



SCHMOTZER

Original operating manual

Hoeing machine


Venterra 2K KPP-LSC

Venterra 2K KPP-MSK

Venterra 2K KPP-M



SCHMOTZER



SCHMOTZER Hacktechnik GmbH & Co. KG

D-91438 Bad Windsheim


Machine no.

Vehicle ID no.

Product

Permissible technical implement weight kg

Model year




CE

UK

CA

Year of construction



SCHMOTZER

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-00006596-I.1

2.1 Basic safety instructions

CMS-T-00006597-I.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-00006598-D.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-00006599-C.1

Dangers areas on the implement

The following basic dangers are encountered in the danger areas:

The implement and its work tools move during operation.

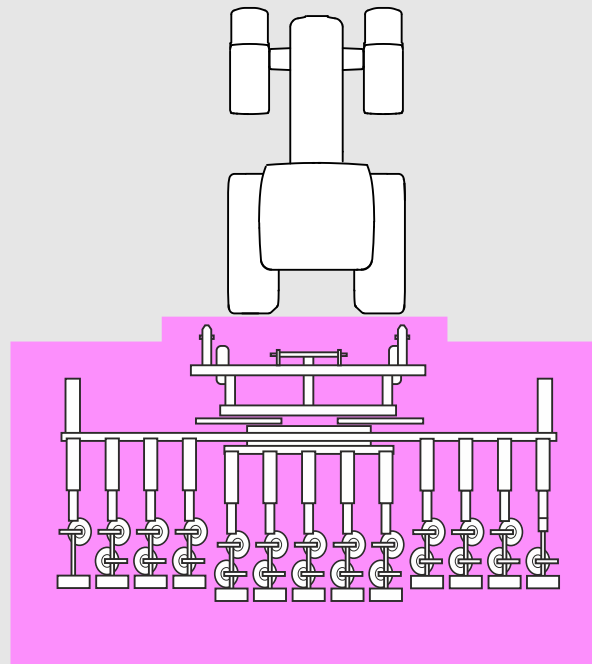
Hydraulically raised implement parts can descend unnoticed and slowly.

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 implement.
- ▶ *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-00004700

Risk of falling between the hoeing elements

- ▶ *When you are moving between the hoeing elements to adjust the implement, be very careful.*

Overhead power lines

When unfolding and folding or when folding and lifting out or raising the implement or implement parts during operation, the implement can reach the height of overhead power lines. This can cause voltage to jump over to the machine and cause lethal electrical shocks or fires. Large voltage differences develop on the ground surrounding the machine.

- ▶ When unfolding and folding or when folding and raising or lifting out the implement or implement parts, maintain a sufficient distance from overhead power lines.
- ▶ Never fold or unfold the implement parts close to overhead power line pylons and overhead power lines.
- ▶ When the implement parts are unfolded, maintain a safe distance from overhead power lines.
- ▶ *If voltage has jumped over to the machine:*
Stay in the cab.
- ▶ Do not touch any metal parts.
- ▶ Warn people to stay away from the machine.
- ▶ Wait for help from a professional rescue team.
- ▶ *If people must exit the cab despite the voltage flashover, e.g. due to direct lethal danger from fire:*
Jump away from the machine into a stable position.
- ▶ Do not touch the machine.
- ▶ Move away from the machine with small steps.

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-00006617-E.1

2.1.5.1 Changes on the implement

CMS-T-00006619-B.1

Only authorised design changes

Design changes and extensions can impede the functioning and operational safety of the implement. 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 SCHMOTZER.

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-00006618-B.1

Unsuitable operating materials

Operating materials that do not meet SCHMOTZER 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-00006620-B.1

Special equipment, accessories, and spare parts

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

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

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-00013513-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 mechanical removal of weeds and grasses between and on the plant rows of crops such as cereals, turnips, maize or vegetables.
- The implement is suitable and intended for burying and exposing weeds or grasses between and on the plant rows of crops such as cereals, turnips, maize or vegetables.
- The implement is used for the cultivation and growth promotion of crops by loosening the soil between and on the plant rows and allowing it to absorb more air and water.
- The implement is used for the cultivation and growth promotion of crops by ridging the soil on the plant rows and providing the plants with additional warmth and growth stimulus.
- The implement is suitable and intended for the conventional weed and pest control by spraying herbicides, fungicides and insecticides.
- The implement is used to spread liquid fertiliser between the plant rows of the crop.
- For 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 be used and maintained only by persons who meet 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 SCHMOTZER.
- 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

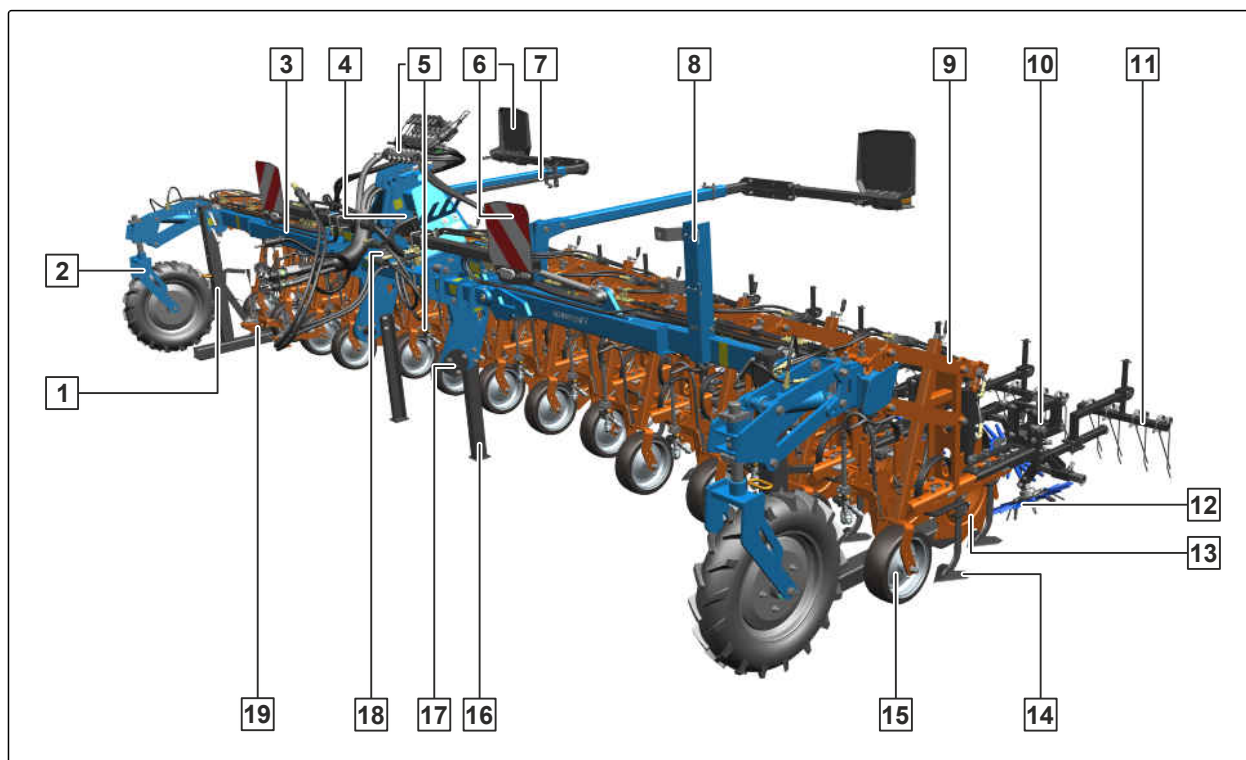
4

CMS-T-00005965-E.1

4.1 Implement overview

CMS-T-00005973-D.1

The basic implement consists of the three-point mounting frame, a hydraulically folding implement slide rail, support wheels, and hoe units. A hoe unit, also called a parallelogram, works between two plant rows. The parallelograms carry hoe shares and finger hoes as hoeing tools, and hoe protection discs to protect the crops. Ridging tools and harrows can also be mounted on the parallelograms, which control weeds by burying or exposing them. Depending on the requirements, the implement can be fitted with special equipment.



CMS-I-00004452

- | | |
|---|---|
| 1 Parking support | 2 Support wheel |
| 3 Hydraulically folding implement slide rail | 4 Section Control parallelograms |

- | | |
|--|--|
| 5 Band sprayer | 6 Lighting and identification for road travel |
| 7 Lifting rod for mechanically lifting parallelograms | 8 Camera bracket |
| 9 Parallelogram | 10 Star parallelogram |
| 11 Tine weeder | 12 Finger hoe or ridging disc |
| 13 Hoe protection disc | 14 Hoe share |
| 15 Guide wheel | 16 Centre parking support |
| 17 Three-point mounting frame | 18 Rating plate on the implement |
| 19 Row sensor | |

4.2 Function of the implement

CMS-T-00005966-D.1

The three-point mounting frame connects the implement to the tractor or to an optionally available sliding frame. The three-point mounting frame also carries the front lighting and the front identification for road travel.

The hydraulically folding implement slide rail carries the three-point mounting frame, the rear lighting and the rear identification for road travel, the camera bracket, the parking supports, and the support wheels. The hydraulically folding implement slide rail also carries the hoe units, which consist of the parallelograms and various special equipment.

The parallelograms precisely guide the depth of the hoeing shares.

The hoe shares on the parallelograms cut the weeds just below the soil surface and deposit them at the surface to desiccate.

The hoe protection discs prevent the crops from being damaged or buried when hoeing.

The finger hoes remove weeds on the crop rows.

The ridging tools pile up the soil on the crop plant rows, taking away the light that the weeds require to grow and providing the crops with additional warmth and growth stimulus.

The tine weeders crumble the soil and deposit cut-off plant residues on the soil surface.

During the hoeing procedure, the band sprayer applies crop protection products on the crop plant rows.

Alternatively, the band sprayer applies liquid fertiliser in the plant rows during the hoeing procedure.

4.3 Special equipment

CMS-T-00005975-D.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:

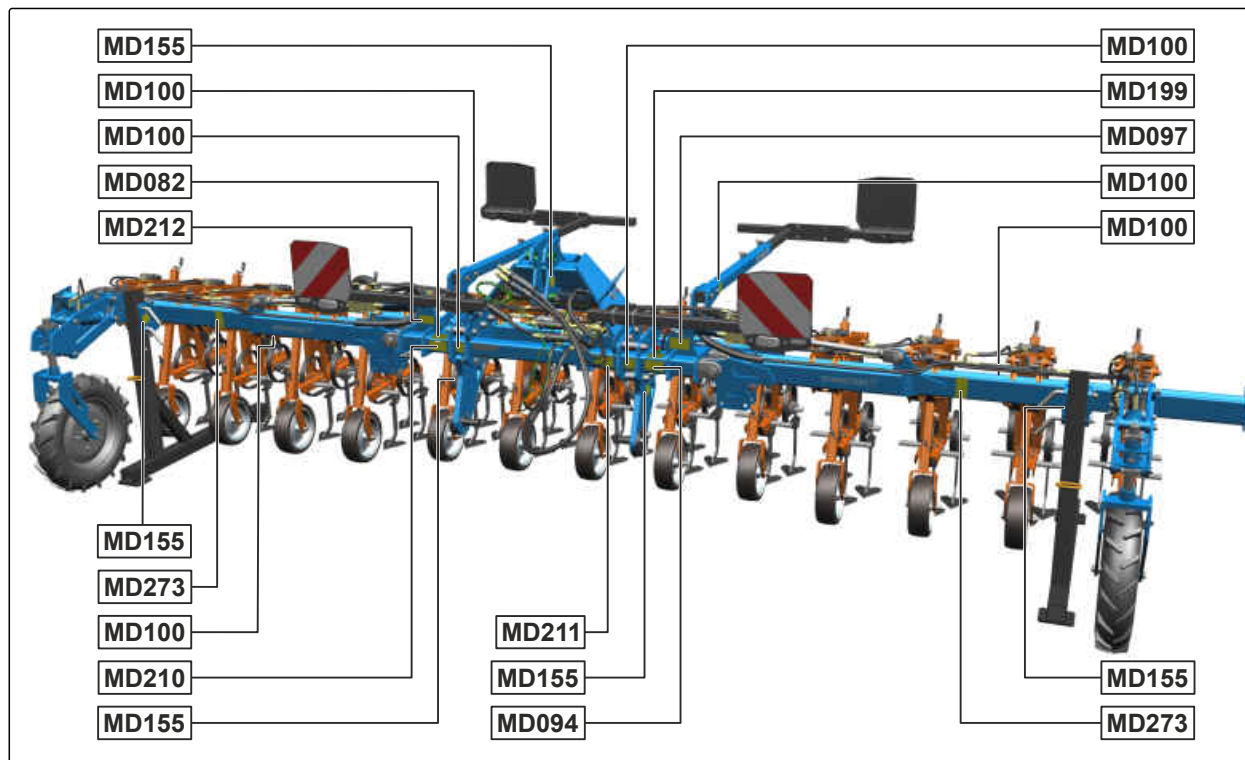
- Section Control parallelograms
- Centre parking supports
- Tool mounting bracket
- Rotavator blade
- Hoe protection discs HSZ
- RowDisc SR, RowDisc RD and RowDisc SD hoe protection discs
- Star parallelograms
- Finger hoes
- Ridging discs
- Shallow ridger
- Shallow ridger on the RapidoClip system
- Tine weeder
- Band sprayer
- Sliding frame AV 5
- Sliding frame VR 2
- Camera system
- Row sensor

4.4 Warning symbols

CMS-T-00005976-D.1

4.4.1 Positions of the warning symbols

CMS-T-00005979-B.1



CMS-I-00004386

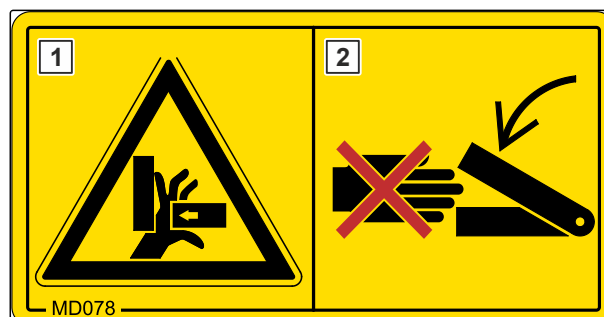
4.4.2 Layout of the warning symbols

CMS-T-000141-D.1

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-I-00000416

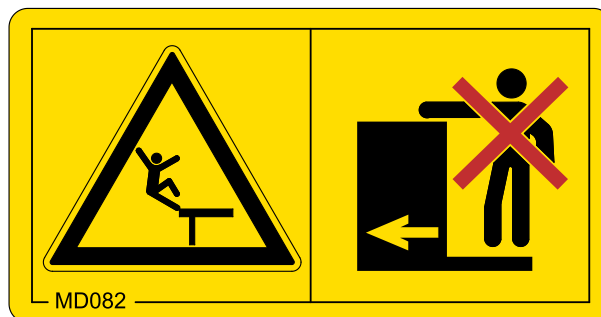
4.4.3 Description of the warning symbols

CMS-T-00005978-D.1

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.

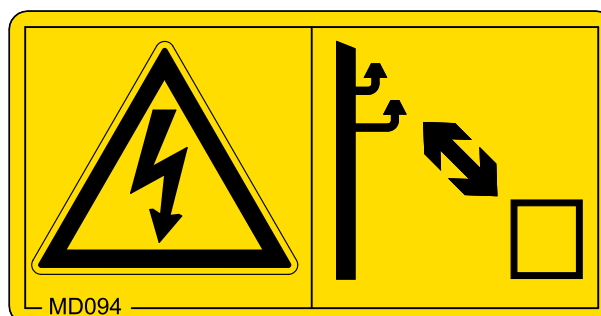


CMS-I-000081

MD094

Danger due to transmission lines

- ▶ Never touch transmission lines with the implement.
- ▶ Maintain an adequately safe distance from electrical transmission lines, especially when folding or unfolding implement parts.
- ▶ Please note that the voltage can flash over when the distance is too small.



CMS-I-000692

MD 097

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.

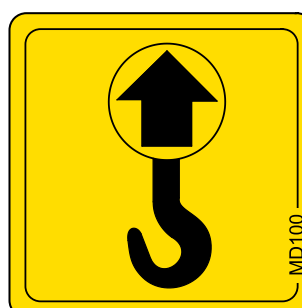


CMS-I-000139

MD 100

Risk of accidents due to improperly attached lifting gear

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

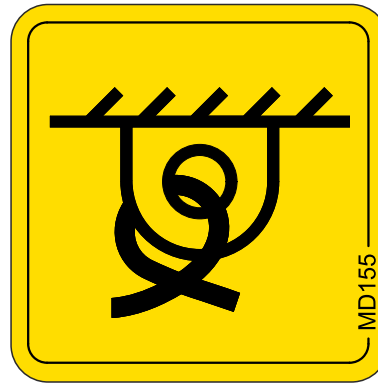


CMS-I-000089

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.

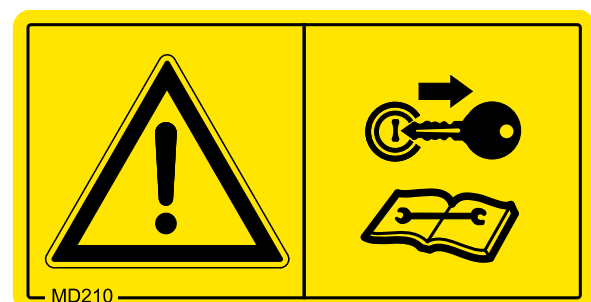


CMS-I-00000486

MD210

Risk due to unintentional starting and unintentional rolling away of the implement

- ▶ Before performing any work, secure the implement against unintentional starting and rolling away.

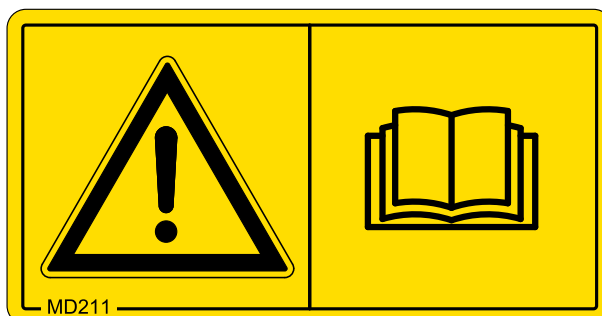


CMS-I-00002251

MD211

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.

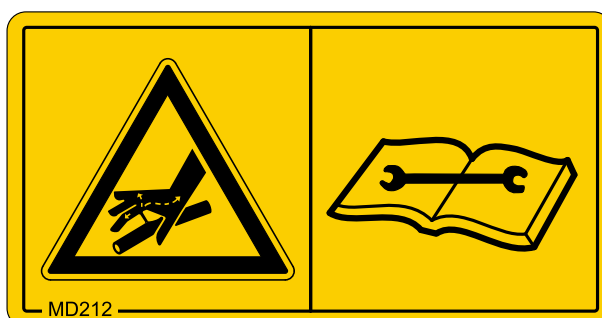


CMS-I-00003658

MD212

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-00004384

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

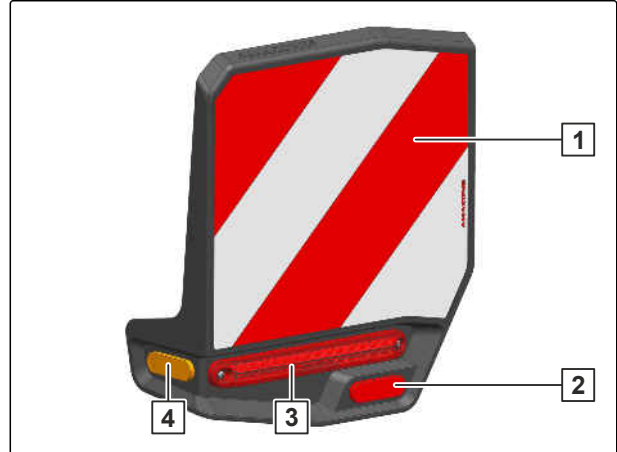
4.5 Lighting and identification for road travel

CMS-T-00006398-C.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



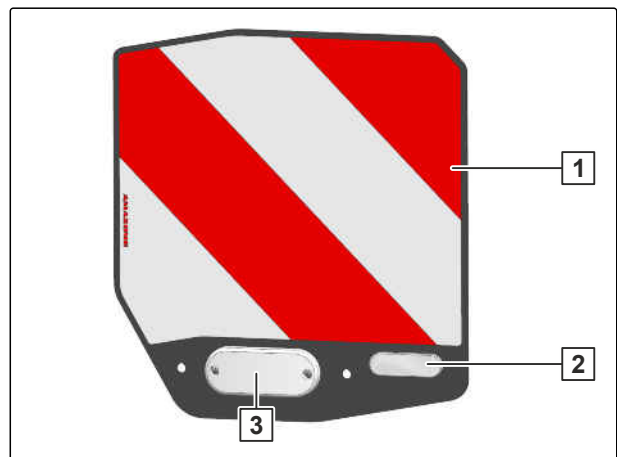
NOTE

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.

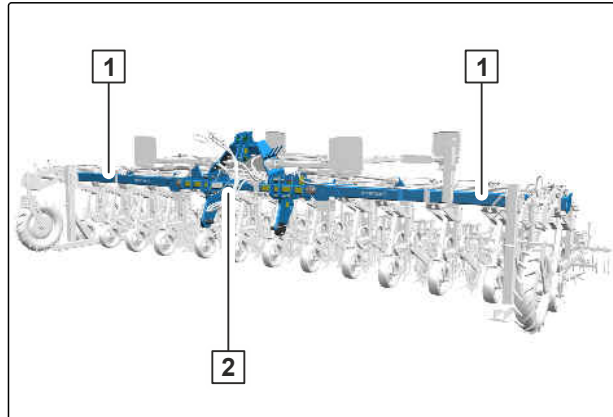
4.6 Implement slide rail

CMS-T-00006292-C.1

The implement slide rail consists of 2 hydraulically folding sections **1** and the centre profile tube **2**.

The following components are attached to the implement slide rail:

- Support wheels
- Parking supports
- Camera bracket
- Three-point mounting frame
- Hoe units
- Rear lighting and rear identification for road travel

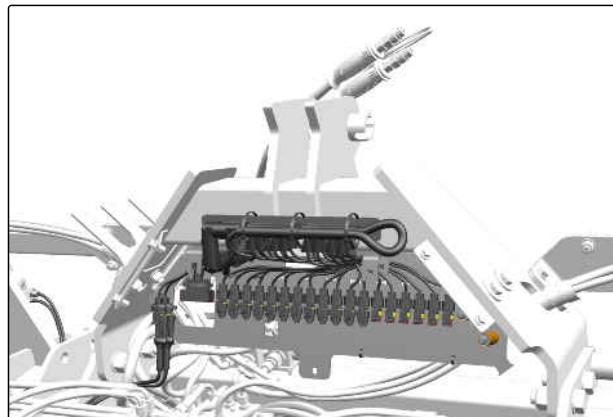


CMS-I-00004552

4.7 Section Control parallelograms

CMS-T-00006293-C.1

For implements with Section Control and hydraulically lifting parallelograms, Section Control regulates the parallelograms electronically through the lowering and lifting of the hoe units controlled by the ISOBUS software.

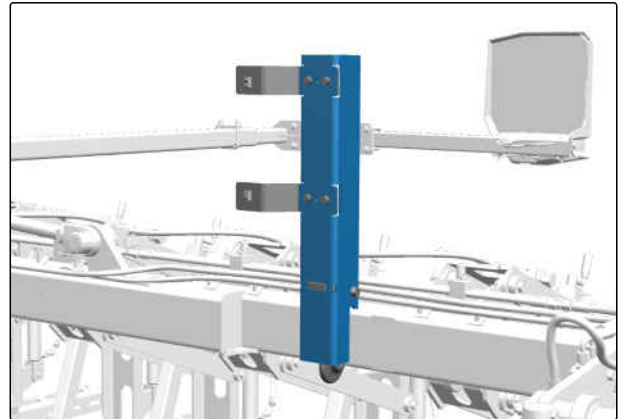


CMS-I-00004553

4.8 Camera bracket

CMS-T-00006294-B.1

If the implement is operated with a sliding frame, the camera bracket carries the camera system.



CMS-I-00004557

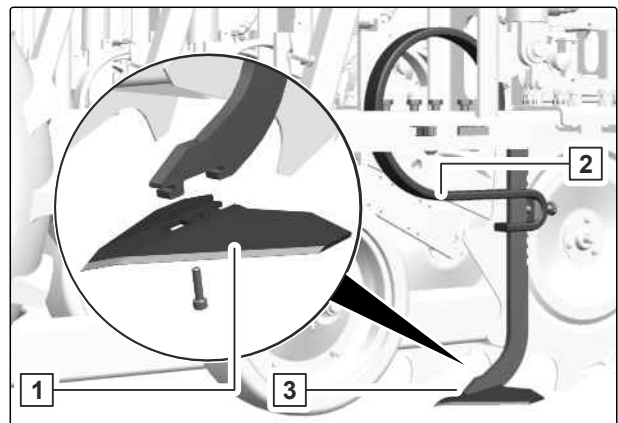
4.9 Hoe share

CMS-T-00006295-C.1

The hoe shares **3** cut the weeds between the plant rows just below the soil surface and deposit them at the surface to desiccate. The hoe shares are installed on the parallelograms with Vibro springs **2**.

The shares mounted on the Vibro springs expose the weeds even more effectively than rigid mounted shares thanks to the vibrating effect of the springs. The Vibro springs enable more uniform hoeing and are more gentle on the roots and capillary water than rigid mounting. The Vibro springs maintain a precise working depth for the hoe shares and automatically adjust the best penetration angle for the hoe shares.

With the Rapido duckfoot shares, the Rapido quick-change system **1** enables quick share replacement, since only the share plates that are fastened to the shaft with one single hexagon socket screw are replaced. Only one tool is required to loosen the bolts.



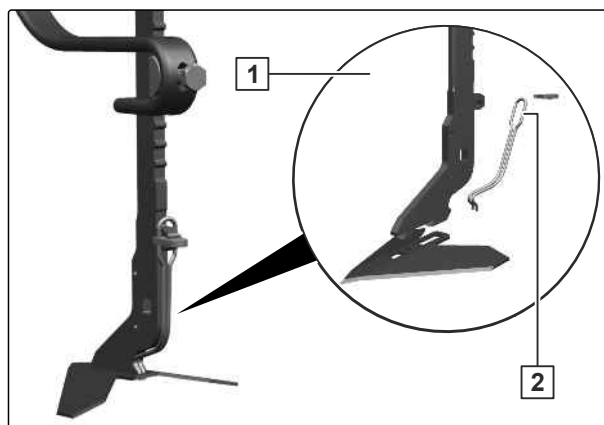
CMS-I-00004558

4 | Product description





Rating plate on the implement

With the Rapido-Clip duckfoot shares, the Rapido-Clip quick-change system **1** enables super easy share replacement within a very short time, since only the share plates that are clamped to the shaft with the Rapido-Clip **2** are replaced, and no tools are required.

The Rotavator blades work directly on the plant row. The one-sided blade guides the flow of soil away from the plant row.



CMS-I-00008658

RAPIDO duckfoot share	RapidoClip duckfoot shares	Rotavator blade, left	Rotavator blade, right
			
Share widths 80 mm, 100 mm, 120 mm, 300 mm, 340 mm, 380 mm	Share widths 140 mm, 160 mm, 180 mm, 200 mm, 240 mm, 280 mm	Share widths 120 mm, 140 mm, 160 mm, 180 mm	

4.10 Rating plate on the implement

CMS-T-00005971-D.1

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

CMS-I-00004461

Technical data

5

CMS-T-00006022-D.1

5.1 Dimensions

CMS-T-00006023-B.1

Working width, depending on the number of rows and row spacing	4.5 m to 6.75 m
Transport width	< 3 m
Total length	2.45 m
Total length with finger hoes or ridging discs	2.85 m
Total length with finger hoes or ridging discs and harrows	3 m
Centre of gravity distance (d), depending on the equipment, e.g. number of rows, row spacing, finger hoes, ridging discs and tines	38 cm to 67 cm
Implement height for road transport, depending on the number of rows and row spacing	2.9 m to 3.7 m

5.2 Hoeing tools

CMS-T-00006459-B.1

Working depth	5 mm to 4 cm
Optimal working depth	2 cm to 3 cm

5.3 Permitted mounting categories

CMS-T-00006028-B.1

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

5.4 Forward speed

CMS-T-00006024-B.1

Optimal working speed	6 km/h to 12 km/h
Permissible transport speed	60 km/h

5.5 Performance characteristics of the tractor

CMS-T-00006029-C.1

Engine rating	
Depending on the implement equipment, number of rows and row spacing: 80 hp to 160 hp	

Electrical system	
Battery voltage	12 V
Lighting socket	7-pin

Hydraulic system	
Maximum operating pressure	210 bar
Tractor pump output	Without Section Control: at least 25 l/min at 180 bar
	With Section Control: at least 40 l/min at 180 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.

5.6 Noise development data



CMS-T-00006025-A.1

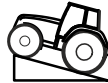
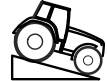
The workplace-related emission sound pressure level is lower than 70 dB(A), measured in operating condition at the ear of the tractor driver with the cab closed.

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

5.7 Drivable slope inclination

CMS-T-00006026-B.1

Across the slope		
On left in direction of travel	10 %	
On right in direction of travel	10 %	

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

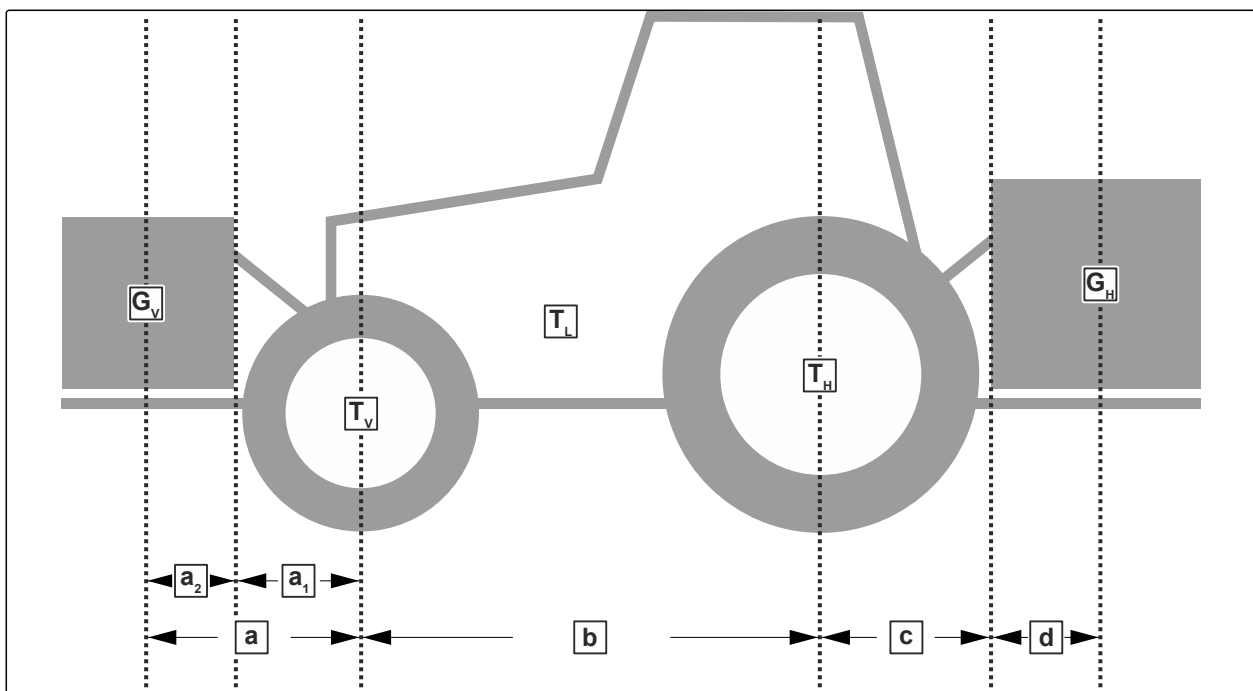
Preparing the machine

6

CMS-T-00006030-E.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.

