



SCHMOTZER

Original operating manual

Sliding frame

AV 5



SCHMOTZER



SCHMOTZER Hacktechnik GmbH & Co. KG

D-91438 Bad Windsheim


Year of construction

Machine no.

UK

CA

CE



Product

Permissible technical implement weight kg

Model year

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.

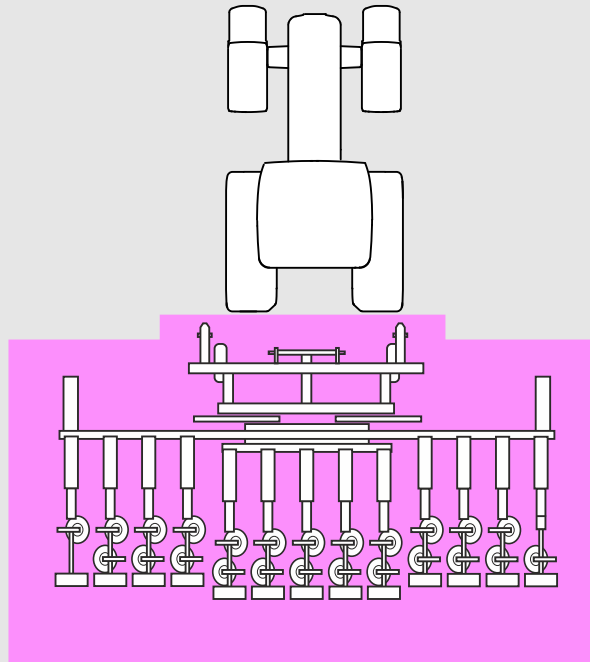
Hydraulically raised implement parts can descend unnoticed and slowly.

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-00006351-C.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.
- Implements for mechanical weed control can be attached to the implement. The implement pushes the towed implement transverse to the direction of travel to guide the towed implement in 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.

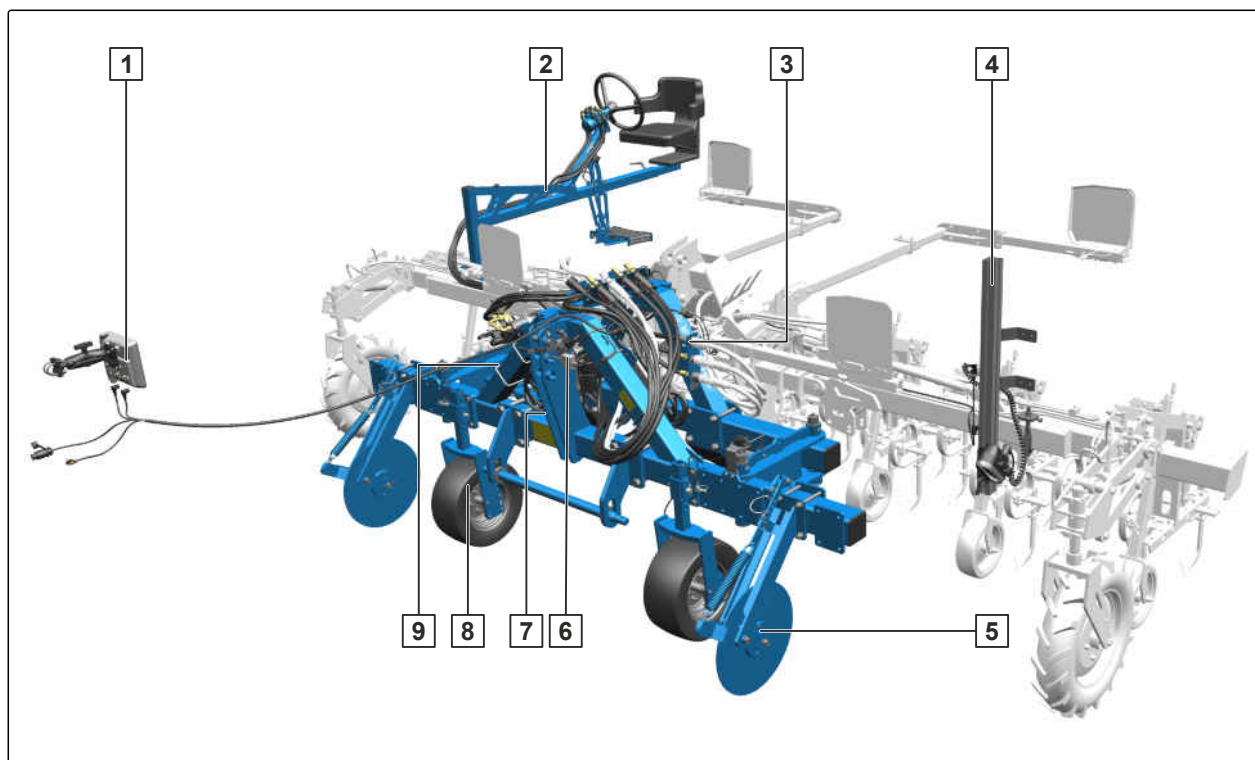
Product description

4

CMS-T-00006352-E.1

4.1 Implement overview

CMS-T-00006358-C.1



CMS-I-00004542

- | | |
|-------------------------------------------------|---------------------------------------------|
| 1 Control terminal for the camera system | 2 Manual steering unit |
| 3 Coupling holder | 4 Camera adjustment rail with camera |
| 5 Stabilisation disc | 6 Working position sensors |
| 7 Rating plate on the implement | 8 Support wheel |
| 9 Control valve | |

4.2 Function of the implement

CMS-S-00006369-C.1

The implement pushes the towed hoeing machine transverse to the direction of travel, to guide the

towed hoeing machine between the plant rows of the crop.

The stabilisation discs prevent the transfer of forces onto the tractor and keep the implement in the track.

The camera system controls the implement automatically.

The steering unit installed on the hoeing machine enables manual control of the implement by a second person at the rear on the hoeing machine.

4.3 Special equipment

CMS-T-00008433-B.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 special equipment:

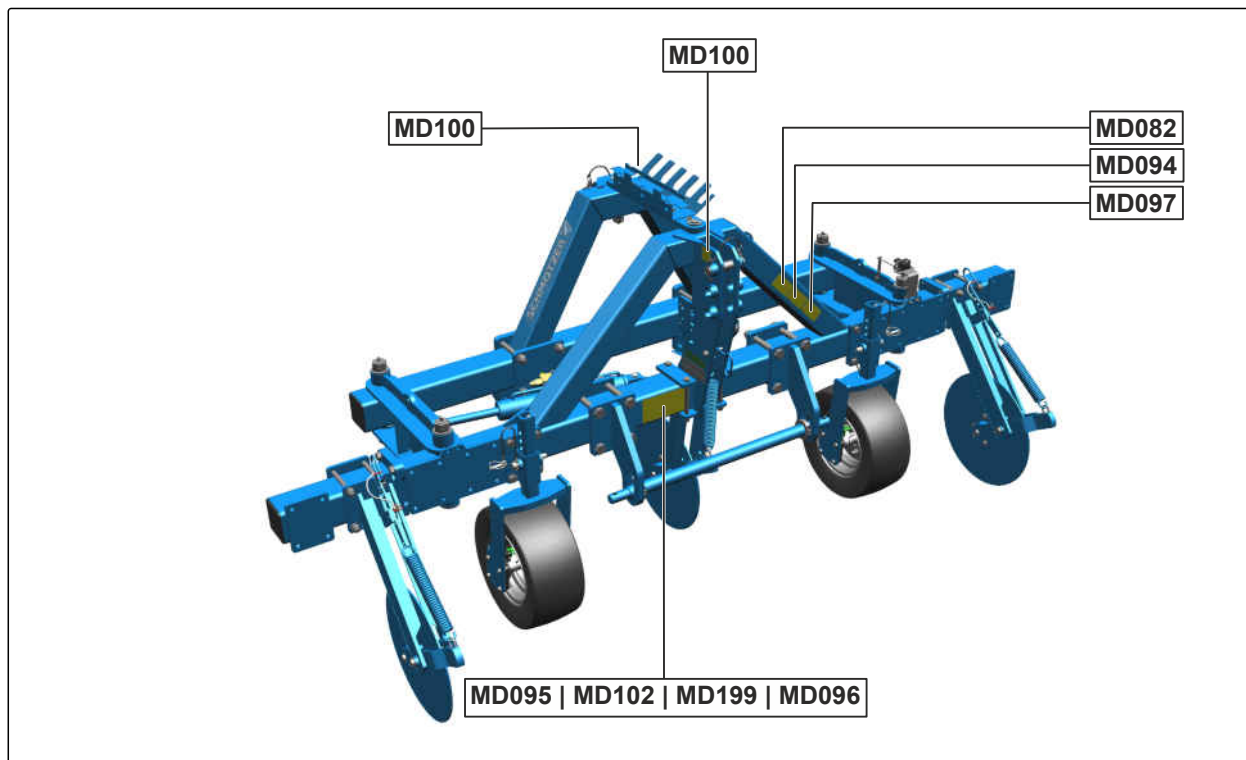
- Preparation for Section Control
- Stabilisation discs
- Steering unit for manual control

4.4 Warning symbols

CMS-T-00006371-E.1

4.4.1 Positions of the warning symbols

CMS-T-00006372-C.1



CMS-I-00004536

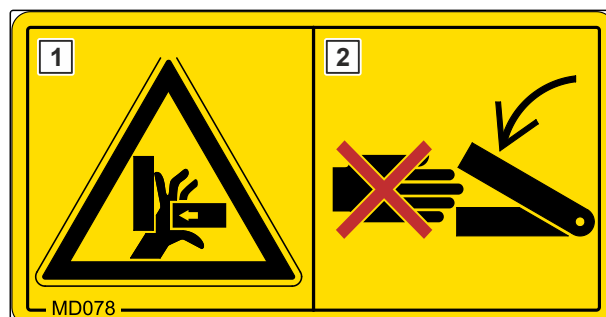
4.4.2 Layout of the warning symbols

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

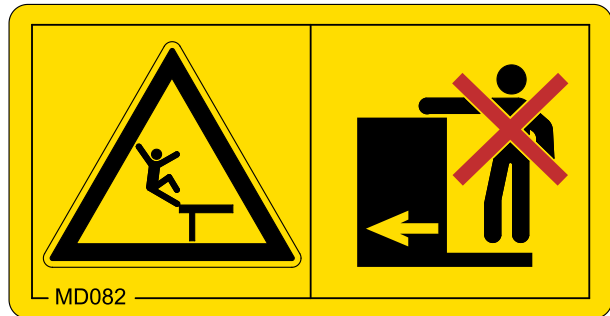
4.4.3 Description of the warning symbols

CMS-T-00006373-E.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.

