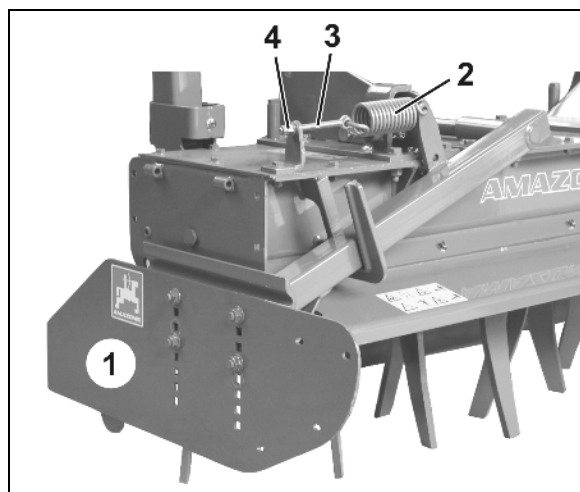


Fig. 32

8.4 Setting the scraper on the wedge ring roller

The scrapers (Fig. 33) are factory set. In order to adapt the setting to the operational conditions proceed as follows:

1. slacken bolted connections.
2. set the scraper in the slotted hole.
3. retighten bolted connections..



Ensure the minimum spacing of 1 cm between scraper and plastic ring, otherwise danger of excessive wear.

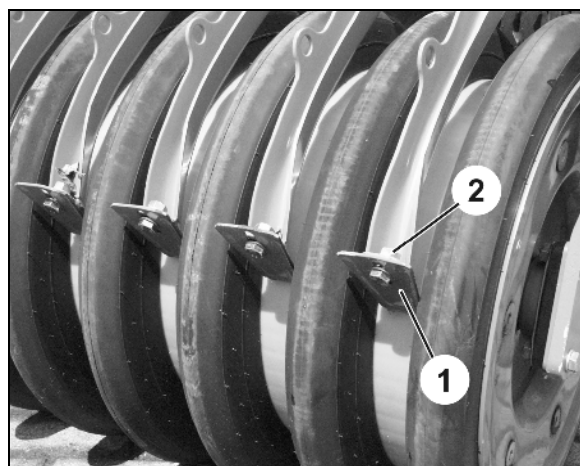


Fig. 33

8.5 Tine rotor speed

The tine rev. speed is set by exchanging the gear wheels on the gearbox.

For one input rev. speed four different output rev. speeds can be set.

For the tine rev. speed please refer to the rev. speed table (Fig. 37).

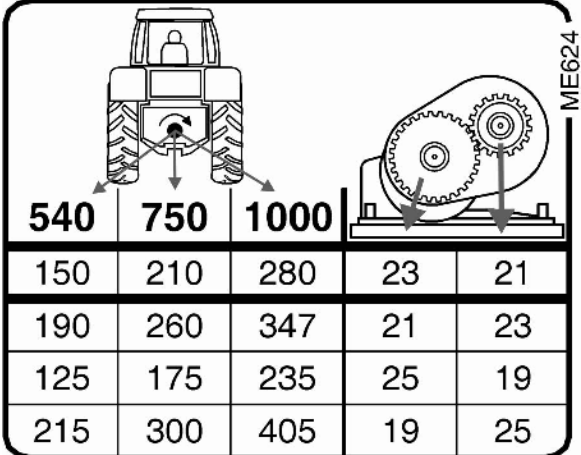
The figures below the tractor PTO shaft speeds indicate the tine rotor speeds that can be selected. Die The tine rotor speeds can be set by inserting the gears according to the list below the gearbox symbol..

Standard ratio:

- Drive Z=21
- Drive Z=23

For the adjustment of another ratio

- the gear wheel pairing can be interchanged
- an additional gear wheel pairing (Z=19, 25) can be fitted.



540	750	1000		
150	210	280	23	21
190	260	347	21	23
125	175	235	25	19
215	300	405	19	25

Fig. 34



- We recommend to adjust the tractor universal joint shaft rev. speed 1000 R.P.M.!
- The adjustment of higher tine rev. speeds would cause a partially considerable higher wear of the tines!

8.5.1 Replacing the exchange gear wheels

1. coupling the **KG** on to tractor upper and lower links (see on page 58).
 2. Use the tractor hydraulics to slightly tilt the **KG** to the front.
- The gearbox oil in the exchange gear main gearbox will not run out even if the gearbox lid is open.



CAUTION

Ensure that the implement is supported properly!

It is possible to reduce the oil level by draining the oil using the oil drain plug (Fig. 35/1). After the gear wheel change the collected oil can be poured back into the gearbox through the dipstick opening, provided the oil is free from foreign particles..

Adjustments

3. Slacken and remove the bolts (Fig. 35/1) on the gearbox cover (Fig. 35/2).
4. Remove the gearbox cover.



Danger!

Remove the gearbox lid (Fig. 35/2) only when the tractor's universal joint shaft is disengaged, the engine is switched off and the ignition key has been removed.

Wait until the rotors have come to a complete standstill!

Do not touch the hot gearbox or gear parts and gears with your bare hands. Use gloves.

Avoid contact with the hot gear oil!

Use suitable tools!

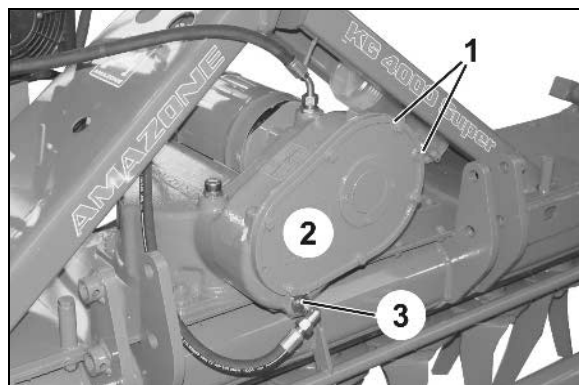


Fig. 35

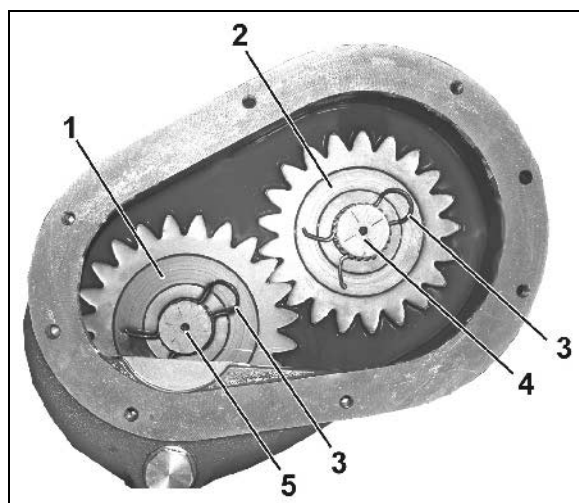


Fig. 36

The gear wheels (Fig. 36 /1) are kept in place and secured against axial movement on the shaft stubs by retaining springs (Fig. 36 /2).