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

$$G_{Vmin} = \underline{\hspace{2cm}}$$

$$G_{Vmin} = \underline{\hspace{2cm}}$$

CMS-I-00000513

2. Calculate the actual front axle load.

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

$$T_{Vtat} = \underline{\hspace{2cm}}$$

$$T_{Vtat} = \underline{\hspace{2cm}}$$

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

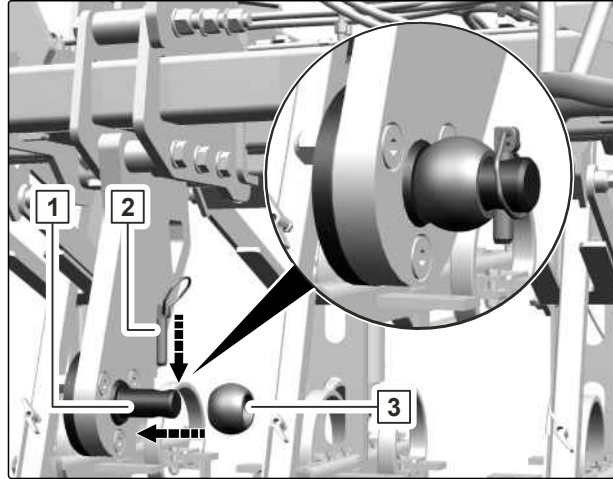
6.2 Coupling the implement

CMS-T-00006039-E.1

6.2.1 Attaching the lower link ball sleeves

CMS-T-00006040-B.1

1. On the three-point mounting frame, put the ball sleeve **3** on the lower link pin **1**.
2. Secure the ball sleeve with a linch pin **2**.
3. Attach the ball sleeve on the other side of the three-point frame in the same way.

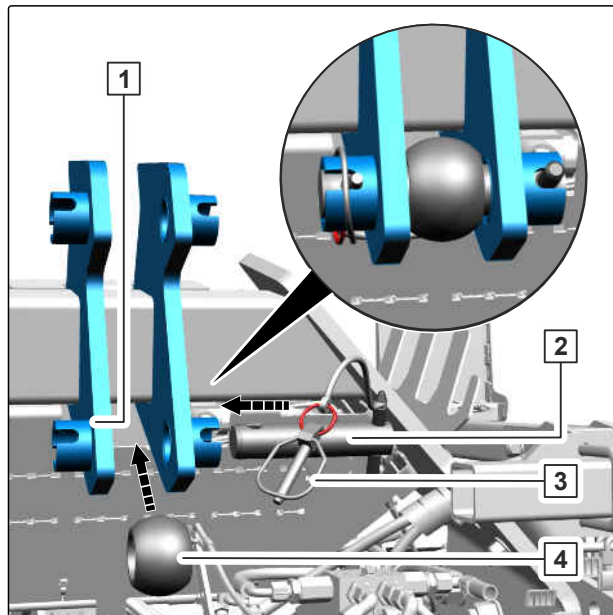


CMS-I-00004322

6.2.2 Attaching the top link ball sleeve

CMS-T-00006041-B.1

1. On the three-point mounting frame, fix the ball sleeve **4** with the top link pin **2** in the lower mount **1**.
2. Secure the top link pin with the linch pin **3**.



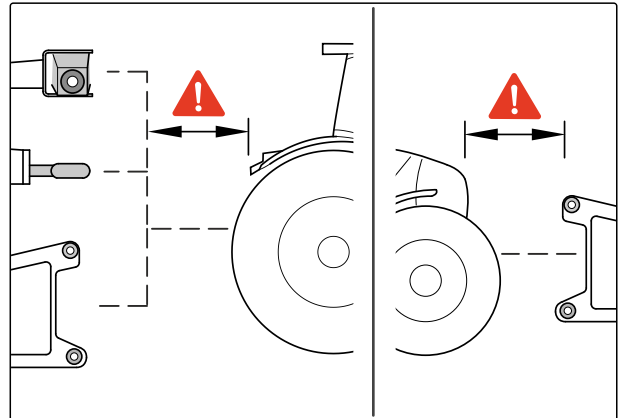
CMS-I-00004328

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.



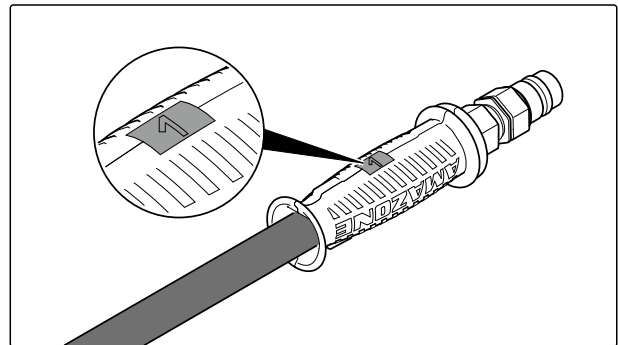
CMS-I-00004045

6.2.4 Coupling the hydraulic hose lines

CMS-T-00006077-C.1

All hydraulic hoses are equipped with handles. The handles have colour labels with a code number or a code letter. The labels are assigned to the respective hydraulic functions of the pressure line of a tractor control unit. Stickers are applied on the implement for the labels, 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	Hydraulic function	Symbol
Latching	Permanent hydraulic oil circulation	
Momentary	Hydraulic oil flow until action is executed	
Floating	Free hydraulic oil flow in the tractor control unit	

Designation		Function			Tractor control unit	
Blue			Sections and support wheels	Unfold and lower	Double-acting	
				Fold and lift		
Green			Parallelograms	Lower	Double-acting	
				Lift		



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.

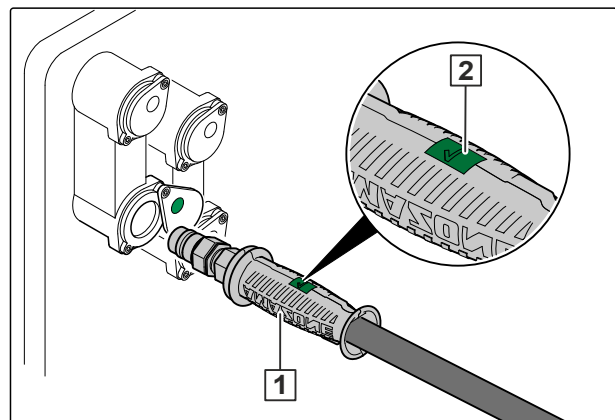


IMPORTANT

Implement damage due to insufficient hydraulic oil return flow

- ▶ Only use lines of size DN16 or larger for the pressureless hydraulic oil return flow.
- ▶ Select short return paths.
- ▶ Connect the pressureless hydraulic return flow to the intended coupling.
- ▶ *Depending on the implement equipment:* couple the leakage oil line in the intended coupling.
- ▶ Install the supplied coupling sleeve on the pressureless hydraulic oil return.

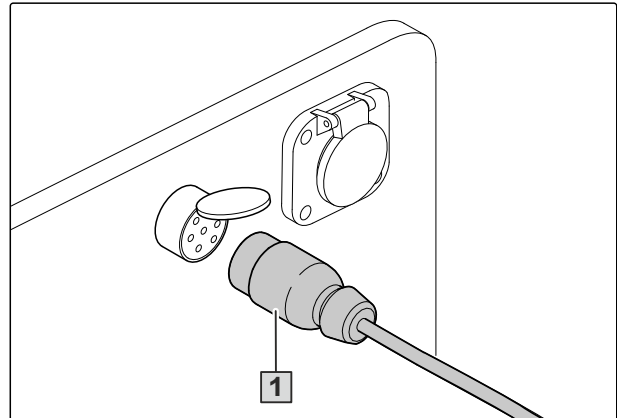
1. Depressurise the hydraulic system between the tractor and the implement using the tractor control unit.
 2. Clean the hydraulic plugs.
 3. Couple the hydraulic hose lines **1** to the hydraulic sockets of the tractor according to the marking **2**.
- ➔ The hydraulic plugs lock perceptibly.
4. Route 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-T-00001399-G.1

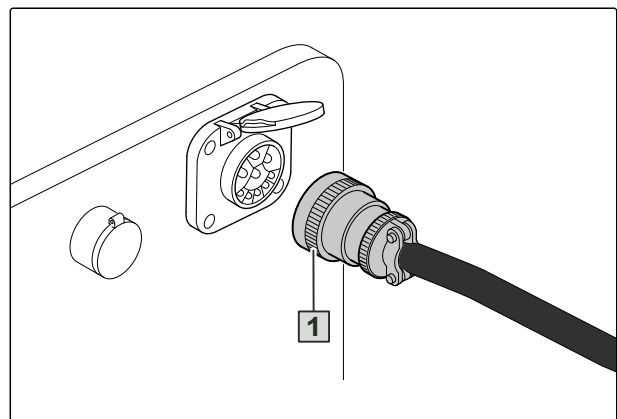
CMS-I-00001048

6.2.6 Coupling the ISOBUS lines

Coupling of the ISOBUS line or ISOBUS lines depends on two factors:

- Product type of the implement
- Equipment of the implement with band sprayer and front tank

1. *If the implement is a KPP-M product type without band sprayer and front tank:*
Skip to the next section without further action; otherwise, continue with step 2.
2. *If the implement is a KPP-LSC or KPP-MSK product type without band sprayer and front tank:*
perform steps 3 and 4, otherwise continue with step 5.
3. Insert the plug **1** for the ISOBUS line of the hoeing machine into the tractor.
4. Route the ISOBUS line with sufficient freedom of movement and without chafing or pinching points.
5. *If the implement is a KPP-M product type with band sprayer and front tank:*
perform steps 6 to 9, otherwise continue with step 10.

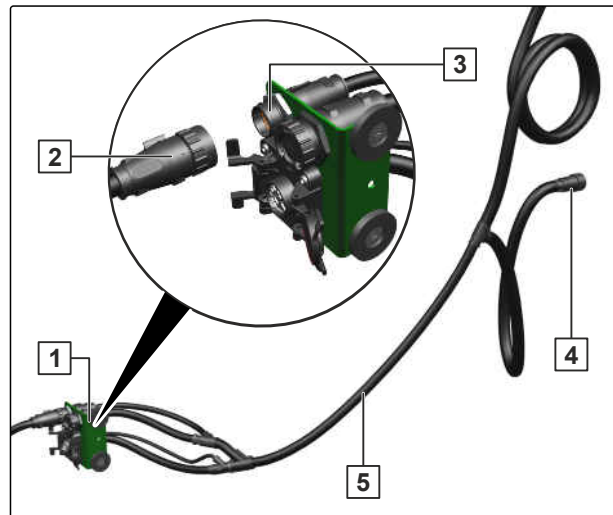


CMS-I-00004333

6 | Preparing the machine

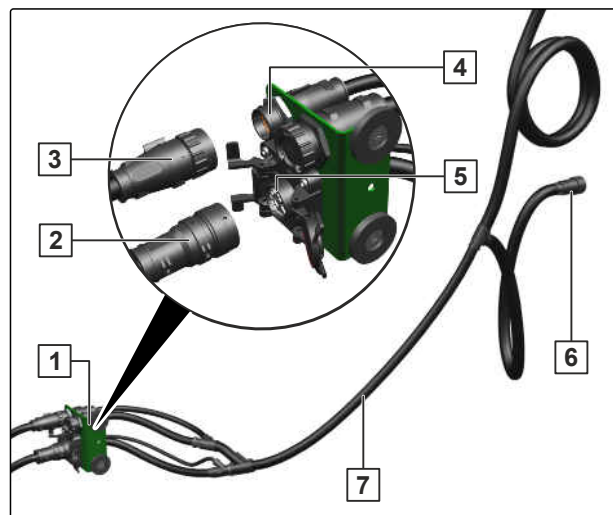
Coupling the implement

6. Attach the wiring harness magnetic holder **1** with the magnets onto the three-point mounting frame of the implement.
7. Insert the plug **2** for the ISOBUS line of the band sprayer into the left upper socket **3** of the wiring harness magnetic holder.
8. Insert the plug **4** for the combined ISOBUS line **5** into the tractor.
9. Route the ISOBUS lines with sufficient freedom of movement and without chafing or pinching points.
10. *If the implement is a KPP-LSC or KPP-MSK product type with band sprayer and front tank:* perform steps 11 to 15.



CMS-I-00005860

11. Attach the wiring harness magnetic holder **1** with the magnets onto the three-point mounting frame of the implement.
12. Insert the plug **3** for the ISOBUS line of the band sprayer into the left upper socket **4** of the wiring harness magnetic holder **1**.
13. Insert the plug **2** for the ISOBUS line of the hoeing machine into the lower socket **5** of the wiring harness magnetic holder.
14. Insert the plug **6** for the combined ISOBUS line **7** into the tractor.
15. Route the ISOBUS lines with sufficient freedom of movement and without chafing or pinching points.

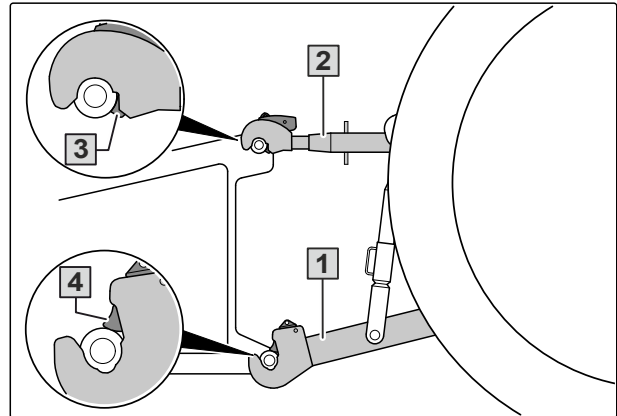


CMS-I-00005845

6.2.7 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.



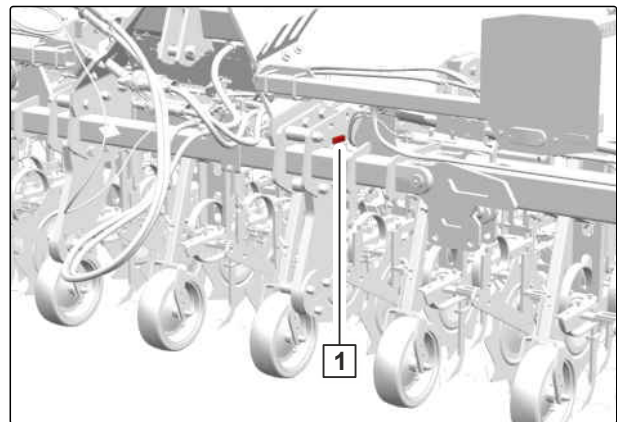
CMS-I-00001225

6.2.8 Aligning the implement

CMS-T-00006603-B.1

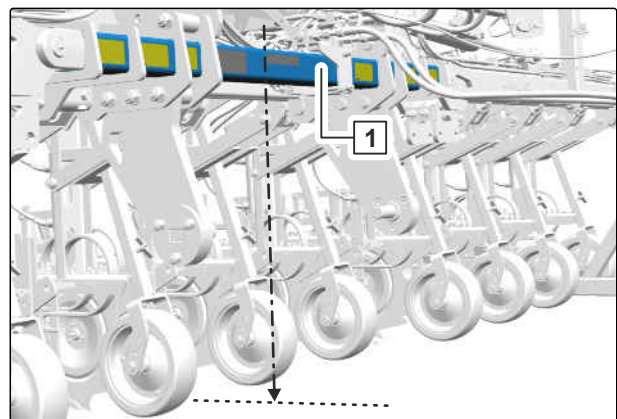
The alignment of the implement depends on the surface on which the implement is aligned. On a level surface, the implement is aligned using the spirit level. On an inclined surface, the implement must be aligned based on the front wall of the centre beam section.

1. *To align the implement on a level surface:*
Align the implement with the top link such that the bubble in the spirit level **1** is centred between the two marks.



CMS-I-00004692

2. *To align the implement on an inclined surface:*
Align the implement with the top link such that the front wall of the centre beam section **1** is vertical to the inclined surface.



CMS-I-00004693

6.3 Preparing the machine for road travel

CMS-T-00006042-D.1

6.3.1 Removing the parking supports

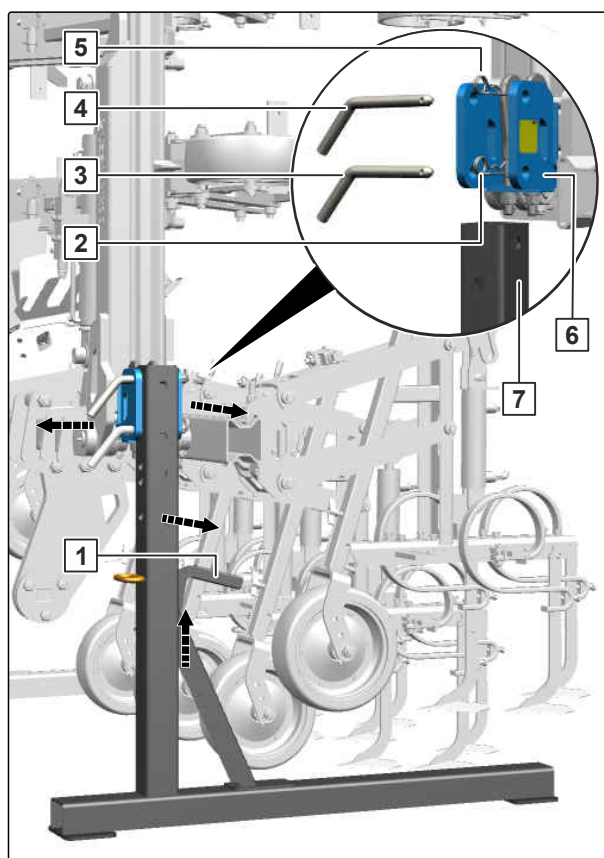
CMS-T-00006613-D.1

6.3.1.1 Removing the parking supports when the implement is folded and parked

CMS-T-00006043-D.1

For the KPP-LSC 12 x 50 product type, after removing the parking supports, the lowering locks must also be removed, which were used to attach the parking supports in the two outer parallelograms of the centre parts of the implement slide rail.

1. Lift the coupled implement with the three-point power lift.
2. Pull the spring cotter pin **2** out of the lower fixing pin **3**.
3. Pull the lower fixing pin out of the holes of the clamp **6** and the holes of the parking support **7**.
4. Pull the spring cotter pin **5** out of the upper fixing pin **4**.
5. Hold the parking support by the handle **1** and lift it slightly.
6. Pull the upper fixing pin out of the holes of the clamp and the holes of the parking support.
7. Hold the parking support by the handle and pull it away from the implement.
8. Repeat steps 2 to 7 for the second parking support.



CMS-I-00004707

9. *If the implement is a KPP-LSC 12 x 50 product type:*
perform steps 10 to 15.



IMPORTANT Damage due to the parking supports not being removed on the inner ends of the sections

When the implement is unfolded without removing the parking supports on the inner ends of the sections, it can cause serious damage to the implement.

- Before unfolding the implement, make sure that the parking supports are removed on the inner ends of the sections.

10. Unfold the implement, see page 51.
11. Move all parallelograms into transport position, see sections "*Display for the status and the position of the parallelograms*" and "*Switching parallelograms manually*" in the operating manual for the ISOBUS hoeing machine software.

12. On one of the two outer parallelograms that are attached to the centre segment of the implement slide rail, hold the lowering lock **2** on the grip eyelet **3**.

13. Release the lowering lock at the bottom of the piston rod **1** and swivel it up.

14. Take off the lowering lock.

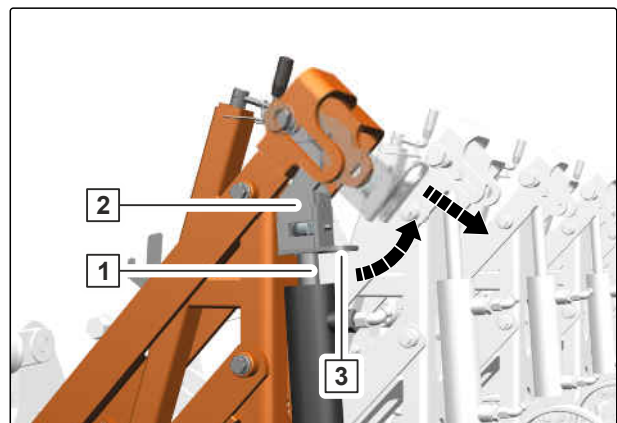
15. Remove the lowering lock on the other outer parallelogram in the same way.

16. *If the section-side hoe shares were pushed up on the two outer parallelograms on the centre section of the implement slide rail when attaching the parking supports:*
perform steps 17 to 19.

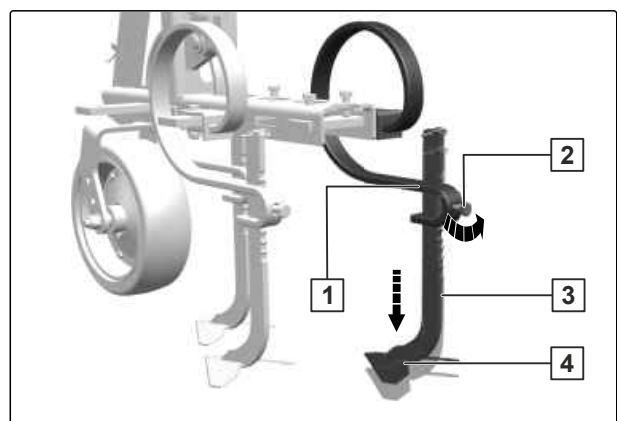
17. Loosen the bolt **2** for the holder **1** on the corresponding hoe share **4**.

18. Slide the shaft **3** of the hoe share down until the blade of the hoe share is at the same level as the blades of the other hoe shares, and retighten the bolt.

19. Set down the other section-side hoe share in the same way.



CMS-I-00004709

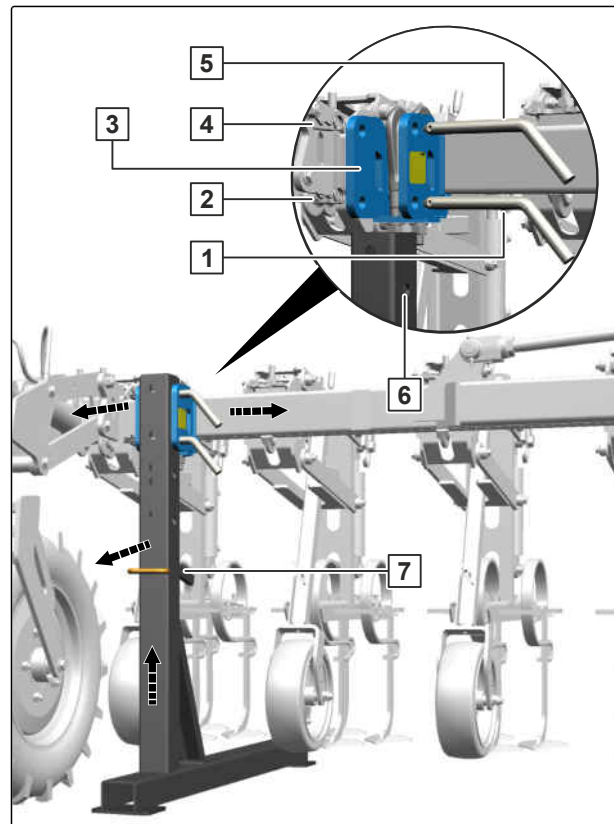


CMS-I-00005766

6.3.1.2 Removing the parking supports when the implement is unfolded and parked

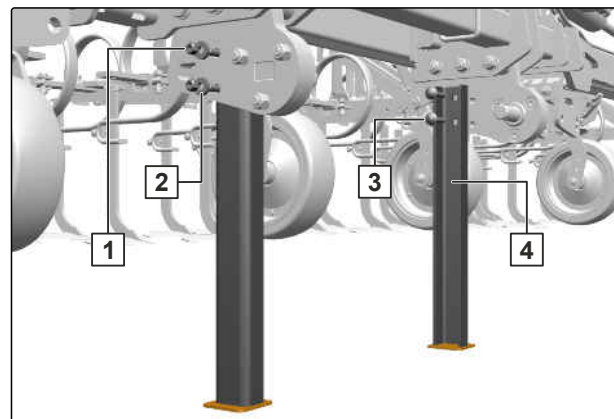
CMS-T-00006614-D.1

1. Lift the coupled implement with the three-point power lift.
2. Pull the spring cotter pin **2** out of the lower fixing pin **1**.
3. Pull the lower fixing pin out of the holes of the clamp **3** and the holes of the parking support **6**.
4. Pull the spring cotter pin **4** out of the upper fixing pin **5**.
5. Hold the parking support by the handle **7** and lift it slightly.
6. Pull the upper fixing pin out of the holes of the clamp and the hole of the parking support.
7. Hold the parking support by the handle and pull it away from the implement.
8. Repeat steps 2 to 7 for the second parking support.



CMS-I-00004330

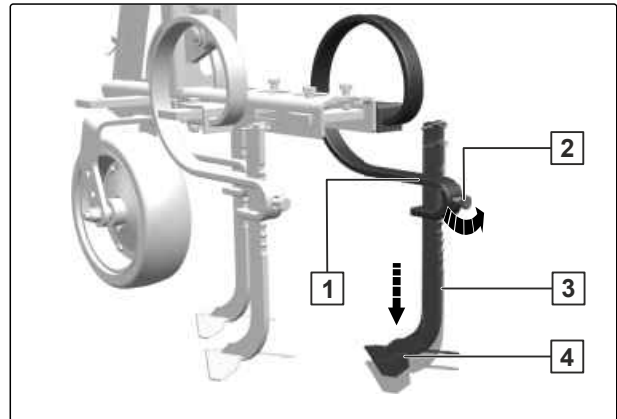
9. *If an additional pair of centre parking supports is attached to the parked implement:* perform steps 10 to 12.
10. Loosen the nuts **1** and remove them along with the washers **2**.
11. Pull out the bolts **3** and remove the centre parking supports **4**.
12. Repeat steps 10 and 11 for the second centre parking support.



CMS-I-00005757

13. If the hoe shares were pushed up above the feet of the parking supports on the parallelograms behind the clamps when attaching the parking supports:
perform steps 14 to 16.

14. Loosen the bolt **2** for the holder **1** on the corresponding hoe share **4**.
15. Slide the shaft **3** of the hoe share down until the blade of the hoe share is at the same level as the blades of the other hoe shares, and retighten the bolt.
16. Set down the hoe share on the parallelogram behind the other clamps in the same way.



CMS-I-00005766

6.3.2 Moving the hoe protection discs into transport position

CMS-T-00013648-B.1

To ensure that the folded implement does not exceed the permissible transport width during road travel, the hoe protection discs of the parallelograms on the sections must be moved into the passive position.

- Move the hoe protection discs HSZ on the sections into passive position according to section "Activating or deactivating hoe protection discs HSZ", see page 62

or

Move the RowDisc hoe protection discs on the sections into passive position according to section "Activating or deactivating RowDisc hoe protection discs", see page 72.

6.3.3 Moving the parallelograms into transport position

CMS-T-00008468-B.1

6.3.3.1 Moving the hydraulically lifting KPP into transport position

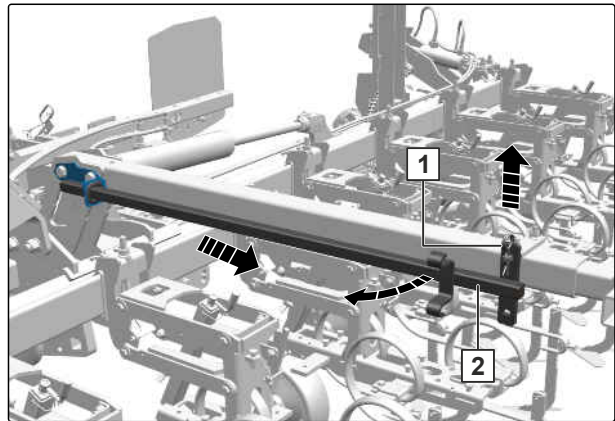
CMS-T-00008469-B.1

- To move the parallelograms into transport position:
observe the sections "Display for the status and the position of the parallelograms" and "Switching parallelograms manually" in the operating manual for the ISOBUS hoeing machine software.

6.3.3.2 Moving the mechanically lifting KPP into transport position

CMS-T-00008470-A.1

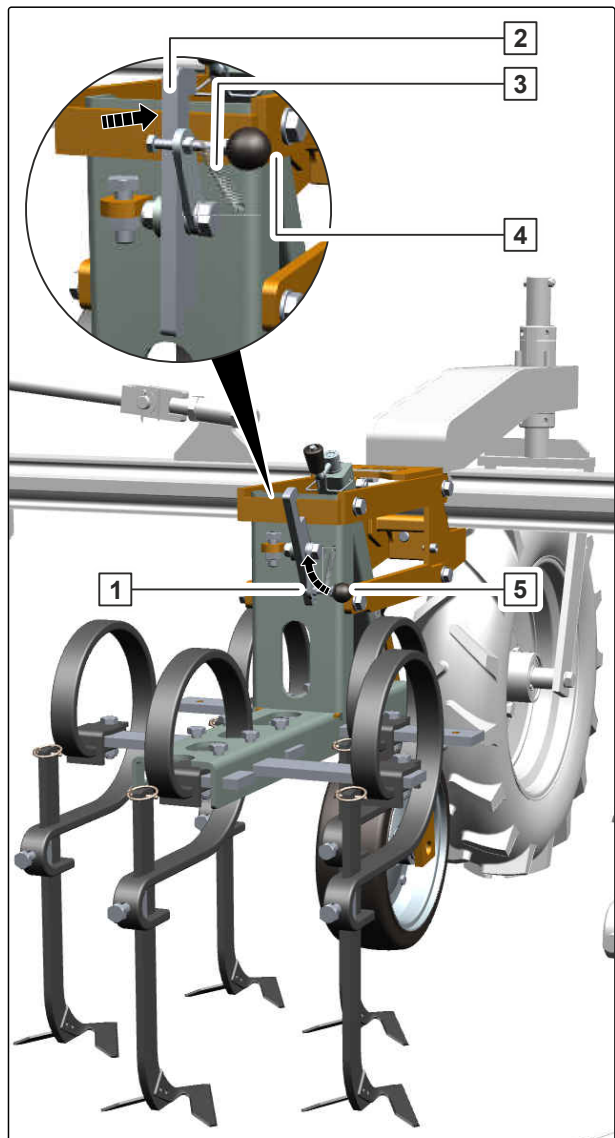
1. Pull out the spring cotter pin **1**.
2. Swivel in the lifting rod **2** to the side and pull it out of the holder.



CMS-I-00005779

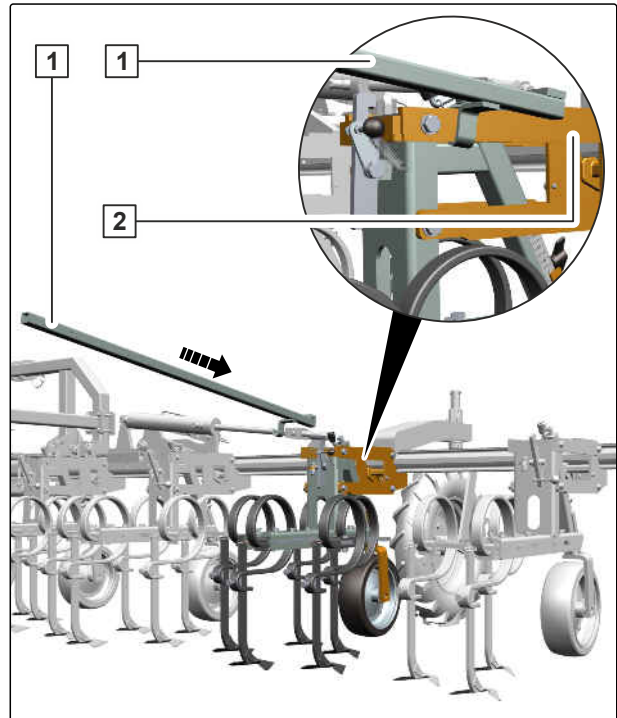
3. Swivel up the lever **1** for locking on the ball head **5**.

