



# Original operating manual

Mounted precision airplanter

Precea 6000-2

Precea 6000-2CC

Precea 6000-2FCC



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




Baujahr  
année de fabrication  
year of construction  
Год изготовления



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-00007640-B.1

## 2.1 Basic safety instructions

CMS-T-00007641-B.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-00007642-A.1

#### 2.1.3.1 Safety hazards on the machine

CMS-T-00002318-D.1

##### Liquids under pressure

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

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

### 2.1.3.2 Danger areas

CMS-T-00007643-A.1

#### Dangers areas on the implement

The following basic dangers are encountered in the danger areas:

The implement and its work tools move during operation.

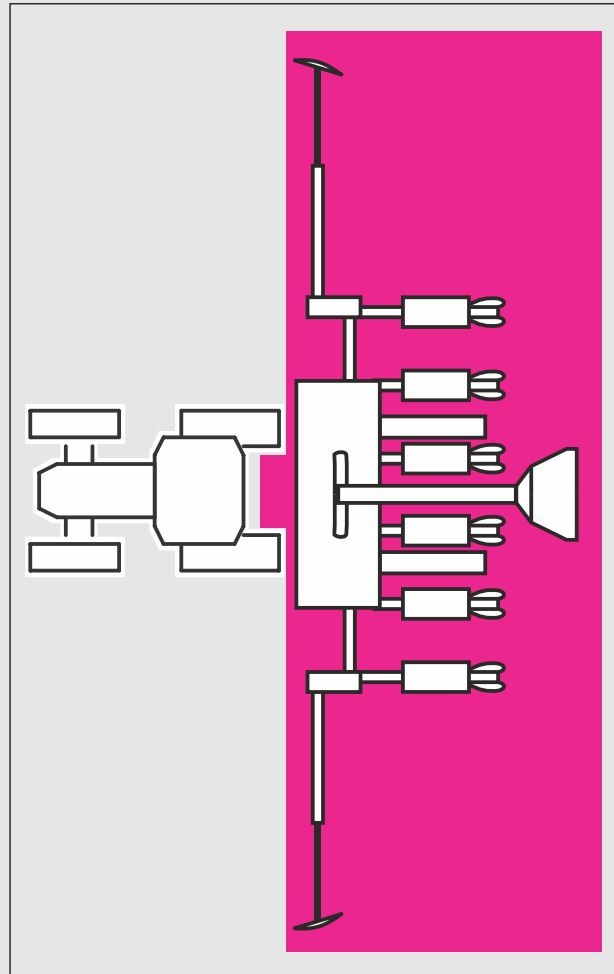
Hydraulically raised implement parts can descend unnoticed and slowly.

The tractor and implement can roll away unintentionally.

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

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

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



CMS-I-00005448

## 2.1.4 Safe operation and handling of the machine

CMS-T-00002304-I.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-E.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 permitted payload for the mounted or towed implement.
- ▶ Observe the permissible axle loads and drawbar loads of the tractor.
- ▶ Observe the permissible drawbar load of the hitch device and drawbar.
- ▶ 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-00002353-A.1

- The implement is designed solely for professional use for the precise spreading of seed according to Good Agricultural Practices.
- The implement is suitable and intended for the precise spreading of various seeds. The seed is singled and deposited in the soil at the desired depth and spacing.
- The implement is an agricultural implement to be mounted on the 3-point power lift of a tractor that meets the technical requirements.
- When driving on public roads, the implement, depending on the provisions of the applicable road traffic regulations, can be mounted and transported at the rear of a tractor that meets the technical requirements.
- The implement may only be used and maintained by persons who fulfil the requirements. The personnel requirements are described in the section "*Personnel qualification*".
- The operating manual is part of the implement. The implement is solely intended for use in compliance with this operating manual. Uses of the implement that are not described in this operating manual can lead to serious personal injuries or even death and to implement and material damage.
- The applicable accident prevention regulations as well as generally accepted safety-related, occupational health and road traffic regulations must also be observed by the users and the owner.
- Further instructions for intended use in special cases can be requested from AMAZONE.
- Uses other than those specified under the intended use are considered as improper. The manufacturer is not liable for any damage resulting from improper use, solely the operator is responsible.

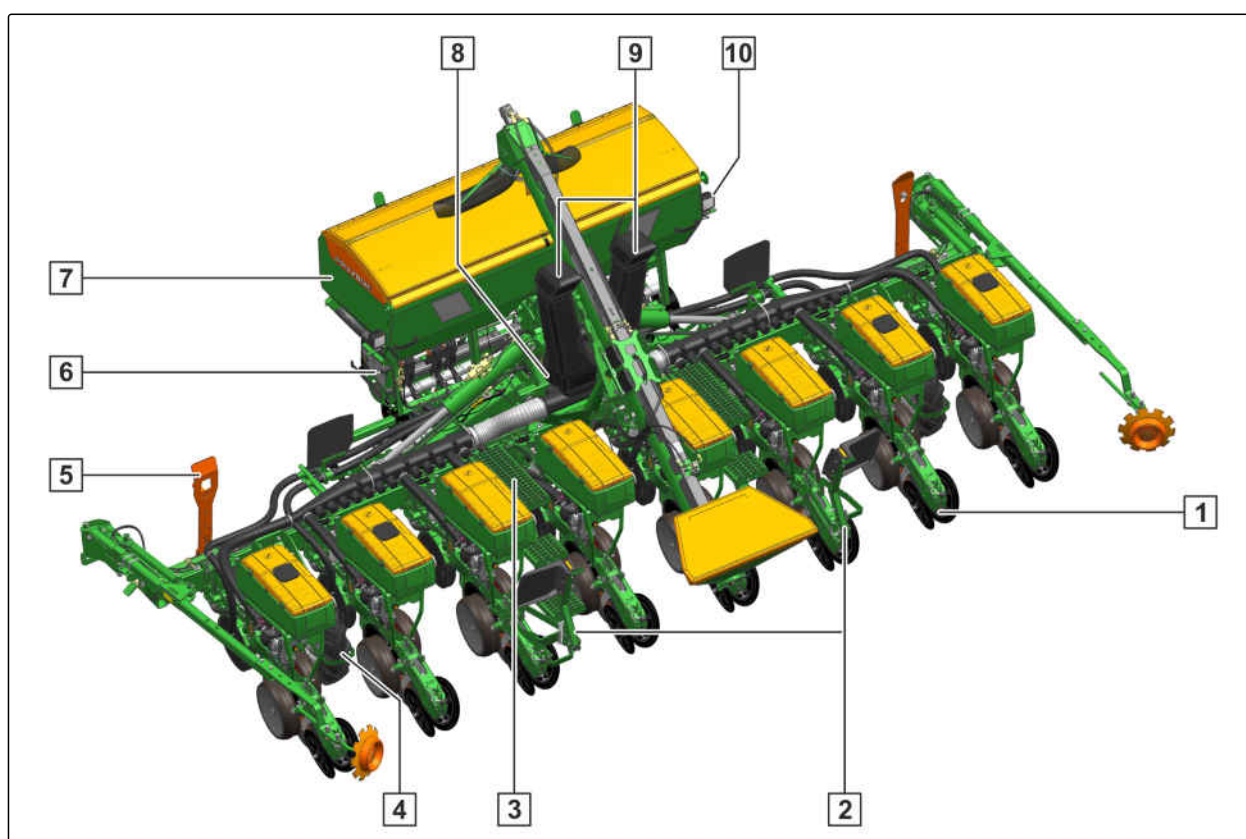
## Product description

# 4

CMS-T-00005533-D.1

### 4.1 Implement overview

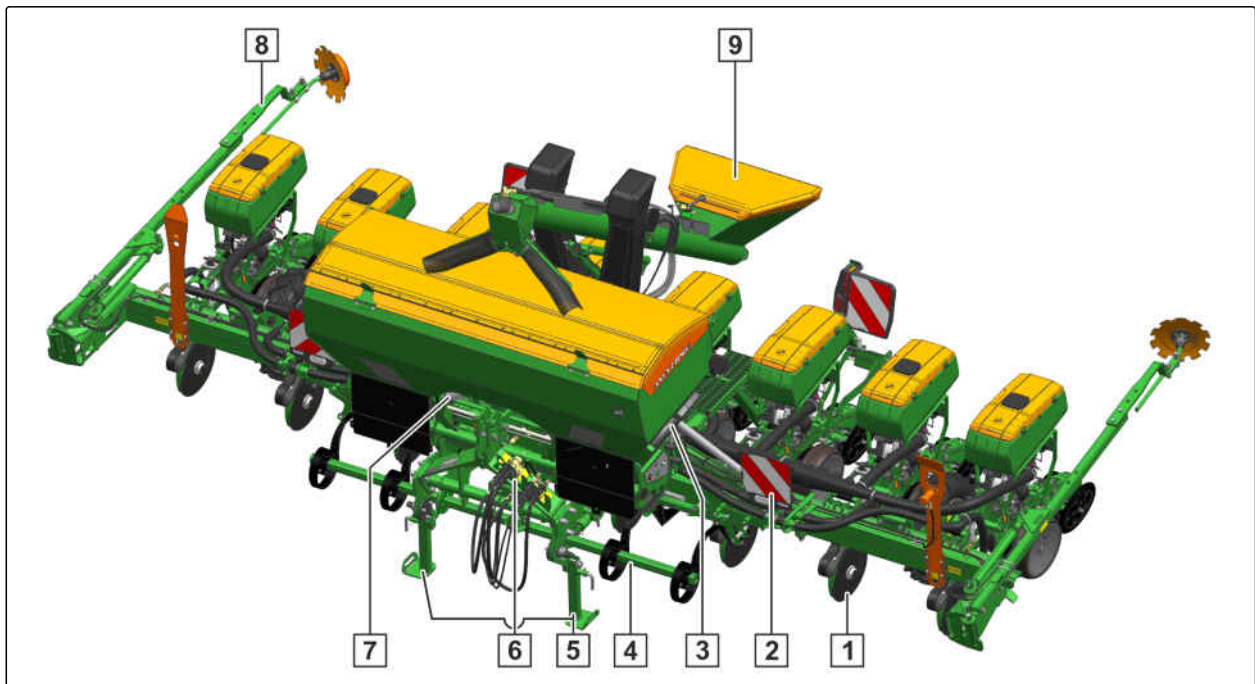
CMS-T-00005539-A.1



CMS-I-00004140

#### Precea 6000-2CC

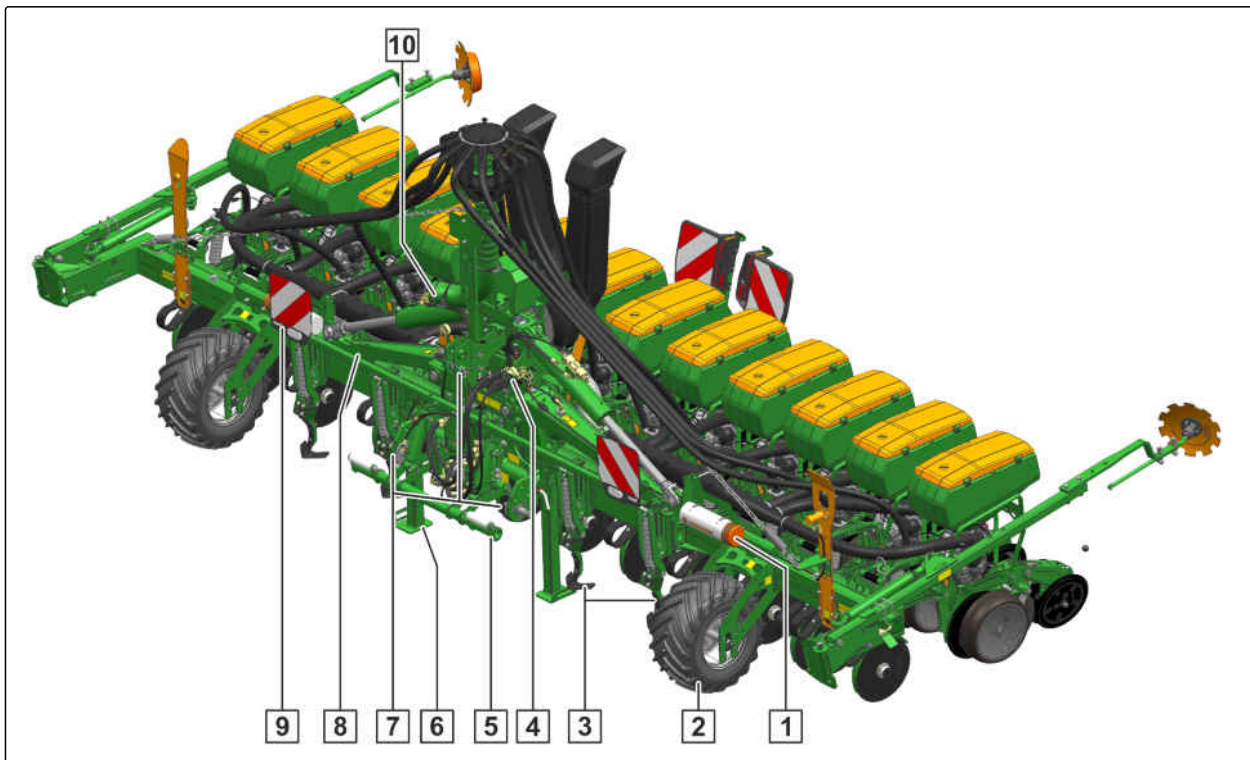
- |                            |  |
|----------------------------|--|
| <b>1</b> Seeding unit      | <b>2</b> Lighting and identification for road travel |
| <b>3</b> Loading board     | <b>4</b> Running gear, trailing                      |
| <b>5</b> Transport lock    | <b>6</b> SmartCenter                                 |
| <b>7</b> Fertiliser hopper | <b>8</b> Compressed air fan                          |
| <b>9</b> Suction baskets   | <b>10</b> Work lights                                |



CMS-I-00004139

#### Precea 6000-2CC

- |   |  |
|---|--|
| <b>1</b> Fertiliser coulter                                     | <b>2</b> Lighting and identification for road travel |
| <b>3</b> Shelf compartment for the collapsible bucket and scale | <b>4</b> Wheel mark eradicator                       |
| <b>5</b> Parking supports                                       | <b>6</b> Hose cabinet                                |
| <b>7</b> Container for implement documents and other tools      | <b>8</b> Track marker                                |
| <b>9</b> Fertiliser filling auger                               |  |

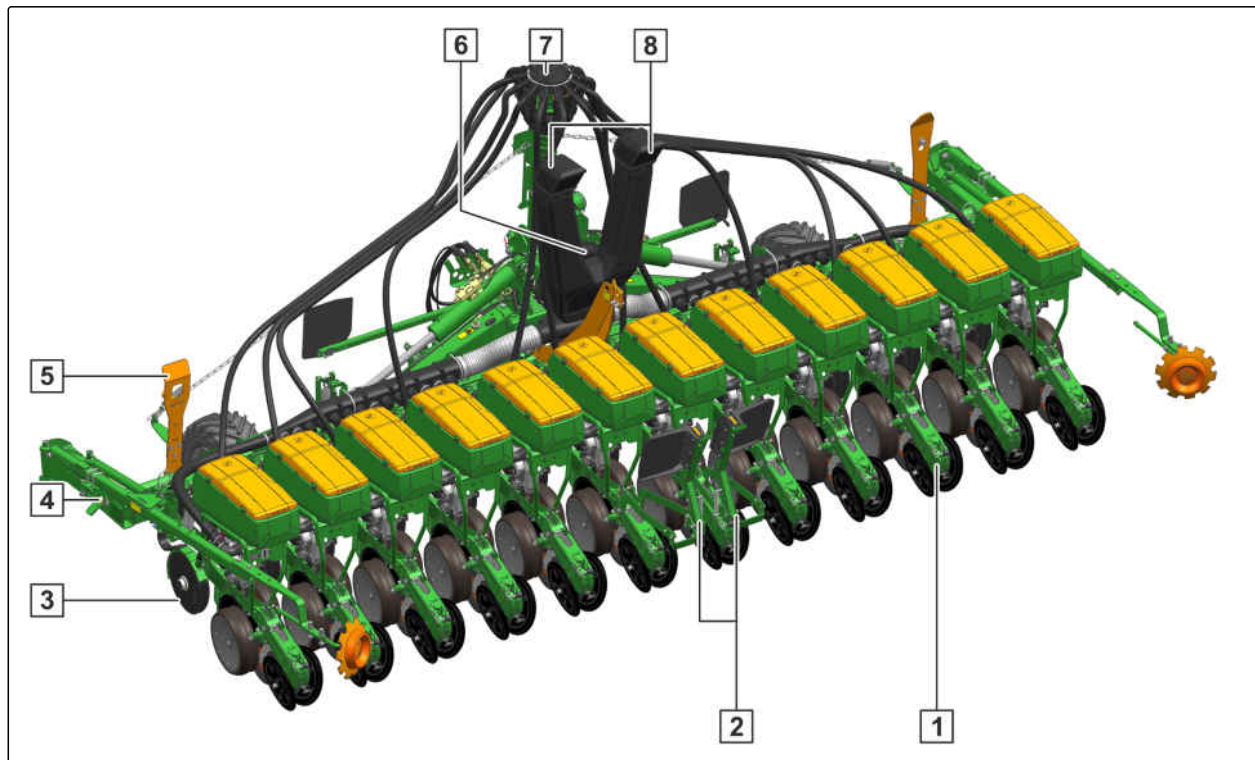


CMS-I-00003966

#### Precea 6000-2FCC

- |  |   |
|--|---|
| <b>1</b> Container for implement documents and other tools | <b>2</b> Running gear, leading          |
| <b>3</b> Wheel mark eradicator                             | <b>4</b> Hose cabinet                   |
| <b>5</b> Frame ballasting                                  | <b>6</b> Parking supports               |
| <b>7</b> 3-point mounting frame                            | <b>8</b> Folding frame                  |
| <b>9</b> Lighting and identification for road travel       | <b>10</b> Conveyor line hose connection |





CMS-I-00003967

#### Precea 6000-2FCC

- |                             |  |
|-----------------------------|--|
| <b>1</b> Seeding unit       | <b>2</b> Lighting and identification for road travel |
| <b>3</b> Fertiliser coulter | <b>4</b> Track marker                                |
| <b>5</b> Transport lock     | <b>6</b> Compressed air fan                          |
| <b>7</b> Distributor head   | <b>8</b> Suction baskets                             |

## 4.2 Function of the implement

CMS-T-00005719-B.1

The basic version of the implement consists of a frame with its own running gear, a compressed air fan, and seeding units. On each row, there is a seeding unit consisting of a seeding coulter with a grain singling unit and seed hopper. The compressed air fan produces the overpressure for the grain singling.

Depending on the requirements, the implement can be fitted with special equipment. Alternatively, the fertiliser can also be carried in a front-mounted hopper. A hose package connects the front-mounted hopper to the rear-mounted implement.

### 4.3 Special equipment

CMS-T-00005545-B.1

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

- Clod/star clearer
- Wheel mark eradicator
- Disc closer
- Rigid cutting disc
- Integrated fertiliser system
- Folded filling auger
- Track marker
- Electronic monitoring and operation
- Frame ballasting
- Lighting
- Micropellet spreader
- Multi-placement tester
- Running gear in front of or between the seed rows
- Hydraulic shifted tramline
- Hydraulic coulter pressure system
- Contact force regulation
- Calibration kit

## 4.4 Protective equipment

CMS-T-00005540-A.1

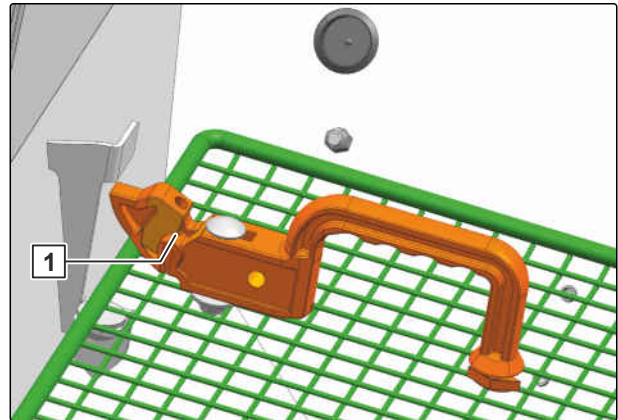
### 4.4.1 Fertiliser metering drive

CMS-T-00002012-A.1

#### 4.4.1.1 Guard screen locking mechanism

CMS-T-00002016-A.1

To protect against injuries, the guard screens are equipped with locking mechanisms **1**.

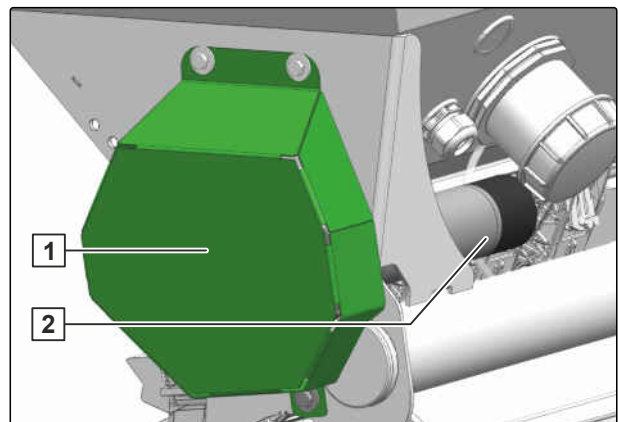


CMS-I-00001937

#### 4.4.1.2 Electric metering drive

CMS-T-00002014-A.1

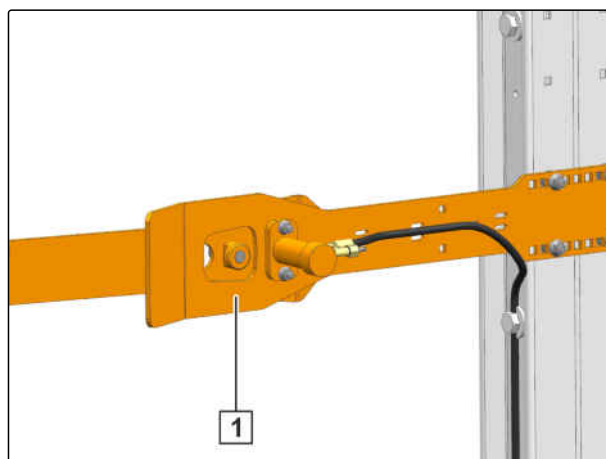
- 1** Drive guard
- 2** Electric metering drive



CMS-I-00001938

#### 4.4.2 Transport lock

The transport lock **1** prevents the frame parts from unfolding unintentionally.



CMS-T-00005541-A.1

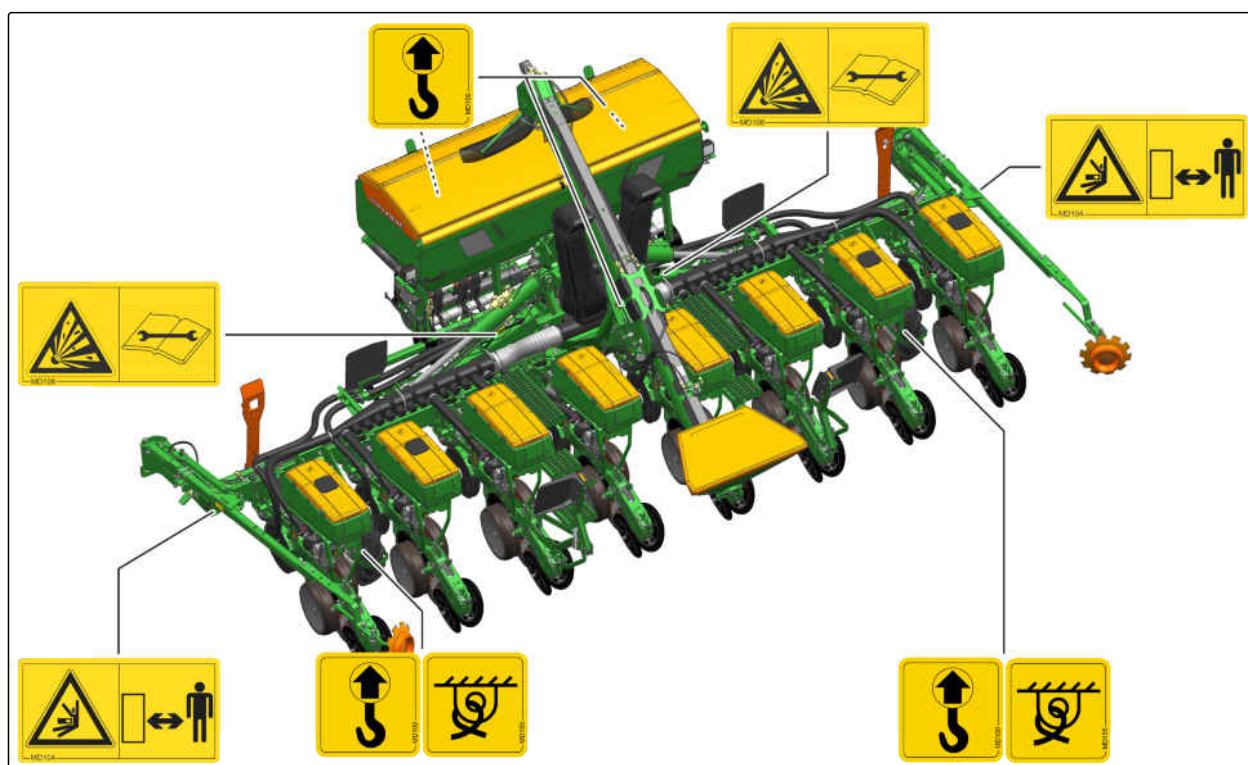
CMS-I-00003932

## 4.5 Warning symbols

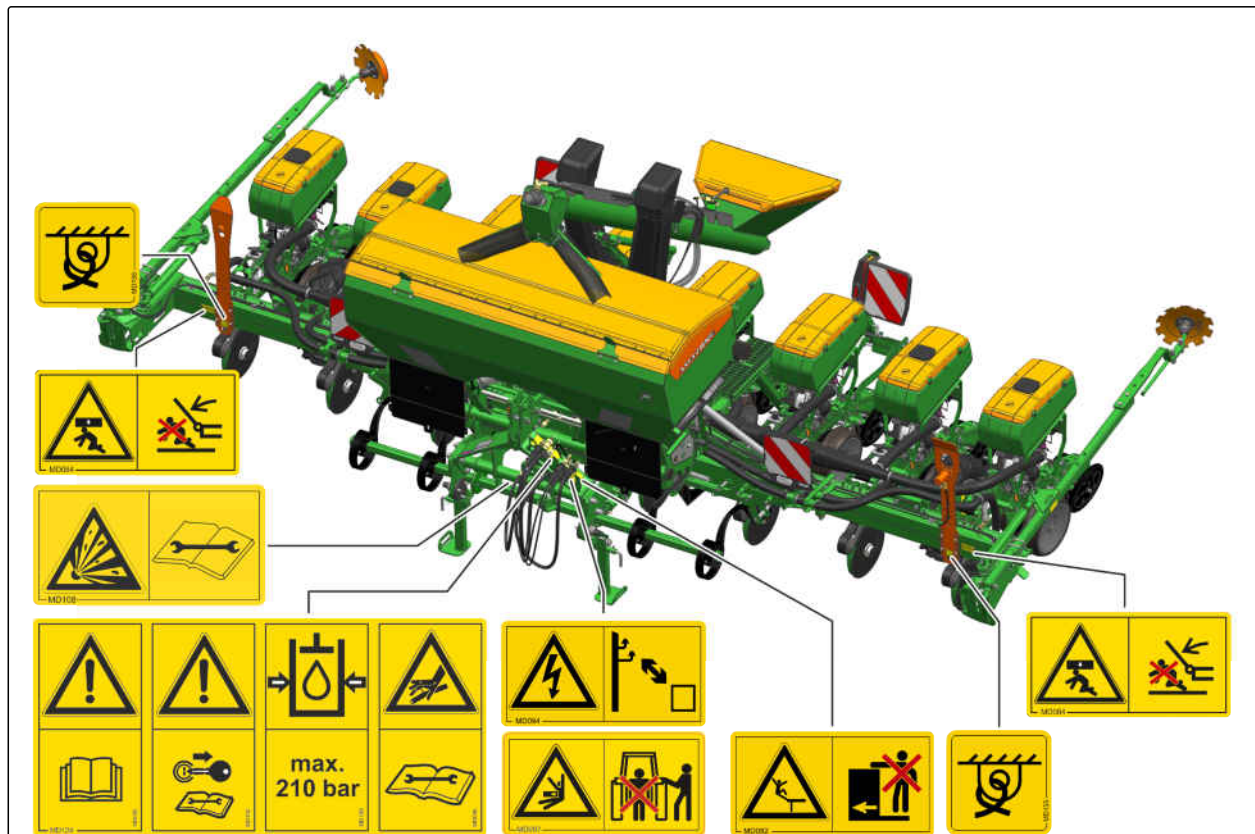
CMS-T-00005542-B.1

#### 4.5.1 Position of the warning symbols

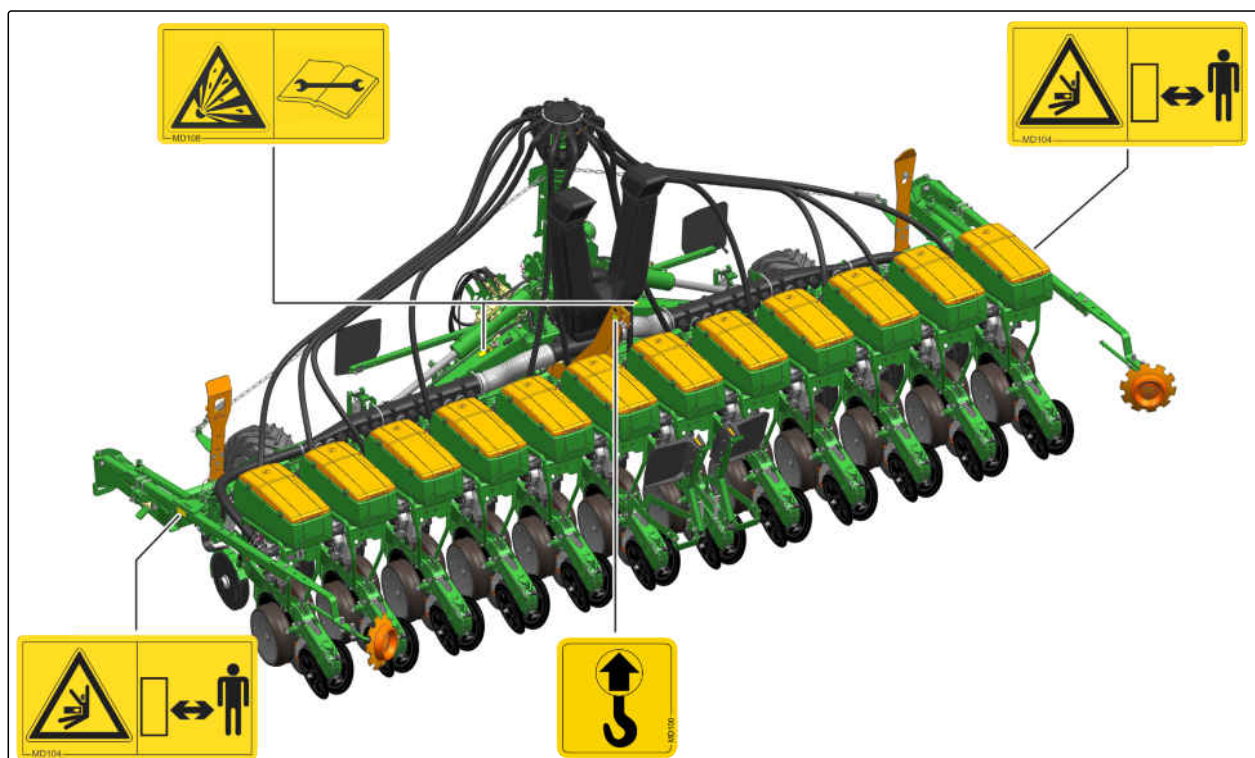
CMS-T-00005544-B.1



CMS-I-00004141

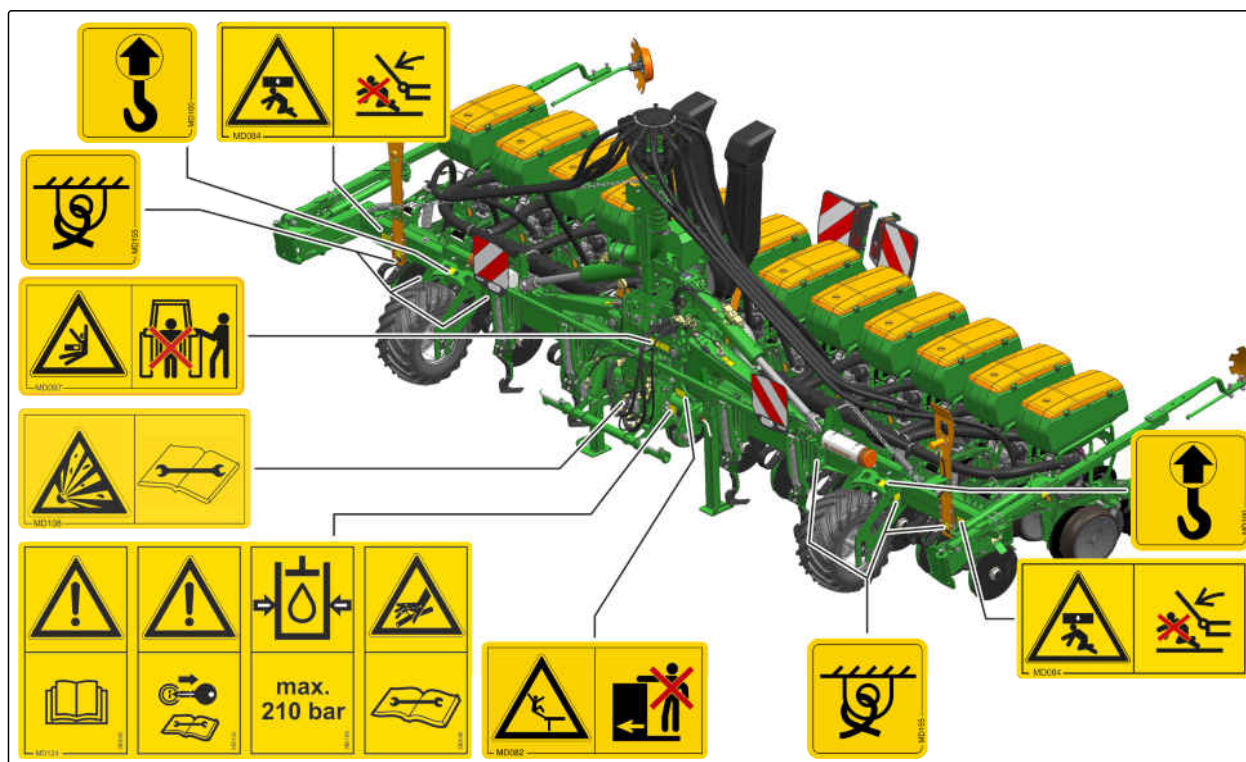


CMS-I-00004142



CMS-I-00003965





CMS-I-00003964

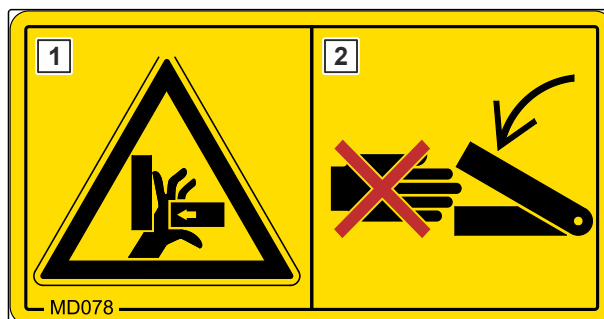
#### 4.5.2 Layout of the warning symbols

CMS-T-000141-D.1

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

A warning symbol consists of two fields:

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



CMS-I-00000416

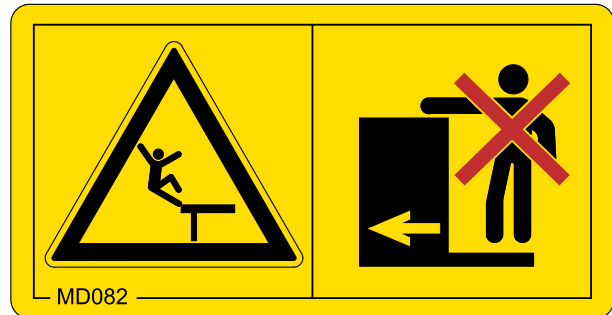
### 4.5.3 Description of the warning symbols

CMS-T-00005543-A.1

#### MD082

##### **Danger of falling from treads and platforms when riding on the implement**

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



CMS-I-000081

#### MD084

##### **Risk of crushing for the whole body from swivelling implement parts!**

- ▶ Instruct people to leave the swivel area before the implement parts are swivelled.

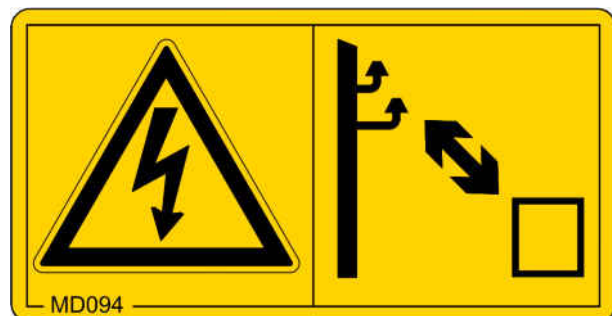


CMS-I-000454

#### MD094

##### **Danger due to transmission lines**

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



CMS-I-000692

#### MD095

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

- *Before you operate the machine,*  
read and understand the operating manual.



CMS-I-000138

#### MD096

**Risk of infection for the whole body from hydraulic oil escaping at high pressure**

- Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.
- *Before you maintain or repair the implement,*  
read the operating manual.
- *If you are injured by hydraulic oil,*  
consult a doctor immediately.

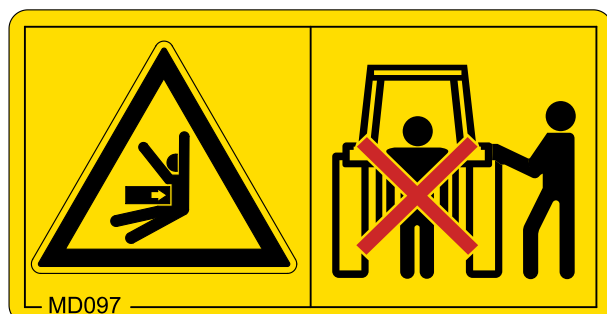


CMS-I-000216

#### MD097

**Risk of crushing between the tractor and the implement in the lifting area of the 3-point hitch**

- *Before you actuate the 3-point hydraulic system,*  
direct people out of the lifting area of the 3-point hitch.
- Only actuate the operating controls for the tractor's 3-point hydraulic system from the intended work station.
- *If there are people in the danger area between the tractor and the implement,*  
never actuate the operating controls of the tractor's 3-point hydraulic system.



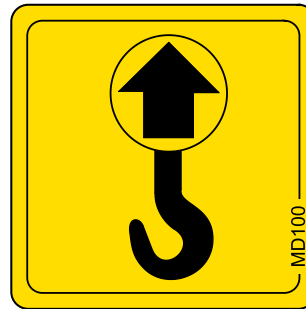
CMS-I-000139



#### MD 100

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

- Only attach the lifting gear at the marked positions.



CMS-I-000089

#### MD102

##### Risk due to unintentional starting and rolling away of the machine

- Secure the tractor and the machine against unintentional starting and rolling before any intervention in the machine.

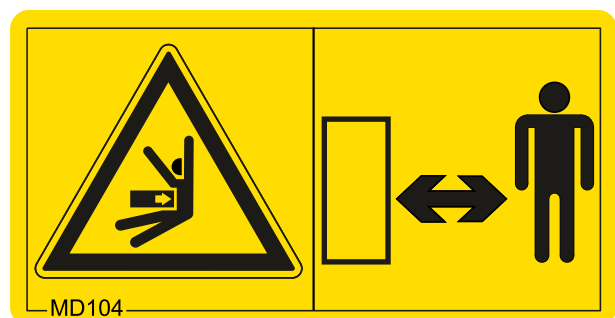


CMS-I-00002253

#### MD104

##### Risk of crushing due to swivelling parts of the implement

- *As long as the tractor engine is running,* maintain an adequate safety distance from swivelling implement parts.
- Make sure that there is nobody standing close to swivelling parts.



CMS-I-00003312

#### MD 108

##### Severe injuries due to incorrect handling of the hydraulic accumulator when it is under pressure

- Have the pressurised hydraulic accumulator checked and repaired only by a qualified specialist workshop.

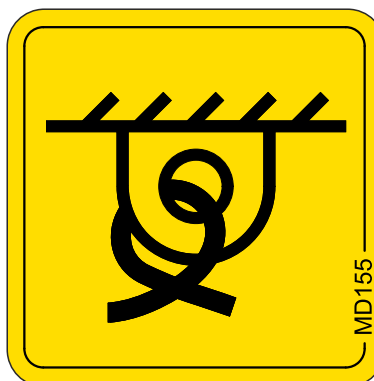


CMS-I-00004027

#### MD 155

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

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



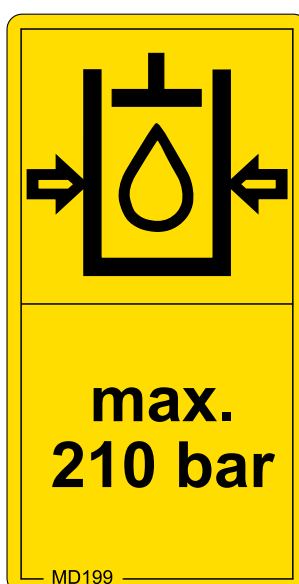
CMS-I-00000450

#### MD199

##### Risk if hydraulic system pressure is too high

The implement's hydraulic system is designed for a pressure of maximum 210 bar. Higher pressure damages the hydraulic system. There is a danger of accident.

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



CMS-I-00000486

## 4.6 Rating plate on the implement

CMS-T-00004505-G.1

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



CMS-I-00004294

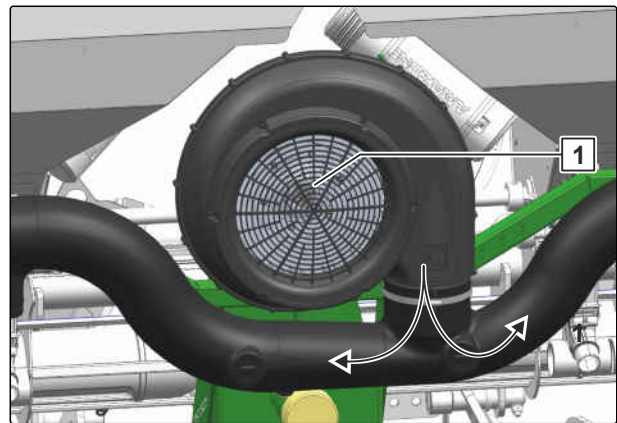
## 4.7 Compressed air fan

CMS-T-00001782-B.1

### NOTE

When the fan is operated with the tractor PTO shaft, excess grease can emerge from the drive bearings during the initial operating hours. A light film of oil is formed after the initial warm-up. After that, grease or oil may no longer emerge.

The compressed air fan **1** produces overpressure, which causes the seed grains to adhere to the singling discs. Depending on the equipment, the fan is driven by the tractor PTO shaft or a hydraulic motor. The overpressure is set through the fan speed. Depending on the implement equipment, the overpressure is displayed by a pressure gauge or the control terminal.



CMS-I-00001943

## 4.8 Grain singling unit

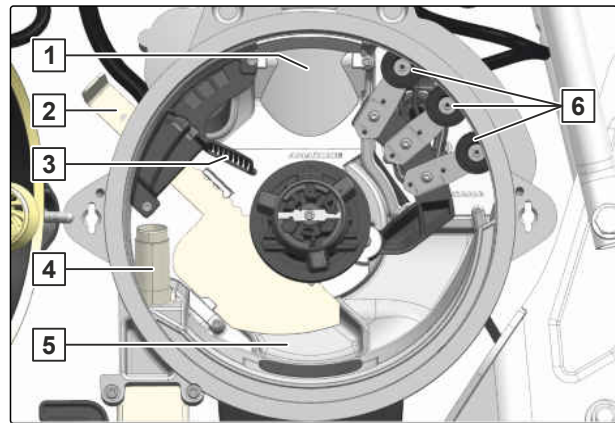
CMS-T-00001990-E.1

### 4.8.1 Layout and function of the grain singling unit

CMS-T-00001773-C.1

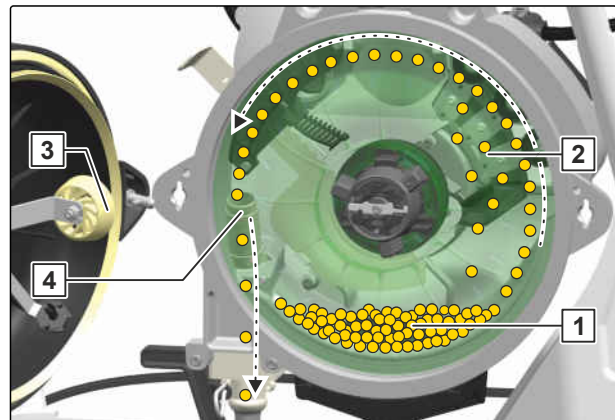
The grain singling unit singles the seed with air overpressure. The spread rate determines the required grain spacing. The spread rate is set by selecting the singling discs and adjusting the singling disc speed. Depending on the implement equipment, the speed of the singling discs is set in the mechanical setting gearbox or on the control terminal. Each grain singling unit has its own seed hopper. The seed flows through the inlet opening in the grain singling unit.

- 1** Seed hopper inlet
- 2** Sliding shutter
- 3** Air guiding element
- 4** Opto-sensor
- 5** Supply area
- 6** Scraper



CMS-I-00002295

The compressed air fan produces the overpressure in the grain singling unit. The grains from the supply area **1** adhere to the holes of the singling disc due to the overpressure. The rotating singling disc guides the singled seed past the scrapers. The scrapers remove excess seed grains **2**. The excess seed grains fall back into the supply area. On the opto-sensor, the holes of the singling disc are closed by the hole covering roller **3**. The seed is transferred to the feed channel by the air current at the opto-sensor **4**. The opto-sensor monitors the grain singling unit.

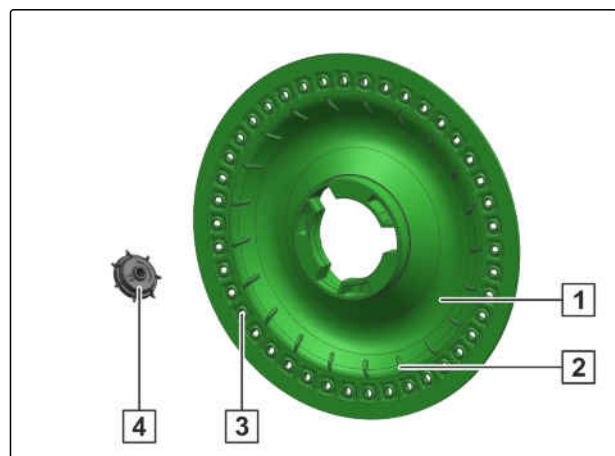


CMS-I-00001946

#### 4.8.2 Singling disc

The singling discs **1** are exchangeable and can be adjusted for the operating conditions as well as the seed characteristics. The blades **2** stir the seed. The marking on the singling discs provides information on the number of holes **3** and the hole diameter of the singling disc. The ejection wheel **4** releases jammed seed and ensures that the singling discs are clean.

CMS-T-00001992-D.1



CMS-I-00001947

## 4.9 PreTeC mulch seeding coulter

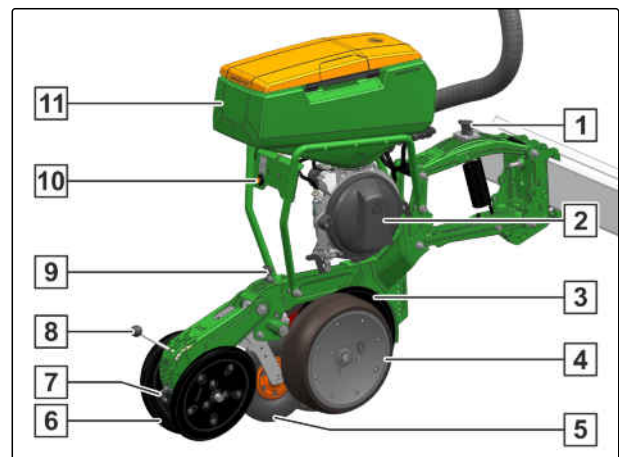
CMS-T-00005814-D.1

### 4.9.1 Seeding unit

CMS-T-00001771-E.1

The seeding unit is used on ploughed or mulched soils. The seeding unit includes the grain singling unit, the seed hopper and the seeding coulter. The seed placement depth and the seeding coulter pressure can be adjusted. The seeding coulter is guided over the soil with the depth control wheel. The cutting disks clear plant residues out of the seed furrow area. Together with the furrow former, the cutting discs shape the seed furrow. The singled seed grains are caught by the catch roller and pressed into the bottom of the furrow for good soil contact. The press rollers close the seed furrow.

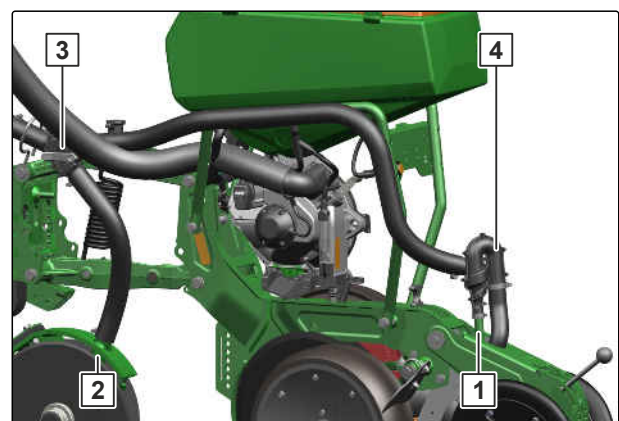
- 1** Coulter pressure adjustment, mechanical or hydraulic
- 2** Grain singling unit
- 3** Cutting discs
- 4** Depth control wheels
- 5** Catch roller
- 6** Press rollers
- 7** Press roller pitch adjustment
- 8** Press roller pressure adjustment
- 9** Seed placement depth adjustment
- 10** Calibration button
- 11** Seed hopper



CMS-I-00002089

Depending on implement equipment, the fertiliser application point can be changed over with a switch

**3**. The fertiliser can therefore be applied in the fertiliser furrow **2** or in the seed belt **1**. The exhaust air **4** is discharged near the ground.

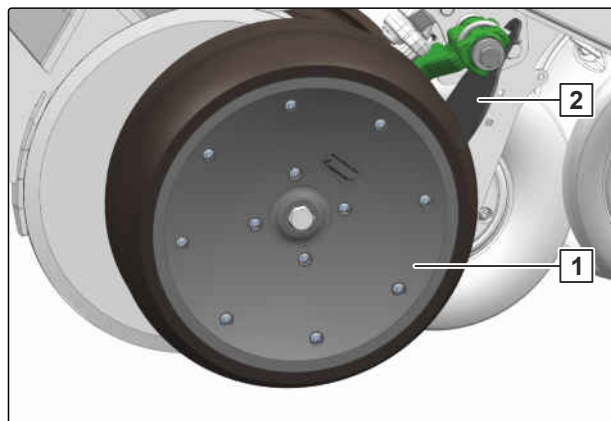


CMS-I-00007255

#### 4.9.2 Depth control wheels

The depth control wheels guide the seeding coulter over the soil.

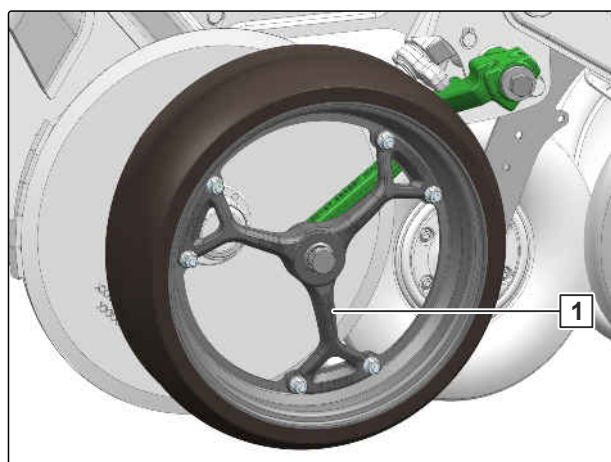
Depth control wheels with closed rim **1** have advantages with high amounts of organic residues. The scrapers **2** prevent soil from sticking and ensure that the seeding coulters run smoothly.



