Operating Manual

AMAZONE

Cenius 4003-2TX
Cenius 5003-2TX
Cenius 6003-2TX
Cenius 7003-2TX

Trailed Cultivator

MG5103
BAG0112.18 03.24
Printed in Germany

SmartLearning

Read and observe this operating manual before using the machine for the first time! Keep it in a safe place for future use!

en

Reading the instruction

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

Leipzig-Plagwitz 1872. Rud. Sark.

Identification data

Manufacturer:	AMAZONEN-WERKE H. DREYER SE & Co. KG
Machine identification no.:	
Type:	Cenius03-2TX
Permissible pressure of system [bar]:	
Year of manufacture:	
Factory:	
Basic weight (kg):	
Approved total weight (kg):	
Maximum load (kg):	

Manufacturer's address

AMAZONEN-WERKE
H. DREYER SE & Co. KG
Postfach 51
D-49202 Hasbergen
Phone: + 49 (0) 5405 50 1-0
E-mail: amazone@amazone.de

Spare part orders

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

Please send orders to your AMAZONE dealer.

Formalities of the operating manual

Document number:	MG5103
Compilation date:	03.24

Foreword

Dear Customer,

You decided to purchase one of our high quality machines from the comprehensive range of farm machinery produced by AMAZONEN-WERKE, H. DREYER SE & 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.

AMAZONEN-WERKE

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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 introduced to 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.

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 observe 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 goggles,
- Safety shoes,
- Protective overall,
- Skin protection cream, etc..

The instruction 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 trained and instructed persons should be allowed to work with/on the machine. The responsibilities of the operating and maintenance personnel must be clearly defined.

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

Activity \ People	Particularly trained persons[1)]	Instructed operator [2)]	Persons with specialist training (authorised 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.

Regularly check that bolted connections are firmly secured and tighten if necessary.

When the maintenance work is completed, check the function of the safety devices.

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-WERKEN 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.

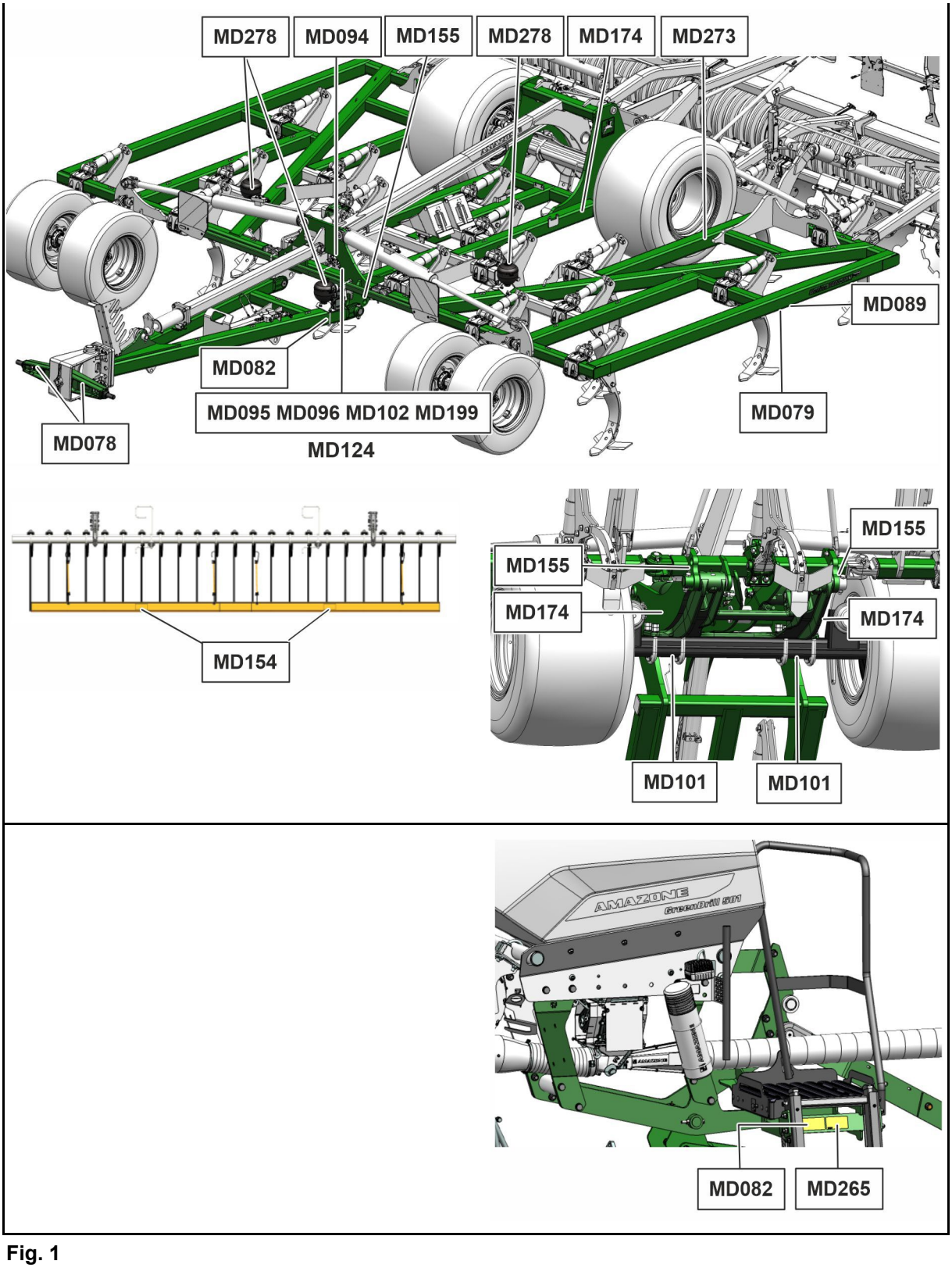


Fig. 1

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 078).

Warning pictograms - structure

Warning pictograms indicate danger areas on the machine and warn of residual dangers. Permanent or unexpected dangers exist in these areas.

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.

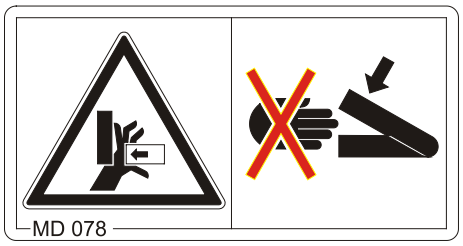
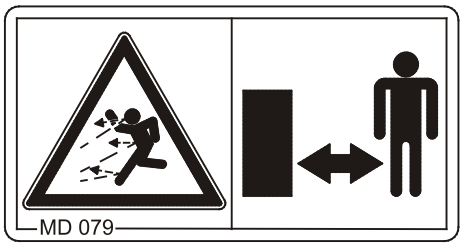
   For example: danger of cutting!

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.

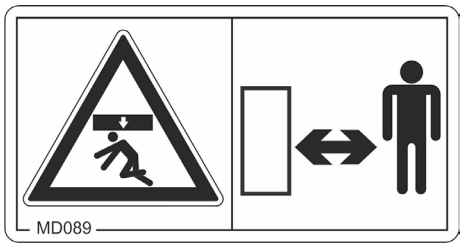
Order number and explanation	Warning pictograms
MD 078 **Risk of crushing of fingers/hand by accessible, moving parts of the machine!** This danger can cause extremely serious injuries resulting in the loss of limbs. Never reach into the danger area when the tractor engine is running with the PTO shaft or hydraulic/electrical system connected.	
MD 079 **Risk of materials or foreign objects being flung away by or out of the machine!** These dangers can cause extremely serious and potentially fatal injuries. • Keep a sufficient safety distance from the machine as long as the tractor engine is running. • Ensure that all other persons also keep a sufficient safety distance from the danger area of the machine as long as the tractor engine is running.	
MD 082 **Danger of falling from treads and platforms when riding on the machine.** This danger causes serious or potentially fatal injuries anywhere on the body. It is forbidden to ride on the machine and/or climb the machine while it is running. This also applies to machines with treads or platforms. Make sure that nobody is riding on the machine.	

MD 089

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

Causes serious, potentially fatal injuries anywhere on the body.

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

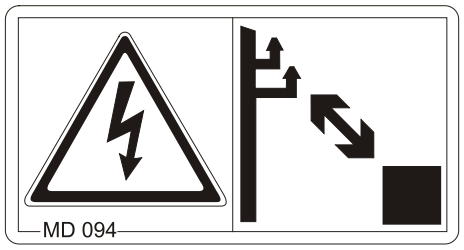


MD 094

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

This danger causes serious or potentially fatal injuries anywhere on the body.

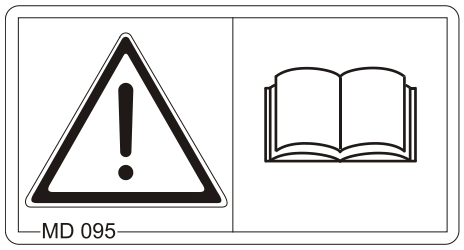
Keep a safe distance to the electric overhead power lines when swinging machine parts in and out.



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

MD 095

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

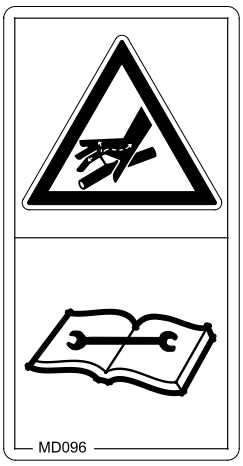


MD 096

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

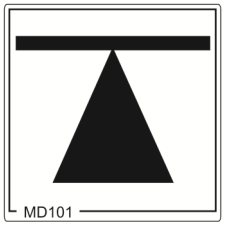
This can inflict serious injuries with potentially fatal consequences if hydraulic fluid escaping at high pressure passes through the skin and into the body.

- 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 101

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

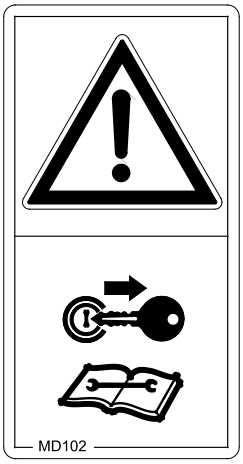


MD 102

Dangerous situations for the operator due to unintentional starting / rolling of the machine during all work on the machine, e.g. installation, adjustment, troubleshooting, cleaning or maintenance.

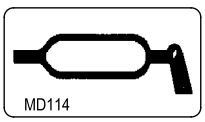
The potential dangers can inflict severe and potentially fatal injuries on all parts of the body.

- 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 this operating manual.



MD 114

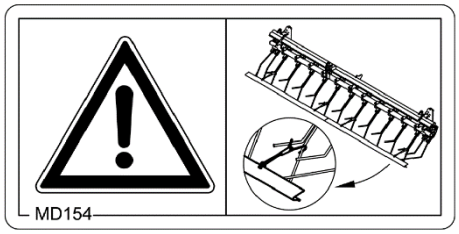
This pictogram indicates a lubrication point



MD 154

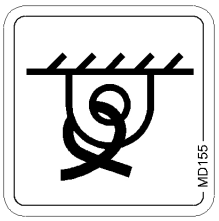
Risk of injury due to non-compliance with the approved transport width.

Before folding the implement, install the road safety bar.



MD 155

This icon designates the restraint points for tieing the machine to a transport vehicle allowing the machine to be transported in a safe manner.

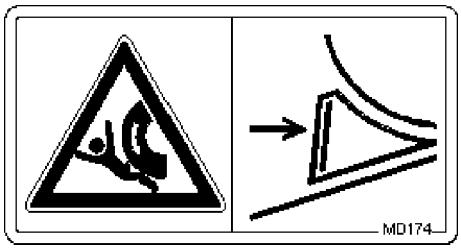


MD 174

Danger from unintended continued movement of the machine.

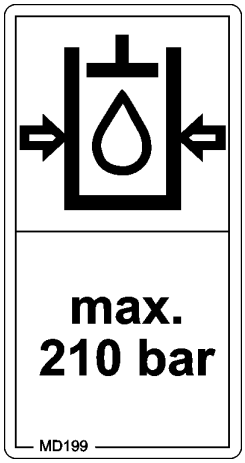
Causes serious, potentially fatal injuries anywhere on the body.

Secure the machine against unintended continued movement before uncoupling the machine from the tractor. To do 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 265

Risk of chemical burns by dressing dust!

Do not breathe in the harmful substance

Avoid contact with eyes and skin.

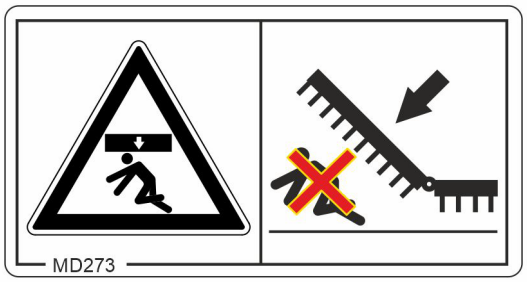
Before working with hazardous materials, put on the protective clothing recommended by the manufacturer.

Observe the manufacturer's safety instructions for handling harmful substances.

MD 273

Risk of crushing for the whole body from lowering implement parts!

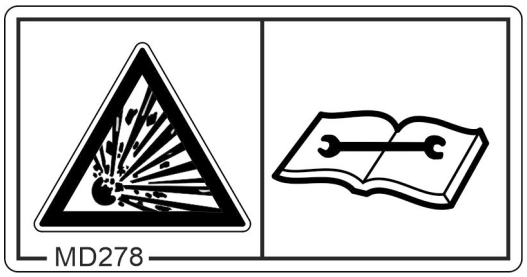
Make sure that nobody is standing in the danger area.



MD 278

Risk of explosion or hydraulic fluid escaping under high pressure, caused by the gas and oil pressure applied onto the pressure accumulator!

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



Causes serious, potentially fatal injuries anywhere on 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.

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

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 couple and transport the machine with a tractor which has been designed for this task and fulfils the power requirements.
- When connecting machines to the tractor three-point hydraulic system, the attachment categories of the tractor and the machine must always be the same!
- 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 unintended rolling away before mounting or dismounting 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.
- Before mounting and dismounting the machine to the three-point linkage secure the control lever for the tractor hydraulics in such a position that an unintended lifting or lowering is impossible.
- 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 inju-

ry 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.
- Standing between tractor and implement when the three point hydraulic is actuated is prohibited.
- Connect the machine to the prescribed equipment in accordance with the specifications.
- 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
  - the bearing frame parts for damage.
- 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 AMAZONE original 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 that are too highly rated, the electrical system will be destroyed – danger of fire!
- Ensure that the battery is connected correctly - firstly connect the positive terminal and then connect the negative terminal. When disconnecting the battery, disconnect the negative terminal first, followed by the positive terminal.
- Always place the appropriate cover over the positive battery terminal. There is a danger of explosion in the event of an accidental earth contact!
- Danger of explosion! Avoid the production of sparks and naked flames in the vicinity of the battery!
- The machine can be equipped with electronic components, the function of which may be influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed.
  - In the case of retrofitting of electrical units and/or components on the machine, with a connection to the on-board power supply, the user must check whether the installation might cause faults on the vehicle electronics or other components.
  - Ensure that the retrofitted electrical and electronic components comply with the EMC Directive 2004/108/EC in the latest version and bear the CE mark.

2.16.4 Coupled machines

- Observe the permitted combination options of the attachment equipment on the tractor and the machine drawbar.

  Only couple permitted combinations of vehicles (tractor and attached machine).
- On 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 attached or coupled to a tractor influence the driving behaviour and steering and braking power of the tractor, and in particular single axle machines with drawbar loads on the tractor.
- Only one specialist workshop can adjust the height of the drawbar if it is a straight drawbar with drawbar load.
- Implements without brake system:

  Observe the national regulations for implements without brake system.

2.16.5 Brake system

- Only specialist workshops or recognised brake services can carry out adjustment and repair work on the brake system.
- Have the brake system thoroughly checked regularly.
- If there are any malfunctions, stop the tractor immediately using the brake system. Have the malfunction 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.
- Always carry out a braking test after any adjusting or repair work on the braking system.

Pneumatic braking system

- Before coupling the machine, clean the sealing rings on the hose couplings of the supply and brake line.
- Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar.
- Drain the air reservoir 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 reservoir if:
  - the air reservoir can be moved in the tensioning belts
  - the air reservoir is damaged
  - the rating plate on the air reservoir is rusty, loose or missing.

Hydraulic brake system for export machines

- Hydraulic brake systems are prohibited 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 Cleaning, maintenance and repairs

- Repair-, maintenance- and cleaning operations as well as the remedy of function faults should principally be conducted with
  - 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.
- Before carrying out any maintenance-, repair- and cleaning work ensure the lifted implement or lifted implement parts against unintended lowering.
- 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 AMAZONE original spare parts!

3 Loading and unloading

WARNING

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

- Use only slings (ropes, belts, chains, etc.) with a minimum tensile strength greater than the total weight of the machine (see Technical data).
- Only attach your lifting gear to/at the designated points.
- Never remain in or enter the area below a raised, unsecured load.

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

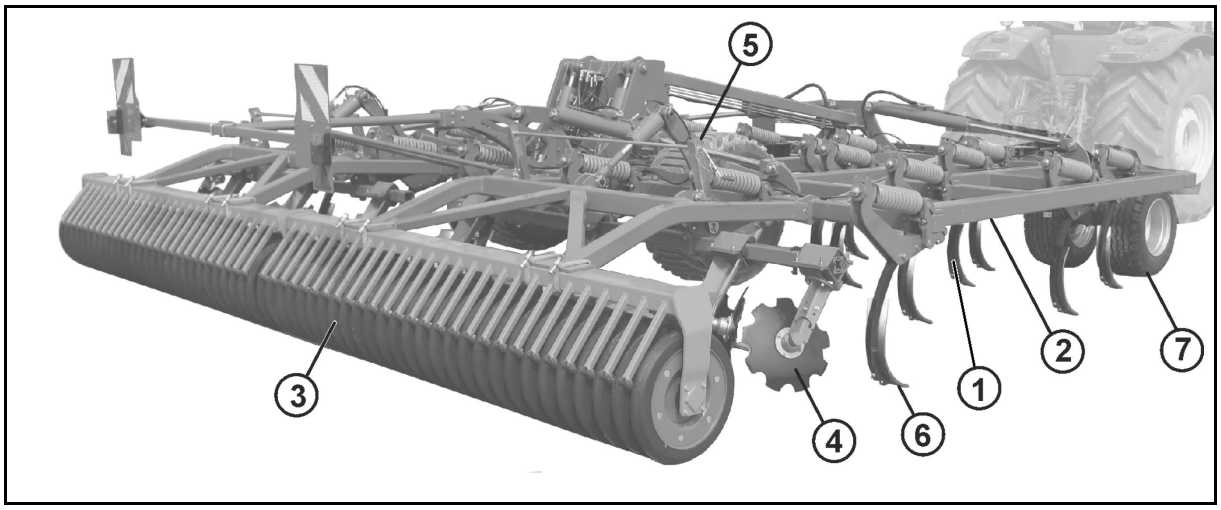


Fig. 2

(1) Tine field
(2) Hydraulic foldable booms
(3) One roller per wing
(4) Levelling unit concave disc arrangement
(5) Depth adjustment of the levelling unit
(6) Coulters
(7) Support wheels (option)

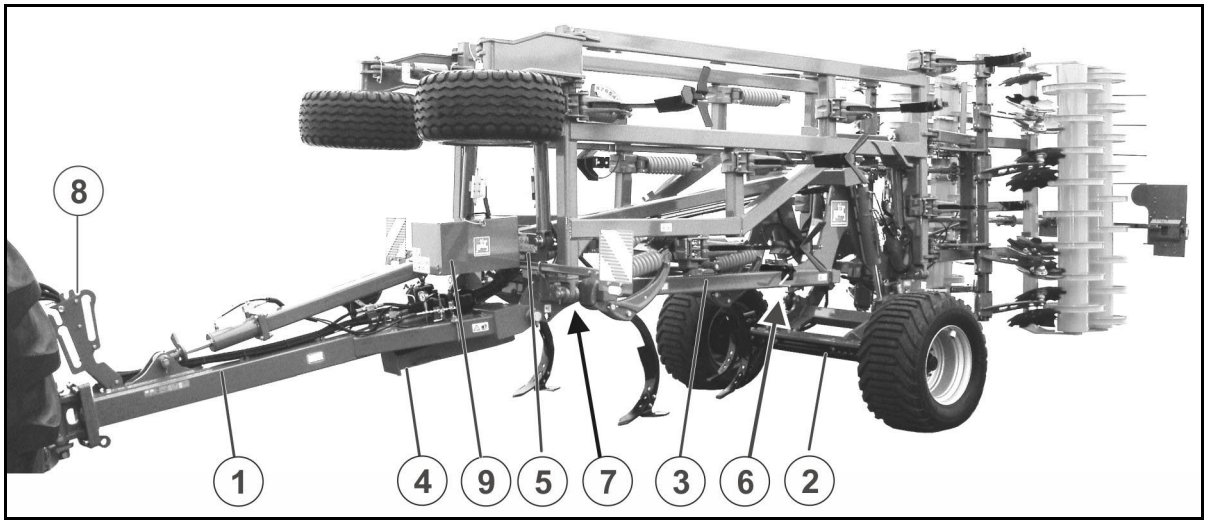


Fig. 3

(1) Drawbar
(2) Swinging running gear
(3) Rigid frame middle section
(4) Stand
(5) Brake system
(6) Parking brake
(7) Brake wedges in transport position
(8) Hose cabinet
(9) Service box

4.2 Safety and protection equipment

- Stop tap for securing the drawbar in transport position
  - o Drawbar locked – secured transport position
  - o Drawbar unlocked – working position

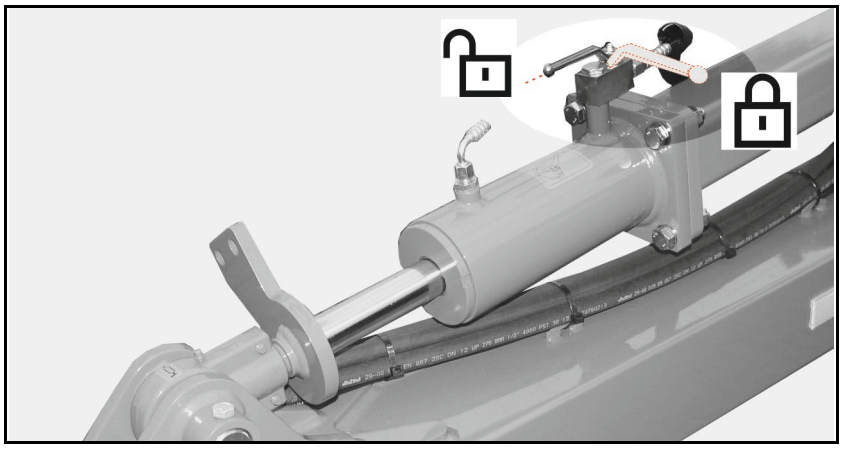


Fig. 4

4.3 Transportation equipment

(1) Rear lights; brake lights; turn indicators
(2) Warning signs
(3) Red reflectors
(4) Number plate holder
(5) Labelling of the max. permissible speed
(6) Side reflectors
with maximum spacing of 3 m.