➔ The locking bar **2** is pressed against the parallelogram **4** with the tension spring **3**.



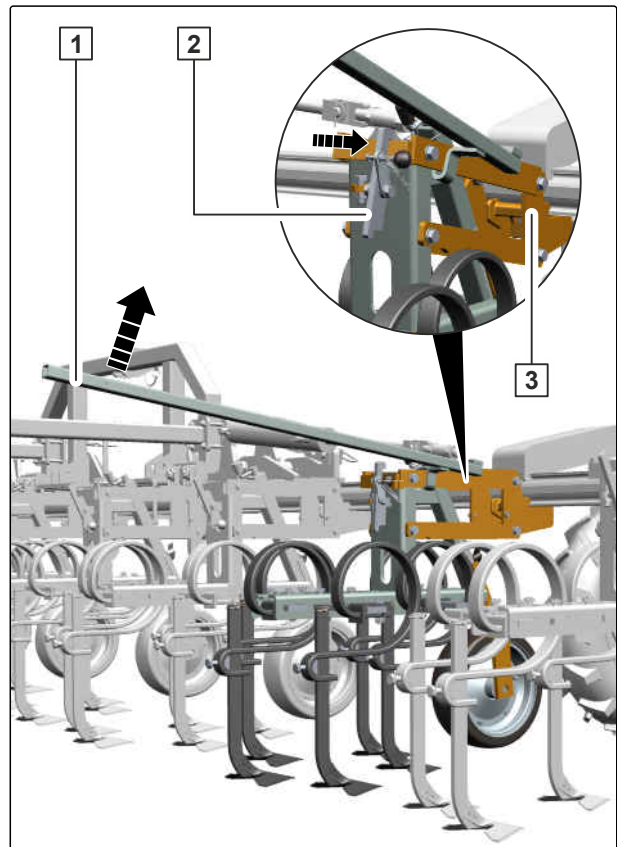
CMS-I-00004277

4. Place the lifting rod **1** on the parallelogram **2**.



CMS-I-00004278

5. Lift up the parallelogram **3** with the lifting rod **1** until the locking bar **2** engages.
6. Remove the lifting rod from the parallelogram.
7. Move all of the parallelograms into transport position in the same way.
8. Insert the lifting rod into the holder and swivel it outwards to the side.
9. Secure the lifting rod with the spring cotter pin.



CMS-I-00004283

6.3.4 Folding the implement

CMS-T-00008467-C.1

6.3.4.1 Folding implements equipped with hydraulically lifting parallelograms

CMS-T-00006050-D.1



REQUIREMENTS

- ✓ The implement is raised
 - ✓ The parking supports are removed, see page 44
- Actuate the "blue" tractor control unit until folding is completed.
- ➔ Depending on the product type, either all of the parallelograms are lifted or the parallelograms on the sections are lifted and the parallelograms on the centre segment of the implement slide rail are completely lowered or lowered to the middle when the lowering lock is installed.
- ➔ The support wheels will be folded into transport position.
- ➔ The sections will be folded.

6.3.4.2 Folding an implement equipped with mechanically lifting parallelograms

CMS-T-00008466-C.1



REQUIREMENTS

- ✓ The implement is raised
 - ✓ The parking supports are removed, see page 44
 - ✓ Parallelograms were moved into transport position, see page 48
1. Check if all parallelograms are securely locked in transport position.
 2. Actuate the "blue" tractor control unit until folding is completed.
- ➔ The support wheels will be folded into transport position.
- ➔ The sections will be folded.

6.4 Preparing the implement for operation

CMS-T-00006051-D.1

6.4.1 Unfolding the implement

CMS-T-00006062-C.1

1. Lift the implement.



IMPORTANT Damage due to the parking supports not being removed on the inner ends of the sections

When the implement is unfolded without removing the parking supports on the inner ends of the sections, it can cause serious damage to the implement.

- ▶ Before unfolding the implement, make sure that the parking supports are removed on the inner ends of the sections.

2. Actuate the "blue" tractor control unit until unfolding is completed.

➔ The sections will be unfolded.

➔ The support wheels will be lowered into working position.

6.4.2 Selecting the parallelograms and moving them into working position

CMS-T-00008471-B.1

6.4.2.1 Selecting the hydraulically lifting KPP and moving them into working position

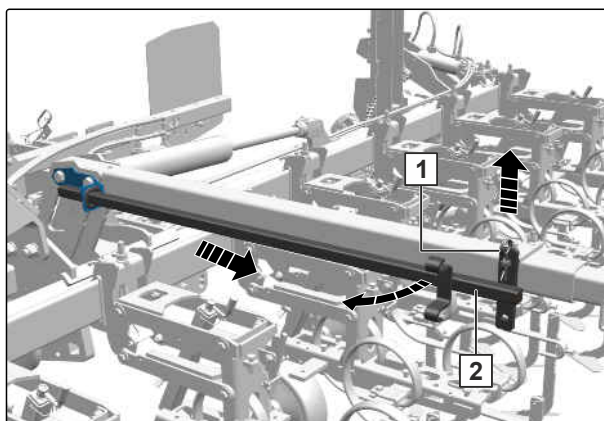
CMS-T-00006267-C.1

- ▶ *To select the parallelograms that should be used and set up for hoeing operation and move them into working position:*
observe the sections "Display for the status and the position of the parallelograms" and "Switching parallelograms manually" in the operating manual for the ISOBUS hoeing machine software.

6.4.2.2 Selecting the mechanically lifting KPP and moving them into working position

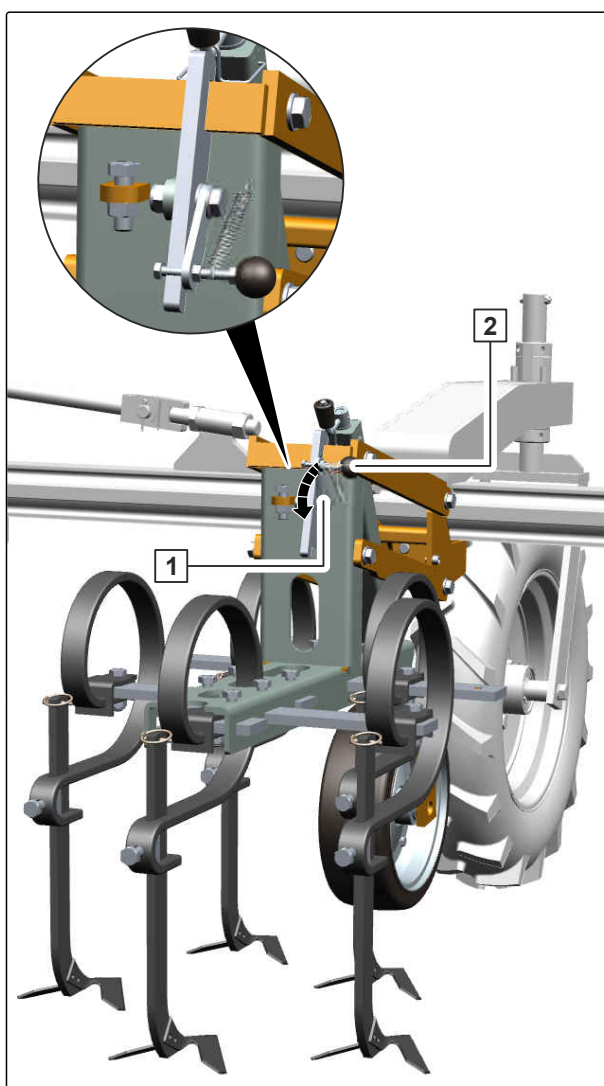
CMS-T-00008472-B.1

1. Pull out the spring cotter pin **1**.
2. Swivel in the lifting rod **2** to the side and pull it out of the holder.



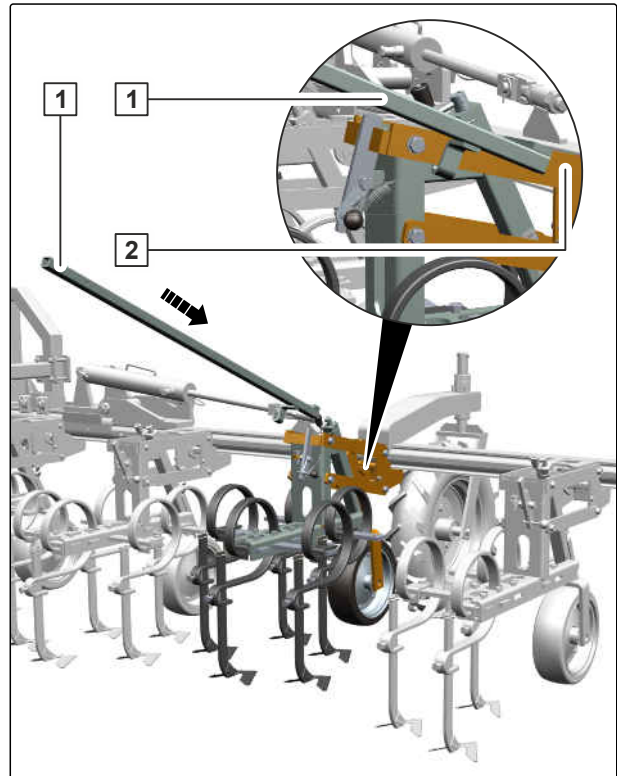
CMS-I-00005779

3. Swivel down the lever **1** for locking on the ball head **2**.



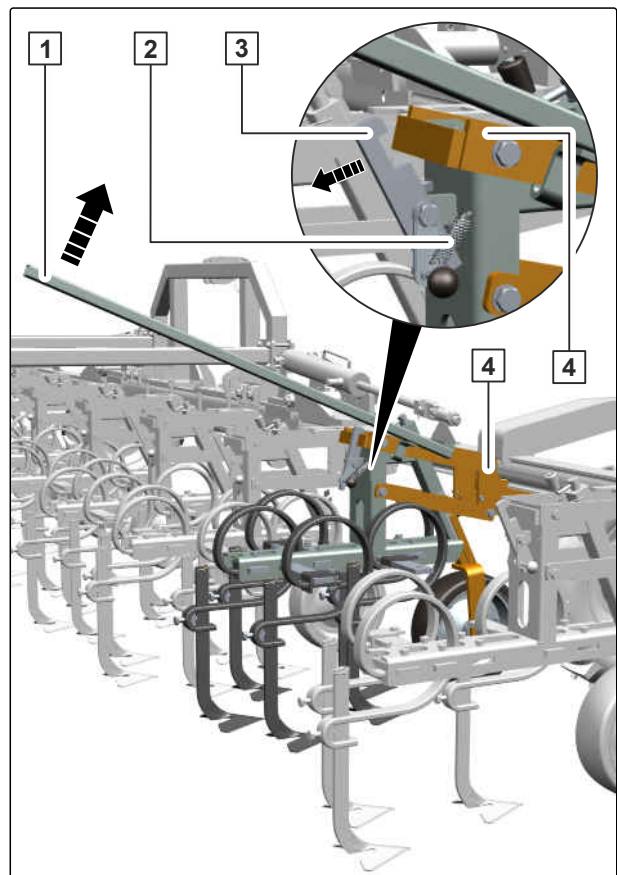
CMS-I-00004284

4. Place the lifting rod **1** on the parallelogram **2**.



CMS-I-00004285

5. Lift up the parallelogram **4** with the lifting rod **1** until the locking bar **3** disengages and the tension spring **2** releases it from the parallelogram **4**.

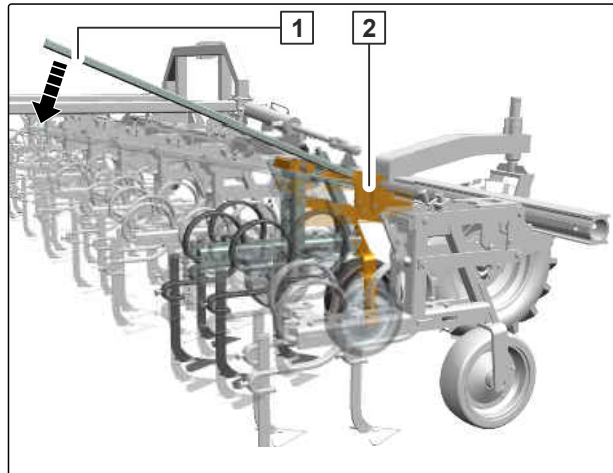


CMS-I-00004286

6 | Preparing the machine

Preparing the implement for operation

6. Lower the parallelogram **2** all the way down with the lifting rod **1**.
7. Remove the lifting rod from the parallelogram.
8. Move all of the parallelograms required for hoeing operation into working position in the same way.
9. Insert the lifting rod into the holder and swivel it outwards to the side.
10. Secure the lifting rod with the spring cotter pin.



CMS-I-00004287

6.4.3 Setting up the support wheels

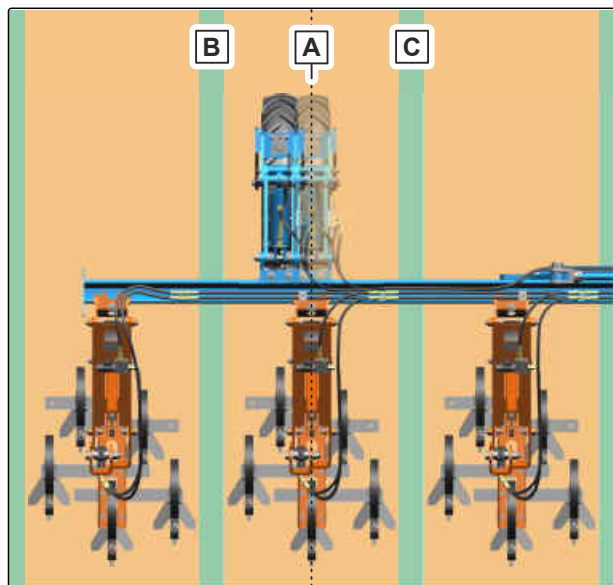
CMS-T-00006052-D.1

6.4.3.1 Aligning the support wheels on the rows

CMS-T-00006054-D.1

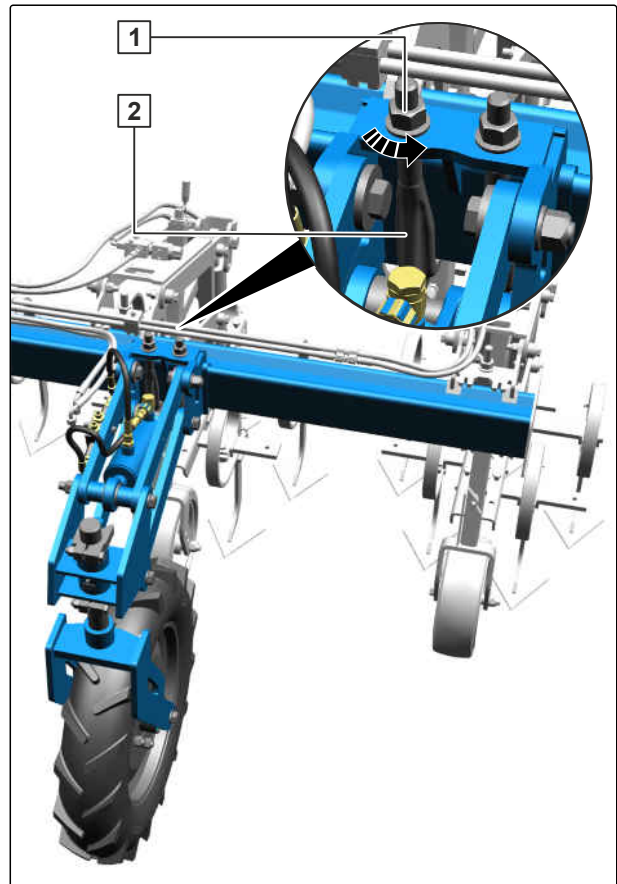
The support wheels must be positioned as follows:

- During hoeing operation, each support wheel should run as close to the centre axis as possible **A** between the two plant rows **B** and **C**.
- During hoeing operation, each support wheel may not touch the two plant rows **B** and **C** when the support wheel can only be positioned off-centre because a camera system is installed beside it.



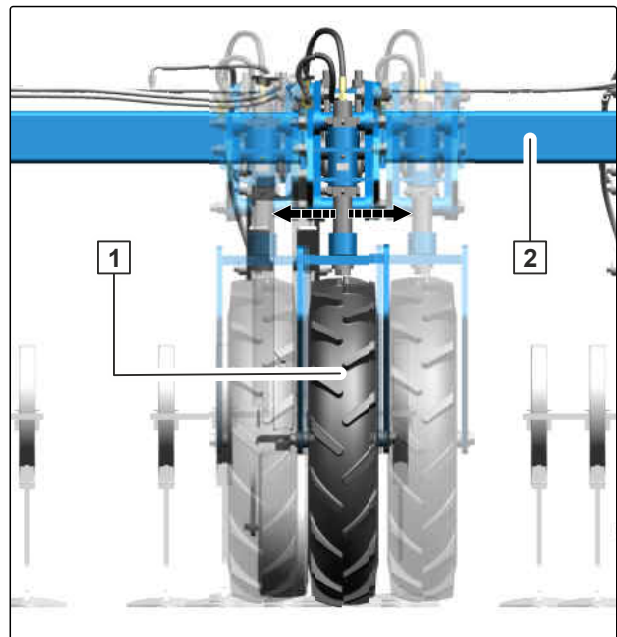
CMS-I-00004334

1. Lower the implement on the field with the three-point power lift.
2. Loosen the nuts **1** of the two clasp bolts **2**.



CMS-I-00004331

3. Lift the implement with the three-point power lift until the support wheel **1** can be moved on the implement slide rail **2**.
4. Move the support wheel to the correct position.
5. Tighten the nuts for the clasp bolts with a torque of 210 Nm.
6. Align the support wheel in the same way on the other side of the implement.



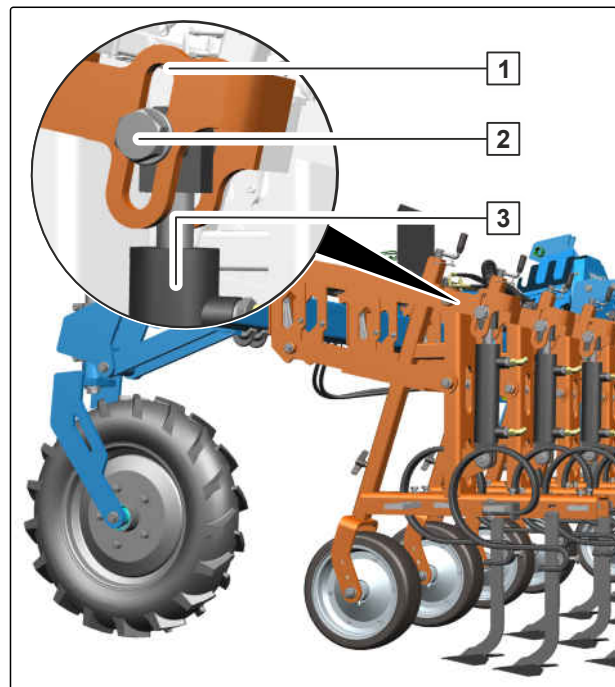
CMS-I-00004332

6.4.3.2 Adjusting the height of the support wheels

CMS-T-00006053-D.1

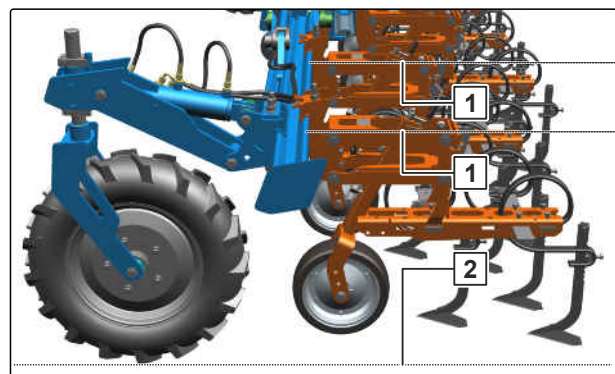
With implements that are equipped with hydraulically lifting parallelograms, the height of support wheels must be positioned such that the upper guide pin **2** of the hydraulic cylinder **3** is positioned at the centre of the elongated slot **1** when the parallelograms are in working position.

If more lifting height is required, the height of the support wheels can be positioned such that the upper guide pin of the hydraulic cylinder is positioned at the upper end of the elongated slot. In this case, however, it must be ensured that the parallelograms are not lifted out during hoeing operation.



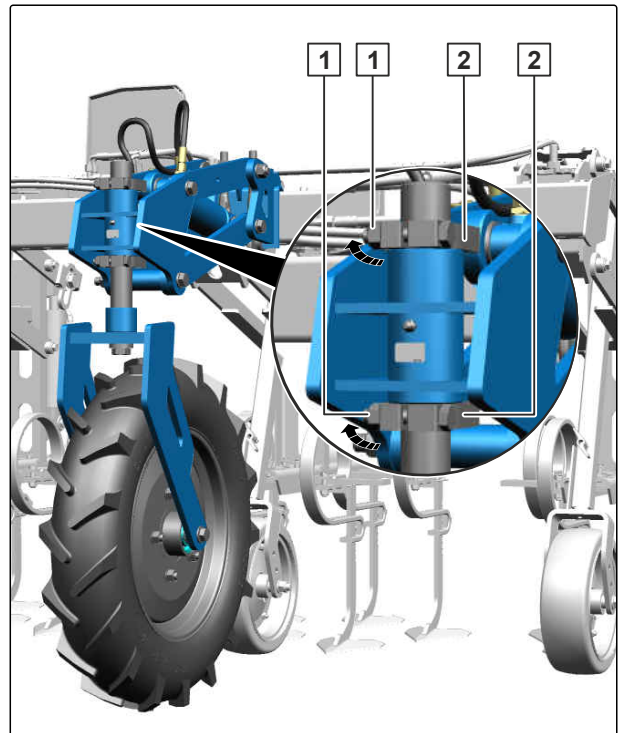
CMS-I-00004335

For implements that are equipped with mechanically lifting parallelograms, the height of the support wheels must be positioned such that the top link bars **1** of the parallelograms run parallel to the ground **2** when in working position.



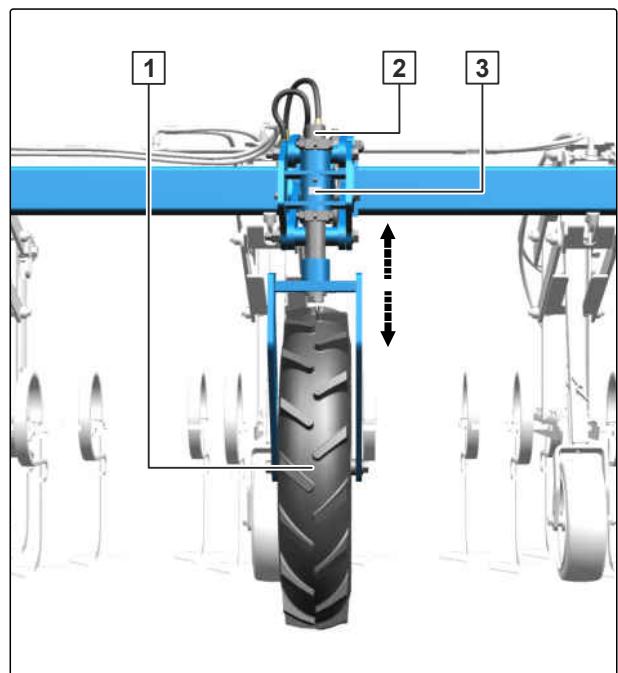
CMS-I-00005756

1. Lower the implement on the field with the three-point power lift.
2. Loosen the nuts **1** of the clamp bolts **2**.



CMS-I-00004336

3. Slide the support wheel **1** up or down in the head tube **3** with the fork stem tube **2** until the support wheel is in the right position.

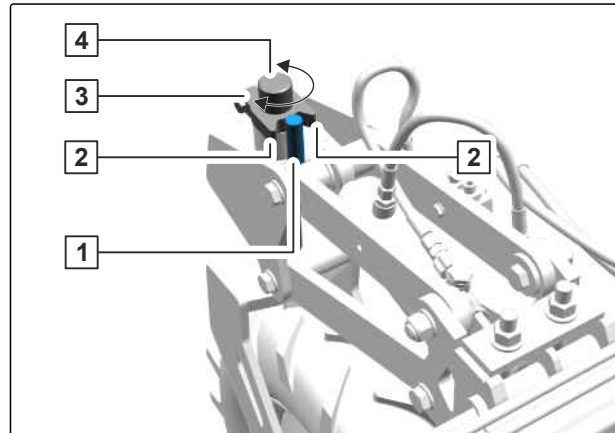


CMS-I-00004337

6 | Preparing the machine

Preparing the implement for operation

- Turn the upper clamp **3** on the fork stem tube **4** so that the steering stop pin **1** is centred between the two stop lugs **2**.
- Tighten the nuts of the clamp bolts.
- Align the support wheel in the same way on the other side of the implement.

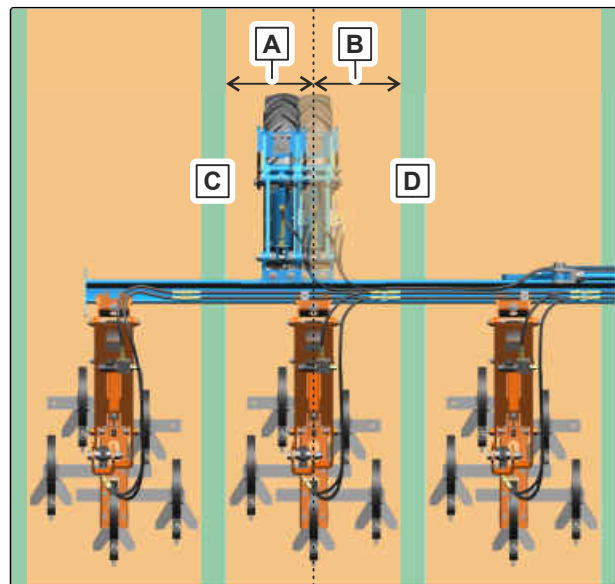


CMS-I-00004338

6.4.4 Aligning the parallelograms on the rows

CMS-T-00006059-D.1

The parallelograms must be positioned such that distances **A** and **B** are exactly the same and each parallelogram runs precisely between the two plant rows **C** and **D** on the left and right of the parallelogram during hoeing operation.



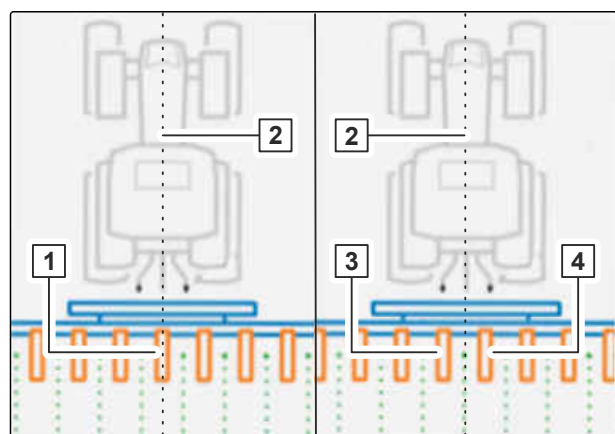
CMS-I-00004339

- Lower the implement on the field with the three-point power lift.
- If the implement is symmetrical:*
Drive onto the field with the implement such that the parallelogram **1** on the tractor's longitudinal axis **2** is positioned exactly at the centre between the plant rows

or

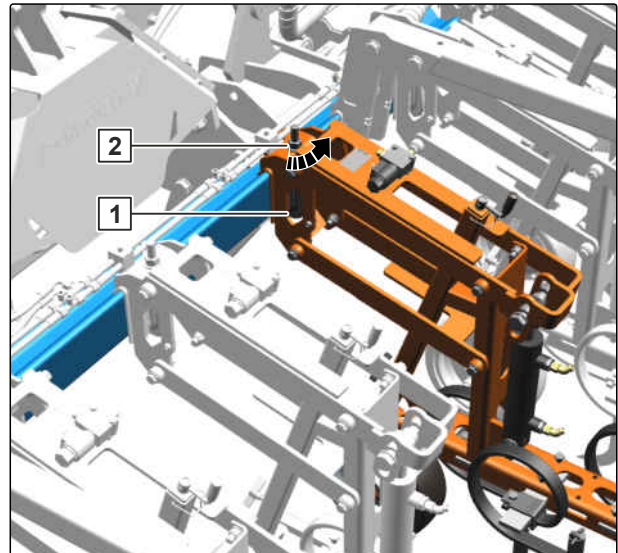
If the implement is asymmetrical:

Drive onto the field with the implement such that the one of the two parallelograms on the left **3** and right **4** of the tractor's longitudinal axis **2** is positioned exactly at the centre between the plant rows.



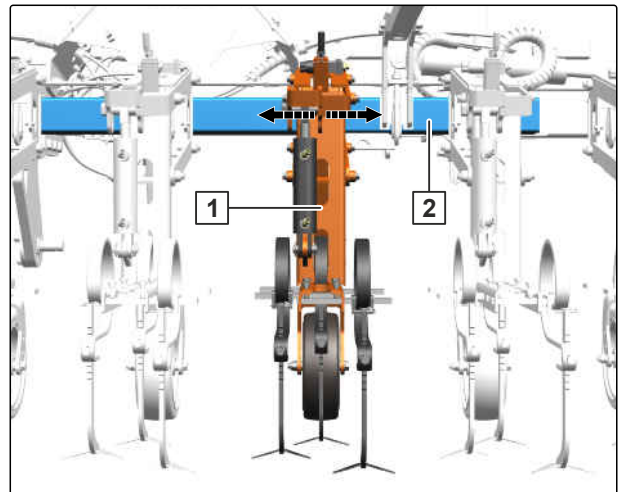
CMS-I-00004311

3. Loosen the nut **2** of the clasp bolt **1** on the parallelogram on the left or right of the parallelogram that is positioned at the centre.



CMS-I-00004340

4. Lift the implement with the three-point power lift until the parallelogram **1** can be moved to the right or left on the implement slide rail **2**.
5. Move the parallelogram to the correct position.
6. Tighten the nut of the clasp bolt with a torque of 210 Nm.
7. Position all of the other parallelograms in the same way centred between the plant rows.

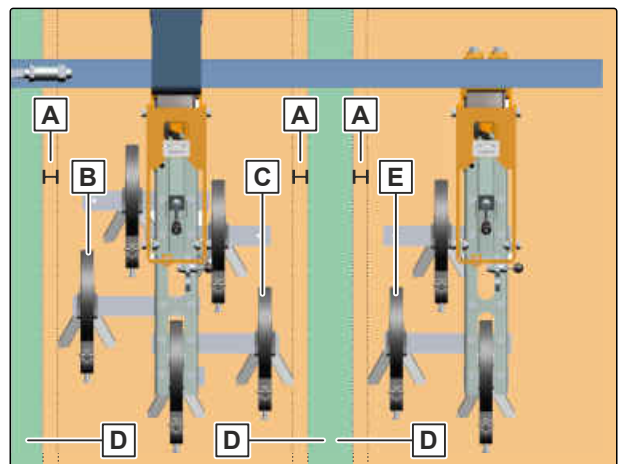


CMS-I-00004341

6.4.5 Adjusting the hoeing width

On parallelograms with more than one hoe share, the hoe shares must be positioned such that the outer hoe share **E** or the two outer hoe shares **B** and **C** each have a distance **A** of at least 4 cm from the plant row **D**.

