Original operating manual

Mounted seeding combination

Avant seeding unit 4002-2

Avant seeding unit 5002-2

Avant seeding unit 6002-2

SmartLearning

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

TABLE OF CONTENTS

About this operating manual 1

CMS-T-00000081-D.1

1.1 Diagrams

CMS-T-005676-C.1

1.1.1 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.

1.1.2 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.

1.1.3 Instructions

CMS-T-00000473-B.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

1.1.3.1 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

1.1.3.2 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

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

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

1.1.4 Lists

CMS-T-000024-A.1

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

Example:

- Point 1
- Point 2

1.1.5 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 Other applicable documents

CMS-T-00000616-B.1

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

1.3 Your opinion is important

CMS-T-000059-C.1

Dear reader, our operating manuals are updated regularly. Your suggestions for improvement help us to create ever more user-friendly operating manuals. Please send us your suggestions by post, fax or email.

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Safety and responsibility 2

CMS-T-00004920-E.1

2.1 Basic safety instructions

CMS-T-00004921-E.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-C.1

2.1.2.1 Personnel qualification

CMS-T-00002306-A.1

2.1.2.1.1 Requirements for all persons working with the machine

CMS-T-00002310-A.1

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

the machine must meet the following minimum requirements:

- The person is physically and mentally capable of controlling the machine.
- 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 head 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-C.1

2.1.2.4.1 Perfect technical condition

CMS-T-00002314-C.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 implement.
- Immediately fix any damage that can affect safety.
- Fix the damage according to this operating manual.
- Any damage that you cannot fix yourself according to this operating manual must be fixed 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-00004922-C.1

2.1.3.1 Safety hazards on the machine

CMS-T-00004924-B.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.

2.1.3.2 Danger areas

CMS-T-00004923-B.1

Dangers areas on the implement

The following basic dangers are encountered in the danger areas:

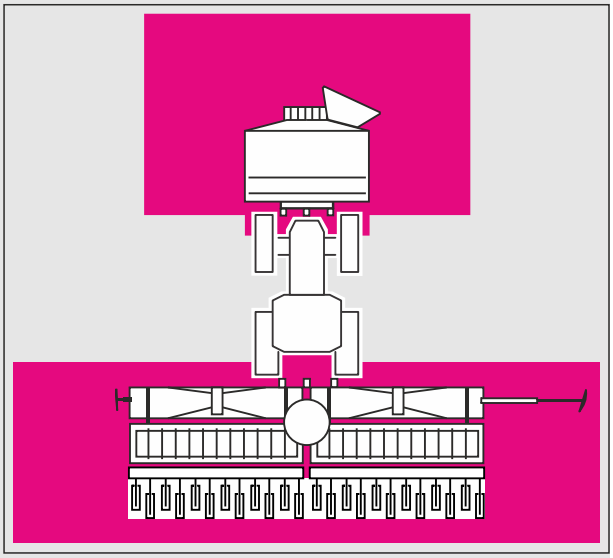
The implement and its work tools move during operation.

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.



CMS-I-00006890

- 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.

2.1.4 Safe operation and handling of the machine

CMS-T-00002304-H.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-D.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 power.*
  Use front ballast weights if necessary.
- Always attach the front or rear ballast weights properly on the specified fixing points.
- Calculate and observe the payload of 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.
- 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.

2.1.5 Safe maintenance and modification

CMS-T-00002305-D.1

2.1.5.1 Changes on the implement

CMS-T-00002322-B.1

Only authorised design changes

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

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

2.1.5.2 Work on the machine

CMS-T-00002323-C.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.

- ► Before performing any work on the machine, shutdown and secure the machine.
- ► *To immobilise the machine,*
  perform the following tasks
- ► If necessary, secure the machine against rolling away with wheel chocks.
- ► Lower lifted loads down to the ground.
- ► Relieve the pressure in the hydraulic hose lines.
- ► *If you have to work on or under raised loads,*
  lower the loads or secure raised machine parts 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.
- ► Remove the key from the battery circuit breaker.
- ► 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.
- Maintenance work that is not described in this operating manual should only be performed by a qualified specialist workshop.
- Maintenance work on safety-related components should be performed only by a qualified specialist workshop.
- 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 3-point mounting frame, drawbars, trailer support, trailer coupling, 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.

2.1.5.3 Operating materials

CMS-T-00002324-C.1

Unsuitable operating materials

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

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

2.1.5.4 Special equipment and spare parts

CMS-T-00002325-B.1

Special equipment, accessories, and spare parts

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

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

2.2 Safety routines

CMS-T-00002300-C.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 machine without using the intended access steps can slip, fall, and suffer severe injury.

- Use only the intended access steps
- *Dirt as well operating materials can impede walking safety and stability.*
  Always keep steps and platforms clean and in proper condition, so that safe stepping and standing is ensured.
- Never climb onto the machine when it is in motion.
- Climb up and down facing the machine.
- When climbing up and down, maintain 3-point contact with the access steps and handrails: always keep two hands and one foot or two feet and one hand on the machine.
- When climbing up and down, never hold onto the control elements. Accidental actuation of control elements can unintentionally activate potentially dangerous functions.
- When climbing down, never jump off of the machine.

Intended use

3

CMS-T-00004522-B.1

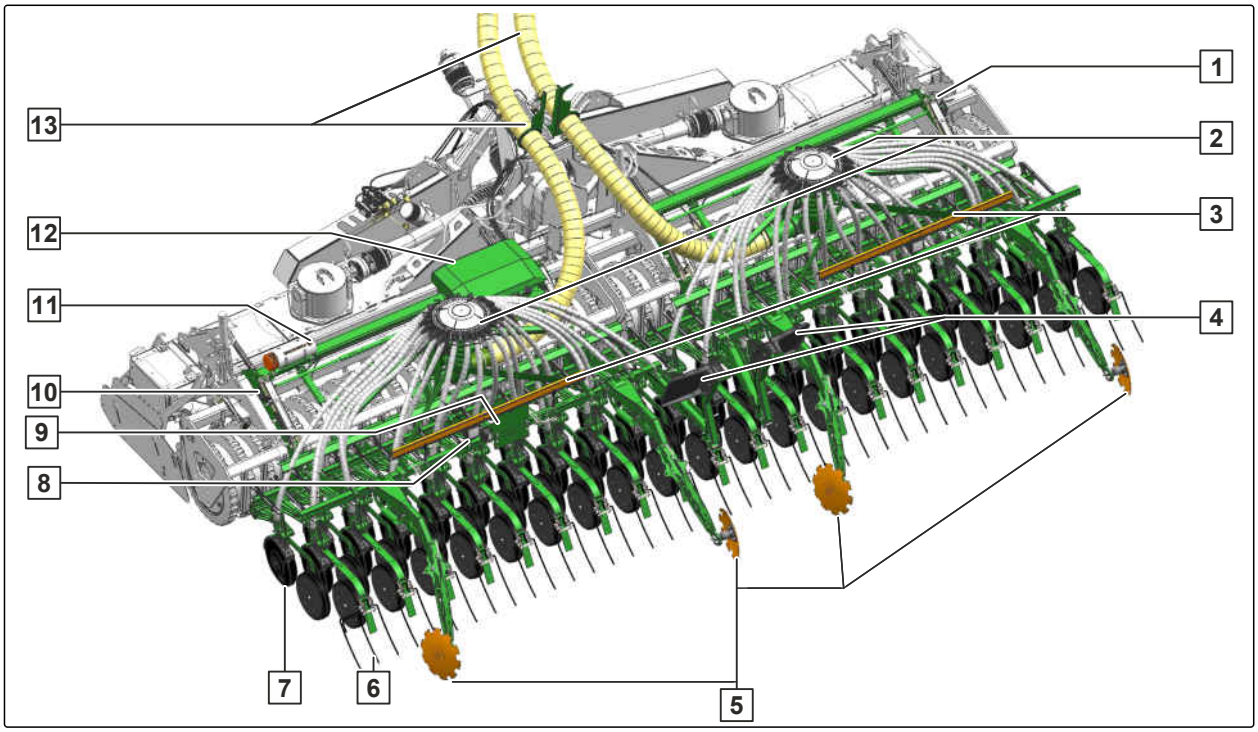
- The implement is designed solely for professional use for the spreading of seed according to Good Agricultural Practices.
- The implement is an agricultural work machine for mounting on a soil tillage implement with a 2-tube roller frame. The soil tillage implement has a special interface that meets the technical requirements.
- When driving on public roads, depending on the provisions of the applicable road traffic regulations, the implement can only be mounted and transported along with the soil tillage implement at the rear of a tractor that meets the technical requirements.
- The implement may only be used and maintained by persons who fulfil the requirements. The personnel requirements are described in the section *"Personnel qualification"*.
- The operating manual is part of the implement. The implement is solely intended for use in compliance with this operating manual. Uses of the implement that are not described in this operating manual can lead to serious personal injuries or even death and to implement and material damage.
- The applicable accident prevention regulations as well as generally accepted safety-related, occupational health and road traffic regulations must also be observed by the users and the owner.
- Further instructions for intended use in special cases can be requested from AMAZONE.
- Uses other than those specified under the intended use are considered as improper. The manufacturer is not liable for any damage resulting from improper use, solely the operator is responsible.

Product description 4

CMS-T-00004321-D.1

4.1 Implement overview

CMS-T-00004326-C.1



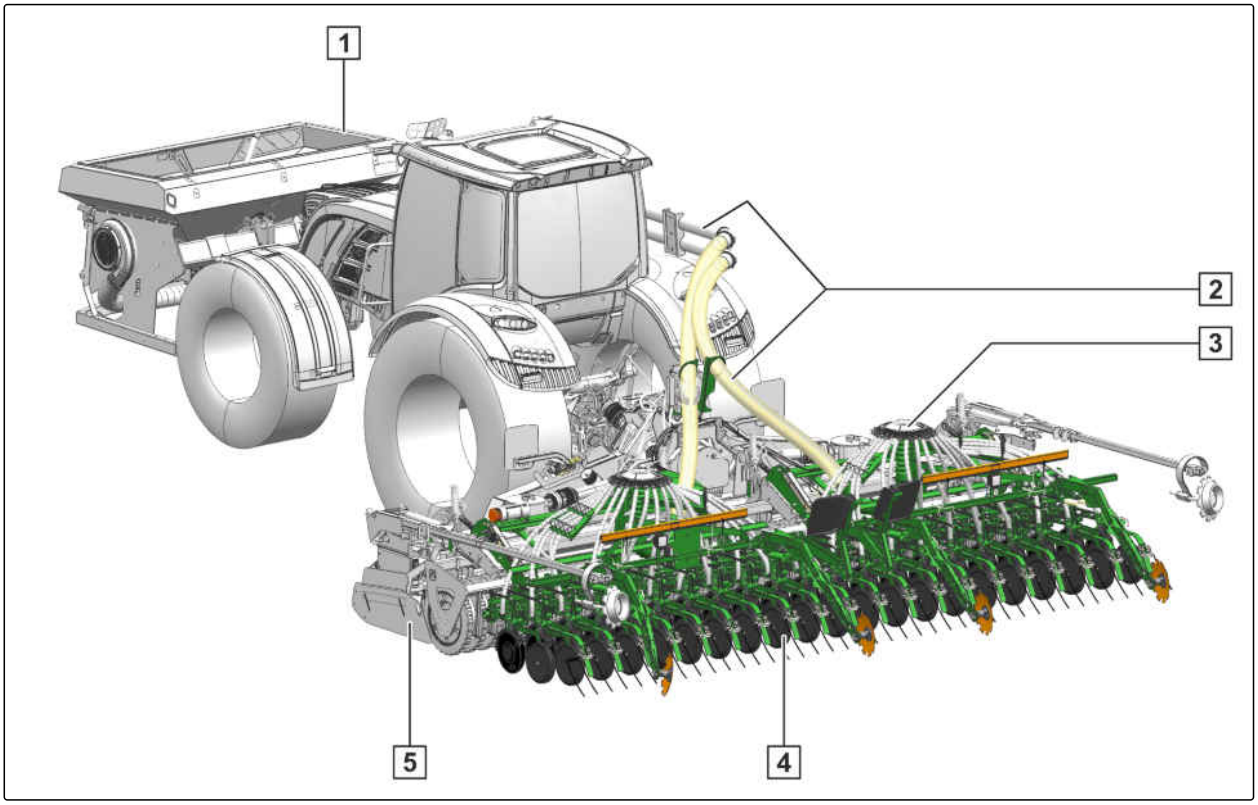
CMS-I-00007100

Avant 6002-2 seeding unit

1	Rating plate on the implement	2	Distributor heads
3	Road safety bars in parking position	4	Rear-facing lighting in parking position
5	Tramline marker	6	Harrow
7	Seeding coulter	8	Work lights
9	Additional license plate	10	Placement depth adjustment
11	Threaded cartridge	12	Job computer
13	Supply hoses		

4.2 Function of the implement

CMS-T-00004333-C.1



CMS-I-00003159

The implement can only be used with a suitable soil tillage implement **5**. The combination enables seedbed preparation and seeding in one field pass.

The metered material is carried with the FTender front hopper **1** and is metered into the conveyor section.

The metered material is conveyed through the hose package **2** to the distributor heads **3**. Depending on the working width of the implement, there are one or two distributor heads.

The seeding coulter **4** forms a seed furrow and deposits the metered material in the seedbed.

4.3 Special equipment

CMS-T-00004328-C.1

- Tramline marker
- Lighting and identification for road travel
- LED work lights
- LED coulter array lighting
- TwinTeC depth control wheel scraper

- TwinTeC coulter pressure increase
- TwinTeC inner scraper
- TwinTeC seed catcher
- Coulter harrow
- Exact following harrow
- Hydraulic exact following harrow pressure adjustment
- Seed tube monitoring
- Electric one-sided switching

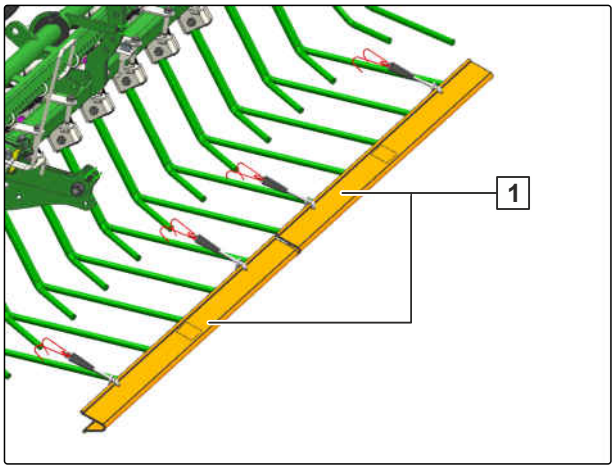
4.4 Protective equipment

CMS-T-00004322-B.1

4.4.1 Road safety bars

CMS-T-00010564-A.1

The road safety bars 1 cover the tines of the harrow to protect against injury and damage.



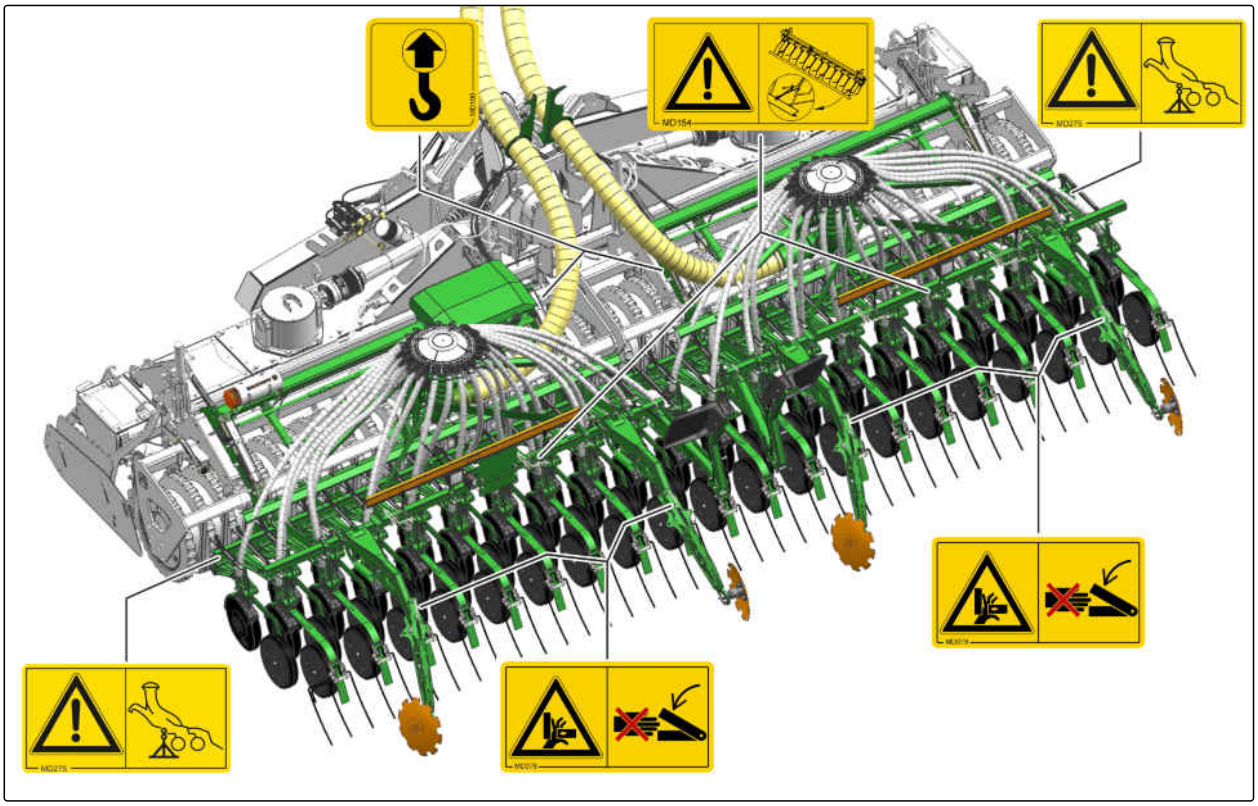
CMS-I-00005527

4.5 Warning symbols

CMS-T-00004330-C.1

4.5.1 Positions of the warning symbols

CMS-T-00004331-B.1



CMS-I-00003265

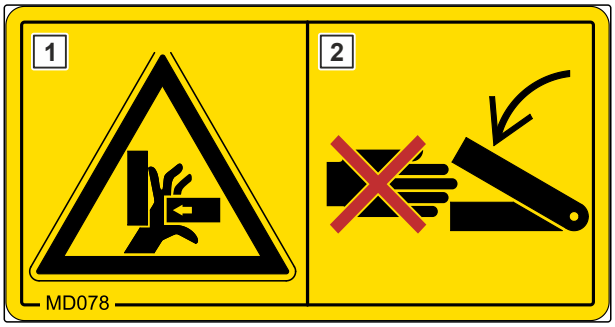
4.5.2 Layout of the warning symbols

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

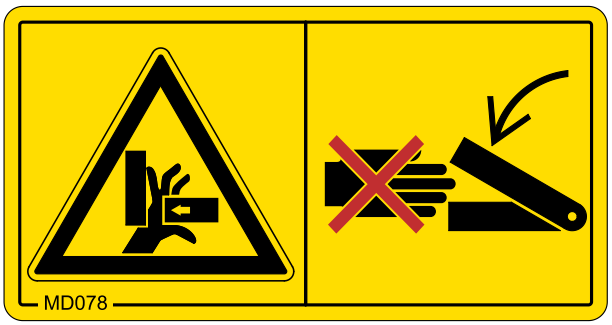
4.5.3 Description of the warning symbols

CMS-T-00004332-C.1

MD 078

Risk of crushing fingers or hands

- *As long as the tractor engine or implement motor is running,*
  stay away from the danger area.
- *If you have to move marked parts with your hands,*
  pay attention to the crushing areas.
- Make sure that there is nobody standing in the danger area.

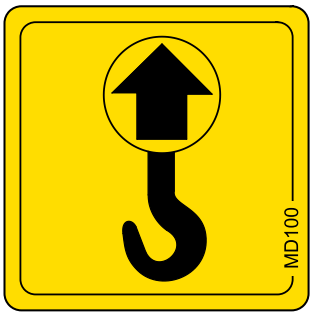


CMS-I-000074

MD 100

Risk of accidents due to improperly attached lifting gear

- Only attach the lifting gear at the marked positions.

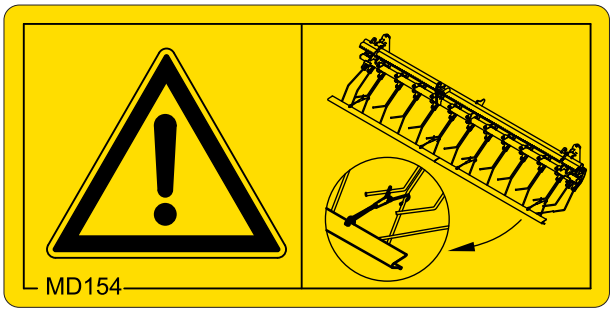


CMS-I-000089

MD 154

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

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



CMS-I-00003657

MD 275

Risk of crushing due to the pack top implement falling over

- Install the parking supports before you park the pack top implement.

CMS-I-00004915

4.6 Threaded cartridge

CMS-T-00001776-E.1

The threaded cartridge contains the following items:

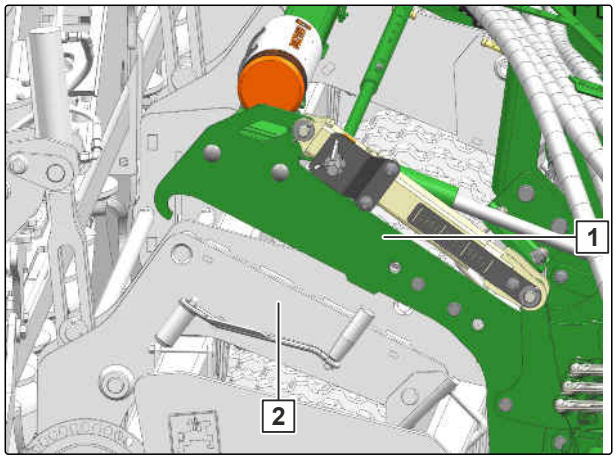
- Documents
- Aids

CMS-I-00002306

4.7 Mounting frame

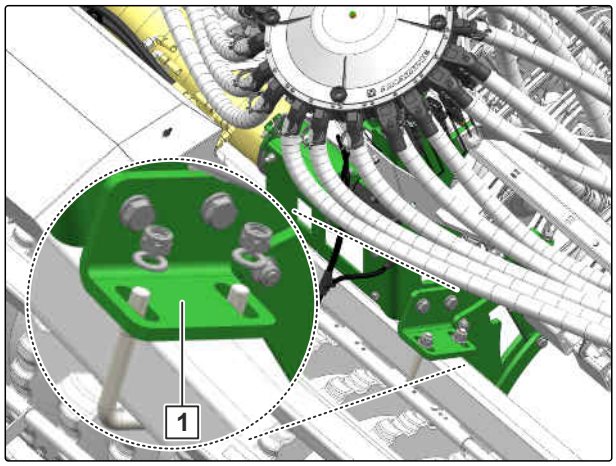
CMS-T-00004327-B.1

The seeding unit is fastened with the mount [1] on the roller frame of the soil tillage implement [2]. Each seeding unit has 2 mounts.



CMS-I-00003160

For implements with 2 distributor heads, the seeding unit is also connected to the roller frame at each distributor head with an angle bracket [1].

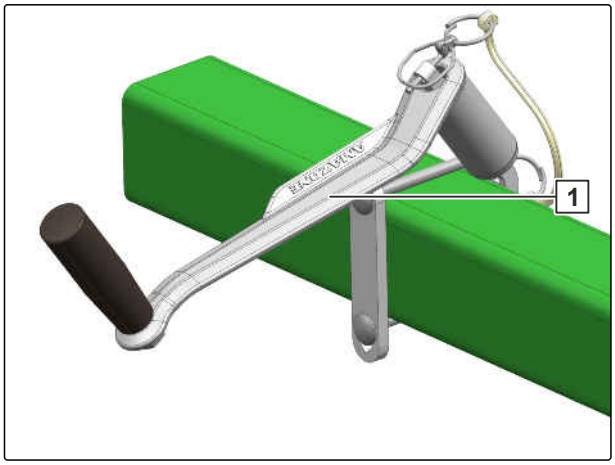


CMS-I-00003161

4.8 Universal operating tool

CMS-T-00001735-B.1

Setting work on the implement is performed with the universal operating tool 1. The universal operating tool is parked in a holder on the implement frame.



CMS-I-00001082

4.9 Rear lighting and identification for road travel

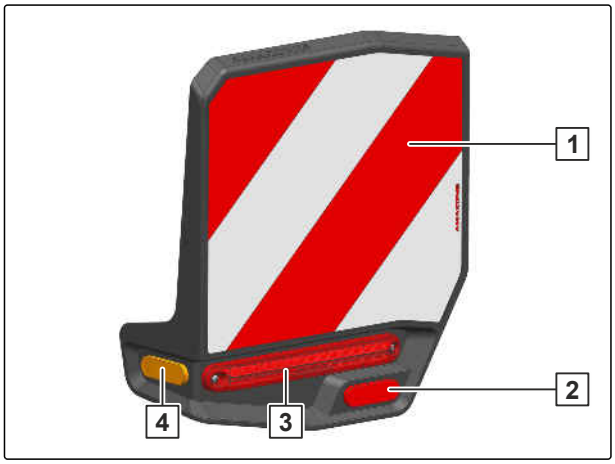
CMS-T-00001498-F.1

1 Warning signs

2 Reflector, red

3 Rear lights, brake lights, and turn indicators

4 Reflector, yellow



CMS-I-00004545

NOTE

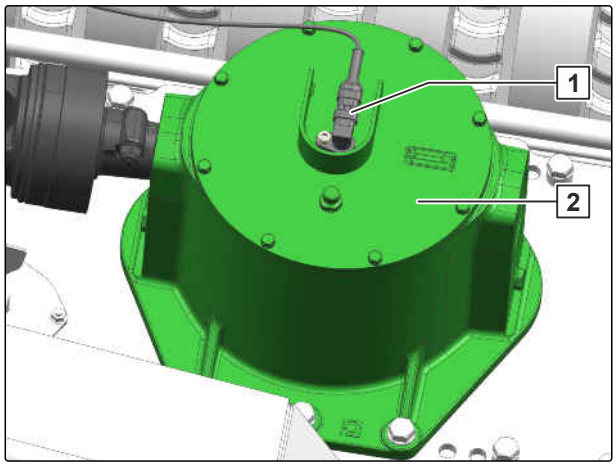
The lighting and identification for road travel can vary depending on the national regulations.

4.10 Electronic drive monitoring

CMS-T-00004030-B.1

The seeding unit monitors the drive of the rotary cultivator. Sensors 1 on both angular gearboxes 2 detect deviations in the gearbox speeds.

If the gearbox speeds differ from one another or the tool carriers are blocked, the control computer issues an alarm with a notification on the display and an acoustic signal.

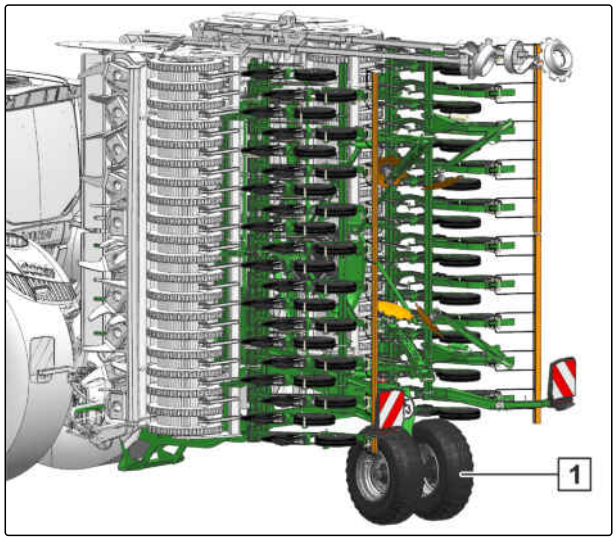


CMS-I-00002953

4.11 Transport frame

CMS-T-00004060-B.1

To reduce the tractor rear axle load, the rotary cultivator is connected to the transport frame 1.