5. Remove the retaining springs (Fig. 36 /2).
6. Pull the gear wheels off the stubs of the drive shaft (Fig. 36 /3) and the auxiliary shaft (Fig. 36 /4).
7. Use the speed table (Fig. 34) as a reference when interchanging the gear wheels or replacing them by another gear wheel set.
8. Install the retaining springs (Fig. 36/2) on both shafts.
9. Bolt the gearbox cover (Fig. 35/2) on to the gearbox housing using an O-ring.
10. When the soil tillage implement is in level position, use the dipstick (/1) to check the oil level (see on on page 81).

8.6 Setting the tractor wheel mark eradicators



DANGER!

Before carrying out any settings or assembly, switch off the engine, remove the ignition key and ensure that the PTO shaft is at a full standstill.

1. For adjustment of the eradicator tines slightly lift the soil tillage implement with the aid of the tractor hydraulic and ensure proper support.
2. Bring the eradicator tines into the correct position (tractor track) and screw on.
3. Adjust the working depth by re-inserting the pin (Fig. 37/1) in the interlocking of the wheel mark eradicator (Fig. 37/3) and secure by using a lynch pin (Fig. 37/2).

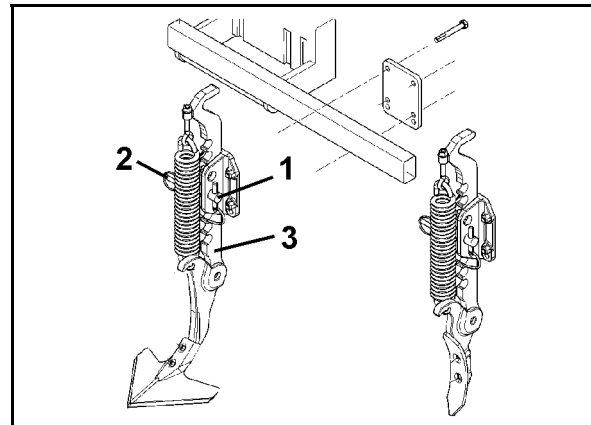


Fig. 37

9 Transport travel



- Prior any transport travel observe the chapter "Safety advice for the operator", page 26.
- Before starting to travel,
 - check the correct connection of the supply lines..
 - check the traffic light kit for damage, function and cleanliness,
 - check the brake and hydraulic system for obvious defects.
 - check whether the parking brake has been completely released.
 - check the function of the brake system.



WARNING

Risk of contusions, cutting, catching, drawing and knocks through unintentional release of the mounted / trailed machine.

Prior to transport travels carry out a visual control to check whether the upper and lower link pins are secured with the aid of the lynch pin from unintentional release.



WARNING

Risk of contusions, cutting, catching, drawing and knocks through unintentional movements of the machine.

- On foldable machines ensure the correct locking of transport locking devices.
- Protect the machine from unintentional movements before starting transport travels.



WARNING

Risk of contusions, cutting, catching, drawing and knocks through improper standing safety or tipping over.

- Drive in such a way that you always have full control over the tractor with coupled or uncoupled machine.
In so doing, take your personal abilities into account as well as road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the mounted or hitched machine.
- Prior to transport travel secure the lateral locking of the tractor lower links so that the mounted or trailed machine does not swing.



DANGER!

- Before any transport travel ensure the Liftpack system is in transport position.

10 Operation of the machine



When using the machine, observe the information in the chapters

- " Warning pictograms and other signs on the machine ", from page 16 and
- "Safety information for the user", from page 24

Observing this information is important for your safety.



WARNING

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

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



WARNING

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

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

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



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through unintentional releasing of the coupled / trailed machine!

Before machine use, carry out a visual check that the upper and lower link bolts are firmly fixed with the lynch pin against unintentional release.



WARNING

Risk of contusions, catching or knocks through damaged components or foreign particles being thrown out of the machine.

Prior to switching on the universal joint shaft of the tractor observe the permissible drive rev. speed of the machine.



WARNING

Risk of catching and dragging and dangers from flinging foreign particles within the danger zone of the driven PTO shaft!

- Prior to any operation of the machine check the proper function and completeness of the safety devices and guards of the PTO shaft.
Take care for immediate replacement of damaged safety devices and guards of the PTO shaft by a specialist workshop..
- Check whether the PTO shaft guard is secured from spinning with the aid of the fixing chain.
- Keep a sufficiently safe distance from the driven PTO shaft.
- Advise people to leave the danger zone of the driven PTO shaft..
- In case of danger immediately stop the tractor engine.



CAUTION

Danger from breakage during operation when the overload clutch is actuated.

Immediately switch off the universal joint shaft of the tractor when the overload coupling is actuated.

In this way you will avoid damage on the overload coupling.



CAUTION

Risk of PTO shaft breakage through not allowed angling of the driven PTO shaft.

When lifting the machine observe the permissible anglings of the driven PTO shaft. Not allowed anglings of the driven PTO shaft will result in an increased, early wear or the direct damage of the PTO shaft.

Immediately switch off the universal joint shaft of the tractor if the lifted machine runs unsteadily.



WARNING

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

Only start up the machine with fully installed protective equipment.



WARNING

Risk of contusions catching and knocks from objects thrown out of the machine when running!

Advise people to leave the danger zone of the machine prior to switching on the universal joint shaft.

10.1 Beginning operation

Immediately before using the rotary cultivator in the field, it is to be lowered using the tractor's hydraulic system until the rotary cultivator's tines are just over the soil but do not touch it. Drive the tractor's PTO shaft with the previously set speed. While the tractor commences driving, lower the rotary entirely.



For tractors with hydraulically or pneumatically switch able PTO shafts, the PTO shaft must only be engaged in neutral gear to prevent damaging the universal joint shaft.

If the packer roller turns with difficulty during the first use due to, e. g. sticking paint, do not immediately adjust the scraper. Instead, simply pull the roller over firm ground (untilled soil), until the roller turns easily..

10.1.1 Tractor PTO shaft speed

The tractor's PTO shaft speed should be set to 1000 R.P.M.. A lower speed of the PTO shaft causes a higher torque, which may lead to a quicker wear of the overload clutch. The tractor's PTO shaft speed should only be set to 540 R.P.M. when light or loosened soil is to be worked at shallow depths.



- **Never select a tine speed that is higher than necessary.**
- **Set the tractor PTO shaft speed to 1000 R.P.M.!**

10.2 During operation



When turning or lifting the rotary cultivator on headlands, lift it until the tines of the rotary cultivator and the packer roller are just above the soil. If the universal joint shaft is only slightly angled, the universal joint shaft can continue to run. If the rotary cultivator runs noisily when it is raised, the tractor's PTO shaft is to be switched off.

