



AMAZONE

Original operating manual

Mounted cultivator

Cenio 4000-2



SmartLearning



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AMAZONE

AMAZONEN-WERKE H. DREYER SE & Co. KG
 Am Amazonenwerk 9-13 D-49205 Hasbergen

Machine no.

Vehicle ID no.

Product

Permissible technical implement weight kg

Model Year






Year of construction



Please enter the identification data of the implement. The identification data can be found on the rating plate.



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About this operating manual

1

CMS-T-00000081-J.1

1.1 Copyright

CMS-T-00012308-A.1

Reprinting, translation and reproduction in any form, including excerpts, require the written approval of AMAZONEN-WERKE.

1.2 Diagrams

CMS-T-005676-G.1

1.2.1 Warnings and signal words

CMS-T-00002415-A.1

Warnings are marked with a vertical bar with a triangular safety symbol and the signal word. The signal words *"DANGER"*, *"WARNING"* or *"CAUTION"* describe the severity of the potential danger and have the following meanings:



DANGER

- Indicates a direct threat with high risk for severe physical injury, such as loss of limbs or death.



WARNING

- Indicates a possible threat with moderate risk for severe physical injury or death.



CAUTION

- Indicates a threat with low risk for light or moderately severe physical injuries.

1.2.2 Further instructions

CMS-T-00002416-A.1



IMPORTANT

- Indicates a risk for damage to the implement.



ENVIRONMENTAL INFORMATION

- Indicates a risk for environmental damage.



NOTE

Indicates application tips and instructions for optimal use.

1.2.3 Instructions

CMS-T-00000473-E.1

1.2.3.1 Numbered instructions

CMS-T-005217-B.1

Actions that have to be performed in a specific sequence are represented as numbered instructions. The specified sequence of the actions must be observed.

Example:

1. Instruction 1
2. Instruction 2

1.2.3.2 Instructions and responses

CMS-T-005678-B.1

Reactions to instructions are marked with an arrow.

Example:

1. Instruction 1
 - ➡ Reaction to instruction 1
2. Instruction 2

1.2.3.3 Alternative instructions

CMS-T-00000110-B.1

Alternative instructions are introduced with the word "or".

Example:

1. Instruction 1

or

Alternative instruction

2. Instruction 2

1.2.3.4 Instructions with only one action

CMS-T-005211-C.1

Instructions with only one action are not numbered, but rather shown with a arrow.

Example:

► Instruction

1.2.3.5 Instructions without sequence

CMS-T-005214-C.1

Instructions that do not require a specific sequence are shown as a list with arrows.

Example:

► Instruction

► Instruction

► Instruction

1.2.3.6 Workshop work

CMS-T-00013932-B.1



WORKSHOP WORK

- Identifies maintenance work that must be performed at a workshop that is adequately equipped in terms of agricultural technology, safety and environmental technology by specialist personnel with appropriate training.

1.2.4 Lists

CMS-T-000024-A.1

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

Example:

- Point 1
- Point 2

1.2.5 Item numbers in figures

CMS-T-000023-B.1

A framed number in the text, e.g. a 1, indicates an item number in an adjacent figure.

1.2.6 Direction information

CMS-T-00012309-A.1

Unless otherwise specified, all directions are always seen in the direction of travel.

1.3 Other applicable documents

CMS-T-00000616-B.1

A list of other applicable documents can be found in the Appendix.

1.4 Digital operating manual

CMS-T-00002024-B.1

The digital operating manual and e-learning can be downloaded from the Info Portal on the AMAZONE website.

1.5 Your opinion is important

CMS-T-000059-D.1

Dear reader, our documents are updated on a regular basis. Your suggestions for improvement help us to create ever more user-friendly documents. Please send us your suggestions by post, fax or email.

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CMS-I-00000638

Safety and responsibility

2

CMS-T-00002298-Q.1

2.1 Basic safety instructions

CMS-T-00002301-Q.1

2.1.1 Meaning of the operating manual

CMS-T-00006180-A.1

Observe the operating manual

The operating manual is an important document and a part of the implement. It is intended for the user and contains safety-related information. Only the instructions provided in the operating manual are reliable. If the operating manual is not observed, it can result in serious injury or death.

- ▶ The safety section must be completely read and observed before initial operation of the implement.
- ▶ Before starting work, also read and observe each section of the operating manual.
- ▶ Keep the operating manual in a safe place.
- ▶ Keep the operating manual available.
- ▶ Hand over the operating manual to the subsequent user.

2.1.2 Safe operating organisation

CMS-T-00002302-D.1

2.1.2.1 Personnel qualification

CMS-T-00002306-B.1

2.1.2.1.1 Requirements for persons working with the implement

CMS-T-00002310-B.1

If the implement is used improperly, people can be injured or killed: To prevent accidents due to improper use, every person who works with

the implement must meet the following minimum requirements:

- The person is physically and mentally capable of checking the implement.
- The person can safely perform work with the machine within the scope of this operating manual.
- The person understands the functioning of the machine within the scope of their work and can recognise and prevent dangers arising during operation.
- The person had understood the operating manual and can implement the information that is conveyed in the operating manual.
- The person must be familiar with safe driving of vehicles.
- For road travel, the person knows the relevant road traffic regulations and has the prescribed driving permit.

2.1.2.1.2 Qualification levels

CMS-T-00002311-A.1

For working with the machine, the following qualification levels are provided:

- Farmer
- Agricultural helper

As a matter of principle, the activities described in this operating manual can be performed by persons with the qualification level "Agricultural helper".

2.1.2.1.3 Farmer

CMS-T-00002312-A.1

Farmers use agricultural implement to cultivate fields. They decide on the use of an implement for a specific purpose.

Farmers are basically familiar with working with agricultural implements and can instruct agricultural helpers in how to use the implements if necessary. They can perform odd tasks and simple maintenance and repair work on agricultural implements themselves.

Farmers can be e.g.:

- Farmers with higher education or training from a technical college
- Farmers by experience (e.g. inherited farm, comprehensive practical knowledge)
- Contractors who work by order of farmers

Activity example:

- Safety training for agricultural helpers

2.1.2.1.4 Agricultural helpers

CMS-T-00002313-A.1

Agricultural helpers use agricultural implements by order of the farmer. They are instructed on the use of the implement by the farmer, and work independently according to the work assignment from the farmer.

Agricultural helpers can be e.g.:

- Seasonal workers and labourers
- Prospective farmers in training
- Employees of the farmer (e.g. tractor driver)
- Family members of the farmer

Activity examples:

- Driving the machine
- Adjusting the working depth

2.1.2.2 Workplaces and passengers

CMS-T-00002307-B.1

Passengers

Passengers can fall, be run over and severely injured or killed due to machine movements. Ejected objects can hit and injure passengers.

- ▶ Do not let anybody ride on the machine.
- ▶ Do not let anybody climb onto the driving machine.

2.1.2.3 Danger for children

CMS-T-00002308-A.1

Danger for children

Children cannot assess dangerous situations and can behave unpredictably. As a result, children are at a higher risk.

- ▶ Keep children away.
- ▶ *When you drive out or actuate machine movements,*
make sure that there are no children in the danger area.

2.1.2.4 Operational safety

CMS-T-00002309-D.1

2.1.2.4.1 Perfect technical condition

CMS-T-00002314-D.1

Only use properly prepared machines

Without correct preparation according to this operating manual, operational safety of the machine is not ensured. This can result in accidents and serious personal injury or even death.

- ▶ Prepare the machine according to this operating manual.

Danger due to damage to the machine

Damage to the machine can impede the operational safety of the machine and cause accidents. This can result in serious injury or death.

- ▶ *If you suspect or observe damage:*
Secure the tractor and machine.
- ▶ Repair safety-relevant damage immediately.
- ▶ Fix the damage according to this operating manual.
- ▶ *If you are not able to fix the damage according to this operating manual yourself:*
Have the damage repaired by a qualified specialist workshop.

Observe the technical limit values

Non-observance of the technical limits values of the machine can result in accidents and serious personal injury or even death. Moreover, the machine can be damaged. The technical limit values can be found in the Technical Data.

- ▶ Comply with the technical limit values.

2.1.2.4.2 Personal protective equipment

CMS-T-00002316-B.1

Personal protective equipment

Wearing personal protective equipment is an important safety element. Missing or unsuitable personal protective equipment increases the risk of damage to health and personal injury. Personal protective equipment includes: work gloves, safety shoes, protective clothing, breathing protection, hearing protection, face protection, and eye protection

- ▶ Determine the personal protective equipment required for each job and have it ready.
- ▶ Use only protective equipment that is in proper condition and offers effective protection.
- ▶ Adjust the personal protective equipment to the person, e.g. the size.
- ▶ Observe the manufacturer's instructions regarding operating materials, seed, fertiliser, crop protection products, and cleaning agents.

Wear suitable clothing

Loosely worn clothing increases the risk of getting caught or entangled on rotating parts and getting stuck on protruding parts. This can result in serious injury or death.

- ▶ Wear close-fitting, snag-free clothes.
- ▶ Never wear rings, necklaces and other jewellery.
- ▶ *If you have long hair,*
wear a hairnet.

2.1.2.4.3 Warning symbols

CMS-T-00002317-B.1

Keep warning symbols legible

Warning symbols on the machine warn you of risks in danger areas and are an important element of the machine's safety equipment. Missing warning symbols increase the risk of serious and lethal personal injury.

- ▶ Clean dirty warning symbols.
- ▶ Immediately replace any damaged and illegible warning symbols.
- ▶ Put the intended warning symbols on spare parts.

2.1.3 Knowing and preventing dangers

CMS-T-00002303-F.1

2.1.3.1 Safety hazards on the implement

CMS-T-00002318-F.1

Liquids under pressure

Escaping high pressure hydraulic fluid can penetrate into the body through the skin and cause serious personal injuries. A hole the size of a needle can already result in serious personal injuries.

- ▶ *Before you uncouple the hydraulic hose lines or check for damage,*
depressurise the hydraulic system.
- ▶ *If you suspect damage on a pressure system,*
have the pressure system checked by a qualified specialist workshop.
- ▶ Never look for leaks with your bare hands.
- ▶ Keep your body and face away from leaks.
- ▶ *If liquids penetrate the body,*
consult a doctor immediately.

Risk of injury on the universal joint shaft

Persons can be caught, pulled in and severely injured by the universal joint shaft and driven components. If the universal joint shaft is overloaded, the implement can be damaged, parts can be ejected at high speed, and persons can be injured.

- ▶ Maintain sufficient coverage of the profile tube, universal joint shaft guard and PTO shaft protective cap.
- ▶ Maintain the direction of rotation and the permissible speed of the universal joint shaft.
- ▶ *If the universal joint shaft is angled down too strongly:*
Switch off the universal joint shaft drive.
- ▶ *If you do not need the universal joint shaft:*
Switch off the universal joint shaft drive.

Risk of injury on the PTO shaft

Persons can be caught, pulled in and severely injured by the PTO shaft and driven components. If the PTO shaft is overloaded, the implement can be damaged, parts can be ejected at high speed, and persons can be injured.

- ▶ Maintain sufficient coverage of the profile tube, universal joint shaft guard and PTO shaft protective cap.
- ▶ Allow the locks on the PTO shaft to engage.
- ▶ *To secure the universal joint shaft guard against rotating:*
Hook on the safety chains.
- ▶ *To secure the coupled hydraulic pump against rotating:*
Put on the torque support.
- ▶ Maintain the direction of rotation and the permissible speed of the PTO shaft.
- ▶ *To prevent implement damage due to torque peaks:*
Slowly couple the PTO shaft at low tractor engine speed.

Danger due to machine parts still running

When the drives are switched off, machine parts can continue running and cause serious personal injury or death.

- ▶ Before approaching the machine, wait until any machine parts that are still running have come to a stop.
- ▶ Only touch machine parts that are standing still.

2.1.3.2 Danger areas

CMS-T-00002319-C.1

Dangers areas on the machine

The following basic dangers are encountered in the danger areas:

The implement and its work tools move during operation.

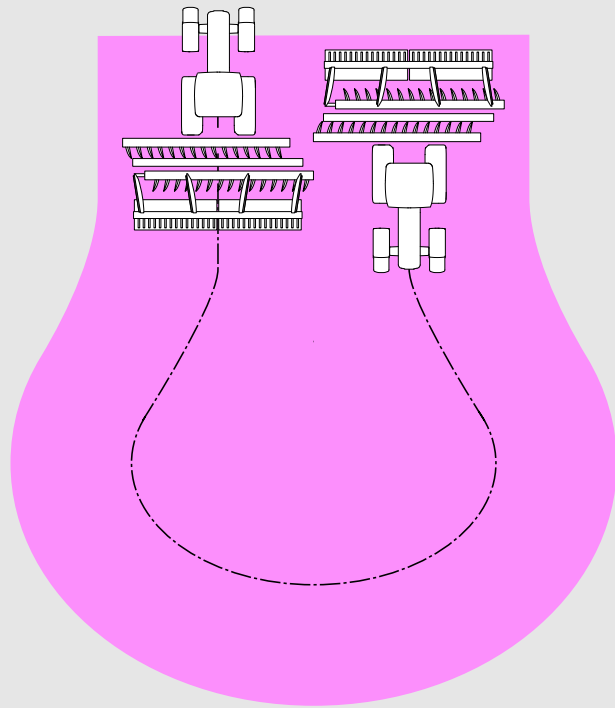
Hydraulically raised machine parts can descend unnoticed and slowly.

The tractor and implement can roll away unintentionally.

Materials or foreign objects can be ejected out of or away from the implement.

If the danger area is not observed, it can result in serious personal injury or death.

- ▶ Keep people out of the danger area of the machine.
- ▶ *If people enter the danger area,* immediately switch off the engines and drives.
- ▶ *Before you work in the danger area of the implement,* secure the tractor and implement. This also applies for quick checking work.



CMS-I-001131

2.1.4 Safe operation and handling of the machine

CMS-T-00002304-J.1

2.1.4.1 Coupling implements

CMS-T-00002320-D.1

Coupling the implement on the tractor

Incorrectly coupling of the implement to the tractor results in hazards that can cause serious accidents.

There are crushing and shear points in the area of the coupling points between the tractor and the implement.

- ▶ *If you couple or uncouple the implement to or from the tractor,* be very careful.
- ▶ Use only suitable tractors for coupling and transporting the implement.
- ▶ *When the implement is coupled onto the tractor,* make sure that the tractor's connecting device meets the implement requirements.
- ▶ Couple the implement properly to the tractor.

2.1.4.2 Driving safety

CMS-T-00002321-F.1

Risk when driving on roads and fields

Any mounted or towed implement as well as front or rear ballast weights on the tractor influence the driving behaviour and the steering and braking power of the tractor. The driving characteristics also depend on the operating condition, the fill level of the load, and on the ground. If the driver does not take account of changing driving characteristics, he can cause accidents.

- ▶ Always ensure that the tractor's steering and braking systems are operating correctly.
- ▶ *The tractor must provide the required brake lag for the tractor and mounted implement.*
Check the function of the brakes before moving off.
- ▶ *The tractor front axle must always be loaded with at least 20 % of the empty tractor weight to ensure sufficient steering capacity.*
Use front ballast weights if necessary.
- ▶ Always attach the front or rear ballast weights properly on the specified fixing points.
- ▶ Calculate and observe the permitted payload for the mounted or towed implement.
- ▶ Observe the permissible axle loads and drawbar loads of the tractor.
- ▶ Observe the permissible drawbar load of the hitch device and drawbar.
- ▶ Comply with the permissible transport width of the implement.
- ▶ Drive in such a way that you always have full control over the tractor with the mounted or towed implement. In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor, and the influence of the mounted implement.

When driving on roads, risk of accident caused by uncontrolled lateral motions of the implement

- ▶ Lock the tractor lower links for road travel.

Preparing the machine for road travel

If the machine is not properly prepared for road travel, it can result in serious traffic accidents.

- ▶ Check the lighting and identification for road travel for proper function.
- ▶ Remove coarse dirt from the implement.
- ▶ Follow the instructions in the section "Preparing the implement for road travel".

Parking the implement

The parked machine can tip over. People can be crushed and killed.

- ▶ Only park the machine on stable and even ground.
- ▶ *Before you perform setting or maintenance work,* make sure that the implement is in a stable position. In case of doubt, support the implement.
- ▶ Follow the instructions in the section "*Parking the implement*".

Unsupervised parking

Parked tractors with coupled implements that are insufficiently secured and unsupervised represent danger for people and playing children.

- ▶ *Before you leave the machine,* shutdown the tractor and the implement.
- ▶ Secure the tractor and machine.

Do not use the control computer or control terminal during road travel

If the driver is distracted, it can result in accidents and injuries or even death.

- ▶ Do not operate the control computer or control terminal during road travel.

2.1.5 Safe maintenance and modification

CMS-T-00002305-J.1

2.1.5.1 Changes on the implement

CMS-T-00002322-B.1

Only authorised design changes

Design changes and extensions can impede the functioning and operational safety of the machine. This can result in serious injury or death.

- ▶ Have any design changes and extensions performed only by a qualified specialist workshop.
- ▶ *To ensure that the operating permit remains valid in accordance with national and international regulations,* ensure that the specialist workshop only uses conversion parts, spare parts and special equipment approved by AMAZONE.

2.1.5.2 Work on the machine

CMS-T-00002323-I.1

Only work on the machine when it is at a standstill

If the machine is not standing still, part can move unintentionally or the machine can be set in motion. This can result in serious injury or death.

- ▶ *If you have to work on or under raised loads:*
Lower the loads or secure the loads with a hydraulic or mechanical locking device.
- ▶ Switch off all drives.
- ▶ Actuate the parking brake.
- ▶ Particularly on slopes, additionally secure the machine against rolling away with wheel chocks.
- ▶ Remove the ignition key and carry it with you.
- ▶ Wait until all parts that are still running come to a stop and that hot parts cool down.

Maintenance work

Improper maintenance work, particularly on safety-related components, endangers operational safety. This can result in accidents and serious personal injury or even death. Safety-related components include, for example, hydraulic components, electronic components, frames, springs, trailer coupling, axles and axle suspensions, lines and tanks containing flammable substances.

- ▶ *Before you adjust, maintain or clean the machine,*
secure the machine.
- ▶ Repair the machine according to this operating manual.
- ▶ Only perform the work that is described in this operating manual.
- ▶ Have maintenance work that is labelled as "*WORKSHOP WORK*" performed at a workshop that is adequately equipped in terms of agricultural technology, safety and environmental technology by specialist personnel with appropriate training.
- ▶ Never perform welding, drilling, sawing, grinding, and cutting work on the frame, running gear or coupling devices of the implement.
- ▶ Never modify safety-related components.
- ▶ Never drill out existing holes.
- ▶ Perform all maintenance work at the prescribed maintenance intervals.

Raised implement parts

Raised implement parts can descend unintentionally and crush or kill people.

- ▶ Never linger under raised implement parts.
- ▶ *If you have to work on or under raised machine parts,*
lower the implement parts or secure the raised implement parts with a mechanical support or hydraulic locking device.

Danger due to welding work

Improper welding work, particularly on or close to safety-related components, endangers the operational safety of the implement. This can result in accidents and serious personal injury or even death. Safety-related components include, for example, hydraulic components and electronic components, frames, springs, coupling devices to the tractor such as the three-point mounting frame, drawbar, trailer support, trailer coupling or tensioned crosspiece as well as axles and axle suspensions, lines and tanks containing flammable substances.

