

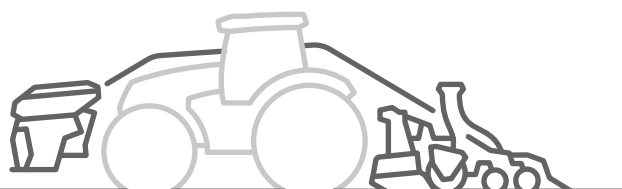


# Original operating manual

Mounted seeding combination

Avant 3002 seeding unit

Avant 4002 seeding unit



SmartLearning



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

Maschinen-Nr.

Fahrzeug-Ident-Nr.

Produkt

zul. technisches Maschinengewicht kg  Modelljahr

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



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# About this operating manual

# 1

CMS-T-00000081-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-C.1

## 2.1 Basic safety instructions

CMS-T-00004921-C.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 had understood the operating manual and can implement the information that is conveyed in the operating manual.
- The person must be familiar with safe driving of vehicles.
- For road travel, the person knows the relevant road traffic regulations and has the prescribed driving permit.

#### 2.1.2.1.2 Qualification levels

CMS-T-00002311-A.1

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

- Farmer
- Agricultural helper

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

#### 2.1.2.1.3 Farmer

CMS-T-00002312-A.1

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

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

**Farmers can be e.g.:**

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

**Activity example:**

- Safety training for agricultural helpers

**2.1.2.1.4 Agricultural helpers**

CMS-T-00002313-A.1

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

**Agricultural helpers can be e.g.:**

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

**Activity examples:**

- Driving the machine
- Adjusting the working depth

**2.1.2.2 Workplaces and passengers**

CMS-T-00002307-B.1

**Passengers**

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

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

#### 2.1.2.3 Danger for children

CMS-T-00002308-A.1

##### **Danger for children**

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

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

#### 2.1.2.4 Operational safety

CMS-T-00002309-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-A.1

##### **2.1.3.1 Safety hazards on the machine**

CMS-T-00004924-A.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 hydraulic hoses or check them 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-A.1

#### Dangers areas on the machine

The following basic dangers are encountered in the danger areas:

The implement and its work tools move during operation.

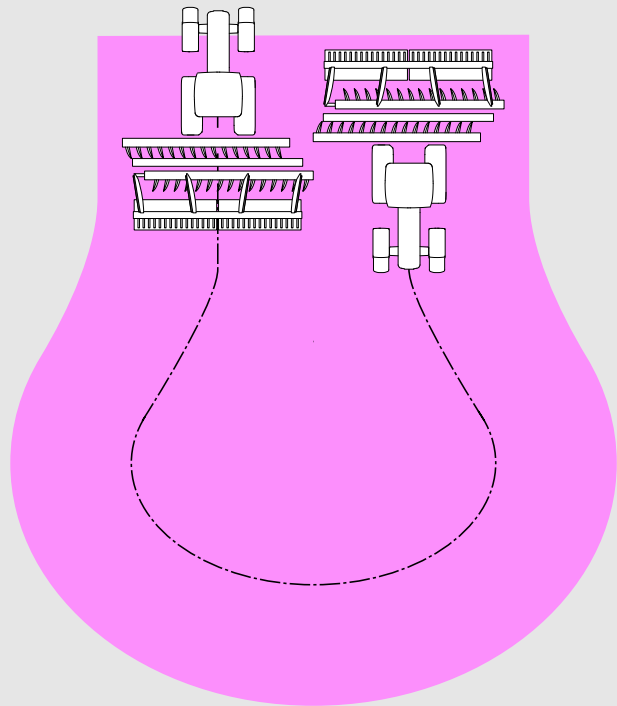
Hydraulically raised machine parts can descend unnoticed and slowly.

The tractor and implement can roll away unintentionally.

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

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

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



CMS-I-001131

## 2.1.4 Safe operation and handling of the machine

CMS-T-00002304-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-A.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 carrying implement. The carrying 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 carrying implement at the rear of a tractor that meets the technical requirements.
- The machine 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 machine. The machine is solely intended for use in compliance with this operating manual. Uses of the machine that are not described in this operating manual can lead to serious personal injuries or even death and to machine 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.

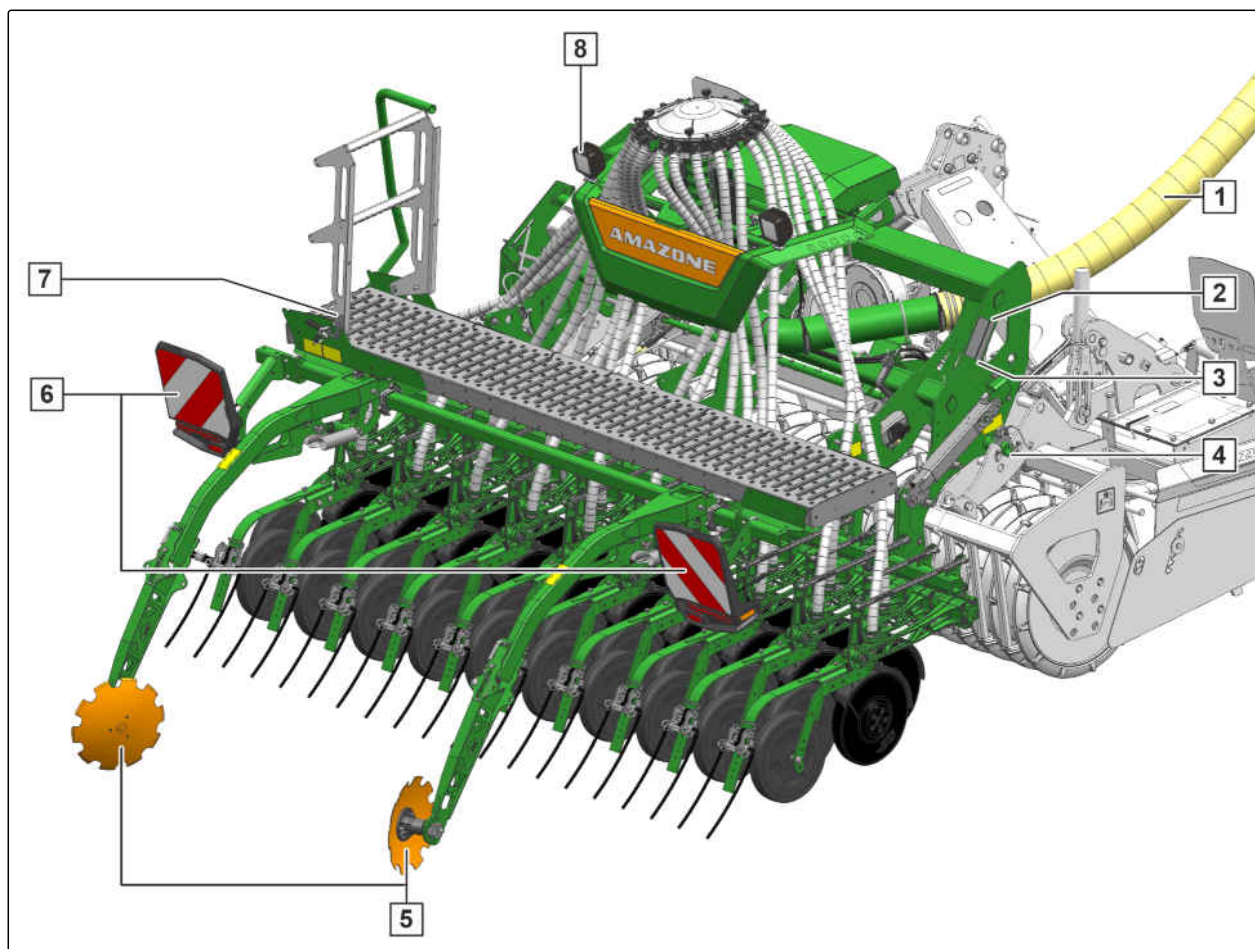
## Product description

# 4

CMS-T-00004877-B.1

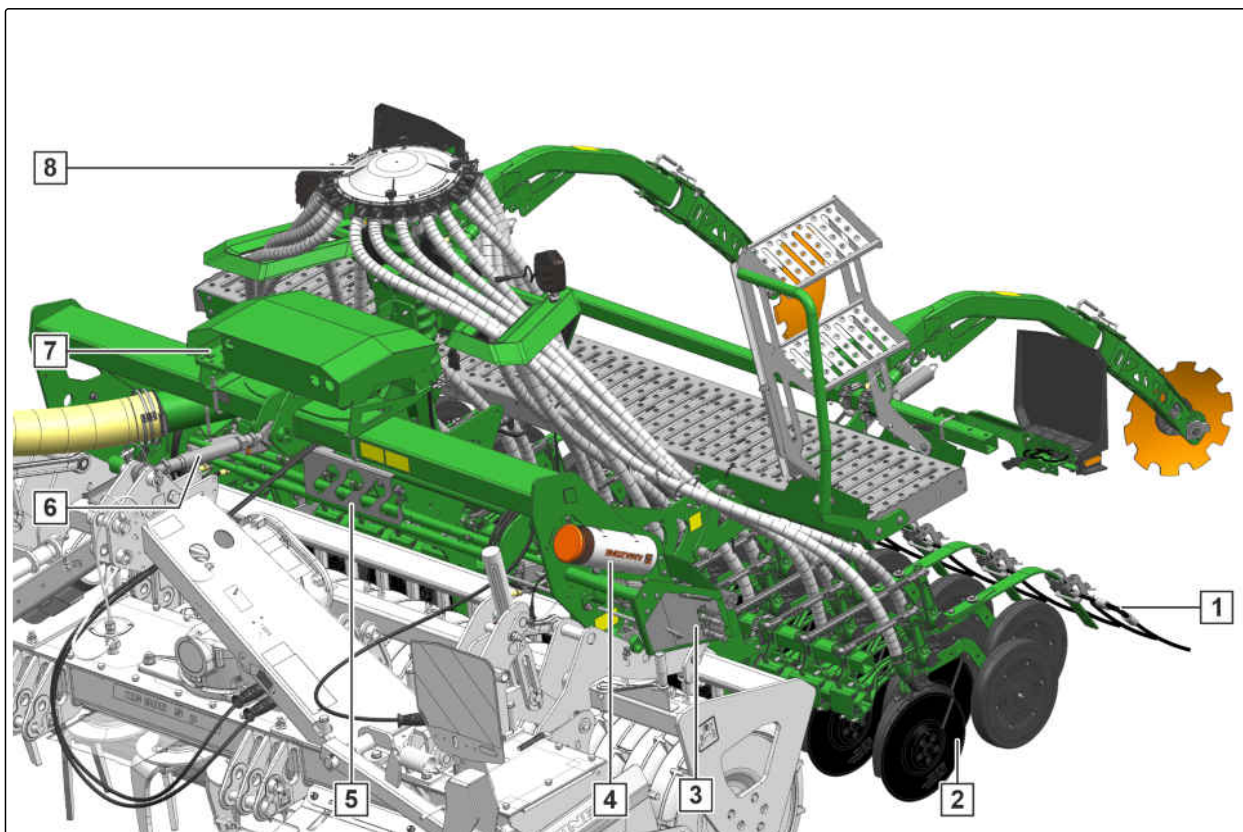
### 4.1 Implement overview

CMS-T-00004883-B.1



CMS-I-00003585

- |  |  |
|--|--|
| <b>1</b> Conveyor hose                 | <b>5</b> Tramline marker                             |
| <b>2</b> Rating plate on the implement | <b>6</b> Lighting and identification for road travel |
| <b>3</b> Implement number              | <b>7</b> Steps                                       |
| <b>4</b> QuickLink catching sockets    | <b>8</b> Work lights                                 |

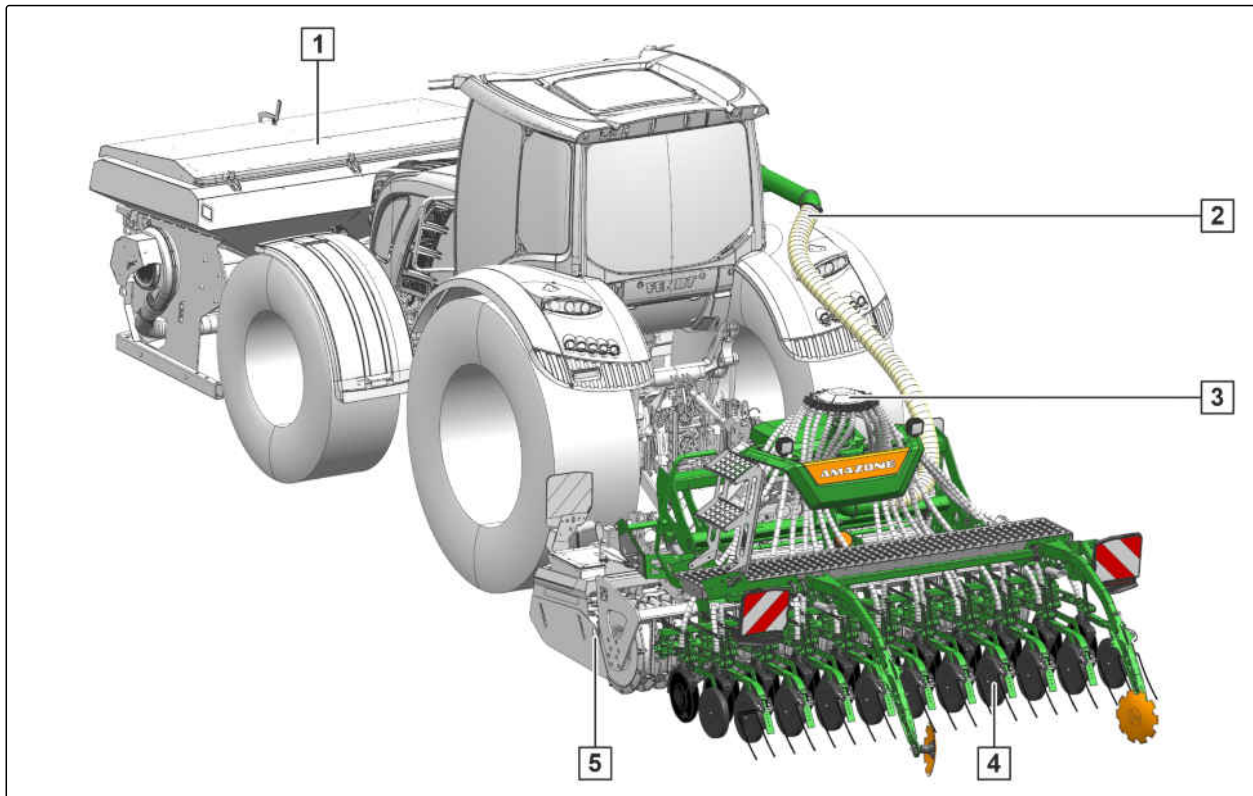


CMS-I-00004543

- |                             |                           |
|-----------------------------|---------------------------|
| <b>1</b> Harrow             | <b>5</b> Hose cabinet     |
| <b>2</b> Seeding coulter    | <b>6</b> Top link         |
| <b>3</b> Adjusting devices  | <b>7</b> Job computer     |
| <b>4</b> Threaded cartridge | <b>8</b> Distributor head |

## 4.2 Function of the implement

CMS-T-00004974-B.1



CMS-I-00003584

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

## 4.3 Special equipment

CMS-T-00004882-B.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



## 4 | Product description

### Warning symbols

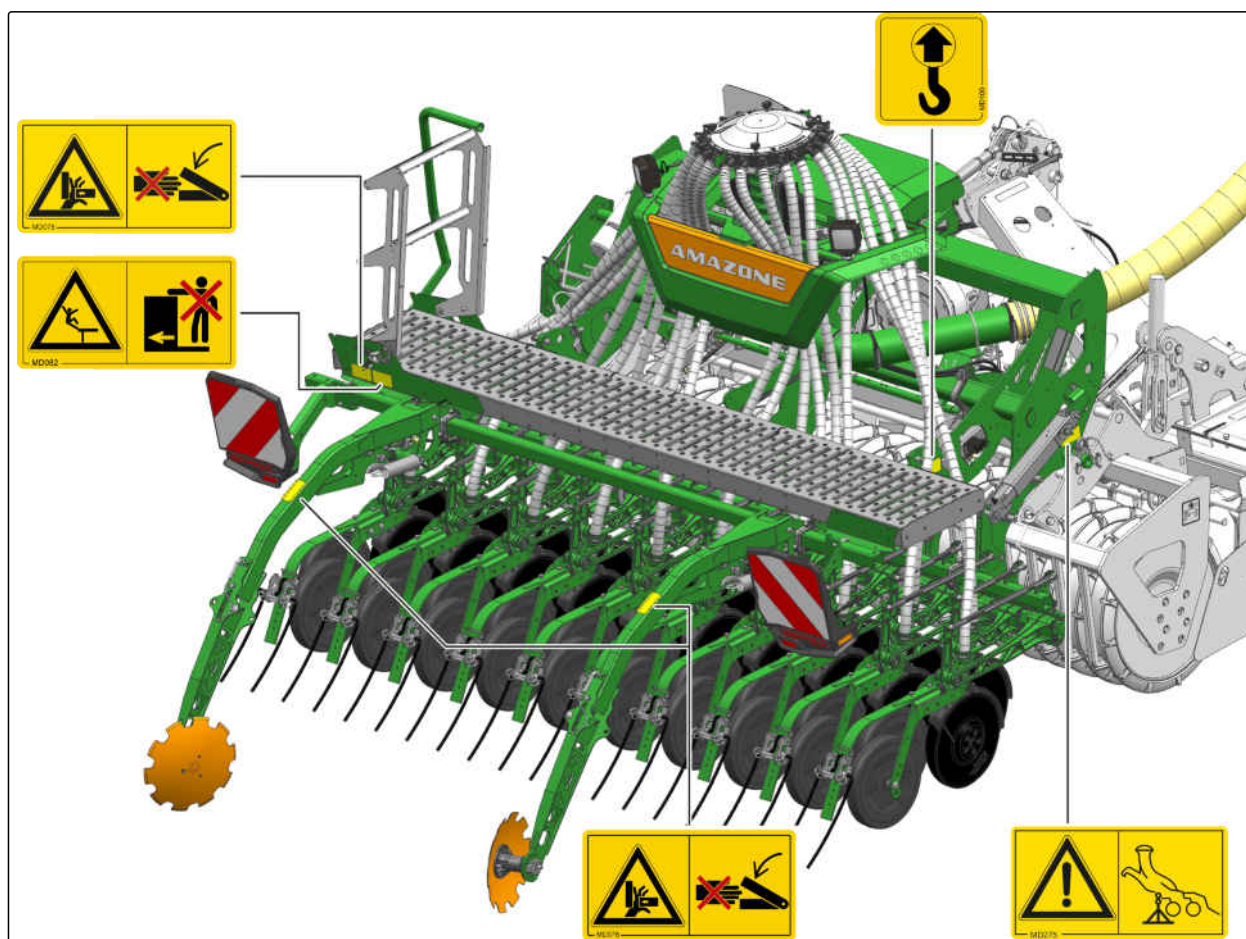
- Hydraulic coulters pressure adjustment
- Coulter harrow
- Exact following harrow
- Exact following harrow lift
- Hydraulic exact following harrow pressure adjustment
- Seed tube monitoring
- One-sided switching

## 4.4 Warning symbols

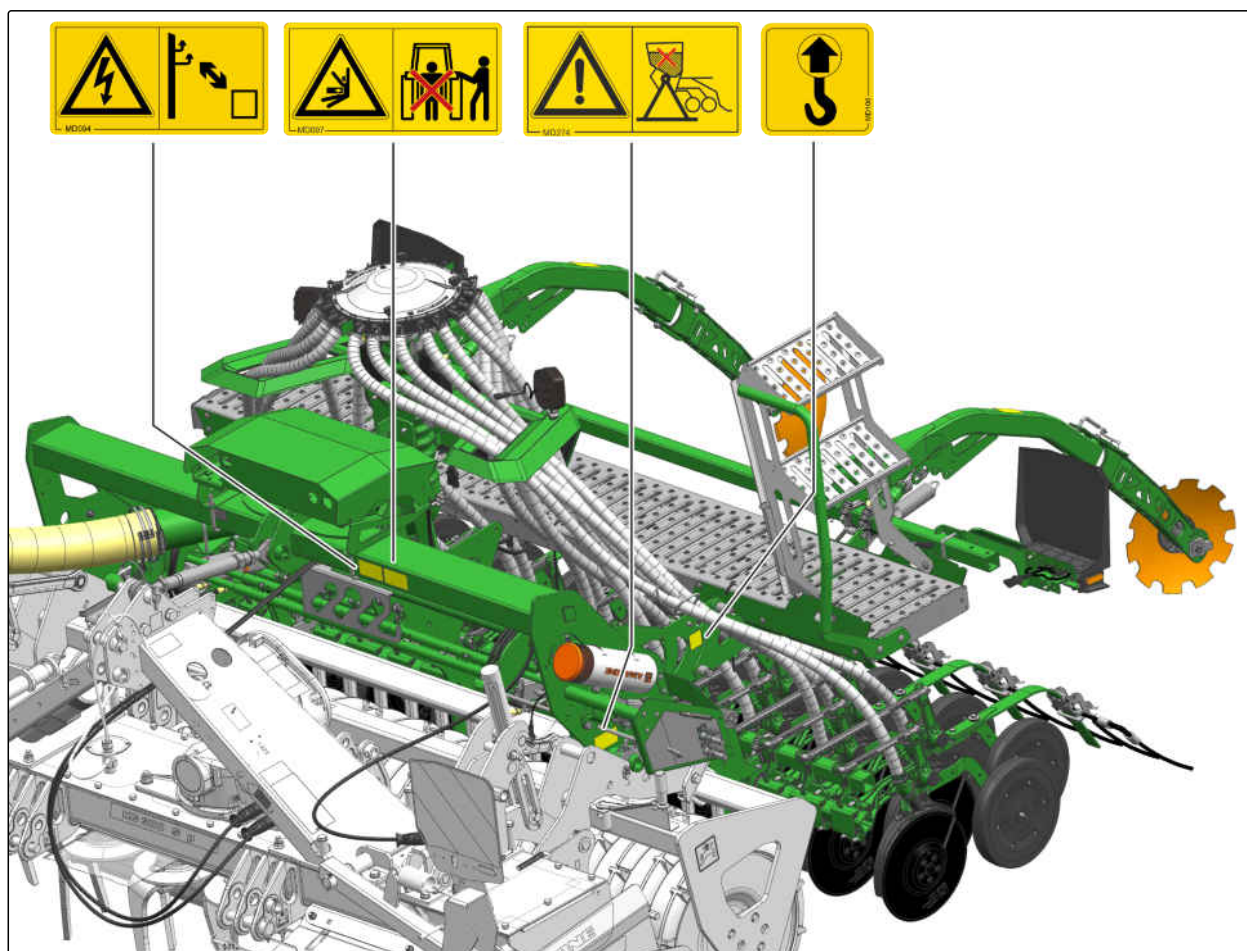
CMS-T-00004878-B.1

### 4.4.1 Positions of the warning symbols

CMS-T-00004879-B.1



CMS-I-00003586



CMS-I-00004648

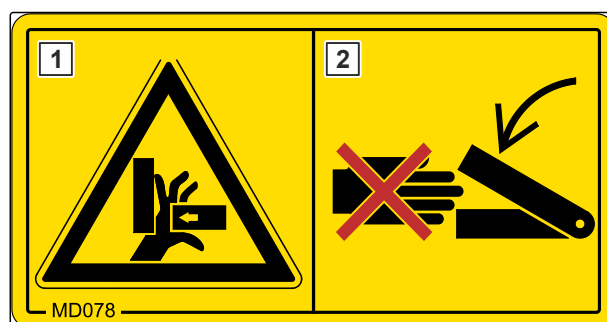
#### 4.4.2 Layout of the warning symbols