Note the minimum length of the tines. When working at great depth replace the tines before they reach the minimum length. Worn tines can regain their original length with the aid of weld-on tips.

As the wear of the tines increases, the setting of the rotary cultivator's working depth should be corrected (see para. 8.1) the side plates and levelling bar should be adapted to the new working depth.

Minimum length of the tines: 150 mm

11 Composition of various machine combinations

The designed use of the **KG Super / Special** is possible as

- solo machine with following **AMAZONE** –roller (**PW**, **KW**, **SW**)
- combination of **KG Super / Special** and **AD** Pack Top seed drill with coupling parts
- combination of **KG Super / Special** and **D9** seed drill with
 - System Liftpack
- combination of **KG Super / Special** and **AD-P** Pack Top pneumatic seed drill with coupling parts. • Combination of **KG Super / Special** and **PS** pneumatic packer sowing rail and **FPS**, **FRS** front tank.

11.1 Mounting and dismounting the rollers

The **AMAZONE AD-P Super** and **PS** seed drills are equipped with a roller fitted to the frame.

For coupling the **KG Super / Special** to the **AD-P Super / PS** dismount the roller of the soil tillage implement.

• Montage:

Each roller has to be attached to the soil tillage implement with two carrying arms (Fig. 38/1).

1. Park the roller on level ground and secure it both at the front and at the back against rolling away.
2. Couple the soil tillage implement to the tractor and back up to the roller.
3. Hitch the mounting arms (Fig. 38/1) of the roller to the supports (Fig. 38/2) of the soil tillage implement using pins (Fig. 38/3) and secure by using bolt and nut (Fig. 38/4)..

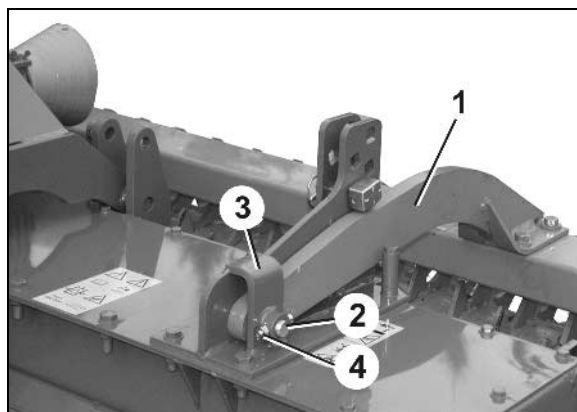


Fig. 38



CAUTION

- For coupling park the roller on level ground and care for a safe support (secure against falling over and rolling away)!
- Fasten the roller to the soil tillage implement with special care because the roller can fall over with improper support. Danger of injury.

→ Setting the working depth of the tines see on page 62.

- **KG** as combination with a seed drill:
Remove the upper pins (Fig. 39/1) when the combination is equipped with a pack top seed drill and it is intended to attach this pack top seed drill to a soil tillage implement and a roller.
- **KG** as a solo machine with following **AMAZONE**-roller:
→ Roller and carrying arm are linked with each 2 pins.

Dismounting:

1. Park the rotary harrow coupled onto the tractor on level ground and secure it both at the front and the back against rolling away
2. Slacken bolts and nuts (Fig. 38/4), pull the pins (Fig. 38/2) of the carrying arms.



Caution!

Before pulling the pins ensure that the pin joint has been released.

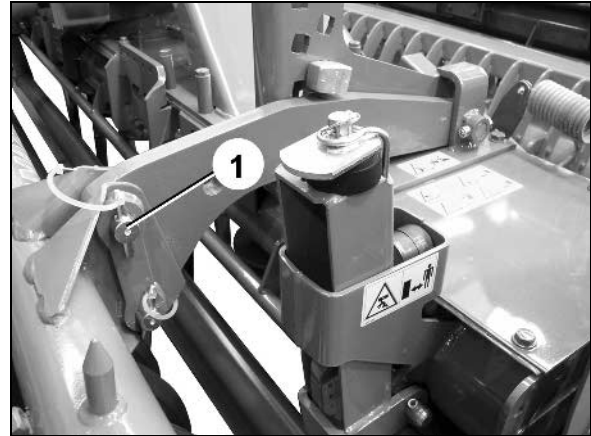


Fig. 39

11.2 **KG** with **AD** Pack Top seed drill

- Fitting the coupling parts
 - Coupling the **AD** to **KG**
- Please refer to the operator's manual for **AD**.

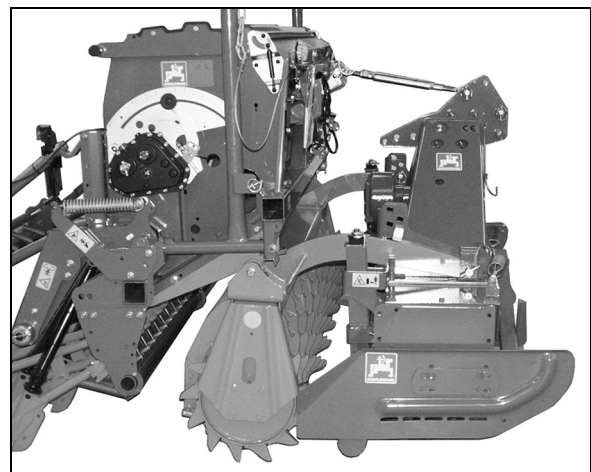


Fig. 40

11.3 **KG** with **AD-P Special Pack** Top seed drill

- Fitting the coupling parts
 - Coupling the **AD-P** to **KG**
- Please refer to the operator's manual for **AD-P**.

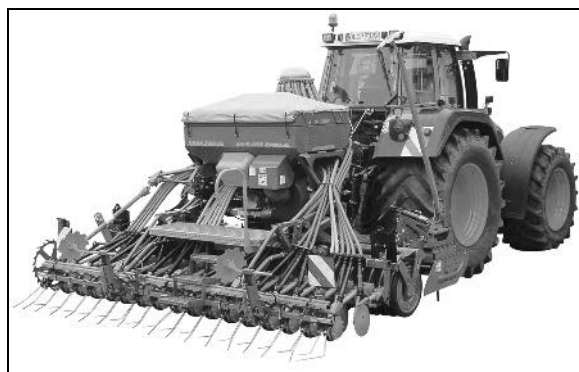


Fig. 41

11.4 KG with D9 seed drill and Liftpack system 2.1

AMAZONE-hitched seed drills can be attached to the soil tillage implement using the "adjustable coupling parts" or the **AMAZONE**-System "Liftpack".

If the lifting power of the tractor is not sufficient to raise the combination of soil tillage implement, roller and mounted seed drill using the "adjustable coupling parts", the lifting power requirement can be considerably reduced by using the **AMAZONE** "Liftpack" system (Fig. 42).

