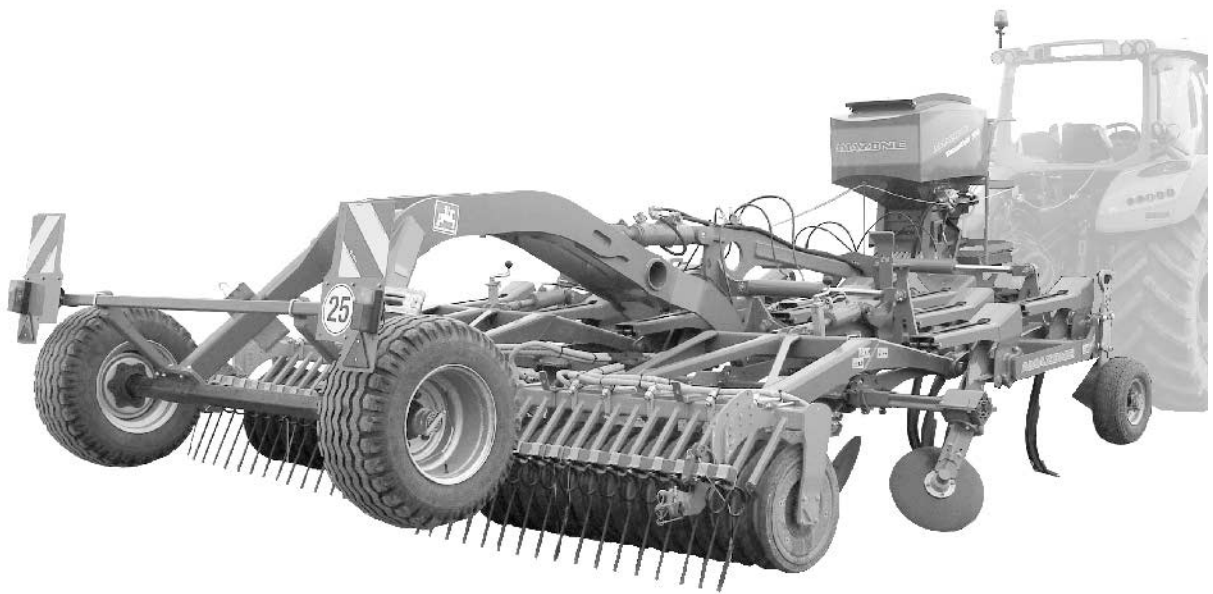


Operating Manual

AMAZONE

Mulch cultivator

Cenius 4002-2T Super / Special
Cenius 4003-2T Special



MG4717
BAG0100.5 11.15
Printed in Germany

**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 GmbH & Co. KG

Machine identification no.:
Type: Cenius

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 GmbH & 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: MG4717
Compilation date: 11.15

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AMAZONEN-WERKE H. DREYER GmbH & Co. KG.

Foreword

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 GmbH & Co. KG. We thank you for your confidence in our products.

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

Please read and follow this operating manual—in particular, the safety instructions—before putting the machine into operation. Only after careful reading will you be able to benefit from the full scope of your newly purchased machine.

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

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

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

User evaluation

Dear Reader

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

AMAZONEN-WERKE

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Postfach 51

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1	User information	8
1.1	Purpose of the document.....	8
1.2	Locations in the operating manual.....	8
1.3	Diagrams used.....	8
2	General safety instructions.....	9
2.1	Obligations and liability	9
2.2	Representation of safety symbols.....	11
2.3	Organisational measures	12
2.4	Safety and protection equipment	12
2.5	Informal safety measures.....	12
2.6	User training.....	13
2.7	Safety measures in normal operation	14
2.8	Dangers from residual energy.....	14
2.9	Maintenance and repair work, fault elimination	14
2.10	Constructive changes	14
2.10.1	Spare and wear parts and aids	15
2.11	Cleaning and disposal.....	15
2.12	User workstation	15
2.13	Warning pictograms and other signs on the machine	16
2.13.1	Positioning of warning pictograms and other labels	16
2.14	Dangers of not observing safety instructions.....	23
2.15	Safety-conscious working	23
2.16	Safety information for users.....	24
2.16.1	General safety and accident prevention information	24
2.16.2	Hydraulic system.....	27
2.16.3	Electrical system	28
2.16.4	Coupled machines	28
2.16.5	Cleaning, maintenance and repairs	29
3	Loading and unloading	30
4	Product description	31
4.1	Overview of subassemblies	31
4.2	Safety and protection equipment	32
4.3	Transportation equipment	33
4.4	Intended use	34
4.5	Danger area and danger points	35
4.6	Rating plate and CE marking.....	36
4.7	Technical data.....	37
4.8	Necessary tractor equipment.....	39
4.9	Noise production data	39
5	Structure and function	40
5.1	Tines	41
5.2	Coulter.....	43
5.3	Coulter C-Mix	45
5.4	Coulter arrangement	46
5.5	Levelling unit	47
5.6	Boundary discs / Side closer	48
5.7	Rollers	50
5.8	Hydraulic connections.....	52
5.8.1	Connecting hydraulic hoses.....	53
5.8.2	Disconnecting hydraulic hoses	53



Table of Contents

5.9	Running gear	54
5.10	Tensioned crosspiece	54
5.11	Stand	55
5.12	Feeler wheels (Option)	55
5.13	Rear harrow (optional).....	56
5.14	GreenDrill catch crop sowing unit	57
5.15	Safety chain for implements without brake system	57
6	Commissioning	58
6.1	Checking the suitability of the tractor	59
6.1.1	Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast	59
6.1.2	Requirements for tractor operation with attached machines.....	63
6.1.3	Machines without their own brake system	63
6.2	Securing the tractor/machine against unintentional start-up and rolling	64
7	Coupling and uncoupling the machine	65
7.1	Coupling the machine.....	66
7.2	Uncoupling the machine.....	68
8	Adjustments.....	69
8.1	Working depth of the tines	69
8.1.1	Mechanical depth adjustment	70
8.1.2	Hydraulic depth adjustment.....	71
8.2	Setting the working depth of the levelling unit.....	72
8.2.1	Setting the working depth of the levelling unit mechanically.....	72
8.3	Adjusting the stripper.....	73
8.4	Setting the feeler wheels	73
9	Transportation	74
9.1	Changing from working to transport position	76
10	Use of the machine	77
10.1	Changing from transport to working position	77
10.2	Operation.....	77
10.3	Headland	77
11	Faults.....	78
12	Cleaning, maintenance and repairs	79
12.1	Cleaning	80
12.2	Lubrication instructions.....	80
12.3	Maintenance plan - overview	83
12.4	Installing and removing the tines.....	84
12.5	Changing the coulters	84
12.5.1	Changing the Vario-Clip coulters	85
12.5.2	Changing the C-Mix coulter.....	85
12.6	Replace the tension springs of the overload safety device (workshop work)	85
12.7	Installing and removing the disc segments (workshop work).....	86
12.8	Replacing discs (workshop work).....	86
12.9	Tine connection	86
12.10	Roller connection.....	87
12.11	Disc carrier connection.....	87
12.12	Hydraulic cylinder for folding	87
12.13	Tyres/wheels	88
12.13.1	Tyre pressures	88
12.13.2	Mounting tyres (workshop work)	89

12.14	Hydraulic system (workshop work)	90
12.14.1	Labelling hydraulic hose lines	91
12.14.2	Maintenance intervals	91
12.14.3	Inspection criteria for hydraulic hose lines	91
12.14.4	Installation and removal of hydraulic hose lines	92
12.15	Lower link pins	92
13	Hydraulic circuit diagram	93
13.1	Screw tightening torques	95

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 are 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 18) of this operating manual and to follow the safety instructions represented by the warning symbols when operating the machine.
- To get to know the machine.
- To read the sections of this operating manual, important for carrying out your work.

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

General safety instructions

Risks in handling the machine

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

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

Only use the machine

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

Eliminate any faults 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 tightened 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.

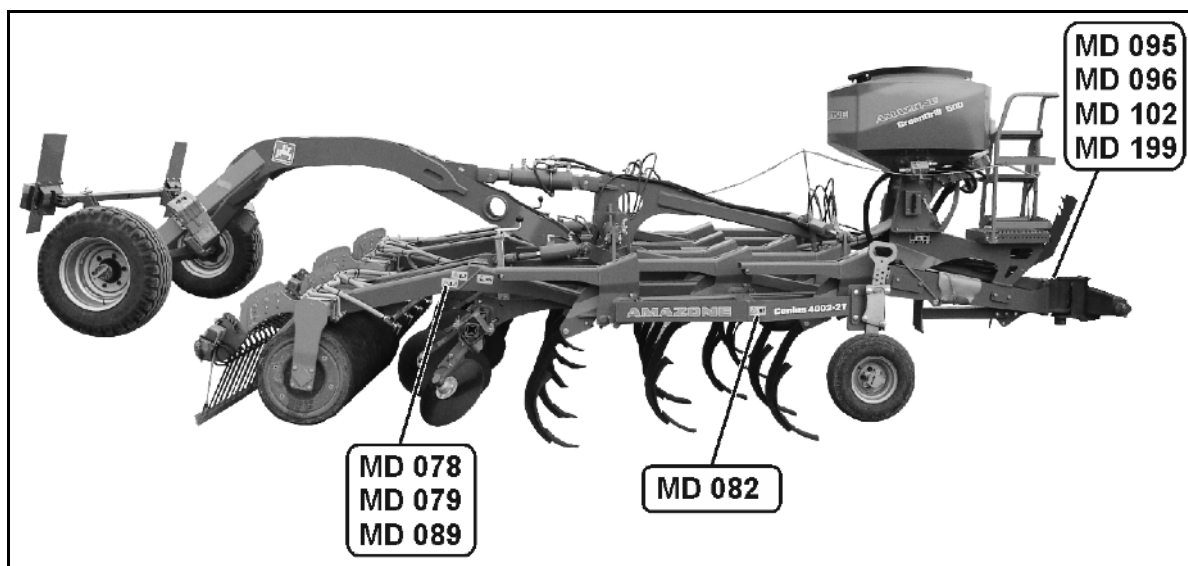


Fig. 1

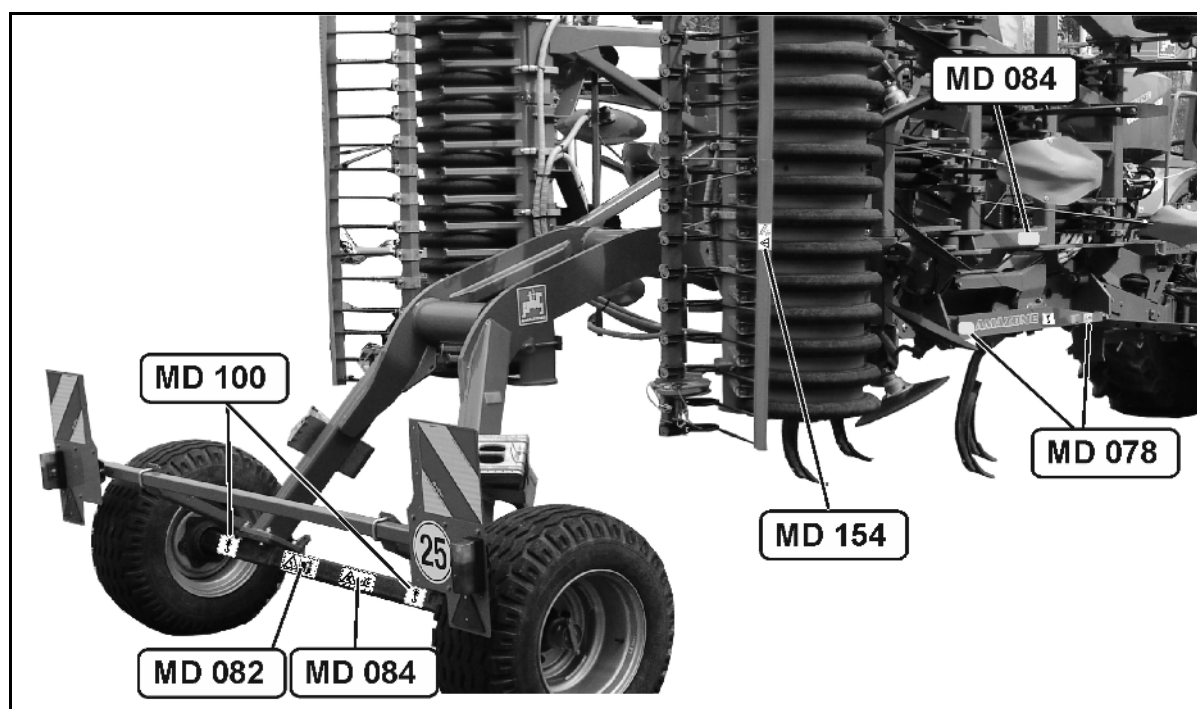


Fig. 2

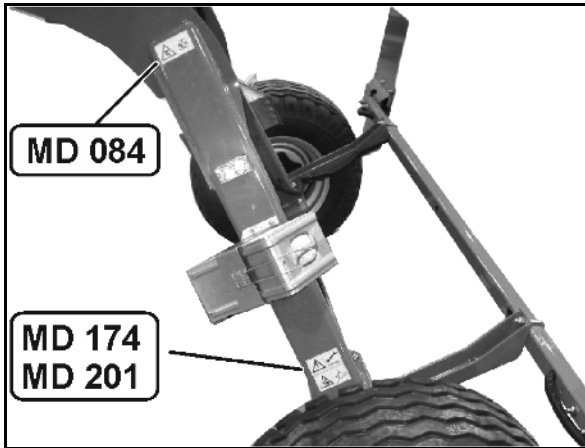


Fig. 3

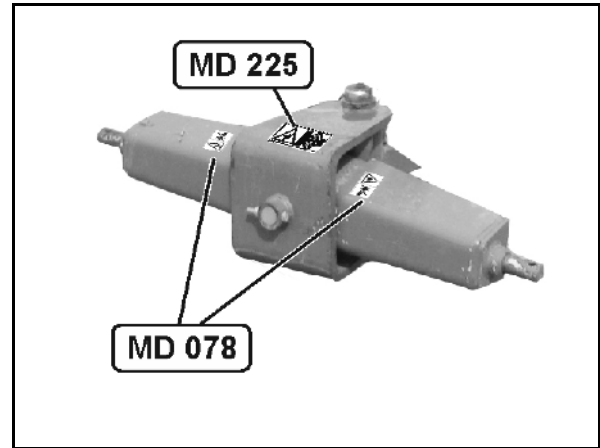


Fig. 4



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

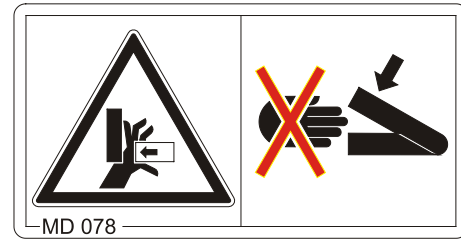
Warning pictograms

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.