- ▶ Allow only qualified specialist workshops with suitably approved personnel to perform welding work on safety-related components.
- ▶ Only allow qualified personnel to perform welding work on all other components.
- ▶ *If you have doubts as to whether a component can be welded:*
Ask a qualified specialist workshop.
- ▶ *Before welding on the implement:*
Uncouple the implement from the tractor.
- ▶ Do not weld close to a crop protection sprayer that was previously used to spread liquid fertiliser.

2.1.5.3 Operating materials

CMS-T-00002324-C.1

Unsuitable operating materials

Operating materials that do not meet AMAZONE requirements can cause implement damage and accidents.

- ▶ Only use operating material that meet the requirements in the Technical Data.

2.1.5.4 Special equipment and spare parts

CMS-T-00002325-B.1

Special equipment, accessories, and spare parts

Special equipment, accessories, and spare parts that do not meet AMAZONE requirements can impede the operational safety of the implement and cause accidents.

- ▶ Only use original parts or parts that meet AMAZONE requirements.
- ▶ *If you have any questions regarding special equipment, accessories or spare parts, contact your dealer or AMAZONE.*

2.2 Safety routines

CMS-T-00002300-D.1

Securing the tractor and implement

If the tractor and implement are not secured against unintentional starting and rolling away, the tractor and implement can be set in motion in an uncontrolled manner, and can run over, crush and kill people.

- ▶ Lower the raised implement or raised implement parts.
- ▶ Relieve pressure in the hydraulic hose lines by actuating the operating devices.
- ▶ *If you have to stand under the raised implement or components, secure the raised implement and components against lowering with a mechanical safety support or hydraulic locking device.*
- ▶ Switch off the tractor.
- ▶ Apply the tractor's parking brake.
- ▶ Remove the ignition key.

Securing the machine

After uncoupling, the implement has to be secured. If the implement and implement parts are not secured, there is a risk of personal injury due to crushing and cutting.

- ▶ Only park the implement on stable and level ground.
- ▶ *Before you depressurise the hydraulic hose lines and disconnect them from the tractor, move the implement into working position.*
- ▶ Protect people against direct contact with sharp-edged or protruding implement parts.

Make sure that the protective equipment is functional

If protective equipment is missing, damaged or removed, implement parts can cause serious personal injury or even death.

- ▶ Check the implement at least once a day for damage, proper installation, and functioning of the protective equipment.
- ▶ *If you are not sure if the protective equipment is properly installed and functional,* have the protective equipment checked by a qualified specialist workshop.
- ▶ Make sure that the protective devices are properly installed and functional before any work on the implement.
- ▶ Replace damaged protective equipment.

Climbing on and off

Negligent behaviour while climbing on and off can cause people to fall off the ladder. People who climb onto the implement without using the intended access steps can slip, fall, and suffer severe injury. Dirt and operating materials can impair stepping and standing safety. Accidental actuation of control elements can unintentionally activate potentially dangerous functions.

- ▶ Use only the intended access steps.
- ▶ *To ensure safe stepping and standing:*
Always keep steps and platforms clean and in proper condition.
- ▶ *When the implement is moving:*
Never climb onto or off of the implement.
- ▶ Climb up and down facing the implement.
- ▶ When climbing up and down, maintain contact with at least 3 points on the steps and handrails: always keep 2 hands and one foot or 2 feet and one hand on the implement.
- ▶ When climbing up and down, never hold onto the control elements.
- ▶ When climbing down, never jump off of the implement.

Intended use

3

CMS-T-00004061-B.1

- The implement is intended solely for professional use for soil tillage on agricultural crop lands according to Good Agricultural Practices.
- The implement is an agricultural implement to be mounted on the three-point power lift of a tractor that meets the technical requirements.
- The implement is suitable and intended for shallow stubble cultivation, seedbed preparation, and primary soil tillage.
- The implement can be used on fields with a soil strength of up to 3.0 MPa.
- When driving on public roads, the implement, depending on the provisions of the applicable road traffic regulations, can be mounted and transported at the rear of a tractor that meets the technical requirements.
- The implement may only be used and maintained by persons who fulfil the requirements. The personnel requirements are described in the section "*Personnel qualification*".
- The operating manual is part of the implement. The implement is solely intended for use in compliance with this operating manual. Uses of the implement that are not described in this operating manual can lead to serious personal injuries or even death and to implement and material damage.
- The applicable accident prevention regulations as well as generally accepted safety-related, occupational health and road traffic regulations must also be observed by the users and the owner.
- Further instructions for intended use in special cases can be requested from AMAZONE.
- Uses other than those specified under the intended use are considered as improper. The manufacturer is not liable for any damage resulting from improper use, solely the operator is responsible.

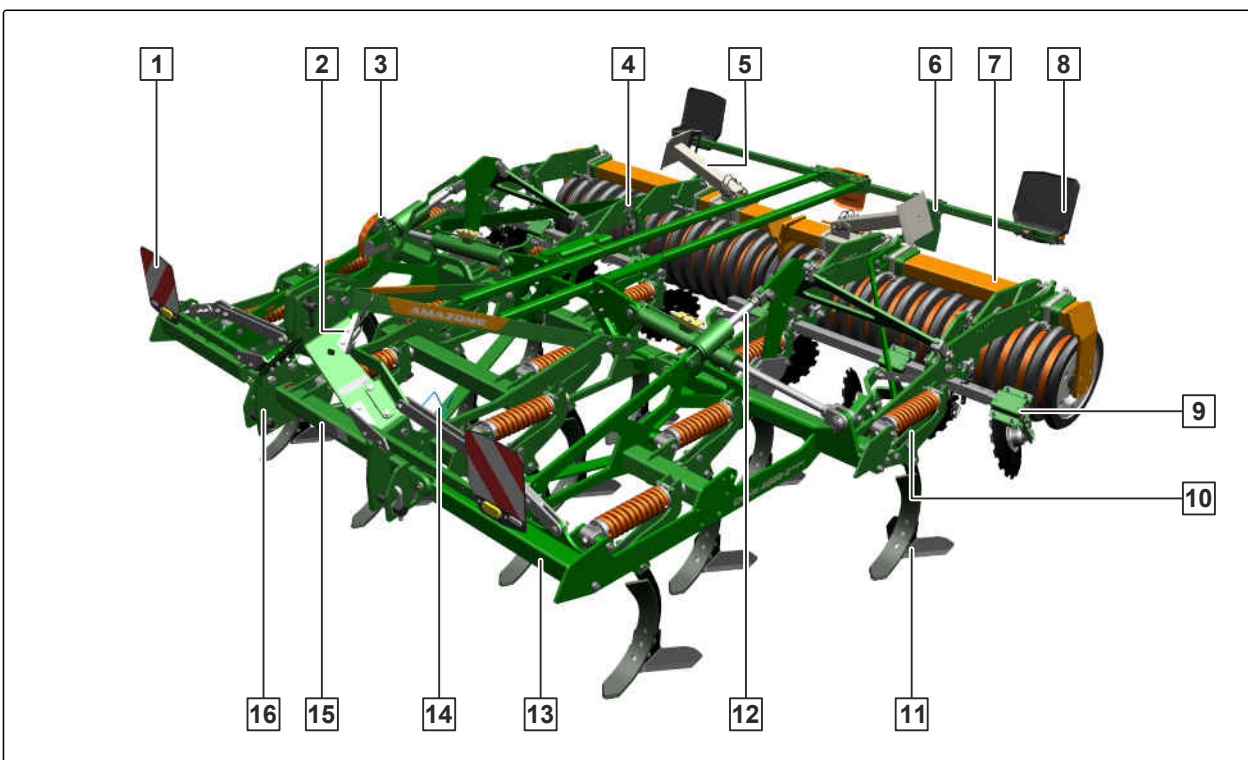
Product description

4

CMS-T-00015659-A.1

4.1 Implement overview

CMS-I-00015662-A.1



CMS-I-00010388

- | | |
|--|--|
| 1 Front lighting and identification for road travel | 2 Hose cabinet |
| 3 Working depth indicator of the coulters | 4 Automatic working depth adjustment of the levelling unit |
| 5 Jack | 6 Additional license plate |
| 7 Roller | 8 Rear lighting and identification for road travel |
| 9 Levelling | 10 Compression spring overload safety or shear bolt overload safety |
| 11 Tine with coulter | 12 Hydraulic working depth adjustment of the coulters |
| 13 Hydraulically folding sections | 14 Threaded cartridge |
| 15 Rating plate on the implement | 16 Three-point mounting frame |

4.2 Function of the implement

CMS-T-00004093-A.1

The tines loosen up the soil.

The levelling unit levels the soil.

The roller reconsolidates the soil.

The rear harrow crumbles the soil and deposits cut-off plant residues on the soil surface.

4.3 Special equipment

CMS-T-00015660-A.1

Special equipment is equipment that is not fitted on the implement or is only available in certain markets. The sales documents provide information on the equipment of your implement, or consult your dealer for more detailed information.

The following equipment is considered special equipment:

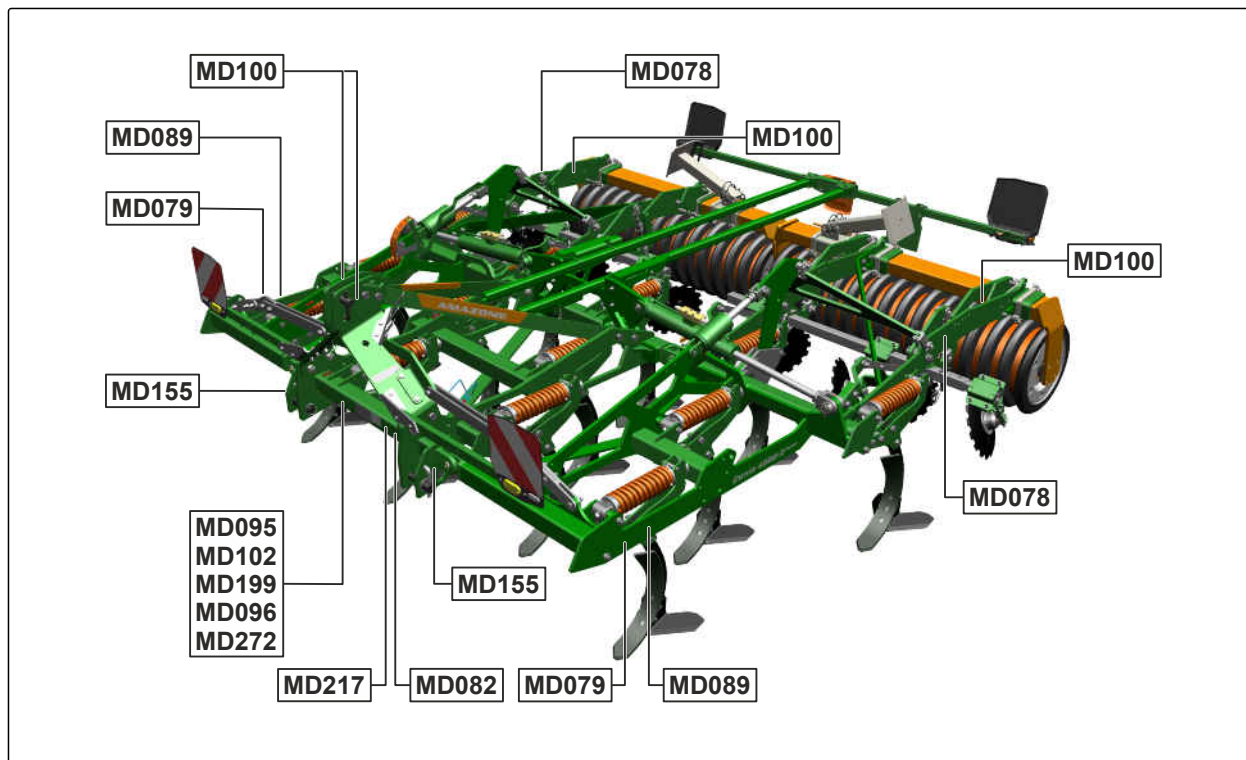
- Lighting and identification for road travel

4.4 Warning symbols

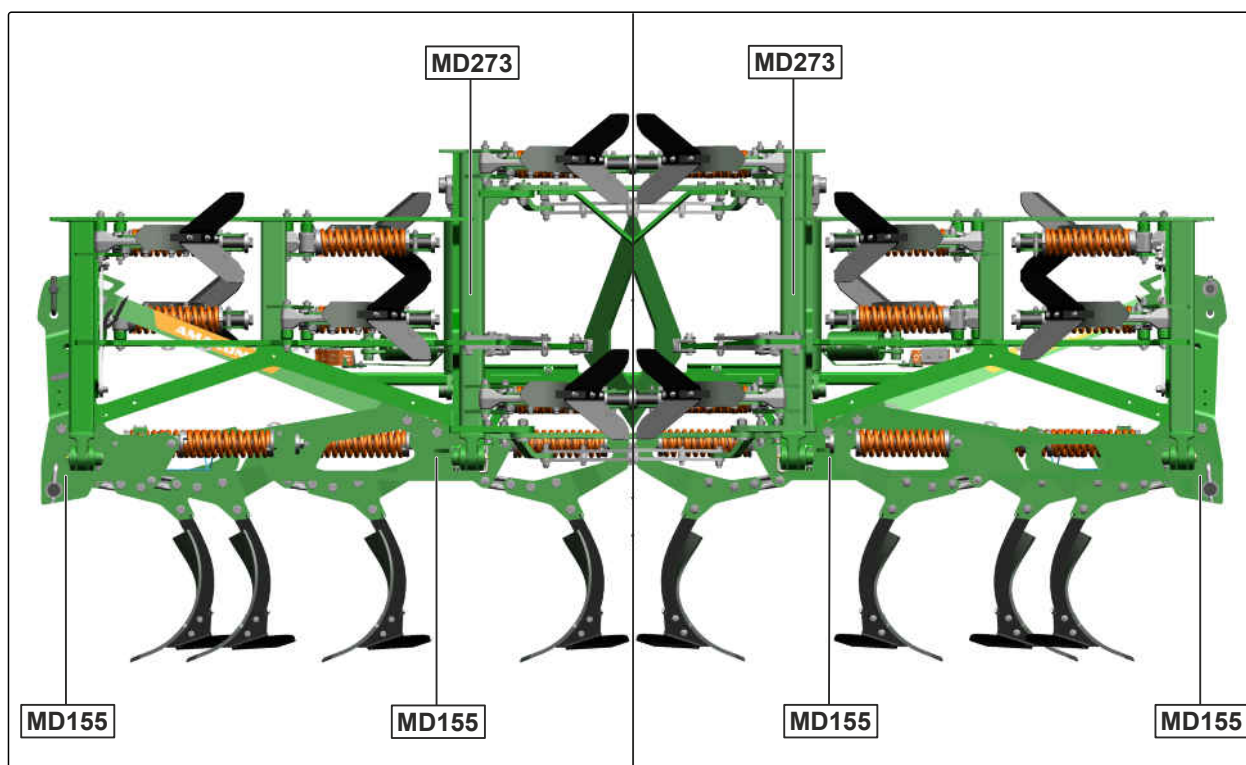
CMS-T-00015664-A.1

4.4.1 Positions of the warning symbols

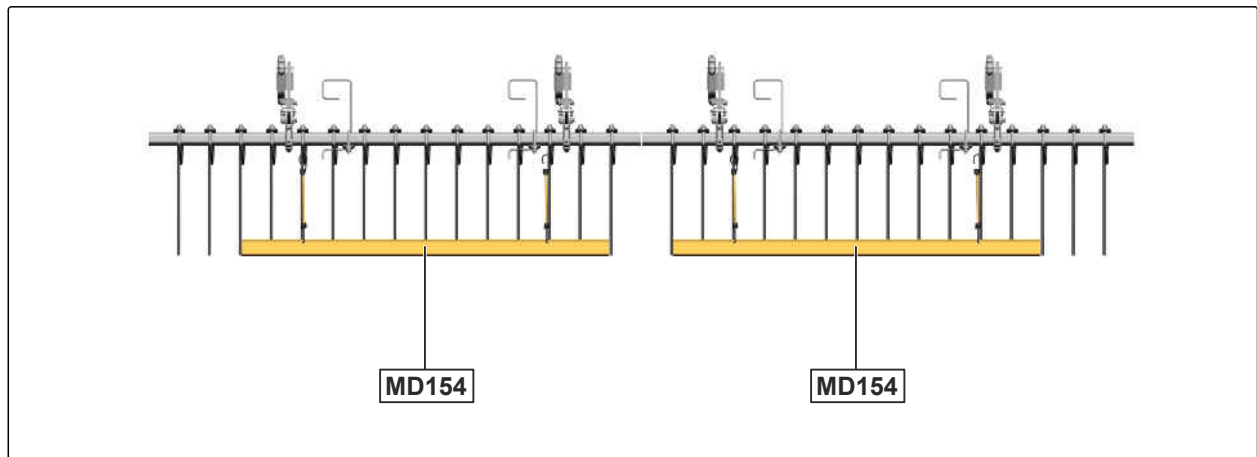
CMS-T-00015666-A.1



CMS-I-00010389



CMS-I-00010391



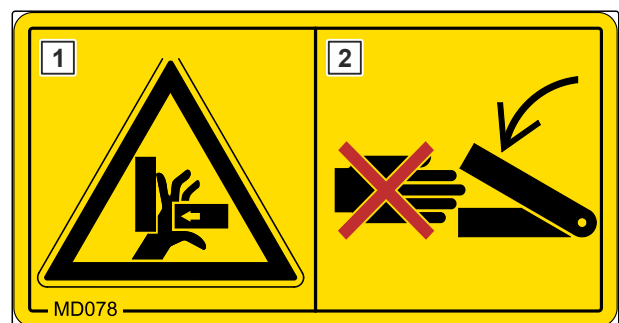
CMS-I-00010392

4.4.2 Layout of the warning symbols

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

A warning symbol consists of two fields:

- Field **1** shows the following:
 - A pictogram depicting the danger area, surrounded by triangular safety symbol
 - The order number
- Field **2** shows a pictogram depicting how to avoid the danger.



CMS-T-000141-D.1

CMS-I-00000416

4.4.3 Description of the warning symbols

MD 078

Risk of crushing fingers or hands

- ▶ Disconnect the power supply from the implement before approaching the danger zone.
- ▶ Wait until all moving parts are at a standstill before reaching into the danger area.
- ▶ Make sure that there is nobody standing in the danger area or close to the moving parts.



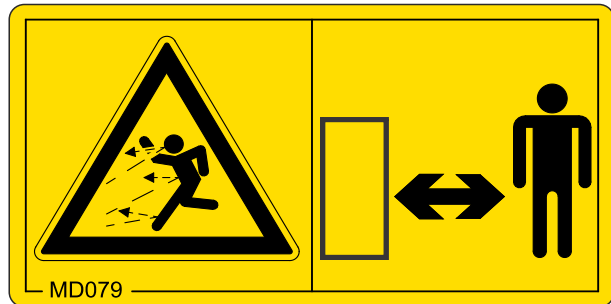
CMS-T-00015665-A.1

CMS-I-000074

MD 079

Danger due to ejected material

- Make sure that there is nobody standing in the danger area or close to the moving parts.