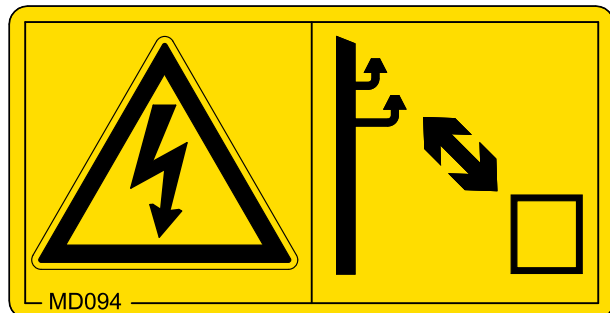


CMS-I-000081

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

MD095

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

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



CMS-I-000138

MD 096

Risk of infection from escaping hydraulic fluid under high pressure

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

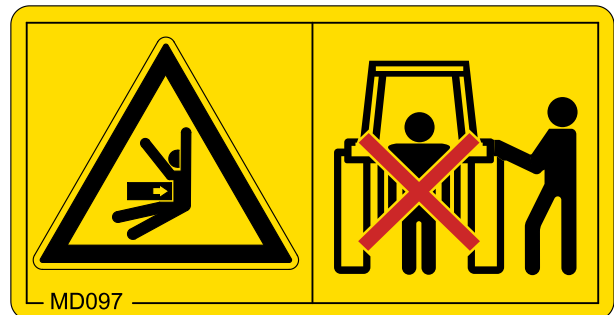


CMS-I-000216

MD 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.

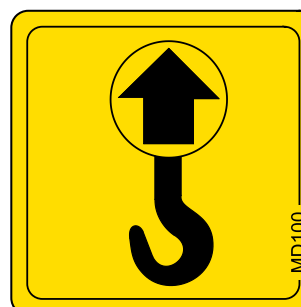


CMS-I-000139

MD 100

Risk of accidents due to improperly attached lifting gear

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



CMS-I-000089

MD 102

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

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

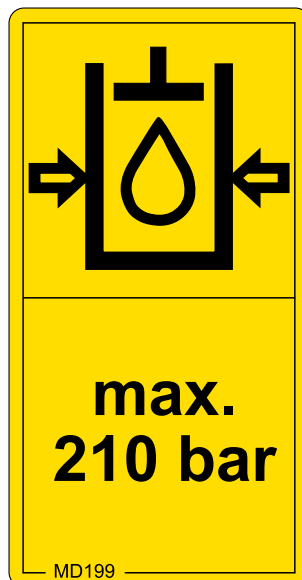


CMS-I-00002253

MD 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.

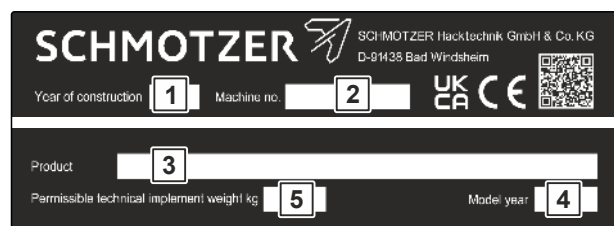


CMS-I-00000486

4.5 Rating plate on the implement

CMS-T-00006401-E.1

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





CMS-I-00004554

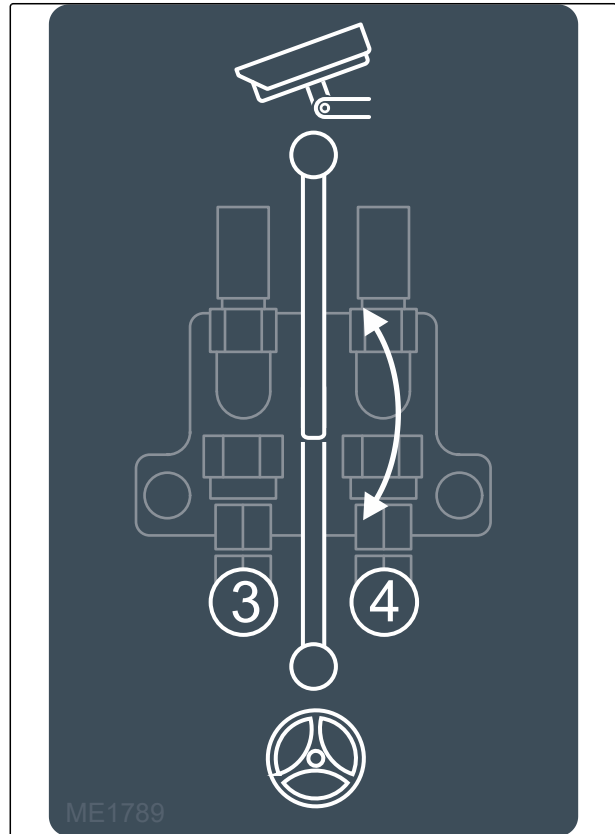
4.6 Other information on the implement

CMS-T-00014112-A.1

4.6.1 Information on the switch tap for automatic or manual control

CMS-T-00014113-A.1

The figure shows that in the  position of the switch tap on the control valve, automatic control of the sliding frame with the camera system is activated, and in the  position, manual control of the sliding frame with the manual steering unit is activated.



CMS-I-00009729

Technical data

5

CMS-T-00006353-C.1

5.1 Dimensions

CMS-T-00006359-C.1

Width in transport position	2.37 m
Width in transport position with widening set	3 m
Total length	1.1 m
Total length with outer stabilisation discs	1.45 m
Centre of gravity distance	35 cm
Height in transport position	1.47 m

5.2 Permitted mounting categories

CMS-T-00006028-B.1

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

5.3 Performance characteristics of the tractor

CMS-T-00015132-A.1

Engine rating	
59–118 kW/80–160 hp	

Hydraulic system	
Maximum operating pressure	210 bar
Tractor pump output	at least 10 l/min at 150 bar
Implement hydraulic oil	HLP 68 DIN 51524-2 The hydraulic fluid is suitable for the combined hydraulic fluid circuits of all standard tractor brands.

5.4 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.

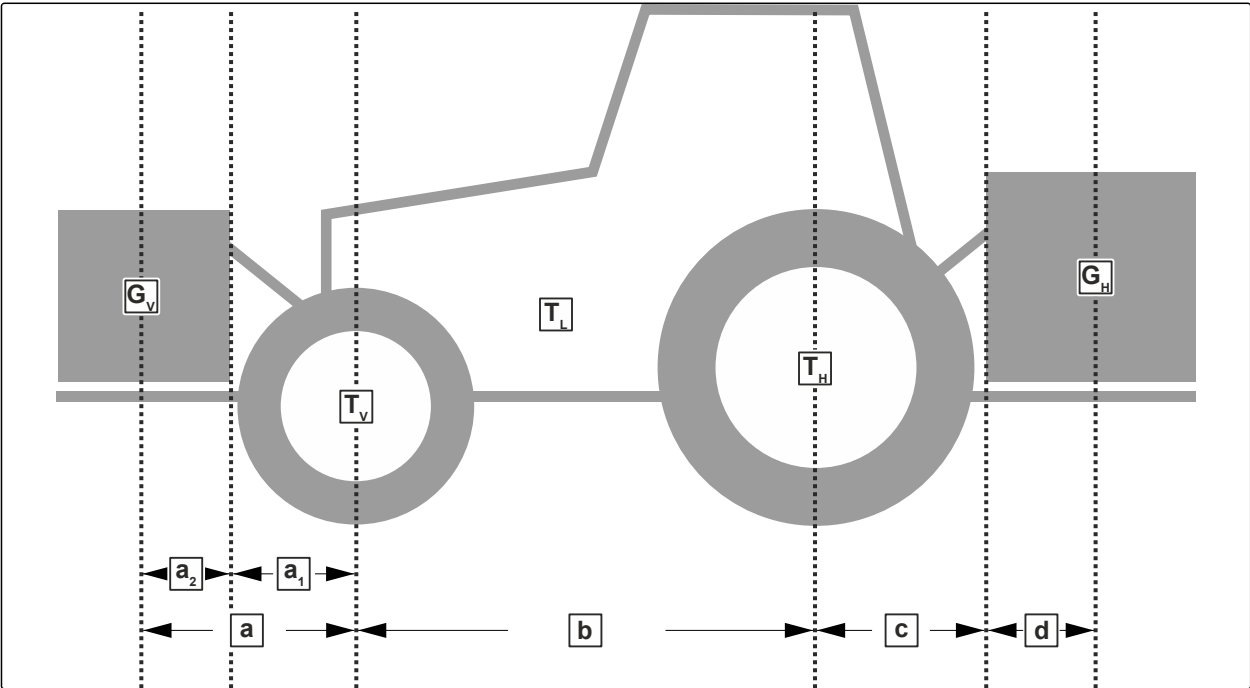
Preparing the machine

6

CMS-T-00006354-D.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	

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.

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

$$G_{\min} = \underline{\hspace{4cm}}$$

$$G_{\min} = \underline{\hspace{4cm}}$$

CMS-I-00000513

2. Calculate the actual front axle load.

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

$$T_{Vtat} = \underline{\hspace{4cm}}$$

$$T_{Vtat} = \underline{\hspace{4cm}}$$

CMS-I-00000516

6 | Preparing the machine

Calculating the required tractor characteristics

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

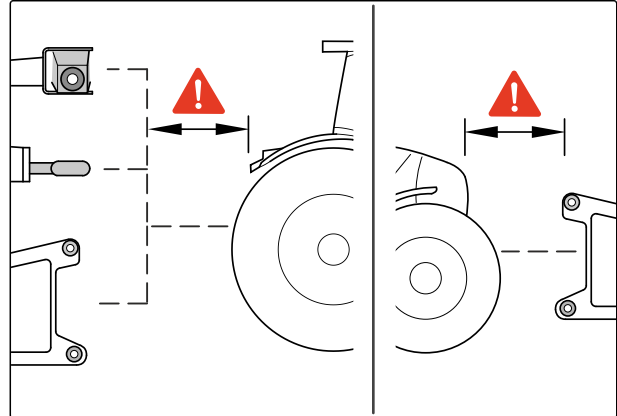
CMS-T-00006355-D.1

6.2.1 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.