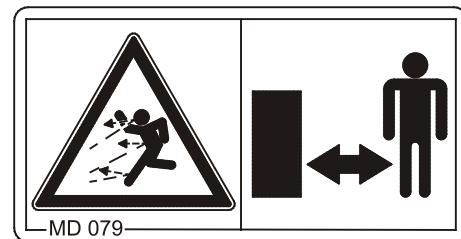


MD 079

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.



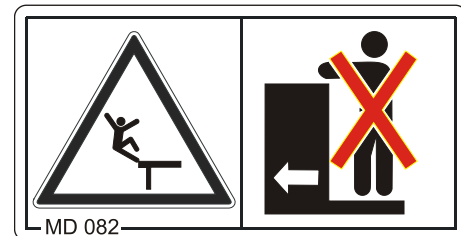
MD 082

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 084

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

This can cause extremely serious and potentially fatal injuries.

It is forbidden to stand in the swivel range when machine parts are being lowered.

Instruct all persons to leave the swivel range of any machine parts which can be lowered before you lower the parts.



General safety instructions

MD 089

Risk of crushing of whole body in the danger area of suspended loads/machine parts!

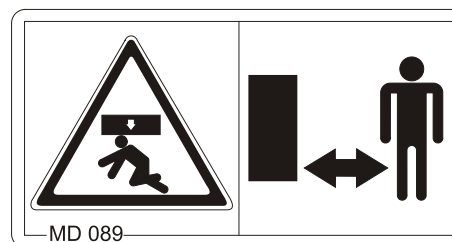
This can cause extremely serious and potentially fatal injuries.

The presence of persons under suspended loads/machine parts is prohibited.

Maintain a sufficient safety clearance between you and any suspended loads/machine parts.

Ensure that all personnel maintain a sufficient safety clearance from suspended loads/machine parts.

Direct persons out of the danger area of suspended loads/machine parts.



MD 095

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

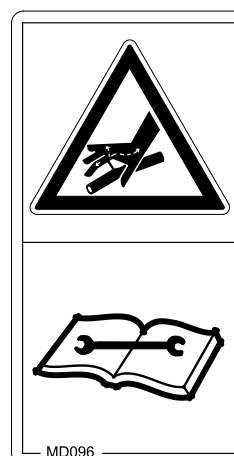


MD 096

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

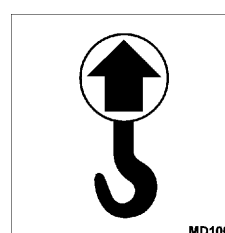
This can inflict serious injuries with potentially fatal consequences if hydraulic fluid escaping at high pressure passes through the skin and into the body.

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



MD 100

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

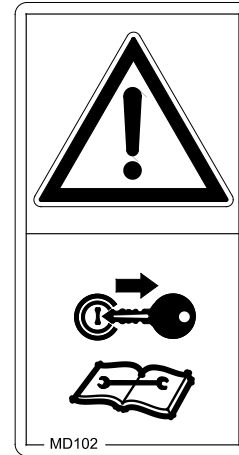


MD 102

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.

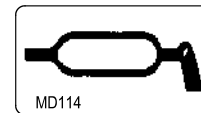
The potential dangers can inflict severe and potentially fatal injuries on all parts of the body.

- 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



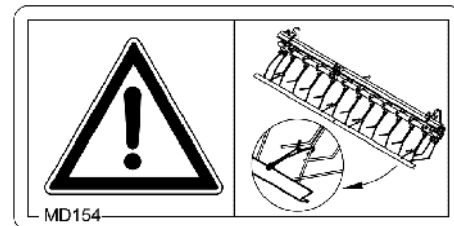
MD 154

Danger of cutting or penetration for other road users caused by transport with un-guarded, sharp harrow tines of the seed harrow!

This danger can cause extremely serious and potentially fatal injuries.

Transportation without a correctly fitted transport guard rail is forbidden.

Install the road safety bar provided before starting transportation.

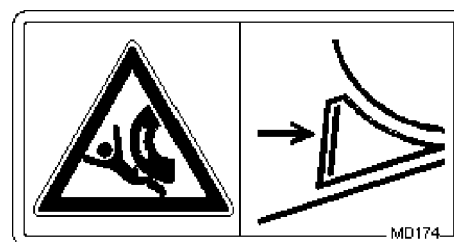


MD 174

Danger from unintended continued movement of the machine.

Causes serious, potentially fatal injuries anywhere on the body.

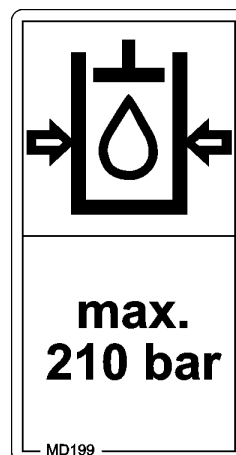
Secure the machine against unintended continued movement before uncoupling the machine from the tractor. To do this, use the parking brake and/or the wheel chock(s).



General safety instructions

MD 199

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



MD 201

The torque for the bolt connection is 325 Nm.

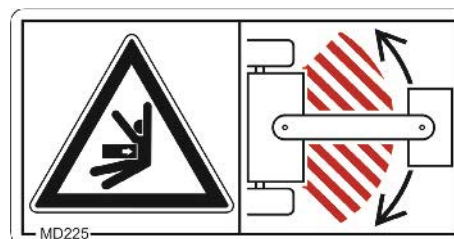


MD 225

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

This danger can cause extremely serious and potentially fatal injuries.

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



2.14 Dangers of not observing safety instructions

Nonobservance of the safety information

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

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

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

2.15 Safety-conscious working

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

Comply with the accident prevention instructions on the warning pictograms.

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

2.16 Safety information for users



WARNING

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 injury from contusion and cutting points!

- Be particularly careful when coupling the machine to the tractor or uncoupling it from the tractor! There are contusion and cutting points in the area of the coupling point between the tractor and the machine.
- 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
- 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.

2.16.5 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.



CAUTION

The minimum tensile strength per sling must be 3000 kg!

The machine has 4 attachment points for lifting equipment!

- Required length of hoisting sling at the front: 4000 mm
- Required length of hoisting sling at the rear: 5500 mm

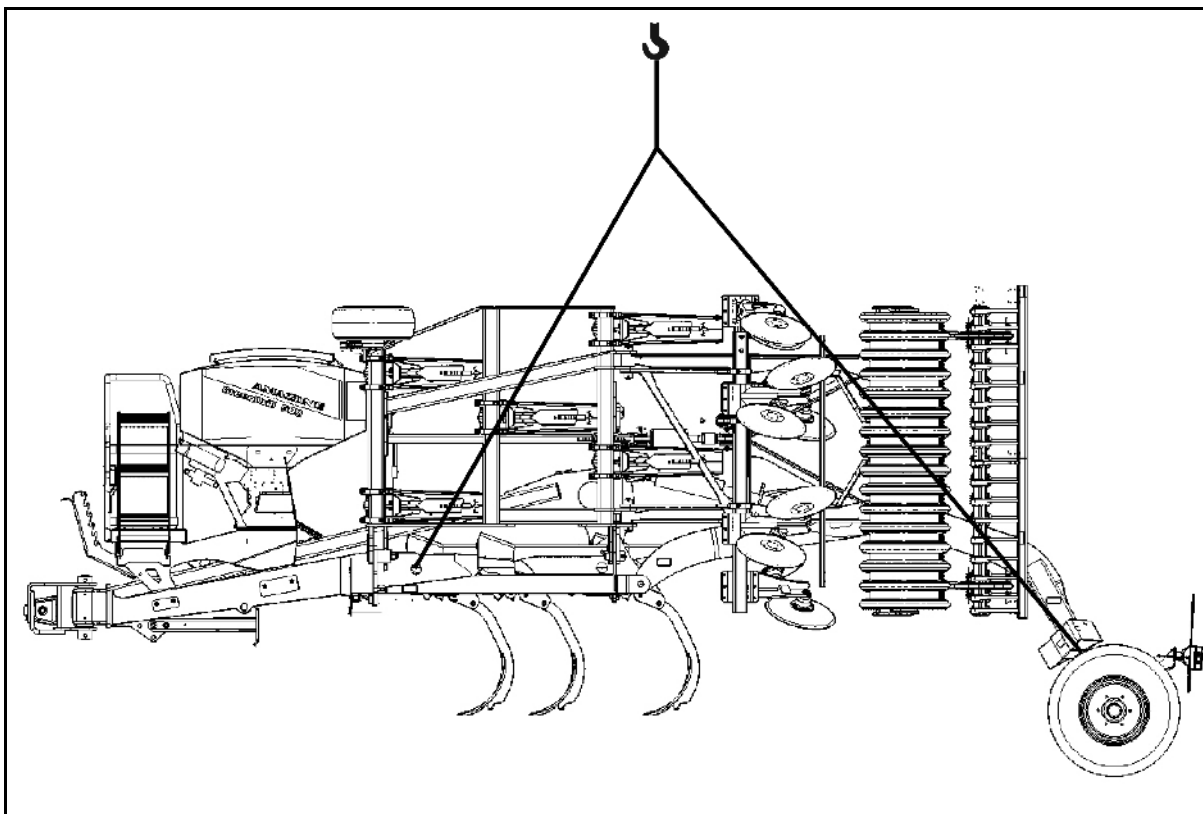


Fig. 5

4 Product description

This section:

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

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

4.1 Overview of subassemblies

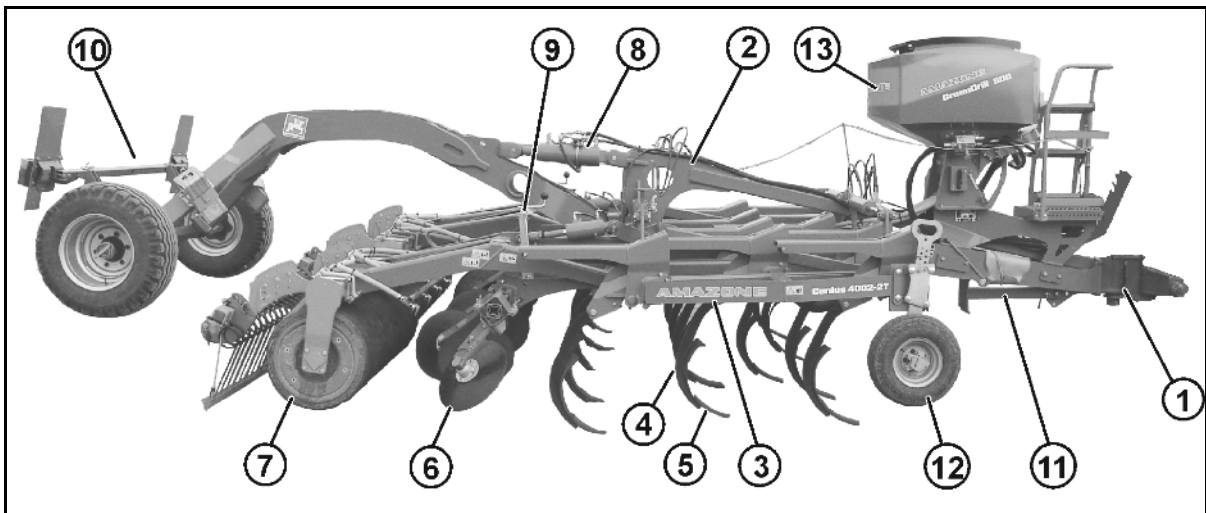


Fig. 6

- | | |
|--|---|
| (1) Draw bar with tensioned crosspiece | (7) One roller per wing |
| (2) Rigid frame middle section | (8) Depth adjustment of the tines (mechanical or hydraulic) |
| (3) Hydraulically folding frame wings | (9) Depth adjustment of the levelling unit |
| (4) Three-row tine field | (10) Swinging chassis |
| (5) Coulters | (11) Stand |
| (6) Levelling unit - spring tines / concave disc arrangement | (12) Sensing wheels (optional) |
| | (13) GreenDrill catch crop sowing unit (optional) |

4.2 Safety and protection equipment

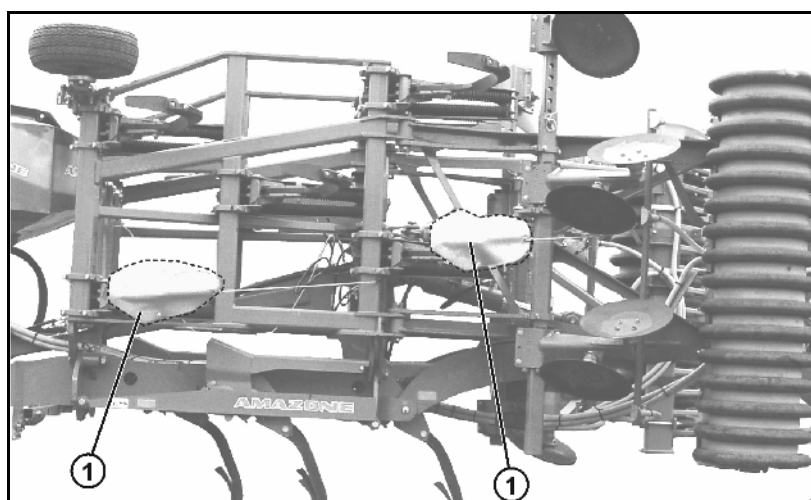


Fig. 7

- Protective cover on both sides for the front and rear tine for road transport.

(1) Tine covered.

(2) Protective cover in parking position.

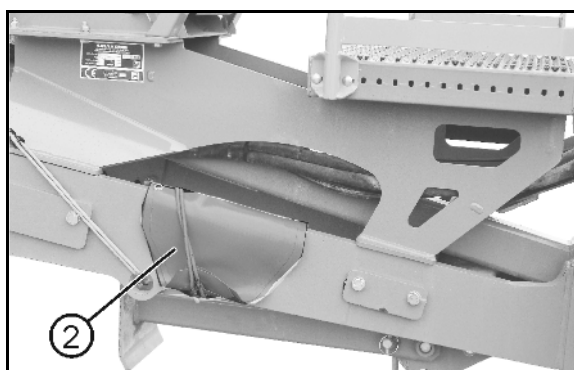


Fig. 8

- Automatic locking mechanism secures against the machine folding out unintentionally.