CMS-T-000141-D.1

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

A warning symbol consists of two fields:

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



CMS-I-00000416

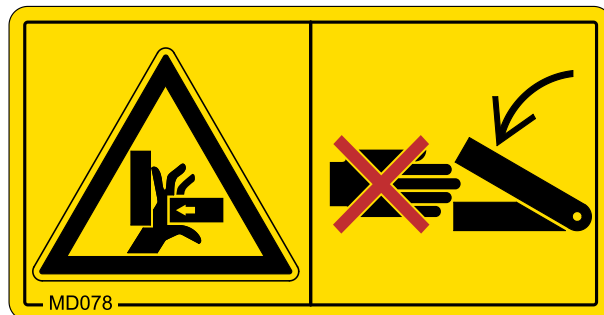
#### 4.4.3 Description of the warning symbols

CMS-T-00004880-B.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 082

###### Risk of falling from tread surfaces and platforms

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

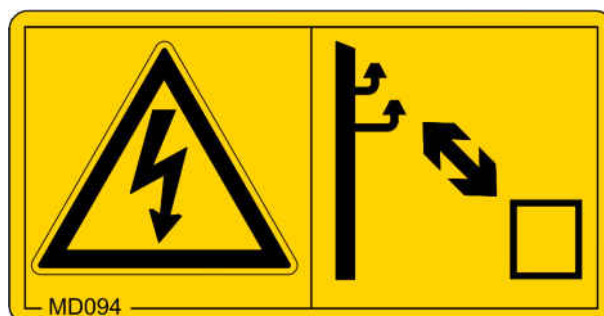


CMS-I-000081

##### MD094

###### Danger due to transmission lines

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

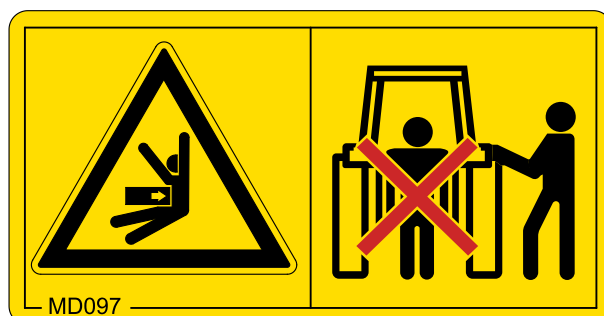


CMS-I-000692

##### MD 097

###### Risk of crushing between the tractor and the implement

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



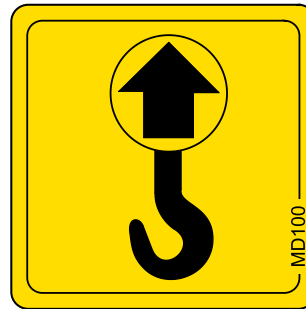
CMS-I-000139



### MD 100

#### Risk of accidents due to improperly attached lifting gear

- Only attach the lifting gear at the marked positions.



CMS-I-000089

#### Risk of crushing due to the mounted implement falling over

- Install the parking supports before you park the mounted implement.



CMS-I-00004915

## 4.5 Threaded cartridge

CMS-T-00001776-B.1

The threaded cartridge contains the following items:

- Documents
- Aids

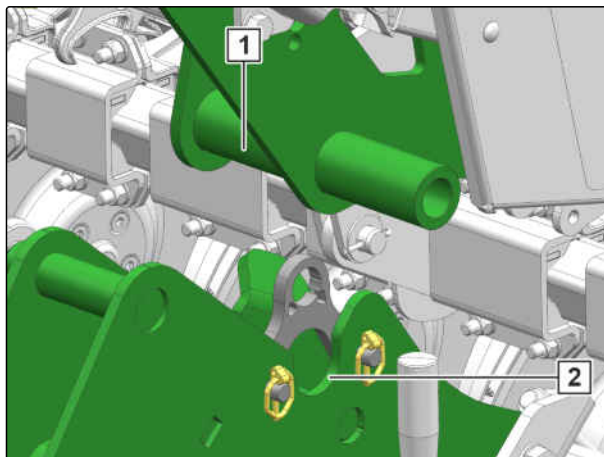


CMS-I-00002306

## 4.6 Mounting frame

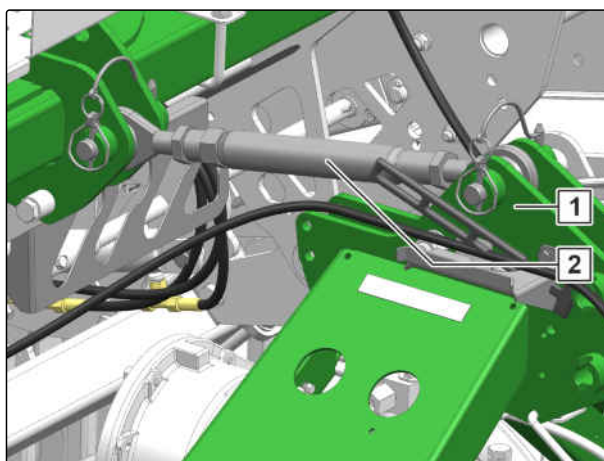
CMS-T-00004881-B.1

The pack top seed drill is fastened on the soil tillage implement **2** with two mounts **1**.



CMS-I-00003592

In addition, the pack top seed drill is connected to the soil tillage implement **2** with a top link **2**.

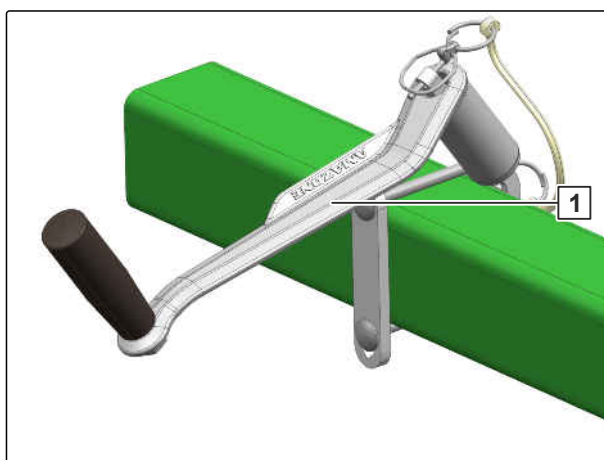


CMS-I-00004568

## 4.7 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.

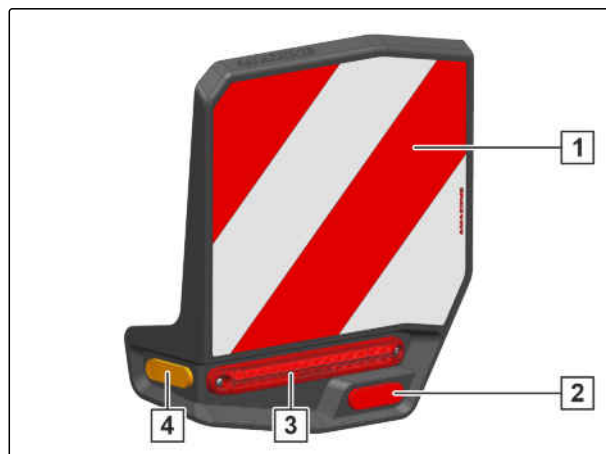


CMS-I-00001082

## 4.8 Rear lighting and identification

CMS-T-00001498-D.1

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



CMS-I-00004545



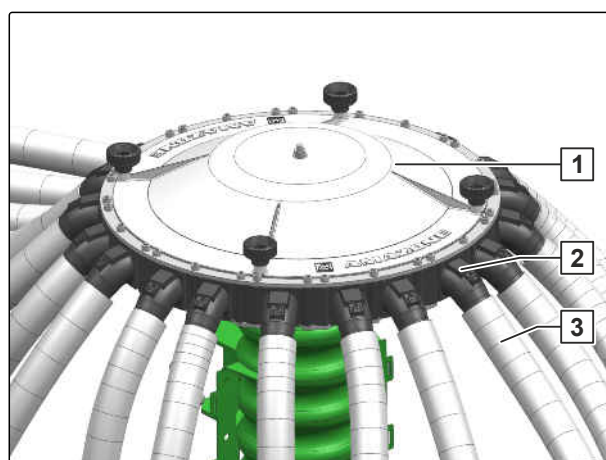
### NOTE

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

## 4.9 Segment distributor head

CMS-T-00004345-B.1

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



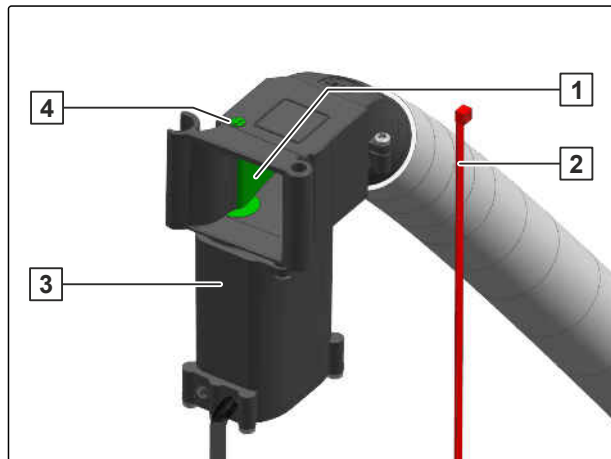
CMS-I-00003164

## 4 | Product description

### One-sided switching

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. The position of the flap can be seen by the position of the arrow **4**.

The number of tramline segments can be adjusted for the track width. A maximum of 12 tramline segments can be controlled per distributor head.



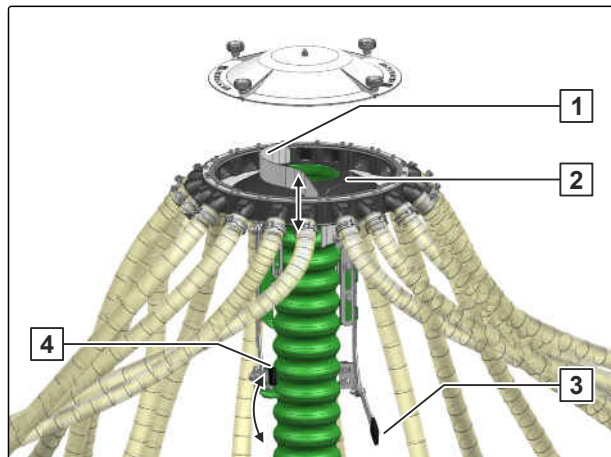
CMS-I-00003165

### 4.10 One-sided switching

CMS-T-00004976-B.1

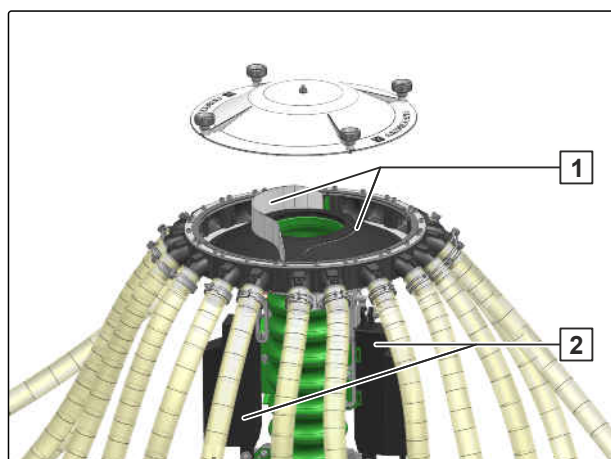
Some tramline rhythms require that the first field pass be done with half the working width.

The left control lever **3** actuates the left sliding shutter **2**, the right control lever **4** actuates the right sliding shutter **1**.



CMS-I-00003597

Depending on the equipment, the sliding shutters **1** are actuated by setting motors **2**.



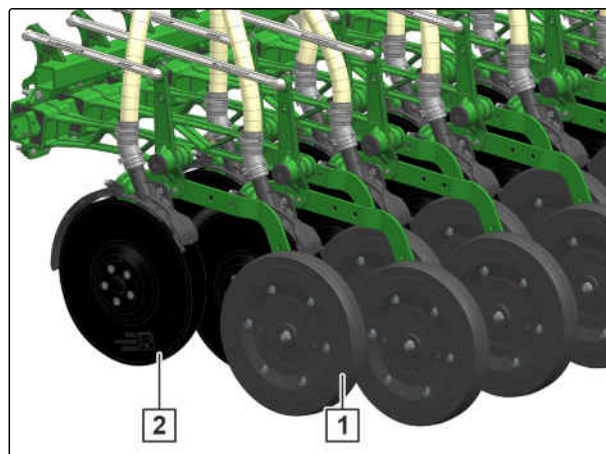
CMS-I-00003587

## 4.11 TwinTeC coulter

CMS-T-00004346-B.1

The TwinTeC coulter is a double disc coulter and it deposits seed and fertiliser on ploughed or mulched soil. 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.



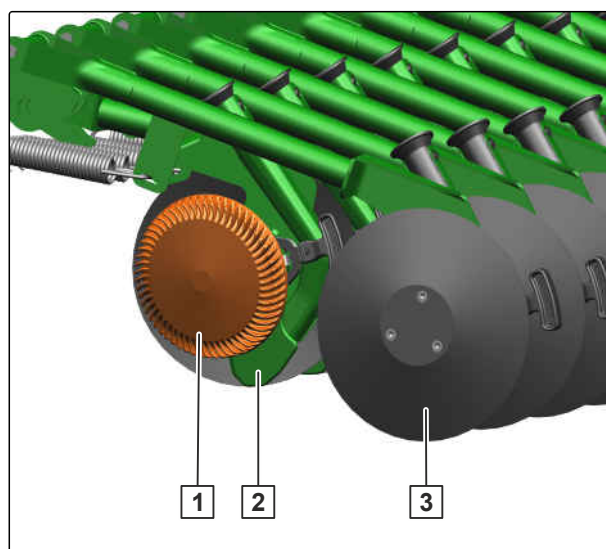
CMS-I-00003166

## 4.12 RoTeC coulter

CMS-T-00006297-A.1

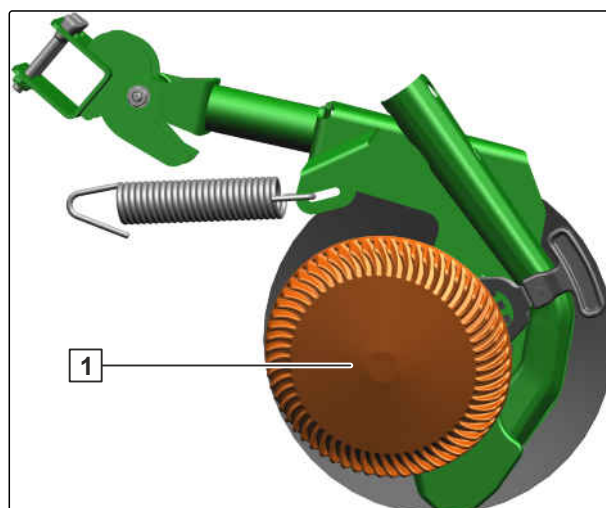
The RoTeC coulter is a single disc coulter and it deposits seed and fertiliser on ploughed or mulched soil. The furrow former **2** and the cutting discs **3** shape the seed furrow, into which the metered material is dropped. The depth control discs and depth control wheel **1** limit the placement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



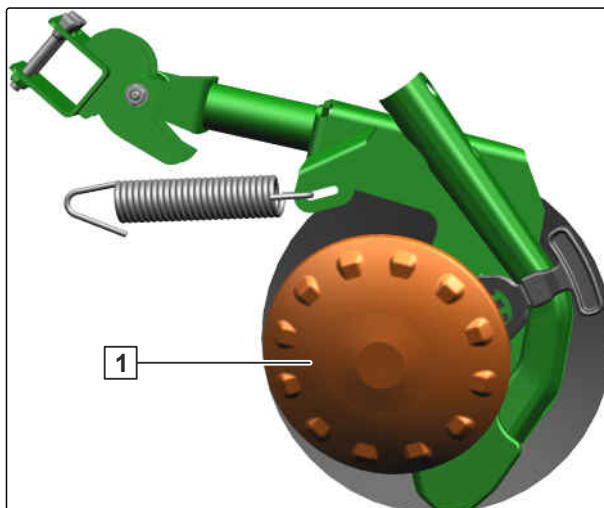
CMS-I-00004578

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.

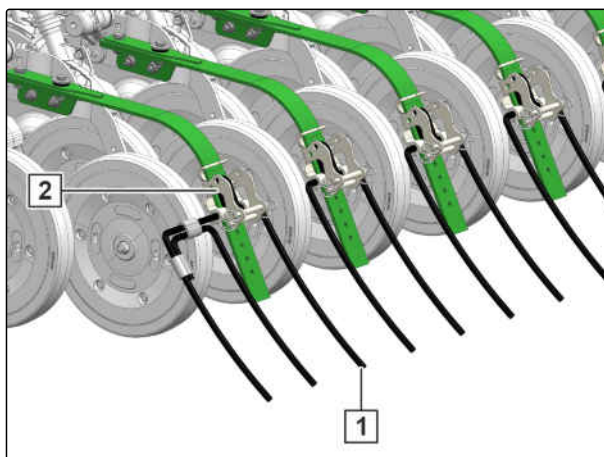


CMS-I-00004585

### 4.13 Coulter harrow

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-T-00006648-A.1

CMS-I-00004734



#### 4.14 Exact following harrow

CMS-T-00006330-A.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.

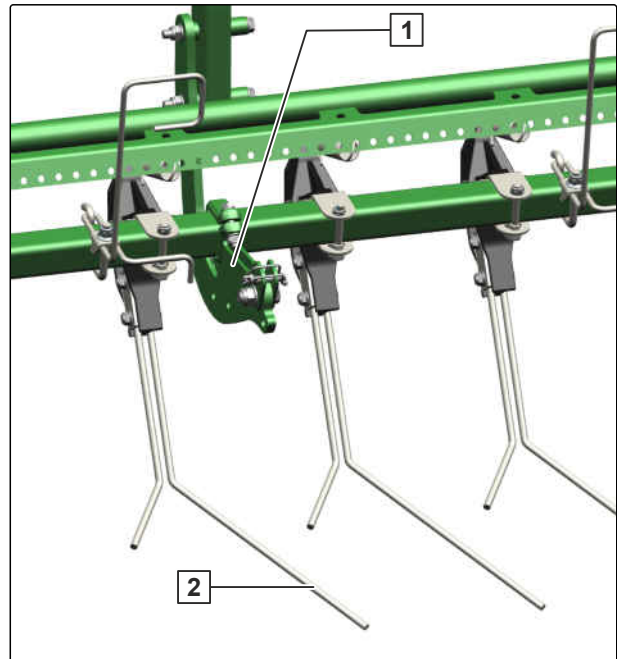
The position of the harrow tines can be adjusted.

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.



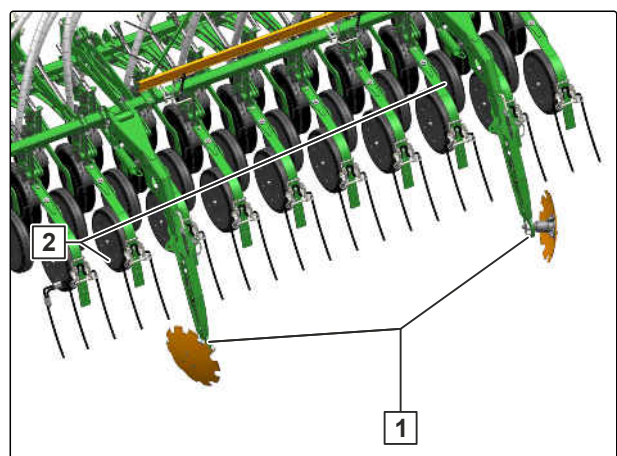
CMS-I-00004589

#### 4.15 Tramline marker

CMS-T-00004347-B.1

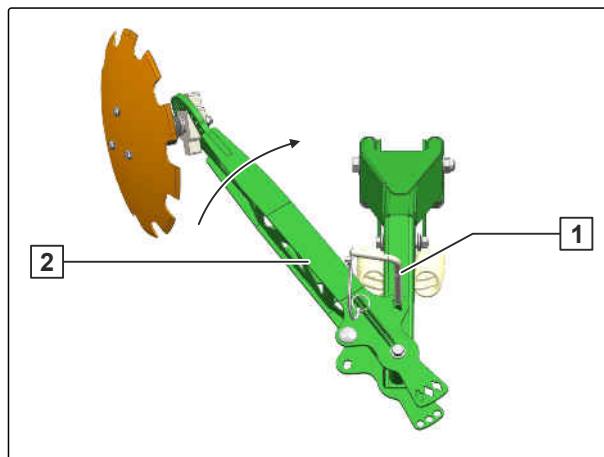
When creating tramlines, the tramline marker automatically lowers the discs **1** and makes tracks. These tracks make the tramlines visible before the seed has germinated. The discs are raised if no tramline is created.

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**.