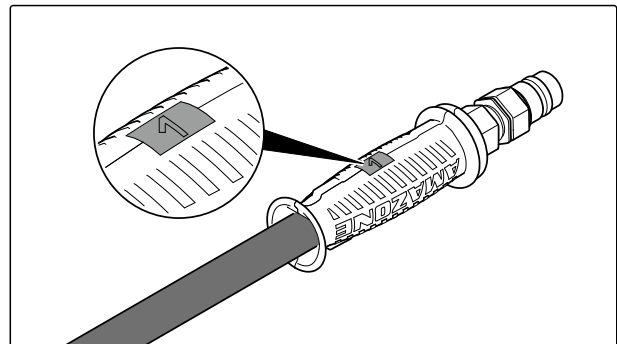
CMS-I-00004045

6.2.2 Coupling the hydraulic hose lines

CMS-T-00006390-C.1



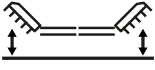

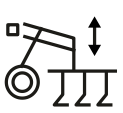

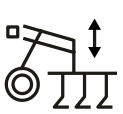

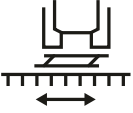



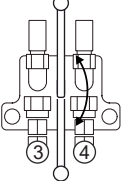

All hydraulic hoses are equipped with handles. The handles have colour labels with a code number or a code letter. The labels are assigned to the respective hydraulic functions of the pressure line of a tractor control unit. Stickers are applied on the implement for the labels, which illustrate the respective 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	<div>1</div> <div>2</div>		Sections of the Venterra or Select hoeing machine / support wheels of the Venterra hoeing machine	unfolding/ lowering folding/lifting	Double-acting	
Blue	<div>3</div> <div>4</div>		Section extensions of the double folding Select hoeing machine	Unfold Fold	Double-acting	
Green	<div>1</div> <div>2</div>		Parallelogram s of the hoeing machine	Lower Lift	Double-acting	
Red	<div>3</div> <div>T</div>		Parallelogram s of the hoeing machine	Section Control	Single-acting Pressure-free return flow	
Red	<div>2</div> <div>T</div>		Sliding frame	automatically moving in parallel	Single-acting Pressure-free return flow	
Beige	<div>1</div> <div>2</div>		Manual steering unit	Pressure line Tank line	Double-acting	
Beige	<div>3</div> <div>4</div>		Manual steering unit	Moving the sliding frame manually in parallel to the right Moving the sliding frame manually in parallel to the left	Double-acting	



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.

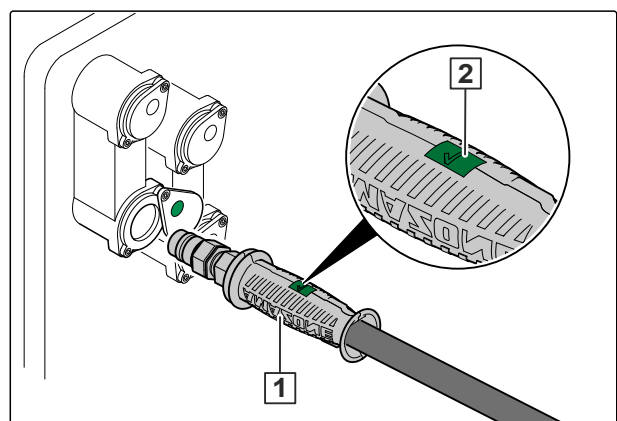


IMPORTANT

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 label **2**.
- ➔ The hydraulic plugs lock perceptibly.
4. Route the hydraulic hose lines with sufficient freedom of movement and without chafing points.



CMS-I-00001045

6.2.3 Coupling the ISOBUS lines

CMS-T-00008589-C.1

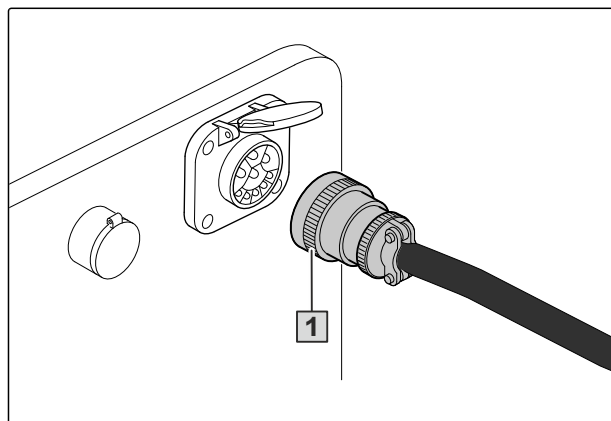
Coupling of the ISOBUS line or ISOBUS lines depends on two factors:

6 | Preparing the machine

Coupling the implement

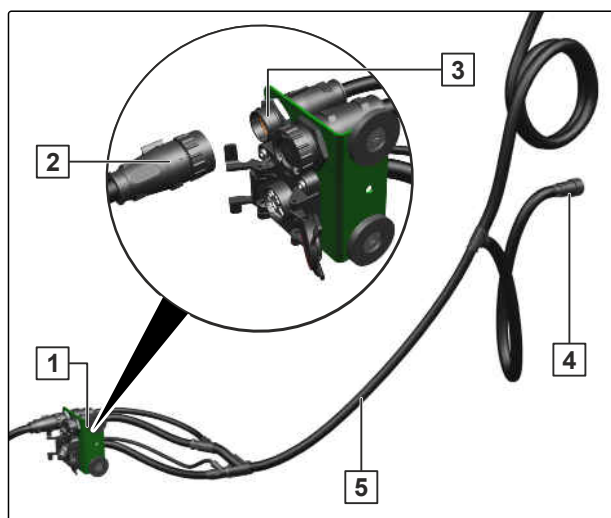
- Equipment of the hoeing machine to be coupled onto the sliding frame with mechanically or hydraulically lifting parallelograms
- Equipment of the hoeing machine with band sprayer and front tank to be coupled to the sliding frame

1. *If the hoeing machine to be coupled onto the sliding frame is an implement with mechanically lifting parallelograms and without band sprayer and front tank:*
Skip to the next section without further action; otherwise, continue with step 2.
2. *If the hoeing machine to be coupled onto the sliding frame is an implement with hydraulically lifting parallelograms and 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 sliding frame into the tractor.
4. Route the ISOBUS line with sufficient freedom of movement and without chafing or pinching points.
5. *If the hoeing machine to be coupled onto the sliding frame is an implement with mechanically lifting parallelograms and with band sprayer and front tank:*
perform steps 6 to 10, otherwise continue with step 11.



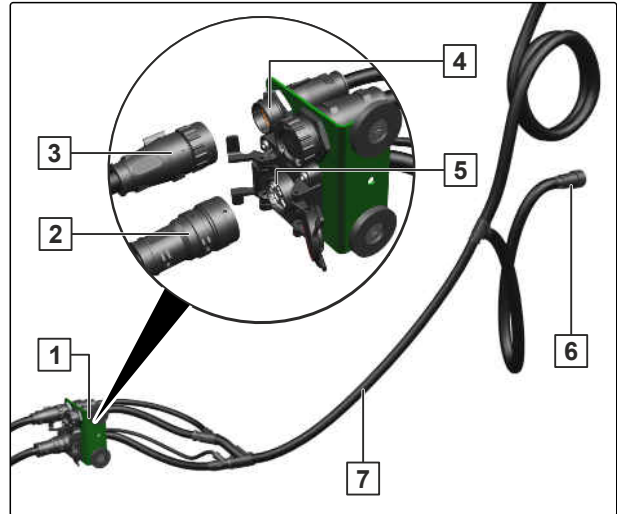
CMS-I-00004333

6. Attach the wiring harness magnetic holder **1** with the magnets onto the three-point mounting frame of the implement.
7. Guide the ISOBUS line of the band sprayer from the uncoupled hoeing machine through the sliding frame to the magnetic holder.
8. Insert the plug **2** for the ISOBUS line of the band sprayer into the left upper socket **3** of the wiring harness magnetic holder.
9. Insert the plug **4** for the combined ISOBUS line **5** into the tractor.



CMS-I-00005860

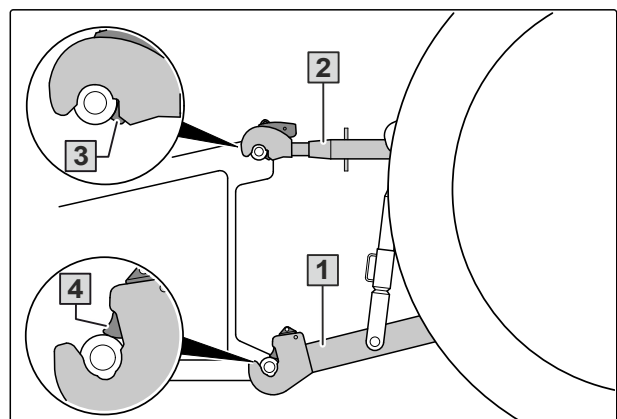
10. Route the ISOBUS lines with sufficient freedom of movement and without chafing or pinching points.
11. *If the hoeing machine to be coupled onto the sliding frame is an implement with hydraulically lifting parallelograms and with band sprayer and front tank:*
perform steps 12 to 16.
12. Attach the wiring harness magnetic holder **1** with the magnets onto the three-point mounting frame of the implement.
13. Guide the ISOBUS line of the band sprayer from the uncoupled hoeing machine through the sliding frame to the magnetic holder.
14. Insert the plug **3** for the ISOBUS line of the band sprayer into the left upper socket **4** of the wiring harness magnetic holder.
15. Insert the plug **2** for the ISOBUS line of the sliding frame into the lower socket **5** of the wiring harness magnetic holder.
16. Insert the plug **6** for the combined ISOBUS line **7** into the tractor.
17. Route the ISOBUS lines with sufficient freedom of movement and without chafing or pinching points.



CMS-I-00005845

6.2.4 Coupling the three-point mounting frame

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.



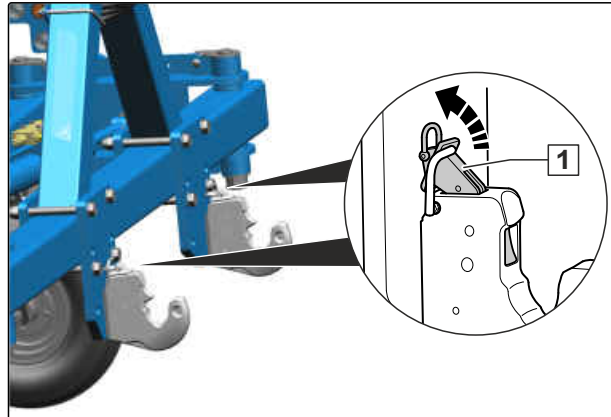
CMS-T-00001400-H.1

CMS-I-00001225

6.3 Coupling the hoeing machine

CMS-T-00006395-C.1

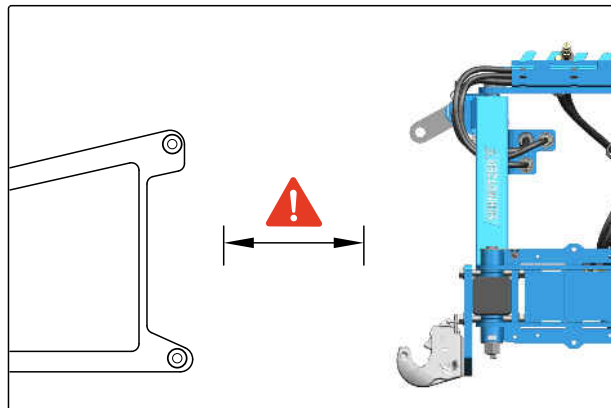
1. Open the locking mechanism **1** on the lower link catch hooks.