CMS-T-00001975-D.1

CMS-I-00001954

Depth control wheels with open rim **1** have advantages on very heavy soils.

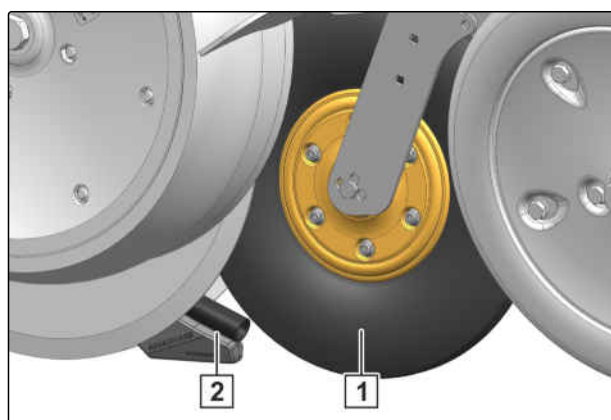


CMS-I-00005367

#### 4.9.3 Furrow former and catch roller

Together with the catch roller **1**, the furrow former **2** represents a central functional unit in the coulter. The furrow former shapes the seed furrow. The shot channel guides the seed grain into the seed furrow. For better soil contact, the catch roller presses the seed grain into the bottom of the furrow.

The furrow former and the catch roller must be adapted to the operating conditions.



CMS-T-00001993-D.1

CMS-I-00001955

### 4.10 Fertiliser hopper

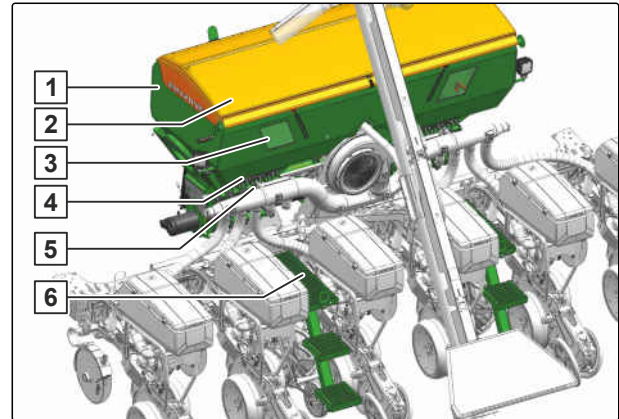
Depending on the implement or configuration, the fertiliser hopper contains 950 or 1250 litres. The

CMS-T-00001985-C.1



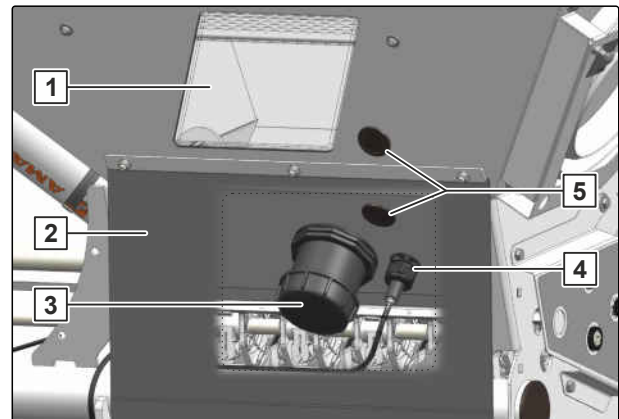
fertiliser metering unit is operated with a mechanical ground wheel drive or an electric drive. The fertiliser hopper has large inspection windows at the front and rear to check the fill level. The rear fertiliser hopper can be safely reached via the loading board.

- 1** Fertiliser hopper
- 2** Cover tarpaulin
- 3** Inspection window
- 4** Unlocking tool
- 5** Fertiliser metering unit
- 6** Loading board



CMS-I-00002257

- 1** Inspection window
- 2** Spray protection
- 3** Residual quantity removal
- 4** Low level sensor
- 5** Mounting positions for the low level sensor



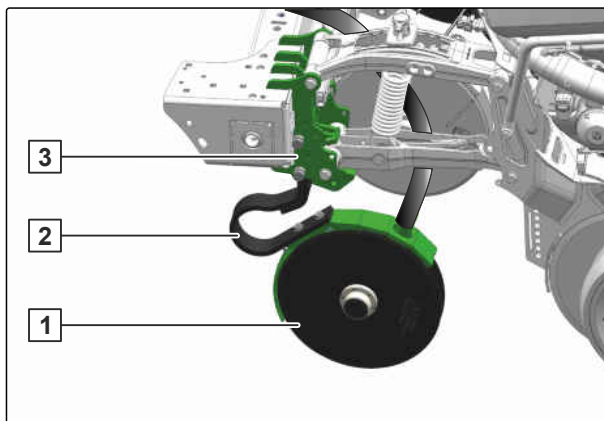
CMS-I-00001966

## 4.11 FerTeC Twin coulter

CMS-T-00005566-B.1

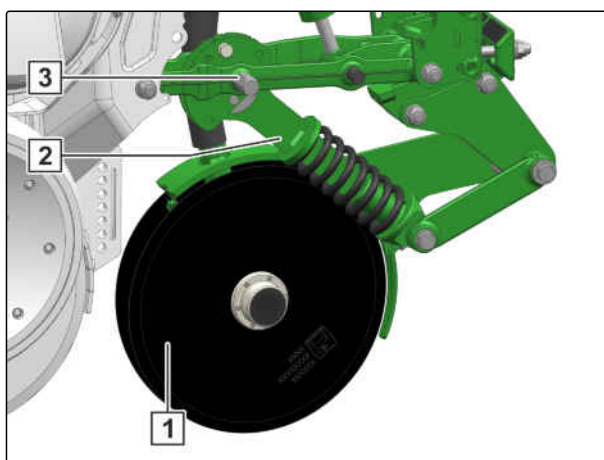
The FerTeC Twin coulters are used on ploughed soils or for mulch seeding. The fertiliser placement depth is adjustable. The distance from the seeding coulter is determined by the coulter mount. The distance is of 60 mm.

- 1** Cutting discs
- 2** Fertiliser coultter pressure spring
- 3** Coulter mount



CMS-I-00001963

- 1** Cutting discs
- 2** Coupling rod, spring-suspended
- 3** Adjustment device



CMS-I-00003934

- 1** Liquid fertiliser connection
- 2** Liquid fertiliser outlet



CMS-I-00002728

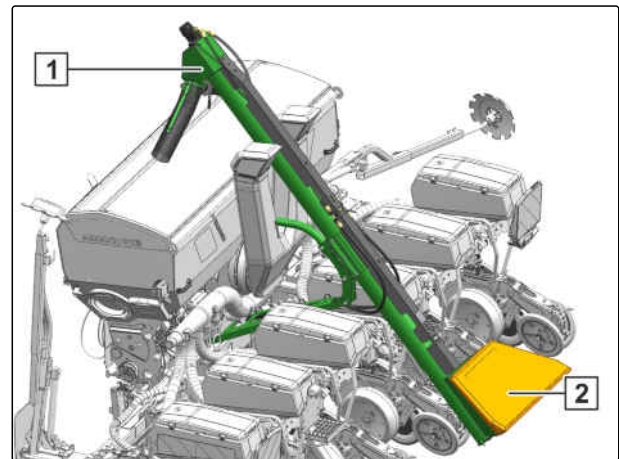
## 4.12 Filling auger

CMS-T-00005567-A.1

The filling auger facilitates the filling procedure for the fertiliser hopper. The filling auger is driven by the tractor's hydraulic system. For more ground clearance, the filling auger is swivelled up during operation.

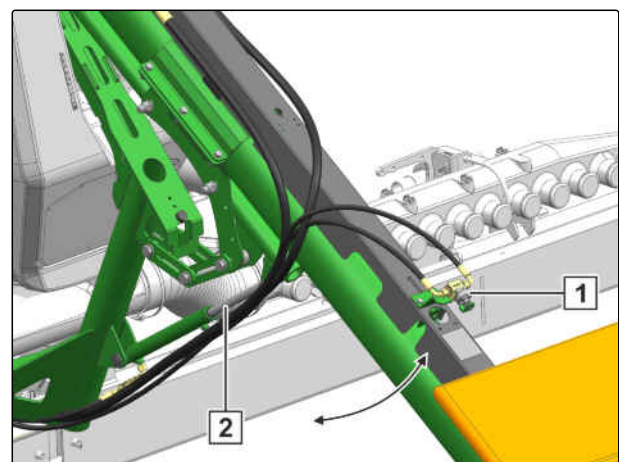


- 1 Filling auger
- 2 Filling funnel



CMS-I-00001964

- 1 Control lever
- 2 Folding cylinder



CMS-I-00003933

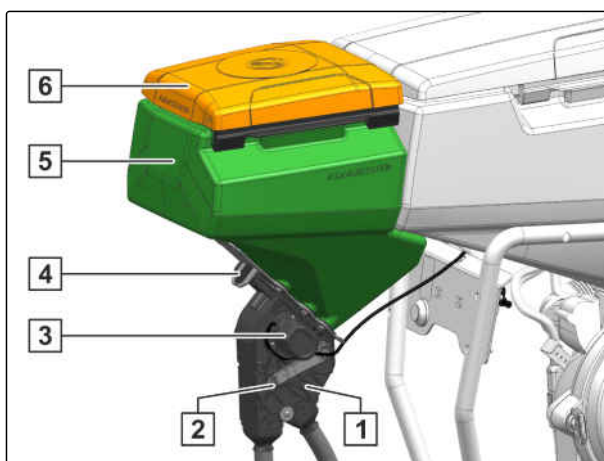
### 4.13 Micropellet spreader

CMS-T-00003594-C.1

Depending on the application, the micropellet spreader is used to spread insecticides, slug pellets or micro-fertilisers. Depending on the active substance, the spreading material is applied in the seed furrow, in the closing seed furrow or on the closed seed furrow.

### Micropellet spreader

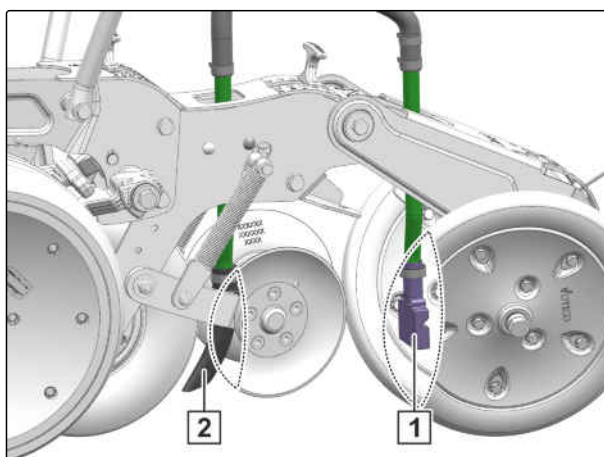
- 1** Micropellet metering unit
- 2** Bottom flap
- 3** Drive
- 4** Sliding shutter
- 5** Micropellet hopper
- 6** Hopper cover



CMS-I-00002590

### PreTeC coulter with closer

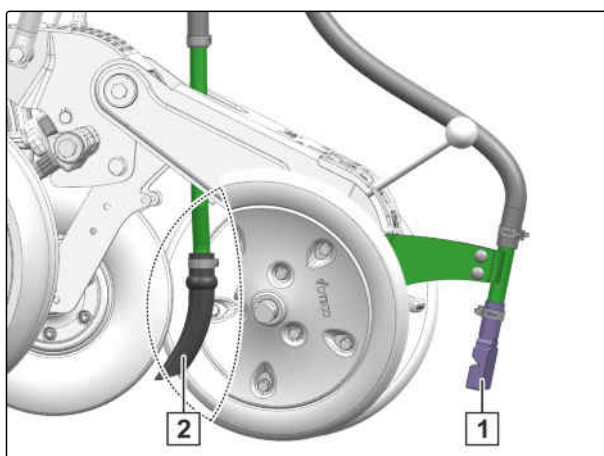
- 1** Application in the closing seed furrow, for slug pellet applications.
- 2** Application in the seed furrow, for insecticide and micro-fertiliser applications.



CMS-I-00003850

### PreTeC coulter without closer

- 1** Application on the soil surface, for slug pellet or herbicide applications.
- 2** Application in the seed furrow, for insecticide and micro-fertiliser applications.



CMS-I-00003849

## 4.14 Lighting

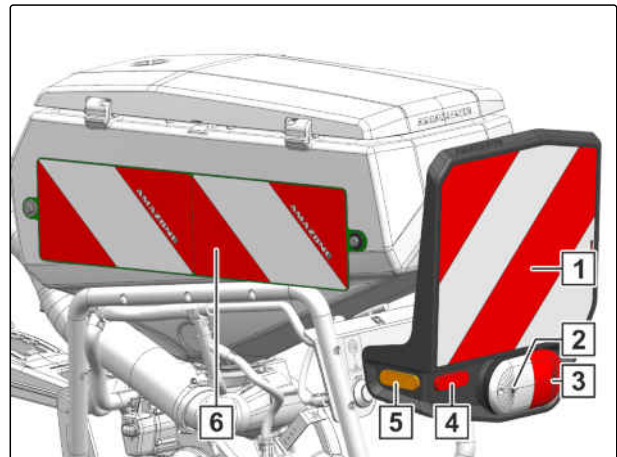
CMS-T-00001988-C.1

### 4.14.1 Lighting and identification for road travel

CMS-T-00001768-B.1

#### Lighting to the rear

- 1 Warning signs
- 2 Turn indicators
- 3 Rear lights and brake lights
- 3 Red reflectors
- 5 Yellow reflector
- 6 Lateral warning signs



CMS-I-00001977

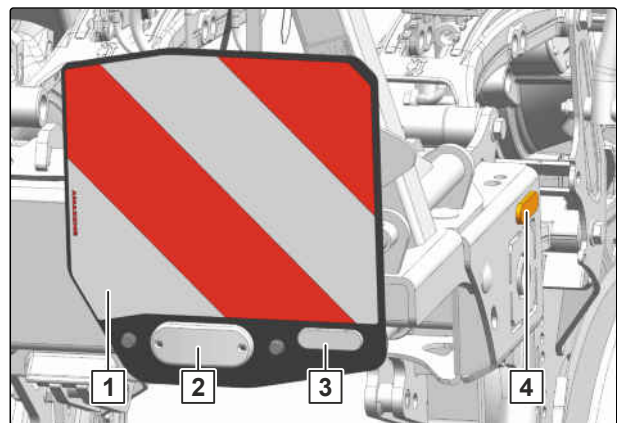


#### NOTE

Depending on the national regulations.

#### Lighting to the front

- 1 Warning signs
- 2 Side marker lights
- 3 White reflector
- 4 Yellow reflector



CMS-I-00001979

### **4.14.2 Work lights**

The work lights are used to improve the illumination of the work area.

CMS-T-00001779-B.1

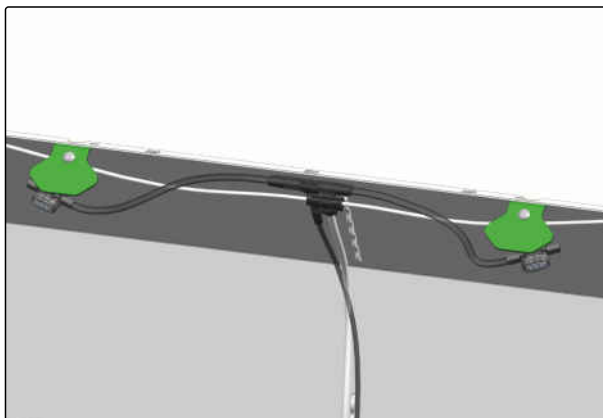


CMS-I-00002218

### **4.14.3 Hopper interior lighting**

The hopper interior lighting serves for better viewing inside the hopper and makes it easier to check the fill level. The hopper interior lighting is switched on via the lighting for road travel.

CMS-T-00001987-B.1



CMS-I-00002219

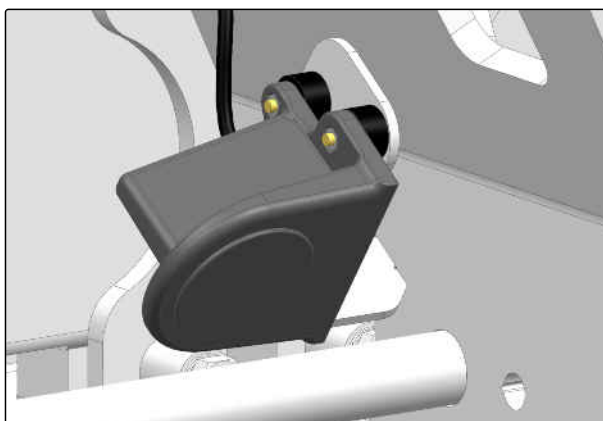
## **4.15 Electronic monitoring**

CMS-T-00001777-C.1

### **4.15.1 Radar sensor**

On electric drives, the radar sensor records the working speed. The working speed is used to determine the worked area and the required speed for the metering drives.

CMS-T-00001778-B.1



CMS-I-00002221

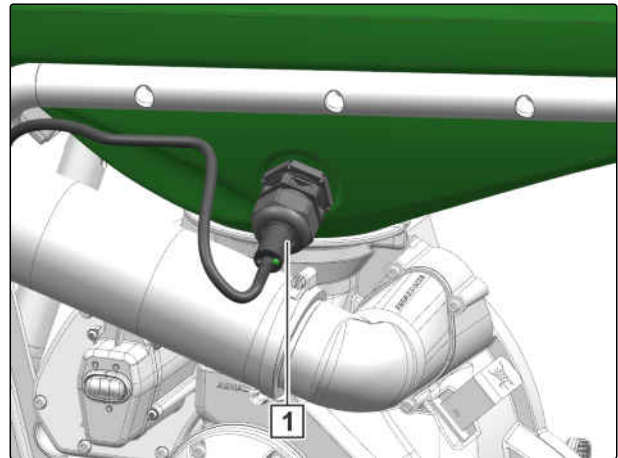
## 4.15.2 Low level sensors

CMS-T-00001979-B.1

### 4.15.2.1 Seed

CMS-T-00001981-B.1

The low level sensor **1** triggers an alarm as soon as the low level sensor is no longer covered with seed.

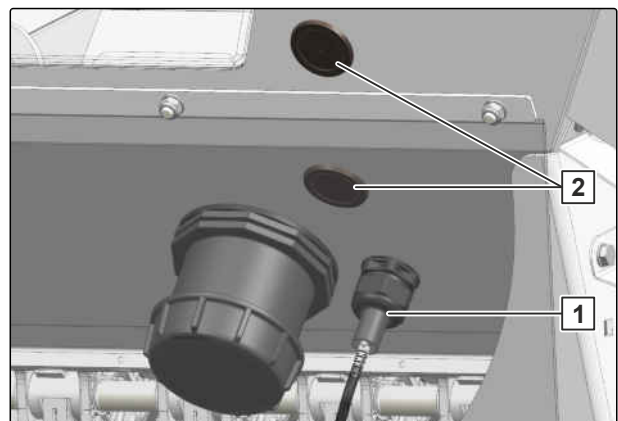


CMS-I-00001986

### 4.15.2.2 Fertiliser

CMS-T-00001983-A.1

The low level sensor **1** triggers an alarm as soon as the low level sensor is no longer covered with fertiliser. The low level sensor can be installed at different positions **2**. As a result, the triggering point can be adapted to the spread rate.



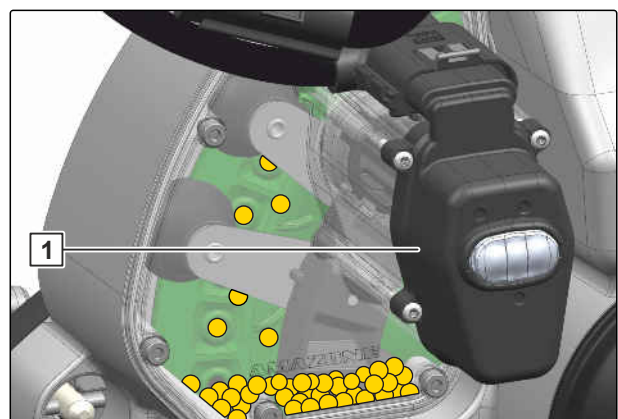
CMS-I-00001987

## 4.15.3 Electronic remote scraper bar adjustment

CMS-T-00001984-B.1

With the electronic remote scraper bar adjustment **1**, the scrapers are conveniently adjusted on the control terminal.

In conjunction with SmartControl, the scrapers are controlled automatically. By means of the opto-sensor monitoring, gaps or doubles are detected and the scraper bar position is adjusted. This automatically reduces gaps and doubles.



CMS-I-00001917

## 4.16 Threaded cartridge

CMS-T-00001776-E.1

The threaded cartridge contains the following items:

- Documents
- Aids



CMS-I-00002306

## 4.17 Calibration kit

CMS-T-00007520-A.1

The calibration kit contains the following items:

- Collapsible bucket
- Tension scale



CMS-I-00005274

## 4.18 TwinTerminal

CMS-T-00004156-B.1

With the TwinTerminal, the following functions can be executed:

- Calibrate the spread rate
- Emptying the implement
- Communication with the control terminal
  - Enter the calibration parameters
  - Enter the collected seed quantity

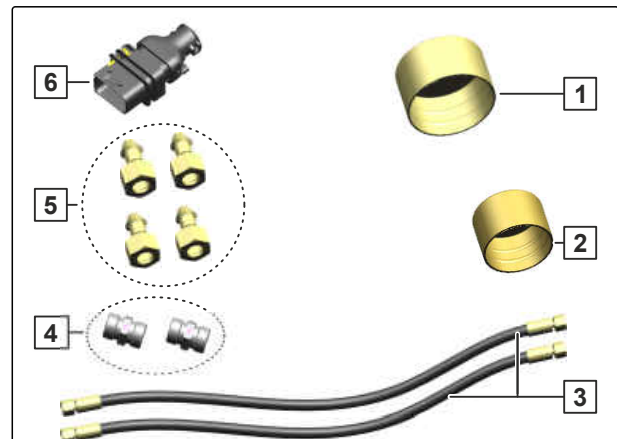


CMS-I-00003079

## 4.19 Sealing kit

CMS-T-00010374-A.1

- 1** Sealing cap for air supply
- 2** Sealing cap for fertiliser metering unit
- 3** Extension hoses for coulter pressure system
- 4** Connector for coulter pressure system
- 5** Sealing caps for coulter pressure system
- 6** Bridge plug for implement wiring harness



CMS-I-00007071

Different row widths are required for seeding different different field crops. The parts listed below are required to convert the implement and to park the dismantled PreTeC mulch seeding coulters.



## Technical data

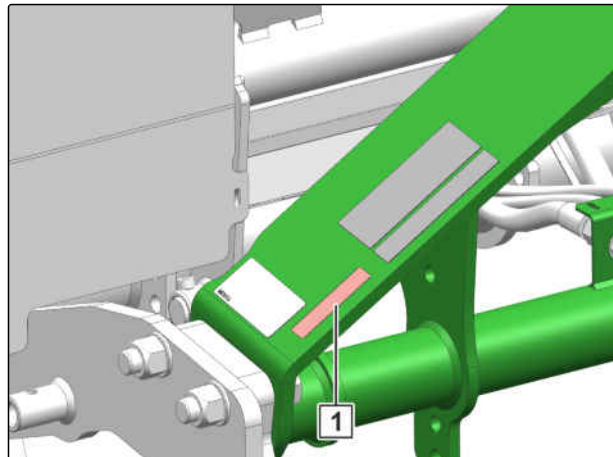
5

CMS-T-00005556-E.1

### 5.1 Serial number

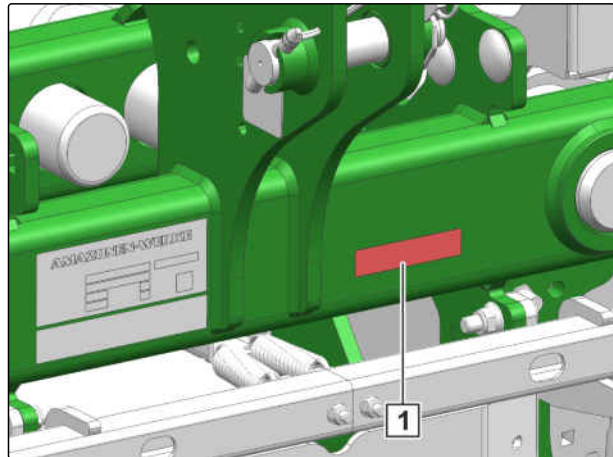
CMS-T-00005561-A.1

The serial number **1** of the Precea 6000-2CC is stamped onto the right of the mounting frame for identification.



CMS-I-00004155

The serial number **1** of the Precea 6000-2 or 6000-2FCC is stamped onto the right of the mounting frame for identification.



CMS-I-00004153



## 5.2 Dimensions

CMS-T-00005560-B.1

	Precea 6000-2	Precea 6000-2FCC	Precea 6000-2CC with fertiliser auger
Transport width	3 m	3 m	3 m
Transport height	< 4 m	< 4 m	< 4 m
Total length	2.8 m	2.8 m	3.28 m
Working width, depending on the row spacing	5,4 – 6,8 m	5,4 – 6,8 m	5,4 – 6,8 m
Centre of gravity distance, depending on the equipment	75 cm	85 cm	1.2 m

## 5.3 Permissible payload

CMS-T-00011018-A.1

Permissible payload =	Permissible technical implement weight according to the rating plate - determined tare weight	= ——— kg
-----------------------	--	----------

## 5.4 Metering unit

CMS-T-00002360-E.1

### 5.4.1 Seed metering unit

CMS-T-00002361-E.1



#### NOTE

The target spacing depends on the type of seed.



#### NOTE

With an electric drive, the target spacing can be adjusted via the forward speed.

The minimum target spacing is based on the maximum working speed, the maximum singling unit speed, and the largest singling disc.

The maximum target spacing is based on the minimum working speed, the minimum singling unit speed, and the smallest singling disc.

Drive	Speed range	Target spacing
Electric drive	2 1/min to 55 1/min	3.8 cm to 86.9 cm

Seed hopper
55 l/70 l

### 5.4.2 Fertiliser metering unit

CMS-T-00002362-E.1



#### NOTE

The maximum spread rate depends on the metered material. The maximum spread rate is based on a working speed of 15 km/h.

With an electric drive, the spread rate can be adjusted via the forward speed.

Application	Application point	Maximum spread rate
Under-root fertilising	Fertiliser coulter	250 kg/ha
	Fertiliser coulter	250 kg/ha
	Seed belt	75 kg/ha
Micro-fertiliser	Seed belt	35 kg/ha

Fertiliser hopper
950 l / 1,250 l

### 5.4.3 Micropellet metering unit

CMS-T-00005413-B.1



#### NOTE

The maximum spread rate depends on the metered material. The maximum spread rate is based on a working speed of 15 km/h.

With an electric drive, the spread rate can be adjusted via the forward speed.

Application	Application point	Maximum spread rate
Micro-fertiliser	Seed belt	35 kg/ha

Micropellet hopper
17 l

## 5.5 Coulters

CMS-T-00005568-C.1

### 5.5.1 PreTeC mulch seeding couler

CMS-T-00005570-C.1



#### NOTE

The maximum placement depth serves as a reference value. The actual value can only be determined during field operation.

Coulter	Load	Coulter pressure	Contact force	Tare weight	Placement depth
PreTeC mulch seeding couler	Spring	100 kg	/	120 kg	0 cm to 10 cm
PreTeC mulch seeding couler in the track		115 kg	/	120 kg	0 cm to 10 cm
PreTeC mulch seeding couler	Hydraulic system	250 kg	/	120 kg	0 cm to 10 cm
		/	30 kg to 100 kg	120 kg	0 cm to 10 cm
PreTeC mulch seeding couler in the track		300 kg	270 kg	120 kg	0 cm to 10 cm

### 5.5.2 FerTeC Twin couler

CMS-T-00005569-C.1



#### NOTE

The maximum placement depth serves as a reference value. The actual value can only be determined during field operation.

Coulter	Load	Coulter pressure	Tripping force of the overload safety	Placement depth
FerTeC Twin couler	Spring	80 kg	/	3 cm to 12 cm
FerTeC Twin couler, coupled	Is adjusted via the PreTeC mulch seeding couler.		200 kg	3 cm to 12 cm

## 5.6 Row spacings

CMS-T-00005558-C.1



### NOTE

It is possible to subsequently convert the number of rows. For more information, contact your specialist workshop.

6000-2 / -2FCC	Number of rows	Seeding coulter spacing	Working width
Running gear in front of the seed rows	8	80 cm	6.4 m
		75 cm	6 m
		70 cm	5.6 m
		65 cm	5.2 m
	9	75 cm	6.75 m
		70 cm	6.3 m
		65 cm	5.85 m
		60 cm	5.4 m
	12	50 cm	6 m
		45 cm	5.4 m
6000-2CC	Number of rows	Seeding coulter spacing	Working width
Running gear in front of or between the seed rows	8	80 cm	6.4 m
		75 cm	6 m
		70 cm	5.6 m
		65 cm	5.2 m

## 5.7 Mounting category

CMS-T-00005559-A.1

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

## 5.8 Working speed

CMS-T-00002367-D.1



### NOTE

High spread rates can prevent the maximum working speed from being reached.

Metering drives	Recommended speed range
Mechanical	2 km/h to 12 km/h
Electric	2 km/h to 15 km/h

## 5.9 Performance characteristics of the tractor

CMS-T-00005893-B.1

Engine rating	
Precea 6000-2	Starting at 110 kW / 150 PS
Precea 6000-2CC	Starting at 110 kW / 150 PS
Precea 6000-2FCC	Starting at 132 kW / 180 PS

Electrical system	
Battery voltage	12 V
Basic tractor equipment for ISOBUS	25 A
Lighting socket	7-pin

Hydraulic system	
Maximum operating pressure	210 bar
Tractor pump output	Implement with mechanical fan drive, at least 20 l/min at 150 bar
	Implement with hydraulic fan drive, at least 50 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
Pressure-free return flow	Do not exceed a back pressure of 5 bar.

## 5.10 Noise development data



CMS-T-00002296-C.1


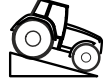
The workplace-related emission sound pressure level is lower than 70 dB(A), measured in operating condition at the ear of the tractor driver with the cab closed.

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

## 5.11 Drivable slope inclination

CMS-T-00002297-E.1

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

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

## 5.12 Lubricants

CMS-T-00002396-B.1

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

## 5.13 Gear oil

CMS-T-00003834-B.1

Manufacturer	Gear oil
WINTERSHALL	Wintal UG22 WTL-HM, ex-factory
FUCHS	Renolin MR5 VG22

## 5.14 Chain oil

CMS-T-00005469-B.1

Chain oil
Non-saponifiable mineral-based chain oil according to ISO VG 68

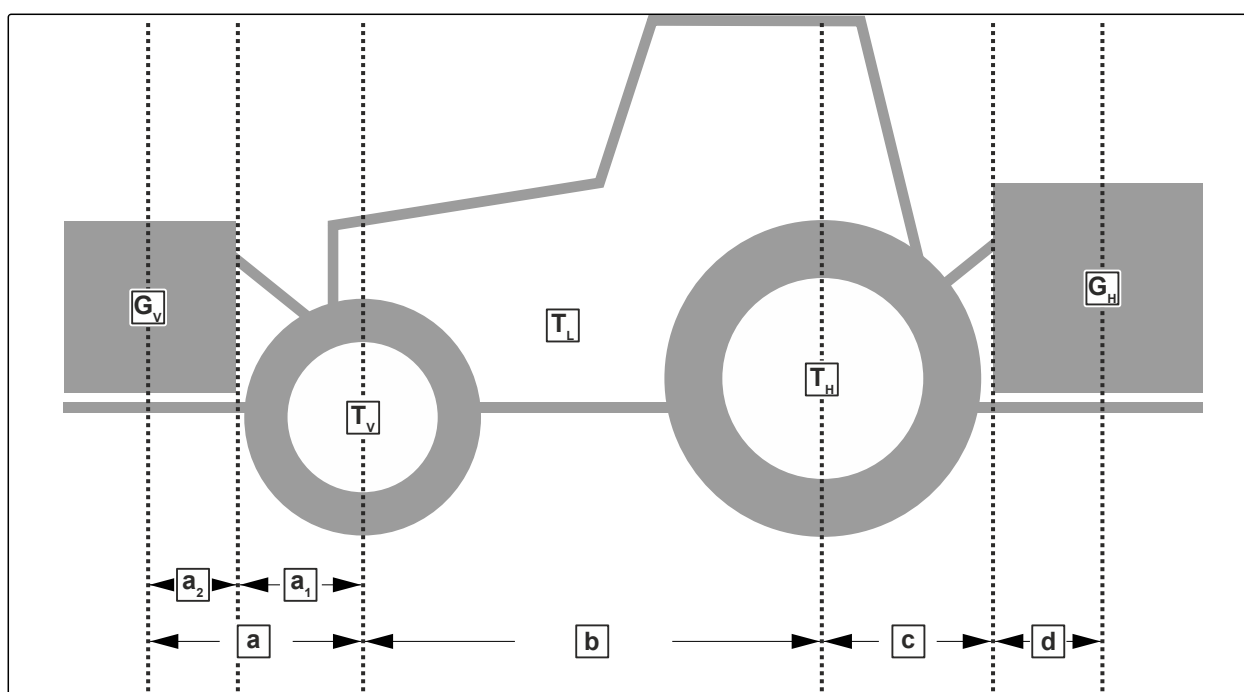
## Preparing the machine

# 6

CMS-T-00005509-E.1

### 6.1 Calculating the required tractor characteristics

CMS-T-00000063-F.1



CMS-I-00000581

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

## 6 | Preparing the machine

### Calculating the required tractor characteristics

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

1. Calculate the minimum front ballasting.

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

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

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

CMS-I-00000513

2. Calculate the actual front axle load.

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

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

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

CMS-I-00000516



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

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

$$G_{tat} =$$

$$G_{tat} =$$

CMS-I-00000515

4. Calculate the actual rear axle load.

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

$$T_{Htat} =$$

$$T_{Htat} =$$

CMS-I-00000514

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



## IMPORTANT

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

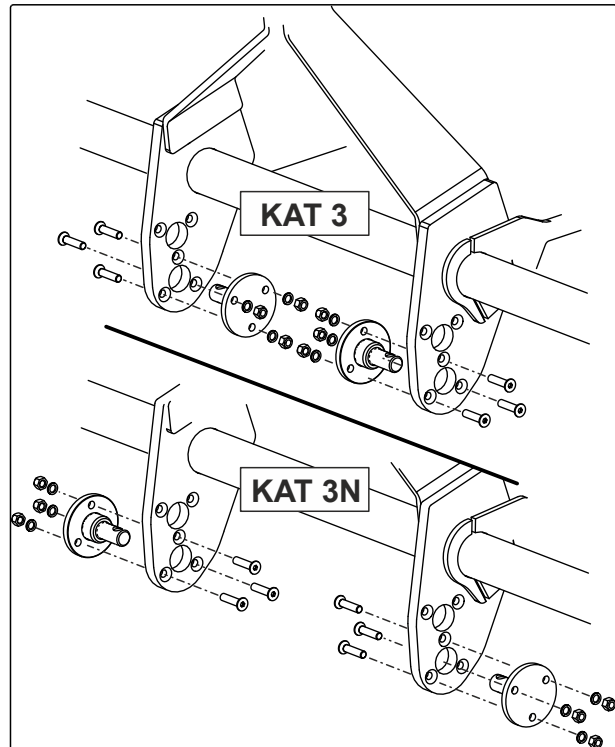
- Make sure that the calculated loads are smaller or equal to the permissible loads.

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

## 6.2 Adjusting the 3-point mounting frame

CMS-T-00004213-B.1

1. Insert the lower link pins into the mounts.
2. Insert the bolts into the holes.
3. Tighten the bolts with washers and nuts.



CMS-I-00003098

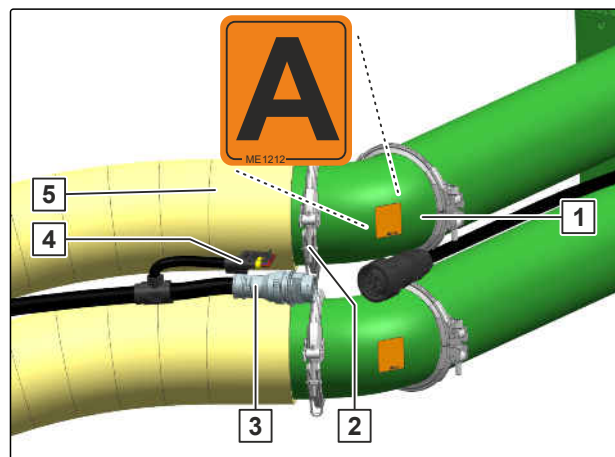
## 6.3 Coupling the implement

CMS-T-00005531-D.1

### 6.3.1 Coupling the supply lines to the front-mounted hopper

CMS-T-00004439-C.1

1. To connect the conveyor hose **5** to the front-mounted hopper **1**, couple the connecting piece with the bracket **2**.
2. Depending on the implement equipment, connect the second conveyor hose to the hose package. Pay attention to the markings on the conveyor hoses.
3. Depending on the implement equipment, connect the front hopper supply **3** to the hose package.
4. Depending on the implement equipment, connect the metering unit shutoff **4** to the hose package.

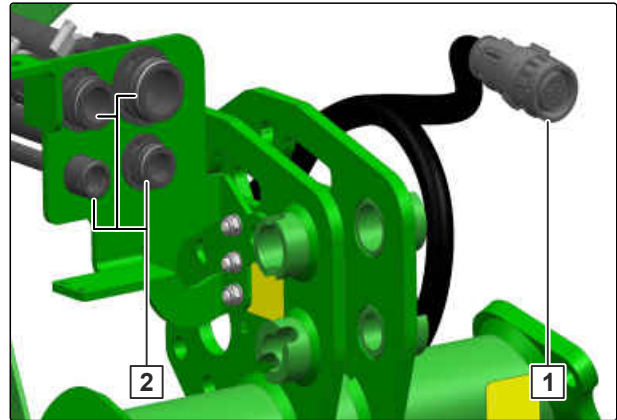


CMS-I-00003124

### 6.3.2 Coupling the supply lines to the front hopper

CMS-T-00010803-A.1

1. Connect the plug for the ISOBUS line **1** to the front hopper.
2. Connect the supply lines **2** to the conveyor hoses of the front hopper.

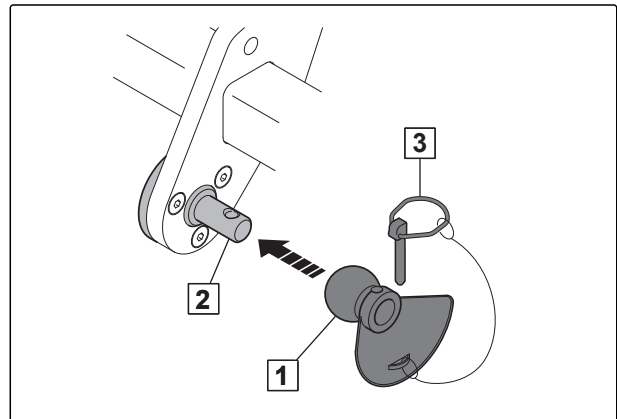


CMS-I-00007399

### 6.3.3 Attaching the backstop profiles for the lower links

CMS-T-00001398-A.1

1. Put the backstop profiles **1** on the lower link pins **2**.
2. Secure the backstop profiles with the linch pin **3**.



CMS-I-00001219

### 6.3.4 Coupling the universal joint shaft

CMS-T-00005462-A.1

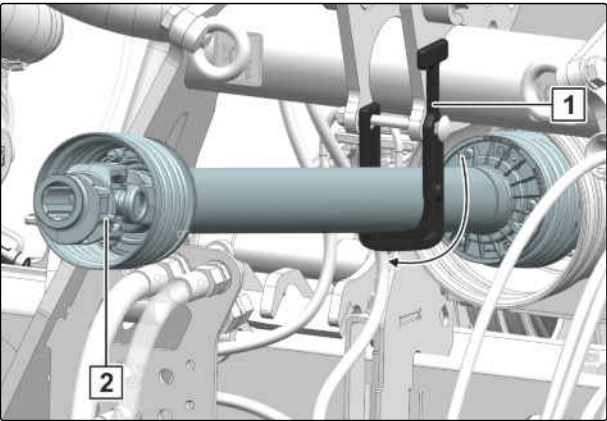


#### REQUIREMENTS

- ✓ The universal joint shaft was installed according to the manufacturer specifications

1. Open the holder **1**.
2. Pull back the drawing sleeve **2** on the tractor side.
3. Push the universal joint shaft onto the tractor PTO shaft.

➔ The drawing sleeve engages.

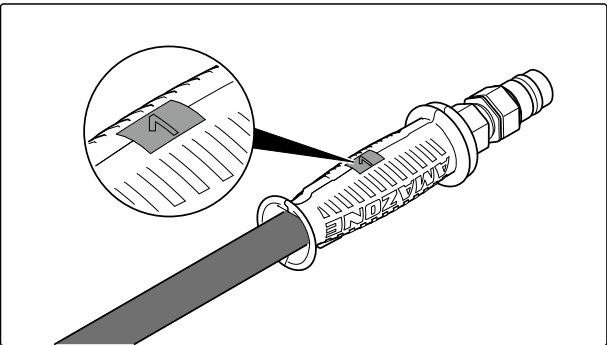


CMS-I-00003956

### 6.3.5 Coupling the hydraulic hose lines

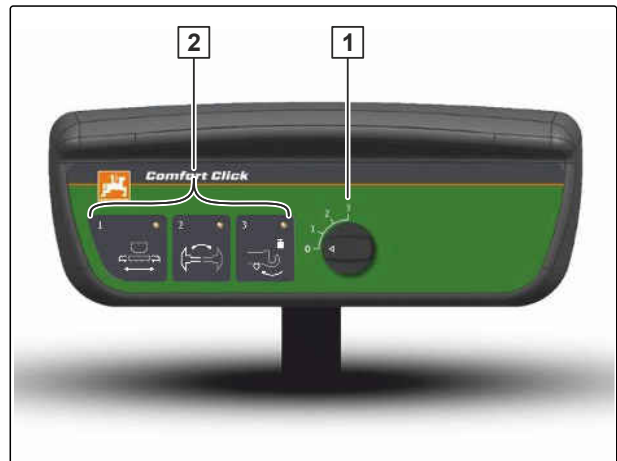
All hydraulic hoses are equipped with handles. The handles have colour markings with a code number or a code letter. The markings are assigned to the respective hydraulic functions of the pressure line of a tractor control unit. Stickers are applied on the implement for the markings, which illustrate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



CMS-I-00001699

If there are fewer tractor control units available than are required, multiple implement functions **2** can be assigned to one tractor control unit with the Comfort hydraulic system. The function is actuated either via the implement software or via Comfort Click **1**.

Designation		Function			Tractor control unit	
Green	<b>1</b>		Section	Unfold	Double-acting	
	<b>2</b>			Fold		
	<b>1</b>		Track marker	Unfold	Double-acting	
	<b>2</b>			Fold		
	<b>1</b>		Frame ballasting	Increase	Double-acting	
	<b>2</b>			Reduce		
Beige	<b>1</b>		Filling auger	Switching on	Single-acting	
Red	<b>1</b>		Fan hydraulic motor	Switching on	Single-acting	
	<b>T</b>	Pressure relief through pressureless return flow				



## WARNING

### Risk of injury or even death

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

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

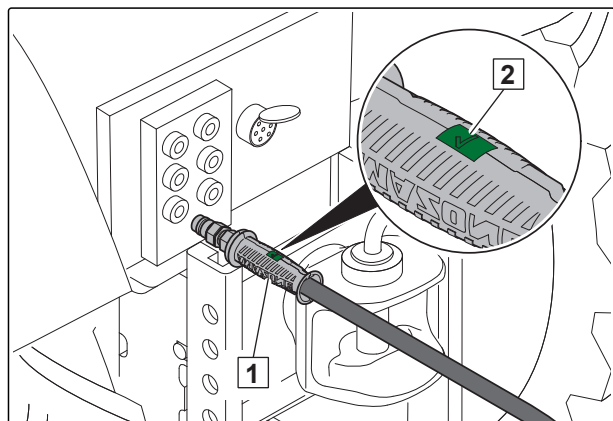


## IMPORTANT

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

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

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

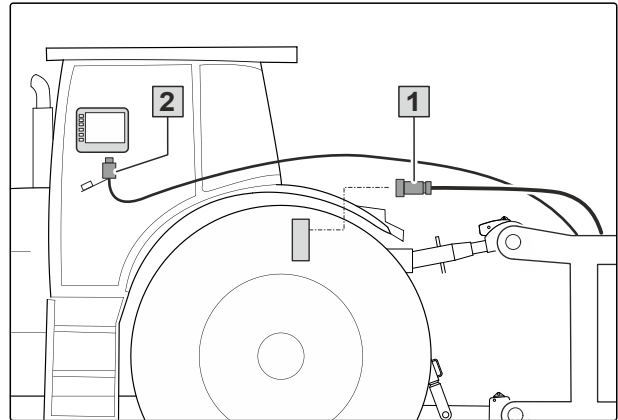


CMS-I-00001045

### 6.3.6 Coupling the ISOBUS or control computer

CMS-T-00003611-E.1

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

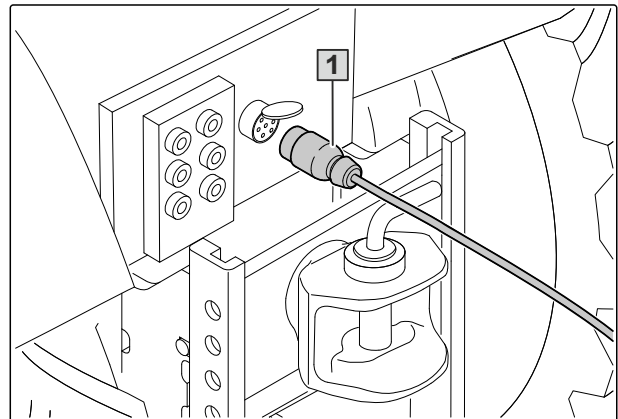


CMS-I-00006891

### 6.3.7 Coupling the power supply

CMS-T-00001399-F.1

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



CMS-I-00001048

### 6.3.8 Coupling the 3-point mounting frame

CMS-T-00007518-B.1



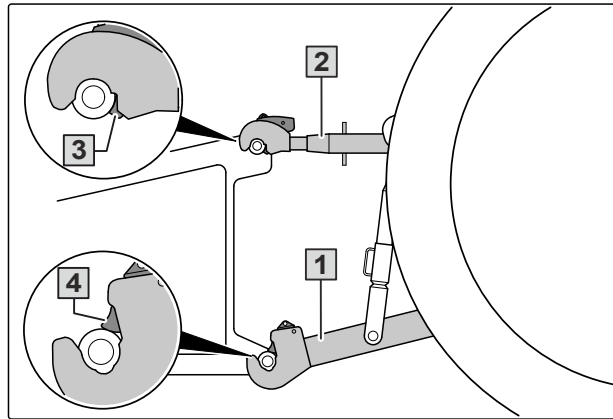
#### IMPORTANT

##### Collision between frame ballasting and tractor tyres

- To ensure that the frame ballasting fits between the tractor tyres, determine the width of the frame ballasting and compare it to the inner track width of the tractor.

## 6 | Preparing the machine Coupling the implement

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.

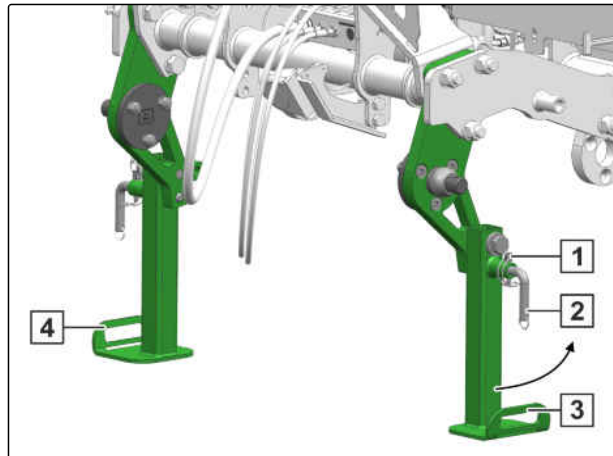


CMS-I-00001225

### 6.3.9 Raising the jacks

The Precea 6000-2CC has swivelling jacks.

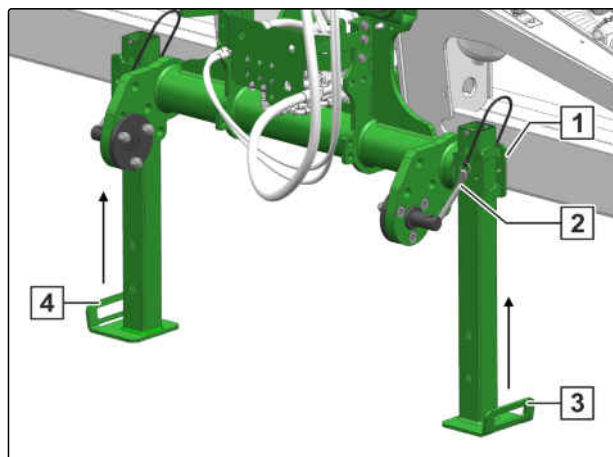
1. *To relieve the jacks,*  
Raise the implement.
2. Pull out the spring cotter pin **1**.
3. Remove the pin **2**.
4. Swivel the jack by the handle **3** to the rear.
5. Secure the jack with a pin.
6. Secure the pin with a spring cotter pin.
7. Repeat the procedure for the second jack **4**.



CMS-I-00003939

The Precea 6000-2 or 6000-2FCC has sliding jacks.

8. *To relieve the jacks,*  
Raise the implement.
9. Pull out the spring cotter pin **1**.
10. Remove the pin **2**.
11. Push the jack up by the handle **3**.
12. Secure the jack with a pin.
13. Secure the pin with a spring cotter pin.
14. Repeat the procedure for the second jack **4**.

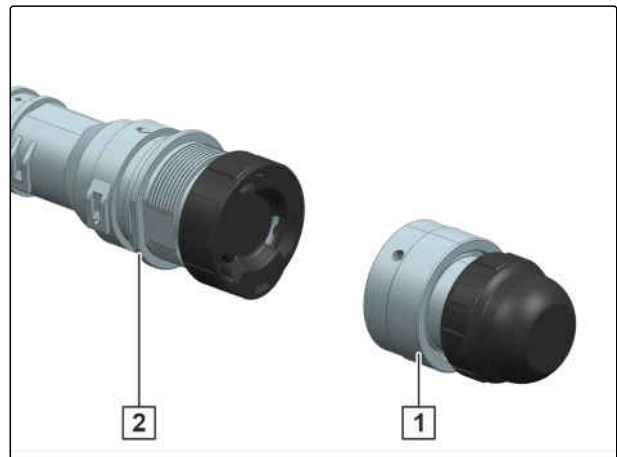


CMS-I-00003940



### 6.3.10 Operation without front hopper

- *If the implement should be used without the front hopper,*  
install the terminating resistor **1** on the signal cable **2** for the front hopper.



CMS-T-00008281-A.1

CMS-I-00005657

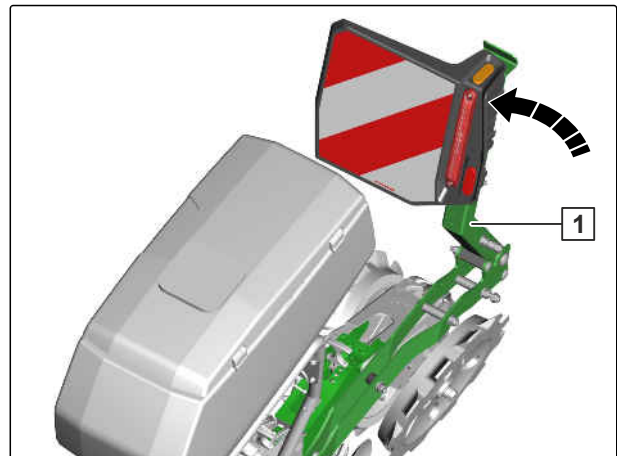
## 6.4 Preparing the implement for operation

CMS-T-00005513-E.1

### 6.4.1 Folding the lighting

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

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



CMS-T-00004418-C.1

CMS-I-00007407

### 6.4.2 Unfolding the implement sections

CMS-T-00005525-C.1



#### CAUTION

There are crushing and shear points between the implement sections and the implement.