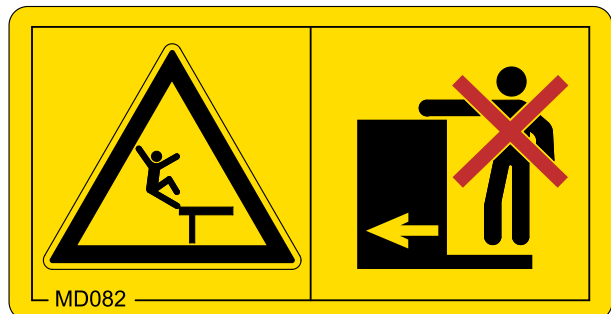


CMS-I-000076

MD 082

Risk of falling from tread surfaces and platforms

- Do not let anybody ride on the implement.
- Do not let anybody climb onto the driving implement.

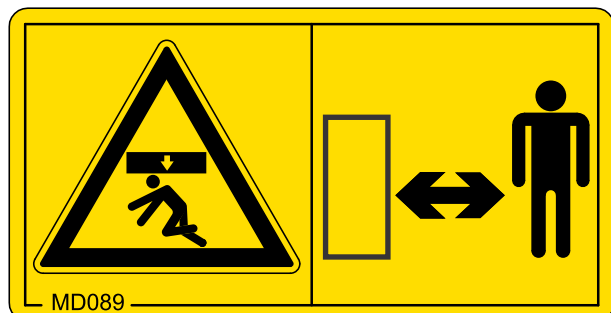


CMS-I-000081

MD089

Risk of crushing from the machine parts unintentionally lowering

- Make sure that there is nobody standing in the danger area.



CMS-I-00003027

MD095

Risk of accident due to non-compliance with the instructions in this operating manual

- Before your work on or with the implement, read and understand the operating manual.



CMS-I-000138

MD 096

Risk of infection from escaping hydraulic fluid under high pressure

- ▶ Never look for leaks in hydraulic hose lines using your hand or fingers.
- ▶ Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.
- ▶ *If you are injured by hydraulic oil, consult a doctor immediately.*

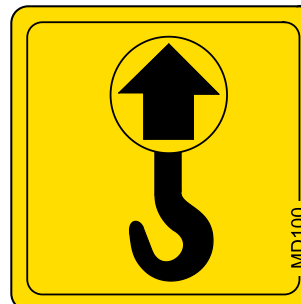


CMS-I-000216

MD 100

Risk of accidents due to improperly attached lifting gear

- ▶ Only attach the lifting gear at the marked positions.



CMS-I-000089

MD 102

Danger due to unintentional starting as well as unintentional and uncontrolled movements of the implement

- ▶ Before all tasks, secure the implement against unintentional starting as well as unintentional and uncontrolled movements.

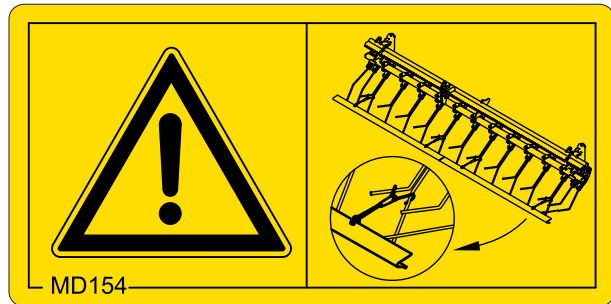


CMS-I-00002253

MD 154

Risk of injury or even death due to unprotected seeding harrow tines

- *Before driving on public roads,* put on the road safety bar as described in the operating manual.

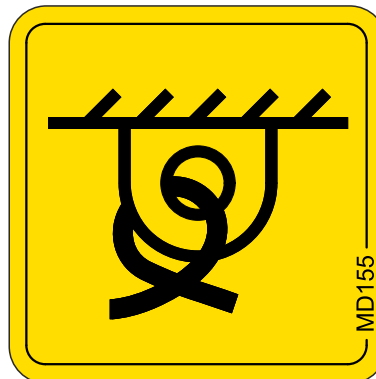


CMS-I-00003657

MD 155

Risk of accident and machine damage during transport due to improperly secured machine

- Only attach the lashing belts at the marked lashing positions for transporting the machine.



CMS-I-00000450

MD 199

Risk of accident if the hydraulic system pressure is too high

- Only couple the implement to tractors with a maximum tractor hydraulic pressure of 210 bar.



CMS-I-00000486

MD 217

Danger due to the implement tipping over

- ▶ Never park the implement in transport position.



CMS-I-000141

MD272

Risk of crushing between the tractor and the implement

- ▶ *Before you actuate the tractor hydraulic system,* instruct persons away from the area between the tractor and the implement.
- ▶ Actuate the tractor hydraulic system only from the designated work station.



CMS-I-00005276

MD 273

Risk of crushing for the whole body from lowering implement parts

- ▶ Make sure that there is nobody standing in the danger area.



CMS-I-00004833

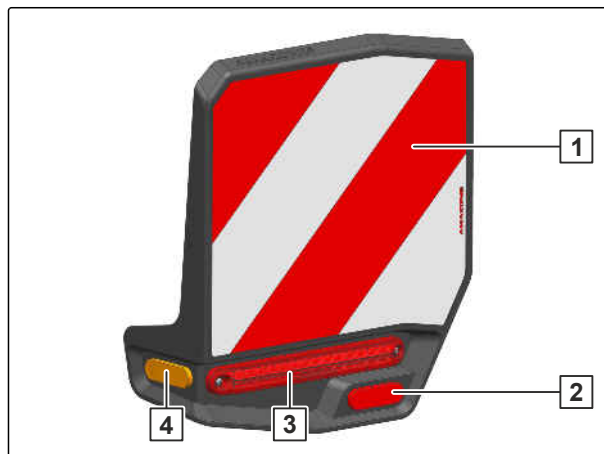
4.5 Lighting and identification for road travel

CMS-T-00015720-A.1

4.5.1 Rear lighting and identification for road travel

CMS-T-00001498-F.1

- 1 Warning signs
- 2 Reflector, red
- 3 Rear lights, brake lights, and turn indicators
- 4 Reflector, yellow



CMS-I-00004545



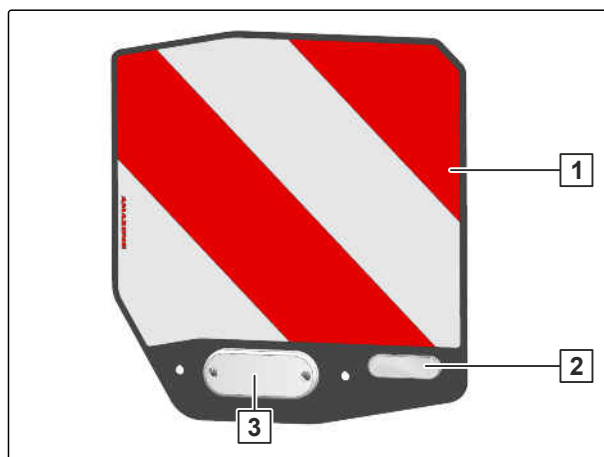
NOTE

The lighting and identification for road travel can vary depending on the national regulations.

4.5.2 Front lighting and identification

CMS-T-00006393-B.1

- 1 Warning signs
- 2 Reflector, white
- 3 Side marker lights



CMS-I-00002940



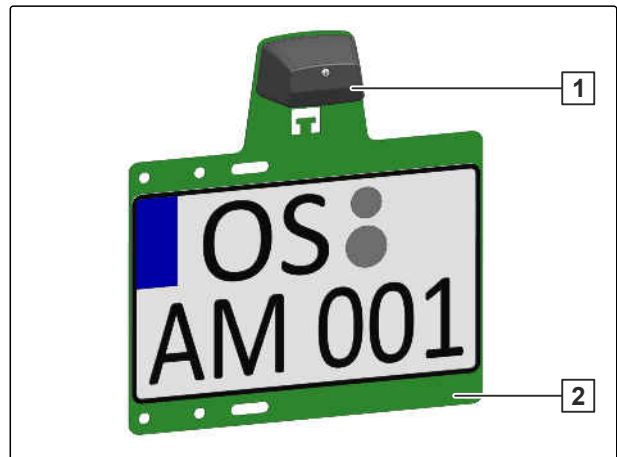
NOTE

The lighting and identification for road travel can vary depending on the national regulations.

4.5.3 Additional license plate

CMS-T-00003999-C.1

- 1 Licence plate lighting
- 2 Licence plate holder

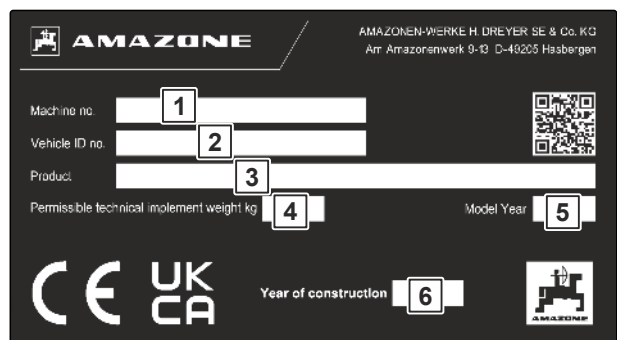


CMS-I-00003163

4.6 Rating plate on the implement

CMS-T-00004505-J.1

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



CMS-I-00004294

4.7 Other information on the implement

CMS-T-00015905-A.1

4.7.1 Information picture for checking the tine connection

CMS-T-00015906-A.1

The information picture indicates that the bolted connections of tines with compression spring overload safety must be checked regularly for centred and tight fit.



CMS-I-00010476

4.8 Threaded cartridge

CMS-T-00001776-E.1

The threaded cartridge contains the following items:

- Documents
- Aids



CMS-I-00002306

4.9 Soil tillage tools

CMS-T-00015721-A.1

4.9.1 Tine

CMS-T-00004096-B.1

4.9.1.1 Tines with compression spring overload safety

CMS-T-00004482-B.1

The compression spring allows the tine to deflect in overload situations.

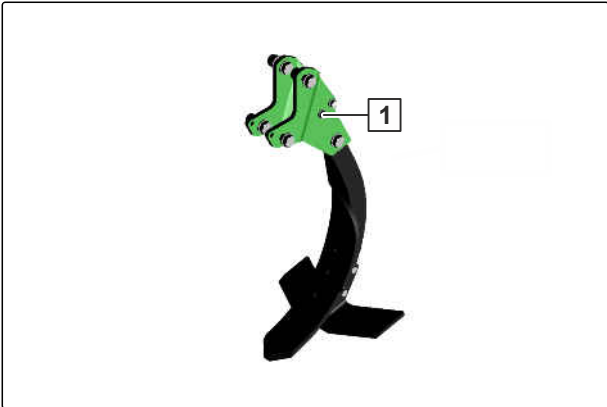


CMS-I-00003022

4.9.1.2 Tines with shear bolt overload safety

CMS-T-00004483-A.1

In the event of an overload, the shear bolt **1** shears off.



CMS-I-00003021

4.9.2 Coulters

CMS-T-00015722-A.1

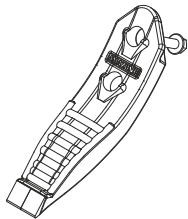
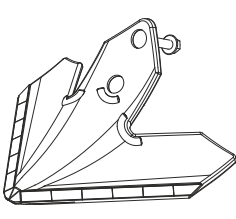
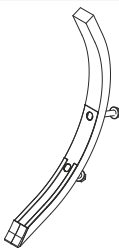
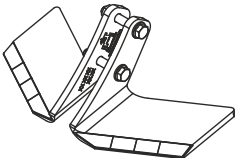
4.9.2.1 Work patterns of the coulter

CMS-T-00008768-C.1

Coulter	Work pattern
C-Mix-3 coulter 40 mm C-Mix-3 HD coulter 40 mm	
C-Mix-3 coulter tip 80 mm C-Mix-3 HD coulter tip 80 mm	
C-Mix-3 coulter tip 100 mm	
C-Mix-3 wing	
C-Mix-3 duck foot coulter tip C-Mix-3 HD duck foot coulter tip	

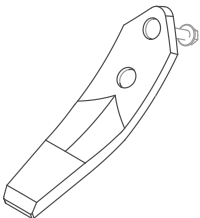
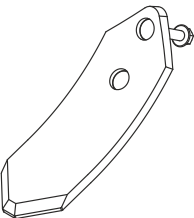
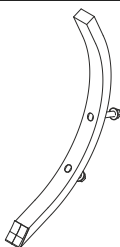
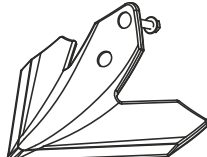
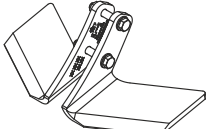
4.9.2.2 C-Mix-3 HD coulters

CMS-T-00008832-C.1

	C-Mix-3 HD coulters tip 80 mm	C-Mix-3 HD duck foot coulters tip	C-Mix-3 HD coulters 40 mm	C-Mix-3 HD wing
Figure				
Coulter width	8 cm	32 cm	40 mm	350 mm or 430 mm
Working depth	12-30 cm	3-10 cm	20-30 cm	-
Can be combined with:				
C-Mix-3 deflector plate 80 mm	X	X		X
C-Mix-3 deflector plate 100 mm		X		X

4.9.2.3 C-Mix-3 coulters

CMS-T-00008834-C.1

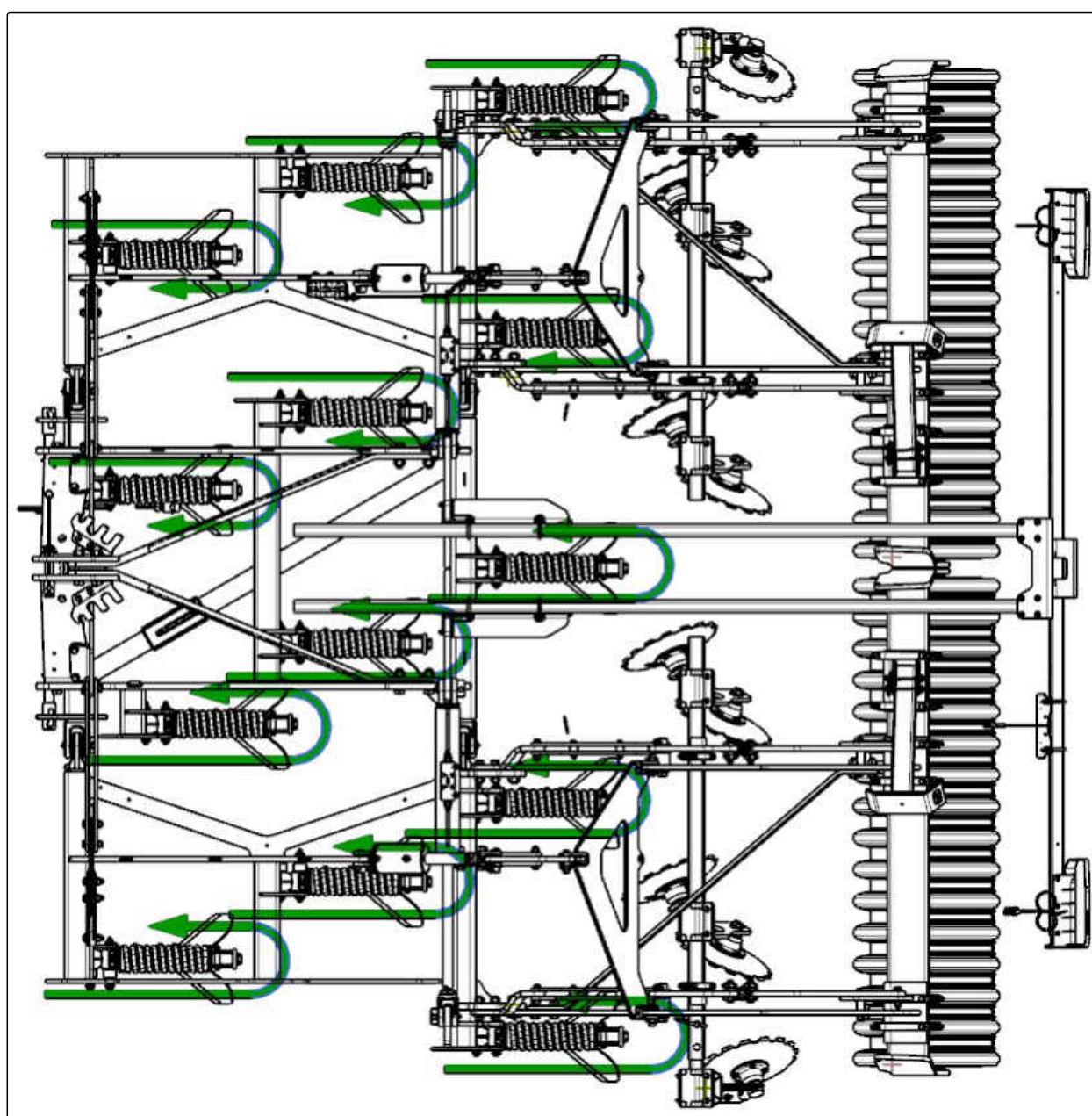
	C-Mix-3 coulters tip 80 mm	C-Mix-3 coulters tip 100 mm	C-Mix-3 coulters 40 mm	C-Mix-3 duck foot coulters tip	C-Mix-3 wing
					
Coulter width	8 cm	10 cm	4 cm	320 mm	35 cm or 43 cm
Working depth	12-30 cm	10-20 cm	20-30 cm	3-10 cm	-
Can be combined with:					
C-Mix-3 deflector plate 80 mm	X	X		X	X

	C-Mix-3 coulter tip 80 mm	C-Mix-3 coulter tip 100 mm	C-Mix-3 coulter 40 mm	C-Mix-3 duck foot coulter tip	C-Mix-3 wing
C-Mix-3 deflector plate 100 mm		X		X	X

4.9.2.4 Deflector guide arrangement on the Cenio 4000-2

CMS-T-00015723-A.1

The deflector guide arrangement is variable. The figure shows the recommended, factory-mounted deflector guide arrangement. The arrows show the throw direction produced by the deflector plates.



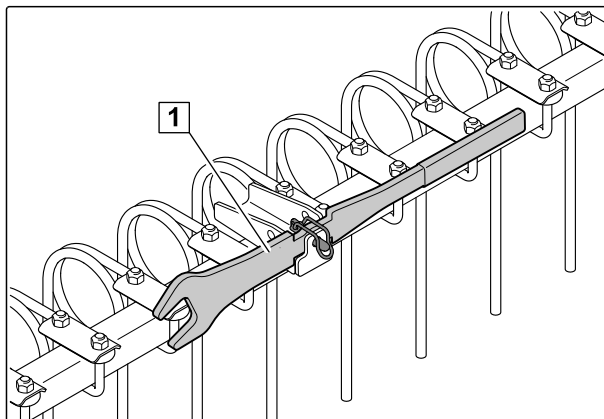
CMS-I-00010272

4.10 Setting lever for the trailing elements

CMS-T-00012588-A.1

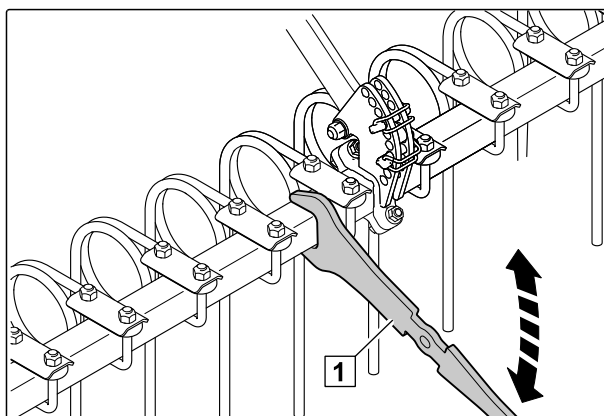
With the setting lever, the tilt of the harrow systems, the double harrow, the spring blade system and the spring clearer system can be conveniently adjusted.

