Operating Manual

AMAZONE

Centaur

4001-2 Super
5001-2 Super

Mulch cultivator

MG3764
BAG0070.5 06.14
Printed in Germany

Please read and follow this operating manual before putting the machine into operation.
Keep it in a safe place for future use.

en

Reading the instruction

Manual and following it should seem to be inconvenient and superfluous as it is not enough to hear from others and to realize that a machine is good, to buy it and to believe that now everything should work by itself. The person in question would not only harm himself but also make the mistake of blaming the machine for possible failures instead of himself. In order to ensure success one should enter the mind of a thing, make himself familiar with every part of the machine and get acquainted with how it's handled. Only in this way could you be satisfied both with the machine and with yourself. This goal 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 rating plate.

Machine identification number: (ten-digit)	
Type:	**Centaur**
Year of manufacture:	
Basic weight (kg):	
Approved total weight (kg):	
Maximum load (kg):	

Manufacturer's address

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

Spare part orders

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: MG3764
Compilation date: 06.14

Foreword

Dear Customer,

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

On receiving the machine, check to see if it was damaged during transport or if parts are missing. Using the delivery note, check that the machine was delivered in full including the ordered special equipment. Replacement will be made only if a claim is filed immediately!

Please read and follow this operating manual—in particular, the safety instructions—before putting the machine into operation. 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 they put the machine into operation.

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

Regular maintenance and timely replacement of worn or damaged parts increases the lifespan of your 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 using 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 viewed in the direction of travel.

1.3 Diagrams used

Instructions for action and reactions

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

Example:

1. Instruction for action 1

→ Reaction of the machine to instruction for action 1

2. Instruction for action 2

Lists

Lists without a mandatory sequence a presented as a list with bullet points.

Example:

- Point 1
- Point 2

Item numbers in diagrams

Numbers in round brackets refer to the item numbers in the diagrams. The first digit refers to the diagram; the second digit, to the item number in the illustration.

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 17) 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).

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 that could impair safety immediately.

Guarantee and liability

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

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

2.2 Representation of safety symbols

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

DANGER

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

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

WARNING

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

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

CAUTION

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

IMPORTANT

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

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

NOTE

Indicates handling tips and particularly useful information.

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

2.3 Organisational measures

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

- 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) Instructed persons are those who have been instructed in their assigned tasks and in the possible risks in the case of improper behaviour, have been trained if necessary, and have been informed about the necessary protective equipment and measures.

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

Comment:

A qualification equivalent to specialist training can be obtained 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 at the machine.

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

2.9 Maintenance and repair work, fault elimination

Carry out prescribed setting, maintenance and inspection work in a timely manner.

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

It is forbidden to:

- Drill holes in the frame or on the chassis.
- Increasing the size of existing holes on the frame or the chassis.
- 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 parts approved by AMAZONEN-WERKE to ensure that the operating permit retains its validity in accordance with national and international regulations. If you use wear and spare parts from third parties, there is no guarantee that they have been designed and manufactured in such a way as to meet the requirements placed on them.

AMAZONEN-WERKE accepts no liability for damage arising from the use of unapproved 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

2.13.1 Positioning of warning pictograms and other labels

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

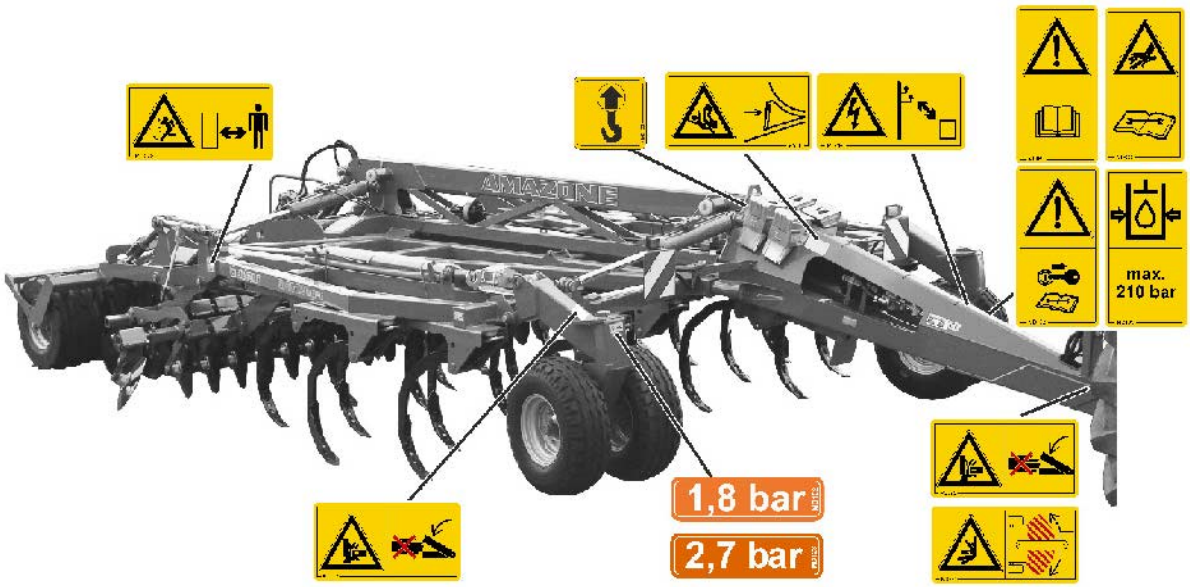


Fig. 1

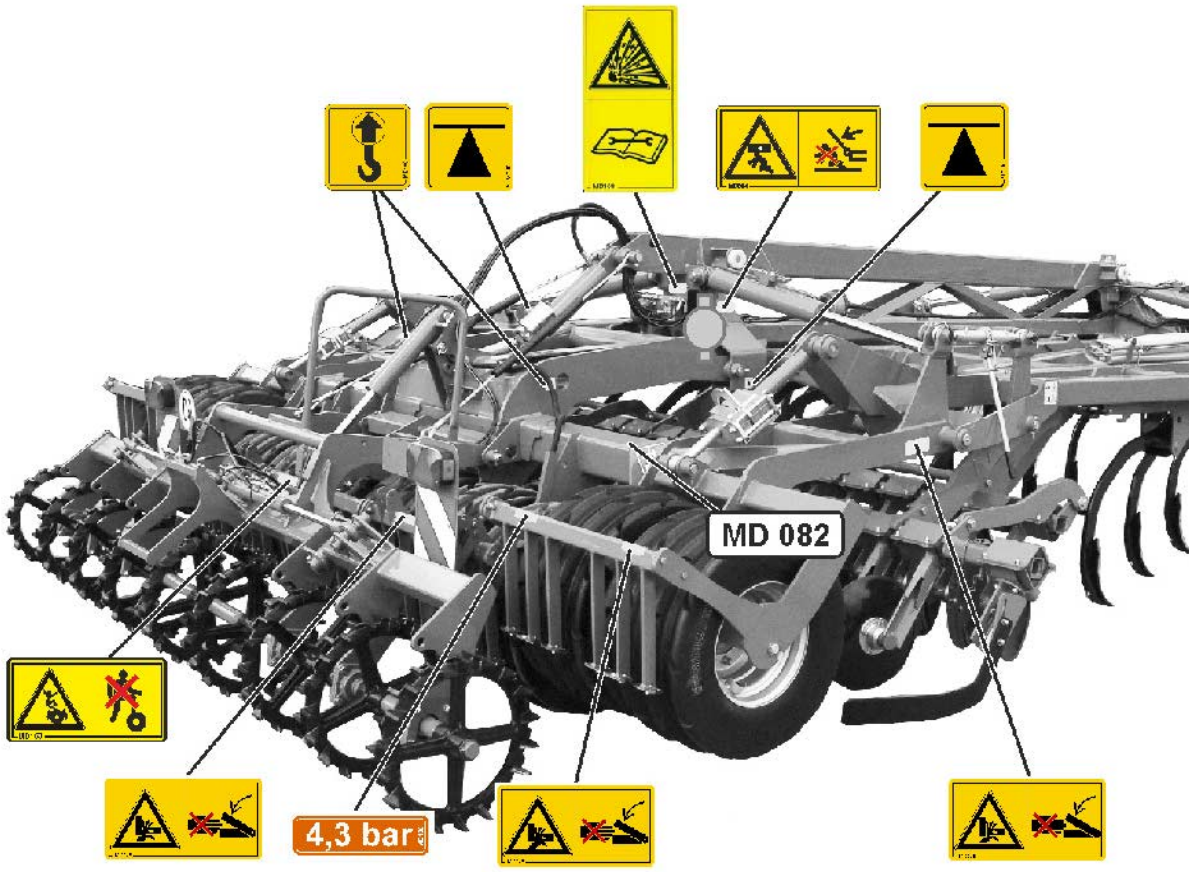


Fig. 2

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

Warning pictograms - structure

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

A warning pictogram consists of two fields:

Field 1

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

Field 2

is a pictogram showing how to avoid the danger.

Warning pictograms - explanation

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

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

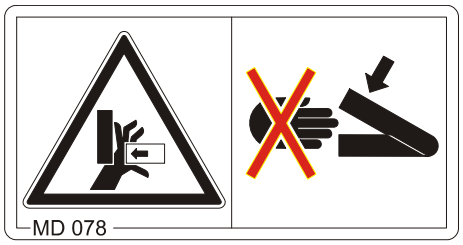
Order number and explanation	Warning pictograms

MD 078

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

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

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

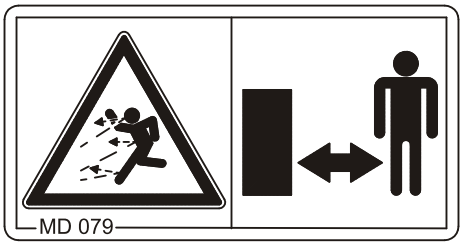


MD 079

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

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

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



MD 082

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

This can cause extremely serious and potentially fatal injuries.

Persons must not ride/climb on machines when they are running. This ban also applies to machines with treads or platforms.

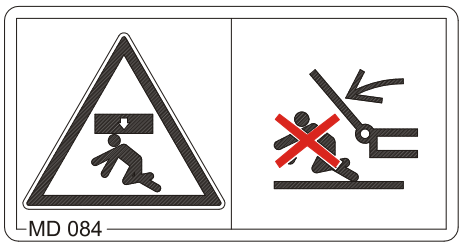
Ensure that no one rides with the machine.

MD 084

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

This can cause extremely serious and potentially fatal injuries.

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

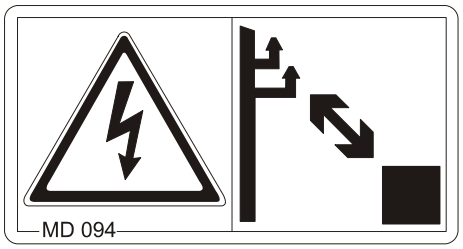


MD 094

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

These dangers can cause extremely serious and potentially fatal injuries.

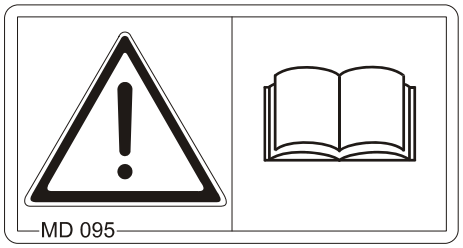
Maintain an adequate safety distance from transmission lines carrying high voltage.



Nominal voltage	Safety distance from transmission lines
up to 1 kV	1 m
over 1 up to 110 kV	2 m
over 110 up to 220 kV	3 m
over 220 up to 380 kV	4 m

MD 095

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

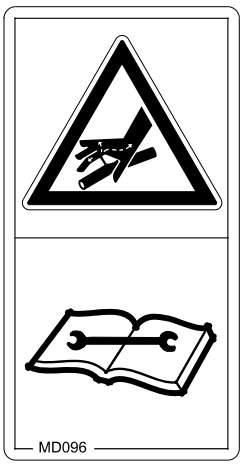


MD 096

Risk of hydraulic fluid escaping under pressure from leaking hydraulic lines!

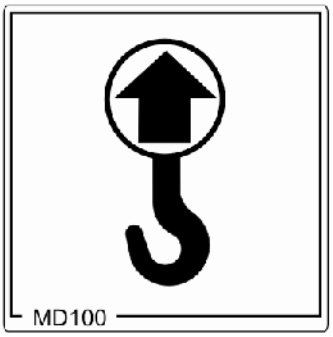
This can inflict serious injuries with potentially fatal consequences if hydraulic fluid escaping at high pressure passes through the skin and into the body.

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



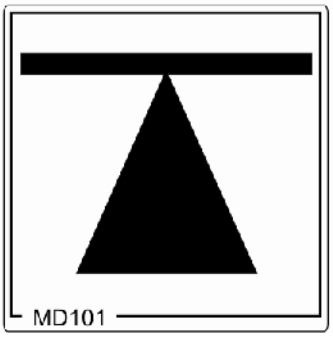
MD 100

This symbol indicates the lifting gear attachment points used for loading of the machine.



MD 101

This symbol indicates jacking points for lifting gear (jack).

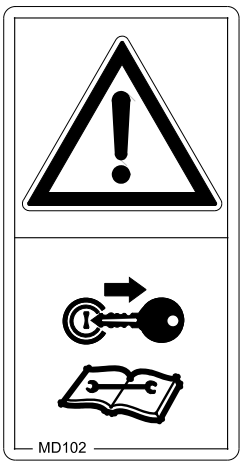


MD 102

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

These dangers can cause extremely serious and potentially fatal injuries.

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

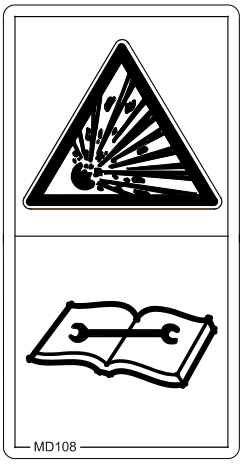


MD 108

Risk of explosion, or danger from hydraulic fluid escaping under high pressure, caused by the pressure accumulator which is under pressure from gas and oil.

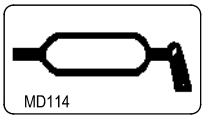
These dangers can cause serious and potentially fatal injuries if highly pressurised, escaping hydraulic fluid penetrates the skin and passes into the body.

- Read and observe the instructions in the operating manual before carrying out any maintenance or repair work.
- If you are injured by hydraulic fluid, contact a doctor immediately.



MD 114

This pictogram indicates a lubrication point



MD 128

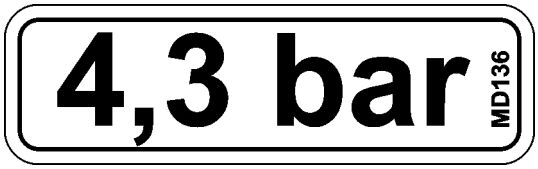
The required tyre pressure is 2,7 bar.

MD 132

The required tyre pressure is 1.8 bar.

MD 136

The required tyre pressure is 4.3 bar.

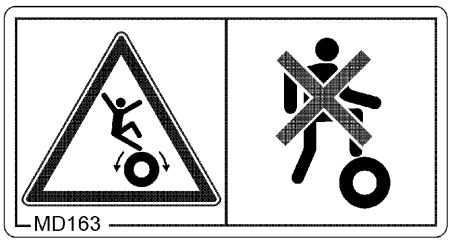


MD 163

Danger of falling caused by unintended twisting of individual roller segments when standing or walking on the support or packer rollers!

This can cause extremely serious and potentially fatal injuries.

Never stand or walk on the roller segments of the support or packer rollers.

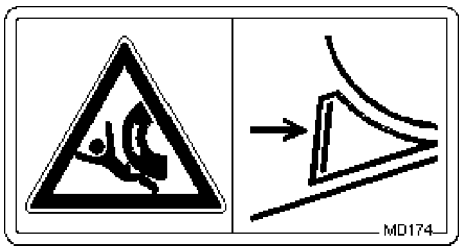


MD 174

Danger resulting from the unintentional movement of the machine!

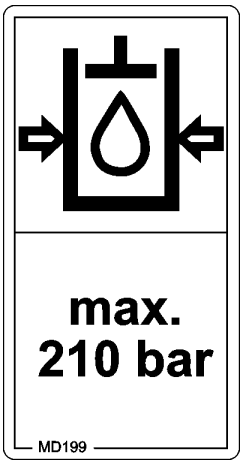
Causes serious injuries anywhere on the body or death.

Secure the machine against unintentional movement before uncoupling the machine from the tractor. For this, use the parking brake and/or the wheel chock(s).



MD 199

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

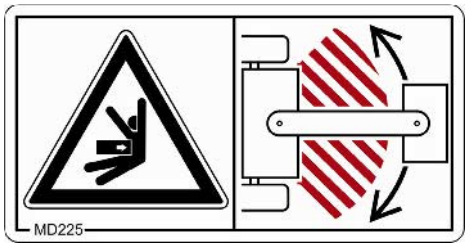


MD 225

Danger of crushing the entire body, caused by remaining in the swivel range of the drawbar between tractor and attached machine.

This danger can cause extremely serious and potentially fatal injuries.

- Do not remain in the danger area between tractor and machine while the tractor engine is running and the tractor is not secured against unintentional rolling.
- Instruct anyone in the danger area between tractor and machine to leave the danger area while the tractor engine is running and the tractor is not secured against unintentional rolling.



2.14 Dangers of not observing safety instructions

Nonobservance of the safety information

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

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

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

2.15 Safety-conscious working

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

Comply with the accident prevention instructions on the warning pictograms.

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

2.16 Safety information for users

WARNING

Risk of being crushed, cut, caught, drawn in or struck due to 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 transporting, secure the operating lever of the three-point hydraulic system against the unintentional raising or lowering of the connected/hitched machine.
- Check that the transport equipment, e.g. lighting, warning equipment and protective equipment, is correctly mounted on the machine.
- Before transportation, carry out a visual check that the upper and lower link pins are firmly fixed with the lynch pin against unintentional release.
- Adjust your 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 attempt to plug leaks in hydraulic lines using your hand or fingers.

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

  If you are injured by hydraulic fluid, contact a doctor immediately. Danger of infection.
- When searching for leak 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 2004/108/EC in the appropriate version and carry the CE mark.

2.16.4 Attached machines

- Comply with the approved combination options for the attachment equipment on the tractor and the machine drawbar.

  Only couple approved combinations of vehicles (tractor and attached machine).
- In the case of single axle machines, observe the maximum permitted drawbar load of the tractor on the attachment equipment.
- Ensure that the tractor has sufficient steering and braking power.

  Machines connected to a tractor can influence your driving behaviour, as well as the steering and braking power of the tractor, in particular in the case of single axle machines with the drawbar load on the tractor.
- Only a specialist workshop may adjust the height of the drawbar on yoke bars with a drawbar load.

2.16.5 Brake system

- Only specialist workshops or recognised brake services may carry out adjustment and repair work on the brake system.
- Have the brake system checked regularly.
- If there are any functional faults in the brake system, stop the tractor immediately. Have the malfunctions rectified immediately.
- Before performing any work on the braking system, park the machine safely and secure the machine against unintentional lowering or rolling away (wheel chocks)
- Be particularly careful when carrying out any welding, torch cutting or drilling work in the area of the brake lines.
- After carrying out any adjusting and repair work on the brake system, always carry out a brake test.

Compressed air brake system

- Before coupling the machine, clean any dirt on the sealing rings on the hose couplings of the supply and brake lines.
- Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar.
- Drain the air tank every day.
- Before driving without the machine, lock the hose couplings on the tractor.
- Hang the hose couplings of the machine supply and brake lines in the appropriate empty couplings.
- When filling up or replacing the brake fluid, use the prescribed fluid. When replacing the brake fluid, comply with the appropriate regulations.
- Do not make any changes to the specified settings on the brake valves!
- Replace the air tank if:
  - the air tank can be moved in the tensioning belts
  - the air tank is damaged
  - the rating plate on the air tank is rusty, loose or missing.

Hydraulic braking system for export machines

- Hydraulic brake systems are not approved in Germany.
- When filling up or replacing the brake fluid, use the prescribed hydraulic fluids. When replacing the hydraulic fluids, comply with the appropriate regulations.

2.16.6 Tyres

- Repair work on tyres and wheels may only be carried out by specialists with suitable installation tools.
- Check the air pressure at regular intervals.
- Inflate tyres to the specified pressure. If the air pressure in the tyres is too high, then there is a risk of explosions!
- Park the machine in a safe place and lock the machine against unintentional falling and rolling (parking brake, wheel chocks), before carrying out work on the tyres.
- Tighten or retighten all the fixing screws and nuts in accordance with the specifications of AMAZONEN-WERKE!

2.16.7 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 and unloading with a tractor

WARNING

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

- Correctly couple the machine to the tractor, before loading the machine onto a transport vehicle or unloading it from a transport vehicle.
- You may only couple and transport the machine with a tractor for loading and unloading, as long as the tractor fulfils the power requirements.
- Compressed air brake system:

  You may only move off with the machine connected if the pressure gauge on the tractor shows 5.0 bar.

If the machine is to be loaded onto or unloaded from a transport vehicle, it must be coupled to a suitable tractor.

Loading:

A person to help with manoeuvring is required for loading.

Secure the machine according to instructions.

Then disconnect the tractor from the machine.

Unloading:

Remove the transportation safety equipment.

A person is required to help with manoeuvring when unloading.

After unloading, park the machine and uncouple the tractor.

Loading using a lifting crane

WARNING

Risk of crushing due to accidental falling of a machine attached to a load carrier during loading and unloading!

- Only attach your lifting gear to/at the designated points.
- Never remain in or enter the area below a raised, unsecured load.

The machine has 3 attachment points for lifting equipment, Fig. 3/1 and Fig. 4/1.