The seed drill is lifted to above the roller (Fig. 43) for transporting and when turning at the end of the field. The lifting frame is operated using a single control spool valve in the tractor cab.



Danger!

Risk of injury on movable parts when raising the lifting frame!

Do not operate the hydraulic lifting frame if there are persons in its immediate vicinity!

Staying under the raised combination if prohibited!



Fig. 42

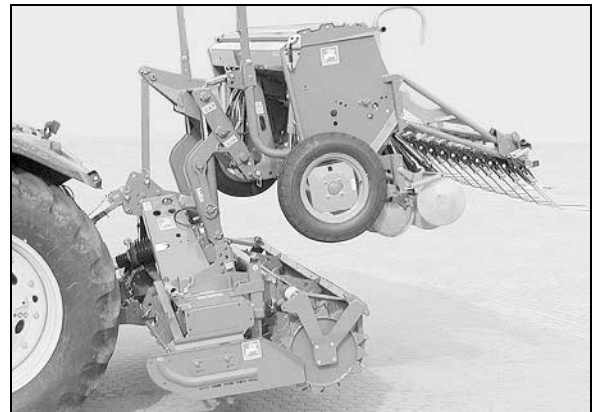


Fig. 43



It is advisable to connect the hydraulic rams of the lifting frame to the oil circulation system of the tractor's lower link arms. For this purpose, the tractor must be fitted with an additional hydraulic coupling. The hydraulic coupling must be attached to one of the tractor's hydraulic hoses which leads to the lifting rams of the tractor's lower link arms.

If the lever normally used to raise the tractor's lower link arms is now actuated from the operator's seat, the oil first flows into the lifting rams of the lifting frame which lifts the seed drill over the culti packer roller. The tractor's lower link arms only move and raise the entire combination from the ground with a now reduced lifting power requirement when the lifting rams of the lifting frame have filled with oil and the seed drill has been raised to above the culti packer roller.

The seed drill coulters are now so far from the ground that the machine can be turned without the coulters coming into contact with the ground. For this reason, the soil tillage implement must be raised only slightly until the tines of the rotary cultivator and the roller are slightly above the ground level. In this position the universal joint shaft of most tractors is angled only slightly so that it is possible to turn without switching off the PTO shaft.

After the implement has been turned, the entire combination first lowers and then the soil tillage implement begins working. As the tractor begins to advance, the seed drill begins sowing at the point where the soil tillage implement began to work. This results in narrower headlands.



Danger!

Do not exceed the permissible trailer load of the lifting frame.

Coupling the seed drill

1. Drive the soil tillage implement up to the seed drill.
Seed drills can be coupled using the coupling points of the lower link points for cat. II.
2. After coupling slide the fastening plates (Fig. 44/1) onto the pins of the lower link arms and secure each fastening plate in place using pins (Fig. 44/2) and secure using lynch pins.
3. Connect the short top link (Fig. 44/3) with the upper coupling point of the seed drill and set on the lifting frame using pin \varnothing 25 x 100 mm.
4. Secure the pins in place using lynch pins and align the seed drill.

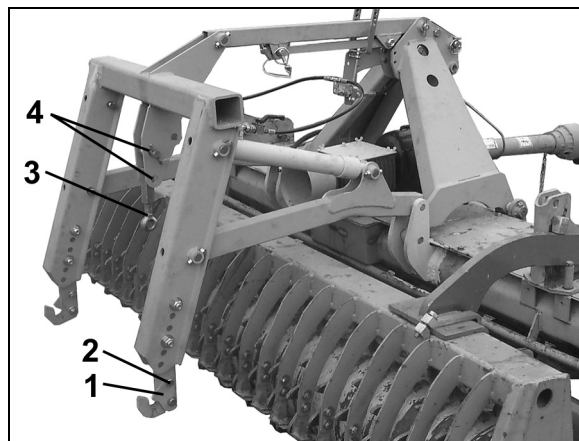


Fig. 44



Please check to ensure that parts of the **AMAZONE** "Liftpack" system do not collide with the rear window of the tractor when the window is open.

If parts could come into contact with the window, the window should not be fully opened.

Attaching the AMAZONE-"Liftpack 2" system

1. Attach the soil tillage implement to the tractor
2. Attach the lifting frame (Fig. 45/1) to a hoist
3. Bolt the lifting frame on to the plates (Fig. 45/2) of the soil tillage implement by using 5 hex. bolts.
4. Affix the top link (Fig. 45/3) on the upper three point linkage of the soil tillage implement by using a pin and secure it using a lynch pin.
5. For attaching the lifting height limiter
6. Connect the preassembled hydraulic hose (Fig. 45/4) with both hydraulic rams (Fig. 45/5) and affix on the soil tillage implement with cable binders.
7. Connect the coupling plug (Fig. 45/6) of the tractor to a single acting control spool valve. Pressurise the lifting frame in the tractor cab and check the hydraulic system for leaks. Eliminate any existing leaks.

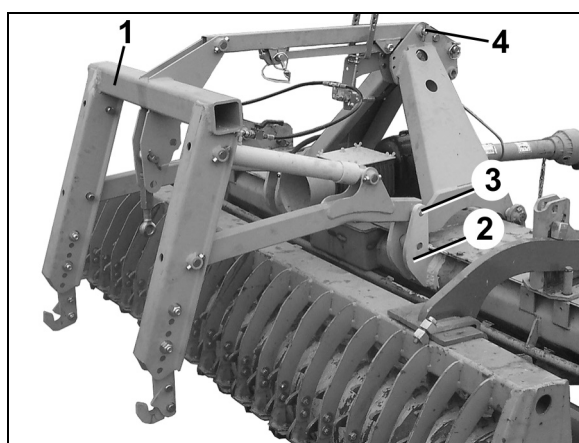




Fig. 45

	<p>DANGER!</p> <p>Before activating the control valve in the tractor cabin make sure that no persons are in the immediate vicinity!</p> <p>Risk of injury on moving parts!</p>
	<p>Make use of the different bolting possibilities for the catching hooks (Fig. 46/4) so that the following seed drill can be attached behind the roller as close as possible.</p>

Road transport **AMAZONE**-**"Liftpack 2"** system

Fig. 46/1: Safety bracket in parking position.

For road transport lift the seed drill and secure the lifting frame from unintentional lowering.

1. Slacken the lynch pin and pull out the pin (Fig. 46/2)
2. Lock the safety bracket in transport position (Fig. 46/3) using the pin and secure using a lynch pin.