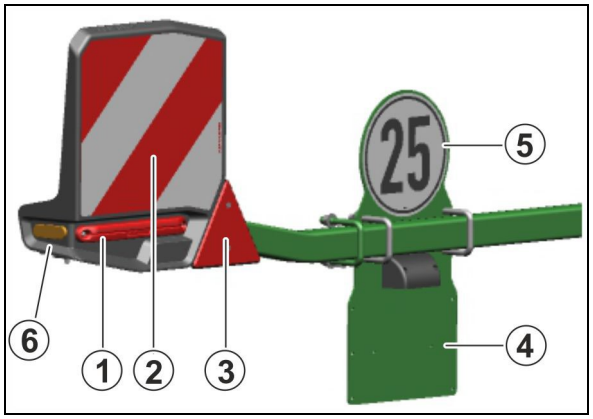


Fig. 5

(1) Warning signs
(2) Front reflectors

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

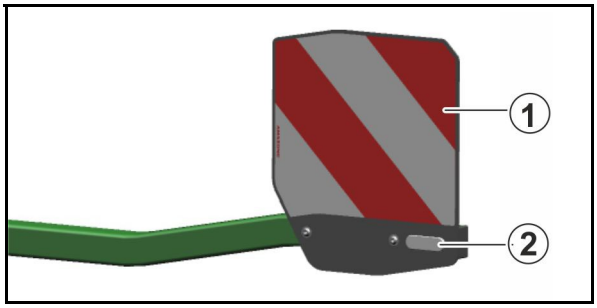


Fig. 6

When using harrows, cutting ring rollers or tandem rollers, an extension is required for the lighting.

4.4 Intended use

The machine

- Is built for conventional use in agricultural operations.
- is coupled to the tractor using the tractor draw bar and operated by an additional person.

Optimum soil tillage can only be achieved up to a soil hardness of 3.0 MPa (in the range of the selected working depth).Slopes can be navigated as follows:

- Along the contours

Direction of travel to left	15 %
Direction of travel to right	15 %

- Along the gradient

Up the slope	15 %
Down the slope	15 %

The intended use also includes:

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

4.5 Danger area and danger points

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

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

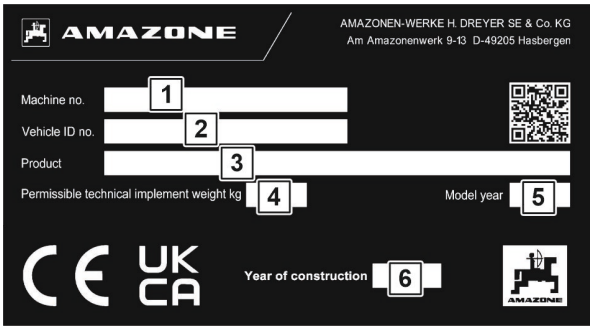
The following danger areas exist:

- 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.

4.6 Rating plate

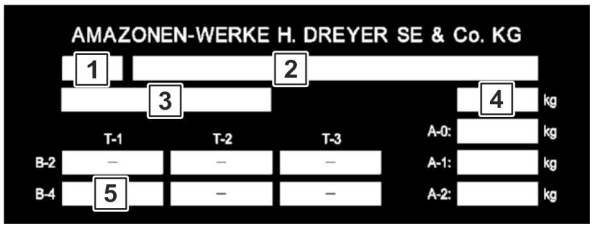
Machine rating plate

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



Additional rating plate

(1) Note for type approval
(2) Note for type approval
(3) Vehicle identification number
(4) Permissible technical total weight
(5) Permissible technical trailer load for a drawbar trailer vehicle with pneumatic brake
(A0) Permissible technical drawbar load A-0
(A1) Permissible technical axle load for axle 1
(A2) Permissible technical axle load for axle 2



4.7 Technical data

Cenius -2TX	4003	5003	6003	7003
Working width	4000 mm	5000 mm	6000 mm	7000 mm
Transport width	3000 mm			
Transport length **(depending on the trailing roller)**	9300 - 10100 mm			
Transport height	2800 mm	3200 mm	3700 mm	4000 mm
Tine spacing	308 mm	294 mm	286 mm	280 mm
Number of tines	13	17	21	25
Number of tine rows	4	4	4	4
Tine spacing in the row	123 mm	117 mm	114 mm	112 mm
Maximum working depth	80-300 mm			
Levelling unit: • Concave discs Disc diameter	460 mm			
• Alternative spring tines				
Working speed	8-15 km/h			
Maximum permissible speed	40 km/h			
Attachment category	Category 3 (factory standard) / 4 / 5 Alternativ: ball head coupling, towing eye			
Road approval	yes			

4.7.1 Payload and tyre load capacity

- Refer to the implement rating plate for the values for the permissible axle load and the permissible drawbar load.
- Weigh the implement to determine the basic weight.

Depending on the tyres, the tyre load capacity of both tyres can be lower than the permissible axle load.

In this case, the tyre load capacity limits the permissible axle load.

Tyre load capacity per wheel

- The load index on the tyre indicates the load capacity of the tyre.
- The speed index on the tyre indicates the maximum speed at which the tyre has the tyre load capacity according to the load index.
- The tyre load capacity is only achieved when the tyre inflation pressure matches the nominal pressure.

Load index	**140**	**141**	**142**	**143**	**144**	**145**	**146**	**147**
Tyre load capacity (kg)	2500	2575	2650	2725	2800	2900	3000	3075
Load index	**148**	**149**	**150**	**151**	**152**	**153**	**154**	**155**
Tyre load capacity (kg)	3150	3250	3350	3450	3550	3650	3750	3850
Load index	**156**	**157**	**158**	**159**	**160**	**161**	**162**	**163**
Tyre load capacity (kg)	4000	4125	4250	4375	4500	4625	4750	5000
Load index	**164**	**165**	**166**	**167**	**168**	**169**	**170**	**171**
Tyre load capacity (kg)	5000	5150	5300	5450	5600	5800	6000	6150
Load index	**172**	**173**	**174**	**175**	**176**	**177**	**178**	**179**
Tyre load capacity (kg)	6300	6500	6700	6900	7100	7300	7500	7750

Speed index	**A5**	**A6**	**A7**	**A8**	**B**	**C**	**D**	**E**
Permissible maximum speed (km/h)	25	30	35	40	50	60	65	70

Driving with reduced inflation pressure

- When the inflation pressure is lower than the nominal pressure, the tyre load capacity is reduced!

  In that case, observe the reduced payload of the implement.
- Please also follow the specifications of the tyre manufacturer!

WARNING

Risk of accident!

In event of too low inflation pressure, the stability of the vehicle is no longer guaranteed.

4.8 Necessary tractor equipment

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

Tractor engine power

	Minimum required	Maximum permissible
Cenius 4003-2TX	from 150 kW (200 hp)	from 280 kW (380 hp)
Cenius 5003-2TX	from 185 kW (250 hp)	from 345 kW (475 hp)
Cenius 6003-2TX	from 220 kW (300 hp)	from 410 kW (570 hp)
Cenius 7003-2TX	from 260 kW (350 hp)	from 485 kW (665 hp)

Electrical system

Battery voltage:
- 12 V (volts)

Lighting socket:
- 7-pin

Hydraulics

Maximum operating pressure:
- 210 bar

Tractor pump power:
- At least 15 l/min at 150 bar

Machine hydraulic fluid:
- HLP68 DIN 51524

  The implement hydraulic fluid is suitable for the combined hydraulic circuits of all standard tractor brands.

Tractor control units
- See page 59
- ⚠ For folding sections, a lockable tractor control unit is required as a tractor-side protective device

Three-point attachment

- The tractor's lower links must have lower link hooks.

4.9 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 depends on the type of tractor used.

5 Structure and function

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

Not all of the listed options are available for all implement versions or can be combined with each other.

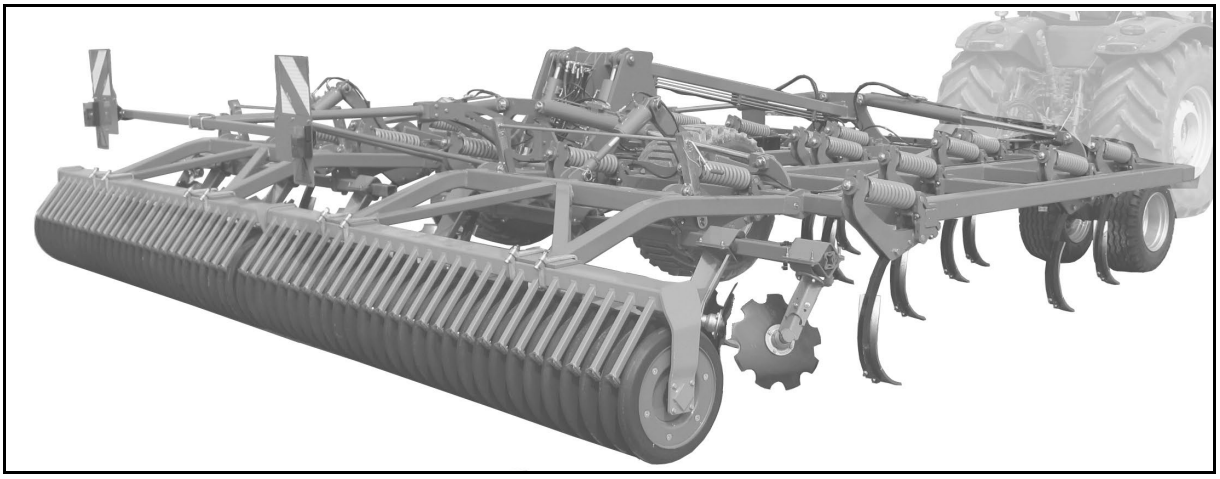


Fig. 7

The Cenius mounted disc cultivator is suitable for

- Stubble processing
- Non-tilling topsoil processing
- Seed bed preparation

It consists of

- A three-row tine field with spring tines that can be equipped with different coulters.
- A row of concave discs or a a row of spring tines.
- A trailing roller.

The tines of the Cenius Super are equipped with a tension spring overload protection element.

5.1 Dual-circuit service brake system

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)

(1) Release valve with actuator button:

→Actuator button;

- o press in until it stops and the service brake system releases, e.g. for shunting the uncoupled trailed sprayer.
- o pull it out as far as it will go, and the trailed sprayer is braked again by the supply pressure coming from the air reservoir..

(2) Brake valve

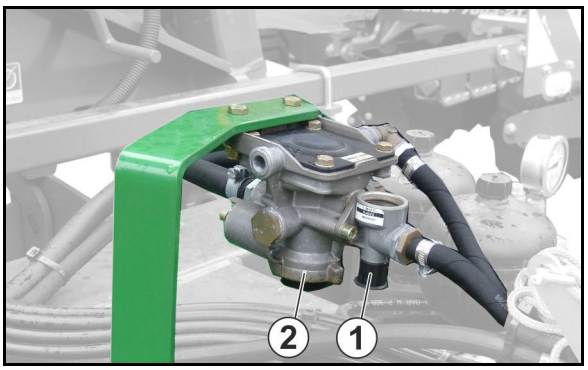


Fig. 8

(1) Air reservoir

(2) Test connection

(3) Drainage valve for condensate

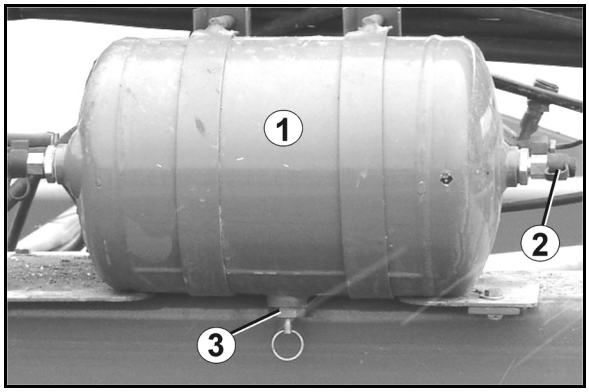


Fig. 9

5.1.1 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.

5.1.2 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.

5.2 Hydraulic service brake system

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

5.2.1 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).

5.2.2 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.

5.2.3 Emergency brake

In event of the machine being released from the tractor during travel, the emergency brake will brake the machine.

Fig. 10/…

(1) Pulling cable

(2) Brake valve with pressure accumulator

(3) Hand pump to relieve the brake

(A) Brake released

(B) Brake applied

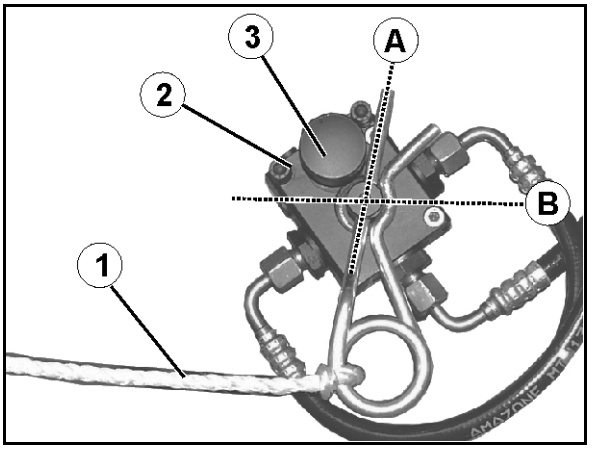


Fig. 10

DANGER

Before travel, set the brake to the application position.

For this purpose:

1. Secure the pulling cable to a fixed point on the tractor.
2. Apply the tractor brake with the tractor engine running and hydraulic brake connected.

→ Pressure accumulator of the emergency brake is being charged.

DANGER

Risk of accident through brake malfunction!
After withdrawing the safety splint (e.g. when activating the emergency brake), it is essential to insert the safety splint into the brake valve from the same side (Fig. 10). Otherwise the brake will not function.

After reinserting the safety splint, carry out a brake test for the service brake and the emergency brake.

When the implement is uncoupled, the pressure accumulator presses hydraulic oil:

- into the brake and decelerates the implement,

or

- into the hose line to the tractor and impedes the coupling of the brake line to the tractor.

In these cases, relieve pressure using the hand pump on the brake valve.

5.3 Parking brake

When the parking brake is on, it secures the uncoupled machine against unintentional rolling. The parking brake is operated by turning the crank, which in turn operates the spindle and bowden cable.

- Crank position for quick releasing / applying.
  - (A) Apply the tractor parking brake.
  - (B) Release parking brake.

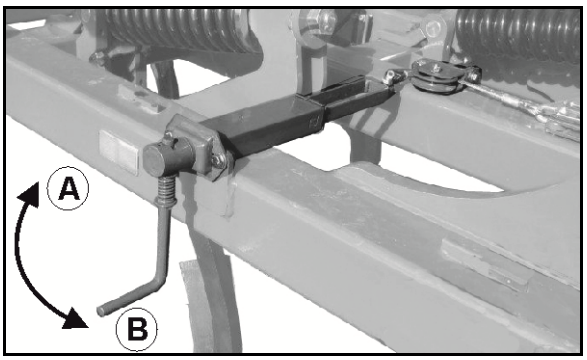


Fig. 11

- Correct the setting of the parking brake if the spindle's tension is no longer sufficient.
- Ensure that the bowden cable is not lying or rubbing against other vehicle parts.
- When the parking brake is off, the bowden cable must be slightly slack.

5.4 Tine

Overload safety device, Super

Tines with compression spring as an overload safety.

In case of overload, the tine can deflect on the obstacle.

The overload safety consists of a compression spring.

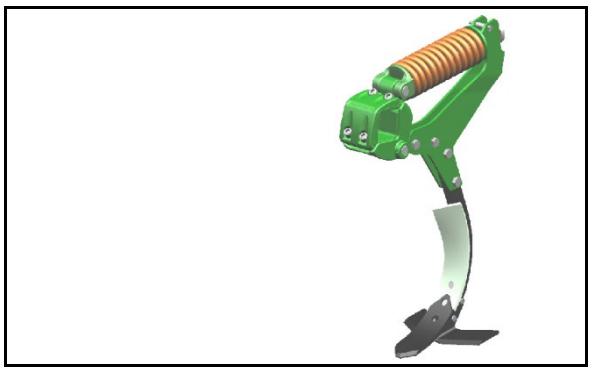


Fig. 12

Ultra overload safety
Tines with hydraulic cylinder as an overload safety.

In case of overload, the tine can deflect on the obstacle.

The overload safety consists of hydraulic cylinders on the tines and an adjustable hydraulic unit.

The overload safety is hydraulically coupled to the running gear hydraulic system.

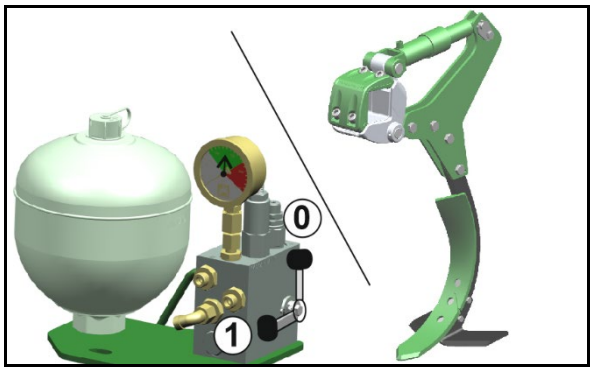


Fig. 13

Switch tap positions

(1) Overload safety ready for operation, default position

(0) Depressurized overload safety, only for maintenance and repairs

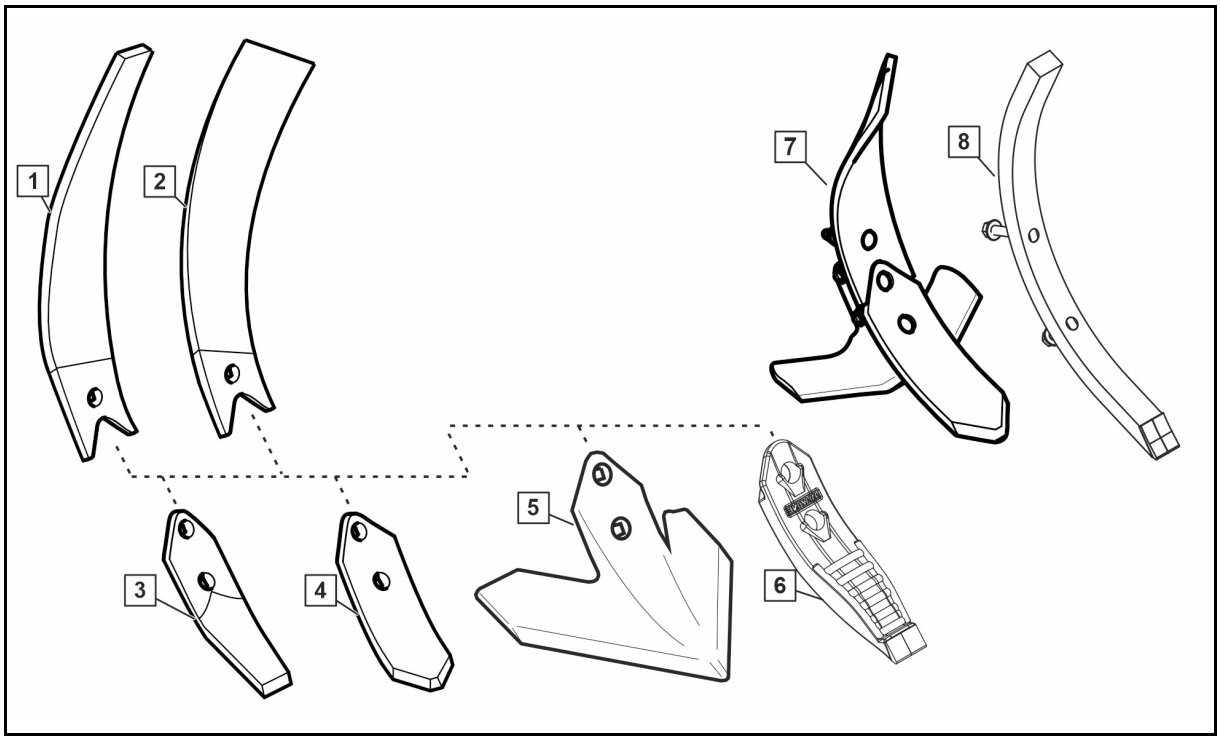
Depth adjustment

The depth of the tines is guided by the roller.

For information on setting the working depth, see page 84.

5.5 Coulter C-Mix

The tines can be fitted with various coulters:



(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) Double-disc coulter 320 mm (with deflector guide 100 mm)

(6) C-Mix HD 80 mm coulter with carbide plates for a longer service life

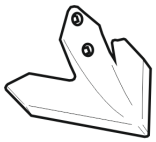
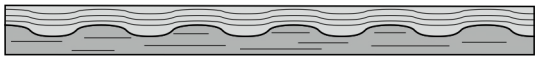
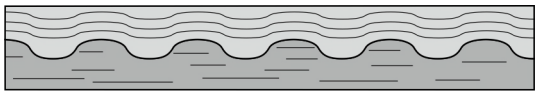
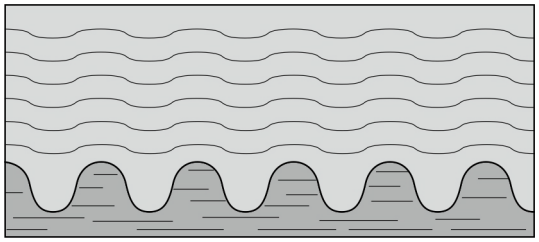
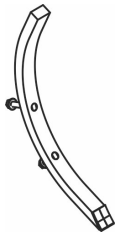
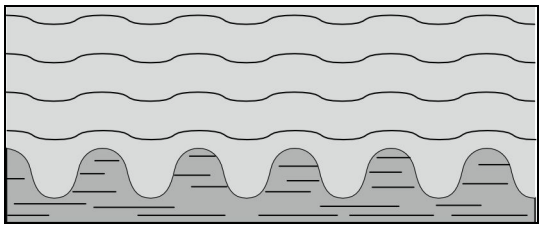
(7) Wing coulter 350 mm (C-Mix / C-Mix HD coulter with wings that can be mounted separately)

(8) C-Mix HD 40 mm coulter

CAUTION

Risk of breaking the coulter!

Never park the implement on solid ground with the coulters!