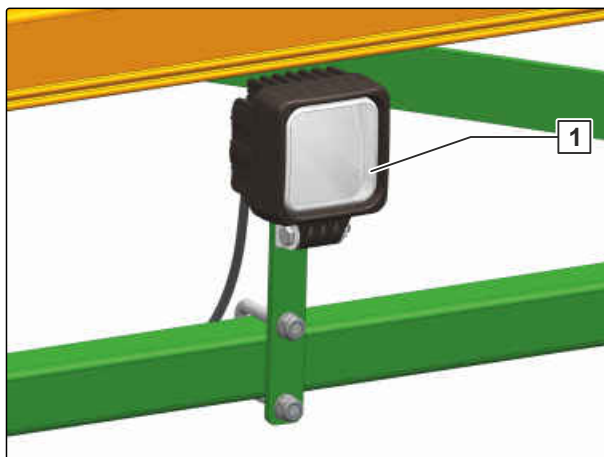


CMS-I-00003172

## 4.16 Work lights

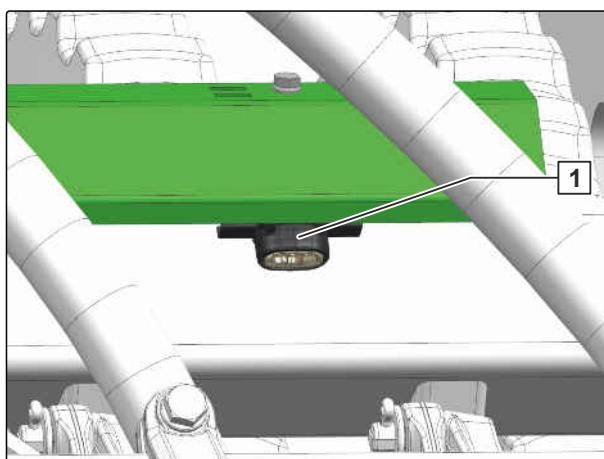
CMS-T-00004348-B.1

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



## 4.17 Rating plate on the implement

CMS-T-00004505-E.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

## Technical data

5

CMS-T-00004897-B.1

### 5.1 Dimensions

CMS-T-00004898-B.1

Dimensions	Avant 3002 seeding unit	Avant 4002 seeding unit
Transport width	3 m	4 m
Transport height (seeding combination with track marker)	2.58 m	
Total length (seeding combination with exact following harrow)	3.3 m	
Working width	3 m	4 m
Centre of gravity distance	93 cm	

### 5.2 QuickLink quick-coupling system

CMS-T-00003190-C.1

Working width of the implement	Distance of the QuickLink catching sockets
2.5 m	1529 ±3 mm
3 m	2029 ±3 mm
3.5 m	2529 ±3 mm
4 m	3029 ±3 mm

### 5.3 Soil tillage tools

CMS-T-00004981-B.1

Dimensions	Avant 3002 seeding unit	
	with RoTeC coulters	with TwinTeC coulters
Number of rows	24	20
Row spacing	12.5 cm	15 cm
Cutting disc diameter	320 mm	400 mm
Placement depth	0-6 cm	0-6 cm

Dimensions	Avant 4002 seeding unit	
	with RoTeC coulters	with TwinTeC coulters
Number of rows	32	26
Row spacing	12.5 cm	15 cm
Cutting disc diameter	320 mm	400 mm
Placement depth	0-6 cm	0-6 cm

## 5.4 Permitted mounting categories

CMS-T-00004900-B.1

Type	Mounting frame of the seeding unit	3-point mounting frame of the carrying implement
Avant 3002 / 4002 seeding unit	QuickLink	Category 3

## 5.5 Optimal working speed

CMS-T-00004350-B.1

Seeding coulters	Working speed, dependent on the soil tillage implement
TwinTeC coulters	8-12 km/h
RoTeC coulters	6-12 km/h

## 5.6 Performance characteristics of the tractor

CMS-T-00004901-B.1

Type	Engine rating
Avant 3002 seeding unit	Starting at 118 kW / 160 HP
Avant 4002 seeding unit	Starting at 118 kW / 160 HP

Electrical system	
Battery voltage	12 V
Lighting socket	7-pin

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

## 5.7 Noise development data



CMS-T-00002296-B.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.

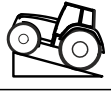

The emission sound pressure level mainly depends on the vehicle used.

## 5.8 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%	

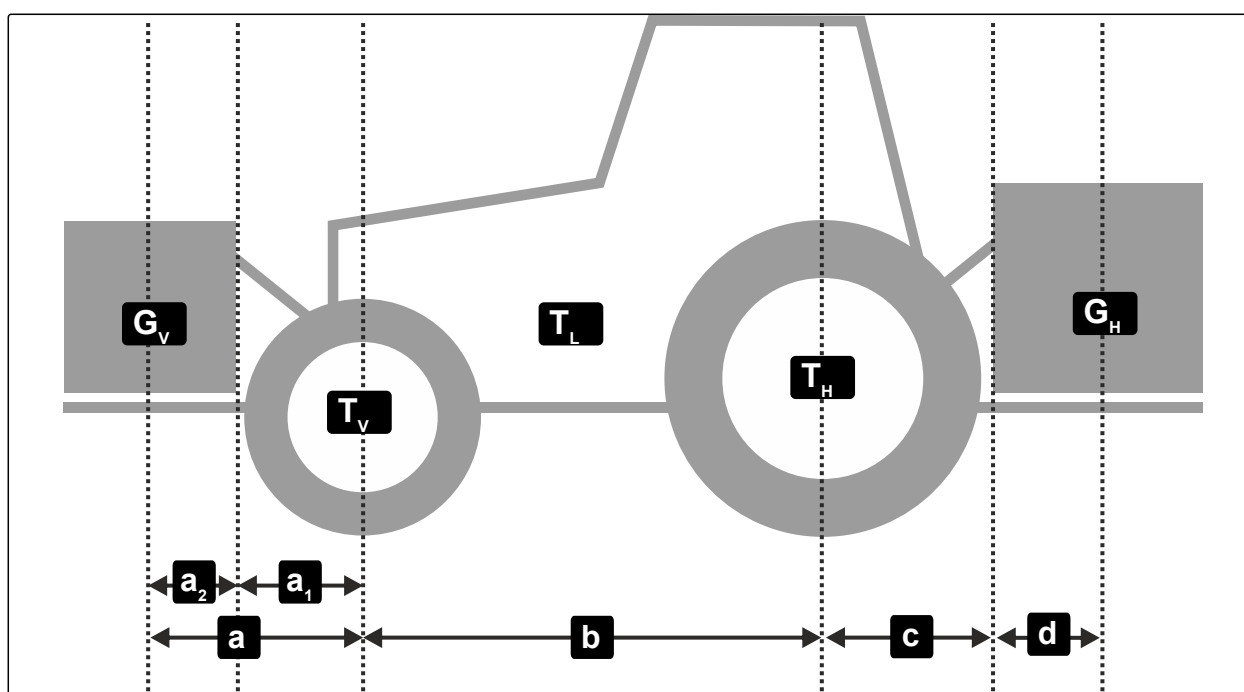
## Preparing the machine

# 6

CMS-T-00004886-B.1

### 6.1 Calculating the required tractor characteristics

CMS-T-00003740-A.1



CMS-I-00000581

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

## 6 | Preparing the machine

### Calculating the required tractor characteristics

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

1. Calculate the minimum front ballast weight.

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

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

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

CMS-I-00000513

2. Calculate the actual front axle load.

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

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

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

CMS-I-00000516

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

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

$$G_{tat} =$$

$$G_{tat} =$$

CMS-I-00000515

4. Calculate the actual rear axle load.

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

$$T_{Htat} =$$

$$T_{Htat} =$$

CMS-I-00000514

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



### IMPORTANT

**Danger of accident due to implement damage caused by excessive loads**

- Check if 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 ballast weight		kg	≤		kg		-	-
Total weight		kg	≤		kg		-	-
Front axle load		kg	≤		kg	≤		kg
Rear axle load		kg	≤		kg	≤		kg

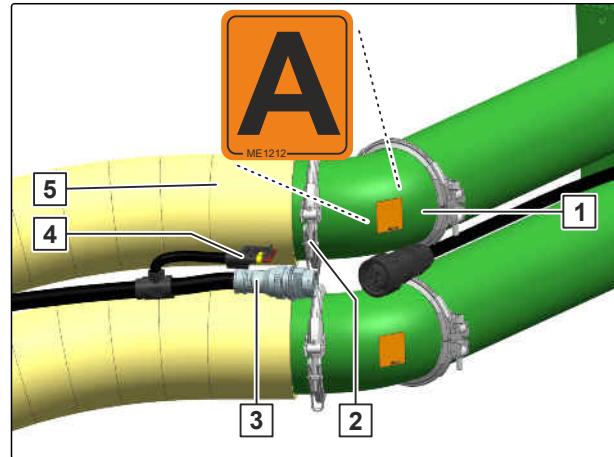
## 6.2 Coupling the implement

CMS-T-00004890-B.1

### 6.2.1 Coupling the supply lines to the hose package

CMS-T-00004439-B.1

1. To connect the conveyor hose **5** to the hose package **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.



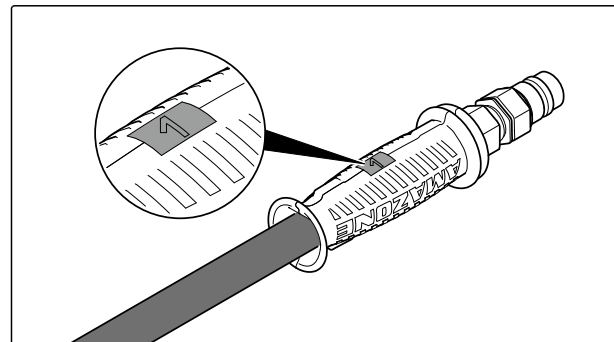
CMS-I-00003124

### 6.2.2 Coupling the hydraulic hose lines

CMS-T-00006178-A.1

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

















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



CMS-I-00000121

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



Designation		Function			Tractor control unit	
Green			Coulter pressure	Increase	Double-acting	
				Reduce / coulter lift		
Beige			Working depth of the tool tines	Increase	Double-acting	
				Reduce		
Yellow			Tramline marker	Lifting	Single-acting	
Not required in combination with track marker.						
Blue			Exact following harrow lift	Lowering	Double-acting	
				Lifting		
Red		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

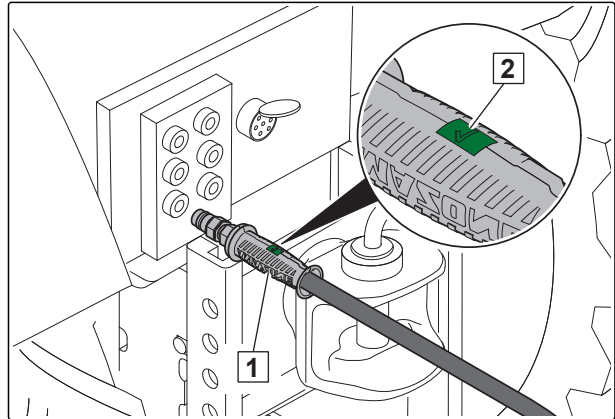
### Implement damage due to insufficient hydraulic oil return flow

- ▶ 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.

## 6 | Preparing the machine

### Coupling the implement

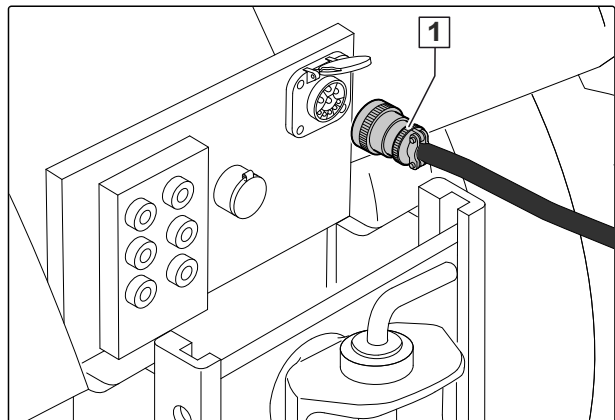
1. Depressurise the hydraulic system between the tractor and the implement using the tractor control unit.
  2. Clean the hydraulic plugs.
  3. Couple the hydraulic hose lines **1** to the hydraulic sockets of the tractor according to the marking **2**.
- ➔ The hydraulic plugs lock perceptibly.
4. Route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



CMS-I-00001045

#### 6.2.3 Coupling the ISOBUS line

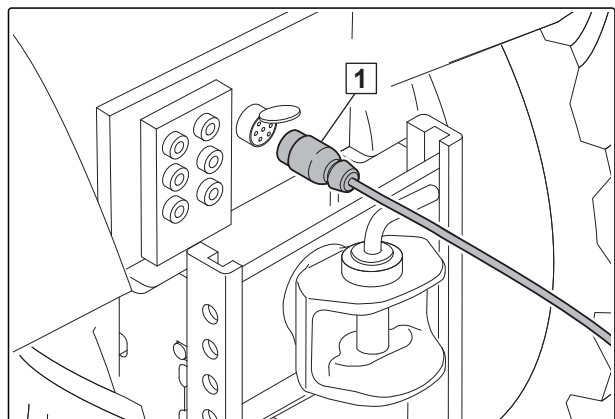
1. Insert the plug **1** of the ISOBUS line.
2. Route the ISOBUS line with sufficient freedom of movement and without chafing or pinching points.



CMS-I-00004333

#### 6.2.4 Coupling the power supply

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

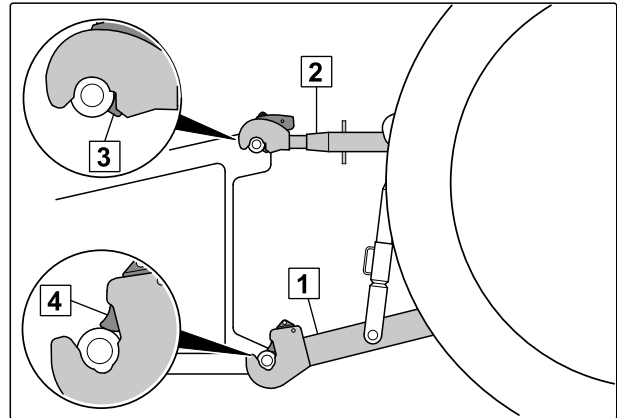


CMS-I-00001048

### 6.2.5 Coupling the 3-point mounting frame

CMS-T-00001400-D.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.

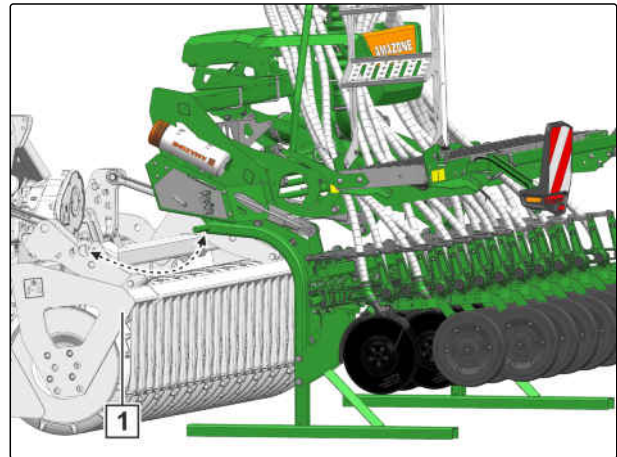


CMS-I-00001225

### 6.2.6 Coupling the Avant seeding unit

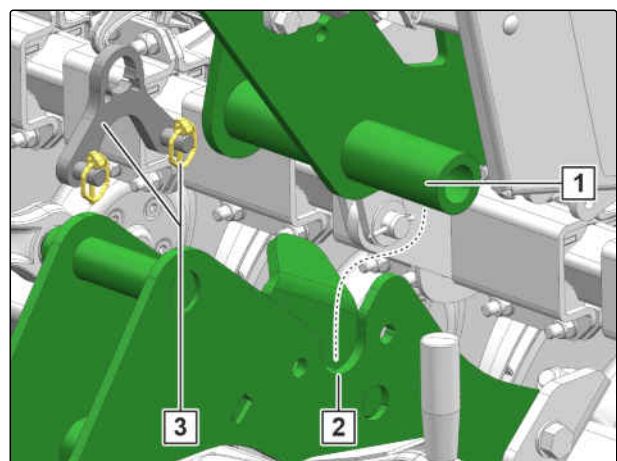
CMS-T-00004892-B.1

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



CMS-I-00003591

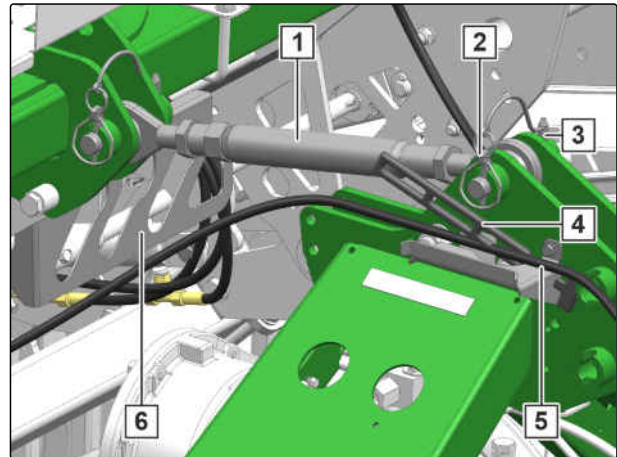
2. Remove the safety clip **3**.
  3. Slowly lift the soil tillage implement.
- ➔ The seeding unit **1** rests in the catching sockets **2** of the soil tillage implement.



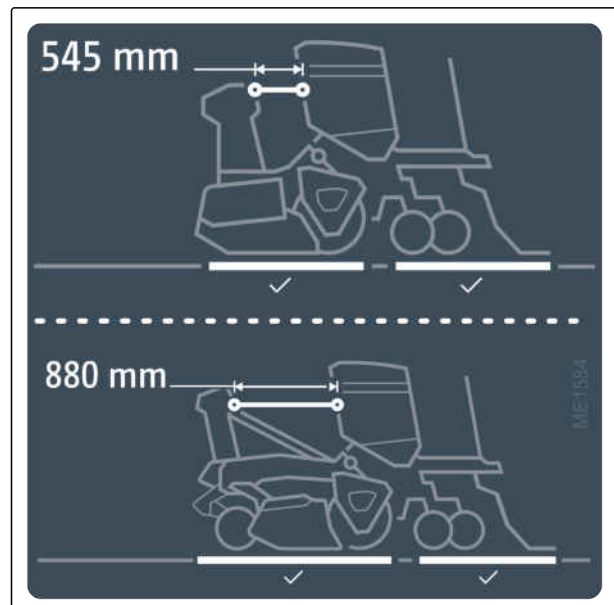
CMS-I-00003590

## 6 | Preparing the machine Coupling the implement

4. Attach the top link **1** with the pin **3**.
5. Secure the pin with the linch pin **2**.
6. Place the hydraulic hose lines from the hose cabinet **6** in the guide **5**.
7. Route the supply line for the job computer over the centre frame to the interface on the hose package.
8. Route the supply line for the job computer over the centre frame to the interface on the tractor.
9. Fasten the hydraulic hose lines and supply line with the holder **4**.
10. Adjust the top link to the desired length.



CMS-I-00004526



CMS-I-00004649

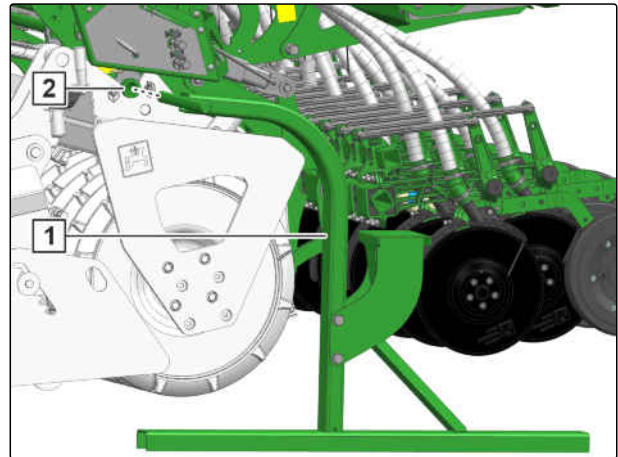


### WARNING

The parking supports do not have a locking device.

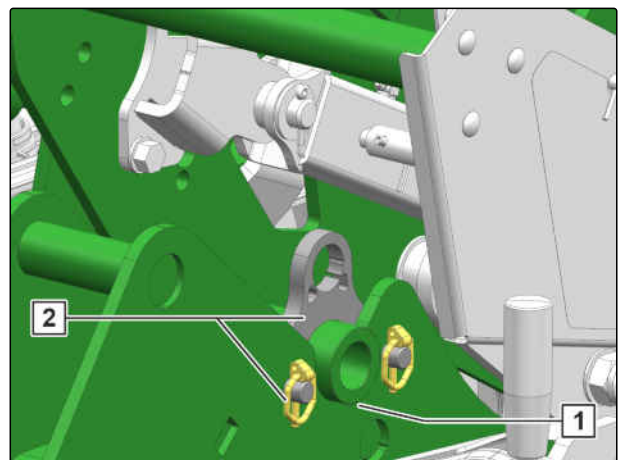
- To prevent the parking supports from falling out of the mount while driving, remove the parking supports.

11. Lift the soil tillage implement with the coupled seeding unit.
12. Remove the parking supports **1** from the implement **2** on both sides.



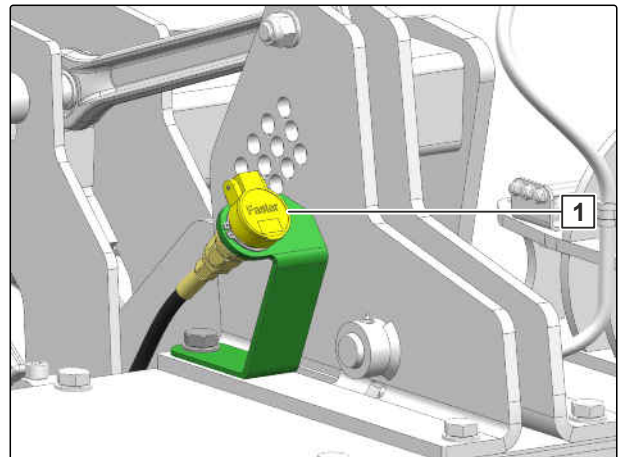
CMS-I-00004938

13. Install the safety clips **2** on all of the brackets **1**.



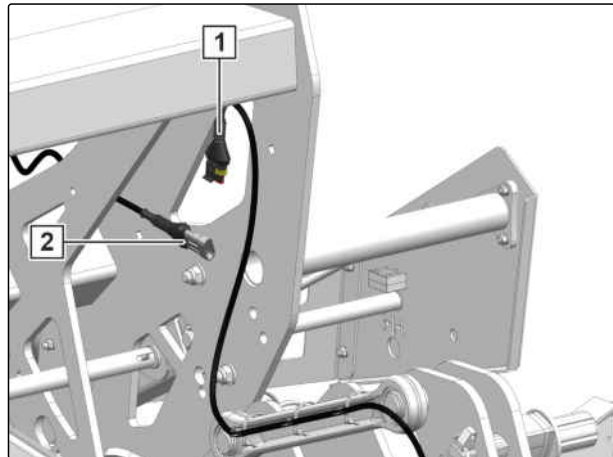
CMS-I-00003593

14. *If the seeding unit has a tramline marker,* connect the supply line of the seeding unit to the soil tillage implement **1**.