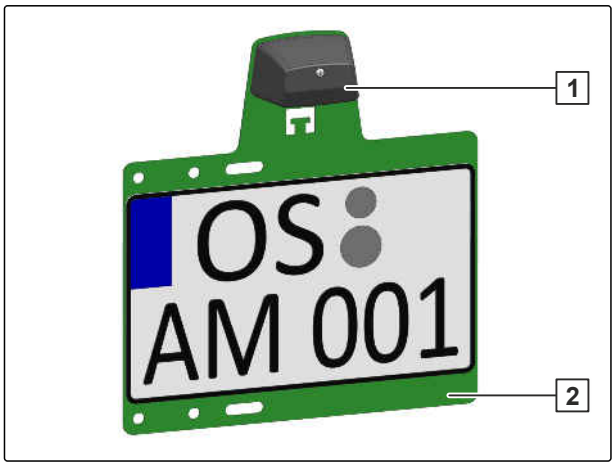
CMS-I-00003162

4.12 Additional license plate

CMS-T-00003999-C.1

1 Licence plate lighting

2 Licence plate holder

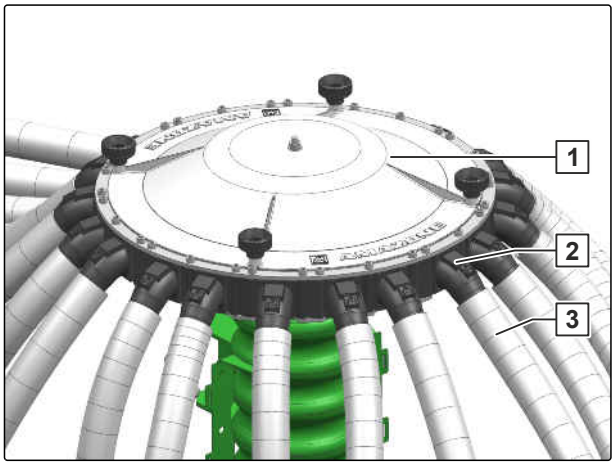


CMS-I-00003163

4.13 Segment distributor head

CMS-T-00007197-B.1

The metered material is distributed to all of the coulters in the segment distributor head 1. The distributor head has outlets 2, to which the seed line tubes 3 are connected.

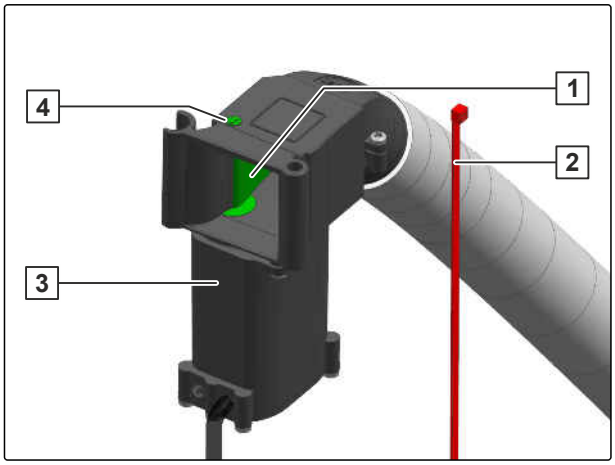


CMS-I-00003164

Depending on the equipment, the segment distributor head is equipped with tramline segments. The tramline segments close off the distributor head outlet with a setting motor 3. The seed line tubes on the tramline segments are marked with a red cable tie 2. The arrow 4 shows whether the flap is closed or open.

The number of tramline segments can be adjusted for the track width. A maximum of twelve tramline segments can be controlled per distributor head.

The tramline segments in the segment distributor head can be expanded, repositioned or replaced with segments without flaps.



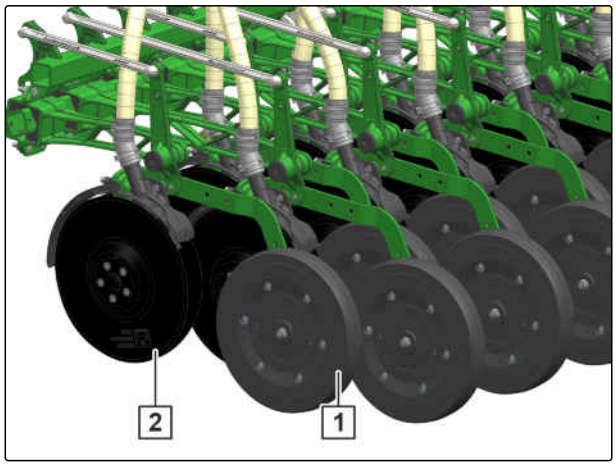
CMS-I-00003165

4.14 TwinTeC coulter

CMS-T-00004346-C.1

The TwinTeC coulter is a double disc coulter for ploughed or mulched soils. The concave discs 2 form the seed furrow. The metered material is guided between the concave discs and falls into the seed furrow. The depth control wheel 1 guides the double disc coulter at the set placement depth and ensures soil closure over the metered material. The coulter pressure and the placement depth can be adjusted.

For soil tillage without seeding, the coulters can be lifted.



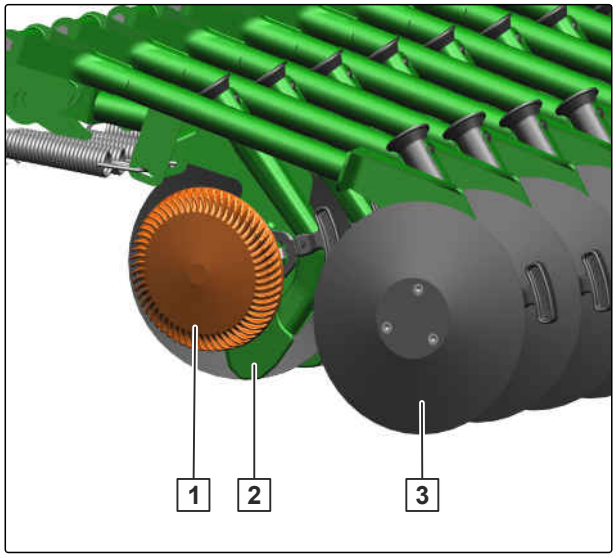
CMS-I-00003166

4.15 RoTeC coulter

CMS-T-00006297-A.1

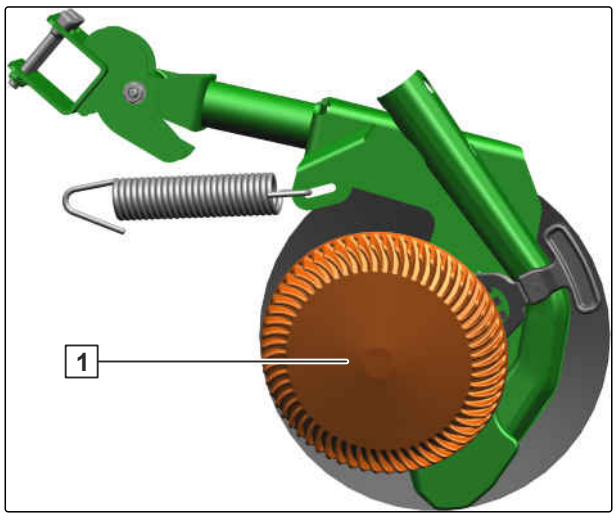
The RoTeC coulter is a single disc coulter and it deposits seed and fertiliser on ploughed or mulched soil. The furrow former 2 and the cutting discs 3 shape the seed furrow, into which the metered material is dropped. The depth control discs and depth control wheel 1 limit the placement depth and clean the cutting discs. The coulter pressure and the placement depth can be adjusted.

For soil tillage without seeding, the coulters can be lifted.



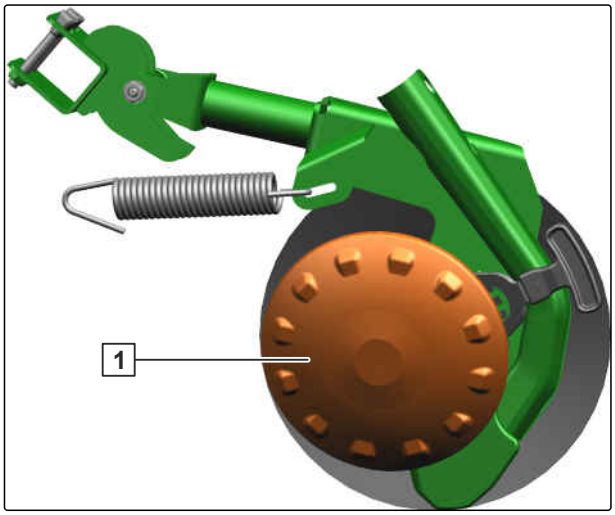
CMS-I-00004578

The Control 25 depth control wheel 1 has a 25 mm-wide contact area and enables shallow seeding with increased coulter pressure on light soils.



CMS-I-00004586

The Control 10 depth control disc 1 has a 10 mm-wide contact area and is used on heavy soils.



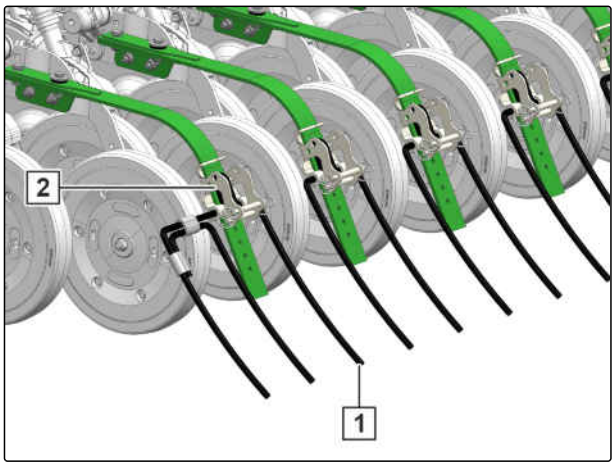
CMS-I-00004585

4.16 Coulter harrow

CMS-T-00006648-A.1

The harrow tines 1 of the coulter harrow cover the deposited metered material evenly with loose soil.

The pitch and the height of the harrow tines can be adjusted.



CMS-I-00004734

4.17 Exact following harrow

CMS-T-00006330-B.1

The harrow tines 2 of the exact following harrow rest horizontally on the ground and cover the deposited metered material evenly with loose soil.

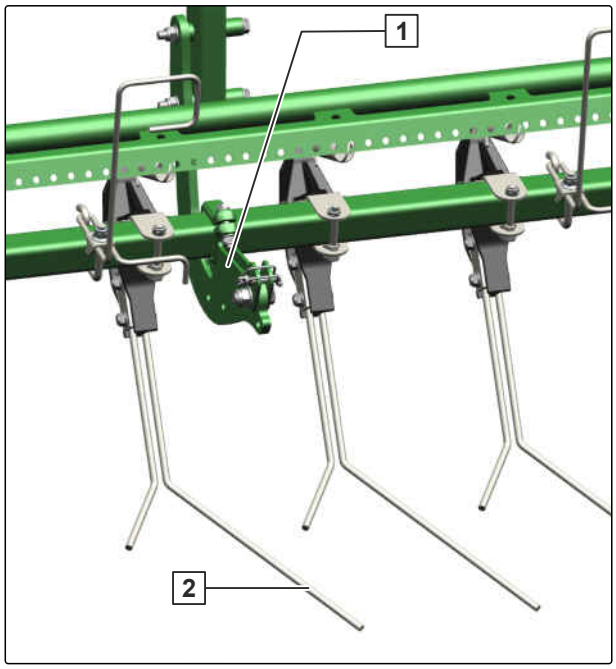
The position of the harrow tines can be adjusted.

The exact following harrow pressure determines the tillage intensity of the exact following harrow. The pressure can be adjusted mechanically or hydraulically. With hydraulic adjustment, the exact following harrow pressure is adjusted together with the coulter pressure.

For seed drills with exact following harrow lift, the exact following harrow can be lifted independently of the position of the coulters.

There is a bracket 1 that is secured with a linch pin on each side of the exact following harrow. The bracket prevents the harrow tines from folding over when driving in reverse and entering the coulters.

If a slight collision occurs when driving in reverse, the harrow tines deflect on the obstacle without being damaged. When driving forwards, the harrow tines return to working position.



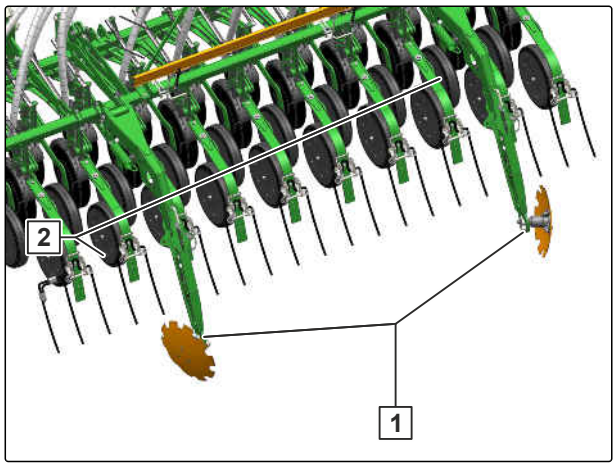
CMS-I-00004589

4.18 Tramline marker

CMS-T-00004347-B.1

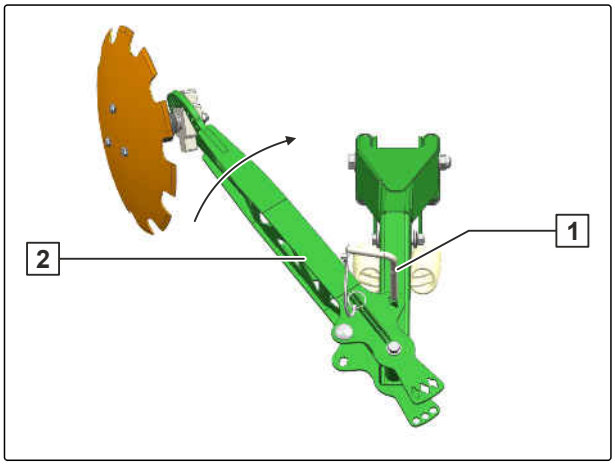
When creating tramlines, the tramline marker automatically lowers the discs 1 and makes tracks. These tracks make the tramlines visible before the seed has germinated. The discs are raised if no tramline is created.

Depending on the implement equipment, a different number of discs can be installed on the implement. The track width and the pitch of the track discs can be adjusted.



CMS-I-00003167

For road travel, all sections 2 are folded and secured with a pin 1.

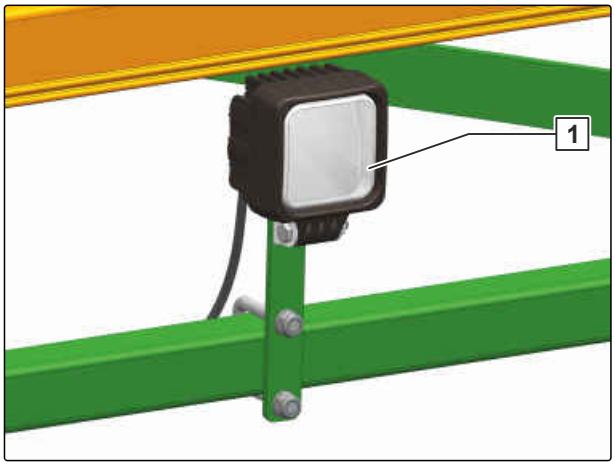


CMS-I-00003172

4.19 Work lights

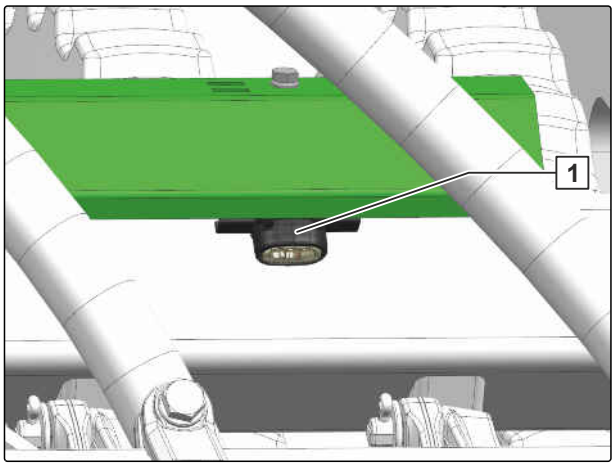
CMS-T-00004348-B.1

The work floodlights 1 make the working area more visible in the dark. The work floodlights are switched via the control terminal.



CMS-I-00003173

The coulter array lighting 1 enables better visibility of the seeding coulters in the dark. The coulter array lighting is switched together with the work floodlights via the control terminal.



CMS-I-00003174

4.20 Rating plate on the implement

CMS-T-00004505-G.1

1 Implement number

2 Vehicle ID number

3 Product

4 Permissible technical implement weight

5 Model year

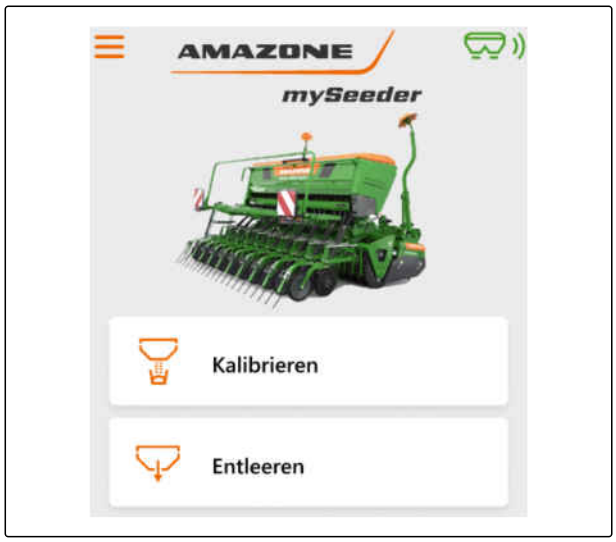
6 Year of manufacture

CMS-I-00004294

4.21 mySeeder app

CMS-T-00006215-C.1

With the mySeeder app, the implement can be connected to a mobile end device via Bluetooth and exchange data with the mySeeder app. Moreover, the mySeeder app can be used to calibrate the implement or empty the hopper through the metering unit.



CMS-I-00004418

The mySeeder app can be obtained from the Apple App Store or the Google Play Store. To do so, use the QR code or the link www.amazone.de/qrcode_mySeeder.

CMS-I-00004417

Technical data

5

CMS-T-00004349-C.1

5.1 Dimensions

CMS-T-00004352-C.1

Dimensions	Avant 4002-2 seeding unit	Avant 5002-2 seeding unit	Avant 6002-2 seeding unit
Transport width	2.9 m	2.9 m	2.9 m
Transport height (seeding combination with running gear and track marker)	3 m	3.4 m	3.9 m
Total length (seeding combination with running gear and track marker)	3.2 m	3.3 m	3.8 m
Working width	4 m	5 m	6 m
Centre of gravity distance	1 m	1 m	1 m

5.2 Basic weight of the seeding combination

CMS-T-00010090-A.1

Type	Basic weight of the seeding combination: Rotary cultivator with Avant seeding unit
Avant 4002-2	4,500 kg
Avant 5002-2	4,900 kg
Avant 6002-2	5,400 kg

5.3 Soil tillage tool

CMS-T-00004355-C.1

Dimensions	Seeding unit	
	with RoTeC coulters	with TwinTeC coulters
Cutting disc diameter	32 cm	40 cm
Placement depth	0 cm to 6 cm	0 cm to 6 cm

Avant 4002-2 seeding unit	with RoTeC coulters	with TwinTeC coulters
Number of rows	32	26
Row spacing	12.5 cm	15.4 cm
Avant 5002-2 seeding unit	**with RoTeC coulters**	**with TwinTeC coulters**
Number of rows	40	34
Row spacing	12.5 cm	14.7 cm
Avant 6002-2 seeding unit	**with RoTeC coulters**	**with TwinTeC coulters**
Number of rows	48	40
Row spacing	12.5 cm	15 cm

5.4 Permitted mounting categories

CMS-T-00004351-C.1

Mounting frame of the seeding unit	3-point mounting frame of the soil tillage implement
Integrated mounting frame	Category 4N

5.5 Permitted roller frame for the soil tillage implement

CMS-T-00010494-A.1

2-tube roller frame

5.6 Optimal working speed

CMS-T-00004350-C.1

Seeding coulter	Working speed, depending on the soil tillage implement
TwinTeC coulter	8 km/h to 12 km/h
RoTeC coulter	6 km/h to 12 km/h

5.7 Performance characteristics of the tractor

CMS-T-00004353-C.1

Type	Engine rating
Avant 4002-2 seeding unit	Starting at 118 kW / 160 PS
Avant 5002-2 seeding unit	Starting at 147 kW / 200 PS
Avant 6002-2 seeding unit	Starting at 176 kW / 240 PS

Electrical system	
Battery voltage	12 V
Lighting socket	7-pin

Hydraulic system	
Maximum operating pressure	210 bar
Tractor pump output	At least 15 l/min at 150 bar
Implement hydraulic oil	HLP68 DIN51524 The hydraulic oil is suitable for the combined hydraulic oil circuits of all standard tractor manufacturers.
Control units	lockable, at least 1 control unit

5.8 Noise development data

CMS-T-00002296-C.1

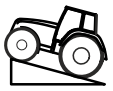
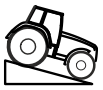
The workplace-related emission sound pressure level is lower than 70 dB(A), measured in operating condition at the ear of the tractor driver with the cab closed.

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

5.9 Drivable slope inclination

CMS-T-00004990-A.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	10%	
Down the slope	10%	

5.10 Lubricants

CMS-T-00002396-B.1

Manufacturer	Lubricant
ARAL	Aralub HL2
FINA	Marson L2
ESSO	Beacon 2
SHELL	Retinax A

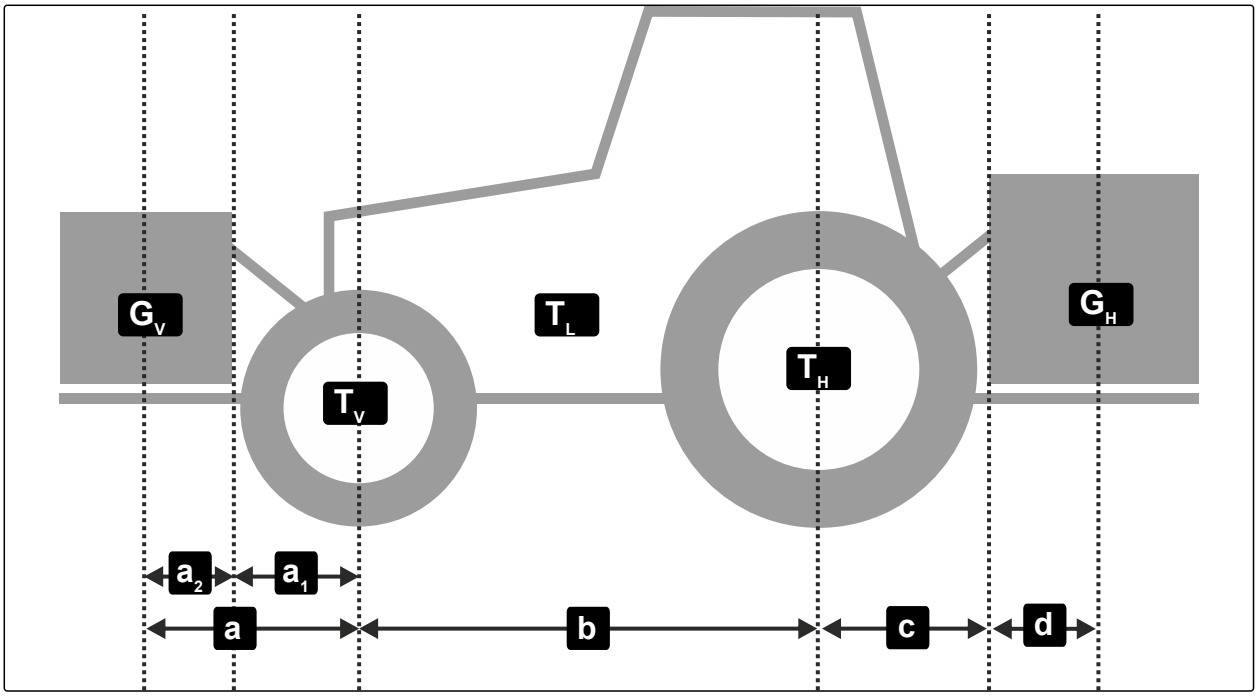
Preparing the machine

6

CMS-T-00004356-D.1

6.1 Calculating the required tractor characteristics

CMS-T-00000063-E.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.

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

G_{Vmin} = _____

G_{Vmin} =

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} = _____

T_{Vtat} =

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-00004367-D.1

6.2.1 Coupling the supply lines to the front-mounted hopper

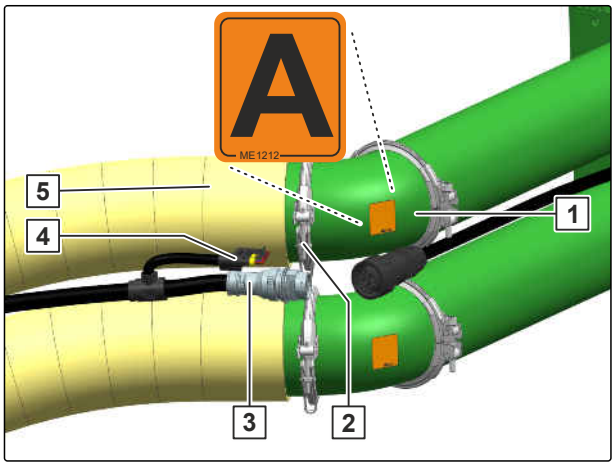
CMS-T-00004439-C.1

1. *To connect the conveyor hose* **5** *to the front-mounted hopper* **1**,
   couple the connecting piece with the bracket **2**.

2. Depending on the implement equipment, connect the second conveyor hose to the hose package. Pay attention to the markings on the conveyor hoses.

3. Depending on the implement equipment, connect the front hopper supply **3** to the hose package.

4. Depending on the implement equipment, connect the metering unit shutoff **4** to the hose package.



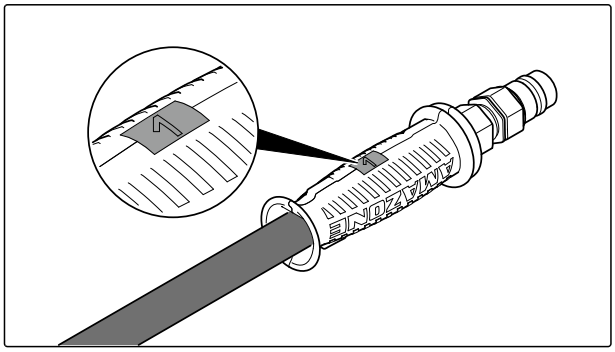
CMS-I-00003124

6.2.2 Coupling the hydraulic hose lines

CMS-T-00006179-C.1

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

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



CMS-I-00000121

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

Designation		Function			Tractor control unit	
Green	1		Pre-selection on the control terminal: Folding the implement	Unfold	Double-acting	
	2			Fold		
Green	1		Pre-selection on the control terminal: Coulter pressure	Increase	Double-acting	
	2			Reduce		
Green	1		Pre-selection on the control terminal: Coulter lift	Lifting	Double-acting	
	2			Lowering		
Beige	1		Working depth of the tool tines	Increase	Double-acting	
	2			Reduce		
Yellow	1		Track marker	Unfold	Double-acting	
	2			Fold		
Yellow Not required in combination with track marker.	1		Tramline marker	Lifting	Double-acting	
	2			Lowering		
Blue	1		Top link	Shortening	Double-acting	
	2			Lengthening		
Red	T	Pressure relief through pressureless return flow.				

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 DN16 lines for the pressureless hydraulic oil return flow.
- Select short return paths.
- Connect the pressureless hydraulic return flow correctly.
- Install the supplied coupling sleeve on the pressureless hydraulic oil return.

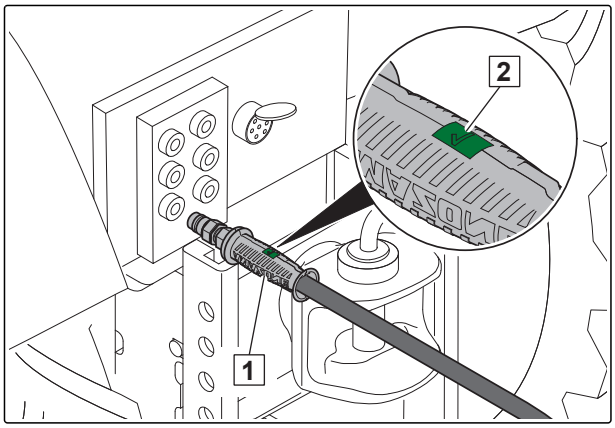
1. Depressurise the hydraulic system between the tractor and the implement using the tractor control unit.