		Method	Working depth
Double-disc coulter 320 mm			3-10 cm
Wing coulter			8 - 12 cm
C-Mix 100 mm			10 – 20 cm
C-Mix 80 mm C-Mix HD 80 mm			12 - 30 cm
C-Mix 40 mm C-Mix HD 40 mm			20 - 30 cm

5.5.1 Coulter arrangement

Cenius 4003-2TX

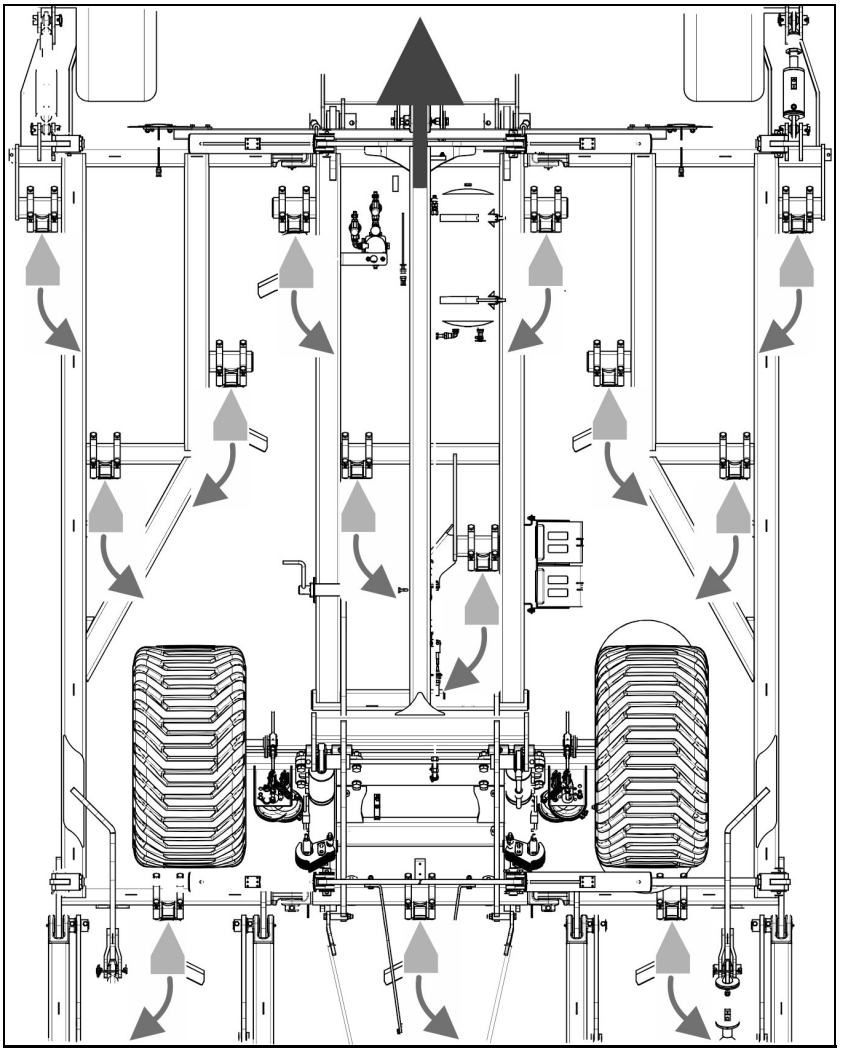


Fig. 14

Cenius 5003-2TX

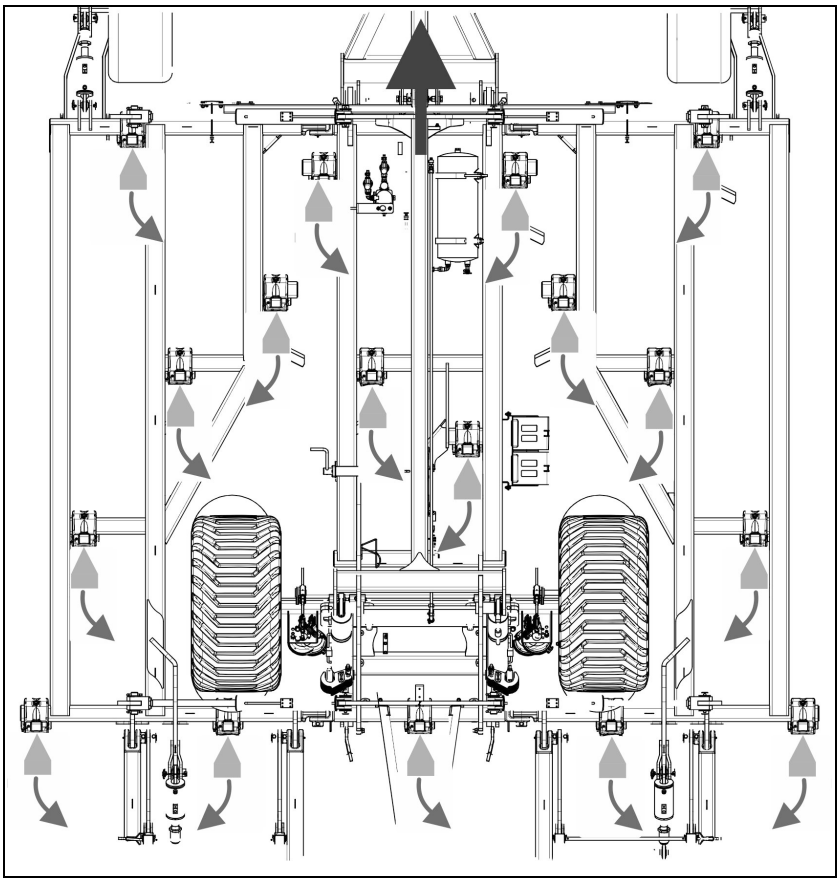


Fig. 15

Cenius 6003-2TX

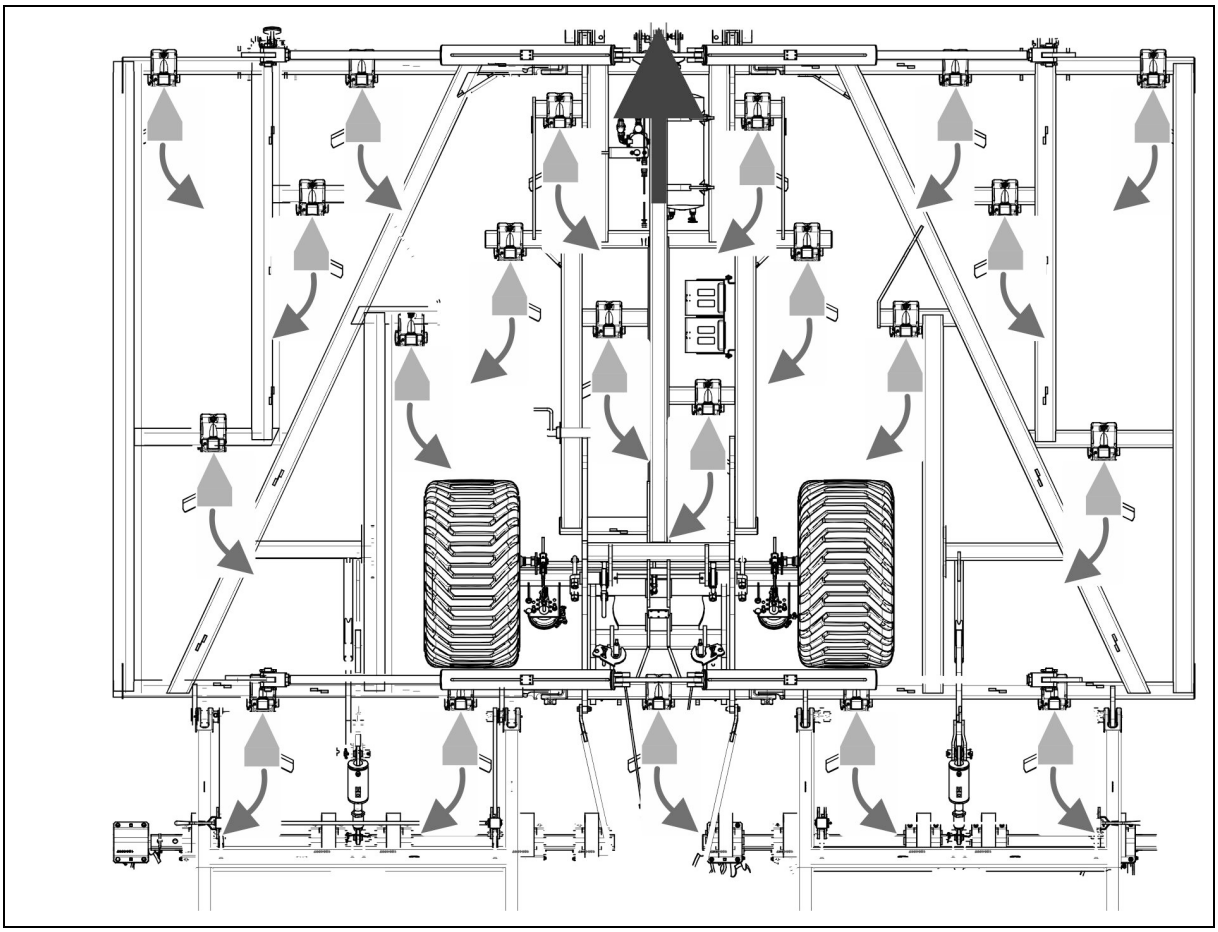


Fig. 16

Cenius 7003-2TX

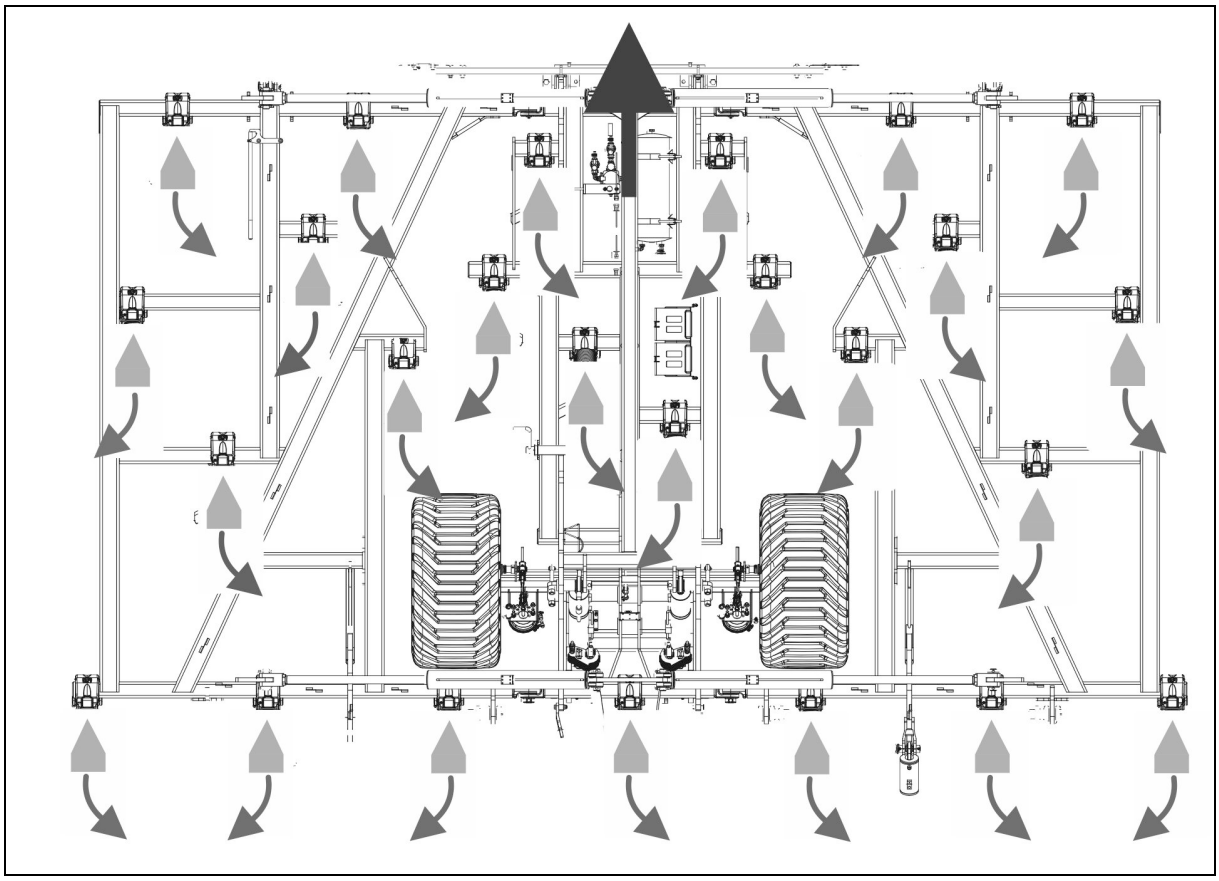


Fig. 17

5.6 Levelling unit

A hollow disc system acts as a levelling unit.

The discs mix, crumble and level out the earth.

The outer elements can be set separately to the next working width to enable clean transit.

- **Concave discs**

The bearings of the concave discs consist of a two rows of angular ball bearings with slide ring seal and oil filling and are maintenance-free.

The discs are protected against overload by rubber spring elements. After passing an obstacle, the discs are moved back to their working position by the rubber spring elements.

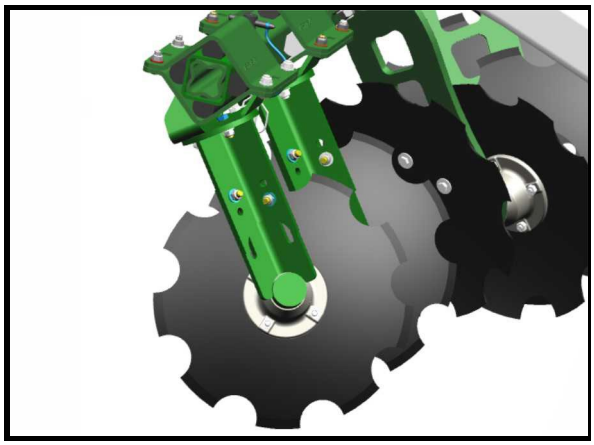


Fig. 18

- **Depth adjustment**

The working depth of the levelling unit is set independently of the working depth of the tines.

For information on setting the working depth, see page 86.

5.7 Boundary discs / side closer

Extendable side discs (Fig. 21)/side closers (Fig. 22) produce a level field with no lateral banks.

As an alternative to round discs, the machine can also be equipped with serrated discs.

- When transporting the implement, completely slide in both side discs/side closers, fix with pins and secure with linch pins.
- For operation, the side discs/side closers can be pegged in different holes

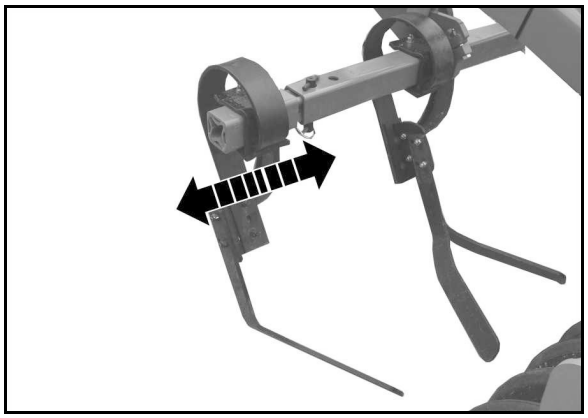


Fig. 19

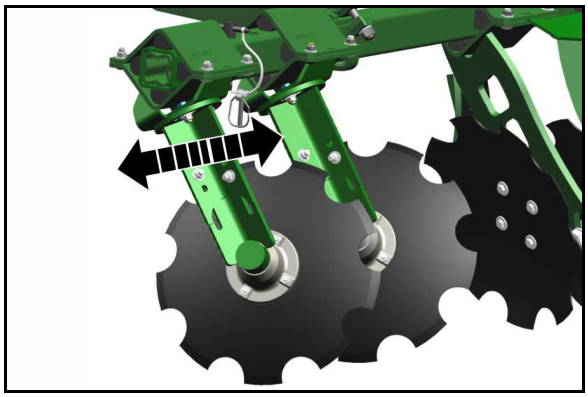


Fig. 20

- **Adjustable boundary discs**

The adjustable boundary discs (Fig. 23) (option) are adjustable in their length and the contact angle can be changed by turning the discs.

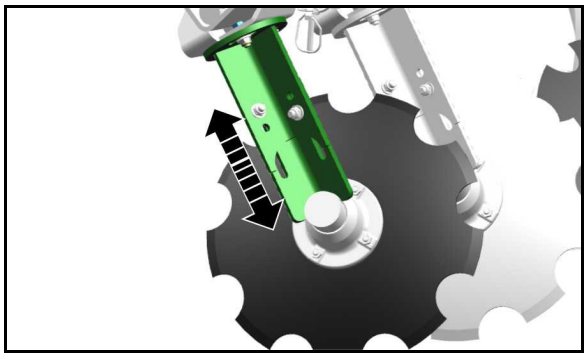


Fig. 21

- **Side closer with overload safety**

(1) Overload safety steel spring

(2) Overload safety rubber elements

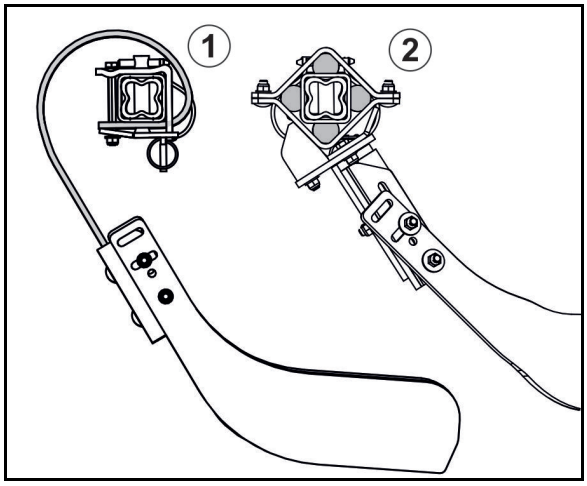


Fig. 22

- Side discs can also be mounted on a tine arrangement.
- Side closers can also be mounted on a disc arrangement.

5.8 Rollers

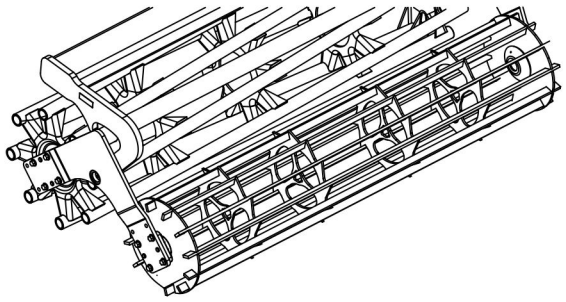
The roller assumes the depth control of the tools.

- **Tandem roller TW520/380**

The tandem roller consists of

- the front spiral tube roller installed in the top group of holes.
- the rod roller installed in the bottom group of holes.

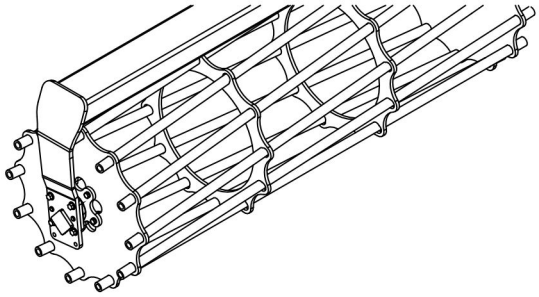
→ Provides very good crumbling.



- **Cage roller SW600**

→ The cage roller can be used where lighter reconsolidation of the soil is required.

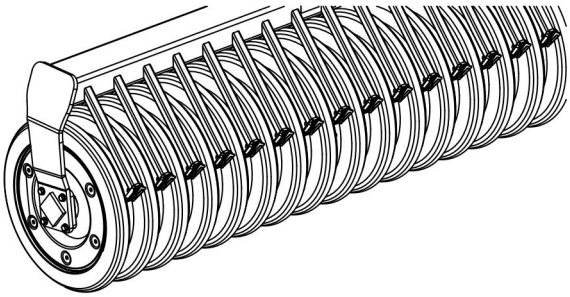
→ Disposes of a very good self-propulsion.



- **Wedge ring roller KW580**

with adjustable scraper.

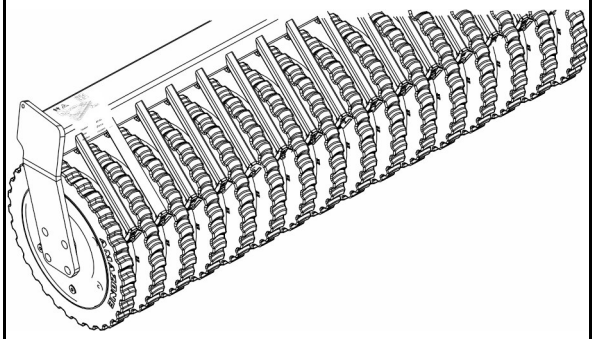
→ Very well suited for medium soils.



- **Wedge ring roller KWM600**

with Matrix profile and adjustable scraper.

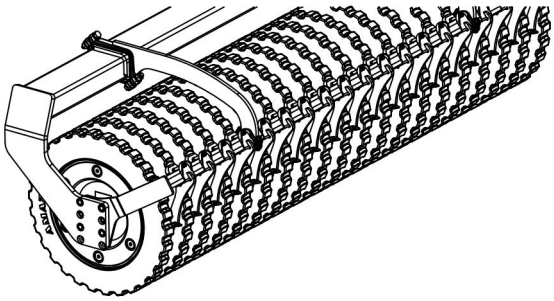
→ Very well suited for light, medium and heavy soils.



- **Wedge ring roller KWM 650**

with Matrix profile and adjustable scraper.

→ Very well suited for light, medium and heavy soils.



- **Double U-profile roller DUW580**

→ Very well suited for light and medium soils.

→ Resistant to clogging and good load-bearing capacity.

- **Disc roller DW600**

→ Very well suited for light, medium and heavy soils.

- Provides very good crumbling.

→ Resistant to clogging and sticking, offers a good load-bearing capacity.

- **Double-disc U-profile roller DDU 600**

→ Very well suited for light, medium and heavy soils.

→ Insensitive to stones and good load-bearing capacity.

- **Double-disc roller DDW**

→ Very well suited for light, medium and heavy soils.

→ Resistant to clogging and sticking, offers a good load-bearing capacity.