The hoe shares on each parallelogram must overlap by at least 2 cm. If the overlap becomes less due to the position of the outer hoe shares, the inner hoe shares must also be moved towards the plant row until the overlap is at least 2 cm again.

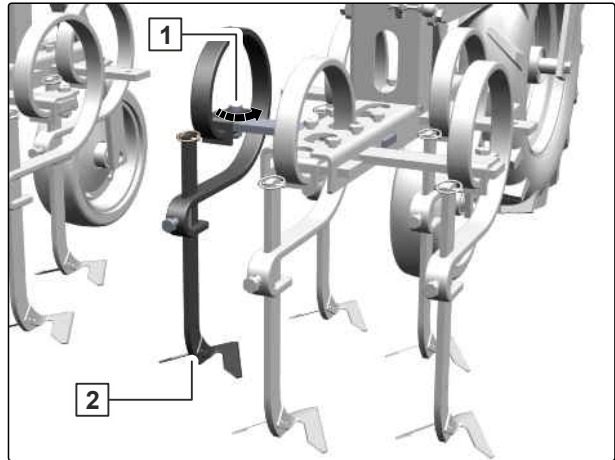


CMS-I-00004317

6 | Preparing the machine

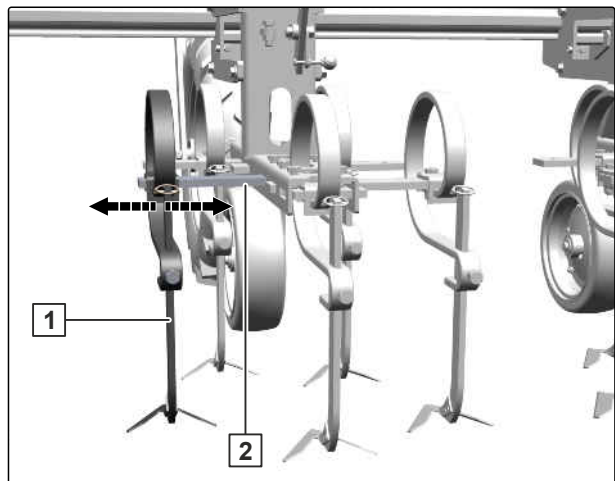
Preparing the implement for operation

1. Lower the implement on the field with the three-point power lift.
2. Loosen the bolt **1** for the hoe share **2**.



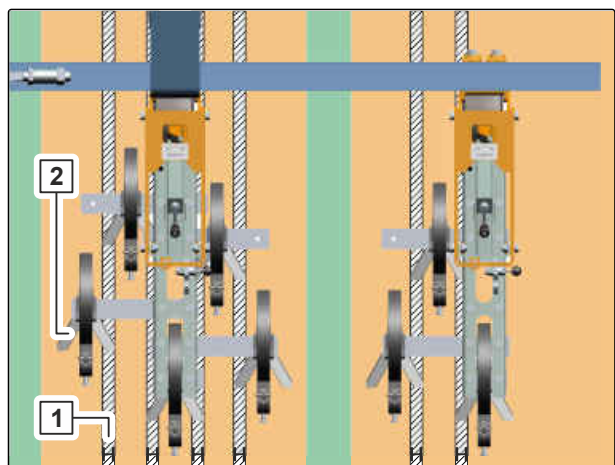
CMS-I-00004318

3. Lift the implement with the three-point power lift until the hoe share **1** can be moved on the tool carrier **2**.
4. Move the hoe share to the correct position.
5. Tighten the bolt for the hoe share.
6. *If the parallelogram has two outer hoe shares:* Position the second outer hoe share of the parallelogram in the same way.



CMS-I-00004320

7. Determine the overlaps **1** of the hoe shares **2**.
8. *If there are overlaps of less than 2 cm:* Move the inner hoe shares towards the plant row until the overlap is at least 2 cm again.
9. Adjust the hoeing width all of the other parallelograms in the same way.

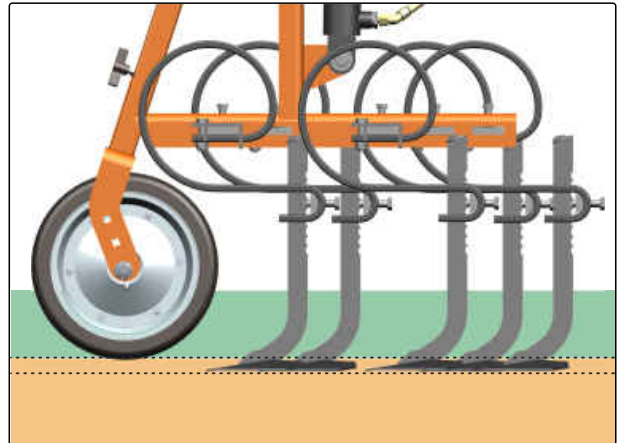


CMS-I-00004321

6.4.6 Adjusting the hoeing depth

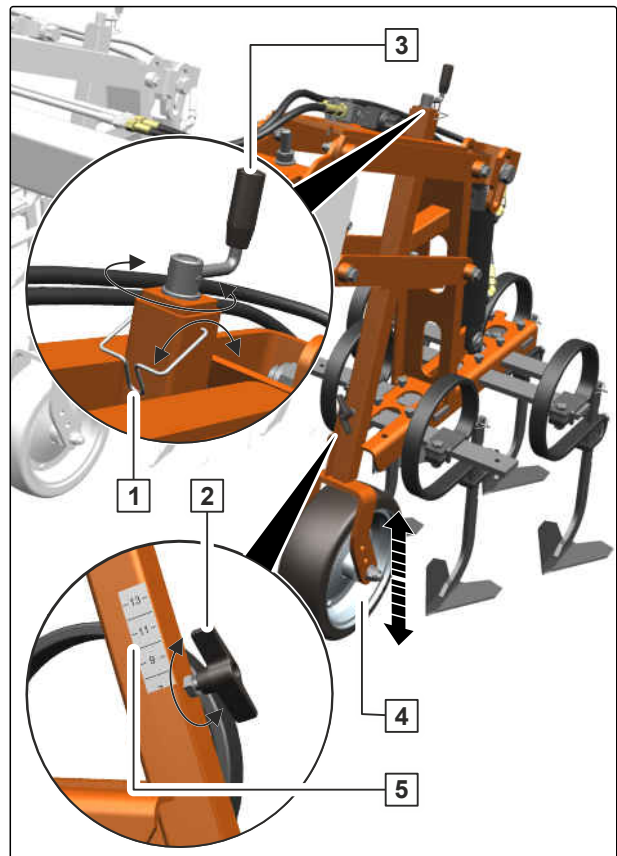
The hoeing depth must be adjusted such that during hoeing operation, the blades of the hoe shares are guided 2 to 3 cm below the surface of the hoed soil.

CMS-T-00006064-D.1



CMS-I-00004342

1. Lower the implement on the field with the three-point power lift.
 2. Fold open the safety clip **1** on the hand crank **3** of the hoeing depth adjustment.
 3. Open the wing screw **2** on the hoeing depth display **5**.
 4. Turn the hand crank to the left or right until the correct hoeing depth adjustment is reached.
- ➔ The guide wheel **4** of the parallelograms will be lifted or lowered.
5. Tighten the wing screw on the hoeing depth display.
 6. Fold down the safety clip on the hand crank.
 7. Adjust the hoeing depth for all of the other parallelograms in the same way.
 8. Hoe for 10 m.
 9. Check the hoeing depth and readjust if necessary.

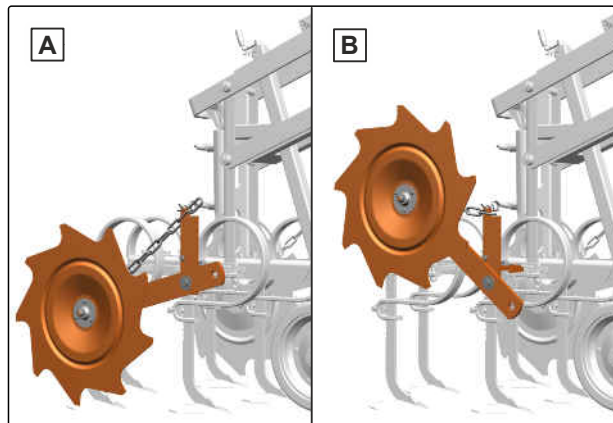


CMS-I-00004346

6.4.7 Activating or deactivating the hoe protection discs HSZ

CMS-T-00006075-C.1

- If the hoe protection discs should be used for a hoeing pass, the hoe protection discs must be moved to the active position **A** and adjusted according to the section *"Adjusting the lateral distance of the hoe protection discs HSZ"*.
- If the hoe protection discs should not be used for a hoeing pass, the hoe protection discs must be moved to the passive position **B**.
- To prepare the implement for road travel, the hoe protection discs of the parallelograms on the sections must be or be moved into the passive position **B**.



CMS-I-00004362



CAUTION

Risk of injury for legs and feet due to falling hoe protection disc

If the released chain slips out of your hand when adjusting the height of the hoe protection disc, the hoe protection disc can fall down and injure your legs and feet.

- Keep your legs and feet out of the area underneath and on the sides of the hoe protection disc.
- When making adjustments, hold the released chain tightly.

1. *To activate and adjust the hoe protection discs on a parallelogram:*
Adjust each hoe protection disc according to the steps 2 to 7 of the section *"Adjusting the height of the hoe protection discs HSZ"*, see page 63.
At step 5, however, lower the deactivated hoe protection disc to the position required for the hoeing pass.
2. Follow the instructions in the section *"Adjusting the lateral distance of the hoe protection discs HSZ"*, see page 66.
3. Activate and adjust the hoe protection discs on all of the parallelograms in the same way.

4. *To deactivate the hoe protection discs on a parallelogram:*
Adjust each hoe protection disc according to the steps 2 to 7 of the section "Adjusting the height of the hoe protection discs HSZ", see page 63. At step 5, however, lift the hoe protection disc all the way up to the passive position.
5. Deactivate the hoe protection discs on all of the other parallelograms in the same way.

6.4.8 Adjusting the hoe protection discs HSZ

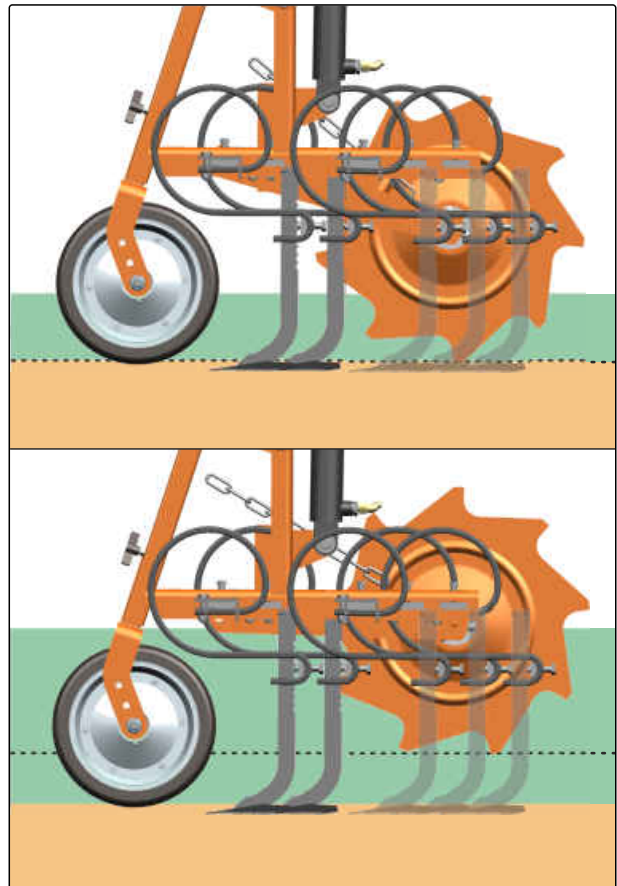
CMS-T-00006055-D.1

6.4.8.1 Adjusting the height of the hoe protection discs HSZ

CMS-T-00006069-D.1

Adjustment of the height depends on the growth stage and size of the crops at the time of the hoeing pass:

- For younger or small crops, the hoe protection discs must be adjusted such that each hoe protection disc has contact with and is driven by the ground during hoeing operation.
- For older or bigger crops, the hoe protection discs must be adjusted such that each hoe protection disc also has contact with and is driven by the leaves of the crops during hoeing operation.



CMS-I-00004348



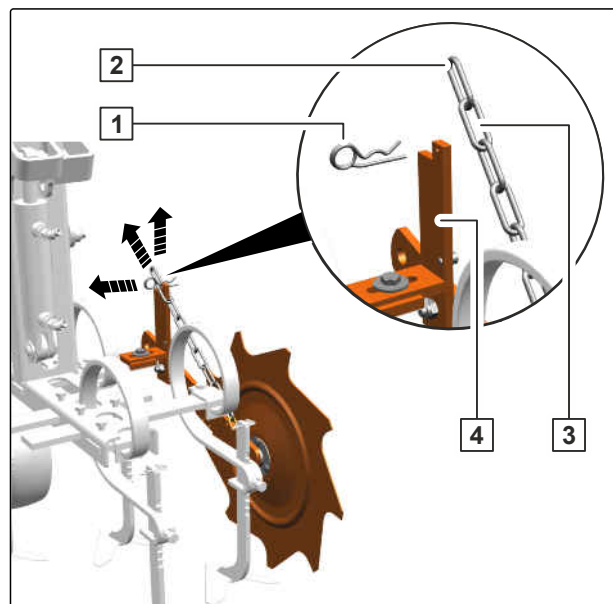
CAUTION

Risk of injury for legs and feet due to falling hoe protection disc

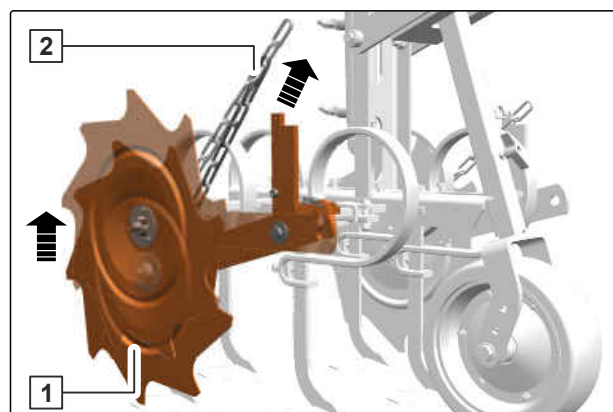
If the released chain slips out of your hand when adjusting the height of the hoe protection disc, the hoe protection disc can fall down and injure your legs and feet.

- Keep your legs and feet out of the area underneath and on the sides of the hoe protection disc.
- When making adjustments, hold the released chain tightly.

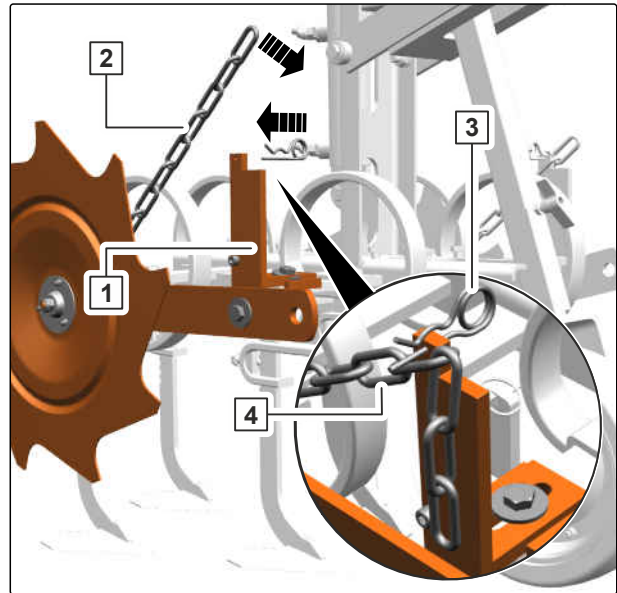
1. To lift the hoe protection disc: perform steps 2 to 7.
2. Lower the implement on the field with the three-point power lift.
3. Pull the spring cotter pin **1** out of the hoe protection disc carrier **4**.
4. Pull the chain **2** towards the implement slide rail and release the chain link **3** from the hoe protection disc carrier.



5. Lift the hoe protection disc **1** with the chain **2** until the hoe protection disc is in the right position.



6. Hook the chain on the hoe protection disc carrier **1** with the suitable chain link **2**.
7. Secure the chain **4** again with the spring cotter pin **3**.



CMS-I-00004351



CAUTION

Risk of injury for legs and feet due to falling hoe protection disc

If the released chain slips out of your hand when adjusting the height of the hoe protection disc, the hoe protection disc can fall down and injure your legs and feet.

- Keep your legs and feet out of the area underneath and on the sides of the hoe protection disc.
- When making adjustments, hold the released chain tightly.

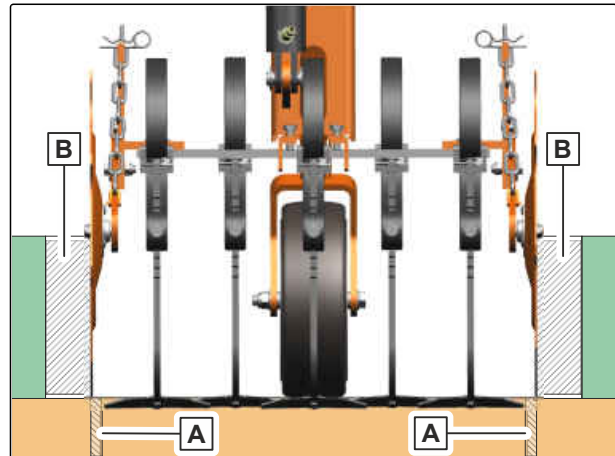
8. *To lower the hoe protection disc:*
Perform steps 2 to 7 as described, but lower the hoe protection disc in step 5.
9. Adjust the height for all of the hoe protection discs in the same way.

6.4.8.2 Adjusting the lateral distance of the hoe protection discs HSZ

CMS-T-00006070-D.1

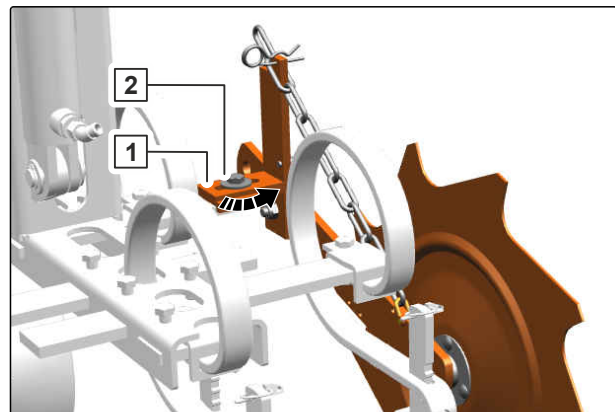
The hoe protection discs must be adjusted as follows:

- During hoeing operation, each hoe protection disc should run at a distance of 1 cm **A** from the end of the blade of the outermost hoe share.
- During hoeing operation, each hoe protection disc should run at a distance of 4 cm **B** from the crop plant row.



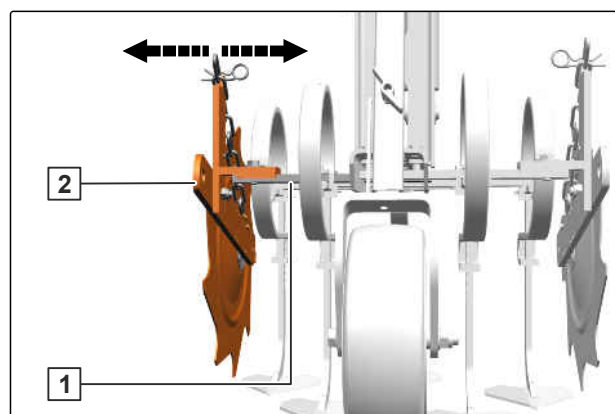
CMS-I-00004352

1. Lower the implement on the field with the three-point power lift.
2. Loosen the bolt **1** for the hoe protection disc carrier **2**.



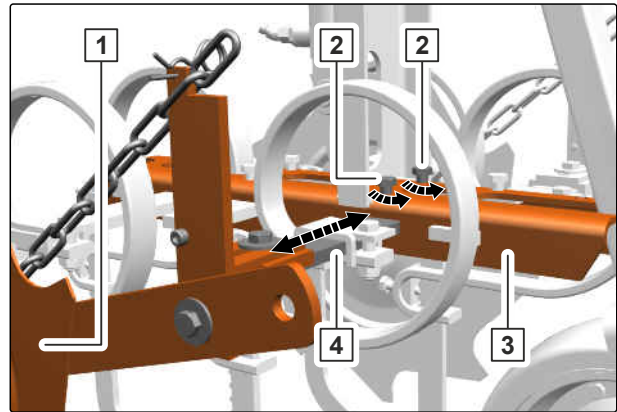
CMS-I-00004353

3. Move the hoe protection disc **2** inwards or outwards on the tool carrier **1** until the hoe protection disc is in the right position.
4. Tighten the bolt for the hoe protection disc carrier.
5. *If the sliding path is not sufficient for the required position of the hoe protection disc:*
Loosen the bolt for the hoe protection disc carrier.
6. Move the hoe protection disc inwards or outwards on the tool carrier up to the stop.
7. Tighten the bolt for the hoe protection disc carrier.



CMS-I-00004354

8. Loosen the bolts **2** on the tool carrier **4**.
9. Move the hoe protection disc **1** with the tool carrier inwards or outwards in the share bracket **3** until the hoe protection disc is in the right position.
10. Tighten the bolts on the tool carrier.
11. *If one hoe share is installed on the tool carrier:*
Move the hoe share on the shifted tool carrier to the previous position, see page 59.
12. Adjust the lateral distance for all of the hoe protection discs in the same way.



CMS-I-00004355

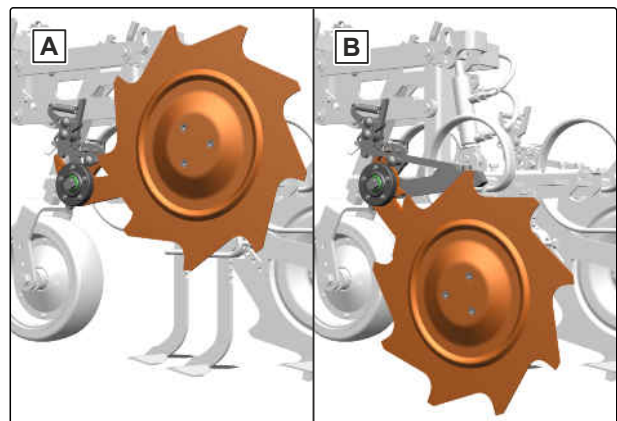
6.4.9 Adjusting the RowDisc hoe protection discs

CMS-T-00012821-B.1

6.4.9.1 Activating and adjusting the height of RowDisc hoe protection discs

CMS-T-00012817-B.1

If you want to use the RowDisc hoe protection discs for a hoeing pass, the RowDisc hoe protection discs must be moved from the passive position **A** to the active position **B** and their height must be adjusted.



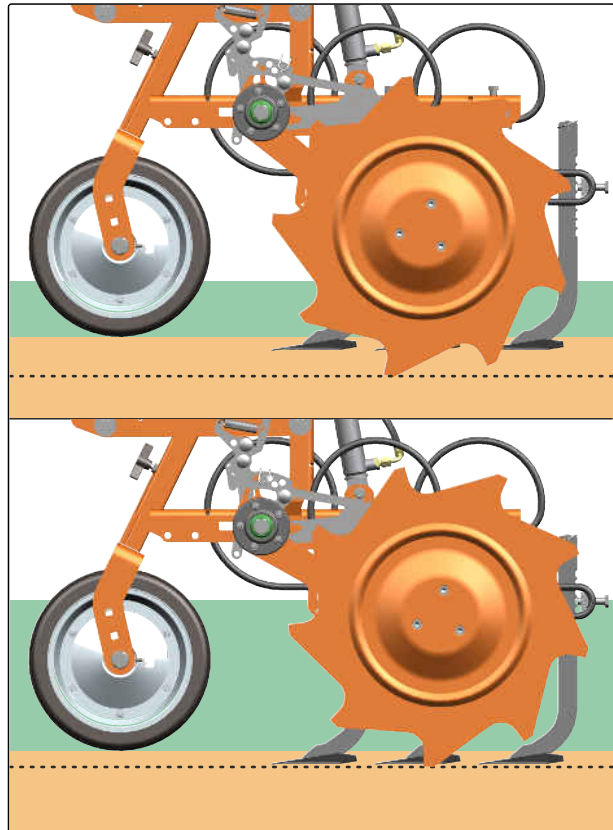
CMS-I-00008392

The height adjustment depends on the design of the hoe protection discs:

With the RowDisc SR hoe protection discs with serrated discs and RowDisc RD hoe protection discs with smooth discs, the adjustment of the height depends on the growth stage and size of the crops at the time of the hoeing pass:

- For younger or small crops, the hoe protection discs should have contact with and be driven by the ground during hoeing operation. During activation, the hoe protection disc is lowered onto the ground. Afterwards, no more adjustments are made to the height.
- For older or large crops, the hoe protection discs should have contact with and be driven by the leaves of the crops during hoeing operation. After activation, the hoe protection discs must be positioned higher relative to the leaves.

The RowDisc SD hoe protection discs with concave discs should always have contact with and be driven by the soil during hoeing operation. During activation, the hoe protection disc is lowered onto the ground. Afterwards, no more adjustments are made to the height.



CMS-I-00008405

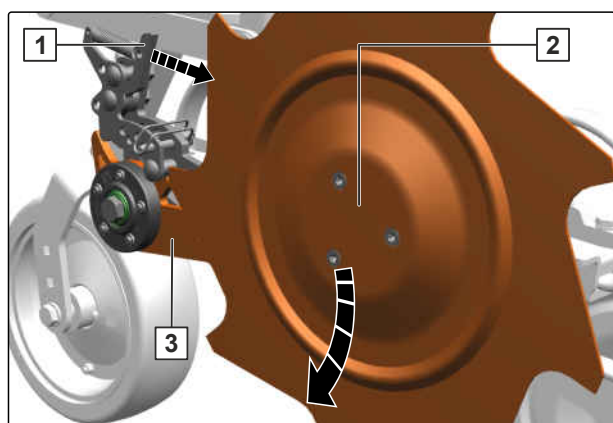


CAUTION

Risk of injury due to falling hoe protection disc

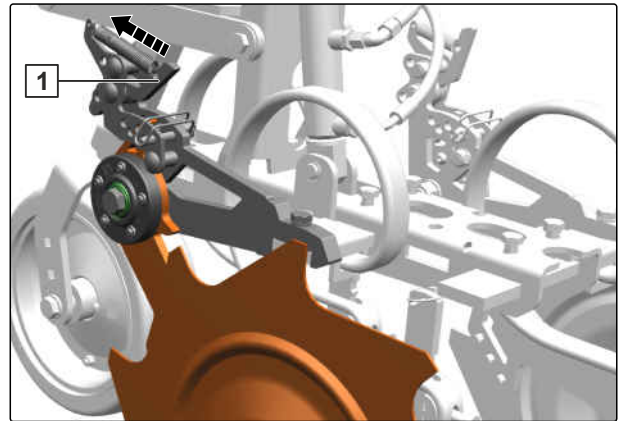
- Hold onto the hoe protection disc tightly when activating, adjusting and deactivating.

1. Lower the implement on the field with the three-point power lift.
2. Grab the RowDisc hoe protection disc **2** by the holder **3** and pull the bar **1** to the rear.
3. Lower the RowDisc hoe protection disc down to the ground.



CMS-I-00008397

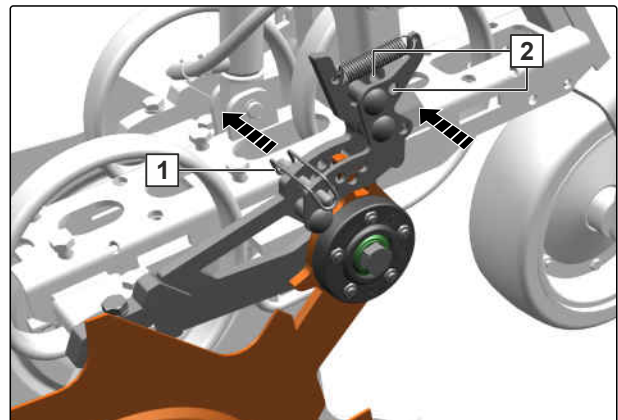
4. Allow the bar **1** to return to its initial position.



CMS-I-00008396

5. *If the RowDisc hoe protection discs should follow the ground contours at a greater depth that the linch pin allows in the rearmost position:*

Pull out the linch pin **1** on the activated RowDisc hoe protection disc and park it in the holes **2**.



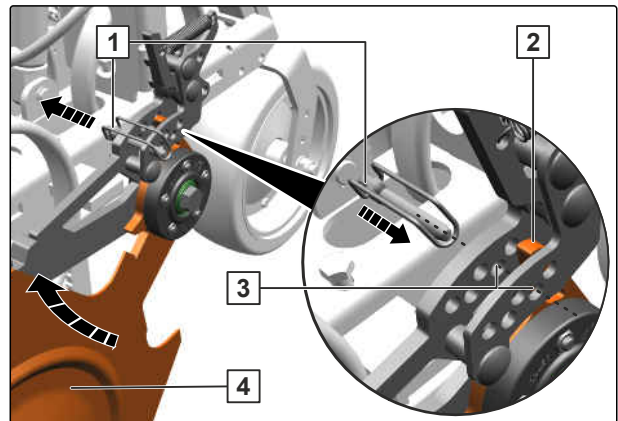
CMS-I-00008361

6. *If the SR and RD type RowDisc hoe protection discs should be used on older or large crops:*
Follow steps 7 to 9.

7. Pull out the linch pin **1** on the activated RowDisc hoe protection disc.

8. Lift the RowDisc hoe protection disc **4** to the desired height.

9. Insert the linch pin through the holes **3** directly behind the retaining lug **2**.



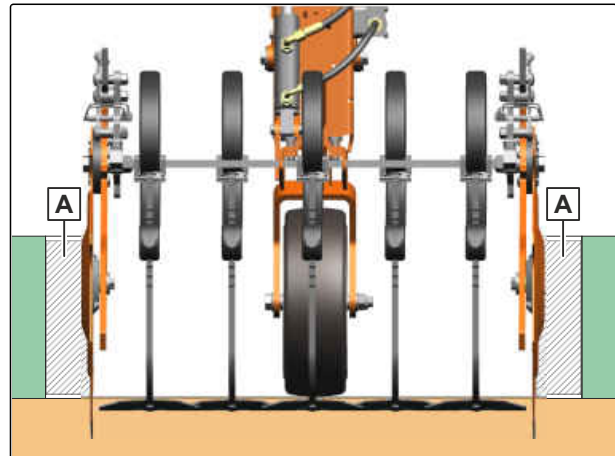
CMS-I-00008402

10. Activate and adjust the height of the RowDisc hoe protection discs on all of the parallelograms in the same way.

6.4.9.2 Adjusting the lateral distance of the RowDisc hoe protection discs

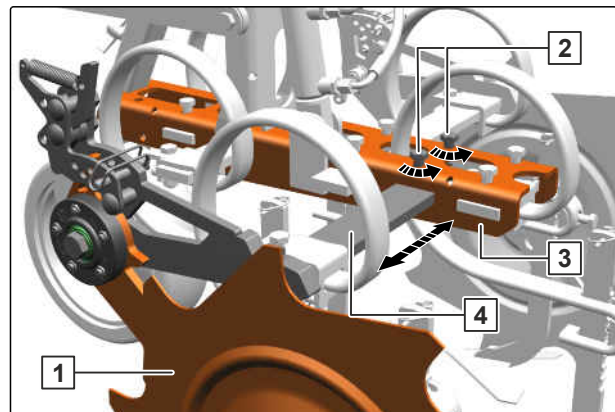
CMS-T-00012820-B.1

During hoeing operation, each RowDisc hoe protection disc should run at a distance **A** of 4 cm from the crop plant row.