2. Clean the hydraulic plugs.

3. Couple the hydraulic hose lines [1] to the hydraulic sockets of the tractor according to the marking [2].

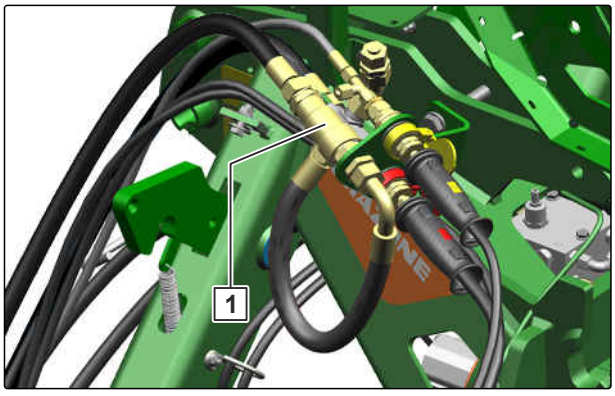
➡ The hydraulic plugs lock perceptibly.

4. Route the hydraulic hose lines with sufficient freedom of movement and without chafing points.



CMS-I-00001045

5. Depending on the implement equipment, couple the pressureless return flow [1] of the front hopper onto the soil tillage implement.

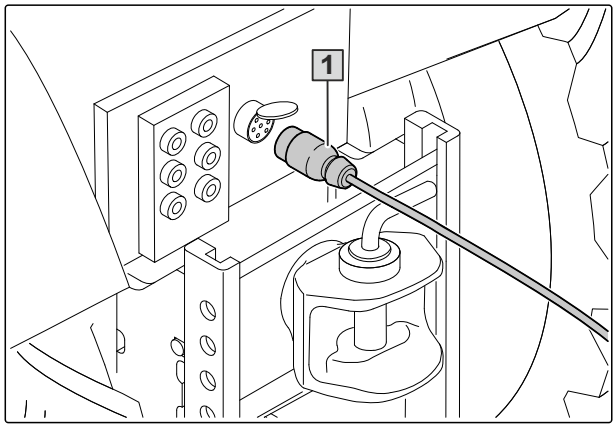


CMS-I-00007203

6.2.3 Coupling the power supply

CMS-T-00001399-F.1

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

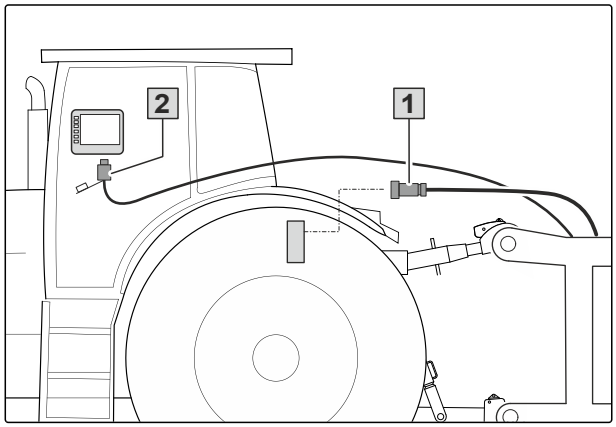


CMS-I-00001048

6.2.4 Coupling the ISOBUS or control computer

CMS-T-00003611-E.1

1. Plug in the connector of the ISOBUS line **1** or the control computer line **2**.
2. Route the ISOBUS line with sufficient freedom of movement and without chafing or pinching points.

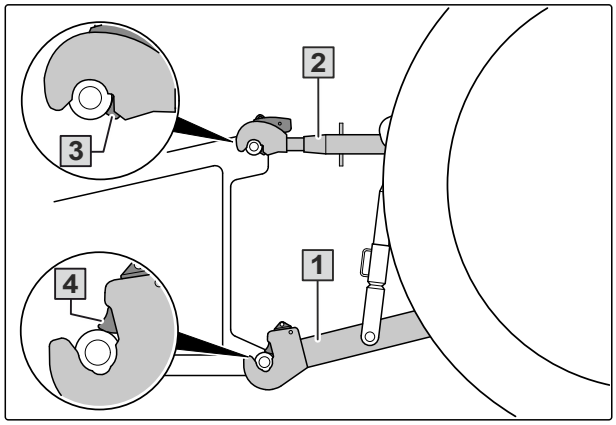


CMS-I-00006891

6.2.5 Coupling the 3-point mounting frame

CMS-T-00001400-G.1

1. Set the tractor lower links **1** to the same height.
2. Couple the lower links **1** 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

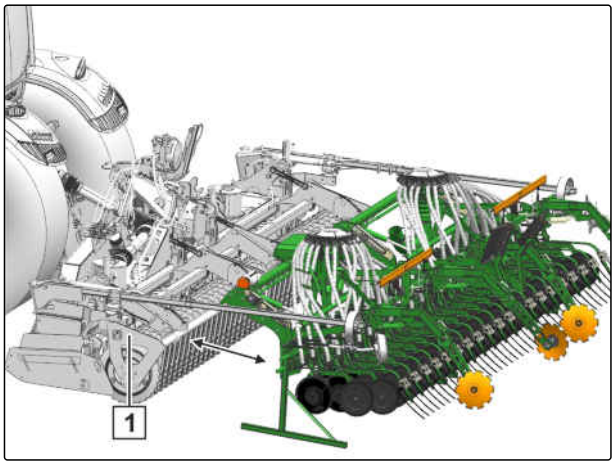
6.2.6 Coupling the Avant seeding unit

CMS-T-00010447-A.1

6.2.6.1 Coupling the seeding unit with 2 distributor heads

CMS-T-00004368-C.1

1. Slowly drive the tractor with the coupled soil tillage implement 1 under the seeding unit.

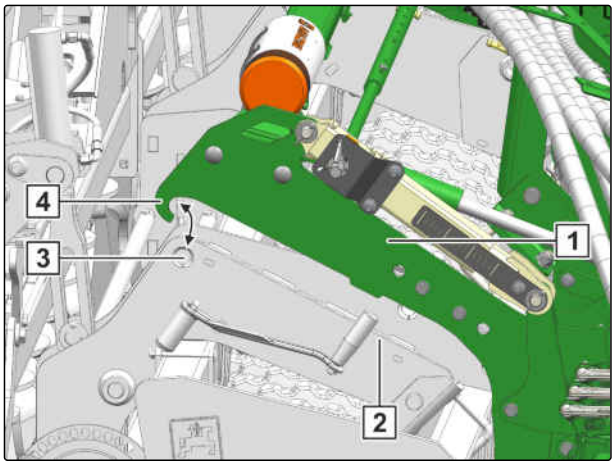


CMS-I-00003130

2. Slowly lift the soil tillage implement.

➡ The soil tillage implement 3 picks up the hooks 4 of the seeding unit.

➡ The bracket 1 is resting on the roller frame 2 of the soil tillage implement.

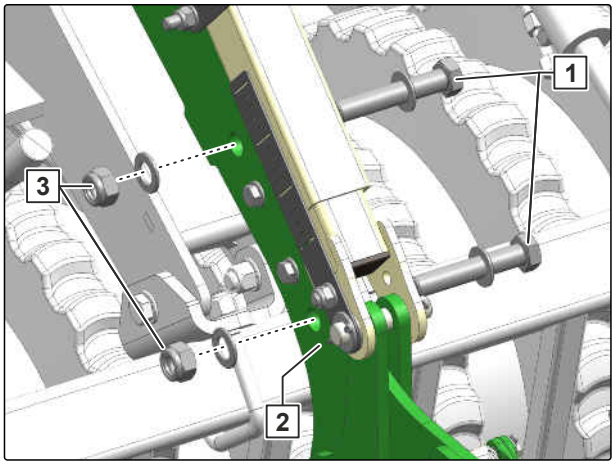


CMS-I-00003131

3. Install the bolts 1 on all of the brackets 2.

➡ The brackets are connected to the roller frame.

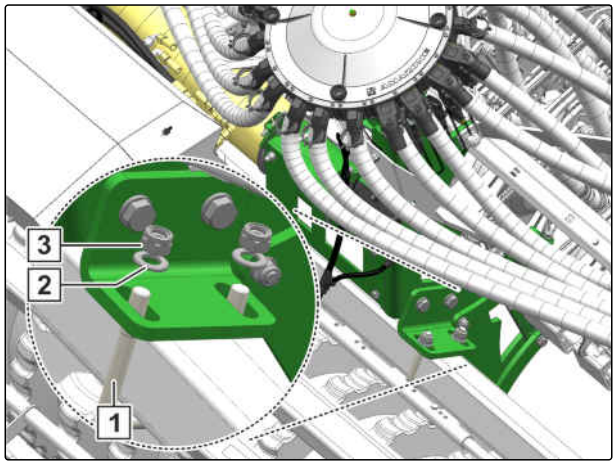
4. Put on the nuts 3 and tighten them.



CMS-I-00003177

Connect the distributor head holder to the roller frame.

5. Put the stirrup bolt 1 around the roller frame.
6. Install the washers 2.
7. Install the nuts 3 and tighten them.
8. Establish the connection on all distributor head holders.



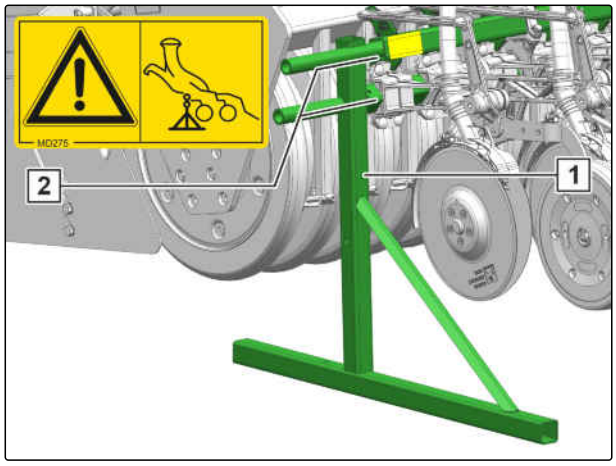
CMS-I-00003139

9. Lift the soil tillage implement with the coupled seeding unit.

WARNING The parking supports do not have a locking device

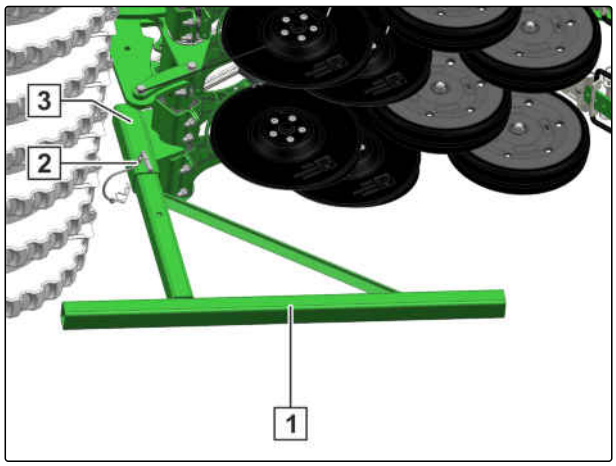
When the implement is folded. the parking supports fall out of the mount.

► *To prevent the parking supports from falling out of the mount,*
remove the parking supports.



CMS-I-00003115

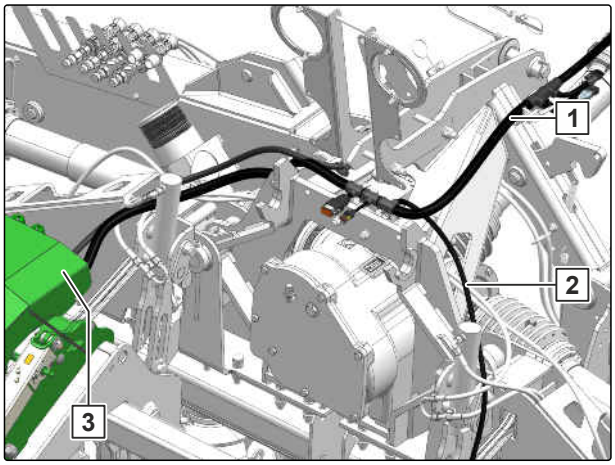
10. Remove the outer parking supports 1 from the seeding unit 2 on both sides.
11. Fold the soil tillage implement with the coupled seeding unit.
12. Loosen the pin 2.
13. Pull the inner parking supports 1 out of the holder 3 on both sides.
14. Unfold the soil tillage implement with the coupled seeding unit.
15. Park the soil tillage implement with the coupled seeding unit on a level surface.



CMS-I-00003116

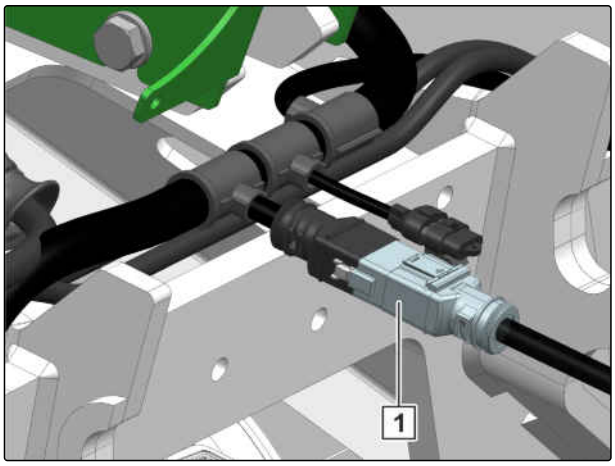
16. Install the supply line from the job computer 3 to the right section 2 on the frame.

17. Route the supply line over the frame 1 to the interface on the hose package.



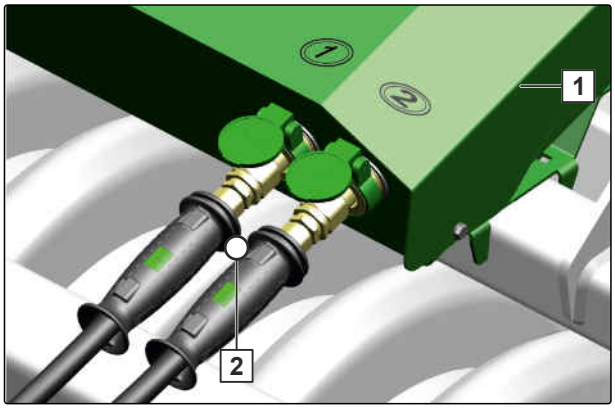
CMS-I-00003138

18. Connect the supply line 1 for the rotary cultivator monitoring.



CMS-I-00003128

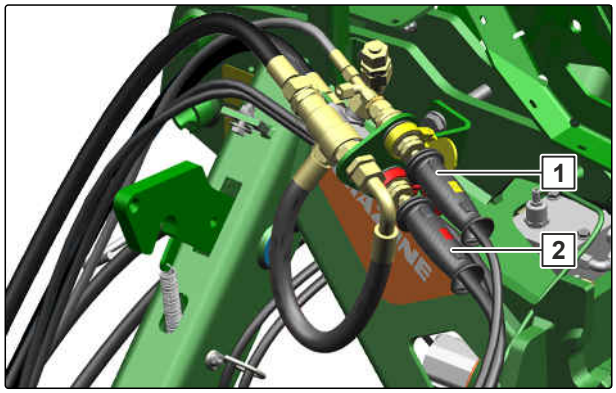
19. Connect the *"green"* tractor control unit of the soil tillage implement 2 to the Comfort hydraulic system of the seeding unit 1.



CMS-I-00003127

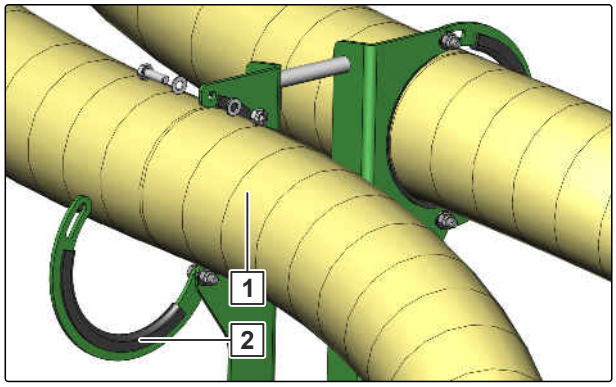
20. Couple the *"red T"* pressureless return flow of the seeding unit **2** onto the soil tillage implement.

21. *If the seeding unit has a tramline marker,* couple the *"yellow 2"* tractor control unit of the seeding unit **1** onto the soil tillage implement.



CMS-I-00007103

22. Install the conveyor hoses **1** in the holder **2**.



CMS-I-00007108

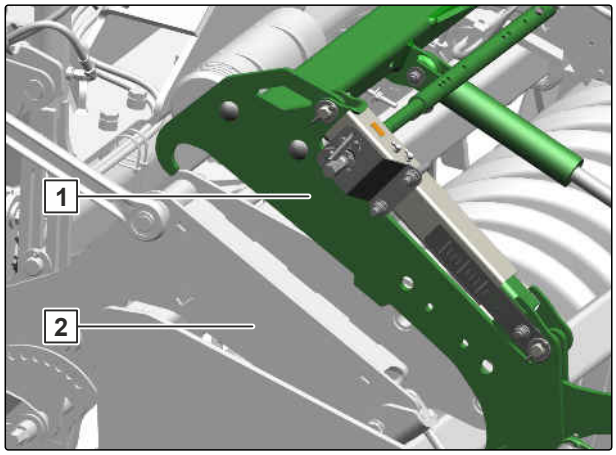
6.2.6.2 Coupling the seeding unit with one distributor head

CMS-T-00010448-A.1

1. Slowly drive the tractor with the coupled soil tillage implement under the seeding unit.

2. Slowly lift the soil tillage implement.

➡ The bracket **1** is resting on the roller frame **2** of the soil tillage implement.

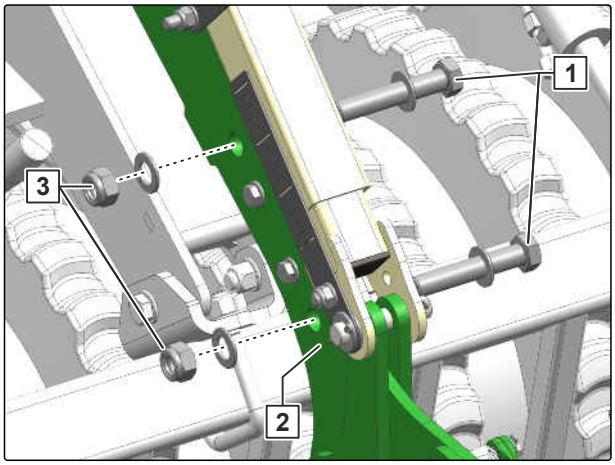


CMS-I-00007099

3. Install the bolts 1 on all of the brackets 2.

➡ The brackets are connected to the roller frame.

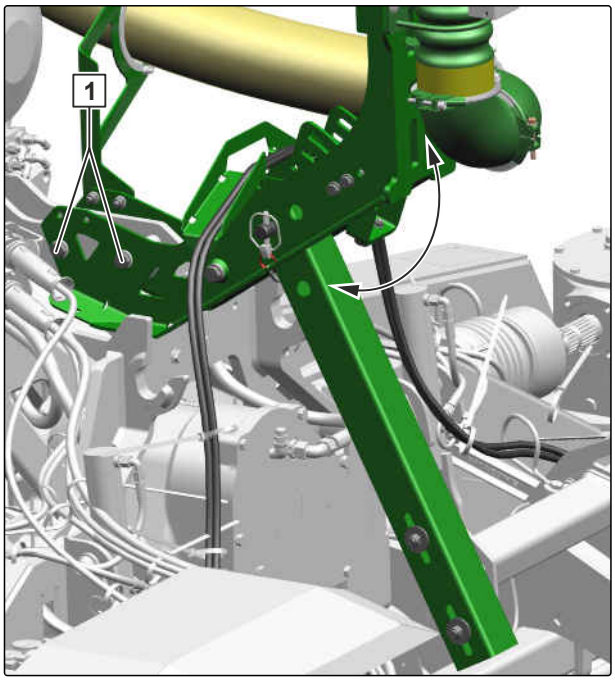
4. Put on the nuts 3 and tighten them.



CMS-I-00003177

5. Swivel up the distributor head.

6. Install the bolts 1.

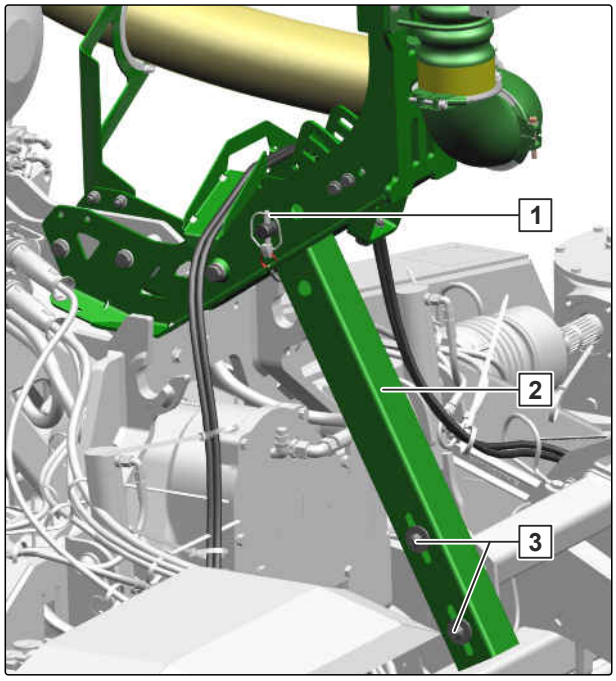


CMS-I-00007114

7. Remove the bolts 3.

8. Pull the linch pin 1 and remove the pin.

9. Take out the retaining tube 2.



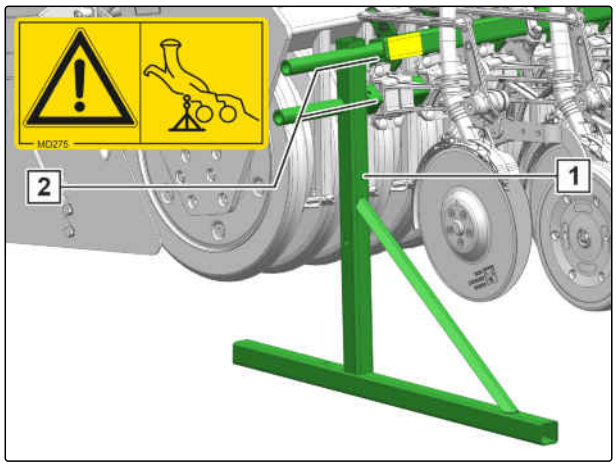
CMS-I-00007113

10. Lift the soil tillage implement with the coupled seeding unit.

WARNING The parking supports do not have a locking device

When the implement is folded. the parking supports fall out of the mount.

► *To prevent the parking supports from falling out of the mount,*
remove the parking supports.



CMS-I-00003115

11. Remove the outer parking supports 1 from the seeding unit 2 on both sides.

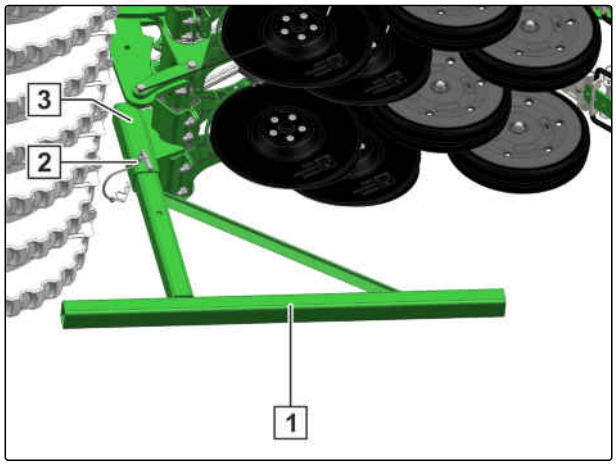
12. Fold the soil tillage implement with the coupled seeding unit.

13. Loosen the pin 2.

14. Pull the inner parking supports 1 out of the holder 3 on both sides.

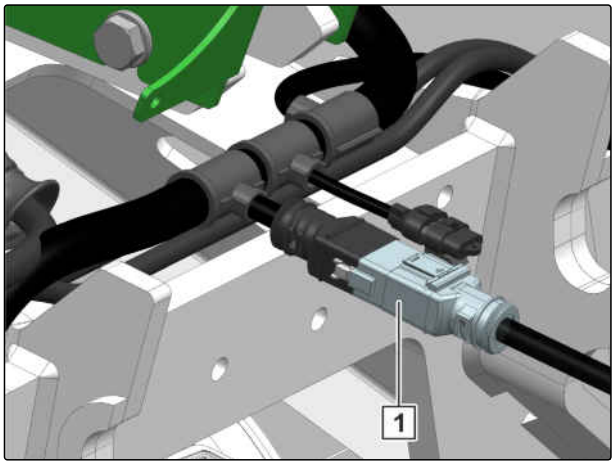
15. Unfold the soil tillage implement with the coupled seeding unit.

16. Park the soil tillage implement with the coupled seeding unit on a level surface.



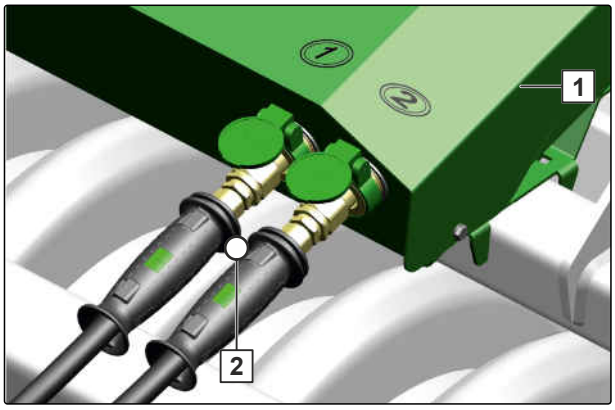
CMS-I-00003116

17. Connect the supply line [1] for the rotary cultivator monitoring.



CMS-I-00003128

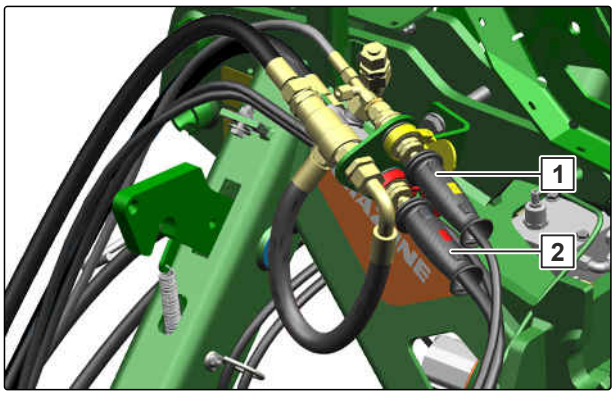
18. Connect the *"green"* tractor control unit of the soil tillage implement [2] to the Comfort hydraulic system of the seeding unit [1].



CMS-I-00003127

19. Couple the *"red T"* pressureless return flow of the seeding unit [2] onto the soil tillage implement.

20. *If the seeding unit has a tramline marker,* couple the *"yellow 2"* tractor control unit of the seeding unit [1] onto the soil tillage implement.



CMS-I-00007103

6.2.7 Installing the lighting on the seeding unit

CMS-T-00004441-B.1

NOTE

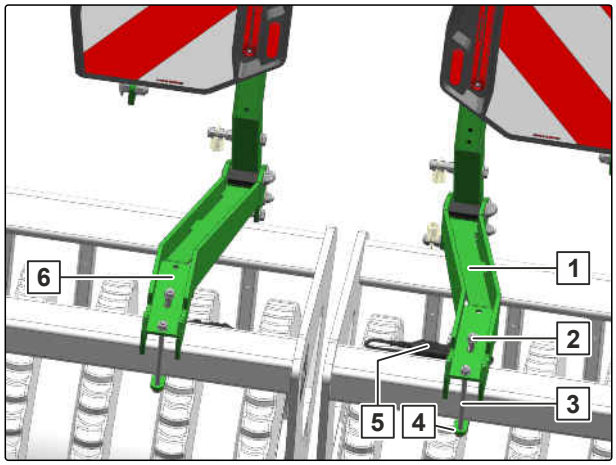
For road travel with the seeding combination, the lighting of the soil tillage implement must be installed on the seeding unit.

1. *To remove the lighting holder* **1** *from the soil tillage implement,*
   remove the counterholder **4** from the roller frame.