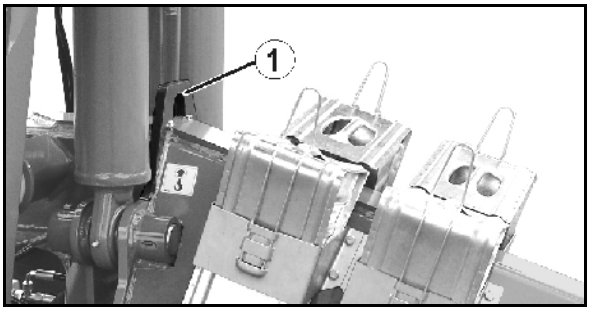


Fig. 3

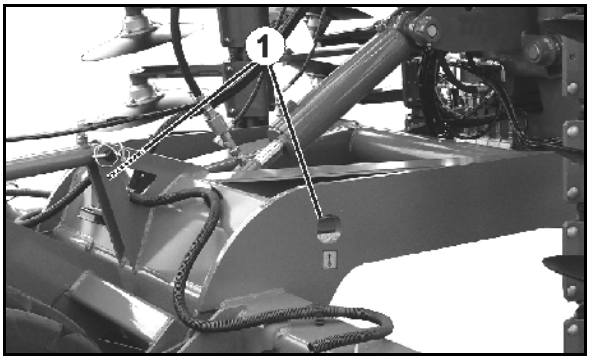


Fig. 4

CAUTION

The minimum tensile strength of each lifting belt must be 7500 kg!

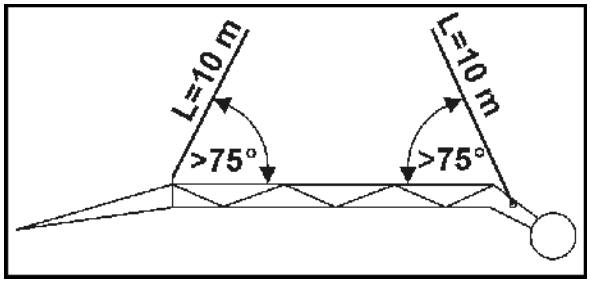


Fig. 5

4 Product description

This section:

- Provides a comprehensive overview of the machine structure.
- Provides the names of the individual modules and controls.

Read this section when actually at the machine. This helps you to understand the machine better.

4.1 Overview of subassemblies

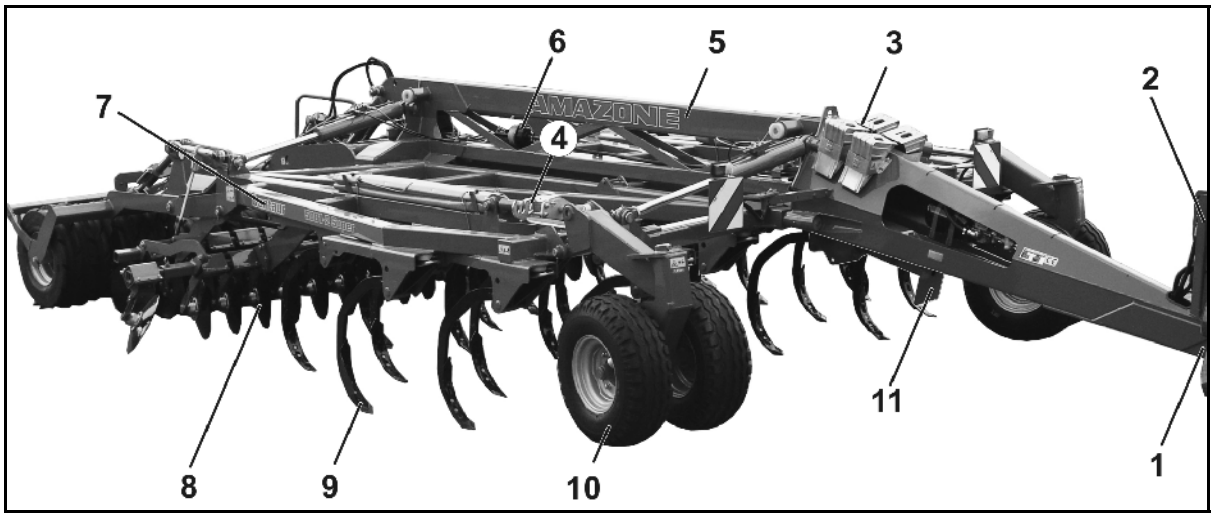


Fig. 6

(1) Cat III (standard) lower link attachment

(2) Parking coupling for hydraulic hose lines

(3) Wheel chocks

(4) Depth adjustment of the feeler/support wheels

(5) Frame

(6) Brake system

(7) Foldable booms

(8) Levelling discs

(9) Tines with overload protection

(10) Support wheels/roller feelers (depending on equipment provided)

(11) Stand

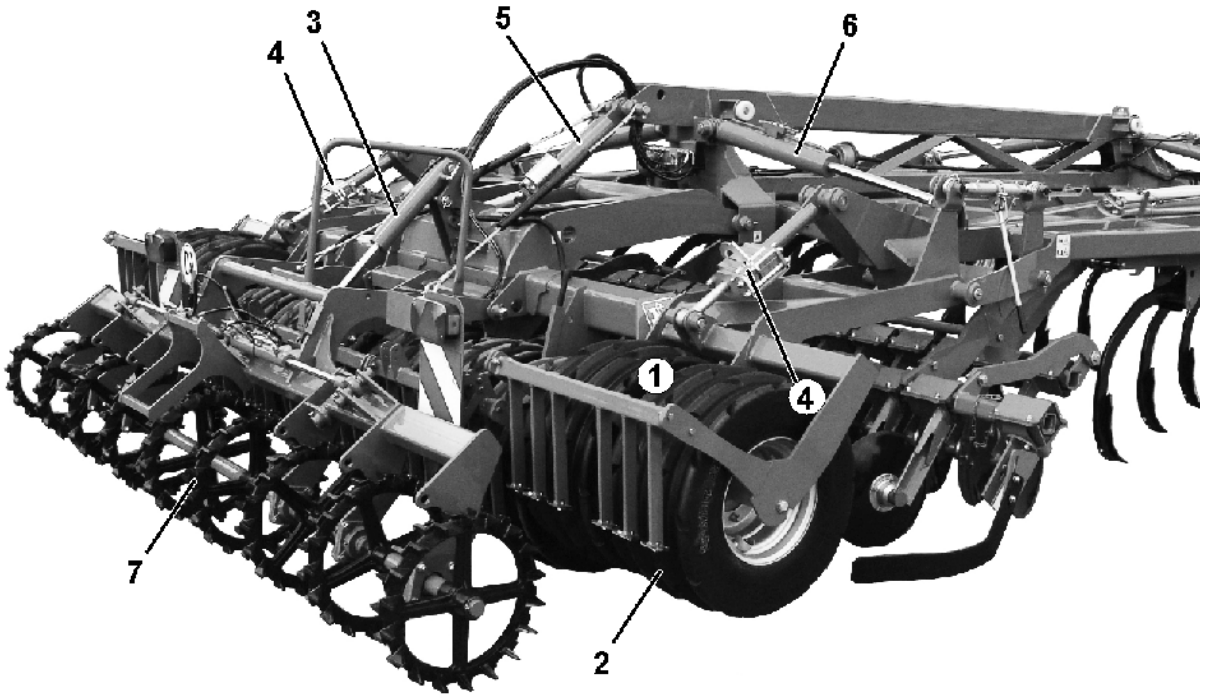


Fig. 7

(1) Running gear and roller wheels

(2) Strippers

(3) Central roller wheel hydraulic cylinder

(4) Depth adjustment of outer roller wheels

(5) Chassis hydraulic cylinder

(6) Hydraulic cylinder for folding extension arm

(7) Rear implement can be installed in various configurations (option)

4.2 Safety and protection equipment

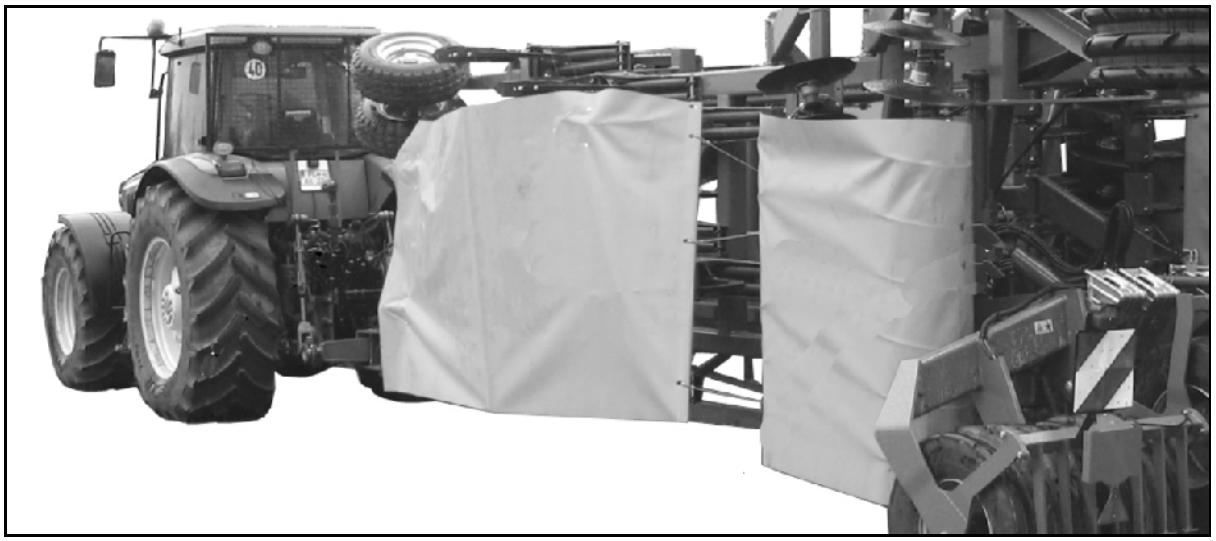


Fig. 8

- Protective tarpaulin for road travel
  - o Attach the protective tarpaulins to the left and right coulters. Pull the loops on the interior of the tarpaulin over the tines and fix it securely to the frame using tensioning ropes.
  - o Attach the protective tarpaulins to the discs. Attach the tarpaulin to the folding disc frame at the front and use tensioning ropes to pull it tight to the folding frame at the rear.

  For operation, the protective tarpaulin is attached to the foldable booms.

Fig. 9

- Mechanical safety of the running gear cylinder (Fig. 10/1) to prevent unintentional lowering of the tines during maintenance work

1. Raise up the implement completely.
2. Sway all spacer elements (Fig. 10/2) away from the piston rod.
3. Remove the safety unit from the parking position (Fig. 10/3).
4. Lay the safety unit around the piston rod and secure it with bolts and clip pins.
5. After use, fasten the safety unit again with bolts and clip pins in the parking position.

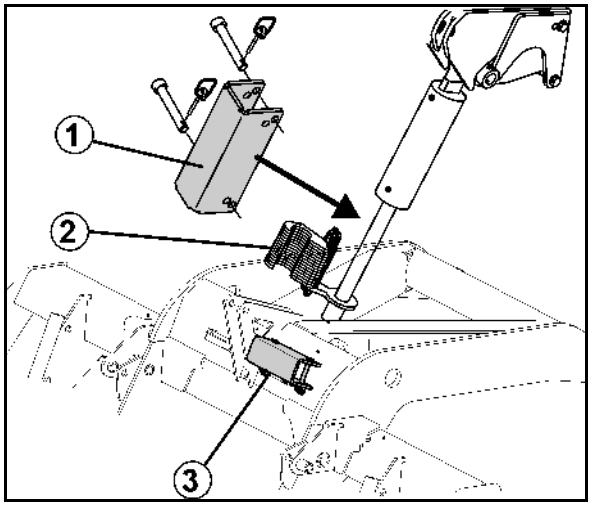


Fig. 10

- Stop valve (Fig. 11/1) to prevent activating an unintentional unfolding action from the tractor via the cable winch (Fig. 11/2).
  - Stop valve in position A – hydraulic unfolding locked.
  - Stop valve in position B – hydraulic unfolding unlocked through activation of the cable winch.

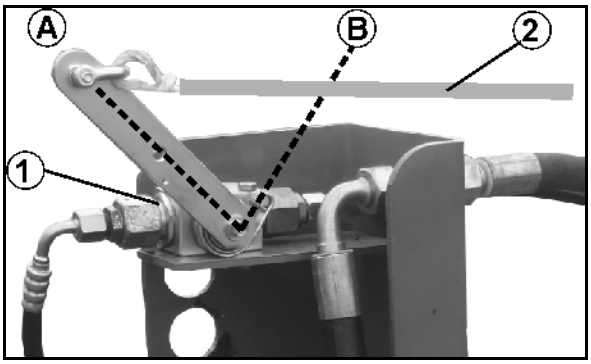


Fig. 11

4.3 Supply lines between the tractor and the machine

Supply hoses in parking position:

- Hydraulic hose lines
- Electric cable for lighting
- Connection to hydraulic brake

Or:

- Pneumatic brake system
  - Brake line with coupling head (yellow)
  - Supply line with coupling head (red)

Fig. 12

4.4 Transportation equipment

Fig. 13: Rear lighting

(1) Rear lights; brake lights; turn indicators

(2) Warning signs (square)

(3) Red reflectors (triangular)

(4) Licence plate holder

- 2 x 3 reflectors, yellow (not pictured) (at side, max. 3m apart)

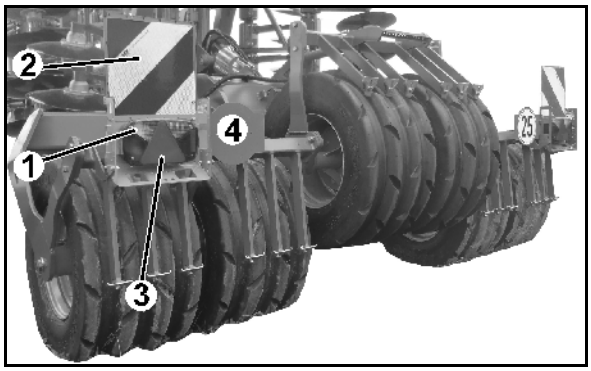


Fig. 13

Fig. 14: Front foldable lighting

(1) Limiting lights; turn indicators

(2) Warning signs (square)

Connect the lighting system to the 7-pin tractor socket via the pin.

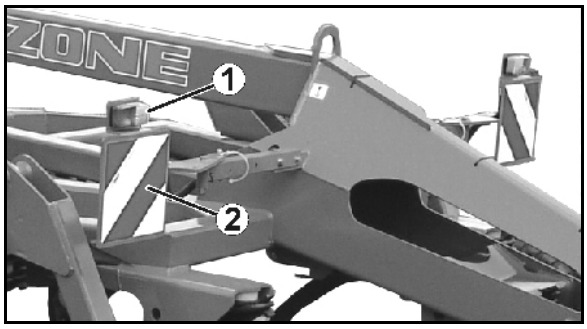


Fig. 14

Fig. 15

Lighting in extended transport position

Before folding in the machine, move the lighting into transport position!

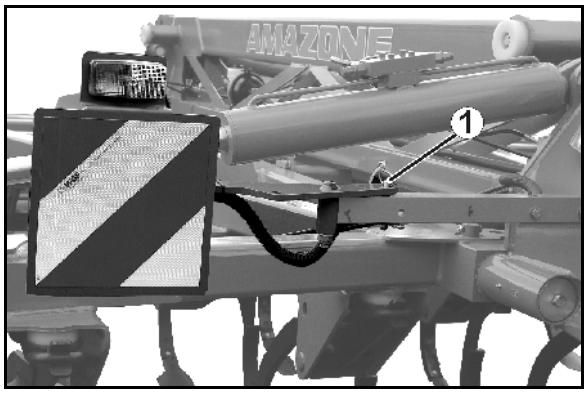


Fig. 15

Fig. 16: Lighting in retracted operating position

After extending or retracting the lighting: pin the lighting using a bolt and secure it using a clip pin.

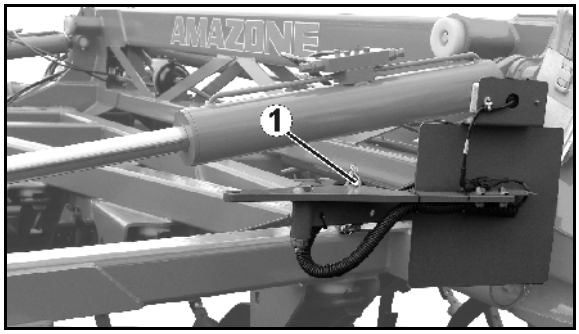


Fig. 16

4.5 Intended use

The **Centaur** mulch cultivator is:

- designed only for conventional usage for agricultural work.
- coupled to the tractor using the tractor lower link and operated by an additional person.

Slopes can be navigated as follows:

- Along the contours

Direction of travel to left	20 %
Direction of travel to right	20 %

- Along the gradient

Up the slope	20 %
Down the slope	20 %

The intended use also includes:

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

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

For any damage resulting from improper use:

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

4.6 Danger area and danger points

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

- By work movements made by the machine and its tools
- By materials or foreign objects ejected by 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 PTO 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.

The following danger areas exist:

- Between the tractor and machine, especially when coupling and uncoupling.
- Near moving parts.
- When the machine is in motion.
- Within the pivot range of the machine wing.
- Underneath raised, unsecured machines or parts of machines.
- When unfolding/folding the machine wing in the area of overhead cables.

4.7 Rating plate and CE marking

The rating plate shows the following information:

- Machine ID no.
- Type
- Permissible system pressure in bar
- Year of manufacture
- Factory
- Power output (kW)
- Basic weight (kg)
- Permissible maximum weight (kg)
- Rear axle load (kg)
- Front axle load/drawbar load (kg)

Fig. 17

4.8 Technical Data

Centaur		4001-2	5001-2
		Super	Super
Working width	[mm]	4,000	5,000
Transport width	[mm]	3,000	3,000
Number of tine rows (offset)		4	4
Number of tines		19	24
Number of rows of discs/spring tines		2	2
Number of discs/spring tines		30	38
Disc diameter	[mm]	460	460
Track width	[mm]	2000	2000
Total length	[mm]	9350	9350
Overall height	[mm]	2800	3300
Empty/basic weight	[kg]	7720	8500
Permissible axle load	[kg]	7500	7500
Permissible drawbar load (F_H)	[kg]	3000	3000
Approved total weight	[kg]	10500	10500
Working speed	[km/h]	8 – 15	
Maximum surface capacity	[ha/h]	6	7.5
Transport speed	[km/h]	25/40	
Coupling point category	Category	3	
Tyres		400/50-15.5	

4.9 Necessary tractor equipment

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

Tractor engine power

4001-2 Super	from 147 kW
5001-2 Super	from 185 kW

Electrical system

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

Hydraulic system

Maximum operating pressure:	• 210 bar
Tractor pump power:	• At least 15 l/min at 150 bar
Machine hydraulic fluid:	• Transmission/hydraulic oil Utto SAE 80W API GL4 The machine hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.
Control units:	• One to three double-acting control units, depending on the machine equipment. See page 43.

Operational brake system

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

Connection fitting between the tractor and the machine:

- The lower link of the tractor must have lower link hooks.

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.

5.1 Functionality

The **Centaur** is suitable for the following tasks:

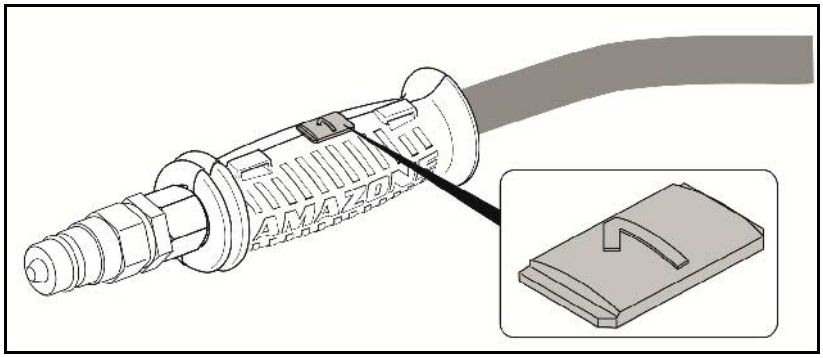
- Ploughing grassland without preparatory work
- Tilling ground for mulch sowing
- Tilling ground with large quantities of straw evenly and reliably
- Stubble processing without preparatory work
- Working on seed beds

During transport, the outer 4 wheels of the central roller act as the running gear wheels.

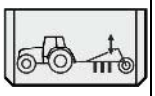
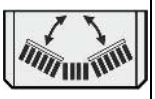
5.2 Hydraulic system connections

All hydraulic hose lines are equipped with gripping sections.

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



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

Tractor control unit		Function	Hose markings
	**Double-action**	• Lowering the machine	1 – yellow
		• Lifting the machine	2 – yellow
	**Double-action**	• Unfolding the machine • Lowering the central 2-wheel roller • Lowering and folding out the finishing unit (optional)	1 – blue
		• Fold in the machine • Lifting the central 2-wheel roller • Lifting and folding up the finishing unit (optional)	2 – blue

WARNING

Danger of infection from escaping hydraulic fluid at high pressure!

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

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

5.2.1 Coupling the hydraulic hose lines

WARNING

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

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

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

1. Place the tractor control unit in float position (neutral).
2. Clean the hydraulic plugs of the hydraulic hose lines before coupling up.
3. Couple the hydraulic hose line(s) with the tractor control unit(s).

5.2.2 Uncoupling the hydraulic hose lines

1. Place the tractor control unit in float position (neutral).
2. Release the hydraulic plugs from the hydraulic sockets.
3. Attach the hydraulic plugs to the parking couplings.