CMS-I-00004652

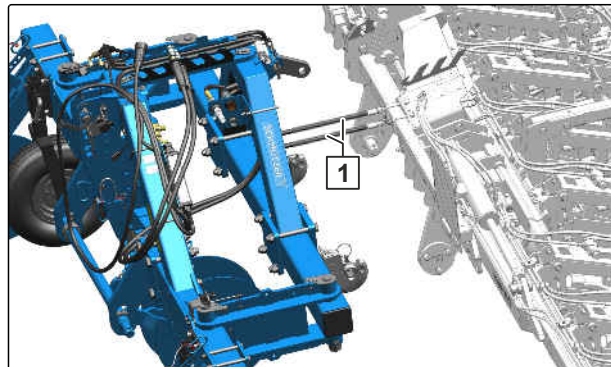
Enough space must remain between the implement and the hoeing machine so that the supply lines can be coupled without obstructions.

2. Drive the implement towards the hoeing machine, leaving a sufficient distance.



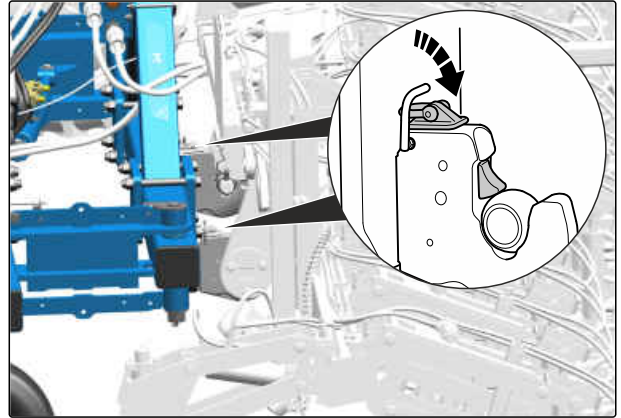
CMS-I-00004546

3. Route the hydraulic hose lines marked in blue **1** for unfolding and folding the sections of the Venterra or Select hoeing machine and for lowering and lifting the support wheels of the Venterra hoeing machine through the sliding frame.
4. *If the hoeing machine is a double folding Select hoeing machine:*
Also route the hydraulic hose lines marked in blue for unfolding and folding the section extensions of the hoeing machine through the sliding frame.
5. *If the hoeing machine is equipped with a manual steering unit:*
Route hydraulic hose lines "beige 1" and "beige 2" through the sliding frame.
6. Drive the implement towards the hoeing machine.
7. *To connect the lower link catch hooks to the lower link balls of the hoeing machine:*
Lift the implement from the tractor seat.



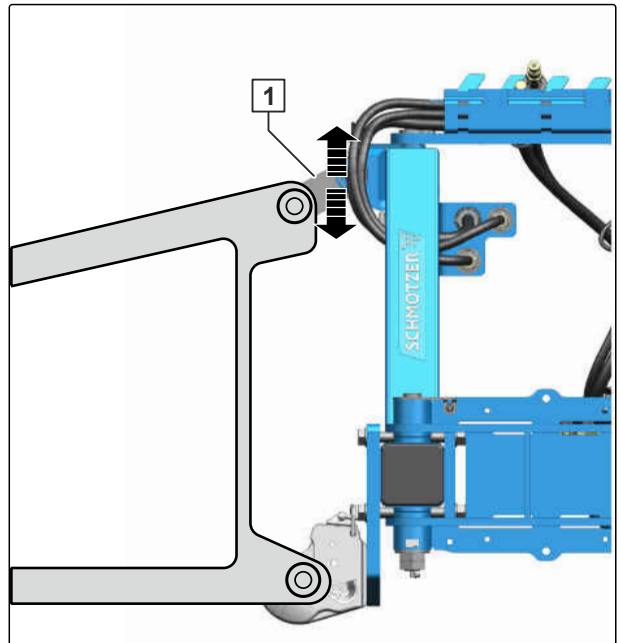
CMS-I-00004687

8. Close the locking mechanisms for the lower link catch hooks.
9. Check whether the locking mechanisms of the lower link catch hooks are correctly locked.



CMS-I-00004653

10. To move the top link plate **1** in the correct position:
move the implement up or down.
11. Couple the top link plate.

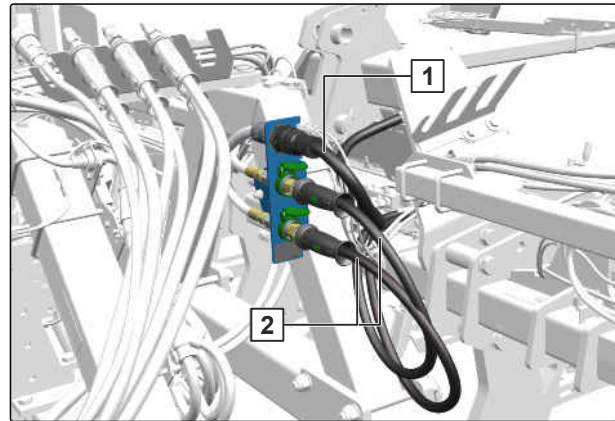


CMS-I-00004547

12. Couple the hydraulic hose lines of the hoeing machine marked in blue onto the tractor.
13. If the hoeing machine is equipped with a manual steering unit:
Couple hydraulic hose lines "beige 1" and "beige 2" onto the tractor.

14. *If the hoeing machine is equipped with hydraulically lifting parallelograms and Section Control:*

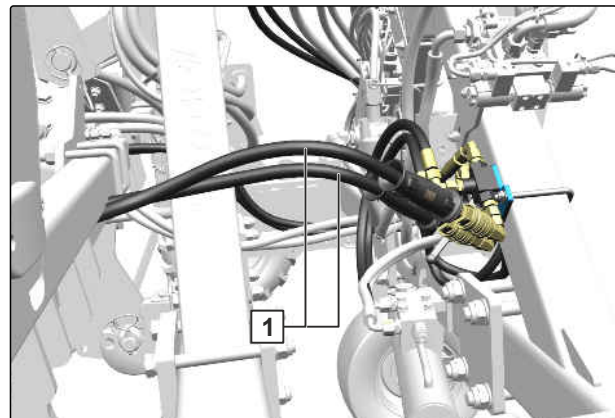
Couple the wiring harness **1** for the Section Control electronics and the hydraulic hose lines marked in green **2** for the parallelograms of the hoeing machine onto the coupling holder.



CMS-I-00004548

15. *If the hoeing machine is equipped with a manual steering unit:*

Couple hydraulic hose lines **1** "beige 3" and "beige 4" onto the control valve.



CMS-I-00009686

6.4 Preparing the implement for operation

CMS-T-00006356-C.1

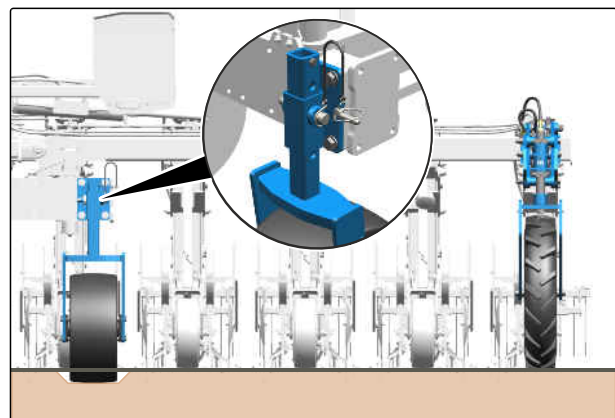
6.4.1 Adjusting the support wheels

CMS-T-00006378-B.1

i NOTE

The support wheels of the sliding frame run in the tractor track and therefore deeper than the support wheels of the hoeing machine. The support wheels of the sliding frame can only be correctly adjusted in the tractor track on the field.

Instructions for aligning the hoeing machine can be found in the hoeing machine operating manual.



CMS-I-00004549

1. Align the coupled hoeing machine.
2. Using the respective hole pattern, lower the support wheels as far as possible onto the ground.

3. Lower the sliding frame using the tractor hydraulic system until the support wheels are standing on the ground.
4. Align the hoeing machine once more.

6.4.2 Adjusting the stabilisation discs

CMS-T-00006382-C.1

The stabilisation discs must penetrate into the soil as deep as possible.



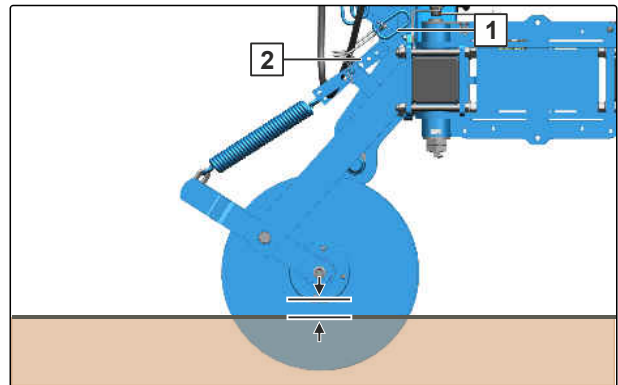
IMPORTANT

Risk of implement damage

- ▶ Do not allow the hubs of the stabilisation discs to sink into the soil.
- ▶ *If the stabilisation disc does not penetrate enough into the soil:*
Use the handle **1** to increase the spring tension via the hole pattern **2**

or

If the stabilisation disc penetrates too deep into the soil:
Use the handle to reduce the spring tension via the hole pattern.



CMS-I-00004551

6.4.3 Adjusting the working position sensors

CMS-T-00006602-C.1

The working position sensor for the implement **2** is only included with certain equipment versions.

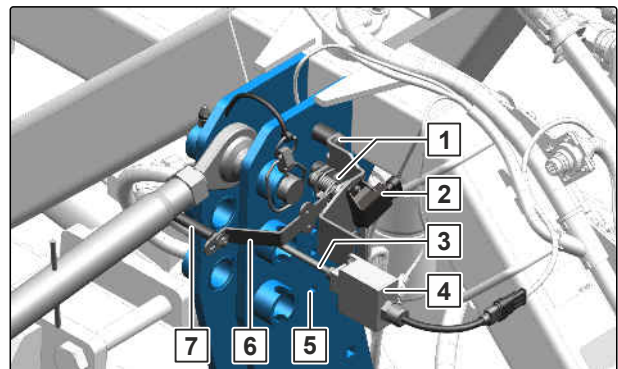
1. *If the top link pin needs to be shifted:*
Reposition the working position sensors with the bolts **1** in the hole pattern **5**.

The settings for the working position sensors depend on the lifting height during field operation.

2. Lift the implement to the desired lifting height.

➔ The guide arm **6** is pressed down.

3. Slide the plastic sleeve **7** to a level area of the top link.



CMS-I-00004685

6 | Preparing the machine

Preparing the implement for operation

4. *To press down the spring* **3**:
shift the working position sensor of the camera system **4**.
5. Check the function of the working position sensors via the control terminal.

6.4.4 Shifting the camera bracket

CMS-T-00006608-C.1

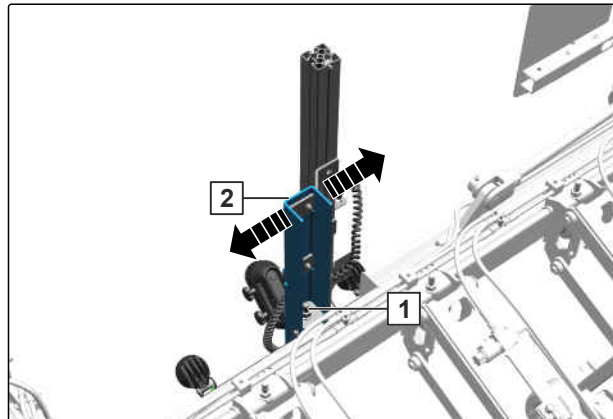


NOTE

The camera bracket is installed on the hoeing machine.