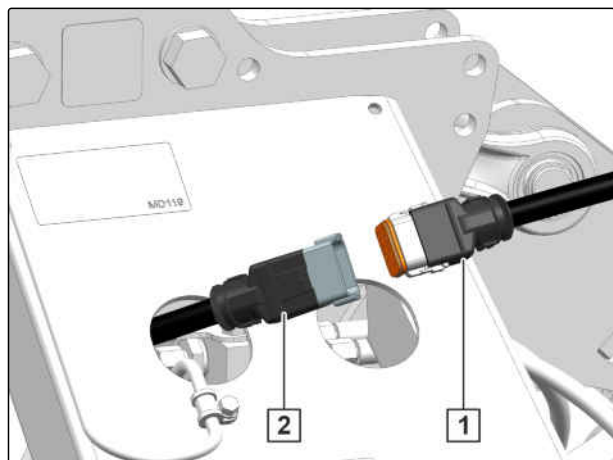
CMS-I-00003485

15. Connect the supply line **2** for the rear lighting and identification to the soil tillage implement **1**.



CMS-I-00004527

16. Connect the supply line **1** to the soil tillage implement **2**.



CMS-I-00004528

## 6.3 Preparing the implement for operation

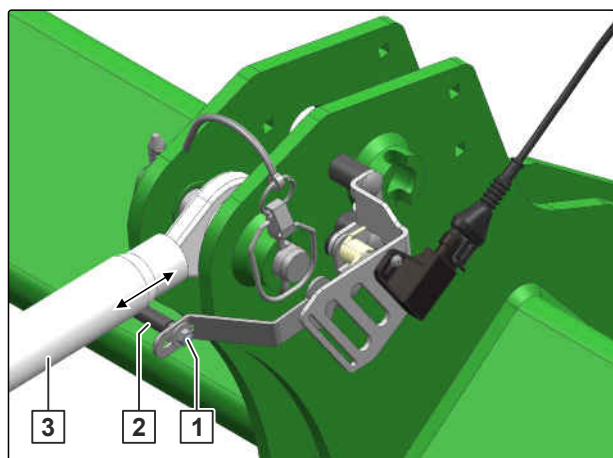
CMS-T-00004887-B.1

### 6.3.1 Adjusting the working position sensor

CMS-T-00003625-C.1

The working position sensor monitors the implement position in the three-point hydraulic system and switches the metering drives. The length of the actuation lever is adjustable. For safe actuation, the control lever must rest on a level contact surface.

1. Loosen the nut **1**.
2. *To rest the control lever **2** on a level contact surface,*  
set the position of the control lever in the desired position on the top link **3**.
3. Tighten the nut.



CMS-I-00002608

4. *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 Adjusting the placement depth on the TwinTeC coulter

CMS-T-00004360-B.1



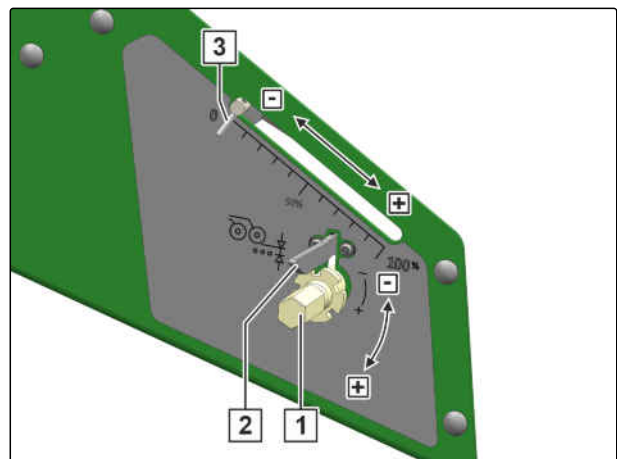
#### NOTE

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. Raise the implement.
2. Put the universal operating tool on the adjustment spindle **1**.
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 **+**.



CMS-I-00003114

4. The scale **3** serves as orientation.
5. Take off the universal operating tool and allow the catch **2** 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".



### 6.3.3 Adjusting the placement depth on the RoTeC coulter

CMS-T-00006301-A.1

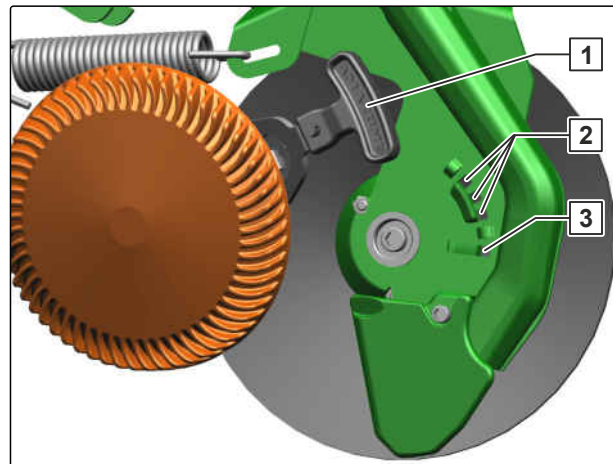
The placement depth can be adjusted in three stages

**1.** 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.



#### 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.



CMS-I-00004587

1. Pull on the lever **X** 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 **2** 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 mechanically" or "Adjusting the coulter pressure hydraulically".



### 6.3.4 Adjusting the coulter pressure hydraulically



#### 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

##### **Combined 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 with 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.

### 6.3.5 Adjusting the coulter pressure mechanically

CMS-T-00006426-A.1

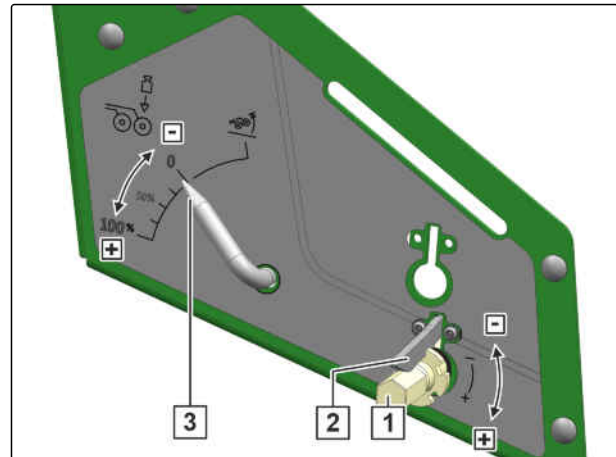
#### **i** NOTE

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

1. Raise the implement.
2. Put the universal operating tool on the adjustment spindle **1**.
3. *To reduce the coulter pressure,*  
turn the universal operating tool counter-clockwise **-**

or

*To increase the coulter pressure,*  
turn the universal operating tool clockwise **+**



4. The scale **3** serves as orientation.
5. Take off the universal operating tool and allow the catch **2** 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.

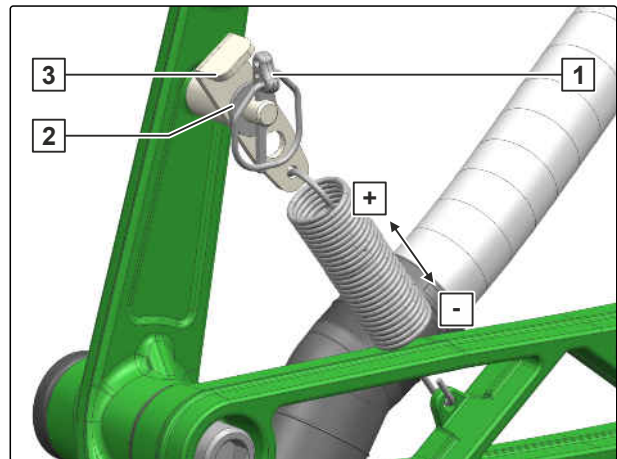
### 6.3.6 Adjusting the additional coulter pressure on the TwinTeC coulter

CMS-T-00004371-B.1

#### **i** 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

### 6.3.7 Lifting the coulter hydraulically

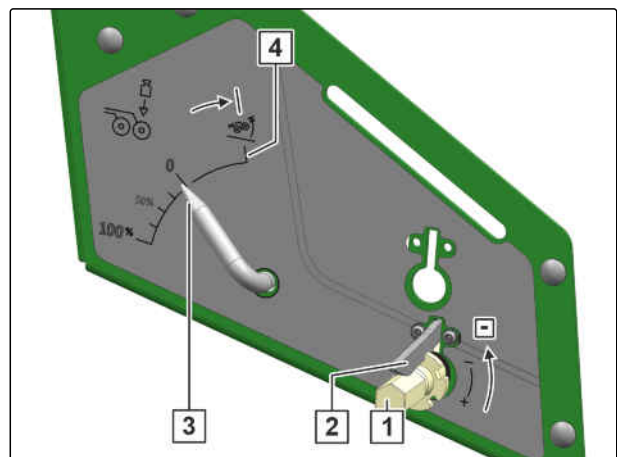
CMS-T-00004416-B.1

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.

### 6.3.8 Lifting the coulters mechanically

CMS-T-00006427-A.1

1. Raise the implement.
  2. Put the universal operating tool on the adjustment  
spindle **1**.
  3. *To lift the coulters,*  
turn the universal operating tool counter-  
clockwise **-**
- ➔ When the pointer **3** is at the end of the scale  
**4**, the coulters are completely lifted.
4. Take off the universal operating tool and allow the  
catch **2** to engage in a groove of the grid.



CMS-I-00004581

### 6.3.9 Adjusting the coulter harrow

CMS-T-00006627-A.1

#### 6.3.9.1 Adjusting the harrow angle

CMS-T-00004372-B.1

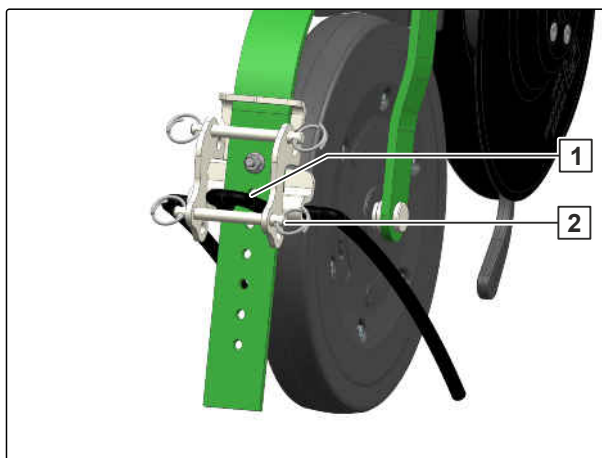
When driving in reverse, the harrow tine **1** folds to the front and rests on the locking pin **2**. As a result, the harrow tine does not protrude into the neighbouring coulters.



#### IMPORTANT

**Damage to the coulters due to folded harrow tines**

- Do not remove the locking pin.



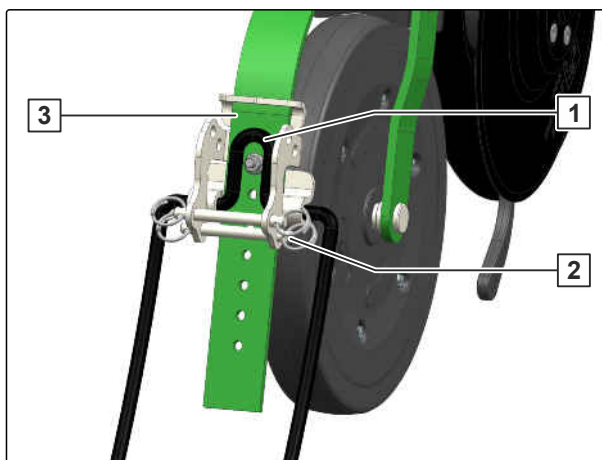
CMS-I-00003184



#### NOTE

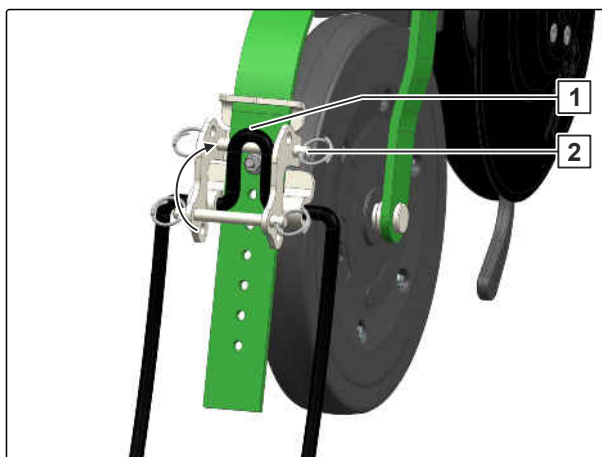
The adjustment of the harrow angle must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Raise 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.



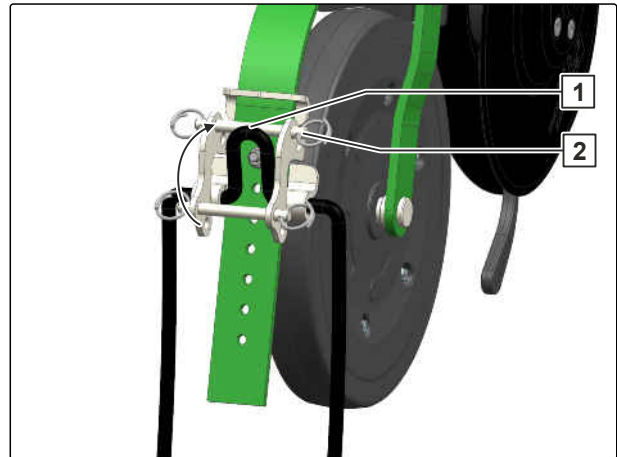
CMS-I-00003187

4. Raise the implement.
5. 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.
6. To check the setting, seed for approx. 30 m at working speed and then check the work pattern.



CMS-I-00003186

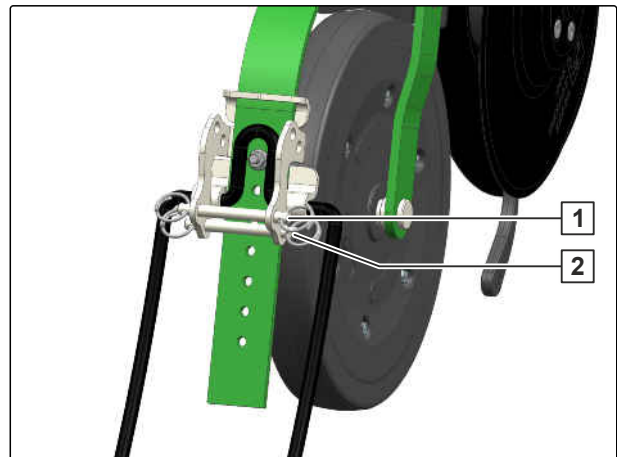
7. Raise the implement.
  8. *To move the harrow tine **1** to the steep working position,*  
Install the pin **2** in the hole shown.
- ➔ The harrow tine is resting on the pin.
9. *To check the setting,*  
seed for approx. 30 m at working speed and then  
check the work pattern.



CMS-I-00003185

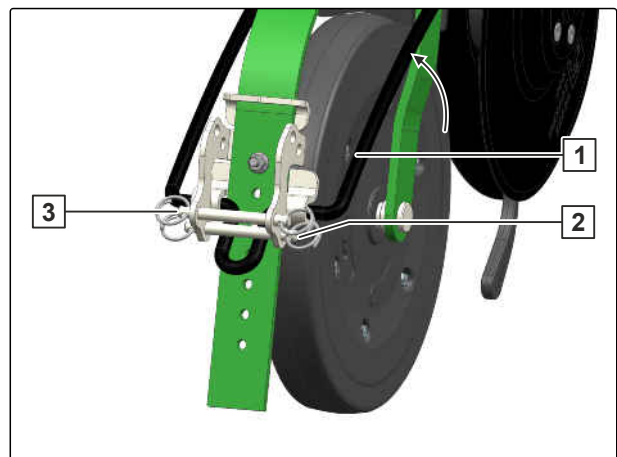
#### 6.3.9.2 Deactivating the harrow tines

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



CMS-I-00003188

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



CMS-I-00003183

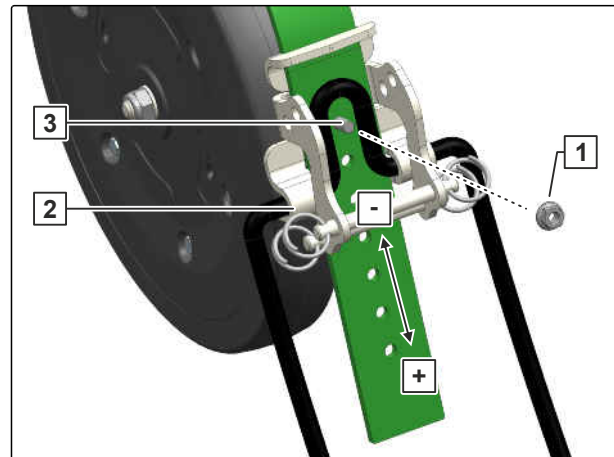
### 6.3.9.3 Adjusting the harrow height

CMS-T-00006457-A.1

#### **i** 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

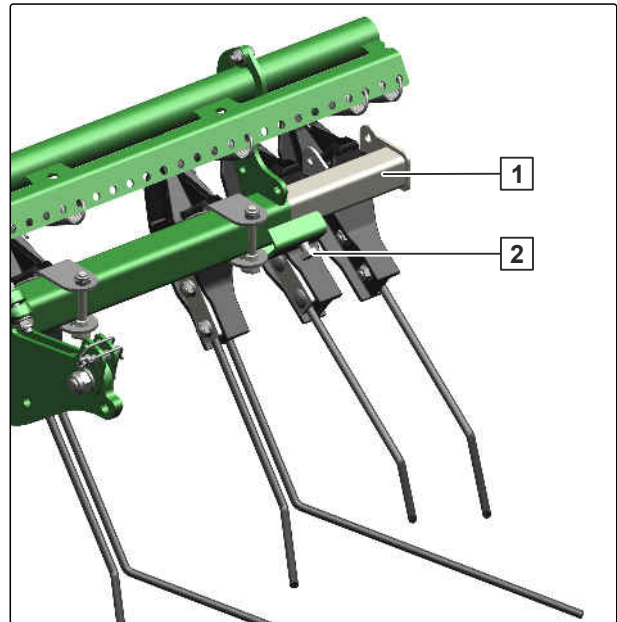
CMS-T-00006326-A.1

#### 6.3.10.1 Moving the exact following harrow into working position

CMS-T-00006334-A.1

The roller and the coulter 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.



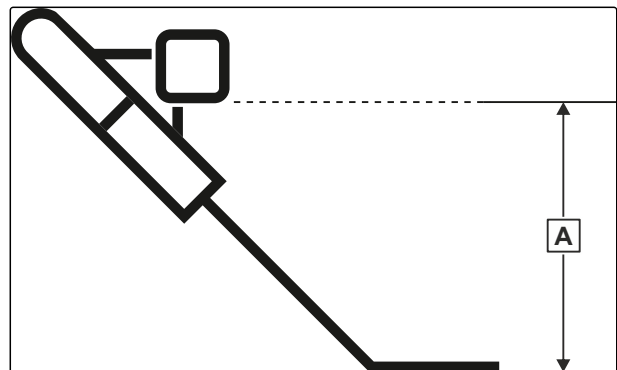
CMS-I-00004674

#### 6.3.10.2 Adjusting the position of the harrow tines on seed drills without exact following harrow lift

CMS-T-00006414-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



### CAUTION

#### **Danger of injury due to the exact following harrow falling down**

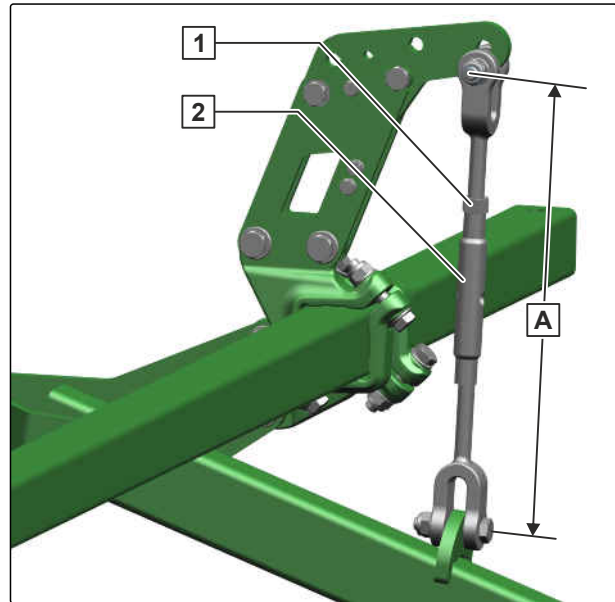
The length of the turnbuckles may not exceed 390 mm; otherwise, the turnbuckle is opened and the exact following harrow fall down.

- Do not set the turnbuckles at lengths of more than 390 mm.

## 6 | Preparing the machine

### Preparing the implement for operation

1. Loosen the lock nut **1**.
2. Turn the turnbuckle **2** to the desired measurement. The measurement **A** may not exceed 390 mm.
3. Tighten the lock nut.
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.