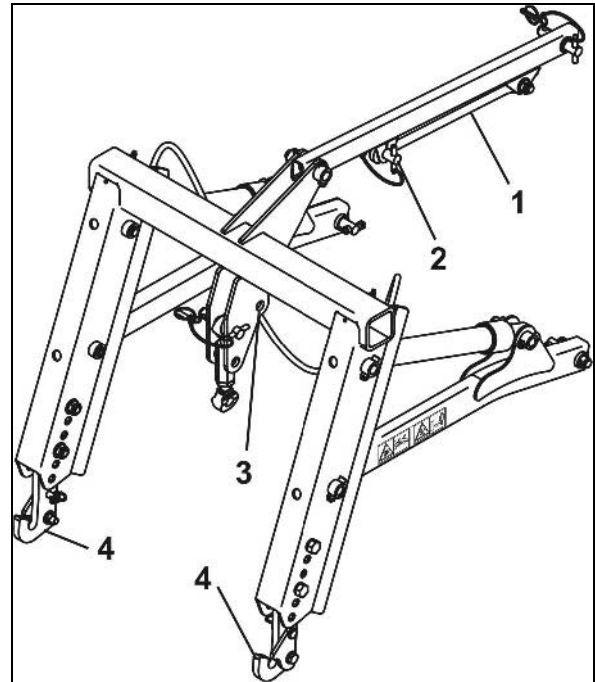


Fig. 46

11.5 Restricting the lifting height of the precision seeder Airplanter ED

If the soil tillage implement is used in combination with a PTO-shaft-driven seed drill, e. g. with a precision seeder AIRPLANTER, it is advisable to limit the lifting height of the lifting frame so that the PTO shaft between the soil tillage implement and the AIRPLANTER can continue to run on raised combination without being damaged, e. g. when turning at the headlands.

Since the PTO-shaft continues to run while turning at the headlands, the precision seeder continues to function. This means that the PTO shaft no longer has to be switched off; thus there is no pressure drop in the precision seeder and seeds do not drop from the metering disc.

If a lifting height limiting valve is fitted, the lifting height of the lifting frame can be restricted.

If the seed drill is raised by the lifting frame, the top link pushes against the pin) and closes the valve that interrupts the flow of oil to the rams.

The lifting height of the seed drill can be adjusted. To set the lifting height, insert the pin into the required hole of the U-clip and secure in place using a lynch pin.

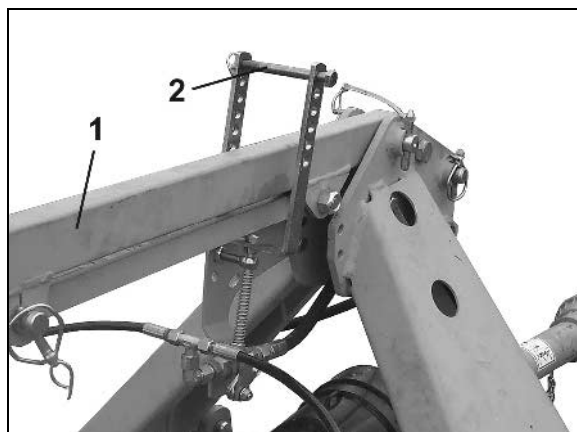


Fig. 47



Danger!

Do not touch the stop used to restrict the lifting height when the lifting frame is being raised. Do not activate the hydraulic lifting frame if there are persons in the immediate vicinity!

For road transport remove the pin (Fig. 47/2) so that the seed drill can be fully raised by the lifting frame.

11.5.1 Assembling the lifting height limiting unit



CAUTION!

The hydraulic system is under high pressure. Depressurise the hydraulic system of the lifting frame before commencing work.

1. Lower the lifting frame
2. Depressurise the hydraulic system and pull the hydraulic hose leading to the hydraulic rams off the tractor plug.
3. As soon as the hydraulic system has been depressurised, disconnect the hydraulic hose on the T-connector (Fig. 48/1).
4. Bolt the valve retainer (Fig. 48/2) on to the upper link point of the soil tillage implement.
5. Connect the hydraulic hoses with the valve (Fig. 48/3) and route the hydraulic hose to the tractor and connect it with a single acting control spool valve.
6. Pressurise the lift frame by actuating the control spool valve in the tractor cab and check the hydraulic system for leakage. Eliminate any existing leaks.

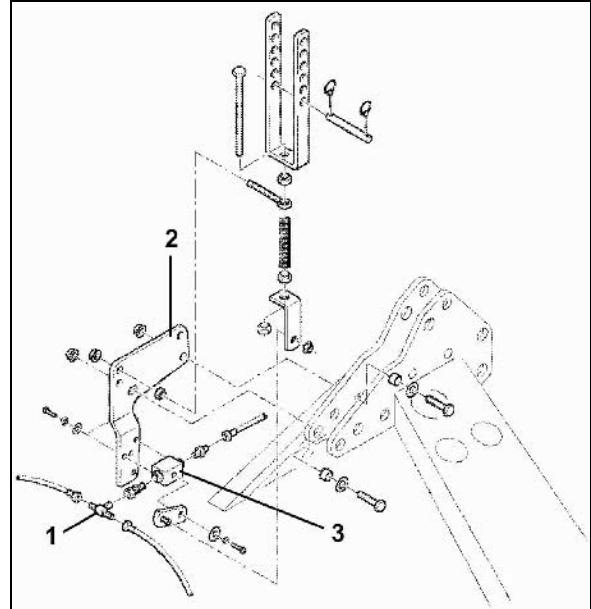


Fig. 48



DANGER!

Before activating the control valve in the tractor cabin make sure that no persons are in the immediate vicinity.

Risk of injury on moving parts.

11.5.2 Restricting the lifting height of the tractor's lower link arms

If the soil tillage implement, e. g. in combination with a precision air seeder, is to continue running when turning at the headlands, the universal joint shaft between the tractor and the soil tillage implement may be angled only slightly. To prevent the angle of the universal joint shaft from becoming too big, the soil tillage implement should only be raised so far that its tines are just above the surface of the soil. Many tractors satisfy these requirements, so that the soil tillage implement can continue to run even when turning.

To ensure that the shallow lifting height of the soil tillage implement is maintained, it is vital to use the lifting height limiting unit on the operating lever for the tractor's lower link arms. Usually there is an adjustable lock on the scale next to the operating lever for the tractor's lower link arms. This lock must be set so that the soil tillage implement does not exceed the desired shallow lifting height.

12 Failures



WARNING

Risk of contusions, shearing, cutting, cutting off, catching, trapping, dragging and nicks through

- **unintentional lowering the machine which has been lifted via the tractor hydraulic system.**
- **unintentional lowering of lifted, unsecured machine parts.**
- **unbeabsichtigtes Starten und unbeabsichtigtes Verrollen der Traktor-Maschine-Kombination.**

Prior to remedy faults on the machine, secure tractor and machine from unintentional start-up and unintentional rolling, please also refer to 56.

Wait until the machine has come to a full standstill before entering the danger zone of the machine.

12.1.1 Standstill of the tines whilst working

The tines or the rotors may come to a standstill in stony soil or when a firm obstacle is hit. To prevent gear damage, either the gearbox or the POT shaft – depending on execution – are equipped with an overload clutch.