1 Setting lever in parking position



CMS-I-00002241

1 Setting lever in set position



CMS-I-00007912

Technical data

5

CMS-T-00015657-A.1

5.1 Dimensions

CMS-T-00015658-A.1

Working width	4 m
Transport width	3 m
Transport height	2.25 m
Transport length with lighting for road travel	≤ 4.8 m
Underbeam clearance	75 cm
Centre of gravity distance (d) for heaviest equipment	≤ 2 m

5.2 Soil tillage tools

CMS-T-00015724-A.1

Line distance	30 cm
Number of tines	13
Number of tine bars	3
Working depth	5–30 cm
Type of tines on the Cenio 4000-2 Special	Tines with shear bolt overload safety
Type of tines on the Cenio 4000-2 Super	Tines with compression spring overload safety and a tripping force of 500 kg

5.3 Permitted mounting categories

CMS-T-00015779-A.1

Three-point mounting frame	Category 3 and Category 4N
----------------------------	----------------------------

5.4 Forward speed

CMS-T-00015725-A.1

Optimal working speed	8–15 km/h
Permissible transport speed	60 km/h

5.5 Performance characteristics of the tractor

CMS-T-00015726-A.1

Engine rating	
130 kW / 175 hp	

Electrical system	
Battery voltage	12 V
Lighting socket	7-pin

Hydraulic system	
Maximum operating pressure	210 bar
Tractor pump output	at least 15 l/min at 150 bar
Implement hydraulic oil	HLP 68 DIN 51524-2 The hydraulic fluid is suitable for the combined hydraulic fluid circuits of all standard tractor brands.
Control units	2, double-acting

5.6 Noise development data



CMS-T-00002296-D.1



The workplace-related emission sound pressure level is lower than 70 dB(A), measured in operating condition at the ear of the tractor driver with the cab closed.

The emission sound pressure level mainly depends on the vehicle used.

5.7 Drivable slope inclination

CMS-T-00002297-E.1

Across the slope		
On left in direction of travel	15 %	
On right in direction of travel	15 %	

Up the slope and down the slope		
Up the slope	15 %	
Down the slope	15 %	

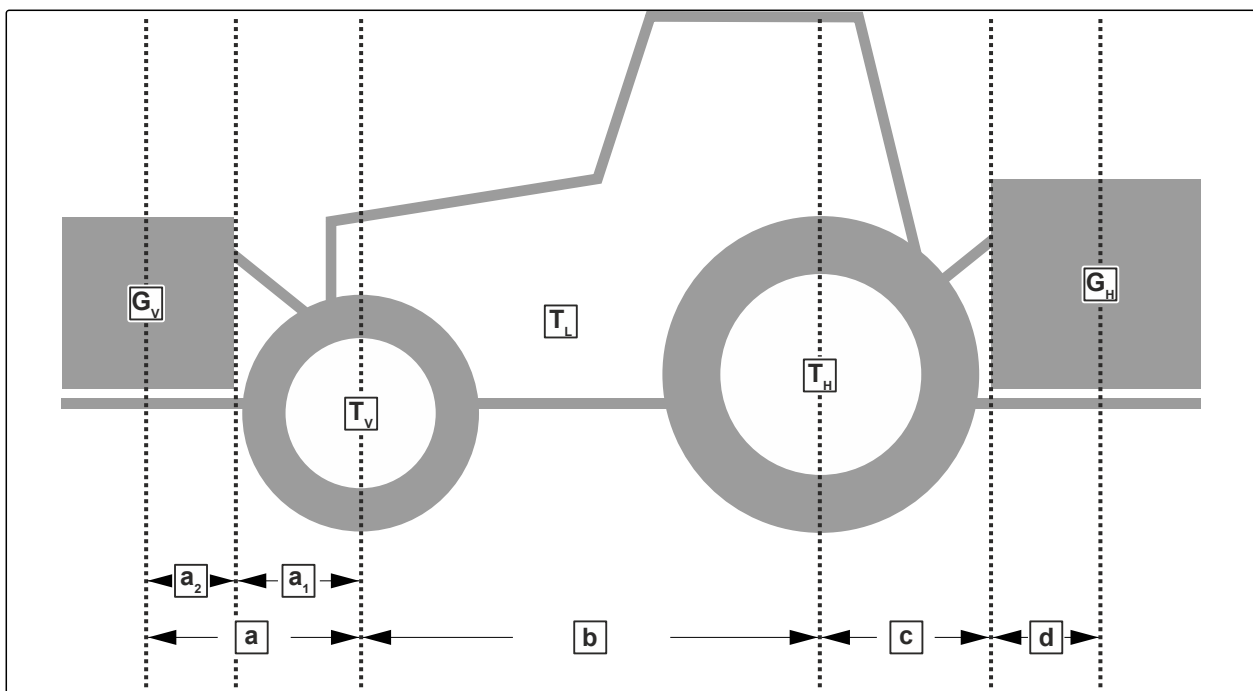
Preparing the machine

6

CMS-T-00015727-A.1

6.1 Calculating the required tractor characteristics

CMS-T-00000063-F.1



CMS-I-00000581

Designation	Unit	Description	Calculated values
T_L	kg	Tractor empty weight	
T_V	kg	Front axle load of the operational tractor without mounted implement or ballast weights	
T_H	kg	Rear axle load of the operational tractor without mounted implement or ballast weights	
G_V	kg	Total weight of front-mounted implement or front ballast	
G_H	kg	Permissible total weight of rear-mounted implement or rear ballast	
a	m	Distance between the centre of gravity of the front-mounted implement or the front ballast and the centre of the front axle	

6 | Preparing the machine

Calculating the required tractor characteristics

Designation	Unit	Description	Calculated values
a_1	m	Distance between the centre of the front axle and the centre of the lower link connection	
a_2	m	Centre of gravity distance: Distance between the centre of gravity of the front-mounted implement or the front ballast and the centre of the lower link connection	
b	m	Wheelbase	
c	m	Distance between the centre of the rear axle and the centre of the lower link connection	
d	m	Centre of gravity distance: Distance between the centre of the lower link coupling point and centre of gravity of the rear-mounted implement or rear ballast.	

1. Calculate the minimum front ballasting.

$$G_{Vmin} = \frac{G_H \cdot (c + d) - T_V \cdot b + 0,2 \cdot T_L \cdot b}{a + b}$$

$$G_{Vmin} = \underline{\hspace{10em}}$$

$$G_{Vmin} = \underline{\hspace{10em}}$$

CMS-I-00000513

2. Calculate the actual front axle load.

$$T_{Vtat} = \frac{G_V \cdot (a + b) + T_V \cdot b - G_H \cdot (c + d)}{b}$$

$$T_{Vtat} = \underline{\hspace{10em}}$$

$$T_{Vtat} = \underline{\hspace{10em}}$$

CMS-I-00000516

3. Calculate the actual total weight of the tractor-implement combination.

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


CMS-I-00000515

4. Calculate the actual rear axle load.

$$T_{Htat} = G_{tat} - T_{Vtat}$$
$$T_{Htat} =$$
$$T_{Htat} =$$

CMS-I-00000514

5. Determine the tyre load capacity for two tractor tyres in the manufacturer specifications.
6. Write down the determined values in the following table.

**IMPORTANT**

Danger of accident due to implement damage caused by excessive loads

► Make sure that the calculated loads are smaller or equal to the permissible loads.

	Actual value according to calculation			Permitted value according to tractor operating manual			Tyre load capacity for two tractor tyres	
Minimum front ballasting		kg	≤		kg		-	-
Total weight		kg	≤		kg		-	-
Front axle load		kg	≤		kg	≤		kg
Rear axle load		kg	≤		kg	≤		kg

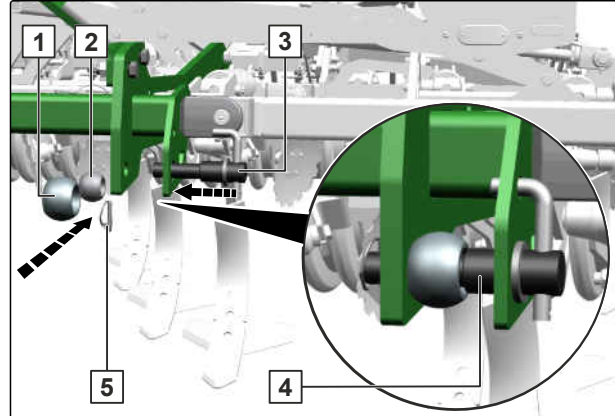
6.2 Coupling the implement

CMS-T-00015730-A.1

6.2.1 Installing the ball sleeves for the lower links

CMS-T-00015794-A.1

1. Remove the linch pin **5**.
2. Pull out the Category 3 **3** or 4N lower link pin.
3. Install a Category 3 **2** ball sleeve with a Category 3 lower link pin
or
Install a Category 4N **1** ball sleeve with a Category 4N **4** lower link pin.
4. Secure the lower link pins with linch pins.
5. Attach the lower link ball sleeve on the other side of the three-point mounting frame in the same way.

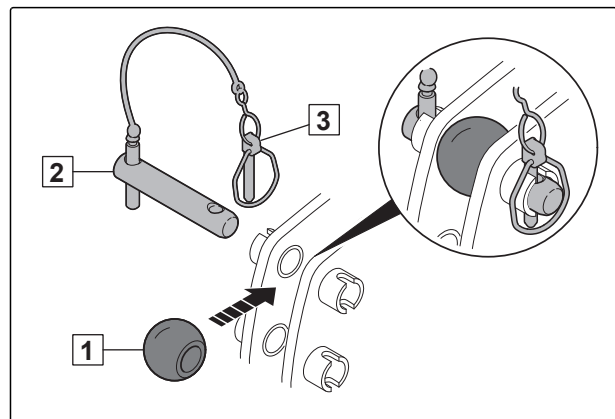


CMS-I-00010359

6.2.2 Attaching the ball sleeve for the top link

CMS-T-00002045-A.1

1. Install the ball sleeve **1** with the top link pin **2**.
2. Secure the top link pin **2** with a linch pin **3**.



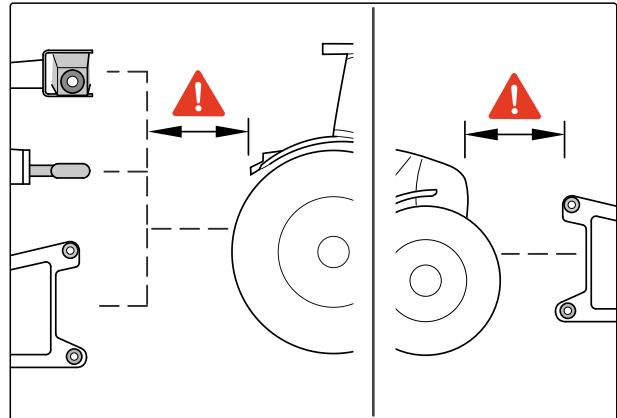
CMS-I-00001223

6.2.3 Driving the tractor towards the implement

CMS-T-00005794-D.1

Enough space must remain between the tractor and implement so that the supply lines can be coupled without obstructions.

- Drive the tractor towards the implement, leaving a sufficient distance.



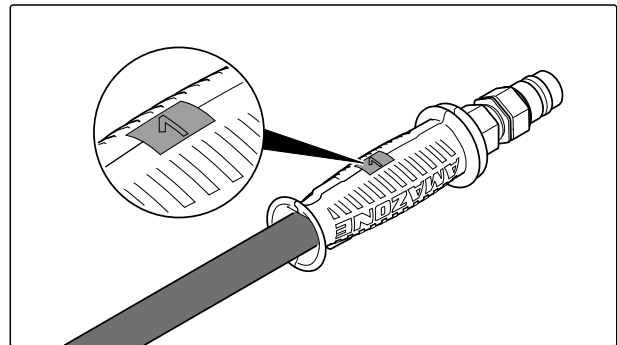
CMS-I-00004045

6.2.4 Coupling the hydraulic hose lines

CMS-T-00015731-A.1

All hydraulic hoses are equipped with handles. The handles have colour markings with a code number or a code letter. The markings are assigned to the respective hydraulic functions of the pressure line of a tractor control unit. Stickers are applied on the implement for the markings, which illustrate the respective hydraulic functions.

The tractor control unit is used with different types of actuation, depending on the hydraulic function:



CMS-I-00000121

Type of actuation	Function	Symbol
Latching	Permanent oil circulation	
Momentary	Oil circulation until action is executed	
Floating	Free oil flow in the tractor control unit	

Designation		Function			Tractor control unit	
Green			Working depth	Increase	Double-acting	
				Reduce		
Blue			Frame sections	Unfold	Double-acting	
				Fold		



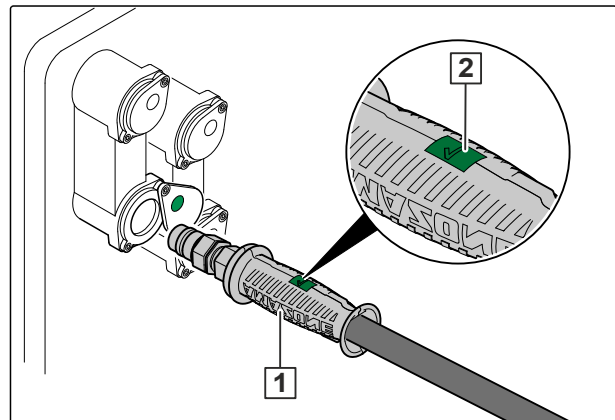
WARNING

Risk of injury or even death

If the hydraulic hose lines are incorrectly connected, the hydraulic functions may be faulty.

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

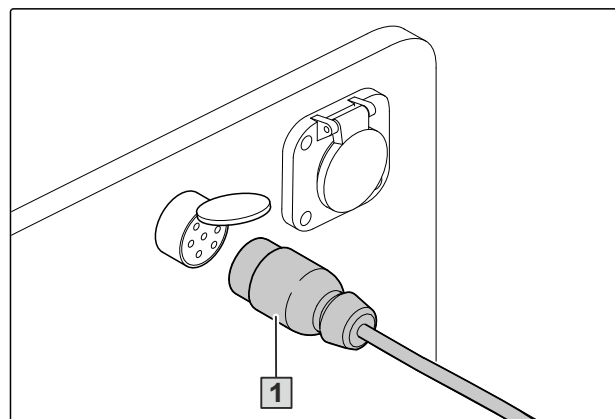
1. Depressurise the hydraulic system between the tractor and the implement using the tractor control unit.
 2. Clean the hydraulic plugs.
 3. Couple the hydraulic hose lines **1** to the hydraulic sockets of the tractor according to the marking **2**.
- ➔ The hydraulic plugs lock perceptibly.
4. Route the hydraulic hose lines with sufficient freedom of movement and without chafing points.



CMS-I-00001045

6.2.5 Coupling the power supply

1. Insert the plug **1** for the power supply.
2. Route the power supply cable with sufficient freedom of movement and without chafing or pinching points.
3. Check the lighting on the implement for proper function.

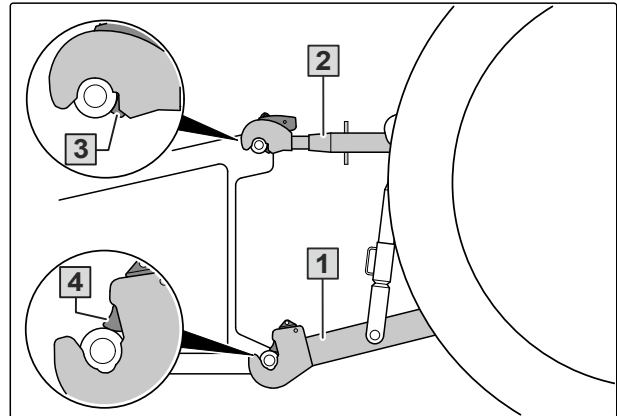


CMS-I-00001048

6.2.6 Coupling the three-point mounting frame

CMS-T-00001400-H.1

1. Set the lower link **1** at the same height.
2. Couple the lower links from the tractor seat.
3. Couple the top link **2**.
4. Check whether the top link catch hooks **3** and lower link catch hooks **4** are correctly locked.



CMS-I-00001225

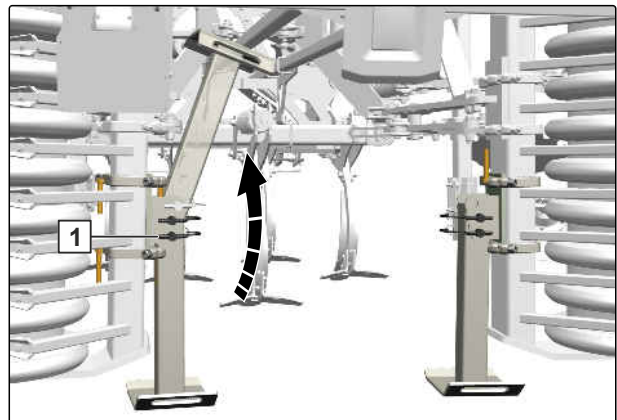
6.2.7 Moving the jacks into transport position

CMS-T-00015751-A.1

REQUIREMENTS

- ✓ Implement is folded

1. Lift the implement with the three-point power lift.
2. Pull the linch pin out of the pin **1**.
3. Pull out the pin.
4. Swivel up the jack.
5. Secure the position with the pin.
6. Secure the pin with the linch pin.
7. Move the second jack into transport position in the same way.



CMS-I-00010361

6.3 Preparing the implement for operation

CMS-T-00015732-A.1

6.3.1 Unlocking the tractor control units

CMS-T-00006819-C.1

- Depending on the equipment, unlock the tractor control units mechanically or electrically.

6.3.2 Unfolding the implement

CMS-T-00015734-A.1



IMPORTANT

Damage to the tines and roller when folding

- Lift the implement completely.



IMPORTANT

Implement damage due to jacks not being moved into transport position

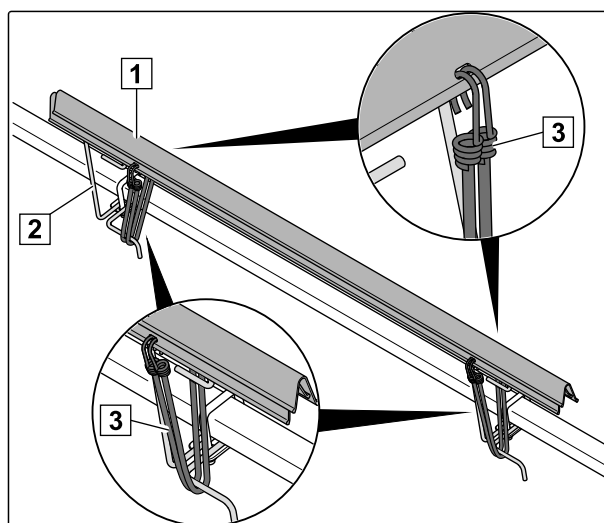
- Before unfolding the implement, make sure that the jacks are in transport position.