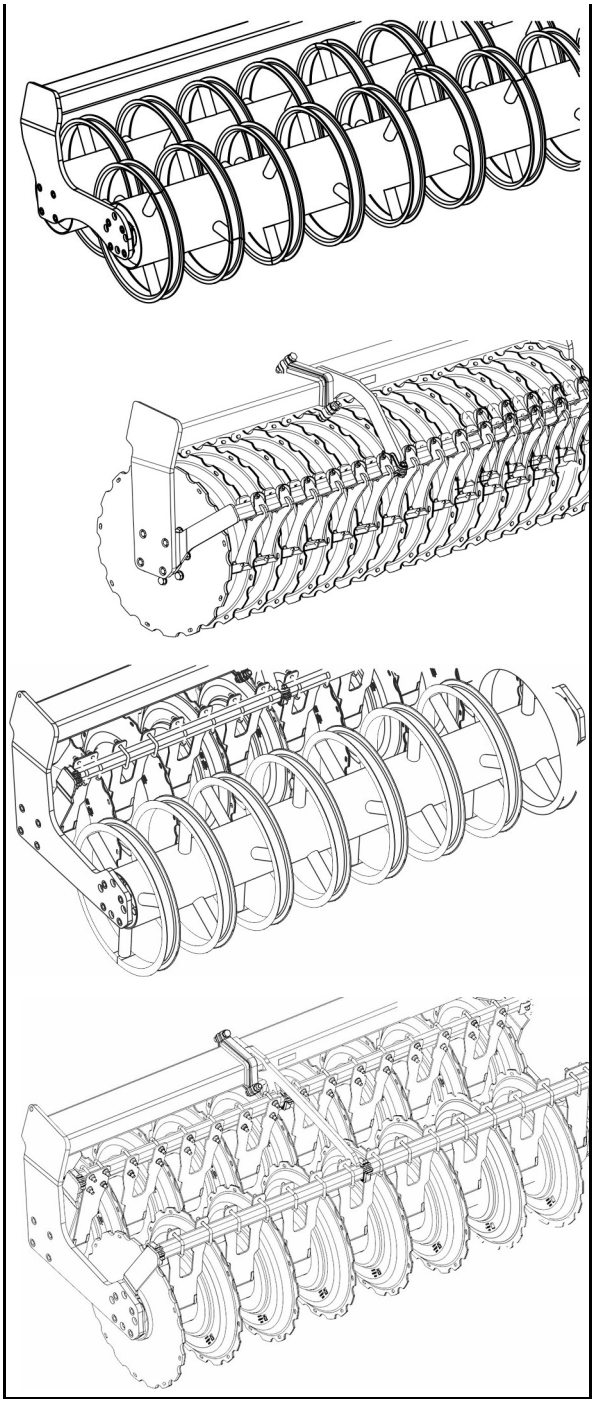


Fig. 23

5.9 Rear harrow (optional)

The rear harrow is used to crumble and level the soil.

The working intensity can be adjusted by inserting the pins into different holes.

Secure the pin with a linch pin.

(1) Positioning pin for adjusting the working intensity.

→ Peg the positioning pin so that the harrow is resting and can swing freely to the rear.

(2) Position of the positioning pin to lock the exact following harrow during road transport.

(3) Install the road safety bar for road transport.

(4) Depending on the harrow system, adjust the harrow height so that it is free of play

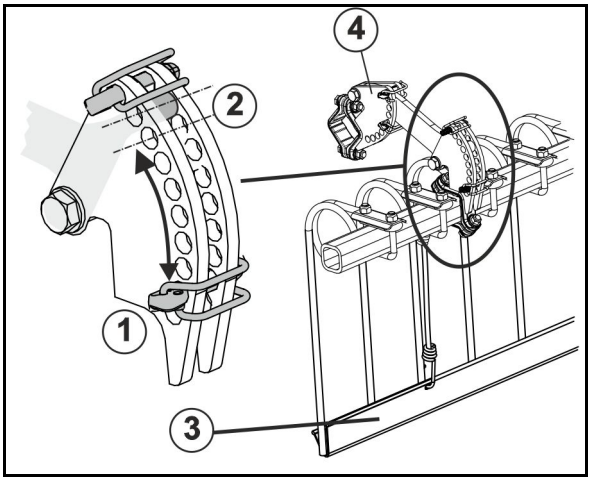


Fig. 24

- Make the same adjustments on all of the setting points.
- Raise and peg the harrow to take it out of operation.
- Attach the transport safety bars on the roller during operation.

Harrow system 12-125 Hi

For rollers: SW600, KW580, KWM600, UW580

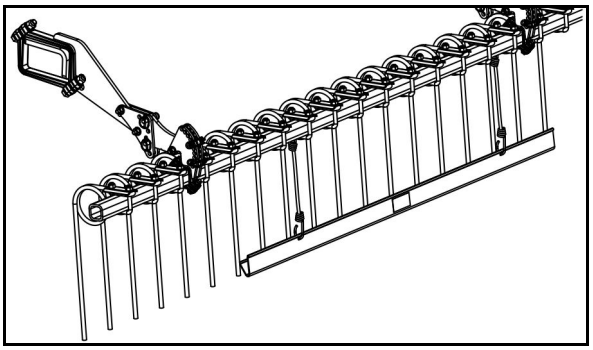


Fig. 25

Harrow system KWM650-125 Hi

For roller: KWM650

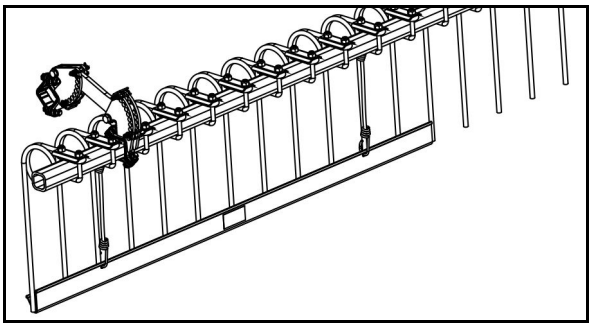


Fig. 26

Harrow system 12-250 Hi

For rollers: DUW580

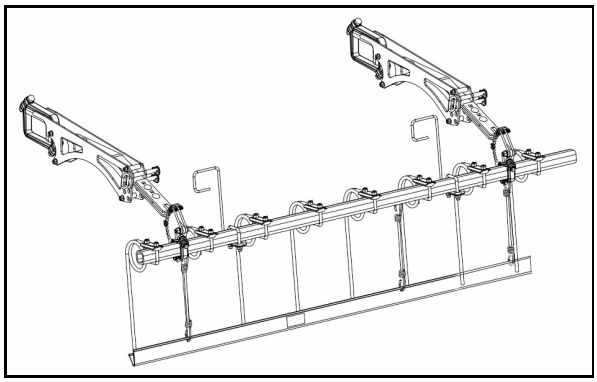
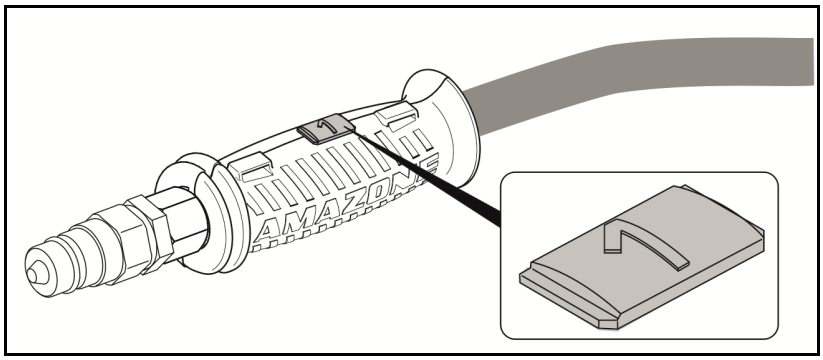


Fig. 27

5.10 Hydraulic connections

- All hydraulic hose lines are equipped with grips.

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



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

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

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

Marking		Function			Tractor control unit	
yellow	1		Running gear / drawbar	Put in working position	Double acting	
	2			Put in transport position / headlands position.		
blue	1		Machine	Fold out	Double-acting, lockable	
	2			Fold in		
green	1		Working depth	Increase	Double acting	
	2			Decrease		
beige	1		Working depth of the levelling unit	Increase	Double acting	
	2			Decrease		

WARNING

Risk of infection from hydraulic fluid escaping at high pressure.

When coupling/uncoupling the hydraulic hose line, ensure that the hydraulic system is not under pressure on the tractor or machine side.

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

5.10.1 Coupling hydraulic hose lines

WARNING

Risk of crushing, cutting, being trapped or drawn in, or impact through faulty hydraulic functions when hydraulic hose lines are incorrectly connected.

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

- Check the compatibility of the hydraulic fluids before connecting the machine to the tractor hydraulic system.

  Do not mix any mineral oils with biological oils.
- Observe the maximum permissible hydraulic fluid pressure of 210 bars.
- Only couple clean hydraulic connectors.
- Plug the hydraulic plug(s) into the hydraulic sockets until you can feel the hydraulic plug(s) locking.
- Check the coupling points on the hydraulic hose lines, to see if they are sitting correctly and are sealed.

1. Swivel the actuation lever on the control valve on the tractor to float position (neutral position).
2. Clean the hydraulic plugs on the hydraulic hose lines before coupling the hydraulic hose lines with the tractor.
3. Connect the hydraulic hose line(s) to the tractor control unit(s).

5.10.2 Disconnecting hydraulic hose lines

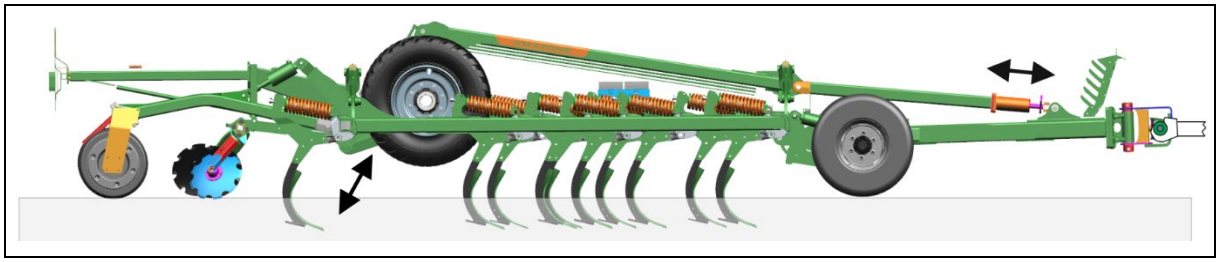
1. Swivel the actuation lever on the tractor control unit on the tractor to float position (neutral position).
2. Unlock the hydraulic connectors from the hydraulic sockets.
3. Protect the hydraulic plug and hydraulic socket against soiling using the dust protection caps.
4. Store the hydraulic hose lines in the hose cabinet.

5.11 Running gear and drawbar

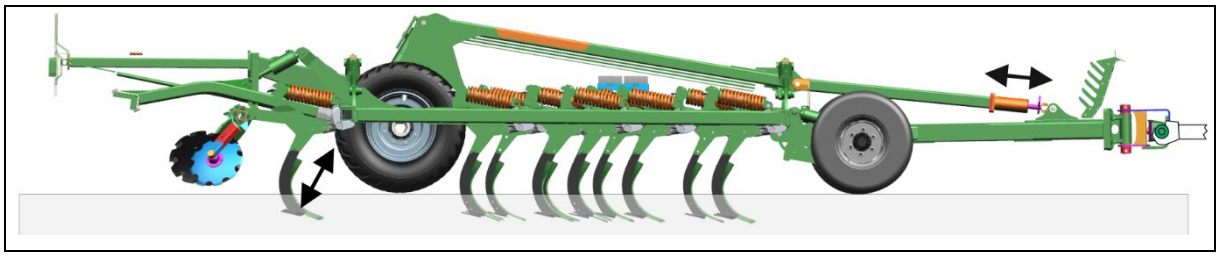
The shared hydraulic system for the running gear and drawbar moves the implement into working position, transport position and headland position.

- Headlands: implement lifted via running gear and drawbar

- Operation: implement lowered via running gear and drawbar, running gear completely lifted, depth control via roller and support wheels



- Operation: implement lowered via running gear and depth control via running gear and support wheels



Drawbar cylinder

(1) Drawbar cylinder

(2) Stop tap

Stop tap open:

- To lift the drawbar for coupling and uncoupling the connecting device
- To adjust the depth of the coulters

Stop tap closed:

- For road transport
- To uncouple the hydraulic hoses

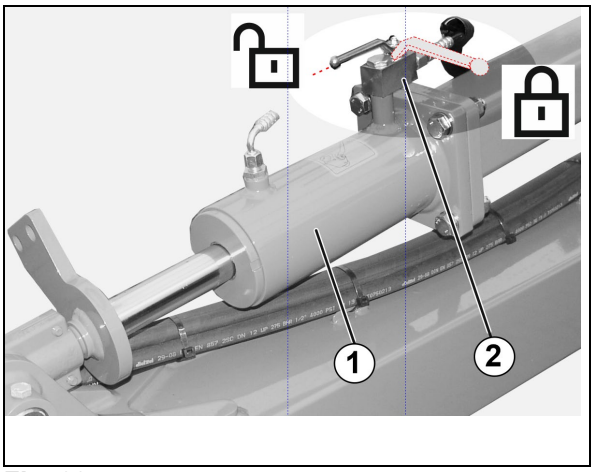


Fig. 28

5.11.1 Traction assistance (option)

With the traction assistance switched on, in working position a portion of the implement weight is transferred to the tractor, to boost the traction of the tractor tyres.

(1) Traction assistance switch tap

- 1 – Traction assistance on
- 0 – Traction assistance off

(2) Pressure accumulator

(3) Pressure gauge for display of weight transfer to the tractor

(4) Adjustable pressure limiting valve

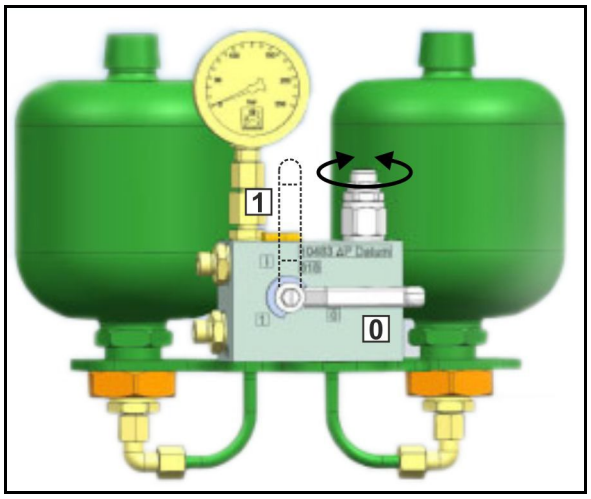


Fig. 29

Switch off traction assistance before transport travel.

5.12 Jack

The jack is raised during operation or transport.

The lowered jack supports the uncoupled implement.

(1) Swivel-mounted jack

(2) Handle

(3) Bolt with linch pin.

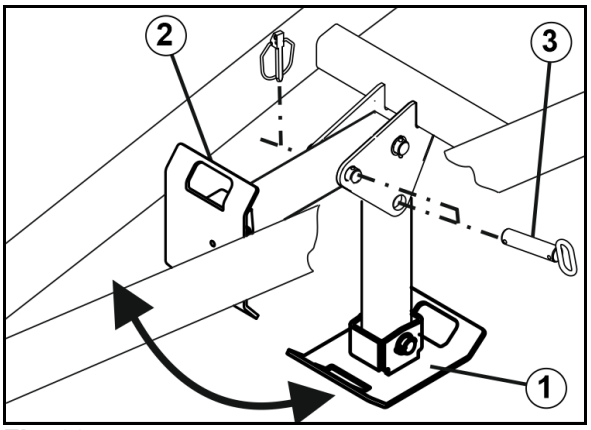


Fig. 30

Bring the jack into the desired position:

1. Grasp and hold the jack with handle from above.
2. Pull the linch pin and the pin.
3. Swing the jack to the end position.
4. Fix the position of the jack with the pin and secure using the linch pin.

5.13 Supporting wheels

The support wheels together with the roller provided depth control of the coulters.

- Support wheel, single

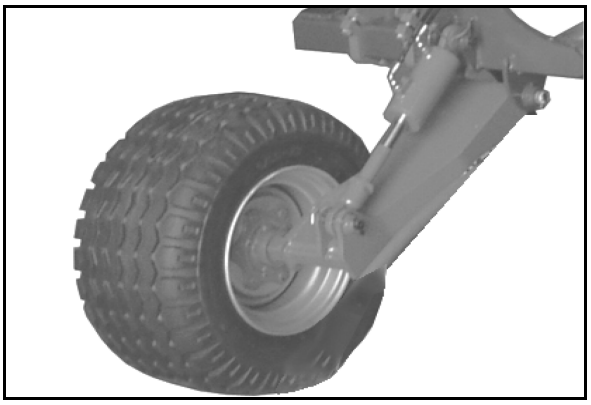


Fig. 31

- Support wheel, double
  (only for Cenius 6003-2TX and 7003-2TX):

Fig. 32

5.14 Hectare counter (optional)

The hectare counter is a mechanical counter on the support wheel for determination of the worked area.

The counter shows the distance run in the working position in kilometres.

Trailing of the feeler wheel and driving backwards distort the area calculation.

The counter also continues counting when driving backwards.

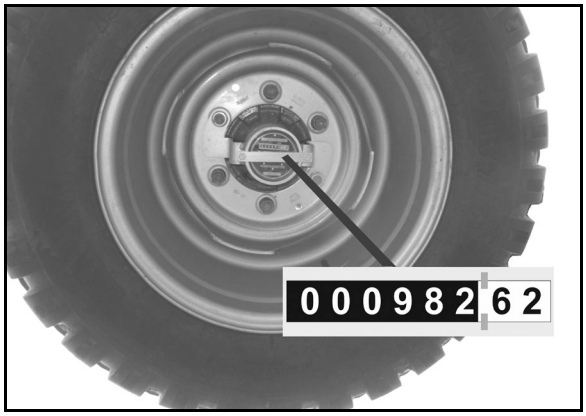


Fig. 33

Determining the area efficiency:

Cenius 4003-2TX:	Area efficiency [ha] = Display value x 0.4
Cenius 5003-2TX:	Area efficiency [ha] = Display value x 0.5
Cenius 6003-2TX:	Area efficiency [ha] = Display value x 0.6
Cenius 7003-2TX:	Area efficiency [ha] = Display value x 0.7

5.15 Service box

The service box is used to store tools, replacement shears and shearing bolts.

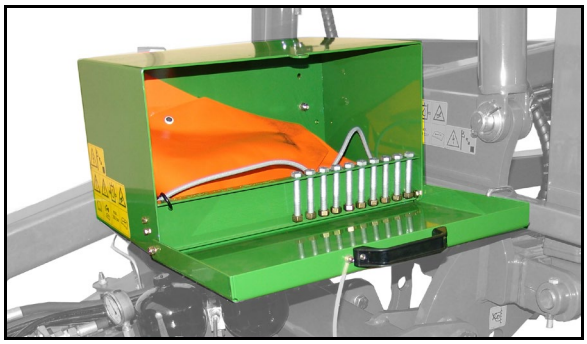
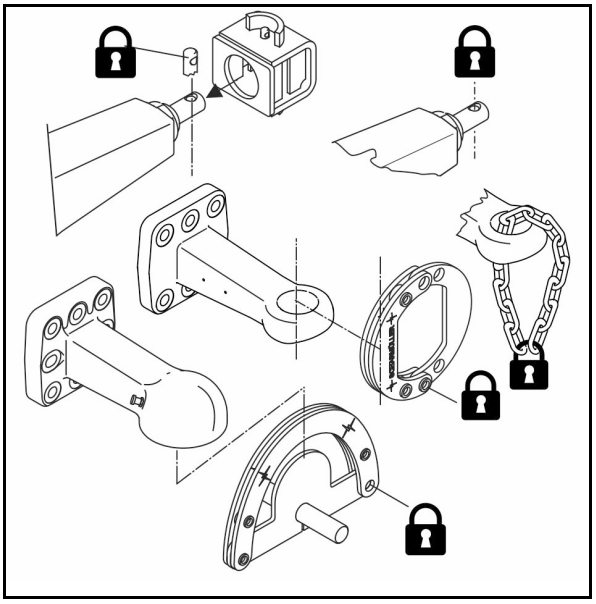


Fig. 34

5.16 Safety device against unauthorised use

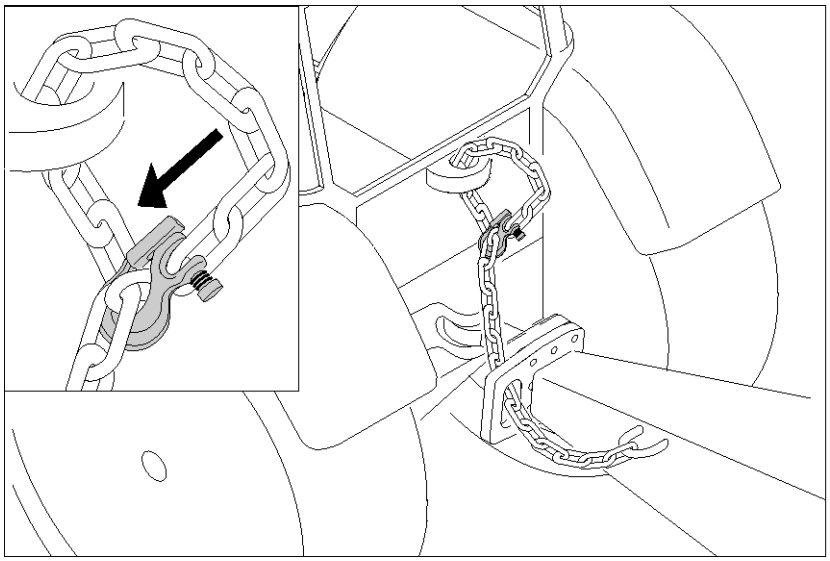
Lockable device for the drawbar eye, ball bracket, or lower link crosspiece, prevents unauthorised use of the machine.



5.17 Safety chain between tractor and implements

Depending on country-specific regulations, implements are equipped with a safety chain.

The safety chain must be mounted at a suitable point on the tractor as prescribed before travelling.



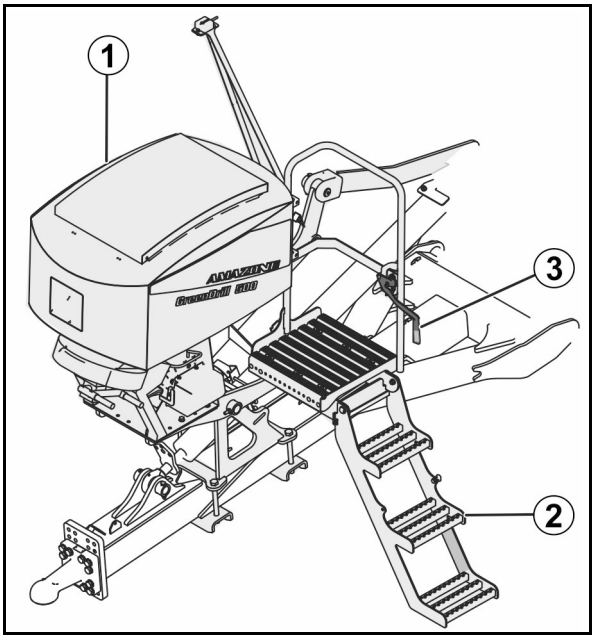
5.18 GreenDrill catch crop sowing unit

The GreenDrill catch crop sowing unit enables the sowing of fine seeds and catch crops during soil cultivation with the Catros disc cultivator.