If the rotors come to a standstill due to the ratchet clutch being deactivated, stop and reduce the PTO shaft speed of the tractor to approx. 300 R.P.M. until the ratchet clutch engages audibly.

Switch off the PTO shaft and remove the obstacle (only if the engine is stopped and the ignition key removed) if the rotors do not start rotating again. The ratchet clutch is then immediately ready for use.

13 Cleaning, maintenance and repairs



WARNING

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

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

Secure the tractor and machine against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on the machine. See page 56.



WARNING

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

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

13.1 Cleaning



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

Cleaning with a high pressure cleaner / steam jet



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

13.2 Lubrication regulations



Lubricate all grease nipples (keep gaskets clean).

Lubricate / grease the machine at the specified intervals.

Lubrication points on the machine are indicated with the foil (Fig. 49).

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



Fig. 49

	Greasing point	Number	Interval [h]	
1	Flange bearing for the roller	2	50 h	Every three months
2	Thread of the levelling bar adjustment	2	100 h	Every six months
3	PTO shaft	see on page 83		
4	Liftpack 2.1	6	100 h	Every six months

13.2.1 Lubricants



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

Company	Lubricant name	
	Normal operating conditions	Extreme operating conditions
ARAL	Aralub HL 2	Aralub HLP 2
FINA	Marson L2	Marson EPL-2
ESSO	Beacon 2	Beacon EP 2
SHELL	Ratinax A	Tetinax AM

13.2.2 Overview – lubrication points

1. Flange bearings of the

- tooth packer roller
- cage roller
- wedge ring roller

2. Thread of the levelling bar adjustment

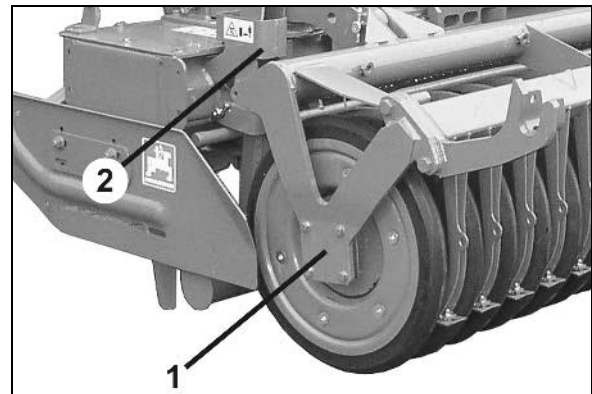


Fig. 50

3. PTO shaft

Apply grease to the guard tubes over winter in order to avoid freezing.



Please also observe PTO shaft manufacturer's fitting and maintenance hints attached to the PTO shaft.

If, e.g. in case of maintenance work on the PTO shaft, it should become necessary to reach the grease nipples of the universal joint, the guard cone should be moved on the PTO shaft.

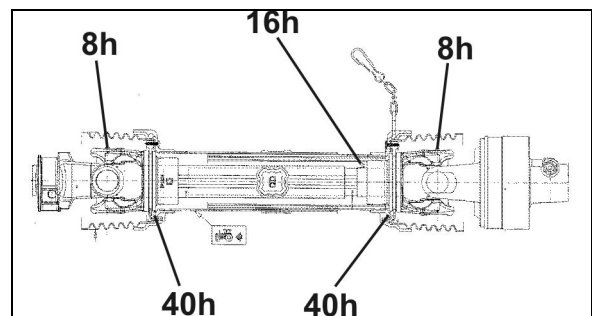


Fig. 51

4. Liftpack 2.1

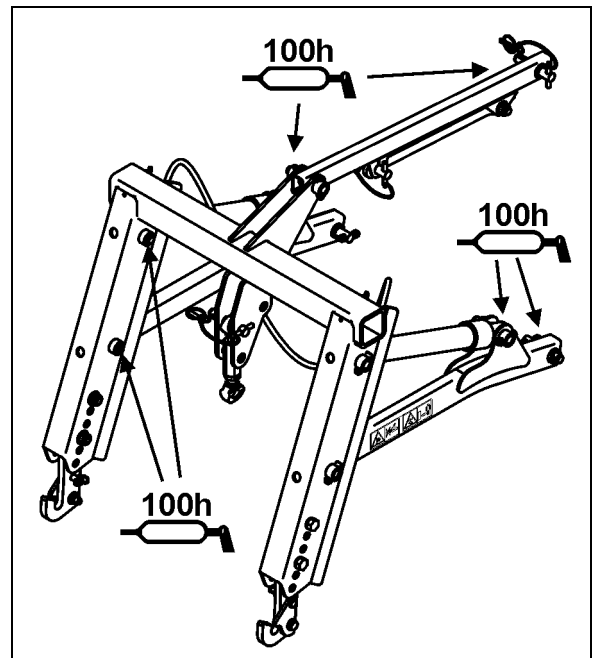


Fig. 52

13.3 Service plan – overview



- Carry out maintenance work when the first interval is reached.
- The times, continuous services or maintenance intervals of any third party documentation shall have priority.

For the first time after 1 week / 50 operational hours

Component	Maintenance work	See	Authorised workshop
Gearbox	• Oil change	en page 85	X

Every 6 months / every 100 operational hours

Component	Maintenance work	See	Specialist workshop
Gearbox	• checking oil level	on page 85	

Every year / every 200 operational hours

Component	Maintenance work	See	Specialist workshop
Oil cooler	• exchange of oil filter	en page 85	X
Breather tube	• check for blockage	on page 85	

Every 2 years / every 350 operational hours

Component	Maintenance work	See	Specialist workshop
Gearbox	• Oil change	en page 85	X

If necessary

Component	Maintenance work	See	Specialist workshop
Tines of soil tillage implement	• exchange	en page 87	X
	• care for original length	en page 87	X

13.3.1 Checking the oil levels

The oil level in the gearbox should always be checked when the machine is in horizontal position

The oil level position to be read from the oil dipstick should be

- between the marks (Fig. 53/1, 2).
- on machines with an oil collar: on the upper mark (Fig. 53/2) befinden.

If necessary, add gear oil through the opening channel for the oil dipstick.

Before opening the oil drainage screw place an appropriate oil collecting container underneath the gearbox (Fig. 53/3).

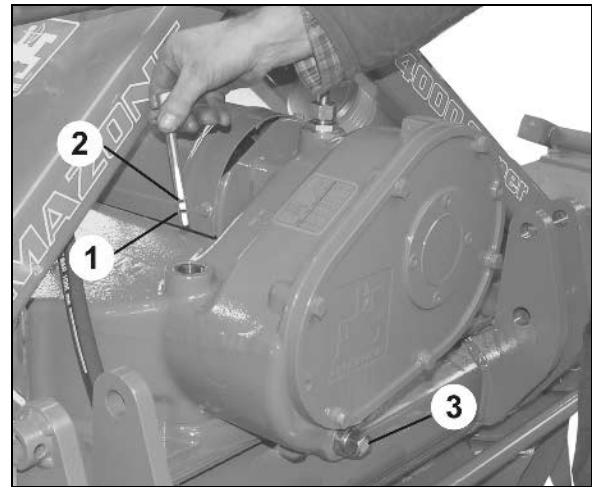


Fig. 53



Important!