CMS-I-00008304

1. Lower the implement on the field with the three-point power lift.
2. Loosen the bolts **2** on the tool carrier **4**.
3. Move the RowDisc hoe protection disc **1** with the tool carrier inwards or outwards in the share bracket **3** until the RowDisc hoe protection disc is in the right position.
4. Tighten the bolts.
5. Adjust the lateral distance for all of the RowDisc hoe protection discs in the same way.



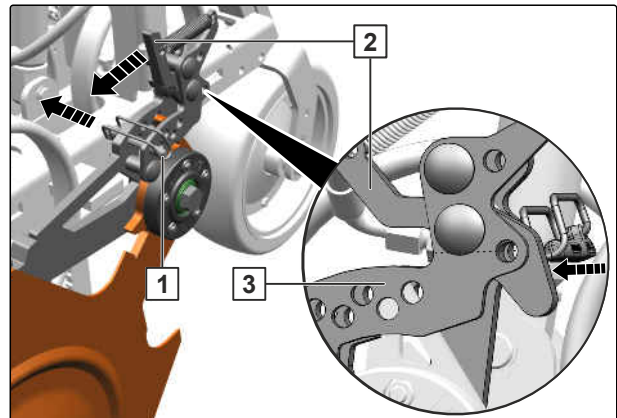
CMS-I-00008306

6.4.9.3 Securing the RowDisc hoe protection discs against unintentional deactivation

CMS-T-00012819-B.1

Hard soils or fast driving speeds or both together can make an activated RowDisc hoe protection disc spring up so strongly during hoeing operation that the retaining lug on the disc holder can overcome the bar and the RowDisc can unintentionally move into the passive position. To prevent this from happening, the bar can be locked with the linch pin.

1. Lower the implement on the field with the three-point power lift.
2. Pull out the linch pin **1** on the activated RowDisc hoe protection disc.
3. Pull the bar **2** to the rear far enough so that the holes in the positioning plate **3** and the hole in the bar are lined up.
4. Insert the linch pin through the holes.
5. Secure all of the RowDisc hoe protection discs against unintentional deactivation in the same way.



CMS-I-00008295



NOTE

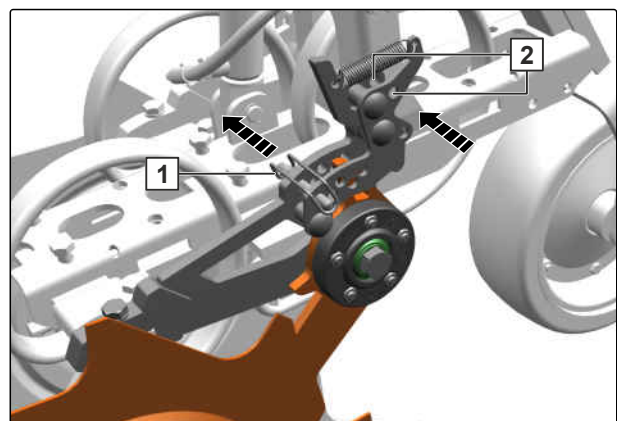
To prepare the implement for road travel, the securing device against unintentional deactivation must be released on all RowDisc hoe protection discs on the sections, and these RowDisc hoe protection discs must be moved into passive position to comply with the permissible transport width according to the section "Deactivating RowDisc hoe protection discs", see page 72.

6.4.9.4 Increasing the contact pressure of the RowDisc hoe protection discs

CMS-T-00012959-B.1

Using a tension spring, the contact pressure of the RowDisc hoe protection discs onto the soil can be increased. The further down the spring holder is inserted, the greater the contact pressure.

1. Lower the implement on the field with the three-point power lift.
2. Pull out the linch pin **1** on the activated RowDisc hoe protection disc and park it in the holes **2**.

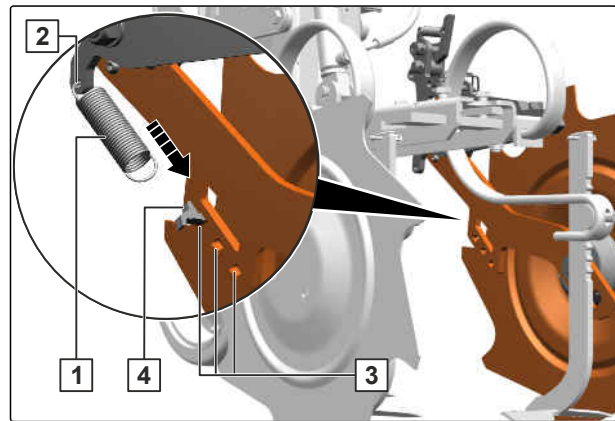


CMS-I-00008361

6 | Preparing the machine

Preparing the implement for operation

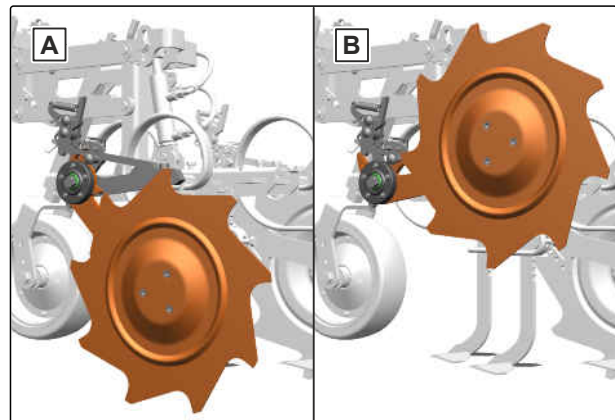
3. Hook one end of the tension spring **1** into the hole **2**.
4. Insert the spring holder **4** into one of the three openings **3**.
5. Pull the free end of the tension spring towards the spring holder and hook it onto the spring holder.
6. Increase the contact pressure for all of the RowDisc hoe protection discs in the same way.



CMS-I-00008364

6.4.9.5 Deactivating the RowDisc hoe protection disc

- If the RowDisc hoe protection discs should not be used for a hoeing pass, the RowDisc hoe protection discs must be moved from the active position **A** to the passive position **B**.
- To prepare the implement for road travel, the RowDisc hoe protection discs of the parallelograms on the sections must be moved from the active position **A** to the passive position **B**.



CMS-I-00008391

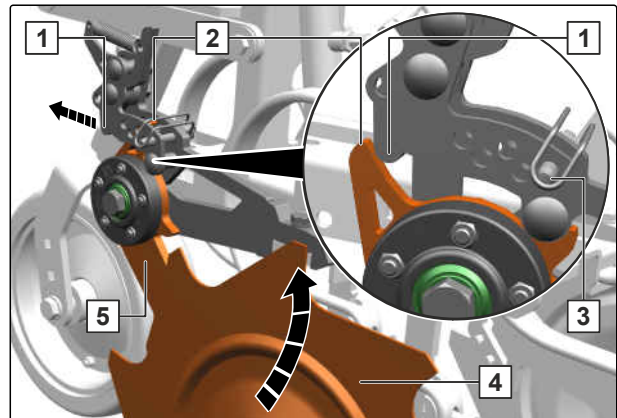


CAUTION

Risk of injury due to falling hoe protection disc

- Hold onto the hoe protection disc tightly when activating, adjusting and deactivating.

1. Lower the implement on the field with the three-point power lift.
2. *If the RowDisc hoe protection disc was secured against unintentional deactivation:*
Pull the linch pin **3** out of the bar **1** and insert it in the rearmost position.
3. Grab the RowDisc hoe protection disc **4** by the holder **5** and lift it far enough so that the retaining lug **2** presses the bar down and to the front and slides in front of the bar.
4. Deactivate the RowDisc hoe protection discs on all of the parallelograms or the parallelograms on the sections in the same way.



CMS-I-00008398

6.4.10 Activating or deactivating the finger hoes

CMS-T-00006074-E.1

- If the finger hoes are to be used for a hoeing pass, the finger hoes must be activated or adjusted according to the section "*Adjusting the finger hoes*".
- If the finger hoes are not to be used for a hoeing pass, the finger hoes must be deactivated.



CAUTION

Risk of injury for hands due to the shearing action of the star parallelogram

When lifting and lowering the star parallelogram, the components of the star parallelogram can act like the scissors.

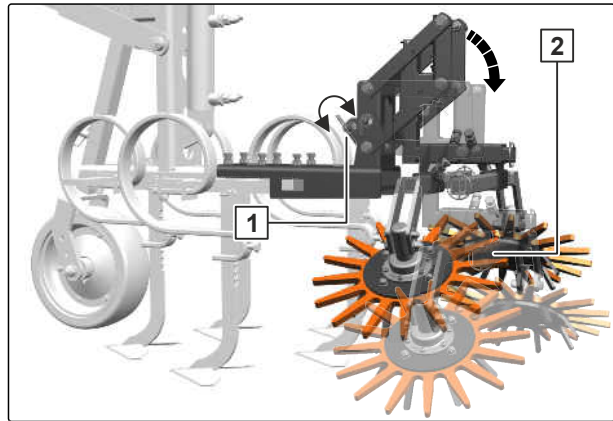
- ▶ Be particularly careful when lifting and lowering the star parallelogram.
- ▶ When lifting and lowering the star parallelogram, do not put your hands in the star parallelogram.

1. *To activate the finger hoe set on a parallelogram:*
Follow steps 2 to 6.
2. Lower the implement on the field with the three-point power lift.

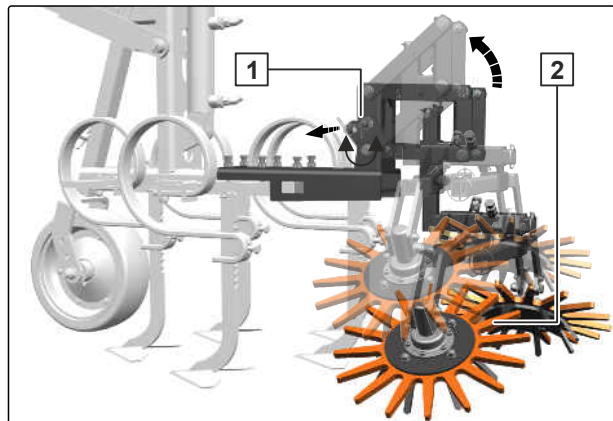
6 | Preparing the machine

Preparing the implement for operation

3. Turn the locking latch **1** by 180 degrees and allow it to engage in the locking notch.
➔ The locking pin will be pulled out of the hole in the frame carrier and locked in the released position.
4. Completely lower the finger hoe set **2**.
5. Activate the finger hoe sets on all of the other parallelograms in the same way.
6. *To adjust the finger hoes:*
Follow the instructions in the section "Adjusting the finger hoes", see page 75.
7. *To deactivate the finger hoe set on a parallelogram:*
Follow steps 8 to 11.
8. Lower the implement on the field with the three-point power lift.
9. Slightly lift the activated finger hoe set **2**.
10. Pull the locking latch **1** out of the locking notch and turn by 180 degrees.
➔ The locking pin of the locking latch slides inwards against the frame carrier.
11. Lift the finger hoe set further until the locking pin of the locking latch slides into the hole in the frame carrier and holds the finger hoe set in the passive position.
12. Deactivate the finger hoe sets on all of the other parallelograms in the same way.



CMS-I-00004364



CMS-I-00004363

6.4.11 Adjusting the finger hoes

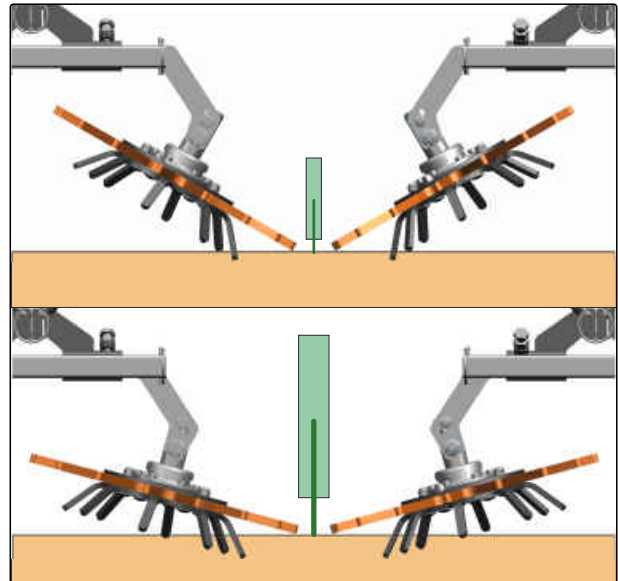
CMS-T-00006060-E.1

6.4.11.1 Adjusting the inclination angle of the finger hoes

CMS-T-00006071-E.1

The adjustment of the inclination angle depends on the growth stage of the crop during the hoeing pass:

- For young and small crops, the finger hoes must be adjusted such that the finger hoes stand at an angle of 40 degrees to the soil.
- For established and bigger crops, the finger hoes must be adjusted such that the finger hoes stand at an angle of 20 degrees to the soil.



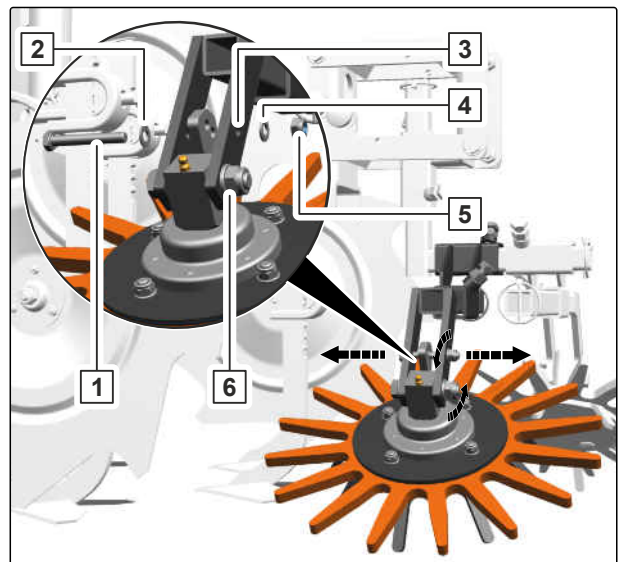
CMS-I-00004356



REQUIREMENTS

- ☉ The finger hoe set is activated, see page 73

1. To change the inclination from 40 degrees to 20 degrees:
Follow steps 2 to 11.
2. Lower the implement on the field with the three-point power lift.
3. Unscrew the nut **5** of the adjuster screw **1**.
4. Remove the washer **4**.
5. Pull the adjuster screw along with the washer **2** out of the holes **3**.
6. Loosen the nut **6** of the retaining screw.

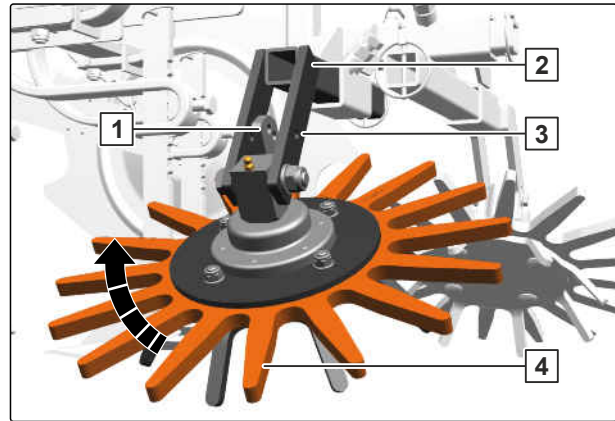


CMS-I-00004429

6 | Preparing the machine

Preparing the implement for operation

7. Swivel the finger hoe **4** into a flatter position until the holes **3** of the section **2** and the upper hole of the bearing unit **1** are flush.
8. Insert the adjuster screw along with the washer through the holes.
9. Put the washer on the adjuster screw.
10. Screw on the nut of the adjuster screw and tighten it.
11. Tighten the nut of the retaining screw.
12. *To change the inclination from 40 degrees to 20 degrees:*
Repeat steps 2 to 11 as described, but at step 7, swivel the finger hoe to a steeper position until the lower holes of the section and the bearing unit are flush.
13. Adjust the inclination angle in the same way for all of the finger hoes.



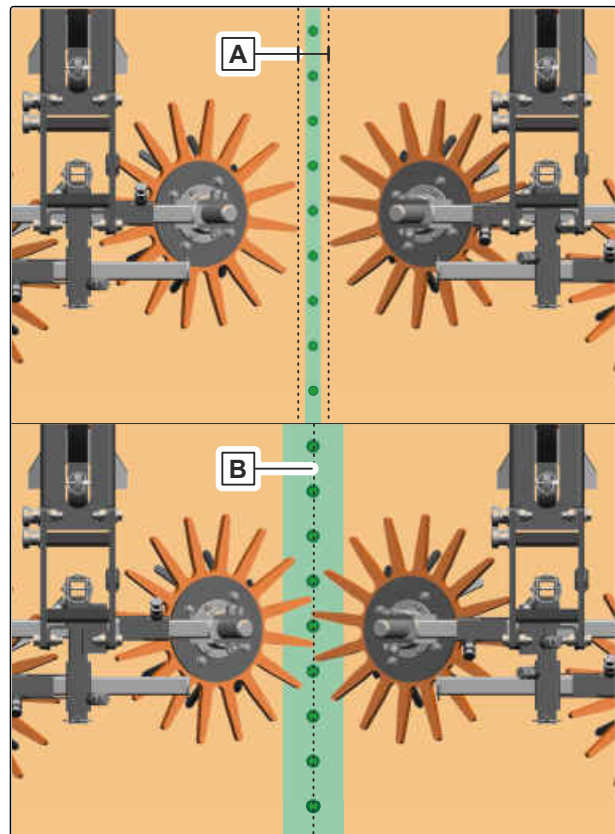
CMS-I-00004430

6.4.11.2 Adjusting the lateral distance of the finger hoes

CMS-T-00006072-E.1

The adjustment of the distance depends on the growth stage of the crop during hoeing operation:

- For young and smaller crops, the finger hoes must be adjusted such that each finger hoe has a distance of 3 bis 4 cm from the plant row. Between two adjacent finger hoes, there should always be a band **A** that is 6 bis 8 cm wide.
- For established and bigger crops, the finger hoes must be adjusted such that the finger hoes do not have a distance **B** from the plant rows. The fingers of two adjacent finger hoes should always interlock. However, the fingers must not overlap by more than 5 mm.

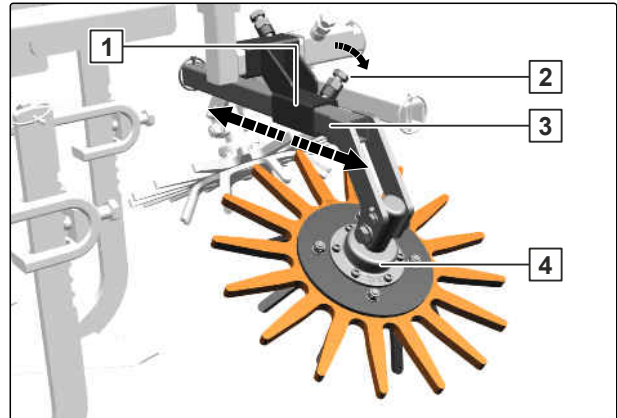


CMS-I-00004373



REQUIREMENTS

- ☑ The finger hoe set is activated, see page 73
- 1. Lower the implement on the field with the three-point power lift.
- 2. Loosen the bolt **2** for the guide tube **1**.
- 3. Move the finger hoe **4** with the sliding tube **3** in the guide tube inwards or outwards until the finger hoe is in the right position.
- 4. Tighten the bolt for the guide tube.
- 5. Adjust the lateral distance for all of the finger hoes in the same way.

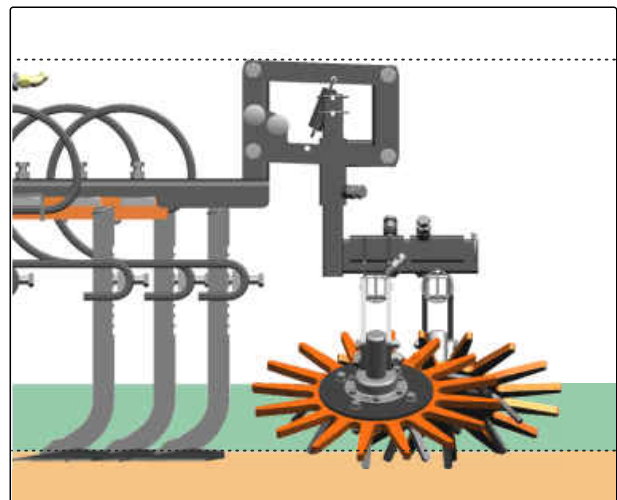


CMS-I-00004375

6.4.11.3 Adjusting the height of the finger hoes

The height of a finger hoe must be set on the star parallelogram as follows:

- The fingers that are pointing the furthest down must touch the soil in the activated position of the finger hoe set.
- When the finger hoe set is in activated position, the star parallelogram must be aligned virtually horizontal, so that the finger hoes can follow the ground contours upwards and downwards.



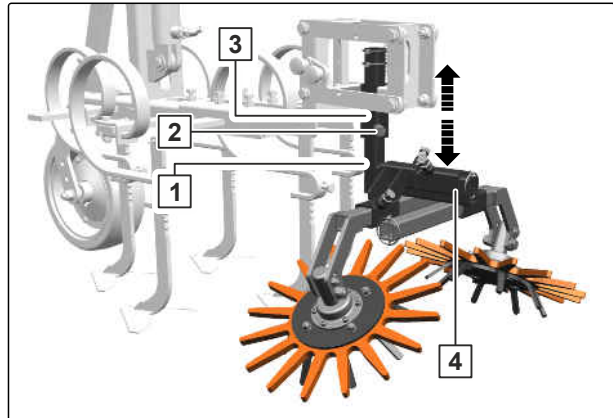
CMS-I-00007222



REQUIREMENTS

✓ The finger hoe set is activated, see page 73

1. Lower the implement on the field with the three-point power lift.
2. Loosen the bolt **2** for the guide tube **3** in the star parallelogram.
3. Push the finger hoe set **4** with the section tube **1** up or down in the guide tube until the finger hoes are in the right position.
4. Tighten the bolt for the guide tube.
5. Adjust the height for all of the finger hoes in the same way.



CMS-I-00007221

6.4.12 Adjusting the ridging tools

CMS-T-00013515-B.1

6.4.12.1 Activating or deactivating the ridging discs

CMS-T-00009650-C.1

6.4.12.1.1 Activating or deactivating ridging discs mounted on the star parallelogram

CMS-T-00009651-C.1

- If the ridging discs should be used during hoeing operation, the ridging discs must be activated and adjusted according to the section "*Adjusting the ridging discs*".
- If the ridging discs should not be used during hoeing operation, the ridging discs must be deactivated.



CAUTION

Risk of injury for hands due to the shearing action of the star parallelogram

When lifting and lowering the star parallelogram, the components of the star parallelogram can act like the scissors.

- ▶ Be particularly careful when lifting and lowering the star parallelogram.
- ▶ When lifting and lowering the star parallelogram, do not put your hands in the star parallelogram.

1. *To activate the ridging discs on a parallelogram:*

Follow steps 2 to 7.

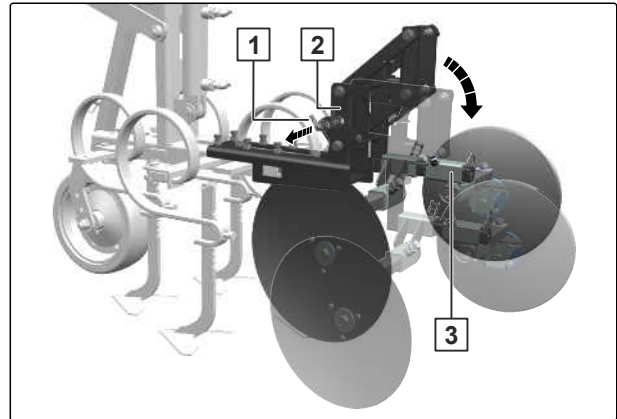
2. Lower the implement on the field with the three-point power lift.

3. Hold the ridging disc set on the section **3** and pull and hold the locking latch **1** outwards.

➔ The locking pin of the locking latch is pulled out of the front hole **2**.

4. Slightly lower the ridging disc set and release the locking latch.

➔ The locking pin of the locking latch slides inwards against the frame carrier.



CMS-I-00004439

5. Lower the ridging disc set until the locking pin of the locking latch slides into the rear hole and holds the ridging disc set in the active position.

6. Activate the ridging discs on all of the other parallelograms in the same way.

7. *To adjust the ridging discs:*

Follow the instructions in the section "Adjusting the ridging discs", see page 81.

8. *To deactivate the ridging discs on a parallelogram:*

Follow steps 9 to 12.

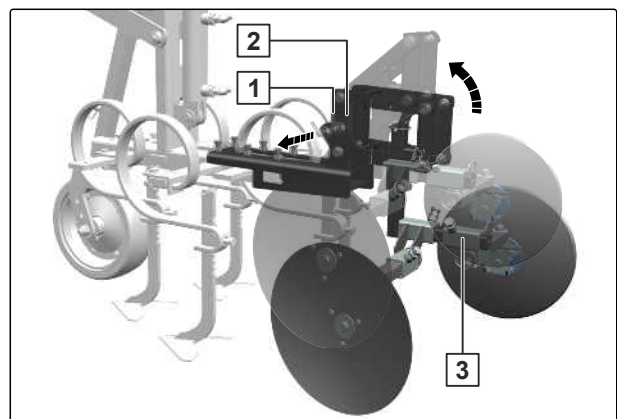
9. Lower the implement on the field with the three-point power lift.

10. Hold the ridging disc set on the section **3** and pull and hold the locking latch **1** outwards.

➔ The locking pin of the locking latch is pulled out of the rear hole in the frame carrier **2**.

11. Slightly lift the ridging disc set and release the locking latch.

➔ The locking pin of the locking latch slides inwards against the frame carrier.



CMS-I-00004440

12. Lift the ridging disc set until the locking pin of the locking latch slides into the front hole in the frame carrier and holds the ridging disc set in passive position.
13. Deactivate the ridging discs on all of the other parallelograms in the same way.

6.4.12.1.2 Activating or deactivating ridging discs mounted on a rigid mount

CMS-T-00009652-B.1

- If the ridging discs should be used during hoeing operation, the ridging discs must be activated and adjusted according to the section "*Adjusting the ridging discs*".
- If the ridging discs should not be used during hoeing operation, the ridging discs must be deactivated.

1. *To activate the ridging discs on a parallelogram:*
Follow steps 2 to 5.
2. Lower the implement on the field with the three-point power lift.
3. Adjust the ridging discs according to the steps 7 to 12 of the section "*Adjusting the ridging discs*", see page 81. At step 10, however, lower the deactivated ridging discs to the position required for the hoeing pass.
4. *To adjust the ridging discs:*
Steps 13 to 26 in the section "*Adjusting the ridging discs*", see page 81.
5. Activate the ridging discs on all of the other parallelograms in the same way.
6. *To deactivate the ridging discs on a parallelogram:*
Follow steps 7 to 9.
7. Lower the implement on the field with the three-point power lift.
8. Adjust the ridging discs according to the steps 7 to 12 of the section "*Adjusting the ridging discs*", see page 81. At step 10, however, move the activated ridging discs all the way up to the passive position.
9. Deactivate the ridging discs on all of the other parallelograms in the same way.

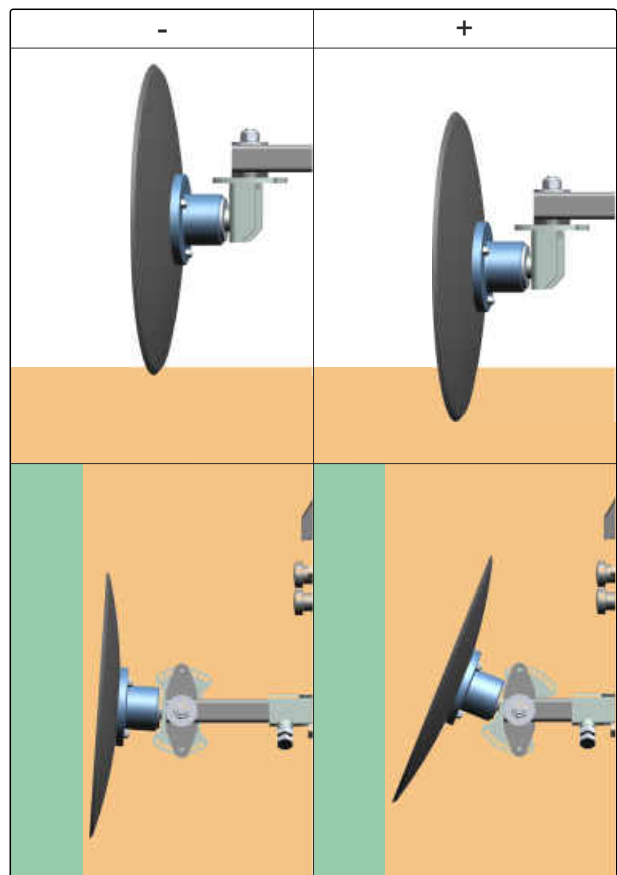
6.4.12.2 Adjusting the ridging discs

The height of the ridging discs from the soil can be adjusted in pairs, and the distance and horizontal tilt relative to the plant row can be adjusted individually. The different settings must be coordinated with each other.

For the adjustment, the following applies:

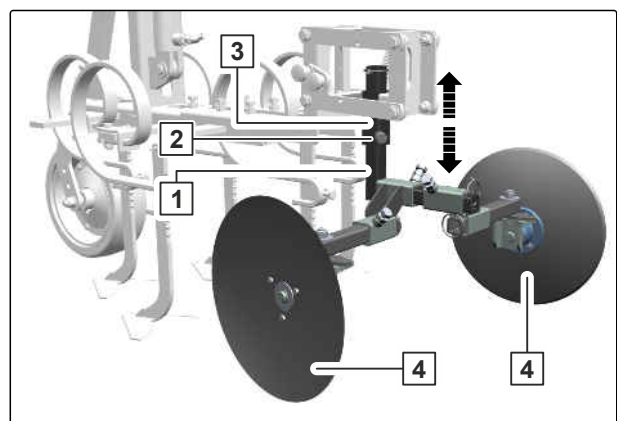
- The deeper a horizontally tilted ridging disc cuts vertically into the arable soil, the more soil will be heaped onto the plant row.
- When the horizontal distance is greater and also the horizontal tilt is steeper relative to the plant row, a ridging disc heaps up more soil. When the horizontal distance is smaller and also the horizontal tilt is flatter relative to the plant row, a ridging disc heaps up less soil.
- The higher the forward speed during hoeing operation, the more soil is heaped by the ridging discs onto the plant rows. If the amount of soil that is heaped should remain the same when the forward speed is increased, the height of the ridging discs must be increased and the distance and horizontal tilt of the ridging discs relative to the plant rows must be reduced.
- If the hoeing depth is changed, see section *"Adjusting the hoeing depth"* and the amount of heaped soil should remain the same, the height of the ridging discs from the arable soil must also be changed.

1. *To adjust the height of ridging discs that are installed on a parallelogram via a star parallelogram:*
Follow steps 2 to 6.
2. Lower the implement on the field with the three-point power lift.
3. Loosen the bolt **2** for the guide tube **3** in the star parallelogram.
4. Push the ridging discs **4** with the section tube **1** up or down in the guide tube until the ridging discs are in the right position.
5. Tighten the bolt for the guide tube.
6. Adjust the height for all of the ridging discs in the same way.