Detailed instructions for setting the camera can be found in the camera system operating manual.

1. Loosen the nut **1**.
2. Shift the camera bracket **2**.
3. Tighten the nut.



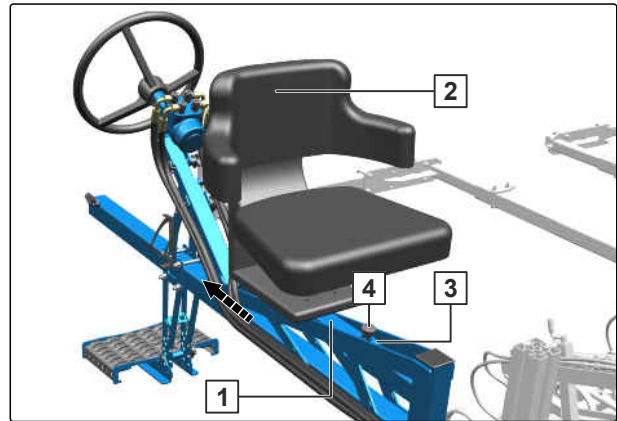
CMS-I-00004689

6.4.5 Moving the seat of the manual steering unit into working position

CMS-T-00014110-A.1

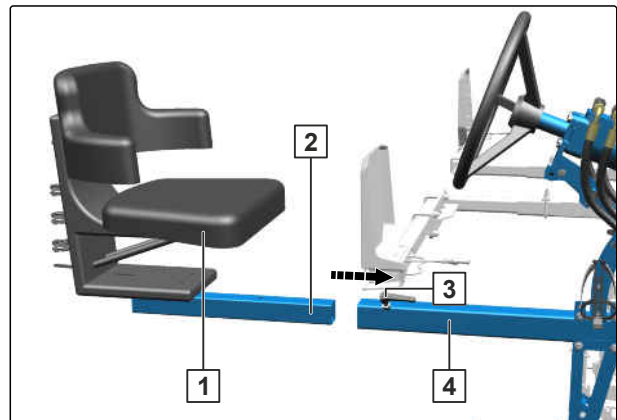
If the coupled hoeing machine is equipped with a manual steering unit and the sliding frame should be controlled with the manual steering unit, the seat of the manual steering unit must be moved from the transport position to the working position before operation.

1. Pull on the lock button **4** and pull the seat **2** out of the holder **3** with the seat rail **1**.



CMS-I-00008940

2. Loosen the lever bolt **3**.
3. Insert the seat **1** with the seat rail **2** into the profile tube **4**.
4. Slide the seat rail into the profile tube until the seat is in the desired horizontal position.
5. Tighten the lever bolt.



CMS-I-00008941

6.4.6 Adjusting the steering wheel for the manual steering unit

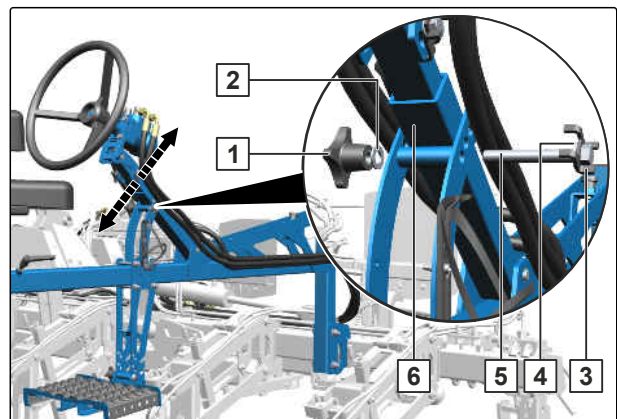
CMS-T-00014082-A.1

NOTE

The manual steering unit is installed on the hoeing machine.

The height, tilt and horizontal position of the steering wheel for the manual steering unit can be adjusted to the needs of the steering person.

1. Loosen the star grip nut **1** and take it off along with the washer **2**.
2. Pull the bolt **5** out of the hole along with the anti-twist device **3** and washer **4**.
3. Swivel the profile tube **6** up or down until the steering wheel is at the desired height.

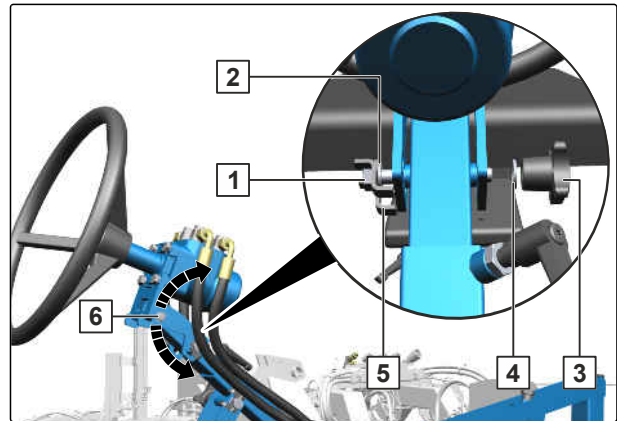


CMS-I-00008902

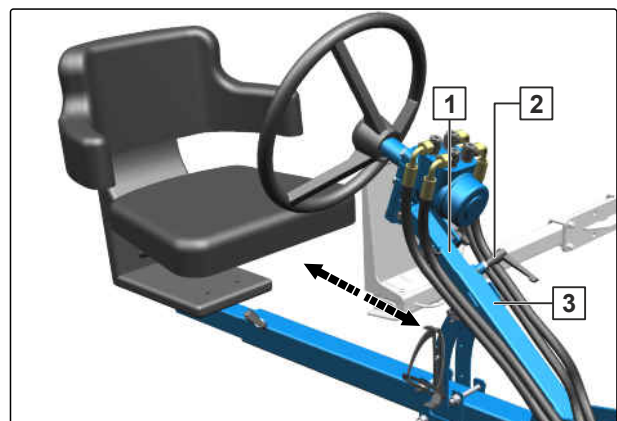
6 | Preparing the machine

Preparing the implement for operation

4. Secure the position of the profile tube with the bolt along with the anti-twist device and washer.
5. Put the washer and star grip nut on the bolt and tighten the star grip nut.
6. Loosen the star grip nut **3** and take it off along with the washer **4**.
7. Pull the bolt **1** out of the hole along with the anti-twist device **5** and washer **2**.
8. Swivel the steering wheel up or down on the pin **6**, until the steering wheel has the desired tilt.
9. Secure the position with the bolt along with the anti-twist device and washer.
10. Put the star grip nut and washer on the bolt and tighten the star grip nut.
11. Loosen the lever bolt **2**.
12. Slide the telescopic tube **1** into the profile tube **3** or pull it out of the profile tube, until the steering wheel is in the desired horizontal position.
13. Tighten the lever screw bolt.



CMS-I-00008917



CMS-I-00008918

6.4.7 Adjusting the seat position of the manual steering unit

CMS-T-00014106-A.1

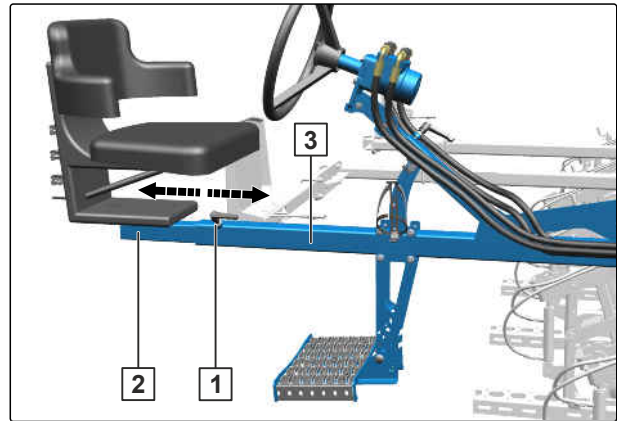


NOTE

The manual steering unit is installed on the hoeing machine.

The height, tilt and horizontal position of the seat for the manual steering unit can be adjusted to the needs of the steering person. The horizontal position, height, and tilt of the step for the manual steering unit can be adjusted to the needs of the steering person.

1. Loosen the lever bolt **1**.
2. Slide the seat rail **2** into the profile tube **3** or pull it out of the profile tube, until the seat is in the desired horizontal position.
3. Tighten the lever bolt.



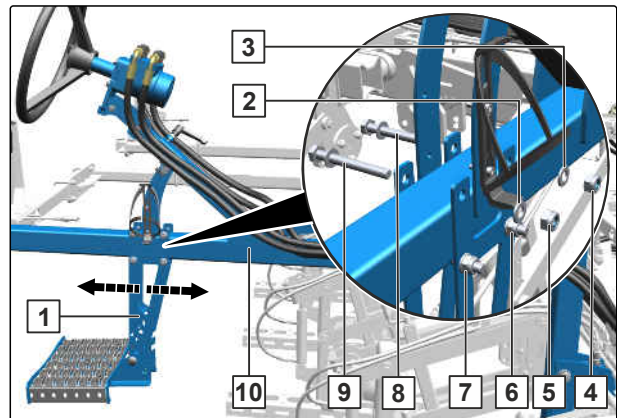
CMS-I-00008931

4. Loosen the nuts **4**, **5**, **6** and **7**.
5. *To move the step to the rear:*
Take off the nut **4** along with the washer **3** and pull the bolt **8** out of the holes together with the washer

or

To move the step to the front:

Take off the nut **5** along with the washer **2** and pull the bolt **9** out of the holes together with the washer.



CMS-I-00009684

6. Slide the step **1** to the rear on the profile tube **10** up to the desired position

or

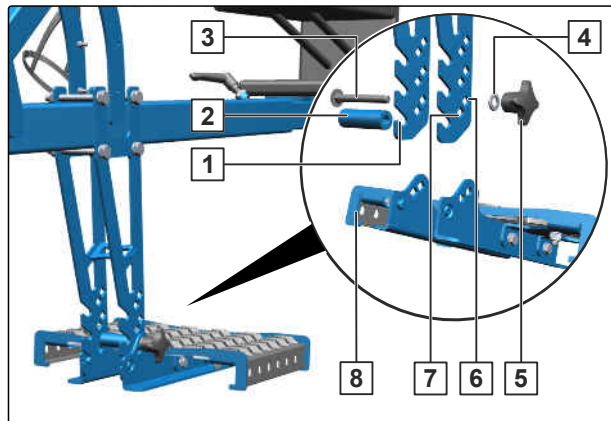
Slide the step to the front on the profile tube up to the desired position.

7. Insert the removed bolt along with the washer through the hole.
8. Put on the removed nut along with the removed washer and tighten the nut.
9. Retighten the three other nuts.