The gearbox has an oil dipstick (Fig. 53/1) with ventilation. Ventilation must always be provided, otherwise, the gearbox may become leaky.

Always check oil dipstick for firm seating.

Gear oil types and quantities

	Quantity	Gear oil
KG Special	ca. 3.5 l	SAE 90 EP GL4
KG Super	ca 4,0 l	
Machines with oil cooler	In addition 1,5l	

13.3.2 Oil filter change on the oil cooler

1. Remove the oil filter pot.
- To do this slacken four bolts and remove the oil filter pot in such a way that no oil will slop over.
2. Exchange the oil filter.
 3. Fit the oil filter pot.



CAUTION

- Only carry out the oil filter exchange with cold oil.

Danger from burning!

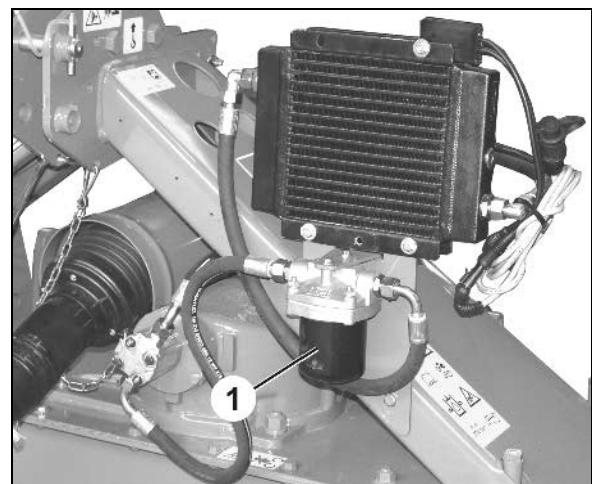


Fig. 54

13.3.3 Oil level in the spur gear housing

Changing the oil is **not** required.

Quantity gear oil spur gear housings	
KG 3000	25
KG 4000	35
KG 4500	40

The teeth of the spur gears must be half covered with gear oil when the soil tillage implement is in a horizontal position.



The spur gear trough is equipped with a breather tube (Fig. 56/1).

To prevent damage, ventilation must always be provided.

Clean the breather tube with the aid of compressed air in regular intervals.



Fig. 55



Use only new gear oil after overhauling the soil tillage implement.

When adding gear oil, ensure that the gear oil used is clean and that no dirt can enter the spur gear housing while adding oil.



Use only gearbox oil of quality **CLP and viscosity **IG 460**.**

The spur gear housings are filled at the factory with gear oil: **ERSOLAN 460
manufacturer: **Wintershall**.**

The oil types listed in table can be added or used instead of the standard oil if gear oil must be added or exchanged and if ERSOLAN 460 gear oil is not available:

Manufacturer	Gear oil
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 634
Shell	Omala 460

13.3.4 Soil tillage tines

The tines (Fig. 56/1) of the soil tillage implement are made of very tough hardened boron steel. The tines are subject to wear and must be replaced at the latest when they have reached a length $L_{\min} = 150 \text{ mm}$ (Fig. 56). At large working depths, the tines must be exchanged earlier to prevent damage (Fig. 56/2).



The manufacturer is not liable for damage caused by stones if the length of the tines drops below the minimum of 150 mm specified by the manufacturer.

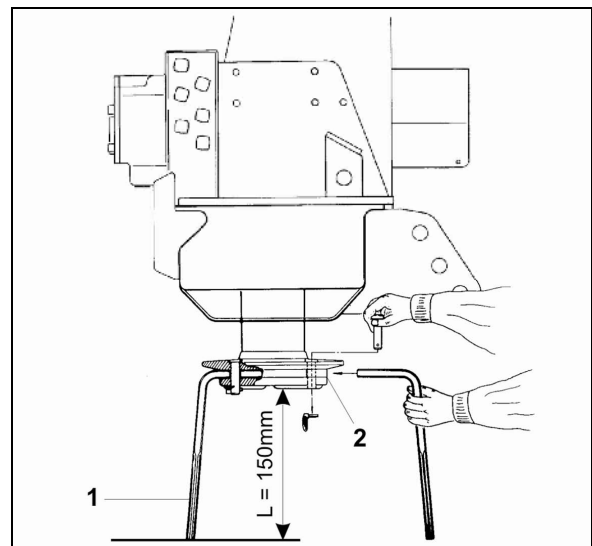


Fig. 56

13.3.4.1 Replacing tines

The tines (Fig. 57/1) are fastened in the pockets of the rotor carriers (Fig. 57/2).

1. Pull the lynch pin (Fig. 57/3) out of the pin (Fig. 57/4).
2. Knock the pin (Fig. 57/4) out of the rotor carrier from below.
3. Pull the tine out of the rotor carrier
4. replace the tine
5. fix using pins and secure using a lynch pin

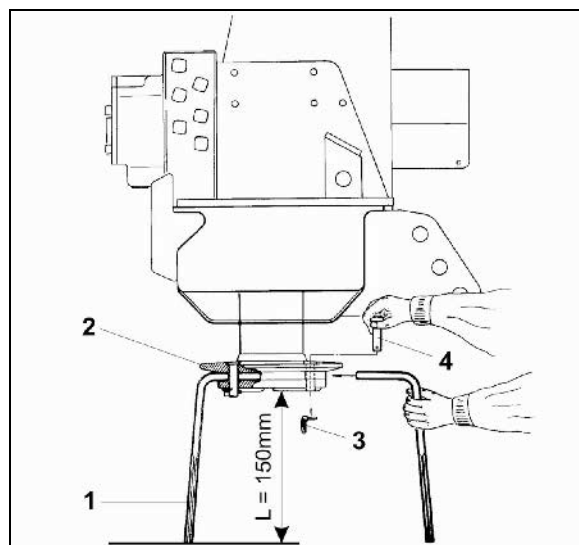


Fig. 57



WARNING

Raise the implement using the tractor's hydraulics and secure by appropriate supports.

Replace tines only if the PTO shaft and the motor are switched off and the ignition key has been removed!



The direction of rotation of the tines is different for each tine rotor. Therefore the soil tillage implement is equipped with two kinds of tines (for every direction of rotation one kind). The tines must not be interchanged.

The outermost left hand tine carrier, seen in driving direction, rotates clockwise. The direction of rotation of the tine carriers is illustrated in Fig. 58, Fig. 59.