2. Remove the bolts **3** as well as the washers and nuts **2**.

3. Disconnect the electrical connection **5**.

4. Remove the second lighting holder **6**.



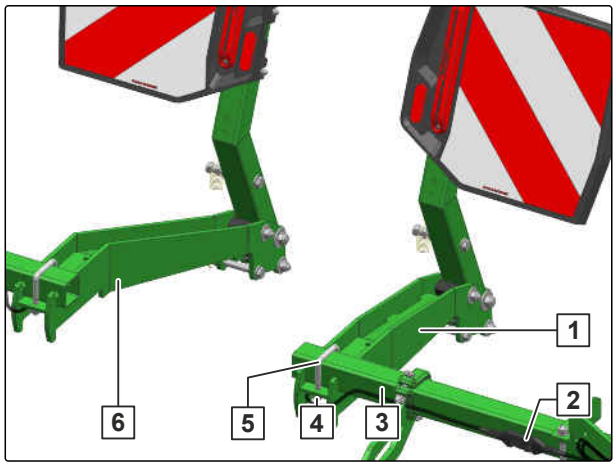
CMS-I-00003222

5. *To install the lighting holder* **2** *on the seeding unit,*
   connect the stirrup bolt **5** to the retaining tube **3**.

6. Install the nuts **4** with washers.

7. Establish the electrical connection **2**.

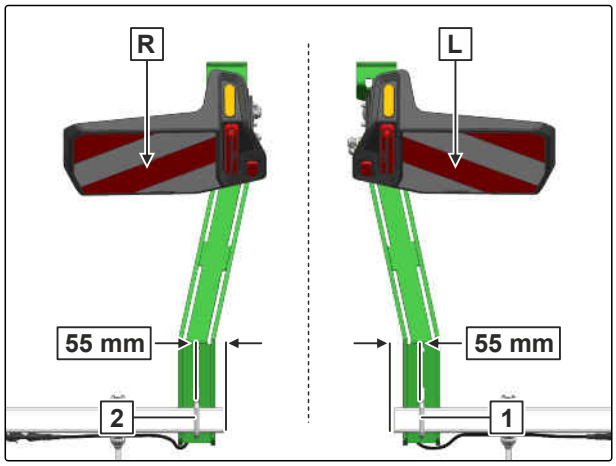
8. Install the second lighting holder **6**.



CMS-I-00003223

9. Align the lighting holders **1** and **2**.

10. Tighten the nuts.



CMS-I-00003221

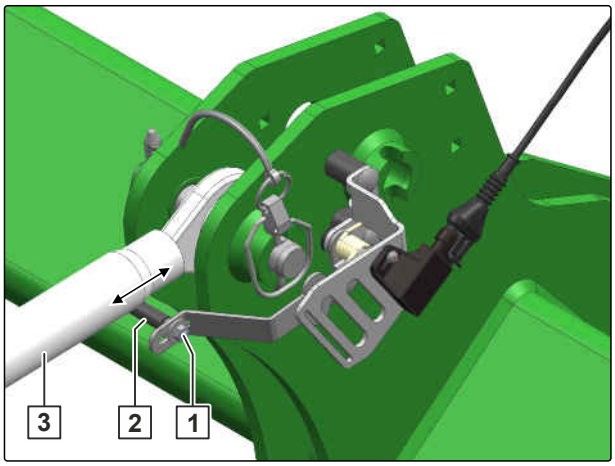
6.3 Preparing the implement for operation

CMS-T-00004357-D.1

6.3.1 Adjusting the working position sensor

CMS-T-00003625-E.1

The working position sensor monitors the implement position in the three-point hydraulic system and switches the metering drives. The lever length is adjustable.



CMS-I-00002608

1. loosen the nut **1**.
2. Place the lever **2** on an level contact surface on the top link **3**.
3. Tighten the nut.
4. *To ensure that the working position sensor is resting on a level surface,*
   completely lift and lower the implement.
5. *To configure the working position sensor,*
   refer to the ISOBUS software operating manual, *"Configuring the working position sensor"*

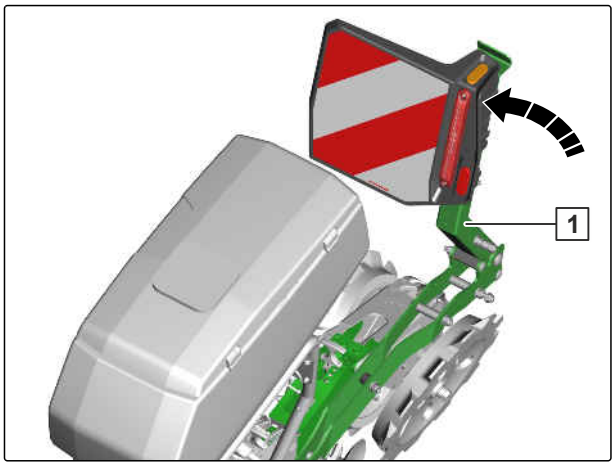
   or

   see *"control computer"* operating manual.

6.3.2 Folding the lighting

CMS-T-00004418-C.1

The lighting must be folded before the implement is unfolded. Depending on the implement equipment, the lighting is folded either manually or hydraulically.



CMS-I-00007407

► *For implements without hydraulically folding lighting,*
move both lighting panels **1** into parking position.

6.3.3 Unfolding the implement

CMS-T-00004419-B.1

1. *To release the transport lock,*
   observe the soil tillage implement operating manual.

2. *Activate the function on implements with Comfort hydraulic system,*
   see ISOBUS software operating manual *"Pre-selection for hydraulic functions"*.

3. *To unfold the seeding combination,*
   actuate the *"green 2"* tractor control unit.

6.3.4 Adjusting the placement depth on the TwinTeC coulter

CMS-T-00010422-A.1

NOTE

The adjustment of the seed placement depth must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Lift the implement.

2. Put the universal operating tool on the adjustment spindle **2**.

3. *To reduce the seed placement depth,*
   turn the universal operating tool counter-clockwise

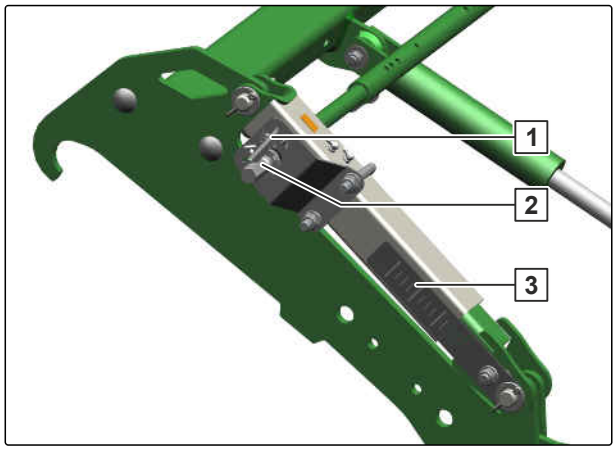
   or

   To increase the seed placement depth,
   turn the universal operating tool clockwise.

4. The scale **3** serves as orientation.

5. Take off the universal operating tool and allow the catch **1** to engage in a groove of the grid.

6. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern, see *"Checking the placement depth"*.

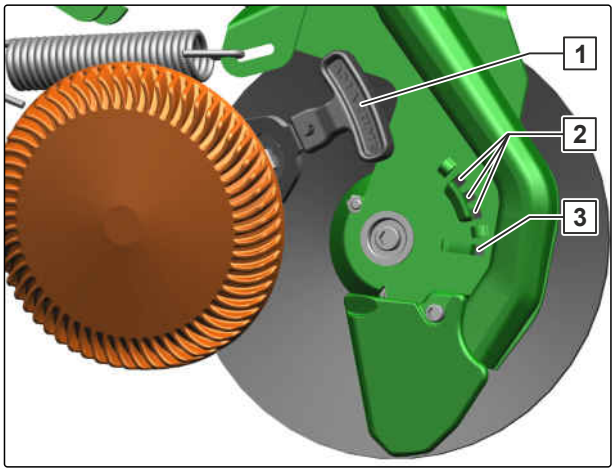


CMS-I-00007102

6.3.5 Adjusting the placement depth on the RoTeC coulter

CMS-T-00010449-A.1

The placement depth can be adjusted in three stages 2. The higher the position of the depth control discs or depth control wheels, the greater the placement depth. The greatest placement depth is achieved when the depth control discs or depth control wheels are completely removed.



CMS-I-00004587

NOTE

The adjustment of the seed placement depth must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Pull on the lever 1 for the depth control disc or depth control wheel, move it up or down and engage it in the desired position

   or

   To completely remove the depth control disc or depth control wheel,
   move the lever all the way down and push it to the rear in the elongated slot 3 until the depth control disc or depth control wheel can be removed.

2. Set all of the depth control discs or depth control wheels at the same height or remove them completely.

3. *To check the adjustment of the placement depth on the field,*
   seed for approx. 30 m at working speed and then check the work pattern, see *"Checking the placement depth"*.

4. If the required placement depth has not yet been reached, the coulter pressure must also be adjusted, see *"Adjusting the coulter pressure hydraulically"*.

6.3.6 Adjusting the coulter pressure hydraulically

CMS-T-00004361-C.1

NOTE

The adjustment of the coulter pressure must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

WARNING

Unexpected movement of the coulter and exact following harrow

The hydraulic cylinders for the coulter pressure adjustment and the exact following harrow pressure adjustment are actuated simultaneously.

- ▶ *Before you actuate the tractor control unit,*
  direct people out of the danger area.

1. *Activate the function on implements with Comfort hydraulic system,*
   see ISOBUS software operating manual *"Pre-selection for hydraulic functions"*.

2. *Adjust the values for the coulter pressure on implements without Comfort hydraulic system,*
   see ISOBUS software operating manual *"Coulter pressure settings"*.

3. *To increase the coulter pressure,*
   actuate the *"green 1"* tractor control unit

   or

   To reduce the coulter pressure,
   actuate the *"green 2"* tractor control unit.

4. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.

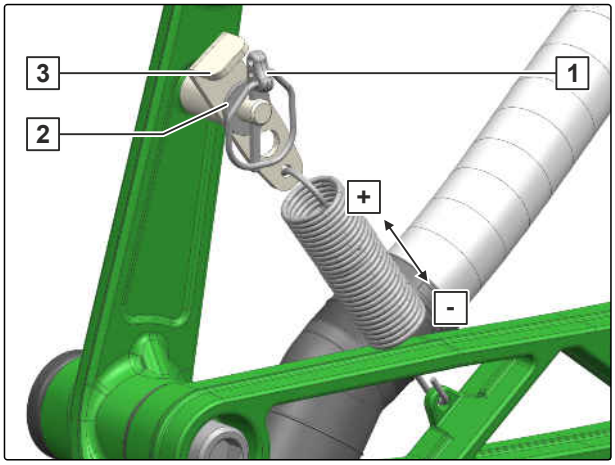
6.3.7 Adjusting the additional coulter pressure on the TwinTeC coulter

CMS-T-00004371-B.1

NOTE

The adjustment of the additional coulter pressure must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Remove the linch pin **1**.
2. Remove the washer **2**.
3. Move the spring holder **3** to the desired position.
4. Install the washer.
5. Install the linch pin.
6. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.



CMS-I-00003181

6.3.8 Lifting the coulters hydraulically

CMS-T-00004416-B.1

1. *To activate the coulter lift on implements with Comfort hydraulic system,*
   see ISOBUS software operating manual *"Pre-selection for hydraulic functions"*.
2. *To lift the coulters, reduce the coulter pressure beyond the value of 0.*
   actuate the *"green 2"* tractor control unit.

6.3.9 Adjusting the coulter harrow

CMS-T-00006627-C.1

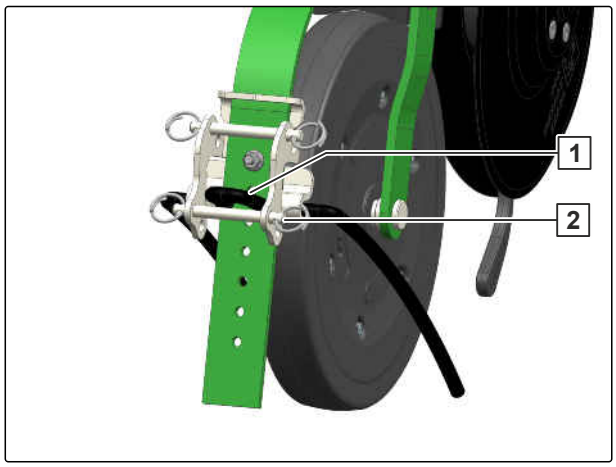
6.3.9.1 Moving the coulter harrow into working position

CMS-T-00009568-B.1

6.3.9.1.1 Moving the coulter harrow into the shallow working position

CMS-T-00009569-A.1

When driving in reverse, the harrow tine 1 folds to the front and rests on the locking pin 2. As a result, the harrow tine does not protrude into the neighbouring coulters.



CMS-I-00003184

IMPORTANT

Damage to the coulters due to folded harrow tines

- Do not remove the locking pin.

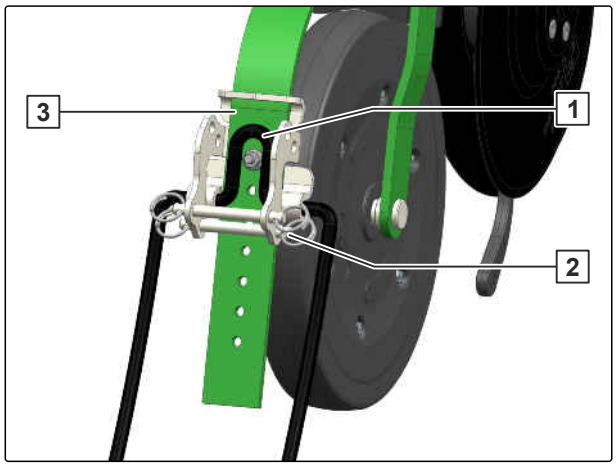
NOTE

The adjustment of the harrow angle must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Lift the implement.
2. *To move the harrow tines 1 into the flat working position,*
   Install the pin 2 in the hole shown.

➥ The harrow tine is resting on the plate 3.

3. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.

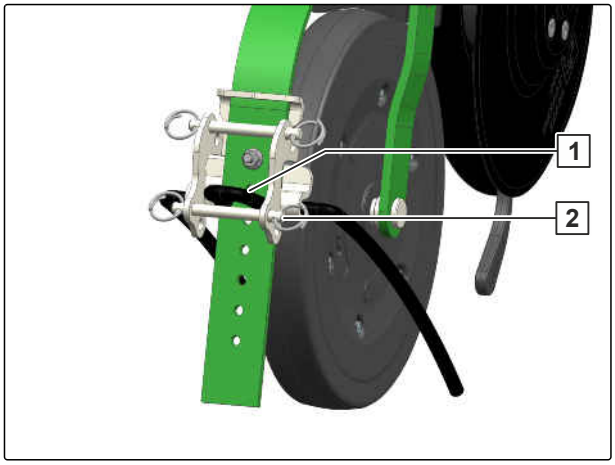


CMS-I-00003187

6.3.9.1.2 Moving the coulter harrow into the medium working position

CMS-T-00009570-A.1

When driving in reverse, the harrow tine [1] folds to the front and rests on the locking pin [2]. As a result, the harrow tine does not protrude into the neighbouring coulters.



CMS-I-00003184

IMPORTANT

Damage to the coulters due to folded harrow tines

- Do not remove the locking pin.

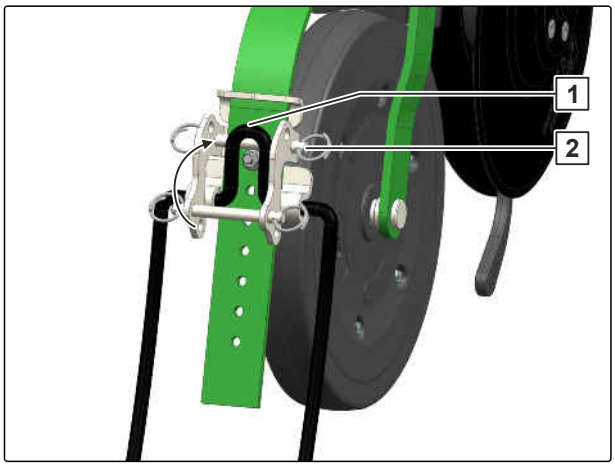
NOTE

The adjustment of the harrow angle must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Lift the implement.
2. *To move the harrow tine [1] to the medium working position,*
   Install the pin [2] in the hole shown.

➡ The harrow tine is resting on the pin.

3. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.

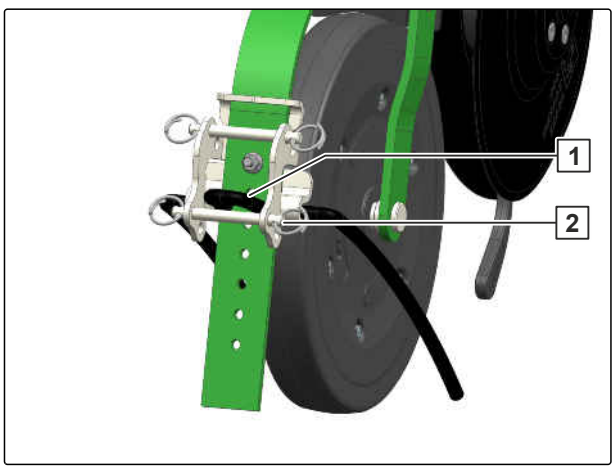


CMS-I-00003186

6.3.9.1.3 Moving the coulter harrow into the steep working position

CMS-T-00009571-A.1

When driving in reverse, the harrow tine [1] folds to the front and rests on the locking pin [2]. As a result, the harrow tine does not protrude into the neighbouring coulters.



CMS-I-00003184

IMPORTANT

Damage to the coulters due to folded harrow tines

- Do not remove the locking pin.

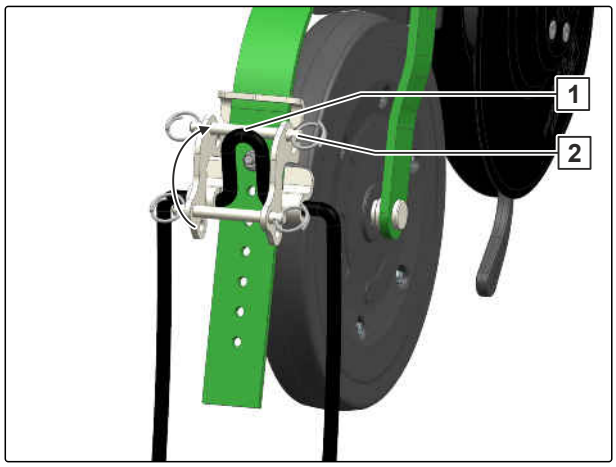
NOTE

The adjustment of the harrow angle must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Lift the implement.
2. *To move the harrow tine* **1** *to the steep working position,*
   Install the pin **2** in the hole shown.

➡ The harrow tine is resting on the pin.

3. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.

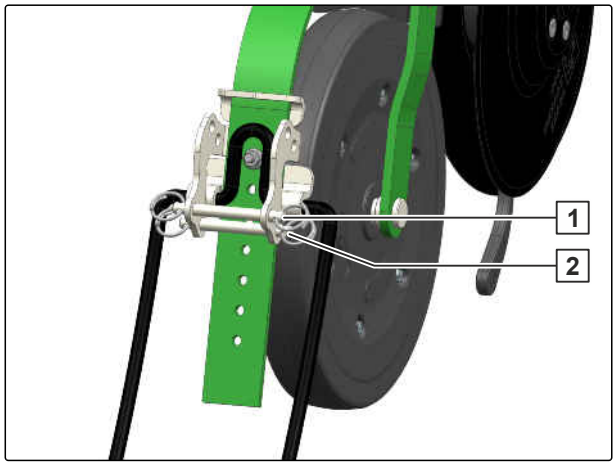


CMS-I-00003185

6.3.9.2 Deactivating the harrow tines

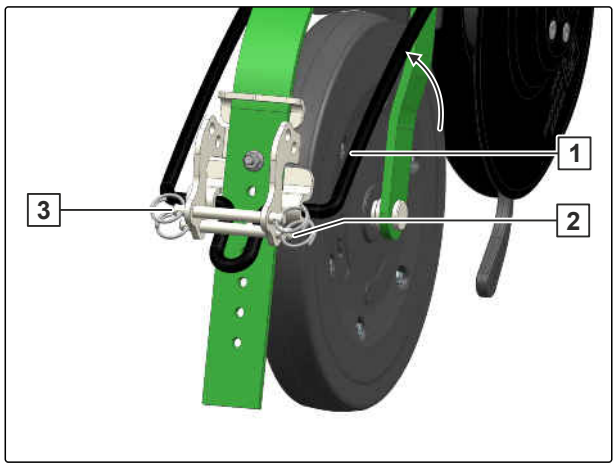
CMS-T-00004370-C.1

1. Lift the implement.
2. Remove the pins **1** and **2**.



CMS-I-00003188

3. fold up the harrow **1**.
4. Install the pins **2** and **3** in the indicated hole.



CMS-I-00003183

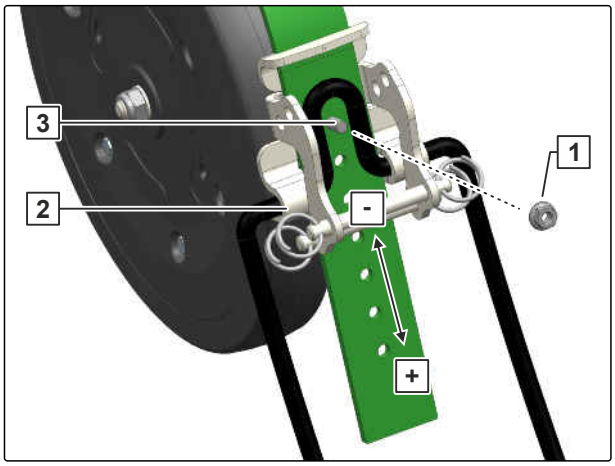
6.3.9.3 Adjusting the harrow height

CMS-T-00006457-A.1

NOTE

The adjustment of the harrow height must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Remove the nut 1.
2. Remove the bolt 3.
3. Move the harrow bracket 2 to the desired position.
4. Install the bolt 3.
5. Install the nut 1 and tighten it.
6. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.



CMS-I-00003182

6.3.10 Adjusting the exact following harrow

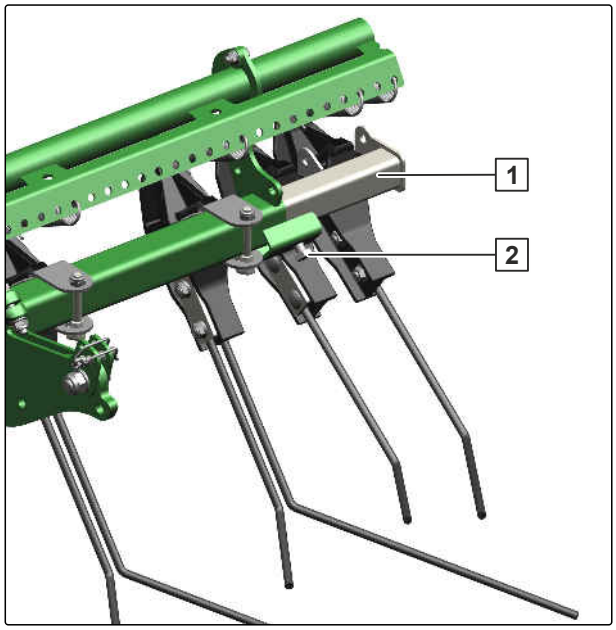
CMS-T-00006326-B.1

6.3.10.1 Moving the exact following harrow into working position

CMS-T-00006334-A.1

The roller and the coulters force the soil outwards to different extents depending on the forward speed and the soil properties. The outer harrow elements must be adjusted such that the soil is guided back and a trackless seedbed is created. The greater the forward speed, the further the outer harrow elements have to be set outwards.

1. Loosen the bolt **2** with the universal operating tool.
2. Push the sliding element **1** outwards.
3. Tighten the bolt **2** with the universal operating tool.
4. Make the same setting for the other side of the implement.
5. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.



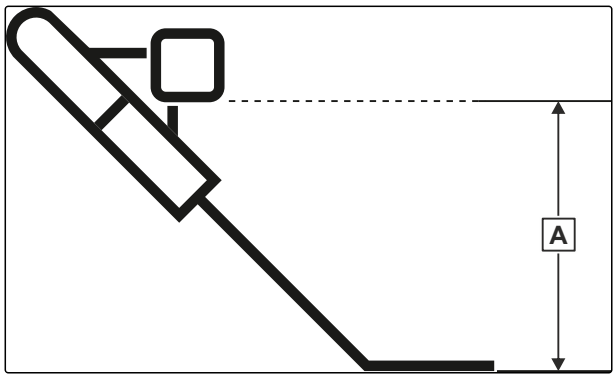
CMS-I-00004674

6.3.10.2 Adjusting the position of the harrow tines on seed drills with exact following harrow lift

CMS-T-00006331-A.1

When the exact following harrow is properly adjusted, the harrow tines rest horizontally on the ground and have 50-80 mm downward play.

To make adjustments, the distance **A** between the carrier tube and the ground is adjusted. The distance must be 230-280 mm.

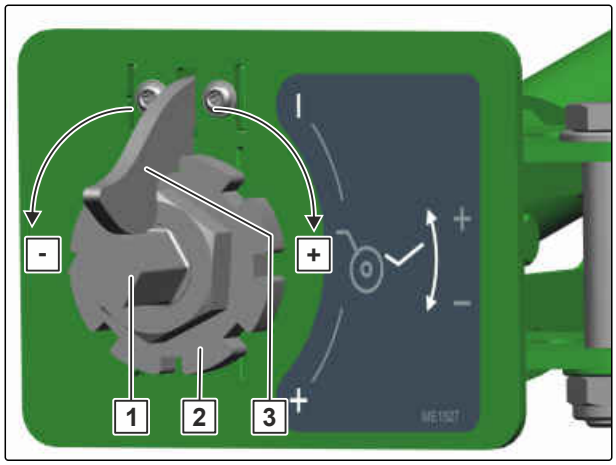


CMS-I-00004668

1. Put the universal operating tool on the adjustment spindle **1**.
2. *To set the exact following harrow deeper,*
   turn the universal operating tool counter-clockwise **-**

   or

   To set the exact following harrow higher,
   turn the universal operating tool clockwise **+**.
3. Position the grid **2** such that a groove is at the top.



CMS-I-00004670

4. Take off the universal operating tool and allow the catch **3** to engage in the groove.

5. *To check the setting,*
seed for approx. 30 m at working speed and then check the work pattern.

6.3.10.3 Adjusting the exact following harrow pressure mechanically

CMS-T-00006333-D.1

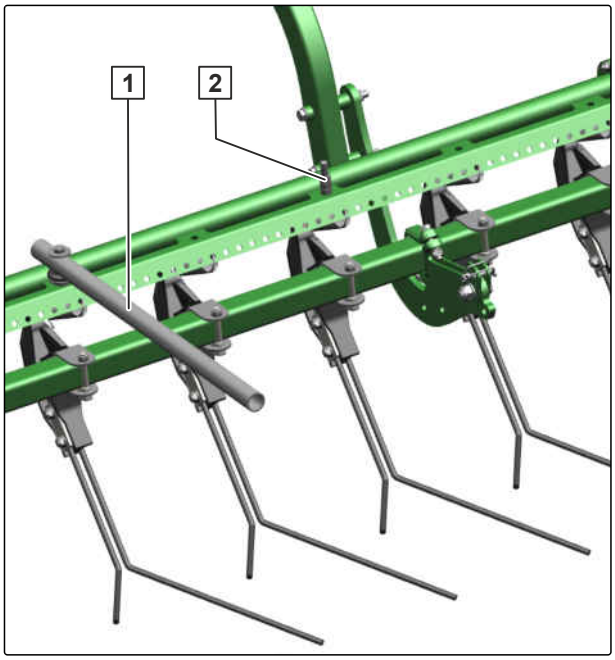
The exact following harrow pressure must be adjusted such that all seed rows are evenly covered with earth. On heavy soils, the pressure must be higher than on light soils.

The exact following harrow pressure is determined by tension springs, which are attached to a rotating tube. To adjust the pressure, a stop is pegged onto the tube. The higher the position of the stop, the greater the exact following harrow pressure.

NOTE

The adjustment of the exact following harrow pressure must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Turn the lever **1** out of the transport lock **2** and pull it up.