6 | Preparing the machine

Preparing the implement for operation

10. Loosen the star grip nut **5** and take it off along with the washer **4**.
11. Pull the carriage bolt **3** out of the holes and take it off together with the spacer tube **2**.
12. Slide the step **8** to the front out of the latch **1** and hook it into one of the two other latches.
13. Secure the step with the carriage bolt and the spacer tube through the holes for the horizontal **6** or tilted **7** position.
14. Put the washer and star grip nut on the carriage bolt and tighten the star grip nut.



CMS-I-00009685

6.4.8 Activating the automatic or manual control

CMS-T-00014111-A.1

If the sliding frame can not only be automatically controlled by the camera system, but also with a manual steering unit coupled to the hoeing machine, the type of steering must be selected with the switch tap on the control valve.


- *To activate automatic control with the camera system:*

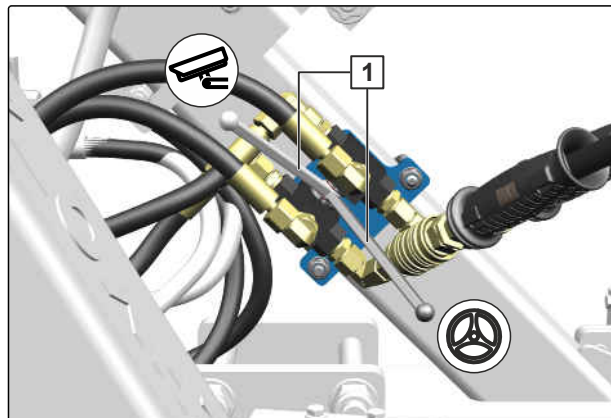
Set the switch tap **1** of the control valve to the



or

To activate manual control with the manual steering unit:

Set the switch tap of the control valve to the  position.



CMS-I-00009741

6.5 Preparing the implement for road travel

CMS-T-00006392-C.1

1. *If the sliding frame is controlled by a camera system:*

Align the hoeing machine centred behind the tractor using the camera terminal

or

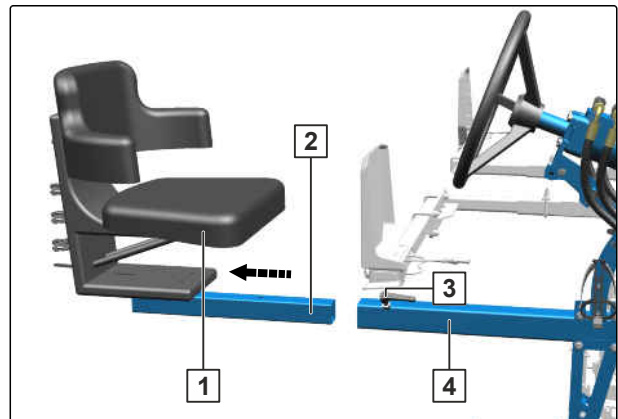
If the sliding frame is controlled by a manual steering unit:

Align the hoeing machine centred behind the tractor using the manual steering unit.

2. Lock the tractor control unit for the sliding hydraulic system.
3. *If the sliding frame is controlled by a camera system:*
Switch off the camera terminal.

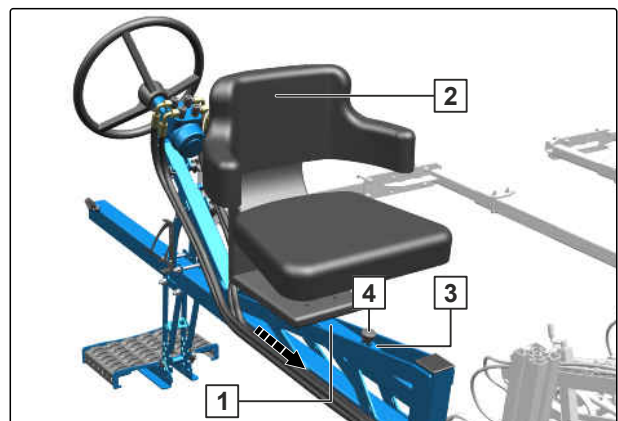
If the coupled hoeing machine is equipped with a manual steering unit, the seat of the manual steering unit must be moved into transport position before road travel.

4. Loosen the lever bolt **3**.
5. Pull the seat **1** with the seat rail **2** out of the profile tube **4**.
6. Tighten the lever bolt.



CMS-I-00008933

7. Pull on the lock button **4** and insert the seat rail **1** into the holder **3**.
8. Slide the seat rail in the holder until the lock button locks the seat **2** in transport position.



CMS-I-00008939

Using the machine

7

CMS-T-00006366-C.1

7.1 Using the implement

CMS-T-00006399-C.1



REQUIREMENTS

- ✓ With automatic control: the camera system is configured and switched on; see camera system operating manual
- ✓ With automatic control and when the hoeing machine is equipped with a manual steering unit: The control by the camera system is activated on the control valve
- ✓ With manual control: The steering unit for manual control on the hoeing machine is configured
- ✓ With manual control: The control by the manual steering unit is activated on the control valve

1. Follow the section "Lowering the implement" in the instructions for the hoeing machine.
2. Align the implement horizontally to the ground.
3. Lower the implement on the support wheels.



NOTE

For a reliable speed signal, the support wheels must have constant contact with the ground during operation.

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

If the tractor lower link is relieved, the tractor is shifted more strongly.

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

5. Drive.
 - ➔ With automatic control: The camera system controls the sliding frame.
 - ➔ With manual control: The steering person on the steering unit on the hoeing machine controls the sliding frame manually.
6. *If working with automatic control:*
Check whether the camera system is working properly.

7.2 Turning on the headlands

CMS-T-00006400-C.1

1. Follow the section "Turning on the headlands" in the instructions for the hoeing machine.
2. *If the sliding frame is controlled by a manual steering unit:*
Have the steering person align the hoeing machine centred behind the tractor using the manual steering unit.
3. Lift the hoeing machine over the crops.
 - ➔ With automatic control: The camera system automatically shifts the sliding frame in the centre position.
4. Turn around.
5. Drive into the row with the implement lifted.
6. Manually align the hoeing machine on the rows using the camera terminal.

or

Have the steering person align the hoeing machine manually on the rows using the manual steering.
7. Lower the implement.
8. Drive.
 - ➔ With automatic control: The camera system controls the sliding frame.

- ➔ With manual control: The steering person on the steering unit on the hoeing machine controls the sliding frame manually.
- 9. *If working with automatic control:*
Check whether the camera system is working properly.

Eliminating faults

8

CMS-T-00006421-B.1

Errors	Cause	Solution
The sliding frame is only shifted to one side.	The hydraulic hose lines for the sliding frame are inverted.	<ul style="list-style-type: none"> ▶ Exchange the connections for the hydraulic hose lines on the tractor. ▶ Use the pressureless return flow.
The sliding frame is shifted out of the track.	The tractor's lower link is not locked.	▶ Lock the tractor lower links laterally.
	The camera is not correctly positioned.	▶ Position the camera centred over the plant row.
	Information on the offset is incorrectly entered on the camera terminal.	<ul style="list-style-type: none"> ▶ Correct the information on the offset on the camera terminal. ▶ <i>To prevent having offset:</i> shift the camera bracket on level ground, so that offset does not occur.

Errors	Cause	Solution
The sliding frame is not shifted automatically.	The automatic function on the camera terminal is switched off.	► Switch on the automatic function on the camera terminal.
	The sliding frame is not standing on the ground.	► Lower the support wheels of the sliding frame onto the ground. ► Completely relieve the tractor's lower link.
	Working position is not detected.	► Check the working position on the camera terminal. ► Correctly install the working position sensor.
	Signal quality of the camera is insufficient.	► Properly adjust the tilt and height of the camera, see camera system operating manual. ► <i>If the weed population is too high or the crop too tall:</i> control the sliding frame manually. ► Clean the camera. ► <i>If it is too dark:</i> switch on the work lights for the camera. ► <i>If it is too bright:</i> Wait for better light conditions.
The tractor is strongly shifted on slopes.	The tractor is not balanced.	► Install front ballast weights.
	The tractor tyres are unsuitable.	► Use narrow tyres.
	The stabilisation discs are not installed.	► Install stabilisation discs on the sliding frames.
	The stabilisation discs do not sink into the soil.	► Adjust the stabilisation discs, see page 41.

Repairing the machine

9

CMS-T-00006367-D.1

9.1 Lubricating the implement

CMS-T-00006376-D.1



IMPORTANT

Implement damage due to improper lubrication

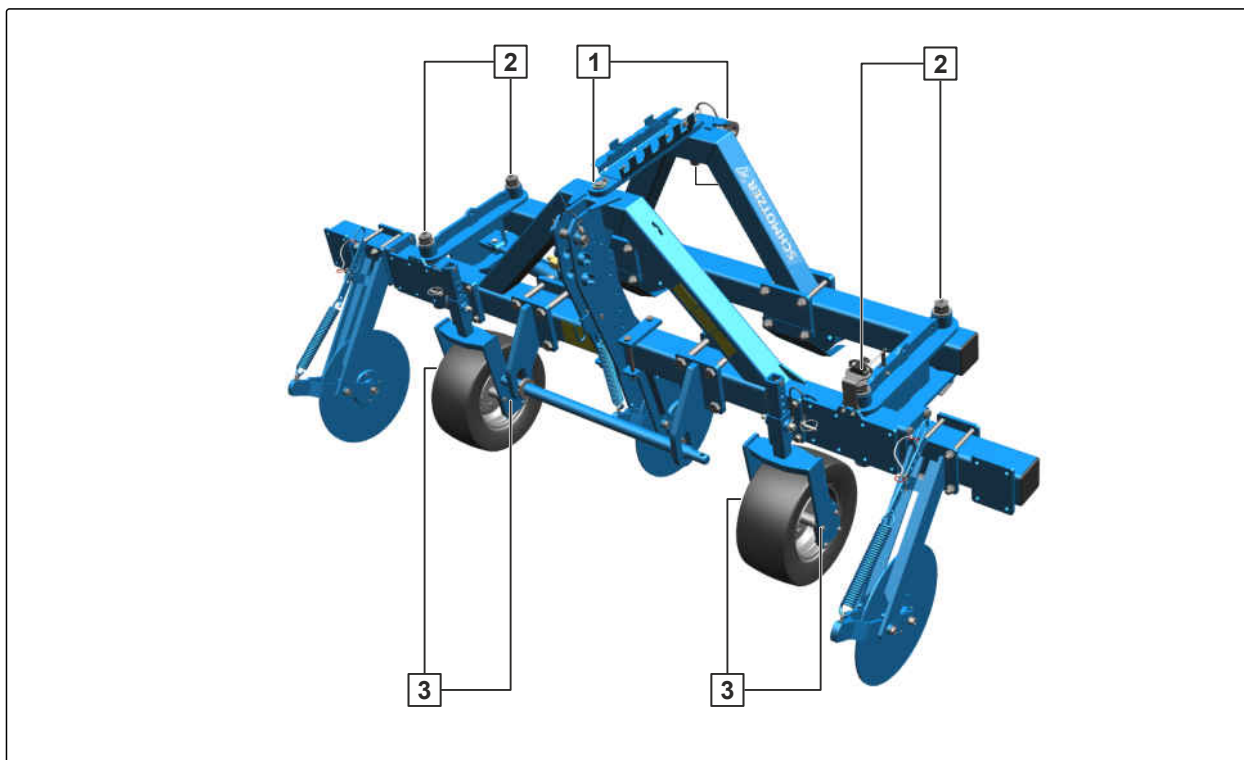
- ▶ Grease the implement at the marked lubrication points according to the lubrication schedule.
- ▶ *To ensure that dirt is not pressed into the lubrication points:*
Thoroughly clean the grease nipples and the grease gun.
- ▶ Only grease the implement with the lubricants listed in the technical data.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