(1) Machine folded in and secured.

(2) Cable winch for unlocking from the tractor.

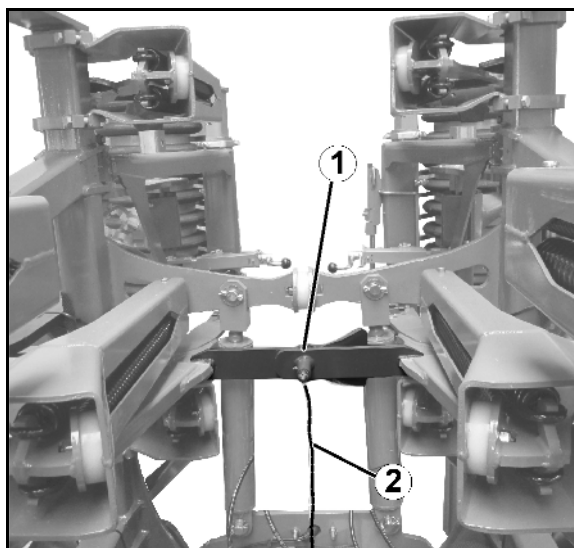


Fig. 9

4.3 Transportation equipment



Fig. 10

- (1) Rear lights, brake lights and turn indicators, red rear reflectors
- (2) Warning signs
- (3) Red reflectors



Fig. 11

- (1) Front boundary lights
- (2) Front warning signs

- Two side reflectors each, left and right side (not illustrated).
- For France: One additional warning sign per side (not illustrated).

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

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.

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 and CE marking

The type plate and CE signare located on the frame.

The rating plate shows the following information:

- Vehicle- / machine ID no.:
- Type
- Basic weight kg
- Permissible support load kg
- Permissible rear axle load kg
- Permissible system pressure bar
- Permissible total weight kg
- Factory
- Model year
- Year of construction



Fig. 12

4.7 Technical data

Cenius Super / Special		4002-2T
Working width	[mm]	4000
Transport width	[mm]	3000
Transport length	[mm]	7700
Transport height	[mm]	3250
Permissible max. transport speed	[km/h]	25
Tine spacing	[mm]	286
Number of tines		14
Number of tine rows		3
Maximum working depth	[mm]	280
Overload protection of the tines: Cenius Super Cenius Special		tension spring shear bolt
Levelling unit: • Concave discs Disc diameter • Alternative spring tines	[mm]	Smooth 460 Serrated 460
Working speed	[km/h]	10-15
Attachment category		category III

Product description

Weight (net weight)

Cenius		4002-2T	4002-2T 4003-2T
		Super	Special
Basic machine	[kg]	3530	3010
Permissible total weight	[kg]	6000	
Permissible drawbar load	[kg]	2700	
Permissible axle load	[kg]	3300	
Equipment			
Concave discs	[kg]	265	
Spring tines	[kg]	205	
Cage roller SW			
Ø 520 mm	[kg]	400	
Ø 600 mm	[kg]	480	
Tooth packer roller PW	[kg]	700	
Tandem roller TW	[kg]	700	
Wedge ring roller KW	[kg]	680	
Cutting ring roller RW	[kg]	740	
U-profile roller UW	[kg]	520	
Boundary discs	[kg]	90	
Boundary spring element	[kg]	60	
Coulter set	[kg]		
o inversion, narrow, stubble coulter		31	
o duckfoot coulter		56	
o Stubble coulter VarioClip system		98	
Rear harrow	[kg]	150	
Depth setting	[kg]		
o mechanical		25	
o hydraulic		60	
Sensing wheels	[kg]	95	
Lighting	[kg]	60	



The basic weight (net weight) is the total weight of the basic machine and the respective machine attachments.



4.8 Necessary tractor equipment

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

Tractor engine power

from 120 kW (160 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 |
| Implement hydraulic fluid: | • HLP68 DIN 51524 |
- The implement hydraulic fluid is suitable for the combined hydraulic fluid circuits of all standard tractor brands.
- | | |
|----------------|----------------|
| Control units: | • See page 51. |
|----------------|----------------|

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.

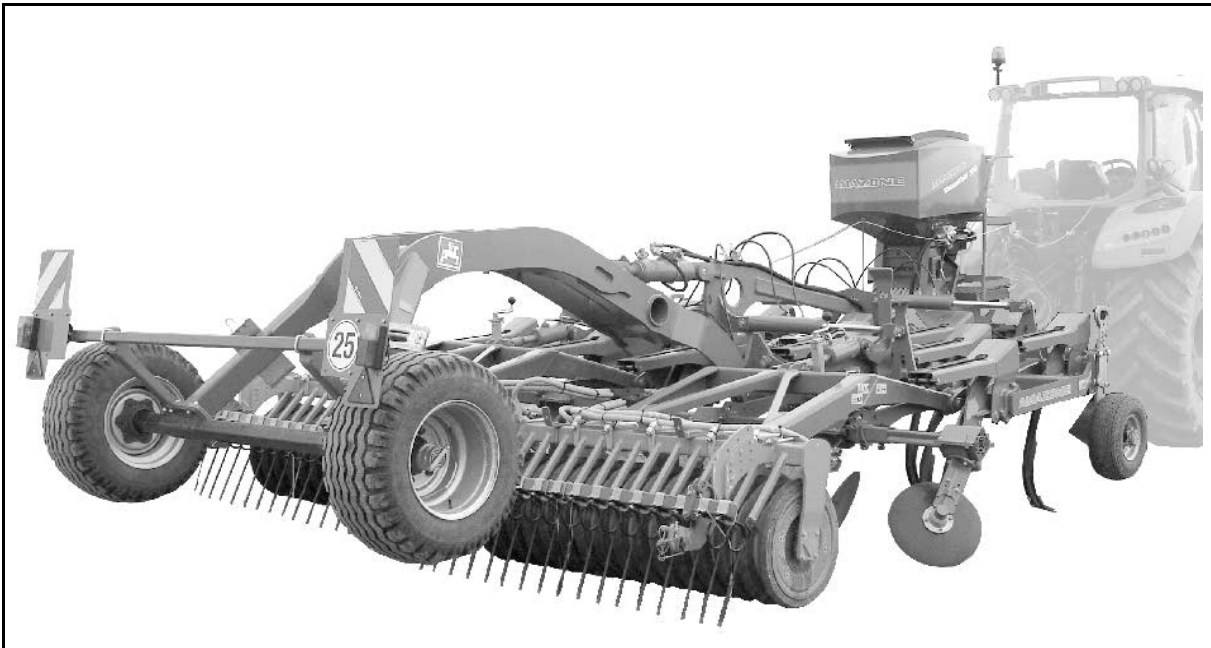


Fig. 13

The Cenius Mulch cultivator is suitable for

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

It consists of

- o A three-row tine field with spring tines.
- o A row of concave discs or a row of spring tines.
- o A trailing roller.

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

The tines of the Cenius Special are fitted with shear bolts.

5.1 Tines

- **Cenius 02 Super: Tines with overload protection by two tension springs.**

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

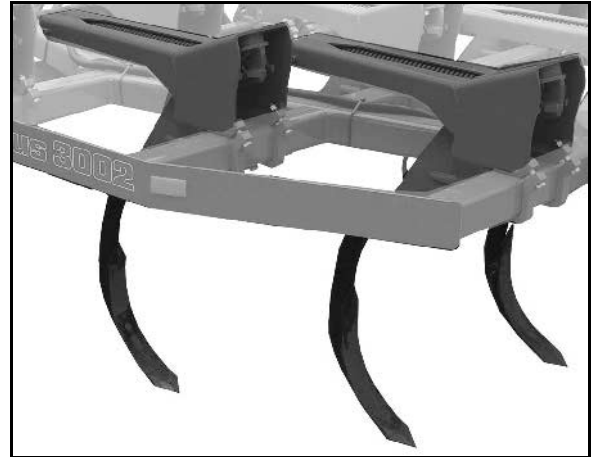


Fig. 14

- **Cenius 02 Special: Tines with overload protection by shear bolt.**

In the event of an overload, the bolt shears off (Fig. 15/1) and has to be replaced.

Use the correct shearing bolts:
M12 x 90 8.8
or
M12 x 110 8.8

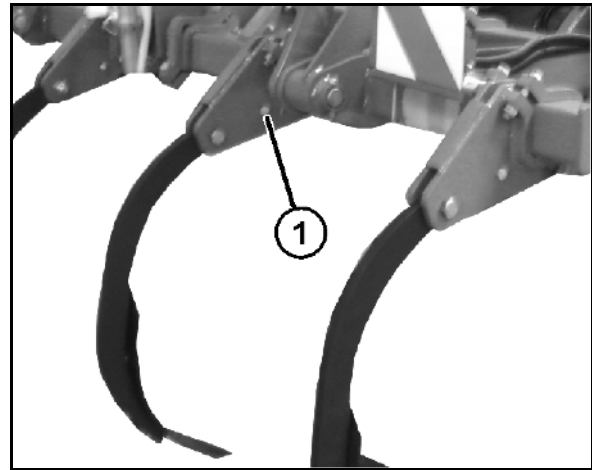


Fig. 15

- **Cenius 03 Special: Tines with overload protection by shear bolt.**

In the event of an overload, the bolt shears off (Fig. 16/1) and has to be replaced.

Use the correct shearing bolts:
M12 x 90 8.8

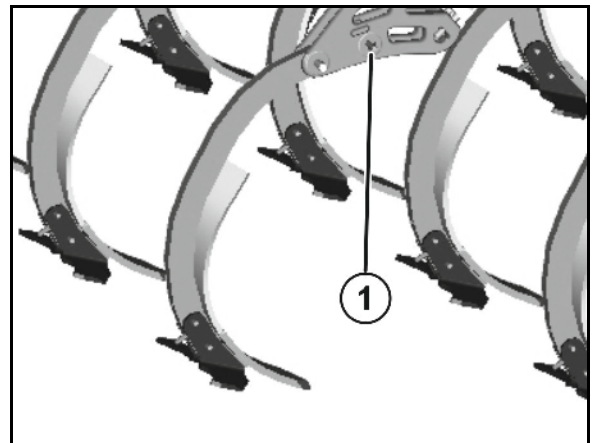


Fig. 16

Structure and function

Spare shear bolts for tines fastened on the frame on Cenius Special.

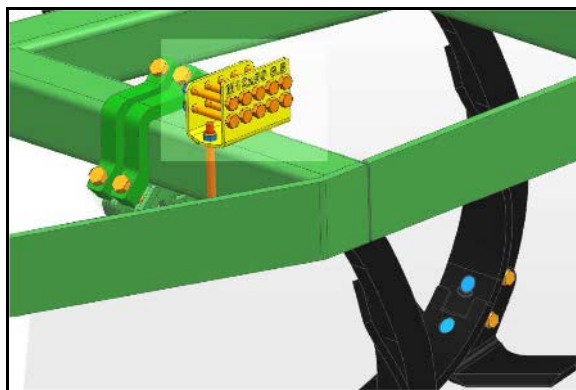


Fig. 17

- **Depth adjustment**

The depth of the tines is guided by the roller.

For information on setting the working depth, see page 69.

5.2 Coulter

The tines can be fitted with various coulters:

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

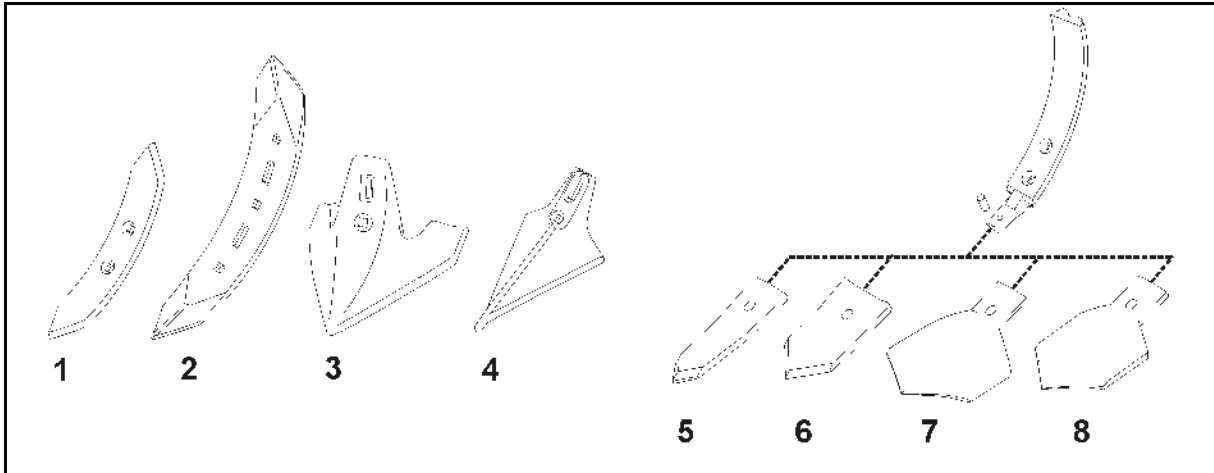


Fig. 18

- | | |
|----------------------------------|---|
| (1) Pointed coulter | (5) Narrow coulter Vario-Clip (75 mm) |
| (2) Helix coulter | (6) Wide coulter Vario-Clip (110 mm) |
| (3) Double-disc coulter (310 mm) | (7) Stubble coulter Vario-Clip (220 mm) |
| (4) Stubble coulter | (8) Stubble coulter Vario-Clip (170 mm) |

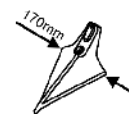

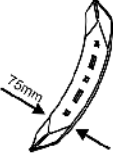
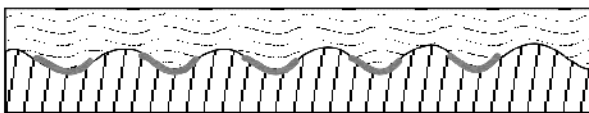
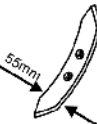
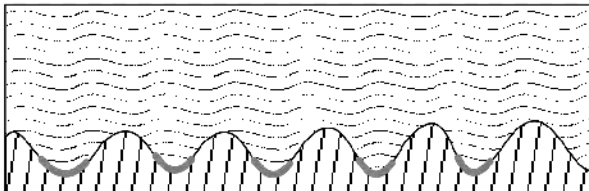


The Cenius 03 cannot be equipped with the Vario-Clip coulter system.