- *When folding or unfolding the implement sections,*  
never reach into the crushing area.



## REQUIREMENTS

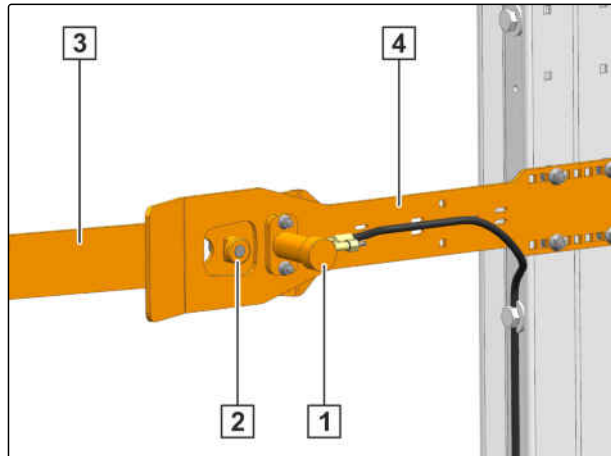
- ✓ The implement is raised
- ✓ The lifting arm is removed



## WARNING

**An unexpected hydraulic function is activated**

- *Before you actuate the tractor control unit, check the selected hydraulic function of the Comfort hydraulic system.*



CMS-I-00003941

1. unfold the implement.
  2. *To unlock the transport lock, actuate the "green 2" tractor control unit.*
  3. *Until the implement sections have reached the end position, actuate the "green 1" tractor control unit.*
  4. *When the implement sections have reached the end position, actuate the "green 1" tractor control unit for 5 seconds.*
- ➔ The hydraulic accumulators are filled.
  - ➔ The hydraulically folded lighting is in parking position.
5. put the "green 1" tractor control unit in the neutral position.

### 6.4.3 Adjusting the working position sensor

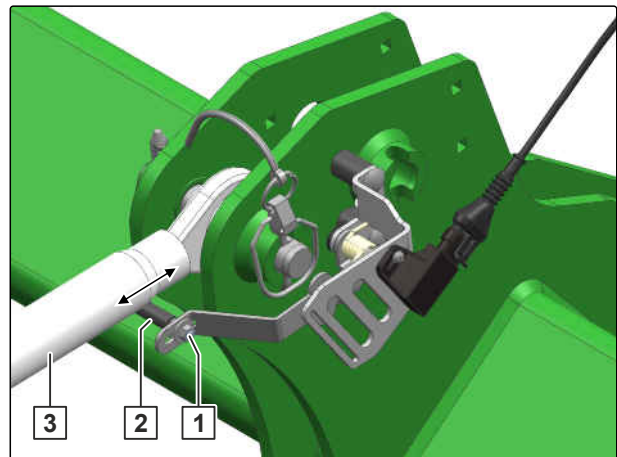
CMS-T-00003625-E.1

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

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

or

see "control computer" operating manual.



CMS-I-00002608

### 6.4.4 Filling the seed hopper

CMS-T-00001914-C.1



#### REQUIREMENTS

- ✓ The implement is coupled to the tractor
- ✓ The tractor and implement are secured
- ✓ The seed and seed hopper are free of foreign objects
- ✓ The seed is dry and does not stick

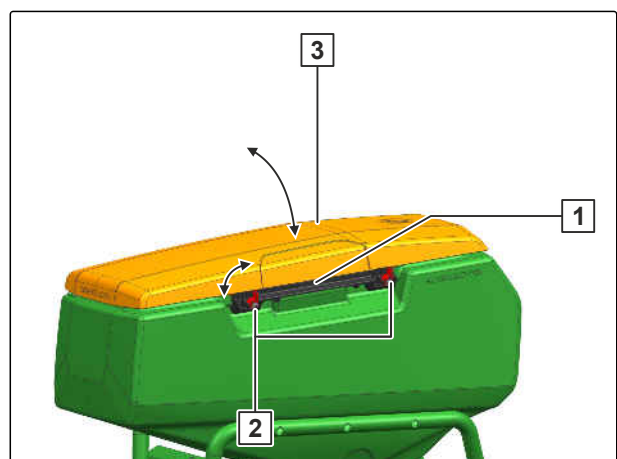


#### IMPORTANT

**Leaks in the hopper cause faulty placement**

- ▶ Do not walk on the hopper cover.
- ▶ Keep the cover seal and sealing surface clean.

1. Open the fastener **2**.
2. Press the hopper cover **3** down.
3. Unlock the **1** fastener.



CMS-I-00001886

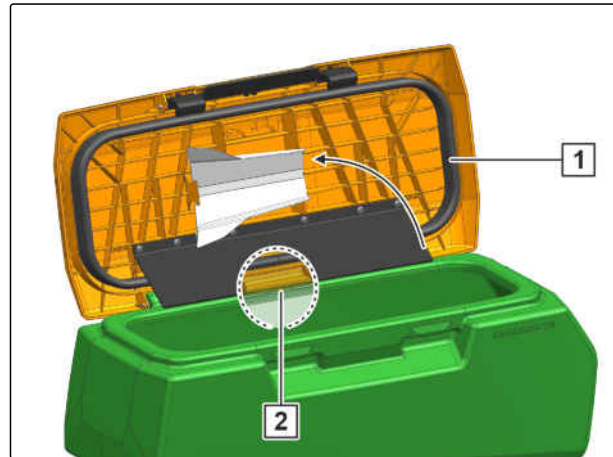
## 6 | Preparing the machine

### Preparing the implement for operation

4. Open the hopper cover **1** completely.

➔ The cover fastener **2** latches.

5. Fill the seed hopper.



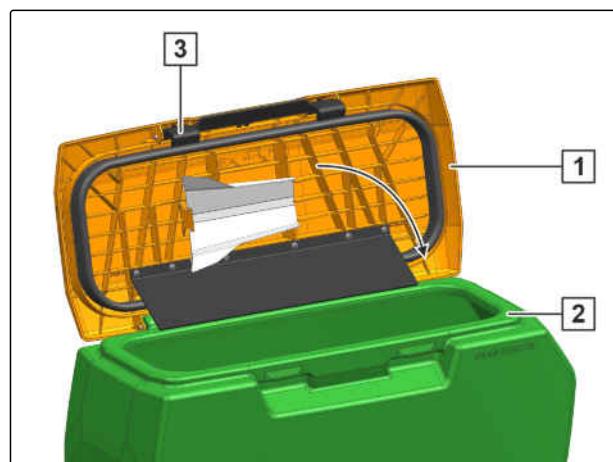
CMS-I-00001887

6. Clean the cover seal and sealing surface **2**.

7. Close the hopper cover **1**.

➔ The fastener **3** is locked.

8. Close the fastener.



CMS-I-00001889

### 6.4.5 Filling the fertiliser hopper

CMS-T-00005526-D.1

#### 6.4.5.1 Filling the fertiliser hopper via the loading board

CMS-T-00001911-D.1

#### **i** NOTE

The guard screen and function screen in the fertiliser hopper are closed. Only a closed guard screen and function screen can prevent fertiliser clumps and/or foreign objects from entering the fertiliser hopper and clogging the metering unit.

#### **✓** REQUIREMENTS

- ✓ The transport vehicle carrying the fertiliser is standing on a level surface

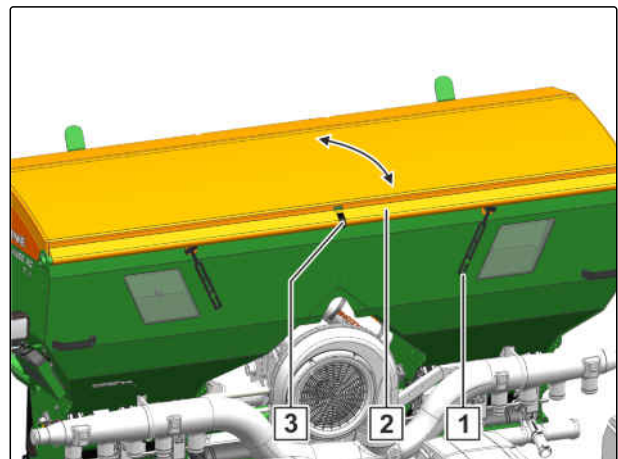
1. Determine the payload of the implement and axles loads of the tractor.
2. Couple the implement to the tractor.

3. Secure the tractor and implement.
4. When working at night, switch on the interior lighting of the fertiliser hopper.
5. Climb onto the loading board using the steps.

or

*To unfold the ladder,  
see "Operating the loading board with ladder".*

6. Open the rubber straps **1**.
7. Open the fertiliser hopper tarpaulin **2**.
8. Remove residues or foreign objects from the fertiliser hopper.
9. Fill the fertiliser hopper.
10. Close the fertiliser hopper tarpaulin with the pull rope **3**.
11. Secure the fertiliser hopper tarpaulin with rubber straps.
12. *To fold the ladder,  
see "Operating the loading board with ladder".*



#### 6.4.5.2 Filling the fertiliser hopper with the folding filling auger

CMS-T-00005527-D.1

#### **i** NOTE

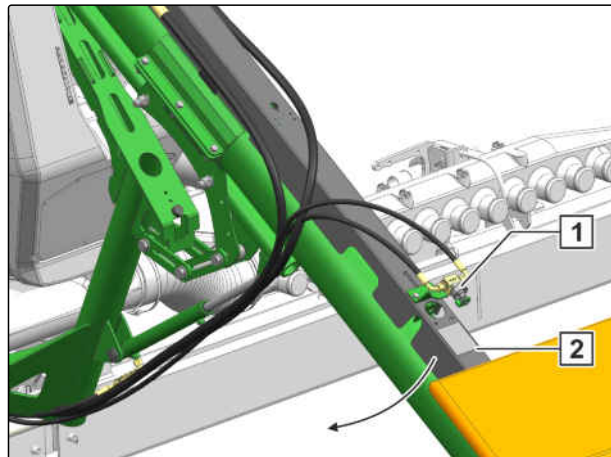
The guard screen and function screen in the fertiliser hopper are closed. Only a closed guard screen and function screen can prevent fertiliser clumps and/or foreign objects from entering the fertiliser hopper and clogging the metering unit.



## REQUIREMENTS

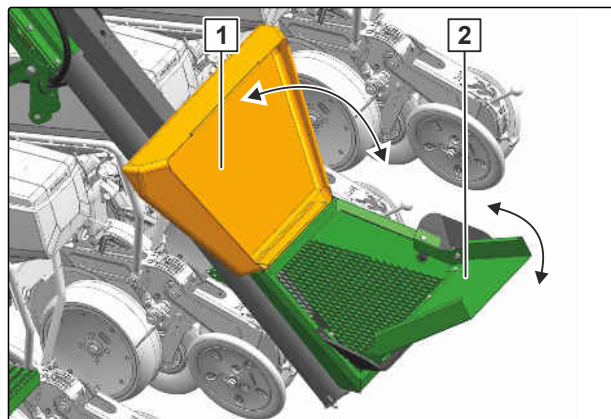
- ✓ The implement is coupled to the tractor
- ✓ The tractor and implement are secured
- ✓ The transport vehicle carrying the fertiliser is standing on a level surface

1. When working at night, switch on the interior lighting of the fertiliser hopper.
  2. Actuate and hold the control lever **1**.
  3. Push the filling auger **2** into the desired position.
  4. Release the control lever.
- ➔ The filling auger is locked in the desired position.



CMS-I-00003949

5. Open the cover tarpaulin **1** of the filling funnel.
6. Swivel out the filling chute **2**.
7. Remove residues or foreign objects from the filling funnel.



CMS-I-00001894



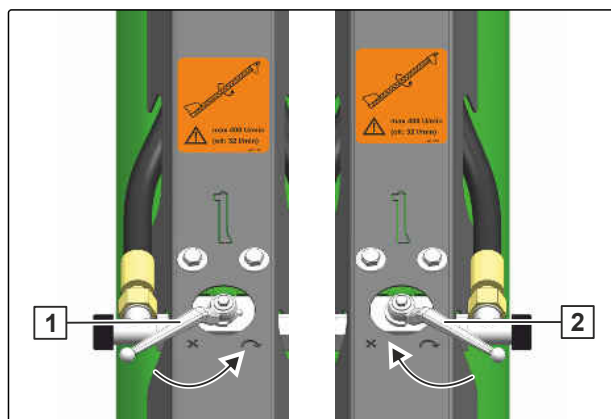
## NOTE

The maximum filling capacity is reached when a material cone is formed over the feed auger. If possible, let the fertiliser run directly into the filling funnel.

8. Switch on the "beige 1" tractor control unit at 32 l/min.
9. Slowly switch on the filling auger's drive on the ball valve **1**.

➔ The fill level in the fertiliser hopper rises.

10. Monitor the fill level through the inspection window.
11. When the fill level rises beyond the edge of the inspection window, reduce the filling auger speed with the ball valve **2**.



CMS-I-00001895

12. *When the fertiliser hopper is full,*  
slowly switch off the filling auger with the ball valve.
13. Switch off the "beige" tractor control unit.
14. Swivel in the filling chute.
15. Close the cover tarpaulin of the filling funnel.
16. *To swivel the filling auger back into the parking position,*  
actuate the "green 1" tractor control unit until the filling auger has reached its end position.

## 6.4.6 Preparing the micropellet spreader for operation

CMS-T-00003596-F.1

### 6.4.6.1 Filling the micropellet hopper

CMS-T-00003595-C.1

#### REQUIREMENTS

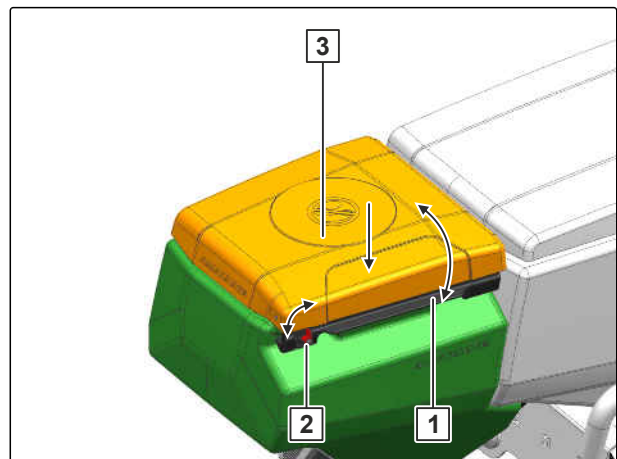
- ✓ The micropellets are free of foreign objects
- ✓ The micropellets are dry and do not stick

#### IMPORTANT

**Leaks in the hopper cause faulty placement**

- ▶ Do no walk on the hopper cover.
- ▶ Keep the cover seal and sealing surface clean.

1. Open the fastener **2**.
2. Press the hopper cover **3** down.
3. Unlock the **1** fastener.



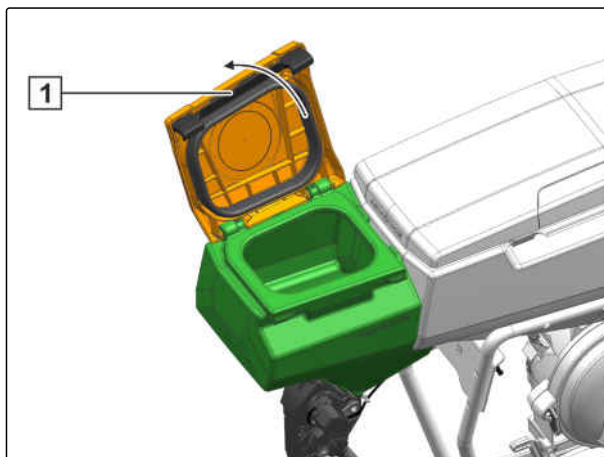
CMS-I-00002595



## 6 | Preparing the machine

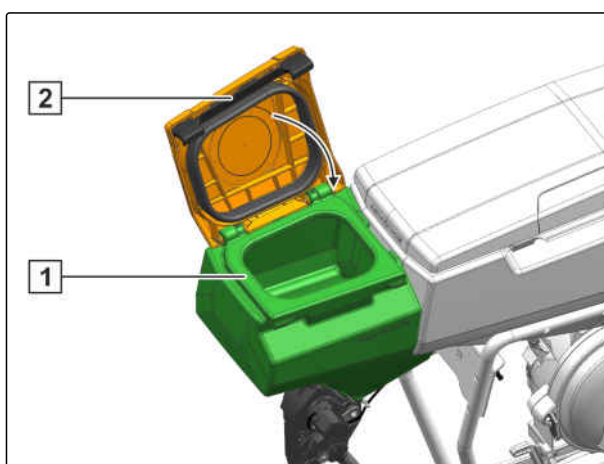
### Preparing the implement for operation

4. Open the hopper cover **1**.
5. Fill the micropellet hopper.



CMS-I-00002598

6. Clean the cover seal and sealing surface **1**.
  7. close the hopper cover.
- ➔ The fastener **2** is locked.
8. Close the fastener.



CMS-I-00002596

#### 6.4.6.2 Changing the metering roller

CMS-T-00003598-D.1

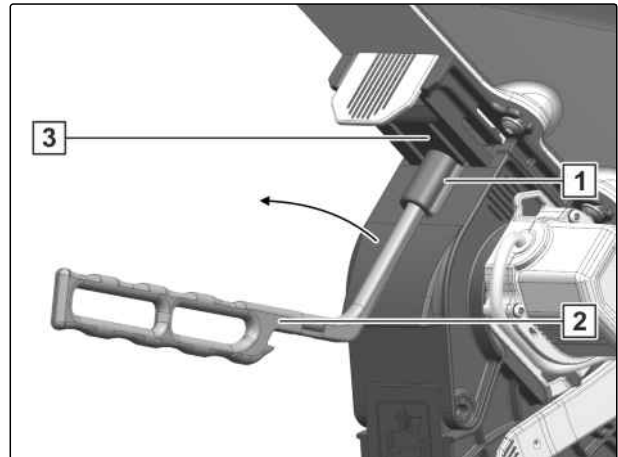
1. Set the sliding shutter **1** to the bottom position.



CMS-I-00002586

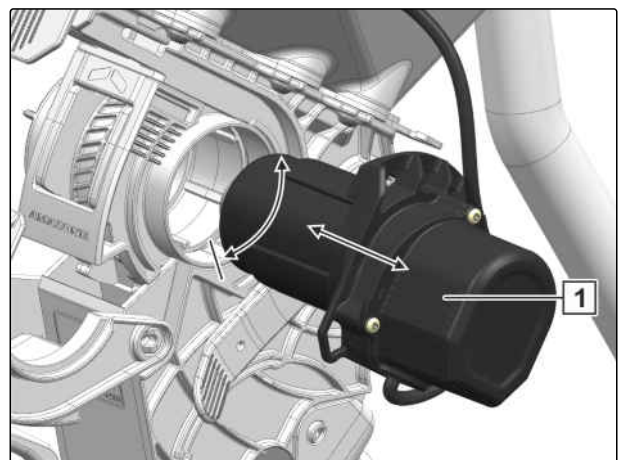


2. Insert the unlocking tool **2** into the metering unit cover **1**.
3. Unlock the metering unit cover on the metering housing **3**.
4. Open the metering unit cover.



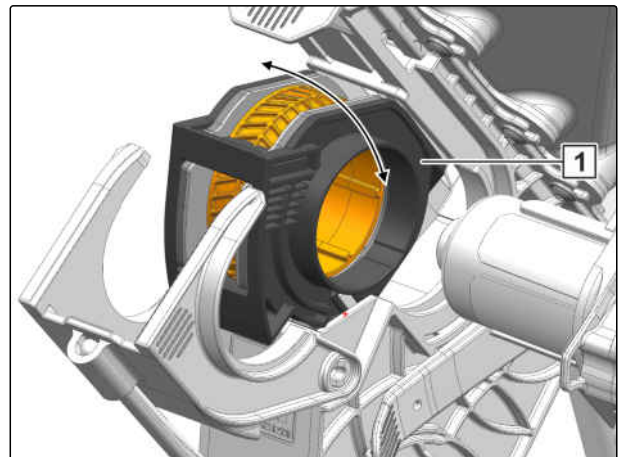
CMS-I-00002582

5. Turn the drive unit **1** counterclockwise.
6. Pull the drive unit out of the metering housing.



CMS-I-00002585

7. Take the roller cage **1** along with the metering roller out of the metering housing.



CMS-I-00002584

## 6 | Preparing the machine

### Preparing the implement for operation

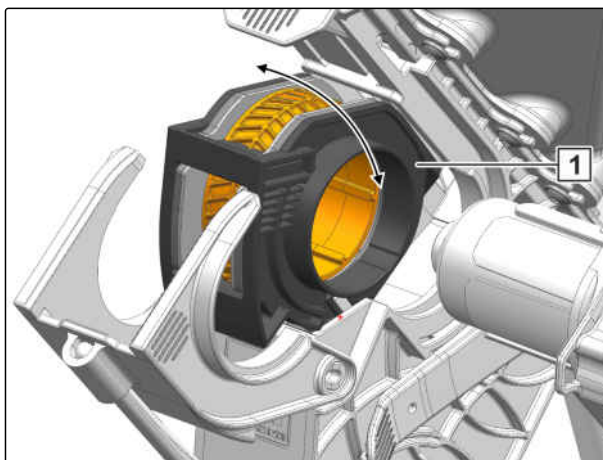
8. Take the metering roller **1** out of the roller cage **2**.
9. *For uniform concentricity,* align the direction of rotation of the desired metering roller with the mark **3**.

Metering wheel	Colour	Applications	Spread rate
Metering wheel 4 cm <sup>3</sup>	Orange	Insecticide	5 kg/ha to 20 kg/ha
Metering wheel 3 cm <sup>3</sup>	Silver grey	Slug pellets	2 kg/ha to 10 kg/ha
Metering wheel 12 cm <sup>3</sup>	Green	Micro-fertiliser	10 kg/ha to 35 kg/ha



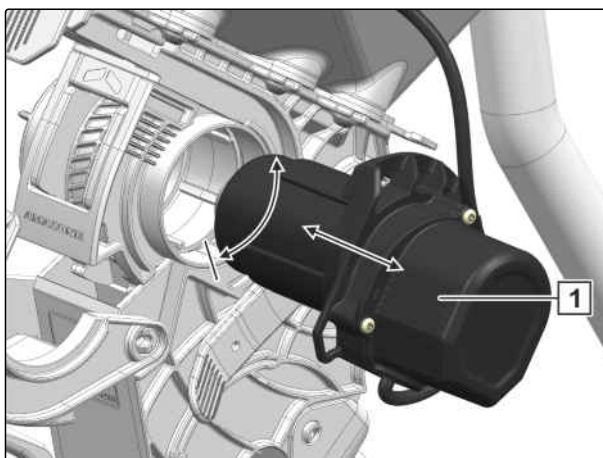
CMS-I-00002583

10. Insert the desired metering roller into the roller cage.
11. Insert the roller cage **1** along with the metering roller into the metering housing.



CMS-I-00002584

12. Insert the drive unit **1** into the metering roller.
13. Rotate the drive unit clockwise.
14. Close the metering unit cover.
- ➔ The locking mechanism engages.
15. Set the sliding shutter to the top position.



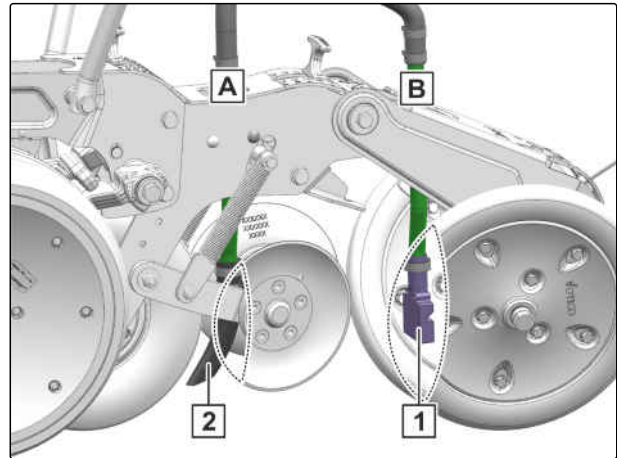
CMS-I-00002585

### 6.4.6.3 Changing the application point

CMS-T-00003633-C.1

#### PreTeC mulch seeding coulters with closer

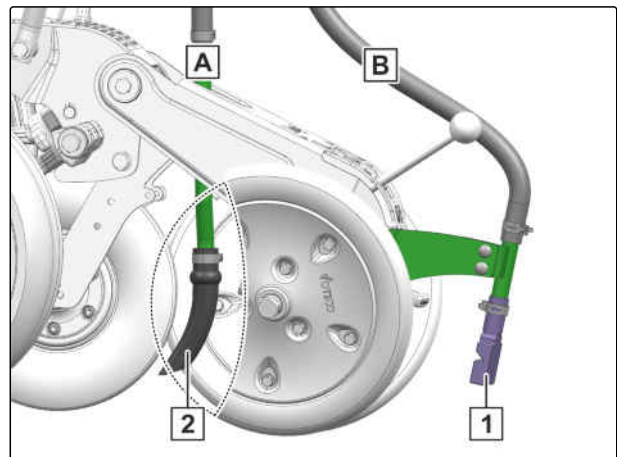
- 1 Application in the closing seed furrow, optionally with targeted outlet or diffuser.
- 2 Application in the seed furrow, optionally with targeted outlet or diffuser.



CMS-I-00002579

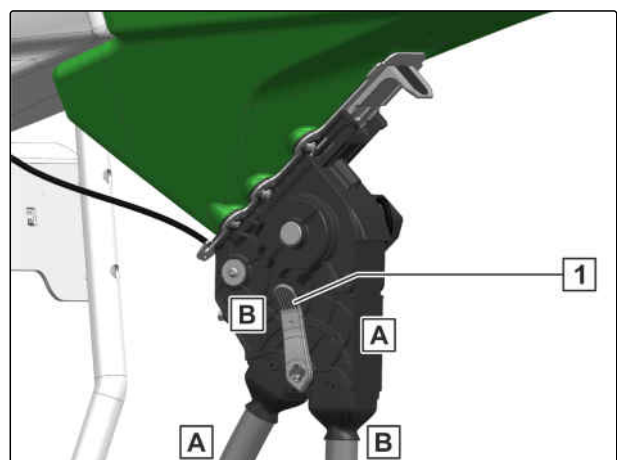
#### PreTeC mulch seeding coulters without closer

- 1 Application on the closed seed furrow with the diffuser.
- 2 Application in the seed furrow, optionally with targeted outlet or diffuser.



CMS-I-00002578

- To activate the outlet that is suitable for the application, move the switchover flap 1 to the desired position.



CMS-I-00002580

#### 6.4.6.4 Adjusting the diffuser angle

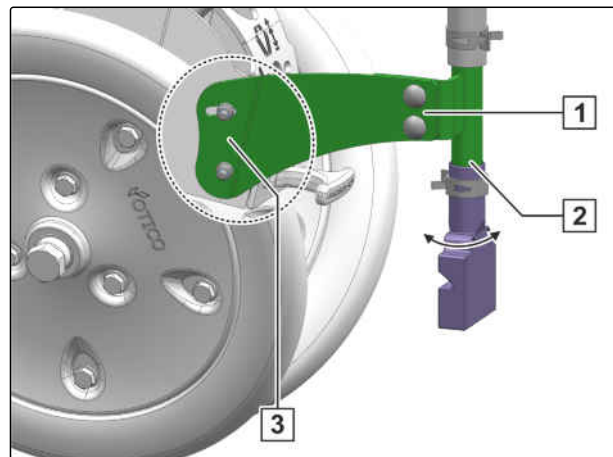
CMS-T-00003884-C.1

1. Loosen the bolts **1**.
2. Move the diffuser **2** to the desired position.

or

*If the desired position cannot be set,*  
Loosen the bolts **3**.

3. Move the diffuser to the desired position.
4. Tighten the bolts.



CMS-I-00002837

#### 6.4.7 Determining the setting parameters

CMS-T-00007715-B.1

Seed	Thousand grain weight	Holes	Hole Ø	Colour	Sliding shutter position	Fan pressure	Filling block	Opto-sensor Ø	Feed channel Ø	Furrow former Ø	Seed press roller
Rapeseed	<4.5 g	120	1 mm	Light grey	B / C	35 mbar ± 5 mbar	Orange	16 mm	16 mm	12 mm	20 mm
	4.5 g to 7 g	120	1.3 mm	Anthracite grey	B / C	35 mbar ± 5 mbar	Orange	16 mm	16 mm	12 mm	20 mm
	> 7 g	120	1.6 mm	Black	B / C	35 mbar ± 5 mbar	Orange	16 mm	16 mm	12 mm	20 mm
Sorghum	25 g to 45 g	80	2.5 mm	Bordeaux red	B / C	35 mbar ± 5 mbar	Orange	16 mm	16 mm	16 mm	16 mm
Soybean	120 g to 265 g	80	4 mm	Silver grey	D / E	45 mbar ± 5 mbar	Green	16 mm	16 mm	16 mm	16 mm
	120 g to 265 g	120	4 mm	Purple	D / E	45 mbar ± 5 mbar	Green	20 mm	20 mm to 16 mm	16 mm	16 mm
Field bean		55	6 mm	Red	G / H	45 mbar ± 5 mbar	Green	20 mm	20 mm	20 mm	16 mm

Seed	Thousand grain weight	Holes	Hole Ø	Colour	Sliding shutter position	Fan pressure	Filling block	Opto-sensor Ø	Feed channel Ø	Furrow former Ø	Seed press roller
Maize	< 220 g	42	4.5 mm	Beige	E / F / G	45 mbar ± 5 mbar	Green	16 mm	16 mm	16 mm	16 mm
	220 g to 300 g	42	5 mm	Green	E / F / G	45 mbar ± 5 mbar	Green	16 mm	16 mm	16 mm	16 mm
	> 300 g	42	5.5 mm	Purple	E / F / G	45 mbar ± 5 mbar	Green	16 mm	16 mm	16 mm	16 mm
Sugar beet		34	2.2 mm	Blue	B / C	35 mbar ± 5 mbar	Orange	16 mm	16 mm	12 mm	20 mm
Sunflower < 15 ml ^ 15 ml See note	70 g to 85 g	34	3 mm	Orange	E / F / G	35 mbar ± 5 mbar	Green	16 mm	16 mm	16 mm	16 mm
	85 g to 95 g	34	3.5 mm	Brown	E / F / G	35 mbar ± 5 mbar	Green	16 mm	16 mm	16 mm	16 mm
	<95 g	34	4 mm	Pink	E / F / G	35 mbar ± 5 mbar	Green	16 mm	16 mm	16 mm	16 mm
Squash		10	4 mm	Opal green	F / G	45 mbar ± 5 mbar	Green	20 mm	20 mm	20 mm	16 mm



#### NOTE

For sunflower seeds larger than 15 ml, use opto-sensor, feed channel and furrow former with a diameter of 20 mm.



#### NOTE

For soya, the size can fluctuate depending on the seed. The actual spread rate can deviate strongly from the target rate. Check the grain placement after driving a short distance.

When using the 120/4 ml discs, there can be deviations in the distribution along the row depending on the seed, target rate and forward speed.



#### NOTE

Operating conditions such as the grain shape, dressing or the addition of talcum affect the correct selection of the singling discs. The selection of the singling discs width must be adapted to the respective operating conditions and can only be determined during field operation.

The sliding shutter position and fan pressures are reference values. Check the grain placement after driving a short distance.

1. The setting parameters can be found in the table.
2. *To adjust the grain singling,*  
see "Adjusting the grain singling unit".
3. *To adjust the PreTeC coulter,*  
see "Adjusting the PreTeC coulter".

### 6.4.8 Adjusting the fan speed via the hydraulic system

CMS-T-00001948-G.1



#### REQUIREMENTS

- ✓ The seed hoppers are filled
- ✓ The implement is unfolded
- ✓ The fan is switched on
- ✓ The singling discs are filled with seed grains

The fan speed changes until the hydraulic fluid has reached its operating temperature.

Depending on the equipment, a pressure gauge, control computer or control terminal shows the air pressure. The specified fan pressures are reference values. Check the grain placement after driving a short distance.

Seed	Fan pressure
Beets, rapeseed, sorghum or sunflower	35 mbar $\pm$ 5 mbar
Maize, soya or field beans	45 mbar $\pm$ 5 mbar



## WARNING

### Risk of injury due to parts of the fan being flung out

If the fan is operated at excessive speeds, fan parts can break and be flung out.

- Make sure that the fan speed does not exceed 5000 rpm.

1. Unfold the folded implement.
2. *To correct the fan pressure,*  
adjust the oil quantity on the tractor control unit.
3. *To monitor the fan,*  
refer to "Configuring the fan speed monitoring" in the ISOBUS operating manual

or

refer to "Configuring the fan speed monitoring" in the control computer operating manual

or

Read the fan pressure on the pressure gauge.



## NOTE

If the desired fan pressure is not reached, a bigger hydraulic motor can help.

For more information, contact your specialist workshop.

## 6.4.9 Preparing the track marker for operation

CMS-T-00005514-C.1

### 6.4.9.1 Calculating the track marker length

CMS-T-00001938-D.1

#### 6.4.9.1.1 Marking at the centre of the tractor

CMS-T-00001939-D.1

The hydraulically actuated track markers produce alternating marks. This mark serves as an reference

## 6 | Preparing the machine

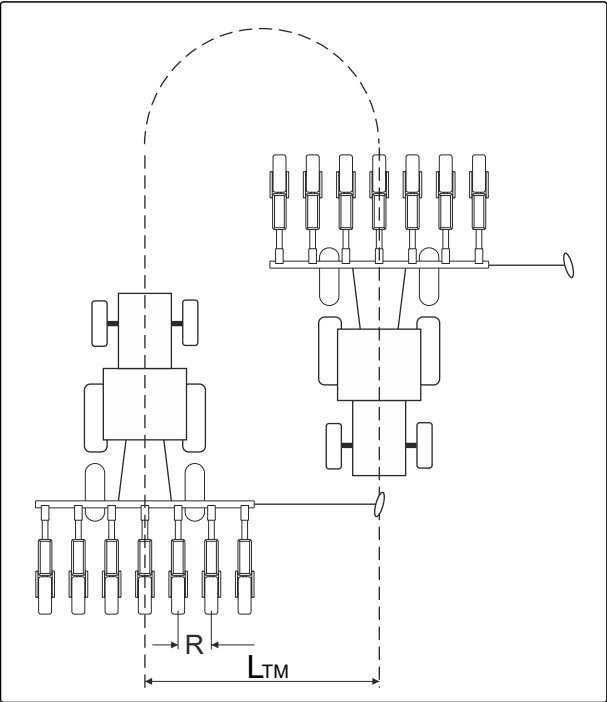
### Preparing the implement for operation

to the tractor driver for driving the next bout after turning at the headland. The length and pitch of the track markers are adjustable.

The track marker length  $L_{TM}$  describes the distance from the centre of the implement to the contact area of the track marker disc at the centre of the tractor.

#### **NOTE**

6.4 m working width can only be marked in the tractor track.



CMS-I-00001215

	Unit	Designation	Calculated values
N		Number of seeding coulters	
R	cm	Row spacing	
$L_{TM}$	cm	Track marker length, track marker marks at the centre of the tractor	

► Calculate the track marker length.

$$L_{TM} = R \times N$$

$$L_{TM} = \quad \times$$

$$L_{TM} =$$

CMS-I-00001214

#### 6.4.9.1.2 Marking in the tractor track

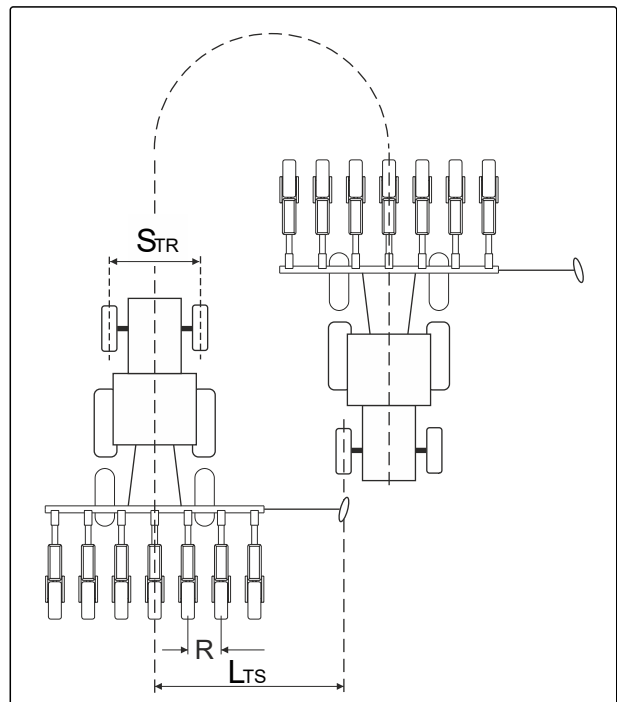
The hydraulically actuated track markers produce alternating marks. This mark serves as an reference

CMS-T-00001941-C.1



to the tractor driver for driving the next bout after turning at the headland. The length and pitch of the track markers are adjustable.

The track marker length  $L_{TS}$  describes the distance from the centre of the implement to the contact area of the track marker disc in the tractor track.



CMS-I-00001216

	Unit	Designation	Calculated values
N		Number of seeding coulters	
R	cm	Row spacing	
$L_{TS}$	cm	Track marker length, track marker marks in the tractor track	
$S_{TR}$	cm	Tractor track width	

► Calculate the track marker length.

$$L_{TS} = R \times N - \frac{S_{TR}}{2}$$

$$L_{TS} = \quad \times \quad - \frac{\quad}{2}$$

$$L_{TS} = \quad$$

CMS-I-00001213

#### 6.4.9.2 Unfolding the track markers

CMS-T-00005436-B.1



### WARNING

**An unexpected hydraulic function is activated**

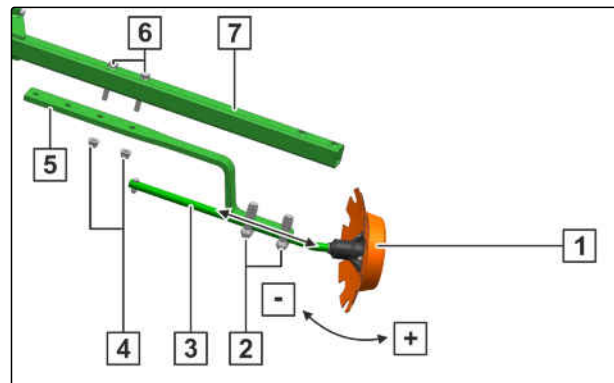
- *Before you actuate the tractor control unit, check the selected hydraulic function of the Comfort hydraulic system.*

1. unfold the implement.
2. *To select the track marker hydraulic function, refer to "Using the Comfort hydraulic system" in the ISOBUS operating manual.*
3. *To select the track marker, refer to "Track marker selection" in the ISOBUS operating manual.*
4. actuate the "green 1" tractor control unit.

#### 6.4.9.3 Adjusting the track marker

CMS-T-00010644-A.1

1. *To adjust the track marker to 5.2 m working width,*  
move the track marker mount **5** on the implement section **7** to the desired position.
2. Install the bolts **6**.
3. Install the nuts **4**.
4. Release the clamp connection **2**.
5. *To adjust the track marker length,*  
move the shaft **3** of the track marker disc **1** to the desired position.
6. *To adjust the pitch of the track marker disc,*  
turn the shaft of the track marker disc to the desired position.



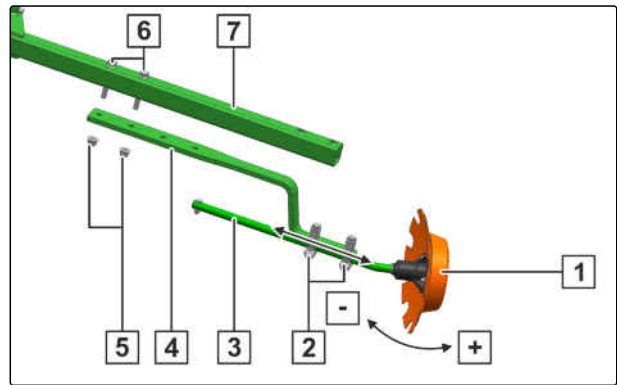
CMS-I-00003871

7. To adjust the track marker to 5.4 m working width,  
move the track marker mount **4** on the  
implement section **7** to the desired position.

8. Install the bolts **6**.

9. Install the nuts **5**.

10. Release the clamp connection **2**.



CMS-I-00003872

11. To adjust the track marker length,  
move the shaft **3** of the track marker disc **1** to  
the desired position.

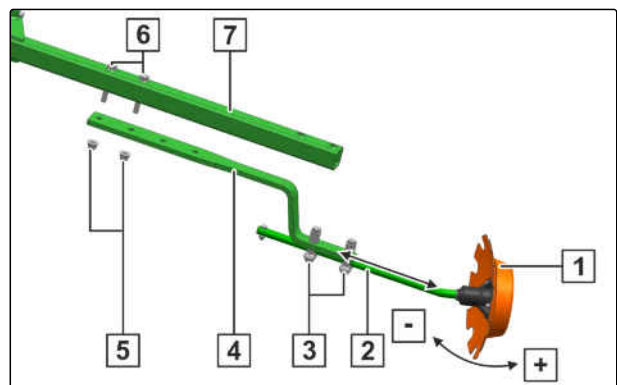
12. To adjust the pitch of the track marker disc,  
turn the shaft of the track marker disc to the  
desired position.

13. To adjust the track marker to 5.6 m working  
width,  
move the track marker mount **4** on the  
implement section **7** to the desired position.

14. Install the bolts **6**.

15. Install the nuts **5**.

16. Release the clamp connection **3**.



CMS-I-00003873

17. To adjust the track marker length,  
move the shaft **2** of the track marker disc **1** to  
the desired position.

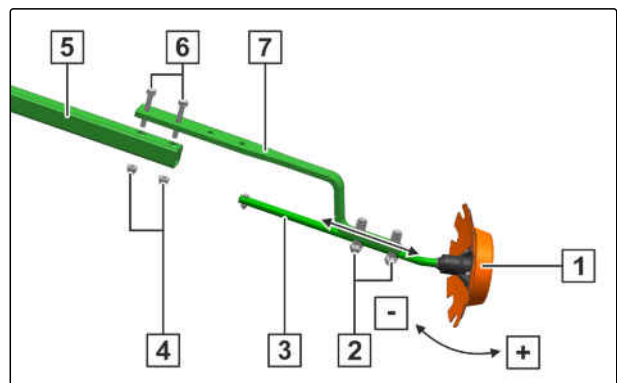
18. To adjust the pitch of the track marker disc,  
turn the shaft of the track marker disc to the  
desired position.

19. To adjust the track marker to 6 m working  
width,  
move the track marker mount **7** on the  
implement section **5** to the desired position.

20. Install the bolts **6**.

21. Install the nuts **4**.

22. Release the clamp connection **2**.



CMS-I-00003874

23. *To adjust the track marker length,*  
move the shaft **3** of the track marker disc **1** to the desired position.
24. *To adjust the pitch of the track marker disc,*  
turn the shaft of the track marker disc to the desired position.

#### **6.4.10 Preparing the wheel mark eradicator for operation**

CMS-T-00001816-F.1

##### **6.4.10.1 Adjusting the working depth of the wheel mark eradicators**

CMS-T-00001486-E.1



### **IMPORTANT**

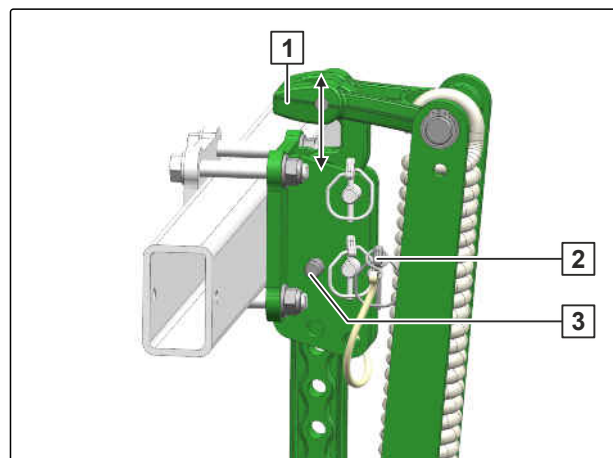
#### **Increased wear of the wheel mark eradicator bracket**

- ▶ *When the overload safety is triggered at short intervals,*  
reduce the working depth.
- ▶ Change to a wheel mark eradicator coulter that is easy to pull.

1. Raise the implement.
2. Release the linch pin **2**.
3. Hold the wheel mark eradicator by the recessed grip **1**.
4. Remove the locking pin **3**.

The maximum working depth is 150 mm.

5. Move the wheel mark eradicator to the desired position.
6. Secure the wheel mark eradicator with the locking pin.
7. Secure the locking pin with the linch pin.
8. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.



CMS-I-00000942

#### 6.4.10.2 Adjusting the wheel mark eradicator to the track width

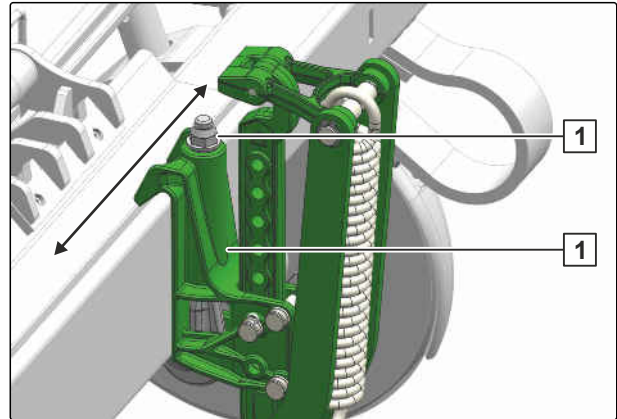
CMS-T-00001930-C.1

##### ✓ REQUIREMENTS

- ✓ The implement is raised
- ✓ The tractor and implement are secured

Tightening torque: 160 Nm

1. Release the clamp connection **1**.
2. Move the wheel mark eradicator bracket **2** to the desired position.
3. Tighten the clamp connection.

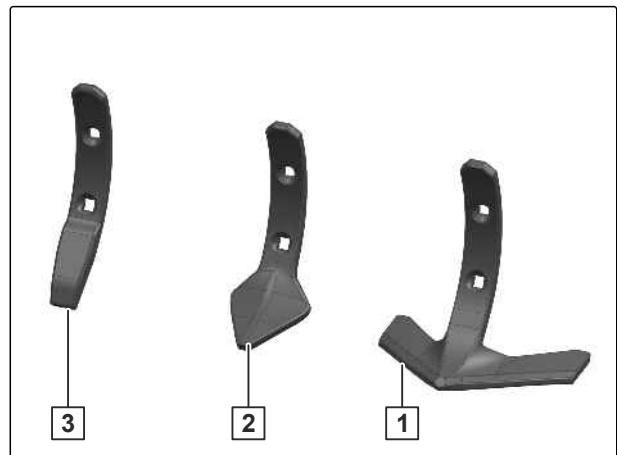


CMS-I-00001908

#### 6.4.10.3 Changing the wheel mark eradicator coulter

CMS-T-00002425-F.1

Different wheel mark eradicator coulters can be installed on the wheel mark eradicator. The choice of the wheel mark eradicator coulter depends on the operating conditions.



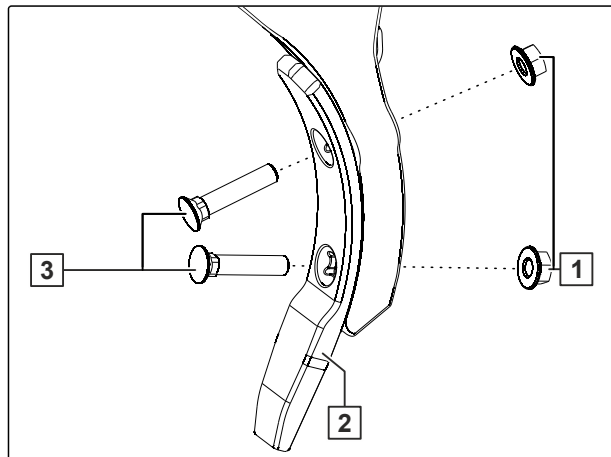
CMS-I-00001967

Number	Wheel mark eradicator coulter	Operating conditions	Pulling force requirement
<b>1</b>	Wing coulter	Shallow loosening and levelling of medium, silty soils	High pulling force requirement
<b>2</b>	Heart-shaped coulter	Medium-depth loosening of various soils	Medium pulling force requirement
<b>3</b>	Narrow coulter	Deep loosening of light soils	Low pulling force requirement

**CAUTION**

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

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



CMS-I-00001080

1. Remove the nuts **1**.
2. Remove the bolts **3**.
3. Install the desired wheel mark eradicator coulters **2** on the tool carrier.
4. Install the bolts.
5. Install the nuts and tighten them.
6. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.

#### 6.4.11 Preparing the pivoting wheel mark eradicator for operation

CMS-T-00005518-A.1

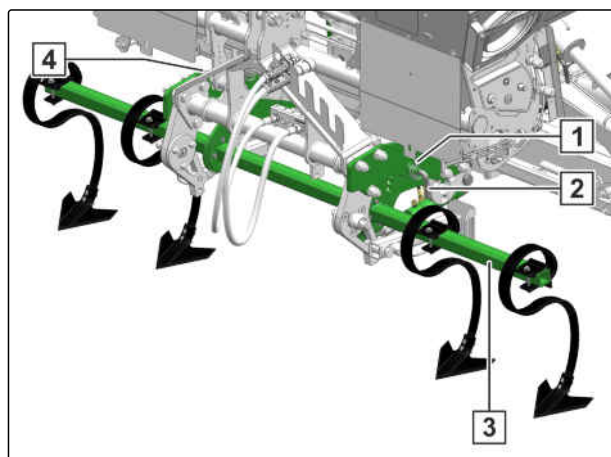
##### 6.4.11.1 Adjusting the working depth of the wheel mark eradicators

CMS-T-00005519-A.1

**NOTE**

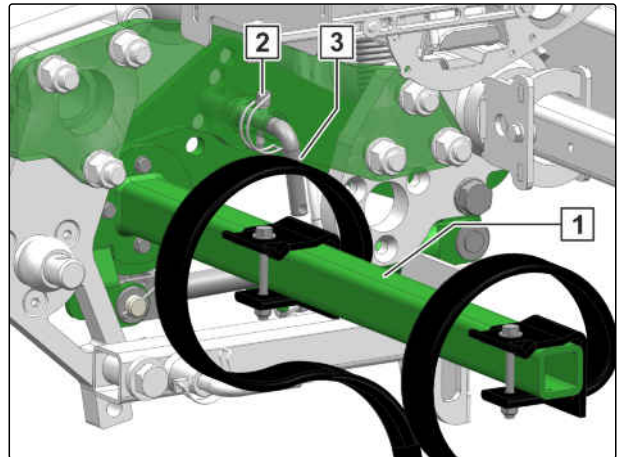
The adjustment of the working depth must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Raise the implement.
2. Release the linch pin **1**.
3. Remove the locking pin **2**.
4. Hold the wheel mark eradicator **3**.
5. Remove the linch pin and locking pin **4**.



CMS-I-00003952

6. Move the wheel mark eradicator **1** to the desired position.
7. Secure the wheel mark eradicator with the locking pin **2**.
8. Secure the locking pin with the linch pin **2**.
9. Insert the locking pin on the opposite side. Secure with the linch pin.