5.3 Dual-circuit service brake system

The machine does not have a parking brake**.**

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

The machine is equipped with a dual-circuit pneumatic braking system with hydraulically actuated braking cylinder for the brake shoes in the brake drums.

Compliance with the maintenance intervals is essential for the correct function of the dual-circuit service brake system.

WARNING

If the machine, when uncoupled from the tractor, has full compressed air tanks, the compressed air from the air tanks acts on the brakes and the wheels jam.

The compressed air in the compressed air tank and hence the braking force will drop continuously until there is a complete brake failure, if the compressed air tank is not refilled. This is why the machine may only be parked using wheel chocks.

The brakes are released immediately with a full compressed air tank when the supply line (red) is connected to the tractor. For this reason, the machine must be connected to the lower links of the tractor and the tractor's hand brake must be applied before the supply line (red) is connected.

The wheel chocks may not be removed until the machine is connected to the lower links of the tractor and the hand brake is applied.

To activate the dual-circuit compressed-air brake system, the tractor requires a compressed-air brake system which is also dual circuit.

- Supply line with coupling head (red)
- Brake line with coupling head (yellow)

Fig. 18/...

(1) Supply line filter

(2) Brake line filter

(3) Trailer brake valve

(4) Compressed air tank

(5) Test connection for pressure gauge

(6) Drain valve

(7) Release valve

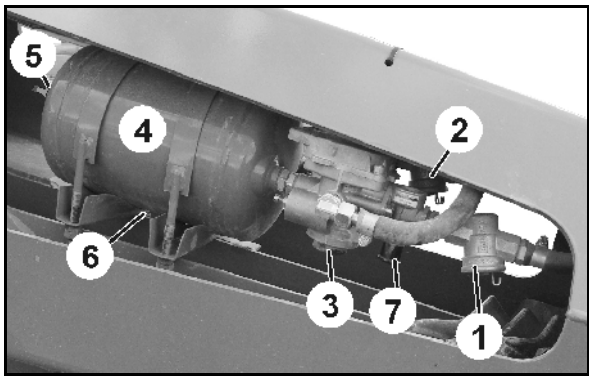


Fig. 18

Fig. 19/...

(1) Brake cylinder

(2) Equalising tank for brake fluid

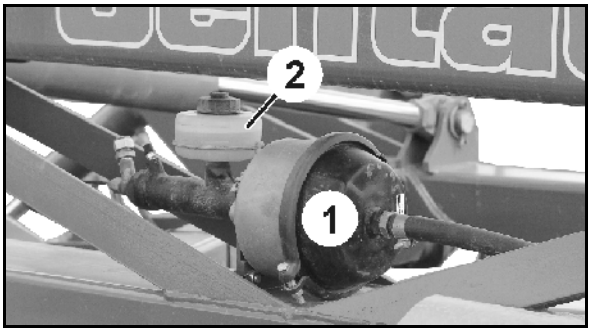


Fig. 19

5.3.1 Coupling the brake and supply lines

WARNING

Risk of contusions, cuts, dragging, catching or knocks from incorrectly functioning brake system.

- When coupling the brake and supply line, ensure that:
  - the coupling head seals are clean.
  - the sealing rings of the hose couplings form a proper seal.
- Always replace damaged seals immediately.
- Drain the air tank before the first journey each day.
- Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar.

WARNING

Risk of contusions, cuts, dragging, catching or knocks from unintentionally rolling machine with the operating brake released!

Always couple the hose coupling of the brake line (yellow) first, followed by the hose coupling of the supply line (red).

The operating brake of the machine moves out of the brake position immediately the red hose coupling has been coupled.

1. Open the tractor coupling head caps.
2. Remove brake line coupling head (yellow) from the empty coupling.
3. Check coupling head seals for damage and cleanness.
4. Clean dirty seals, replace damaged seals.
5. Fasten the brake line coupling head (yellow) as directed in the tractor coupling with the yellow marking.
6. Remove the supply line coupling head (red) from the empty coupling.
7. Check coupling head seals for damage and cleanness.
8. Clean dirty seals, replace damaged seals.
9. Fasten the supply line coupling head (red) in the tractor coupling with the red marking, as instructed.

→ On coupling the supply line (red), the supply pressure coming from the tractor automatically pushes out the button for the release valve on the trailer brake valve.

10. Remove wheel chocks.

5.3.2 Uncoupling the brake and supply lines

WARNING

Risk of contusions, cuts, dragging, catching or knocks from unintentionally rolling machine with the operating brake released!

Always uncouple the hose coupling of the supply line (red) first followed by the hose coupling of the brake line (yellow).

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

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

When the machine is uncoupled or pulled away from the trailer, air is vented from the trailer brake valve supply line. The trailer brake valve is automatically switched and operates the service braking system independently of the automatic, load-dependent braking force regulator.

1. Secure the machine against unintentionally rolling away. Use chocks.
2. Release supply line coupling head (red).
3. Release brake line coupling head (yellow).
4. Fasten coupling heads in the empty coupling points.
5. Close tractor coupling head caps.

5.4 Hydraulic service brake system

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

The machine does not have a parking brake**.**

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

5.4.1 Coupling the hydraulic service brake system

Only couple clean hydraulic couplings.

1. Remove the protective caps.
2. Clean the hydraulic plug and socket if necessary.
3. Couple the machine's hydraulic socket with the tractor's hydraulic plug.
4. Manually tighten the hydraulic screw joint (if present).

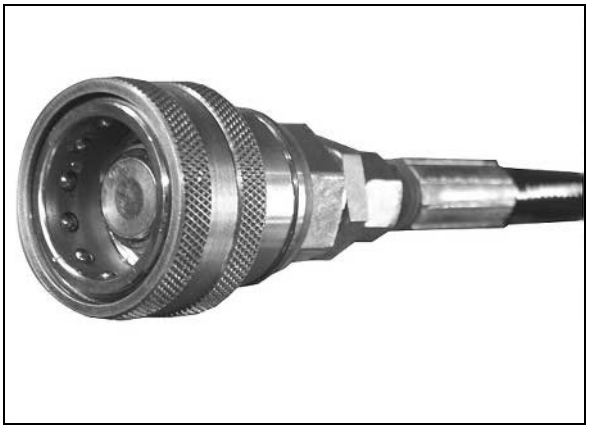


Fig. 20

5.4.2 Uncoupling the hydraulic operating brake system

1. Loosen the hydraulic screw joint (if present).
2. Use the protective caps to protect the hydraulic plug and socket from contamination.
3. Store the hydraulic hose line in the hose cabinet.

5.5 Tines

The tine rows are carried by the chassis. The stroke gap is as follows:

- 20 cm for the **Centaur Super**
- 25 cm for the **Centaur Special**

The chassis height of 105 cm enables large quantities of straw to pass without becoming jammed.

The overload protection, which consists of two tension springs, allows the tines to give way if an overload situation occurs.

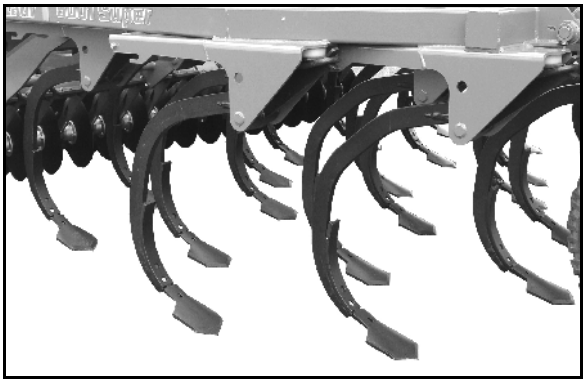


Fig. 21

Setting the working depth

The working depth is set in one of the following ways, depending on the machine and its equipment mechanically on the frame using spacer elements.

For more information on setting the working depth, see pages 77.

5.6 Coulters

The tines of the **Centaur** can be fitted with various coulters:

- Stubble coulter: used to mix in volunteer grain and straw when processing flat stubble.
- Helix coulter: used for average soil depths; good mixing in of organic matter.
- Narrow coulter: used for topsoil loosening. With deeper loosening, rocks remain at the lower level.
- Wide coulter: flat to medium working depths from 8 to 15cm.
- Double-disc coulter: flat, full area stubble tillage for working depths from 3-8 cm.

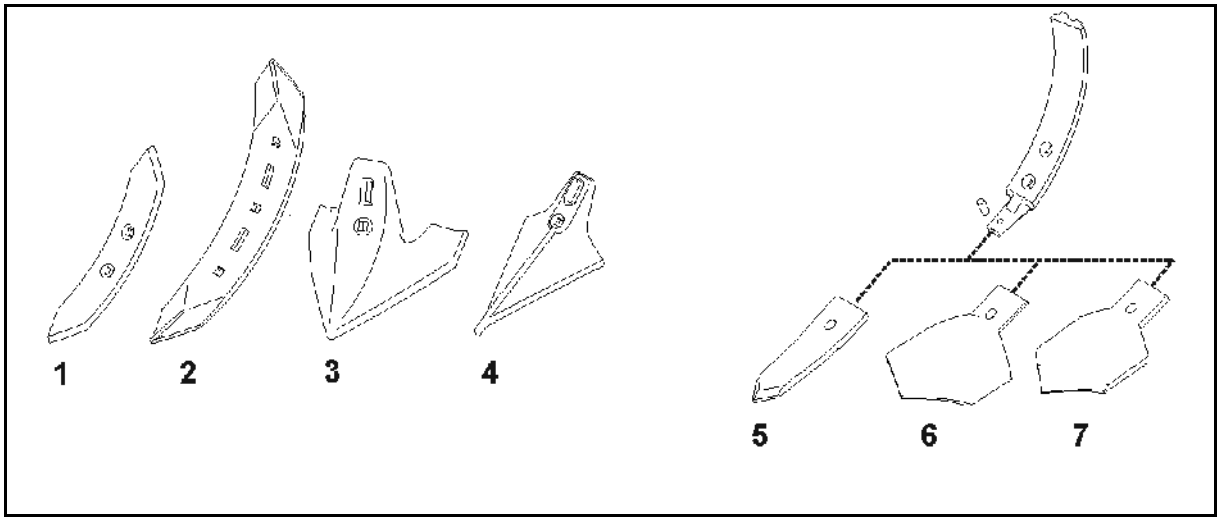
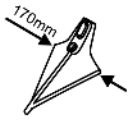
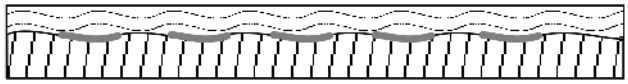
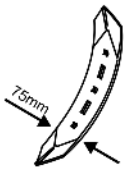
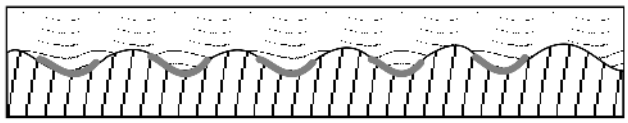
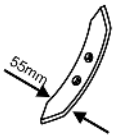
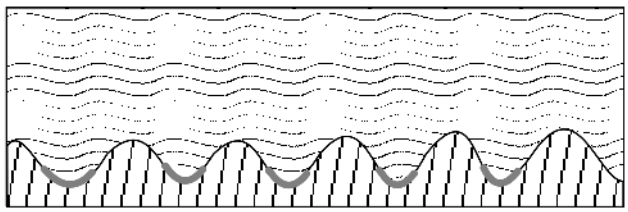


Fig. 22

(1) Pointed coulter (55 mm)
(2) Helix coulter (75 mm)
(3) Double-disc coulter (250 mm)
(4) Stubble coulter (170 mm)
(5) Narrow coulter Vario-Clip (75 mm)
(6) Stubble coulter Vario-Clip (220 mm)
(7) Stubble coulter Vario-Clip (170 mm)

In the case of local conditions that require frequent coulter changes, we recommend using the **Vario-Clip** quick change system.

The coulter mounting bracket is attached securely to the tine; the coulter body itself can be changed easily.

	Method	Working depth
Stubble coulter	 	7 – 10 cm
Helix coulter	 	10 – 20cm
Narrow coulter	 	20 – 35cm

5.7 Coulter C-Mix

The tines can be fitted with various coulters:

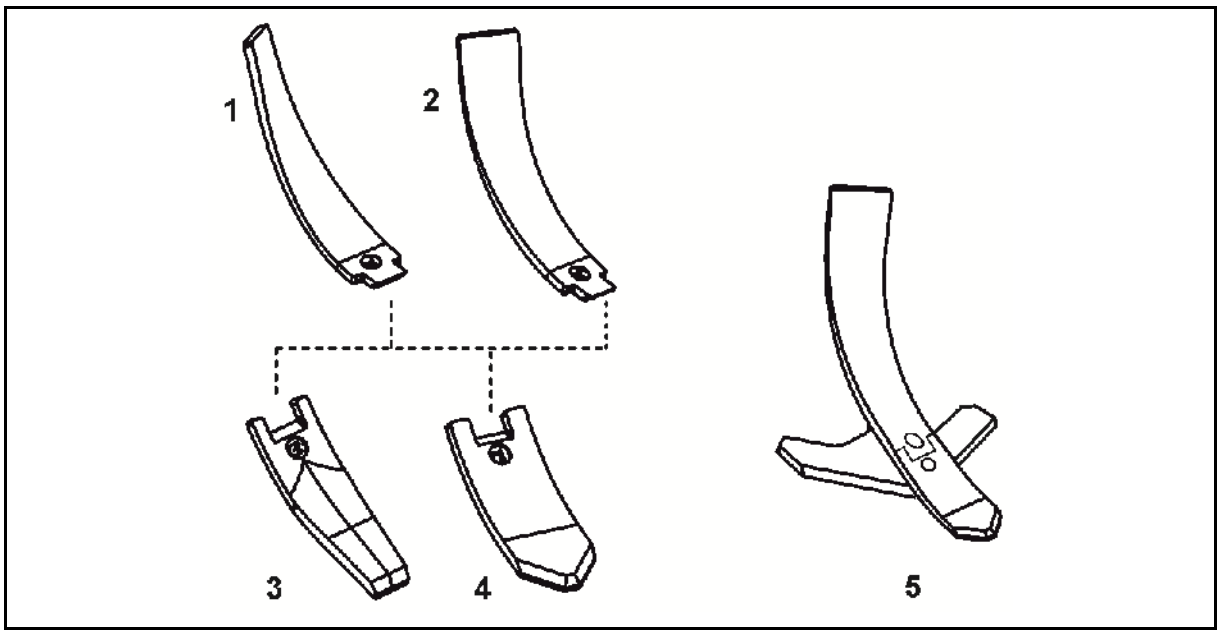


Fig. 23

(1) Deflector guide, left side (80 or 100 mm)

(2) Deflector guide, right side (80 or 100 mm)

(3) C-Mix coulter 80 mm

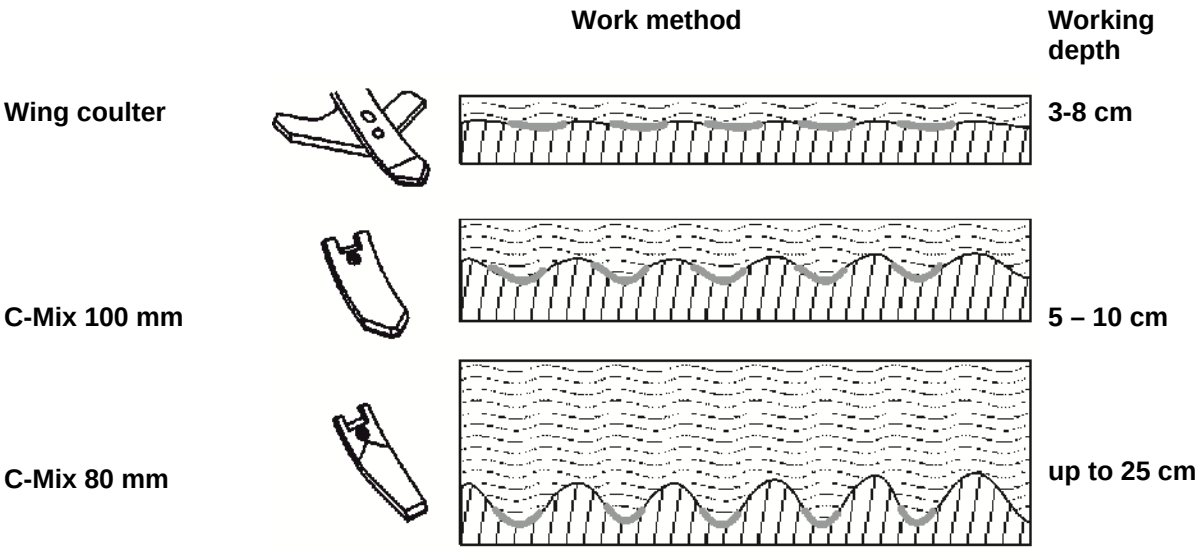
(4) C-Mix coulter 100 mm

(5) Wing coulter 350 mm (C-Mix coulter with wings that can be mounted separately)

CAUTION

Risk of breaking the coulter!

Never park the implement on solid ground with the coulters!



5.7.1 Share arrangement for inversion shares and guide plates

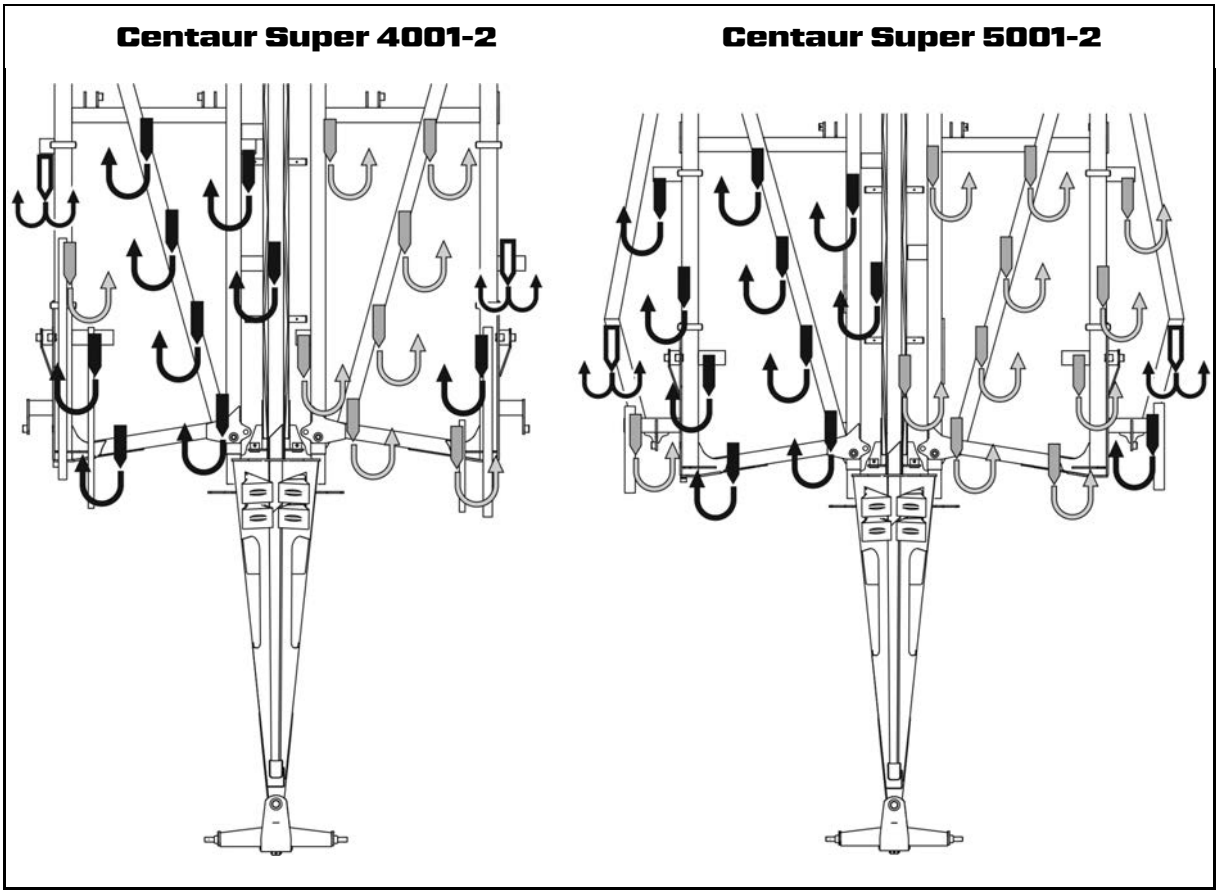


Fig. 24

5.8 Feeler wheels

(depending on equipment provided)

The fixed feeler wheels prevent the **Centaur** from shaking during unfavourable working conditions.

CAUTION

Set the **Centaur**'s depth guidance so that the lower links of the tractor keep the machine at the required height and bear the load.

The feeler wheels can touch the ground but must not carry the weight of the machine. They are not intended to be load-bearing elements.

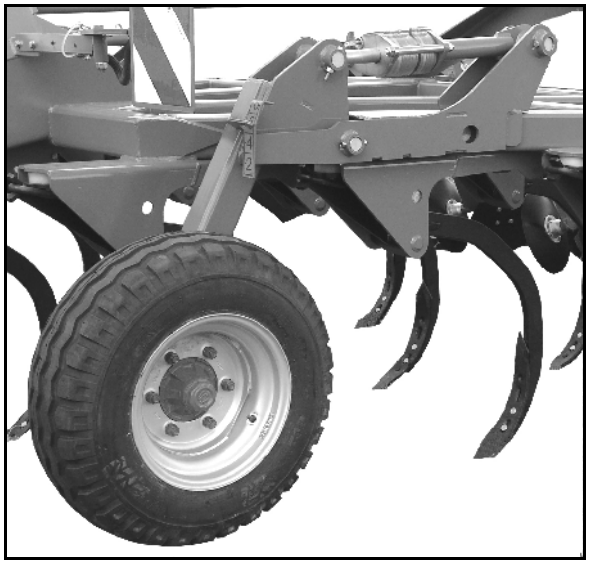


Fig. 25

CAUTION

- **If the feeler wheels are overloaded, the guarantee is invalidated.**
- **When cornering and on headlands, the machine is to be lifted using the tractor's lower links.**

5.9 Support wheels

The support wheels are designed for a load that has the mass of the machine so that the lower links of the tractor can be moved in the float position.