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

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

	Method		Working depth
Stubble coulter			3-8 cm
Helix coulter			5 – 10 cm
Pointed coulter			up to 25 cm

5.3 Coulter C-Mix

The tines can be fitted with various coulter:

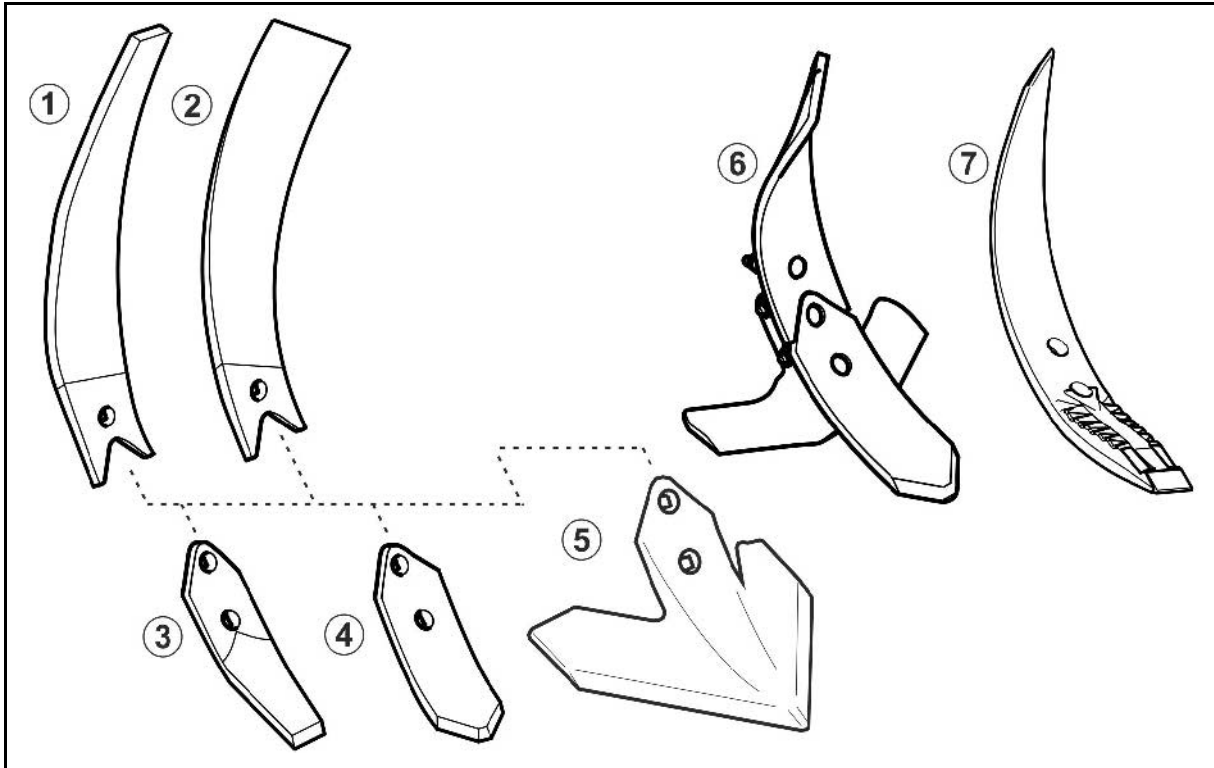


Fig. 19

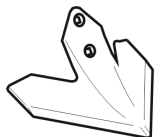






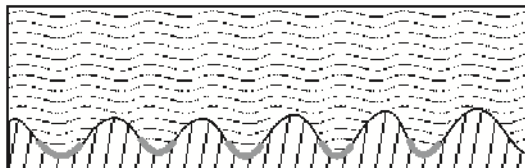
- (1) Deflector guide, left side (80 or 100 mm)
- (2) Deflector guide, right side (80 or 100 mm)
- (3) C-Mix coulter 80 mm
- (4) C-Mix coulter 100 mm
- (5) Double-disc coulter 320 mm (with deflector guide 100 mm)
- (6) Wing coulter 350 mm (C-Mix coulter with wings that can be mounted separately)
- (7) C-Mix HD 80 mm coulter with carbide plates for a longer service life



CAUTION

Risk of breaking the coulter!

Never park the implement on solid ground with the coulter!

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

5.4 Coulters arrangement

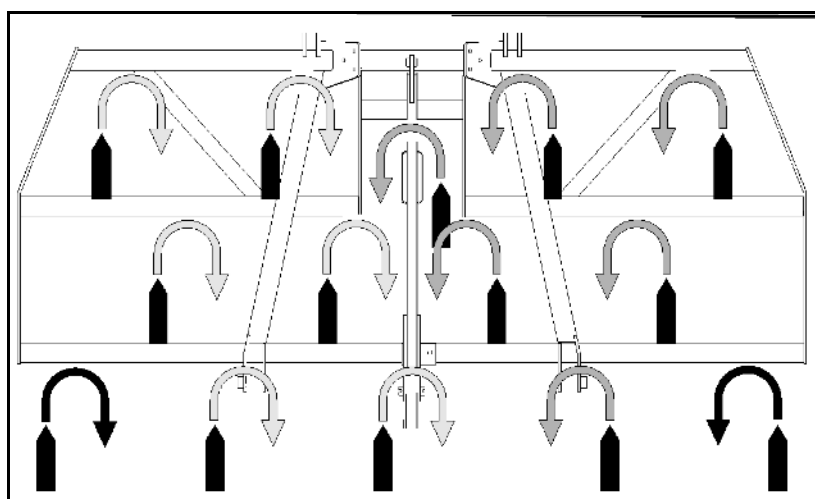


Fig. 20



The coulters arrangement recommended by the factory is illustrated. However, an individual arrangement is also possible.

5.5 Levelling unit

The following components act as levelling elements:

- A concave disc arrangement or
- A spring tine arrangement.

• Concave discs

The discs mix, crumble and level out the earth. The bearings of the concave discs consist of a two rows of angular-contact ball bearings with slip 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.

As an alternative to smooth discs, the implement can also be equipped with serrated discs.



Fig. 21

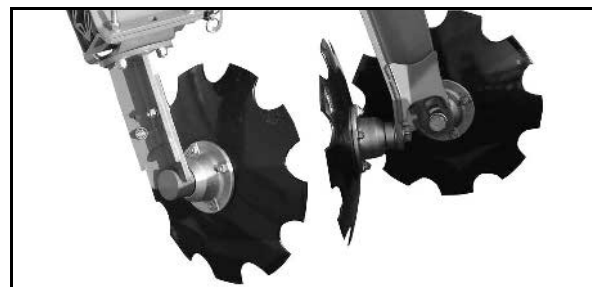


Fig. 22

• Spring tines

The spring tines level the soil.

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



Fig. 23

• 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 72.

5.6 Boundary discs discs / Side closer

Extendable boundary discs (Fig. 25) / side closers (Fig. 25) prepare an even field with no lateral banks.

- 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.

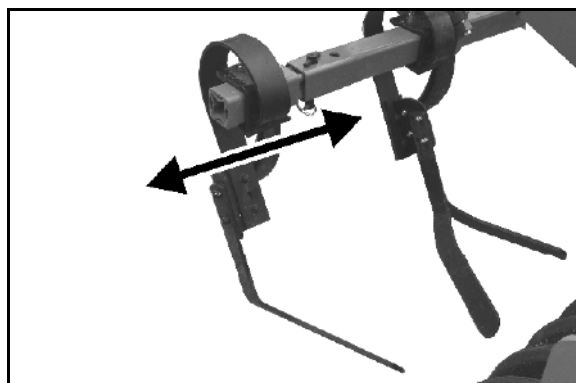


Fig. 24

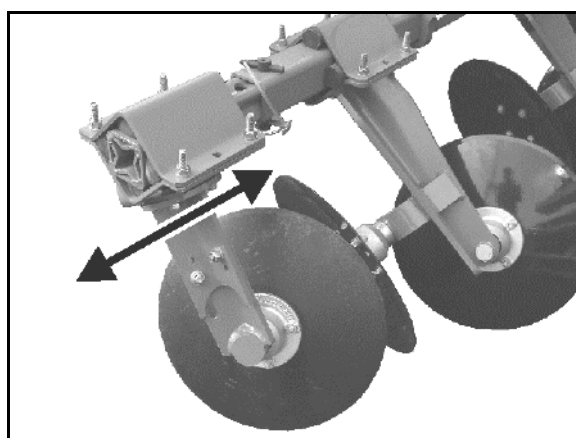


Fig. 25

- **Adjustable boundary discs**

The adjustable boundary discs (Fig. 26) (option) are adjustable in their length and the contact angle can be changed by turning the discs.

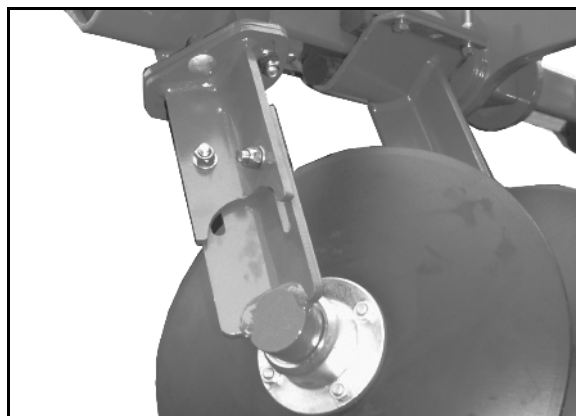


Fig. 26

- **Side closer with overload safety**

- (1) Overload safety steel spring
- (2) Overload safety rubber elements

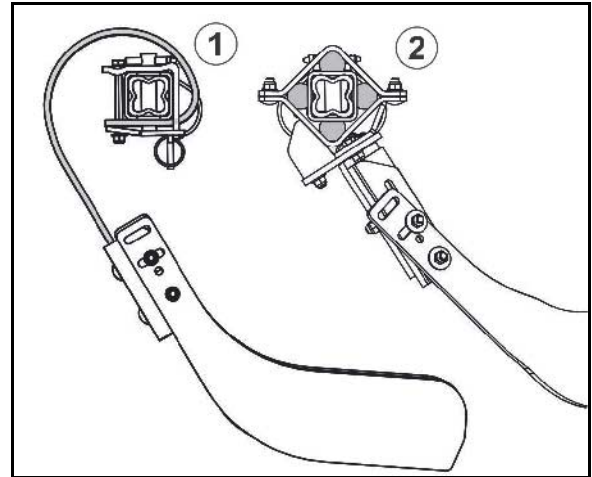


Fig. 27



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

5.7 Rollers

The roller assumes the depth control of **the tools**.

- **Tandem roller TW520/380**

The tandem roller consists of

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

→ Provides very good crumbling.

- **Cage roller**

- o SW520
- o 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.

- **Tooth packer roller PW 600**

→ Very well suited for medium and heavy soils.

- **Cutting ring roller RW600**

The cutting ring roller is equipped with an adjustable knife holder.

Raising the knife holder with increased organic matter content reduces the risk of blocking.

→ Very well suited for medium and heavy soils.

→ Unsuitable for stony soils

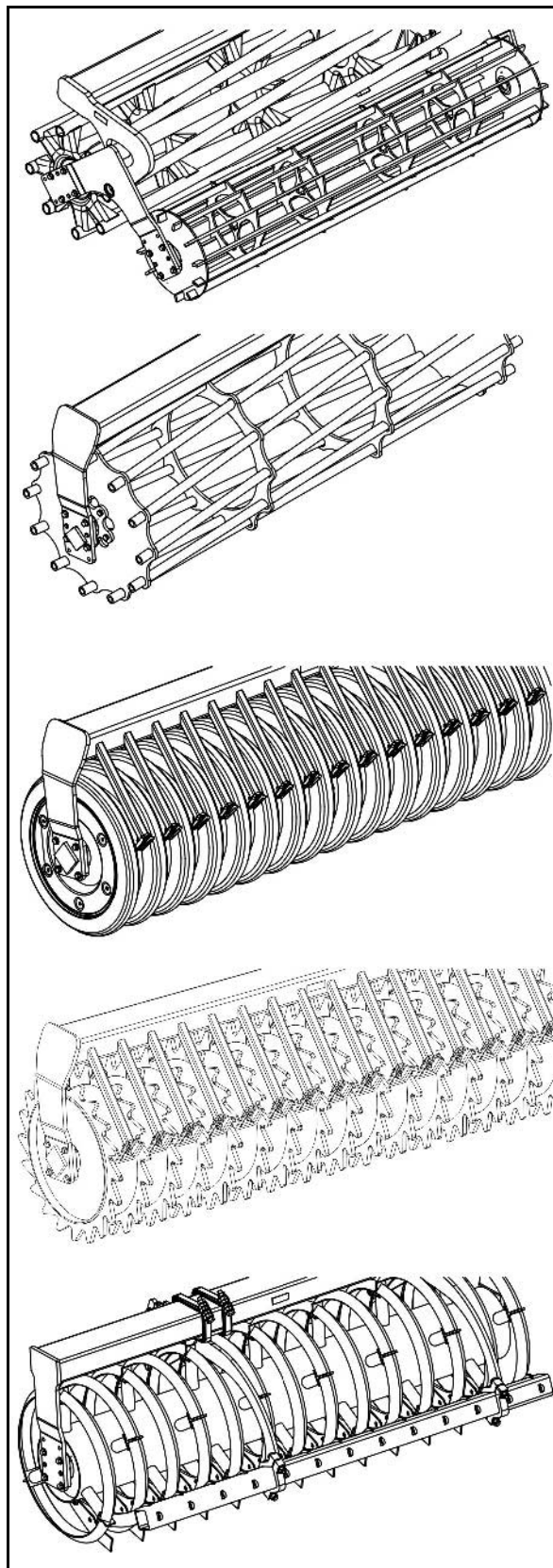


Fig. 28

Cutting ring roller with knife holder

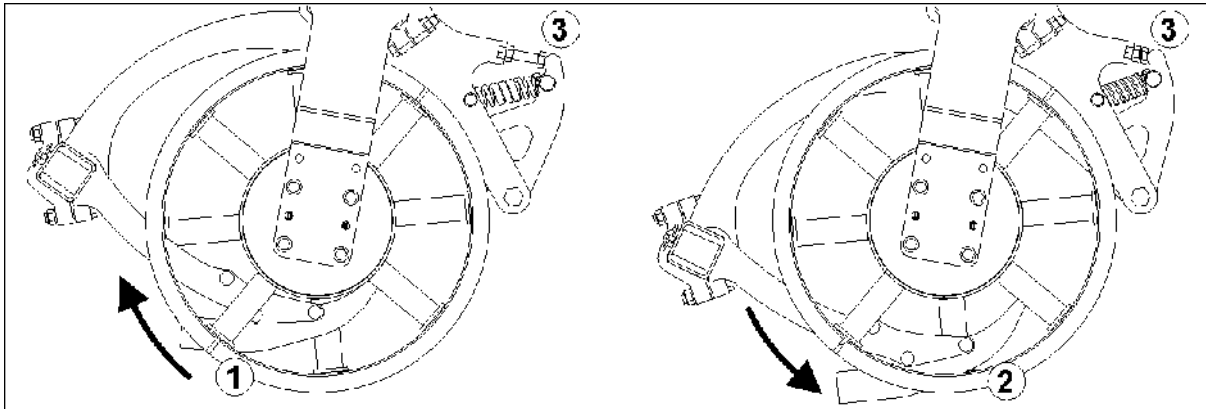


Fig. 29

- (1) Knife holder raised
- (2) Knife holder lowered
- (3) Adjustment screw with lock nut

→ After adjusting, lock the bolts with a lock nut!