CMS-I-00004673

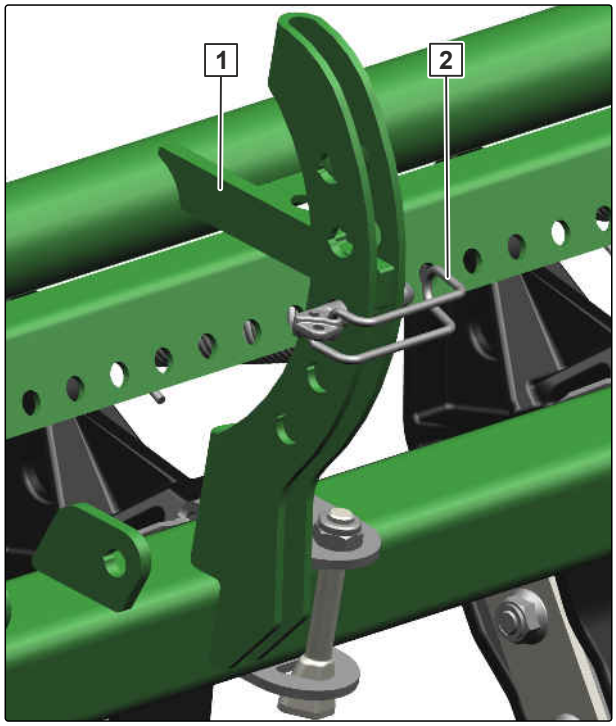
2. *To increase the exact following harrow pressure,*
   remove the linch pin **2** and insert it in a higher hole under the stop **1**

   or

   To reduce the exact following harrow pressure,
   remove the linch pin **2** and insert it in a lower hole under the stop **1**.

3. Relieve the lever and fasten it in the transport lock.

4. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.



CMS-I-00004671

6.3.10.4 Adjusting the exact following harrow pressure hydraulically

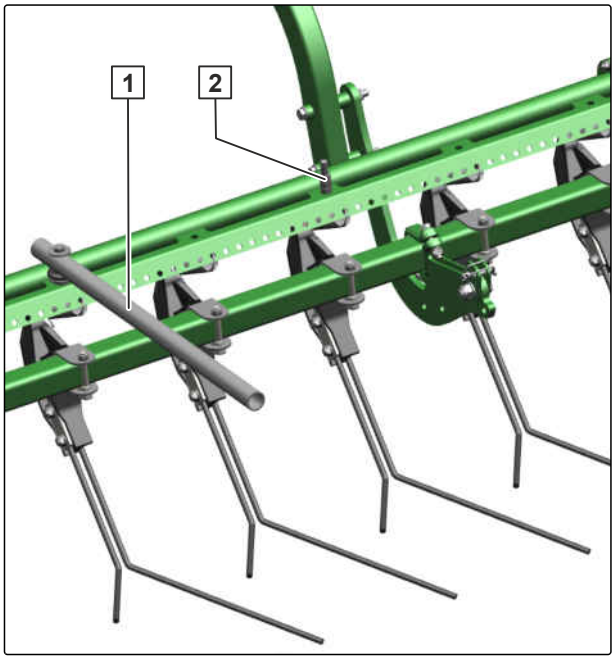
CMS-T-00006338-B.1

The exact following harrow pressure must be adjusted such that all seed rows are evenly covered with earth. On heavy soils, the pressure must be higher than on light soils.

To make adjustments, the minimum pressure and the maximum pressure of the exact following harrow must first be determined by mechanical pegging.

The exact following harrow pressure is then hydraulically adjusted together with the coulter pressure. With higher coulter pressure, higher exact following harrow pressure is also set at the same time.

1. Take the lever 1 out of the transport lock 2 and pull it up.

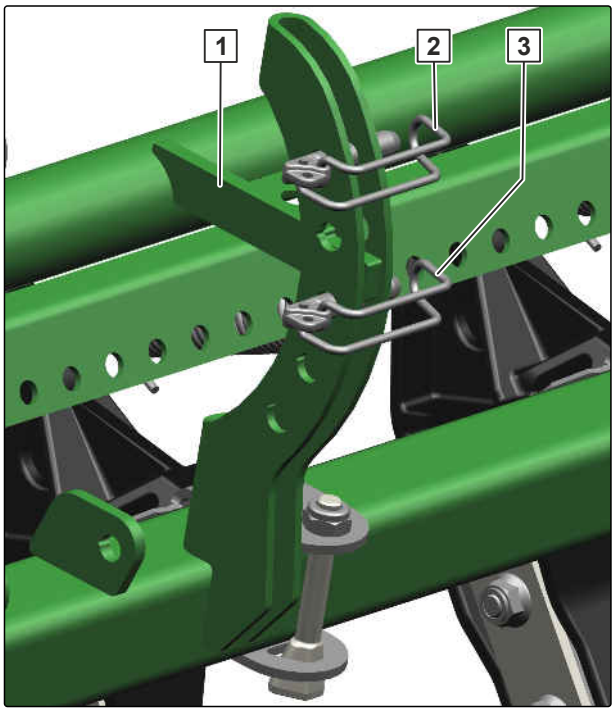


CMS-I-00004673

2. *To define the minimum pressure of the exact following harrow,*
   remove the linch pin 3 and insert it in a the desired hole under the stop 1. The higher the hole, the greater the minimum pressure of the exact following harrow.

3. Relieve the lever and fasten it in the transport lock.

4. *To define the maximum pressure,*
   remove the second linch pin 2 and insert it in the desired hole under the stop 1. The higher the hole, the greater the maximum pressure of the exact following harrow.



CMS-I-00004672

5. *To set the higher exact following harrow pressure,*
   actuate the *"green 1"* tractor control unit

   or

   To set the lower exact following harrow pressure,
   actuate the *"green 2"* tractor control unit.

6. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.

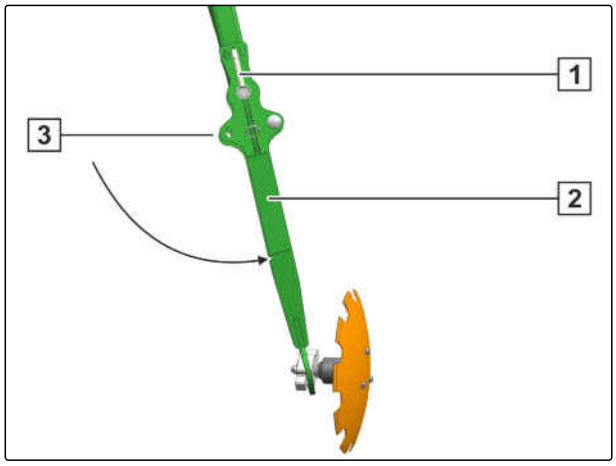
6.3.11 Adjusting the tramline marker on the implement frame

CMS-T-00004373-C.1

6.3.11.1 Unfolding the tramline marker

CMS-T-00004374-C.1

1. Remove the pin **1** from the pegging hole **3**.
2. Move the swivel arm **2** into working position.
3. Insert the pin in the middle hole.
4. *To secure the pin in the adjuster segment,*
   turn the pin down.

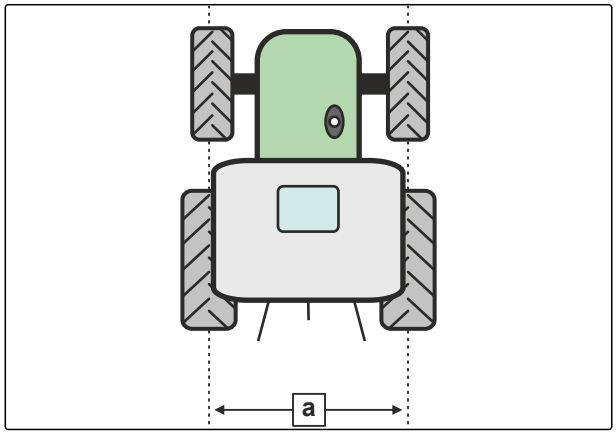


CMS-I-00003168

6.3.11.2 Adjusting the track width

CMS-T-00004375-D.1

1. Determine the tractor track width **a** of the cultivating implement.

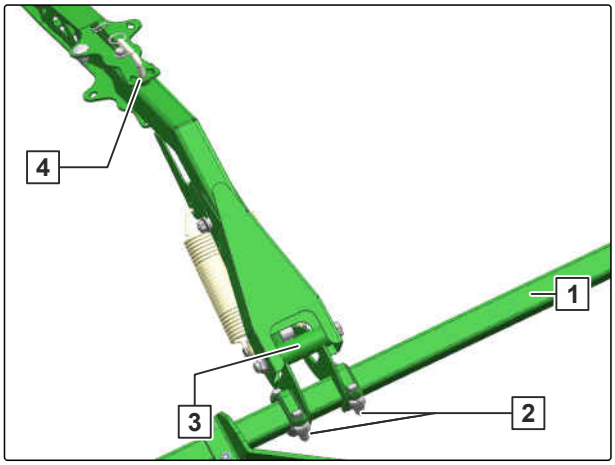


CMS-I-00003195

2. Secure the adjuster segment **4** in the middle hole

   or

   To create a double tramline with a track width of 2.20 m,
   set the track discs at 2.0 m and select the outer holes on the adjuster segment.



CMS-I-00003169

3. Loosen the bolts **2**.

4. *To adjust the tramline marker to the track width of the cultivating implement,*
   move the bracket **3** on the profile tube **1**.

5. Move the track disc to the desired position.

6. Tighten the bolts.

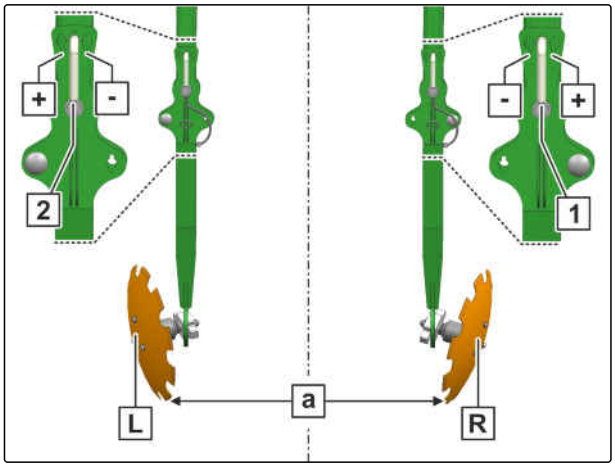
With the adjacent pegging holes, the set track width **a** can be varied.

7. Release the pins **1** and **2** from the pegging hole.

8. *To reduce the track width of the tramline marker by 20 cm,*
   insert the pin in position **-**,

   or

   to increase the track width of the tramline marker by 20 cm,
   insert the pin in position **+**.



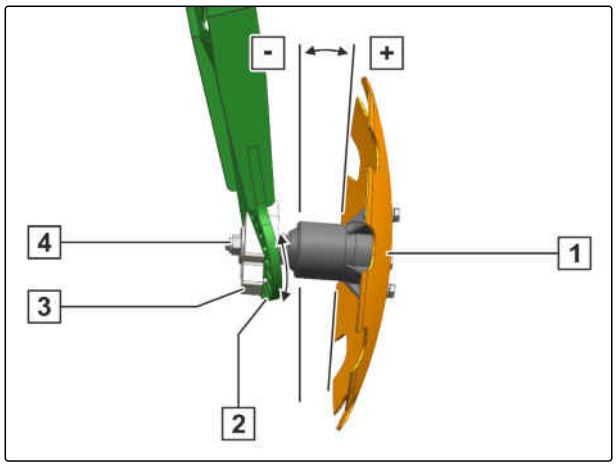
CMS-I-00003170

9. *To secure the pin in the adjuster segment,*
   turn the pin down.

10. *To check the setting,*
    seed for approx. 30 m at working speed and then check the work pattern.

6.3.11.3 Adjusting the track disc pitch

CMS-T-00004377-C.1



CMS-I-00003171

1. loosen the nut **4**.
2. *To increase the effect of the track disc* **1**, increase the pitch

   or

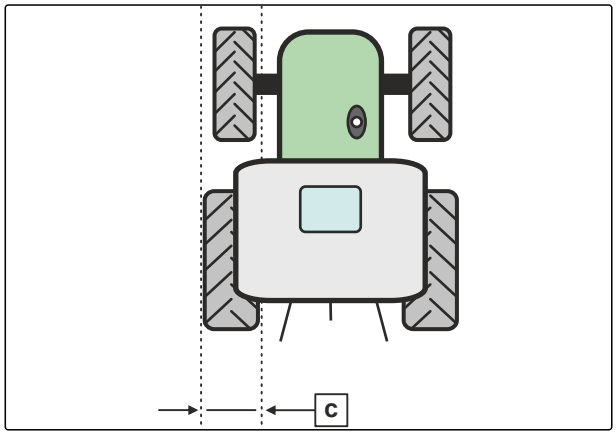
   To reduce the effect of the track disc, reduce the pitch.
3. Move the clamping part **3** in the grid **2** to the desired position.
4. Tighten the nut.
5. *To check the setting,* seed for approx. 30 m at working speed and then check the work pattern.

6.3.11.4 Adjusting the tramline wheelmark width

CMS-T-00004379-C.1

6.3.11.4.1 Installing the tramline segments

CMS-T-00004376-C.1



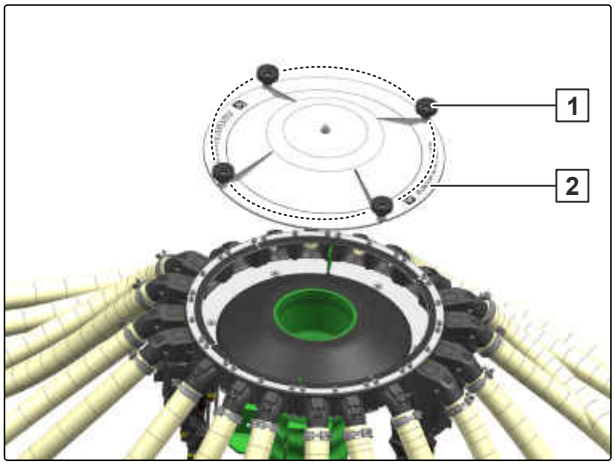
CMS-I-00003196

1. Determine the tractor track width by **c** of the cultivating implement.
2. *Depending on the determined tractor track width,* replace seed outlets with tramline segments

   or

   replace tramline segments with seed outlets.

3. Loosen the four knurled screws 1.
4. Remove the cover 2.

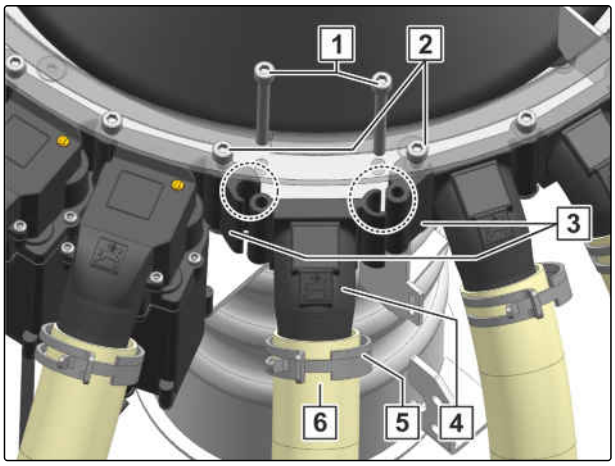


CMS-I-00003190

5. Remove the bolts 1.
6. Loosen the bolts 2.

➡ The intermediate segments 3 are easy to move.

7. Take the seed outlet 4 out of the intermediate segments.
8. Loosen the hose clamp 5.
9. Remove the conveyor hose 6.
10. *Depending on the determined tractor track width and row spacing,*
install an additional tramline segment in the intermediate segment.
11. Install the bolts.
12. Install the adjacent bolts on the intermediate segments.
13. Install the conveyor hose.
14. Install the hose clamp.
15. Install the cover.
16. Tighten the four knurled screws by hand.
17. *To ensure that all tramlines have the same wheelmark width,*
install additional tramline segments for all tramlines.



CMS-I-00003132

18. *For the additional tramline segments to be switched,*
see section *"Connecting tramline segments"*

or

If fewer tramline segments are required,
see section *"Disconnecting tramline segments"*.

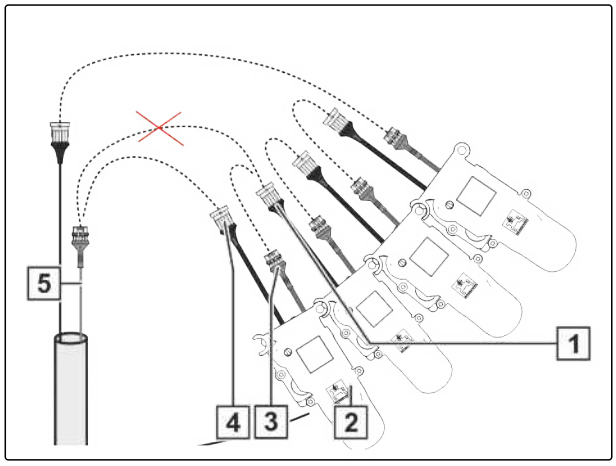
6.3.11.4.2 Connecting additional tramline segments

CMS-T-00004380-C.1

1. Disconnect the plug connection between **1** and **5**.
2. Establish the plug connection between **1** and **3**.
3. Establish the plug connection between **4** and **5**.

➡ The new tramline segment **2** will be switched.

4. *To ensure that all tramlines have the same wheelmark width,*
connect all of the additional tramline segments.



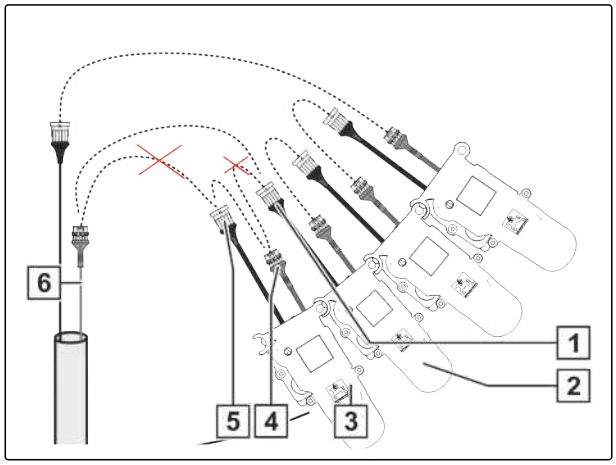
CMS-I-00003194

6.3.11.4.3 Disconnecting tramline segments

CMS-T-00004381-C.1

1. Disconnect the plug connection between **1** and **4**.
2. Disconnect the plug connection between **5** and **6**.
3. *To ensure that the switch on the tramline segment* **2** *is not interrupted,*
Establish the plug connection between **1** and **6**.
4. *To protect against moisture and soiling,*
Establish the plug connection between **4** and **5**.

➡ Tramline segment **3** is without function.



CMS-I-00003193

NOTE

Deactivated tramline segments must be opened. If the flap in the tramline segment is closed, the coulter will not be supplied with seed.

5. *To ensure that all tramlines have the same wheelmark width,*
   disconnect all tramline segments that are not required.

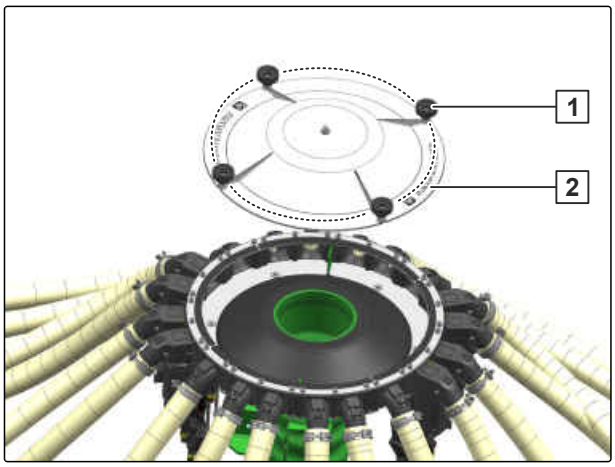
6.3.12 Adjusting the row spacing

For large row spacings, e.g. for seeding maize, individual seed rows can be closed.

1. Loosen the four knurled screws [1].

2. Remove the cover [2].

CMS-T-00004489-D.1



CMS-I-00003190

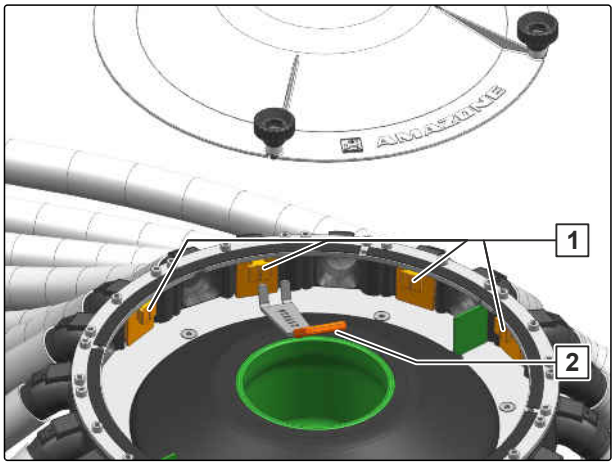
NOTE

A maximum of 50 percent of the seed outlets may be closed off, otherwise the seed is not deposited in the furrow.

3. *To increase the row spacing,*
   use the tool [2] to install the sealing plugs [1] in the seed outlets

   or

   To reduce the row spacing,
   use the tool [2] to remove the sealing plugs [1] from the seed outlets.



CMS-I-00003247

NOTE

The sealing plugs fit only in the seed outlets, since the tramline segments are opened and closed electronically. To keep the tramline segments permanently closed, disconnect the closed tramline segments, see *"Disconnecting tramline segments"*.

4. *To activate tramline control,*
   see *"ISOBUS software"* operating manual

   or

   see *"control computer"* operating manual.

5. *To close all of the tramline segments,*
   see *"ISOBUS software"* operating manual

   or

   see *"control computer"* operating manual.

6. *To permanently deactivate the desired tramline segments,*
   see section *"Disconnecting tramline segments"*.

7. *To open the remaining active tramline segments again,*
   advance the tramline counter.

8. Deactivate tramline control.

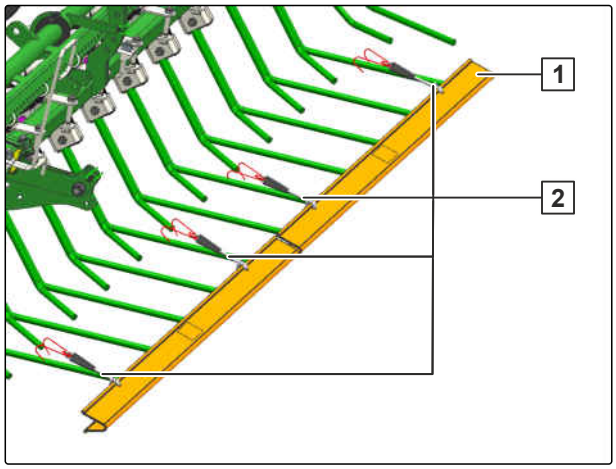
6.4 Preparing the machine for road travel

CMS-T-00004369-D.1

6.4.1 Putting on the road safety bars on the harrow

CMS-T-00010538-A.1

1. Remove coarse dirt from the harrow tines.
2. Push the road safety bars 1 over the tines.
3. Secure the road safety bars with the tensioners 2.
4. Check for firm seating.



CMS-I-00005185

6.4.2 Unfolding the lighting

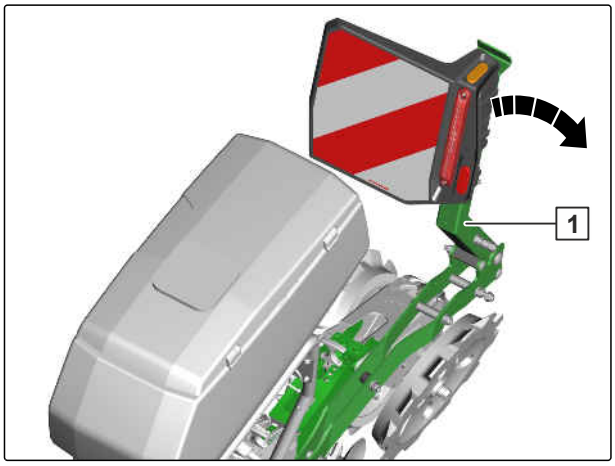
CMS-T-00004420-C.1

REQUIREMENTS

✓ Implement is folded

After the implement has been folded, the lighting must be unfolded. Depending on the implement equipment, the lighting is unfolded manually or hydraulically.

► *For implements without hydraulically folding lighting,*
unfold both lighting panels **1**.

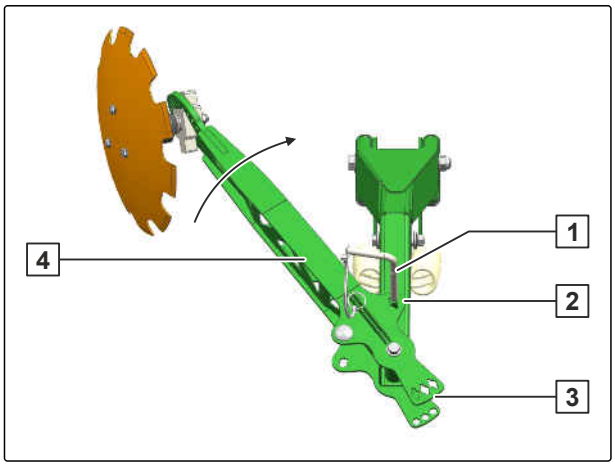


CMS-I-00007408

6.4.3 Folding the tramline marker onto the implement frame

CMS-T-00004422-B.1

1. *To move the track disc out of the ground,*
slightly lift the implement.
2. Remove the pin **1** from the pegging hole **3**.
3. Put the swivel arm **4** into transport position.
4. Peg the swivel arm in transport position **2**.
5. *To secure the pin in the adjuster segment,*
turn the pin down.



CMS-I-00003216

6.4.4 Folding the implement

CMS-T-00004421-A.1

REQUIREMENTS

✓ The road safety bars are installed
✓ The lighting is unfolded
✓ The tramline marker is folded

► *To fold the seeding combination,*
see *"Soil tillage implement"* operating manual.

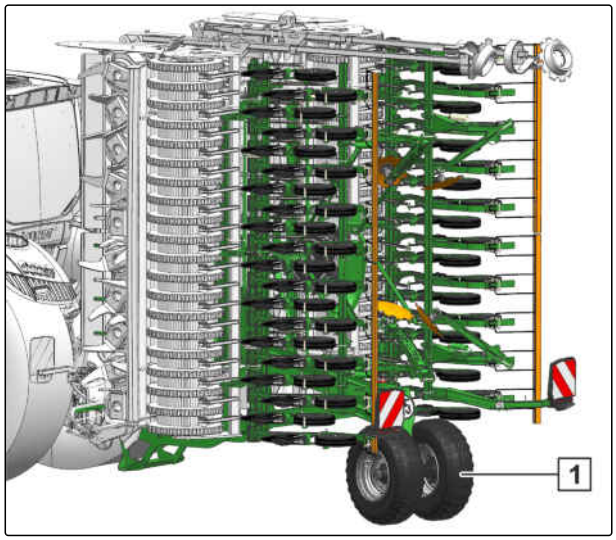
6.4.5 Road travel with an Avant seeding combination

CMS-T-00004497-C.1

1. *To couple the transport frame to the Avant seeding combination,*
see *"Soil tillage implement"* operating manual.

IMPORTANT Moving the seeding combination with the coupled transport frame

- ▶ *The seeding combination with the coupled transport frame may not be moved in the rigid 3-point hitch.*
Put the hydraulic top link in float position.
- ▶ *The transport frame is designed for forwards driving only.*
Lift the implement for manoeuvring.



CMS-I-00003162

2. *To move the hydraulic top link into float position,*
see *"Soil tillage implement"* operating manual.

3. *To move the tractor control unit into float position,*
see *"Soil tillage implement"* operating manual.

NOTE

The maximum permissible speed for the seeding combination, consisting of the front hopper, soil tillage implement, roller and Avant seeding unit, is 25 km/h.

6.5 Calculating the permissible payload

CMS-T-00002254-D.1

WARNING

Risk of accident due to exceeded payload

If the payload is exceeded, the implement can be damaged or/and it can result in uncontrolled driving behaviour of the tractor.

- ▶ Carefully determine the payload of the implement.
- ▶ Never exceed the payload of the implement.

Maximum payload = Permissible technical implement weight - tare weight

1. Read the permissible technical implement weight from the rating plate.

2. *To determine the tare weight,*
   weigh the implement with empty hoppers.