The front supporting wheels guide the Centaur reliably at the set working depth.

Fig. 26: **Centaur 5001-2**

The steerable design enables easy cornering.

Fig. 26

Fig. 27: **Centaur 4001-2**

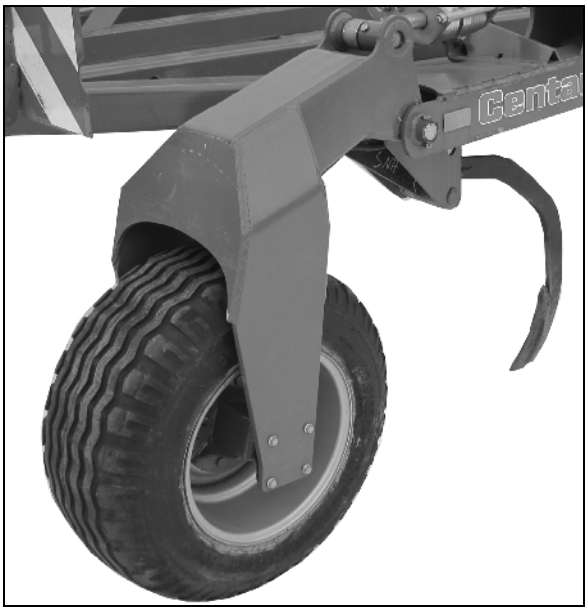


Fig. 27

If the slippage on the tractor rear wheels is too high, we recommend that you transfer some of the weight from the **Centaur** to the tractor by slightly raising the lower links.

5.10 Centaur Super levelling unit

The two-row hollow disc system acts as a levelling unit (Fig. 28). The discs, which have a diameter of 460 mm, are arranged so that there are eight discs per metre of working width. They mix, crumble and level out the earth.

The working depth of the disc unit is set using turnbuckles.

When the tine working depth is adjusted, the disc elements automatically adjust accordingly by means of a guide connection. The outer elements can be set separately to the next working depth to enable clean transit.

For information on setting the working depth, see page 81.

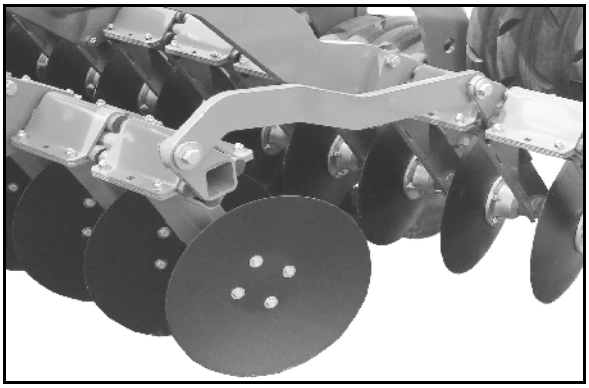


Fig. 28

5.11 Edge levelling

One of the following can be used on each side for edge levelling:

- One side disc
- A standard disc (**Centaur 5001-2 Super**) and a closer.

Adjustments can be made for soil conditions and operational speed.

The edge leveller not in use is transported on the machine and can be fitted at any time.

Outside discs

(1) The outside discs

- Are telescopic
- Can have their working depth adjusted
- Can have their penetration angle adjusted

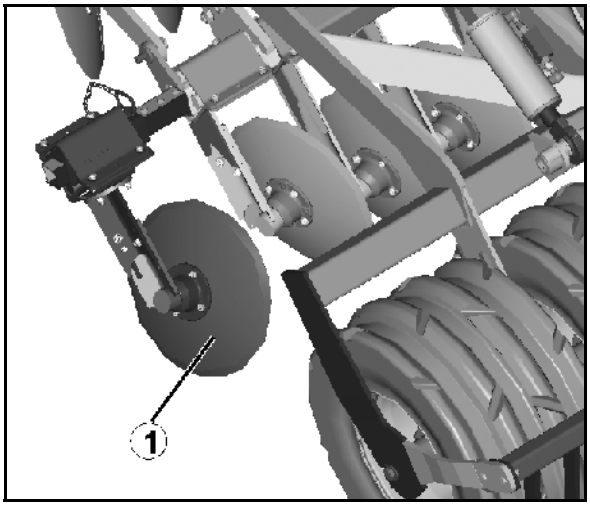


Fig. 29

Closers

(1) The closers

- Are telescopic
- Can have their working depth adjusted
- Can have their penetration angle adjusted.

(2) Additional standard disc (**Centaur 5001-2 Super**)

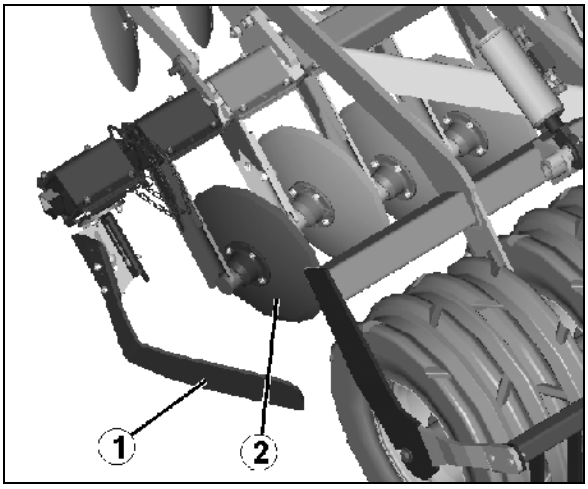
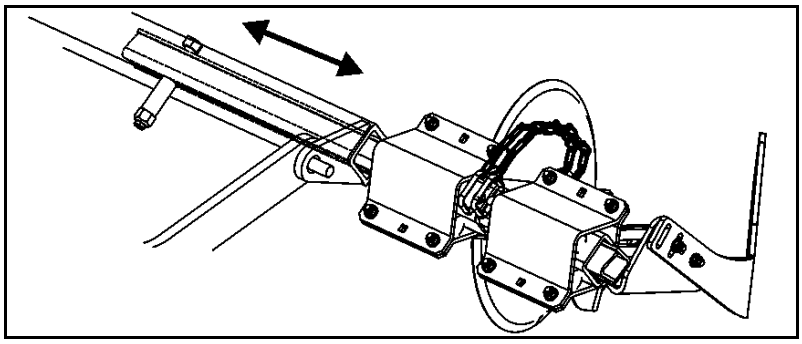


Fig. 30

Centaur 5001-2 Super:
To use the closers, pull out the telescoping bracket and secure with the bolt.
To use the side disc, push in the telescoping bracket and secure with the bolt.



Parking positions of the edge levellers

(1) Parking position closers / edge disc
(2) Parking position of additional standard disc (**Centaur 5001-2 Super**)

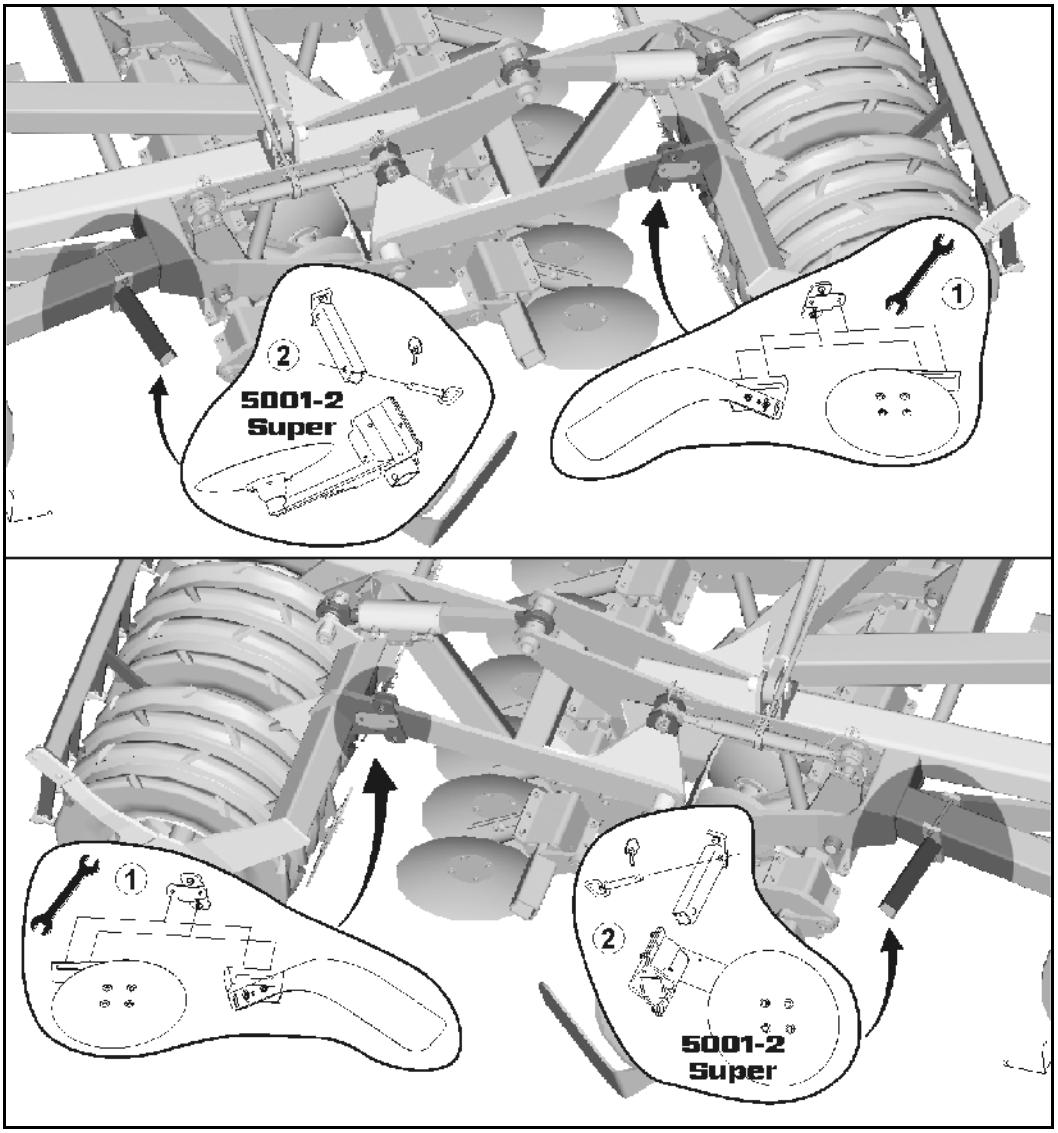


Fig. 31

5.12 Roller wheels/running gear wheels

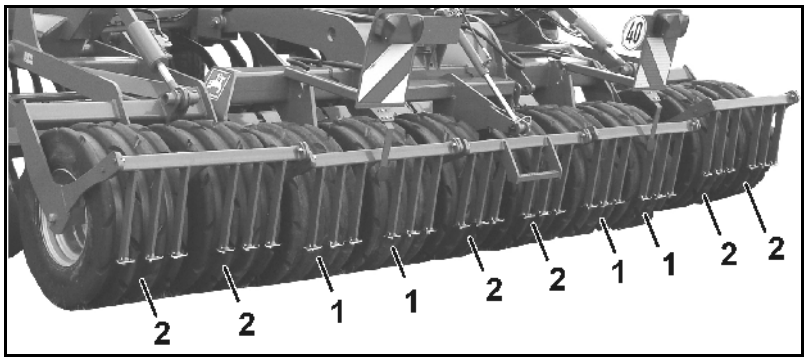


Fig. 32

(1) Running gear wheels

(2) Roller wheels

- During work, the machine is guided to the required depth at the rear using running gear wheels and roller wheels.
- During transport and in the headland, the machine runs on the running gear wheels.

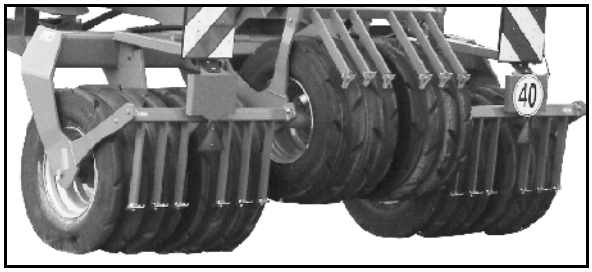


Fig. 33

5.13 Levellers

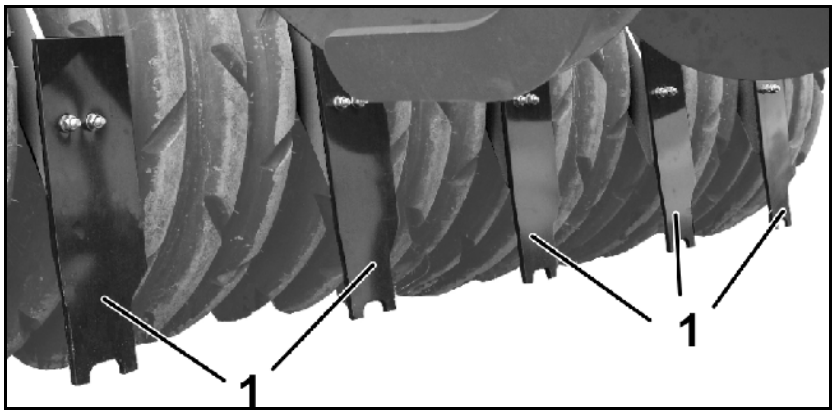


Fig. 34

Levellers can be installed in front of the roller wheels. These plastic elements close off the clearance between the individual roller wheels. They provide a level work pattern without dam formation.

The levellers are recommended particularly for sites with light soil.

For transport, the levellers in the central part of the machine are pivoted up.

5.14 Tensioned crosspiece

The category III tensioned crosspiece is used to couple the machine to the tractor.

Alternatively, tensioned crosspieces of category IV and V (Kirovetz tractors) can be supplied.

Secure the tensioned crosspiece using clip pins (Fig. 35/1) to prevent unintentional releasing of the attached machine.

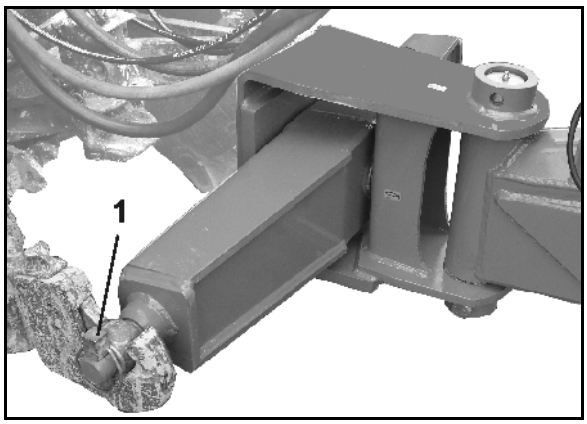


Fig. 35

5.15 Stand

- Stand raised for use or transport.
- Stand lowered with machine uncoupled.

A bolt with star grip locks the stand in place when raised or lowered.

Raising/lowering the stand:

1. Pull out the star grip (Fig. 36/1).
2. Raise/slowly lower the stand.
3. Release the star grip.
4. Check that the stand is locked in place in the respective end position.

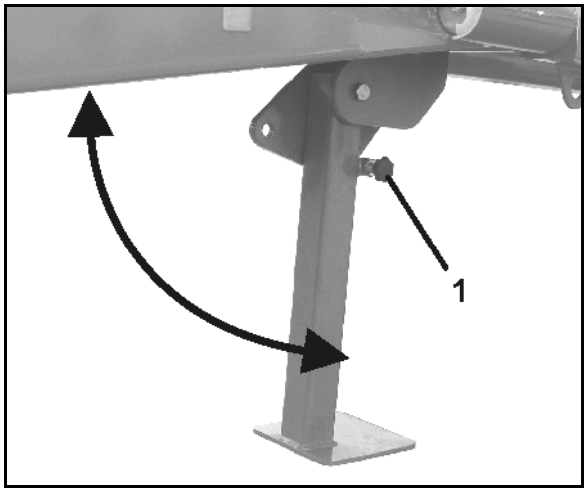


Fig. 36

5.16 Additional ballast

(Optional)

To obtain a higher level of re-consolidation, the **Centaur** can be fitted with additional ballast up to 500 kg.

Installation:

- Mount to the outside on the left and right of the rear square tube of the chassis.
- Secure the additional weight (Fig. 38/1) and retaining plate (Fig. 38/2) to the chassis tube using two screws for each.

Fig. 37

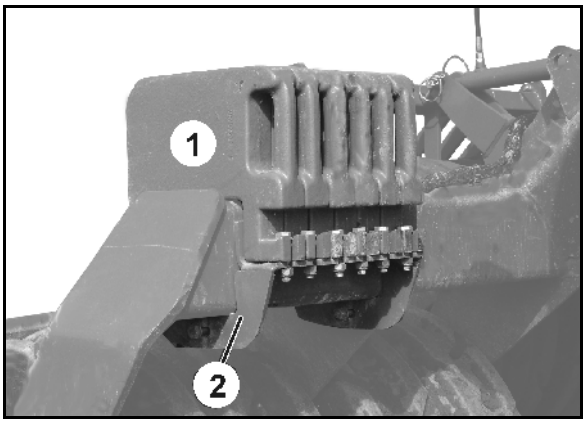


Fig. 38

5.17 Rear harrow

(Optional)

The **Centaur** can be equipped on the rear with harrows (Fig. 39) as additional tillage units.

The harrow produces a fine seed bed.

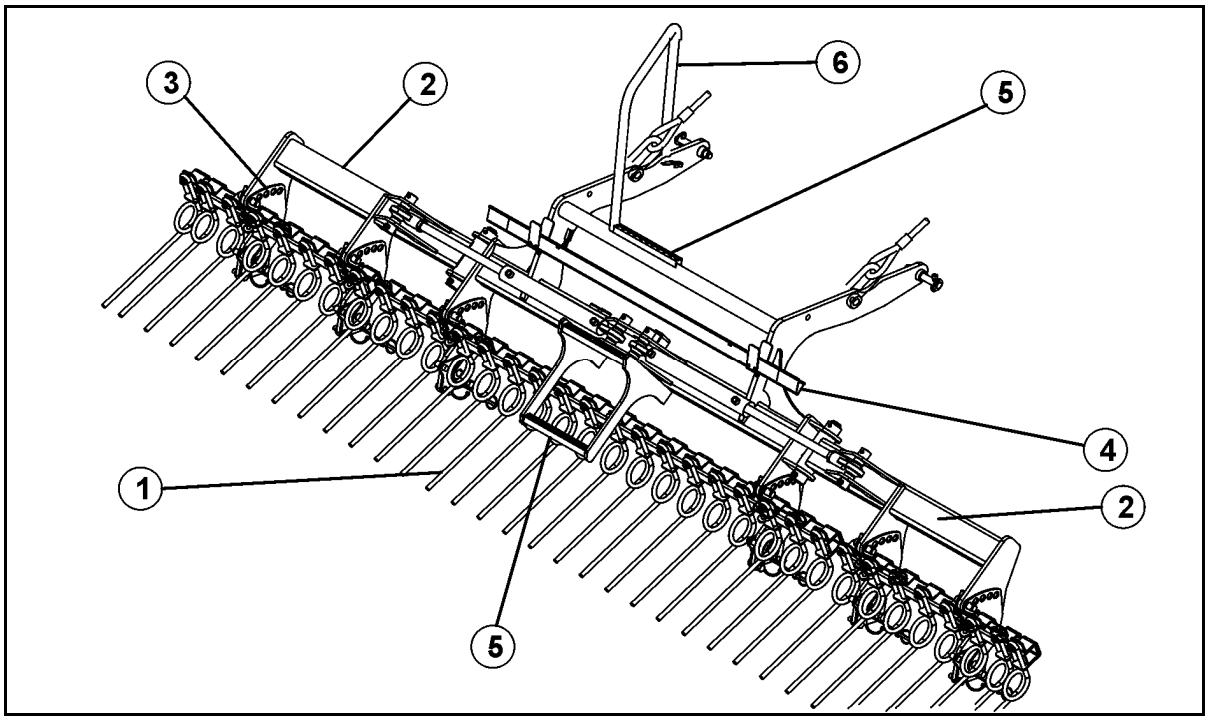


Fig. 39

Fig. 39/…

(1) Rear harrow

(2) Hydraulically foldable wings

(3) Rear harrow adjuster

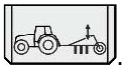
(4) Traffic safety guards (in parking position) as safety device during road transport

(5) Steps for safe access to the tine depth adjustment device

(6) Handrail for safe access to the tine depth adjustment device

Be sure to completely raise machines with rear harrow at the headlands.

Setting the harrow

1. Actuate the tractor control unit  .

→ The harrow lifts up, releasing the adjusting pins.

- **Move the adjusting pins upwards for greater aggressiveness.**
- **Move the adjusting pins downwards front for less aggressiveness.**

2. Release the clip pin (Fig. 40/1).
3. Secure the adjusting pins (Fig. 40/2) in the desired position.
4. Resecure the clip pin.