- (1) Fastening bolts of the knife holder.
- (2) Stop bolt for the blade

The fastening bolts of the knife holder shear in event of overload. The stop bolt can be temporarily used as a replacement.

Fastening bolt:

Round-headed bolt 603 10X 25 8.8 A2G.

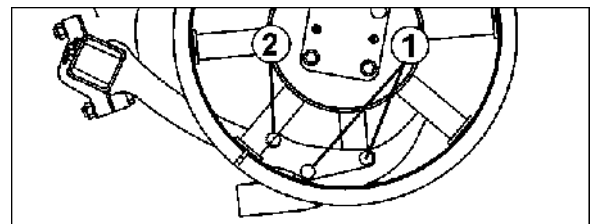


Fig. 30



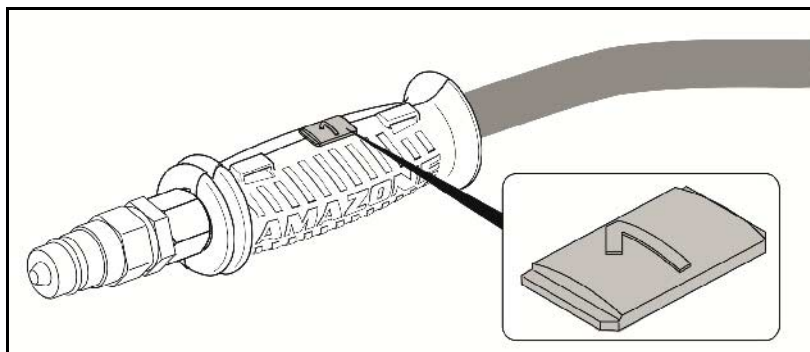
Risk of blockage with new installation of the arms on the knife holder.

The arms of the knife holder must be installed on the profile of the roller frame so that they are not located in the soil flow of the levelling unit.

5.8 Hydraulic connections




- All hydraulic hose lines are equipped with grips.

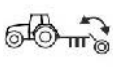







Coloured markings with a code number or code letter have been applied to the gripping sections in order to assign the respective hydraulic function to the pressure line of a tractor control unit!



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	Lifting	Double acting	
	2			Lowering		
blue	1		Machine	Fold out	Double acting	
	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

Danger of infection from escaping hydraulic fluid at high pressure!

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

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

5.8.1 Connecting hydraulic hoses



WARNING

Danger from incorrect hydraulic functions if the hydraulic hoses are connected incorrectly!

When coupling the hydraulic hose, observe the coloured marks on the hydraulic connectors. See "Hydraulic connections, page 53.



- Observe the maximum admissible working pressure of 210 bar.
- Check the compatibility of the hydraulic fluids before connecting the machine to the hydraulic system of your tractor.
- Do not mix mineral oils with bio-oils..
- Push the hydraulic plug(s) into the hydraulic sockets until you feel them lock.
- Check the couplings of the hydraulic hoses for a correct, tight seat.
- Connected hydraulic hoses
 - Must give without tension, bending or rubbing on all movements when travelling round corners.
 - May not scour other parts.

1. Move the control lever of the spool valve on the tractor to float position (neutral position).
2. Clean the hydraulic connectors of the hydraulic hoses before connecting the hydraulic hoses to the tractor.
3. Connect the hydraulic hoses to the tractor control units.

5.8.2 Disconnecting hydraulic hoses

1. Move the control lever of the tractor control unit to float position (neutral position).
2. Release the hydraulic connectors from the hydraulic sockets.
3. Protect the hydraulic sockets from soiling by fitting the dust caps.
4. Hook the hydraulic connectors into the connector holders.

5.9 Running gear

- chassis raised, implement in working position.

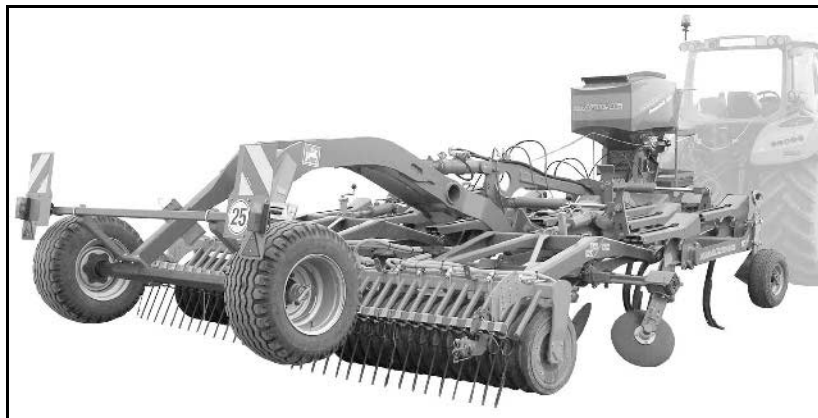


Fig. 31

- chassis lowered in transport position.

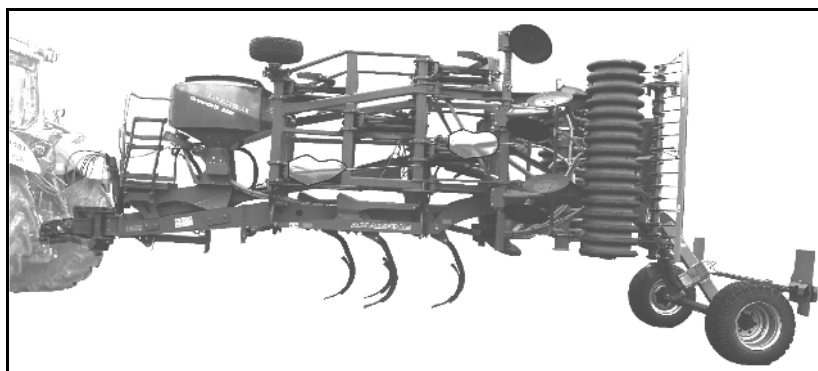


Fig. 32

5.10 Tensioned crosspiece

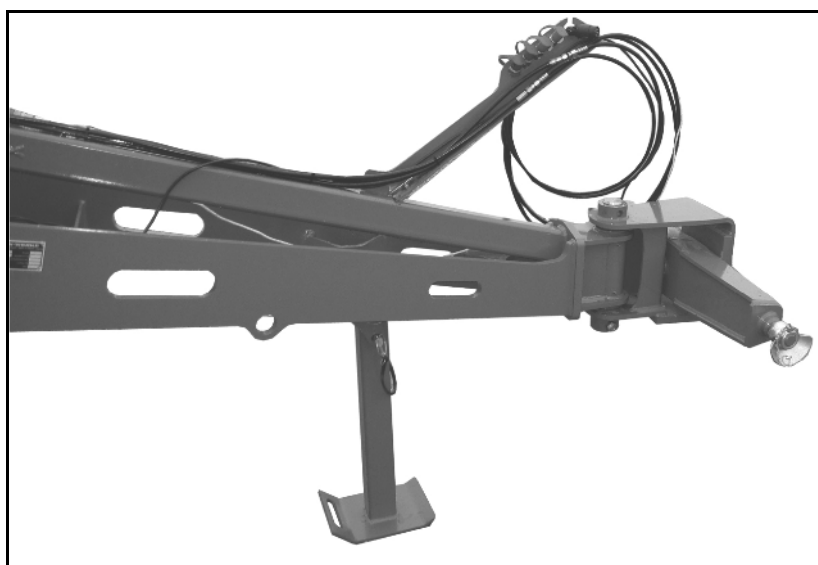


Fig. 33

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



WARNING

Risk of accidents if the connection between machine and tractor separates!

Always use ball sleeves with sockets and integral lynch pins.

5.11 Stand

Fig. 34/...

- (1) Handle
- (2) Pin

During operation or transport:

Jack fixed in raised position with pin and secured with lynch pin.

With machine uncoupled:

Jack fixed in lowered position with pin and secured with lynch pin.

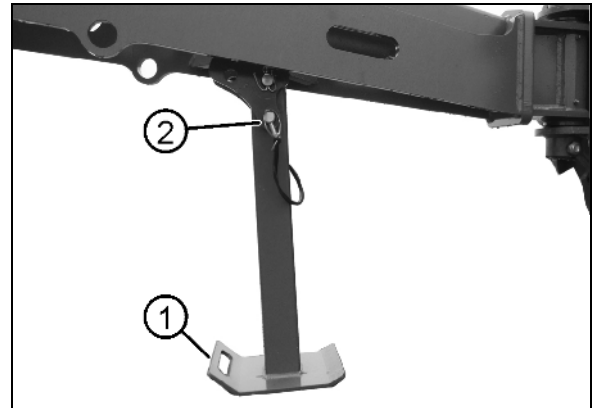


Fig. 34

5.12 Feeler wheels (Option)

The feeler wheels reduce swinging around the longitudinal axis during operation.



WARNING

Damage to the machine.

Never support the whole weight of the machine on the feeler wheels (e.g., by putting the lower link in float position during operation)



Required tyre pressure: 6.5 bar.

- (1) Feeler wheel
- (2) Locating pin for height adjustment
- (3) Eccentric lever for height adjustment

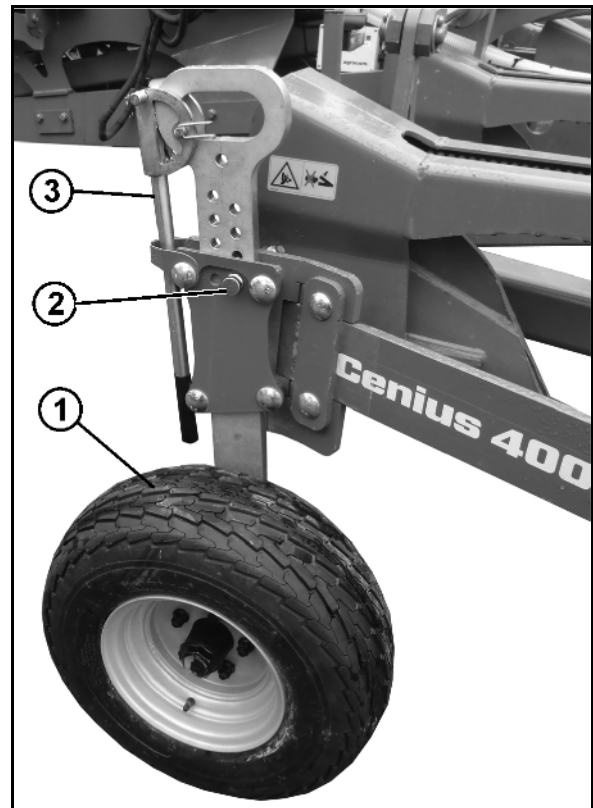


Fig. 35

5.13 Rear harrow (optional)



The rear harrow cannot be used on implements with cutting ring roller RW600 and tandem roller TW520/380.

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

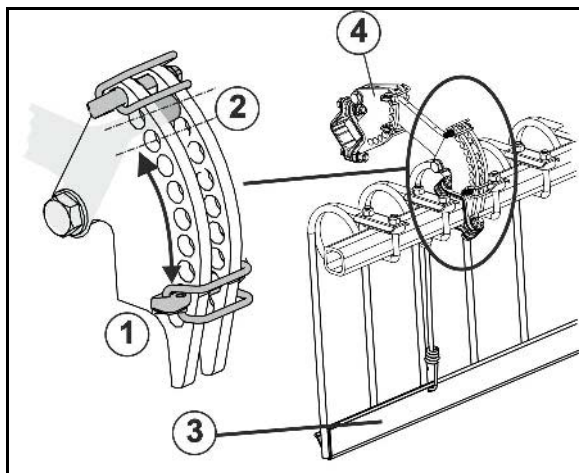


Fig. 36



- 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: SW520, SW600, PW600, KW580, RW600, UW580

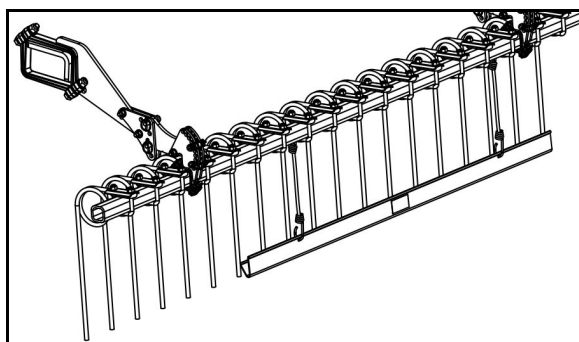


Fig. 37

5.14 GreenDrill catch crop sowing unit

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

- (1) GreenDrill
- (2) Foldable ascent
- (3) Locking pin for securing the foldable ascent



See also the GreenDrill operating manual

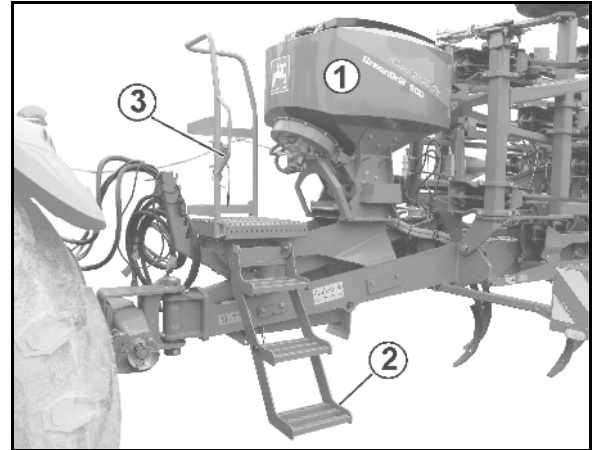


Fig. 38

5.15 Safety chain for implements without brake system

Implements without a brake system or with a single-line brake system must be equipped with a safety chain in compliance with local country regulations.