3. Calculate the payload.

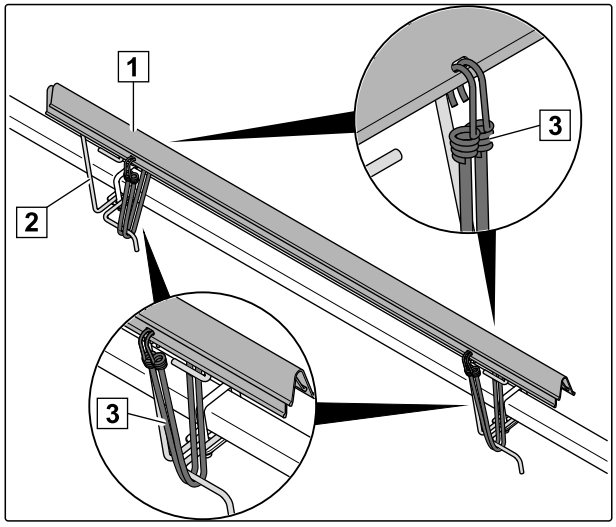
Using the machine 7

CMS-T-00004490-C.1

7.1 Removing the road safety bars

CMS-T-00000091-C.1

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



CMS-I-00000518

7.2 Starting work with one part-width section

CMS-T-00004408-B.1

Some tramline rhythms require that the first field pass be done with half the working width.

1. *To deactivate a conveyor section on implements with 2 distributor heads,*
   see *"Front hopper"* operating manual.
2. *To deactivate one half width on implements with one distributor head,*
   see *"ISOBUS software"* operating manual.
3. *To halve the seed rate when using half the working width,*
   see *"ISOBUS software"* operating manual.

7.3 Using the implement

CMS-T-00004492-C.1

1. Align the implement parallel to the ground.
2. Lower the implement on the field.
3. Move the hydraulic system of the 3-point power lift into float position.
4. Switch on the tractor PTO shaft. Slowly couple the tractor PTO shaft only at an idle or at low tractor engine speed.
5. *To check the settings of the implement,* seed for approx. 30 m at working speed and then check the work pattern.

NOTE

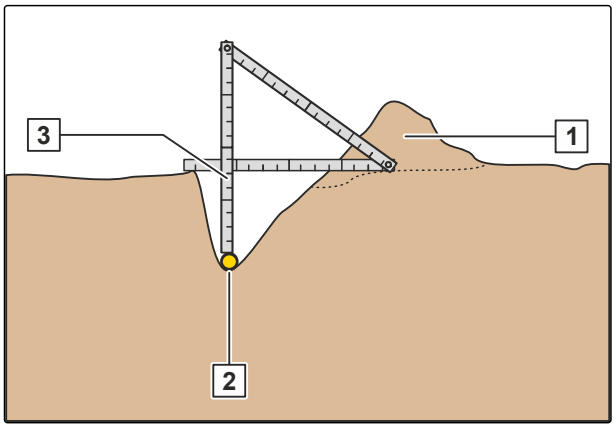
Perform the following visual inspections regularly, e.g. after each reloading with seed:

- Placement depth
- Segment distributor heads
- Coulters
- Metering unit

7.4 Checking the placement depth

CMS-T-00004517-C.1

1. Remove the fine soil 1 over the seed 2.
2. Determine the placement depth 3.
3. Cover the seed with fine soil again.
4. Check the placement depth in several places in a longitudinal and transverse direction relative to the implement.



CMS-I-00003257

7.5 Turning on the headlands

CMS-T-00004491-B.1

NOTE

Lifting the implement causes the metering roller in the metering unit to stop. When the fan is running, seed emerges from the coulters until the conveyor section is empty.

1. *To prevent seed accumulations,*
   give the tractor control unit for the fan drive priority.

2. *To prevent lateral loads when driving in curves on the headlands,*
   Raise the implement.

3. *To avoid damage to the implement,*
   pay attention to obstacles when turning.

4. *When the direction of the implement matches that of the direction of travel,*
   lower the implement.

Eliminating faults

8

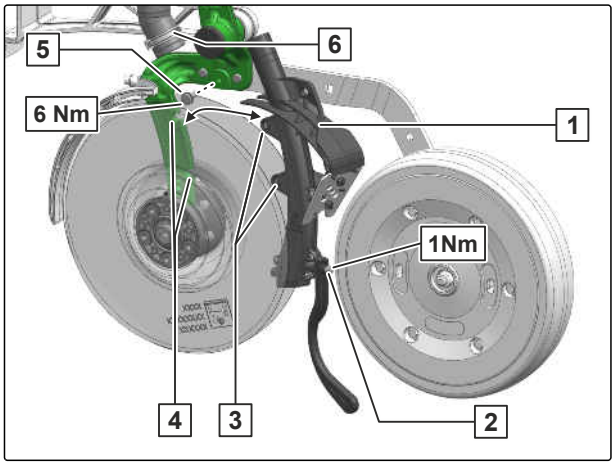
CMS-T-00004444-C.1

Errors	Cause	Solution
The lighting for road travel has a malfunction.	Lamp or lighting supply line is damaged.	► Replace the lamp. ► Replace the lighting supply line.
Control terminal shows a speed error	The speed sensor detects a speed error despite that the implement is running.	► Remove the speed sensor. ► Remove chips from the magnetic sensor surface. ► Install the speed sensor.
The TwinTeC coulter does not fix the seed sufficiently in the furrow	When the seed catcher is worn, the seed is not fixed in the furrow.	see page 80
The TwinTeC coulter does not guide the seed precisely into the furrow	When the guide extension is worn, the seed is not guided into the furrow.	see page 80
TwinTeC cutting discs are blocked	If the inner scraper is worn, the cutting discs are blocked by adhering soil.	see page 81
The exact following harrow does not cover the seed sufficiently with fine soil	The harrow tines are not aligned parallel to the ground.	► See *"Adjusting the position of the harrow tines on seed drills with exact following harrow lift"*
	The exact following harrow pressure is incorrectly set	► See *"Adjusting the exact following harrow"* > *"Adjusting the exact following harrow pressure mechanically"* or *"Adjusting the exact following harrow pressure hydraulically"*
	The harrow tines are worn.	see page 81
The coulter harrow does not cover the seed sufficiently with fine soil	The angle of the coulter harrow is incorrectly set.	► See *"Adjusting the TwinTeC coulter"* > *"Adjusting the harrow angle"*
	The height of the coulter harrow is incorrectly set.	► See *"Adjusting the TwinTeC coulter"* > *"Adjusting the harrow height"*
	The harrow tines of the coulter harrow are worn.	see page 82

Errors	Cause	Solution
The RoTeC coulter is not spreading seed	The seed outlet is slightly blocked.	► Raise the implement. ► Clean the seed outlet from below.
	The seed outlet is strongly blocked.	see page 82
The TwinTeC coulter is not spreading seed	The seed outlet is slightly blocked.	► Raise the implement. ► Clean the seed outlet from below.
	The seed outlet is strongly blocked.	see page 83

The TwinTeC coulter does not fix the seed sufficiently in the furrow

CMS-T-00006593-D.1



CMS-I-00003260

1. Remove the hose **6**

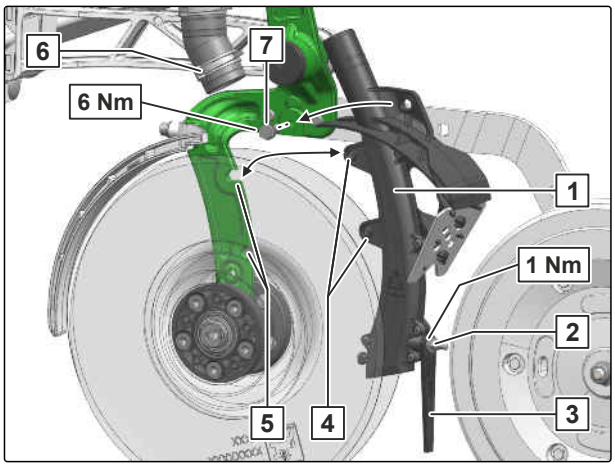
   or

   Remove the Y-piece.

2. Remove the bolt **5**.
3. Remove the TwinTeC seed outlet **1**.
4. Remove the bolt **2**.
5. Replace the seed catcher **3**.
6. Install the bolt.
7. *To install the TwinTeC seed outlet,*
   place the guides **3** in the coulter bodies **4**.
8. Install the bolt.
9. Install the hose.

The TwinTeC coulter does not guide the seed precisely into the furrow

CMS-T-00006594-C.1



CMS-I-00003242

1. Remove the hose **6**

   or

   Remove the Y-piece.

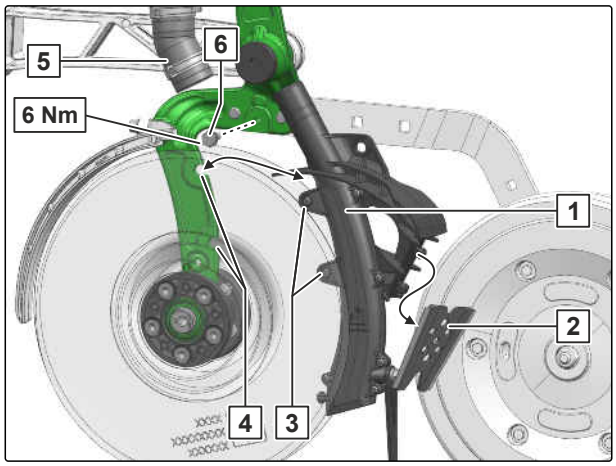
2. Remove the bolt **7**.
3. Remove the TwinTeC seed outlet **1**.
4. Remove the bolt **2**.
5. Replace the guide extension **3**.
6. Install the bolt.
7. *To install the TwinTeC seed outlet,*
   place the guides **4** in the coulter bodies **5**.

8. Install the bolt.

9. Install the hose.

TwinTeC cutting discs are blocked

CMS-T-00006595-C.1



CMS-I-00003245

1. Remove the hose **5**

   or

   Remove the Y-piece.

2. Remove the bolt **6**.

3. Remove the TwinTeC seed outlet **1**.

4. Replace the inner scraper **2**.

5. Install the bolt.

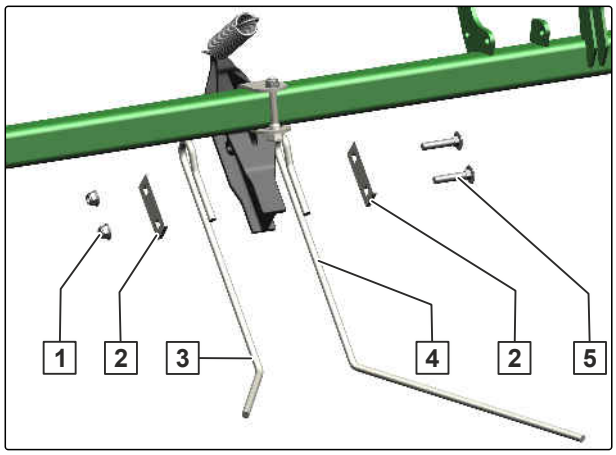
6. *To install the TwinTeC seed outlet,*
   place the guides **3** in the coulter bodies **4**.

7. Install the bolt.

8. Install the hose.

The exact following harrow does not cover the seed sufficiently with fine soil

CMS-T-00010566-A.1



CMS-I-00004677

1. Remove the nuts **1**.

2. Remove the bolts **5** and plates **2**.

3. Replace the harrow tines **3** and **4**.

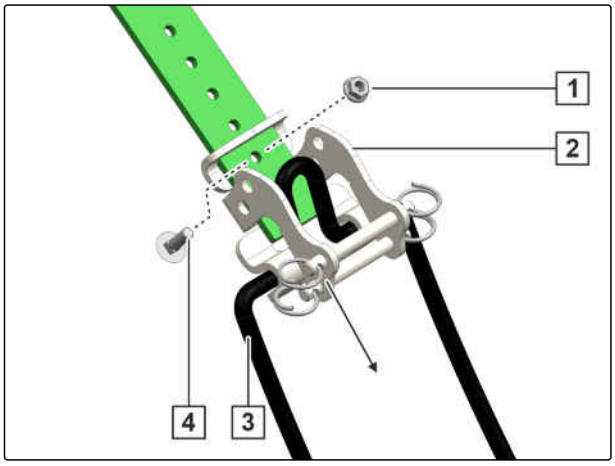
4. Install the plates and bolts.

5. Install the nuts and tighten them.

The coulter harrow does not cover the seed sufficiently with fine soil

CMS-T-00006604-A.1

1. Remove the nut **1**.
2. Remove the bolt **4**.
3. Remove the harrow bracket **2**.
4. Replace the harrow tines **3**.
5. Move the harrow bracket to the desired position.
6. Install the bolt.
7. Install the nut and tighten it.
8. *To check the setting,*
   seed for approx. 30 m at working speed and then check the work pattern.

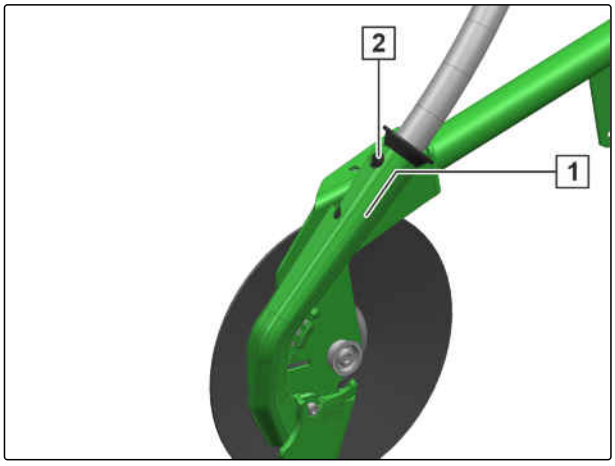


CMS-I-00004632

The RoTeC coulter is not spreading seed

CMS-T-00006606-A.1

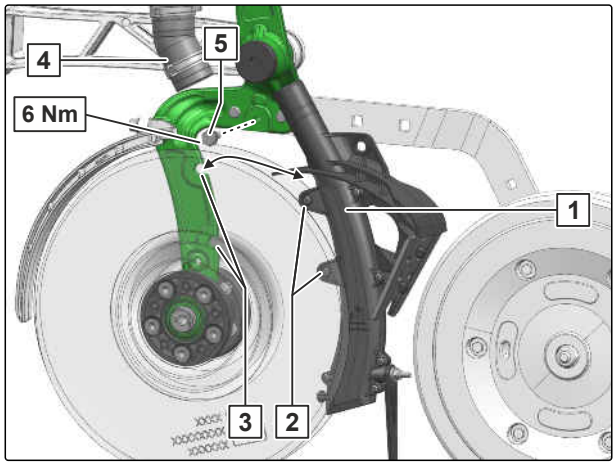
1. *If the blockage cannot be removed from below,*
   Remove the conveyor hose **2**.
2. Clean the seed outlet **1** from above.
3. Install the conveyor hose.



CMS-I-00004767

The TwinTeC coulter is not spreading seed

CMS-T-00006601-B.1



CMS-I-00003246

1. *If the blockage cannot be removed from below,*
   Remove the hose **4**

   or

   Remove the Y-piece.
2. Remove the bolt **5**.
3. Remove the seed outlet **1**.
4. Clean the seed outlet.
5. *To install the seed outlet,*
   place the guides **2** in the coulter bodies **3**.
6. Install the bolt.
7. Install the hose.

Parking the machine

9

CMS-T-00010146-B.1

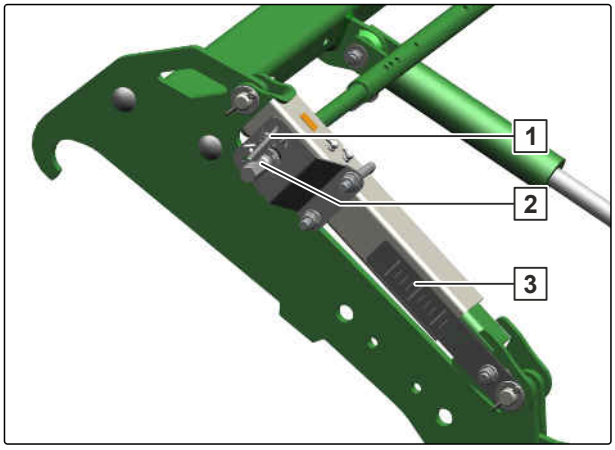
9.1 Parking the TwinTeC coulter

CMS-T-00010423-A.1

1. Lift the implement.
2. Put the universal operating tool on the adjustment spindle **2**.
3. *To reduce the seed placement depth to 0,* turn the universal operating tool counter-clockwise until the display reaches the end of the scale **3**.

➡ The TwinTeC coulters are in parking position.

4. Take off the universal operating tool and allow the catch **1** to engage in a groove of the grid.

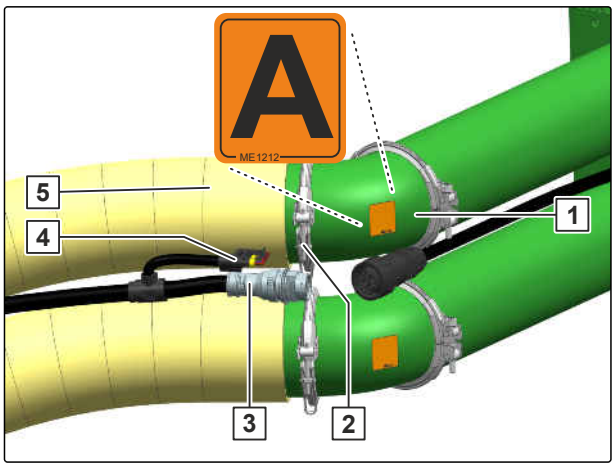


CMS-I-00007102

9.2 Disconnecting the supply lines from the front-mounted hopper

CMS-T-00004440-B.1

1. *To disconnect the conveyor hose* **5** *from the front-mounted hopper* **1**, remove the bracket **2** on the connecting piece.
2. Depending on the implement equipment, disconnect the second conveyor hose from the hose package.
3. Depending on the implement equipment, disconnect the front hopper supply **3** from the hose package.
4. Depending on the implement equipment, disconnect the metering unit shutoff **4** from the hose package.

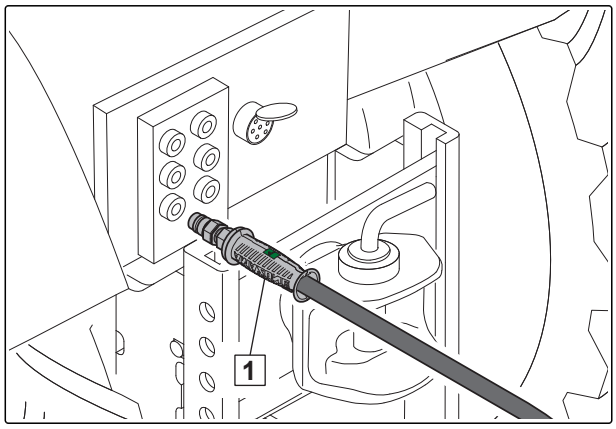


CMS-I-00003124

9.3 Disconnecting the hydraulic hose lines

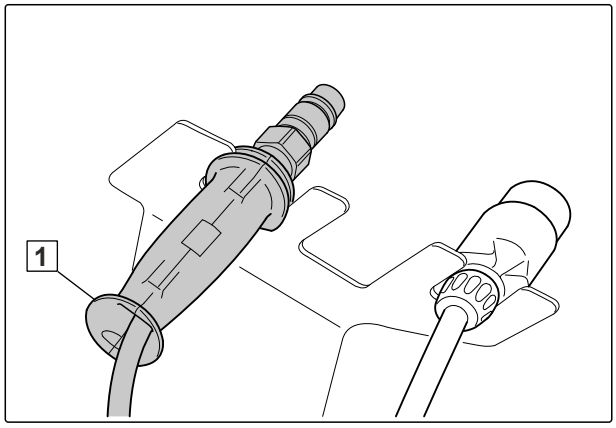
CMS-T-00000277-E.1

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.

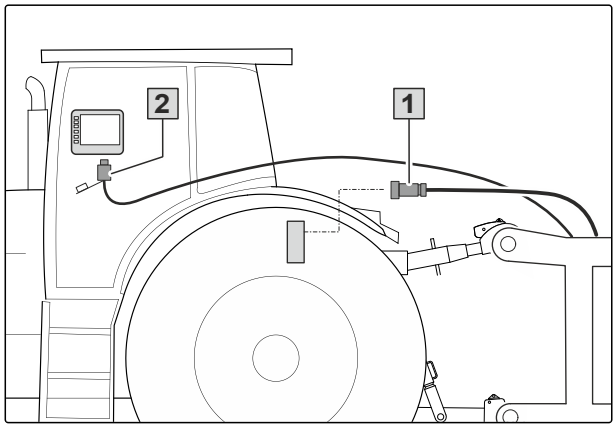


CMS-I-00001250

9.4 Uncoupling the ISOBUS or control computer

CMS-T-00006174-D.1

1. Unplug the connector of the ISOBUS line **1** or the control computer line **2**.
2. Protect the plug with a dust cap.
3. Hang the plug in the hose cabinet.

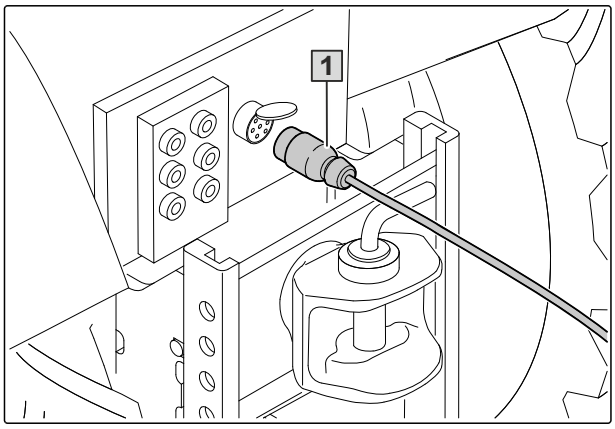


CMS-I-00006891

9.5 Uncoupling the power supply

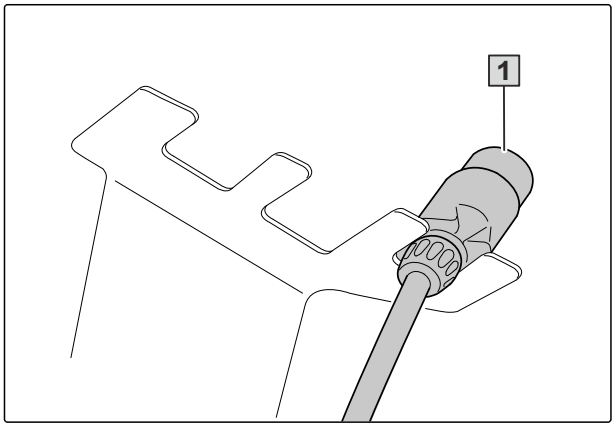
CMS-T-00001402-G.1

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

9.6 Uncoupling the Avant seeding combination

CMS-T-00010565-A.1

WARNING

Risk of injury or even death due to tipping over of the implement

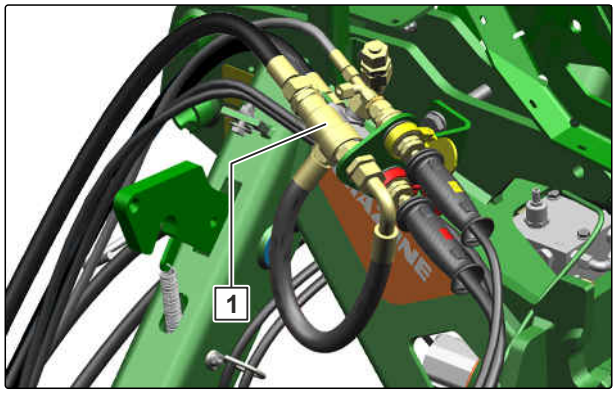
- Park the implement on stable and even ground.

WARNING

Risk of injury or even death due to tipping over of the seeding combination

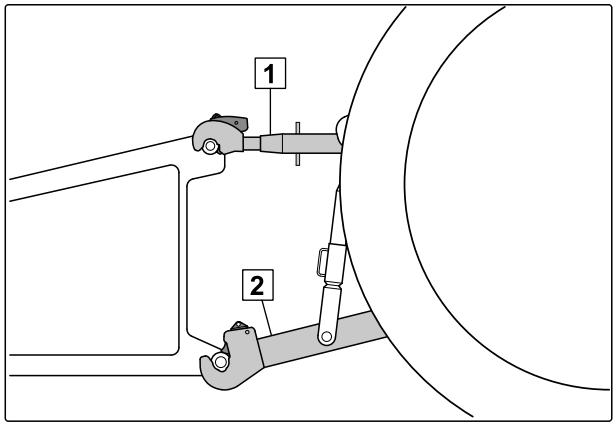
- *Since the parking supports are not designed for the coupled seeding combination,*
  do not park the seeding combination on the parking supports.

1. Depending on the implement equipment, uncouple the pressureless return flow 1 of the front hopper from the soil tillage implement.



CMS-I-00007203

2. Release the top link 1.
3. Disconnect the top link 1 from the implement from the tractor seat.
4. Release the lower links 2.
5. *To secure the Avant seeding combination against rolling away,*
   put 2 pieces of squared timber with a size of at least 80 mm x 80 mm in front of and behind the roller of the soil tillage implement.
6. Uncouple the lower link 2 from the implement from the tractor seat.
7. Drive the tractor forward.



CMS-I-00001249

9.7 Parking the Avant seeding unit separately

CMS-T-00010433-A.1

9.7.1 Parking the seeding unit with 2 distributor heads separately

CMS-T-00004437-C.1

WARNING

Risk of injury or even death due to tipping over of the implement

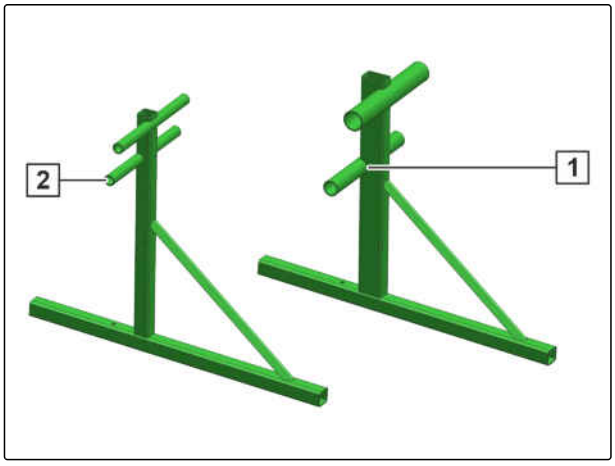
- ▶ Park the implement on stable and even ground.

WARNING

Risk of injury or even death due to tipping over of the seeding combination

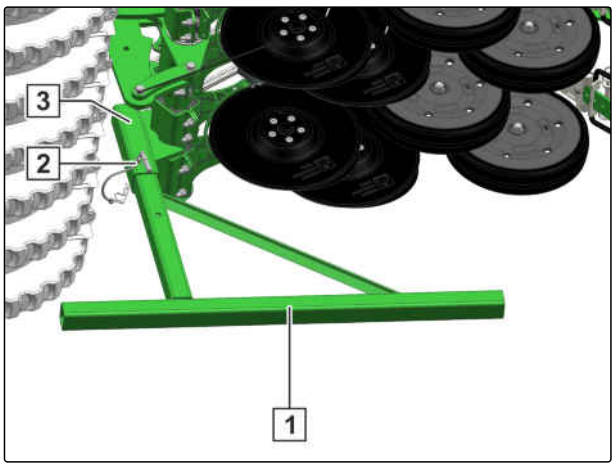
- ► *Since the parking supports are not designed for the coupled seeding combination,*
  do not park the seeding combination on the parking supports.

Parking support 1 for implements with RoTeC coulters. Parking support 2 for implements with TwinTeC coulters.



CMS-I-00004940

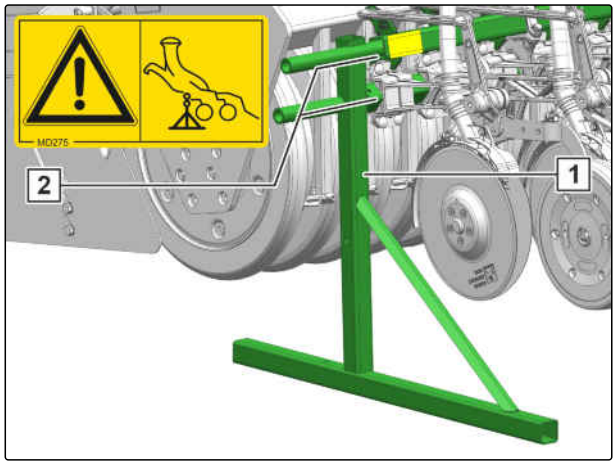
1. *To set the coulter pressure to 0,*
   see section "Adjusting the coulter pressure hydraulically"
2. *To set the placement depth to 0,*
   see section "Adjusting the placement depth on the TwinTeC coulter".
3. Lift the soil tillage implement with the coupled seeding unit.
4. Fold the soil tillage implement with the coupled seeding unit.
5. Slide the inner parking supports 1 in the holder 3 on both sides.
6. Secure the parking supports with pins 2.