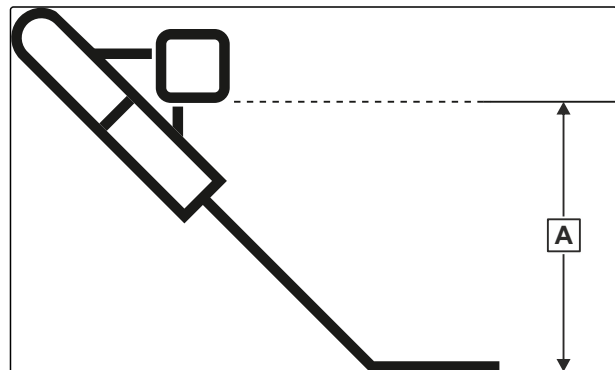
CMS-I-00004708

#### 6.3.10.3 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.



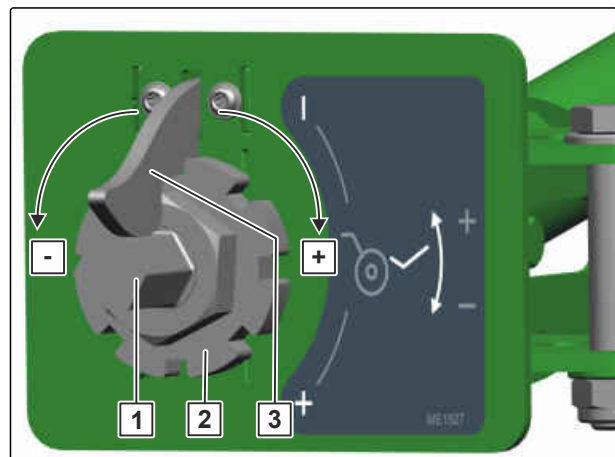
CMS-I-00004668

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.

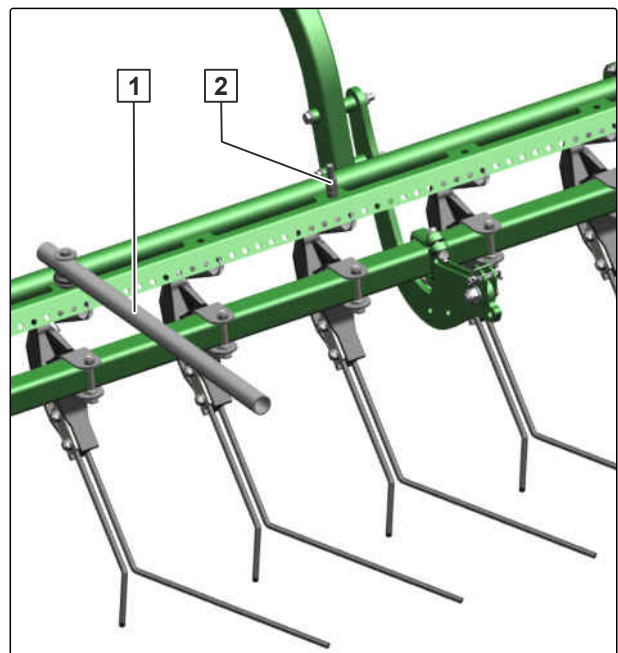
#### 6.3.10.4 Adjusting the exact following harrow pressure mechanically

CMS-T-00006333-A.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.

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



CMS-I-00004673

## 6 | Preparing the machine

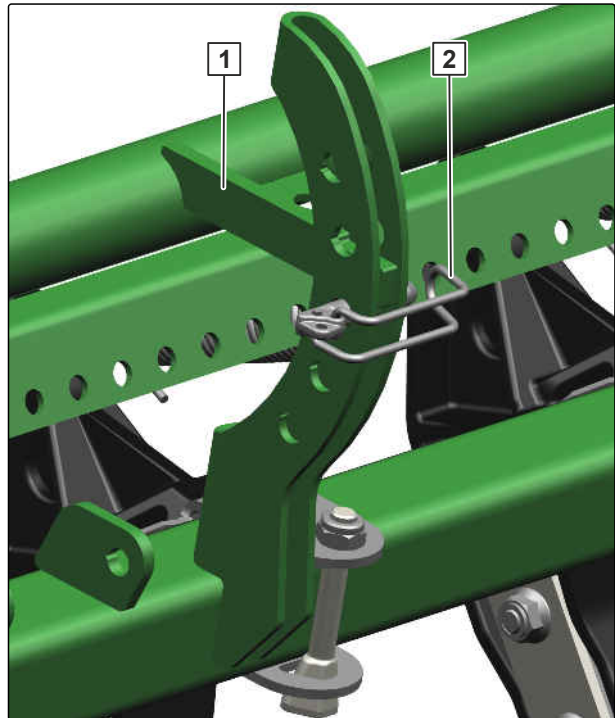
### Preparing the implement for operation

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

#### 6.3.10.5 Adjusting the exact following harrow pressure hydraulically

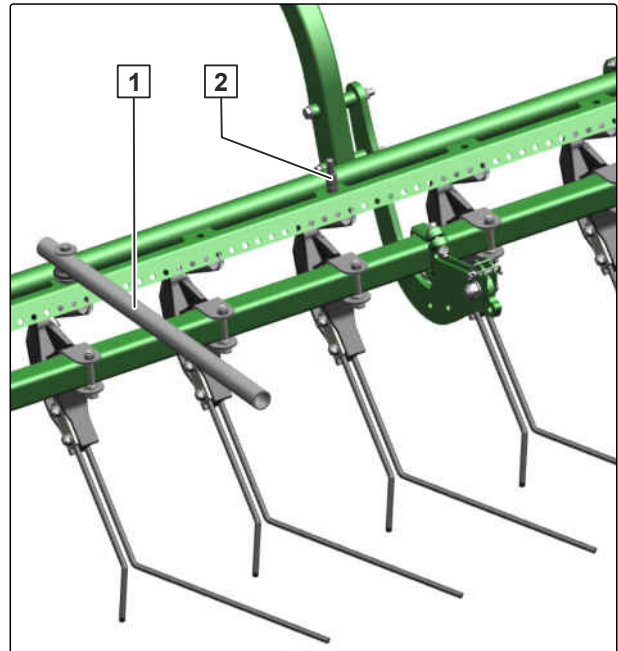
CMS-T-00006338-A.1

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.

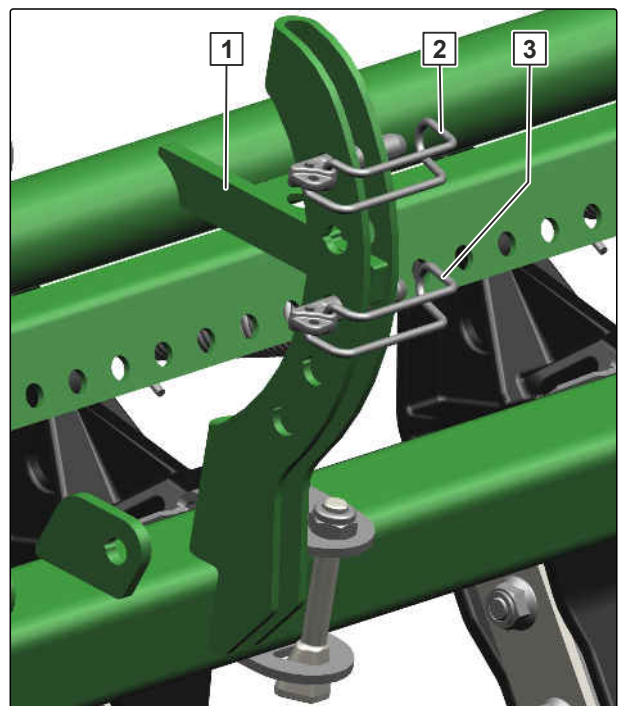
The exact following harrow pressure is then hydraulically adjusted together with the coulter pressure. With higher coulter pressure, higher exact following harrow pressure is also set at the same time.

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

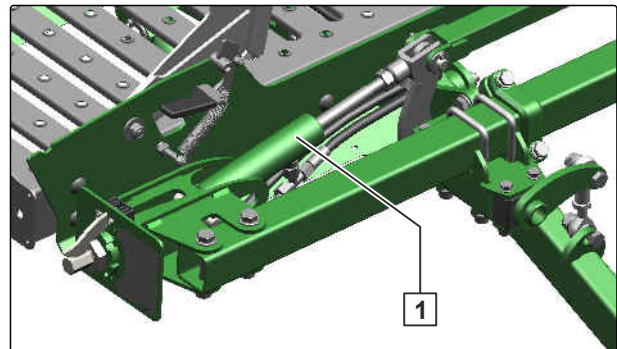
*To set the lower exact following harrow pressure,*  
actuate the "green 2" tractor control unit.

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

#### **6.3.10.6 Lifting the exact following harrow**

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

A hydraulic cylinder **1** lifts the exact following harrow.



CMS-I-00004703

- *To lift the exact following harrow,*  
actuate the "blue 2" tractor control unit until the  
hydraulic cylinder is retracted to the end position

or

*To lower the exact following harrow,*  
actuate the "blue 1" tractor control unit until the  
hydraulic cylinder is extended to the end position.

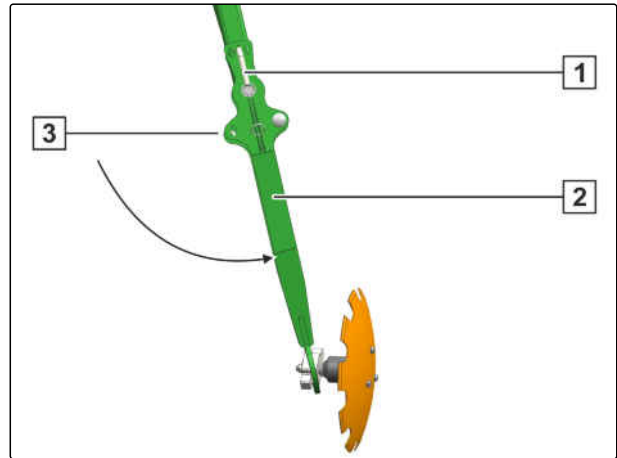
### 6.3.11 Adjusting the tramline marker on the implement frame

CMS-T-00004373-B.1

#### 6.3.11.1 Unfolding the tramline marker

CMS-T-00004374-B.1

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

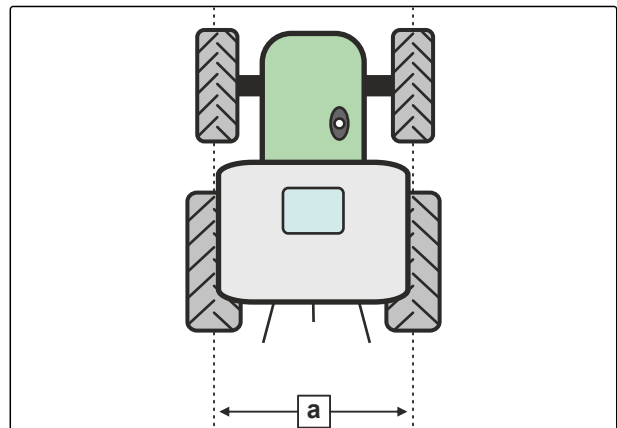


CMS-I-00003168

#### 6.3.11.2 Adjusting the track width

CMS-T-00004375-B.1

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



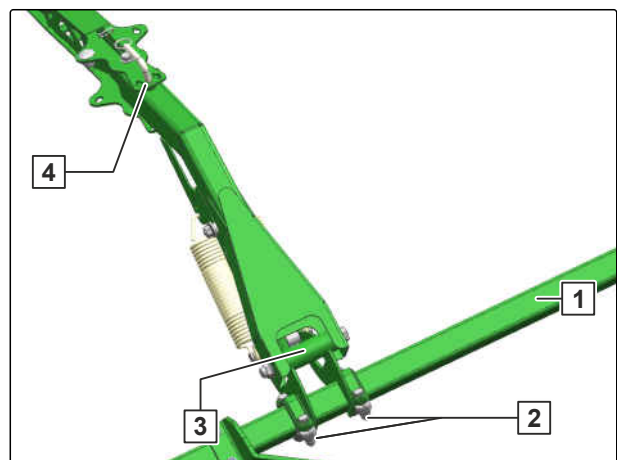
CMS-I-00003195

2. Secure the adjuster segment **4** in the middle hole.
3. Loosen the bolts **2**.

#### **i** NOTE

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

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



CMS-I-00003169

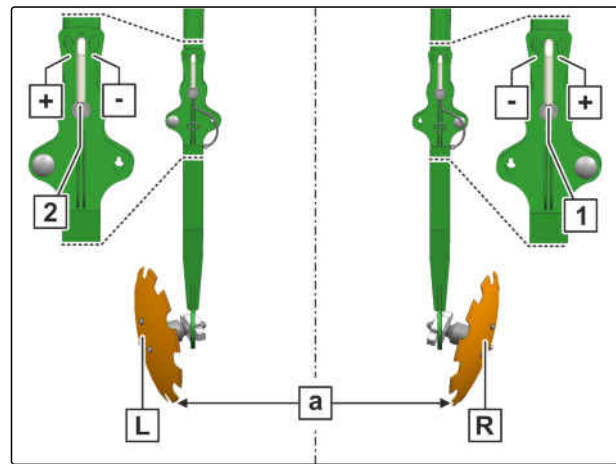
## 6 | Preparing the machine

### Preparing the implement for operation

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.

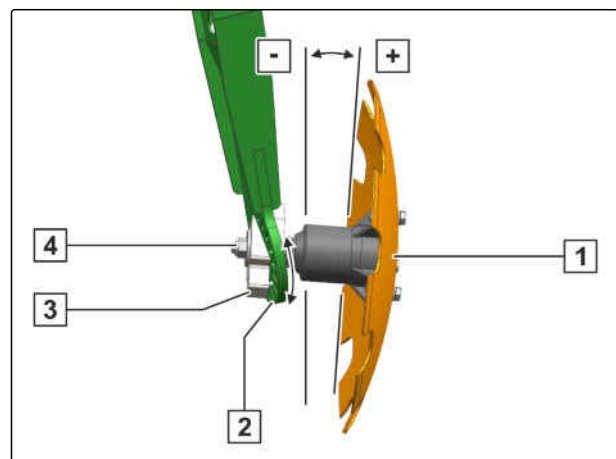
7. Release the pins **1** and **2** from the pegging hole.
8. *To reduce the track width of the tramline marker by 20 cm,*  
insert the pin in position **-**,  
  
or  
  
*to increase the track width of the tramline marker by 20 cm,*  
insert the pin in position **+**.
9. *To secure the pin in the adjuster segment,*  
turn the pin down.
10. *To check the setting,*  
seed for approx. 30 m at working speed and then  
check the work pattern.



CMS-I-00003170

#### 6.3.11.3 Adjusting the track disc pitch

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.



CMS-I-00003171

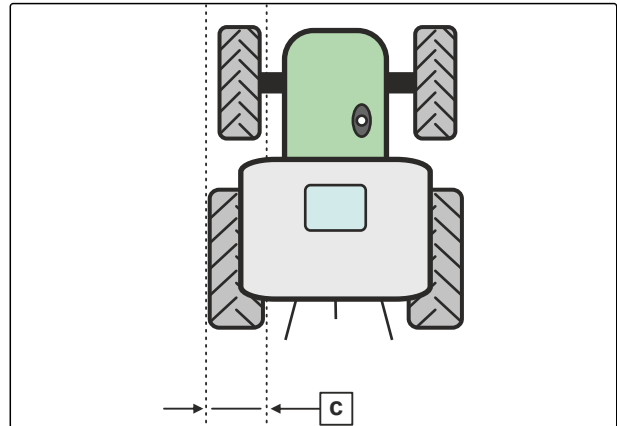
#### 6.3.11.4 Adjusting the tramline wheelmark width

CMS-T-00004379-B.1

##### 6.3.11.4.1 Installing the tramline segments

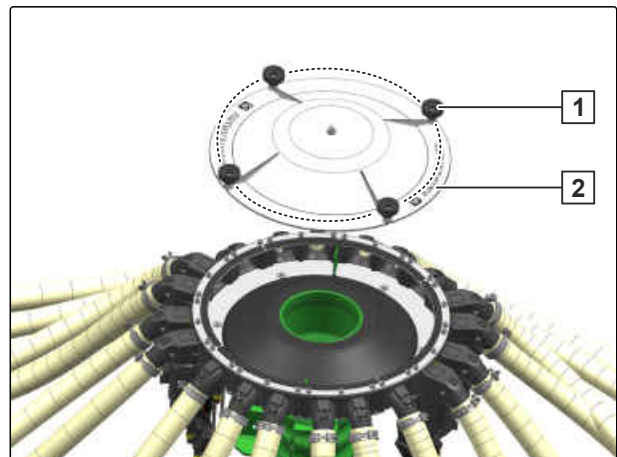
CMS-T-00004376-B.1

1. Determine the tractor wheelmark width **c** of the cultivating implement.
2. *If additional tramline segments are required, replace the seed outlets with tramline segments.*



CMS-I-00003196

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



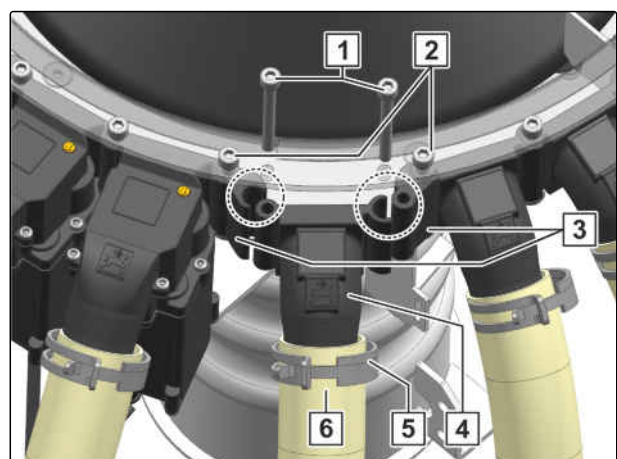
CMS-I-00003190

5. Remove the bolts **1**.
  6. Loosen the adjacent 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. Install the conveyor hose **6**.



CMS-I-00003132

10. Install an additional tramline segment in the intermediate segment.

11. Install the bolts.



## 6 | Preparing the machine

### Preparing the implement for operation

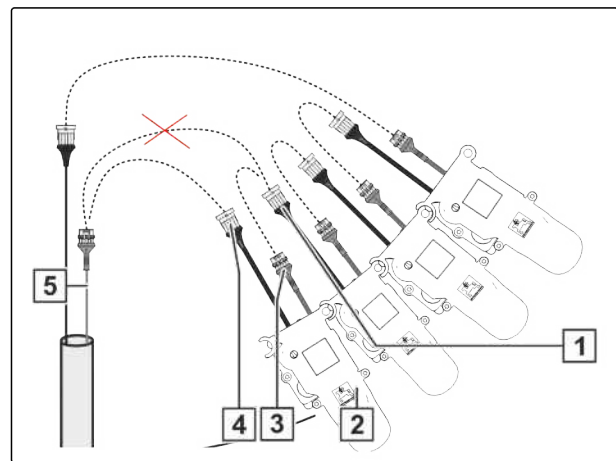
12. Install the adjacent bolts on the intermediate segments.
13. Install the conveyor hose.
14. Install the hose clamp.
15. Install the cover.
16. Tighten the 4 knurled screws by hand.
17. *To ensure that all tramlines have the same wheelmark width,*  
install additional tramline segments for all tramlines.
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 the tramline segments

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.

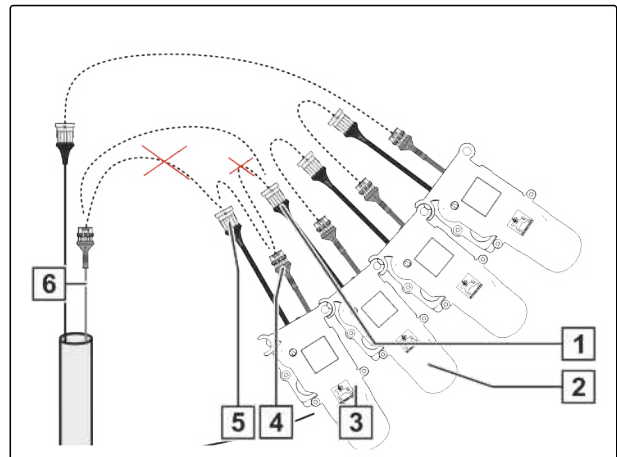




#### 6.3.11.4.3 Disconnecting tramline segments

CMS-T-00004381-B.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**.



CMS-I-00003193

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

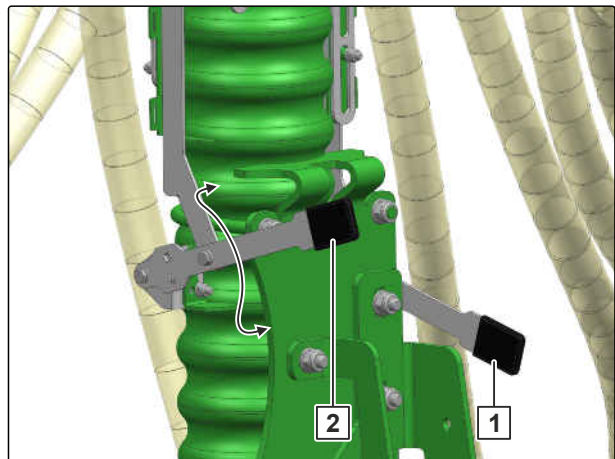
#### **i** NOTE

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 Operating the one-sided switching

The left control lever **1** actuates the left sliding shutter, open here. The right control lever **2** actuates the right sliding shutter, closed here.



CMS-T-00004888-B.1

CMS-I-00003596

1. *To actuate the desired sliding shutter,*  
swivel up the corresponding control lever.

or

*To operate the electrically actuated sliding shutter,*  
see "ISOBUS software" operating manual

or

see "control computer" operating manual.

2. *To halve the seed rate when using half the working width,*  
see "ISOBUS software" operating manual

or

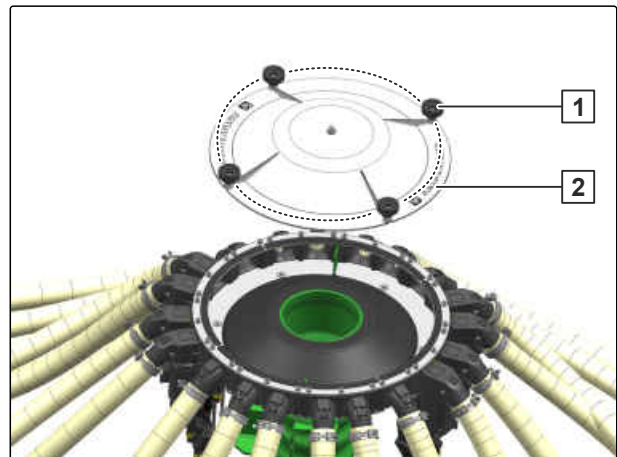
see "control computer" operating manual.