The safety chain must be correctly fixed to a suitable position on the tractor before transporting.

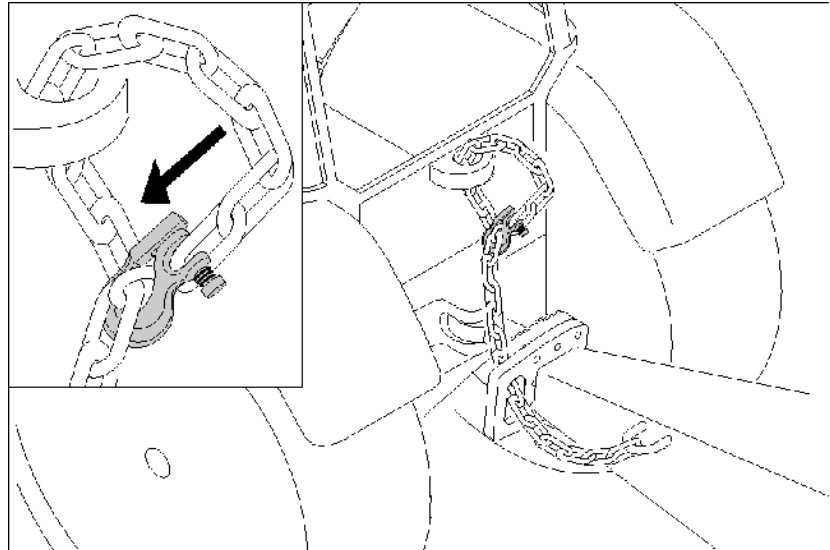


Fig. 39

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

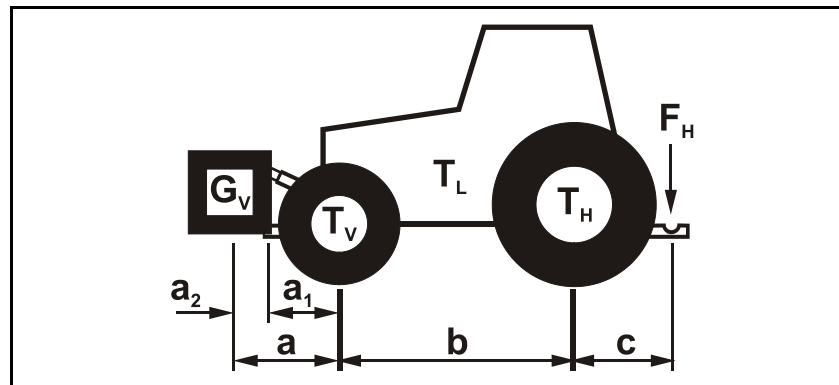


Fig. 40

T _L	[kg]	Empty tractor weight	See tractor operating manual or vehicle documentation
T _V	[kg]	Front axle load of the empty tractor	
T _H	[kg]	Rear axle load of the empty tractor	
G _V	[kg]	Front weight (if available)	See front weight in technical data, or weigh
F _H	[kg]	Maximum drawbar load	See technical data of machine
a	[m]	Distance between the centre of gravity of the front machine mounting or the front weight and the centre of the front axle (total a ₁ + a ₂)	See technical data of tractor and front machine mounting or front weight or measurement
a ₁	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement
a ₂	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front machine mount or front weight (centre of gravity distance)	See technical data of front machine mounting or front weight or measurement
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement

6.1.1.2 Calculation of the required minimum front ballast $G_{V \min}$ of the tractor to ensure safe steering

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

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

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

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

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 tractor/ implement combination

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

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 tractor rear axle load $T_{H \text{ act}}$

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

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 carrying 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	<div>/ kg</div>	--	--
Total weight	<div>kg</div>	<div>kg</div>	--
Front axle load	<div>kg</div>	<div>kg</div>	<div>kg</div>
Rear axle load	<div>kg</div>	<div>kg</div>	<div>kg</div>



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



WARNING

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.

6.1.3 Machines without their own brake system



WARNING

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

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

If the implement does not possess its own brake system:

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

Some countries have regulations that deviate. In Russia, for example, the weight of the tractor must be twice as high as that of the implement connected.
- The maximum forward speed is 25 km/h, in Russia it is 10 km/h.

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 63.



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 59.



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.

1. Secure the ball sleeves over the lower link pins in the pivot points of the three-point attachment frame.
2. Secure each of the pins with lynch pins to ensure that they do not accidentally come loose.
3. Instruct people to leave the danger area between the tractor and the machine before you approach the machine.
4. First connect the supply lines to the tractor before coupling the machine to the tractor as follows:
 - 4.1 Drive the tractor up to the machine in such a way that a gap (approx. 25 cm) remains between tractor and machine.
 - 4.2 Secure the tractor against unintentional starting and rolling away.
 - 4.3 Connect the supply lines.
 - 4.4 Position the lower link hooks so that they are aligned with the lower pivot points on the machine.
5. Now reverse the tractor further towards the machine so that the tractor's lower link hooks connect with the lower pivot points of the machine.

The lower link hook locks automatically

6. Visually check that the upper and lower link hooks are correctly locked before you drive off.
7. Lift the stand.
8. Remove the wheel chocks.

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.

1. Secure the tractor against unintentional starting and rolling away, see page 63.
2. Lower the stand.
3. Uncouple the machine from the tractor as follows:
 - 3.1 Relieve the lower links.
 - 3.2 Unlock and uncouple the lower link hooks from the tractor seat.
 - 3.3 Drive the tractor approx. 25 cm forwards.
→ This will allow more room between tractor and machine and give better access for uncoupling the supply lines.
 - 3.4 Secure the tractor against unintentional starting and rolling away, see page 63.
 - 3.5 Disconnect 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 63.

8.1 Working depth of the tines



The working depth of the levelling unit is automatically adjusted when setting the working depth of the tines.

8.1.1 Mechanical depth adjustment

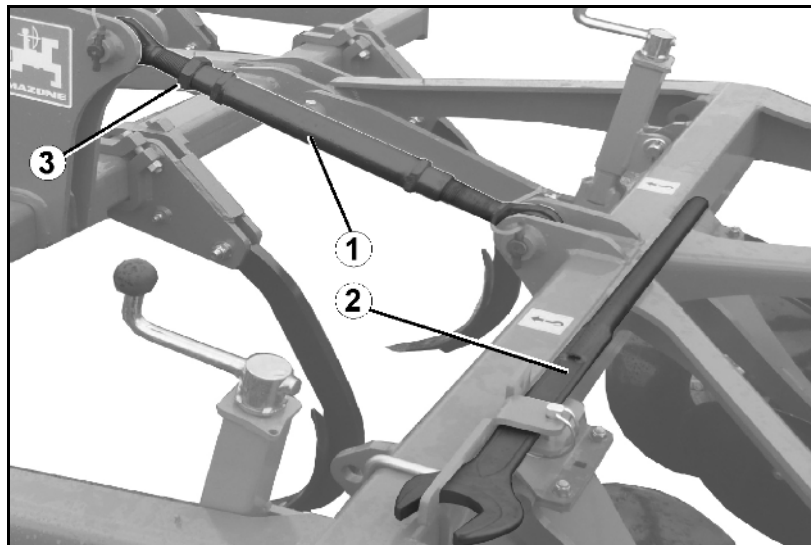


Fig. 41

- (1) Spindle
- (2) Tools for setting the spindle length (in parking position).
- (3) Lock nut

The working depth of the tines is set by adjusting the spindle length using the tool.

1. Slacken lock nut.
2. Set the spindle length.
 - o Spindle shortened → Increase the working depth.
 - o Spindle lengthened → Reduces the working depth.
3. Re-tighten the lock nut.
4. After use, move the tool back into the parking position and secure using locking pins.



- Adjust both spindles to the same length.
- If the spindle should rotate when tightening the lock nut, lift the machine and load the spindle using the roller.

8.1.2 Hydraulic depth adjustment

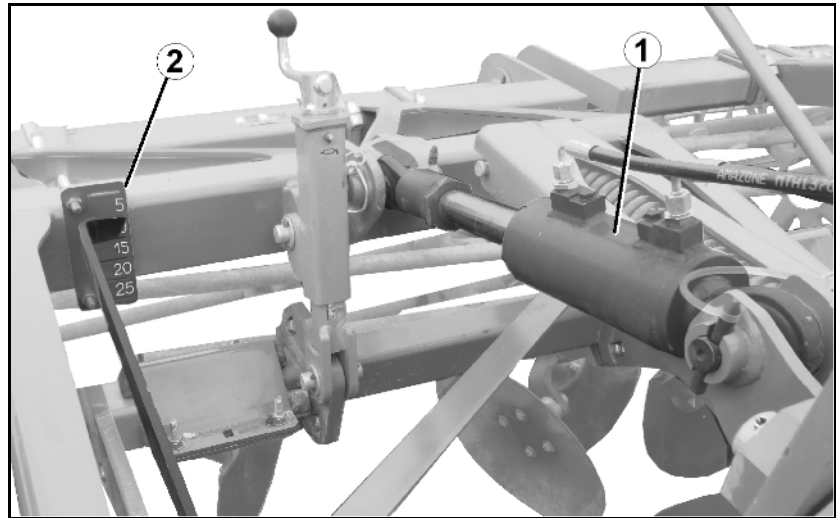


Fig. 42

- (1) Hydraulic depth adjustment
- (2) Scale with pointer that displays the working depth.



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

Setting the working depth is carried out using the tractor controller *green*.

8.2 Setting the 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.

1. Remove the linch pin (Fig. 43/1).
 2. Adjust the working depth at the crank.
 3. Secure the adjustment using the linch pin.
- Turn the crank to the right → Reduce working depth.
 - Turn the crank to the left → Increase working depth

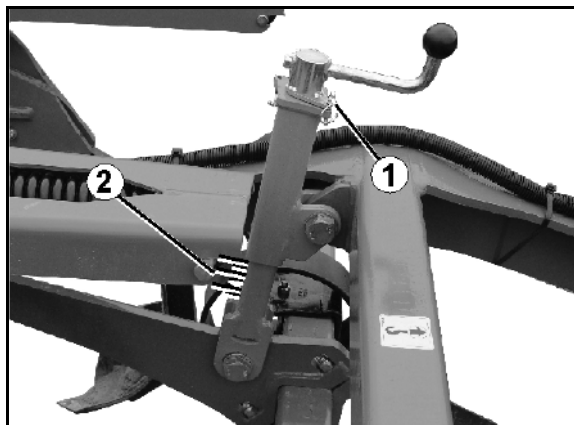


Fig. 43



- Set the depth at all the adjustment units in the same way.
- A scale is provided for orientation on the adjustment units (Fig. 43/2).

8.3 Adjusting the stripper

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.

Wedge ring rollers

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

Tooth packer roller:

Adjust the distance between the scraper and roller shell to 1 mm.



Rotate the roller to check whether the distance of 1 mm is maintained at all points. The carbide-coated scrapers must not touch the roller shell.



Fig. 44

8.4 Setting the feeler wheels

Adjust the feeler wheels height using the group of holes so that they run with a 1-3 cm gap above the ground.

1. Take the eccentric lever out of park position.
 2. Completely insert the pivot pins of the eccentric lever into a suitable hole in the hole group and release the safety pins.
 3. Remove the safety pins.
 4. Adjust the feeler wheel by raising or lowering the lever.
 5. Fit the safety pin and secure with the locking pin.
 6. Place eccentric lever in parking position and secure.
- Set both feeler wheels at the same height.

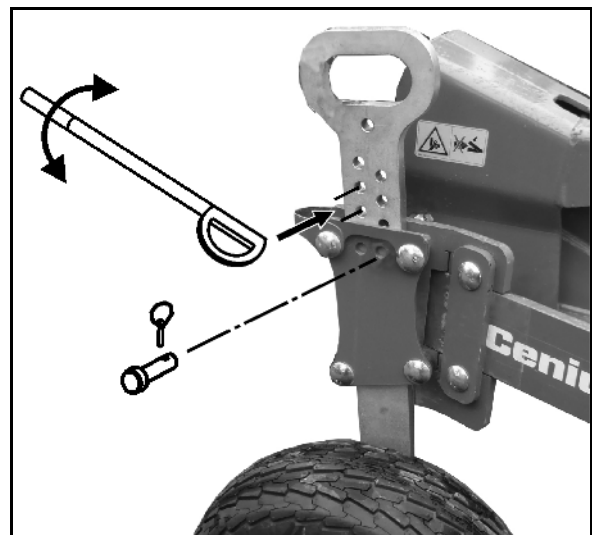


Fig. 45

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
- Do not exceed the maximum permissible speed of 25 km/h during transport!



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**

Risk of injury with overwidth transport.

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



GreenDrill: Fold up ascent into transport position.

9.1 Changing from working to transport position

1. Actuate tractor control unit *yellow*.
- Lift the machine over the running gear
2. Raise tractor lower links.
3. Move both side discs / outside tines to the transport position.
4. Actuate control unit *green*.
- Fold in the machine.
5. Cover the two lower tines (left and right) with the protective cover (1).

Fig. 46: Implement in transport position.

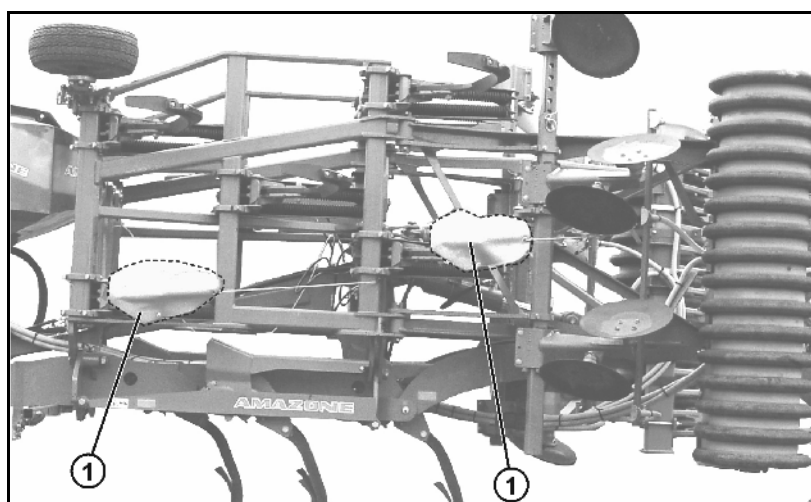


Fig. 46

Rear harrow (optional)



WARNING

Before folding the implement

- Install the transport safety bar (Fig. 47/3).