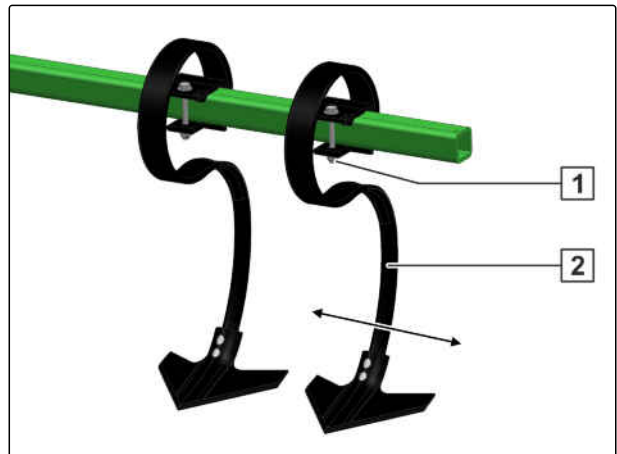


CMS-I-00003945

#### 6.4.11.2 Adjusting the wheel mark eradicator to the track width

CMS-T-00005520-A.1

1. Loosen the nut **1**.
2. Move the track marker **2** to the desired position.
3. Tighten the nut.



CMS-I-00003951

#### 6.4.11.3 Changing the wheel mark eradicator coulter

CMS-T-00005521-A.1



#### CAUTION

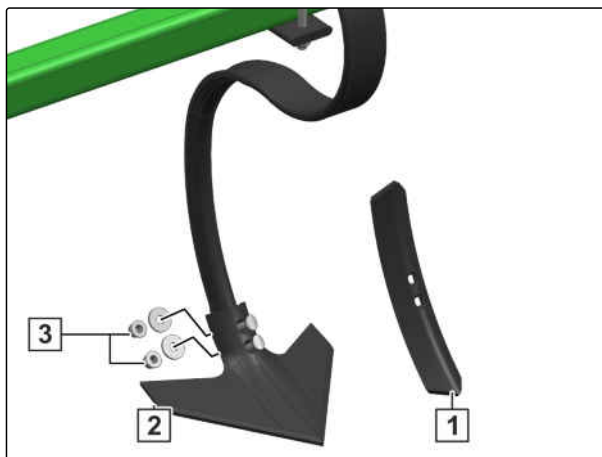
**Risk of injury from sharp edges on the coulters and the bolt heads**

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

## 6 | Preparing the machine

### Preparing the implement for operation

Different wheel mark eradicator coulters can be installed on the wheel mark eradicator bracket **1**. The choice of the wheel mark eradicator couler depends on the operating conditions.



CMS-I-00003950

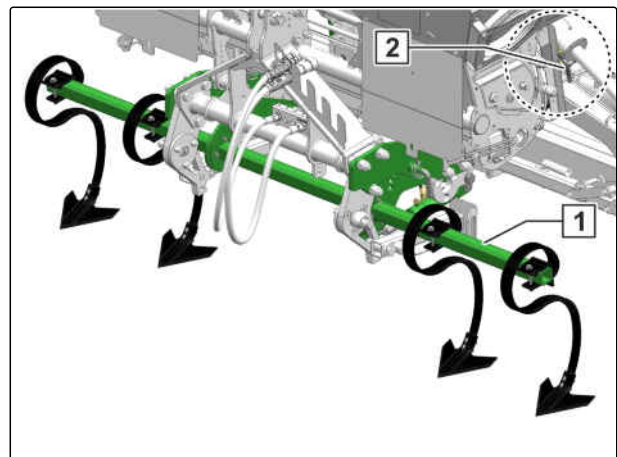
Number	Wheel mark eradicator couler	Operating conditions	Pulling force requirement
<b>1</b>	Narrow couler	Deep loosening of light soils	Low pulling force requirement
<b>2</b>	Wing couler	Shallow loosening and levelling of medium, silty soils	High pulling force requirement

1. Remove the nuts **3** and washers.
2. Remove the bolts.
3. Install the desired wheel mark eradicator couler on the tool carrier.
4. Install the bolts.
5. Install the nuts and tighten them.
6. After 5 hours of operation, check the bolt connection for tight fit.



#### 6.4.11.4 Deactivating the wheel mark eradicator

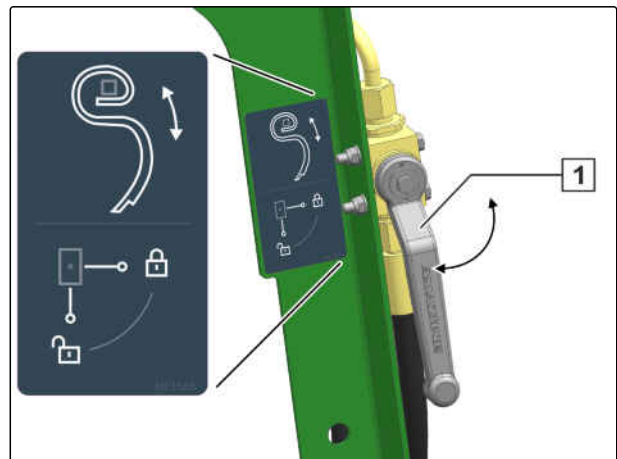
The wheel mark eradicator **1** is automatically swivelled into working position as soon as the implement is unfolded. The wheel mark eradicator is locked in parking position with the control lever **2**.



CMS-T-00005575-A.1

CMS-I-00003942

1. To deactivate the track marker, fold the implement.
  2. Put the control lever in the locked position.
- ➔ The implement is now unfolded without the wheel mark eradicator swivelling down.



CMS-I-00003938

#### 6.4.12 Setting up the speed sensor on the implement

To start the metering unit or the electronic monitoring, a speed signal is required. The speed sensor on the implement can be used for this.

1. Set up the speed sensor on the implement.
2. See "Determining the pulses per 100 m" in the control computer operating manual

or

See ISOBUS operating manual "Setting up the speed sensor on the implement".

CMS-T-00001908-C.1

### 6.4.13 Using the multi-placement tester

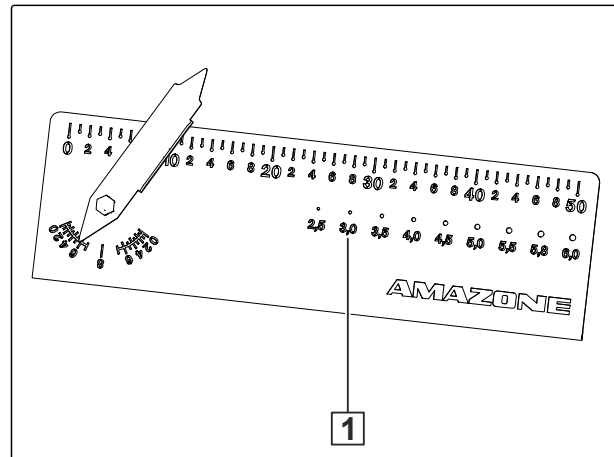
CMS-T-00005293-C.1

#### 6.4.13.1 Determining the grain size

CMS-T-00001888-C.1

Determine the grain size of the seed with the multi-placement tester.

1. Put the seed in the reference holes **1**.
2. *If the seed lies loosely on the reference hole, read the hole diameter.*

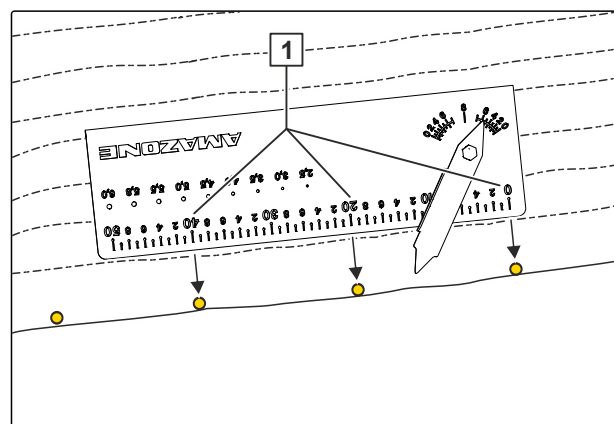


CMS-I-00001217

#### 6.4.13.2 Checking the grain spacing

CMS-T-00002354-C.1

The spread rate determines the required grain spacing. The grain spacing is adjusted by selecting the singling discs and adjusting the singling disc speed.



CMS-I-00002011

1. Spread seed for 30 m at working speed.
2. Use the read-off edge of the multi-placement tester to remove the earth in layers.
3. Expose 11 grains in one row.
4. Place the multi-placement tester horizontally on the ground.
5. Measure 10 grain spacings with the ruler **1**.

6. Calculate the average grain spacing.

$$K_{Ab1} \rightarrow K_{Ab10}$$

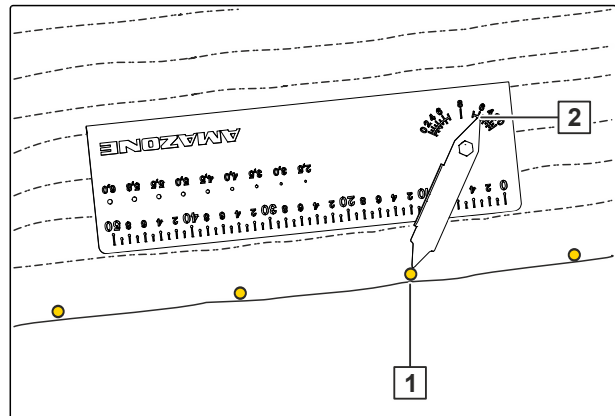
$$K_{Ab1-10} = \frac{K_{Ab1} + K_{Ab2} + K_{Ab3} + \dots + K_{Ab10}}{10}$$

$$K_{Ab1-10} = \frac{\boxed{\phantom{00}} + \boxed{\phantom{00}} + \boxed{\phantom{00}} + \dots + \boxed{\phantom{00}}}{10}$$

CMS-I-00002066

#### 6.4.13.3 Checking the seed placement depth

1. Seed approx. 30 m at working speed.
2. Expose the grains at several points using the multi-placement tester.
3. Use the read-off edge of the multi-placement tester to remove the earth in layers.
4. Place the multi-placement tester horizontally on the ground.
5. Set the pointer **1** on the seed grain.
6. Read the seed placement depth on the scale **2**.
7. *If the desired seed placement depth cannot be set, increase the coulter pressure.*  
See section "Adjusting the coulter pressure".



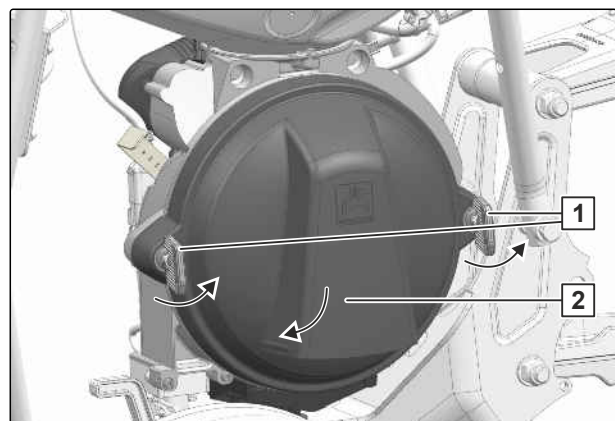
CMS-I-00002010

#### 6.4.14 Adjusting the grain singling unit

CMS-T-00005516-D.1

##### 6.4.14.1 Changing the singling disc

1. Secure the tractor and implement.
2. Open the locks **1**.
3. Remove the cover **2**.

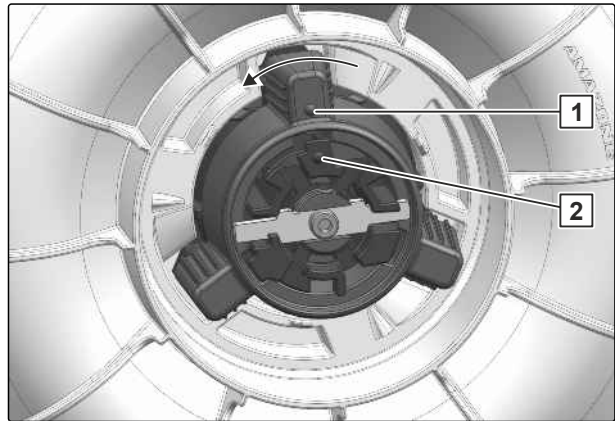


CMS-I-00001909

## 6 | Preparing the machine

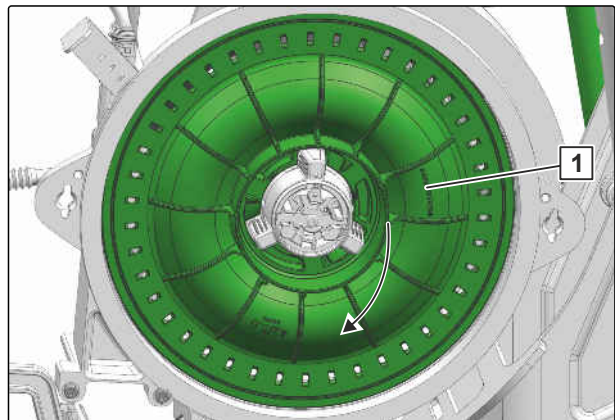
### Preparing the implement for operation

4. Release the lock until the points **1** and **2** are aligned.



CMS-I-00001910

5. remove the singling disc **1** from the drive hub.

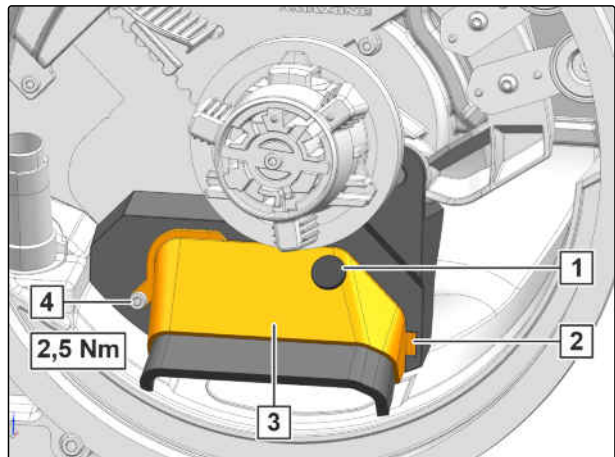


CMS-I-00001912

#### **i** NOTE

The filling blocks are only required for folding implement frames.

6. *The orange filling block is required for use in rapeseed, beets, or sorghum.*  
Remove the bolt **4**.
7. Install the orange filling block **3** in the mount **2**.
8. Install the bolt.
9. For use in rapeseed, beets, or sorghum, remove the cap **1**.

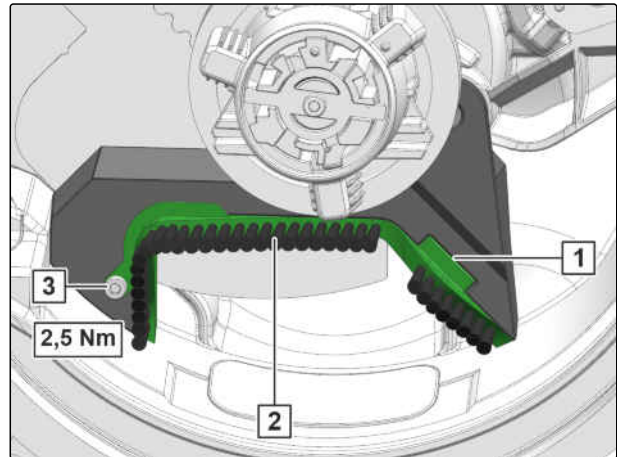


CMS-I-00003937

10. The green filling block is required for use in soybean, field bean, maize or sunflower.  
Remove the bolt **3**.

11. Install the green filling block **2** in the mount **1**.

12. Install the bolt.



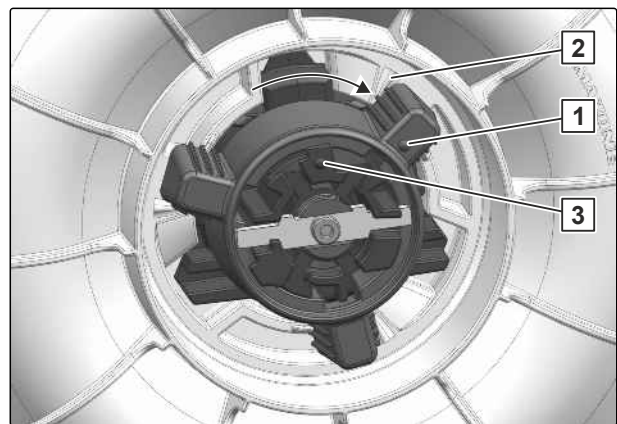
CMS-I-00003936

13. To select the singling disc, see "Determining the setting parameters".

14. The studs point towards the seeding housing and stir the seed to ensure optimal filling of the disc.  
Install the desired singling disc.

15. Turn the lock beyond the notch **2**.

➔ The points **1** and **3** are no longer aligned.



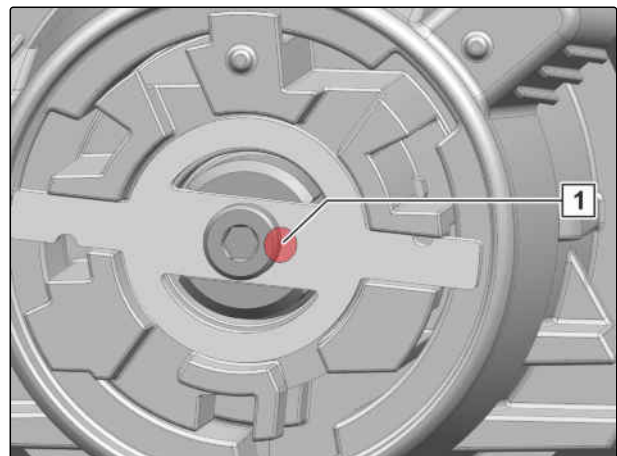
CMS-I-00001911

### **i** NOTE

The sealing wax dot **1** indicates a factory setting.

16. Check the sealing wax dot.

17. If the sealing wax dot has been broken, contact your specialist workshop.



CMS-I-00005636

## 6 | Preparing the machine

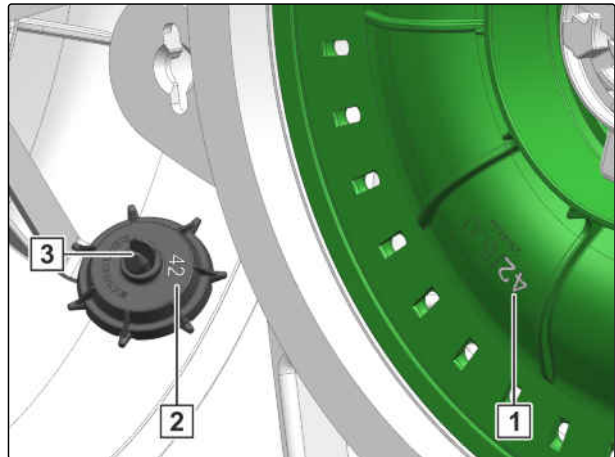
### Preparing the implement for operation

18. Press the ejector holder **3** together.

19. Pull off the ejection wheel **2**.

The number on the ejection wheel must be the same as the number of holes on the singling disc **1**. Deviating from this, the singling disc for squash requires an ejection wheel for the singling disc with 42 holes.

20. Install the desired ejection wheel.



CMS-I-00002072

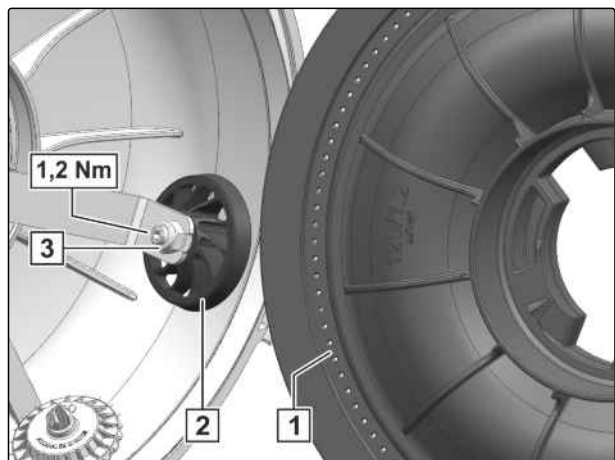
For singling discs **1** with 1 mm, 1.3 mm and 1.6 mm holes, a narrow hole covering roller **2** is required.

21. Remove the nut **3**.

22. Remove the wide hole covering roller.

23. Install the narrow hole covering roller **2**.

24. Put on the nut.

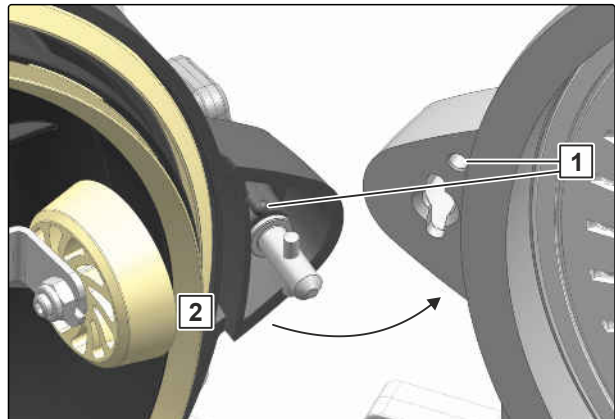


CMS-I-00003868

25. Align the guide pin **1**.

26. Close the cover **2**.

27. Close the locks.



CMS-I-00001913



#### 6.4.14.2 Adjusting the sliding shutter

CMS-T-00001901-E.1



#### NOTE

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

If a filling block is installed in the singling unit, it takes longer until the desired fill level is adjusted.

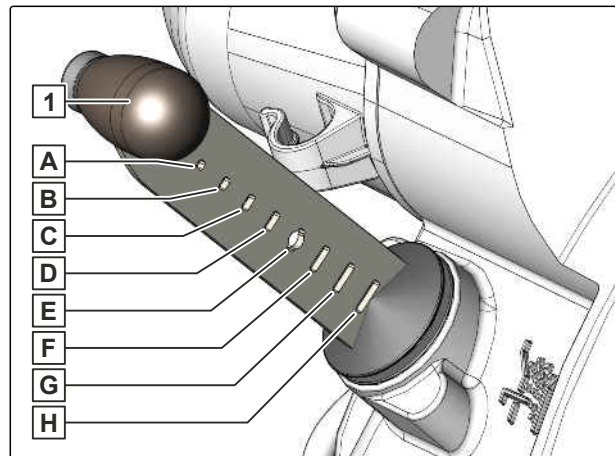


#### NOTE

The factory setting of the sliding shutter is marked with a circular cut-out.

Seed	Rapeseed	Sorghum	Soybean	Field bean	Maize	Sugar beet	Sunflower	Squash
Sliding shutter position	B / C	B / C	D / E	G / H	E / F / G	B / C	E / F / G	F / G

1. Move the sliding shutter **1** to the desired position.



CMS-I-00001915

2. When the fill level rises beyond the edge of the inspection window **1**, gradually close the sliding shutter

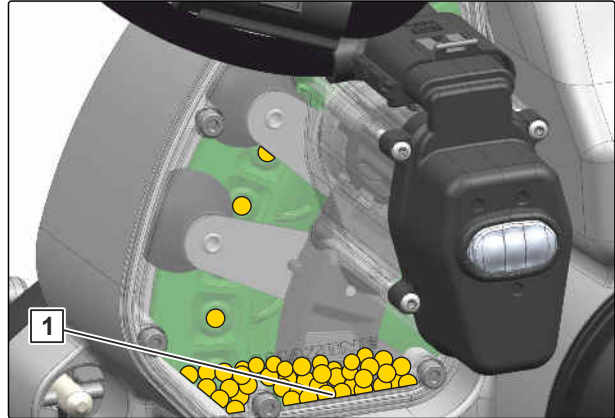
or

*if the fill level falls below the edge of the inspection window,*  
gradually open the sliding shutter

or

*If gaps occur,*  
gradually open the sliding shutter.

3. Check the adjustment of the sliding shutter on the field after driving a short distance.



CMS-I-00001916

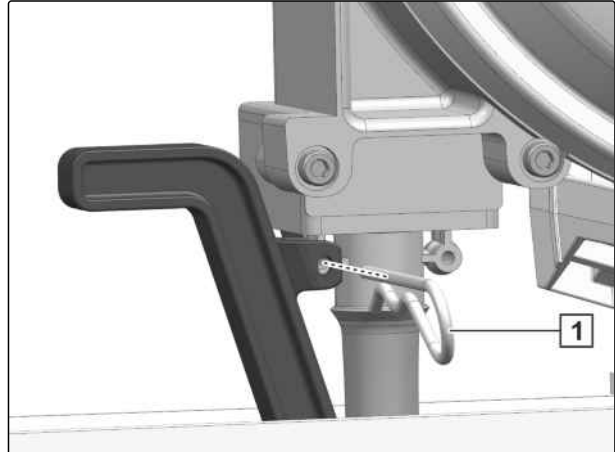
#### 6.4.14.3 Changing the opto-sensor and shot channel

CMS-T-00005387-B.1

#### **i** NOTE

The opto-sensor must be adapted to the respective operating conditions.

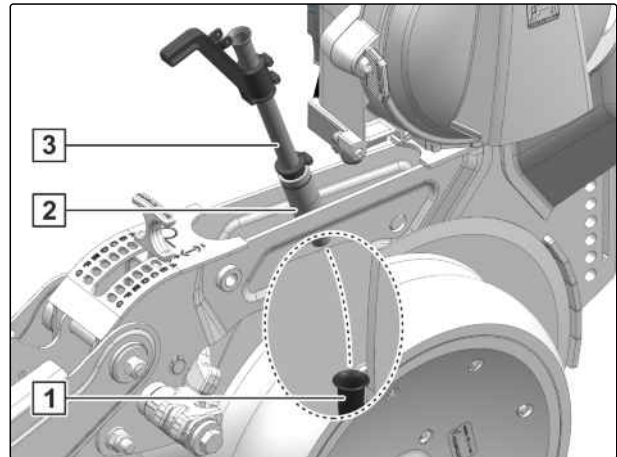
1. Uncouple the ISOBUS line.
2. Remove the spring cotter pin **1**.



CMS-I-00003814

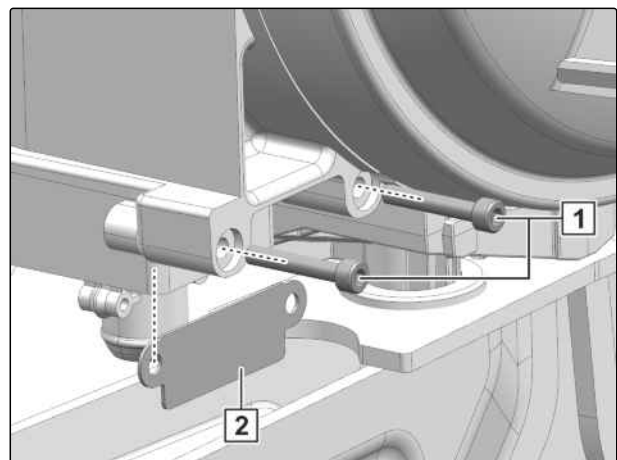


3. Press the shot channel **3** against the gasket **2** in the funnel **1**.
4. Swivel the shot channel away from the opto-sensor and pull it up.



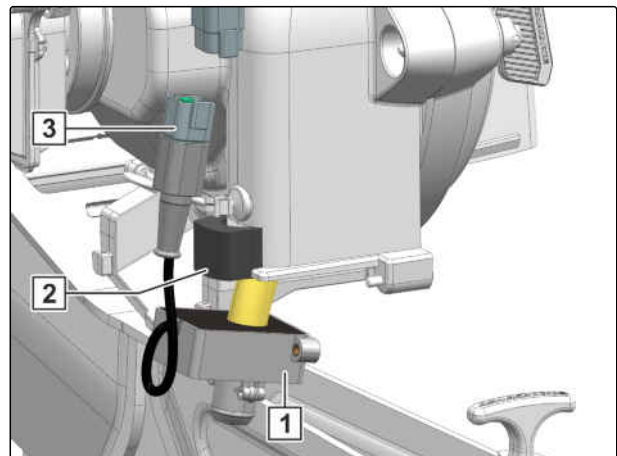
CMS-I-00003815

5. Remove the bolts **1**.
6. Remove the spacer plate **2**.



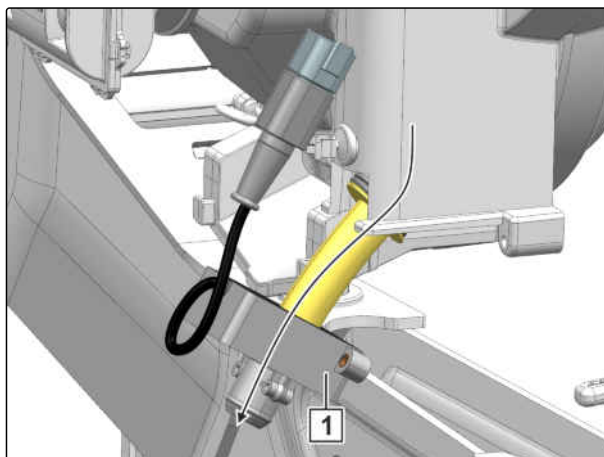
CMS-I-00003816

7. Disconnect the plug connection **3**.
8. Move the opto-sensor **1** down.
9. Remove the gasket **2**.



CMS-I-00003817

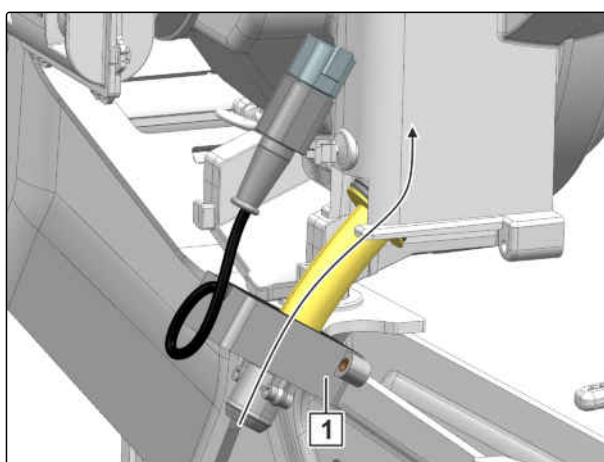
10. Remove the opto-sensor **1**.



CMS-I-00002827

11. *To select the opto-sensor,  
see "Determining the setting parameters".*

12. Install the desired opto-sensor **1**.

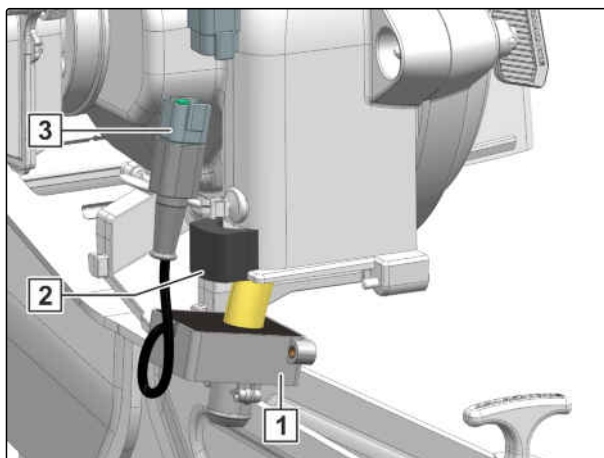


CMS-I-00002826

13. Move the opto-sensor **1** up.

14. Put on the gasket **2**.

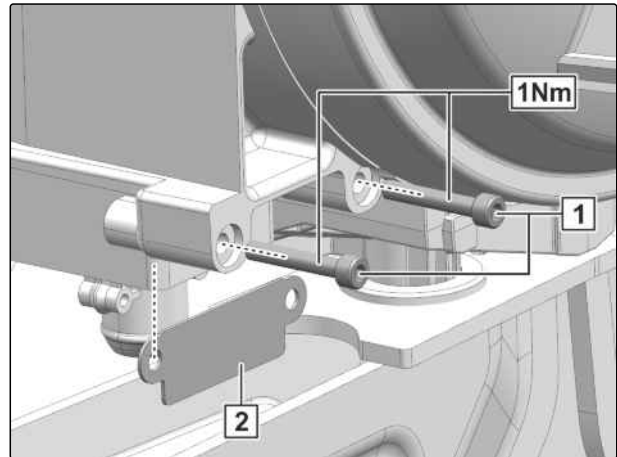
15. Establish the plug connection **3**.



CMS-I-00003817

16. Install the spacer plate **2**.

17. Install the bolts **1**.



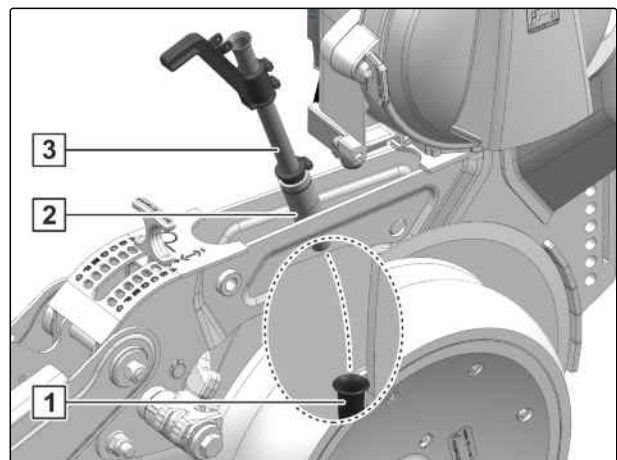
CMS-I-00003818

The shot channel **3** must be changed to fit the seed.

18. To select the shot channel,  
see "Determining the setting parameters".

19. Press the shot channel against the gasket **2** in  
the funnel **1**.

20. Swivel the shot channel under the opto-sensor.

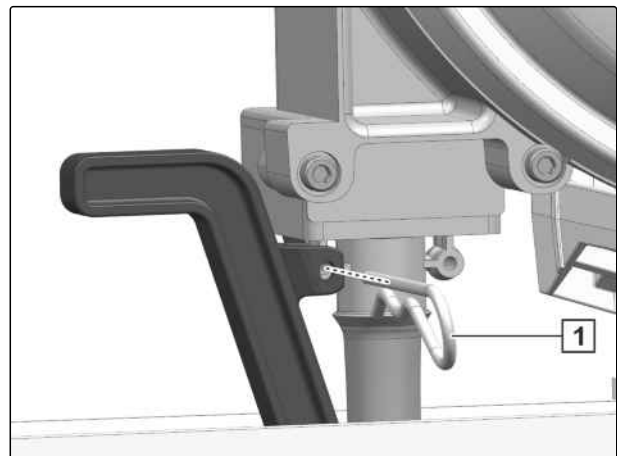


CMS-I-00003815

21. Install the shot channel with the spring cotter pin  
**1**.

22. Couple the ISOBUS line.

23. Restart the implement.



CMS-I-00003814

#### 6.4.14.4 Adjusting the scraper mechanically

CMS-T-00001896-C.1



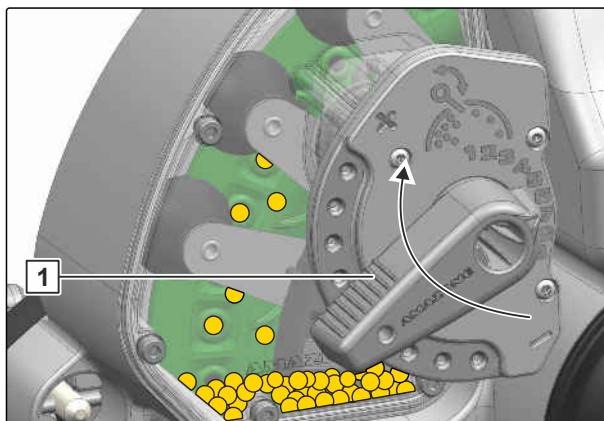
#### NOTE

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

## 6 | Preparing the machine

### Preparing the implement for operation

1. *If the control terminal detects doubles,* increase the setting value on the scraper **1**.
2. *If the control terminal detects gaps,* reduce the setting value on the scraper **1**.
3. Check the adjustment of the scraper on the field after driving a short distance.



CMS-I-00001918

#### 6.4.14.5 Adjusting the scraper electrically

CMS-T-00001897-C.1

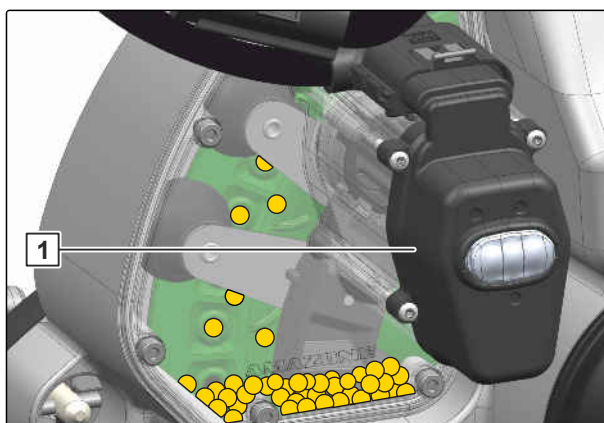
##### **i** NOTE

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

The control terminal detects doubles and gaps.

Depending on the implement equipment, the scrapers **1** are adjusted automatically.

1. *If the control terminal detects doubles,* increase the effect on the scraper.
2. *If the control terminal detects gaps,* reduce the effect on the scraper.
3. *To move the scraper to the desired position,* see "Adjusting the scraper manually" in the ISOBUS operating manual.
4. Check the adjustment of the scraper on the field after driving a short distance.



CMS-I-00001917

#### 6.4.15 Changing the seed spread rate

CMS-T-00001884-H.1

##### 6.4.15.1 Manually calculating the grain spacing

CMS-T-00003838-C.1

Formula symbol	Designation
G	Grains
G/ha	Spread rate per hectare
R <sub>w</sub>	Row width m

Formula symbol	Designation
$K_{AB}$	Grain spacing cm

- Determine the grain spacing using the equation.

$$\frac{K}{m^2} = \frac{K}{ha} \times \frac{1 ha}{10.000m^2}$$

$$\frac{K}{m^2} = \frac{\boxed{\phantom{000}}}{ha} \times \frac{1 ha}{10.000m^2} = \boxed{\phantom{000}}$$

$$K_{Ab} = \frac{1}{\frac{K}{m^2} \times R_w} \times \frac{100cm}{1m}$$

$$K_{Ab} = \frac{1}{\frac{\boxed{\phantom{000}}}{m^2} \times \boxed{\phantom{000}}} \times \frac{100cm}{1m} = \boxed{\phantom{000}}$$

CMS-I-00002047

### **i** NOTE

For grain spacing  $\leq 4$  cm, there can be multiples or gaps in the holes of the singling disc. The working speed has to be reduced to obtain constant high placement accuracy.

## 6.4.15.2 Adjusting the electrically driven grain singling unit

CMS-T-00002038-G.1

### 6.4.15.2.1 Adjusting the spread rate

CMS-T-00001886-C.1

### **i** NOTE

For grain spacing  $\leq 4$  cm, there can be multiples or gaps in the holes of the singling disc.

The working speed has to be reduced to obtain constant high placement accuracy.

- See "Changing the seed spread rate" in the ISOBUS operating manual

### 6.4.15.2.2 Determining the working speed

CMS-T-00002251-G.1

### **i** NOTE

The specified values are reference values. They are based on a constant power supply of at least 12 volt.

Singling disc with 10 holes					
Spread rate	Row width				
	0.45 m	0.6 m	0.75 m	0.8 m	0.9 m
1 k/m <sup>2</sup>	3.9 km/h to 15 km/h	3 km/h to 15 km/h	2.4 km/h to 15 km/h	2.2 km/h to 15 km/h	2 km/h to 15 km/h
1.2 k/m <sup>2</sup>	3.3 km/h to 15 km/h	2.5 km/h to 15 km/h	2 km/h to 15 km/h	1.9 km/h to 15 km/h	1.7 km/h to 15 km/h
1.4 k/m <sup>2</sup>	2.8 km/h to 15 km/h	2.1 km/h to 15 km/h	1.7 km/h to 15 km/h	1.6 km/h to 15 km/h	1.4 km/h to 15 km/h
1.6 k/m <sup>2</sup>	2.5 km/h to 15 km/h	1.9 km/h to 15 km/h	1.5 km/h to 15 km/h	1.4 km/h to 15 km/h	1.3 km/h to 14.6 km/h
1.8 k/m <sup>2</sup>	2.2 km/h to 15 km/h	1.7 km/h to 15 km/h	1.4 km/h to 15 km/h	1.3 km/h to 15 km/h	-
2 k/m <sup>2</sup>	2 km/h to 15 km/h	1.5 km/h to 15 km/h	1.2 km/h to 14 km/h	1.1 km/h to 13.1 km/h	-

Singling disc with 34 holes					
Spread rate	Row width				
	0.45 m	0.5 m	0.6 m	0.75 m	0.8 m
≤9 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
10 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	13.5 km/h	12.6 km/h
11 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	12.2 km/h	11.5 km/h
12 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	11.2 km/h	10.5 km/h
13 k/m <sup>2</sup>	15 km/h	15 km/h	12.9 km/h	10.4 km/h	9.7 km/h
14 k/m <sup>2</sup>	15 km/h	14.4 km/h	12 km/h	9.6 km/h	9 km/h
15 k/m <sup>2</sup>	15 km/h	13.5 km/h	11.2 km/h	9 km/h	8.4 km/h
16 k/m <sup>2</sup>	14 km/h	12.6 km/h	10.5 km/h	8.4 km/h	7.9 km/h
17 k/m <sup>2</sup>	13.2 km/h	11.9 km/h	9.9 km/h	7.9 km/h	7.4 km/h
18 k/m <sup>2</sup>	12.5 km/h	11.2 km/h	9.4 km/h	7.5 km/h	7 km/h

Singling disc with 42 holes					
Spread rate	Row width				
	0.45 m	0.5 m	0.6 m	0.75 m	0.8 m
≤10 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
11 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	15 km/h	14.2 km/h
12 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	13.9 km/h	13 km/h
13 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	12.8 km/h	12 km/h
14 k/m <sup>2</sup>	15 km/h	15 km/h	14.9 km/h	11.9 km/h	11.1 km/h
15 k/m <sup>2</sup>	15 km/h	15 km/h	13.9 km/h	11.1 km/h	10.4 km/h

Singling disc with 42 holes					
Spread rate	Row width				
	0.45 m	0.5 m	0.6 m	0.75 m	0.8 m
16 k/m <sup>2</sup>	15 km/h	15 km/h	13 km/h	10.4 km/h	9.7 km/h
17 k/m <sup>2</sup>	15 km/h	14.7 km/h	12.2 km/h	9.8 km/h	9.2 km/h
18 k/m <sup>2</sup>	15 km/h	13.9 km/h	11.6 km/h	9.2 km/h	8.7 km/h

Singling disc with 55 holes					
Spread rate	Row width				
	0.45 m	0.5 m	0.6 m	0.75 m	0.8 m
20 k/m <sup>2</sup>	15 km/h	15 km/h	13.6 km/h	10.9 km/h	10.2 km/h
24	15 km/h	13.6 km/h	11.3 km/h	9.1 km/h	8.5 km/h
28 k/m <sup>2</sup>	13 km/h	11.7 km/h	9.7 km/h	7.8 km/h	7.3 km/h
32 k/m <sup>2</sup>	11.3 km/h	10.2 km/h	8.5 km/h	6.8 km/h	6.4 km/h
36 k/m <sup>2</sup>	10.1 km/h	9.1 km/h	7.6 km/h	6.1 km/h	5.7 km/h
40 k/m <sup>2</sup>	9.1 km/h	8.2 km/h	6.8 km/h	5.4 km/h	5.1 km/h
44 k/m <sup>2</sup>	8.3 km/h	7.4 km/h	6.2 km/h	5 km/h	4.6 km/h
48 k/m <sup>2</sup>	7.6 km/h	6.8 km/h	5.7 km/h	4.5 km/h	4.3 km/h
52 k/m <sup>2</sup>	7 km/h	6.3 km/h	5.2 km/h	4.2 km/h	3.9 km/h
56 k/m <sup>2</sup>	6.5 km/h	5.8 km/h	4.9 km/h	3.9 km/h	3.6 km/h
60 k/m <sup>2</sup>	6.1 km/h	5.4 km/h	4.5 km/h	3.6 km/h	3.4 km/h

Singling disc with 80 holes					
Spread rate	Row width				
	0.45 m	0.5 m	0.6 m	0.75 m	0.8 m
32 k/m <sup>2</sup>	15 km/h	14.9 km/h	12.4 km/h	9.9 km/h	9.3 km/h
36 k/m <sup>2</sup>	14.7 km/h	13.2 km/h	11 km/h	8.8 km/h	8.3 km/h
40 k/m <sup>2</sup>	13.2 km/h	11.9 km/h	9.9 km/h	7.9 km/h	7.4 km/h
44 k/m <sup>2</sup>	12 km/h	10.8 km/h	9 km/h	7.2 km/h	6.8 km/h
48 k/m <sup>2</sup>	11 km/h	9.9 km/h	8.3 km/h	6.6 km/h	6.2 km/h
52 k/m <sup>2</sup>	10.2 km/h	9.1 km/h	7.6 km/h	6.1 km/h	5.7 km/h
56 k/m <sup>2</sup>	9.4 km/h	8.5 km/h	7.1 km/h	5.7 km/h	5.3 km/h
60 k/m <sup>2</sup>	8.8 km/h	7.9 km/h	6.6 km/h	5.3 km/h	5 km/h
64 k/m <sup>2</sup>	8.3 km/h	7.4 km/h	6.2 km/h	5 km/h	4.6 km/h
68 k/m <sup>2</sup>	7.8 km/h	7 km/h	5.8 km/h	4.7 km/h	4.4 km/h
72 k/m <sup>2</sup>	7.3 km/h	6.6 km/h	5.5 km/h	4.4 km/h	4.1 km/h
76 k/m <sup>2</sup>	6.9 km/h	6.3 km/h	5.2 km/h	4.2 km/h	3.9 km/h

**6 | Preparing the machine**  
**Preparing the implement for operation**

Singling disc with 80 holes					
Spread rate	Row width				
	0.45 m	0.5 m	0.6 m	0.75 m	0.8 m
80 k/m <sup>2</sup>	6.6 km/h	5.9 km/h	5 km/h	4 km/h	3.7 km/h

Singling disc with 120 holes					
Spread rate	Row width				
	0.45 m	0.5 m	0.6 m	0.75 m	0.8 m
≤28 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
32 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	14.9 km/h	13.9 km/h
36 k/m <sup>2</sup>	15 km/h	15 km/h	15 km/h	13.2 km/h	12.5 km/h
40 k/m <sup>2</sup>	15 km/h	15 km/h	14.9 km/h	11.9 km/h	11.1 km/h
44 k/m <sup>2</sup>	15 km/h	15 km/h	13.5 km/h	10.8 km/h	10.2 km/h
48 k/m <sup>2</sup>	15 km/h	14.9 km/h	12.5 km/h	9.9 km/h	9.3 km/h
52 k/m <sup>2</sup>	15 km/h	13.7 km/h	11.4 km/h	9.1 km/h	8.6 km/h
56 k/m <sup>2</sup>	14.1 km/h	12.8 km/h	10.7 km/h	8.6 km/h	7.9 km/h
60 k/m <sup>2</sup>	13.2 km/h	11.9 km/h	9.9 km/h	7.9 km/h	7.5 km/h
64 k/m <sup>2</sup>	12.5 km/h	11.1 km/h	9.3 km/h	7.5 km/h	6.9 km/h
68 k/m <sup>2</sup>	11.7 km/h	10.5 km/h	8.7 km/h	7.1 km/h	6.6 km/h
72 k/m <sup>2</sup>	10.9 km/h	9.9 km/h	8.3 km/h	6.6 km/h	6.2 km/h
76 k/m <sup>2</sup>	10.4 km/h	9.5 km/h	7.8 km/h	6.3 km/h	5.9 km/h
80 k/m <sup>2</sup>	9.9 km/h	8.9 km/h	7.5 km/h	6 km/h	5.6 km/h

- The maximum working speed for the desired spread rate can be read from the table.



### 6.4.15.3 Adjusting the mechanically driven grain singling unit

CMS-T-00003646-E.1

#### 6.4.15.3.1 Determining the gear ratio with leading wheel drive

CMS-T-00003651-C.1



#### REQUIREMENTS

- ✓ The singling disc is selected
- ✓ The gear wheel in the leading wheel drive is selected

1. To calculate the desired grain spacing from the spread rate,  
refer to the AmaScan2 operating manual,  
"Entering the target rate",

or

refer to the AmaCheck operating manual,  
"Determining the grain spacing".

2. Depending on the gear wheel **1** in the leading wheel drive and the desired grain spacing, determine the gear ratio for the leading wheel drive from the table.

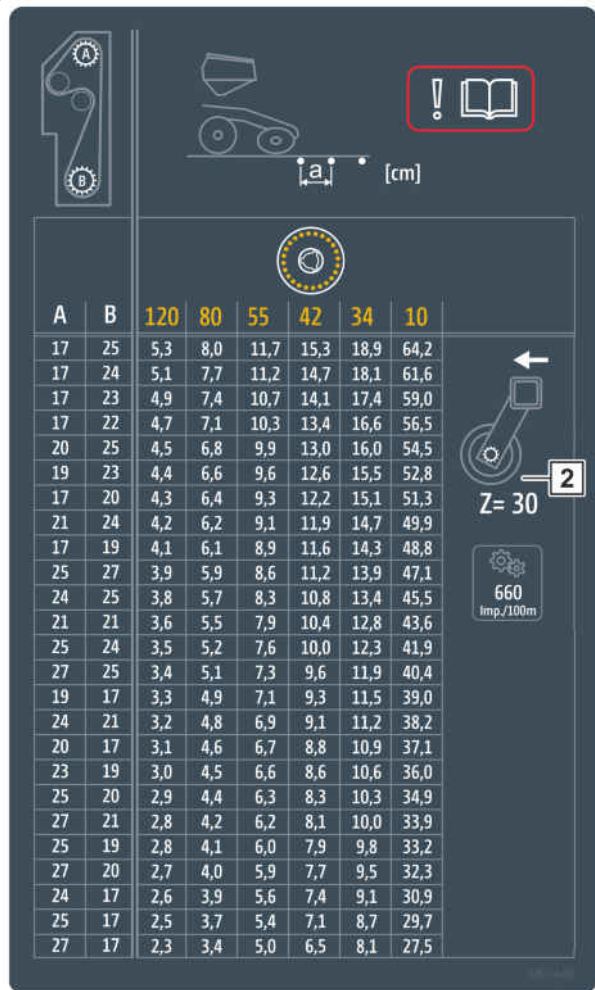
A	B	120	80	55	42	34	10
17	25	10,7	16,0	23,3	30,6	37,7	128,3
17	24	10,3	15,4	22,4	29,3	36,2	123,2
17	23	9,8	14,8	21,5	28,1	34,7	118,1
17	22	9,4	14,1	20,5	26,9	33,2	112,9
20	25	9,1	13,6	19,8	26,0	32,1	109,1
19	23	8,8	13,2	19,2	25,2	31,1	105,6
17	20	8,6	12,8	18,7	24,4	30,2	102,7
21	24	8,3	12,5	18,1	23,7	29,3	99,7
17	19	8,1	12,2	17,7	23,2	28,7	97,5
25	27	7,9	11,8	17,1	22,4	27,7	94,3
24	25	7,6	11,4	16,5	21,6	26,7	90,9
21	21	7,3	10,9	15,9	20,8	25,7	87,3
25	24	7,0	10,5	15,2	19,9	24,6	83,8
27	25	6,7	10,1	14,7	19,2	23,8	80,8
19	17	6,5	9,8	14,2	18,6	23,0	78,1
24	21	6,4	9,5	13,9	18,2	22,5	76,4
20	17	6,2	9,3	13,5	17,7	21,8	74,2
23	19	6,0	9,0	13,1	17,2	21,2	72,1
25	20	5,8	8,7	12,7	16,6	20,5	69,8
27	21	5,7	8,5	12,3	16,2	20,0	67,9
25	19	5,5	8,3	12,1	15,8	19,5	66,3
27	20	5,4	8,1	11,8	15,4	19,0	64,6
24	17	5,2	7,7	11,2	14,7	18,2	61,8
25	17	4,9	7,4	10,8	14,1	17,5	59,3
27	17	4,6	6,9	10,0	13,1	16,2	54,9

CMS-I-00002868

## 6 | Preparing the machine

### Preparing the implement for operation

3. Depending on the gear wheel **2** in the leading wheel drive and the desired grain spacing, determine the gear ratio for the leading wheel drive from the table.



The diagram shows a machine's gear system with a table of gear ratios. The table has columns for gear wheel A, gear wheel B, and a series of gear ratios (120, 80, 55, 42, 34, 10). The table is divided into two sections: a top section for gear wheel A and a bottom section for gear wheel B. The top section has a gear wheel A of 17 and a gear wheel B of 25. The bottom section has a gear wheel A of 20 and a gear wheel B of 25. The table also includes a diagram of a wheel with a gear wheel 2 and a label Z=30.