### 6.3.13 Adjusting the row spacing

CMS-T-00004489-B.1

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

1. Loosen the 4 knurled screws **1**.
2. Remove the cover **2**.

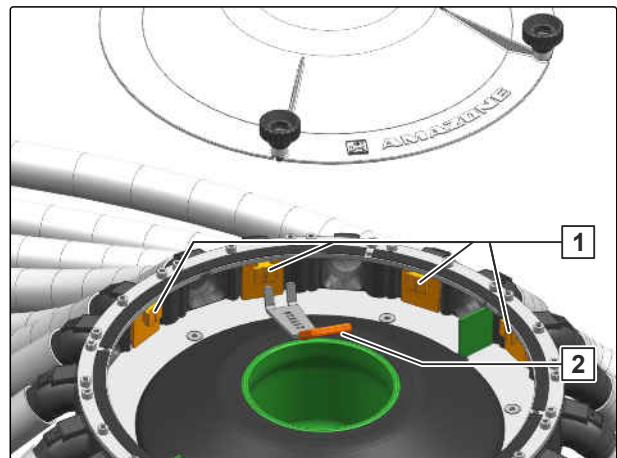


CMS-I-00003190

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

or

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



CMS-I-00003247



#### NOTE

The sealing plugs do not fit in the tramline segments. To work with permanently closed tramline segments, disconnect the closed tramline segments.

4. Activate tramline control.
5. *To close all of the tramline segments,*  
advance the tramline counter.
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.

### 6.3.14 Operating the loading board with steps

CMS-T-00007020-A.1



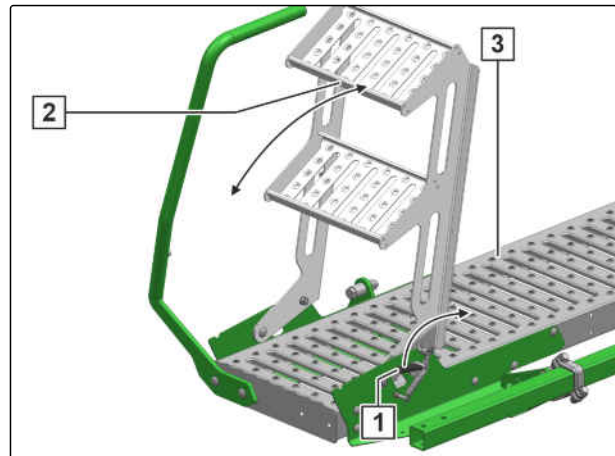
#### REQUIREMENTS

- ✓ The seed drill is coupled to the soil tillage implement

1. Hold the steps **2** in position.
2. *To unfold the steps,* release the transport lock **1**.
3. Swivel the steps down.
4. Climb onto the loading board **3** using the steps.
5. After use, swivel the steps up and put them in the parking position.

➔ The transport lock locks automatically.

6. Make sure that the transport lock is properly engaged.



CMS-I-00004942

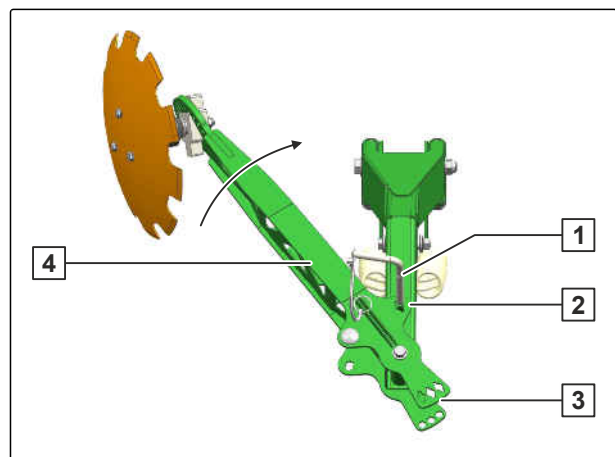
## 6.4 Preparing the machine for road travel

CMS-T-00004889-B.1

### 6.4.1 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

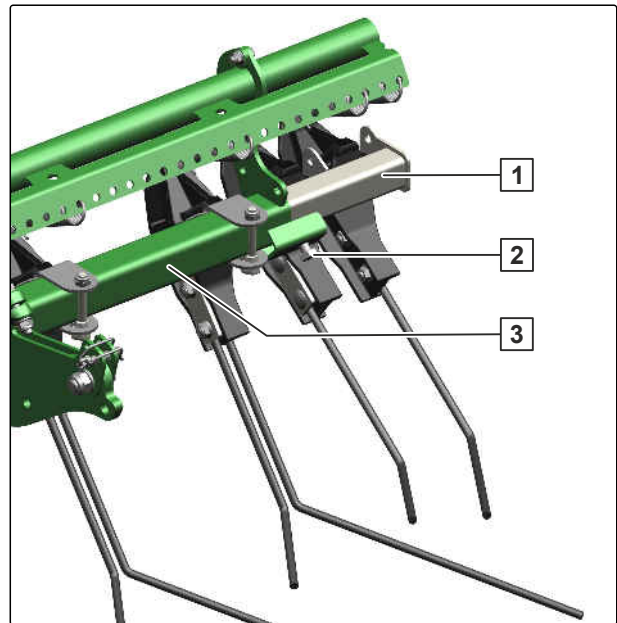
### 6.4.2 Moving the exact following harrow into transport position

CMS-T-00006417-A.1

The outer harrow elements can exceed the permissible transport width during transport. To avoid exceeding the permitted transport width, the exact

following harrow must be moved into transport position before road transport.

1. Loosen the bolt **2** with the universal operating tool.
2. Push the sliding element **1** into the carrier tube **3** up to the stop.
3. Tighten the bolt **2** with the universal operating tool.
4. Make the same setting for the other side of the implement.



CMS-I-00004675

## 6.5 Calculating the permissible payload

CMS-T-00002254-C.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-B.1

### 7.1 Using the implement

CMS-T-00004492-B.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

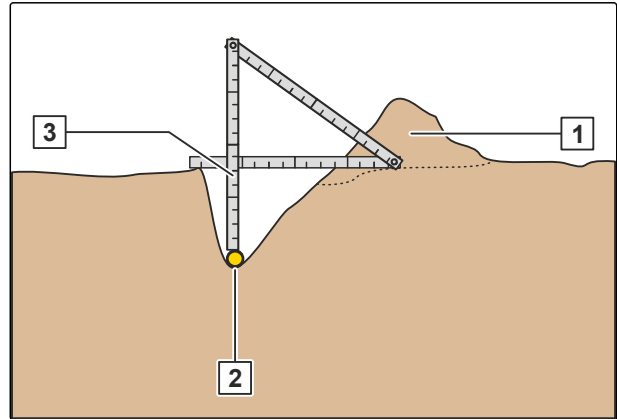
Make use of an implement standstill, e.g. after loading with seed, to make a visual check of the implement.

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

## 7.2 Checking the placement depth

CMS-T-00004517-B.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.



CMS-I-00003257

## 7.3 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.

# Parking the machine

8

CMS-T-00004895-B.1

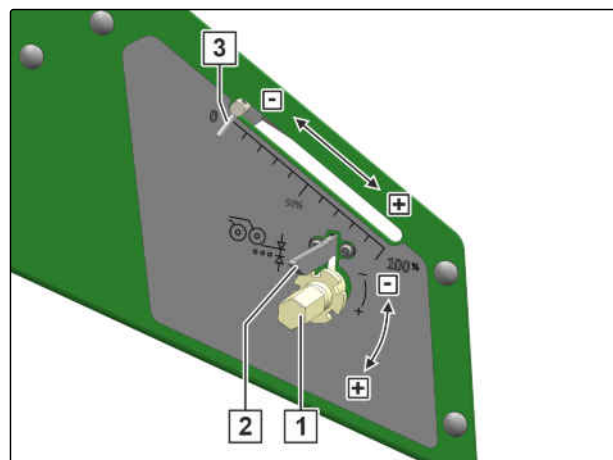
## 8.1 Parking the TwinTeC couler

CMS-T-00004436-B.1

1. Raise the implement.
2. Put the universal operating tool on the adjustment spindle **1**.
3. *To move the TwinTeC coulters into the parking position, reduce the placement depth to zero.* Turn the universal operating tool counter-clockwise **-**.

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

4. Take off the universal operating tool and allow the catch **2** to engage in a groove of the grid.

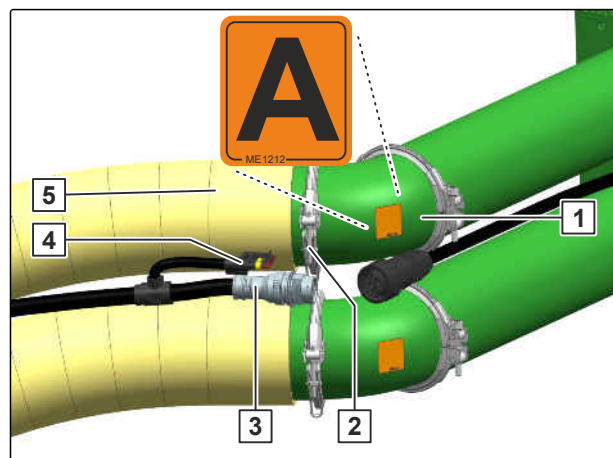


CMS-I-00003114

## 8.2 Disconnecting the supply lines from the hose package

CMS-T-00004440-A.1

1. *To disconnect the conveyor hose **5** from the hose package **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.



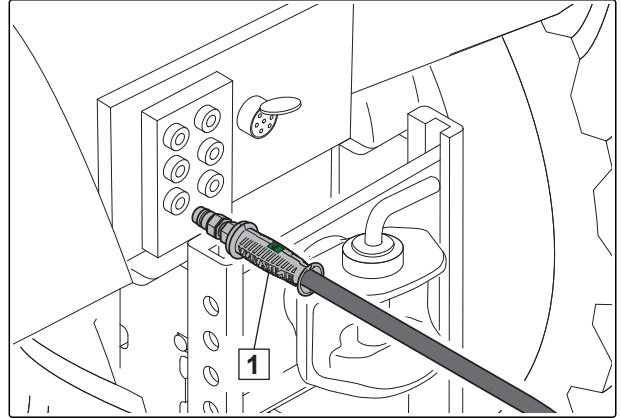
CMS-I-00003124



### 8.3 Disconnecting the hydraulic hose lines

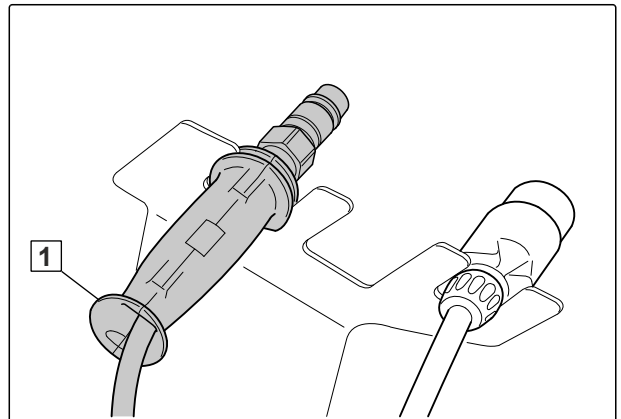
CMS-T-00000277-D.1

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.

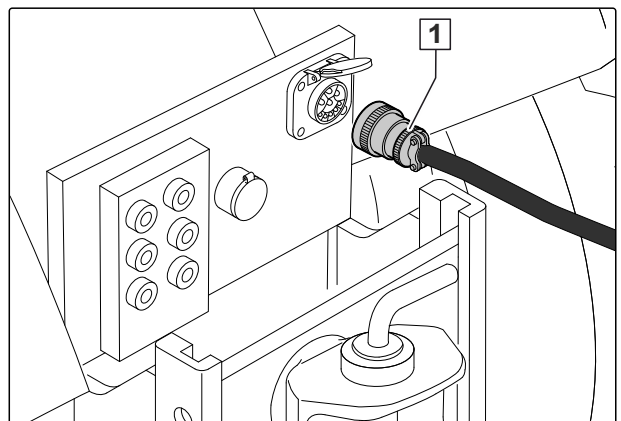


CMS-I-00001250

### 8.4 Uncoupling the ISOBUS line

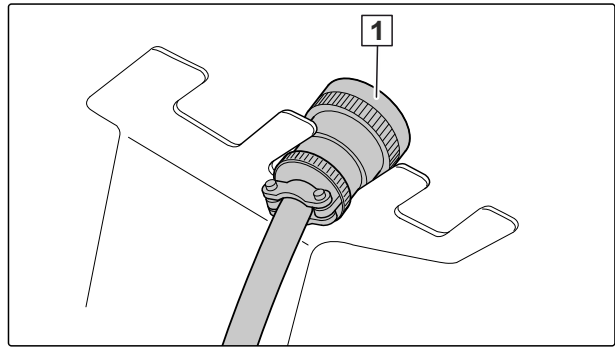
CMS-T-00006174-A.1

1. Unplug the connector **1** of the ISOBUS line.



CMS-I-00004333

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

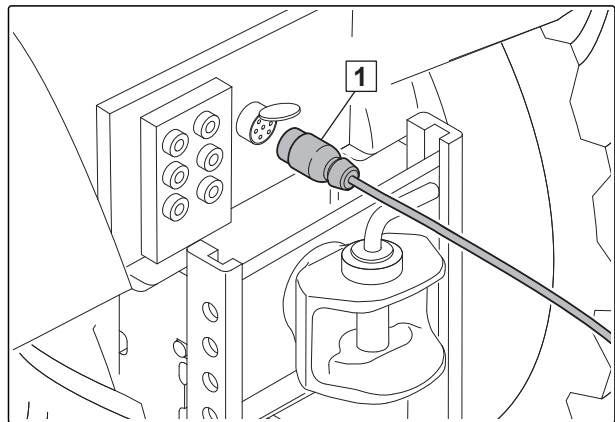


CMS-I-00004414

## 8.5 Uncoupling the power supply

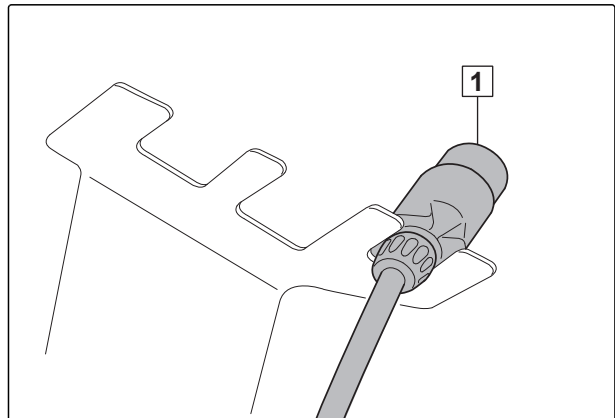
CMS-T-00001402-D.1

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

## 8.6 Uncoupling the Avant seeding combination

CMS-T-00004438-B.1



### WARNING

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

- Park the implement on stable and even ground.

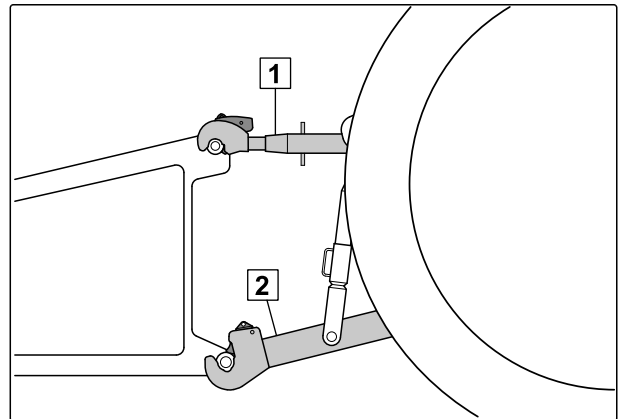


## WARNING

**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. Release the top link **1**.
2. Disconnect the top link **1** from the implement from the tractor seat.
3. Release the lower links **2**.
4. *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.*
5. Uncouple the lower link **2** from the implement from the tractor seat.
6. Drive the tractor forward.

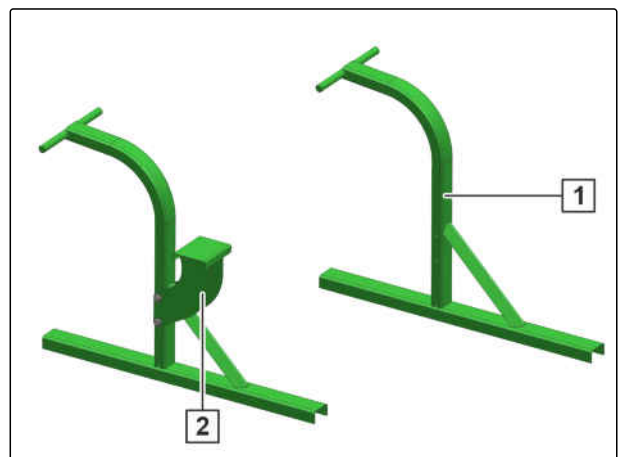


CMS-I-00001249

## 8.7 Parking the Avant seeding unit separately

CMS-T-00004896-B.1

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



CMS-I-00004939

## 8 | Parking the machine

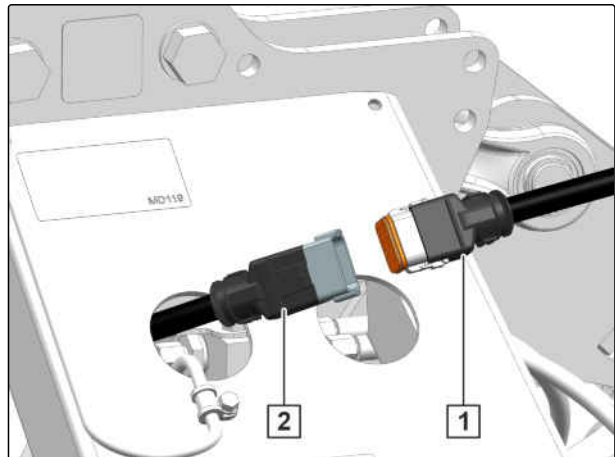
### Parking the Avant seeding unit separately

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

or

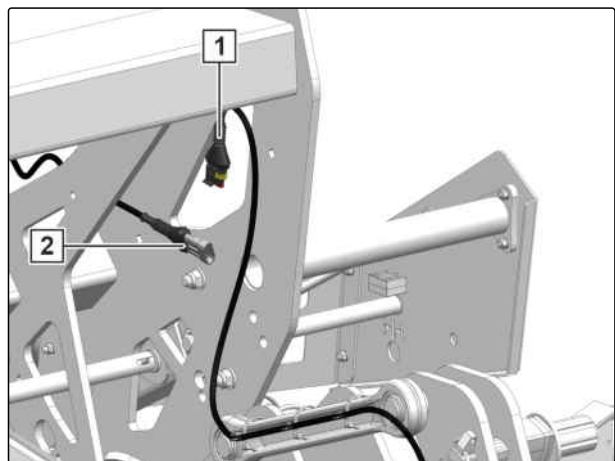
Section "Adjusting the coulter pressure  
mechanically".

2. To set the placement depth to 0,  
see section "Adjusting the placement depth on  
the TwinTeC coulter".
3. Disconnect the supply line **1** from the soil tillage  
implement **2**.



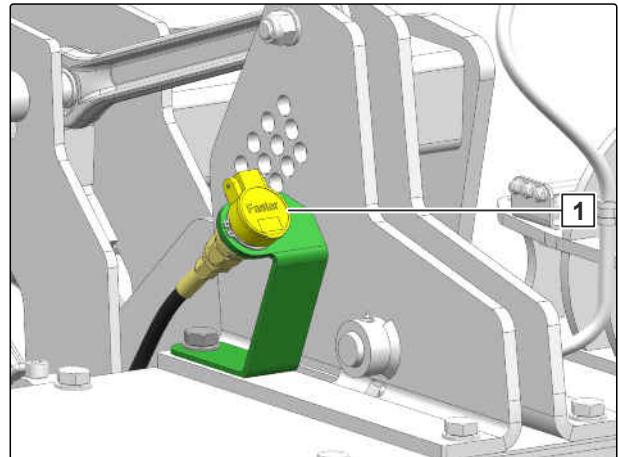
CMS-I-00004528

4. Disconnect the supply line **2** for the rear lighting  
and identification from the soil tillage implement  
**1**.



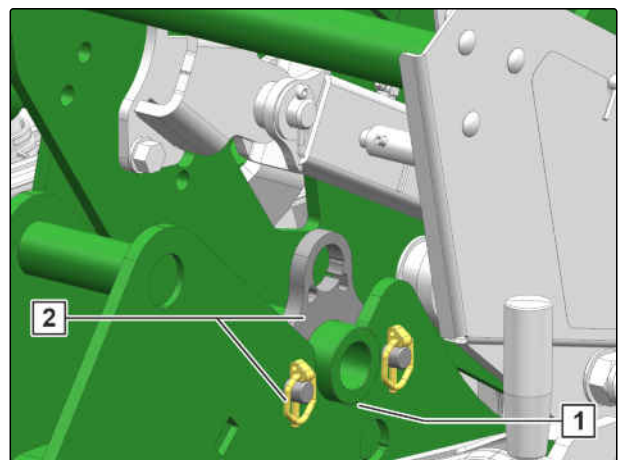
CMS-I-00004527

5. If the seeding unit has a tramline marker, disconnect the supply line of the seeding unit from the soil tillage implement **1**.



CMS-I-00003485

6. Remove the safety clips **2** from all of the brackets **1**.



CMS-I-00003593

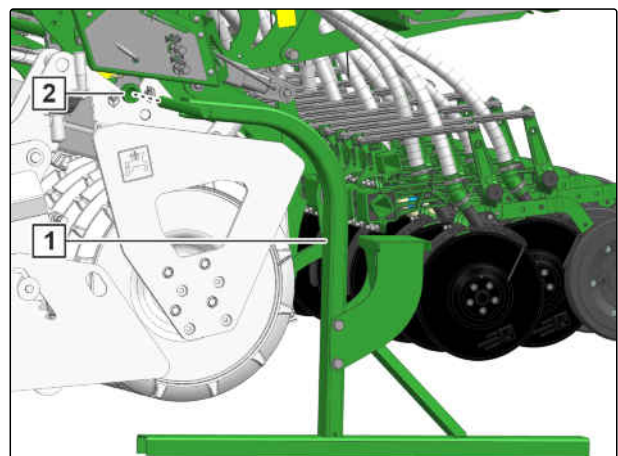


## WARNING

The parking supports do not have a locking device.