CMS-T-00009657-B.1

CMS-I-00004448



CMS-I-00004443

6 | Preparing the machine

Preparing the implement for operation

7. *To adjust the height of ridging discs that are installed on a parallelogram via a rigid mount:*
Follow steps 8 to 12.

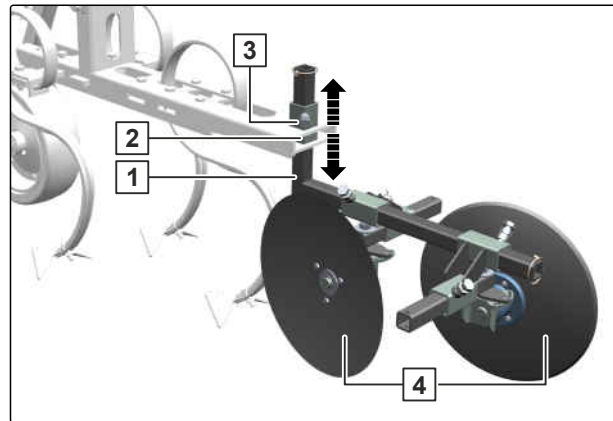
8. Lower the implement on the field with the three-point power lift.

9. Loosen the bolt **2** for the guide tube **3** in the share bracket.

10. Push the ridging discs **4** with the section tube **1** up or down in the guide tube until the ridging discs are in the right position.

11. Tighten the bolt for the guide tube.

12. Adjust the height for all of the ridging discs in the same way.



CMS-I-00006668

13. *To adjust the lateral distance of a ridging disc:*
Follow steps 14 to 18.

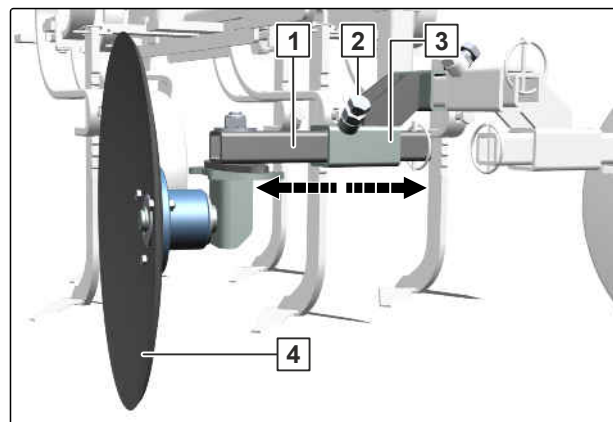
14. Lower the implement on the field with the three-point power lift.

15. Loosen the bolt **2** for the guide tube **3**.

16. Push the ridging disc **4** with the sliding tube **1** in the guide tube inwards or outwards until the ridging disc is in the right position.

17. Tighten the bolt for the guide tube.

18. Adjust the lateral distance for all of the ridging discs in the same way.

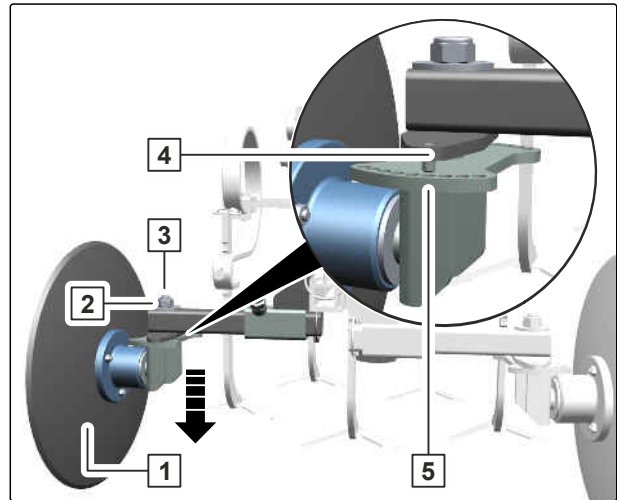


CMS-I-00004445

19. *To adjust the horizontal tilt of a ridging disc relative to the plant row:*
Follow steps 20 to 26.

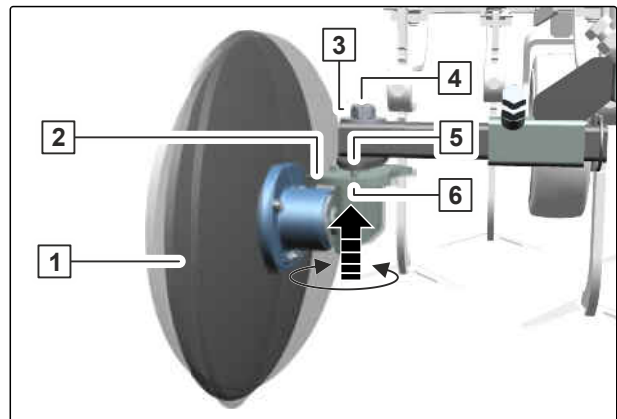
20. Lower the implement on the field with the three-point power lift.

21. Loosen the nut **2** on the bolt **3**.
22. Unscrew the nut and lower the ridging disc **1** until the cylinder dowel pins **4** no longer engage in the locking plate **5**.



CMS-I-00004446

23. Turn the ridging disc **1** with the locking plate **2** to the left or right around the longitudinal axis of the bolt **4** until the ridging disc has the right tilt angle.
24. Press the ridging disc up with the locking plate so that the cylinder dowel pins **5** slide into the locking holes **6**.
25. Tighten the nut **3** on the bolt.
26. Adjust the horizontal tilt for all of the ridging discs in the same way.



CMS-I-00004447

6.4.12.3 Adjusting the shallow ridger

CMS-T-00007017-B.1

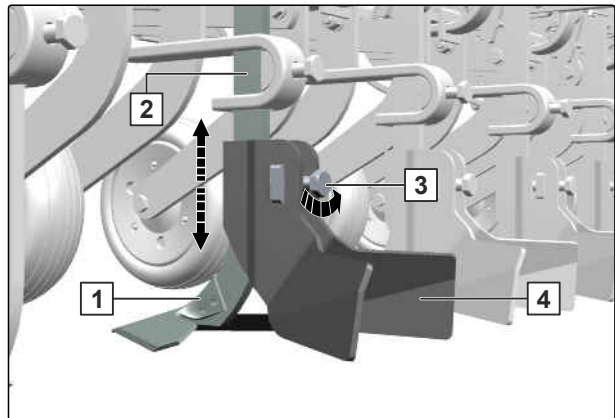
Adjustments can be made to the working depth of the shallow ridgers. The following applies for adjustments:

- The deeper a shallow ridger cuts into the arable soil, the more soil will be heaped onto the plant row.
- The higher the forward speed during hoeing operation, the more soil is heaped by each shallow ridger onto the plant rows. If the amount of soil that is heaped should remain the same when the forward speed is increased, the working depth of the shallow ridgers must be reduced.
- If the hoeing depth is changed, see section *"Adjusting the hoeing depth"*, and the amount of heaped soil should remain the same, the distance of the shallow ridgers from the arable soil must also be changed.

6 | Preparing the machine

Preparing the implement for operation

1. Lower the implement on the field with the three-point power lift.
2. Remove the bolt **3**.
3. Lift the implement with the three-point power lift until the shallow ridger **4** can be moved on the shaft **2** of the hoeing tool **1**.
4. Slide the shallow ridger up or down until it reaches the desired position.
5. Tighten the bolt.
6. Adjust the working depth for all of the shallow ridgers in the same way.



CMS-I-00005144

6.4.12.4 Adjusting the shallow ridgers on the RapidoClip system

CMS-T-00013990-B.1

6.4.12.4.1 Activating the shallow ridger and adjusting the working depth

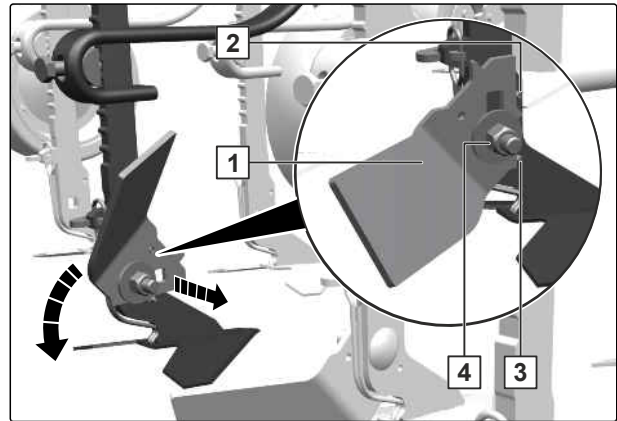
CMS-T-00013978-B.1

If you want to use the shallow ridgers for a hoeing pass, the shallow ridgers must be moved from the passive position to the active position and their working depth must be adjusted.

To adjust the working depth, the following applies:

- The deeper a shallow ridger cuts into the arable soil, the more soil will be heaped onto the plant row.
 - The higher the forward speed during hoeing operation, the more soil is heaped by each shallow ridger onto the plant rows. If the amount of soil that is heaped should remain the same when the forward speed is increased, the working depth of the shallow ridgers must be reduced.
 - If the hoeing depth is changed, see section *"Adjusting the hoeing depth"*, and the amount of heaped soil should remain the same, the distance of the shallow ridgers from the arable soil must also be changed.
1. *To move a shallow ridger from the passive position to the active position:*
Follow steps 2 to 6.
 2. Lower the implement on the field with the three-point power lift.

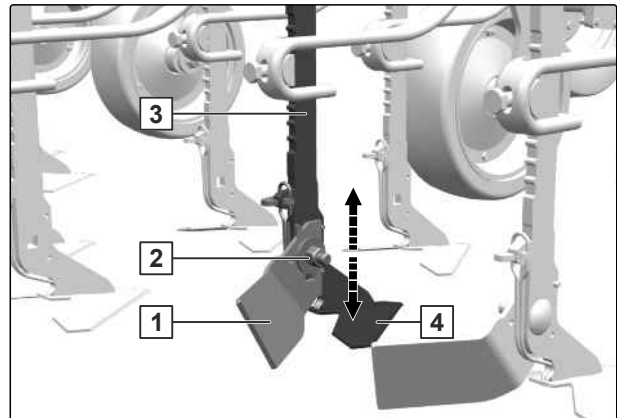
3. Unscrew the nut **4**.
4. Pull the shallow ridger outwards, until the roll pin **2** is no longer engaged in the hole.
5. Turn the shallow ridger 90 degrees to the rear.
6. Tighten the nut until the shallow ridger is resting against the shaft of the RapidoClip duckfoot share and is held by the two roll pins **2** and **3** in a horizontal position.



CMS-I-00008737

7. *To adjust the working depth of the shallow ridger in active position:*
Follow steps 8 and 9.

8. Slide the shallow ridger **1** down by the shaft **3** of the RapidoClip duckfoot share **4** up to the desired position.
9. Tighten the nut **2**.



CMS-I-00008682

10. *To change the working depth of an activated shallow ridger:*
Follow steps 11 to 13.
11. Loosen the nut.
12. Slide the shallow ridger up or down up to the desired position.
13. Tighten the nut.
14. Activate all of the shallow ridgers in the same way and adjust their working depth.

6.4.12.4.2 Deactivating shallow ridgers

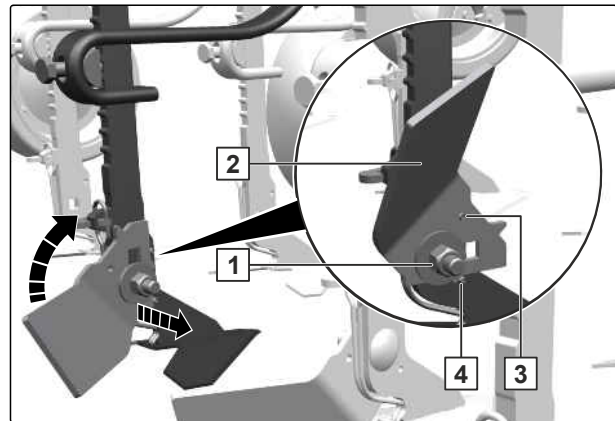
CMS-T-00013994-B.1

If the shallow ridgers should not be used for a hoeing pass, the shallow ridgers must be moved from the active position to the passive position.

6 | Preparing the machine

Preparing the implement for operation

1. Lower the implement on the field with the three-point power lift.
2. Loosen the nut **1** until the shallow ridgers **2** can be moved on the shaft of the RapidoClip duckfoot share.
3. Push the shallow ridger all the way up.
4. Unscrew the nut some more, until the shallow ridger can be pulled outwards until the roll pins **3** and **4** are no longer resting on the front edge of the shallow ridger.
5. Pull the shallow ridger outwards and turn by 90 degrees to the front.
6. Push the shallow ridger inwards, until the roll pin **3** is completely inserted in the hole in the shallow ridger and the shallow ridger is resting on the shaft of the RapidoClip duckfoot share.
7. Tighten the nut.
8. Deactivate all shallow ridgers in the same way.



CMS-I-00008738

6.4.13 Activating or deactivating the tine weeder

CMS-T-00013516-B.1

- If the tine weeder should be used during hoeing operation, the tine weeder must be activated.
 - If the tine weeder should not be used during hoeing operation, the tine weeder must be deactivated.
1. *To activate the tine weeder on a parallelogram:*
Follow steps 2 to 5.
 2. Lower the implement on the field with the three-point power lift.
 3. Activate the finger hoe set according to the section "*Activating or deactivating the finger hoes*", see page 73.
 4. Adjust the tine weeder according to the section "*Adjusting the tine weeder*", see page 87. At step 3, however, lower the deactivated tine weeder to the position required for the hoeing pass.
 5. Activate the tine weeder on all of the other parallelograms in the same way.

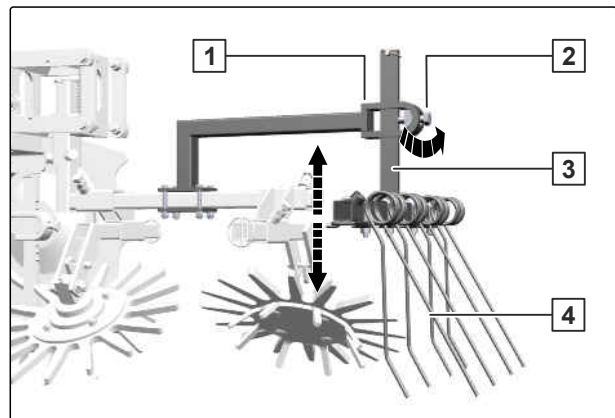
6. *To deactivate the tine weeder on a parallelogram:*
Follow steps 7 to 9.
7. Lower the implement on the field with the three-point power lift.
8. Adjust the tine weeder according to the section "Adjusting the tine weeder", see page 87. At step 3, however, move the activated tine weeder all the way up to the passive position.
9. Deactivate the tine weeders on all of the parallelograms in the same way.

6.4.14 Adjusting the tine weeder

CMS-T-00006073-D.1

The harrow must be adjusted such that the harrow tines apply slight pressure on the hoed arable soil.

1. Lower the implement on the field with the three-point power lift.
2. Loosen the bolt **2** for the holder **1**.
3. Move the tine carrier **3** up or down in the holder until the harrow tines **4** are in the right position.
4. Tighten the bolt.
5. Adjust all of the tine weeders in the same way.



CMS-I-00004376

6.4.15 Setting the band sprayer

CMS-T-00008534-C.1

6.4.15.1 Attaching or changing spraying nozzles

CMS-T-00008559-C.1

Each nozzle body can carry one or multiple spraying nozzles. If the nozzle body does not have a spraying nozzle yet, at least one nozzle must be attached. If the existing spraying nozzle(s) equipment does not meet the requirements, the attached spraying nozzle(s) can be replaced by one or several spraying nozzles.

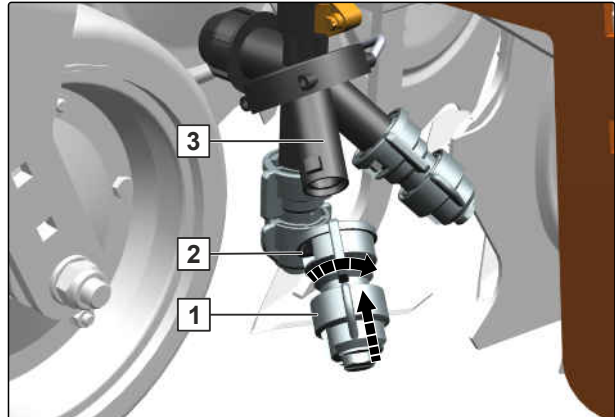
6 | Preparing the machine

Preparing the implement for operation

1. Lower the implement on the field with the three-point power lift.
2. Make sure that the corresponding seal is inserted in the new spraying nozzle to be attached.
3. *To attach a spraying nozzle on the nozzle body:* insert the spraying nozzle **1** with the bayonet lock **2** on the connection tube **3** of a free nozzle position and lock by turning to the right.

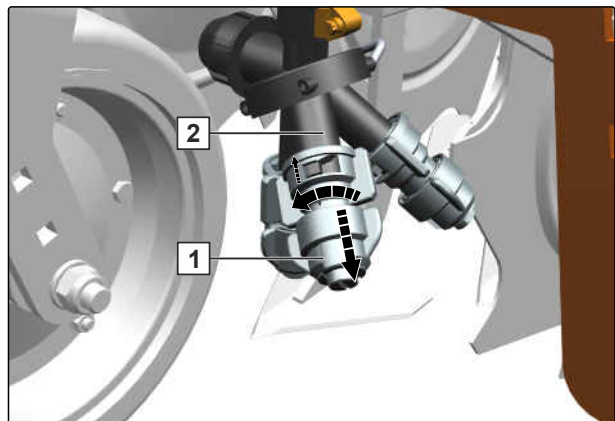
NOTE

It is recommended to protect nozzle positions that are not equipped with a spraying nozzle against soiling with a blind cap.



CMS-I-00005817

4. *To change a spraying nozzle:* perform steps 5 to 7.
5. Unlock the spraying nozzle to be exchanged **1** by pressing against the connection tube **2** and turning to the left.
6. Pull off the spraying nozzle that should be exchanged.
7. Attach the new spraying nozzle as explained in step 3.
8. Equip all of the nozzle bodies with spraying nozzles or change the existing equipment in the same way.



CMS-I-00005818

6.4.15.2 Activating spraying nozzles on multiple nozzle bodies

CMS-T-00008555-C.1

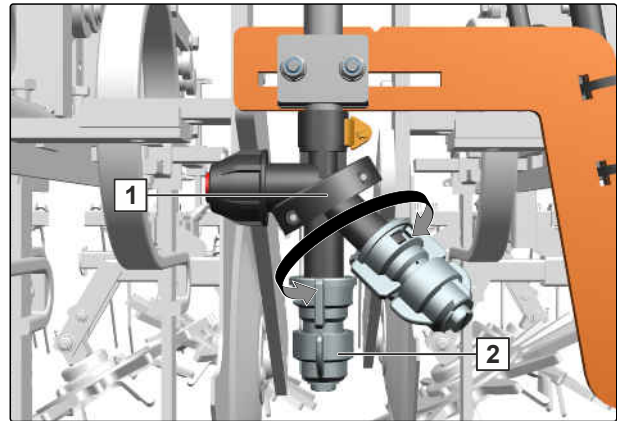
On multiple nozzle bodies, only the spraying nozzle that points down vertically is active during the spraying procedure. By turning the rotating head of the multiple nozzle body, each of the equipped spraying nozzles can be set as the active spraying nozzle.

1. Lower the implement on the field with the three-point power lift.
2. *To ensure that there is no pressure on the multiple nozzle body when selecting the spraying nozzle:* switch off the sprayer via the ISOBUS control terminal.

3. *To activate the desired spraying nozzle:*
Turn the rotating head of the multiple nozzle body **1** until the desired spraying nozzle **2** engages in the vertically pointing down position.

NOTE

The rotating head of the multiple nozzle body must always be engaged in a position; otherwise, spray liquid will emerge from the rotating joint during the spraying procedure.



CMS-I-00005820

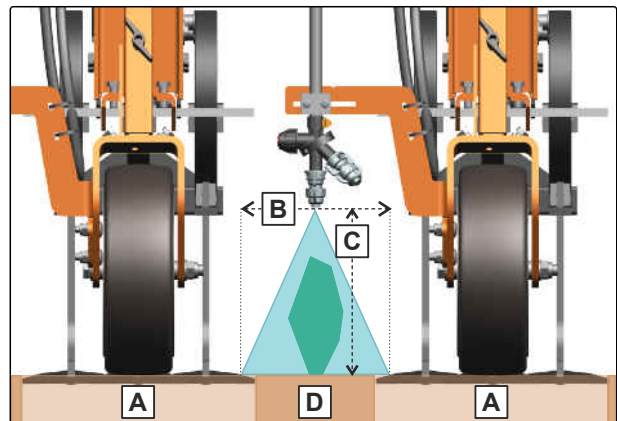
4. Activate the desired spraying nozzle in the same way on all of the multiple nozzle bodies.

6.4.15.3 Adjusting the height of the spraying nozzles

CMS-T-00008535-C.1

To adjust the vertical position of the spraying nozzles, the following applies:

- The adjustment of the height **C** depends on the growth stage of the crop at the time of the spraying procedure: The taller the plants, the higher the spraying nozzles must be set.
- The spraying nozzles must always have a sufficient distance from the tip of the plants. If the plants have reached a height that exceeds the maximum height adjustment of the spraying nozzles, a spray treatment is no longer possible.
- By increasing or reducing the height **C**, the width **B** of the spray cone is increased or reduced. The width must be adjusted with the height adjustment such that when hoeing and spraying simultaneously, both the band **D** where weeds are not removed by the hoe shares and the edges of the hoed bands **A** adjacent to this area are treated with the spray agent. However, the width may not be so large that the spray agent reaches the parallelograms or mounting parts of the parallelograms.

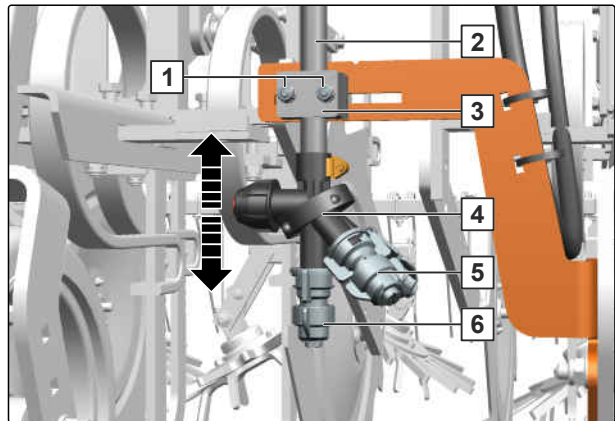


CMS-I-00005824

6 | Preparing the machine

Preparing the implement for operation

1. Lower the implement on the field with the three-point power lift.
2. Loosen the nuts **1** of the carriage bolts.
3. Slide the nozzle tube **2** together with the nozzle body **4** equipped with one or more spraying nozzles **5** up or down in the clamping bracket **3** until the spraying nozzle pointing down vertically **6** is in the right position.
4. Tighten the nuts of the carriage bolts.
5. Adjust the height for all of the spraying nozzles on the implement in the same way.

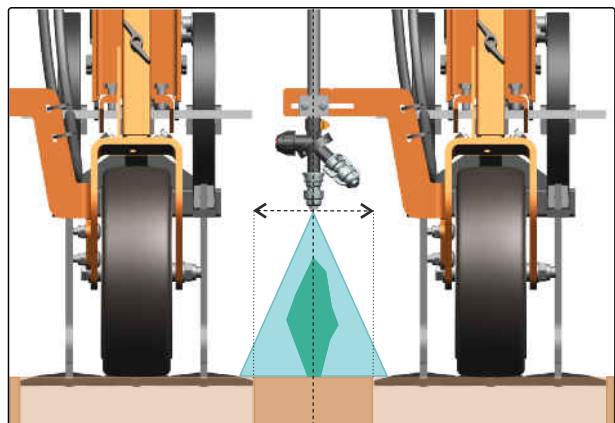


CMS-I-00005825

6.4.15.4 Adjusting the horizontal position of the spraying nozzles

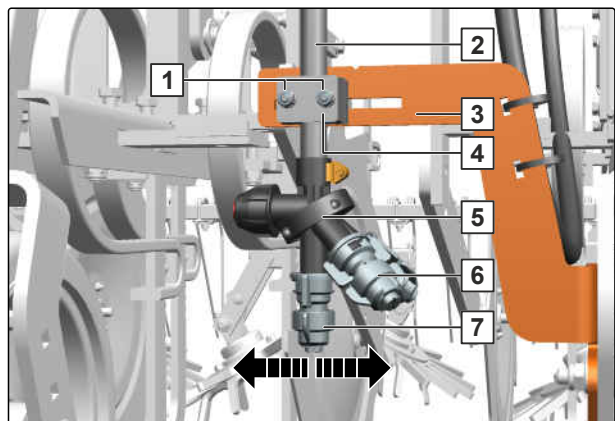
CMS-T-00008536-C.1

During spraying operation, the active spraying nozzles must always be vertical and positioned precisely centred on the crops.



CMS-I-00005826

1. Lower the implement on the field with the three-point power lift.
2. Loosen the nuts **1** of the carriage bolts.
3. Slide the clamping bracket **4** together with the nozzle tube **2** and the nozzle body **5** equipped with one or more spraying nozzles **6** to the left or right in the nozzle holder **3** until the spraying nozzle pointing down vertically **7** is in the right position.
4. Tighten the nuts of the carriage bolts.
5. Adjust the horizontal position for all of the spraying nozzles on the implement in the same way.



CMS-I-00005827

6.4.16 Adjusting the row sensor

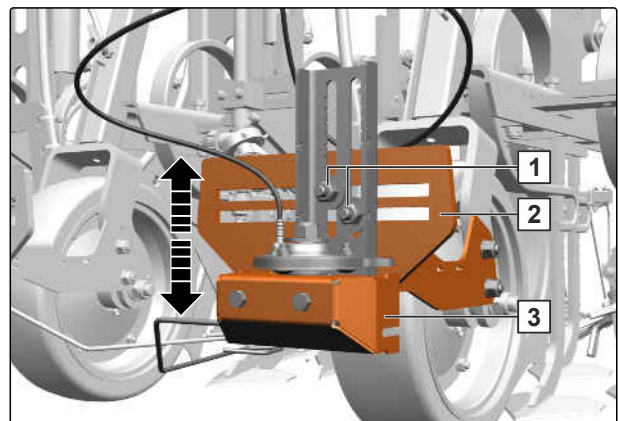
CMS-T-00008560-D.1

6.4.16.1 Adjusting the height of the row sensor

CMS-T-00008561-C.1

To adjust the vertical position of the row sensor, the following applies:

- The two guide arms should touch the plants below at a sufficiently stable point.
 - The guide arms may not run so low that the guide arms can collide with clods or stones.
1. Lower the implement on the field with the three-point power lift.
 2. Loosen the nuts **1** of the carriage bolts on the first sensor unit **3**.
 3. Push the sensor unit up or down in the holder **2** until the sensor unit is in the right position.
 4. Tighten the nuts of the carriage bolts.
 5. Adjust the second sensor unit at the same height in the same way.



CMS-I-00005830

6.4.16.2 Adjusting the row sensor to the row spacing

CMS-T-00008564-C.1

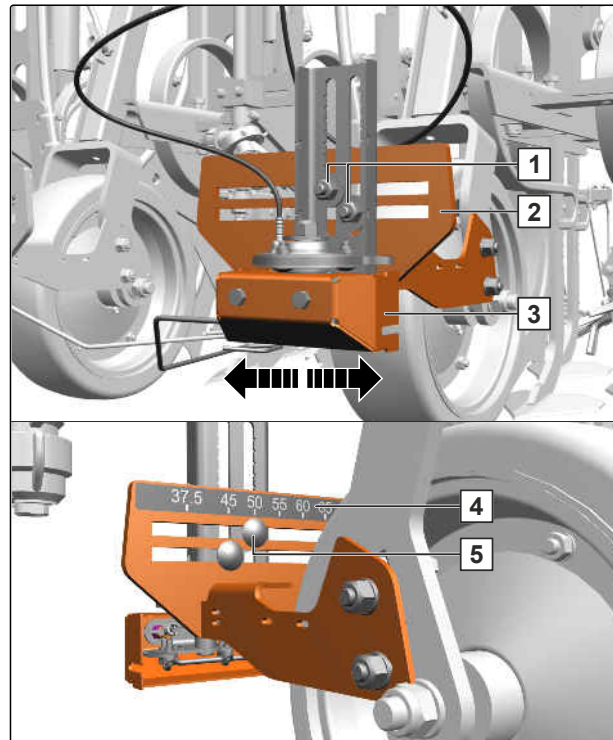
To adjust the horizontal position of the row sensor, the following applies:

- The two sensor units must be set to the row spacing of the plant rows using the width scale.
- The guide arms should overlap slightly at the inner ends.

6 | Preparing the machine

Preparing the implement for operation

1. Lower the implement on the field with the three-point power lift.
2. Loosen the nuts **1** of the carriage bolts on the first sensor unit **3**.
3. Slide the sensor unit along with the carriage bolts to the left or right in the holder **2** until the width scale **4** on the inner carriage bolt **5** indicates the row spacing of the plant row.
4. Tighten the nuts of the carriage bolts.
5. Adjust the second sensor unit to the same row spacing in the same way.
6. *If the ends of the guide arms do not slightly overlap:*
repeat the adjustment of the horizontal position on both sensor units until the guide arms slightly overlap with the same scale values for the row spacing.



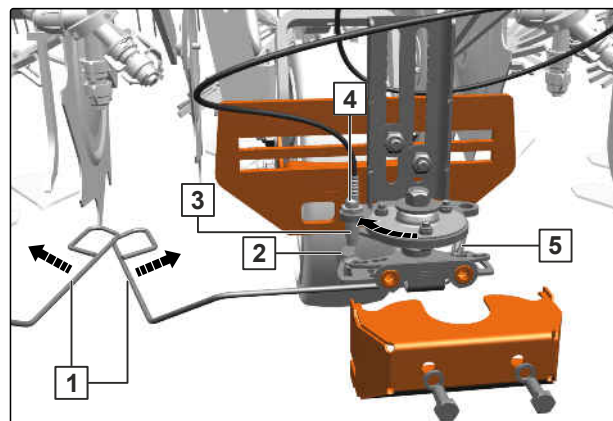
CMS-I-00005831

6.4.16.3 Adjusting the response of the row sensor

If the sliding frame is controlled by the row sensor, the sliding movements are not guided by the camera system, but are rather triggered by pulses that are emitted from the inductive sensors **3** in the two sensor units. These pulses are generated when the guide arms **1** are pressed out of the plant row towards the parallelograms due to contact with the plants.

Due to the resulting rotating movement, the contact tab **2** in each sensor unit is moved towards the sensor. As soon as the centre axes are completely covered by the contact tab and sensor, the sensor emits switching signals.

The response of the sensor units can be adjusted via the position of the contact tab and the tension of the tension spring **5**. The greater the distance from the contact tab to the sensor, the greater the deflection of the guide arm must be until the sensor emits a pulse. The stronger the tension spring presses onto the guide arm, the greater the force must be to deflect the guide arm. The smaller the distance from the contact tab to the sensor and the pulling force of



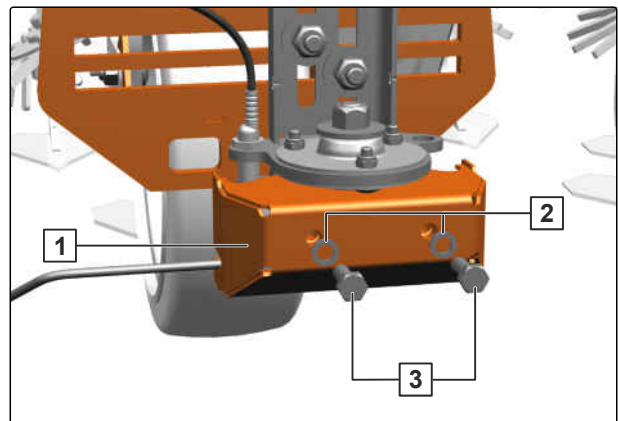
CMS-I-00005832

the springs, the earlier and faster the sensor sends control pulses to the sliding frame in case of contact of the guide arm with the plant.