(1) GreenDrill

(2) Foldable ascent

(3) Locking pin for securing the foldable ascent



See also the GreenDrill operating manual.

Fold the access ladder to the transport position before driving.

Use the step of the ladder as handle.

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.
- Tractor and machine must satisfy the national road traffic regulations!
- Vehicle owner and vehicle operator are responsible for compliance with the statutory provisions of the national 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 in the event of 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 load capacity of the installed tyres

  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

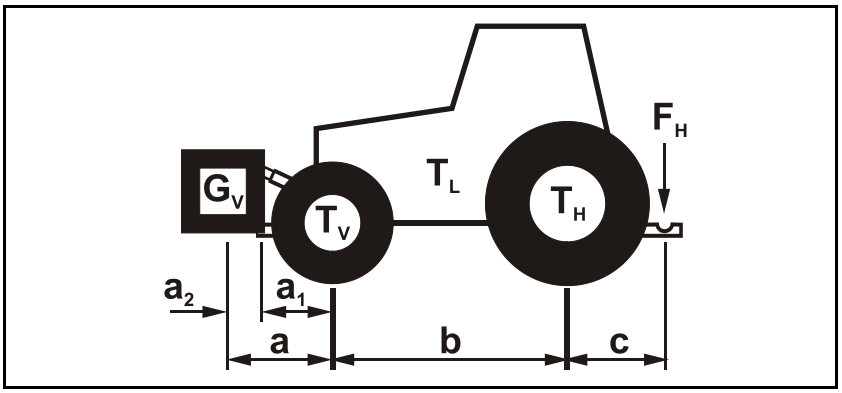


Fig. 35

T_L	[kg]	Tractor empty weight	See tractor operating manual or vehicle documentation
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of the empty tractor	
G_V	[kg]	Front weight (if available)	See front weight in technical data, or weigh
F_H	[kg]	Actual drawbar load	determining
a	[m]	Distance between the centre of gravity of the front machine mounting or the front ballast and the centre of the front axle (total $a_1 + a_2$)	See technical data of tractor and front machine mounting or front ballast 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 ballast (centre of gravity distance)	See technical data of front machine mounting or front ballast 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 front ballast $G_{V\ min}$ of the tractor to ensure safe steering

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

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

Crush, cut, entanglement, pulling in and impact hazards caused by poor stability and insufficient steering and braking capacity of the tractor.

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

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

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

6.1.2 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 drawbar load 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 load does not exceed the permissible rear axle load.
  - that the permissible total weight of the tractor is observed.
  - that the approved load capacities of the tractor tyres are not exceeded.

6.1.2.1 Combination options of coupling devices

The table shows the permitted combination options of coupling devices for the tractor and implement.

Coupling device				
Tractor		**AMAZONE implement**		
Upper hitch				
Pin coupling, form A, B, C A not automatically B automatic smooth pin C automatic curved pin	(ISO 6489-2)	Drawbar eye	Socket ⌀ 40 mm	(ISO 5692-2)
		Drawbar eye	⌀ 40 mm	(ISO 8755)
		Drawbar eye	⌀ 50 mm, only compatible with form A	(ISO 1102)
Upper / lower hitch				
Ball head coupling Ø 80 mm	(ISO 24347)	Ball coupling	⌀ 80 mm	(ISO 24347)
Lower hitch				
Towing hooks / hitch hooks	(ISO 6489-19)	Drawbar eye	Centre bore Ø 50 mm Eyelet Ø 30 mm	(ISO 5692-1)
		Swivel drawbar eye	compatible only with form Y, hole Ø 50 mm,	(ISO 5692-3)
		Drawbar eye	Centre bore Ø 50 mm Eyelet Ø 30 - 41 mm	(ISO 20019)
Drawbar - Category 2	(ISO 6489-3)	Drawbar eye	Centre bore Ø 50 mm Eyelet Ø 30 mm	(ISO 5692-1)
			Socket ⌀ 40 mm	(ISO 5692-2)
			⌀ 40 mm	(ISO 8755)
			⌀ 50 mm	(ISO 1102)
Drawbar	(ISO 6489-3)	Drawbar eye		(ISO 21244)
Drawbar / Piton-fix	(ISO 6489-4)	Drawbar eye	Centre bore Ø 50 mm Eyelet Ø 30 mm	(ISO 5692-1)
		Swivel drawbar eye	compatible only with form Y, hole Ø 50 mm	(ISO 5692-3)
Yoke that cannot be rotated	(ISO 6489-5)	Swivel drawbar eye		(ISO 5692-3)
Lower link hitch	(ISO 730)	Lower link traverse		(ISO 730)

6.1.2.2 Compare the permissible D_C value with actual D_C value

WARNING

Danger from breaking the coupling devices between the tractor and the implement when the tractor is not used for its intended purpose!

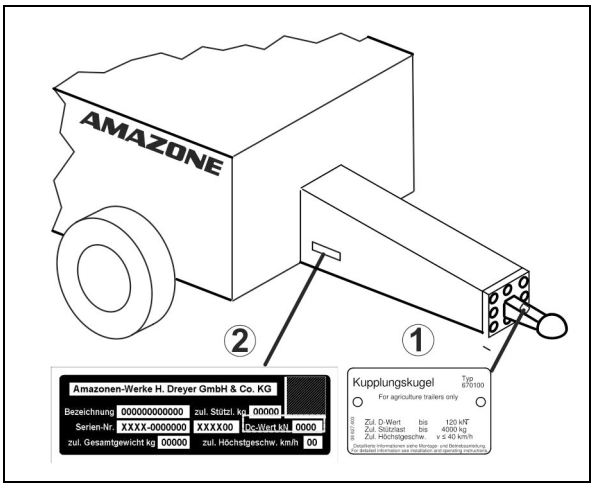
1. Calculate the actual D_C value of your combination, comprising tractor and implement.
2. Compare the actual D_C value with the following permissible D_C values:

- Coupling device of the implement
- Drawbar of the implement
- Coupling device of the tractor

The actual D_C value calculated for the combination must be less than or equal (≤) to the D_C values specified.

The permissible D_C values of the implement can be found on the rating plate of the coupling device (1) and the drawbar (2).

The permissible D_C value of the tractor coupling device can be found directly on the coupling device / in the operating manual of your tractor.



actually calculated D_C value for the combination		**specified D_C value**
kN	≤	Coupling device on the tractor: kN
	≤	Coupling device of the implement: kN
	≤	Drawbar of the implement: kN

Calculate the actual D_C value for the combination to be coupled

The actual D_C value of a combination to be coupled is calculated as follows:

$$D_C = g \times \frac{T \times C}{T + C}$$

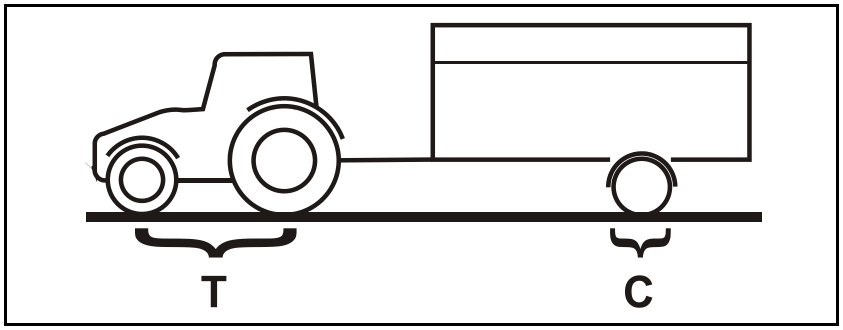


Fig. 36

T: permissible total weight of your tractor in [t] (See tractor operating manual or vehicle documentation)

C: axle load of the implement [t] loaded with the permissible mass without drawbar load (working load).

g: Gravity (9.81 m/s²)

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

WARNING

Risk of crushing, shearing, cutting, catching, drawing in and knocks during all work on the machine

- **By driven work elements.**
- **By unintentional movement of work elements or unintentional actuation of hydraulic functions when the tractor engine is running.**
- **By unintentional starting and rolling of the tractor and mounted machine.**

- Secure the tractor and the machine against unintentional starting 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 a connected PTO shaft/hydraulic system.
  - if the ignition key is in the tractor and the tractor engine can be started unintentionally with the PTO shaft/hydraulic system connected.
  - if moving parts are not blocked against unintentional movement.
  - If there are persons (children) on the tractor.

  Particularly during these operations there are dangers due to unintentional contact with driven, unguarded work elements.

1. Lower the machine and machine parts when raised and unsecured.

→ This prevents unintentional falling.

2. Switch off the tractor engine.
3. Remove the tractor ignition key.
4. Apply the tractor parking brake.
5. Secure the implement against rolling away unintentional (only if the implement is hitched)
   - By using the wheel chocks on level terrain or with the parking brake if fitted.
   - By using wheel chocks and the parking brake on very uneven terrain or on a slope.

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 crushing, catching, drawing in and/or knocks due to unintentional starting and rolling of the tractor when coupling or uncoupling the PTO shaft and supply lines.

Secure the tractor and machine against unintentional starting and rolling before entering the danger area between the tractor and machine to couple or uncouple the the PTO shaft and supply lines. See page 79.

WARNING

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

- It is forbidden to actuate the three-point hydraulic system of the tractor as long as persons are standing between the rear of the tractor and the machine.
- Actuate the operator controls for the tractor's three-point hydraulic system
  - Only from the intended workstation alongside the tractor.
  - Only when you are outside the danger area between the tractor and the machine.

7.1 Coupling the machine

WARNING

Risk of crushing and contusions between the tractor and the machine when coupling 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 crushing, drawing in, catching or contusions if the machine unexpectedly comes away 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 (original pins) 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 locking pins to secure the upper and lower link pins against accidental loosening.
- Visually check that the upper and lower link hooks are correctly locked before you drive off.

WARNING

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

You may only connect the machine to tractors suitable for the purpose. See section "Checking tractor suitability", page 70.

WARNING

Risk of power supply failure between the tractor and the machine through damaged supply 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.

Couple the implement with draw rail on the lower link of the tractor

1. Slide ball sleeves onto the lower link pins of the implement and secure them with linch pins.
2. Direct people out of the danger area between the tractor and implement before you approach the implement with the tractor.
3. First couple the supply lines to the tractor before coupling the implement to the tractor.
   - 3.1 Drive the tractor up to the implement in such a manner that a free space (approx. 25 cm) remains between tractor and implement.
   - 3.2 Secure the tractor against unintentional starting and rolling away.
   - 3.3 Couple supply lines to the tractor.
   - 3.4 Position the lower link hooks so that they are aligned with the lower pivot points on the implement.
4. Now drive the tractor in reverse further towards the implement, so that the lower link hooks of the tractor automatically take up the lower pivot points of the implement.

→ The lower link hooks lock automatically.

5. Visually inspect to ensure whether the lower link hooks are correctly locked.
6. Lift stand.
7. Remove wheel chocks.
8. Disengage parking brake.
9. Close the stop tap on the drawbar cylinder for road transport.

Couple the implement with ball bracket on the tractor ball head

1. Instruct persons to get out of the danger area between the tractor and the implement.
2. First couple the supply lines before coupling the implement to the tractor.
   - 2.1 Drive tractor up to the implement in such a manner that a free space (approx. 25 cm) remains between tractor and implement.
   - 2.2 Secure the tractor against unintentional starting and rolling away.
   - 2.3 Couple supply lines to the tractor.
3. Drive the tractor in reverse to the implement so that the coupling device can be coupled.
4. Open the stop tap on the drawbar cylinder.
5. Actuate the tractor control unit *yellow*.

→ Lower drawbar.

6. Couple the coupling device.
7. Lift the stand into transport position.
8. Remove wheel chocks
9. Release the parking brake.
10. Close the stop tap on the drawbar cylinder for road transport.

7.2 Uncoupling the machine

DANGER

Danger of injury from coulters breaking and coulter pieces being ejected!

Do not rest the implement on the tines!

Park the folded implement with running gear and jack on a level parking surface with solid ground.

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.

Uncouple the implement with draw rail

1. Safeguard tractor and implement against rolling off unintentionally. See page 79.
2. Lower the stand.
3. Decouple the implement from the tractor.
   - 3.1 Release the lower link.
   - 3.2 Unlock and uncouple the lower link hooks from the tractor seat.
   - 3.3 Move the tractor forward by approx. 25 cm.
   - → This will allow more clearance between tractor and implement and give better access for uncoupling the supply lines.
   - 3.4 Safeguard tractor and implement against rolling off unintentionally.
   - 3.5 Close the stop tap on the drawbar cylinder.
   - 3.6 Switch the tractor control unit *yellow* to float position and depressurise the hydraulic hose lines.
   - 3.7 Uncouple the supply lines.

Uncouple the implement with ball bracket

1. Safeguard tractor and implement against rolling off unintentionally. See page 79.
2. Lower the stand.
3. Open the stop tap on the drawbar cylinder.
4. Decouple the implement from the tractor.
   - 4.1 Decouple the coupling device.
   - 4.2 Actuate the tractor control unit *yellow*.
     - → Lift off the drawbar.
   - 4.3 Pull the tractor forward by approx. 25 cm.
   - → This will allow more clearance between tractor and implement and give better access for uncoupling the supply lines.
   - 4.4 Safeguard the tractor and implement against unintentionally rolling off.
   - 4.5 Close the stop tap on the drawbar cylinder.
   - 4.6 Switch tractor control unit *yellow* to float position and thus depressurise the hydraulic hose lines.
   - 4.7 Decouple the supply lines.

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 79.

8.1 Working depth of the coulters

With the adjustment of the working depth of the coulters, the levelling unit is also adjusted.

Manual adjustment

Adjustment of the working depth of the coulters is carried out hydraulically in working position via the tractor control unit *green*.

The adjustment is carried out via:

- The roller or running gear (if the roller is dismounted)
- The support wheels

With the roller removed: Use the running gear for adjusting the working depth (*yellow* tractor control unit).

There is a scale on the right support wheel that shows the set depth.

(1) Scale (0 – 30 cm)

(2) Pointer indicates the working depth

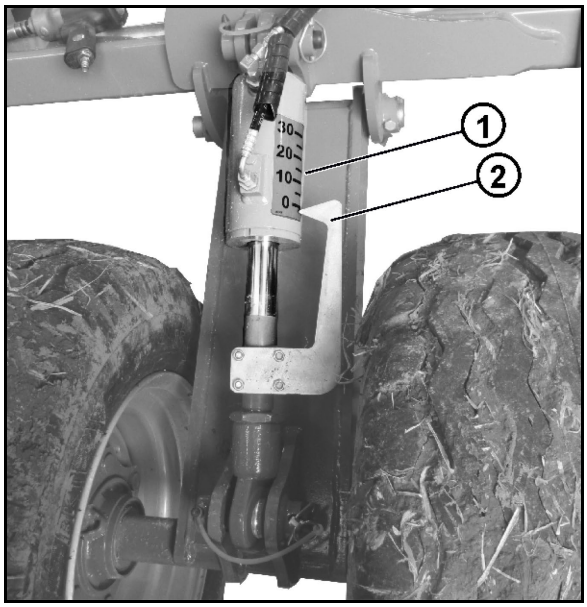


Fig. 37

The values of the scale only indicate the approximate working depth.

If a uniform working depth cannot be adjusted, see page **102**.

Manual adjustment

Manual adjustment of the working depth of the coulters is performed when the implement is raised.

The adjustment is carried out via:

- the roller
- the support wheels

With the roller removed: Use the running gear for adjusting the working depth (see page 91).

→ Use as many spacer elements as required so that the implement is horizontal during operation.

The working depth of the discs is set by adjusting the spindle length.

Use the hand lever with the ratchet to make the adjustment.

- Shorten spindle → Increases the working depth.
- Lengthen spindle → Reduces the working depth.

Adjust all of the spindles to the same length.

Adjusting the spindle using the ratchet

1. Remove the linch pin (3).
2. Engage the turning lever (2) in the required direction.
3. Use the hand lever (1) to lengthen or shorten the spindle.
4. Secure the adjustment using the linch pin (3).
5. Rest the hand lever in parking position on the frame and secure with a linch pin.

The scale (4) serves for orientation during adjustment.

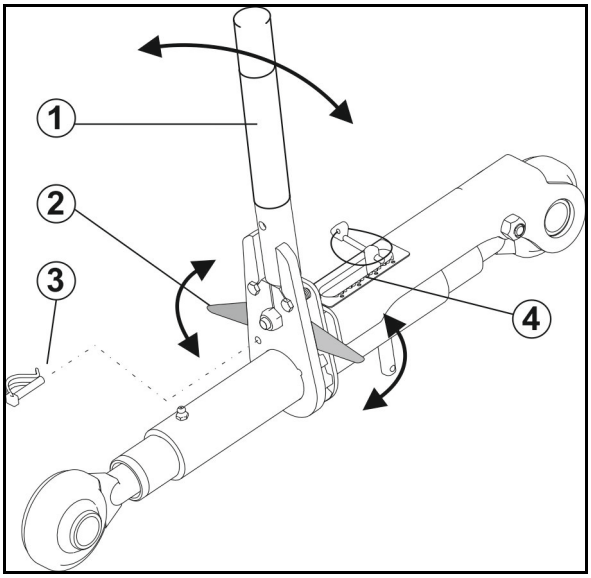


Fig. 38

8.2 Working depth of the levelling unit

If the levelling unit leaves furrows behind the roller:

→ Working depth of the levelling unit is too deep

If the tines leave furrows behind the roller:

→ Working depth of the levelling unit is too shallow

8.2.1 Setting the working depth of the levelling unit mechanically

The working depth of the levelling unit can be adapted to the working depth of the tines at the cranks.

Adjust the working depth via the crank and secure the crank with the bracket.

- Turn the crank to the right → Reduce working depth.
- Turn the crank to the left → Increase working depth.

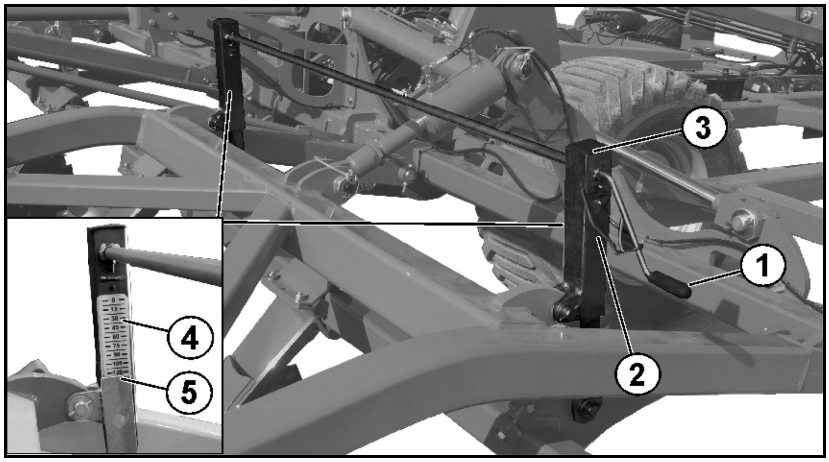


Fig. 39

(1) Crank
(2) Lock bracket
(3) Adjustment spindle
(4) Scale (0 -195)
(5) Pointer

- Set both adjustment units to the same values.
- The values of the scale do not describe the working depth in mm.

8.2.2 Setting the working depth of the levelling unit hydraulically

Die Einstellung der Arbeitstiefe der Einebnungseinheit wird hydraulisch in Arbeitsstellung über das Traktor-Steuergerät *beige* durchgeführt.

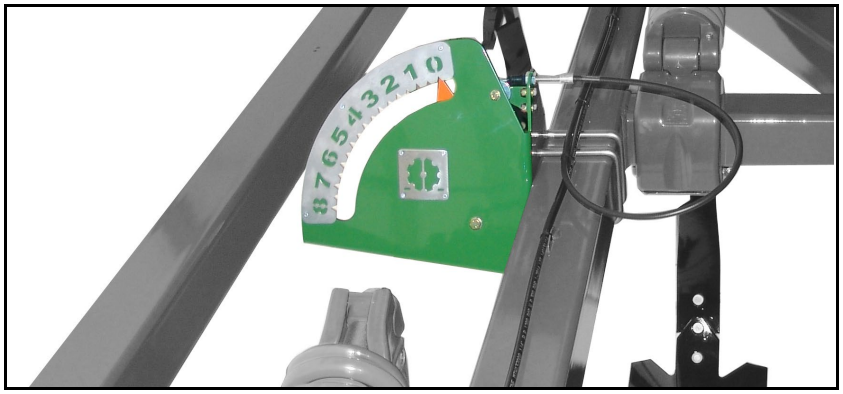


Fig. 40

On the right boom, there is a scale (0-8) that indicates the depth set.

The values on the scale do not specify the working depth set in cm.

8.3 Adjusting the traction assistance

The weight transfer to the tractor can be adjusted to meet the requirements via the hydraulic system pressure of the traction assistance.

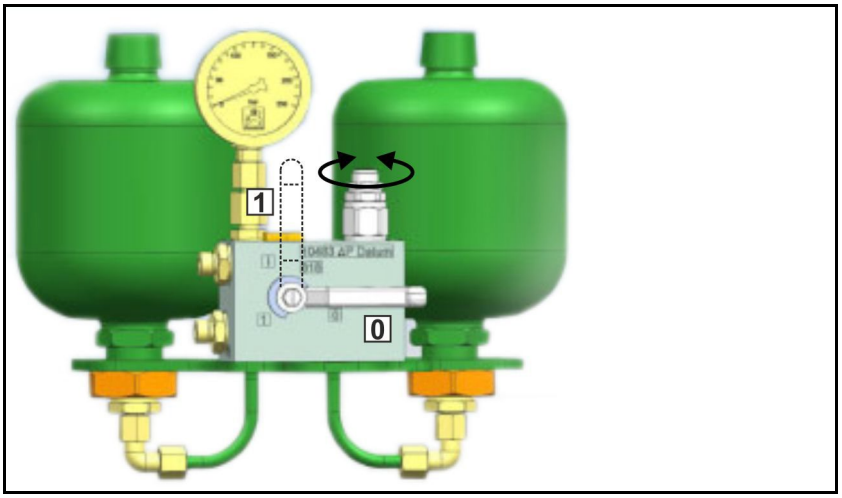


Fig. 41

1. Switch on traction assistance
2. Completely close the pressure-limiting valve.
3. Actuate the tractor control unit *yellow*.

→ Lift the implement.

4. Switch the tractor control unit *yellow* to float position.
5. Open the pressure-limiting valve far enough that the desired pressure is shown on the pressure gauge.