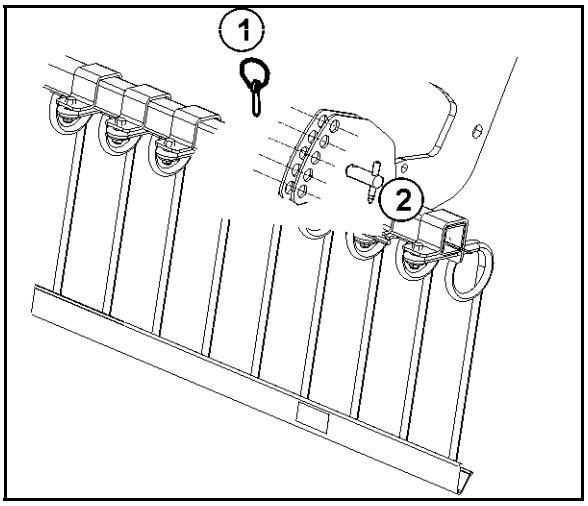


Fig. 40

Fix all harrow adjusting pins in the same position.

If there is a lot of plant remains on the soil surface, there is the risk of increasing shaking of the harrow. In this case, the aggressiveness must be reduced, i.e. the tines must be set at a flatter angle.

For use in seed bed preparation on ploughed or cultivated areas, the aggressiveness can be increased for more intensive work, i.e. the tines can be set at a steeper angle.

Completely raise the machine with rear harrow before reversing, as otherwise the rear harrow may be damaged.

Machines with rear harrow must always be completely raised at the headlands.

The display indicates the lift.

Fig. 41/…

(1) Display "Machine sufficiently raised"

(2) Display "Machine not sufficiently raised"

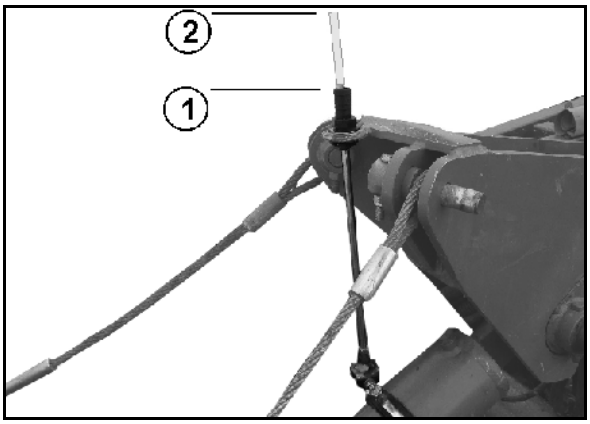


Fig. 41

Road transport

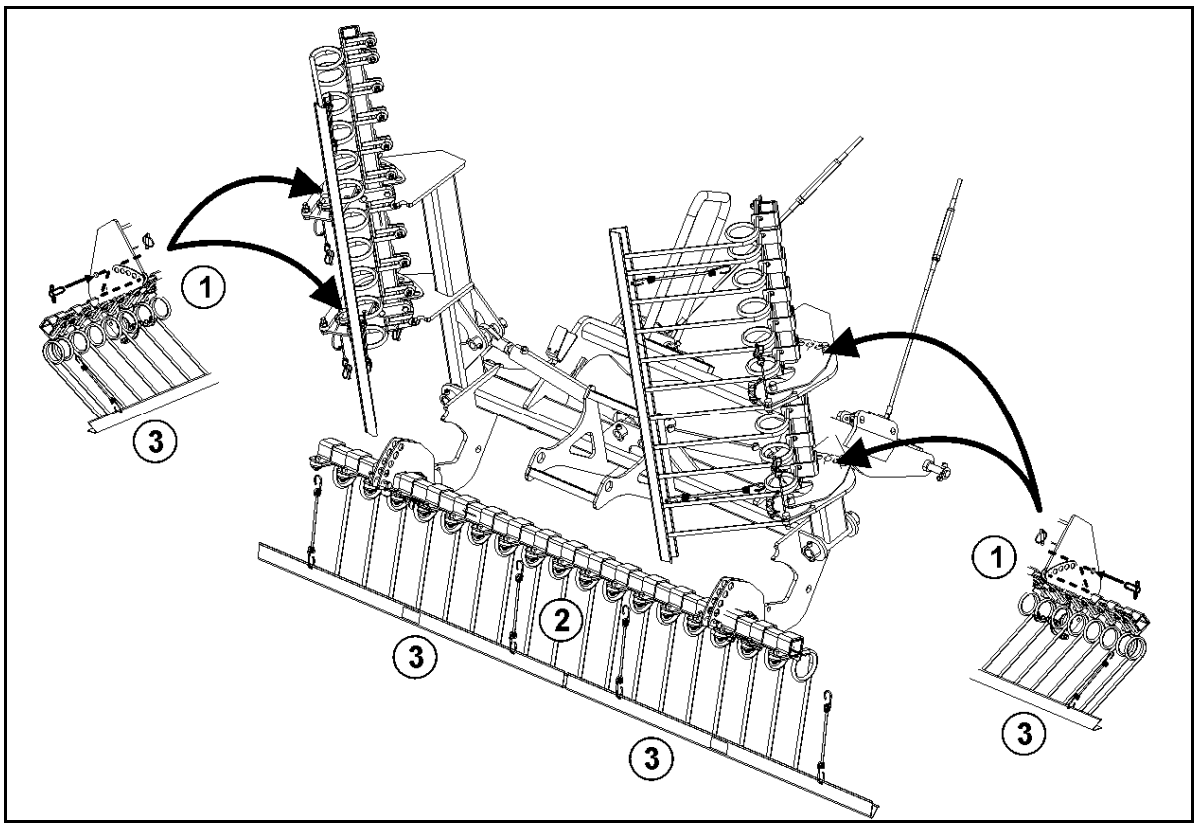
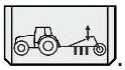


Fig. 42

Move the rear harrow to transport position

1. Actuate the tractor control unit  .

→ The harrow lifts up, releasing the adjusting pins.

2. Foldable wings:

Raise the harrow units, insert the bolt into the bore and secure using the clip pin. (Fig. 42/1).

→ Transport width is reduced.

Centre section:

Allow the harrow element to swing down (Fig. 42/2).

3. Install the traffic safety guards on the harrow elements (Fig. 42/3).

When the rear harrow is not in use

Remove the rear harrow when not in use. Use a crane (workshop work)!

Removing the rear harrow when folded out:

1. Raise the harrow units, insert the bolt into the bore and secure using the clip pin.
2. Install traffic safety guards.
3. Attach the rear harrow to a crane at the four lifting points.
4. Disconnect the hydraulic couplers and close off with dust caps.

WARNING

Damage due to hydraulic short-circuit.

After disconnecting the hydraulic hoses, on no account join the two machine-side couplers together.

5. Disconnect the wire ropes on the machine side.
6. Pull out the two bolts of the rear harrow.
7. Lift the rear harrow off the machine using a crane.

Carry out installation in the reverse order.

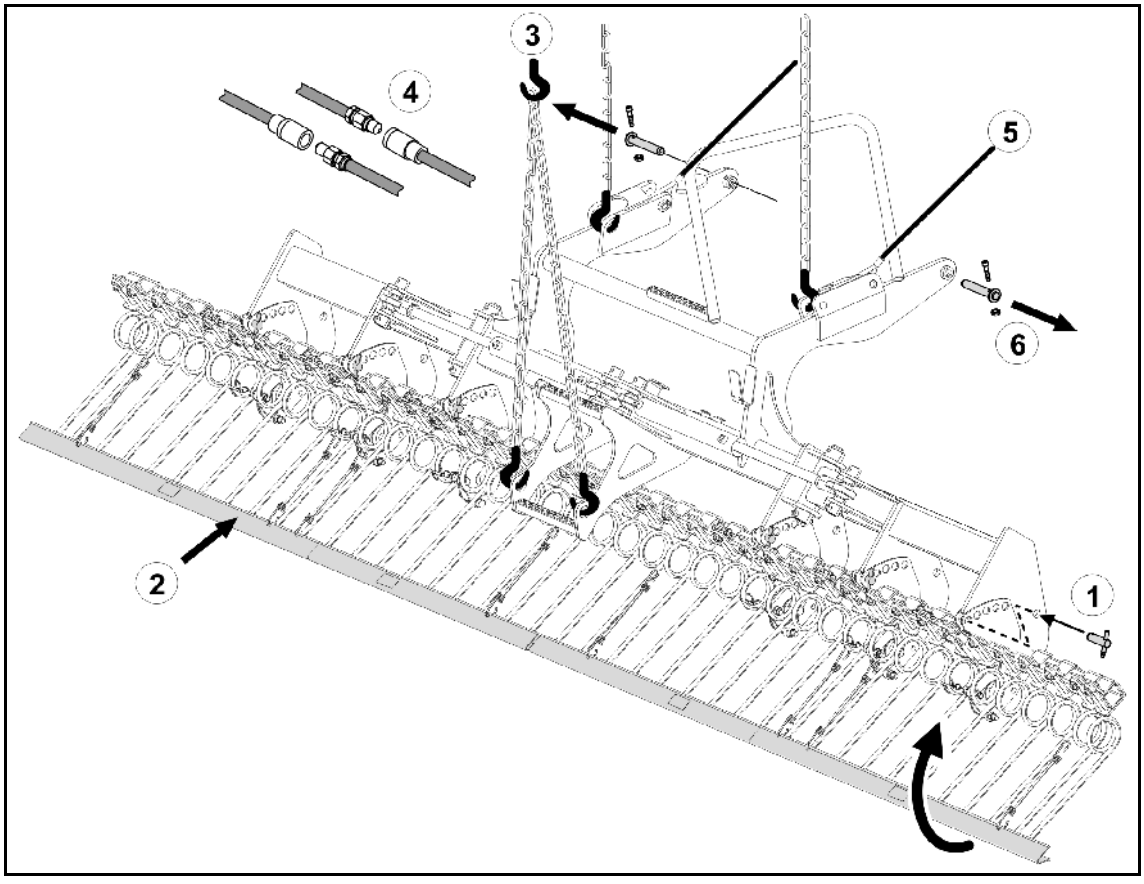


Fig. 43

5.18 End runners

(Optional)

The end runners ensure a uniform back-packing between the wedge ring tyres.

The folding of the two outer wings is not connected to the machine folding system.

Crosskill end runners for heavy soils (Fig. 44)

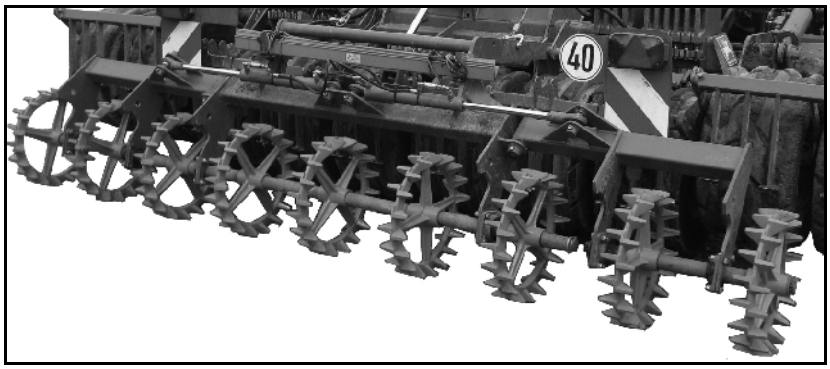


Fig. 44

Remove the end runners when not in use, see rear harrow page 64.
Use a crane (workshop work)!

5.19 Safety chain for machines without brake systems

Machines without brake systems are equipped with a safety chain according to the regulations in each country.

The safety chain must be mounted on an appropriate location of the tractor as prescribed before setting the vehicle in motion.

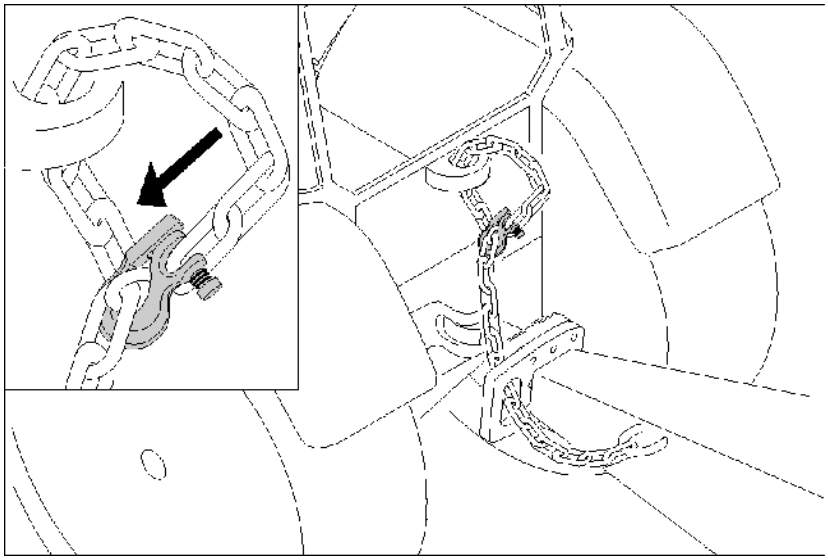


Fig. 45

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 rating plate or in the vehicle documentation and in the tractor operating manual.

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

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

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

The 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

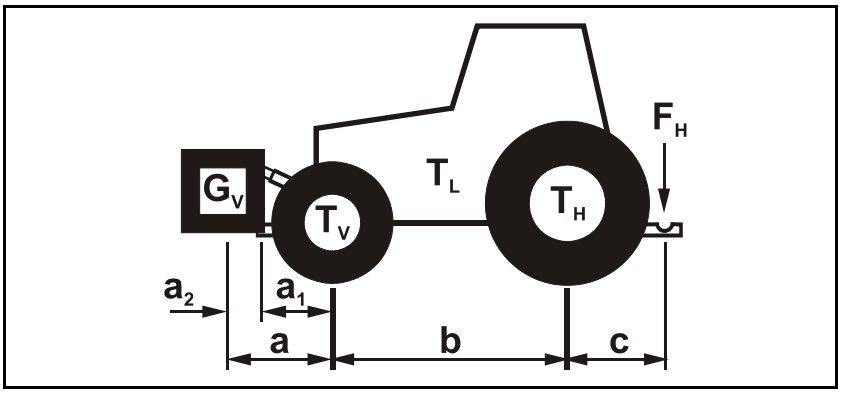


Fig. 46

T_L	[kg]	Empty tractor weight	See tractor operating manual or vehicle documentation
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of the empty tractor	
G_V	[kg]	Front weight (if available)	See front weight in technical data, or weigh
F_H	[kg]	Maximum drawbar load	See technical data of machine
a	[m]	Distance between the centre of gravity of the front machine mounting or the front weight and the centre of the front axle (total $a_1 + a_2$)	See technical data of tractor and front machine mounting or front weight or measurement
a_1	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement
a_2	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front machine mount or front weight (centre of gravity distance)	See technical data of front machine mounting or front weight or measurement
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement

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

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

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

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

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

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

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

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

Enter the numeric value for the calculated actual total weight and the approved total tractor weight specified in the tractor operating manual in the table (section 6.1.1.7).

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

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

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

6.1.1.6 Tyre load capacity

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

6.1.1.7 Table

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

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

WARNING

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

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

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

You must use a front weight, which is equal to at least the required minimum front ballast ($G_{V\ min}$).

6.1.2 Requirements for tractor operation with attached machines

WARNING

Risk of breakage during operation of components through unapproved combinations of connecting equipment!

- Ensure:
  - that the connection fittings on the tractor possess sufficient permissible support capability for the supported weight actually present.
  - that the axle loads and weights of the tractor altered by the drawbar load are within the approved limits. If necessary, weigh them.
  - that the tractor's actual static rear axle weight does not exceed the permissible rear axle weight.
  - that the permissible total weight of the tractor is observed.
  - that the approved load capacities of the tractor tyres are not exceeded.

6.1.3 Machines without their own brake system

WARNING

Risk of contusions, cuts, dragging, catching or knocks from insufficient tractor brake power.

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

If the machine does not possess its own brake system:

- Then the actual tractor weight must be greater than or equal to (≥) the actual weight of the connected machines.

  In many countries, other regulations apply. In Russia, for example, the weight of the tractor must be double that of the attached machine.
- The maximum movement speed is 25 km/h.

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

WARNING

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

- **unintentional lowering of the 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 PTO shaft/hydraulic system connected.
  - if the ignition key is in the tractor and the tractor engine can be started unintentionally with the PTO 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. Lower the raised/unsecured machine (machine parts).

→ This prevents parts from falling unintentionally.

2. Turn off the tractor engine.
3. Remove the ignition key.
4. Apply the tractor's parking brake.
5. Secure the machine against rolling unintentional (only if the machine is hitched) as follows:
   - by applying the parking brake (if fitted) or by using wheel chocks, if the terrain is level.
   - by applying the parking brake and using wheel chocks if the machine is on unlevel terrain or on an incline.

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 72.

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 67.

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.
- 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. Using the lower link pins, secure the ball sleeves to the hinging points of the three-point attachment frame.
2. Secure each of the lower link pins with lynch pins to ensure that they do not accidentally become loose.
3. Direct people away from the danger area between the tractor and machine before you approach the machine with the tractor.
4. Connect the supply lines before coupling machine and tractor.
   - 4.1 Drive tractor up to the machine in such a way that there remains a gap (approx. 25 cm) between tractor and machine.
   - 4.2 Secure the tractor against unintentional starting and unintentional rolling away.
   - 4.3 Check that the tractor's PTO is switched off.
   - 4.4 Connect the supply lines to the tractor.
   - 4.5 Position the lower link hooks so that they are aligned with the lower linking points on the machine.
5. Now reverse the tractor further towards the machine so that the tractor's lower link hooks automatically pick up the ball linings on the machine's lower pivot points.

→ The lower link hooks lock automatically.

6. Raise the stand into the transport position.
7. Before moving off:
   - o Visually check that the lower link hooks are correctly locked.
   - o Remove the wheel chocks.

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!

Place the machine due to the high supported load, only on a horizontal storage space with a solid base.

When uncoupling the machine, there must always be enough space in front of the machine, so that you can align the tractor with the machine if necessary.

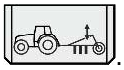
The **Centaur 4001 -2/5001-2** can be uncoupled as follows:

- When folded out.
  Place the machine on the tines.

→ Important during longer down times.

- When retracted.
  Place the machine on the stand.

1. Park the machine on a level parking surface on solid ground.
2. Uncouple the machine from the tractor.
   - 2.1 Secure the machine against unintentionally rolling away. See page 72.
   - 2.2 Lower the stand (where applicable).
   - 2.3 Release the lower link.

     At the same, simultaneously actuate control unit  .

     → Lower the running gear, thus keeping the machine horizontal.
   - 2.4 From the tractor seat, unlock the lower link hooks and uncouple them.
   - 2.5 Pull tractor forward approx. 25 cm.

     → This will allow more room between tractor and machine and give better access for uncoupling the PTO shaft and supply lines.
   - 2.6 Secure tractor and machine against unintentional starting and rolling away.
   - 2.7 Disconnect the supply lines.
   - 2.8 Fasten supply lines to their respective parking sockets.
3. Secure the machine against rolling away with wheel chocks.

7.2.1 Shunting the uncoupled machine

Dual circuit air brake system

CAUTION

You must be particularly careful when shunting the machine with the service brake system released, since only the manoeuvring vehicle is now braking the machine.

The machine must be connected to the manoeuvring vehicle before you actuate the release valve on the trailer brake valve.

The brakes on the manoeuvring vehicle must be on.

The service brake system cannot be released using the release valve if the air pressure in the air reservoir drops below 3 bar (e.g. if the release valve has been actuated multiple times or if there are leaks in the brake system).

Release the service brake as follows:

- **Fill the air reservoir.**
- **Completely deaerate the brake system using the drain valve on the air reservoir.**

1. Connect the machine to the manoeuvring vehicle.
2. Actuate the brakes on the manoeuvring vehicle.
3. Remove wheel chocks.
4. Pull out the release valve until it reaches the stop position.

→ This releases the service brake system so that the machine can be shunted.

5. Once shunting is complete, push in the release valve until it reaches the stop position.

→ The pressure from the air reservoir brakes the machine again.

6. Actuate the brakes on the manoeuvring vehicle.
7. Secure the machine against rolling away with wheel chocks.
8. Uncouple the machine from the manoeuvring vehicle.

Hydraulic brake system

DANGER

You must be particularly careful when shunting the machine, since only the manoeuvring vehicle is now braking the machine.

The machine must be connected to the manoeuvring vehicle before you release the parking brake.

The brakes on the manoeuvring vehicle must be on.

1. Connect the machine to the manoeuvring vehicle.
2. Actuate the brakes on the manoeuvring vehicle.
3. Remove wheel chocks.
4. Actuate the brakes on the manoeuvring vehicle again once you have finished shunting the machine.
5. Secure the machine against rolling away with wheel chocks.
6. Uncouple the machine from the manoeuvring vehicle.

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 72.

8.1 Working depth of coulter

- With the depth adjustment the rear roller wheels and the front feeler/support wheels (optional) are set to the accurate depth guidance.
- If neither feeler wheels nor support wheels are mounted, set the front depth guidance using the tractor lower link.

Mechanical depth adjustment enables the easy adjustment of the working depth of the **Centaur** on the stand. Spacer elements on the roller and running gear units at the rear and the depth guidance wheels at the front (optional) are mounted so that they can not be detached. They can be tilted in or out in accordance with the required working depth. This allows the working depth range to be set to one of 15 levels.

CAUTION

Hand pinch point.

Do not reach between cylinder base and spacer elements!

- After setting the working depth at the rear, use the tractor's lower links to place the machine on a level. Use the tine row frame to help you.
- If fitting the **Centaur** with feeler wheels, the machine is to be guided at the front using the lower links of the tractor. The feeler wheels must not be allowed to bear the mass of the machine.

Only make the adjustment with the machine folded out.