1. Completely lift the implement with the three-point power lift.
2. Make sure that the jacks are in transport position, see page 43.
3. Make sure that the space under the implement is clear.
4. Actuate the "blue" tractor control unit until the sections are completely unfolded.

6.3.3 Removing the road safety bars

1. Remove the road safety bars from the harrow system.
2. Turn the traffic safety bars **1** by 180°, place on top of each other on the brackets **2**.
3. Secure the road safety bars with tensioners **3**.

CMS-T-00000091-D.1



CMS-I-00000518

6.3.4 Hydraulic adjustment of the coulter working depth

CMS-T-00005119-C.1



NOTE

If a uniform working depth cannot be adjusted, the hydraulic cylinders must be synchronised.

1. To synchronise the hydraulic cylinders, completely extend the hydraulic cylinders with the "green" tractor control unit.
2. Hold the "green" tractor control unit for 10 seconds.

➔ The hydraulic cylinders will be synchronised.

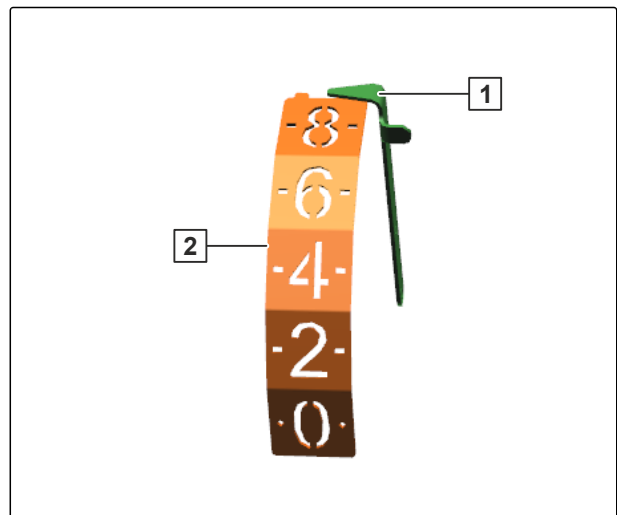
The arrow **1** on the scale **2** shows the set working depth.



NOTE

The scale value only serves for orientation. The scale value does not represent the working depth in centimetres.

3. Adjust the working depth hydraulically using the "green" tractor control unit.



CMS-I-00002447

6.3.5 Adjusting the automatic working depth adjustment of the levelling

CMS-T-00004168-D.1

The working depth of the levelling is automatically adjusted when the working depth of the coulters is adjusted.

The working depth of the levelling relative to the working depth of the coulters can be adjusted using 2 threaded spindles.

Default values for the threaded spindle length:

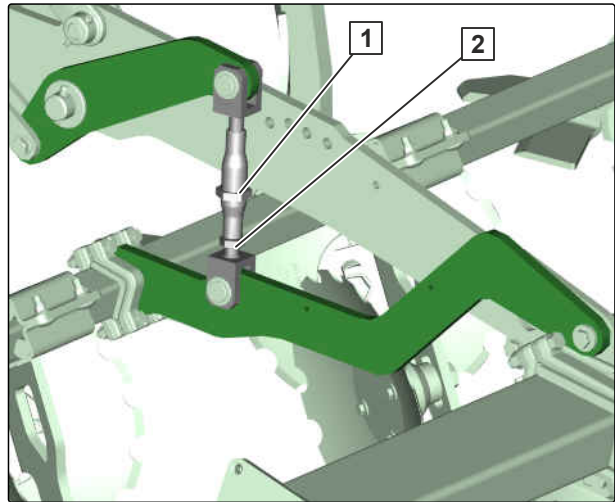
- Levelling with double discs: 315 mm
- Levelling with spring steel closers: 350 mm

Working depth of the levelling	Threaded spindle
increase	lengthen
reduce	shorten

6 | Preparing the machine

Preparing the implement for operation

1. Slightly raise the implement.
2. Remove the lock nut **2**.
3. Adjust the length of the threaded spindle on the hexagon **1** with a spanner.
4. Tighten the lock nut.
5. Adjust the second spindle to the same length.



CMS-I-00003061

6.3.6 Preparing the edge levelling discs for operation

CMS-T-00015735-A.1

6.3.6.1 Adjusting the edge levelling discs

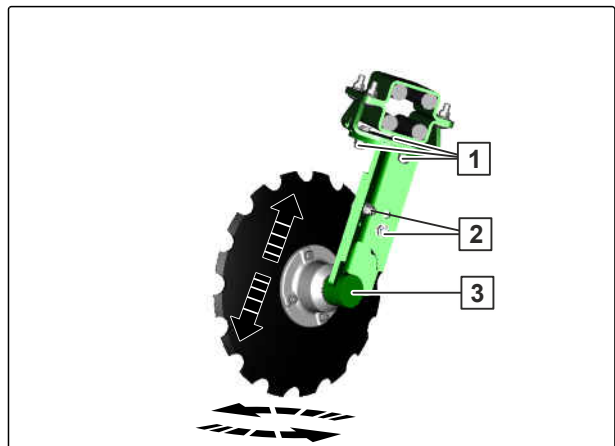
CMS-T-00004545-D.1

The working depth and penetration angle of the edge levelling discs are adjusted to prevent the formation of soil ridges during operation.

1. Raise the implement.
2. Loosen the bolts **1**.

The bearing journal and the hub of the edge levelling disc **3** serve as handles.

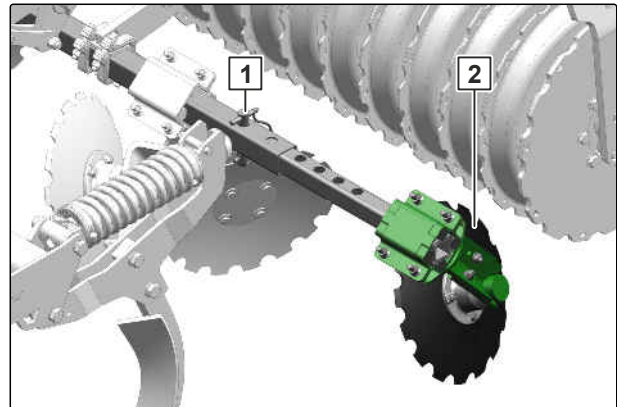
3. Turn the edge levelling disc to the desired position.
4. Tighten the bolts **1**.
5. Loosen the bolts **2**.
6. Move the edge levelling disc up or down.
7. Tighten the bolts **2**.



CMS-I-00003276

6.3.6.2 Moving the edge levelling discs manually

1. Pull out the pin **1**.
2. Slide the edge levelling disc **2** to the desired position.
3. Secure the edge levelling disc with a pin.
4. Secure the pin with a linch pin.



CMS-T-00006610-C.1

CMS-I-00004690

6.3.7 Adjusting the scraper to the roller

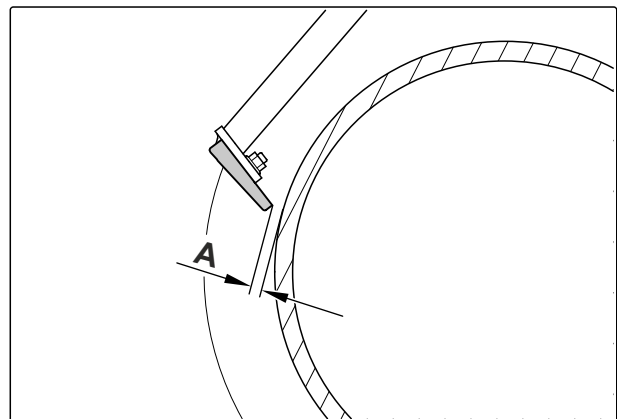
The scrapers on the roller are set at the factory. The scrapers can be adapted to the working conditions.



NOTE

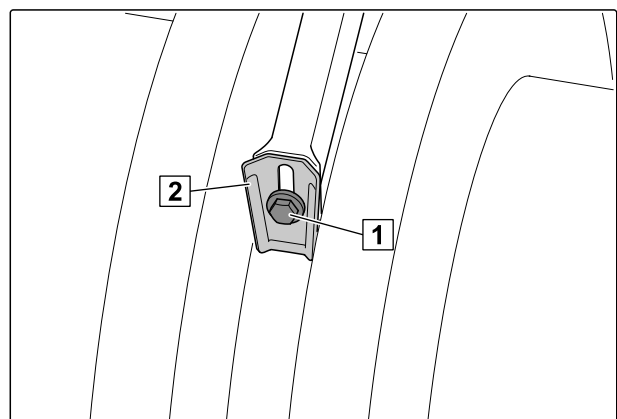
Permitted distances **A between the roller element and scraper:**

- Wedge ring roller: $12 \text{ mm} \pm 2 \text{ mm}$
- Wedge ring roller with matrix tyre profile: $13 \text{ mm} \pm 2 \text{ mm}$
- Tooth packer roller: at least 1 mm



CMS-I-00002071

1. Loosen the bolt **1** on the scraper **2**.
2. Move the scraper in the elongated slot.
3. Tighten the bolt **1**.
4. Check the distances when the implement is lowered.



CMS-I-00000521

6.3.8 Adjusting the trailing elements

CMS-T-00015733-A.1

6.3.8.1 Adjusting the harrow system 12-125 HI

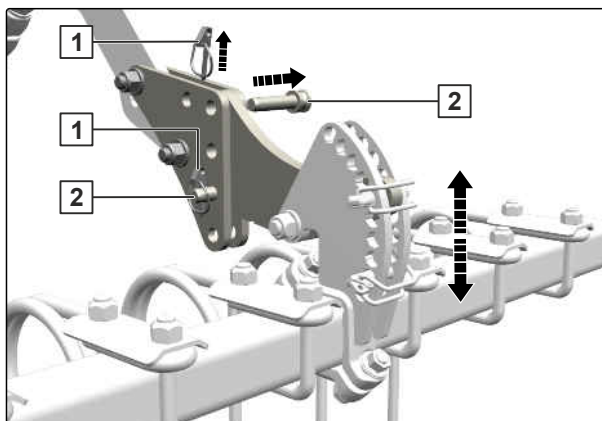
CMS-T-00012142-A.1

6.3.8.1.1 Adjusting the height of the harrow system 12-125 HI

CMS-T-00012144-A.1

Four height settings can be pegged with the two pins on the adjustment units.

1. Secure the harrow with suitable lifting gear and slings against lowering.
2. Pull out the linch pins **1** from the two pins **2**.
3. Pull out the two pins.
4. Remove the pins on the second adjustment unit in the same way.
5. Lift or lower the harrow to the desired height.
6. Secure the setting with the pins.
7. Secure the pins with the linch pins.



CMS-I-00007854

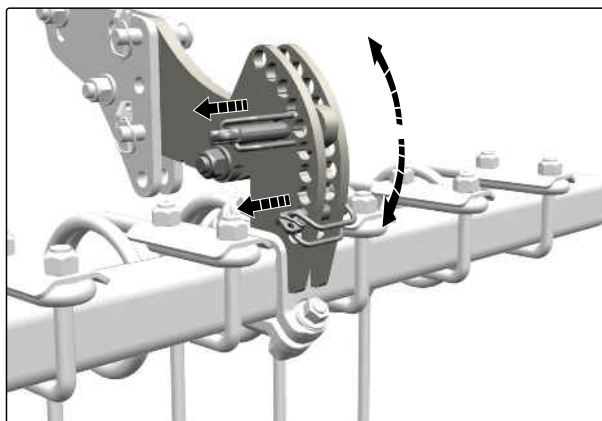
6.3.8.1.2 Adjusting the tilt of the harrow system 12-125 HI

CMS-T-00012143-A.1

1. Pull out the both linch pins on both adjustment units.

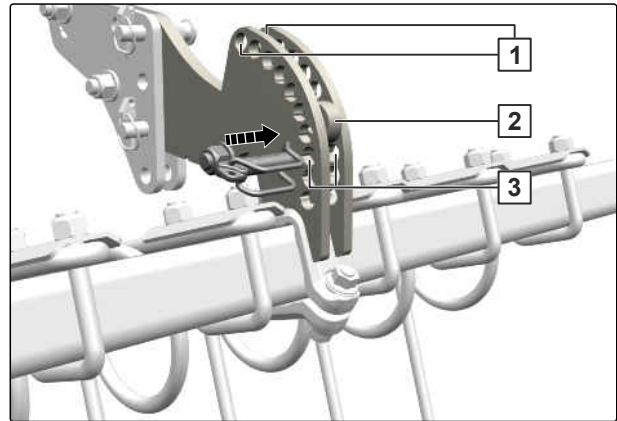
The next step can also be performed with the setting lever.

2. Turn the harrow to the desired position.



CMS-I-00007852

3. Insert a linch pin through each of the holes **3** directly below the bracket **2**.
4. Park the second linch pin in each of the topmost holes **1**.



CMS-I-00007853

6.3.8.2 Adjusting harrow system 12-125 HI KWM/DW

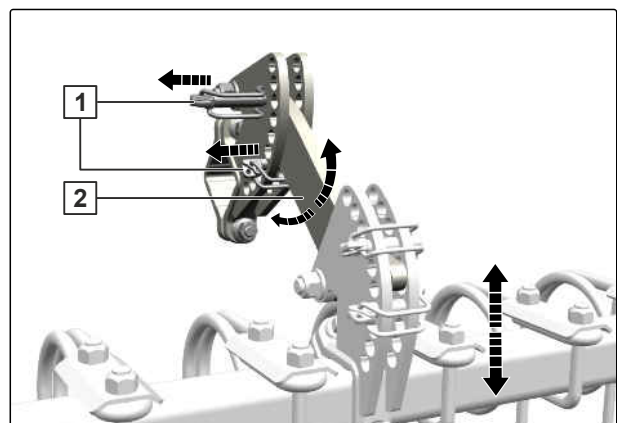
CMS-T-00012148-A.1

6.3.8.2.1 Adjusting the height of harrow system 12-125 HI KWM/DW

CMS-T-00012150-A.1

Six height settings can be pegged with the two linch pins on the adjustment units.

1. Pull out the both linch pins **1** on both adjustment units.
2. Lift or lower the harrow to the desired height.
3. Insert a linch pin through each of the holes directly above the bracket **2**.



CMS-I-00007870

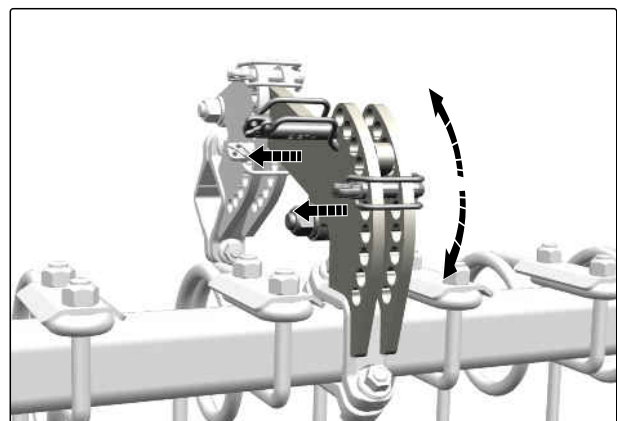
6.3.8.2.2 Adjusting the tilt of harrow system 12-125 HI KWM/DW

CMS-T-00012149-A.1

1. Pull out the both linch pins on both adjustment units.

The next step can also be performed with the setting lever.

2. Turn the harrow to the desired position.

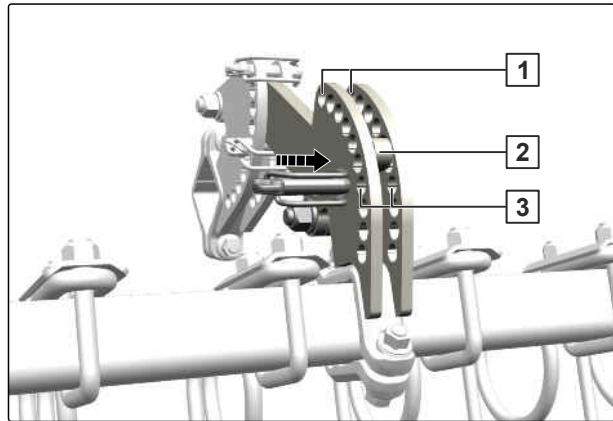


CMS-I-00007866

6 | Preparing the machine

Preparing the implement for operation

3. Insert a lynch pin through each of the holes **3** directly below the bracket **2**.
4. Park the second lynch pin in each of the topmost holes **1**.



CMS-I-00007869

6.3.8.3 Adjusting the harrow system 12-250 HI

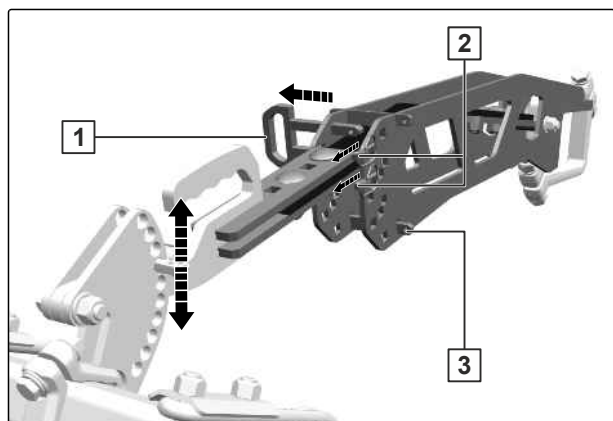
CMS-T-00012163-A.1

6.3.8.3.1 Adjusting the height of the harrow system 12-250 HI

CMS-T-00012166-A.1

Five height settings can be pegged with the double pin on the adjustment units.

1. On both adjustment units, pull the two lynch pins **2** out of the double pin **1** and insert them in the parking positions **3**.
2. Pull out the double pin.
3. Lift or lower the harrow to the desired height.
4. Secure the setting with the double pins.
5. Pull the lynch pins out of the parking position and secure the double pin with the lynch pins.



CMS-I-00007880

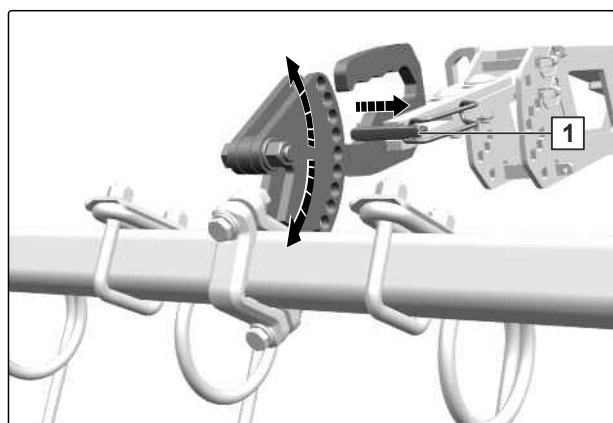
6.3.8.3.2 Adjusting the tilt of the harrow system 12-250 HI

CMS-T-00012164-A.1

1. Pull out the lynch pins **1** on both adjustment units.

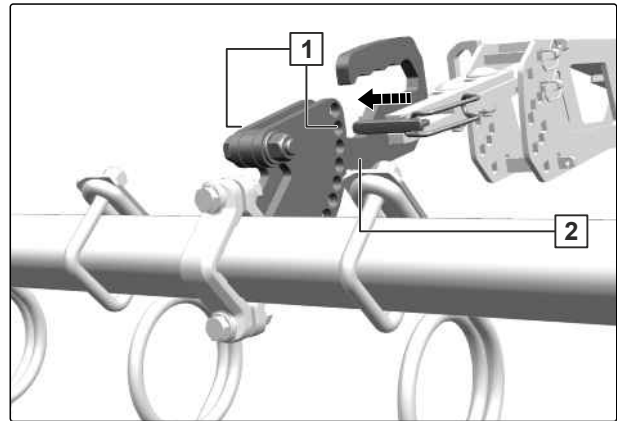
The next step can also be performed with the setting lever.