The length of the trigger path can be checked with an LED **4** in the sensor. As soon as the contact tab has triggered a pulse, the LED lights up. This requires that a camera system be installed and switched on.

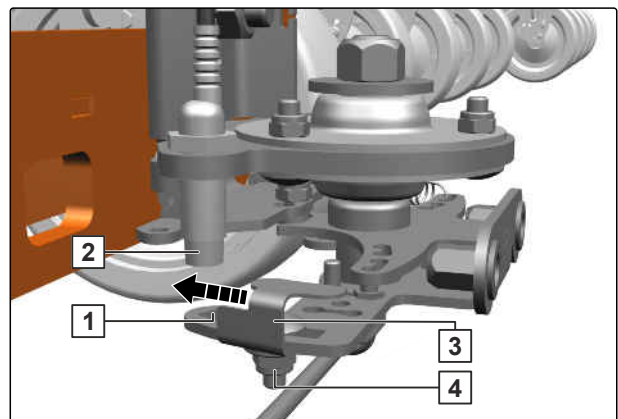
It is recommended to start with the setting at the largest trigger path and the highest spring tension, and to gradually reduce the path and the tension by repeating steps 4 to 8 until the desired response is achieved.

1. Lower the implement on the field with the three-point power lift.
2. Unscrew the bolts **3** on the cover **1** of both sensor units, and remove them along with the wedge lock washers **2**.
3. Remove the cover.



CMS-I-00005833

4. Release the nut **4** of the contact tab **3** on the first sensor unit.
5. *To set a faster trigger:*
Move the contact tab in the slot **1** towards the sensor **2**.
6. Tighten the nut of the contact tab.



CMS-I-00005834

6 | Preparing the machine

Preparing the implement for operation

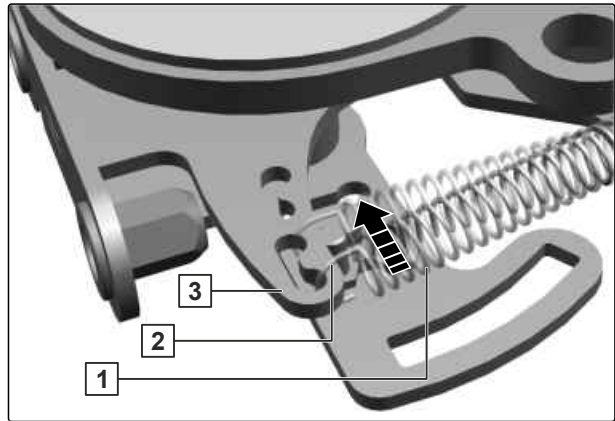
7. *To set a lighter trigger:*

Release the tension spring **1** on the front eye **2** from the spring holder **3** on the first sensor unit, and hook it back on further inwards.

8. Adjust the response of the second sensor unit to the same values in the same way.

9. Put the covers on the two sensor units.

10. Put on the bolts for the covers along with the wedge lock washers, and tighten them.



CMS-I-00005835

Using the implement

7

CMS-T-00006098-D.1

7.1 Using the KPP-LSC implement or KPP-MSK implement

CMS-T-00008496-C.1

7.1.1 Using the implement

CMS-T-00014006-B.1



REQUIREMENTS

- ☑ The implement is unfolded
- ☑ The parallelograms required for hoeing operation have been selected and moved into working position
- ☑ The implement is set up and adjusted for operation
- ☑ The implement is raised

1. Lift all of the parallelograms intended for hoeing operation, see sections *"Display for the status and the position of the parallelograms"* and *"Switching parallelograms manually"* in the operating manual for the ISOBUS hoeing machine software.
2. *If the parallelograms should be automatically lowered or lifted at the beginning and end of the plant rows:*
Switch on Section Control, see section *"Hoeing"* in the operating manual for the ISOBUS hoeing machine software.
3. Lower the implement on the field with the three-point power lift until the support wheels are resting on the ground.



NOTE

If the load on the support wheels is too high, the support wheels sink in.

4. Use the three-point power lift to distribute the load on the tractor lower link and the support wheels.

5. Drive off with the tractor.

- ➔ If the Section Control function was activated in step 2 and the headland is straight, the parallelograms automatically switch to working position all at the same time at the beginning of the plant rows.
- ➔ If the Section Control function was activated in step 2 and the headland is angular, the respective parallelogram automatically switches to working position at each beginning of a plant row.

6. *If the Section Control function is not being used and the headland is straight:*
After approaching the beginning of the plant rows, manually move all of the parallelograms into working position simultaneously, see sections "*Display for the status and the position of the parallelograms*" and "*Switching parallelograms manually*" in the operating manual for the ISOBUS hoeing machine software

or

If the Section Control function is not being used and the headlands is angular:
After approaching the beginning of each plant row, the respective parallelogram must be moved into working position manually, see sections "*Display for the status and the position of the parallelograms*" and "*Switching parallelograms manually*" in the operating manual for the ISOBUS hoeing machine software.

7.1.2 Turning on the headlands

CMS-T-00014008-B.1

1. When reaching the headland, drive out of the field.
- ➔ If the Section Control function was activated and the headland is straight, all of the parallelograms are automatically lifted simultaneously when reaching the end of the plant rows.
 - ➔ If the Section Control function was activated and the headland is angular, the respective parallelogram is automatically individually lifted when reaching the end of each plant row.

2. *If the Section Control function is not being used and the headland is straight:*

When reaching the end of the plant row, manually lift all of the parallelograms simultaneously, see sections "*Display for the status and the position of the parallelograms*" and "*Switching parallelograms manually*" in the operating manual for the ISOBUS hoeing machine software

or

If the Section Control function is not being used and the headlands is angular:

When reaching the end of each plant row, manually lift the respective parallelogram, see sections "*Display for the status and the position of the parallelograms*" and "*Switching parallelograms manually*" in the operating manual for the ISOBUS hoeing machine software.

3. *To prevent lateral loads when driving in curves on the headlands:*

Lift the implement with the three-point power lift.

4. Turn around.

5. *When the direction of the implement matches that of the direction of travel:*

Lower the implement on the field with the three-point power lift until the support wheels are resting on the ground.



NOTE

If the load on the support wheels is too high, the support wheels sink in.

6. Use the three-point power lift to distribute the load on the tractor lower link and the support wheels.

7. Drive into the field with the tractor.

➔ If the Section Control function was activated and the headland is straight, all of the parallelograms are automatically lowered simultaneously when reaching the beginning of the plant rows.

➔ If the Section Control function was activated and the headland is angular, the respective parallelogram is automatically individually lowered when reaching the beginning of each plant row.

8. *If the Section Control function is not being used and the headland is straight:*

When reaching the beginning of the plant rows, manually lower all of the parallelograms simultaneously, see sections "*Display for the status and the position of the parallelograms*" and "*Switching parallelograms manually*" in the operating manual for the ISOBUS hoeing machine software.

or

If the Section Control function is not being used and the headlands is angular:

When reaching the beginning of each plant row, manually lower the respective parallelogram, see sections "*Display for the status and the position of the parallelograms*" and "*Switching parallelograms manually*" in the operating manual for the ISOBUS hoeing machine software.

7.2 Using the KPP-M implement

CMS-T-00008497-C.1

7.2.1 Using the implement

CMS-T-00008501-C.1



REQUIREMENTS

- ☑ The implement is unfolded
- ☑ The parallelograms required for hoeing operation have been selected and moved into working position
- ☑ The implement is set up and adjusted for operation
- ☑ The implement is raised

1. *If the headland is straight:*

Drive into the field with the tractor until the parallelograms have reached the beginning of the plant rows

or

If the headland is slanted:

Drive into the field with the tractor until one of the two outermost parallelograms has reached the beginning of a plant row.

2. Lower the implement on the field with the three-point power lift until the support wheels are resting on the ground.



NOTE

If the load on the support wheels is too high, the support wheels sink in.

3. Use the three-point power lift to distribute the load on the tractor lower link and the support wheels.
4. Drive off with the tractor.

7.2.2 Turning on the headlands

CMS-T-00008502-C.1

1. *If the headland is straight:*
Drive out of the field with the tractor until the parallelograms have reached the end of the plant rows

or

If the headland is slanted:
Drive out of the field with the tractor until the second outermost parallelogram has reached the end of the two plant rows between which it is driving.

2. Lift the implement with the three-point power lift.
3. Turn until the direction of the implement matches the direction of travel.
4. *If the headland is straight:*
Drive into the field with the tractor until the parallelograms have reached the beginning of the plant rows

or

If the headland is slanted:
Drive into the field with the tractor until one of the two outermost parallelograms has reached the beginning of a plant row.

5. Lower the implement on the field with the three-point power lift until the support wheels are resting on the ground.



NOTE

If the load on the support wheels is too high, the support wheels sink in.

6. Use the three-point power lift to distribute the load on the tractor lower link and the support wheels.
7. Drive into the field with the tractor.

Eliminating faults

8

CMS-T-00006113-C.1

Errors	Cause	Solution
The crop is buried	The forward speed is too high.	▶ Reduce the forward speed. Maintain the optimal working speed according to the section "Technical data", see page 33.
	The ridging discs are adjusted too aggressively.	▶ Adjust the setting of the ridging discs, see page 81.
	There are no active hoe protection discs.	▶ Activate the hoe protection discs, see page 62 or see page 67. ▶ Check the adjustment of the hoe protection discs. Adjust the setting if necessary, see page 63 or see page 67.
The parallelogram pulls to one side	The working depth of the hoeing tools is not evenly adjusted.	▶ Adjust all hoeing tools to the same working depth, see page 61.
	The mounted additional tools are not evenly adjusted.	▶ Adjust all of the additional tools the same way.
The hoeing tool gets clogged with too much organic material	Too many hoeing tools are mounted.	▶ To increase the clearance between the hoeing tools, reduce the number of mounted hoeing tools.
	The soil flow is insufficient due to incorrect setting of the working depth.	▶ Increase or reduce the working depth of the hoeing tools to achieve better soil flow, see page 61.
Weeds are not removed between the rows	The hoeing width is not set correctly.	▶ Check the setting for the hoeing width. ▶ Set a hoeing width with at least 2 cm overlap, see page 59.
The tractor is strongly pulled down on slopes	The tractor is not properly balanced.	▶ Install front ballast on the tractor.
	Unsuitable tyres are installed on the tractor.	▶ Use narrow cultivation tyres on the tractor.

Errors	Cause	Solution
The row widths vary greatly after seeding	The parallelograms are incorrectly aligned.	► Adjust the alignment of the parallelograms on each row, see page 58.
	Wrong direction of travel.	► Observe the direction of travel and drive through the field the same way as for seeding.
	The seed drill is not correctly set.	► Check the setting of the seed drill.
	The bearings of the seed drill are defective.	► Check the bearings on the seed drill. ► Replace defective bearings immediately.
The finger hoes run too deep	The finger hoes are not correctly set.	► Check the setting of the finger hoes. ► <i>To reduce the preload:</i> Move the finger hoes up, see page 75.
	The height of the finger hoe set on the star parallelogram is too low.	► Position the finger hoe set higher up in the star parallelogram using the section tube and the guide tube, see page 77
The hoe shares run too deep	The working depth setting for the hoe shares is wrong.	► Check if the hoe shares are set equally. ► Set the working depth of the hoe shares at 2 bis 3 cm, see page 61. ► <i>If soil should be ridged:</i> Then mount the corresponding tools.
The hoeing tool is not running in the soil	The parallelograms are not in working position.	► Move the parallelograms into working position, see page 51.

Parking the implement

9

CMS-T-00006099-D.1

9.1

Moving the parallelograms into working position to park the implement

CMS-T-00013589-A.1

To ensure the stability of a parked implement, before parking an implement

- of product type KPP-M and
- of any product type

in a folded state, the parallelograms must be lowered into working position.

For implements of product type KPP-LSC and KPP-MSK, the parallelograms cannot be generally lowered into working position for parking in a folded state: when folding these implements, either all of the parallelograms are automatically lifted or the parallelograms on the sections are automatically lifted and only the parallelograms on the centre segment of the implement slide rail are completely lowered or lowered to the middle when the lowering lock is installed.

- *To move the parallelograms of an implement with hydraulically lifting parallelograms into working position before parking it in an unfolded state:*

Observe the sections "*Display for the status and the position of the parallelograms*" and "*Switching parallelograms manually*" in the operating manual for the ISOBUS hoeing machine software

or

To move the parallelograms of an implement with mechanically lifting parallelograms into working position before parking it in a folded or unfolded state:

Proceed according to section "*Selecting the mechanically lifting KPP and moving them into working position*", see page 52.

9.2 Attaching the parking supports

CMS-T-00006611-D.1

9.2.1 Attaching the parking supports when parking the folded implement

CMS-T-00006172-D.1

If the implement is to be parked in a folded state, the parking supports must be attached at the inner ends of the sections beside the folding hinges.

For the KPP-LSC 12 x 50 product type, before attaching the parking supports, a lowering lock must be used on each of the two outer parallelograms on the centre section of the implement slide rail. The lowering locks ensure that space remains for the parking supports underneath and in front of the two outer parallelograms.

For all other product types, before attaching the parking supports, the section-side hoe protection discs must be deactivated or the section-side hoe shares must be pushed up on two outer parallelograms on the centre section of the implement slide rail, if there is not enough space otherwise for the feet of the parking supports under the two outer parallelograms.



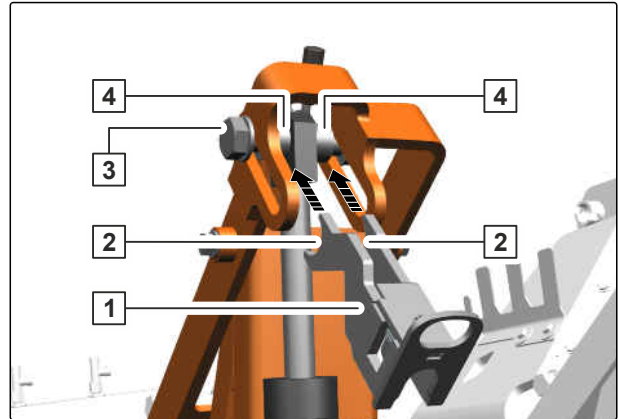
REQUIREMENTS

- ☑ The implement is unfolded
- ☑ The parallelograms were moved into working position

1. *If the implement is a KPP-LSC 12 x 50 product type:*
perform steps 2 to 5, otherwise continue with step 6.

2. Lift all of the parallelograms, see page 47.

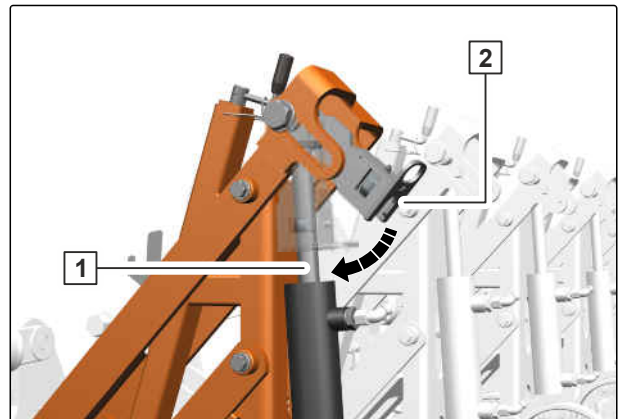
3. On one of the two outer parallelograms that are attached to the centre section of the implement slide rail, put one of the two lowering locks **1** with the half-moon shaped notches **2** on the spacer rings **4** of the upper guide pin **3**.



CMS-I-00004717

4. Swivel the lowering lock down and allow it to engage at the bottom with the plastic clamp **2** on the piston rod **1**.

5. Attach the second lowering lock on the other outer parallelogram in the same way.



CMS-I-00004724

6. Fold the implement using the "blue" tractor control unit.

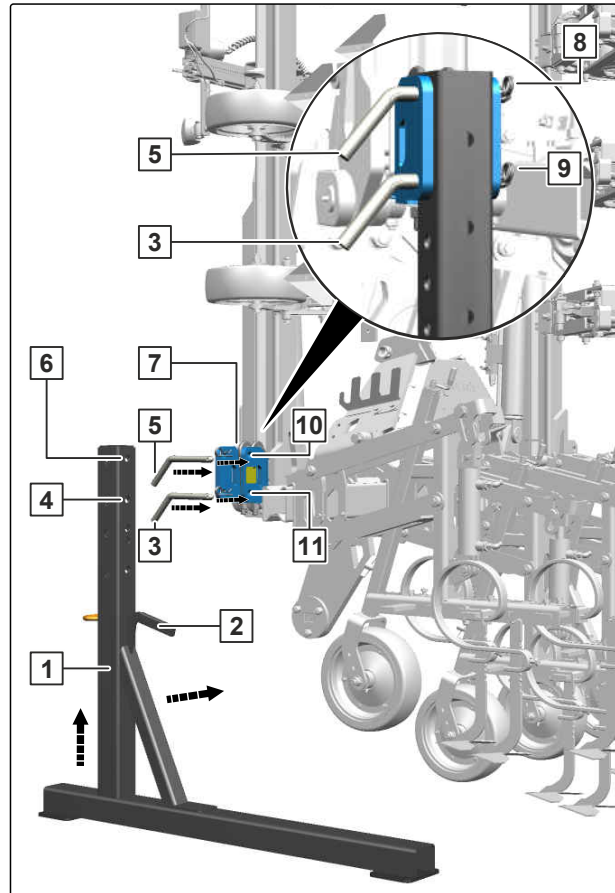
9 | Parking the implement

Attaching the parking supports

7. Hold the parking support **1** by the handle **2** and push it to the side towards the clamp **7**.
8. *If a hoe protection disc or a hoe share prevents the parking support from being completely pushed onto the clamp:*
follow steps 15 to 18, otherwise continue with the next step.
9. Hold the parking support by the handle and lift it into the clamp such that the holes **4** and **6** of the parking support and the holes **11** and **10** of the clamp are lined up.
10. Insert the upper fixing pin **5** through the upper holes on the clamp.
11. Secure the upper fixing pin with the spring cotter pin **8**.
12. Insert the lower fixing pin **3** through the lower holes on the clamp.
13. Secure the lower fixing pin with the spring cotter pin **9**.
14. Repeat steps 7 to 13 for the second parking support.
15. *To remove a hoe protection disc from the space required for the foot of the parking support:*
Deactivate the corresponding hoe protection disc, see page 62 or see page 72, and continue with step 7

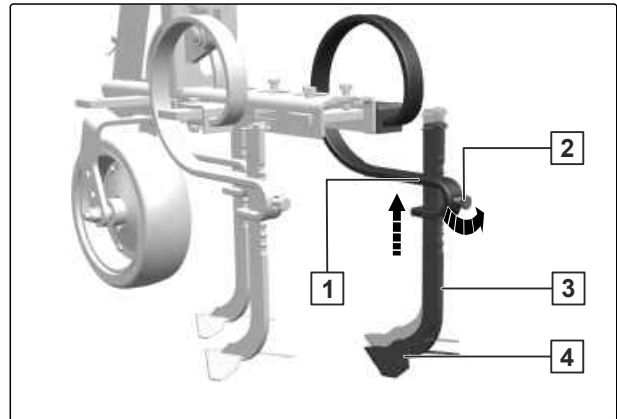
or

To remove a hoe share from the space required for the foot of the parking support:
perform steps 16 to 18.



CMS-I-00004397

16. Loosen the bolt **2** for the holder **1** on the corresponding hoe share **4**.
17. Push the shaft **3** of the hoe share all the way up and retighten the bolt.
18. Continue with step 7.



CMS-I-00005767

9.2.2 Attaching the parking supports when parking the unfolded implement

CMS-T-00006612-D.1

If the implement is to be parked in an unfolded state, the parking supports must be attached at the outer ends of the sections beside the support wheels.

The clamps for the parking supports are attached to the inner ends of the sections ex-factory. If the implement is to be parked in an unfolded state, the clamps must be repositioned at the outer ends of the sections.

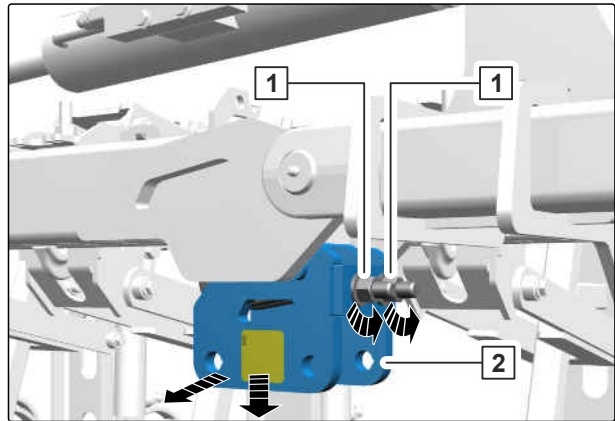
Before attaching the parking supports, the corresponding hoe protection discs must be deactivated or the corresponding hoe shares must be pushed up on the parallelograms behind the clamps, if there is not enough space otherwise for the feet of the parking supports under the two respective parallelograms.

If the implement should be parked unfolded for a longer period of time, it is recommended to attach a pair of optionally available centre parking supports. When the unfolded implement should be lashed for transport, see page 124, it is mandatory to attach centre parking supports.

9 | Parking the implement

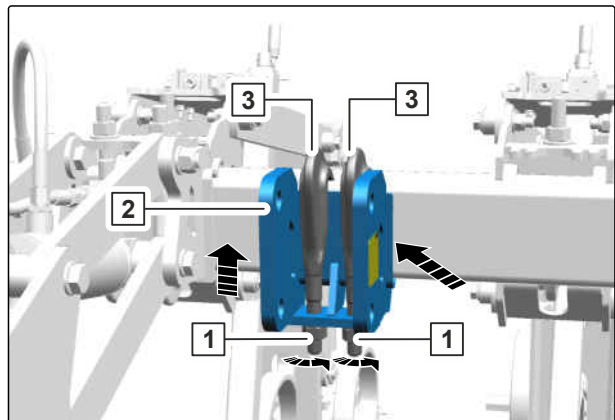
Attaching the parking supports

1. Loosen the nuts **1** of the clasp bolts and unscrew until the clamp **2** can be removed from the inner end of the section.
2. Remove the clamp.



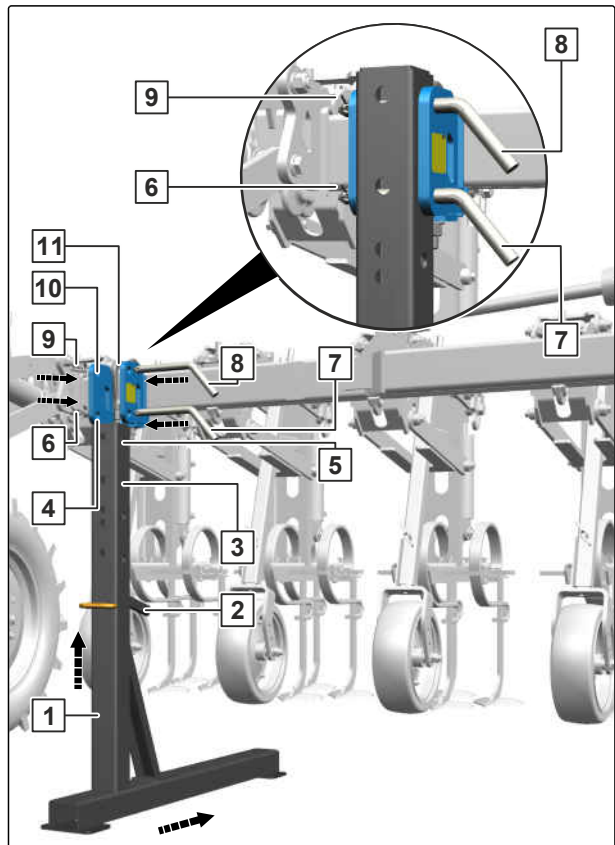
CMS-I-00004399

3. Put the clamp **2** on the outer end of the section.
4. Tighten the nuts **1** for the clasp bolts **3** with a tightening torque of 210 Nm.
5. Reposition the clamp on the other section in the same way.



CMS-I-00004400

6. Hold the parking support **1** by the handle **2** and push it towards the implement.
7. *If a hoe protection disc or a hoe share prevents the parking support from being completely pushed onto the clamp:*
follow steps 14 to 17, otherwise continue with the next step.
8. Hold the parking support by the handle and lift it into the clamp **11** such that the holes **3** and **5** of the parking support and the holes **4** and **10** of the clamp are lined up.
9. Insert the upper fixing pin **8** through the upper holes on the clamp.
10. Secure the upper fixing pin with the spring cotter pin **9**.
11. Insert the lower fixing pin **7** through the lower holes on the clamp.



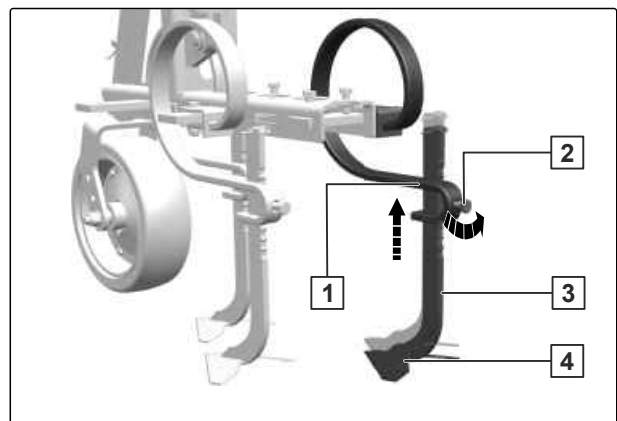
CMS-I-00004401

12. Secure the lower fixing pin with the spring cotter pin **6**.
13. Repeat steps 6 to 12 on the other section for the second parking support.
14. *To remove a hoe protection disc from the space required for the foot of the parking support:*
Deactivate the corresponding hoe protection disc, see page 62 or see page 72, and continue with step 6

or

To remove a hoe share from the space required for the foot of the parking support:
perform steps 15 to 17.

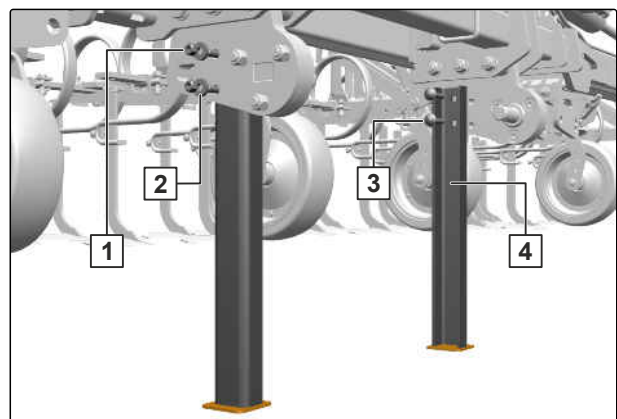
15. Loosen the bolt **2** for the holder **1** on the corresponding hoe share **4**.
16. Push the shaft **3** of the hoe share all the way up and retighten the bolt.
17. Continue with step 6.



CMS-I-00005767

18. *To attach an additional pair of centre parking supports:*
perform steps 19 to 22.

19. Position the centre parking support **4**.
20. Slide the bolts **3** through the holes.
21. Put the nuts **1** along with the washers **2** on the bolts and tighten them.
22. Repeat steps 19 to 21 for the second centre parking support.

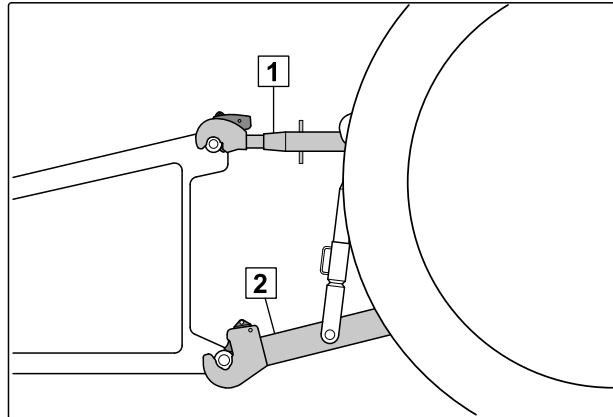


CMS-I-00005767

9.3 Uncoupling the three-point mounting frame

CMS-T-00001401-D.1

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



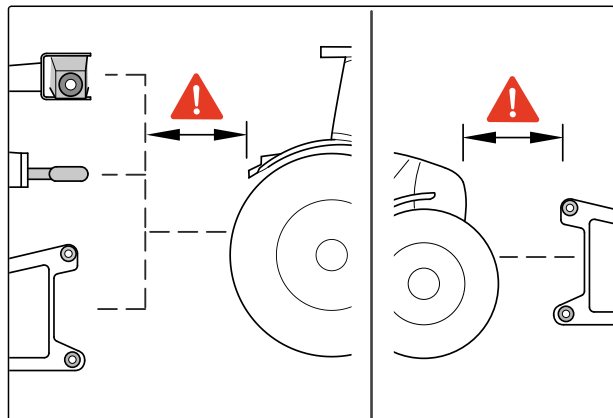
CMS-I-00001249

9.4 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

9.5 Uncoupling the ISOBUS lines

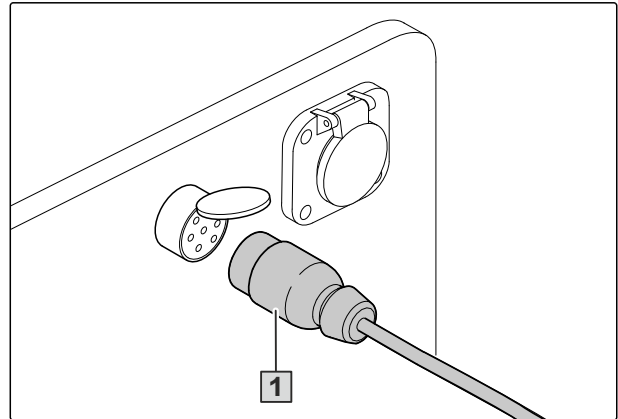
CMS-T-00008613-B.1

1. Disconnect all of the ISOBUS plugs that were connected when coupling the implement, see page 41, section "Coupling the ISOBUS lines".
2. Hang the plug for the ISOBUS lines of the hoeing machine and the band sprayer in the hose cabinet on the implement.
3. Fasten the plug for the combined ISOBUS line on the tractor.
4. Remove the wiring harness magnetic holder of the combined ISOBUS line from the implement and hang it on the tractor.

9.6 Uncoupling the power supply

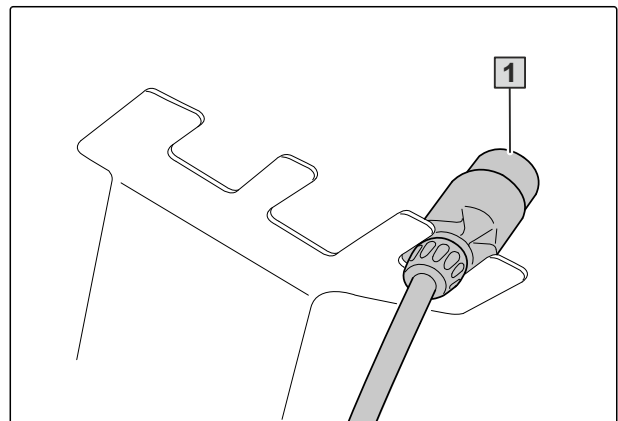
CMS-T-00001402-H.1

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



CMS-I-00001048

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

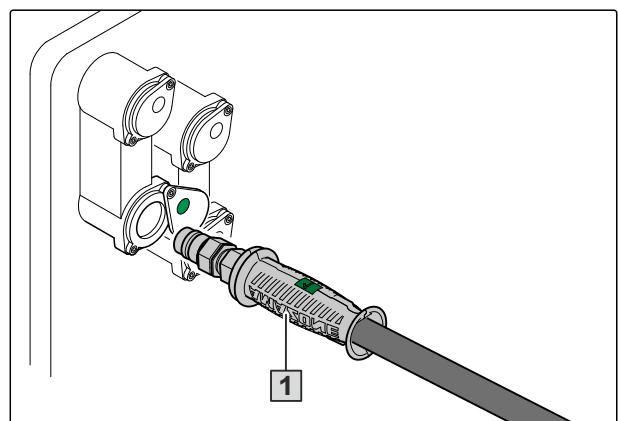


CMS-I-00001248

9.7 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.