- To prevent the parking supports from falling out of the mount while driving, remove the parking supports.

7. Install the parking supports **1** on the implement **2** on both sides.
8. Park the soil tillage implement with the coupled seeding unit.

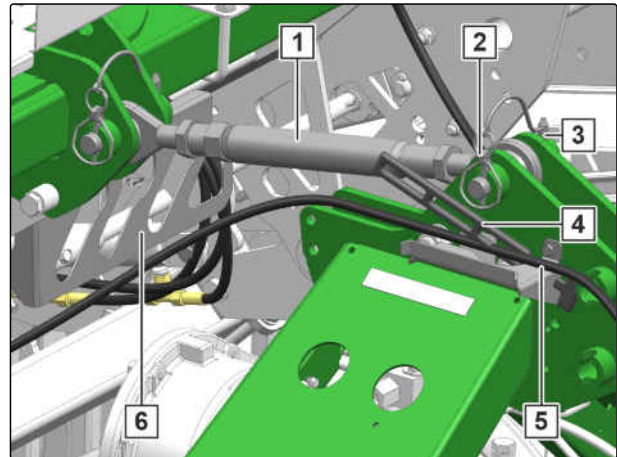


CMS-I-00004938

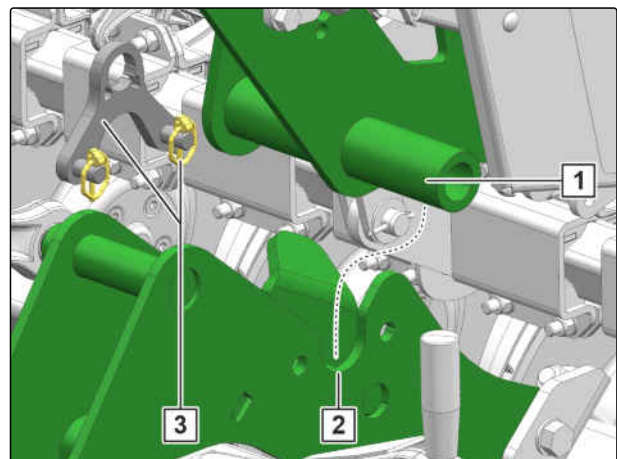
## 8 | Parking the machine

### Parking the Avant seeding unit separately

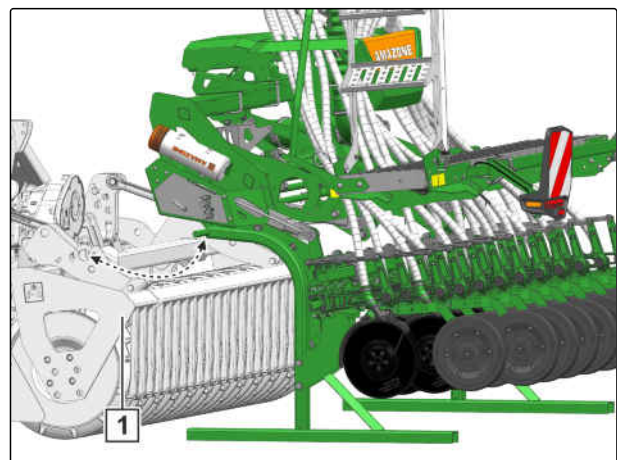
9. Remove the linch pin **2**.
10. Remove the pin **3**.
11. Disconnect the top link **1** from the soil tillage implement.
12. Release the holder **4**.
13. Take the hydraulic hose lines out of the guide **5** and place them in the hose cabinet **6**.
14. Disconnect the supply line for the job computer from the hose package and place it in the hose cabinet
15. Disconnect the supply line for the job computer from the tractor and place it in the hose cabinet
16. *To park the implement on a level surface with solid ground,*  
Slowly lower the soil tillage implement.
  - ➔ The catching sockets **2** of the soil tillage implement are lowered.
  - ➔ The seeding unit **1** is standing on the parking supports.
17. Install the safety clips **3** on the soil tillage implement.
18. Slowly drive the tractor with the coupled soil tillage implement **1** forward.



CMS-I-00004526



CMS-I-00003590



CMS-I-00003591

# Repairing the machine

# 9

CMS-T-00004903-B.1

## 9.1 Maintaining the machine

CMS-T-00004446-B.1

### 9.1.1 Maintenance schedule

<b>After initial operation</b>	
Checking the hydraulic hose lines	see page 91
<b>at the end of the season</b>	
Checking the depth control discs and depth control wheels	see page 87
<b>daily</b>	
Checking the top link pin and lower link pin	see page 90
<b>Every 10 operating hours / daily</b>	
Cleaning the segment distributor head	see page 90
<b>Every 50 operating hours / weekly</b>	
Checking the TwinTeC concave disc	see page 84
Checking the TwinTeC concave disc spacing	see page 84
Checking the TwinTeC depth control wheel	see page 86
Checking the TwinTeC depth control wheel scraper	see page 86
Checking the cutting discs	see page 89
Checking the RoTeC furrow former	see page 89
Checking the hydraulic hose lines	see page 91
<b>Every 100 operating hours / at the end of the season</b>	
Cleaning the conveyor section	see page 92



### 9.1.2 Checking the TwinTeC concave disc

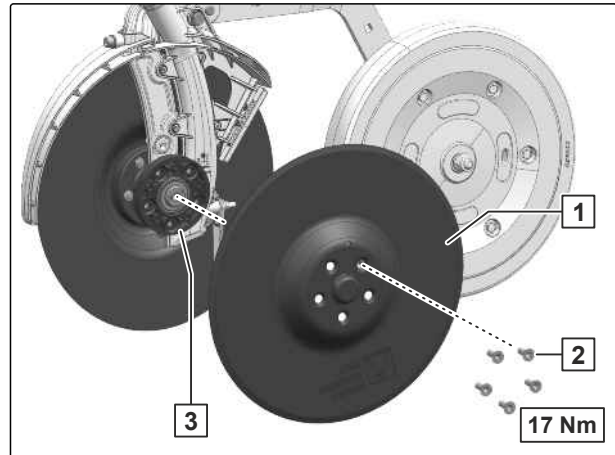
CMS-T-00004452-B.1



#### INTERVAL

- Every 50 operating hours  
or  
weekly

1. Determine the concave disc diameter.
2. *If the diameter of the concave discs is smaller than 300 mm, replace the concave discs.*
3. Remove the bolts [2].
4. Remove worn concave discs [1].
5. Pay attention to the orientation of the sealing ring [3].
6. Install new concave discs.
7. *To ensure that the concave discs touch slightly, see section "Checking the TwinTeC concave disc spacing".*



CMS-I-00003233

### 9.1.3 Checking the TwinTeC concave disc spacing

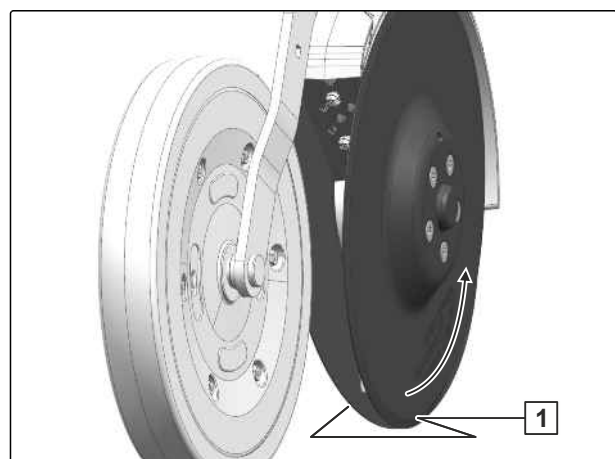
CMS-T-00004447-B.1



#### INTERVAL

- Every 50 operating hours  
or  
weekly

1. Rotate the concave disc [1].  
➔ The opposite disc rotates along. The spacing is correctly set.
2. *If the opposite disc does not rotate along, adjust the concave disc spacing.*



CMS-I-00003244



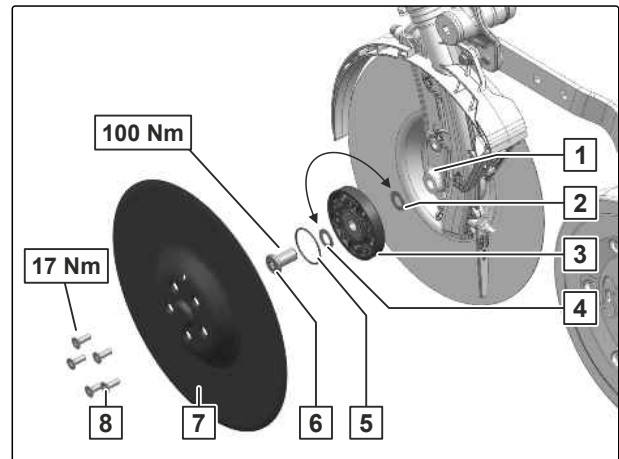
3. Remove the bolts **8**.
4. Remove the concave disc **7**.
5. Remove the sealing ring **5**.
6. Remove the central bolts **6**.

### **i** 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 concave discs touch slightly, adjust the spacing of the concave discs with the spacer discs **4** and **2**.*
8. Install spacer discs that are not required on the opposite side of the concave disc bearing **3** with the central bolt.
9. Install the concave 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 concave disc.
13. Install the bolts.



CMS-I-00003234

### 9.1.4 Checking the TwinTeC depth control wheel

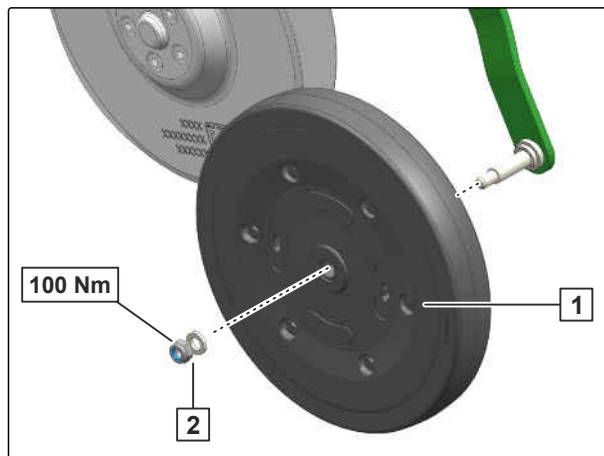
CMS-T-00004451-B.1



#### INTERVAL

- Every 50 operating hours  
or  
weekly

1. Check the depth control wheel **1**.
2. *If the depth control wheel has cracks or fractures,*  
replace the depth control wheel.
3. Remove the nut and washer **2**.
4. Replace the damaged depth control wheel.
5. Install the nut and washer.



CMS-I-00003243

### 9.1.5 Checking the TwinTeC depth control wheel scraper

CMS-T-00004989-B.1



#### INTERVAL

- Every 50 operating hours  
or  
weekly

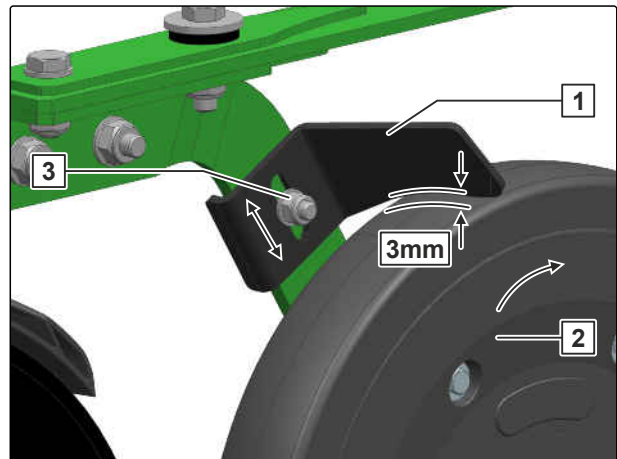


#### IMPORTANT

**Damage to the support roller due to abrasion by the scraper**

- *To check the distance,*  
rotate the support roller

1. Raise the implement.
2. *To check the distance of the depth control wheel scraper* **1**,  
rotate the wheel **2**.
3. *If the distance is too big,*  
Loosen the nut **3**.
4. Adjust the depth control wheel scraper **1**.
5. Tighten the nut.
6. *To check the distance,*  
Rotate the wheel again.
7. *If the depth control wheel scraper cannot be readjusted any further,*  
replace the press roller scraper.
8. Remove the nut and washer.
9. Replace the depth control wheel scraper.
10. Install the washer and nut.
11. *To check the distance,*  
rotate the wheel.



CMS-I-00003180

### 9.1.6 Checking the depth control discs and depth control wheels

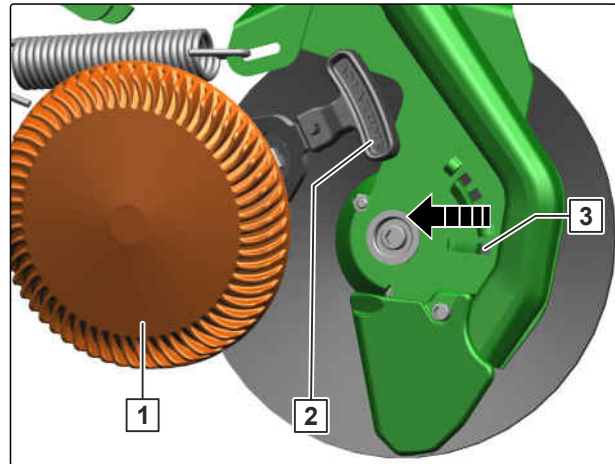
CMS-T-00006349-A.1



#### INTERVAL

- at the end of the season
1. Check the depth control discs or depth control wheels for damage such as cracks or fractures.
  2. *If a depth control disc or depth control wheel is damaged,*  
replace the depth control disc or depth control wheel.

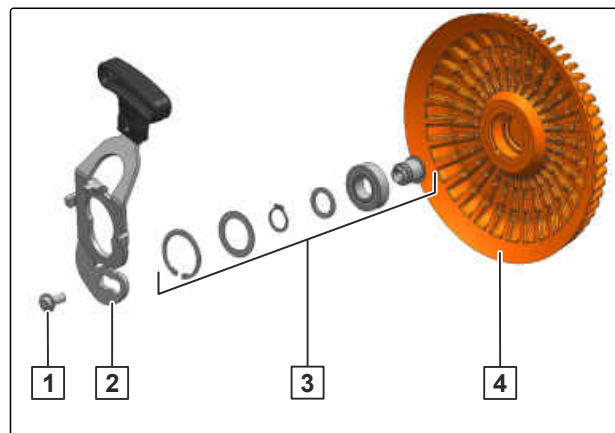
3. To remove the damaged depth control disc or depth control wheel **1** from the coulter, press firmly against the depth control disc or depth control wheel, move the lever **2** all the way down and push it to the rear in the elongated slot **3** until the depth control disc or depth control wheel can be removed.



CMS-I-00004665

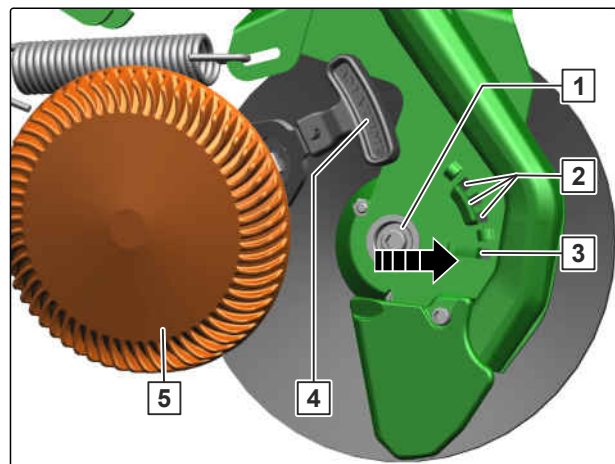
The removed unit consisting of depth control disc or depth control wheel **4** and lever **2** can be replaced as a whole or further disassembled. If only the depth control disc or depth control wheel should be replaced, the unit must be further disassembled as described in the following.

4. Remove the bolt **1**.
5. Take the axle, ball bearing, locking rings and locking washers **3** out of the worn depth control disc or depth control wheel and insert them in the new depth control disc or depth control wheel.



CMS-I-00004802

6. Install the lever **2** with the bolt **1** on the new depth control disc or depth control wheel **4**.
7. To install the new depth control disc or 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 depth control disc or depth control wheel and pull the lever towards the front in the elongated slot **3** until the depth control disc or depth control wheel completely engages.



CMS-I-00004836

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

### 9.1.7 Checking the cutting discs

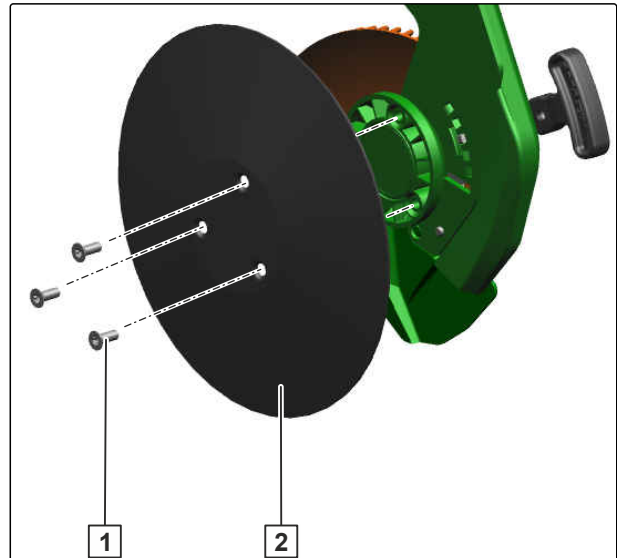
CMS-T-00006335-A.1



#### 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

### 9.1.8 Checking the RoTeC furrow former

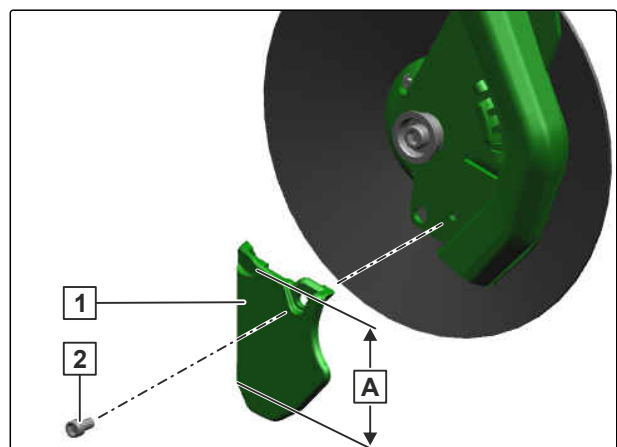
CMS-T-00006374-A.1



#### 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

### 9.1.9 Cleaning the segment distributor head

CMS-T-00004448-C.1



#### INTERVAL

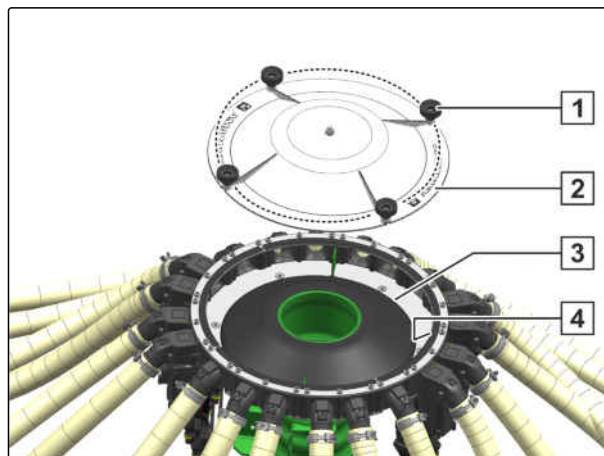
- Every 10 operating hours  
or  
daily



#### NOTE

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

Shorten the checking intervals under very dusty conditions.



CMS-I-00003133

1. Loosen the 4 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 4 knurled screws by hand.

### 9.1.10 Checking the top link pin and lower link pin

CMS-T-00002330-E.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.

### 9.1.11 Checking the hydraulic hose lines

CMS-T-00002331-B.1



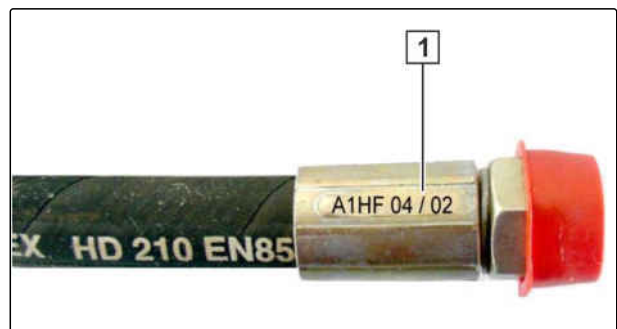
#### INTERVAL

- 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.