2. Turn the harrow to the desired position.



CMS-I-00007871

3. Insert a linch pin through each of the holes **1** directly above the bracket **2**.



CMS-I-00007874

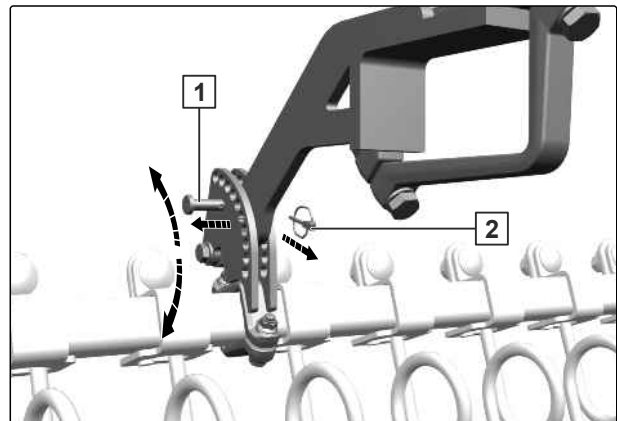
6.3.8.4 Adjusting the spring blade system 142 or spring clearer system 167

CMS-T-00012170-A.1

1. Pull the linch pin **2** out of the pin **1** on both adjustment units of a spring blade bar or spring clearer bar.
2. Pull out the pin.

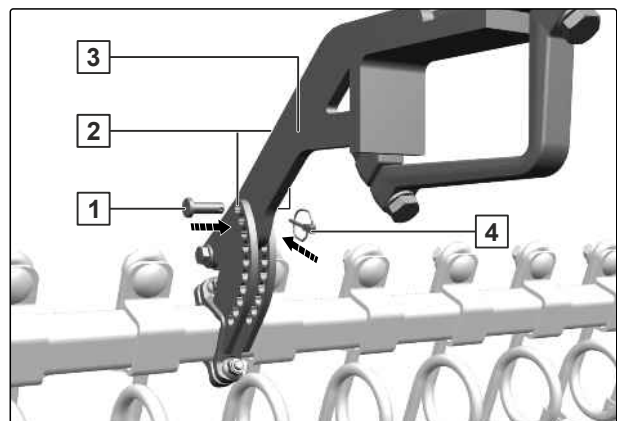
The next step can also be performed with the setting lever.

3. Turn the spring blade bar or spring clearer bar to the desired position.



CMS-I-00007888

4. Insert a pin **1** through each of the holes **2** and one of the holes in the bracket **3**.
5. Secure the pins with the linch pins **4**.



CMS-I-00007889

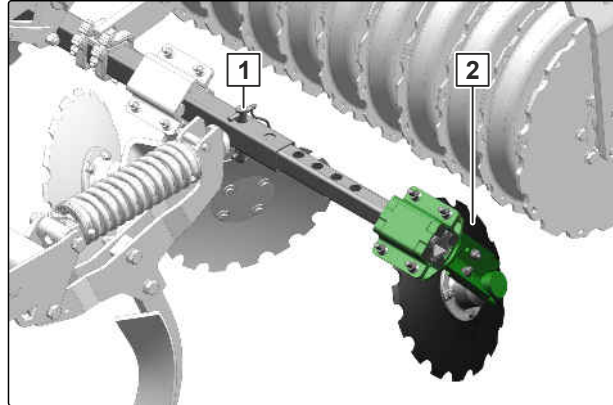
6.4 Preparing the machine for road travel

CMS-T-00015728-A.1

6.4.1 Sliding the edge levelling discs into parking position manually

CMS-T-00015736-A.1

1. Pull out the pin **1**.
2. Slide in the edge levelling disc **2** completely.
3. Secure the edge levelling disc with a pin in the outermost hole.
4. Secure the pin with a linch pin.



CMS-I-00004690

6.4.2 Moving the harrow into transport position

CMS-T-00015729-A.1

6.4.2.1 Moving harrow system 12-125 HI into transport position

CMS-T-00012324-A.1

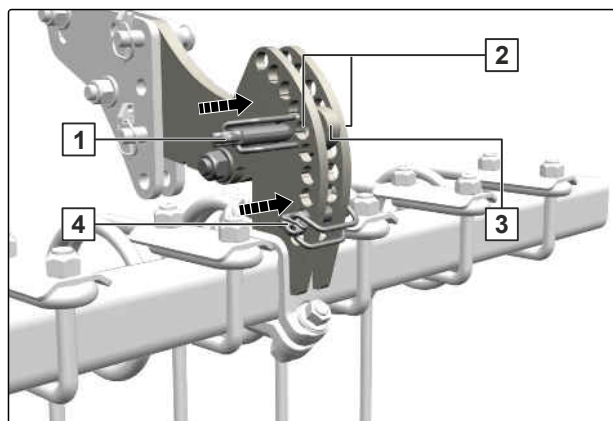
On folding implements, the harrow tines together with the road safety bars may not exceed the transport width of 3 m.

1. Pull out the both linch pins on both adjustment units.

The next step can also be performed with the setting lever.

2. *If the harrow tines exceed the transport width when the implement is folded:*
Turn the harrow bar to a flatter tilt.

3. Insert a linch pin **1** through each of the holes **2** and the hole in the bracket **3**.
4. Park each of the second linch pins **4** below the bracket.



CMS-I-00007934

6.4.2.2 Moving harrow system 12-125 HI KWM/DW into transport position

CMS-T-00012322-A.1

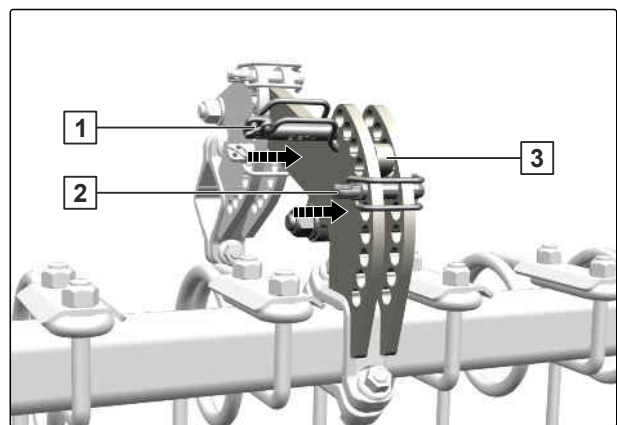
On folding implements, the harrow tines together with the road safety bars may not exceed the transport width of 3 m.

1. Pull out the both linch pins on both adjustment units.

The next step can also be performed with the setting lever.

2. *If the harrow tines exceed the transport width when the implement is folded:*
Turn the harrow bar to a flatter tilt.

3. Insert the linch pins **1** and **2** through each of the holes directly above and below the bracket **3**.



CMS-I-00007936

6.4.2.3 Moving harrow system 12-250 HI into transport position

CMS-T-00012326-A.1

On folding implements, the harrow tines together with the road safety bars may not exceed the transport width of 3 m.

1. Pull out the the linch pins on both adjustment units.

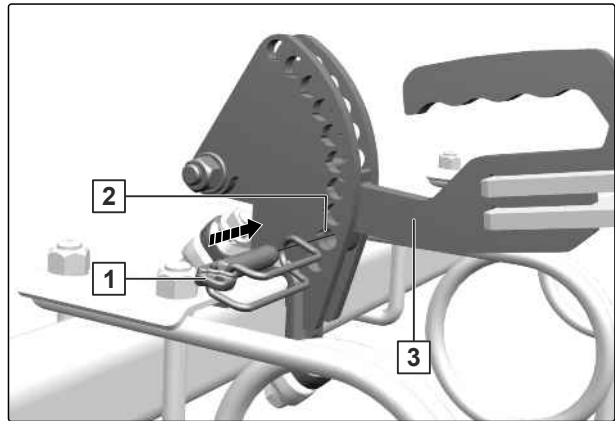
The next step can also be performed with the setting lever.

2. *If the harrow tines exceed the transport width when the implement is folded:*
Turn the harrow bar to a flatter tilt.

6 | Preparing the machine

Preparing the machine for road travel

3. Insert a linch pin **1** through each of the holes **2** and the hole at the bottom of the bracket **3**.

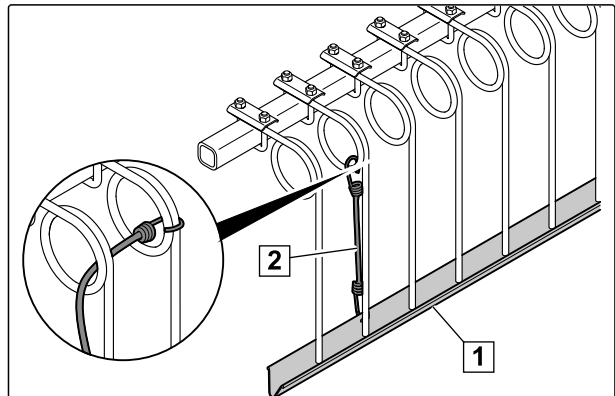


CMS-I-00007907

6.4.3 Putting on the road safety bars

1. Remove coarse dirt from the tines.
2. Push the road safety bars **1** over the tines.
3. Secure the road safety bars with the tensioners **2**.
4. Check for firm seating.
5. *If the tensioners do not provide enough tension, guide the tensioner through the tine coils.*

CMS-T-00000614-C.1



CMS-I-00000517

6.4.4 Folding the implement

CMS-T-00015737-A.1



IMPORTANT

Damage to the tines and roller when folding

- Lift the implement completely.

1. Completely lift the implement with the three-point power lift.
2. Actuate the "blue" tractor control unit until the sections are completely folded.

6.4.5 Locking the tractor control units

CMS-T-00006337-D.1

- Depending on the equipment, the tractor control units are locked mechanically or electrically.

Using the machine

7

CMS-T-00015746-A.1

7.1 Using the implement

CMS-T-00015747-A.1



REQUIREMENTS

- ☑ The implement is unfolded
- ☑ The implement is set up and adjusted for operation
- ☑ The implement is raised

1. Lower the implement on the field with the three-point power lift.
2. Switch the three-point power lift to float position.
3. Drive forward with the tractor until the coulters have penetrated into the soil.
4. Using the top link, align the implement such that the frame is parallel to the ground lengthwise.
5. Continue driving.

7.2 Turning on the headlands

CMS-T-00015748-A.1

1. When driving out of the field, lift the implement with the three-point power lift.
2. Turn around.
3. *When the direction of the implement matches the direction of travel:*
Lower the implement.
4. Switch the three-point power lift to float position.
5. Resume work.

Eliminating faults

8

CMS-T-00015773-A.1

Errors	Cause	Solution
Shear bolt on the shear bolt overload safety sheared off	The tine with coulter has hit a solid obstacle.	► see page 57
Tines with shear bolt overload safety broken off	The tine with coulter has hit a solid obstacle.	► see page 57
Tine with compression spring overload safety broken off	The tine with coulter has hit a solid obstacle.	► see page 58
The implement does not reach the desired working depth	The working depth of the coulters is incorrectly adjusted.	► Adjust the working depth of the coulters, see page 45.
	The shares are worn.	► Replace the coulters, see page 66.
	The top link is set too high.	► Set the top link lower down.
The working depth is uneven across the entire implement width	The hydraulic cylinders have different lengths.	► see page 58
The work pattern behind the roller is uneven	The levelling unit is not correctly set.	► see page 58
	The hydraulic cylinders for the working depth adjustment have different lengths.	► see page 59
Soil piles up in front of the roller	The roller is working too deep.	► Reduce the working depth of the tines, see page 45.
	Too much load on the roller.	► <i>To unload the roller:</i> Slightly lift the implement with the three-point power lift.

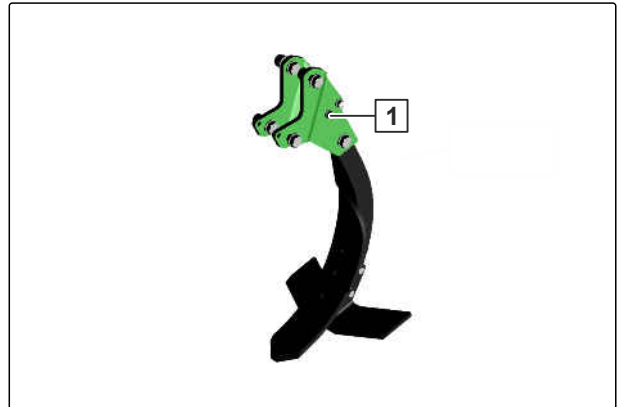
Shear bolt on the shear bolt overload safety sheared off

CMS-T-00004548-B.1

Replacement shear bolts are fastened to the frame.

Shear bolt size: M12 x 80, 8.8

- Replace the shear bolt **1**.



CMS-I-00003021

Tines with shear bolt overload safety broken off

CMS-T-00015775-A.1



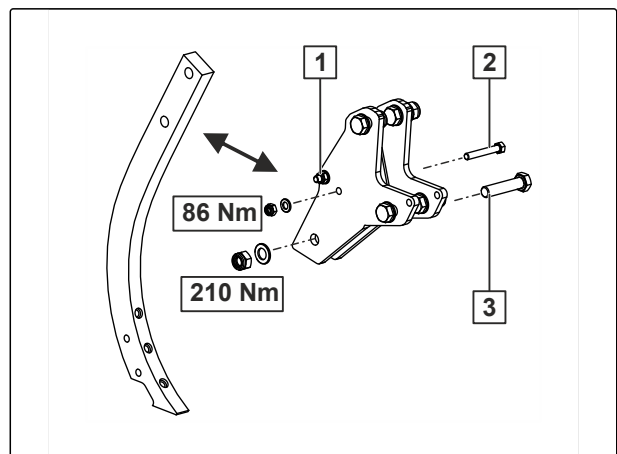
WARNING

Risk of crushing due to lowering of the implement

- Raise the implement only slightly.

A broken-off tine is replaced as follows:

1. Remove the bolt **1**.
2. Remove the shear bolt **2** and bolt **3** on the tine.
3. Insert the new tine.
4. Install the shear bolt and bolt on the tine.
5. Tighten the shear bolt and the bolt.



CMS-I-00010351

Tine with compression spring overload safety broken off

CMS-T-00015774-A.1



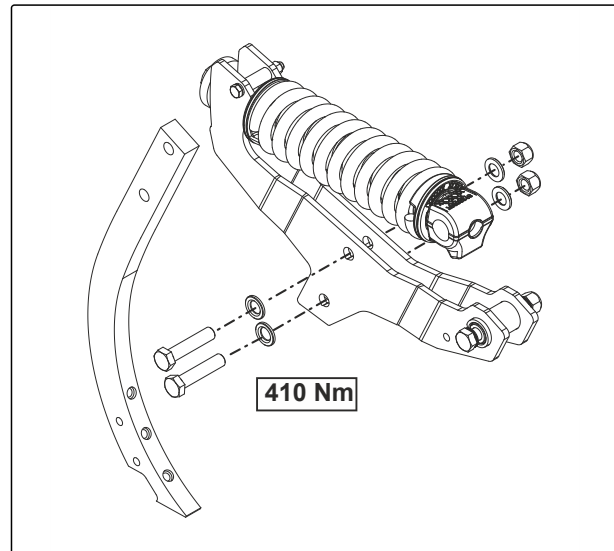
WARNING

Risk of crushing due to lowering of the implement

- Raise the implement only slightly.

A broken-off tine is replaced as follows:

1. Remove the bolts on the tine.
2. Insert the new tine.
3. Install the bolts on the tine.



CMS-I-00003072

The working depth is uneven across the entire implement width

CMS-T-00005120-B.1

1. completely extend the hydraulic cylinders with the "green" tractor control unit.
2. Hold the "green" tractor control unit for 10 seconds.

➡ The hydraulic cylinders will be synchronised.

The work pattern behind the roller is uneven

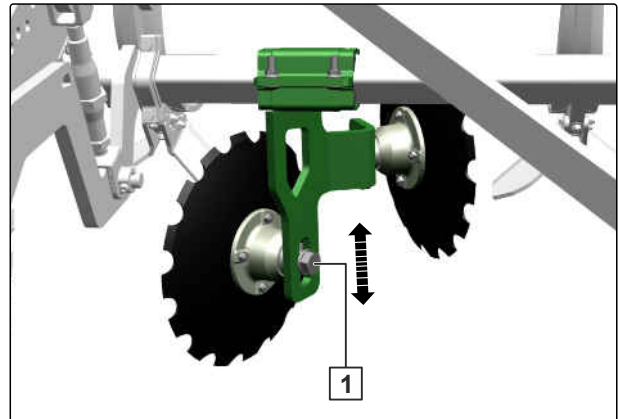
CMS-T-00015784-A.1

The levelling unit is not correctly set.

1. Adjust the automatic working depth adjustment of the levelling unit, see page 45.
2. Adjust the edge levelling discs, see page 46.
3. Move the edge levelling discs, see page 47.

Set individual levelling discs higher or lower as follows:

4. Remove the bolt **1**.
5. Move the levelling disc up or down in the slot.
6. Tighten the bolt.



CMS-I-00010382

The hydraulic cylinders for the working depth adjustment have different lengths.

1. completely extend the hydraulic cylinders with the "green" tractor control unit.
 2. Hold the "green" tractor control unit for 10 seconds.
- ➔ The hydraulic cylinders will be synchronised.

Parking the machine

9

CMS-T-00015749-A.1

9.1 Moving the jacks into parking position

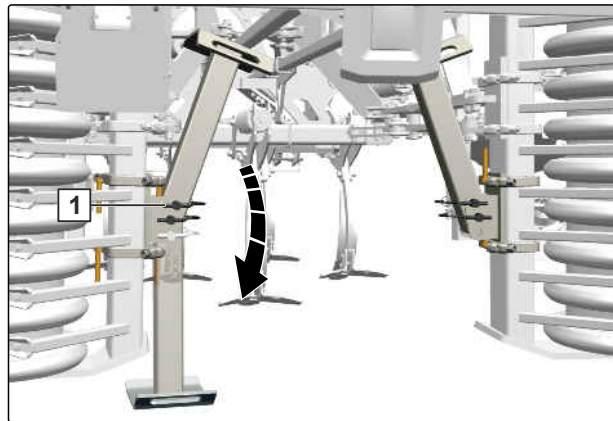
CMS-T-00015750-A.1



REQUIREMENTS

- ✓ Implement is folded
- ✓ The implement is raised

1. Pull the lynch pin out of the pin **1**.
2. Pull out the pin.
3. Swivel down the jack.
4. Secure the position with the pin.
5. Secure the pin with the lynch pin.
6. Move the second jack into parking position in the same way.