The arrows above the tool carriers indicate their direction of rotation.

Figure (Fig. 58/1) (Fig. 59/1) shows the tine for clockwise rotating tool carriers.

Figure (Fig. 58/2) (Fig. 59/1) shows the tine for counter clockwise rotating tool carriers.

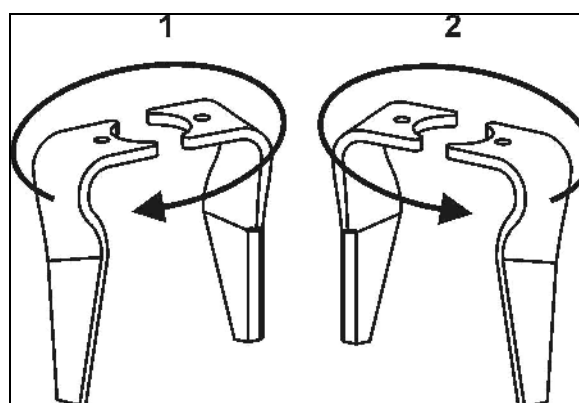


Fig. 58



Fig. 59:

The tines of the rotary cultivator are positioned "on grip" if the tines are attached to the rotor as described above. The tines can also be attached on the rotary cultivator in a dragging manner, i.e. in the opposite direction of rotation. For this, attach the tines for the clockwise rotating tine rotors on the counter clockwise rotating tool rotors and vice versa.

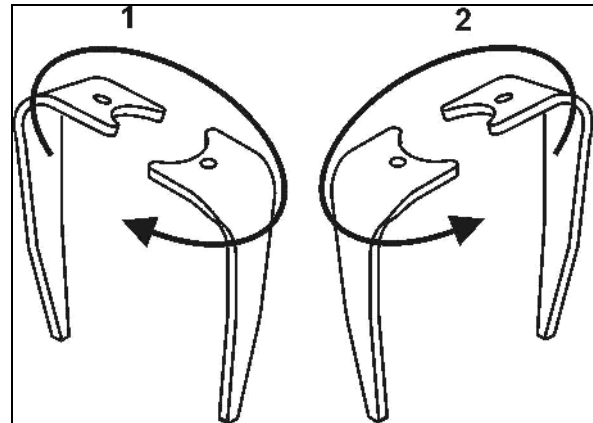


Fig. 59

13.3.5 Welding on new tine tips to regain the original length of the tines

Only for tines "on grip":

With increasing wear the original length of the tines can be regained by using welding tips (Fig. 60/1). First remove the tines from the rotor according on page 88.

If, in extraordinary cases, the tines are to be lengthened without removing them, the ground must be attached directly to the tines during electric welding to prevent damage on the tine rotor bearings and the gearbox.

1. Hold the tip to be welded (Fig. 60/1) to the old tine and make a cutting mark.
2. Cut the old tine on the mark (Fig. 61/1).
3. Attach the tip to be welded (Fig. 61/2) on the tine stump, solder with root of the seam (Fig. 61/3) and let the tine cool.
4. After the covering layer welding (Fig. 61/6) the tine is again ready for use.

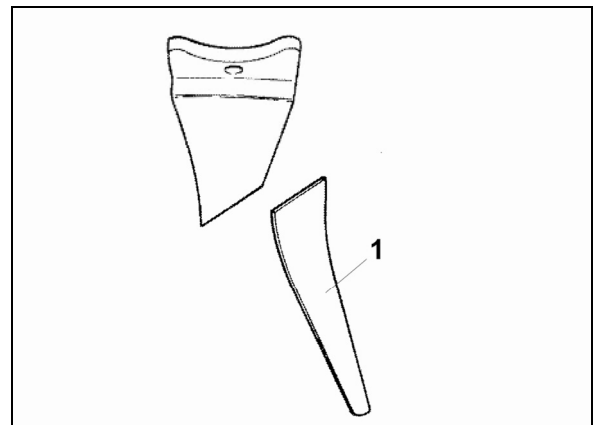


Fig. 60

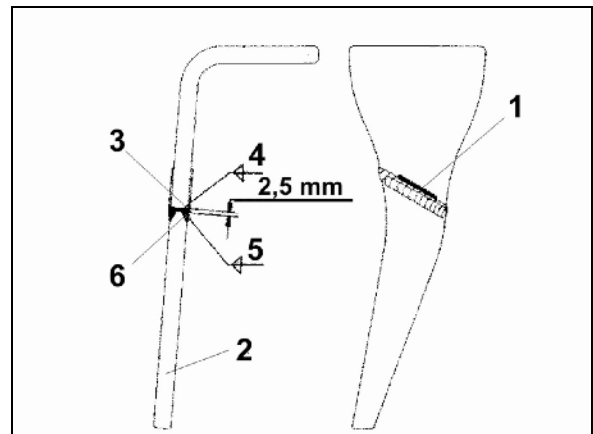


Fig. 61

Materials

Use wire electrodes for MAGC/MAGM-welding of non-alloyed, low-alloyed, heat resistant and fine-grained steel, e.g. Union K 52 (Thyssen).

Use bar electrodes labelled:

SH black	3 K
SH green	K 70
SH Ni 2	K 90
SH Ni 2	K 100.

13.4 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 try to bung leaking hydraulic lines with your hand or with your fingers.

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

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



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

13.4.1 Labelling hydraulic hose lines

The assembly labelling provides the following information:

Fig. 62/...

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

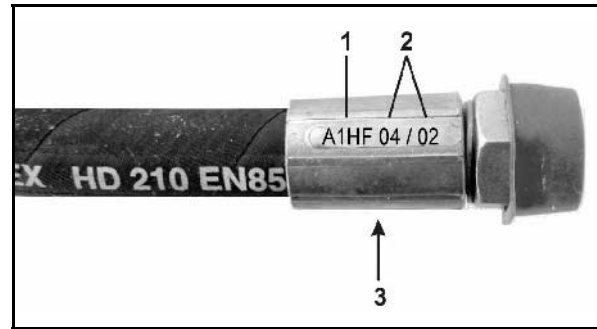


Fig. 62

13.4.2 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.

13.4.3 Inspection criteria for hydraulic hose lines



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

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

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

- Life span of 6 years has been exceeded.
The date of manufacture of the hydraulic hose line on the assembly is decisive for determining these six years. If the date of manufacture on the assembly is "2004", then the hose should not be used beyond February 2010. See also "Labelling of hydraulic hose lines".

13.4.4 Installation and removal of hydraulic hose lines



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

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

13.5 Upper and lower link pins



WARNING

Risk of contusions, catching, trapping and knocks for persons if the machine unintentionally releases from the tractor.

At every coupling procedure of the machine check the upper and lower link pins for visible defects. Exchange upper and lower link pins if clear signs of wear are noticed.

13.6 Screw tightening torques

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



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