CAUTION

When climbing onto the machine to adjust the depth on the running gear hydraulic cylinder, use the ascent (Fig. 47/1) and the handle (Fig. 47/2)

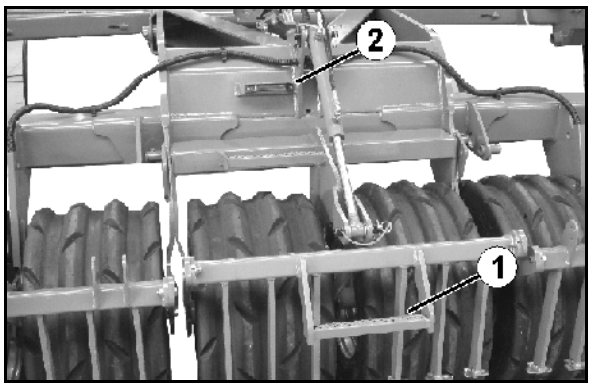


Fig. 47

Carry out mechanical depth adjustment:

- On the running gear hydraulic cylinder.

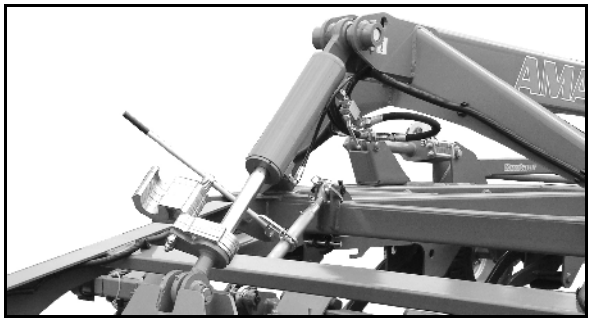


Fig. 48

- The roller feelers/support wheels (depending on the equipment).

Fig. 49

- Using the left and right spacer elements on the rear roller.

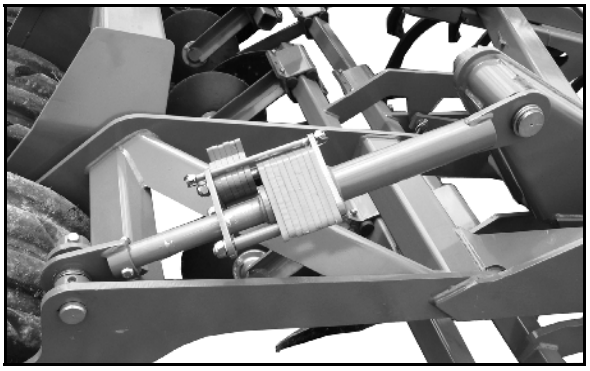


Fig. 50

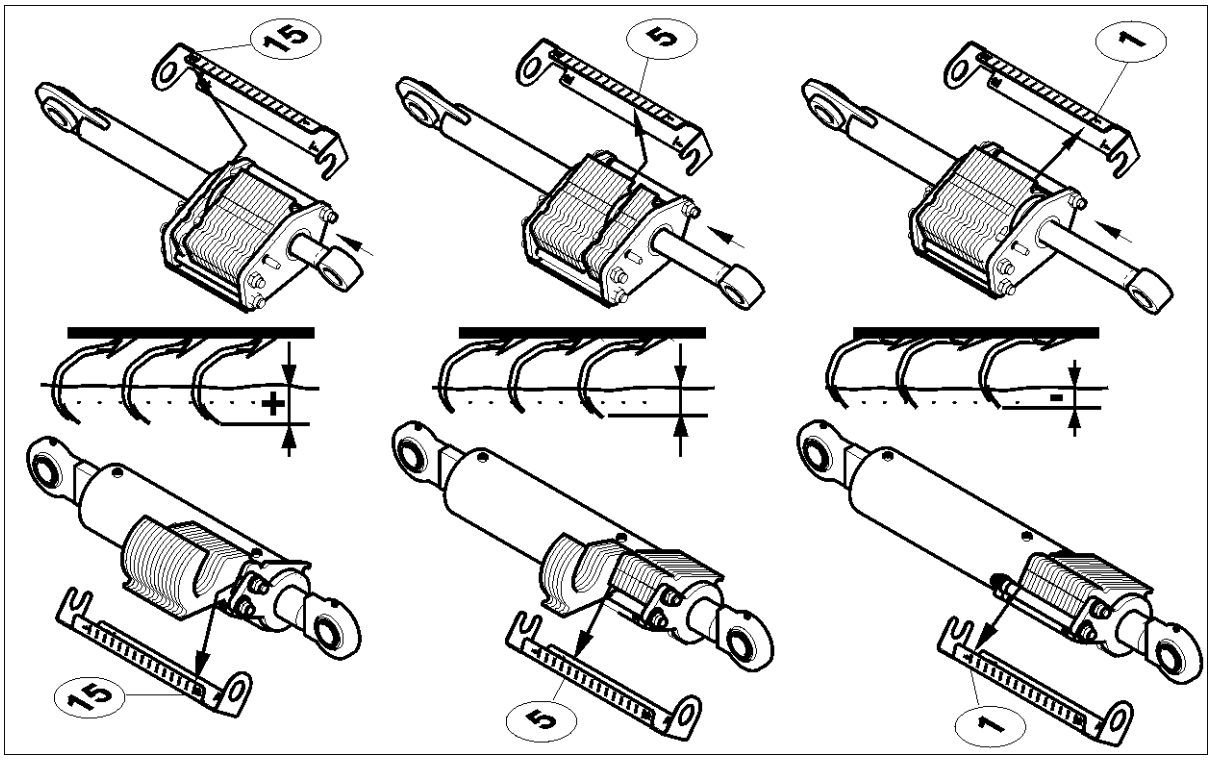


Fig. 51

Scale on the setting units:

- Large working depth: Setting 15
- Medium working depth: Setting 5
- Small working depth: Setting 1

The working depth is reduced by swinging in the spacer elements, starting from position 15.

The last spacer element under pressure serves as the pointer for the scale from 1 to 15.

Chassis cylinder:

Be sure to insert the spacer elements starting from the cylinder eyebolt when adjusting.

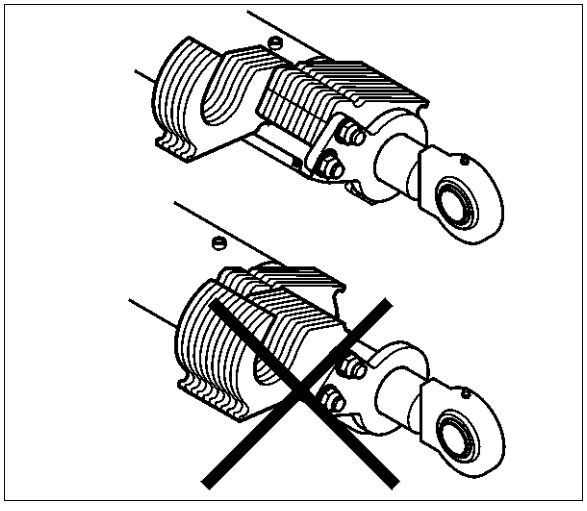
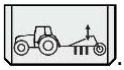


Fig. 52

Carrying out the adjustment

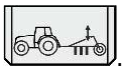
To reduce the working depth:

1. Tractor control unit  .

→ Raise the machine, thus relieving spacer elements.

2. Increase the number of spacer elements on the piston rod.

To increase the working depth:

1. Tractor control unit  .

→ Raise the machine, thus relieving spacer elements.

2. Decrease the number of spacer elements on the piston rod.

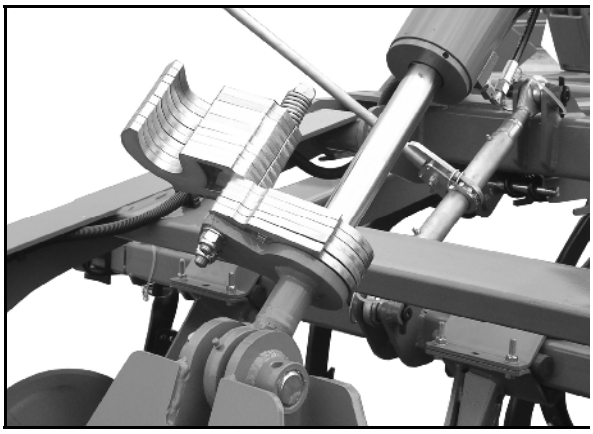


Fig. 53

Set the working depth to the same value at all adjustment units.

Adjustment on the rear rollers left and right / sensing wheels / supporting wheels

Before making the adjustment, pull the fastening bolt (Fig. 54/2).

After the adjustment, hold the spacer elements (Fig. 54/1) in place using the fastening bolt and secure them using the clip pin (Fig. 54/3).

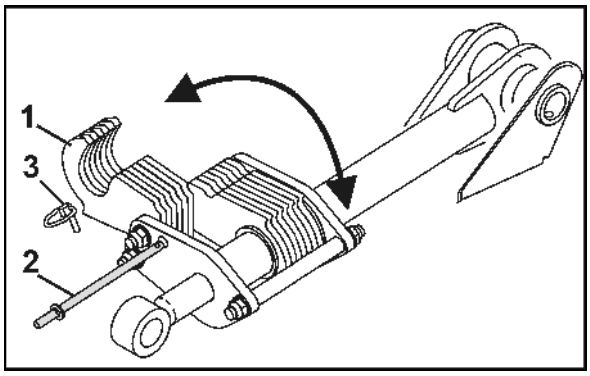
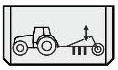


Fig. 54

After setting the working depth, pivot the free spacer elements (Fig. 55/1) on the piston rod (starting from position 1) in front of the adjustment plate (Fig. 55/4).

→ Improved feeding behaviour.

First:

Actuate tractor control unit 

→ Lower the machine.

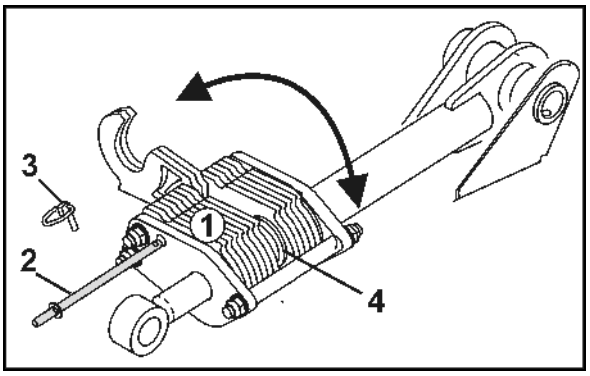


Fig. 55

- For the **Centaur,** the working depth of the levelling unit automatically adjusts when the working depth of the coulter is adjusted.
- For the **Centaur Super** in particular, the working depth of the levelling unit significantly influences the traction force demand, which, in turn, influences the fuel consumption in relation to the area. For this reason, you should not set the working depth to a greater value than required.

8.2 Working depth of the levelling unit

Levelling units can have their working depth adjusted in line with changing soil types, plant growth, and operational speed.

Setting the working depth of the levelling unit via screw spindle.

Set the left and right spindles to the same length.

Centaur Special, Fig. 56

- Shorten the spindle:

→ Reduce the working depth.

- Lengthen the spindle:

→ Increase the working depth.

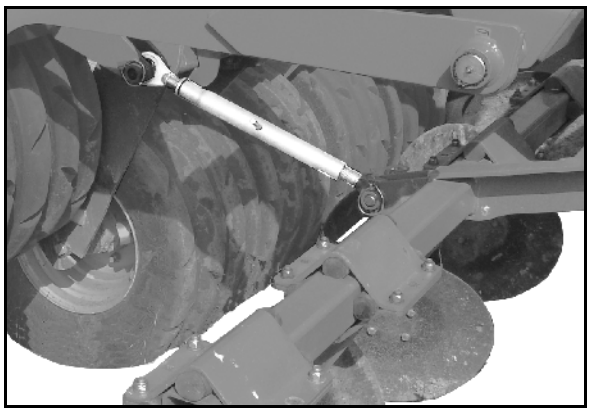


Fig. 56

Centaur Super, Fig. 57

- Shorten the spindle:

→ Increase the working depth.

- Lengthen the spindle:

→ Reduce the working depth.

Scale for working depth:

The scale (Fig. 57/1) helps you to set the spindles to the same length.

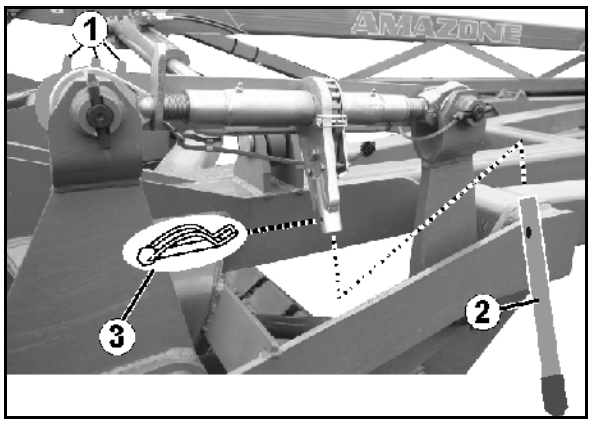


Fig. 57

To set the spindle length:

1. Move the hand lever from parking position (Fig. 58).
2. Secure the hand lever (Fig. 57/2) with linch pin (Fig. 57) to the ratchet (Fig. 57).

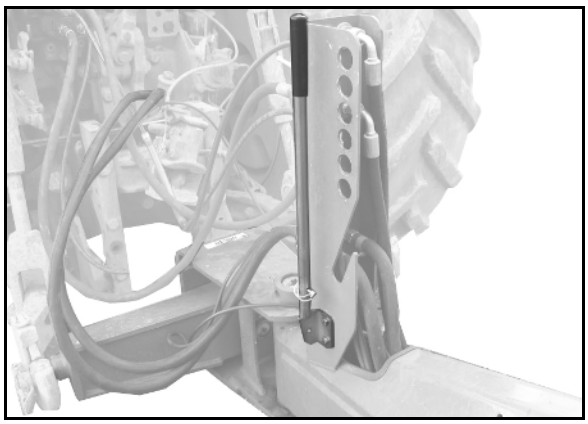


Fig. 58

Adjusting the spindle using the ratchet

1. Remove the clip pin (Fig. 59/3).
2. Engage the turning lever (Fig. 59/2) in the required direction.
3. Use the hand lever (Fig. 59/1) to lengthen or shorten the spindle.
4. Secure using the clip pin (Fig. 59/3).
5. Move the lever back to parking position.

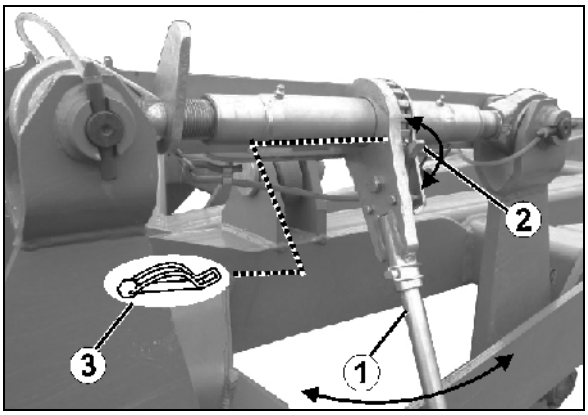


Fig. 59

8.3 Adjusting outside discs / closers

Adjust the closers parallel to the ground, slightly lower at the rear.

Telescoping outside disc

1. Actuate tractor control unit .

→ Raise the running gear!

2. Loosen clip pin and remove bolt (Fig. 60/1).
3. Telescope the outside disc with the bolt and secure using the clip pin.

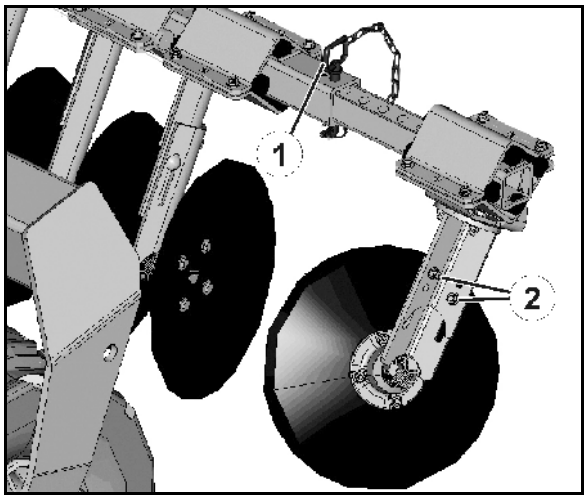


Fig. 60

Telescope the side discs / closers.

1. Actuate tractor control unit .

→ Raise the running gear!

2. Release screw unions (Fig. 60/2).
3. Adjust the side discs / closers in the slot so that no dam formation is caused during use.
4. Retighten the screw unions.

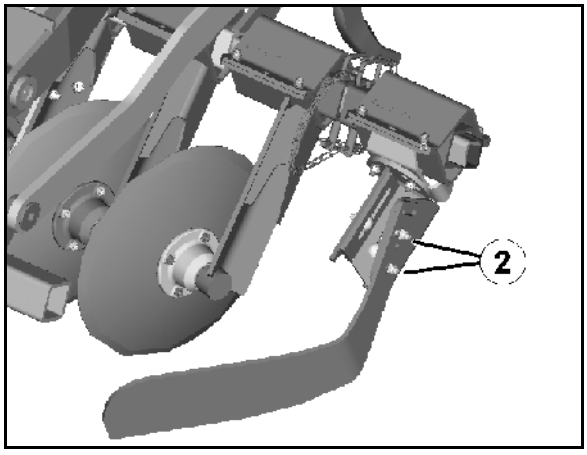


Fig. 61

Set the penetration angle of the side discs / closers

1. Actuate tractor control unit .

→ Raise the running gear!

2. Undo three screw unions (Fig. 62/1).
3. Adjust the penetration angle by turning the side discs / closers so that there is no dam formation during use.
4. Retighten the screw unions.

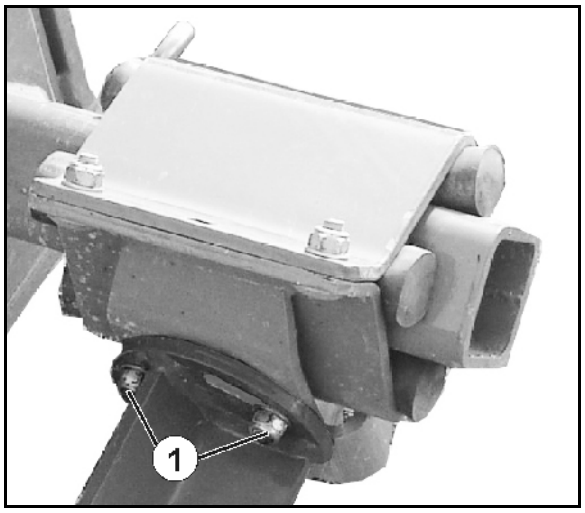


Fig. 62

9 Transportation

- During transportation, follow the instructions given in the section "Safety instructions for the operator", page 26.
- Before moving off, check:
  - that the supply lines are connected correctly.
  - the lighting system for damage, proper operation and cleanness,
  - the braking and hydraulic systems visually for obvious defects.
  - the function of the brake system.

WARNING

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

Before transportation, make a visual check to ensure that the upper and lower link pins are secured with clip pins to prevent them from coming loose.

WARNING

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

- On folding machines, check that the transport locks are locked correctly.
- Secure the machine against unintentional movements before starting transportation.

WARNING

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

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

  In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected machine.
- Before transportation, fasten the side locking of the tractor lower link, so that the connected or coupled machine cannot swing back and forth.

WARNING

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

These risks pose serious injuries or death.

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

WARNING

Risk of falling from the machine if riding against regulations!

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

WARNING

Risk of stabbing other road users through machine parts extending out into the road area!

Cover any protruding parts on machines.

You must make protruding parts clearly visible if you can not cover them easily.

DANGER

Risk of injury with overwidth transport.

- Push in and lock the outer border discs / border tines!
- Duckfoot coulter / wing coulter: mount the outer tine receptacle far enough to the inside so that the permissible transport width is maintained.

9.1 Placing the machine in the transport position

Switching the machine from the working position to the transport position:

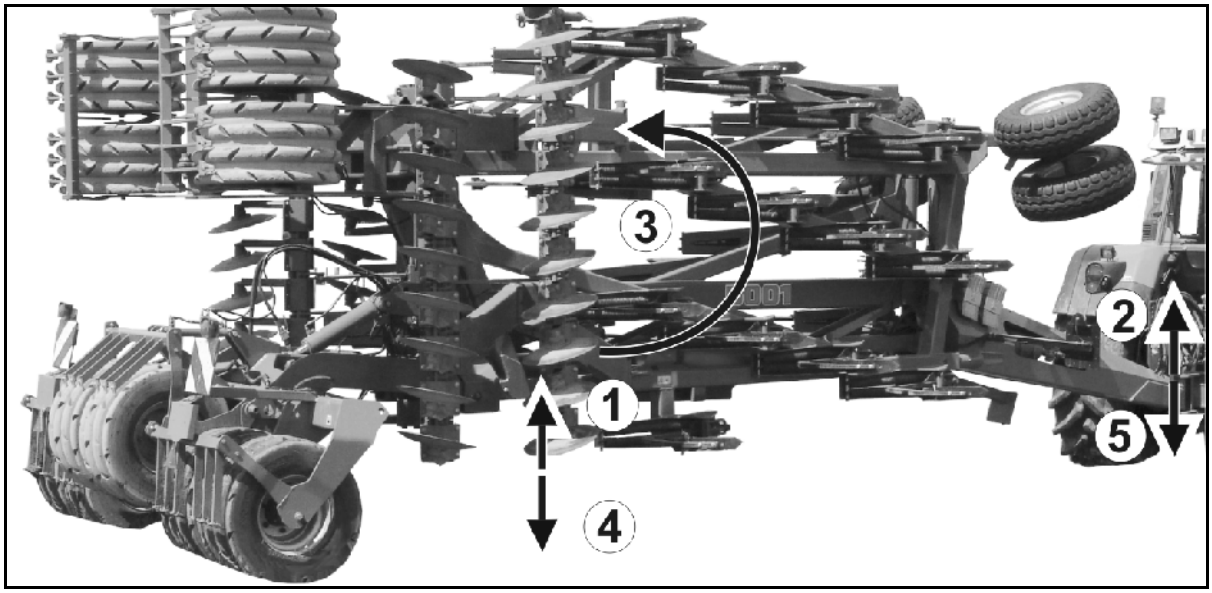
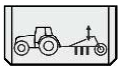
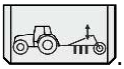


Fig. 63

1. Remove the protective tarpaulins from the booms.

The brake must be released when **tractor control unit**  is actuated so that the roller wheels can unroll.