A	B	120	80	55	42	34	10
17	25	5,3	8,0	11,7	15,3	18,9	64,2
17	24	5,1	7,7	11,2	14,7	18,1	61,6
17	23	4,9	7,4	10,7	14,1	17,4	59,0
17	22	4,7	7,1	10,3	13,4	16,6	56,5
20	25	4,5	6,8	9,9	13,0	16,0	54,5
19	23	4,4	6,6	9,6	12,6	15,5	52,8
17	20	4,3	6,4	9,3	12,2	15,1	51,3
21	24	4,2	6,2	9,1	11,9	14,7	49,9
17	19	4,1	6,1	8,9	11,6	14,3	48,8
25	27	3,9	5,9	8,6	11,2	13,9	47,1
24	25	3,8	5,7	8,3	10,8	13,4	45,5
21	21	3,6	5,5	7,9	10,4	12,8	43,6
25	24	3,5	5,2	7,6	10,0	12,3	41,9
27	25	3,4	5,1	7,3	9,6	11,9	40,4
19	17	3,3	4,9	7,1	9,3	11,5	39,0
24	21	3,2	4,8	6,9	9,1	11,2	38,2
20	17	3,1	4,6	6,7	8,8	10,9	37,1
23	19	3,0	4,5	6,6	8,6	10,6	36,0
25	20	2,9	4,4	6,3	8,3	10,3	34,9
27	21	2,8	4,2	6,2	8,1	10,0	33,9
25	19	2,8	4,1	6,0	7,9	9,8	33,2
27	20	2,7	4,0	5,9	7,7	9,5	32,3
24	17	2,6	3,9	5,6	7,4	9,1	30,9
25	17	2,5	3,7	5,4	7,1	8,7	29,7
27	17	2,3	3,4	5,0	6,5	8,1	27,5

CMS-I-00002869

The determined gear ratio depends on the wheel slip.

4. To determine the pulses per 100 m during field operation,  
refer to the AmaScan2 operating manual,  
"Running in the pulses",

or

refer to the AmaCheck operating manual,  
"Running in the pulses".

When the determined pulses per 100 m differs from the values below, the desired grain spacing must be calculated manually.

Gear wheel	I <sub>z</sub> = Pulses per 100 m
Z=15	330
Z=30	660

$$a_R = \frac{a_T}{I_Z} \times I_E$$

$$a_R = \frac{18,2}{330} \times 300 = 16,6$$

$$a_R = \frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}} \times \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

CMS-I-00002684

- $a_R$  = Manually calculated grain spacing
  - $a_T$  = Grain spacing determined on the control terminal
  - $I_Z$  = Pulses per 100 m, see table above
  - $I_E$  = Determined pulses per 100 m
5. Manually calculate the desired grain spacing.
  6. Read the gear ratio for the manually calculated grain spacing from the table.

### 6.4.15.3.2 Determining the gear ratio with trailing wheel drive

CMS-T-00003652-E.1



#### REQUIREMENTS

- ✓ The singling disc is selected

1. To calculate the desired grain spacing from the spread rate,  
refer to the AmaScan2 operating manual,  
"Determining the grain spacing",

or

refer to the AmaCheck operating manual,  
"Determining the grain spacing".

2. With the desired grain spacing,  
determine the gear ratio for the trailing wheel drive from the table.

The diagram shows a tractor with a trailing wheel drive. A gear selection table is displayed on the right side of the tractor. The table has columns for gear ratios (A, B) and a grid of values. A red box highlights the '!' icon in the top right corner of the table. A red box also highlights the '1' in the bottom right corner of the table. The table is labeled 'Z= 24' and '485 Imp./100m'.

A	B	120	80	55	42	34	10
17	25	7,3	10,9	15,9	20,8	25,7	87,3
17	24	7,0	10,5	15,2	20,0	24,7	83,8
17	23	6,7	10,0	14,6	19,1	23,6	80,3
17	22	6,4	9,6	14,0	18,3	22,6	76,8
20	25	6,2	9,3	13,5	17,7	21,8	74,2
19	23	6,0	9,0	13,1	17,1	21,1	71,9
17	20	5,8	8,7	12,7	16,6	20,5	69,9
21	24	5,7	8,5	12,3	16,2	20,0	67,9
17	19	5,5	8,3	12,1	15,8	19,5	66,4
25	27	5,3	8,0	11,7	15,3	18,9	64,1
24	25	5,2	7,7	11,2	14,7	18,2	61,9
21	21	4,9	7,4	10,8	14,1	17,5	59,4
25	24	4,8	7,1	10,4	13,6	16,8	57,0
27	25	4,6	6,9	10,0	13,1	16,2	55,0
19	17	4,4	6,6	9,7	12,7	15,6	53,1
24	21	4,3	6,5	9,4	12,4	15,3	52,0
20	17	4,2	6,3	9,2	12,0	14,8	50,5
23	19	4,1	6,1	8,9	11,7	14,4	49,1
25	20	4,0	5,9	8,6	11,3	14,0	47,5
27	21	3,8	5,8	8,4	11,0	13,6	46,2
25	19	3,8	5,6	8,2	10,7	13,3	45,1
27	20	3,7	5,5	8,0	10,5	12,9	44,0
24	17	3,5	5,3	7,6	10,0	12,4	42,1
25	17	3,4	5,0	7,3	9,6	11,9	40,4
27	17	3,1	4,7	6,8	8,9	11,0	37,4

CMS-I-00002790

The determined gear ratio depends on the wheel slip.

3. *To determine the pulses per 100 m during field operation,*  
refer to the AmaScan2 operating manual,  
*"Running in the pulses",*

or

refer to the AmaCheck operating manual,  
*"Running in the pulses".*

When the determined pulses per 100 m differs from the values below, the desired grain spacing must be calculated manually.

Gear wheel	$I_Z$ = Pulses per 100 m
Z=24	485

$$a_R = \frac{a_T}{I_Z} \times I_E$$

$$a_R = \frac{18,2}{485} \times 463 = 17,4$$

$$a_R = \frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}} \times \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

CMS-I-00002683

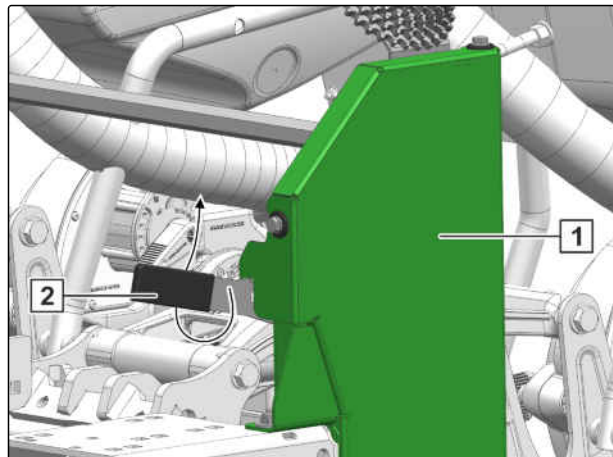
- $a_R$  = Manually calculated grain spacing
  - $a_T$  = Grain spacing determined on the control terminal
  - $I_Z$  = 485 pulses per 100 m
  - $I_E$  = Determined pulses per 100 m
4. Manually calculate the desired grain spacing.
  5. Read the gear ratio for the manually calculated grain spacing from the table.

### 6.4.15.3 Adjusting the grain spacing in the interchangeable wheel gear

CMS-T-00003634-C.1

1. Release the lever **2** and swivel it up.

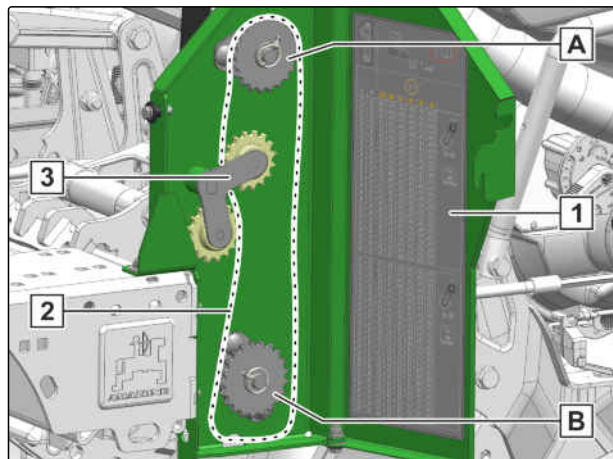
➔ The cover **1** opens automatically.



CMS-I-00002656

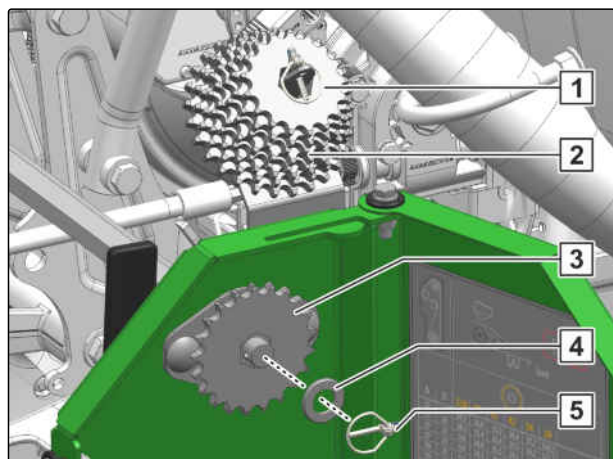
The chain tensioner **3** is relieved. The drive chain **2** is lying loosely on the chain wheels **A** and **B**.

2. To determine the right gear ratio **1**, refer to the operating manual, "Determining the gear ratio for the wheel drive".



CMS-I-00002654

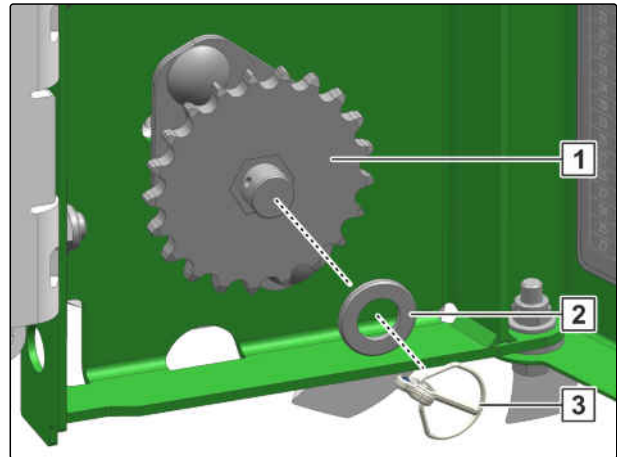
3. Remove the cotter pin **5**.
4. Remove the washer **4**.
5. Remove the gear wheel **3**.
6. Remove the cotter pin **1**.
7. Take the desired gear wheel from the parking position **2**.
8. Put the removed gear wheel in the parking position **2**.
9. Install the cotter pin.
10. Install the desired gear wheel on the drive shaft.
11. Install the washer.
12. Install the cotter pin.



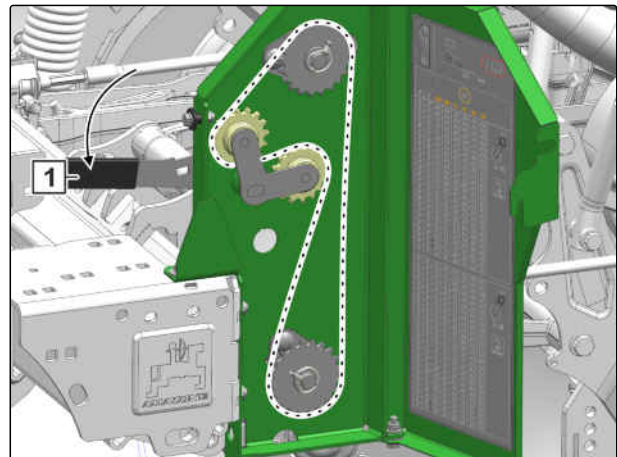
CMS-I-00002653



13. Remove the cotter pin **3**.
  14. Remove the washer **2**.
  15. Remove the gear wheel **1**.
  16. Take the desired gear wheel from the parking position.
  17. Put the removed gear wheel in the parking position.
  18. Install the desired gear wheel on the drive shaft.
  19. Install the washer.
  20. Install the cotter pin.
  21. Actuate the lever **1**.
- ➔ The drive chain will be tightened.
22. Hold the lever.

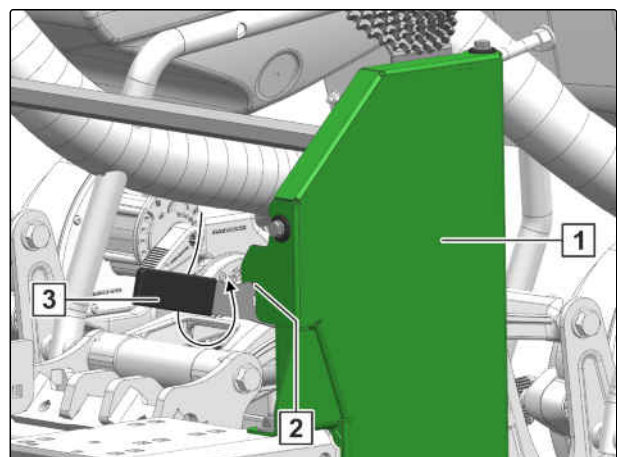


CMS-I-00002652



CMS-I-00002651

23. Close the cover **1** against the spring pressure.
  24. *To lock the cover,*  
Continue actuating the lever **3**.
- ➔ The cover will be locked on the chain tensioner **2**.



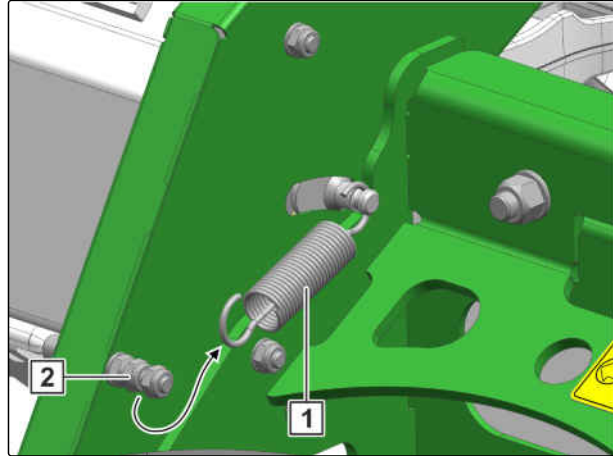
CMS-I-00002647

#### 6.4.15.3.4 Replacing the gear wheel in the leading wheel drive

CMS-T-00003647-C.1

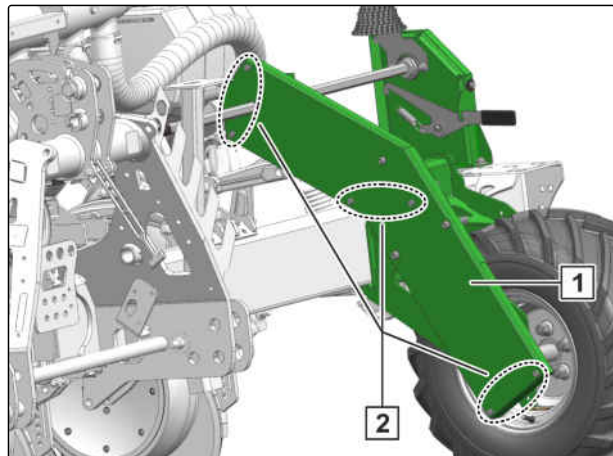
If the high spread rate is not reached when seeding rapeseed or soya, replace gear wheel Z=15 with gear wheel Z=30.

1. To relieve the drive chain, release the tension spring **1** from the retaining pin **2**.



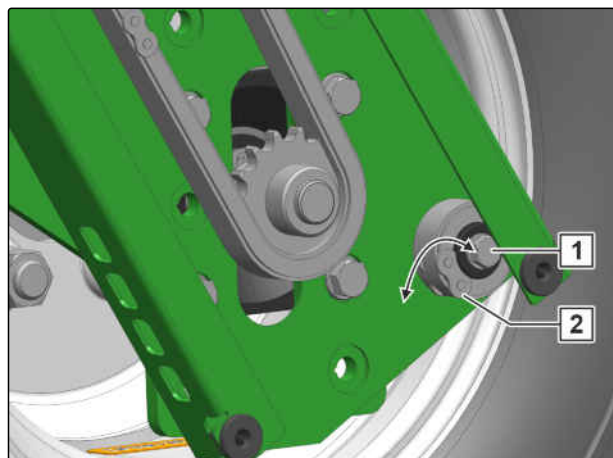
CMS-I-00002649

2. Remove the bolts **2**.
3. Push the cover **1** to the side.
4. Swivel up the cover.



CMS-I-00002646

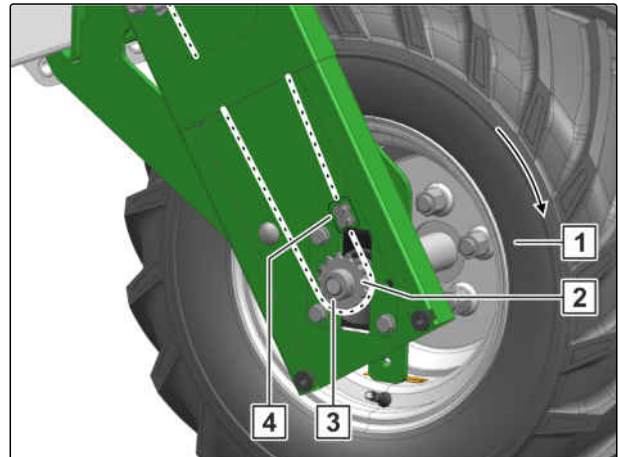
5. Loosen the bolt **1**.
6. If the parking position can be tipped far enough, take the chain extension **2** from the parking position.



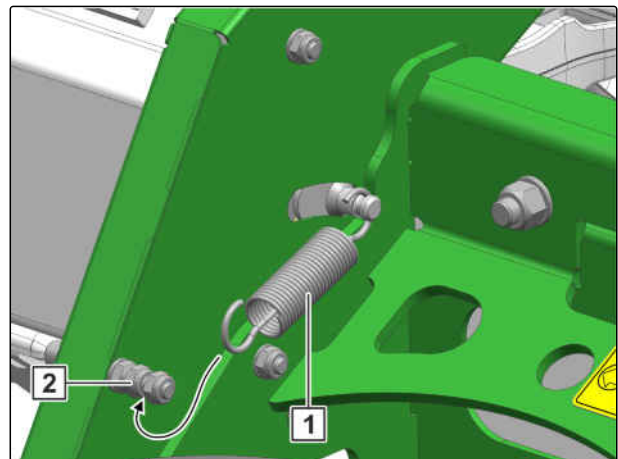
CMS-I-00005656



7. To make the chain lock **4** accessible, turn the drive wheel **1** clockwise.
8. Remove the clamping ring **3**.
9. Remove the gear wheel Z=15.
10. Install the gear wheel Z=30.
11. Install the chain extension.
12. Put the gear wheel **2** in the chain.
13. Install the gear wheel on the drive shaft.
14. Install the clamping ring.
15. To tighten the drive chain, put the tension spring **2** around the retaining pin **3**.

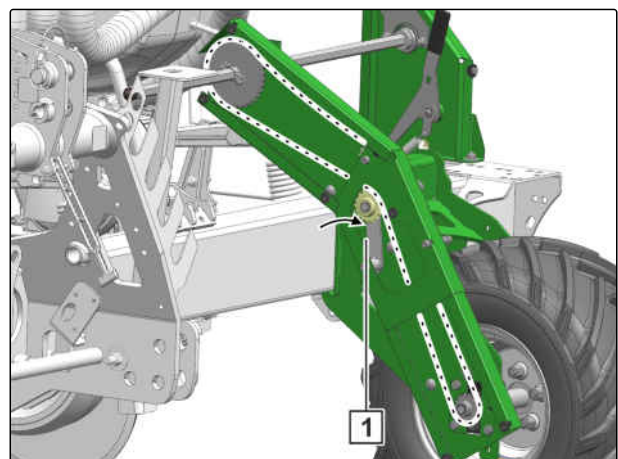


CMS-I-00002657



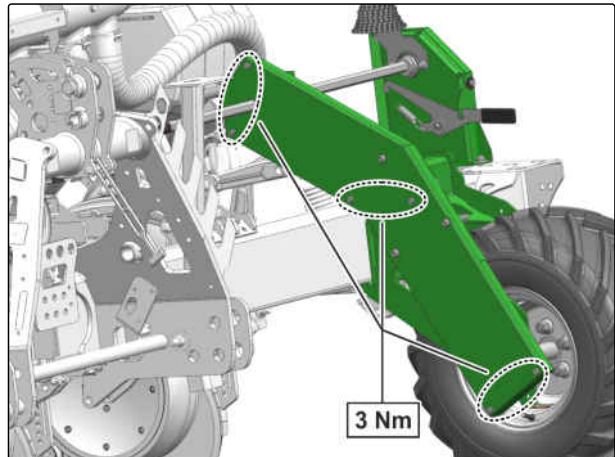
CMS-I-00002650

16. To ensure that the tightened drive chain **1** runs on all of the gear wheels, turn the drive wheel.



CMS-I-00002648

17. Install the cover **1**.
18. Install the bolts and washers **2**.

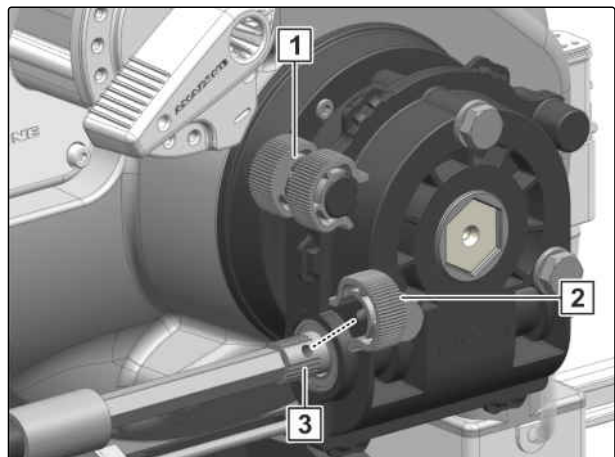


CMS-I-00002645

#### 6.4.15.3.5 Deactivating the mechanically driven grain singling unit

CMS-T-00003865-A.1

1. To deactivate the mechanically driven grain singling unit, remove the shear pin **2**.
- ➔ The grain singling unit is separated from the drive shaft **3**.
2. Park the shear pin on the grain singling unit **1**.



CMS-I-00002696

#### 6.4.16 Adjusting the PreTeC mulch seeding coulter

CMS-T-00005523-E.1

##### 6.4.16.1 Adjusting the star clearers

CMS-T-00001933-D.1

The star clearers allow the seeding unit to run smoothly on soils with coarse surface structures. The star clearers should only move plant residues to the side. If the soil is moved completely, the press roller does not have enough fine soil to close the seed furrow.

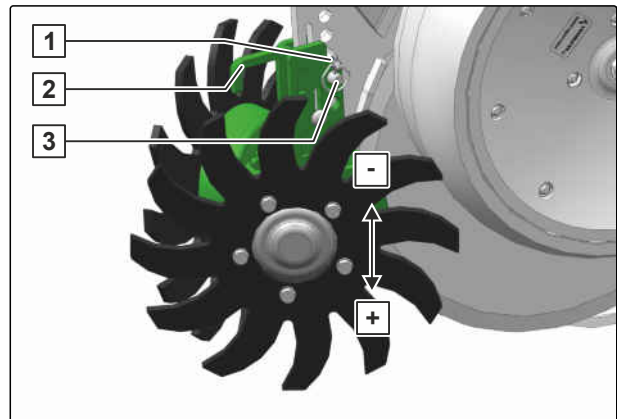


#### CAUTION

The star clearers are subject to wear. This can cause sharp edges.

- Wear protective gloves.

1. Lift the implement.
2. Secure the tractor and implement.
3. Remove the linch pin **1**.
4. Hold the star clearer by the handle **2**.
5. Pull out the positioning pin **3**.
6. Move the star clearer by the handle to the desired position,  
or  
*If star clearers are not needed,*  
secure the star clearers in the topmost position.
7. Insert the positioning pin in the adjuster segment.
8. Secure the pin with the linch pin.
9. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.



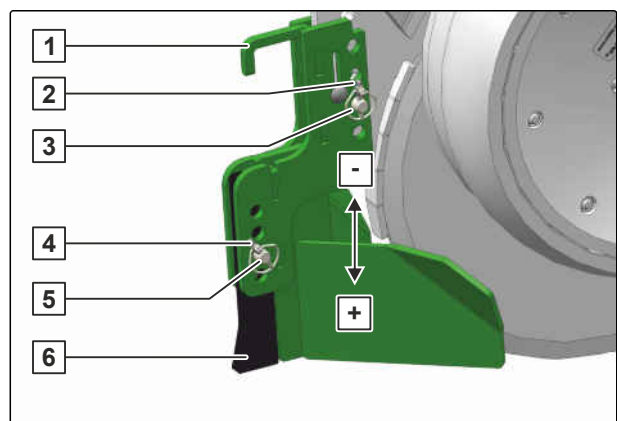
CMS-I-00002084

#### 6.4.16.2 Adjusting the clod clearers

CMS-T-00001934-D.1

The clod clearers allow the seeding unit to run smoothly on soils with coarse surface structures. The clod clearer and the clod clearer tip should only move large clods or stones to the side. The clod clearer tip may not work deeper than the coulter. If the soil is moved completely by the clod clearer or the clod clearer tip, the press roller does not have enough fine soil to close the seed furrow.

1. Lift the implement.
2. Secure the tractor and implement.
3. Hold the clod clearer by the handle **1**.
4. Remove the linch pin **2**.
5. Pull out the positioning pin **3**.



CMS-I-00002086

## 6 | Preparing the machine

### Preparing the implement for operation

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6. Move the clod clearer by the handle to the desired position,  
  
or  
  
*If clod clearers are not needed,*  
secure the clod clearers in the topmost position.
7. Insert the positioning pin in the adjuster segment.
8. Secure the pin with the linch pin.
9. Check the adjustment of the clod clearers on the field after driving a short distance.
10. Remove the linch pin **4**.
11. Hold the coulter tip **6**.
12. Pull out the positioning pin **5**.
13. Move the coulter tip to the desired position.



Do not position the coulter tip too deep.

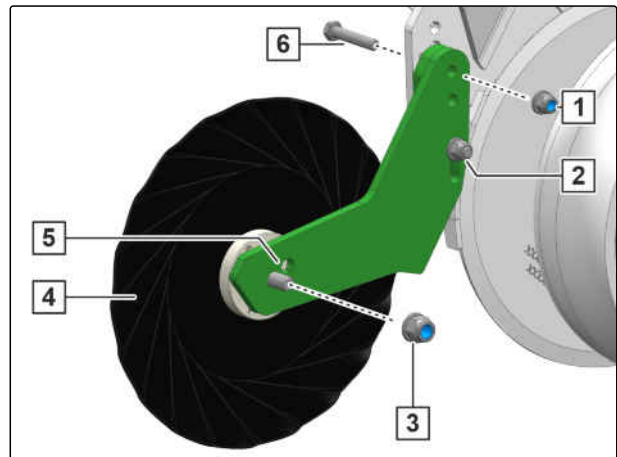
14. Insert the positioning pin in the adjuster segment.
15. Secure the pin with the linch pin.
16. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.

#### 6.4.16.3 Adjusting the rigid cutting disc

CMS-T-00007646-B.1

The rigid cutting discs allow the seeding unit to run smoothly on soils with coarse surface structures. The rigid cutting discs cut through plant residues and clear the area of the seeding coulter.

1. Lift the implement.
2. Secure the tractor and implement.
3. Remove the nut and washer **1**.
4. Remove the bolt **6**.
5. Loosen the nut **2**.
6. Move the bracket **5** to the desired height.
7. Install the bolt.
8. Install the nuts and washers and tighten them.



CMS-I-00005362

If the setting range is not enough, install the cutting disc **4** at the desired height on the bracket.

9. Remove the nut and washers **3**.
10. Install the cutting disc at the desired height on the bracket.
11. Install the nut and washer.
12. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.

#### 6.4.16.4 Adjusting the seed placement depth

CMS-T-00005825-C.1



#### NOTE

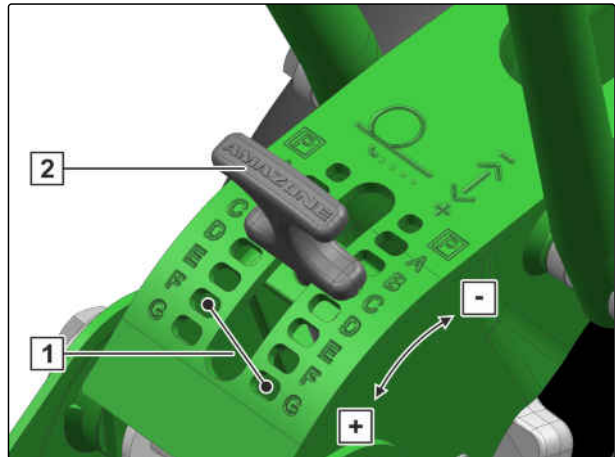
The adjustment of the seed placement depth must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

#### NOTE

Position **P** is only needed for parking the implement.

The setting lever **2** can also be engaged in half-steps **1** in the grid.

1. Lift the implement.
2. Secure the tractor and implement.
3. Unlock the setting lever.



CMS-I-00001919

#### NOTE

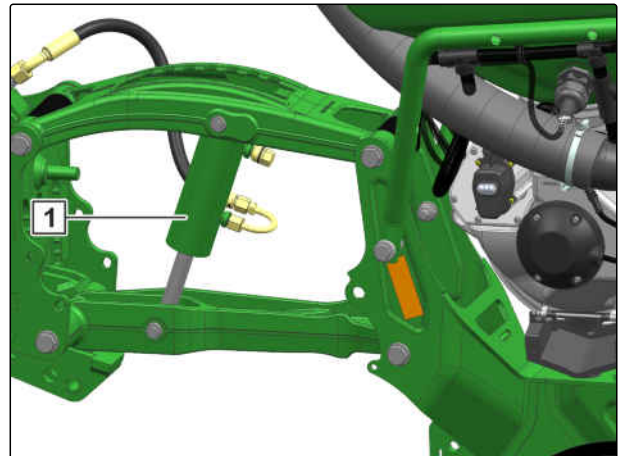
Beyond depth positions F-G, the contact force regulation is without function.

4. *To use the coulter pressure control,*  
see "Configuring the coulter pressure monitoring"  
in the ISOBUS operating manual.
5. *To increase the seed placement depth,*  
move the setting lever towards **G**  
  
or  
  
*To reduce the seed placement depth,*  
move the setting lever towards **A**.
6. Lock the setting lever in the grid.
7. *To check the setting,*  
drive for 30 m at working speed and "*check the seed placement depth*".

#### 6.4.16.5 Adjusting the coulter pressure hydraulically

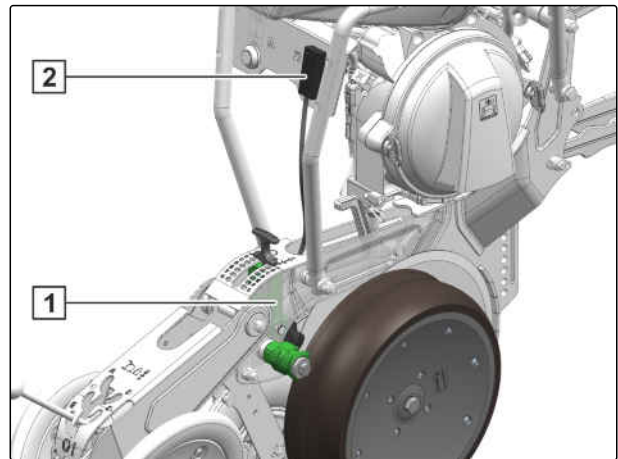
CMS-T-00005524-D.1

The coulter pressure is applied with a hydraulic cylinder **1**.



CMS-I-00003953

The hydraulic coulter pressure system can be equipped with contact force regulation. The force sensors **1** determine the contact force of the coulters. The signal processing **2** calculates an average value for all coulters and regulates the pressure in the hydraulic coulter pressure system.



CMS-I-00003921

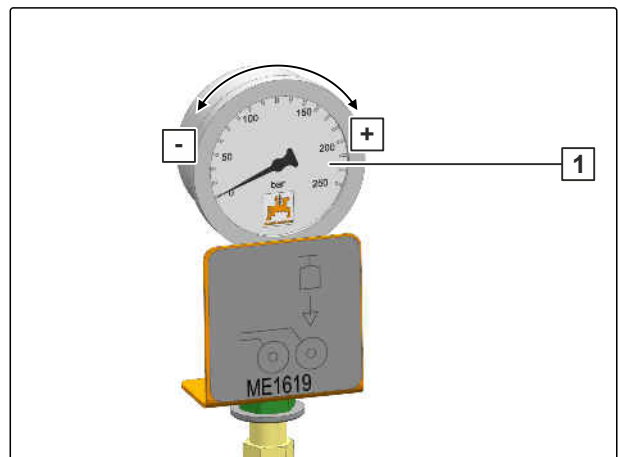
1. Switch on the fan.

If the hydraulic coulter pressure is set too high, the implement will be lifted by the PreTeC coulters.

2. *To increase the coulter pressure specifically in the tracks:*  
See section "Adjusting the coulter pressure in the track".



The working range is between 5 and 100 bar.



CMS-I-00005409

3. *To increase the coulter pressure for heavy soils **+** or to decrease it for light soils **-**,* refer to the ISOBUS operating manual "Adjusting the coulter pressure".
4. *To check the setting,* drive for 30 m at working speed and "check the seed placement depth".



#### 6.4.16.6 Adjusting the coulter pressure mechanically

CMS-T-00001905-E.1

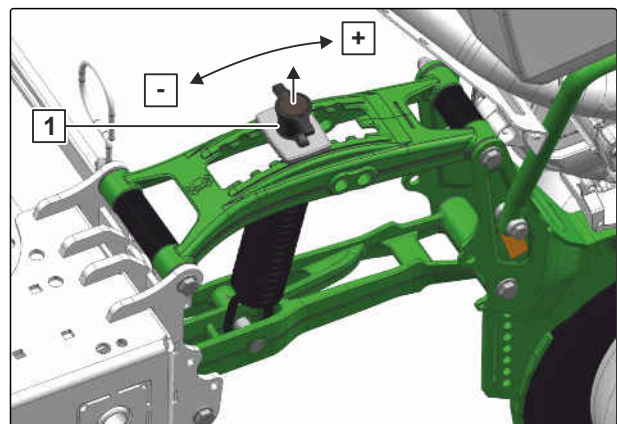
Operating conditions	Coulter pressure
Heavy soils	Increase the coulter pressure: <b>+</b>
Light soils	Reduce the coulter pressure: <b>-</b>

1. Lift the implement.
2. Secure the tractor and implement.
3. Unlock the setting lever.
4. Put the coulter pressure to the desired position.
5. Lock the setting lever in the grid.
6. Make the same adjustment for all coulters.

or

Put the coulter pressure in the tracks to the desired position.

7. *To check the setting, drive for 30 m at working speed and "check the seed placement depth".*

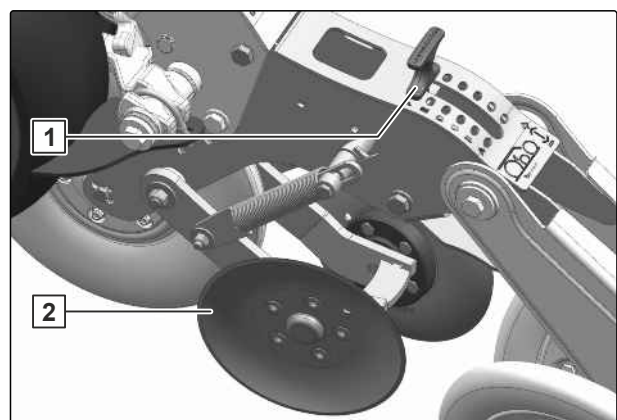


CMS-I-00001923

#### 6.4.16.7 Adjusting the disc closer

CMS-T-00001932-E.1

- 1 Disc closer
- 2 Disc closer setting lever



CMS-I-00001962

The disc closers are used on ploughed or mulched soils. They cover the seed furrow with fine soil. The disc closer pressure is adjustable.





## NOTE

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



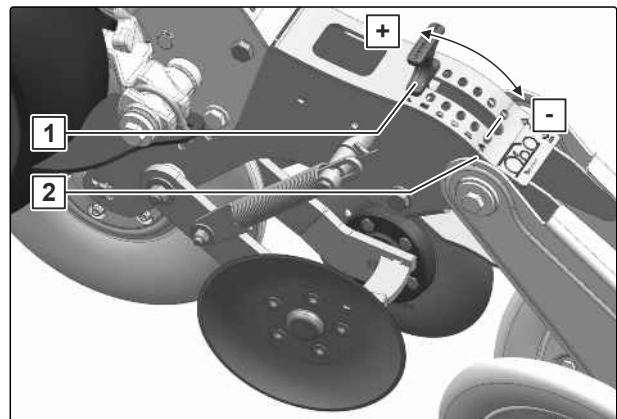
## NOTE

Position A **2** is only used for parking the implement.

The working intensity of the disc closers is adjusted with the setting lever **1**.

Operating conditions	Working intensity
Heavy soils	Increase the working intensity: <b>+</b>
Light soils	Reduce the working intensity: <b>-</b>

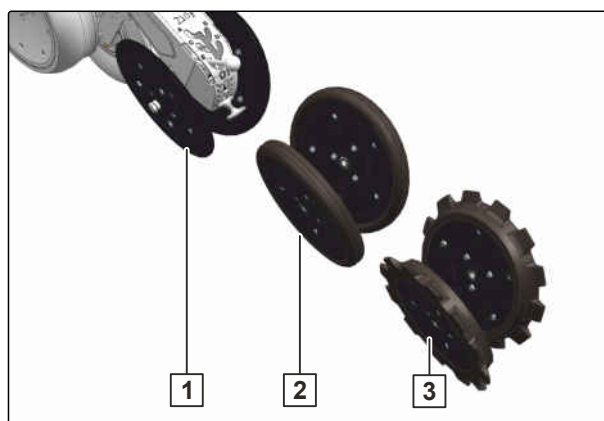
1. Lift the implement.
2. Secure the tractor and implement.
3. Unlock the setting lever **1**.
4. Move the working intensity of the disc closers to the desired position.
5. Make the same adjustment for all disc closers.  
  
or  
  
Move the disc closers in the tracks to the desired position.
6. Lock the setting lever in the grid.
7. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.



CMS-I-00001926

#### 6.4.16.8 Adjusting the press rollers

CMS-T-00001931-F.1



CMS-I-00001953

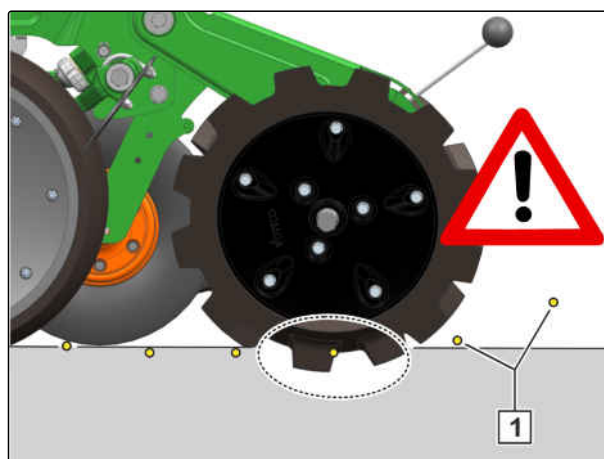
Number	V press rollers	Operating conditions
1	Smooth press rollers 350x33	Light soils
2	Smooth press rollers 350x50	Medium-heavy soils
3	Serrated press rollers 350x50	Heavy soils

The press rollers close the seed furrow. The press roller pressure, the pitch, and the distance between the press rollers can be adjusted.

#### NOTE

To ensure that the seed is not moved out of the soil **1**, the serrated press rollers may not work deeper than the set seed placement depth.

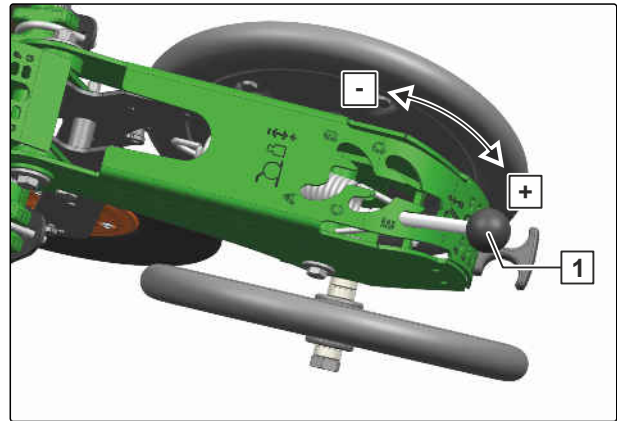
Operating conditions	Press roller pressure
Heavy soils	Increase the press roller pressure: <b>+</b>
Light soils	Reduce the press roller pressure: <b>-</b>



CMS-I-00002743

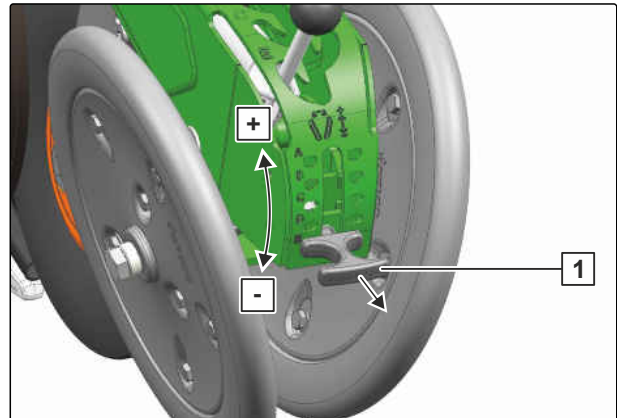
1. Lift the implement.
2. Secure the tractor and implement.
3. Unlock the setting lever **1**.

4. Move the setting lever to the desired position.
5. Lock the setting lever in the grid.
6. *To check the setting,*  
drive for 30 m at working speed and then check  
the work pattern.
7. *If the seed furrow is not closed at the set press  
roller pressure,*  
you must also adjust the press roller pitch.



CMS-I-00001927

8. Move the setting lever to the desired position.
9. Lock the setting lever in the grid.
10. *To check the setting,*  
drive for 30 m at working speed and then check  
the work pattern.
11. *If the seed furrow is not closed at the set press  
roller pitch,*  
you must also adjust the press roller distance.

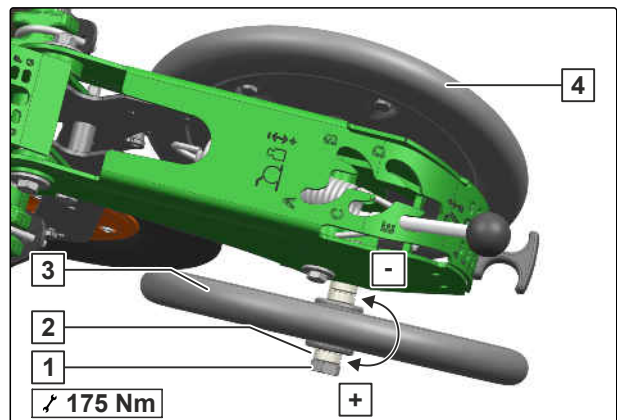


CMS-I-00001929

Operating conditions	Press roller distance
Heavy soils	Reduce the press roller distance: <b>-</b>
Light soils	Increase the press roller distance: <b>+</b>

### **i** NOTE

To adjust the pressure point of the press rollers at the centre of the furrow, there are setting bushings at different distances.



CMS-I-00001928

12. Loosen the inner lock nut and remove it.
13. Remove the bolt **1** with the press roller.
14. Move the press roller **3** with the setting bushing **2** to the desired position.
15. Install the press roller with bolts.
16. Tighten the lock nut.

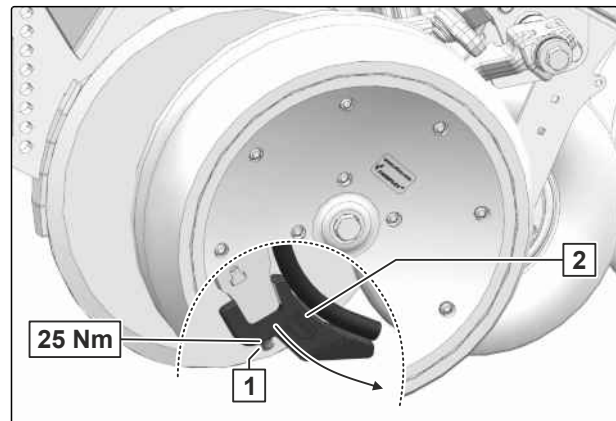
17. Move the opposite press roller **4** to the desired position.
18. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.

#### 6.4.16.9 Changing the furrow former

##### **i** NOTE

The depth control wheel and cutting disc are only partially shown for a better view. The depth control wheel and the cutting disc do not need to be removed to change the furrow former.

1. Lift the implement.
2. Secure the tractor and implement.
3. Remove the bolt **1**.
4. Remove the bolt and the bolt lock.
5. Pull out the furrow former **2** downwards.
6. *To select the furrow former,*  
see "*Determining the setting parameters*".
7. Install the desired furrow former.
8. Install the bolt and bolt lock and tighten.
9. *To install the suitable catch roller for the furrow former,*  
see "*Changing the catch roller*".



CMS-T-00003900-D.1

CMS-I-00002045

#### 6.4.16.10 Adjusting the depth control wheel scraper



##### **IMPORTANT**

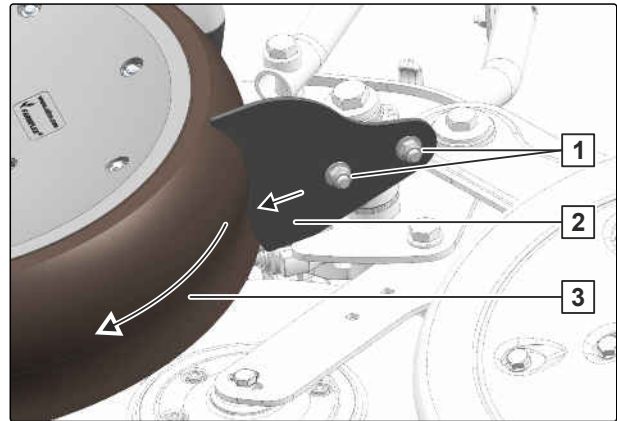
**Damage to the depth control wheel due to abrasion by the scraper**

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

CMS-T-00001936-E.1

The scrapers enable smooth running of the coulters on soils with sticky surface structures.

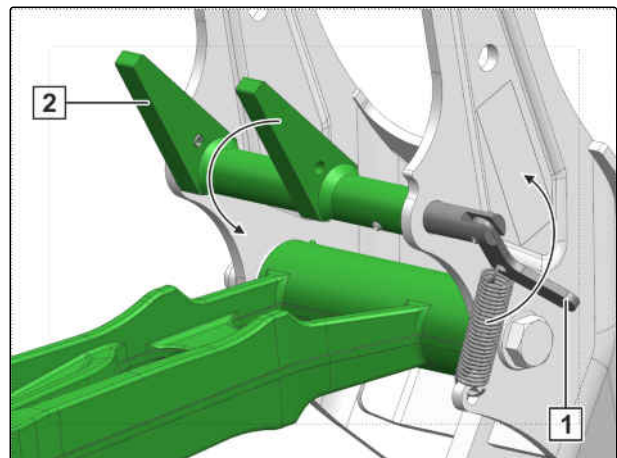
1. Lift the implement.
2. Secure the tractor and implement.
3. Loosen the nuts **1**.
4. Adjust the scraper **2** to a distance of 2 ml.
5. *To check the distance,*  
rotate the depth control wheel **3**.
6. Tighten the nuts.
7. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.



CMS-I-00001930

#### 6.4.16.11 Using the coulter raised position

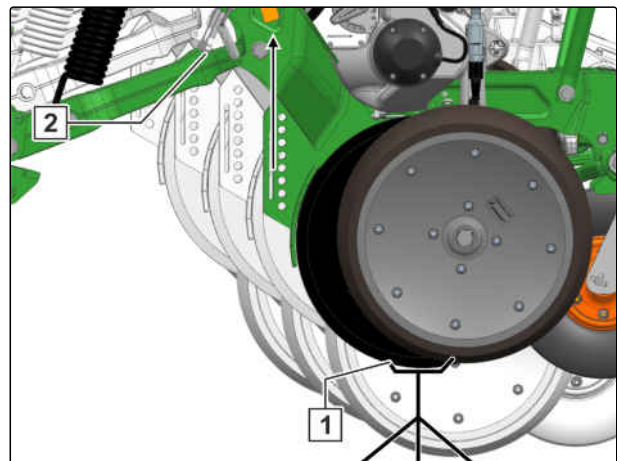
1. Switch over the control lever **1**.
- ➔ The locking mechanism **2** folds onto the lower link.



CMS-I-00002700

2. Put a suitable support **1** under the coulter.
3. *To move the locking mechanism **2** to the locking position,*  
slowly lower the implement.

➔ The coulter is fixed in the parking position.



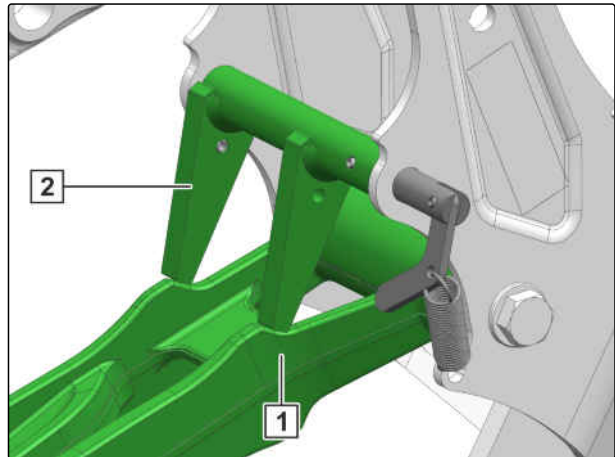
CMS-I-00002706

## 6 | Preparing the machine

### Preparing the implement for operation

4. Put a suitable support under the coulter.
5. slowly lower the implement.

➔ The locking mechanism **1** on the lower link **1** is load-free.

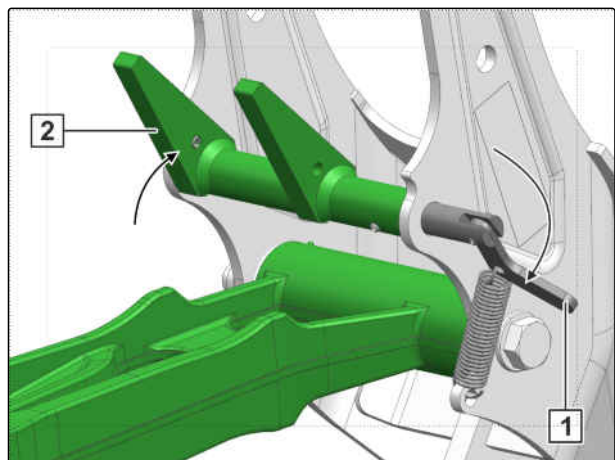


CMS-I-00002697

6. To put the locking mechanism **2** into parking position,  
Switch over the control lever **1**.

7. Slowly lift the implement.

➔ The coulter is lowered into working position.



CMS-I-00002699

#### 6.4.16.12 Adjusting the catch roller scraper

CMS-T-00003720-D.1



#### IMPORTANT

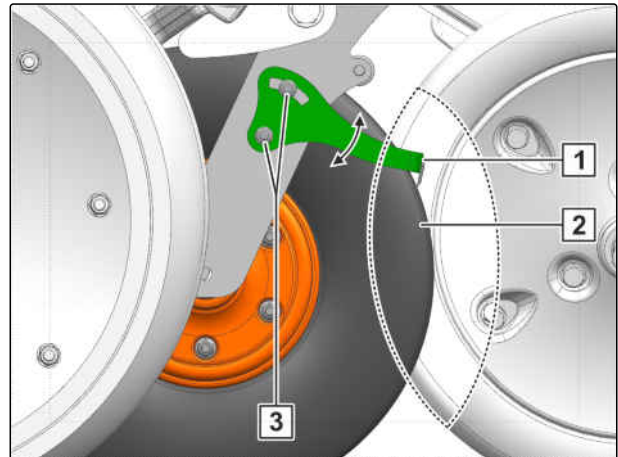
Damage to the depth control wheel due to abrasion by the scraper

- To check the distance,  
rotate the depth control wheel



The scrapers enable smooth running of the catch roller on soils with sticky surface structures.