The optimal value for adjusting the traction assistance depends on

- the soil conditions
- the working width of the implement
- the tractor
- from working with or without roller

Reference values for setting the pressure:

Cenius			
4003-2TX	**5003-2TX**	**6003-2TX**	**7003-2TX**
80 bar	100 bar	120 bar	140 bar

When working with traction assistance, the front tines are relieved. If the working depth at the front is shallower than that behind, the pressure of the traction assistance is set too high.

8.4 Setting the Ultra overload safety

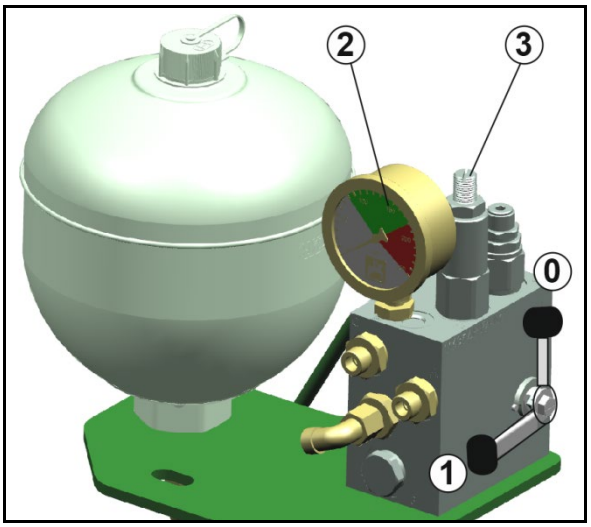
1. Couple the implement to the tractor.
2. Move the switch tap to position (0).
3. To relieve the pressure in the overload safety, put the yellow tractor control unit in float position.

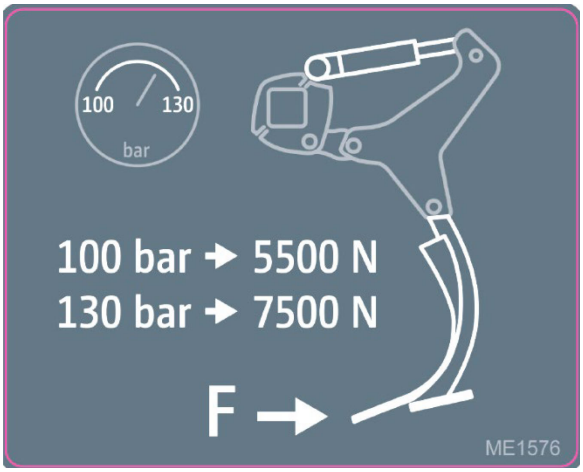
⚠ Be careful, the machine is lowered!

4. Loosen the lock nut on the setting valve (3).
5. Screw in the adjuster screw further to increase the setting pressure.
   Unscrew the adjuster screw further to reduce the pressure.
6. Move the switch tap to position (1).
7. To build up the pressure in the overload safety, actuate the yellow tractor control unit and hold it slightly longer.

⚠ Be careful, the implement is lifted!

8. Read the setting pressure on the pressure gauge (2).
9. Repeat the procedure to optimise the setting pressure.
10. Lock the setting valve with the lock nut.





8.5 Adjusting the stripper of the wedge ring rollers

The strippers are set at the factory. To adjust the setting to the working conditions:

1. Loosen the bolts.
2. Adjust the stripper in the slot.
3. Tighten the bolts again.

Do not adjust the distance between stripper and spacer ring to less than 10 mm to avoid excessive wear.

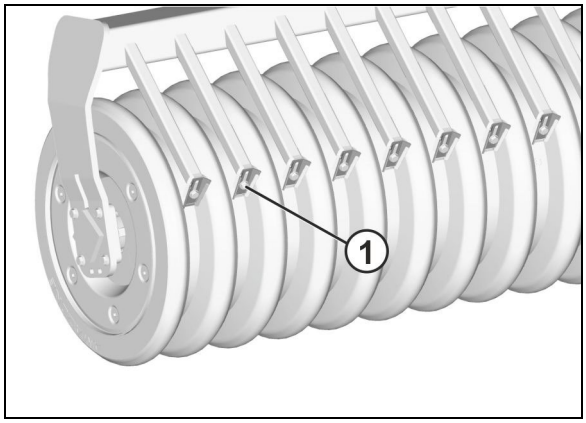


Fig. 42

8.6 Mounting / dismounting the roller

After dismounting the rollers, the spacer elements on the running gear cylinder must be pivoted so that the running gear can take over the depth control in implementation.

Prior to mounting the rollers, the spacer elements must be pivoted away from the running gear cylinder, so that the running gear can be completely lifted.

→ First, pivot the spacer elements/ away from the running gear cylinder, then mount / dismount the roller.

When pivoting in the spacer elements, the apertures must completely enclose the piston rod.

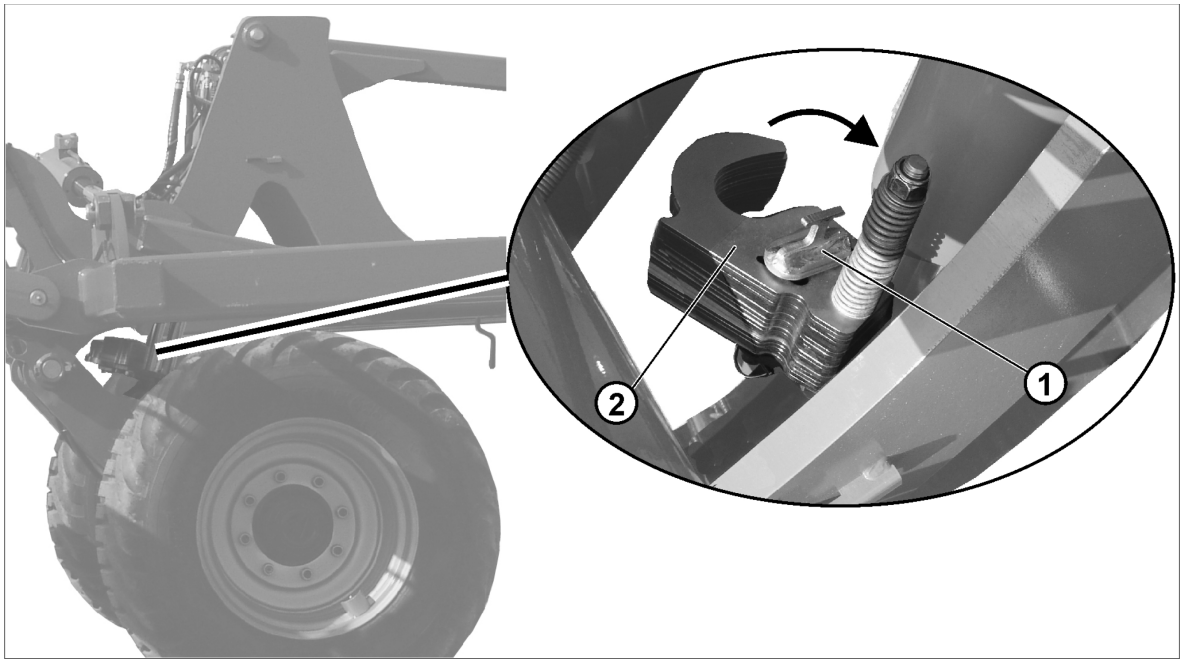


Fig. 43

Attaching / removing the spacer elements on the running gear cylinder.

Always attach or remove the spacer elements on both running gear cylinders.

1. Actuate the tractor control unit *yellow*.

→ Completely lift out the implement.

2. Pull out the pin (Fig. 45/1).
3. Pivot spacer element into the desired position.
4. Remount the pin and secure it with a linch pin.

Dismounting rollers

1. Actuate the tractor control unit *yellow*.

→ Completely lift out the implement.

2. Guide the parking feet into the parking fixture and secure them with linch pins.
3. Actuate the tractor control unit *yellow*.

→ Carefully set down the roller.

4. Unscrew the threaded unions on them roller receptacles and take off the retaining clips.
5. Pivot in the spacer elements on the running gear cylinders.

Mounting the rollers

1. Pivot the spacer elements away from the running gear cylinders.
2. Carefully drive the implement in reverse up to the packed rollers.

→ A second person who can guide the operator is necessary for this task!

→ Alternatively, position the rollers with a hoisting crane.

3. Actuate the tractor control unit *yellow*.

→ Lower the implement far enough that the roller receptacles enclose the roller

4. Fasten the rollers on the roller receptacles with retaining clips and threaded unions.

To connect the rollers correctly, the clamping bracket and its bolts must be installed according to Fig. 48.

Required tightening torque: 210 Nm

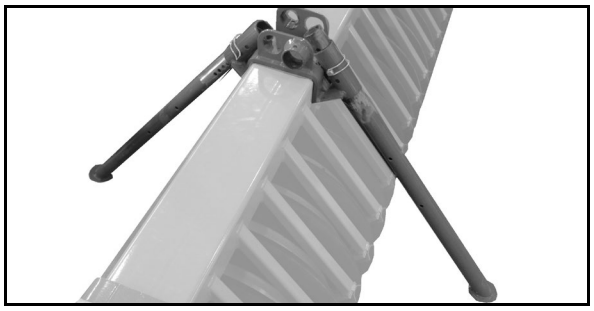


Fig. 44

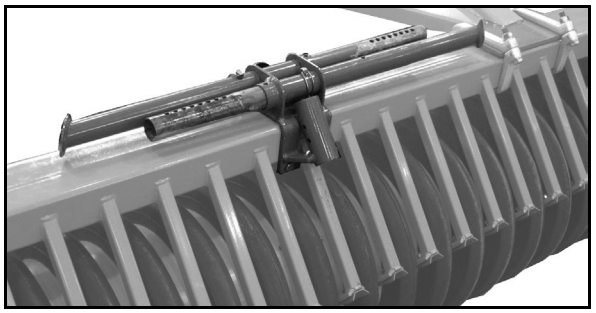


Fig. 45

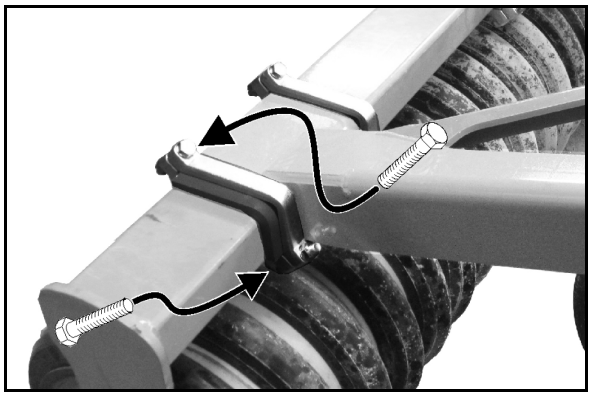


Fig. 46

8.7 Adjusting the working position horizontally via support wheels

Due to changing soil conditions or when changing the rollers, horizontal adjustment of the working position can be necessary.

1. Couple the implement on the tractor.
2. Place the support wheels on the ground without force.
3. Release the lock nut.
4. Pull out the pin on the hydraulic cylinder.
5. Turn the tie-rod in such a manner that the implement is horizontal in working position.
6. If necessary move the hydraulic drawbar for enough that the pin can be remounted.
7. Remount the pin and secure it with the linch pin.
8. Re-tighten the lock nut.

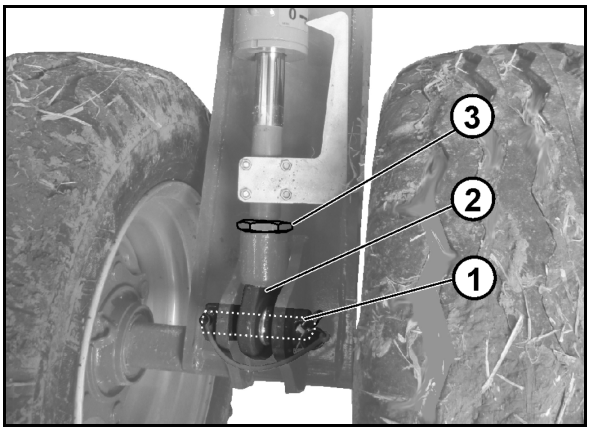


Fig. 47

Carry out the adjustment on both support wheels in the same manner.

8.8 Height of the ball bracket / towing eye

With the implement removed, the height of the ball bracket/towing eye (Fig. 50/1) can be adjusted to the tractor.

Loosen the screws (Fig. 50/2) and screw the ball bracket/towing eye on at the desired height.

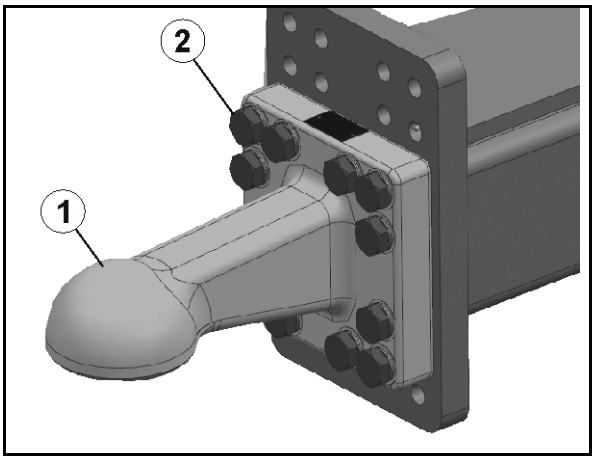


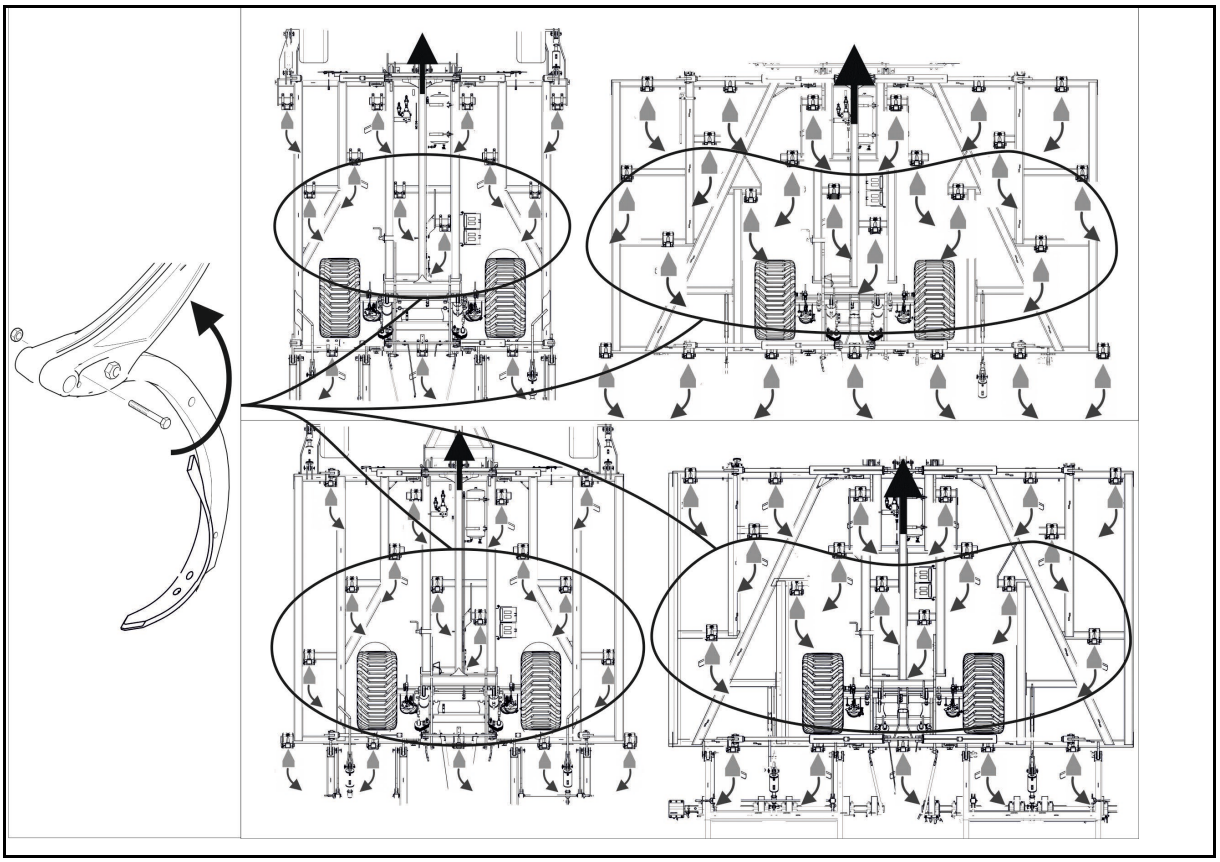
Fig. 48

8.9 Increasing the line distance

By taking out the second and third row of tines, the line distance can be doubled, therefore reducing the pulling force requirement.

The line distance is doubled by swivelling up the tines.

Cenius 4003 **Cenius 6003**



Cenius 5003 **Cenius 7003**

1. Actuate *yellow* tractor control unit.

→ Raise the unfolded implement a little bit.

2. Remove the shear bolt.
3. Swivel the tines up.

→ The tines must remain in the raised position. Retighten the remaining bolted connections if necessary.

4. Reinstall the shear bolt in the tine bracket.

9 Transportation

- During transportation, follow the instructions given in the section "Safety instructions for the operator", page 27.
- Before moving off, check:
  - that the supply lines are connected correctly.
  - the lighting system for damage, proper operation and cleanness,
  - the hydraulic systems visually for obvious defects
  - the bearing frame parts for damage.

WARNING

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

Carry out a visual check that the lower link pins are firmly fixed with the lynch pin against unintentional release.

WARNING

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

- 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.

Observe the permissible axle and drawbar loads of the tractor.

WARNING

Risk of falling from the machine if riding against regulations!

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

DANGER

Danger of accident if traction assistance is switched on for road travel.

The traction assistance must only be used when working on the field.

DANGER

Cenius 7003-2TX: Danger of accident if the permissible transport height of 4 m is exceeded.

Push in and secure the outer boundary discs / boundary tines!

9.1 Changing from working to transport position

1. Actuate the tractor control unit *yellow*.

→ Lift the implement via running gear and drawbar.

2. Switch off traction assistance (option).
3. Move both side discs / outside tines to the transport position.
4. Adjust the working depth so that the transport width of 3 m is not exceeded.

Implements with tandem roller:

Set the maximum working depth.

→ This ensures that the maximum transport width of 3 m is not exceeded.

5. Actuate the tractor control unit *blue*.

→ Fold in the implement.

6. Actuate the *blue* tractor control unit against unintentional actuation.
7. Cenius 7003-2TX: Actuate the tractor control unit *yellow*.

→ Lower the implement height to less than 4 m. For this, maintain a ground clearance of approx. 25 cm.

8. Close the stop tap on the drawbar cylinder for road transport.

Rear harrow (optional)

WARNING

Before folding the implement

- Install the transport safety bar (Fig. 51/3).

Risk of injury due to non-compliance with the approved transport width.

- Lock the tines in position 2 with the positioning pins (Fig. 51/1).

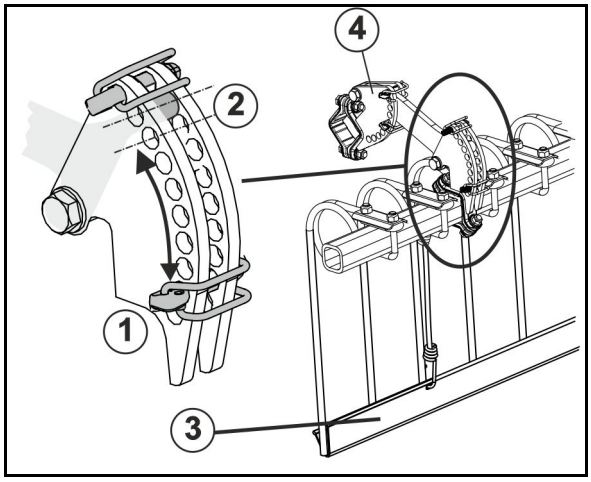
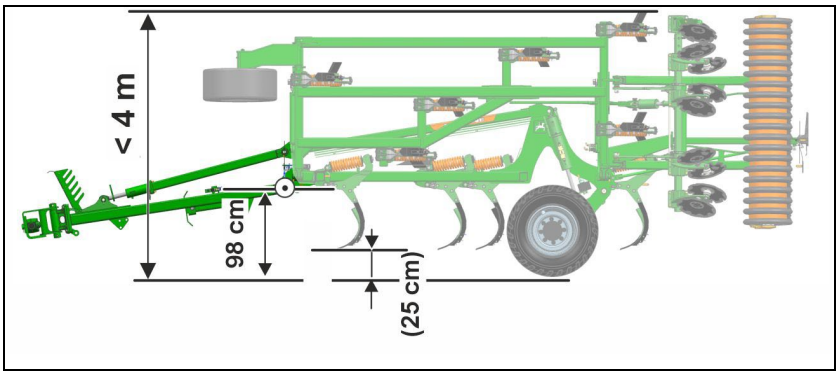


Fig. 49

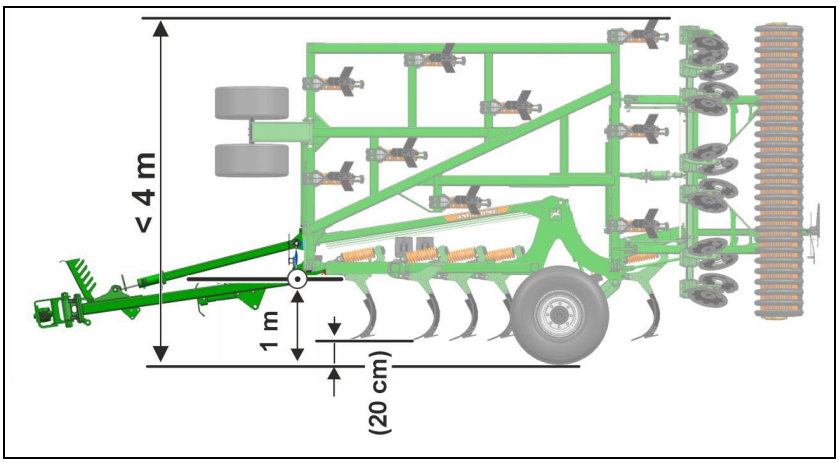
The values specified for the ground clearance and for the height of the drawbar pivot point define the transport position.

When the values are observed, the maximum permitted transport height of 4 m is maintained.

Cenius 4003-2TX
Cenius 5003-2TX



Cenius 6003-2TX
Cenius 7003-2TX



10 Use of the machine

When using the machine, observe the information in the sections

- "Warning pictograms 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

Danger from catching, entanglement, pulling in or entrapment due to accessible moving elements (e.g. agitator shaft, spreading discs)!