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

- Lock the tines in position 2 with the positioning pins (Fig. 47/1).

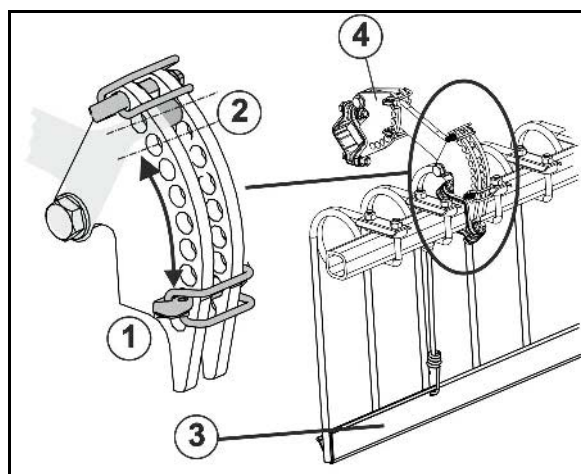


Fig. 47

10 Use of the machine



DANGER!

- Observe the chapter "Safety instructions for the user", page 24, when using the machine.
- Observe the warning signs on the machine. The warning signs provide you with important hints for the safe operation of the machine. Compliance with this information guarantees your safety!

10.1 Changing from transport to working position

1. Actuate tractor control unit *yellow*.
- Lift the implement over the running gear.
2. Raise tractor lower links.
 3. Put the protective covers of the two lower tines in park position (Fig. 46).
 4. Pull on the cable winch for releasing the locking mechanism against unintentional unfolding
- and simultaneously
Operate control unit 1.
- Fold out the machine.
5. Move both outside discs to operational position
 6. Actuate tractor control unit *yellow*.
- Lift the machine over the running gear
7. Raise tractor lower links.

10.2 Operation

- The machine is coupled to the tractor.
- The working depth of the tines and the levelling unit is set.
- The machine is in working position.



Avoid reversing when the machine is in working position!



- Adjust the implement using the lower links of the tractor so that the frame is parallel to the ground in longitudinal and transverse directions during operation!
- Do not place the tractor lower links in the float position.

10.3 Headland



- In tight curves, raise the machine to avoid transverse loads on the tools!
- Lower the machine at the headland only when the machine is facing in the working direction!

11 Faults

Fault	Correction
Discs / tine rows clog with crop material.	Raise the machine and lower again.
Build up of soil in front of the roller.	Raise the machine and lower again. Reduce working depth.
Clogging of the packer roller.	Adjust the strippers.

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 63.



DANGER!

- **During cleaning, maintenance and repair work, observe chapter "Safety instructions for the user" from page Seite 29,**
- **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 81) 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. 48).

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.

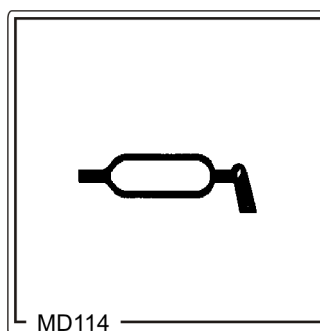


Fig. 48

Lubricants

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

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

Lubrication plan

	Designation	Quantity	Lubrication intervall [h]
1	Machine wing bearings	4	50
2	Spindles / Hydraulic cylinder tine depth	4	50
3	Cranks	2	50
4	Rear rocker arms	4	50
5	Chassis	2	50
6	Chassis hydraulic cylinder	4	50
7	Tensioned crosspiece	2	10
8	Tensioned crosspiece	1	50
9	Tandem roller	4	50

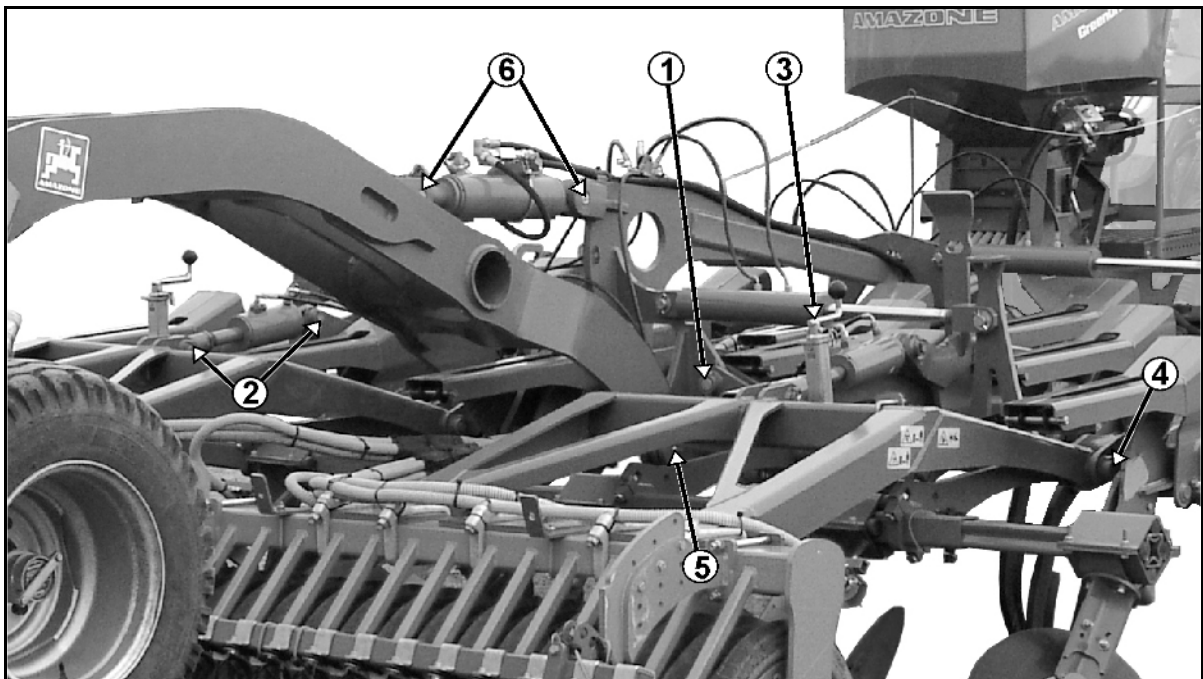


Fig. 49

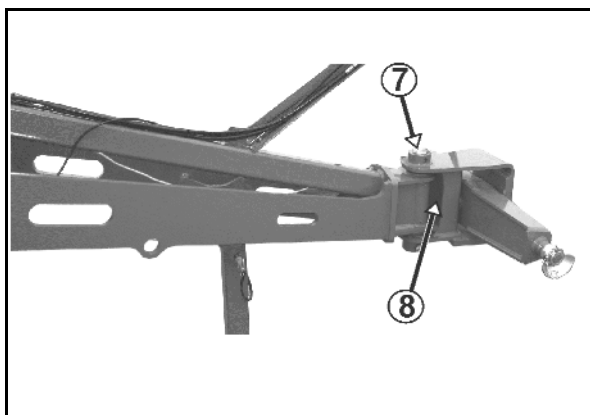


Fig. 50

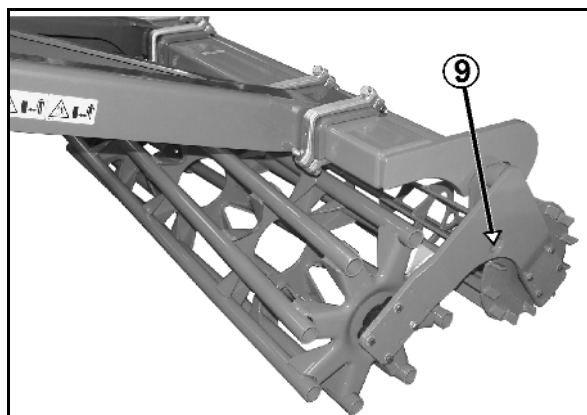


Fig. 51

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	<ul style="list-style-type: none"> Inspect the bolts 	90	
Hydraulic system	<ul style="list-style-type: none"> Inspection for defects Inspect for leaks 	90	X
Wheels	<ul style="list-style-type: none"> Wheel nut check 	88	

Weekly/every 50 working hours

Component	Servicing work	see page	Workshop work
Hydraulic system	<ul style="list-style-type: none"> Inspection for defects 	90	X
Tine connection	<ul style="list-style-type: none"> Inspect the bolts 	86	
Roller connection	<ul style="list-style-type: none"> Inspect the bolts 	87	
Disc carrier connection	<ul style="list-style-type: none"> Inspect the bolts 	87	
Scraper on the roller	<ul style="list-style-type: none"> Check the distance 	73	
Wheels	<ul style="list-style-type: none"> Check air pressure Wheel nut check 	88	

Every three months / 200 operating hours

Component	Servicing work	see page	Workshop work
Hydraulic cylinder folding	<ul style="list-style-type: none"> Inspect the bolts 	87	

As required

Component	Servicing work	see page	Workshop work
Coulter	<ul style="list-style-type: none"> Replace 	84	
Tines	<ul style="list-style-type: none"> Replace 	84	
Overload safety device, Super	<ul style="list-style-type: none"> Replace the tension springs. 	85	X
Disc XL041	<ul style="list-style-type: none"> Inspect for wear - replace when the minimum diameter of 360 mm is reached 	86	X
Disc segments	<ul style="list-style-type: none"> Replace 	86	X
Lower link pin	<ul style="list-style-type: none"> Replace 	92	

12.4 Installing and removing the tines



CAUTION

The tines and coulter of the Genius can be replaced when on the field. For this purpose, slightly raise the machine in order to minimise the risk of injuries by the machine lowering unintentionally.

Genius Special

- (1) Shear bolt M12
 - (2) Fastening bolt M20 maximum tightening torque off he bolt: 210 Nm.
- Otherwise the shear bolt safety protection has no function.

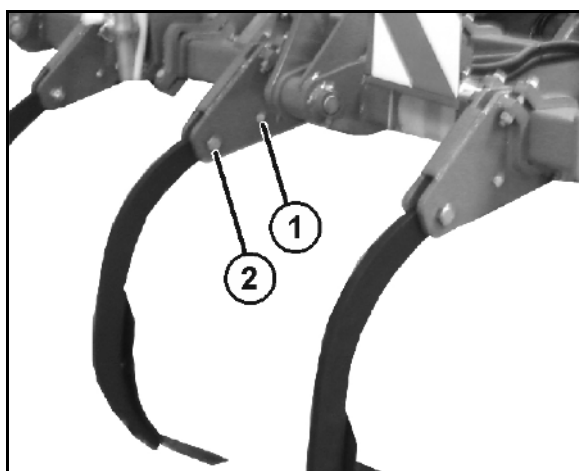


Fig. 52

12.5 Changing the coulters



CAUTION

Take special care when changing coulters.

Do not turn the screws on the square shaft.

Risk of injury from sharp edges.



Fig. 53

12.5.1 Changing the Vario-Clip coulters

To remove the Vario-Clip coulters (Fig. 54/1), knock the spiral pin (Fig. 54/2) out by knocking it downwards using a drift and remove the coulters towards the front.

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



CAUTION

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

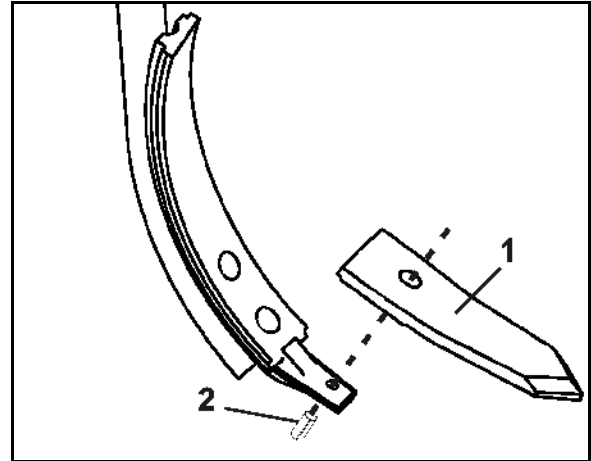


Fig. 54

12.5.2 Changing the C-Mix coulters

When changing the coulters, observe:

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

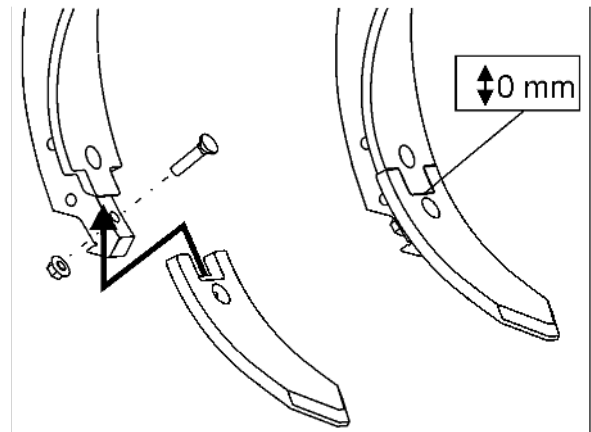


Fig. 55

12.6 Replace the tension springs of the overload safety device (workshop work)



CAUTION

Cenius Super:

The overload safety on the tines consists of two tension springs in each case. They are under high pretension. You must use the device to mount and remove the tension springs in all cases.

Otherwise, there is a risk of injury.



- Order the disassembly device via customer services / dealer:
 - Order number 78800341 (for Cenius, hydraulic)
 - Order number 78800576 (for Cenius, mechanical)
- When changing the springs, change the spring bolts as well.
- Replace the retaining bolts on the tines with bolt ISO 4014 12X 70 10.9.

12.7 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!

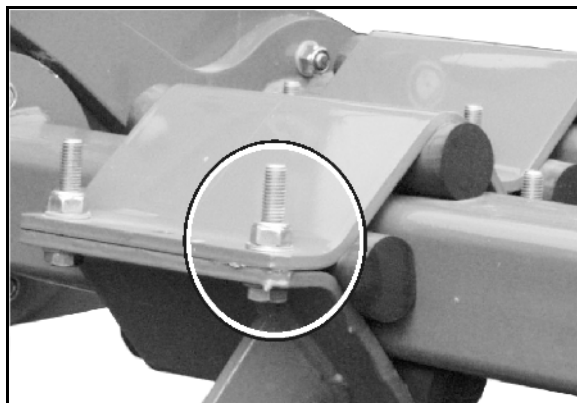


Fig. 56

12.8 Replacing discs (workshop work)

Minimum disc diameter: 360 mm.