2. Actuate **tractor control unit**  .

→ Completely raise the machine (Fig. 63/1), headland setting.

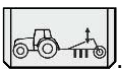
3. Raise the tractor lower links (Fig. 63/2).

4. Actuate **tractor control unit**  :

→ Completely fold up the machine (Fig. 63/3).

CAUTION

- **Note that the maximum transport height is 4 m. (Observe national road traffic requirements)!**
  With rear accessories installed: Swing out all spacer elements on the running gear cylinder and retract it completely.
- **Make sure that there is enough ground clearance.**

5. Actuate **tractor control unit**  .

→ Lower the machine (Fig. 63/4).

6. Lower the tractor's lower links (Fig. 63/5).

→ Make sure that there is enough ground clearance.

7. Fit the protective tarpaulins as a safety precaution on the tines and discs.

CAUTION

Risk of injury from the tines and discs when attaching protective tarpaulins.

When the machine is folded in and out, the rear harrow and levellers are also raised or lowered.

If necessary, also move the rear harrow to transport position!

10 Use of the machine

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

- "Warning signs and other labels on the machine", from page 17 and
- "Safety instructions for operators", from page 24.

Observing this information is important for your safety.

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

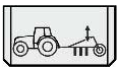
Each time before the machine is used, carry out a visual check that the upper and lower link pins are secured with a lynch pin against unintentional release.

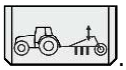
10.1 Placing the machine in the working position

Switching the machine from the transport position to the working position:

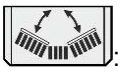
1. Remove protective tarpaulins.
2. Unlock stop tap against unintentional unfolding via cable winch, see page 35.

Fig. 64

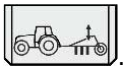
The brake must be released when **tractor control unit**  is actuated so that the roller wheels can unroll.

3. Actuate **tractor control unit**  .

→ Completely raise the machine (Fig. 64/1).

4. Raise the tractor lower links (Fig. 64/2).
5. Actuate **tractor control unit**  :

→ Completely unfold the machine (Fig. 64/3).

6. Actuate **tractor control unit**  .

→ Completely lower the machine (Fig. 64/4).

7. Lower the tractor's lower links (Fig. 64/5)

   until the frame is horizontal.

- Feeler wheels: the optional feeler wheels may not bear the weight of the machine.
- Support wheels (optional): the machine is parked on the support wheels.

8. Fasten the protective tarpaulins to the foldable booms.

10.2 During the work

Machine with support wheels:

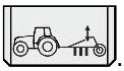
- Drive the tractor lower links in the float position.
- If the slippage on the rear tractor wheels is too high, we recommend that you transfer some of the weight from the machine to the tractor by slightly lifting the lower links.

Machine with feeler wheels:

- Place the machine in a horizontal position using the tractor's lower links.
- The feeler wheels may not bear the weight of the machine.
- When cornering sharply, the machine is to be lifted using the tractor's lower links.

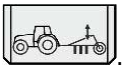
10.3 Headland

Before turning on headlands:

- Actuate **tractor control unit**  .
- Raise the tractor's lower links.

→ Raise the machine.

After turning:

- Actuate **tractor control unit**  .
- Lower the tractor's lower links.

→ Work now continues.

When lifting the machine, ensure that the brake is not engaged. That often prevents sufficient lifting.

The chassis must be able to roll freely.

11 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 72.

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.

11.1 Cleaning

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

Cleaning with a 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.

11.2 Lubrication specifications (workshop work)

Grease all lubricating nipples (keep seals clean).

Lubricate/grease the machine at the specified intervals.

Lubrication points on the machine are indicated with the foil (Fig. 65).

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.

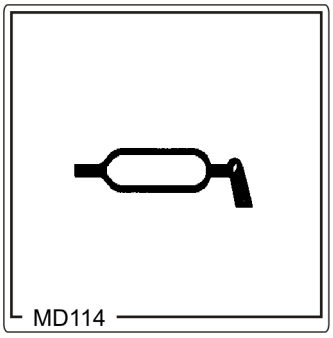


Fig. 65

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	Retinax A	Tetinax AM

11.2.1 Lubrication point overview

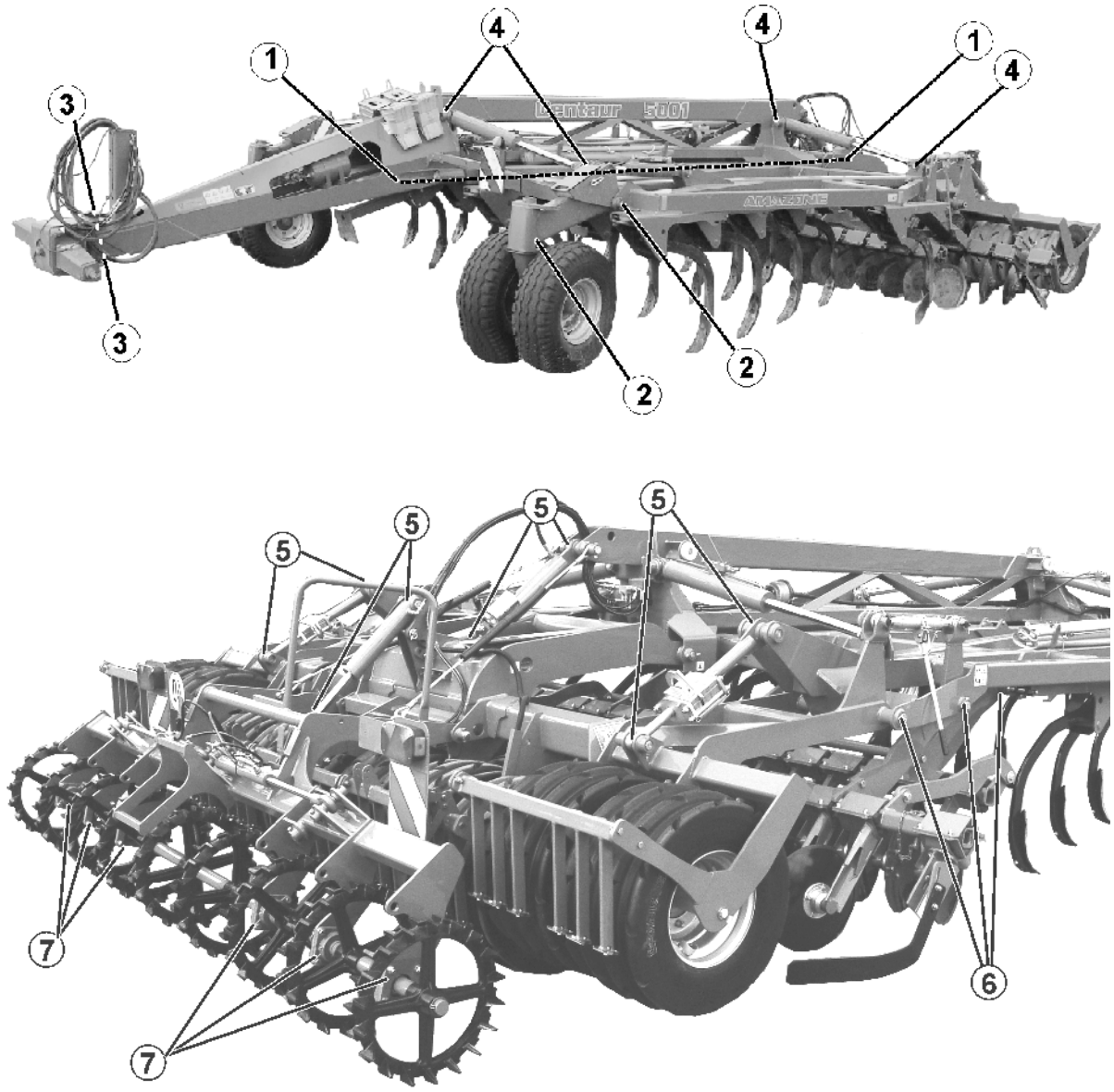


Fig. 66

	Lubricating points	Interval [h]	Quantity
(1)	Machine wing bearing	50	4
(2)	Support/feeler wheel	50	4/2
(3)	Tensioned crosspiece	10	3
(4)	Hydraulic cylinder for folding	50	8
(5)	Hydraulic roller cylinder	50	2 to 8
(6)	Roller and disc crosspiece bearings	50	4 to 12
(7)	Crosskill bearings	10	6

11.3 Maintenance 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.**

After the first working run

Component	Servicing work	see page	Workshop work
Wheels	• Wheel nut check	106	
Hydraulic system	• Inspection for defects • Check leak tightness	94	**X**

Daily / every 10 working hours

Component	Servicing work	see page	Workshop work
Air reservoir	• Drain	100	
Rear harrow	• Inspection of bolts, clamp, harrow tube	107	

Weekly / every 50 working hours

Component	Servicing work	see page	Workshop work
Hydraulic system	• Inspection for defects	94	**X**
Wheels	• Check air pressure	106	
Brake system	• Check brake fluid level	103	
Rear harrow	• **Inspect the wire ropes**	107	

Every three months/200 working hours

Component	Servicing work	see page	Workshop work
Dual-circuit service brake system	• Inspection according to check instructions	102	**X**
	• Clean line filter	100	
Brake system	• Brake pad check	104	
Hydraulic cylinder folding	• Inspect the bolts	99	

Each year/1000 operational hours

Component	Servicing work	see page	Workshop work
Brake system	• Brake check on hydraulic part of brake system	104	**X**
Brake drum	• Clean	100	**X**

Every 2 years

Component	Servicing work	see page	Workshop work
Brake system	• Check brake fluid	104	**X**

As required

Component	Servicing work	see page	Workshop work
Electric lighting	• Changing defective bulbs	112	
Coulter	• Replace	96	**X**
Scraper	• Adjust	96	
Disc XL041	• Wear check - replace if minimum diameter 360mm	97	**X**
Levellers	• Replace	98	**X**
Lower link pin	• Replace	112	**X**

11.4 Mounting and removing tines (workshop work)

CAUTION

The overload protection on the tines consists of 2 tension springs in each case. They are under high pretension. You must use the VM700064000 device to mount and remove tines.

Otherwise, there is a risk of injury.

11.5 Changing the coulter (workshop work)

WARNING

Danger of injury or death from unintentional lowering of the raised implements.

Mount the locking device against unintentional lowering of the coulter, see page 35.

CAUTION

Take special care when changing coulters.

Do not turn the screws on the square shaft.

Risk of injury from sharp edges.

You must wear protective goggles and gloves.

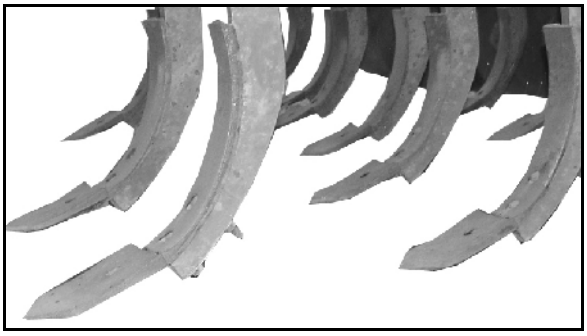


Fig. 67

11.5.1 Changing the Vario-Clip coulter (workshop work)

To remove the Vario-Clip coulter (Fig. 68/1), knock the spiral pin (Fig. 68/2) out by knocking it downwards using a drift and remove the coulter towards the front.

To install the Vario-Clip coulter, slide it in and secure with the spiral pin.

CAUTION

Coulters are made of hardened material. If you use a hammer for the mounting/removal procedures, the ends may break off and cause considerable injury.

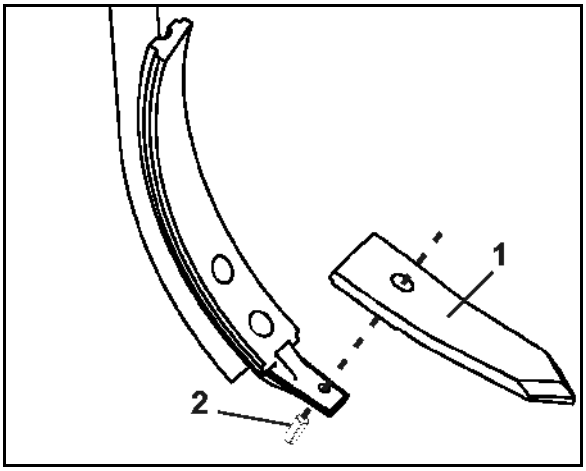


Fig. 68

11.5.1 Changing the C-Mix coulter

When changing the coulter, observe:

- Mount the coulter parallel to the deflector guide without a gap.
- If necessary, knock the coulter into position using a rubber or plastic hammer.
- Bolt tightening torque: 145 Nm.
- after 5 hours of use, check the bolt connection for tight fit.

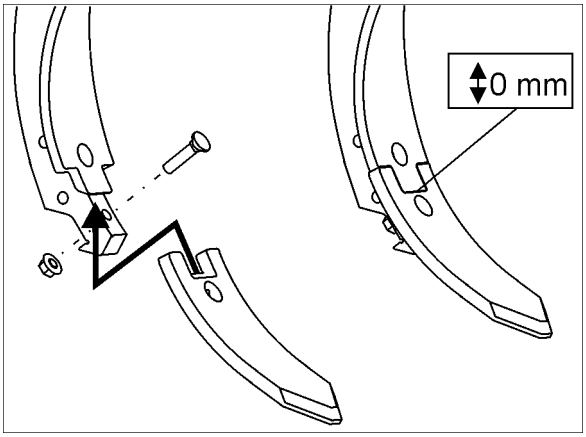


Fig. 69

11.6 Installing and removing the disc segments (workshop work)

- Pay attention to the preload when removing spring-loaded elements (disc segments)! Use suitable devices!
- In addition, use longer bolts as aids when removing and installing the disc segments!

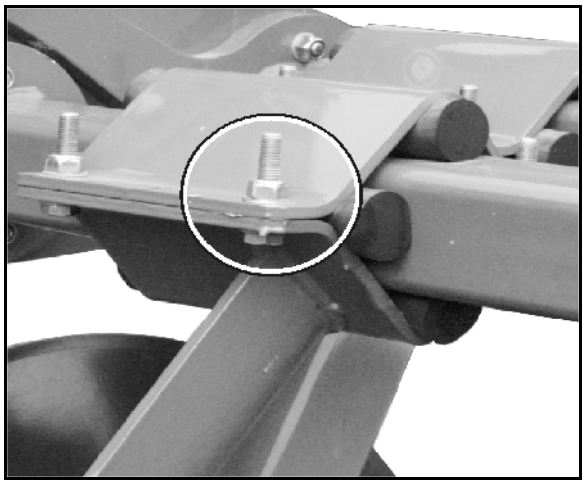


Fig. 70

11.7 Replacing discs (workshop work)

WARNING

Danger of injury or death from unintentional lowering of the raised implements.

Mount the locking device against unintentional lowering of the coulter, see page 35.

Minimum disc diameter: 360 mm.

The discs are replaced

- with the machine folded in,
- the machine lifted, headland setting
- the discs raised
- the machine secured against unintentional lowering

To replace the discs, unscrew the four screw unions, then retighten them.

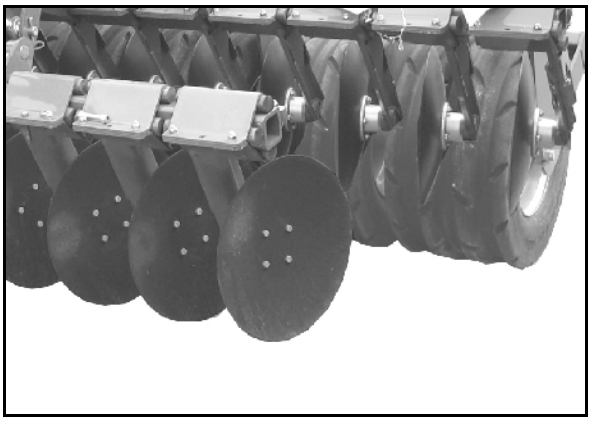


Fig. 71

11.8 Replacing the levellers

WARNING

Danger of injury or death from unintentional lowering of the raised implements.

Mount the locking device against unintentional lowering of the coulter, see page 35.

The levellers are replaced with

- on the booms with the machine folded out,
- on the central part with the machine folded in,
- the machine lifted, headland setting
- the machine secured against unintentional lowering

To replace the levellers, unscrew the screw union, then retighten it.

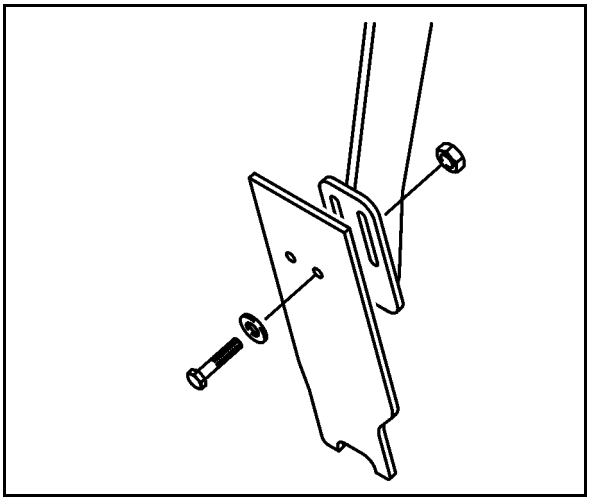


Fig. 72

11.9 Hydraulic cylinder for folding

Check that the cylinder eye is firmly attached to the hydraulic cylinder.

If it is loose, secure the piston rod with high-strength bolt locking compound and tighten the lock nut to 300 Nm.

11.10 Axle and brake

For optimum brake performance with a minimum of wear, we recommend that the brakes on the tractor are balanced with those on the machine. After the service braking system has been run in for a suitable period, arrange for the brakes to be balanced by a specialist workshop.

To avoid problems with the brakes, adjust all vehicles in accordance with EC Guideline 71/320 EEC.

WARNING

- **Repair and adjustment work on the service braking system should only be carried out by trained specialist personnel.**
- **Special care is required for welding, torch cutting and drilling work in the vicinity of brake lines.**
- **Always carry out a braking test after any adjusting or repair work on the braking system**

General visual inspection

WARNING

Carry out a general visual check of the brake system. Observe and check the following criteria:

- **Pipe lines, hose lines and coupler heads must not be externally damaged or rusted.**
- **Hinges, e.g. on fork heads, must be properly secured, easy to move, and not worn out.**
- **Ropes and cables**
  - **Must be properly run.**
  - **May not have any visible cracks.**
  - **May not be knotted.**
- **Check the piston stroke on the brake cylinders, and adjust as necessary.**
- **The air reservoir must not**
  - **move around in the tensioning belts.**
  - **be damaged.**
  - **show any outward signs of corrosion damage.**

11.10.1 Draining the air reservoir

1. Pull the drain valve (Fig. 73/1) in a sideways direction using the ring until no more water escapes from the air reservoir.

→ Water flows out of the drain valve.

2. Unscrew the drain valve from the air reservoir and clean the reservoir if there are signs of dirt.

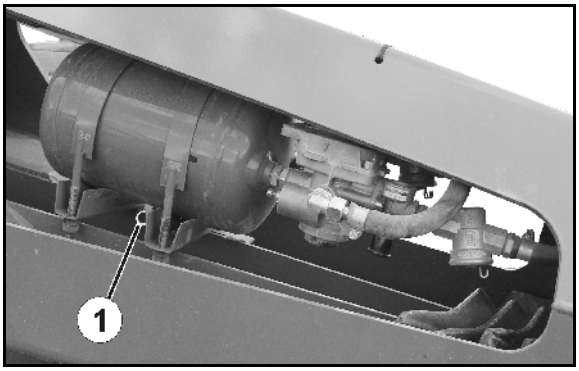


Fig. 73

11.10.2 Cleaning line filters

Clean the two line filters (Fig. 74/1) every 3 months (more frequently in harsh operating conditions). Proceed as follows to do so:

(1) Press the two lugs (Fig. 74/2) together and remove the locking piece with the O-ring, pressure spring, and filter insert.

(2) Clean (rinse out) the filter insert with petrol or thinner and then dry it with compressed air.

To reassemble, reverse the procedure and make sure that the O-ring is not twisted in the guide slot.

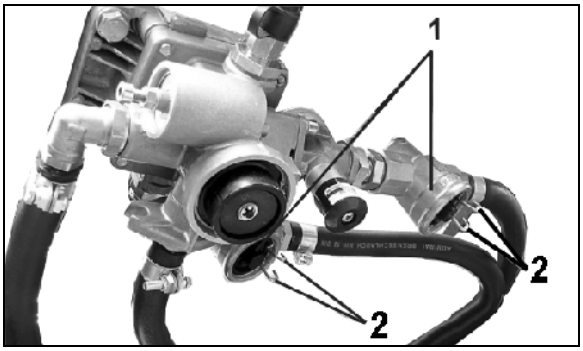


Fig. 74

11.10.3 Cleaning the brake drums (workshop work)

Clean the brake drums once a year to ensure the reliable function of the brake system.