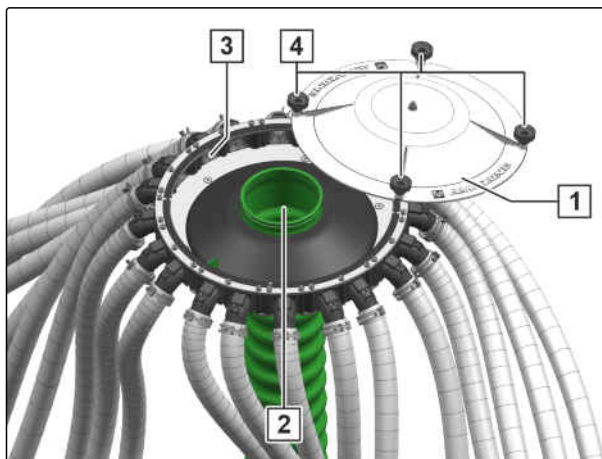
### 9.1.12 Cleaning the conveyor section



#### 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



## 9.2 Lubricating the implement

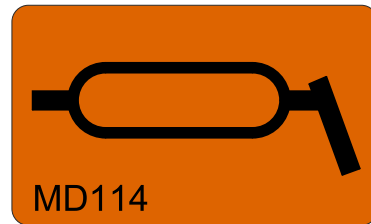
CMS-T-00004904-B.1



### IMPORTANT

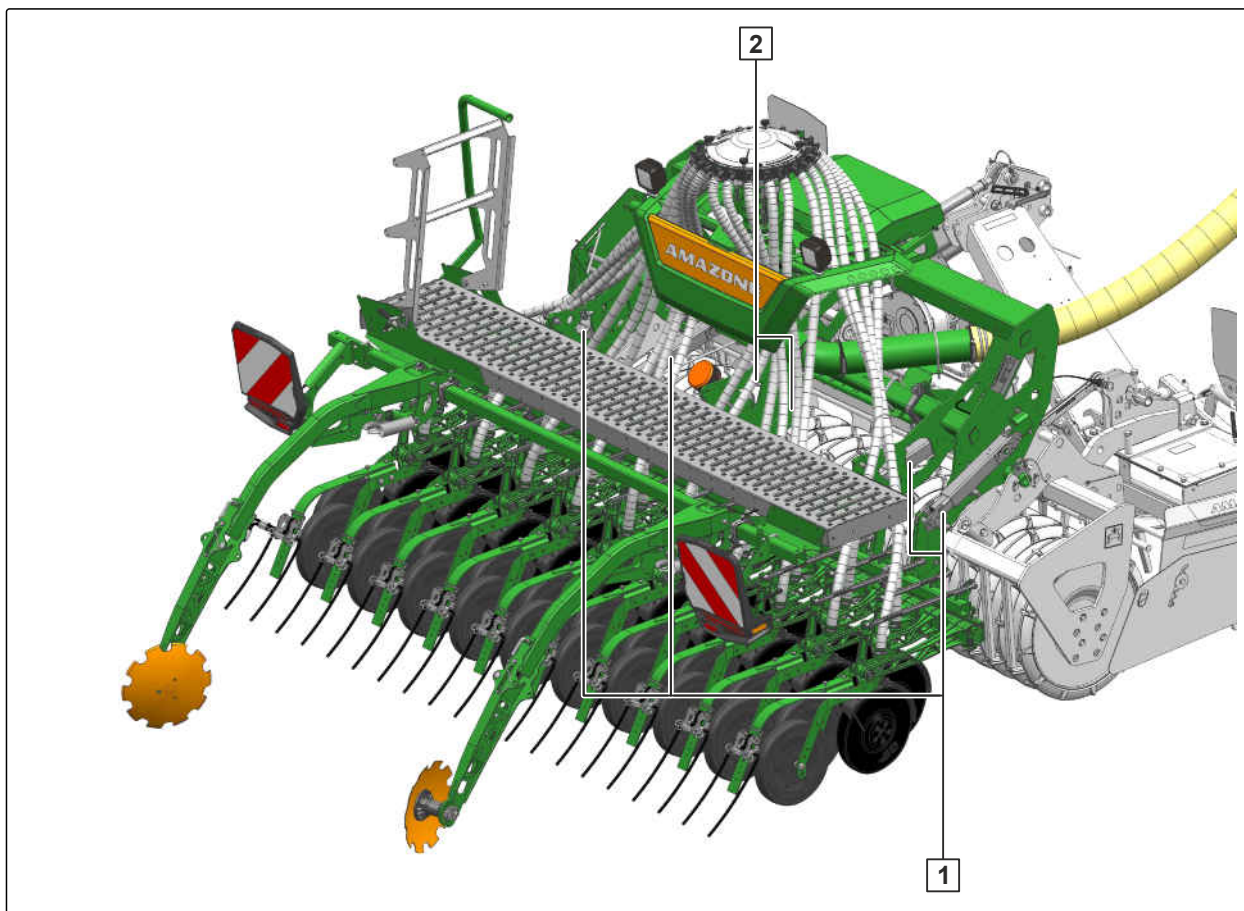
#### Implement damage due to improper lubrication

- ▶ 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.



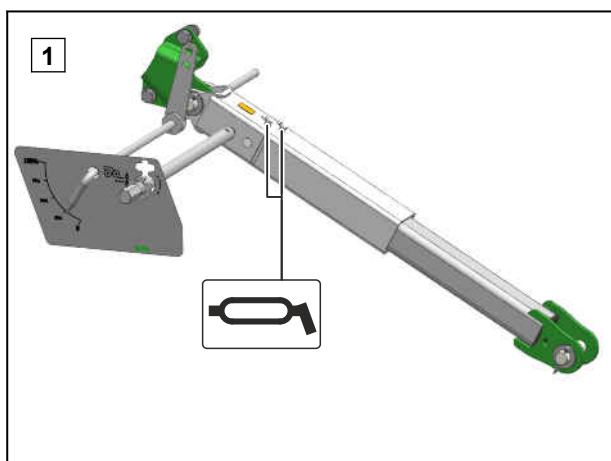
## 9.2.1 Overview of lubrication points

CMS-T-00004905-B.1



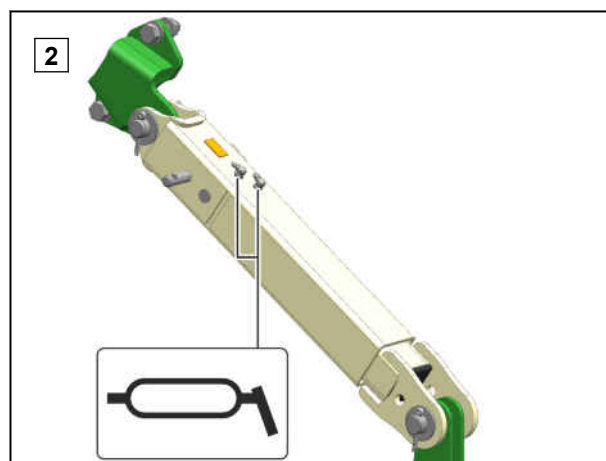
CMS-I-00003594

### Every 100 operating hours



CMS-I-00005328

Avant 3002, Avant 3502 and Avant 4002



CMS-I-00003231

Avant 4002

### 9.3 Eliminating faults

CMS-T-00004444-B.1

Errors	Cause	Solution
The lighting for road travel has a malfunction.	Lamp or lighting supply line is damaged.	<ul style="list-style-type: none"> <li>► Replace the lamp.</li> <li>► Replace the lighting supply line.</li> </ul>
Control terminal shows a speed error	The speed sensor detects a speed error despite that the implement is running.	see page 97
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 97
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 98
TwinTeC concave disc blocked	When the inner scraper is worn, the concave discs are blocked by adhering soil.	see page 98
The exact following harrow does not cover the seed sufficiently with fine soil	On seed drills without exact following harrow lift, the overload safety is triggered.	see page 99
	The harrow tines are not aligned parallel to the ground.	<ul style="list-style-type: none"> <li>► See "Adjusting the exact following harrow" &gt; "Adjusting the position of the harrow tines on seed drills without exact following harrow lift" or "Adjusting the position of the harrow tines on seed drills with exact following harrow lift"</li> </ul>
	The exact following harrow pressure is incorrectly set	<ul style="list-style-type: none"> <li>► See "Adjusting the exact following harrow" &gt; "Adjusting the exact following harrow pressure mechanically" or "Adjusting the exact following harrow pressure hydraulically"</li> </ul>
	The harrow tines are worn.	see page 99
The coulter harrow does not cover the seed sufficiently with fine soil	The angle of the coulter harrow is incorrectly set.	<ul style="list-style-type: none"> <li>► See "Adjusting the TwinTeC coulter" &gt; "Adjusting the harrow angle"</li> </ul>
	The height of the coulter harrow is incorrectly set.	<ul style="list-style-type: none"> <li>► See "Adjusting the TwinTeC coulter" &gt; "Adjusting the harrow height"</li> </ul>
	The harrow tines of the coulter harrow are worn.	see page 100

<b>Errors</b>	<b>Cause</b>	<b>Solution</b>
The RoTeC coulter is not spreading seed	The seed outlet is slightly blocked.	<ul style="list-style-type: none"> <li>▶ Raise the implement.</li> <li>▶ Clean the seed outlet from below.</li> </ul>
	The seed outlet is strongly blocked.	see page 100
The TwinTeC coulter is not spreading seed	The seed outlet is slightly blocked.	<ul style="list-style-type: none"> <li>▶ Raise the implement.</li> <li>▶ Clean the seed outlet from below.</li> </ul>
	The seed outlet is strongly blocked.	see page 101

### 9.3.1 Control terminal shows a speed error

CMS-T-00004518-A.1

**The speed sensor detects a speed error despite that the implement is running.**

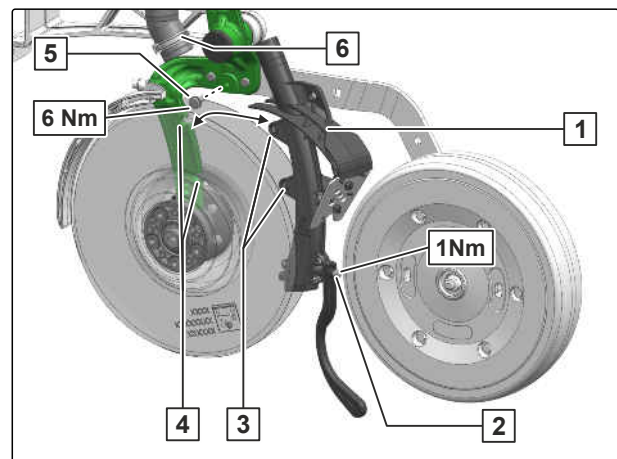
1. Remove the speed sensor.
2. Remove chips from the magnetic sensor surface.
3. Install the speed sensor.

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

CMS-T-00006593-A.1

**When the seed catcher is worn, the seed is not fixed in the furrow.**

1. Remove the hose **6**.
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.



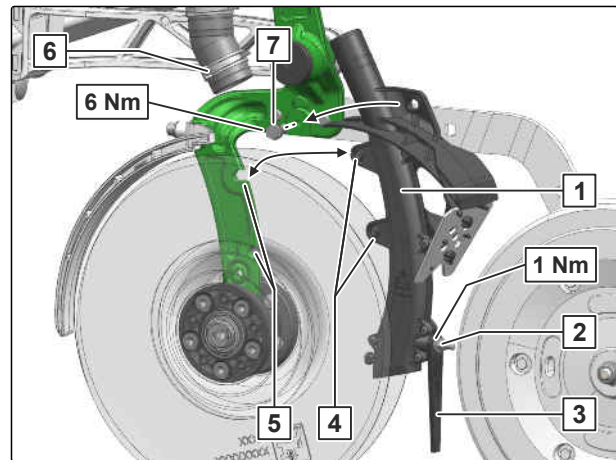
CMS-I-00003260

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

CMS-T-00006594-A.1

**When the guide extension is worn, the seed is not guided into the furrow.**

1. Remove the hose [6].
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.



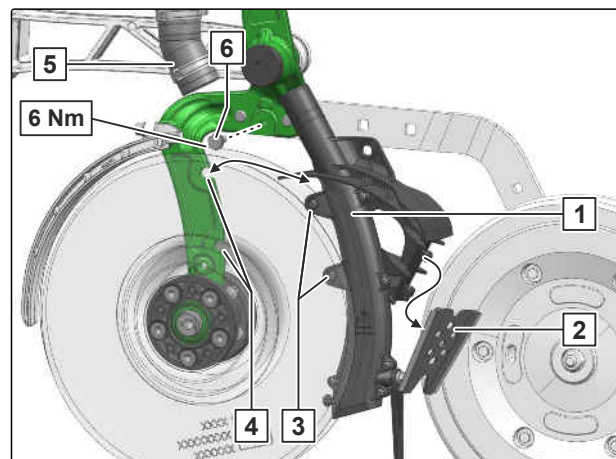
CMS-I-00003242

### 9.3.4 TwinTeC concave disc blocked

CMS-T-00006595-A.1

**When the inner scraper is worn, the concave discs are blocked by adhering soil.**

1. Remove the hose [5].
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.



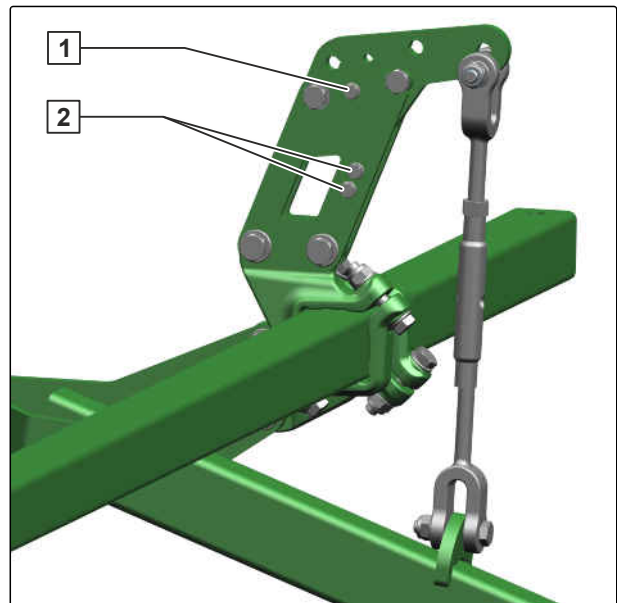
CMS-I-00003245

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

CMS-T-00006600-A.1

**On seed drills without exact following harrow lift, the overload safety is triggered.**

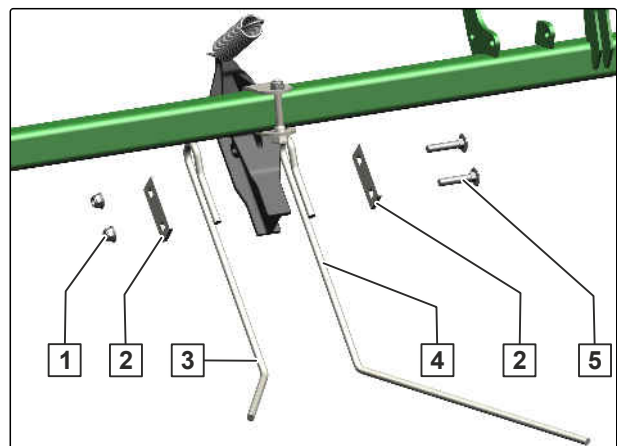
1. *To position the exact following harrow correctly, raise the implement.*
2. Remove the remainders of the torn shear bolt **1**.
3. Take out one of the spare shear bolts **2**.
4. Install the spare shear bolt with washers and nut at position **1**.



CMS-I-00004678

**The harrow tines are worn.**

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.



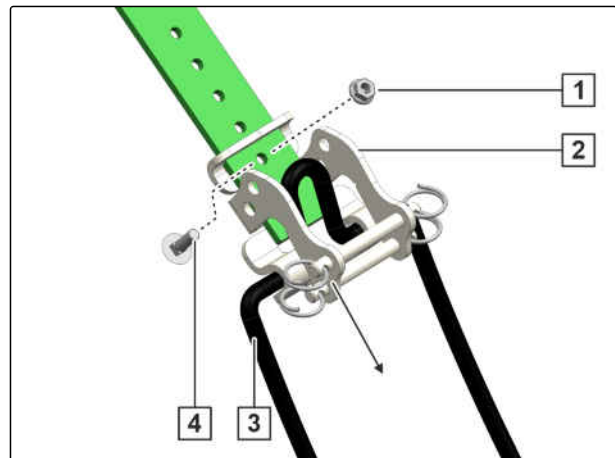
CMS-I-00004677

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

CMS-T-00006604-A.1

**The harrow tines of the coulter harrow are worn.**

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.



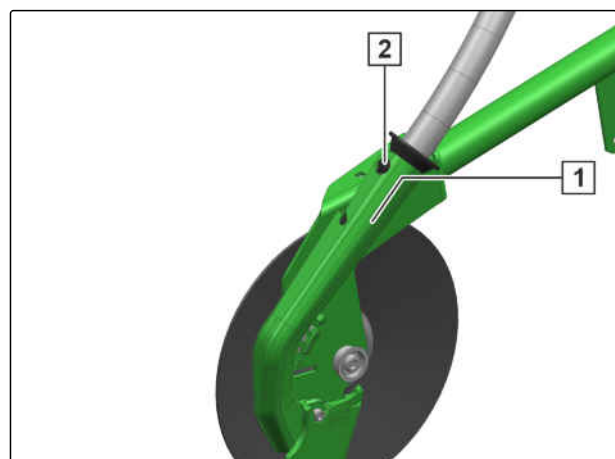
CMS-I-00004632

### 9.3.7 The RoTeC coulter is not spreading seed

CMS-T-00006606-A.1

**The seed outlet is strongly blocked.**

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

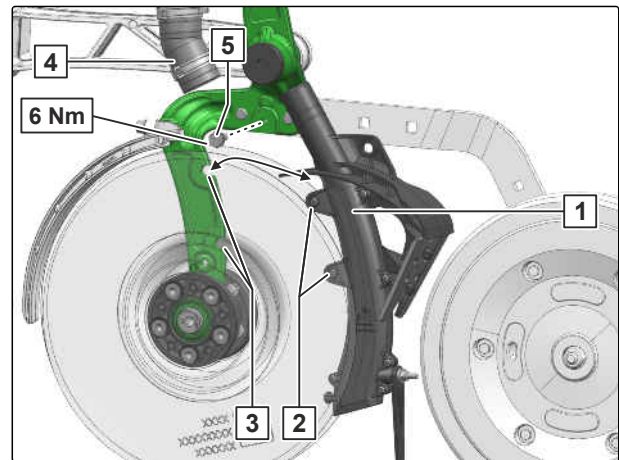


### 9.3.8 The TwinTeC coulter is not spreading seed

CMS-T-00006601-A.1

**The seed outlet is strongly blocked.**

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



CMS-I-00003246

## 9.4 Cleaning the machine

CMS-T-00000593-C.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 300 mm between the high-pressure nozzle and the machine.
  - ▶ Do not exceed a water pressure of 120 bar.
- ▶ Clean the machine with a high-pressure cleaner or a hot water high-pressure cleaner.

# Loading the machine

10


CMS-T-00004906-B.1

## 10.1 Lifting the implement

CMS-T-00004908-B.1

The implement has 2 lashing points for slings for lifting.

In addition, the top link pin on the soil tillage implement is used as a lashing point for slings.

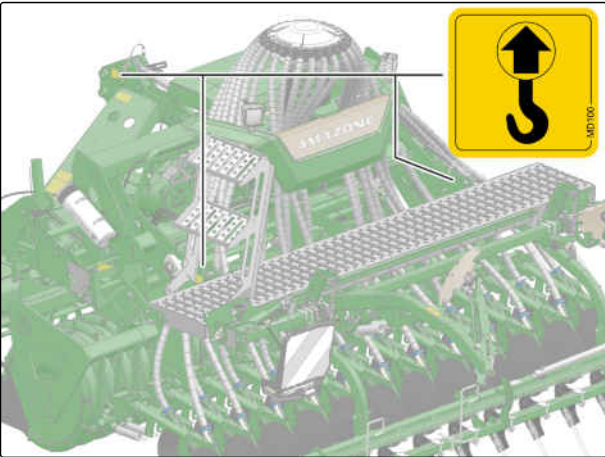


**WARNING**

**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-00003595

Required load-bearing capacity per sling	4000 kg
--	---------

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

## 10.2 Lashing the machine

CMS-T-00006345-A.1

The implement has 3 lashing points for lashing straps.

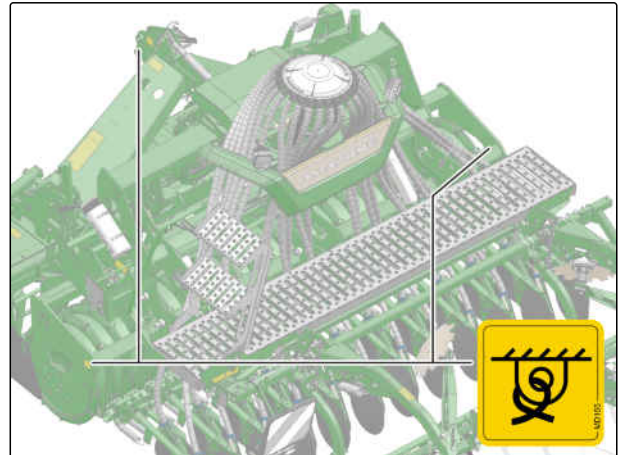


### WARNING

#### Risk of accident due to improper lashing

It is not permitted to lash the implement on the parking supports or jacks.

- ▶ Do not lash the implement on the parking supports or jacks.



CMS-I-00003673



### 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

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.

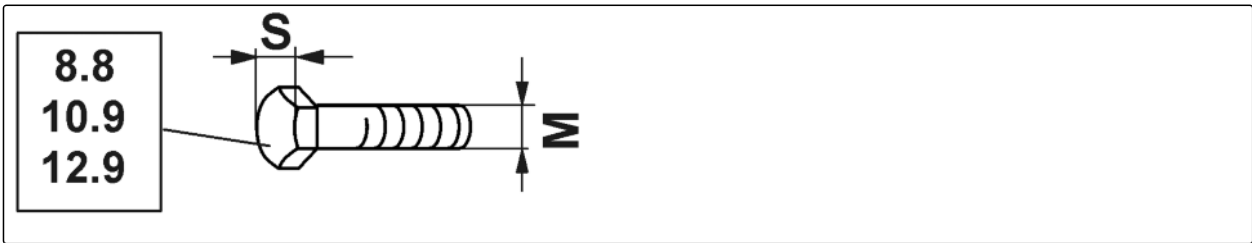
Appendix

11

CMS-T-00003775-A.1

11.1 Bolt tightening torques

CMS-T-00000373-B.1

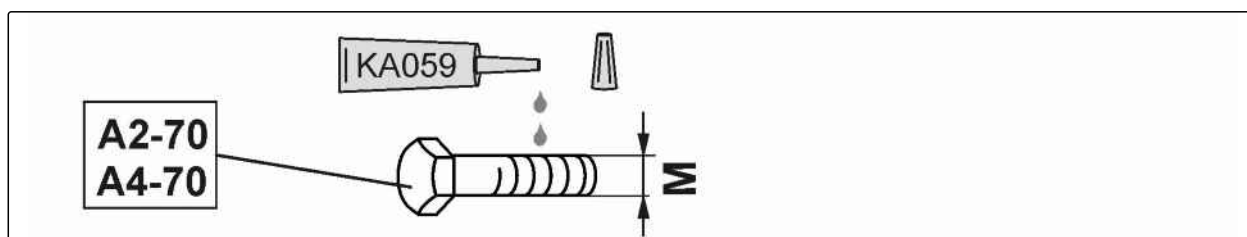


CMS-I-000260

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

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

M	S	Nm		
		8.8	10.9	12.9
M22	32	550	780	930
M22x1.5		610	860	1050
M24	36	710	1000	1200
M24x2		780	1100	1300
M27	41	1050	1500	1800
M27x2		1150	1600	1950
M30	46	1450	2000	2400
M30x2		1600	2250	2700



CMS-I-00000065

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

## 11.2 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

# 12

## 12.1 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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