CMS-I-00003116

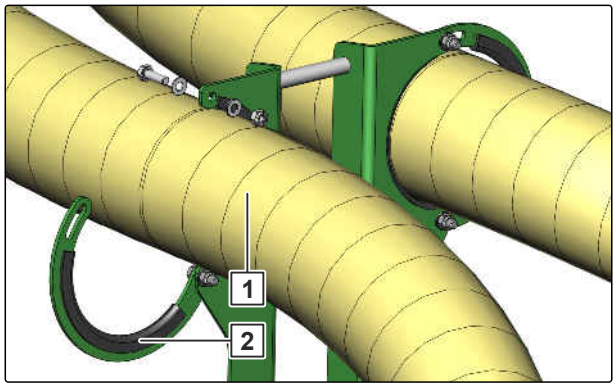
7. Unfold the soil tillage implement with the coupled seeding unit.

8. Install the outer parking supports [1] on the seeding unit [2] on both sides.



CMS-I-00003115

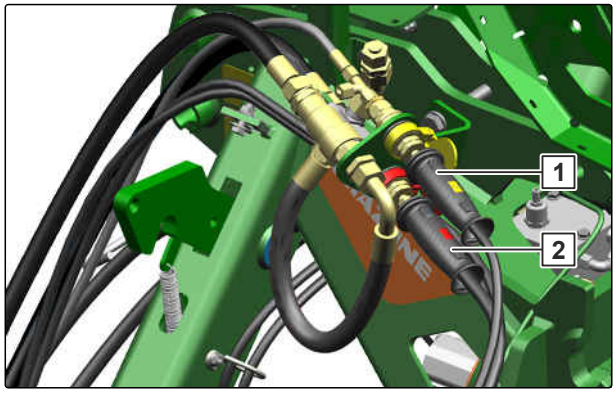
9. Remove the conveyor hoses [1] from the holder [2].



CMS-I-00007108

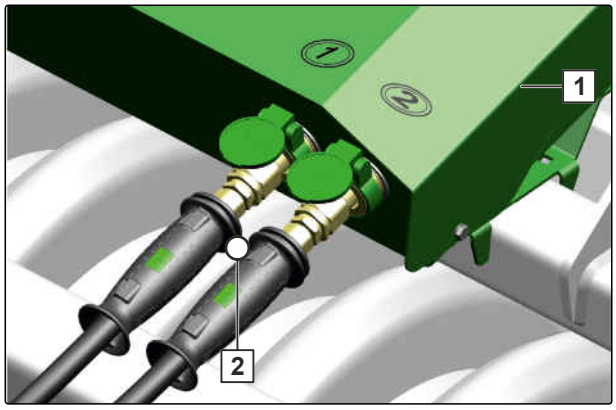
10. *If the seeding unit has a tramline marker,* uncouple the *"yellow 2"* tractor control unit of the seeding unit [1] from the soil tillage implement.

11. Uncouple the *"red T"* pressureless return flow of the seeding unit [2] from the soil tillage implement.



CMS-I-00007103

12. Disconnect the *"green"* tractor control unit of the soil tillage implement [2] from the Comfort hydraulic system of the seeding unit [1].

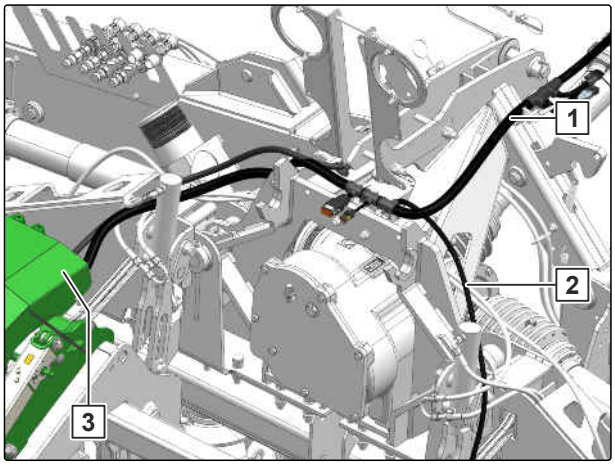


CMS-I-00003127

13. Remove the supply line of the job computer 3 from the centre frame 2.

14. Remove the supply line of the job computer to the interface of the hose package 1.

15. Park all of the electrical and hydraulic supply lines on the seeding unit.

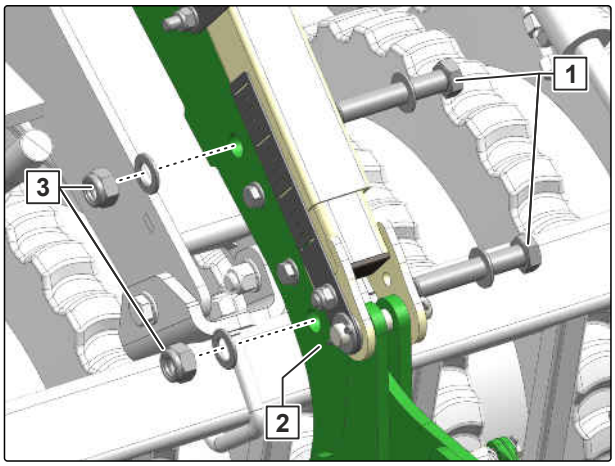


CMS-I-00003138

16. Remove the nuts 3.

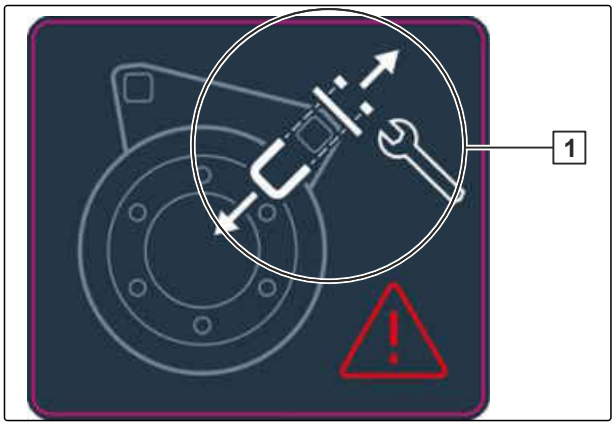
17. Remove the bolts 1 from all of the brackets 2.

➡ The brackets are removed from the roller frame.



CMS-I-00003177

18. Remove the distributor head holder from the roller frame.



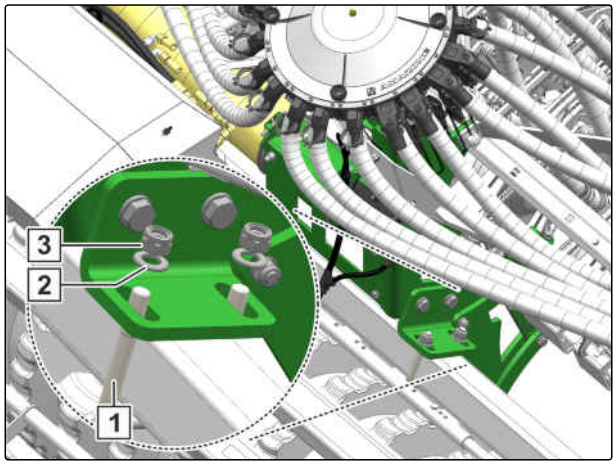
CMS-I-00003250

19. Remove the nuts 3.

20. Remove the washers 2.

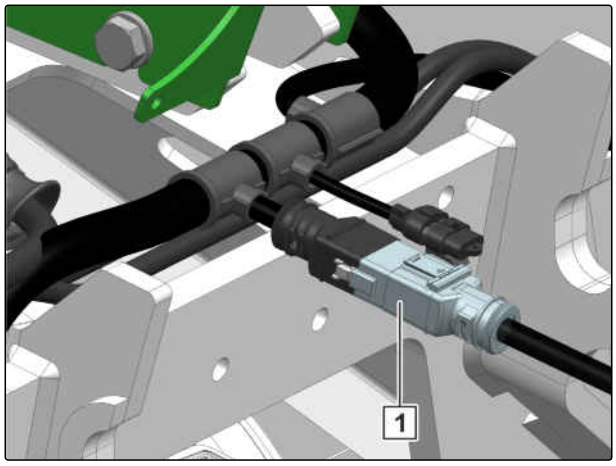
21. Remove the stirrup bolt 1.

22. Disconnect the connection on all distributor head holders.



CMS-I-00003139

23. Disconnect the supply line 1 for the rotary cultivator monitoring.



CMS-I-00003128

24. *To park the implement,*
slowly lower the soil tillage implement.

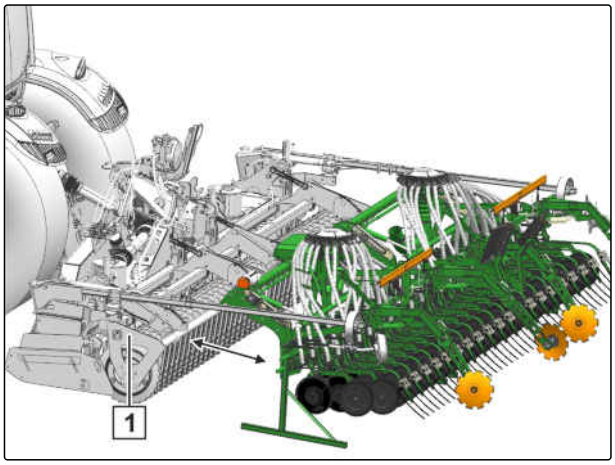
➡ The soil tillage implement 3 is released from the hooks 4 of the seeding unit.

➡ The bracket 1 is no longer resting on the roller frame 2 of the soil tillage implement.

➡ The seeding unit is standing on the parking supports.

CMS-I-00003131

25. Slowly drive the tractor with the coupled soil tillage implement 1 forward.



CMS-I-00003130

9.7.2 Parking the seeding unit with one distributor head separately

CMS-T-00010147-A.1

WARNING

Risk of injury or even death due to tipping over of the implement

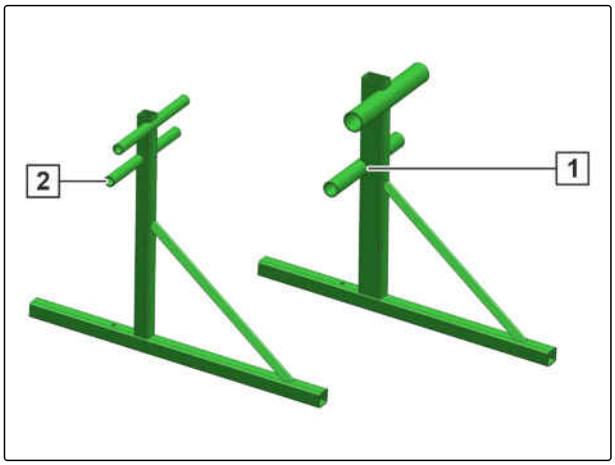
- Park the implement on stable and even ground.

WARNING

Risk of injury or even death due to tipping over of the seeding combination

- *Since the parking supports are not designed for the coupled seeding combination,*
  do not park the seeding combination on the parking supports.

Parking support 1 for implements with RoTeC coulters. Parking support 2 for implements with TwinTeC coulters.



CMS-I-00004940

1. *To set the coulter pressure to 0,*
   see section "Adjusting the coulter pressure hydraulically".

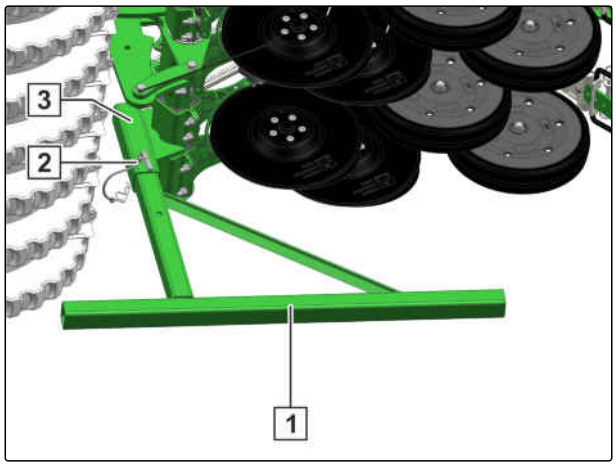
2. *To set the placement depth to 0,*
   see section "Adjusting the placement depth on the TwinTeC coulter".

3. Lift the soil tillage implement with the coupled seeding unit.

4. Fold the soil tillage implement with the coupled seeding unit.

5. Slide the inner parking supports 1 in the holder 3 on both sides.

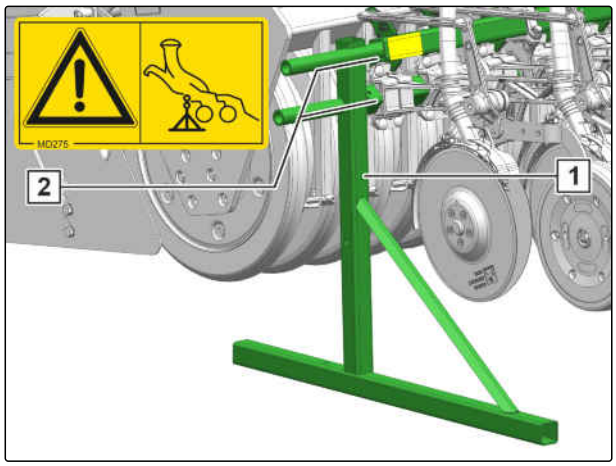
6. Secure the parking supports with pins 2.



CMS-I-00003116

7. Unfold the soil tillage implement with the coupled seeding unit.

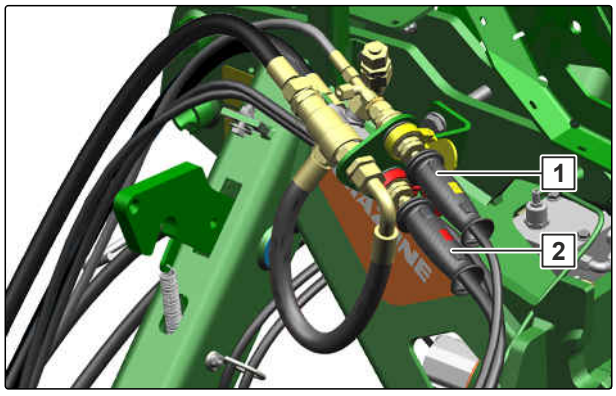
8. Install the outer parking supports 1 on the seeding unit 2 on both sides.



CMS-I-00003115

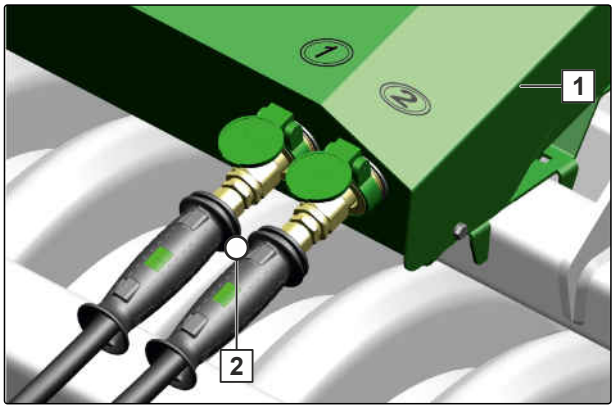
9. Uncouple the *"red T"* pressureless return flow of the seeding unit 2 from the soil tillage implement.

10. *If the seeding unit has a tramline marker,*
    uncouple the *"yellow 2"* tractor control unit of the seeding unit 1 from the soil tillage implement.



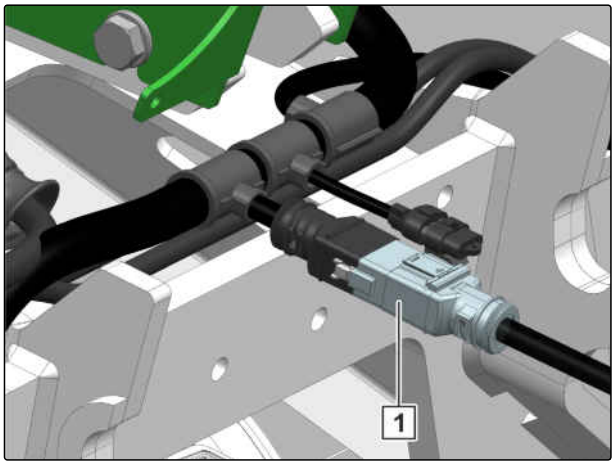
CMS-I-00007103

11. Disconnect the *"green"* tractor control unit of the soil tillage implement **2** from the Comfort hydraulic system of the seeding unit **1**.



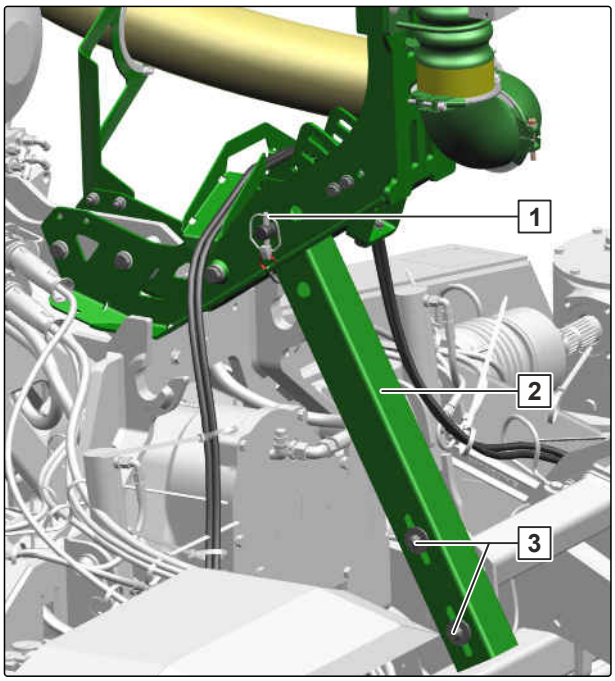
CMS-I-00003127

12. Disconnect the supply line **1** for the rotary cultivator monitoring.



CMS-I-00003128

13. Insert the retaining tube **2**.
14. Install the pin **1** and secure it with the linch pin.
15. Install the bolts **3**.

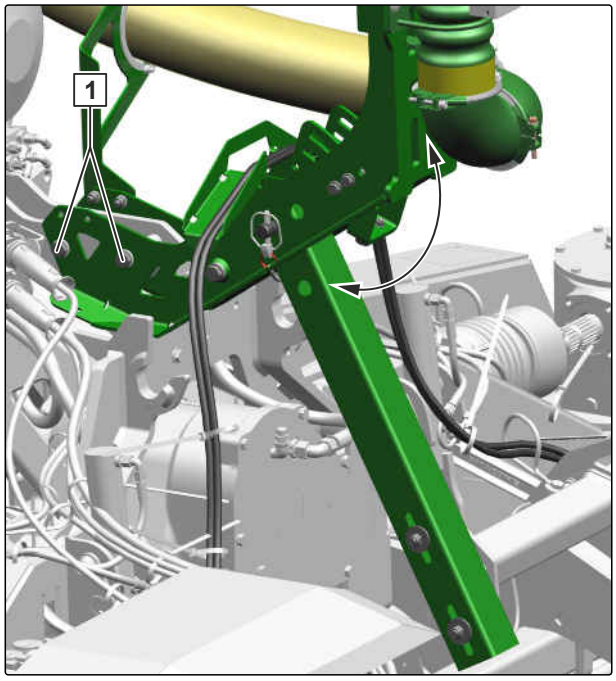


CMS-I-00007113

16. Remove the bolts 1.

17. Swivel the distributor head down.

➡ The distributor head is resting on the retaining tube.

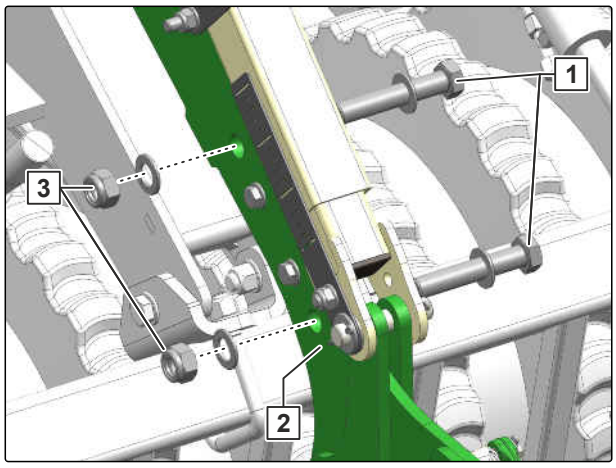


CMS-I-00007114

18. Remove the nuts 3.

19. Remove the bolts 1 from all of the brackets 2.

➡ The brackets are removed from the roller frame.



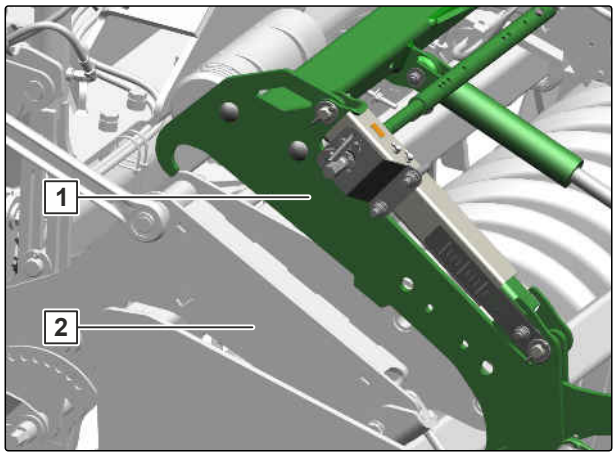
CMS-I-00003177

20. *To park the implement,*
slowly lower the soil tillage implement.

➡ The bracket 1 is no longer resting on the roller frame 2 of the soil tillage implement.

➡ The seeding unit is standing on the parking supports.

21. Slowly drive the tractor with the coupled soil tillage implement forward.



CMS-I-00007099

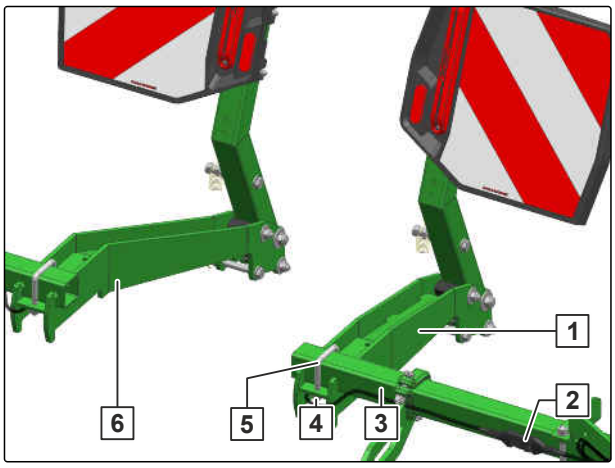
9.8 Installing the lighting on the soil tillage implement

CMS-T-00004442-B.1

NOTE

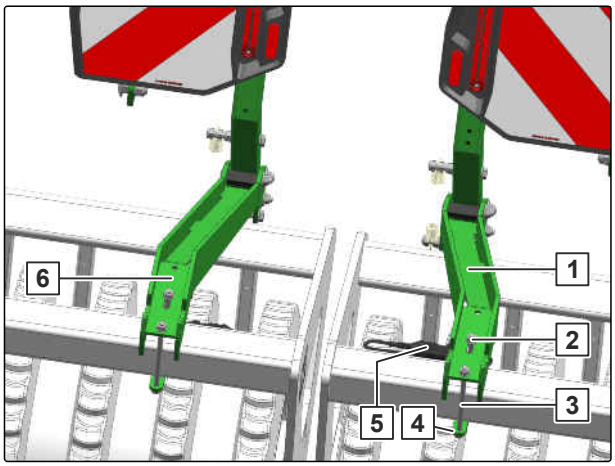
For road travel with the soil tillage implement, the lighting of the seeding unit must be installed on the soil tillage implement.

1. *To remove the lighting holder* **2** *from the seeding unit,*
   remove the stirrup bolt **5** from the retaining tube **3**.
2. Remove the nuts **4** with the washers.
3. Disconnect the electrical connection **2**.
4. Remove the second lighting holder **6**.



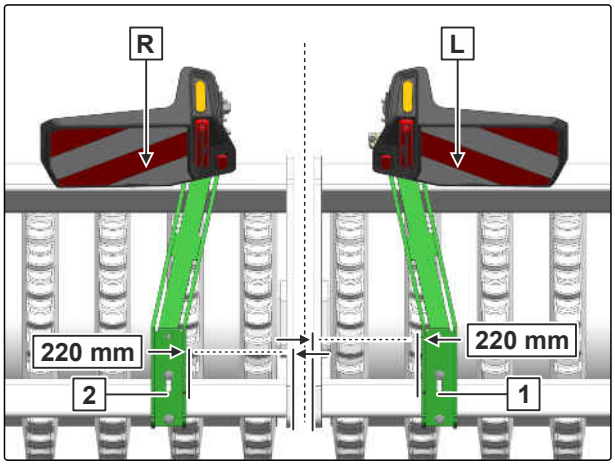
CMS-I-00003223

5. *To install the lighting holder* **1** *on the soil tillage implement,*
   connect the counterholder **4** with the roller frame.
6. Install the bolts **3** as well as the washers and nuts **2**.
7. Establish the electrical connection **5**.
8. Install the second lighting holder **6**.



CMS-I-00003222

9. Align the lighting holders **1** and **2**.
10. Tighten the nuts.



CMS-I-00003220

Repairing the machine 10

CMS-T-00004443-D.1

10.1 Maintaining the machine

CMS-T-00004446-D.1

10.1.1 Maintenance schedule

After initial operation	
Checking the hydraulic hose lines	see page 105

at the end of the season	
Checking the RoTeC depth control discs and RoTeC depth control wheels	see page 102

daily	
Checking the top link pin and lower link pin	see page 105

Every 10 operating hours / daily	
Cleaning the segment distributor head	see page 104

Every 50 operating hours / weekly	
Checking the TwinTeC cutting discs	see page 98
Checking the TwinTeC cutting disc distance	see page 99
Checking the TwinTeC depth control wheel	see page 100
Checking the TwinTeC depth control wheel scraper	see page 101
Checking the cutting discs	see page 103
Checking the RoTeC furrow former	see page 104
Checking the hydraulic hose lines	see page 105

Every 100 operating hours / at the end of the season	
Cleaning the conveyor section	see page 106

10.1.2 Checking the TwinTeC cutting discs

CMS-T-00004452-D.1

INTERVAL

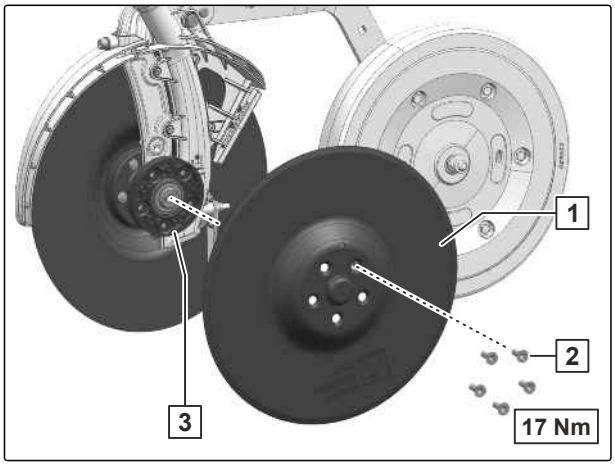
- Every 50 operating hours

  or

  weekly

Original disc diameter	Wear limit
340 mm	300 mm

1. Slightly raise the implement.
2. Determine the cutting disc diameter.
3. *If the diameter of a cutting disc is smaller than the wear limit from the table,*
   replace the TwinTeC cutting disc.
4. Remove the bolts **2**.
5. Remove worn TwinTeC cutting discs **1**.
6. Pay attention to the orientation of the sealing ring **3**.
7. Install new TwinTeC cutting discs.
8. *To ensure that the TwinTeC cutting discs touch slightly,*
   see section *"Checking the TwinTeC cutting disc distance"*.