Only start up the machine, when all the safety equipment has been attached and is in the safety position.

The implement can be used with or without a trailing roller.

When using the implement with trailing roller, the roller takes over the rear depth control. The running gear is completely lifted and has no ground contact.

When using the implement without trailing roller, the roller must be dismounted. The running gear takes over the rear depth control.

10.1 Changing from transport to working position

1. Open the stop tap on the drawbar cylinder.
2. Actuate the tractor control unit *yellow*.

→ Lift out the implement in headland setting.

3. Actuate the tractor control unit *blue*.

→ unfold the implement.

4. Bring both side discs / side tines into working position.
5. Actuate the tractor control unit *yellow*.

→ Lower the implement via running gear and drawbar.

6. Switch the tractor control unit *yellow* into float position.

10.2 Operation

Implement with tensioned crosspiece:

Work with the tractor lower links locked to the sides.

- The machine is coupled to the tractor.
- The machine is in working position.

- When carrying out work, operate the tractor control unit *yellow* in float position.
- Adjust the tractor lower link so that the drawbar cylinder can be freely extended and retracted in float position.
- It is forbidden to drive in reverse when the implement is in working position!

Always use traction assistance for implements with ball brackets.

Otherwise, negative drawbar loads can cause damage to the coupling device.

10.3 Headland

Prior to turning on headlands:

- Actuate the tractor control unit *yellow*.

→ Raise the implement.

After turning:

1. Actuate the tractor control unit *yellow*.

→ Lower the implement.

2. Switch the tractor control unit *yellow* to float position.

→ Work now continues.

Use at the headland only when the direction of the implement corresponds to the direction of working.

11 Faults

Fault	Remedy
Different working depths across the working width	• Hydraulic depth setting: Synchronise the hydraulic cylinders, see below. • Mechanical depth setting: Check that all of the spindles have the same length. • Reduce the traction assistance • Check the coulters for wear • Check for correct working position: o Operate the drawbar in float position. o Completely retract the running gear. o Completely unfold the booms.
Discs/tine rows clog with crop material.	• Raise the implement and lower again. • Check/adjust the working depth of the tine array and the levelling unit.
Uneven work pattern behind the roller	• Check/adjust the setting of the levelling unit.
Build up of soil in front of the roller.	• Raise the implement and lower again. • Reduce the working depth. • Lower the running gear far enough so that it can carry part of the implement weight. Adjust using the spacer elements on the running gear cylinder. • Swivel the spring clearers or blade system up wards
Blockage of the tooth packer roller.	Adjust the scraper.
The drawbar slopes down when the implement in uncoupled.	Close the stop tap on the drawbar cylinder.
Shear bolts of the overload safety shear off repeatedly.	Check the tightening torques and bolt quality

Different working depths across the working width?

→ Synchronise the hydraulic cylinders!

For a uniform working depth across the entire implement width, the corresponding hydraulic cylinders must have the same length.

If this is not the case, the hydraulic cylinders can be synchronised:

1. Keep actuating the *green* tractor control unit until the hydraulic cylinders are completely extended.
2. Continue actuating the control unit for another 10 s.

→ An overflow process is initiated that flushes all of the cylinders. This adjusts the cylinders to the same length.

This procedure should also be performed before operation after a longer period of standstill.

Different working depths at the front and rear?

- Synchronise the hydraulic cylinders (see above)
- Mechanical depth adjustment: Check that all of the spindles have the same length.
- Reduce the pressure of the traction assistance.

12 Cleaning, maintenance and repairs

WARNING

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

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

Secure the tractor and machine against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on the machine. See page 79.

DANGER!

- **During cleaning, maintenance and repair work, observe chapter "Safety instructions for the user" from page Seite 30,**
- **Always use suitable supports when carrying out maintenance work on the raised machine.**
- **Check the proper function of the light system!**

- After repair work involving repainting, the product logos and instruction signs must be replaced!
- Worn and damaged parts must be replaced. Use only OEM spare parts!
- All marked lubrication points must be lubrication according to the lubrication plan (page 105) and the sliding and pivot points greased accordingly!
- Clean the tools after work!

12.1 Cleaning

- Pay particular attention to the brake, air and hydraulic hoses!
- Never treat brake, air and hydraulic hoses 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 by using 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 chrome-plated components.
  - Never aim the cleaning jet of the cleaning nozzle of the high pressure cleaner/steam jet directly at lubrication points, bearings, rating plates, warning signs, and stickers.
  - Always maintain a minimum jet distance of 300 mm between the high pressure or steam jet cleaning nozzle and the machine.
  - The set pressure of the high-pressure cleaner/steam jet must not exceed 120 bar.
  - Comply with the safety regulations when working with high pressure cleaners.

12.2 Lubrication instructions

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. 52).

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.

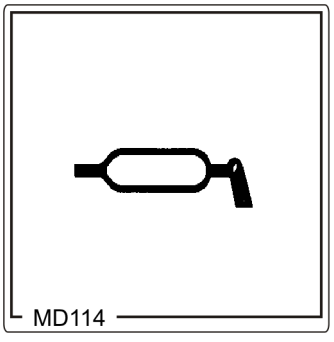


Fig. 50

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

Company	Lubricant name
ARAL	Aralub HL 2
FINA	Marson L2
ESSO	Beacon 2
SHELL	Retinax A

Lubrication plan

	Designation	Quantity	**Lubrication intervall [h]**
1	Boom	4	50
2	Running gear	2	50
3	Draw bar	5	50
4	jack	1	50
5	Crank and spindle	8	50
6	Rear rocker arm	4	50
7	Running gear hydraulic cylinder	4	50
8	Draw rail	6	10
9	Support wheel / axle wheel bearing	4 / 2	500

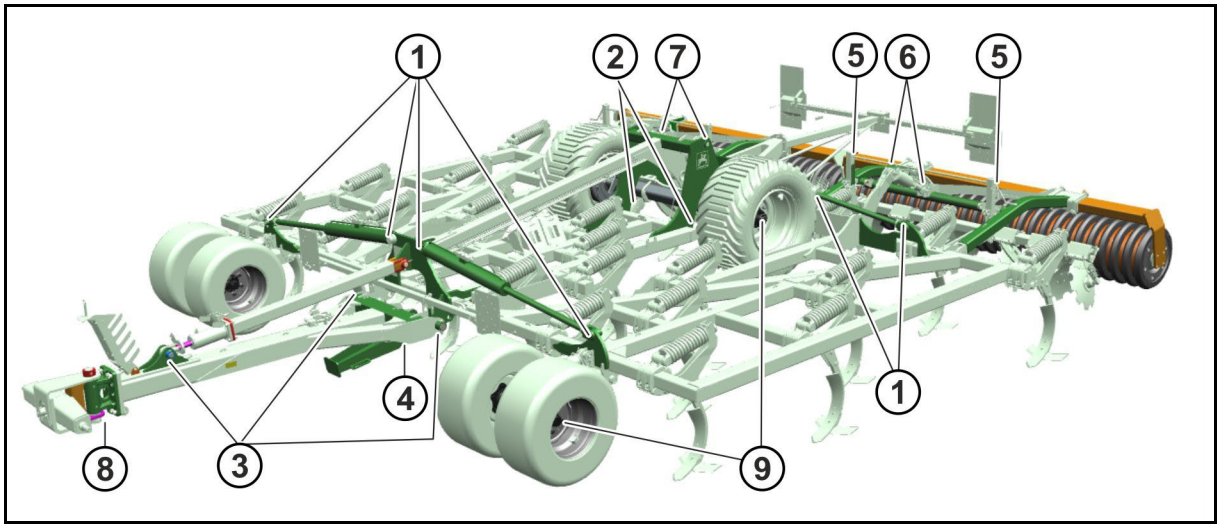


Fig. 51

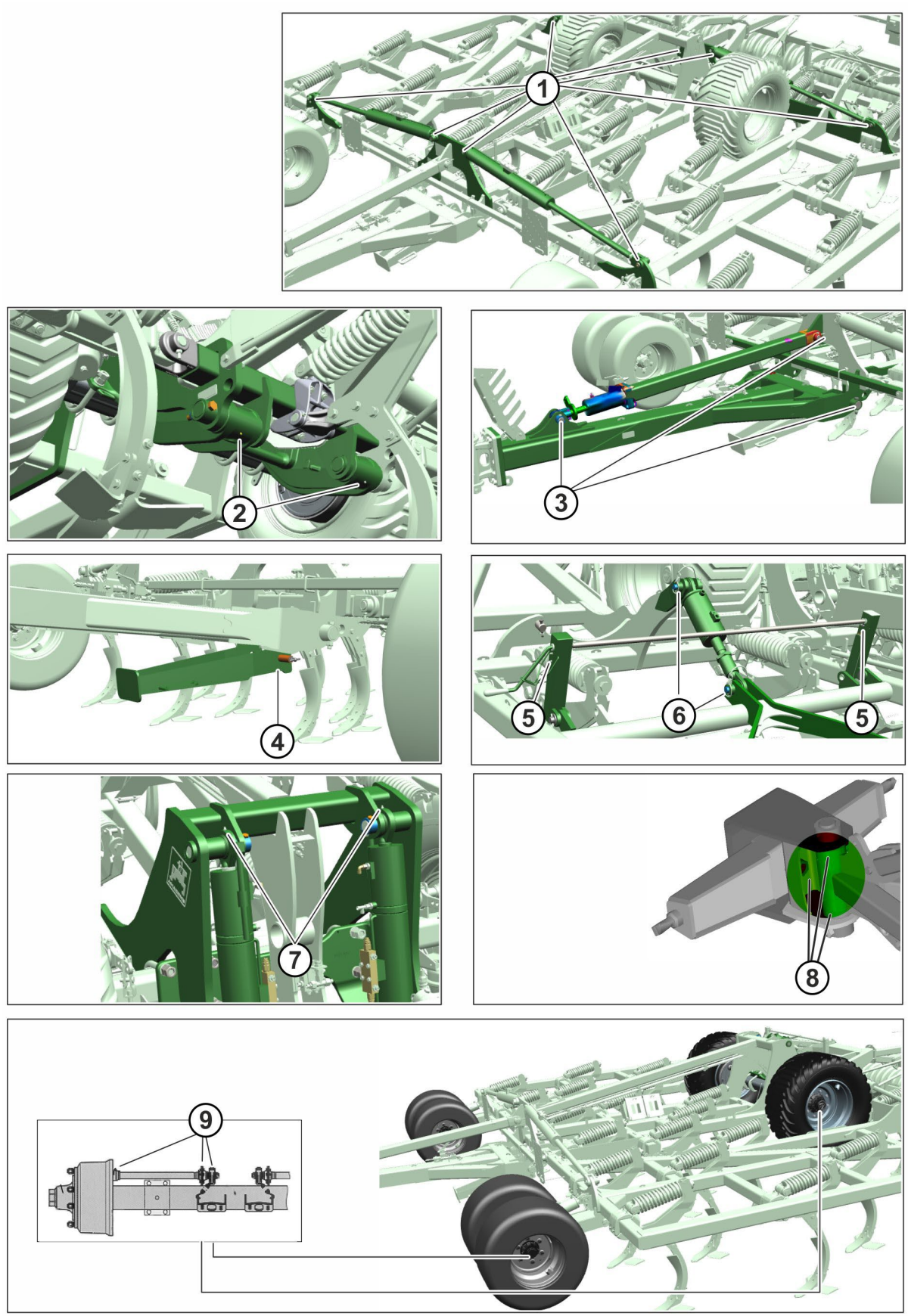


Fig. 52

12.3 Maintenance plan - overview

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

After the first working run

Component	Servicing work	See page	Workshop work
Tine connection	• Inspect the bolts	126	
Roller connection	• Inspect the bolts	114	
Hydraulic system	• Inspection for defects • Inspect for leaks	126	**X**
Wheels	• Wheel nut check	124	
Axle	• Inspect the bolts	116	

After 5 hours of use

Component	Servicing work	See page	Workshop work
Socs	• Inspect the bolts	113	

On a daily basis

Component	Maintenance work	see page	Specialist workshop
Whole implement	• Visual inspection before operation		
Brake system	• Drain	121	

Weekly/every 50 working hours

Component	Servicing work	See page	Workshop work
Hydraulic system	• Inspection for defects	126	X
Tine connection	• Inspect the bolts	113	
Super and Ultra overload safety	• Check the wear on the C-Mix Super and Ultra bearing sleeves	110	X
Roller connection	• Inspect the bolts	114	
Disc carrier connection	• Inspect the bolts	114	
Axle	• Inspect the bolts	116	
Scraper on the roller	• Check the distance	88	
Wheels	• Chec k the air pressure • Wheel nut check • Check for damage	124	
Parking brake	• Check the braking effect with the brake on	122	
Brake system	• Perform visual inspection	115	
Coupling device	• Check for damage, deformation and cracks	123	

Every three months / 200 operating hours

Component	Servicing work	See page	Workshop work
Hydraulic cylinder folding	• Inspect the bolts	125	
Dual-circuit service brake system	• Visual inspection of brake cylinder	121	X
	• Brake pad check	117	
	• Adjustment of the slack adjuster		
Axle	• Inspect the bolts	116	
Frame	• Check for damage		
Roller	• Check the roller	114	
Coupling device	• Check the fastening bolts for wear and tight fit	123	

Every 6 months / 500 operating hours

Component	Servicing work	See page	Workshop work
Axle (running gear / support wheel)	• Retighten the bolts on the hub cap	--	**X**
	• Check / adjust the play on the hub bearing	117	**X**

Every year / 1000 operating hours

Component	Servicing work	See page	Workshop work
Brake system	• Check the brake drum for dirt	**116**	**X**
	Automatic slack adjuster • Functional check • Settings	**118**	**X**
Pneumatic brake	• Clean the compressed air line filter on the coupling head	120	**X**

Every 2 years

Component	Servicing work	See page	Workshop work
Axle (running gear / support wheel)	• Check the hub bearing		**X**

As required

Component	Servicing work	see page	Workshop work
Coulter	• Replace	114	
Tines	• Replace	111	
Disc XL041 / XL043	• Inspect for wear	113	**X**
Disc segments	• Replace	112	**X**
Lower link pin	• Replace	129	

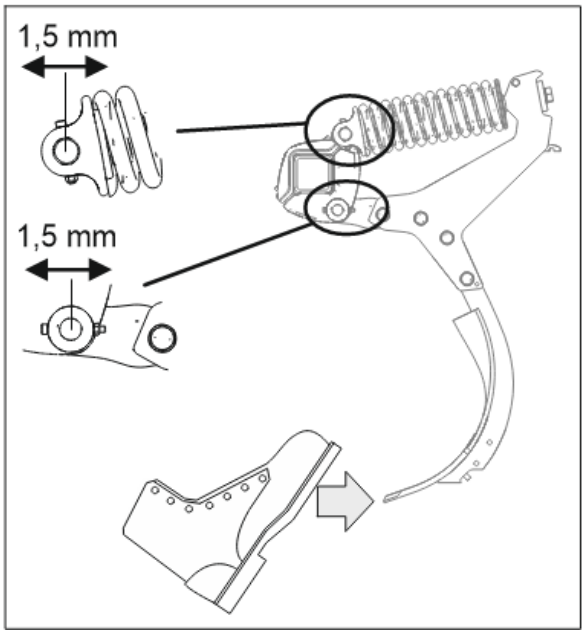
12.4 Check the wear on the C-Mix Super and Ultra bearing sleeves

1. Park the implement and slightly lift it.

→ The coulters are just above the ground.

2. Using your foot, apply a horizontal force on the coulter tip.
3. Measure the bearing clearance between the pin and the cast holder.
4. Measure the bearing clearance between the pin and the bearing arm.

Maximum permissible clearance: 1.5 mm



5. If the bearing clearance is greater than 1.5 mm, the bearing sleeves must be replaced.

→ Workshop work.

12.5 Coulter replacement and tine replacement

CAUTION

- The tines and coulters can be replaced on the field. For this purpose, slightly raise the implement in order to minimise the risk of injuries by the implement lowering unintentionally.
- On a solid substrate the implement must not be set down on the coulters.

CAUTION

Risk of injury from sharp edges.

- **Take special care when changing coulters!!**
- **Prevent the screws from turning in the square.**
- **Always use protective goggles and gloves!**

12.5.1 Tine replacement

Cenius Super

To change the tines, the top bolts (1) must only be loosened and not removed.

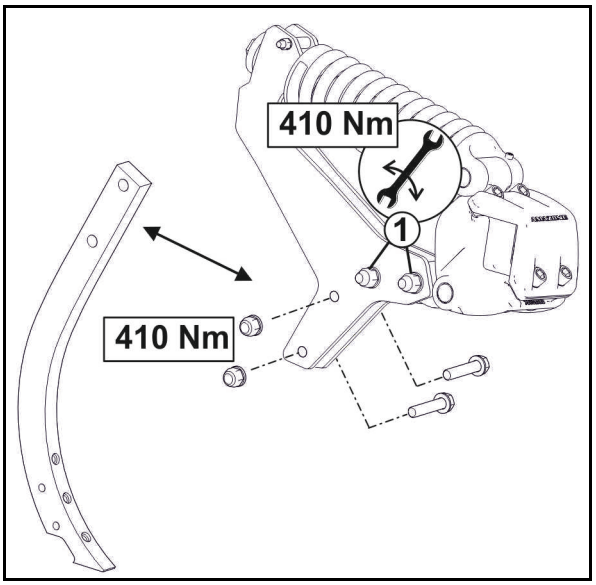


Fig. 53

12.5.2 Coulter replacement

When changing coulters, comply with the following:

- Screw tightening torque: 145 Nm
- after 5 hours of use, check the bolt connection for tight fit.

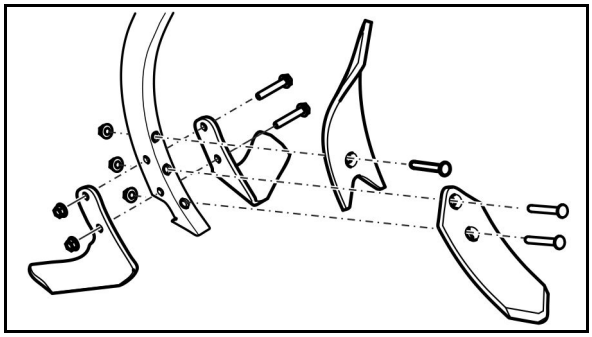


Fig. 54

12.6 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!

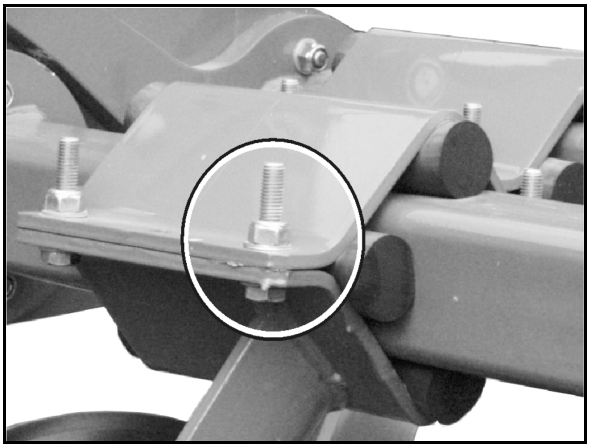


Fig. 55

12.7 Replacing discs (workshop work)

Minimum disc diameter: 360 mm.

The discs are replaced with the implement folded out.

Unscrew screws for replacing discs and re-tighten afterwards.

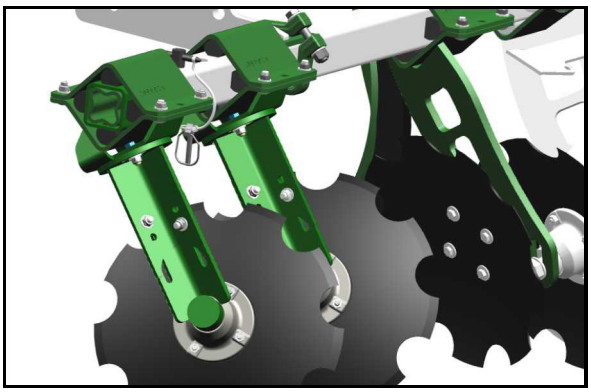


Fig. 56

12.8 Tine connection

Inspect the bolts of the tine connection for tightness.

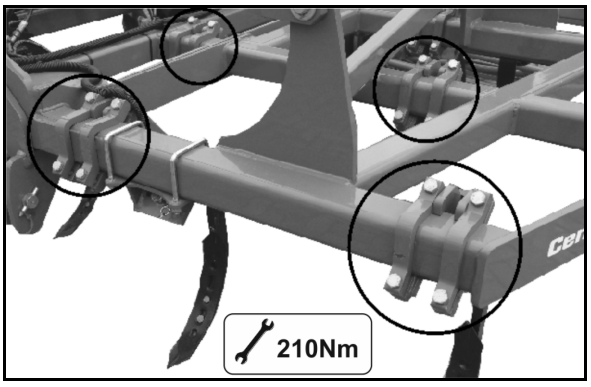


Fig. 57

12.9 Checking the roller

- Check the alignment of the bolts (1).
- Check the bolts (1) for tightness.
- Check the roller bearing (2) for ease of movement.

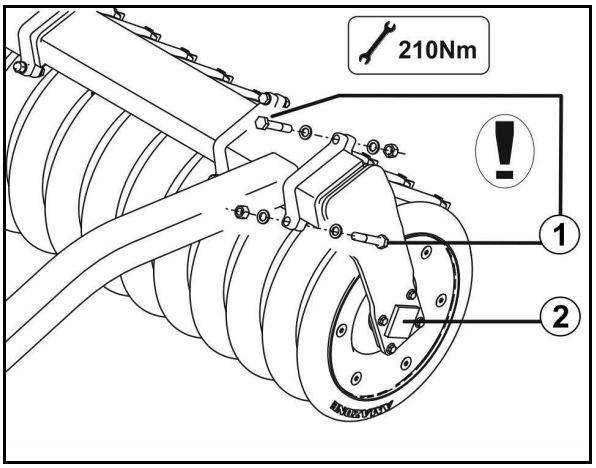


Fig. 58

12.10 Disc carrier connection

Inspect the bolts of the tine connection for tightness.

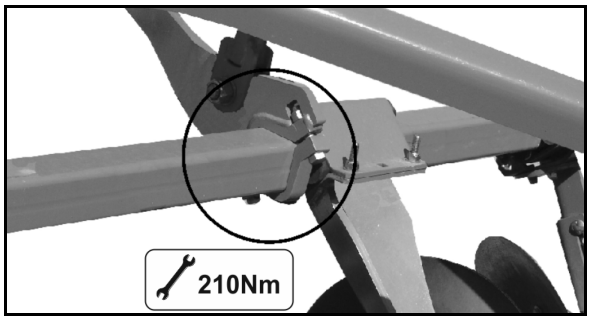


Fig. 59

12.11 Axle (running gear / support wheel) 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 trailed sprayer. After the service braking system has been run in for a suitable period, arrange for the brakes to be balanced by a specialist workshop.