CMS-I-00002270

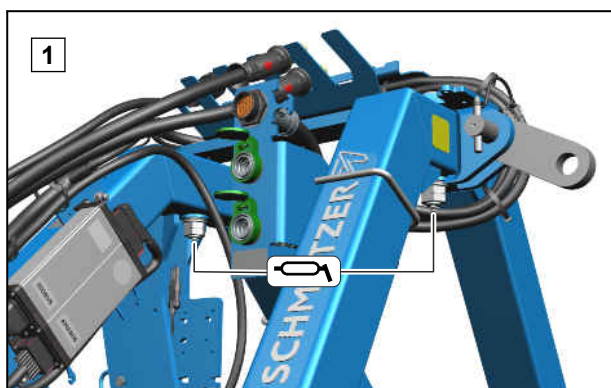
9.1.1 Overview of lubrication points

CMS-T-00006377-B.1

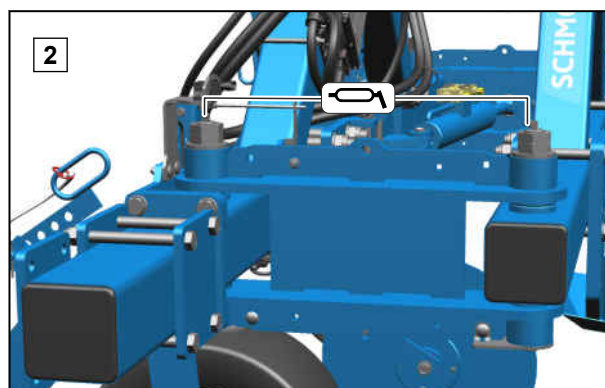


CMS-I-00004535

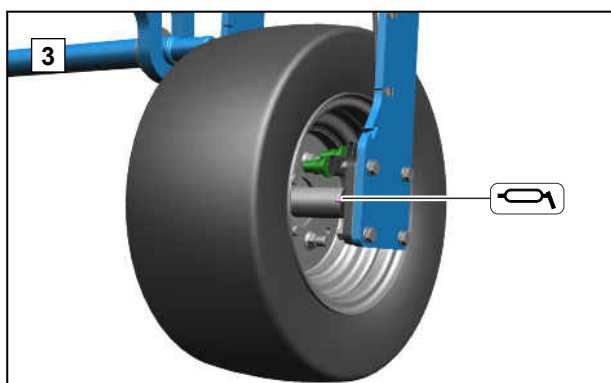
Every 20 operating hours



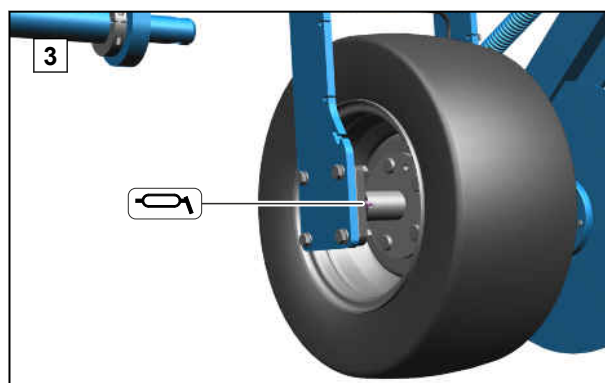
CMS-I-00004532



CMS-I-00004534



CMS-I-00004533



CMS-I-00005776

9.2 Maintaining the implement

CMS-T-00014874-B.1

9.2.1 Maintenance schedule

After initial operation	
Checking the hydraulic hose lines	see page 55
Daily	
Checking the lower link pins and top link pins	see page 56
Every 50 operating hours / Weekly	
Checking the hydraulic hose lines	see page 55

9.2.2 Checking the hydraulic hose lines

CMS-T-00002331-G.1



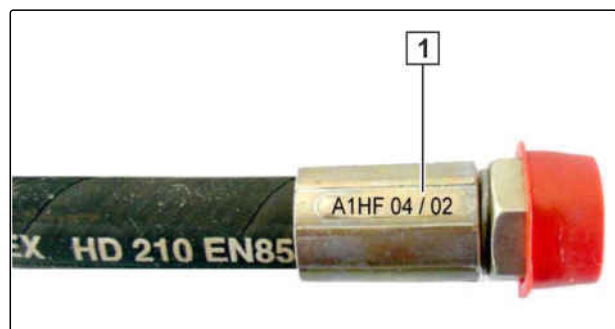
INTERVAL

- 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.

9.2.3 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.

9.3 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.

Parking the machine

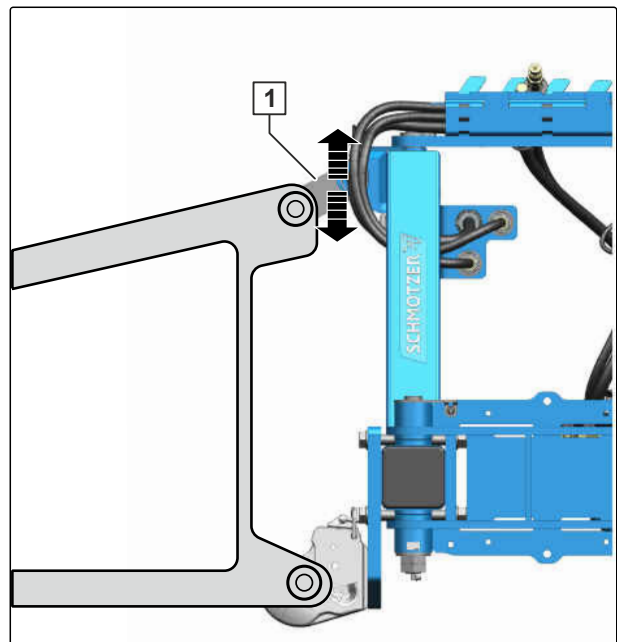
10

CMS-T-00006384-C.1

10.1 Uncoupling the hoeing machine

CMS-T-00006387-C.1

1. Park the implement together with the coupled hoeing machine on a level surface with solid ground.
2. Uncouple the hydraulic hose lines of the hoeing machine marked in blue from the tractor.
3. *If the hoeing machine is equipped with a manual steering unit:*
Uncouple hydraulic hose lines "beige 1" and "beige 2" from the tractor.
4. Relieve the top link plate **1**.
5. Uncouple the top link plate from the hoeing machine.

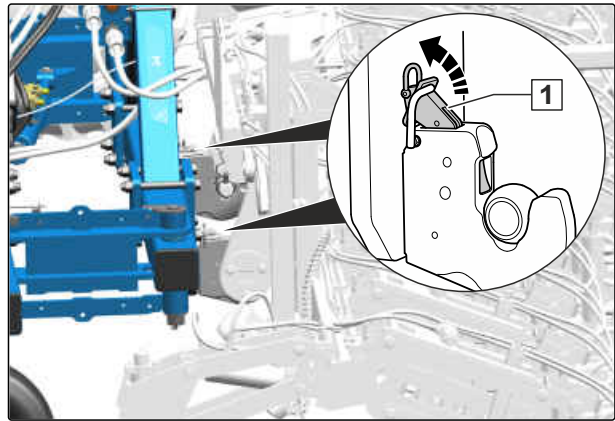


CMS-I-00004547

10 | Parking the machine

Uncoupling the hoeing machine

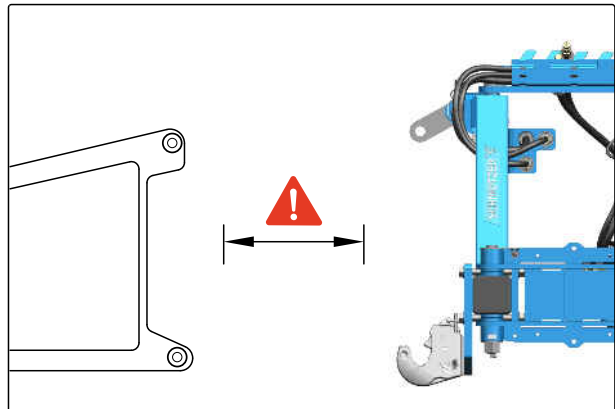
6. Relieve the tractor's lower link.
7. Open the locking mechanism **1** on the lower link catch hooks.
8. *To release the lower link catch hooks from the lower link balls of the hoeing machine:*
Lower the implement from the tractor seat.



CMS-I-00004654

Enough space must remain between the implement and the hoeing machine so that the supply lines can be uncoupled without obstructions.

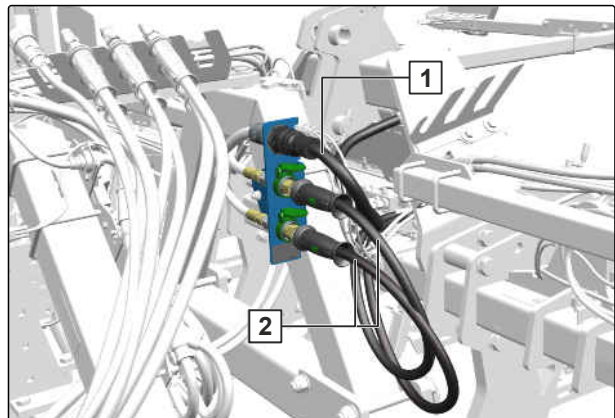
9. Drive the implement away from the hoeing machine, leaving a sufficient distance.



CMS-I-00004546

10. *If the hoeing machine is equipped with hydraulically lifting parallelograms and Section Control:*

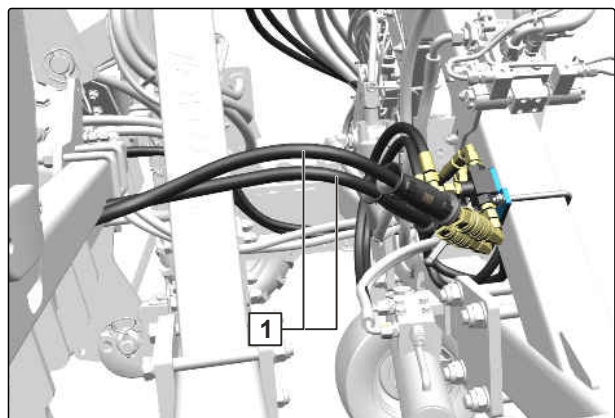
Uncouple the wiring harness for the Section Control electronics **1** and the hydraulic hose lines marked in green **2** for the parallelograms of the hoeing machine **2** from the coupling holder and hang them in the hose cabinet of the hoeing machine.