1. Lift the implement.
2. Secure the tractor and implement.
3. Loosen the nuts **3**.
4. Adjust the scraper **1** to a distance of 1 mm.
5. *To check the distance,*  
Rotate the catch roller **2**.
6. Tighten the nuts.
7. *To check the setting,*  
drive for 30 m at working speed and then check the work pattern.



CMS-I-00002727

#### 6.4.16.13 Changing the catch roller

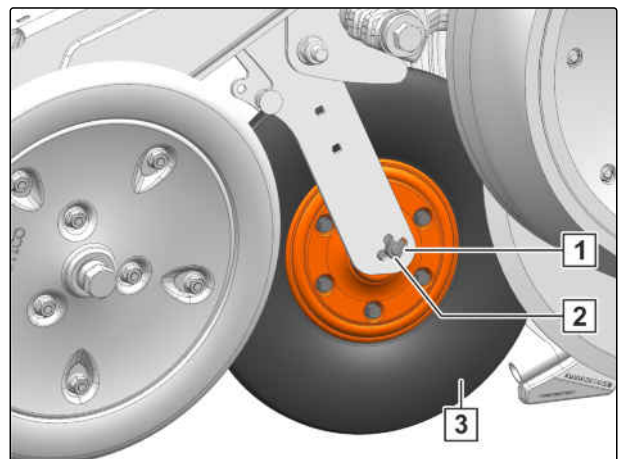
CMS-T-00003902-D.1



#### NOTE

The catch roller must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

1. Raise the implement.
2. Secure the tractor and implement.
3. Remove the nut **1**.
4. Remove the bolt lock **2**.
5. Remove the bolt.
6. Remove the catch roller **3**.
7. *To select the catch roller,*  
see "Determining the setting parameters".
8. Install the desired catch roller.
9. *To install the suitable furrow former for the catch roller,*  
see "Changing the furrow former".



CMS-I-00002876

## 6.4.17 Creating tramlines

CMS-T-00001881-A.1

### 6.4.17.1 Configuring the tramline control

CMS-T-00001883-A.1

#### NOTE

The automatic tramline control requires an electrically driven grain singling unit.

- See "Configuring the tramline control" in the ISOBUS software operating manual.

## 6.4.18 Calibrating the electrically driven fertiliser metering unit

CMS-T-00003839-E.1

### 6.4.18.1 Performing the calibration

CMS-T-00001945-E.1

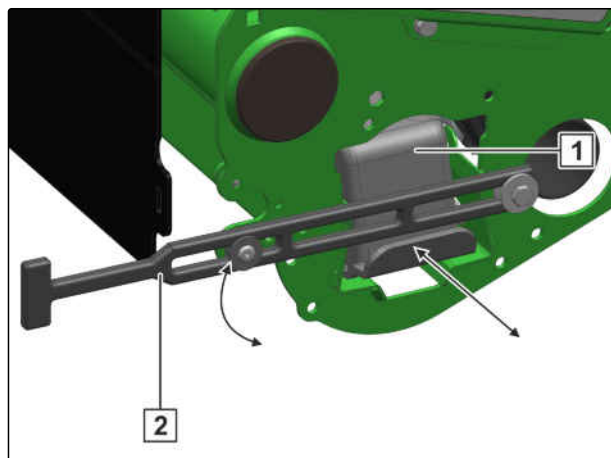
#### REQUIREMENTS

- ✓ The fertiliser hopper is at least  $\frac{1}{4}$  full with fertiliser

1. Switch off the fan.
2. Release the lock **2** and swivel it downwards.
3. *To take the calibration buckets out of the parking position on implements with hydraulic fan drive,*  
pull out the interlocked calibration buckets **1** to the side.

or

*To take the calibration buckets out of the parking position on implements with mechanical fan drive,*  
pull out the calibration buckets individually to the side on the left and right.



CMS-I-00001932

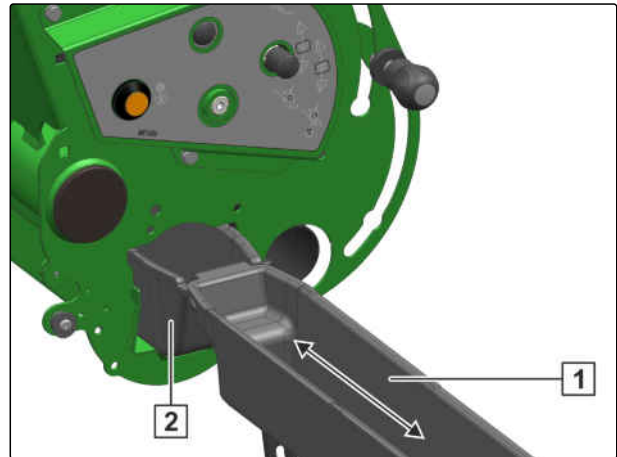


4. *To move the calibration buckets into calibration position on implements with hydraulic fan drive,*  
slide the calibration bucket **2** under the metering unit with the opening facing up.

5. Hook on the calibration bucket **1** with the opening facing up and slide it under the metering unit.

or

*To move the calibration buckets into calibration position on implements with mechanical fan drive,*  
slide the calibration buckets individually under the metering units from the left and right.



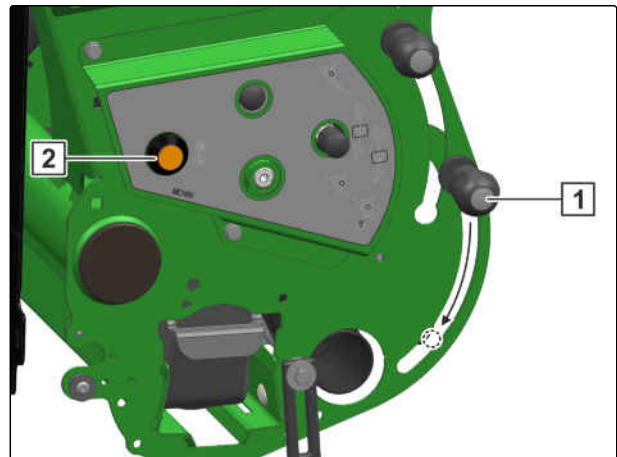
CMS-I-00001931

6. *To move the calibration flap lever to the calibration position,*  
press and hold the lock button **1** and push it down.

7. *To fill the fertiliser metering unit,*  
Actuate the calibration button **2** for 10 seconds.

8. Empty the calibration bucket.

9. *To calibrate the spread rate for the fertiliser,*  
refer to the ISOBUS software operating manual, "Calibrating the spread rate for fertiliser or micropellets".



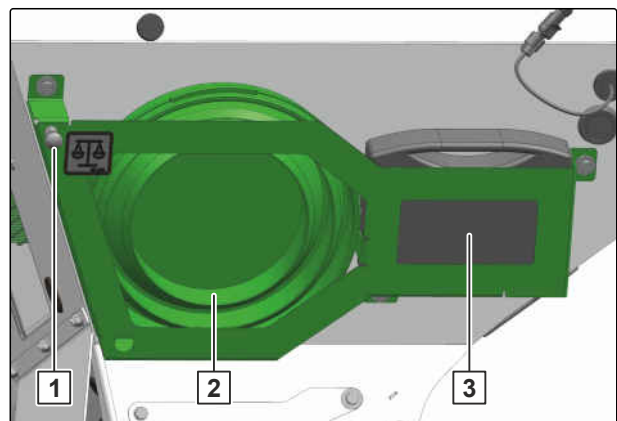
CMS-I-00001933

10. Fill the fertiliser from the calibration buckets into the collapsible bucket **2**.

11. Hook on the collapsible bucket with the scale **3** on the weighing point **1**.

12. Enter the determined value on the control terminal.

13. *To enter the spread rate for the fertiliser on the control terminal,*  
refer to the ISOBUS software operating manual, "Calibrating the spread rate for fertiliser or micropellets".



CMS-I-00001956

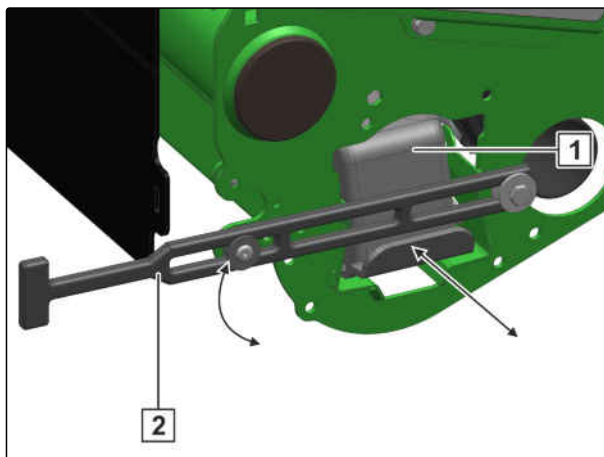
## **i** NOTE

To prevent overflowing of the calibration bucket, monitor the fill level.

## 6 | Preparing the machine

### Preparing the implement for operation

14. Empty the calibration bucket.
15. *To prevent soiling of the calibration buckets,* slide the calibration bucket **1** under the metering unit with the opening facing down.
16. Swivel up the lock **2** and close it.
17. *To move the calibration flap lever into working position,* press and hold the lock button and push it upwards.



CMS-I-00001932

#### 6.4.18.2 Determining the maximum fertiliser spread rate

CMS-T-00002412-D.1



#### NOTE

The values in the table serve as a reference and require a constant power supply of at least 12 V.

- Read the values from the table.

CAN / DAP / NPK / phosphate					
Fertiliser quantity	Row width				
	45 cm	50 cm	60 cm	75 cm	80 cm
100 kg/ha	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
140 kg/ha	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
180 kg/ha	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
220 kg/ha	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
260 kg/ha	15 km/h	15 km/h	15 km/h	13.5 km/h	12.7 km/h
300 kg/ha	15 km/h	15 km/h	14.7 km/h	11.7 km/h	11 km/h
340 kg/ha	15 km/h	15 km/h	12.9 km/h	10.4 km/h	9.7 km/h
380 kg/ha	15 km/h	13.9 km/h	11.6 km/h	9.3 km/h	8.7 km/h
420 kg/ha	14 km/h	12.6 km/h	10.5 km/h	8.4 km/h	7.9 km/h
460 kg/ha	12.8 km/h	11.5 km/h	9.6 km/h	7.7 km/h	7.2 km/h
500 kg/ha	11.7 km/h	10.6 km/h	8.8 km/h	8 km/h	7.6 km/h
540 kg/ha	10.9 km/h	9.8 km/h	8.1 km/h	6.5 km/h	6.1 km/h
580 kg/ha	10.1 km/h	9.1 km/h	7.6 km/h	6.1 km/h	5.7 km/h
620 kg/ha	9.5 km/h	8.5 km/h	7.1 km/h	5.7 km/h	5.3 km/h
660 kg/ha	8.9 km/h	8 km/h	6.7 km/h	5.3 km/h	5 km/h
700 kg/ha	8.4 km/h	7.5 km/h	6 km/h	5 km/h	4.7 km/h
740 kg/ha	7.9 km/h	7.1 km/h	5.9 km/h	4.8 km/h	4.5 km/h

CAN / DAP / NPK / phosphate					
Fertiliser quantity	Row width				
	45 cm	50 cm	60 cm	75 cm	80 cm
780 kg/ha	7.5 km/h	6.8 km/h	5.6 km/h	4.5 km/h	4.2 km/h

Urea					
Fertiliser quantity	Row width				
	45 cm	50 cm	60 cm	75 cm	80 cm
100 kg/ha	15 kg/ha	15 kg/ha	15 kg/ha	15 kg/ha	15 kg/ha
140 kg/ha	15 kg/ha	15 kg/ha	15 kg/ha	15 kg/ha	15 kg/ha
180 kg/ha	15 kg/ha	15 kg/ha	15 kg/ha	13.4 kg/ha	12.6 kg/ha
220 kg/ha	15.0	15 kg/ha	13.8 kg/ha	11 kg/ha	10.3 kg/ha
260 kg/ha	15 kg/ha	14 kg/ha	11.6 kg/ha	9.3 kg/ha	8.7 kg/ha
300 kg/ha	13.4 kg/ha	12.1 kg/ha	10.1 kg/ha	8.1 kg/ha	7.6 kg/ha
340 kg/ha	11.9 kg/ha	10.7 kg/ha	8.9 kg/ha	7.1 kg/ha	6.7 kg/ha
380 kg/ha	10.6 kg/ha	9.6 kg/ha	8 kg/ha	6.4 kg/ha	6 kg/ha
420 kg/ha	9.6 kg/ha	8.6 kg/ha	7.2 kg/ha	5.8 kg/ha	5.4 kg/ha
460 kg/ha	8.8 kg/ha	7.9 kg/ha	6.6 kg/ha	5.3 kg/ha	4.9 kg/ha
500 kg/ha	8.1 kg/ha	7.3 kg/ha	6.1 kg/ha	4.8 kg/ha	4.5 kg/ha
540 kg/ha	7.5 kg/ha	6.7 kg/ha	5.6 kg/ha	4.5 kg/ha	4.2 kg/ha
580 kg/ha	7 kg/ha	6.3 kg/ha	5.2 kg/ha	4.2 kg/ha	3.9 kg/ha
620 kg/ha	6.5 kg/ha	5.9 kg/ha	4.9 kg/ha	3.9 kg/ha	3.7 kg/ha
660 kg/ha	6.1 kg/ha	5.5 kg/ha	4.6 kg/ha	3.7 kg/ha	3.4 kg/ha
700 kg/ha	5.8 kg/ha	5.2 kg/ha	4.3 kg/ha	3.5 kg/ha	3.2 kg/ha
740 kg/ha	5.5 kg/ha	4.9 kg/ha	4.1 kg/ha	3.3 kg/ha	3.1 kg/ha
780 kg/ha	5.2 kg/ha	4.7 kg/ha	3.9 kg/ha	3.1 kg/ha	2.9 kg/ha

## 6.4.19 Calibrating the mechanically driven fertiliser metering

CMS-T-00003665-E.1

### 6.4.19.1 Determining the crank turns for standard working widths

CMS-T-00003668-B.1

- $A_B$  = Working width in m
- $n_R$  = Number of rows
- $R_W$  = Row width in cm

$$A_B = \frac{n_R}{100} \times R_W$$

$$A_B = \frac{6}{100} \times 75 = 4,5$$

$$A_B = \frac{\boxed{\phantom{000}}}{100} \times \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

CMS-I-00002685

1. Determine the working width of the implement with the equation above.
2. Determine the crank turns from the table above.

### 6.4.19.2 Determining the number of crank turns for special working widths

CMS-T-00003669-B.1

- $A_B$  = Working width in m
- $n_R$  = Number of rows
- $R_W$  = Row width in cm

$$A_B = \frac{n_R}{100} \times R_W$$

$$A_B = \frac{6}{100} \times 75 = 4,5$$

$$A_B = \frac{\boxed{\phantom{000}}}{100} \times \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

CMS-I-00002685

1. Determine the special working width of the implement with the equation above.

- $U_K$  = Crank turns for special working width
- $A_T$  = The next working width in metres. See table, "Determining the crank turns for standard working widths".
- $U_T$  = Crank turns suitable for standard working width, see table "Determining the number of crank turns for standard working width".

$$U_K = \frac{U_T \times A_T}{A_B}$$

$$U_K = \frac{27 \times 3,6}{3,4} = 28,5$$

$$U_K = \frac{\boxed{\phantom{00}} \times \boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \boxed{\phantom{00}}$$

CMS-I-00001251

2. Determine the crank turns for the implement with the equation above.

#### 6.4.19.3 Performing the calibration

CMS-T-00003655-C.1

With the calibration, you can check if the desired fertiliser quantity is being metered.

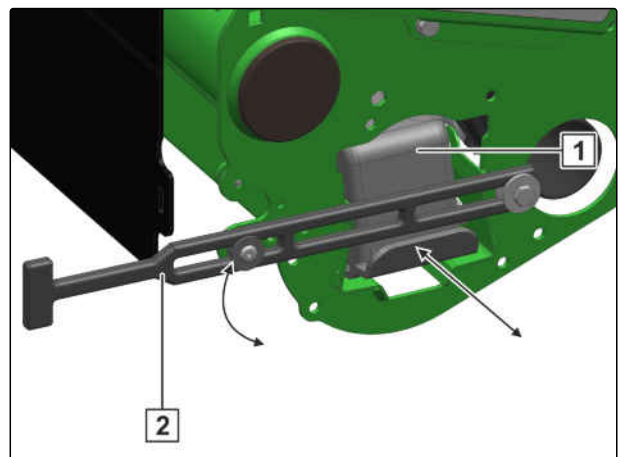
#### ✓ REQUIREMENTS

- ✓ The fertiliser hopper is at least  $\frac{1}{4}$  full with fertiliser

1. Switch off the fan.
2. Release the lock **2** and swivel it downwards.
3. *To take the calibration buckets out of the parking position on implements with hydraulic fan drive,*  
pull out the interlocked calibration buckets **1** to the side.

or

*To take the calibration buckets out of the parking position on implements with mechanical fan drive,*  
pull out the calibration buckets individually to the side on the left and right.



CMS-I-00001932

## 6 | Preparing the machine

### Preparing the implement for operation

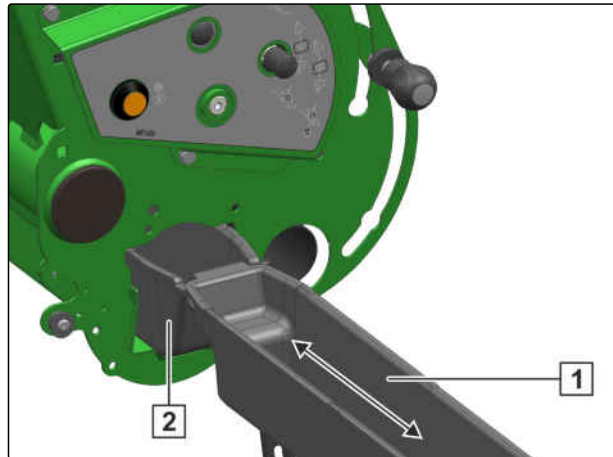
4. *To move the calibration buckets into calibration position on implements with hydraulic fan drive,*  
slide the calibration bucket **2** under the metering unit with the opening facing up.

5. Hook on the calibration bucket **1** with the opening facing up and slide it under the metering unit.

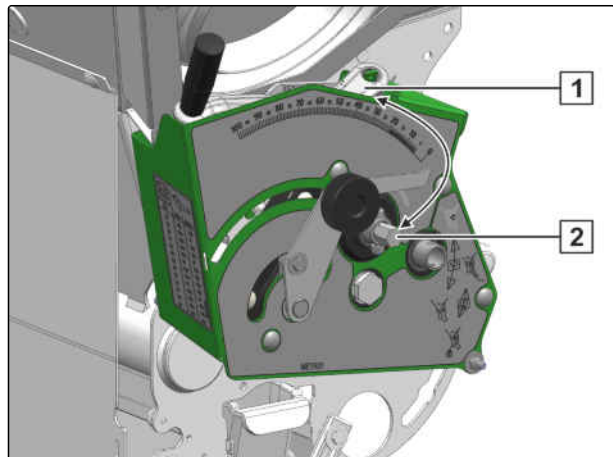
or

*To move the calibration buckets into calibration position on implements with mechanical fan drive,*  
slide the calibration buckets individually under the metering units from the left and right.

6. Take the operating tool from the parking position **1**.
7. Put the operating tool on the gear shaft **2**.

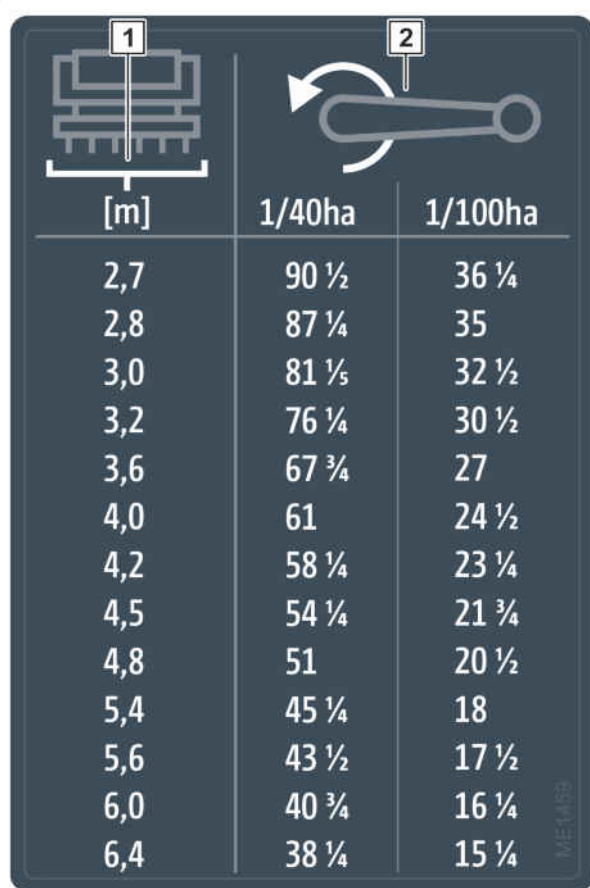


CMS-I-00001931



CMS-I-00002785

8. Depending on the working width **1** and desired calibration area **2**, read the number of crank turns from the table.

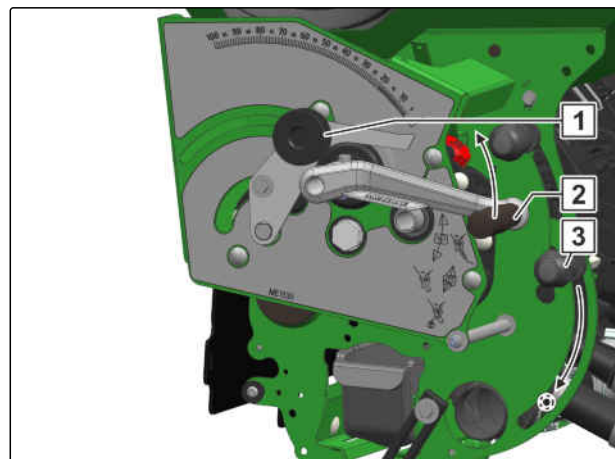


The diagram shows a calibration bucket with a pointer (labeled 2) and a table of crank turns. The table has three columns: working width [m], 1/40ha, and 1/100ha. The working width values range from 2,7 to 6,4 meters. The corresponding crank turns are given in whole numbers and fractions.

[m]	1/40ha	1/100ha
2,7	90 ½	36 ¼
2,8	87 ¼	35
3,0	81 ½	32 ½
3,2	76 ¼	30 ½
3,6	67 ¾	27
4,0	61	24 ½
4,2	58 ¼	23 ¼
4,5	54 ¼	21 ¾
4,8	51	20 ½
5,4	45 ¼	18
5,6	43 ½	17 ½
6,0	40 ¾	16 ¼
6,4	38 ¼	15 ¼

CMS-I-00002784

9. To move the calibration flap lever to the calibration position, press and hold the lock button **3** and push it down **4**.
10. Release the lock button **1**.
11. Set the pointer to the setting value 70.
12. To fill the fertiliser metering unit, turn the operating tool by 5 turns.
13. Empty the calibration bucket.
14. Turn the operating tool counterclockwise by the desired number of turns.



CMS-I-00002786



#### NOTE

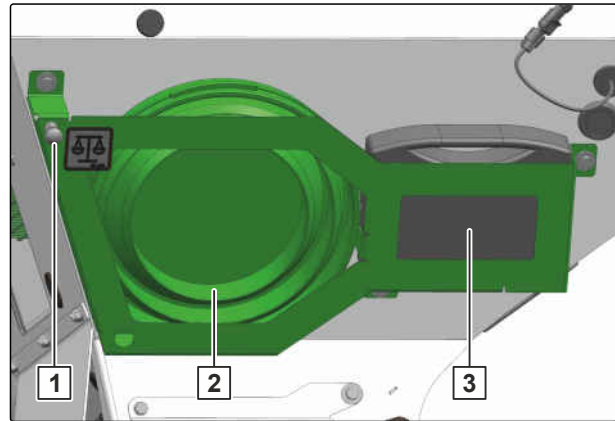
To prevent overflowing of the calibration bucket, monitor the fill level.

Stop the calibration and empty the bucket if necessary.

## 6 | Preparing the machine

### Preparing the implement for operation

15. Fill the fertiliser from the calibration buckets into the collapsible bucket **2**.
16. Hook on the collapsible bucket with the scale **3** on the weighing point **1**.
17. Determine the collected fertiliser quantity. Take account of the bucket weight.



CMS-I-00001956

- $D_M$  = Fertiliser quantity in kilograms per hectare
- $A_M$  = Collected fertiliser quantity in kilograms per 1/40 or 1/100 hectare
- K = Calibration factor depending on calibration area 40 or 100

$$D_M = A_M \times K$$

$$D_M = 4,38 \times 40 = 175$$

$$D_M = \boxed{\phantom{00}} \times \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

CMS-I-00002691

18. Multiply the determined weight by the calibration factor.
19. *The required spread rate is not reached during the first calibration test.*  
Using the values for the first calibration, determine the gearbox position for the desired spread rate, see "*Determining the gearbox position with the calculator disc*".
20. Repeat the calibration until the desired quantity is metered.

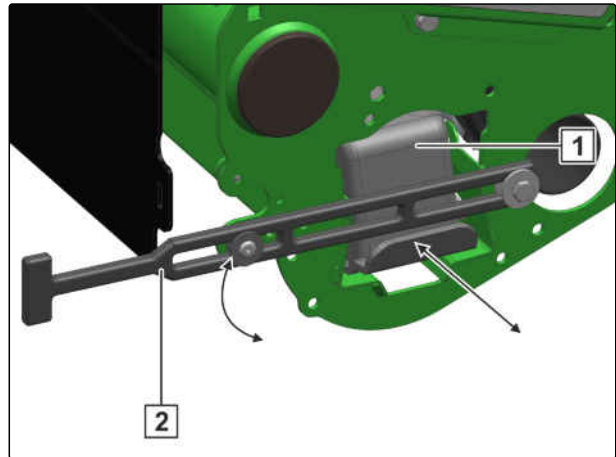


#### NOTE

If the desired spread rate is not reached, contact your specialist workshop for more information.



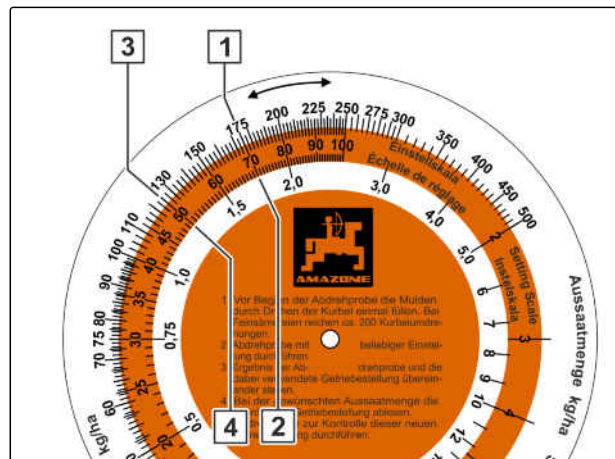
21. Empty the calibration bucket.
22. *To prevent soiling of the calibration buckets,*  
slide the calibration bucket **1** under the metering unit with the opening facing down.
23. Swivel up the lock **2** and close it.
24. *To move the calibration flap lever into working position,*  
press and hold the lock button and push it upwards.



CMS-I-00001932

#### 6.4.19.4 Determining the gearbox position with the calculator disc

- Determined spread rate 175 kg/ha **1**
- Utilised gearbox position 70 **2**
- Desired spread rate 125 kg/ha **3**
- Gearbox position 50 **4** for the desired spread rate



CMS-I-00002787

1. Align the determined spread rate **1** with the gearbox position 70 **2** on the calculator disc.
2. Read the gearbox position **4** for the desired spread rate **3** from the calculator disc.

## NOTE

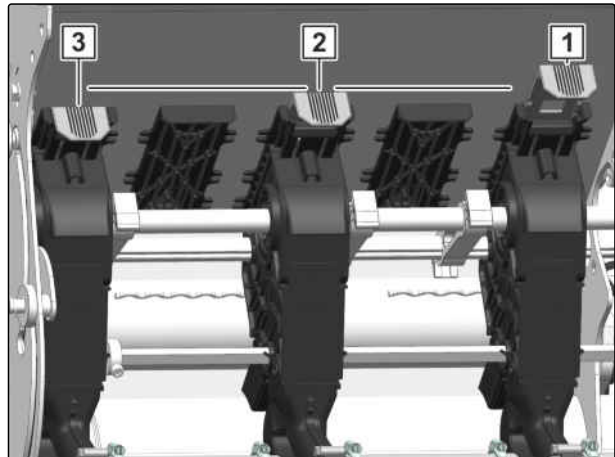
Set the gearbox setting lever between the scale positions 20 and 80.

3. Set the gearbox setting lever to the value read from the disc.

## 6 | Preparing the machine

### Preparing the implement for operation

- The sliding shutter is completely open **1**
- The sliding shutter is opened to 1/3 **2**
- The sliding shutter is closed **3**



CMS-I-00002689

4. If the setting range is between 0.1 and 5, move the sliding shutter for the fertiliser metering unit to position **2**.

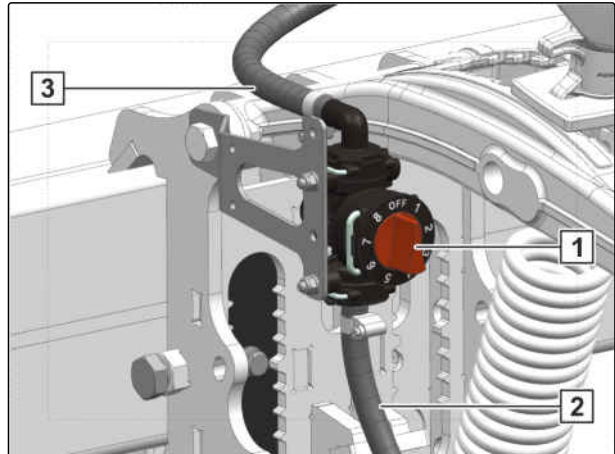
➔ The supply to the metering unit is reduced.

5. Repeat the calibration.

#### 6.4.20 Changing the application rate for liquid fertiliser

CMS-T-00003722-C.1

The liquid fertiliser metering unit **1** is connected to the tank via the supply hose **3**. The liquid fertiliser flows through the hose **2** to the application point and is applied in the soil.



CMS-I-00002729

- A = Rate in l/ha
- $A_R$  = Pure fertiliser rate in kg/ha
- $G_{\%}$  = Fertiliser content in percent
- $\rho$  = Density in kg/l

1. Determine the application rate for the fertiliser using the equation.

$$A = \frac{A_R \times 100}{G_{\%} \times \rho}$$

$$A = \frac{55 \times 100}{28 \times 1,28} = 153,5$$

$$A = \frac{\quad \times 100}{\quad \times \quad} = \quad$$

CMS-I-00002734

- D = Flow rate in l/min
- A = Rate in kg/ha
- v = Forward speed in km/h
- R<sub>w</sub> = Row width in m

2. Determine the flow rate with the equation.

$$D = \frac{A \times v \times R_w}{600}$$

$$D = \frac{154 \times 15 \times 0.75}{600} = 2,89$$

$$D = \frac{\boxed{\phantom{000}} \times \boxed{\phantom{000}} \times \boxed{\phantom{000}}}{600} = \boxed{\phantom{000}}$$

CMS-I-00002733

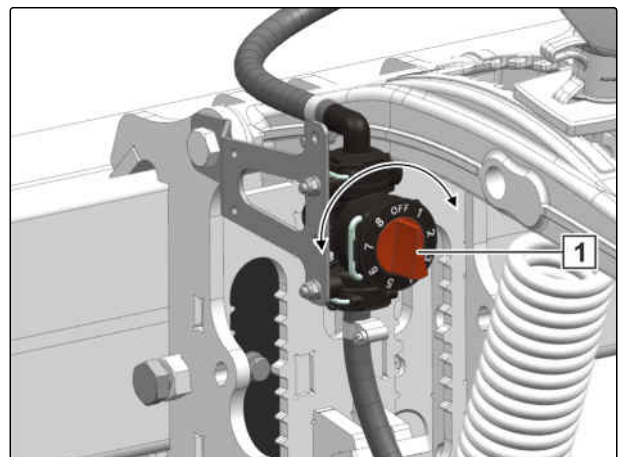
Flow rate							
Valve position	Pressure						
	1 bar	1.5 bar	2 bar	2.5 bar	3 bar	3.5 bar	4 bar
1	0.43 l/min	0.53 l/min	0.61 l/min	0.68 l/min	0.74 l/min	0.8 l/min	0.86 l/min
2	0.61 l/min	0.75 l/min	0.87 l/min	0.97 l/min	1.06 l/min	1.15 l/min	1.23 l/min
3	0.97 l/min	1.19 l/min	1.37 l/min	1.53 l/min	1.68 l/min	1.81 l/min	1.94 l/min
4	1.4 l/min	1.71 l/min	1.98 l/min	2.21 l/min	2.42 l/min	2.62 l/min	2.8 l/min
5	2.15 l/min	2.63 l/min	3.04 l/min	3.4 l/min	3.72 l/min	4.02 l/min	4.3 l/min
6	3.1 l/min	3.8 l/min	4.38 l/min	4.9 l/min	5.37 l/min	5.8 l/min	6.2 l/min
7	3.97 l/min	4.87 l/min	5.62 l/min	6.28 l/min	6.88 l/min	7.43 l/min	7.95 l/min
8	5.06 l/min	6.19 l/min	7.15 l/min	7.99 l/min	8.76 l/min	9.46 l/min	10.11 l/min

3. Depending on the set pump pressure, read the valve position from the table above.

4. Move the valve **1** to the desired position.

5. Since the flow rate depends on the applied material, check the setting by calibrating.

➔ Observe the operating manual for the liquid fertiliser tank



CMS-I-00002735



#### NOTE

- The determined values are reference values.
- Check the setting each time the applied material is changed.
- During application in the seed furrow, liquid fertiliser can drip out of the application point in the headland position.

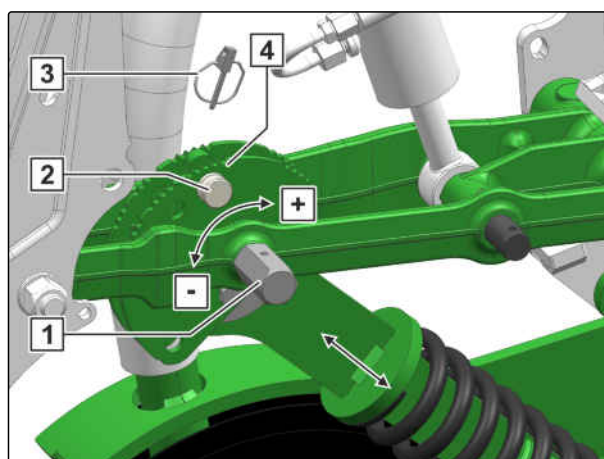
### 6.4.21 Adjusting the placement depth on the coupled fertiliser coulter

CMS-T-00005574-B.1

1. Raise the implement.
2. Secure the tractor and implement.
3. Remove the linch pin **3**.
4. Remove the pin **2**.

The notches **4** between 1 and 5 serve as orientation.

5. *To adjust the fertiliser placement depth,* turn the setting shaft **1** to the desired position.



CMS-I-00003935

6. Install the pin.
7. Install the linch pin.
8. Make the same adjustment for all fertiliser coulters.

### 6.4.22 Adjusting the placement depth on the leaf spring-guided fertiliser coulter

CMS-T-00002061-D.1

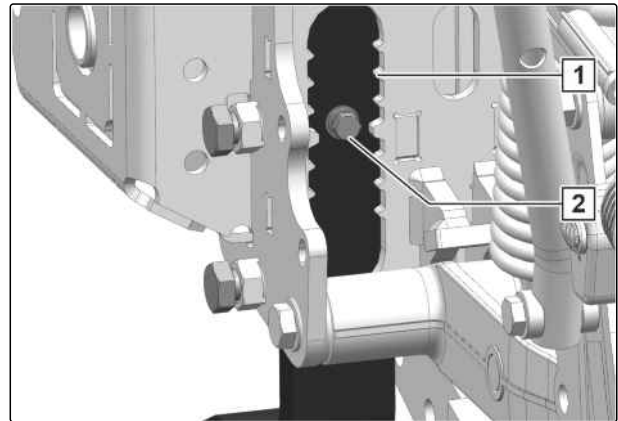


#### NOTE

The operating conditions affect the correct setting.

The adjustment of the fertiliser coulter must be adapted to the respective operating conditions. Check the adjustment of the fertiliser coulter on the field after driving a short distance.

The bolt **2** serves for orientation on the scale **1**.



CMS-I-00002042

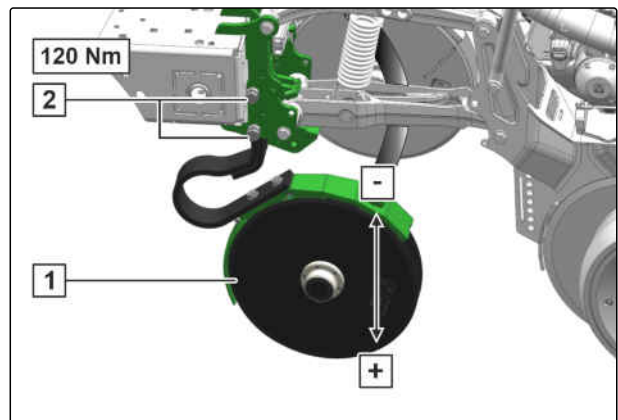


### REQUIREMENTS

- ✓ Implement is standing on a solid floor of an equipment building.
1. Lift the implement.
  2. *For row widths less than 70 cm*  
Secure the machine.
  3. *Hold the fertiliser coulter **1** in the set position,*  
Loosen the bolts **2**.
  4. Move the fertiliser coulter to the desired position.
  5. *Hold the fertiliser coulter in the desired position,*  
Tighten the bolts.
  6. Make the same adjustment for all fertiliser coulters.

or

Put the fertiliser placement depth in the tracks in the desired position.

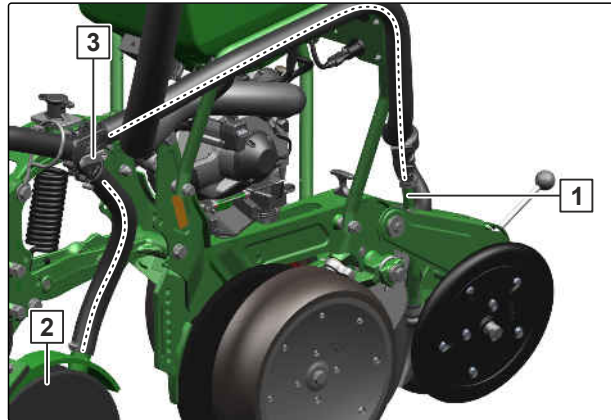


CMS-I-00001934

### 6.4.23 Adjusting the fertiliser application point

CMS-T-00010605-B.1

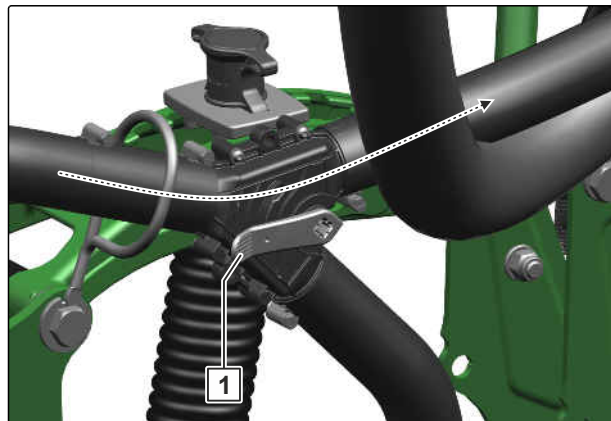
Use the switch **3** to change the fertiliser application point between the fertiliser coulter **2** or the seed bed placement **1**.



CMS-I-00007256

► To select the fertiliser application point, set the lever **1** to the desired position.

➔ The lever engages perceptibly.



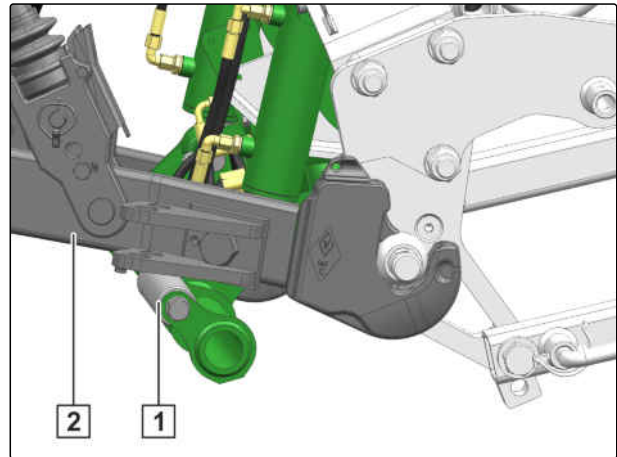
CMS-I-00007258

### 6.4.24 Adjusting the frame ballasting

CMS-T-00005522-C.1

The hydraulically actuated frame ballasting **1** is supported on the lower links **2** and transfers the weight from the tractor to the implement frame. As a result, there is an additional load on the precision airplanter and the placement depth can be maintained even under difficult operating conditions.

For maximum effect of the frame ballasting, the implement must be coupled to the highest top link point on the tractor side.



CMS-I-00003948



## WARNING

**An unexpected hydraulic function is activated**

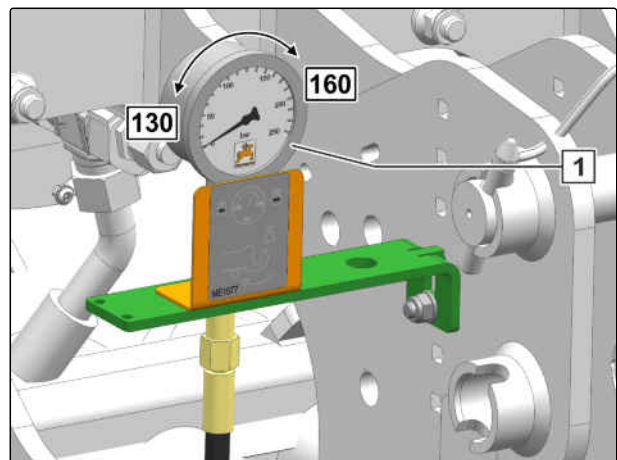
- *Before you actuate the tractor control unit, check the selected hydraulic function of the Comfort hydraulic system.*



## NOTE

The working range is between 130 and 160 bar.

Always rest the frame ballasting on the lower link.



CMS-I-00004101

1. Lower the implement onto the ground.
2. *To move the frame ballasting to the desired position, actuate the "green 1" tractor control unit.*

or

*To relieve the frame ballasting, actuate the "green 2" tractor control unit and set a pressure of 30 bar.*

➔ The frame ballasting is resting on the lower links.



### 6.4.25 Adjusting the filling auger

CMS-T-00002217-D.1



#### REQUIREMENTS

- ✓ The implement is not coupled to the tractor
- ✓ The implement is properly parked



#### CAUTION

**Risk of tripping due to difficult access**

- For safe access, use a platform ladder.

1. Fertiliser hopper is filled unevenly in the direction of travel.

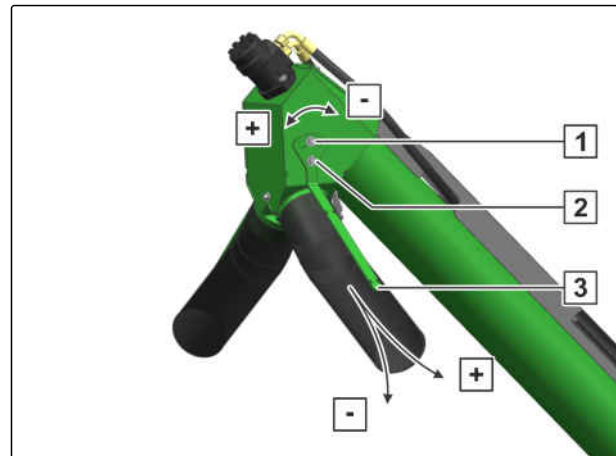
Loosen the bolt **2**.

2. Loosen the bolt **1** and remove it.

3. Move the outlet to the desired position.

4. Insert the bolt **1** and tighten it.

5. Tighten the bolt **2**.



CMS-I-00002029



#### CAUTION

**Risk of tripping due to difficult access**

- For safe access, use a platform ladder.

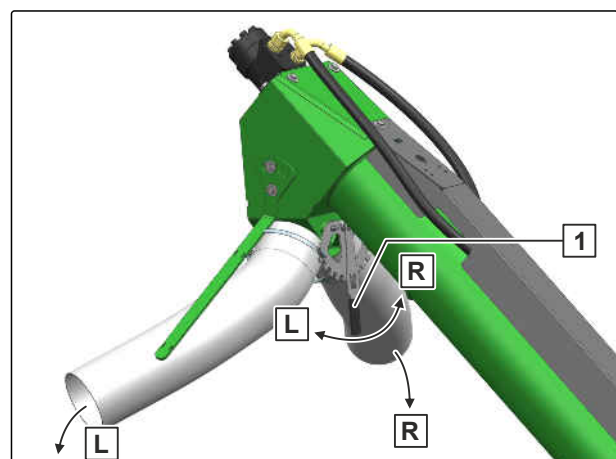
6. Fertiliser hopper is filled unevenly transverse to the direction of travel.

Unlock the setting lever **1**.

7. Move the setting lever to the desired position.

➔ In the end position, the outlet is closed.

8. The setting lever must lock in the setting grid.



CMS-I-00002030

### 6.4.26 Adjusting the shifted tramline

CMS-T-00007955-B.1

With a shifted tramline, tramlines are created without switching off the coulters. The coulter **2** is pushed onto the adjacent coulter **4** with the hydraulic

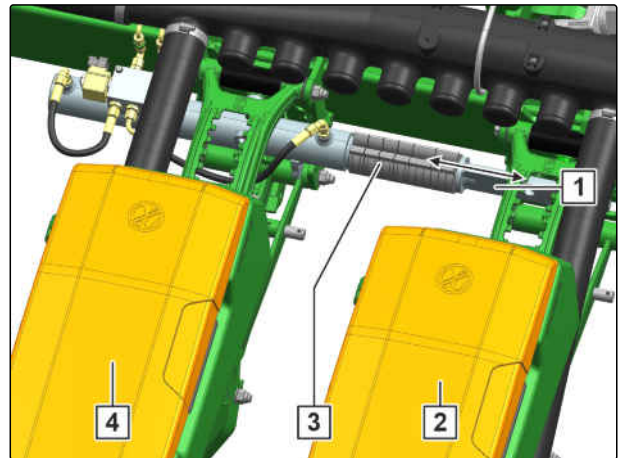


cylinder **1**. The shifting distance can be adjusted for the cultivating implement with spacer elements **3**.

### **i** NOTE

The maximum track width is 2.25 m and the maximum tyre width is 80 cm.

Tramlines with a track width of 2.25 m and a tyre width of 80 cm cannot be created. One of the two parameters needs to be reduced.



CMS-I-00005537

Tramline system	Tramline spacing									
	13.5 m	18 m	24 m	27 m	30 m	36 m	40.5 m	42 m	48 m	54 m
Symmetrical 8 rows with 75 cm		X			X			X		X
Asymmetrical 8 rows with 75 cm			X			X			X	
Asymmetrical 9 rows with 75 cm	X			X			X			X



### REQUIREMENTS

- ✓ The fan is running



### WARNING

#### The coulters are hydraulically shifted

The shifting procedure cannot be stopped.

- Keep people out of the danger area of the implement.

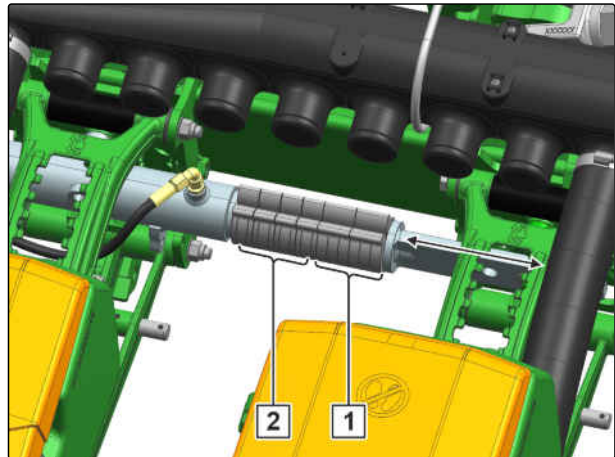
1. To configure the shifted tramline, see "ISOBUS software operating manual" > "Configuring the tramline control".
2. After configuring the shifted tramline, check whether the desired coulters are shifted.

The large spacer elements **1** are 38 ml wide. The small spacer elements **2** are 25.4 ml wide.

3. *To adjust the tramline width for the cultivating implement,*  
add the desired spacer elements

or

remove the desired spacer elements.



CMS-I-00005546

#### 6.4.27 Adjusting the coulter pressure in the track

CMS-T-00007879-C.1

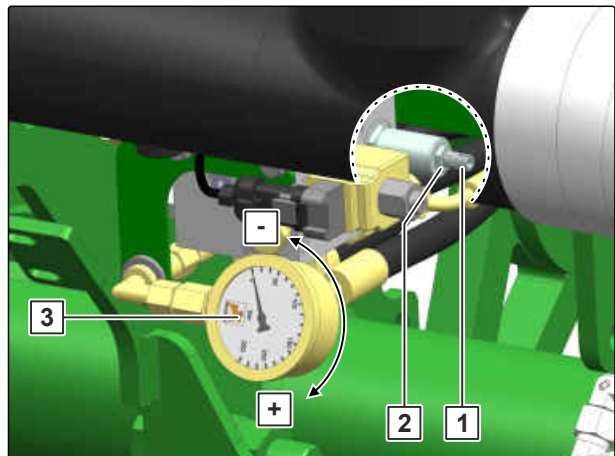
1. Switch on the fan.
2. *To set the coulter pressure beside the tracks to zero:*  
Refer to the ISOBUS operating manual,  
"Adjusting the coulter pressure".



**CAUTION** Risk of tripping due to difficult access

- For safe access,  
use a platform ladder.

Additional coulter pressure can be applied onto the coulters in the track. The additional coulter pressure can be set between 10 bar and 50 bar.



CMS-I-00005531

3. *To adjust the additional coulter pressure in the track:*  
Remove the lock nut **2**.
  4. put the coulter pressure in the desired position on the setting screw **1**.
- ➔ The pressure gauge **3** shows the additional coulter pressure in the tracks.
- ➔ When the coulter pressure beside the tracks is adjusted, the coulter pressure in the tracks is increased by the set value.
5. Tighten the lock nut.
  6. *To check the setting after driving a short distance:*  
See "Checking the placement depth".

### 6.4.28 Adjusting the running gear height



#### NOTE

In the factory settings, the running gear wheels are installed in the centre position.

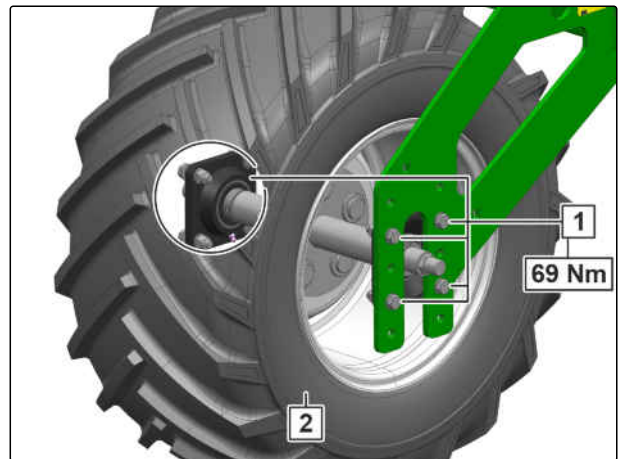
Special operating conditions can require a different running gear height. In doing so, it must be noted that the range of movement of the seeding coulter is restricted. For example, if the running gear height is increased, the set placement depth may not be reached on very hilly terrain.



#### REQUIREMENTS

- ✓ Implement is standing on a solid floor of an equipment building.