Have the balancing process carried out before these empirical values are reached if you discover excessive wear on the brake pads.

To avoid problems with the brakes, adjust all vehicles in accordance with EC Directive 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 inspection of the brake system. Observe and check the following criteria:

- **Pipe lines, hose lines and coupler heads must not be externally damaged or corroded.**
- **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.**

Axle bolts with clamping plates

Inspect the bolts of the tine connection for tightness.

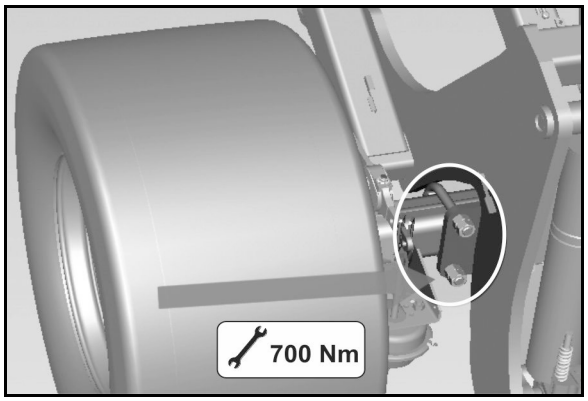


Fig. 60

Checking the brake drum for dirt

1. Unscrew the two cover plates (Fig. 63/1) on the inside of the brake drum.
2. Remove any dirt and plant debris which may have entered the drum.
3. Refit the cover plates.

CAUTION

Dirt entering the drums may be deposited on the brake pads (Fig. 63/2) and thus die appreciably reduce brake performance.

Risk of accident.

If dirt is discovered in the brake drum, the brake pads must be inspected by a specialist workshop.

For this to happen, the wheel and brake drum must be removed.

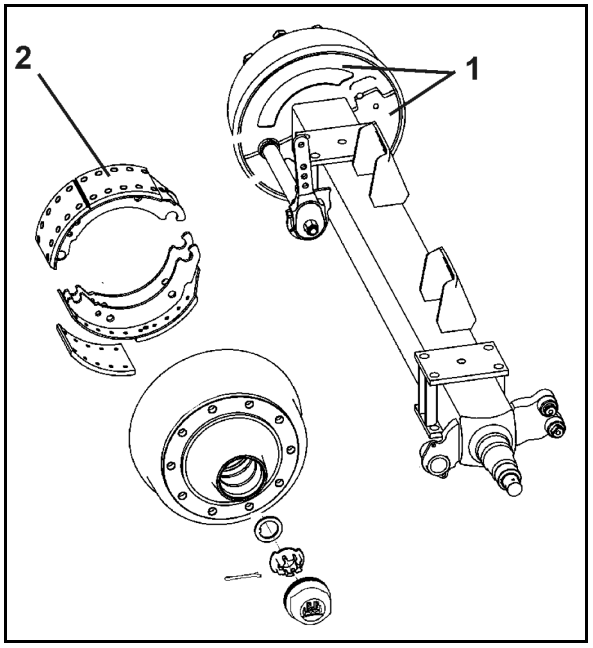


Fig. 61

Checking the play on wheel hub bearings

1. To check the play on wheel hub bearings, raise the axle until the wheels turn freely.
2. Release the brake.
3. Place a lever between the tyre and the ground and check the play.

If bearing play can be detected:

Adjust the bearing play

1. Remove the dust cup or hub cap.
2. Remove the split pin from the axle nut.
3. Tighten the wheel nut while turning the wheel at the same time until the wheel hub is lightly braked as it turns.
4. Turn axle nut back to the next available split pin hole. To the next matching hole (max. 30°).
5. Fit split pin and bend slightly open.
6. Top up the dust cap with high melting point grease and drive it into, or screw it onto the wheel hub.

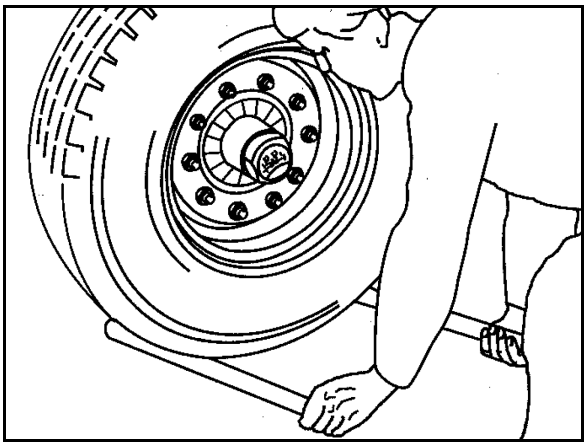


Fig. 62

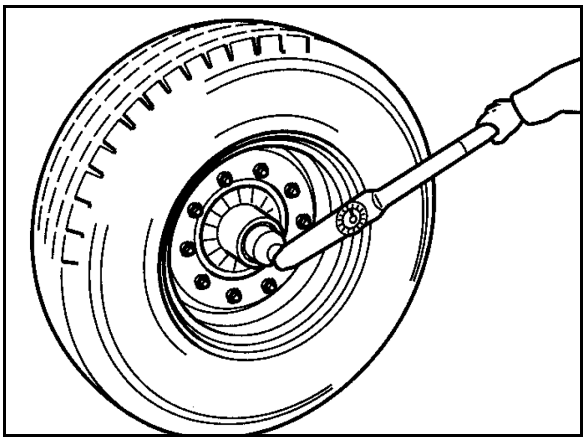


Fig. 63

Brake pad check

To check the brake pad thickness, open the inspection hole (1) by opening the rubber tab.

Changing the brake pads → Workshop work

Criterion for changing the brake pads:

- Minimum pad thickness of 5 mm was reached.
- Wear edge (2) was reached.

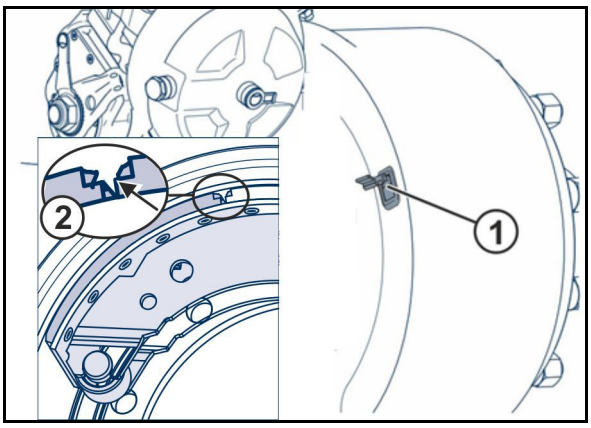


Fig. 64

Adjusting the linkage adjuster

Move the linkage adjuster by hand in the pressure direction. If the free travel of the long-stroke diaphragm cylinder pressure rod is max. 35 mm, the wheel brake must be readjusted.

Adjustments are made using the readjustment hexagon bolt on the linkage adjuster. Set the free travel "a" to 10-12 % of the connected brake lever length "B",
e.g. lever length 150 mm = free travel 1
5 – 18 mm.

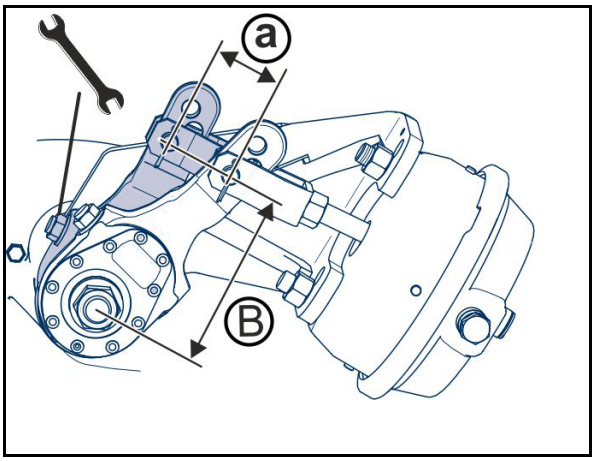


Fig. 65

Checking the function of the automatic slack adjuster

1. Secure the machine against rolling away and release the service brake and parking brake.
2. Manually actuate the slack adjuster.

The free travel (a) may be a maximum of 10-15% of the connected brake lever length (B) (e.g. brake lever length 150 mm = free travel 15 – 22 mm).

Readjust the slack adjuster if the free travel is outside of the tolerance. → Workshop work

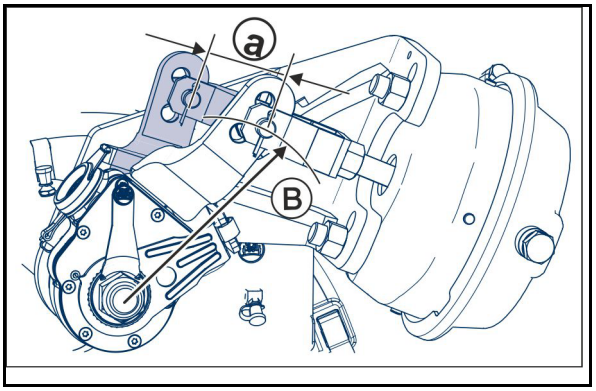


Fig. 66

Draining the air reservoir

Drain the air reservoir every day.

1. Run the tractor engine (approx. 3 mins.) until the compressed air tank has filled.
2. Switch off the tractor engine, apply the handbrake and remove the ignition key.
3. Pull the drainage valve (Fig. 69/1) in a sideways direction by the ring until no more water escapes from the compressed air tank.
4. If the escaping water is dirty, let off air, unscrew the drainage valve from the compressed air tank and clean the compressed air tank.

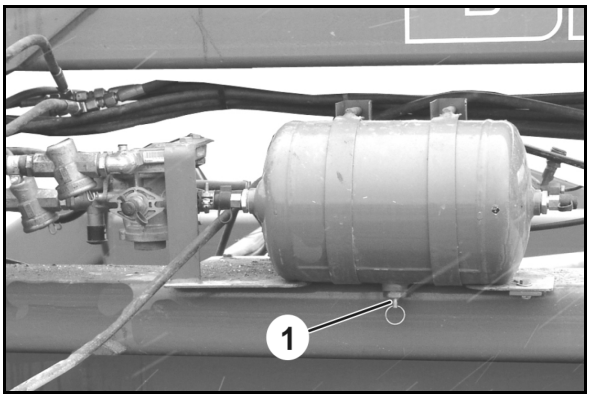


Fig. 67

The compressed air tank (Fig. 69/1) must not

- move around in the tensioning belts
- be damaged
- show any outward signs of corrosion damage

The rating plate must not

- show signs of corrosion
- be loose
- be missing

Replace the compressed air tank (workshop), if one of the above-stated points applies!

Cleaning the compressed air line filter on the coupling head

Perform work in an unpressurized state. Secure the implement against rolling away.

1. Remove the bolt locking compound by hammering and remove the bolts (1).
2. Unscrew the bolts (2) by a few turns.
3. Lift the plate (3) over the rubber seal (4) and turn to the side.

The unit is under spring tension.

4. Remove the rubber seal.

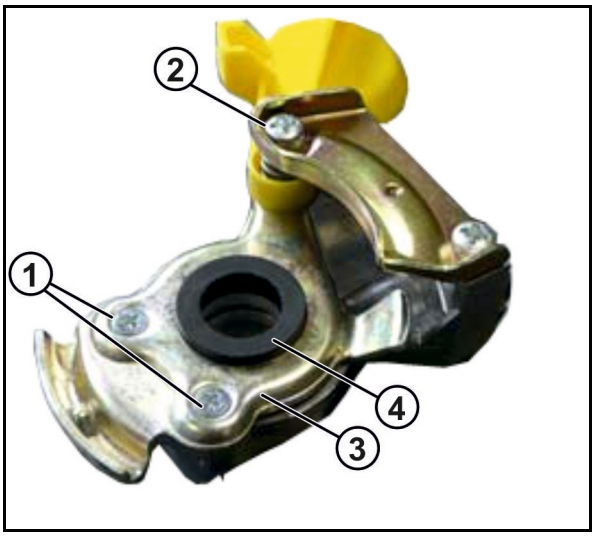


Fig. 68

5. Clean and grease the sealing surfaces, O-ring and filter.

→ Replace the rubber seal if necessary.

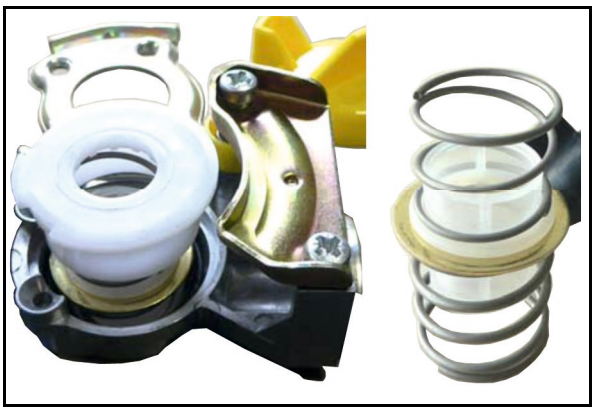


Fig. 69

Correctly position the O-ring on the plastic ring.

6. Reassemble in the reverse sequence.

- Bolt tightening torque (1): 2.5 Nm
- Bolt tightening torque (2): 7 Nm

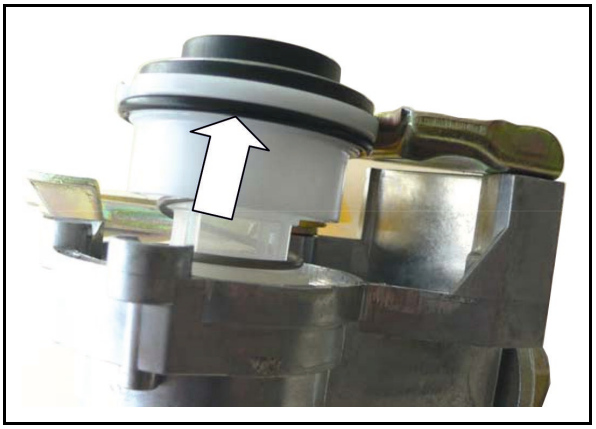


Fig. 70

Inspection instructions for the dual circuit service brake system

1. Leak tightness check

1. Check all connections, pipe lines, hose lines and screw connections for leak tightness.
2. Remedy leakages.
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. Checking the 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. Checking the 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 the 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.

12.11.1 Hydraulic brakes

Check of the hydraulic brake

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

Venting the brake system (workshop work)

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

1. Slightly loosen the vent valve.
2. Actuate the tractor brake.
3. Close the vent valve as soon as oil escapes.

→ Collect the escaping oil.

4. Perform a brake check.

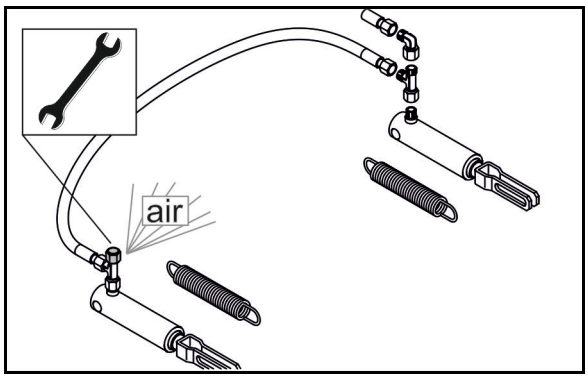


Fig. 71

12.11.2 Parking brake

On new machines, the brake cables of the parking brake may stretch.

Readjust the parking brake,

- if three quarters of the spindle tensioning distance is required to firmly apply the parking brake.
- if you have just fitted new brake pads.

Adjusting the parking brake

When the parking brake is off, the brake cable must be slightly slack. However, the brake cable must not rest or chafe against other parts of the vehicle.

1. Release the cable clamps.
2. Shorten the brake cable as appropriate and retighten the cable clamps.
3. Check for the correct braking effect from the parking brake when applied.

12.12 Check the coupling device

DANGER!

- **Replace a damaged drawbar with a new one immediately - for road traffic safety reasons.**
- **Repairs may only be carried out by the manufacturer factory.**
- **For safety reasons, it is forbidden to weld on and drill holes in the drawbar.**

Check the coupling device (drawbar, lower link traverse, ball coupling, drawbar eye) for the following:

- damage, deformation, cracks
- wear
- tight fit of the fastening bolts

Coupling device	Wear dimension	Fixing bolts	Number	Tightening torque
Lower link traverse	Cat. 3: 34.5 mm Cat. 4: 48.0 mm Cat. 5: 56.0 mm	M20 8.8	8	410 Nm
Ball coupling				
K80 (LI009)	82 mm	M16 10.9	8	300 Nm
K80 (LI040)	82 mm	M20 10.9	8	560 Nm
K80 (LI015)	82 mm	M20 10.9	12	560 Nm
Drawbar eye				
D35 (LI038)	42 mm	M16 12.9	6	340 Nm
D40 (LI017)	41.5 mm	M16 10.9	6	300 Nm
D40 (LI006)	42.5 mm	M20 8.8	8	395 Nm
D46(LI034)	48 mm	M20 10.9	12	550 Nm
D50 (LI037)	60 mm	M16 12.9	4	340 Nm
D50 (LI010)	51.5 mm	M16 10.9	8	300 Nm
D50 (LI012)	51.5 mm	M20 10.9	4	540 Nm
D50 (LI011)	51.5 mm	M20 8.8	8	410 Nm
D50 (LI030)	52.5 mm	M20 8.8	8	395 Nm
D51 (LI039)	53 mm	M20 10.9	12	600 Nm
D51 (LI069)	53 mm	M16 10.9	6	290 Nm
D58 (LI031)	60 mm	M20 10.9	12	550 Nm
D62 (LI007)	63.5 mm	M20 10.9	8	590 Nm
D79 (LI021)	81 mm	M20 10.9	12	550 Nm

12.13 Tyres / wheels

	Running gear tyre / Support wheels:	Required tightening torque for wheel nuts or bolts
	M18 x 1,5	**270 Nm (-0/+20)**
	M20 x 1,5	**350 Nm (- 0/+30)**
	M22 x 1,5	**450 Nm (-0/+60)**

- 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.

12.13.1 Tyre pressures

Inflate the tyres with the indicated tyre inflation pressure.

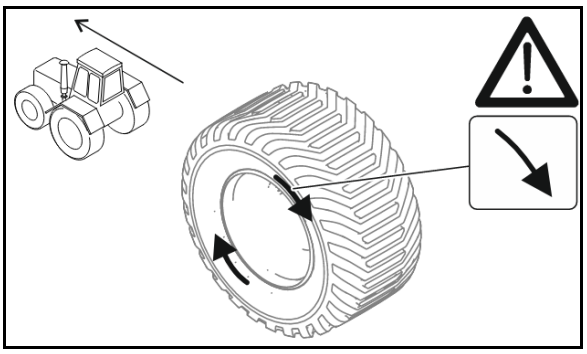
The tyre inflation pressure is specified on a sticker on the rim.

12.13.2 Fitting tyres

- Remove any instances 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.

12.13.3 Installing the tyres (workshop work)

Install the tyres in the direction of rotation opposite to that specified on the tyre.



12.14 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.

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

12.15.1 Labelling hydraulic hose lines

The assembly labelling provides the following information:

Fig. 74/...

(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).

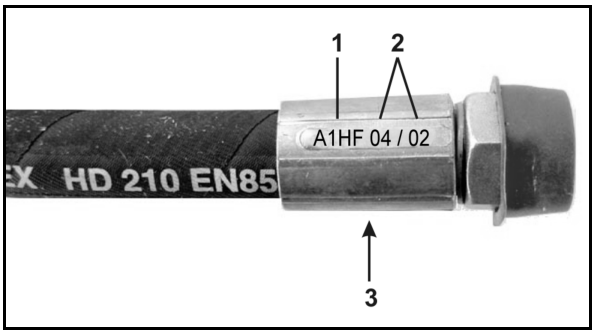


Fig. 72

12.15.2 Maintenance intervals

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

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

Before each start-up:

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

12.15.3 Inspection criteria for hydraulic hose lines

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

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

- Damage to the outer layer up to the ply (e.g. scouring points, cuts, cracks).
- Brittleness of the outer layer (crack formation of the hose material).
- Deformations which do not match the natural shape of the hose or the hose line. Both in a depressurised and pressurised state or when bent (e.g. layer separation, bubble formation, pinching, bends).
- Leak points.
- Damage or deformation of the hose assembly (sealing function restricted); minor surface damage is not a reason for replacement.
- Movement of the hose out of the assembly.
- Corrosion of assembly, reducing the function and tightness.
- Installation requirements not complied with.
- Life span of 6 years has been exceeded.

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

12.15.4 Installation and removal of hydraulic hose lines

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

- Only use AMAZONE original 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.

12.16 Lower link pins check

DANGER!

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

Replace damaged top link pins and lower link pins immediately for road traffic safety reasons.

Test criteria for top link pins and lower link pins:

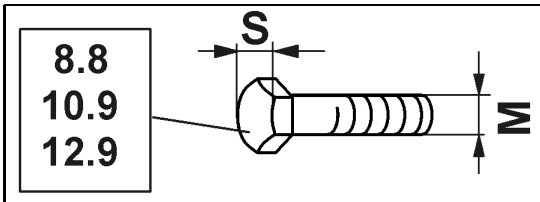
- Visual check for cracks
- Visual check for fractures
- Visual check for permanent deformations
- Visual chec

k and measurements for wear. The permissible wear is 2 mm.

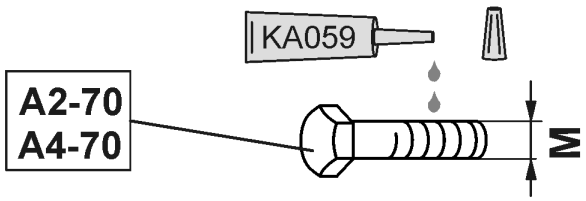
- Visual check for wear on the ball sleeves
- If applicable: check the fastening bolts for tightness

If a wear criterion is met, replace the top link pin or lower link pin.

12.17 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	2,4	4,9	8,4	20,6	40,7	70,5	112	174	242	342	470	589

Coated screws have different tightening torques.Note special information for tightening torques in chapter Maintenance.

13 Checklist for using the implement

Observe the safety instructions in the corresponding sections of the operating manual!

Steps:	See page:
Coupling the implement	80
Prepare for using the implement	
• Converting from transport to working position	**100**
• Adjusting the working depth of the coulters	84
• Setting the working depth of the levelling unit	86
• Traction assistance	100
Using the implement	101
• Turning on headlands	101
• Eliminate faults	**102**
o Different working depths across the working width	
Prepare for transport	**100**
• Converting from working to transport position	98
Uncoupling the implement	82

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