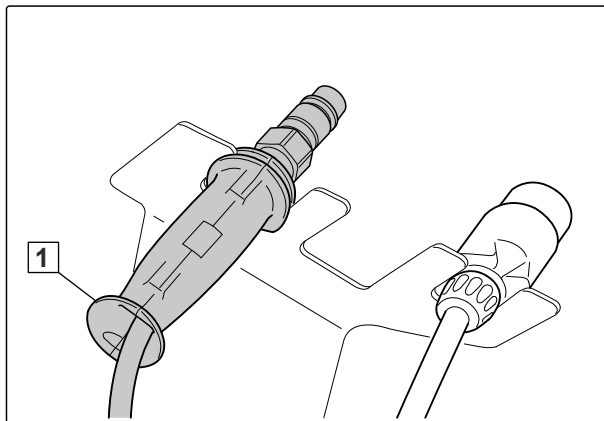


CMS-I-00001065

9 | Parking the implement

Disconnecting the hydraulic hose lines

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



CMS-I-00001250

Repairing the implement

10

CMS-T-00006100-E.1

10.1 Maintaining the implement

CMS-T-00006111-E.1

10.1.1 Maintenance schedule

After initial operation	
Checking the hydraulic hose lines	see page 114
As required	
Replacing Rapido duckfoot shares	see page 115
Replacing RapidoClip duckfoot shares	see page 116
Replacing the Rotavator blade	see page 117
Replacing finger hoes	see page 118
Daily	
Checking the lower link pins and top link pins	see page 114
Every 50 operating hours / Weekly	
Checking the hydraulic hose lines	see page 114

10.1.2 Checking the hydraulic hose lines

CMS-T-00002331-G.1



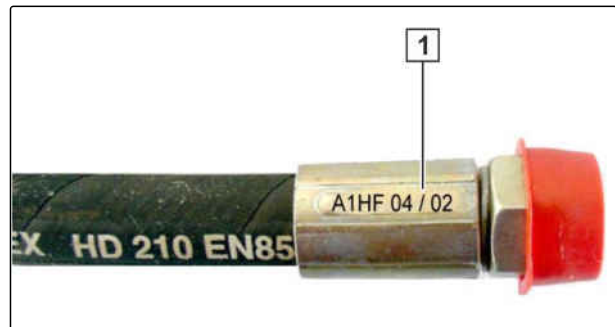
INTERVAL

- 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.

10.1.3 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.

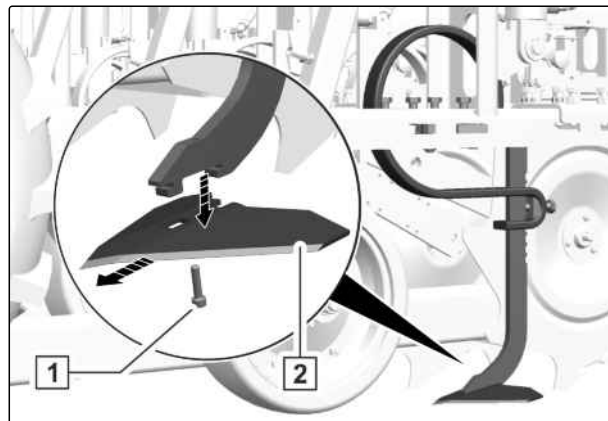
10.1.4 Replacing Rapido duckfoot shares

CMS-T-00010476-B.1

INTERVAL

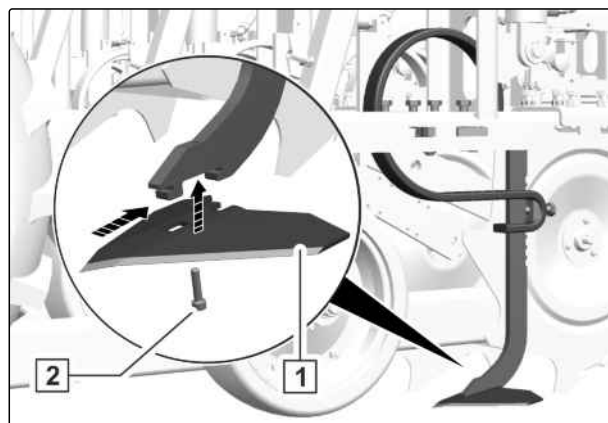
- As required

1. Lift the parallelogram and secure it.
2. Unscrew the bolt **1**.
3. Push the share plate **2** to the front and remove downwards.



CMS-I-00004576

4. Place the share plate **1** on the mount and push to the rear.
5. Screw in the bolt **2**.



CMS-I-00004575

10.1.5 Replacing RapidoClip duckfoot shares

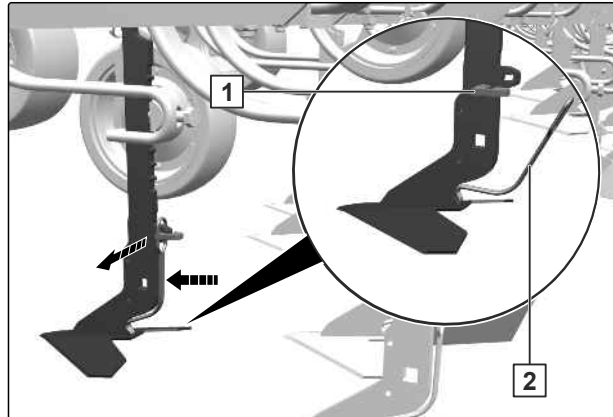
CMS-T-00013915-A.1



INTERVAL

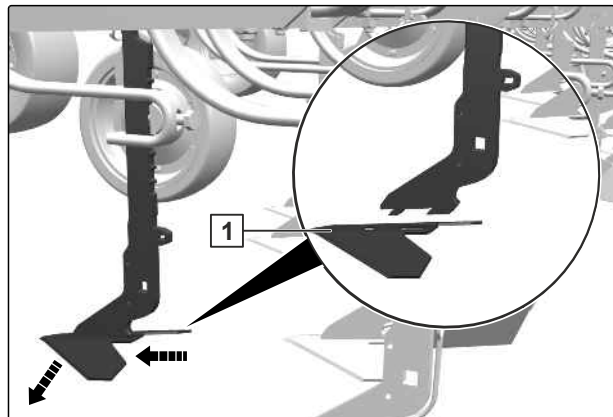
- As required

1. Lift the parallelogram and secure it.
 2. Push the RapidoClip **2** to the front and pull out the lock **1**.
- ➔ The RapidoClip swivels to the rear.
3. Take off the RapidoClip.



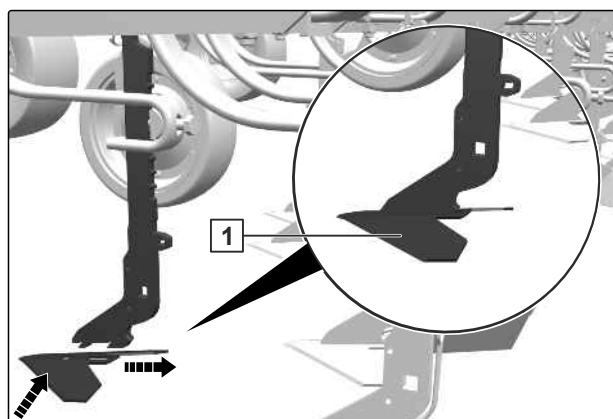
CMS-I-00008660

4. Push the old share plate **1** to the front out of the mounts and remove downwards.



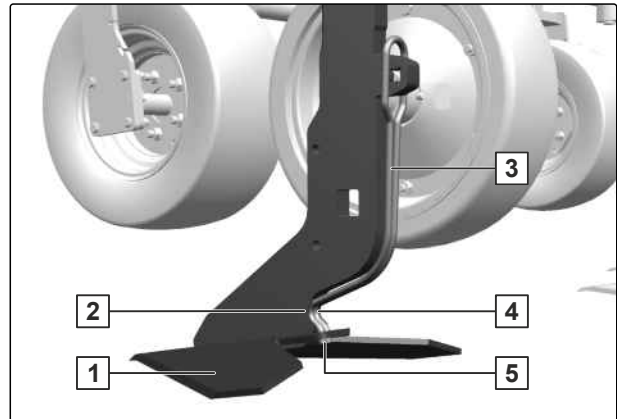
CMS-I-00008661

5. Make sure that the mounts are clean.
6. Place the new share plate **1** on the mount from below and push to the rear.
7. Make sure that the share plate is properly fitted.



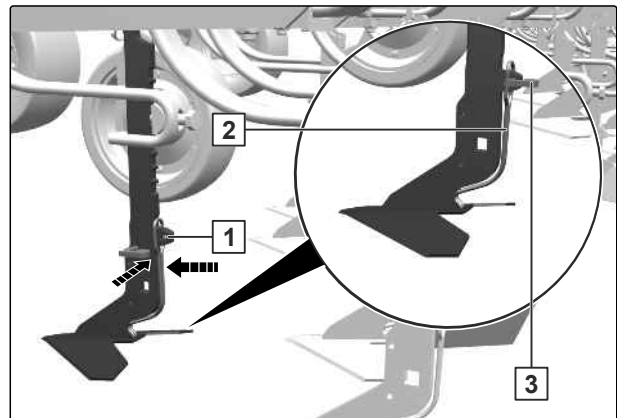
CMS-I-00008662

8. Insert the RapidoClip **3** such that the lower end **5** fits in the share plate **1** and the rounded part **2** is resting in the dent **4** of the shaft.



CMS-I-00008745

9. Press the RapidoClip **2** to the front against the shaft and insert the lock **3** through the opening **1**.
10. Make sure that the RapidoClip is pressed firmly to the rear against the inserted lock.



CMS-I-00008663

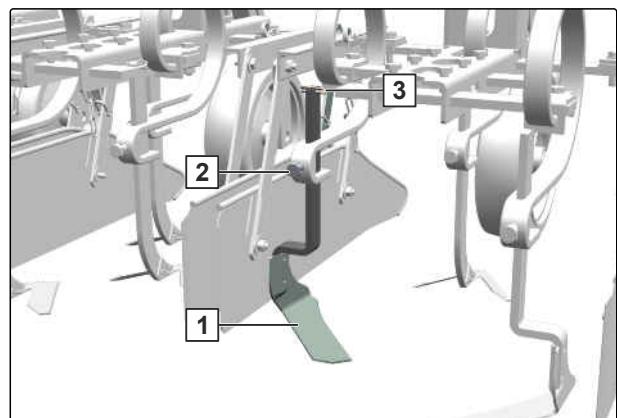
10.1.6 Replacing the Rotavator blade

CMS-T-00014205-A.1

INTERVAL

- As required

1. Lift the parallelogram and secure it.
2. Remove the loss prevention device **3**.
3. Loosen the bolt **2** for the holder on the tool mounting bracket or on the Vibro spring.
4. Pull out the Rotavator blade **1** downwards and remove it.
5. Slide the new Rotavator blade into the holder from below up to the desired height.
6. Tighten the bolt for the holder.
7. Put on the loss prevention device.



CMS-I-00007148

10.1.7 Replacing finger hoes

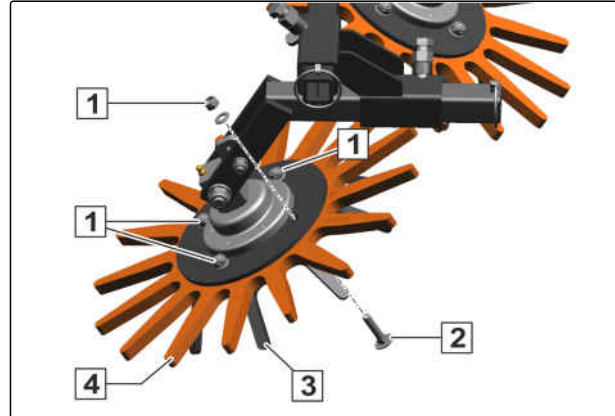
CMS-T-00006418-A.1



INTERVAL

- As required

1. Lift the parallelogram and secure it.
2. Unscrew the nuts **1** with washers.
3. Pull out the bolts **2**.
4. Take off the finger hoe drive **3** and the finger hoe **4**.
5. Put on a new finger hoe with finger hoe drive.
6. Insert the bolts.
7. Screw on the nuts with washers.



CMS-I-00004577

10.2 Lubricating the implement

CMS-T-00006112-C.1



IMPORTANT

Implement damage due to improper lubrication

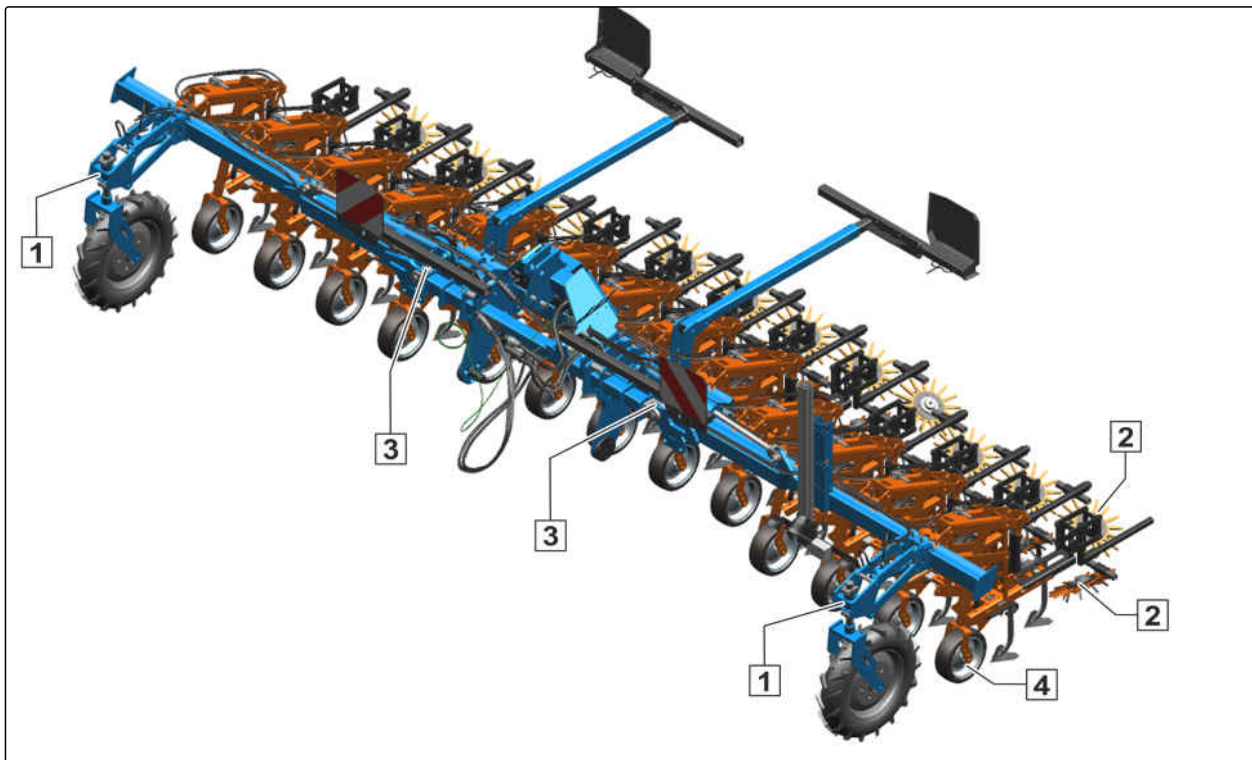
- ▶ Grease the implement at the marked lubrication points according to the lubrication schedule.
- ▶ *To ensure that dirt is not pressed into the lubrication points:*
Thoroughly clean the grease nipples and the grease gun.
- ▶ Only grease the implement with the lubricants listed in the technical data.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



CMS-I-00002270

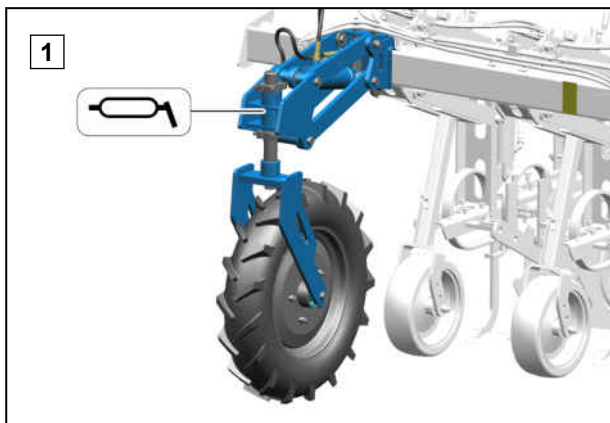
10.2.1 Overview of lubrication points

CMS-T-00006209-A.1

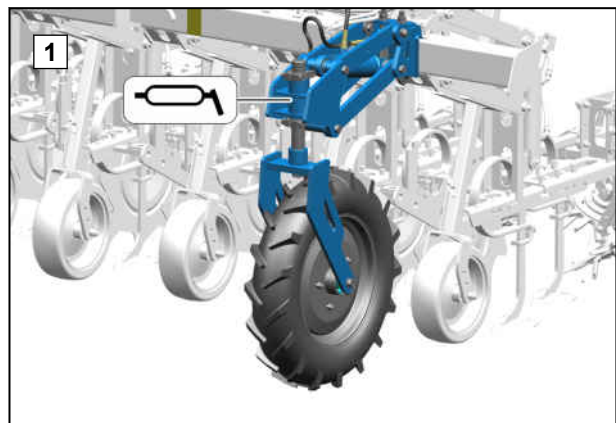


CMS-I-00004567

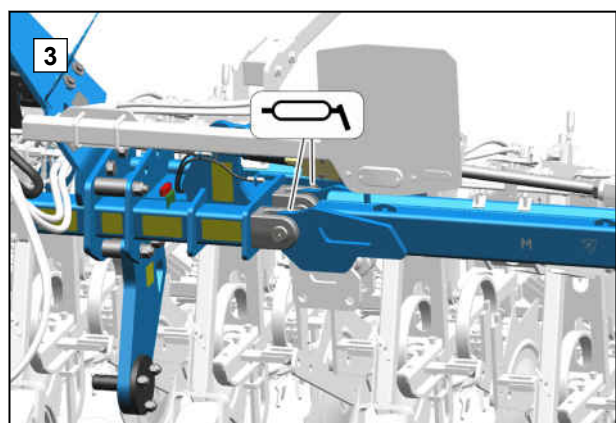
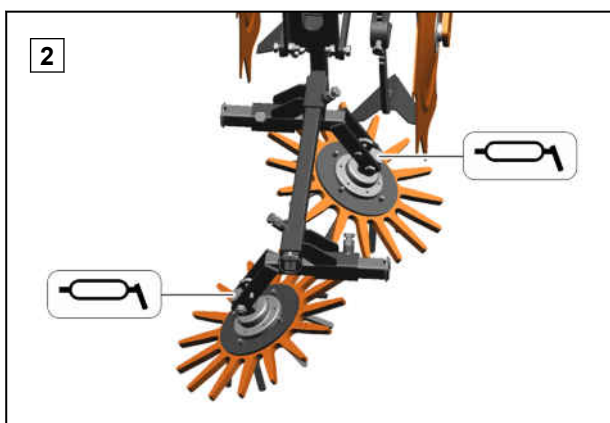
Every 20 operating hours



CMS-I-00004566

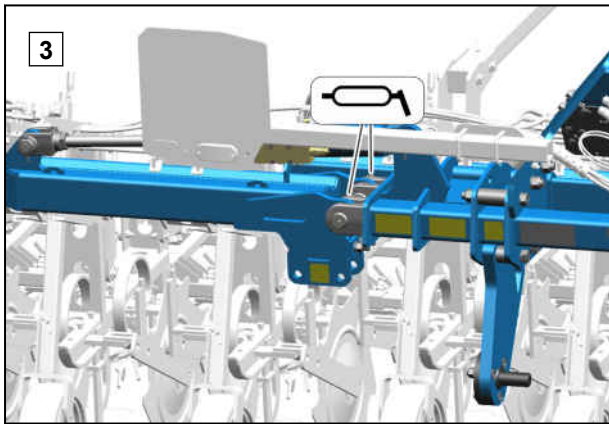


CMS-I-00004565



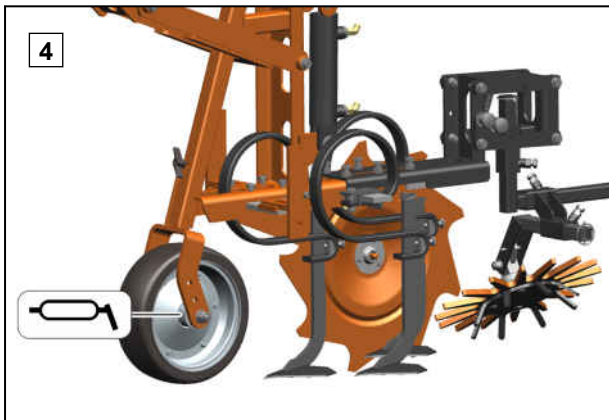
CMS-I-00004561

CMS-I-00004563



CMS-I-00004564

Every 50 operating hours



CMS-I-00004562

10.3 Cleaning the implement

CMS-T-00006591-B.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.



CMS-I-00002692

1. Only blow off the implement with compressed air.
2. Remove heavy soiling on the tools with a high-pressure cleaner or a hot water high-pressure cleaner.

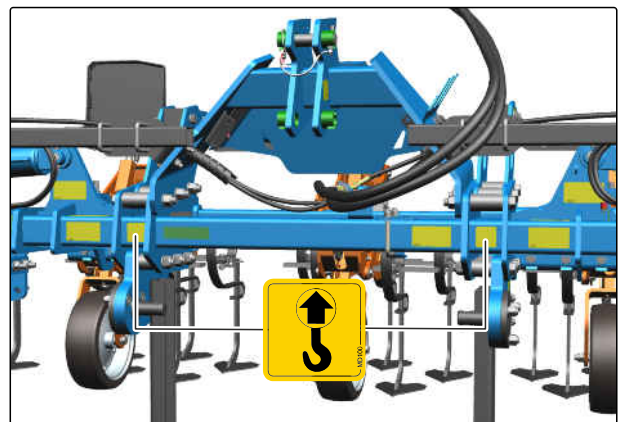
Loading the implement

11

CMS-T-00006101-B.1

11.1 Loading the unfolded implement with a crane

CMS-T-00006170-B.1



CMS-I-00004569

The implement has 4 lashing points for slings for lifting.

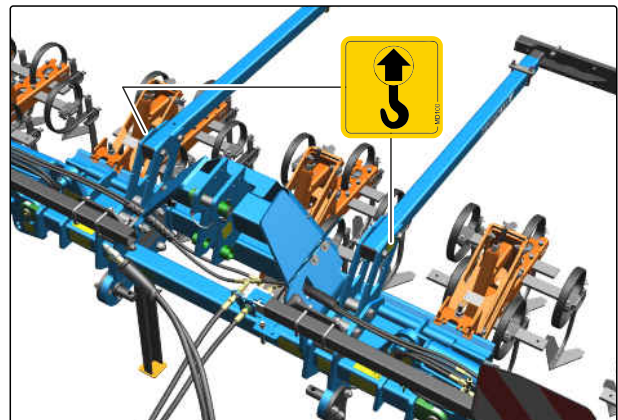


WARNING

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-00004570

1. Attach the lifting gear for lifting at the marked positions.
2. Slowly lift the implement.

11.2 Loading the folded implement with a crane

CMS-T-00006561-B.1

The implement has 2 lashing points for slings for lifting.

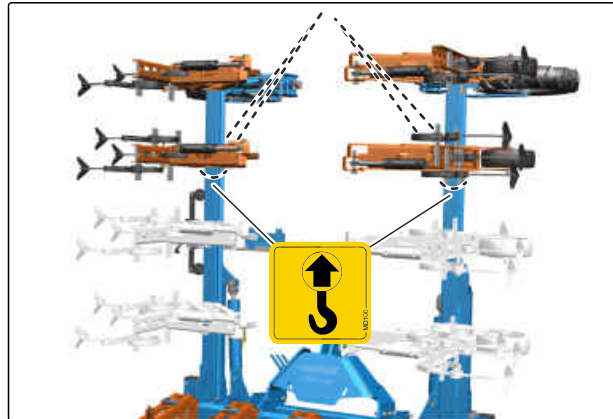


WARNING

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.



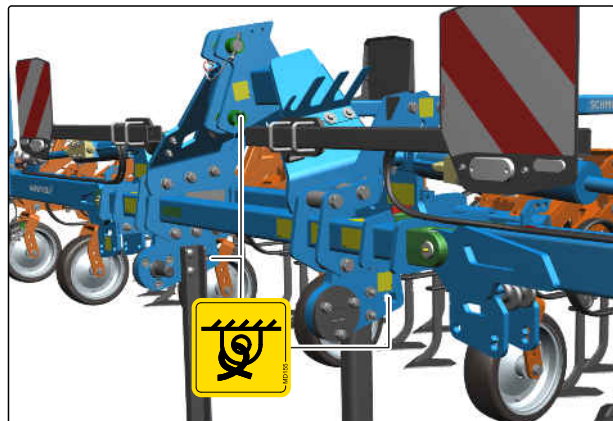
CMS-I-00004633

1. Attach the lifting gear for lifting at the marked positions.
2. Slowly lift the implement.

11.3 Lashing the unfolded implement

CMS-T-00006171-B.1

The implement has lashing points for securing the load.



CMS-I-00004573



CMS-I-00004571

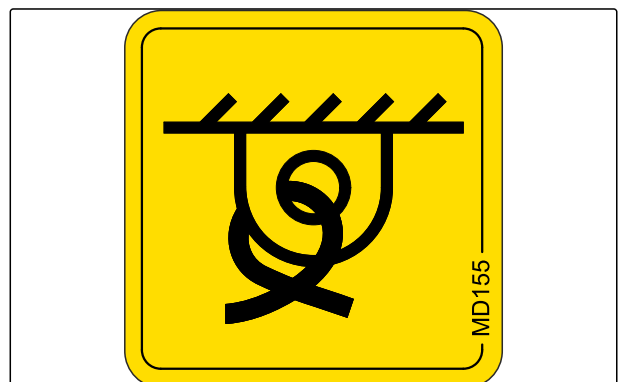


CMS-I-00004572



REQUIREMENTS

- ✓ The implement is unfolded
 - ✓ The parking supports are attached at the end of the sections
 - ✓ Centre parking supports are attached to the lower link lugs
1. Attach the lashing straps at the marked points.
 2. Lash down the implement on the transport vehicle in compliance with the national regulations.



CMS-I-00000450

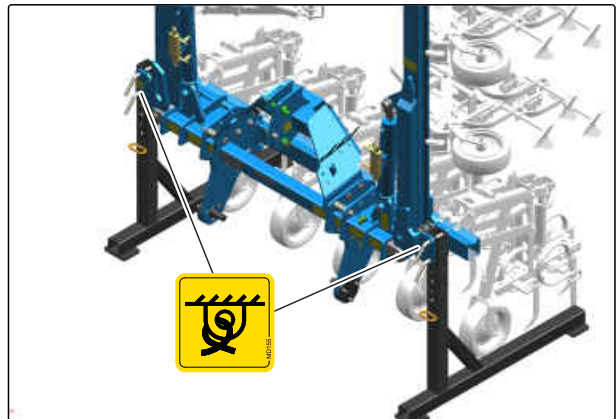
11.4 Lashing the folded implement

CMS-T-00006562-B.1

The implement has lashing points for securing the load.



CMS-I-00009107



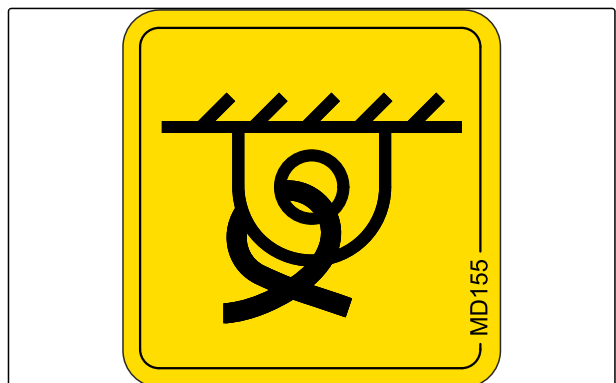
CMS-I-00004634



REQUIREMENTS

- ✓ Implement is folded
- ✓ The inner parking supports are attached

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



CMS-I-00000450

Disposing of the implement

12

CMS-T-00010906-B.1

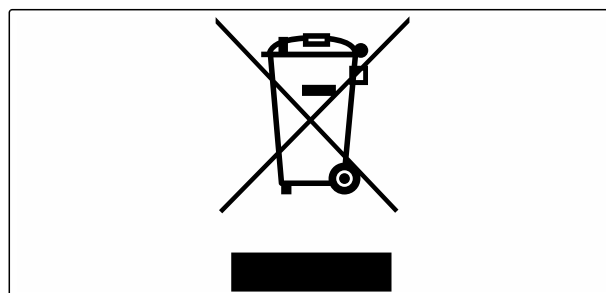


ENVIRONMENTAL INFORMATION

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.

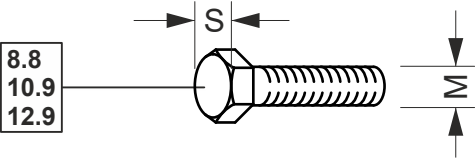
Appendix

13

CMS-T-00006102-D.1

13.1 Bolt tightening torques

CMS-T-00000373-E.1



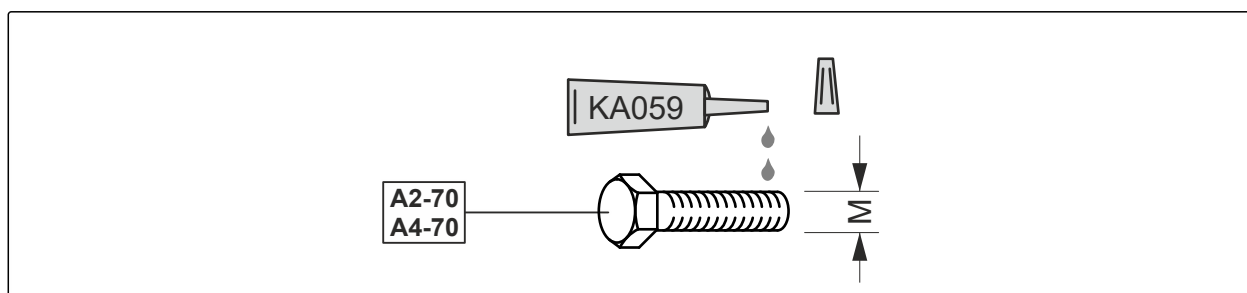
CMS-I-000260

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-00006103-C.1

- Tractor operating manual
- Operating manual for the ISOBUS control terminal
- Operating manual for the ISOBUS hoeing machine software
- Operating manual of the sliding frame AV 5
- Operating manual of the sliding frame VR 2
- Operating manual of the camera system
- Operating Manual of the front tank FT-P 1502
- Operating manual of the ISOBUS field sprayer software

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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