CMS-I-00010360

9.2 Uncoupling the three-point mounting frame

CMS-T-00015752-A.1

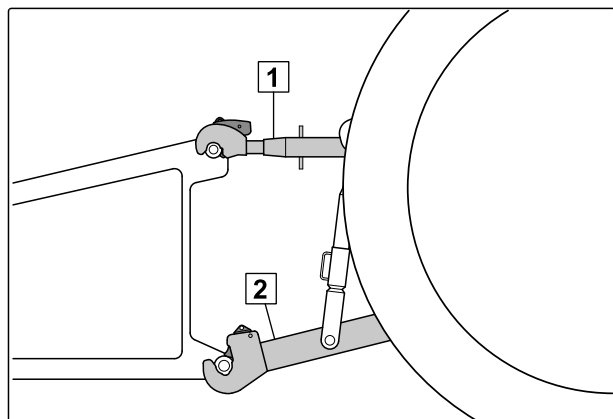


IMPORTANT

Damage to the tines and coulter due to hard ground

- To protect the tines and coulter, lay out boards or rubber mats.

1. Park the implement on a level surface with solid ground.
2. Release the top link **1**.
3. Uncouple the top link from the implement.



CMS-I-00001249

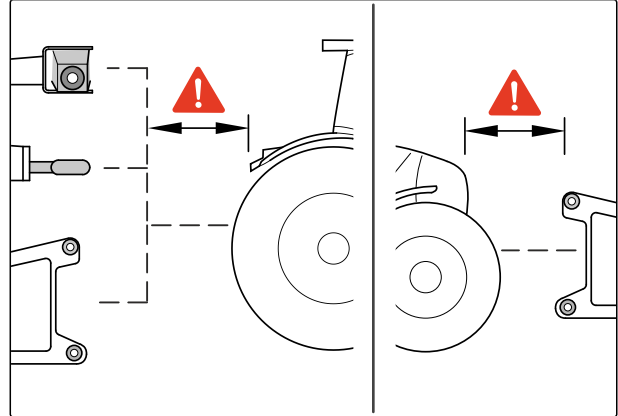
4. Release the lower links **2**.
5. Uncouple the lower links from the implement from the tractor seat.

9.3 Driving the tractor away from the implement

CMS-T-00005795-D.1

There must be enough space between the tractor and implement so that the supply lines can be uncoupled without obstructions.

- Drive the tractor away from the implement, leaving a sufficient distance.

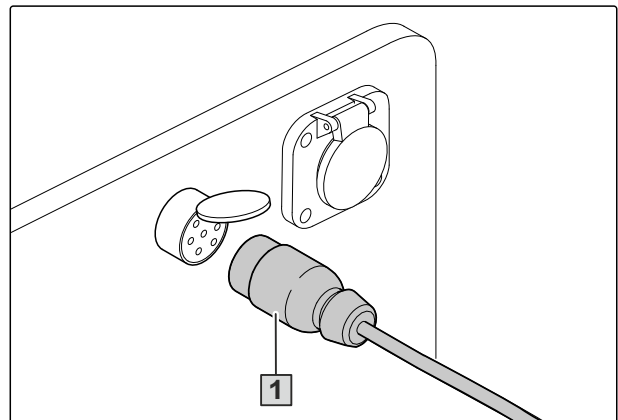


CMS-I-00004045

9.4 Uncoupling the power supply

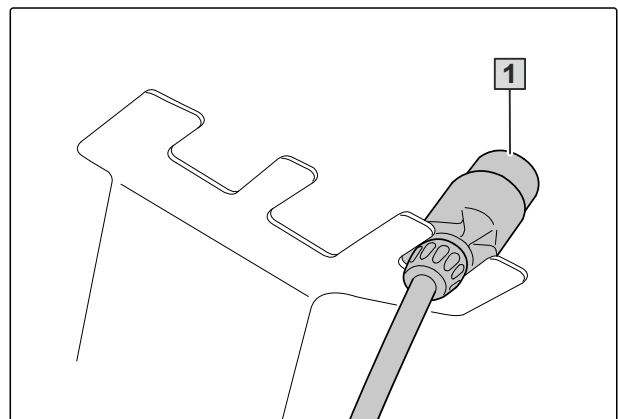
CMS-T-00001402-H.1

1. Pull out the plug **1** for the power supply.



CMS-I-00001048

2. Hang the plugs **1** in the hose cabinet.

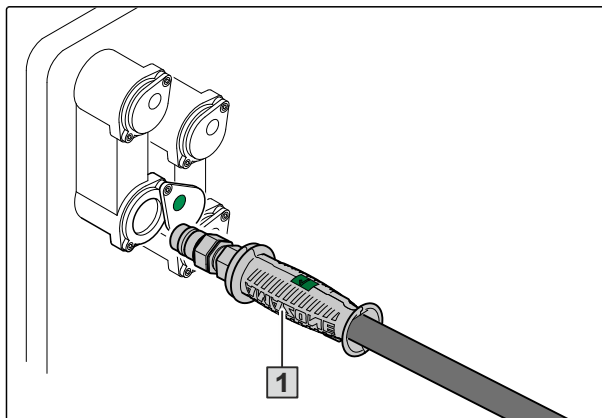


CMS-I-00001248

9.5 Disconnecting the hydraulic hose lines

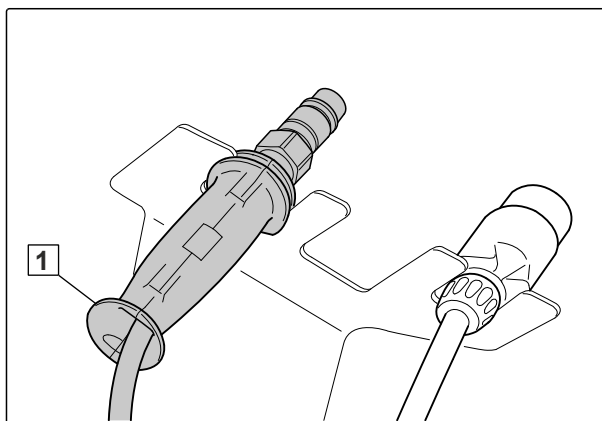
CMS-T-00000277-F.1

1. Secure the tractor and implement.
2. Put the control lever on the tractor control unit in float position.
3. Disconnect the hydraulic hose lines **1**.
4. Put the dust caps on the hydraulic sockets.



CMS-I-00001065

5. Hang the hydraulic hose lines **1** in the hose cabinet.



CMS-I-00001250

Repairing the implement

10

CMS-T-00015654-A.1

10.1 Maintaining the implement

CMS-T-00015772-A.1

10.1.1 Maintenance schedule

After initial operation	
Checking the connection of tines with compression spring overload safety	see page 64
Checking the connection of tines with shear bolt overload safety	see page 65
Checking the adjustment spindles of the automatic levelling unit depth adjustment	see page 67
Checking the levelling connection	see page 67
Checking the disc carrier connection	see page 68
Checking the bearings of the levelling discs	see page 69
Checking the rollers	see page 70
Checking the hydraulic hose lines	see page 71
Checking the hydraulic cylinder for folding	see page 72

As required	
Replacing C-Mix-3 coulters	see page 66
Replacing the discs	see page 69

Daily	
Checking the lower link pins and top link pins	see page 70

Every 12 months	
Checking the connection of tines with shear bolt overload safety	see page 65
Checking the adjustment spindles of the automatic levelling unit depth adjustment	see page 67
Checking the levelling connection	see page 67
Checking the disc carrier connection	see page 68

Every 12 months	
Checking the disc carrier rubber O-rings	see page 68
Checking the hydraulic cylinder for folding	see page 72

Every 50 operating hours / Weekly	
Checking the connection of tines with compression spring overload safety	see page 64
Checking the wear on the bearing sleeves of the C-Mix Super and Ultra tines	see page 65
Checking the hydraulic hose lines	see page 71

Every 200 operating hours / Every 3 months	
Checking the bearings of the levelling discs	see page 69
Checking the rollers	see page 70

10.1.2 Checking the connection of tines with compression spring overload safety

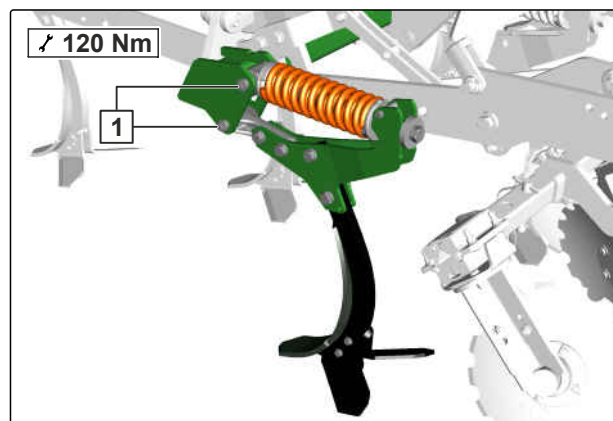
CMS-T-00015790-A.1



INTERVAL

- After initial operation
 - Every 50 operating hours
- or
- Weekly

- Check the bolted connections **1** for centred and tight fit.



CMS-I-00010367

10.1.3 Checking the connection of tines with shear bolt overload safety

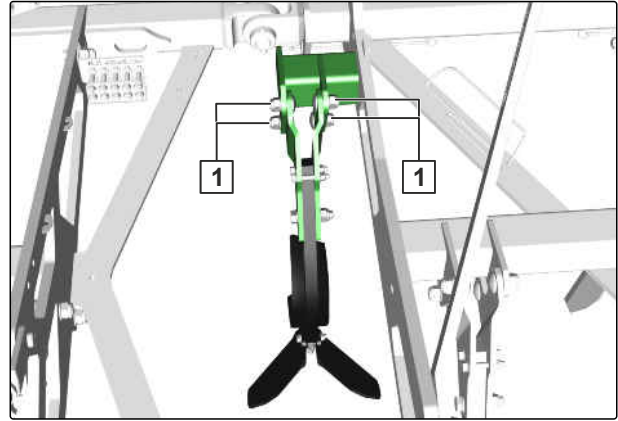
CMS-T-00015820-A.1



INTERVAL

- After initial operation
- Every 12 months

► Check the bolted connections **1** for tight fit.



CMS-I-00010377

10.1.4 Checking the wear on the bearing sleeves of the C-Mix Super and Ultra tines

CMS-T-00015580-A.1



INTERVAL

- Every 50 operating hours
or
Weekly

1. Park the implement and slightly lift it.

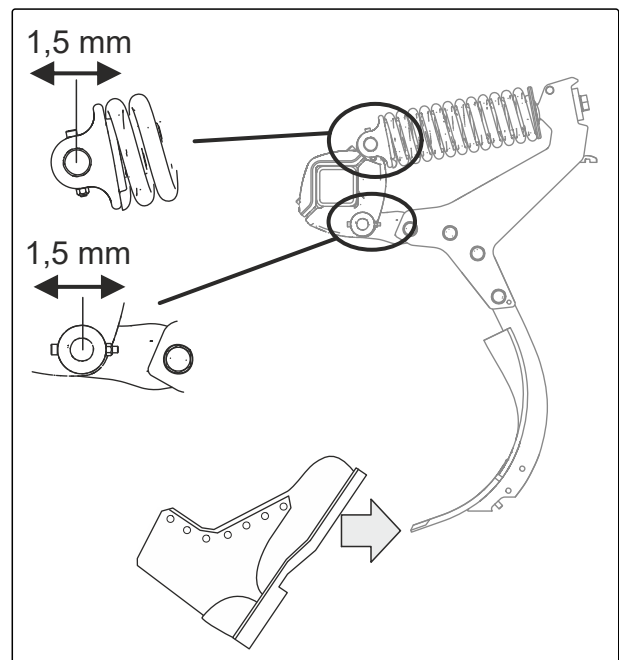
➔ The coulters are just above the ground.

2. Using your foot, apply a horizontal force on the coulter tip several times consecutively.

3. Measure the bearing clearance between the pin and the cast holder.

4. Measure the bearing clearance between the pin and the bearing arm.

➔ Maximum permissible bearing clearance: 1.5 mm.



CMS-I-00010210



WORKSHOP WORK

5. *If the bearing clearance is more than 1.5 mm:*
Replace the bearing sleeves.

10.1.5 Replacing C-Mix-3 coulters

CMS-T-00004184-C.1



INTERVAL

- As required



WARNING

Risk of crushing due to lowering of the implement

- ▶ Raise the implement only slightly.

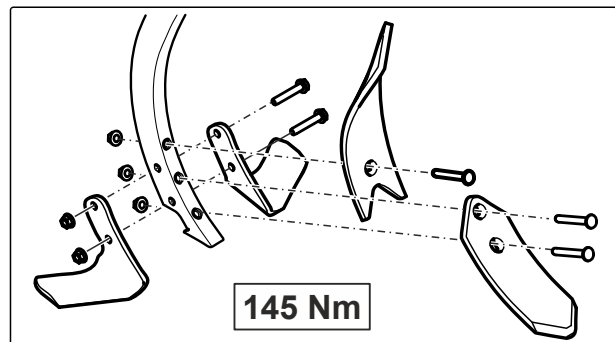


CAUTION

Risk of injury from sharp edges on the coulters and the bolt heads

- ▶ Wear gloves.
- ▶ Pay attention to sharp edges.
- ▶ Do not allow carriage bolts to rotate.

1. Remove the bolts.
2. Replace the coulters.
3. Install the bolts.
4. Tighten the bolts.
5. Retighten the bolts after 5 operating hours.



CMS-I-00003077

10.1.6 Checking the adjustment spindles of the automatic levelling unit depth adjustment

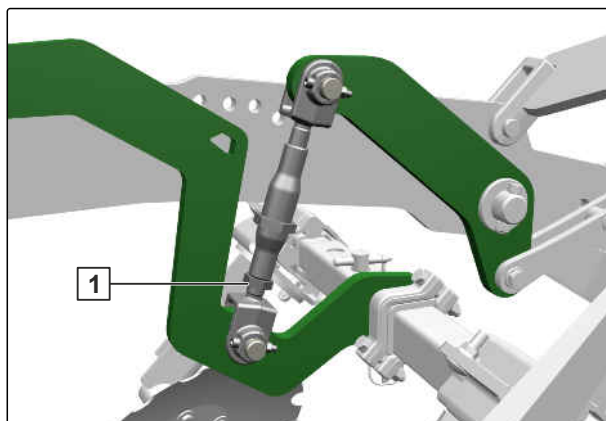
CMS-T-00015864-A.1



INTERVAL

- After initial operation
- Every 12 months

- Check the locknut **1** on the adjustment spindles for tight fit.



CMS-I-00010426

10.1.7 Checking the levelling connection

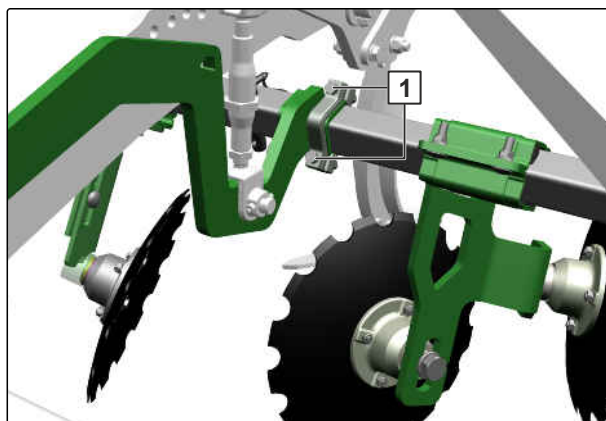
CMS-T-00015787-A.1



INTERVAL

- After initial operation
- Every 12 months

- Check the bolted connections **1** for tight fit.



CMS-I-00010368

10.1.8 Checking the disc carrier connection

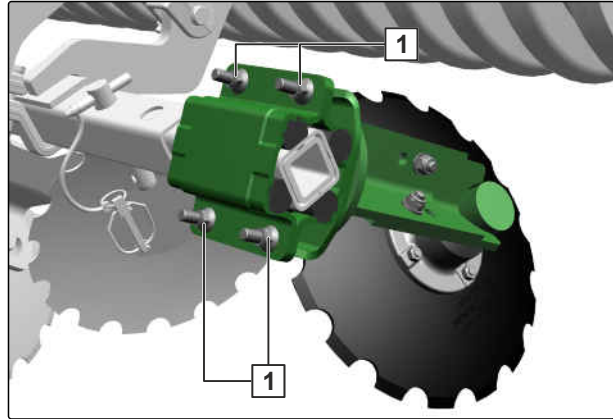
CMS-T-00015788-A.1



INTERVAL

- After initial operation
- Every 12 months

- Check the bolted connections **1** for tight fit.



CMS-I-00010369

10.1.9 Checking the disc carrier rubber O-rings

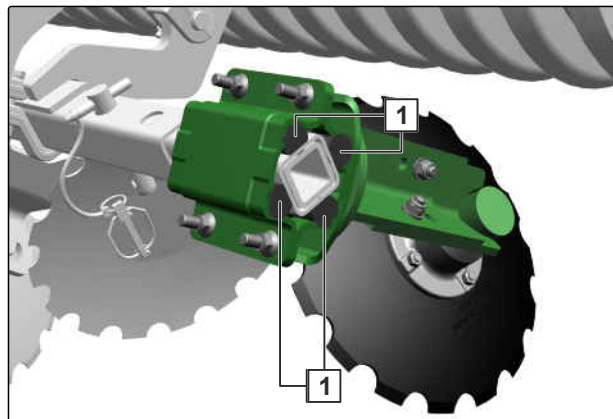
CMS-T-00015789-A.1



INTERVAL

- Every 12 months

1. Perform a visual check of the disc carrier rubber O-rings **1**.



CMS-I-00010370



WORKSHOP WORK

2. *If the disc carrier rubber O-rings are damaged:*
Replace the disc carrier rubber O-rings.

10.1.10 Checking the bearings of the levelling discs

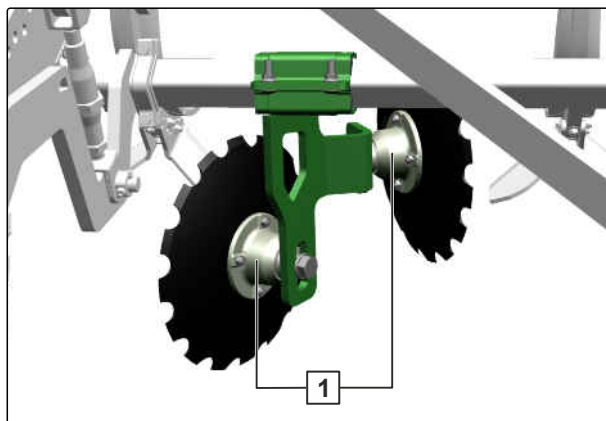
CMS-T-00015819-A.1



INTERVAL

- After initial operation
- Every 200 operating hours
or
Every 3 months

- Check the bearings of the levelling discs **1** for ease of movement.



CMS-I-00010376



WORKSHOP WORK

- Replace worn bearings.