CMS-I-00003233

10.1.3 Checking the TwinTeC cutting disc distance

CMS-T-00004447-D.1

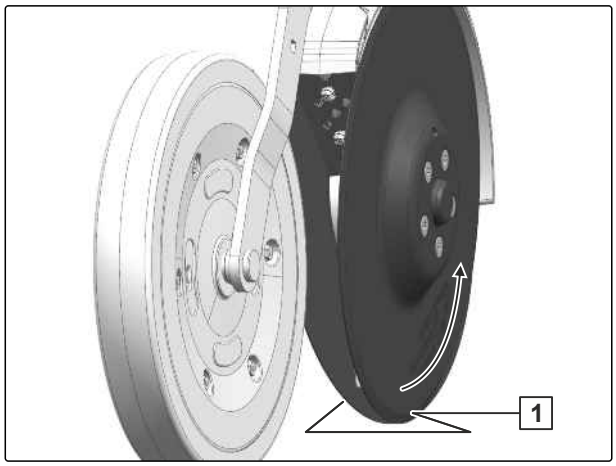
INTERVAL

- Every 50 operating hours
  or
  weekly

1. Rotate the TwinTeC cutting disc **1**.

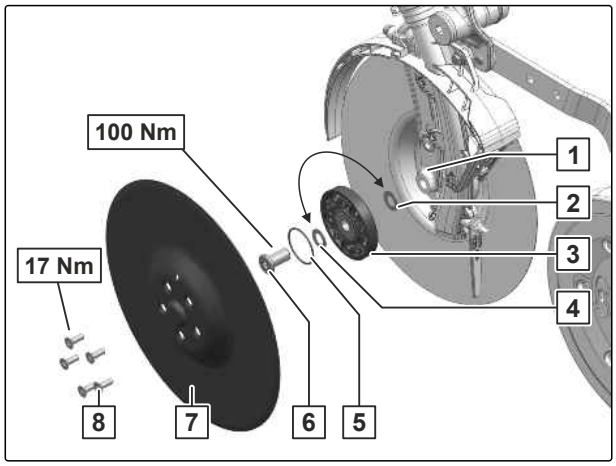
➡ The opposite disc rotates along. The spacing is correctly set.

2. *If the opposite disc does not rotate along,*
   adjust the cutting disc distance.



CMS-I-00003244

3. Remove the bolts **8**.
4. Remove the TwinTeC cutting disc **7**.
5. Remove the sealing ring **5**.
6. Remove the central bolts **6**.



CMS-I-00003234

NOTE

The central bolts have different threads:

- The right central bolt has right-hand thread
- The left central bolt has left-hand thread

7. *To ensure that the TwinTeC cutting discs touch slightly,*
   adjust the spacing of the TwinTeC cutting discs with the spacer discs **4** and **2**.
8. Install spacer discs that are not required on the opposite side of the cutting disc bearing **3** with the central bolt.
9. Install the cutting disc bearing on the coulter **1**.
10. Install the central bolt.

11. *Check the sealing ring before installation.*
Replace in case of damage.
Install the sealing ring.

12. Install the TwinTeC cutting disc.

13. Install the bolts.

10.1.4 Checking the TwinTeC depth control wheel

CMS-T-00004451-C.1

INTERVAL

- Every 50 operating hours

  or

  weekly

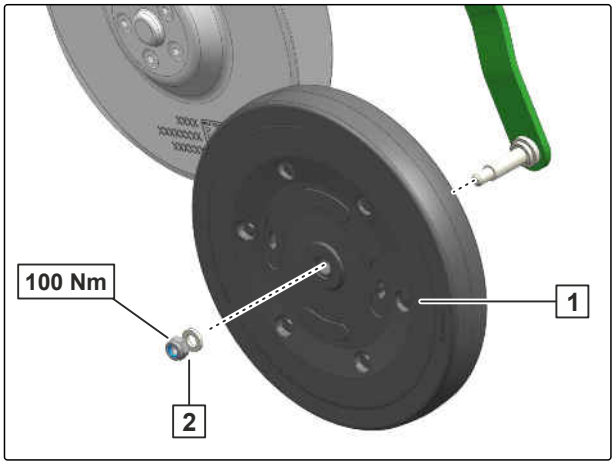
1. Check the TwinTeC depth control wheel 1.

2. *If the TwinTeC depth control wheel has cracks or fractures,*
replace the depth control wheel.

3. Remove the nut and washer 2.

4. Replace the damaged TwinTeC depth control wheel.

5. Install the nut and washer.



CMS-I-00003243

10.1.5 Checking the TwinTeC depth control wheel scraper

CMS-T-00004989-D.1

INTERVAL

- Every 50 operating hours

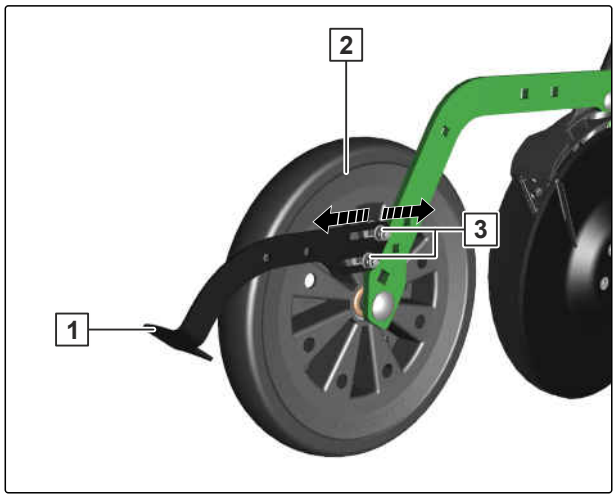
  or

  weekly

IMPORTANT

Damage to the depth control wheel due to abrasion by the scraper

▶ *To check the distance,*
rotate the depth control wheel



CMS-I-00006164

1. Lift the implement.
2. *To check the distance of the TwinTeC depth control wheel scraper* **1**,
   rotate the wheel **2**.
3. *If the distance is larger or smaller than 3 mm,*
   loosen the nut **3**.
4. Adjust the TwinTeC depth control wheel scraper **1**.
5. Tighten the nut.
6. *To check the distance,*
   Rotate the wheel again.
7. *If the TwinTeC depth control wheel scraper cannot be readjusted any further,*
   replace the press roller scraper.
8. Remove the nut and washer.
9. Replace the TwinTeC depth control wheel scraper.
10. Install the washer and nut.
11. *To check the distance,*
    rotate the wheel.

10.1.6 Checking the RoTeC depth control discs and RoTeC depth control wheels

CMS-T-00006349-C.1

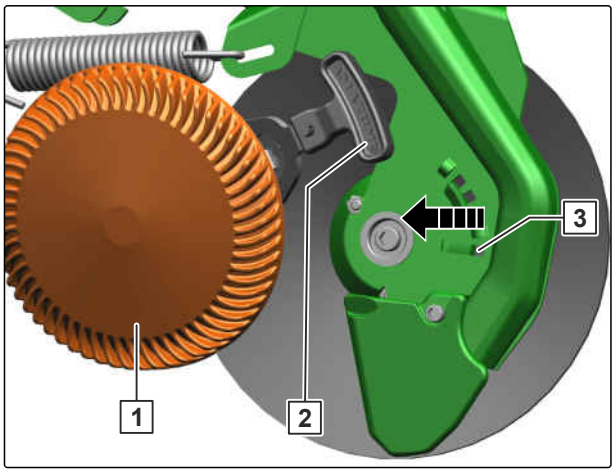
INTERVAL

- at the end of the season

1. Check the RoTeC depth control discs or RoTeC depth control wheels for damage such as cracks or fractures.

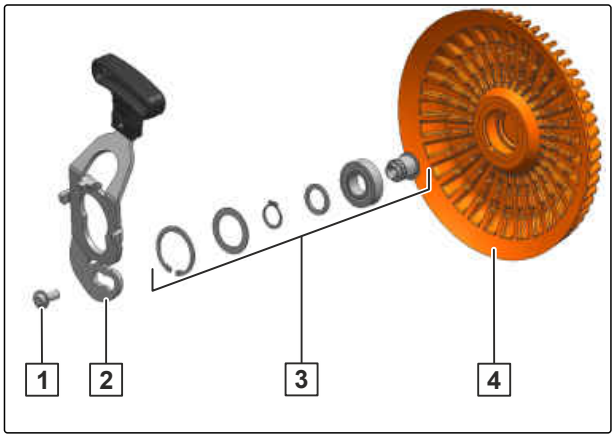
2. *If a RoTeC depth control disc or RoTeC depth control wheel is damaged,*
   replace the RoTeC depth control disc or RoTeC depth control wheel.

3. *To remove the damaged RoTeC depth control disc or RoTeC depth control wheel* **1** *from the coulter,*
   move the lever all the way down and push it to the rear in the elongated slot **3** until the RoTeC depth control disc or RoTeC depth control wheel can be removed.



CMS-I-00004665

The removed unit consisting of RoTeC depth control disc or RoTeC depth control wheel **4** and lever **2** can be replaced as a whole or further disassembled. If only the RoTeC depth control disc or RoTeC depth control wheel should be replaced, the unit must be further disassembled as described in the following.



CMS-I-00004802

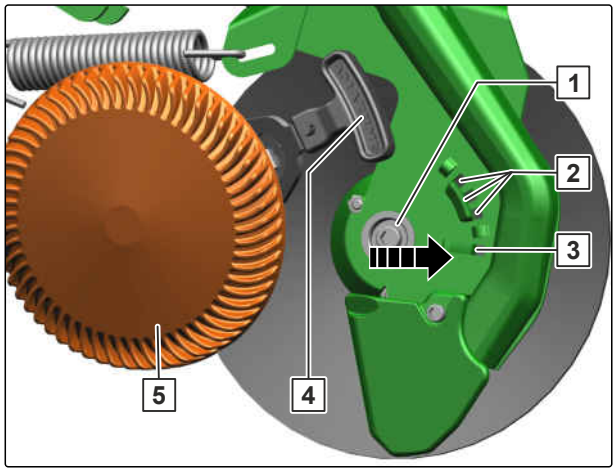
4. Remove the bolt **1**.

5. Take the axle, ball bearing, locking rings and locking washers **3** out of the worn RoTeC depth control disc or RoTeC depth control wheel and insert them in the new RoTeC depth control disc or RoTeC depth control wheel.

6. Install the lever **2** with the bolt **1** on the new RoTeC depth control disc or RoTeC depth control wheel **4**.

7. *To install the new RoTeC depth control disc or RoTeC depth control wheel* **5** *on the coulter,* set the notch of the lever **4** on the bearing seat **1** of the cutting disc, press it firmly against the RoTeC depth control disc or RoTeC depth control wheel and pull the lever towards the front in the elongated slot **3** until the RoTeC depth control disc or RoTeC depth control wheel completely engages.

8. *To adjust the placement depth,* pull on the lever for the RoTeC depth control disc or RoTeC depth control wheel, move it up and engage it in the desired hole **2**.



CMS-I-00004836

10.1.7 Checking the cutting discs

CMS-T-00006335-A.1

INTERVAL

- Every 50 operating hours

  or

  weekly

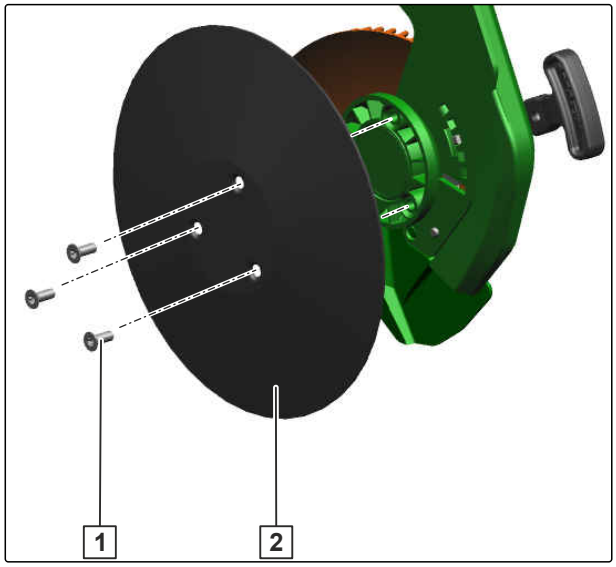
1. Determine the diameter of the cutting discs.

2. *If the diameter of a cutting disc is smaller than 289 mm,* replace the cutting disc.

3. *To replace the cutting disc,* remove the bolts **1** on the front side of the cutting disc.

4. Replace the worn cutting disc **2**.

5. Install the bolts.



CMS-I-00004584

10.1.8 Checking the RoTeC furrow former

CMS-T-00006374-A.1

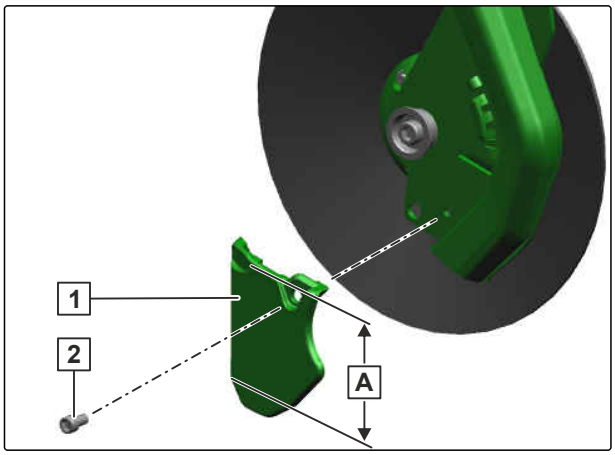
INTERVAL

- Every 50 operating hours

  or

  weekly

1. Remove the depth control disc or depth control wheel.
2. *When the indicated measurement* **A** *on a furrow former is smaller than 98 mm,* replace the furrow former.
3. *To replace the furrow former,* remove the bolt **2** and dispose of it.
4. Replace the worn furrow former **1**.
5. Install the a new bolt **2**. The bolts for the furrow former are coated and may not be reused.



CMS-I-00004667

10.1.9 Cleaning the segment distributor head

CMS-T-00004448-F.1

INTERVAL

- Every 10 operating hours

  or

  daily

NOTE

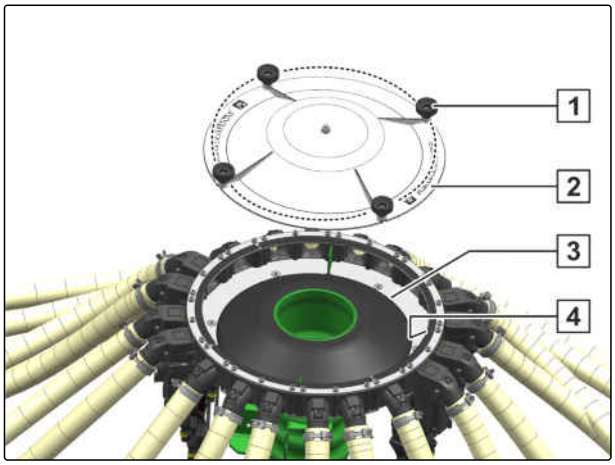
The segment distributor head must be kept free of dust, deposits, and foreign objects.

Shorten the checking intervals under very dusty conditions.

WARNING

Risk of chemical burns by dressing dust

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



CMS-I-00003133

1. Loosen the four knurled screws **1**.

2. Remove the cover **2**.

3. Clean the segment distributor head **3** using a paint brush, hand brush or with compressed air.

4. Clean the seed outlets and tramline segments **4** using a paint brush, hand brush or with compressed air.

5. Install the cover.

6. Tighten the four knurled screws by hand.

10.1.10 Checking the top link pin and lower link pin

CMS-T-00002330-H.1

INTERVAL

- daily

1. Check the top link pins and lower link pins for cracks or broken areas.

Permissible wear	2 mm

2. Replace the pins if there is significant wear.

10.1.11 Checking the hydraulic hose lines

CMS-T-00002331-C.1

INTERVAL

- After initial operation
- Every 50 operating hours

  or

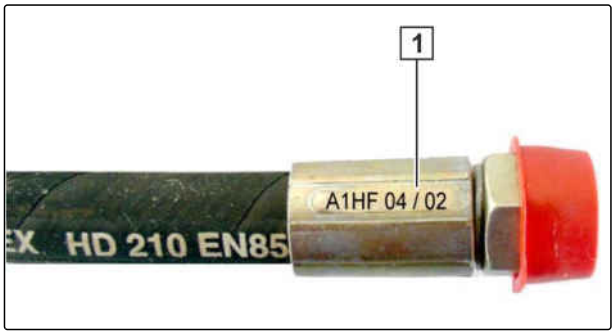
  weekly

1. Check the hydraulic hose lines for damage, such as chafing point, cuts, tears and deformation.

2. Check the hydraulic hose lines for leaks.

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

3. Check the manufacturing date **1**.



CMS-I-00000532

4. Have any worn, damaged or aged hydraulic hose lines immediately replaced at a specialist workshop.

5. Retighten loose bolted connections.

10.1.12 Cleaning the conveyor section

CMS-T-00006621-A.1

INTERVAL

- Every 100 operating hours

  or

  at the end of the season

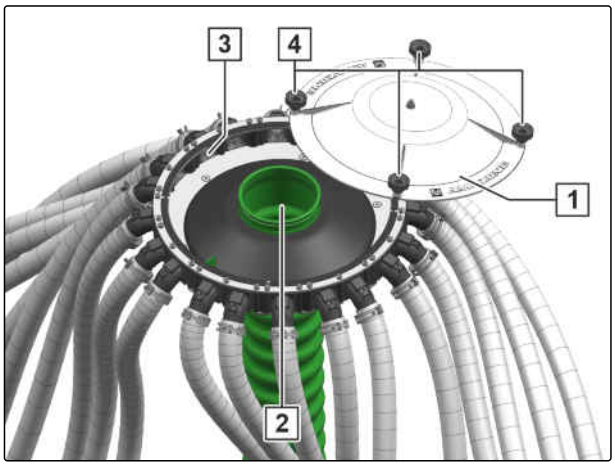
1. Loosen the 4 knurled screws **4**.

2. Remove the cover **1**.

3. *To remove the deposits,*
   aim a water jet into the seed outlets **3** and into the corrugated tube **2**.

4. Install the cover.

5. Tighten the 4 knurled screws by hand.



CMS-I-00004702

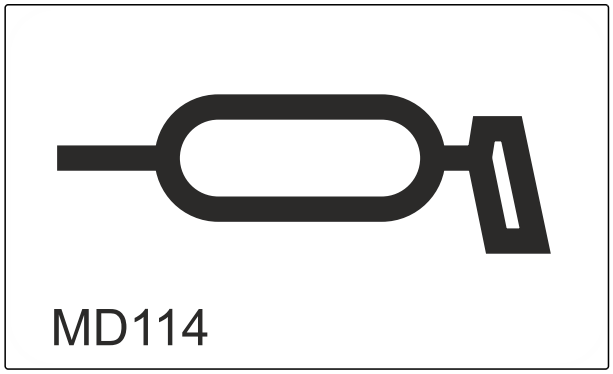
10.2 Lubricating the implement

CMS-T-00004453-C.1

IMPORTANT

Implement damage due to improper lubrication

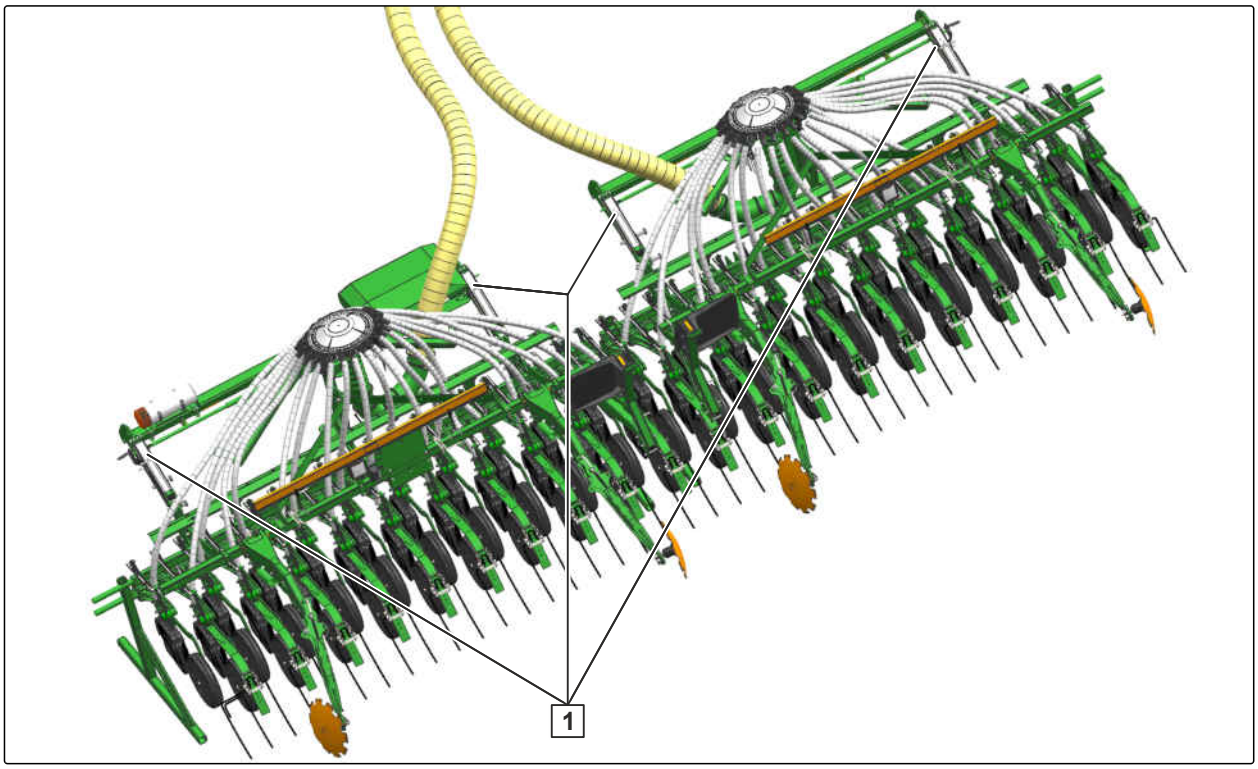
- Grease the implement at the marked lubrication points according to the lubrication schedule.
- *To ensure that dirt is not pressed into the lubrication points,*
  thoroughly clean the grease nipples and the grease gun.
- Only grease the implement with the lubricants listed in the technical data.
-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



CMS-I-00002270

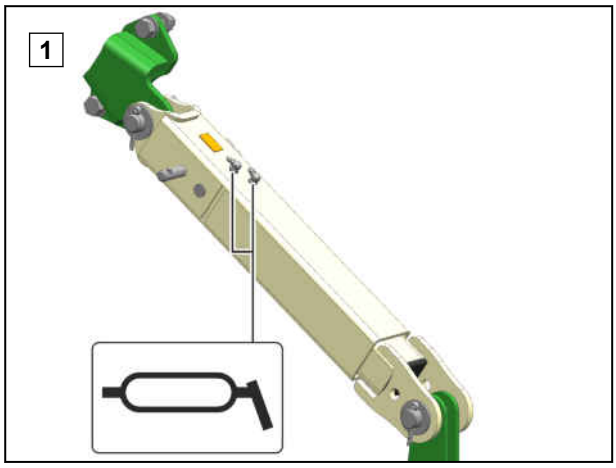
10.2.1 Overview of lubrication points

CMS-T-00004454-B.1



CMS-I-00003232

Every 100 operating hours



CMS-I-00003231

10.3 Cleaning the implement

CMS-T-00000593-F.1

IMPORTANT

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

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

CMS-I-00002692

- Clean the machine with a high-pressure cleaner or a hot water high-pressure cleaner.

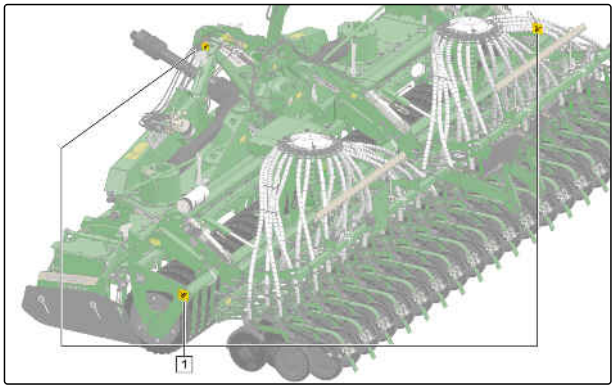
Loading the machine 11

CMS-T-00004493-B.1

11.1 Lashing the machine

CMS-T-00004859-B.1

The implement has 3 lashing points for lashing straps.



CMS-I-00003497

WARNING

Risk of accidents due to improperly attached lashing straps

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

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

REQUIREMENTS

✓ The Avant seeding unit is coupled to a soil tillage implement

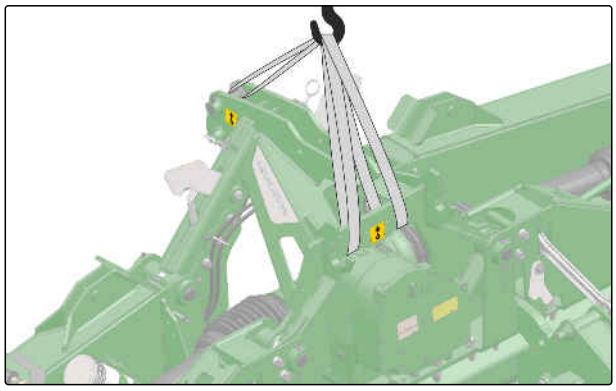
✓ The implement is unfolded

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

11.2 Lifting the implement

CMS-T-00004154-B.1

The implement has 3 lashing points for slings for lifting.



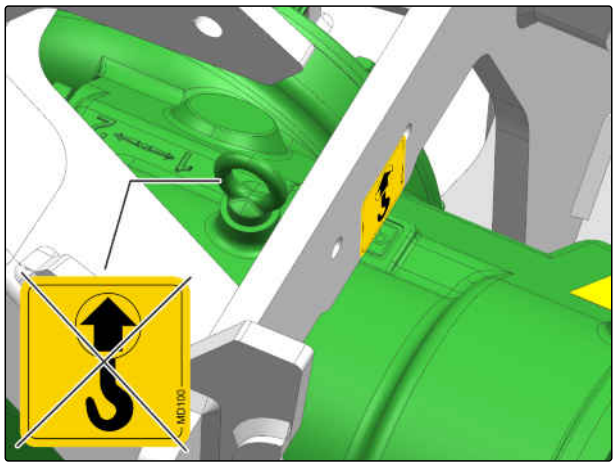
CMS-I-00003268

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.
- *To determine the required load-bearing capacity of the slings,*
  observe the specifications in the following table.



CMS-I-00003269

Required load-bearing capacity per sling	4000 kg

REQUIREMENTS

✓ The implement is unfolded

1. Attach the slings for lifting on the intended lashing points.

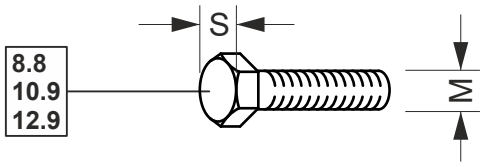
2. Slowly lift the implement.

Appendix 12

CMS-T-00003775-D.1

12.1 Bolt tightening torques

CMS-T-00000373-E.1



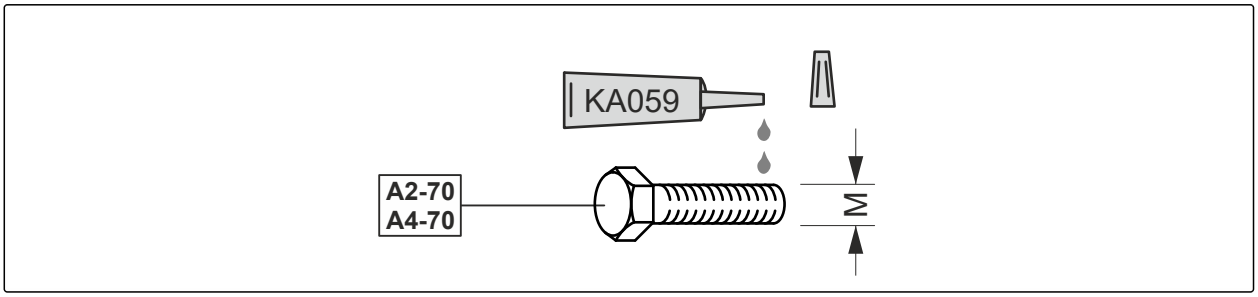
CMS-I-000260

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

12.2 Other applicable documents

CMS-T-00003776-A.1

- Tractor operating manual
- Soil tillage implement operating manual
- ISOBUS software operating manual
- Control terminal operating manual

Directories 13

13.1 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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