1. Lift the implement.
2. Secure the machine.
3. Fix the height of the wheel **2** with a suitable aid.
4. Remove the bolts **1**.
5. Move the wheel to the desired position with a suitable aid.
6. Install the bolts and tighten them.
7. After 5 hours of operation, check the bolt connection for tight fit.



CMS-I-00005634

For implements with mechanical drives, the length of the drive chain must be adjusted.

In the upper position, the chain must be shortened by 3 links, and in the lower position, it must be lengthened by 3 links.

8. *To adjust the length of the drive chain, see "Replacing the gear wheel in the leading wheel drive".*



#### NOTE

For more information, please contact your AMAZONE customer service.

## 6.4.29 Installing a seed row

CMS-T-00005483-D.1

### 6.4.29.1 Installing the PreTeC mulch seeding coulters

CMS-T-00005491-C.1

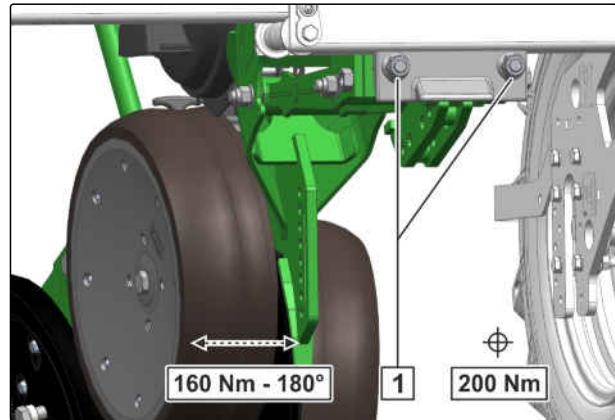
1. To move the installed coulters to the desired position,  
Loosen the bolts **1**.

2. Push the coulters into the desired position.

3. For telescopic coulters  
Tighten the bolts to 160 Nm minus 180°,

or

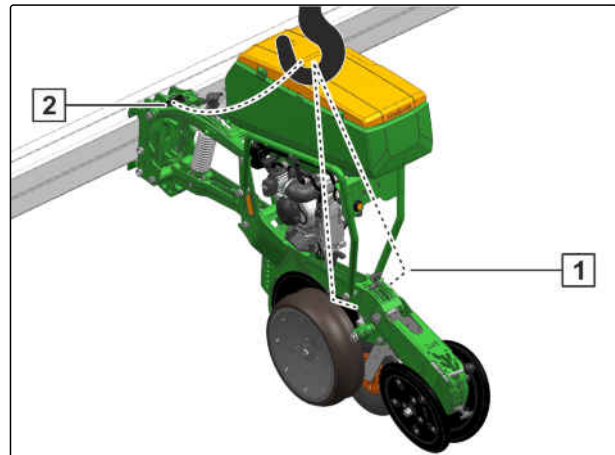
For non-telescopic coulters  
Tighten the bolts to 200 Nm.



CMS-I-00002039

Installing the coulters with a crane is described in the following.

4. To make the coulter tip slightly towards the front for installation, select a longer front load handling device at the front than at the rear.
5. Fasten the load handling device on the coulter top link **2**.
6. Fasten 2 load handling devices on the coulter body **1**.



CMS-I-00004137

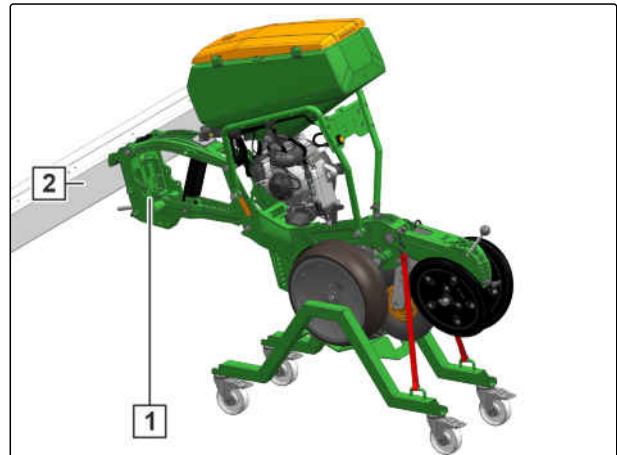
7. Guide the tilted coulter **1** along the frame **2**.
8. Lower the coulter.



CMS-I-00004136

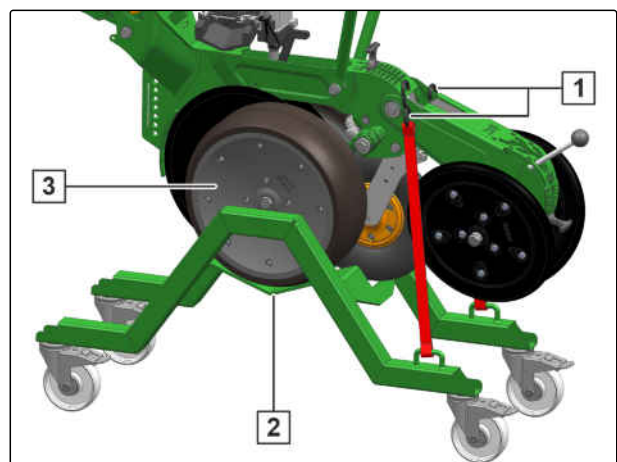
Installing the coulters with the PreTeC transport dolly is described in the following.

9. lower the implement.
10. Move the transport dolly **2** with the tilted coulter **1** towards the frame **2**.



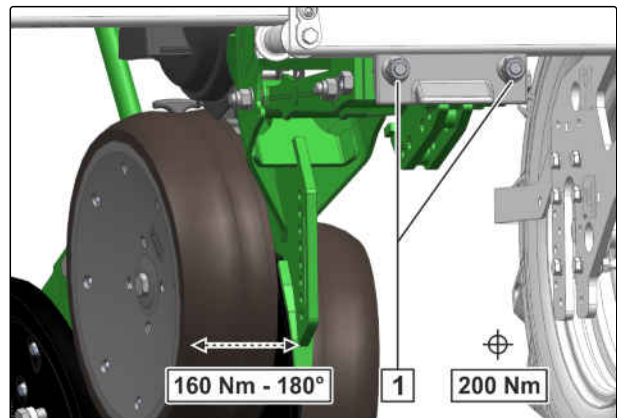
CMS-I-00005133

11. Lift the implement.
- ➔ The depth control wheels **3** are resting on the transport dolly **2**.
12. Loosen the belts **1** from the coulter.
13. Lift the implement further.



CMS-I-00005134

14. Install the coulter bracket.
15. *For telescopic coulters*  
Tighten the bolts **1** to 160 Nm minus 180°,  
  
or  
  
*For non-telescopic coulters*  
Tighten the bolts to 200 Nm.



CMS-I-00002039

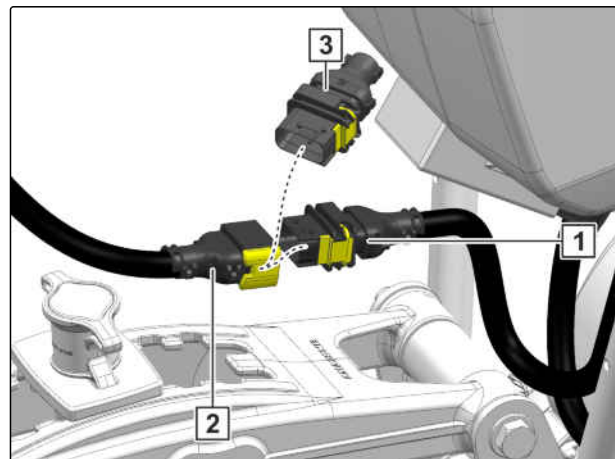
16. *To put the desired coulter into operation, see "Coupling the air and fertiliser supply".*
17. *To put the desired coulter into operation, see "Coupling the energy supply".*
18. *If the implement is equipped with a hydraulic coulter pressure system, see "Coupling the hydraulic supply".*



19. Connect the ISOBUS to the tractor.
20. Restart the implement.
21. *To enter the changed working width on the control terminal,*  
see "ISOBUS software operating manual" >  
"Defining the geometry".

#### 6.4.29.2 Establishing the energy supply

1. Disconnect the ISOBUS from the tractor.
2. *To activate the coultter,*  
disconnect the coultter wiring harness **1** from  
the bridge plug **3**.
3. Connect the implement wiring harness **2** to the  
coultter wiring harness **1**.
4. Seal the bridge plug with a dust cap.



CMS-T-00005490-C.1

CMS-I-00003830

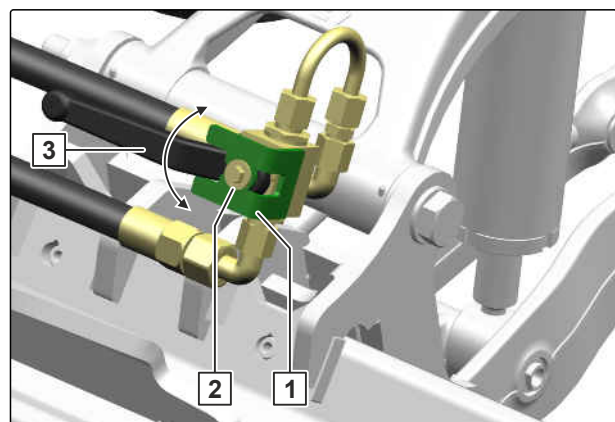
#### 6.4.29.3 Establishing the hydraulic supply



##### REQUIREMENTS

- ✓ The implement is lifted
- ✓ The fan is switched off
- ✓ The tractor and implement are secured

1. *To unfold the implement,*  
see "Unfolding the implement sections".
  2. *To set the coultter pressure to zero,*  
refer to the ISOBUS operating manual, "Adjusting  
the coultter pressure".
  3. Lower the implement and move the three-point  
hydraulic system of tractor into float position.
- ➔ The coultter pressure cylinders retract and the  
coultter pressure is relieved.
4. Switch off the fan.
  5. Secure the tractor and implement.



CMS-I-00007310

6. Remove the bolt **2**.
7. Remove the fastener **1**.
8. *To relieve the residual pressure from the hydraulic coulters pressure system,*  
open the valve **3**.
9. *To relieve the residual pressure from the opposite hydraulic coulters pressure system,*  
repeat steps 6 to 8 on the opposite section.



## ENVIRONMENTAL INFORMATION

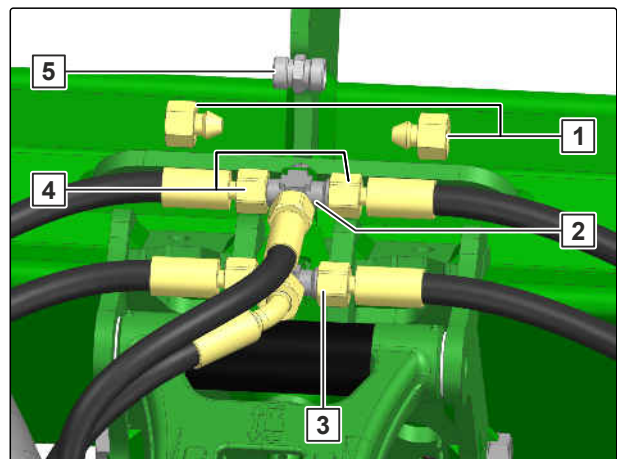
### Danger due to escaping oil

- ▶ Collect any escaping oil.
- ▶ Dispose of oil removal material in an environmentally friendly manner.

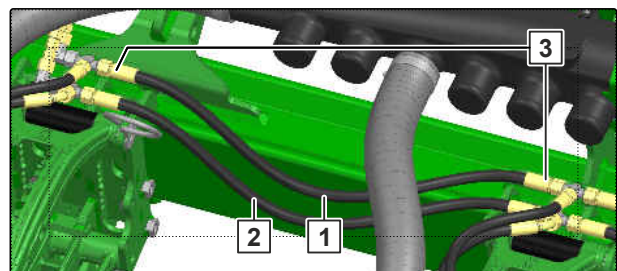
10. Disconnect the connection **4** and store connectors **5** in the threaded cartridge.
11. Remove the sealing caps **1** from the T-piece **2**.
12. Install the hydraulic hoses on the T-piece.
13. *To convert the hydraulic supply of the second line **3**,*  
repeat steps 1 to 3.

For a conversion from 8 to 12 rows, the longer hydraulic hoses between row 1 and 2 and between row 11 and 12 are no longer needed.

14. Disconnect the connection **3**.
15. Remove the long hydraulic hose **1**.
16. Install the original hydraulic hose between the coulters.
17. *To replace the second line **2**,*  
repeat steps 1 to 3.

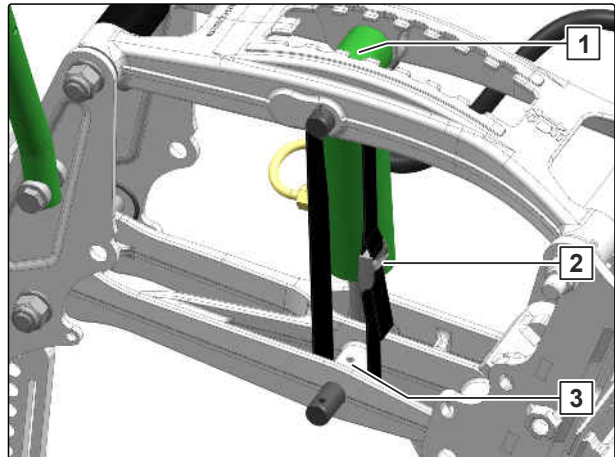


CMS-I-00007201



CMS-I-00007202

18. Loosen the tension belt **2** from the top link **1** and lower link **3** and remove it.



CMS-I-00005312

19. *To set the coulter pressure to zero,*  
 refer to the ISOBUS operating manual "Adjusting the coulter pressure".

20. Switch on the fan at 2000 rpm.

**i NOTE**

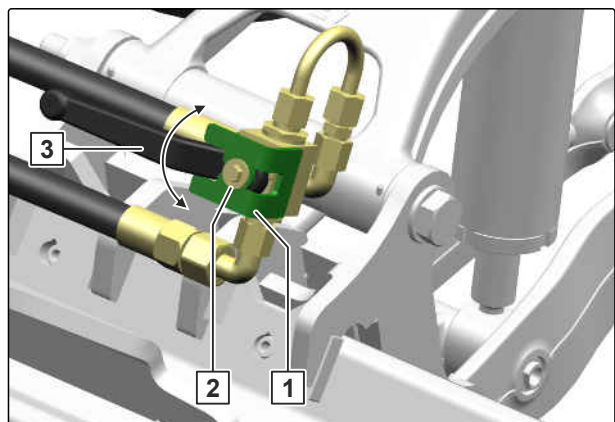
Ensure that the oil supply in the hydraulic unit is sufficient.

21. *To vent the coulter pressure system on both sides,*  
 move the seeding units on both implement sections up and down consecutively with a crane.

22. *When the hydraulic coulter pressure system has been vented,*  
 close the valve **3**.

23. Install the fastener **1**.

24. Install the bolt **2**.



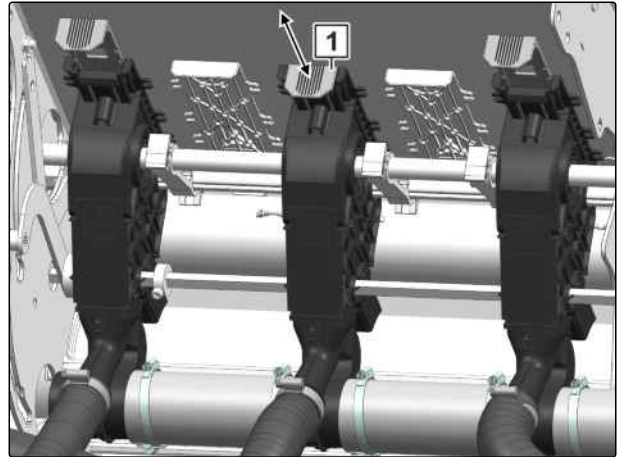
CMS-I-00007310



#### 6.4.29.4 Establishing the air and fertiliser supply on the rear hopper

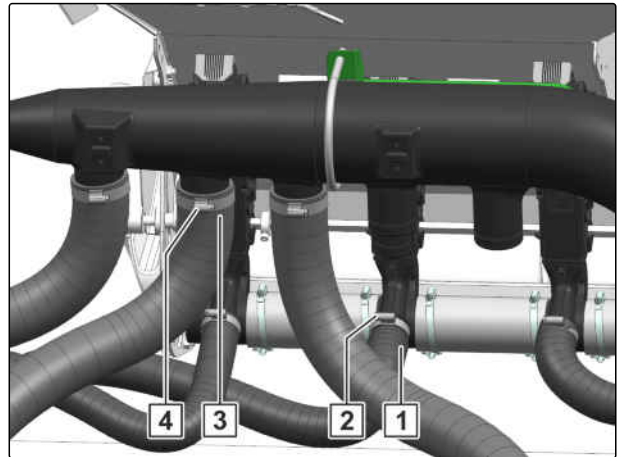
CMS-T-00005487-C.1

1. Open the sliding shutter **1** on the fertiliser metering unit.



CMS-I-00003915

2. Install the fertiliser hose **1** on the fertiliser metering unit.
3. Install the clamp **2**.
4. Install the air supply **3** on the air distributor.
5. Install the clamp **4**.



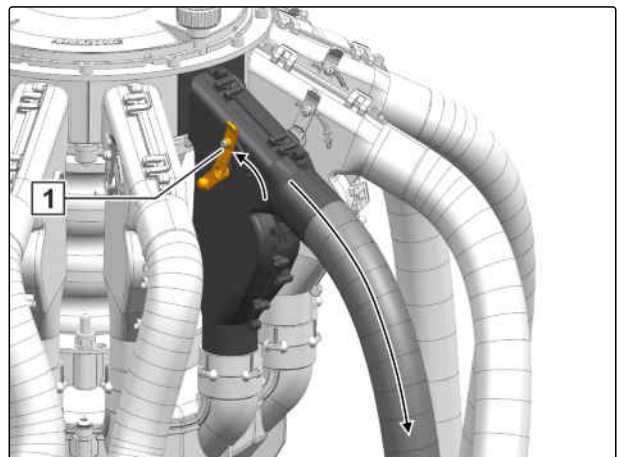
CMS-I-00003916

#### 6.4.29.5 Establishing the air and fertiliser supply on the distributor head

CMS-T-00005489-D.1

1. *To restore the fertiliser flow on implements with distributor heads:*  
actuate the lever **1**.

➔ The fertiliser is conveyed into the fertiliser coulter.



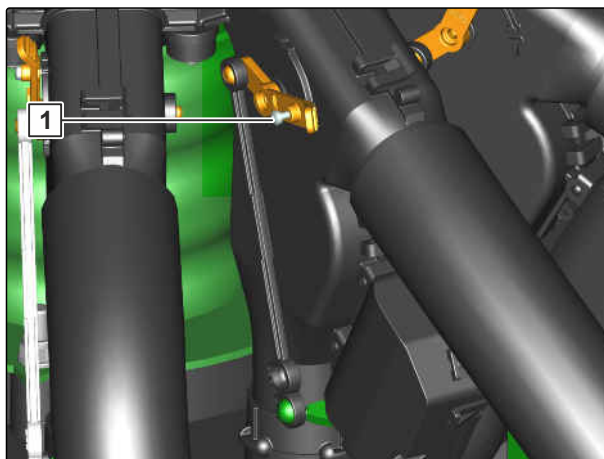
CMS-I-00003960

## 6 | Preparing the machine

### Preparing the implement for operation

2. To restore the fertiliser flow on implements with distributor heads and single row control:

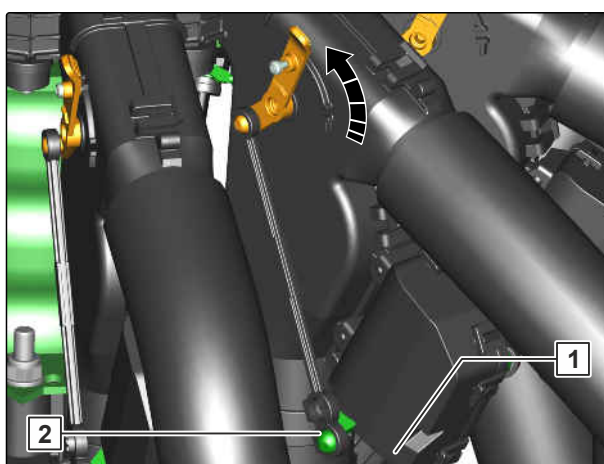
Remove the bolt **1**.



CMS-I-00007406

3. Actuate the coupling rod **2**.

Row	1	2	3	4	5	6	7	8	9	10	11	12
Connection	A	B	C	D	E	F	G	H	I	J	G	L



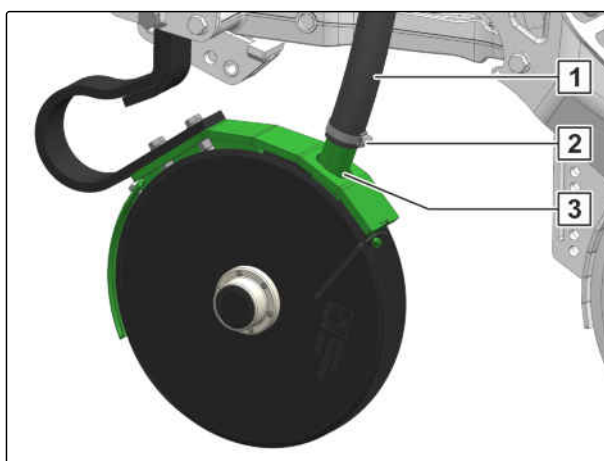
CMS-I-00007405

4. Connect the connection cable for the setting motors **1** to the wiring harness according to the table.

5. Seal the free connection cable with a dust cap after the row conversion.

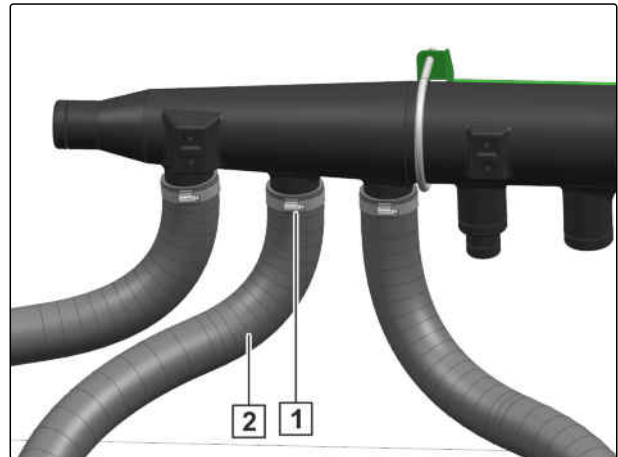
6. Install the conveyor hose **1** on the fertiliser coulter **3**.

7. Install the clamp **2**.



CMS-I-00003920

8. Install the air supply **2** on the air distributor.
9. Install the clamp **1**.



CMS-I-00003919

## 6.4.30 Removing seed rows

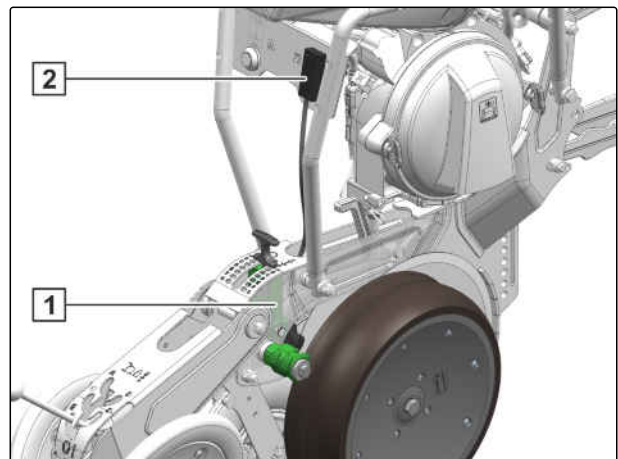
CMS-T-00005471-D.1

### 6.4.30.1 Removing recommendation

CMS-T-00010522-A.1

**i NOTE**

Rows with a contact force sensor **1** may not be removed. The contact force sensor can be recognised by the signal processing **2**.



CMS-I-00003921

Conversion	Removing recommendation
From 6 to 4 rows	Rows 2 and 5
From 12 to 8 rows	Rows 3, 5, 8 and 10

## **i** NOTE

The removal recommendation applies to implements with a hydraulic coulters pressure system.

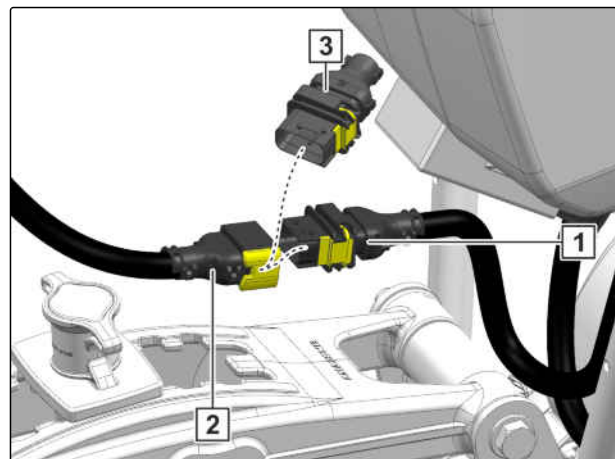
Depending on the row conversion that is performed, new supply hoses for air and fertiliser supply may be necessary.

Other conversion possibilities must be tested by a specialist workshop.

- *To ensure optimal hose routing after removing the PreTeC mulch seeding coulters, see the table to determine the rows that must be removed.*

### 6.4.30.2 Disconnecting the energy supply

1. Disconnect the ISOBUS from the tractor.
2. *To deactivate the coulters,* disconnect the coulters wiring harness **1** from the implement wiring harness **2**.
3. Take the bridge plug **3** out of the sealing kit.
4. Connect the bridge plug to the implement wiring harness.

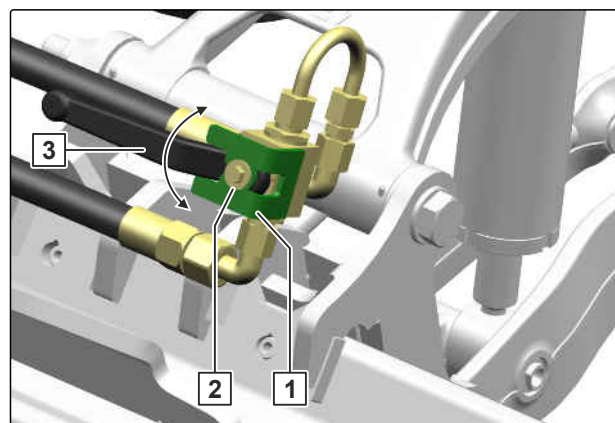


CMS-T-00005474-C.1

CMS-I-00003830

### 6.4.30.3 Adjusting the hydraulic supply

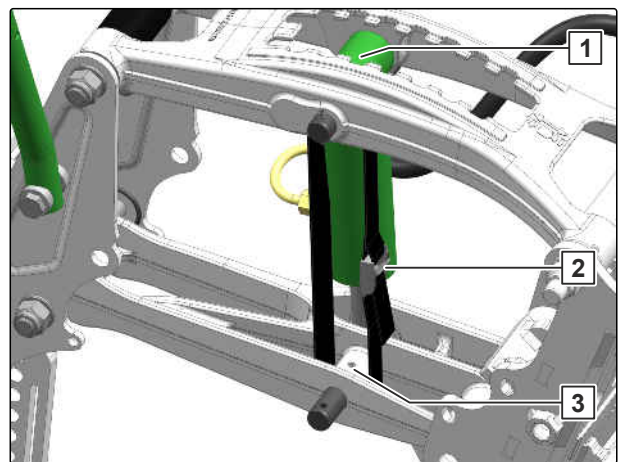
1. *To unfold the implement,* see "Unfolding the implement sections".
  2. *To set the coulters pressure to zero,* refer to the ISOBUS operating manual, "Adjusting the coulters pressure".
  3. Lower the implement and move the three-point hydraulic system of tractor into float position.
- ➔ The coulters pressure cylinders retract and the coulters pressure is relieved.
4. Switch off the fan.



CMS-T-00005478-C.1

CMS-I-00007310

5. Secure the tractor and implement.
6. Remove the bolt **2**.
7. Remove the fastener **1**.
8. *To relieve the residual pressure from the hydraulic coultter pressure system, open the valve **3**.*
9. *To relieve the residual pressure from the opposite hydraulic coultter pressure system, repeat steps 6 to 8 on the opposite section.*
10. Take the tensioning strap **2** out of the sealing kit.
11. *To fix the coultter pressure cylinder, lash the top link **1** and the lower link **3** with a tension belt.*



CMS-I-00005312

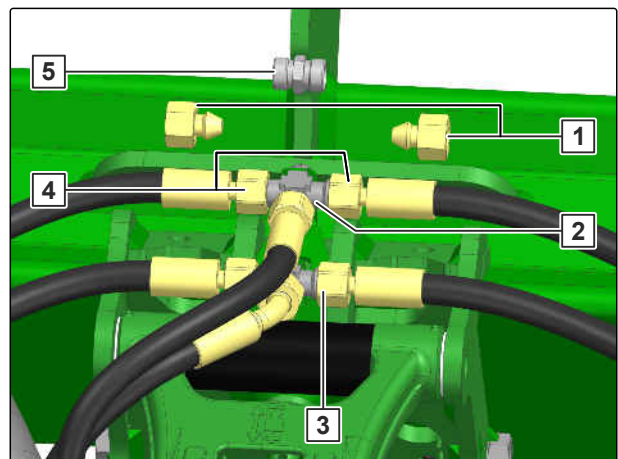


## ENVIRONMENTAL INFORMATION

### Danger due to escaping oil

- ▶ Collect any escaping oil.
- ▶ Dispose of oil removal material in an environmentally friendly manner.

12. Disconnect the connection **4**.
13. Install connectors **5** between the hydraulic hoses.
14. Install sealing caps **1** from the sealing kit on the T-piece **2**.
15. *To convert the hydraulic supply of the second line **3**, repeat steps 1 to 3.*



CMS-I-00007201

## 6 | Preparing the machine

### Preparing the implement for operation

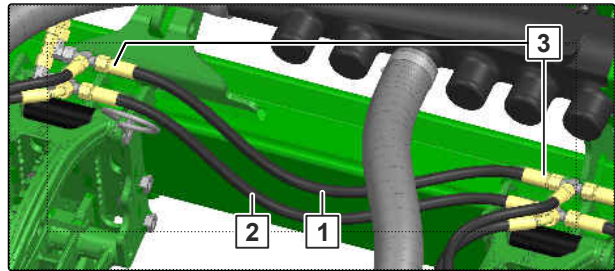
For a conversion from 12 to 8 rows, longer hydraulic hoses are needed between row 1 and 2 and between row 11 and 12. This is the only way to shift the remaining coulters to the desired row spacing after the conversion.

16. Disconnect the connection **3**.
17. Remove the hydraulic hose **1**.
18. Install the long hydraulic hose from the sealing kit between the coulters.
19. *To replace the second line **2**,*  
repeat steps 1 to 3.
20. *To set the coulter pressure to zero,*  
refer to the ISOBUS operating manual "Adjusting the coulter pressure".
21. Switch on the fan at 2000 rpm.

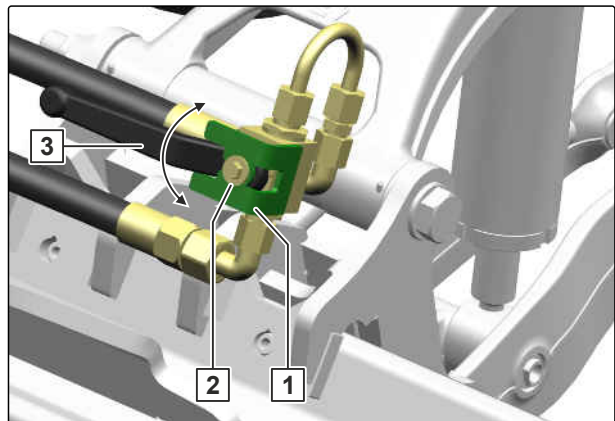
#### **i** NOTE

Ensure that the oil supply in the hydraulic unit is sufficient.

22. *To vent the coulter pressure system on both sides,*  
move the seeding units on both implement sections up and down consecutively with a crane.
23. *When the hydraulic coulter pressure system has been vented,*  
close the valve **3**.
24. Install the fastener **1**.
25. Install the bolt **2**.



CMS-I-00007202



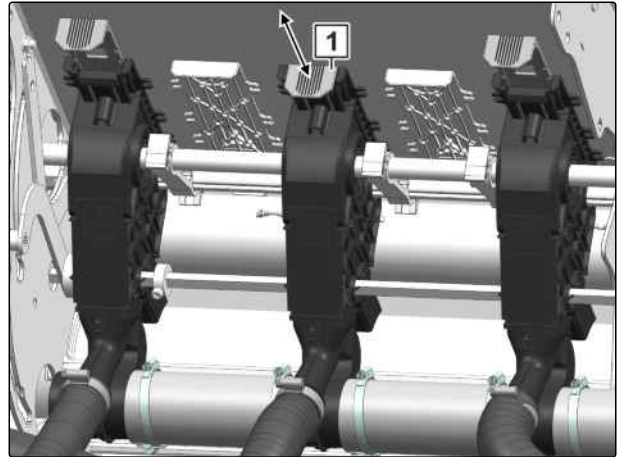
CMS-I-00007310



#### 6.4.30.4 Disconnecting the air and fertiliser supply on the rear hopper

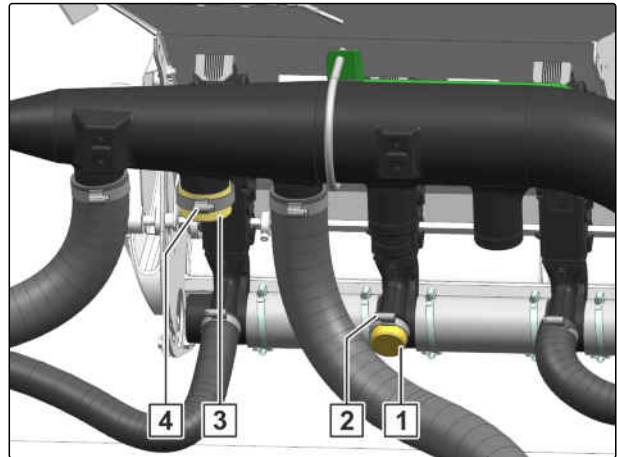
CMS-T-00005480-C.1

1. *For implements with central metering drive,*  
Close the sliding shutter **1** on the fertiliser metering unit.



CMS-I-00003915

2. Remove the fertiliser hose from the fertiliser metering unit.
3. Seal the open connection with a cap **1**.
4. Install the clamp **2**.
5. Disconnect the air supply on the air distributor.
6. Seal the open connection with a cap **3**.
7. Install the clamp **4**.

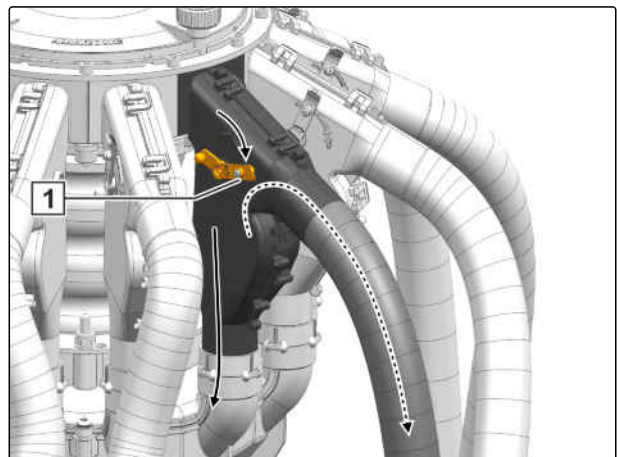


CMS-I-00003917

#### 6.4.30.5 Disconnecting the air and fertiliser supply on the distributor head

CMS-T-00005477-D.1

1. *To interrupt the fertiliser flow on implements with distributor heads:*  
actuate the lever **1**.
- ➔ The fertiliser is then conveyed back into the corrugated tube and the conveyor air is diverted close to the ground.

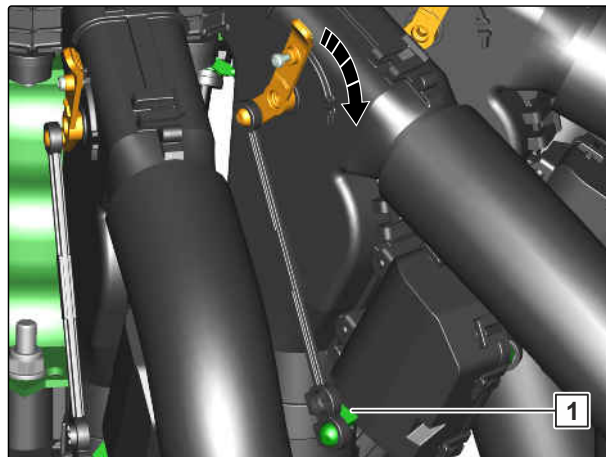


CMS-I-00003959

## 6 | Preparing the machine

### Preparing the implement for operation

2. *To interrupt the fertiliser flow on implements with distributor heads and single row control,*  
Actuate the coupling rod **1** on the rows to be removed.

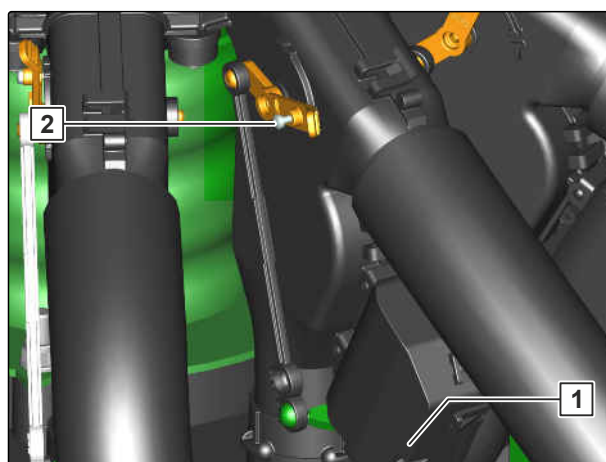


CMS-I-00007404

3. *To fix the flap in the position:*  
Install the bolt **2**.
4. *For a conversion from 6 to 4 rows*  
disconnect the setting motors **1** for rows 2 to 6  
from the wiring harness

or

*For a conversion from 12 to 8 rows*  
disconnect the setting motors for rows 3 to 12  
from the wiring harness.



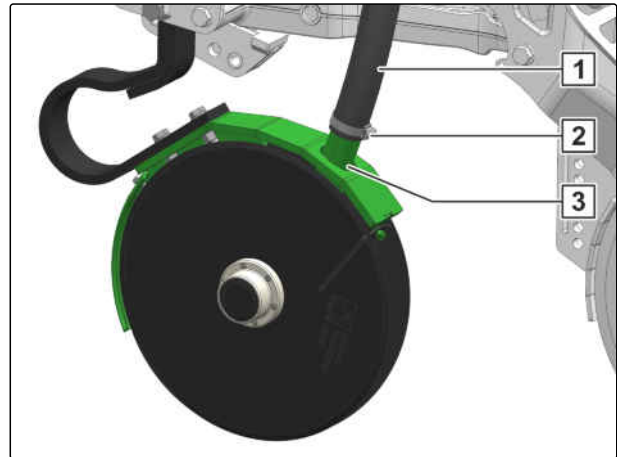
CMS-I-00007403

Row	1	2	3	4	5	6	7	8	9	10	11	12
Connection	A	B	C	D	E	F	G	H	Dust protection cap			
	A	B	C	D	E	F	Dust protection cap					

5. *For a conversion from 6 to 4 rows*  
connect the setting motors for rows 2 to 6 to the  
wiring harness according to the table
- or
- For a conversion from 12 to 8 rows*  
connect the setting motors for rows 3 to 12 to the  
wiring harness according to the table.
6. Seal the free connection cable with a dust cap.

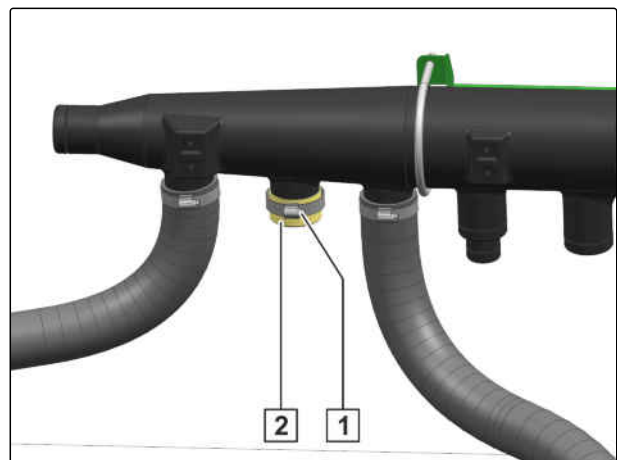


7. Remove the clamp **2**.
8. Remove the conveyor hose **1** from the fertiliser coulter **3**.
9. *To divert the conveyor air close to the ground, fasten the conveyor hose on the implement with the opening facing down.*



CMS-I-00003920

10. Disconnect the air supply on the air distributor.
11. Seal the open connection with a cap **2**.
12. Install the clamp **1**.



CMS-I-00003918

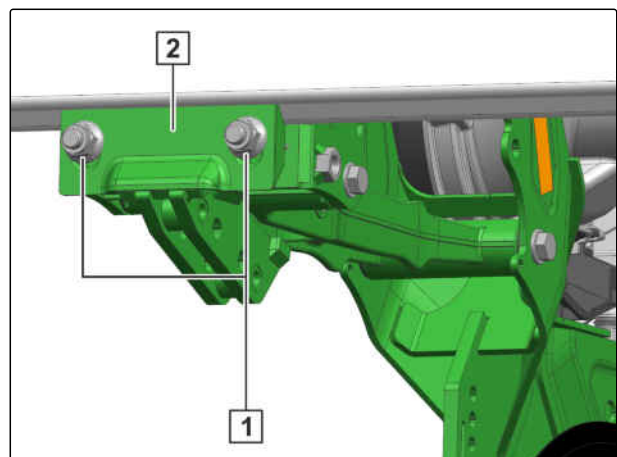
#### 6.4.30.6 Removing the PreTeC mulch seeding coulter

CMS-T-00005475-C.1

##### ✓ REQUIREMENTS

- ✓ Energy supply disconnected
- ✓ Hydraulic supply disconnected
- ✓ Air and fertiliser supply disconnected

1. Remove the bolts **1**.
2. Remove the coulter bracket **2**.



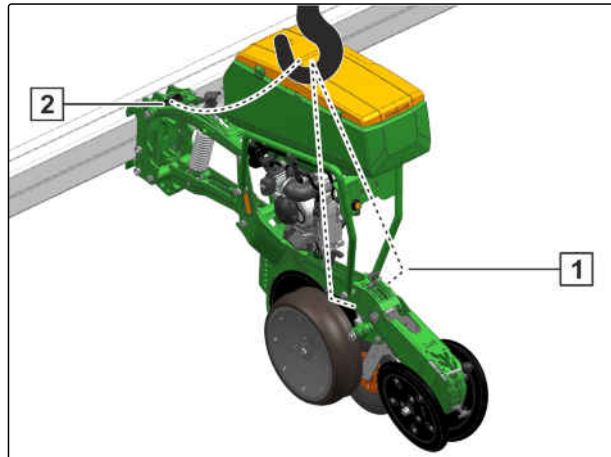
CMS-I-00004135

## 6 | Preparing the machine

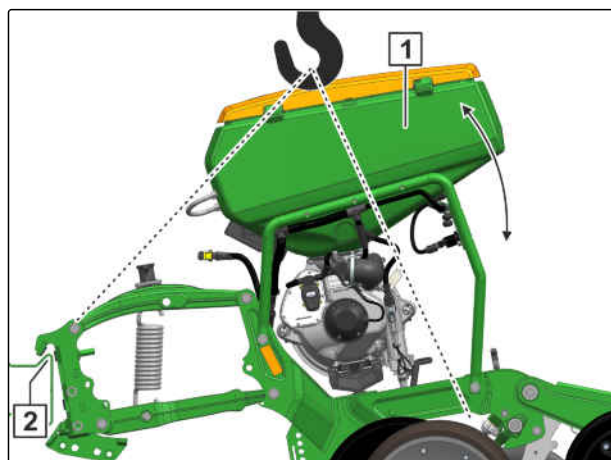
### Preparing the implement for operation

Removing the coulter with a crane is described in the following.

3. *To make the coulter tip slightly towards the front for removal,*  
select a longer front load handling device at the front than at the rear.
4. Fasten the load handling device on the coulter top link **2**.
5. Fasten 2 load handling devices on the coulter body **1**.
6. Lift the coulter **1**.
7. Release the tilted coulter from the frame **2**.



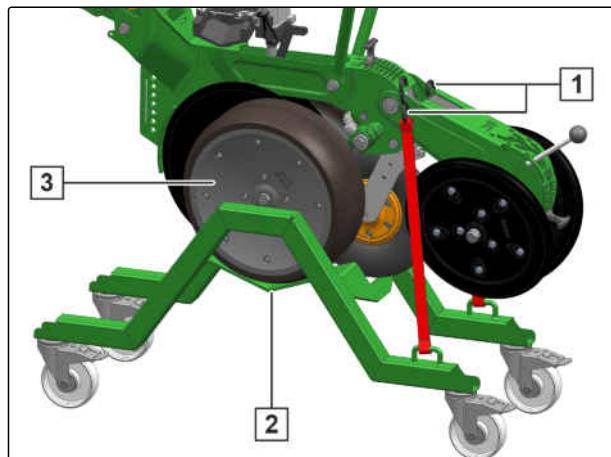
CMS-I-00004137



CMS-I-00004136

Removing the coulters with the PreTeC transport dolly is described in the following.

8. *To set the fertiliser coulters to the topmost position,*  
see "Adjusting the fertiliser placement depth".
9. *To set the coulter pressure to the highest value,*  
see "Adjusting the coulter pressure mechanically".
10. *To put the placement depth into parking position **P**,*  
see "Adjusting the seed placement depth".
11. *To move the catch roller to position **A**,*  
see "Adjusting the catch roller".
12. Lift the implement.
13. Position the transport dolly **2** under the coulter to be removed.



CMS-I-00005134

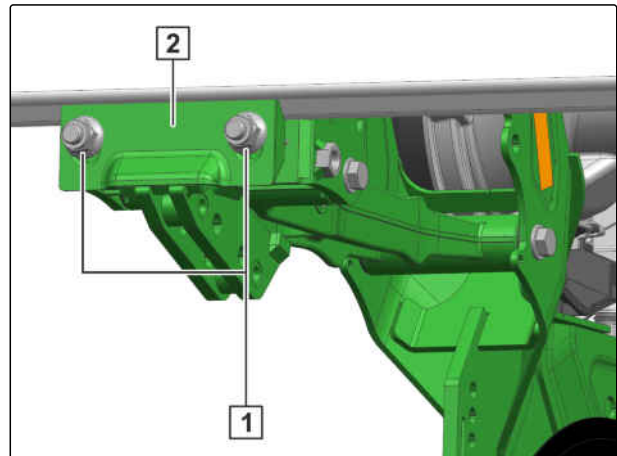
14. lower the implement.

➔ The depth control wheels **3** are resting on the transport dolly.

15. Hook the belts **1** onto the couler.

16. Remove the bolts **1**.

17. Remove the couler bracket **2**.

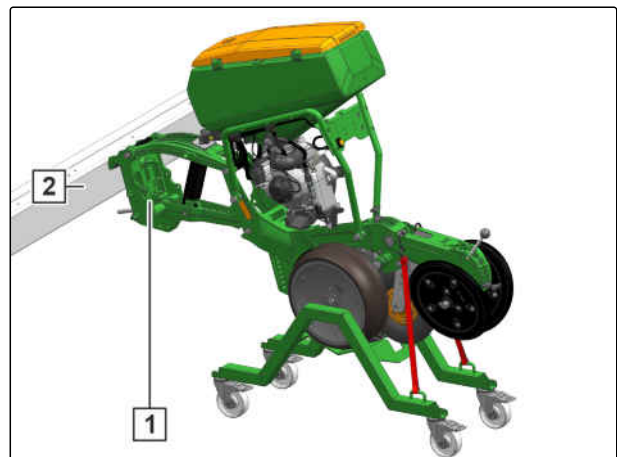


CMS-I-00004135

18. Continue lowering the implement.

➔ The couler **1** tips forward.

19. Release the tilted couler from the frame **2**.



CMS-I-00005133

20. To move the remaining coulters to the desired position,

Loosen the bolts **1**.

21. Push the coulters into the desired position.

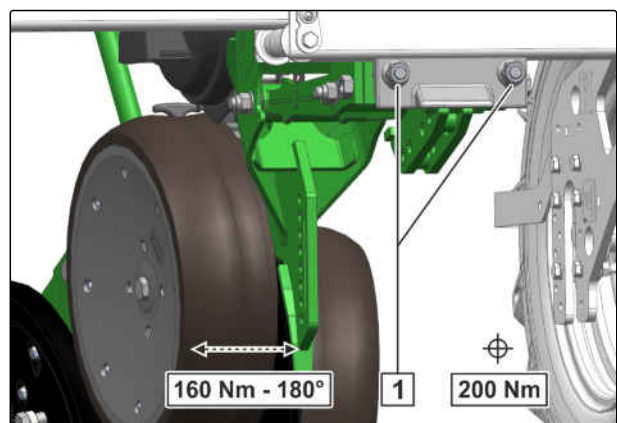
22. For telescopic coulters

Tighten the bolts to 160 Nm minus 180°,

or

For non-telescopic coulters

Tighten the bolts to 200 Nm.



CMS-I-00002039

23. Connect the ISOBUS to the tractor.

24. Restart the implement.
25. *To enter the changed working width on the control terminal,  
see "ISOBUS software operating manual" >  
"Defining the geometry".*

#### 6.4.31 Removing the lifting arm

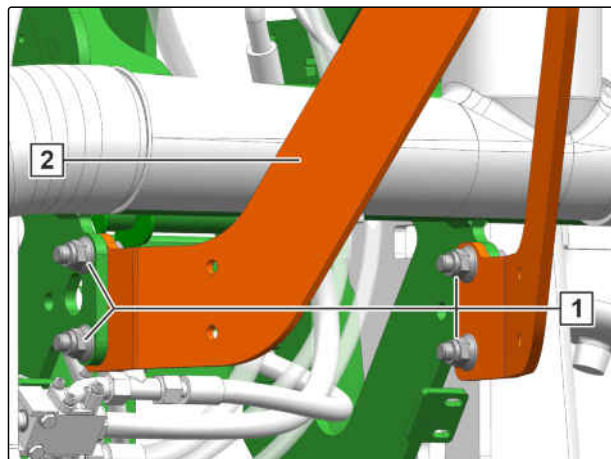


##### IMPORTANT

The lifting arm connects the moving frame parts.

The lifting arm or the moving frame parts will be damaged when unfolding the implement.

- Remove the lifting arm.



CMS-T-00008179-A.1

CMS-I-00005645

1. Loosen the bolted connections **1**.
2. Remove the lifting arm **2**.
3. Store the lifting arm and bolted connections in a suitable place.

## 6.5 Preparing the machine for road travel

CMS-T-00005528-D.1

### 6.5.1 Lifting the implement

CMS-T-00002071-A.1



##### REQUIREMENTS

- ✓ The lighting system is clean and in perfect technical condition
  - ✓ Track markers are folded in
1. Lift the implement with the 3-point power lift of the tractor.
  2. Check the connections of the hydraulic lines and the power supply.
  3. Switch off control terminal.
  4. Switch off the work lights.
  5. Lock the tractor control units.

### 6.5.2 Unfolding the lighting

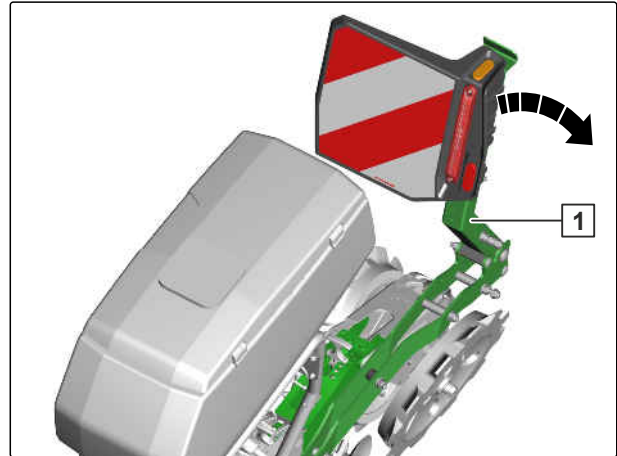
CMS-T-00004420-C.1

#### REQUIREMENTS

- ✓ Implement is folded

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

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



CMS-I-00007408

### 6.5.3 Folding in the track marker

CMS-T-00005530-B.1

#### WARNING

**An unexpected hydraulic function is activated**

- *Before you actuate the tractor control unit,*  
check the selected hydraulic function of the Comfort hydraulic system.