DANGER

Use the marked attachment points for lifting equipment!

Procedure for all braked chassis wheels (Fig. 75):

1. Raise the machine on one side using suitable lifting equipment at the marked attachment points.
2. Disconnect the brake hose.
3. Remove the wheel with axle.
4. Remove the wheel.
5. Remove the brake drum.
6. Clean the brake drum.

- Do not clean the inner surfaces of the brake drums using sharp or pointed tools.
- Do not use oily substances for cleaning.

7. Then install again in the reverse order.
8. Bleed the brakes, see page 104.

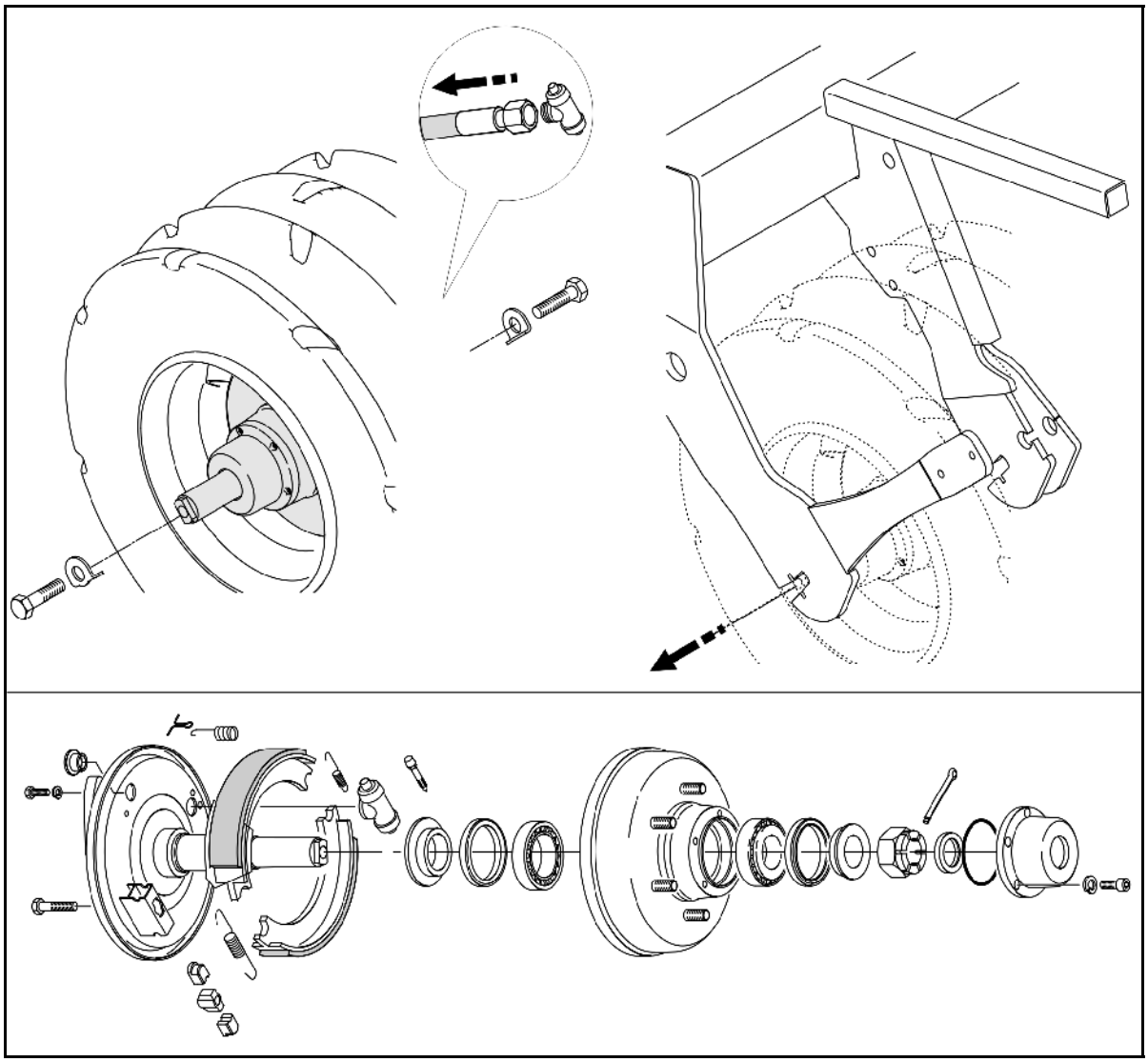


Fig. 75

11.10.4 Checking instructions for dual circuit service brake system (workshop work)

1. Leak tightness check

1. Check all connections, pipe lines, hose lines and screw connections for leak tightness.
2. Remedy leaks.
3. Repair any areas of chafing on pipes and hoses.
4. Replace porous and defective hoses.
5. The dual-circuit service brake system may be considered leakproof if the drop in pressure is no more than 0.15 bar after 10 minutes.
6. Seal any leaking areas or replace leaking valves.

2. Check pressure in the air reservoir

1. Connect a pressure gauge to the test connection on the air reservoir.

   Set value 6.0 to 8.1 $^{+ 0.2}$ bar

3. Check brake cylinder pressure

1. Connect a pressure gauge to the test connection on the brake cylinder.

   Set value: with brake not applied 0.0 bar

4. Visual inspection of brake cylinder

1. Check the dust sleeves or gaiters for damage.
2. Replace damaged parts.

5. Joints on brake valves, brake cylinders and brake linkages

Joints on brake valves, brake cylinders and brake linkages must move freely. Grease or lightly oil, if necessary.

11.10.5 Hydraulic component of brake system

11.10.5.1 Checking the brake fluid level

Check brake fluid level:

The equalising tank (Fig. 76) is filled in accordance with DOT 4 up to the "max." marking with brake fluid.

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

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

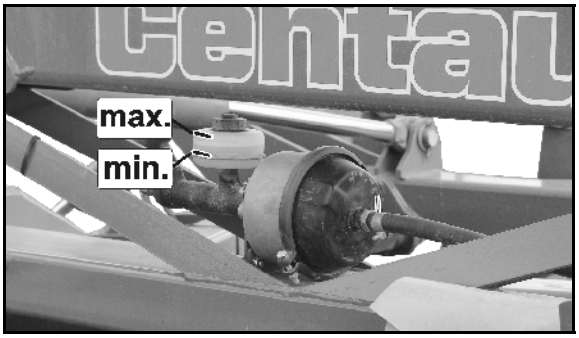


Fig. 76

11.10.5.2 Brake fluid

When handling brake fluid observe the following:

- Brake fluid is corrosive and must therefore not come into contact with the paint on the machine. If necessary, wipe it off immediately and wash it off with plenty of water.
- Brake fluid is hygroscopic, i.e. it absorbs moisture from the air. Therefore store the brake fluid only in closed containers.
- Brake fluid that has already been used in the braking system must not be reused.
  Even when venting the braking system, use only new brake fluid.
- The requirements made of brake fluid are subject to the standard SAE J 1703 or the American safety statutes DOT 3 and DOT 4. Use only brake fluids in compliance with DOT 4.

Brake fluid must never come into contact with mineral oil. Even small traces of mineral oil will render brake fluid unusable or cause a failure of the braking system. Plugs and collars on the braking system will be damaged, if they come into contact with agents that contain mineral oil. For cleaning purposes do not use any wiping cloths that contain mineral oils.

WARNING

Under no circumstances may drained brake fluid be reused.

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

11.10.5.3 Brake check on hydraulic component of brake system (workshop work)

Brake check on the hydraulic part of the braking system:

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

11.10.5.4 Replacing brake fluid (workshop work)

If possible, change the brake fluid after the winter.

11.10.5.5 Checking brake pad thickness (workshop work)

Checking brake pad thickness:

The brake pads must be checked for wear every 500 operating hours or at least once before the start of the season.
This servicing interval is a recommendation. Depending on the deployment, e.g. constant driving on hilly terrain, this may have to be shortened.
If the remaining brake pad is less than 1.5 mm, replace the brake shoes (only use original brake shoes with type-tested brake pads). When you do this, the shoe return springs may have to be renewed.

11.10.5.6 Bleeding the brake system (workshop work)

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

The brake system is bled in the specialist workshop using a brake filling and bleeding device as follows:

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

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

Perform a safety check:

- Are the venting screws tightened?
- Has sufficient brake fluid been filled?
- Check that all connections are leak-tight.

Following any repair work to the brake system, check that it is working properly by braking several times on a road with little traffic. When you do this, you must perform at least one emergency braking application.

Caution: Pay attention to any traffic behind you when testing the brake system.

11.11 Tyres/wheels

- Check chassis wheels regularly for damage and firm seating on the wheel rim.
- There must be a minimum gap of at least 25 mm between the scraper and the running gear tyres.

- Required tyre pressure.
  - Running gear/roller tyres: **4.3 bar**
  - Feeler/support wheels: **1.8 bar**
  - Support wheel, fixed (4001-2) **4,3 bar**
- Required tightening torque for wheel nuts or bolts:
  - Roller wheels: **350 Nm**
  - Support wheels: **250 Nm**
- Required tightening torque for axle bolts: **450 Nm**

- Regularly check
  - that wheel nuts are firmly seated.
  - tyre pressures.
- Only use the tyres and wheels which we have specified.
- Repair work on tyres must only be carried out by specialists using suitable assembly tools.
- Tyre fitting requires sufficient skills and proper assembly tools.
- Use the jack only at the jacking points indicated.

11.11.1 Tyre pressures

- The required tyre pressure is dependent on
  - tyre size.
  - tyre load rating.
  - speed of travel.
- The operational performance of the tyres is reduced
  - by overloading.
  - if tyre pressure is too low.
  - if tyre pressure is too high.

- Check tyre pressures regularly when the tyres are cold, i.e. before starting a run.
- The difference in pressure between the tyres on one axle must be no greater than 0.1 bar.
- Tyre pressure can be raised by up to 1 bar after a fast run or in warm weather. Tyre pressure should on no account be reduced as it is then too low when the tyres cool down.

11.11.2 Mounting tyres (workshop work)

- Remove any outbreaks of corrosion from the wheel rim seating surfaces before fitting a new/another tyre. Corrosion can cause damage to the wheel rims when the vehicle is in operation.
- When fitting new tyres, always use new valves for tubeless tyres or new inner tubes.
- Always fit the valves with valve caps which have a gasket insert.

11.12 Scraper

To adjust the scrapers, unscrew the screw union, move the scraper and retighten the screw union.

There must be a minimum gap of **25 mm** between the scraper and the wedge ring tyres.

If the minimum distance is not observed, the tyres may be damaged, which could lead to accidents!

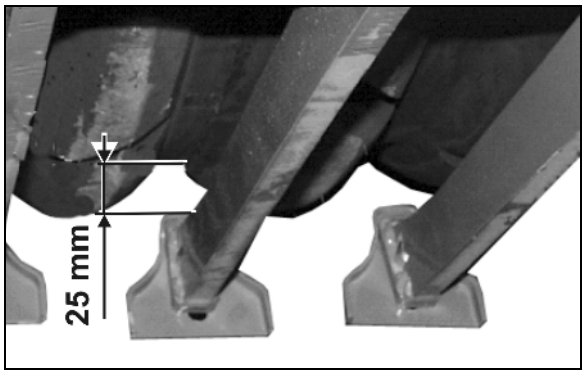


Fig. 77

11.13 Rear harrow / Crosskill- end runners

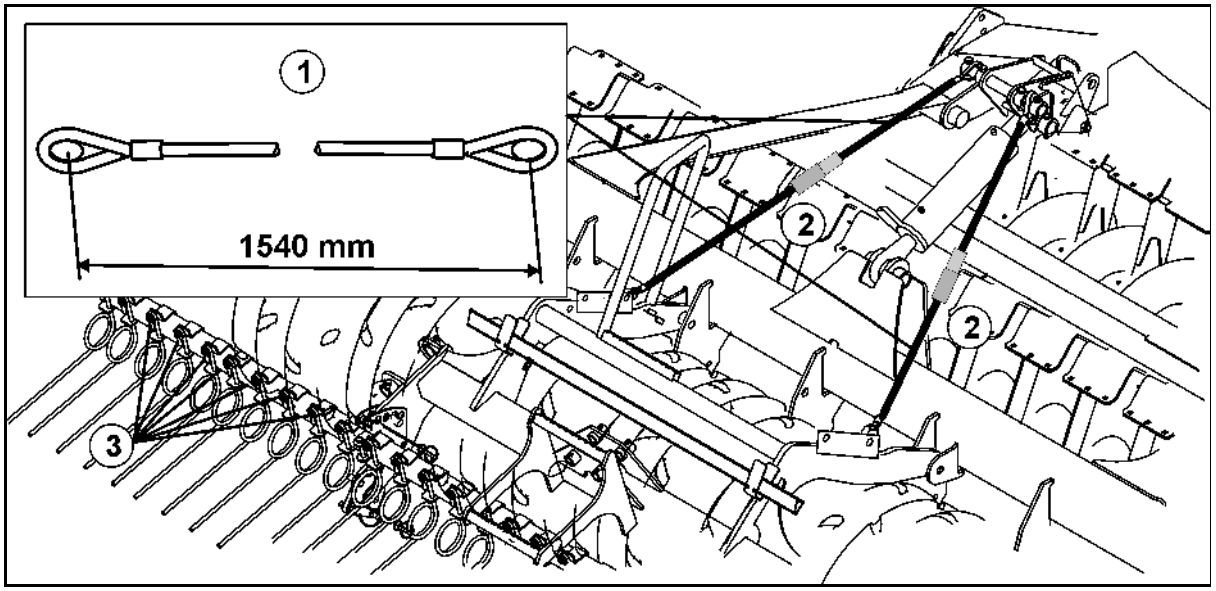


Fig. 78

(1) Check the length of the wire ropes.

(2) Check the turnbuckles on the wire ropes to ensure that the lock nuts are tight.

(3) Check the bolts used to clamp the harrow to the harrow tube.

11.14 Hydraulic system (workshop work)

WARNING

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

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

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

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

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

11.14.1 Labelling hydraulic hose lines

The assembly labelling provides the following information:

Fig. 79/...

(1) Manufacturer's marking on the hydraulic hose line (A1HF)

(2) Date of manufacture of hydraulic hose line (04/02 = year/month = February 2004)

(3) Maximum approved operating pressure (210 BAR).

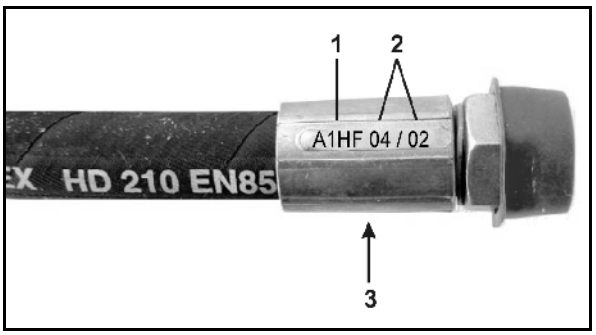


Fig. 79

11.14.2 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.

11.14.3 Inspection criteria for hydraulic hose lines

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

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

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

- Life span of 6 years has been exceeded.

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

11.14.4 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. Avoid using hose clips in places where they impede the natural movement and length changes of the hose.
- Painting over hydraulic lines is not permitted.

11.15 Lower link pins

WARNING

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

Check the lower link pins for visible damage each time you couple the machine. Replace lower link pins / tensioned crosspiece if there are clear signs of wear.

11.16 Electrical lighting system

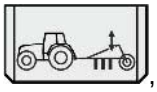
Changing bulbs:

1. Unscrew safety lens.
2. Remove defective bulb.
3. Insert replacement bulb (make sure voltage and wattage is correct).
4. Fit safety lens and screw on.

11.17 Hydraulics diagram

Lifting:

Fig. 80:

(1) Connection to double-action **tractor control unit**  , yellow hose marking

(2) Chassis hydraulic cylinder

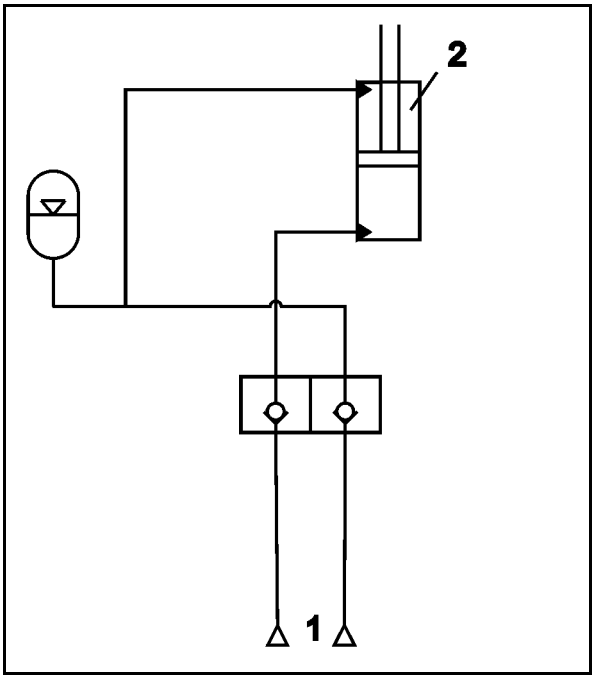
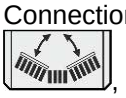


Fig. 80

Folding circuit

Fig. 81/...

(1) Connection to **tractor control unit**  , blue hose marking

(2) Hydraulic folding cylinder

(3) Central roller wheel hydraulic cylinder

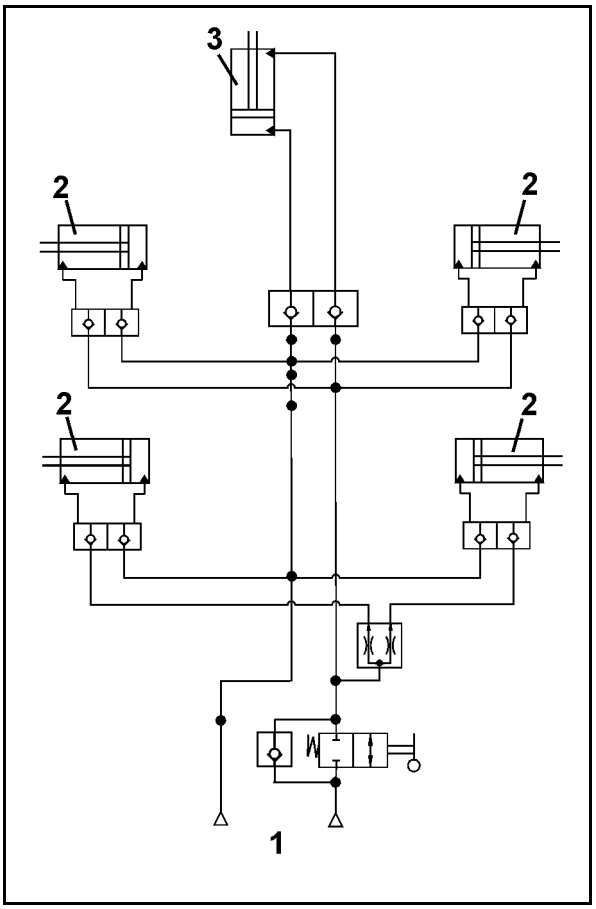


Fig. 81

Rear harrow

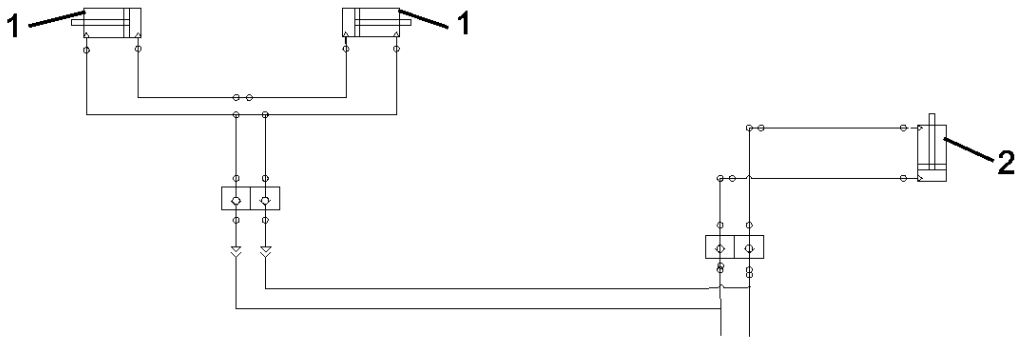


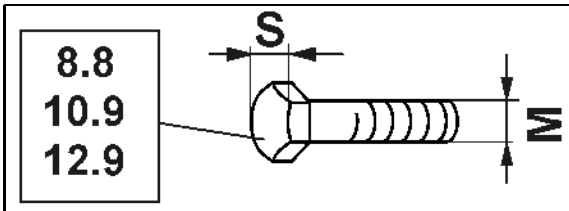
Fig. 82

Fig. 82/…

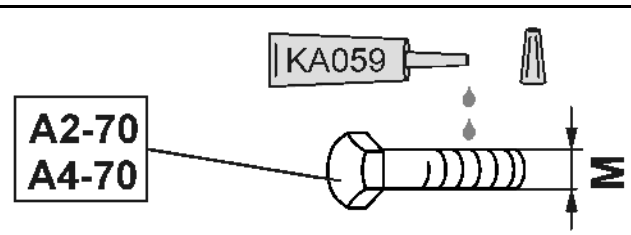
(1) Hydraulic cylinder for folding rear harrow

(2) Central roller wheel hydraulic cylinder

11.18 Screw tightening torques



M	S	Nm 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



M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Nm	2,3	4,6	7,9	19,3	39	66	106	162	232	326	247	314

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