CMS-I-00004548

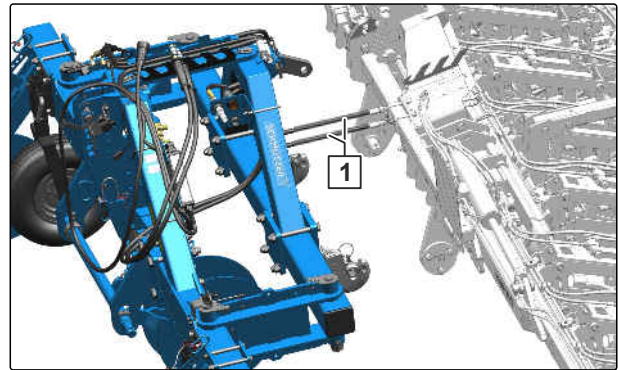
11. *If the hoeing machine is equipped with a manual steering unit:*

Uncouple hydraulic hose lines **1** "beige 3" and "beige 4" from the control valve and hang them in the hose cabinet of the hoeing machine.



CMS-I-00009686

12. Remove the hydraulic hose lines marked in blue **1** for unfolding and folding the Venterra or Select hoeing machine and for lowering and lifting the support wheels of the Venterra hoeing machine from the sliding frame and hang them in the hose cabinet of the hoeing machine.

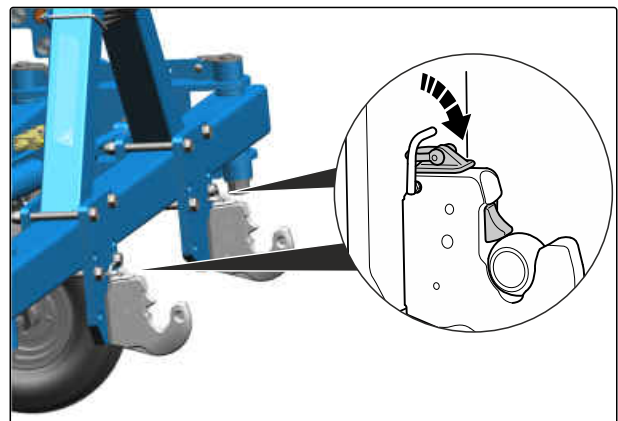


CMS-I-00004687

13. *If the hoeing machine is a double folding Select hoeing machine:*
Also remove the hydraulic hose lines marked in blue for unfolding and folding the section extensions of the hoeing machine from the sliding frame and hang them in the hose cabinet of the hoeing machine.

14. *If the hoeing machine is equipped with a manual steering unit:*
Remove hydraulic hose lines "beige 1" and "beige 2" from the sliding frame and hang them in the hose cabinet of the hoeing machine.

15. Close the locking mechanisms for the lower link catch hooks.



CMS-I-00004676

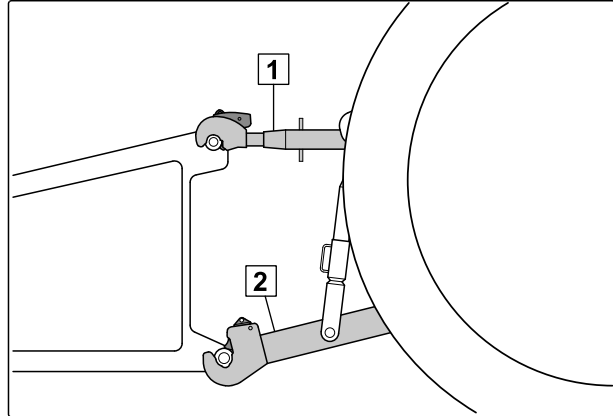
10.2 Uncoupling the implement

CMS-T-00006386-D.1

10.2.1 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.



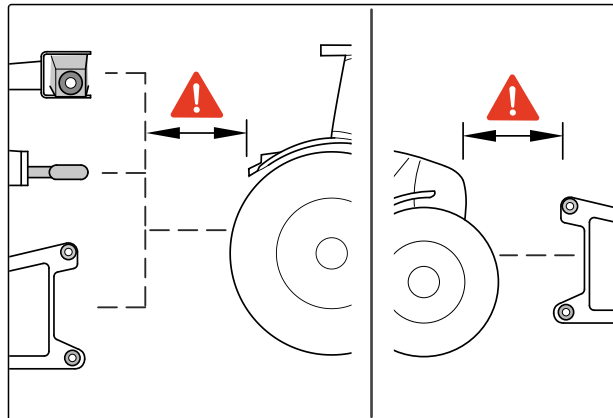
CMS-I-00001249

10.2.2 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

10.2.3 Uncoupling the ISOBUS lines

CMS-T-00008686-B.1

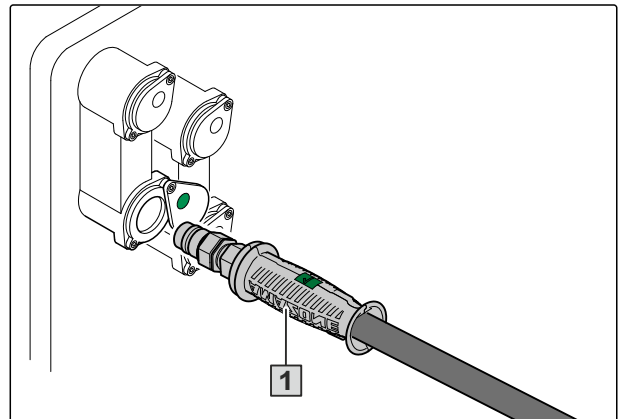
1. Disconnect all of the ISOBUS plugs that were connected when coupling the implement, see page 35, section "Coupling the ISOBUS lines".
2. Hang the plug for the ISOBUS line of the sliding frame in the hose cabinet on the implement.
3. Hang the plug for the ISOBUS line of the band sprayer in the hose cabinet on the hoeing machine.

4. Fasten the plug for the combined ISOBUS line on the tractor.
5. Remove the wiring harness magnetic holder of the combined ISOBUS line from the implement and hang it on the tractor.

10.2.4 Disconnecting the hydraulic hose lines

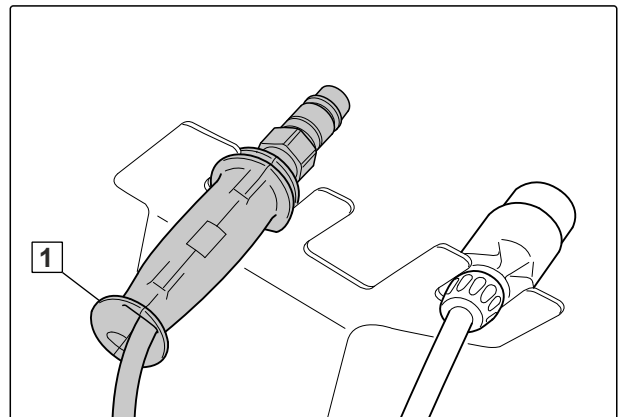
CMS-T-00000277-F.1

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



CMS-I-00001065

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



CMS-I-00001250

Loading the implement

11

CMS-T-00006368-C.1

11.1 Loading the implement with a crane

CMS-T-00006402-C.1

The implement has 2 lashing points for slings for lifting.

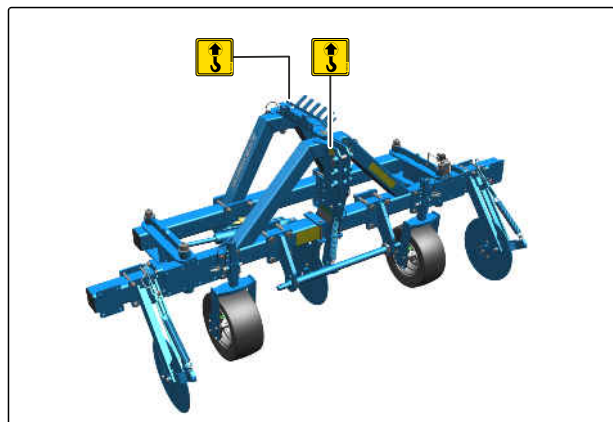


WARNING

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-00004556

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

Disposing of the implement

12

CMS-T-00010906-B.1

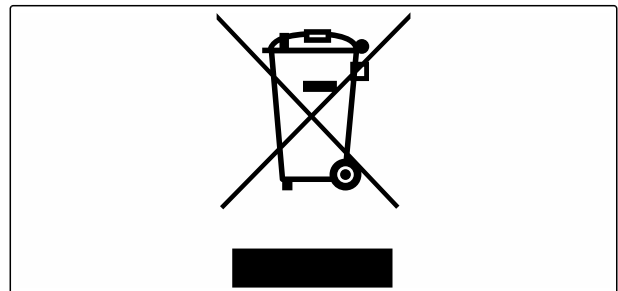


ENVIRONMENTAL INFORMATION

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.

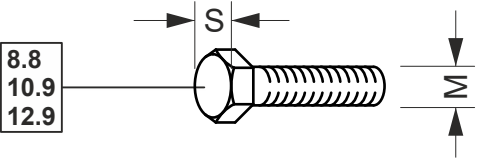
Appendix

13

CMS-T-00015860-A.1

13.1 Bolt tightening torques

CMS-T-00000373-E.1



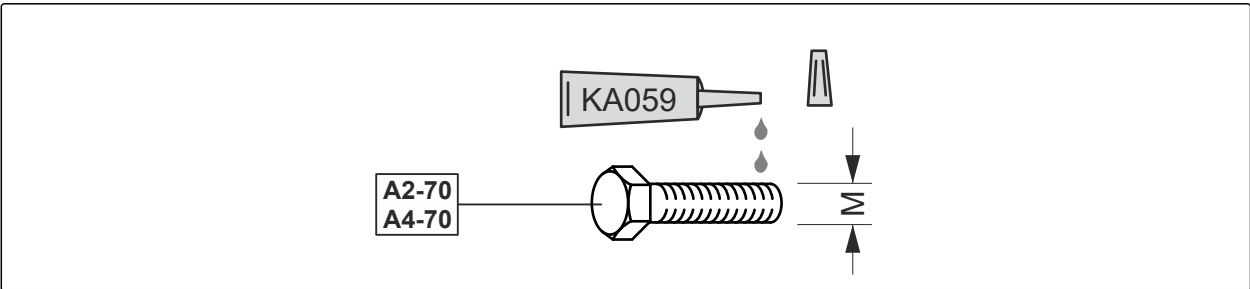
CMS-I-000260

NOTE

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

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

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



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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-00015861-A.1

- Tractor operating manual

Directories

14

14.1 Glossary

CMS-T-00000513-B.1

M

Machine

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

O

Operating materials

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

T

Tractor

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

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