The discs are replaced

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



Fig. 57

12.9 Tine connection

Inspect the bolts of the tine connection for tightness.

Required tightening torque: 210 Nm

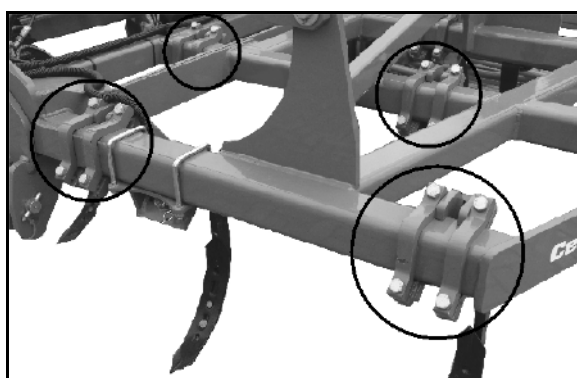


Fig. 58

12.10 Roller connection

Inspect the bolts of the tine connection for tightness.

Required tightening torque: 210 Nm



To connect the rollers correctly, the clamping bracket and its screw connections must be mounted according to Fig. 59.

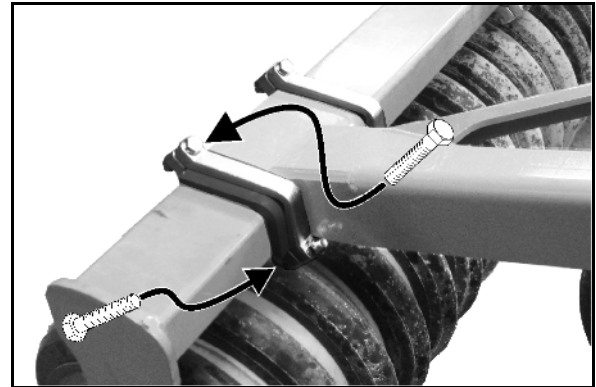


Fig. 59

12.11 Disc carrier connection

Inspect the bolts of the tine connection for tightness.

Required tightening torque: 210 Nm

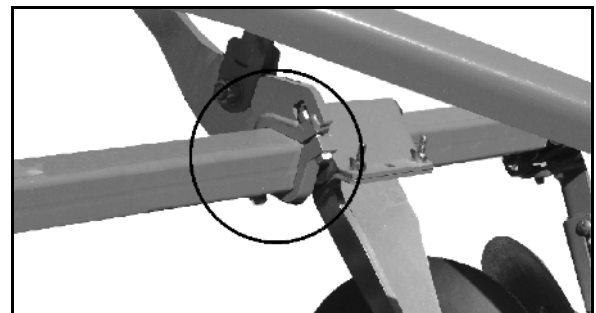


Fig. 60

12.12 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.

12.13 Tyres/wheels



Check chassis wheels regularly for damage and firm seating on the wheel rim.



- Required tyre pressure.
 - chassis wheels: **3,0 bar**
 - Feeler wheels: **6,5 bar**
- Required tightening torque for wheel nuts or bolts:
325 Nm



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

12.13.1 Tyre pressures



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



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

12.13.2 Mounting tyres (workshop work)



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

12.14 Hydraulic system (workshop work)



WARNING

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

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

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

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



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

12.14.1 Labelling hydraulic hose lines

The assembly labelling provides the following information:

Fig. 61/...

- (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).

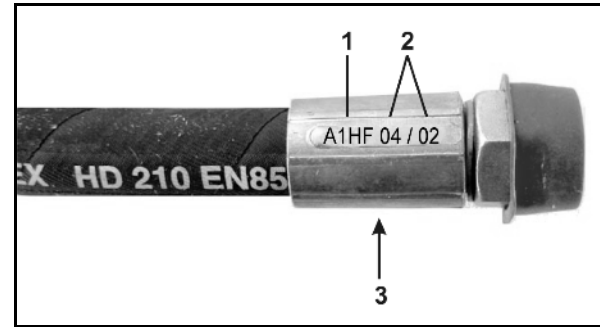


Fig. 61

12.14.2 Maintenance intervals

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

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

Before each start-up:

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

12.14.3 Inspection criteria for hydraulic hose lines



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

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

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

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

12.14.4 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.

12.15 Lower link pins



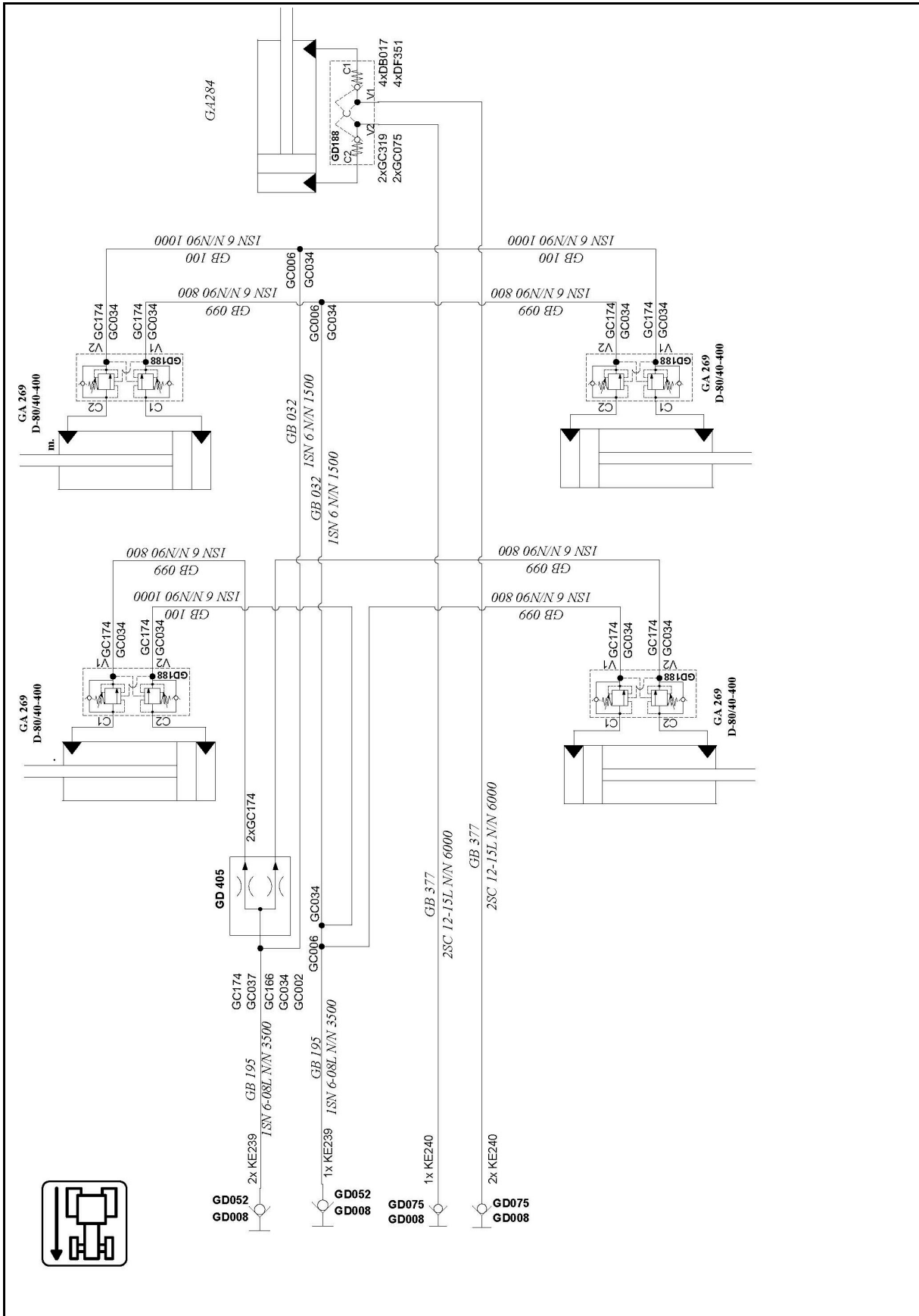
WARNING

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

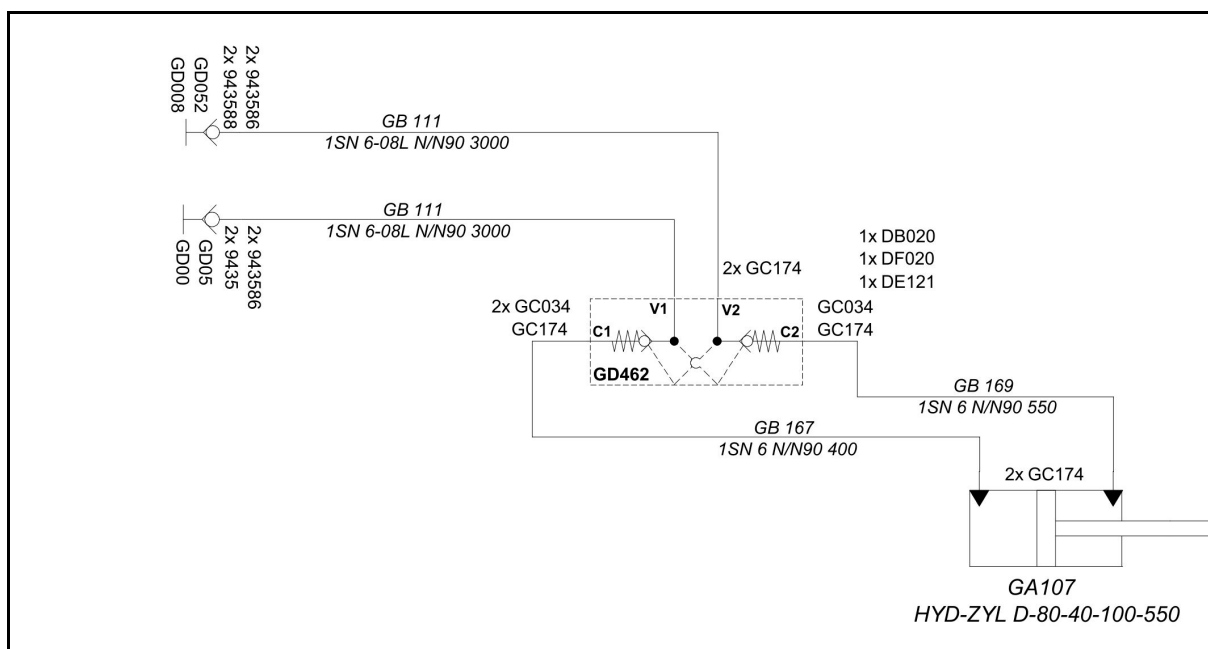
Check the lower link pins for visible damage each time you couple the machine. Replace lower link pins if there are clear signs of wear.

13 Hydraulic circuit diagram

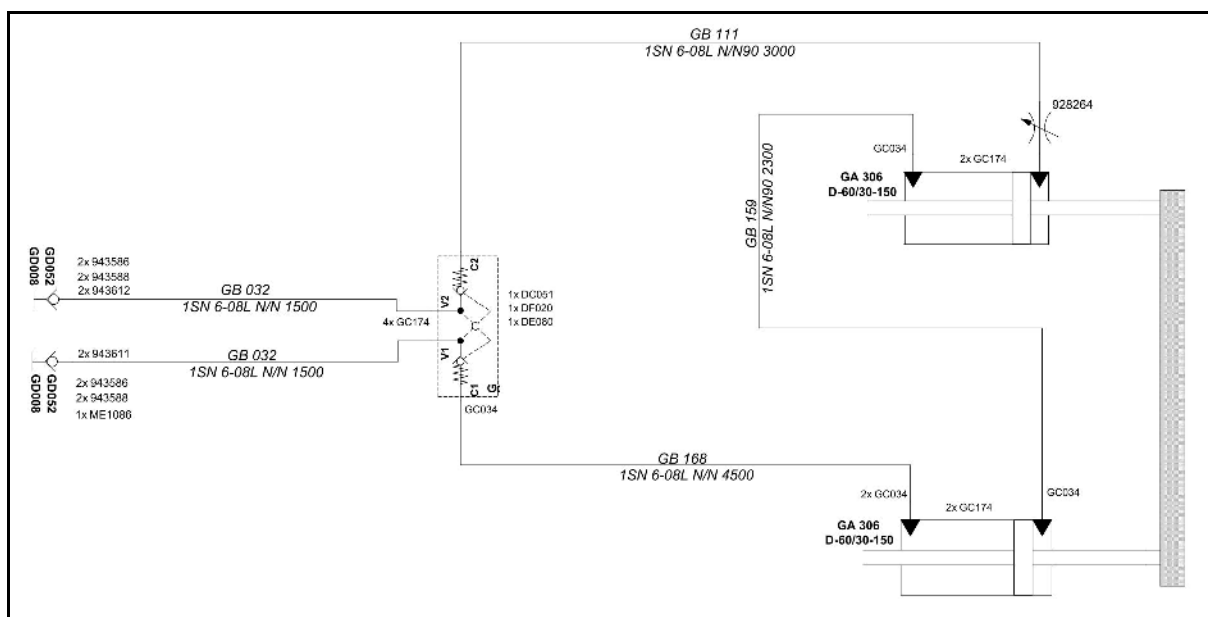
Chassis / folding



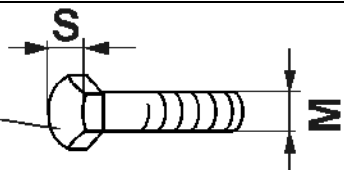

Depth adjustment (tines)

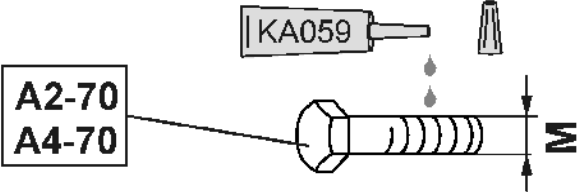



Depth adjustment (levelling)



13.1 Screw tightening torques

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> 8.8 10.9 12.9 </div>  </div>				
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

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> A2-70 A4-70 </div>  </div>												
M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
 Nm	2.3	4.6	7.9	19.3	39	66	106	162	232	326	247	314



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



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