10.1.11 Replacing the discs

CMS-T-00002327-I.1

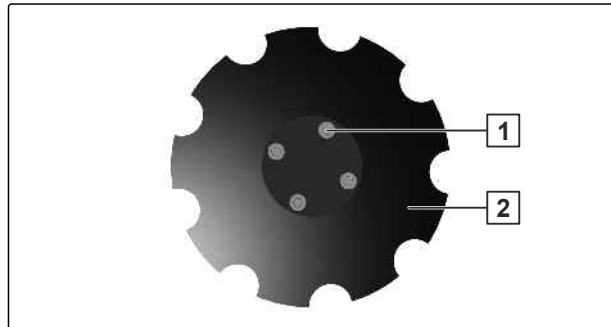


INTERVAL

- As required

Original disc diameter	Wear limit
46 cm	36 cm
48 cm	40 cm
51 cm	36 cm
61 cm	43 cm
66 cm	46 cm

1. Slightly raise the implement.



CMS-I-00002450

2. Loosen the 4 bolts **1** for the disc fastening.
3. Remove the washer **2**.
4. Fasten the new disc with the 4 bolts.

10.1.12 Checking the rollers

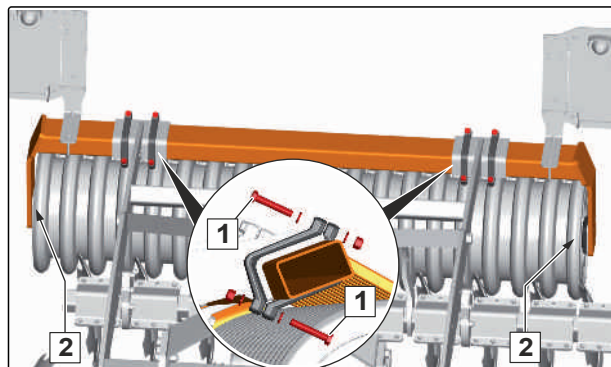
CMS-T-00002329-D.1



INTERVAL

- After initial operation
- Every 200 operating hours
or
Every 3 months

- ▶ Check the bolts **1** for tightness.
- ▶ *If the bolts need to be replaced,*
pay attention to the alignment of the bolts.
- ▶ Check the roller bearing **2** for ease of movement.



CMS-I-00000099

10.1.13 Checking the lower link pins and top link pins

CMS-T-00002330-K.1



INTERVAL

- Daily

Criteria for visual inspection of lower link pins and top link pins:

- Cracks
- Fractures

- Permanent deformations
 - Permissible wear: 2 mm
1. Check the lower link pins and top link pins for the listed criteria.
 2. Replace worn pins.

10.1.14 Checking the hydraulic hose lines

CMS-T-00002331-G.1

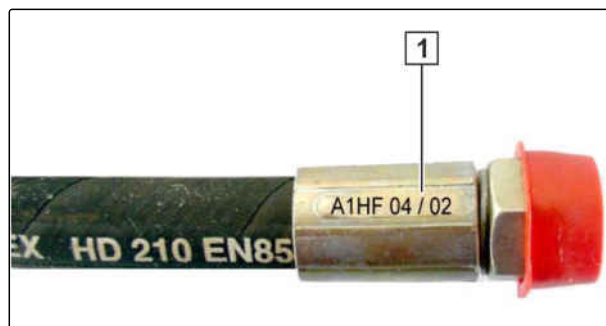


INTERVAL

- After initial operation
 - Every 50 operating hours
or
Weekly
1. Check the hydraulic hose lines for damage, such as chafing point, cuts, tears and deformation.
 2. Check the hydraulic hose lines for leaks.
 3. Retighten loose bolted connections.

Hydraulic hose lines must not be more than 6 years old.

4. Check the manufacturing date **1**.



CMS-I-00000532



WORKSHOP WORK

5. Replace worn, damaged or aged hydraulic hose lines.

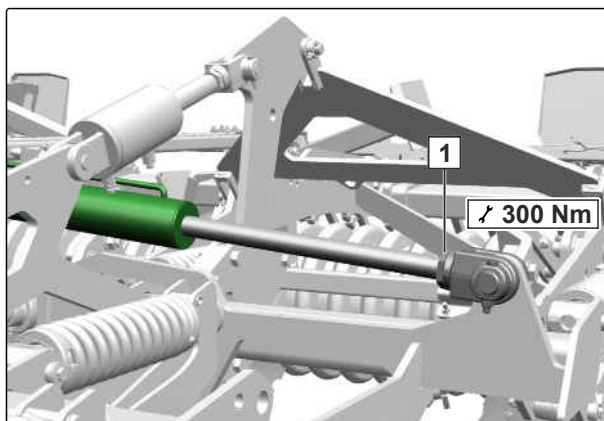
10.1.15 Checking the hydraulic cylinder for folding

CMS-T-00015792-A.1



INTERVAL

- After initial operation
 - Every 12 months
- Check the tightening torque of the locknut **1** on both hydraulic cylinders for folding.



CMS-I-00010371

10.2 Lubricating the implement

CMS-T-00015655-A.1



IMPORTANT

Implement damage due to improper lubrication

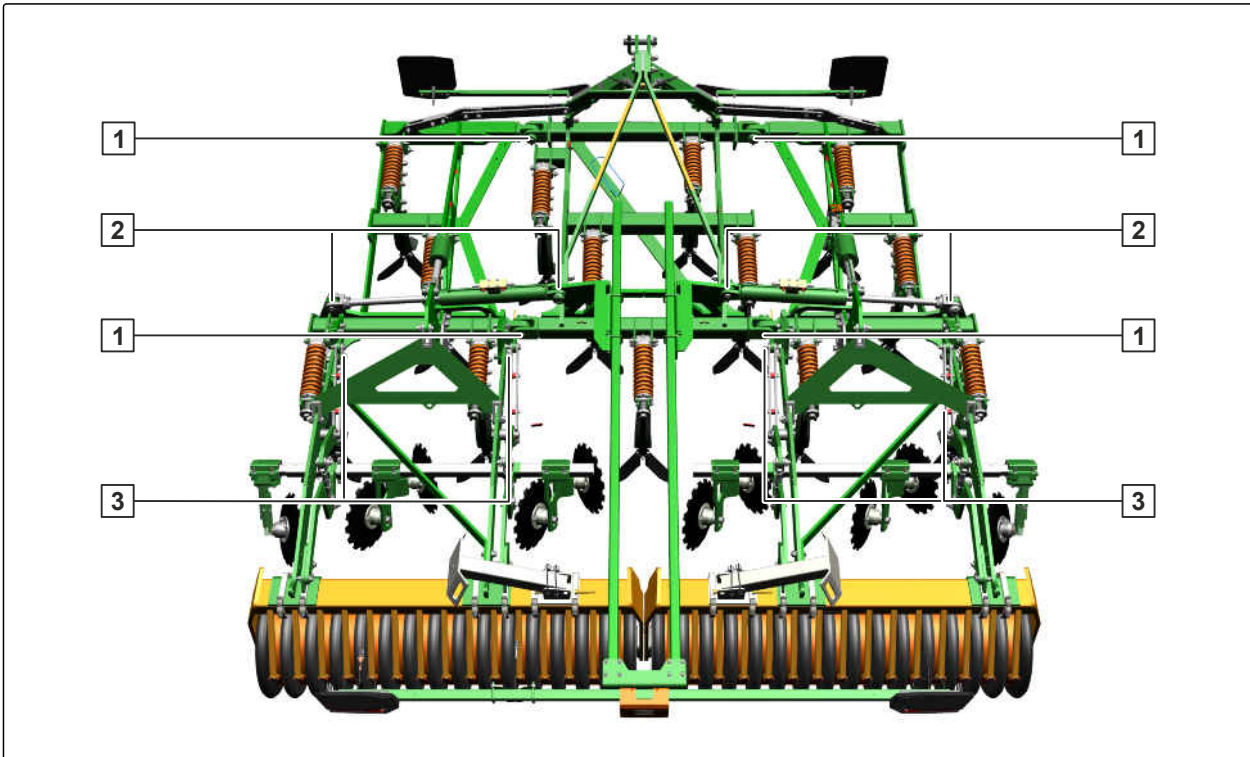
- ▶ Grease the implement at the marked lubrication points according to the lubrication schedule.
- ▶ *To ensure that dirt is not pressed into the lubrication points:*
Thoroughly clean the grease nipples and the grease gun.
- ▶ Only grease the implement with the lubricants listed in the technical data.
- ▶ Press the dirty grease completely out of the bearings.



CMS-I-00002270

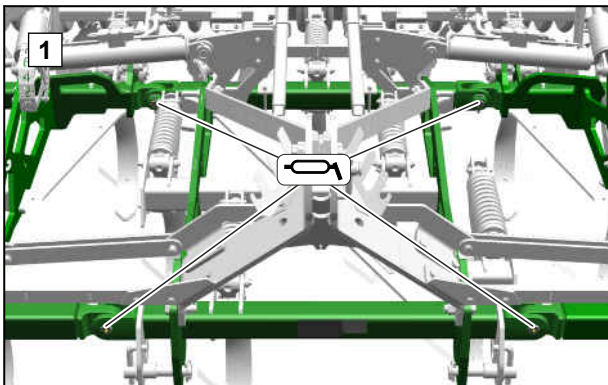
10.2.1 Overview of lubrication points

CMS-T-00015656-A.1

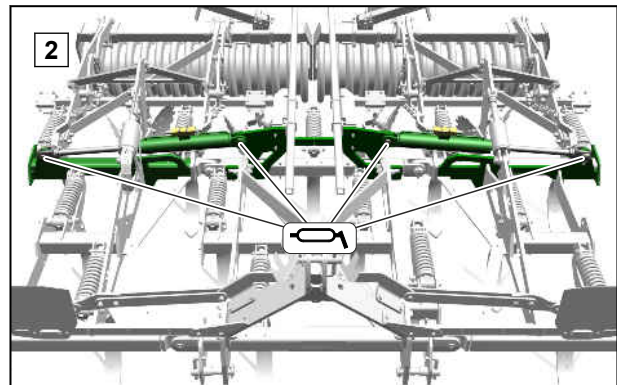


CMS-I-00010398

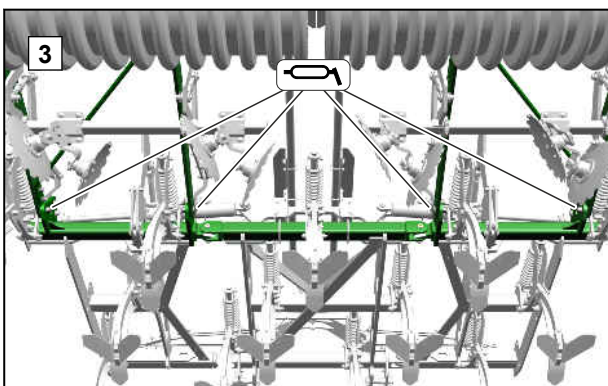
Every 20 operating hours



CMS-I-00010401



CMS-I-00010402



CMS-I-00010403

10.3 Cleaning the implement

CMS-T-00000593-F.1



IMPORTANT

Risk of machine damage due to cleaning jet of the high-pressure nozzle

- ▶ Never direct the cleaning jet of the high-pressure cleaner or hot water high-pressure cleaner onto the marked components.
 - ▶ Never aim the cleaning jet of high-pressure cleaners or hot water high-pressure cleaners on electrical or electronic components.
 - ▶ Never aim the cleaning jet of the high pressure cleaner directly on lubrication points, bearings, rating plates, warning signs, and stickers.
 - ▶ Always maintain a minimum distance of 30 cm between the high-pressure nozzle and the implement.
 - ▶ Do not exceed a water pressure of 120 bar.
-
- ▶ Clean the machine with a high-pressure cleaner or a hot water high-pressure cleaner.



CMS-I-00002692

Loading the implement

11

CMS-T-00015767-A.1

11.1 Loading the implement with a crane

CMS-T-00015769-A.1

The implement has 3 lashing points for slings for lifting.

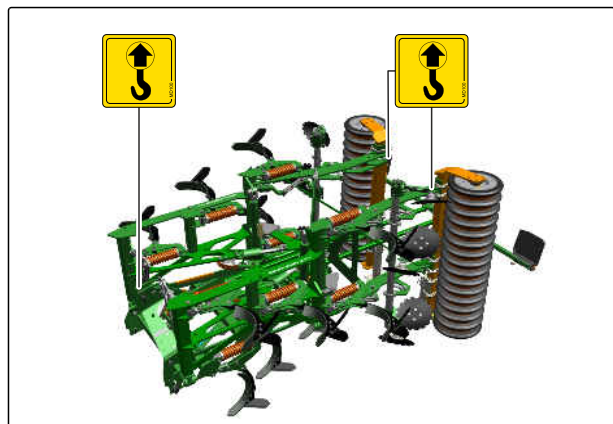


WARNING

Risk of accidents due to improperly attached slings for lifting

If the slings are not attached at the marked lashing points, the implement can be damaged during lifting and endanger safety.

- Only attach the slings for lifting at the marked lashing points.



CMS-I-00010396

1. Attach the slings for lifting on the intended lashing points.
2. Slowly lift the implement.

11.2 Lashing the implement

CMS-T-00015768-A.1

The implement has 4 lashing points for lashing straps.

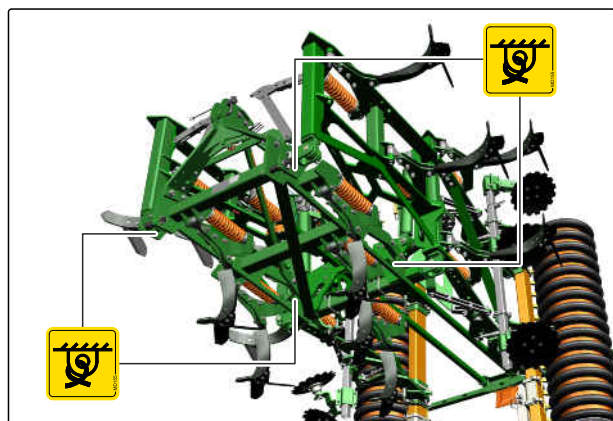


WARNING

Risk of accidents due to improperly attached lashing straps

If the lashing straps are not attached at the marked lashing points, the implement can be damaged during lashing and endanger safety.

- Attach the lashing straps only at the marked lashing points.



CMS-I-00010397

1. Put the implement on the transport vehicle.
2. Attach the lashing straps at the marked points.
3. Lash down the implement in compliance with the national regulations for load securing.

Disposing of the implement

12

CMS-T-00010906-B.1

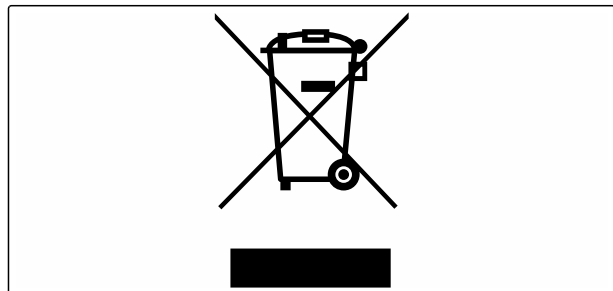


ENVIRONMENTAL INFORMATION

Environmental damage due to improper disposal

- ▶ Observe the regulations of the local authorities.
- ▶ Observe the symbols on the implement regarding disposal.
- ▶ Observe the following instructions.

1. Components with this symbol should not be disposed of with household waste.



CMS-I-00007999

2. Return batteries to the distributor
or
Dispose of batteries at a collection point.
3. Put recyclable materials in the recycling.
4. Treat operating materials like hazardous waste.



WORKSHOP WORK

5. Dispose of the coolant.

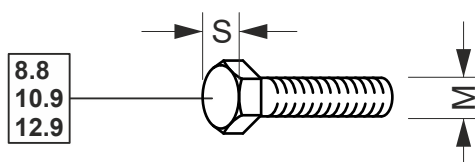
Appendix

13

CMS-T-00015770-A.1

13.1 Bolt tightening torques

CMS-T-00000373-E.1



CMS-I-000260

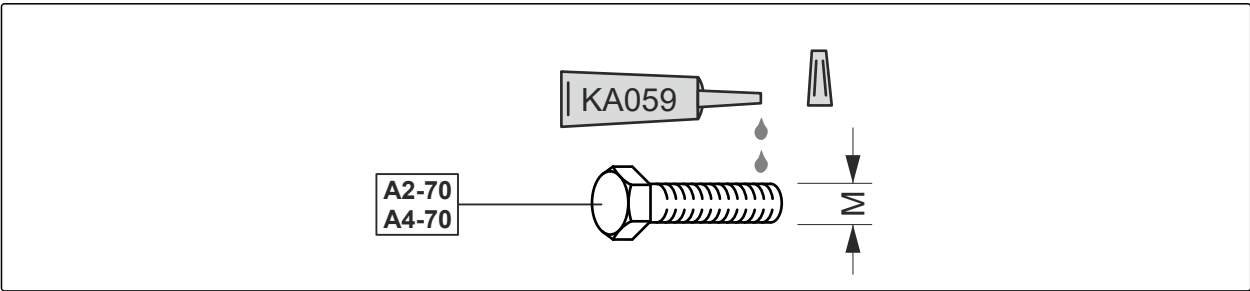


NOTE

Unless specified otherwise, the bolt tightening torques listed in the table apply.

M	S	Strength classes		
		8.8	10.9	12.9
M8	13 mm	25 Nm	35 Nm	41 Nm
M8x1		27 Nm	38 Nm	41 Nm
M10	16(17) mm	49 Nm	69 Nm	83 Nm
M10x1		52 Nm	73 Nm	88 Nm
M12	18(19) mm	86 Nm	120 Nm	145 Nm
M12x1.5		90 Nm	125 Nm	150 Nm
M14	22 mm	135 Nm	190 Nm	230 Nm
M 14x1.5		150 Nm	210 Nm	250 Nm
M16	24 mm	210 Nm	300 Nm	355 Nm
M16x1.5		225 Nm	315 Nm	380 Nm
M18	27 mm	290 Nm	405 Nm	485 Nm
M18x1.5		325 Nm	460 Nm	550 Nm
M20	30 mm	410 Nm	580 Nm	690 Nm
M20x1.5		460 Nm	640 Nm	770 Nm

M	S	Strength classes		
		8.8	10.9	12.9
M22	32 mm	550 Nm	780 Nm	930 Nm
M22x1.5		610 Nm	860 Nm	1,050 Nm
M24	36 mm	710 Nm	1,000 Nm	1,200 Nm
M24x2		780 Nm	1,100 Nm	1,300 Nm
M27	41 mm	1,050 Nm	1,500 Nm	1,800 Nm
M27x2		1,150 Nm	1,600 Nm	1,950 Nm
M30	46 mm	1,450 Nm	2,000 Nm	2,400 Nm
M30x2		1,600 Nm	2,250 Nm	2,700 Nm



CMS-I-00000065

M	Tightening torque	M	Tightening torque
M4	2.4 Nm	M14	112 Nm
M5	4.9 Nm	M16	174 Nm
M6	8.4 Nm	M18	242 Nm
M8	20.4 Nm	M20	342 Nm
M10	40.7 Nm	M22	470 Nm
M12	70.5 Nm	M24	589 Nm

13.2 Other applicable documents

CMS-T-00015771-A.1

- Tractor operating manual

Directories

14

14.1 Glossary

CMS-T-00000513-B.1

M

Machine

Mounted implements are accessory parts of the tractor. However, mounted implements are always referred to as the implement in this operating manual.

O

Operating materials

Operating materials serve to ensure operational readiness. Operating materials include e.g. cleaning agents and lubricants such as lubricating oil, greases or cleaners.

T

Tractor

In this operating manual, the designation tractor is always used, even for other agricultural tractor units. Implements are mounted on the tractor or towed by the tractor.

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