1. *To activate the function for folding the track marker,*  
see "Using the Comfort hydraulic system with ISOBUS".
2. *To fold in the track marker,*  
actuate the "green 2" tractor control unit.

### 6.5.4 Folding the implement sections

CMS-T-00005529-B.1



#### CAUTION

There are crushing and shear points between the implement sections and the implement.

- When folding or unfolding the implement sections,  
never reach into the crushing area.



#### REQUIREMENTS

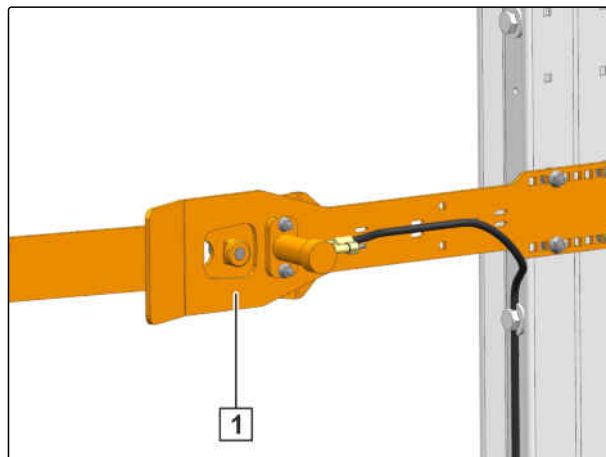
- ✓ The implement is raised



#### WARNING

An unexpected hydraulic function is activated

- Before you actuate the tractor control unit,  
check the selected hydraulic function of the Comfort hydraulic system.



CMS-I-00003932

1. To fold the implement,  
actuate the "green 2" tractor control unit.  
  
➔ The transport lock **1** engages.
2. When the transport lock has engaged,  
put the "green 2" tractor control unit in the neutral position.
3. If the permitted transport height of the folded  
implement is exceeded,  
lower the implement according to the national regulations.

### 6.5.5 Increasing the mechanical coulter pressure

CMS-T-00007516-A.1



#### IMPORTANT

The seeding coulters swing strongly during road transport

- To prevent the seeding coulters from  
swinging during road transport,  
increase coulter pressure.

- *To put the coulter pressure to the middle position,  
see "Adjusting the coulter pressure mechanically".*

### 6.5.6 Locking the tractor control units

CMS-T-00006337-C.1

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



# Using the machine

7

CMS-T-00005576-C.1

## 7.1 Pre-calibrating the mechanically driven grain singling unit

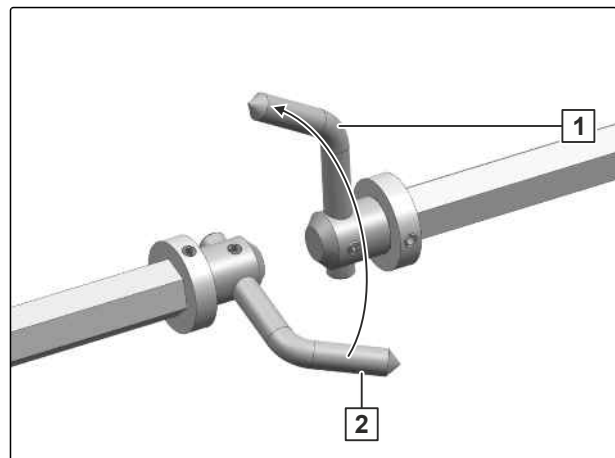
CMS-T-00007525-A.1

To ensure that all grain singling units spread seeds simultaneously, the mechanical drive must be pre-calibrated.

- To move the coupling finger **2** onto the coupling finger **1**, turn the drive wheel of the lifted implement by 360 degrees in the direction of travel

or

before starting operation, drive the lowered implement 2 metres forward.



CMS-I-00005278

## 7.2 Using the implement

CMS-T-00001921-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. Drive off with the tractor.



#### NOTE

To prevent deviations in the distribution along the row, avoid strong braking and accelerating.

The speed of the singling discs is immediately adjusted to normal changes in speed.

6. *To check the seed placement depth and grain spacing after the first 30 m, see "Checking the seed placement depth" and "Checking the grain spacing".*

## 7.3 Using the Comfort hydraulic system with ISOBUS

CMS-T-00002003-A.1



### WARNING

**An unexpected hydraulic function is activated**

- *Before you actuate the tractor control unit,*  
check the selected hydraulic function of the Comfort hydraulic system.

With the Comfort hydraulic machine, the same tractor control unit can be used to execute different hydraulic functions.

- See *"Using the Comfort hydraulic system"* in the ISOBUS operating manual.

## 7.4 Turning on the headlands

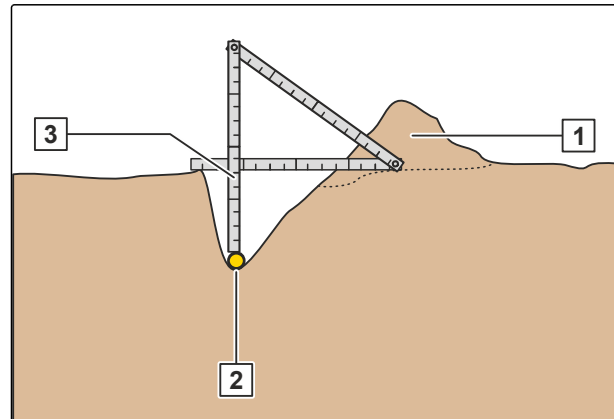
CMS-T-00001922-B.1

1. *To ensure filling of the singling discs,*  
make sure that there is an overpressure of at least 20 mbar in the grain singling unit.
2. *To prevent lateral loads when driving in curves on the headlands,*  
raise the soil tillage tools.
3. *When the direction of the implement matches that of the direction of travel,*  
lower the soil tillage tools.

## 7.5 Checking the placement depth

CMS-T-00004517-C.1

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



CMS-I-00003257

## 7.6 Using the shifted tramline

CMS-T-00005493-B.1



### REQUIREMENTS

- ✓ The fan is running



### WARNING

#### Specific coulters are hydraulically shifted

The shifting procedure cannot be stopped.  
Only a bit of space remains between the coulters.

- Keep people out of the danger area of the implement.

1. *To adjust the tramline width for the cultivating implement,*  
see "Adjusting the shifted tramline".
2. *To configure the shifted tramline,*  
see "ISOBUS software operating manual" > "Configuring the tramline control".
3. *To shift the coulters,*  
drive into the upcoming tramline with the implement lifted.

or

*If the coulters have not reached the end position,*  
slowly drive up with the implement lowered.

## 7.7 Using the track marker

CMS-T-00005898-A.1

If the implement is lifted when "Change" is pre-selected, the job computer actuates the track marker valves. If work is started without actuating the tractor control unit, the position will be faulty. The active track marker folds in partially due to the ground resistance. The opposite track marker is partially extended due to the oil overflowing.

- *To prevent the track marker from moving to a faulty position,*  
actuate the "green" tractor control unit.

# Eliminating faults

# 8

CMS-T-00005550-D.1

Errors	Cause	Solution
Track marker collision protection has been triggered.	The track marker has encountered a solid obstacle. The shear bolt is torn and the track marker folded to the rear.	see page 172
Gaps can be caused by insufficient seed in the grain singling unit.	Bridge formation disturbs the seed flow in the grain singling unit.	see page 172
An increased cleaning effort of the opto-sensor is observed.	Talc in the seed shortens the cleaning interval of the opto-sensor.	► Clean the opto-sensor.
The seed is not caught and jumps out of the furrow.	The seed collides against the catch roller or against the seed furrow.	see page 173
The control terminal shows a spread rate error.	The shot channel is blocked.	see page 173
The control terminal shows a speed error.	Check the gap on the inductive sensor. Defect on the mechanical drive.	► Adjust the distance between the inductive sensor and pulse wheel to 1-2 mm.
Press rollers get blocked.	Clods or stones get jammed between the press rollers.	see page 173
Blocking the depth control wheels.	Soil gets stuck between the cutting discs and the depth control wheels with closed rim.	see page 174
	Organic residues get stuck on the open rims.	see page 174
The electric drives do not run or start running at the wrong time.	The switch points of the working position sensor are wrong.	► <i>To configure the working position sensor, see "Configuring the working position sensor".</i>
The lighting for road travel has a malfunction.	Lamp or lighting supply line is damaged.	► Replace the lamp. ► Replace the lighting supply line.
Stopping of one or several singling discs.	The fuse for the electric drive is defective.	see page 174
	Fuse for the mechanical drive is defective.	see page 175

Errors	Cause	Solution
The grain spacings are larger than the setpoint.	Too much slip on the drive wheels.	► <i>To configure the working position sensor, see "Configuring the working position sensor".</i>
	Too much slip on the drive wheels.	► <i>To configure the working position sensor, see "Configuring the working position sensor".</i>
Speed fluctuations on the hydraulic drive.	Speed fluctuations occur on the hydraulic drive.	► Contact your specialist workshop.
The fill level in the singling unit housing is too high.	The brushes of the filling block are worn.	see page 175
The fertiliser coupling is leaky.	The funnels for the fertiliser coupling are misadjusted.	see page 176
The seed furrow is unstable or does not maintain its shape.	The furrow former is worn.	► <i>To replace the furrow former, see "Changing the furrow former".</i>

### Track marker collision protection has been triggered

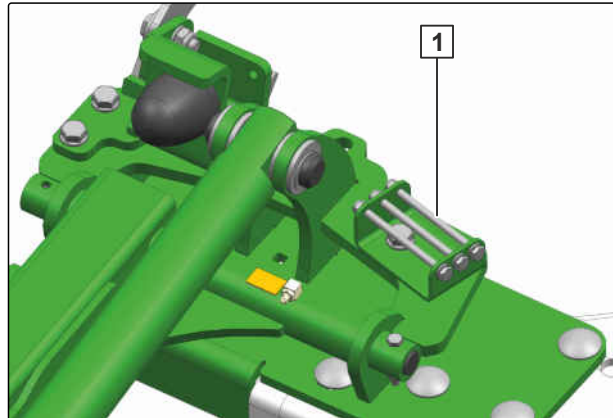
CMS-T-00005551-B.1



#### NOTE

Only use original bolts as a replacement. Refer to the online spare parts list. Spare bolts are in the track marker bracket **1**.

1. Remove the damaged bolt from the overload safety.
2. Insert the spare bolt in the track marker boom.
3. Tighten the spare bolt.



CMS-I-00002081

### Gaps due to insufficient seed in the grain singling unit

CMS-T-00002346-A.1



#### NOTE

Talc in the seed shortens the cleaning interval of the opto-sensor.

Do not use graphite. Graphite disturbs the function of the opto-sensor.

- *To improve the flow of seed, adjust the sliding shutter.*

or

*If the grain shape and dressing cause the formation of bridges, improve the sliding capacity of the seed by adding 1.6 g of talc per 1 kg of seed.*



## Seed is not caught and jumps out of the furrow

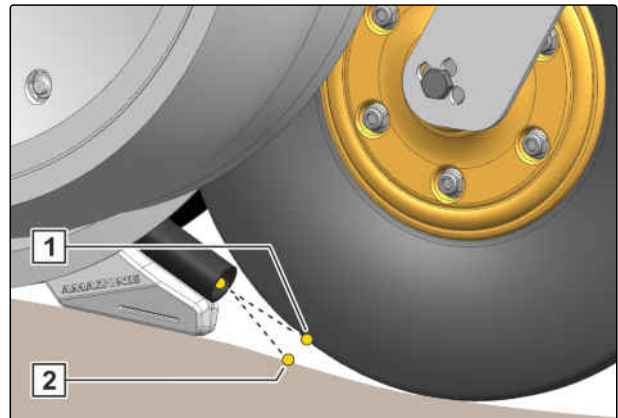
CMS-T-00002347-C.1

**NOTE**

If the seed collides against the catch roller **1** or the seed furrow **2**, it is not reliably caught. The position of the catch roller can be adjusted.

The position of the catch roller must be adjusted by trained specialist personnel.

- Contact your specialist workshop.

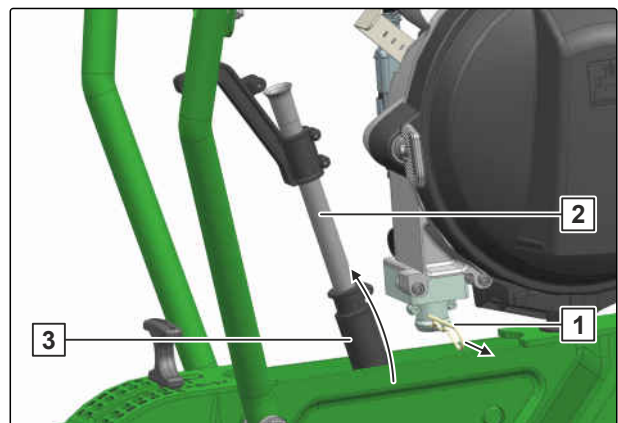


CMS-I-00001925

## Control terminal shows a spread rate error

CMS-T-00002348-B.1

1. Remove the spring cotter pin **1**.
2. Press the shot channel **2** down against the spring element **3**.
3. Remove the shot channel upwards.
4. Clean the shot channel.
5. Install the shot channel.
6. Secure the shot channel with a spring cotter pin **1**.



CMS-I-00002040

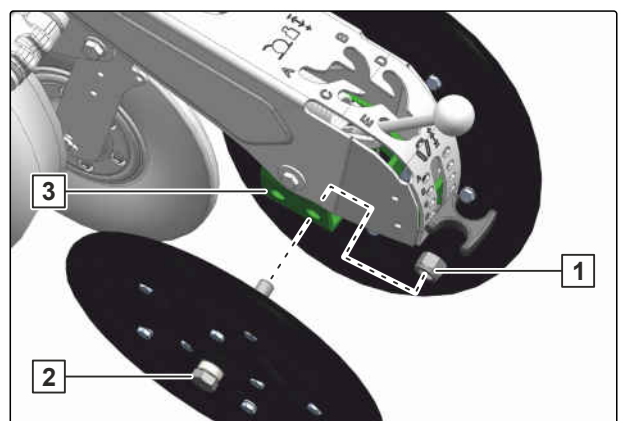
## Blocking of the press rollers

CMS-T-00002373-B.1

**NOTE**

Offset installation is not possible in conjunction with disc closers.

1. Unscrew the nut **1** and remove it.
2. Remove the press roller.
3. *To increase the throughput on the press rollers, install the press roller with offset.*



CMS-I-00002041

4. Install the press roller with the bolt **2** in the hole **3**.
5. Put on the nut and tighten it.

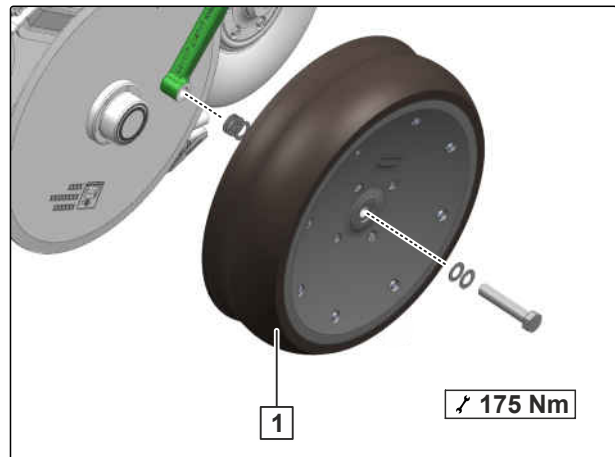
### Blocking the depth control wheels

CMS-T-00007530-B.1

- Remove the depth control wheels **1** and clean them

or

*If the predominant operating conditions do not allow for continuous operation of the implement,*  
replace the depth control wheels with closed rim with depth control wheels with open rim.



CMS-I-00005302

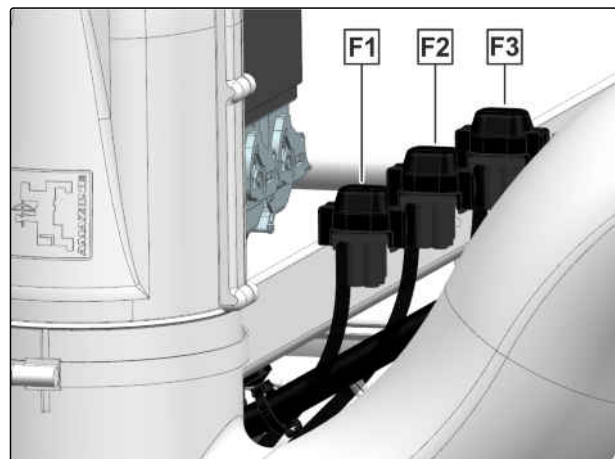
- Clean the depth control wheels

or

*If the predominant operating conditions do not allow for continuous operation of the implement,*  
replace the depth control wheels with open rim with depth control wheels with closed rim.

### Stopping of one or several singling discs

CMS-T-00003677-B.1

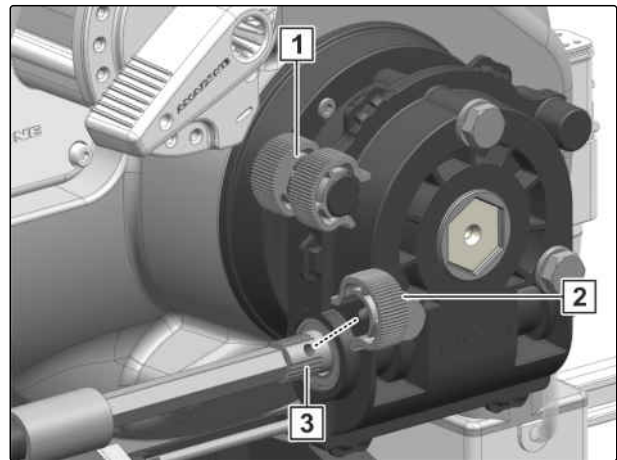


CMS-I-00002695

10-amp fuse	Protected rows
<b>F1</b>	Row 1 to 4
<b>F2</b>	Row 5 to 8
<b>F3</b>	Row 8 to 12

1. Clean the singling unit.
2. Check the singling disc for ease of movement.
3. Replace defective fuses.

1. Remove the defective shear pin **2**.
2. Remove the defective shear pin from the drive shaft **3**.
3. Clean the singling unit.
4. Check the singling disc for ease of movement.
5. Install the new shear pin **1**.



CMS-I-00002696

#### Fill level in the singling unit housing is too high

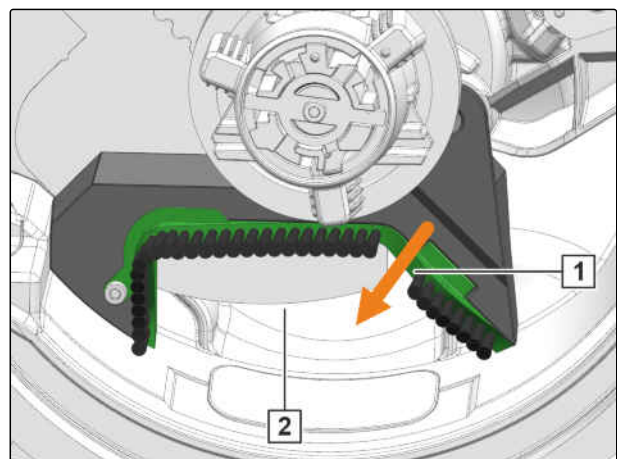
CMS-T-00008170-A.1

The scraper removes excess seed from the singling disc. If the brushes of the filling block are worn, the seed does not flow back into the storage area **2** within the filling block.

- To replace the defective filling block, see "Changing the singling disc"

or

contact your specialist workshop.



CMS-I-00005635

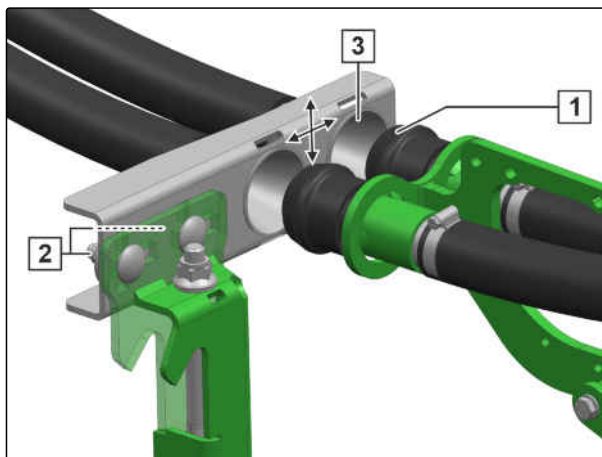
### The fertiliser coupling is leaky

CMS-T-00008171-A.1

As soon as the folding frame has been moved into working position, the funnels **3** move onto the conical mounts **1**.

If the conical mounts are not flush with the funnels and the conveyor section has leaks, the funnels need to be aligned.

1. Unfold the implement until the funnels are just in front of the conical mounts.
2. Loosen the bolts **2**.
3. Align the funnels centred in front of the conical mounts.
4. Tighten the bolts.



CMS-I-00005639

## Parking the machine

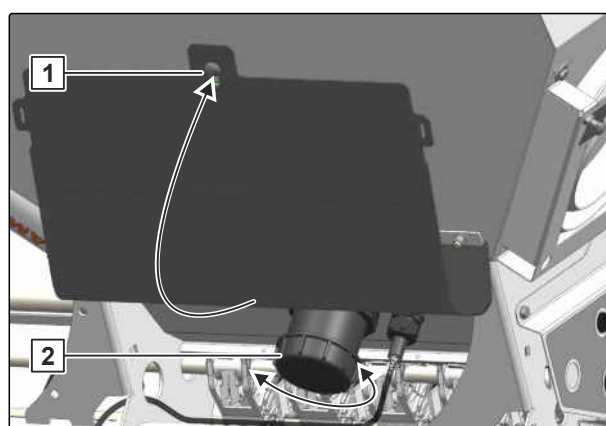
9

CMS-T-00005562-D.1

### 9.1 Emptying the fertiliser hopper

CMS-T-00001915-C.1

1. Open the spray protection **1**.
2. Open the residual emptying **2**.
3. Collect the residual quantity from the hopper tips on both sides.
4. Close the residual emptying.
5. Close the spray protection.



CMS-I-00001993

### 9.2 Emptying the seed hopper through the residual quantity flap

CMS-T-00001917-C.1



#### REQUIREMENTS

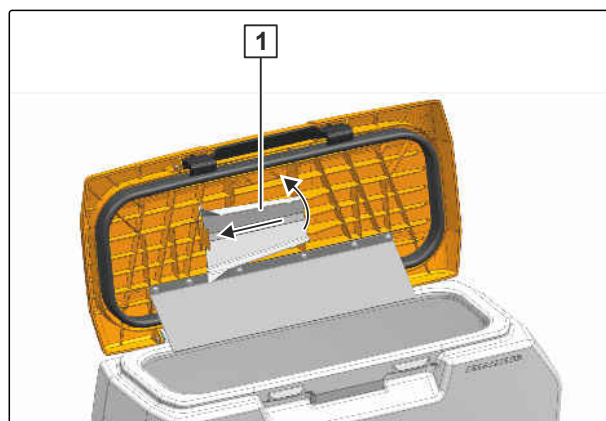
- ✓ The implement is coupled to the tractor
- ✓ The tractor and implement are secured



#### NOTE

The parking position for the chute is in the hopper cover for row 1.

1. Take out the chute **1**.



CMS-I-00001888

## 9 | Parking the machine

### Emptying the seed hopper through the singling disc

- Hook the chute **1** onto the singling unit.

#### **NOTE**

When the collection bucket is hooked onto the chute, the chute can be loaded with a maximum of 12 kg.

- Put the collection bucket **2** under the chute

or

Hook the collection bucket **2** onto the chute.

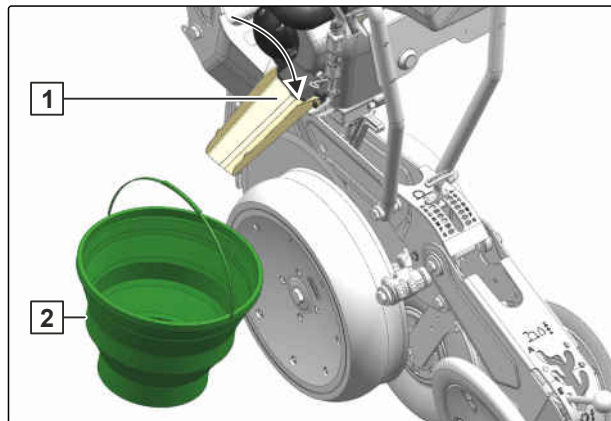
- Open the locking spring **1**.

➔ The flap **2** is opened and the residual quantity is collected.

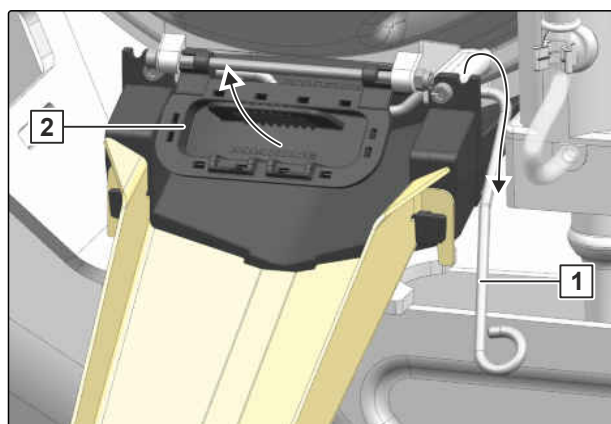
- When the residual quantity has been collected, park the chute back into the hopper cover.

- Close the flap.

- Lock the locking spring.



CMS-I-00001995



CMS-I-00001996

## 9.3 Emptying the seed hopper through the singling disc

CMS-T-00002194-C.1



#### **REQUIREMENTS**

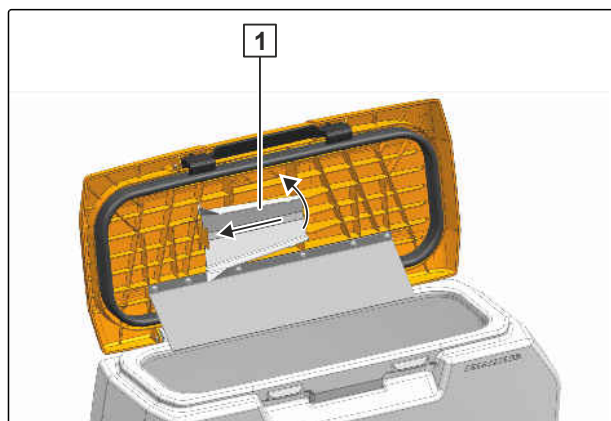
- ✓ The implement is coupled to the tractor
- ✓ The tractor and implement are secured



#### **NOTE**

The parking position for the chute is in the hopper cover for row 1.

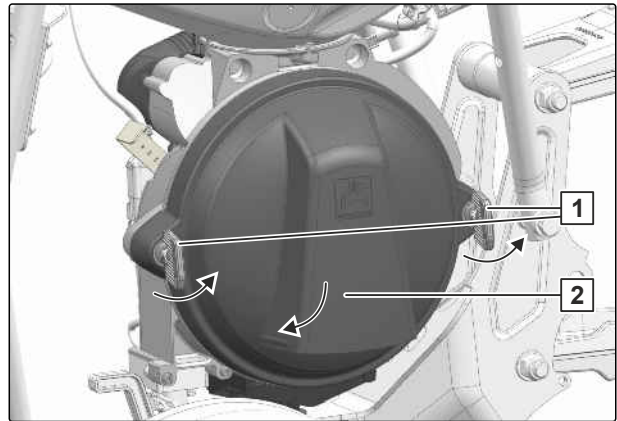
- Take out the chute **1**.



CMS-I-00001888



2. Open the locks **1**.
3. Remove the cover **2**.



CMS-I-00001909

4. Hook the chute **1** onto the singling unit.

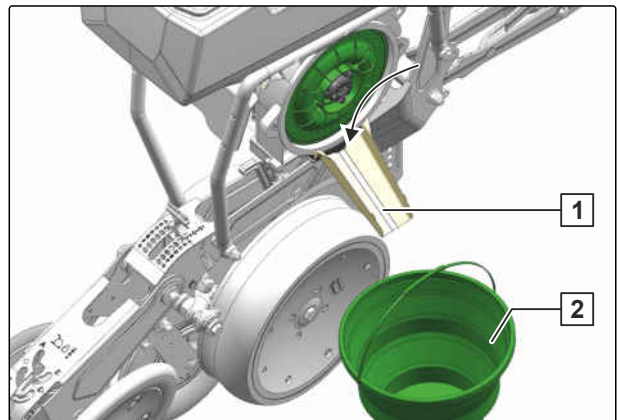
**i NOTE**

When the collection bucket is hooked onto the chute, the chute can be loaded with a maximum of 12 kg.

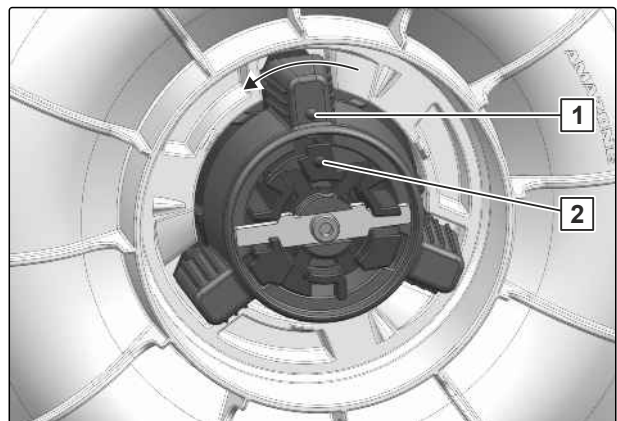
5. Put the collection bucket **2** under the chute.  
or

Hook the collection bucket **2** onto the chute.

6. Put the collection bucket **2** under the chute.
7. Release the lock **1** until the points **2** are aligned.



CMS-I-00001997



CMS-I-00001910

## 9 | Parking the machine

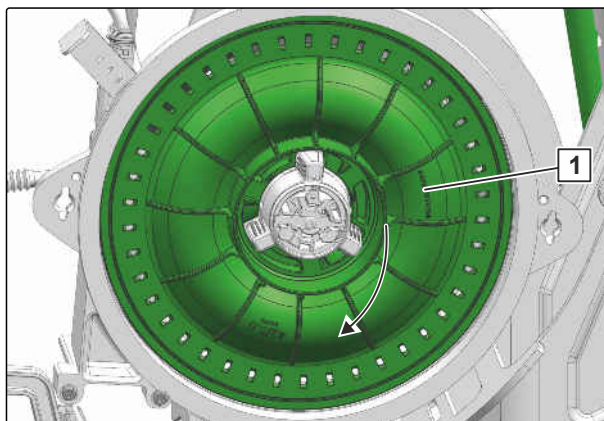
### Emptying the seed hopper through the singling disc

8. To collect the residual quantity, remove the singling disc **1** from the drive hub.

#### **i** NOTE

When the collection bucket is hooked onto the chute, the chute can be loaded with a maximum of 12 kg.

9. When the residual quantity has been collected, park the chute back into the hopper cover.

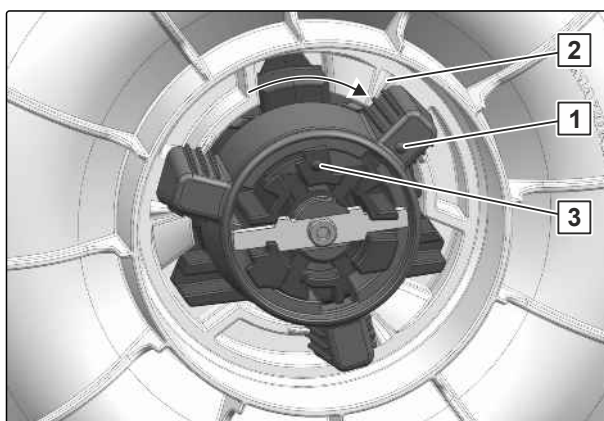


CMS-I-00001912

10. Position the singling disc **1** on the drive hub.

11. Turn the lock **1** beyond the notch **2**.

➔ The points **3** are no longer aligned.



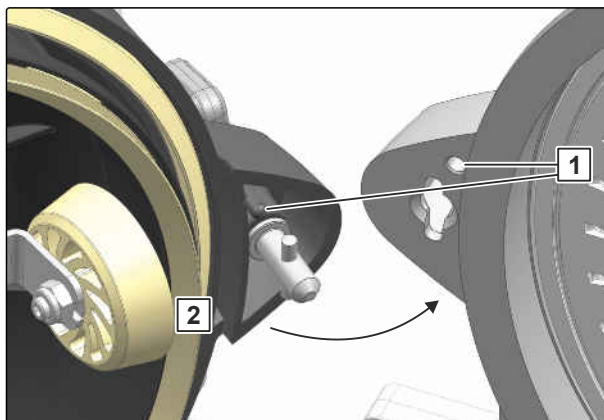
CMS-I-00001911

12. Close the cover **2**.

#### **i** NOTE

Pay attention to the guide pin **1**.

13. Close the locks.



CMS-I-00001913



## 9.4 Emptying the fertiliser metering unit

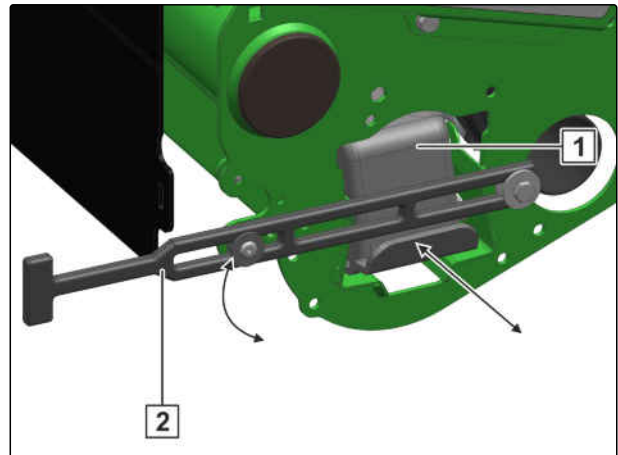
CMS-T-00003599-B.1

1. Switch off the fan.
2. Release the lock **2** and swivel it downwards.
3. *To take the calibration buckets out of the parking position on implements with hydraulic fan drive,*  
pull out the interlocked calibration buckets **1** to the side.

or

*To take the calibration buckets out of the parking position on implements with mechanical fan drive,*

pull out the calibration buckets individually to the side on the left and right.



CMS-I-00001932

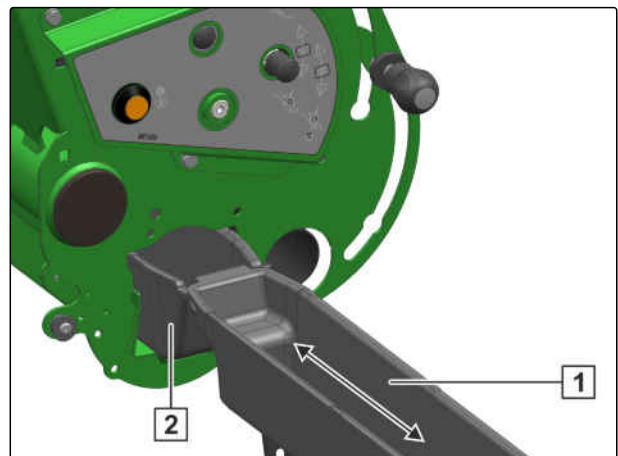
4. *To move the calibration buckets into calibration position on implements with hydraulic fan drive,*  
slide the calibration bucket **2** under the metering unit with the opening facing up.

5. Hook on the calibration bucket **1** with the opening facing up and slide it under the metering unit.

or

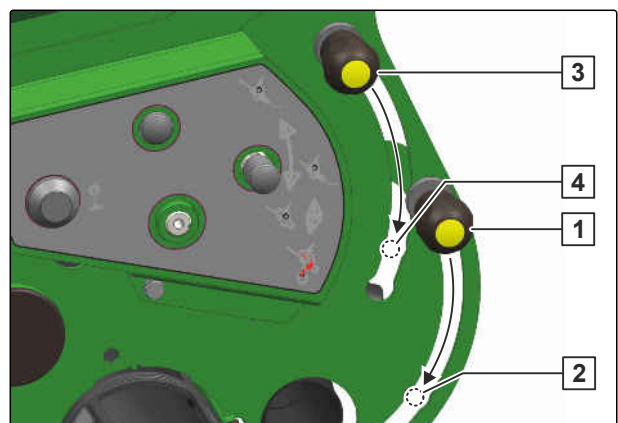
*To move the calibration buckets into calibration position on implements with mechanical fan drive,*

slide the calibration buckets individually under the metering units from the left and right.



CMS-I-00001931

6. *To move the calibration flap lever to the calibration position,*  
press and hold the lock button **1** and push it down **2**.
7. *To move the bottom flap lever to the emptying position,*  
press and hold the lock button **3** and push it down **4**.
8. Take out the residual quantity.

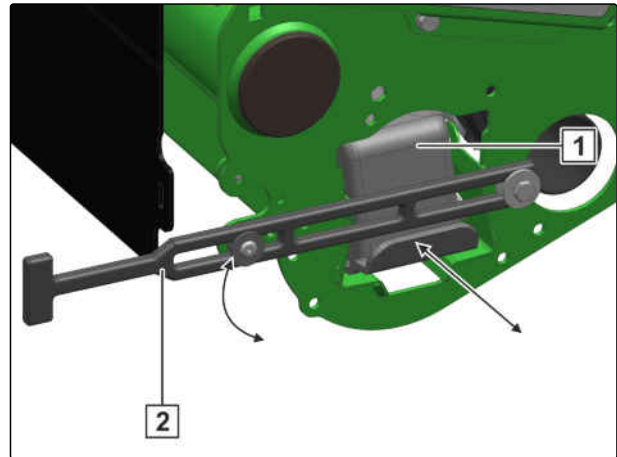


CMS-I-00001994

## 9 | Parking the machine

### Emptying the micropellet hopper

9. Empty the calibration bucket.
10. *To prevent soiling of the calibration buckets,* slide the calibration bucket **1** under the metering unit with the opening facing down.
11. Swivel up the lock **2** and close it.
12. *To move the calibration flap lever into working position,* press and hold the lock button and push it upwards.
13. *To move the bottom flap lever into working position,* press and hold the lock button and push it upwards.



CMS-I-00001932

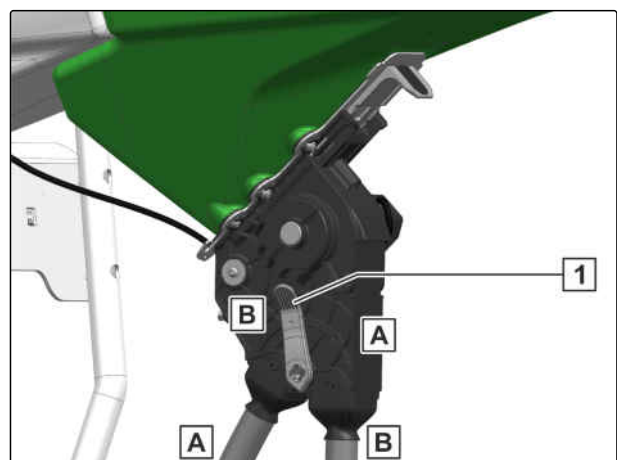
## 9.5 Emptying the micropellet hopper

CMS-T-00003603-A.1

1. Close the the sliding shutter **1** on the micropellet hopper.
2. Move the switchover flap **1** to position **A**.

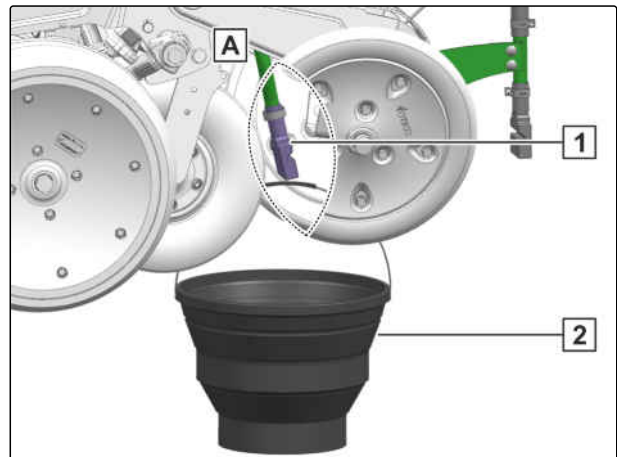


CMS-I-00002586



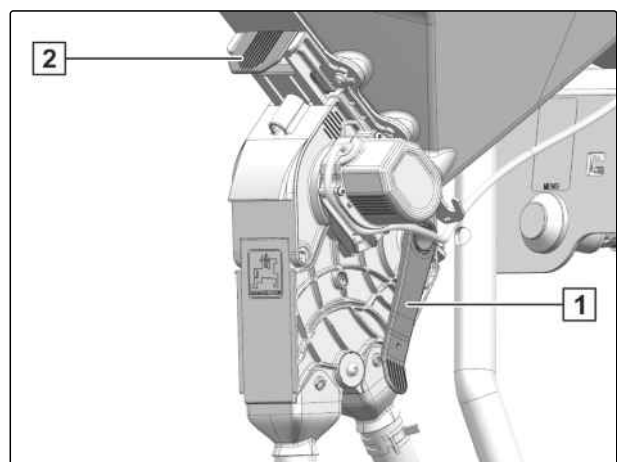
CMS-I-00002580

3. Put the collapsible bucket **2** under the activated micropellet outlet **1**.



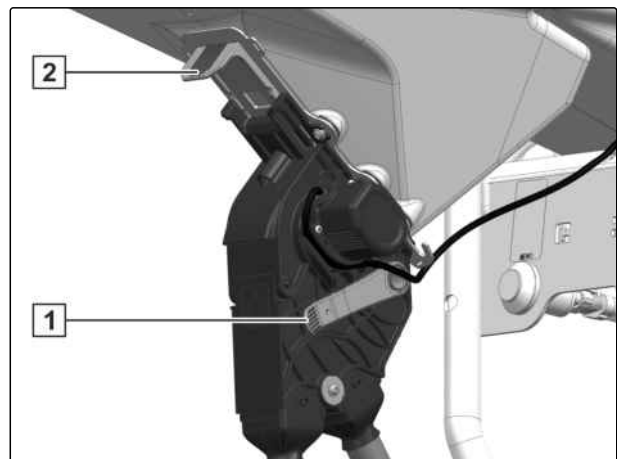
CMS-I-00002621

4. Relieve the bottom flap lever **1**.
  5. Slowly open the sliding shutter **1**.
- ➔ The micropellets are collected in the collapsible bucket.



CMS-I-00002576

6. *When the residual quantity has be fully collected,*  
move the bottom flap lever **1** back into working position.
7. Open the sliding shutter **2** completely.

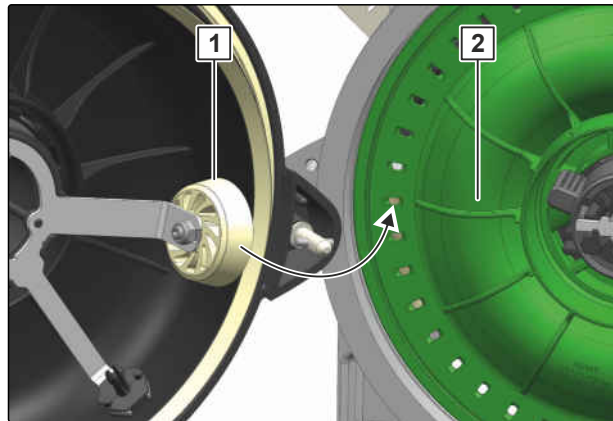


CMS-I-00002622

## 9.6 Relieving the hole covering rollers

CMS-T-00002211-A.1

To ensure the concentricity of the hole covering rollers **1**, the hole covering rollers must be relieved when they are not used for longer periods. To do so, the singling discs **2** must be removed from all of the grain singling units.



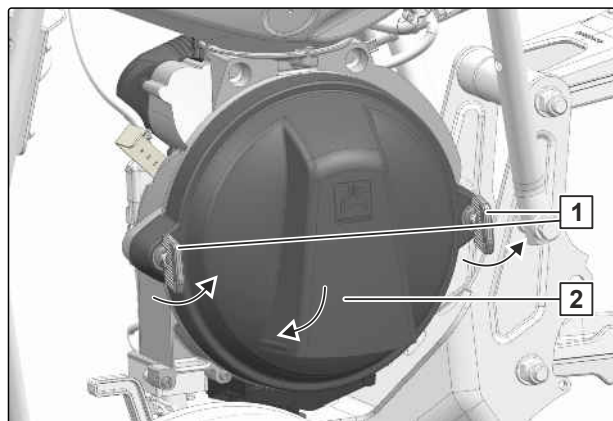
CMS-I-00002023



### REQUIREMENTS

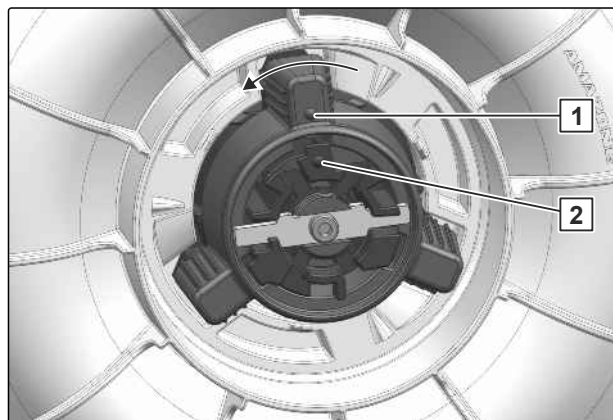
- ✓ The implement is coupled to the tractor
- ✓ The tractor and implement are secured

1. Open the locks **1**.
2. Remove the cover **2**.



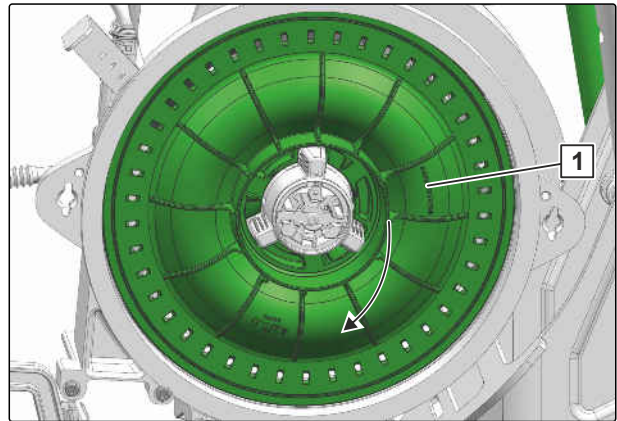
CMS-I-00001909

3. Release the lock **1** until the points **2** are aligned.



CMS-I-00001910

4. remove the singling disc **1** from the drive hub.
5. Keep the singling disc in the seed hopper.



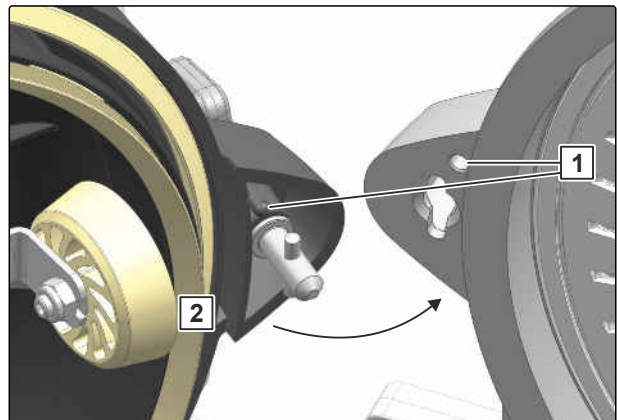
CMS-I-00001912

6. Close the cover **2**.

### **i** NOTE

Pay attention to the guide pin **1**.

7. Close the locks.



CMS-I-00001913

## 9.7 Parking the pivoting wheel mark eradicator

CMS-T-00005564-A.1

### **✓** REQUIREMENTS

- ✓ The tractor and implement are secured

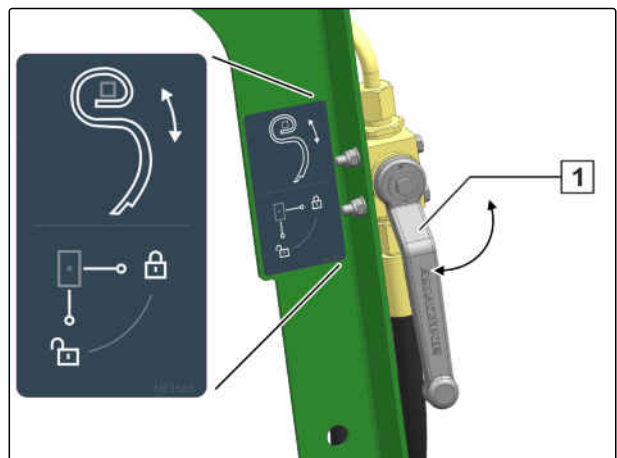
### **⚙** IMPORTANT

#### Damage to the wheel mark eradicator

- *Before parking the implement on solid ground, move the wheel mark eradicators into parking position.*

1. fold the implement.
2. *To deactivate the track marker, put the control lever **1** in the locked position.*

➔ The wheel mark eradicator now remains in the parking position.



CMS-I-00003938

## 9.8 Parking the wheel mark eradicator

CMS-T-00001919-B.1



### REQUIREMENTS

- ✓ The implement is raised
- ✓ The fan is switched off
- ✓ The tractor and implement are secured

Depending on the implement equipment, the topmost position can differ.

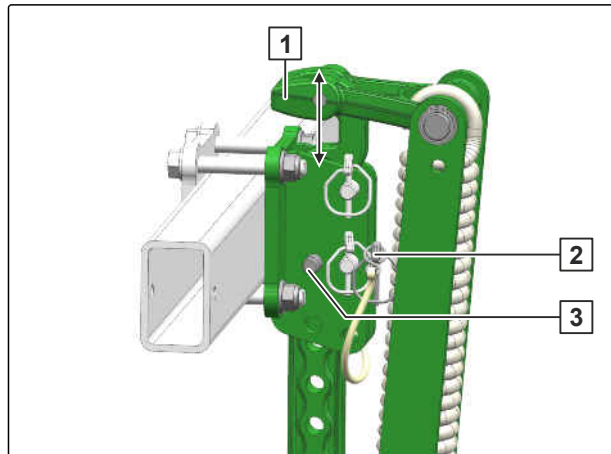


### IMPORTANT

#### Damage to the wheel mark eradicator

- *Before parking the implement on solid ground,*  
move the wheel mark eradicators into parking position.

1. Remove the linch pin **1** from the locking pin **3**.
2. Hold the wheel mark eradicator by the recessed grip **2**.
3. Remove the locking pin **3**.
4. Move the wheel mark eradicator into the topmost position.
5. Secure the wheel mark eradicator with the locking pin.
6. Secure the locking pin with the linch pin.



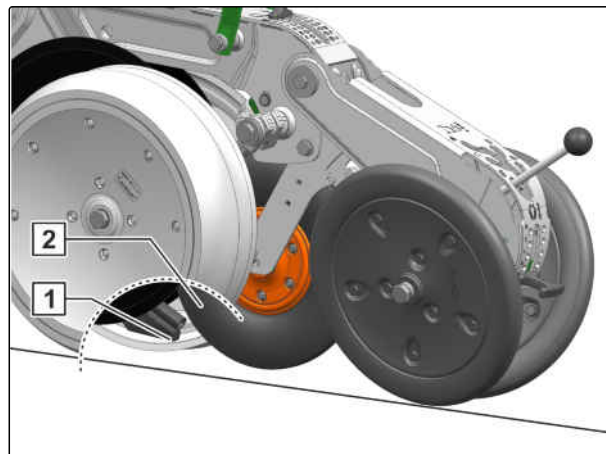
CMS-I-00000942



## 9.9 Parking the PreTeC coulter

CMS-T-00001920-D.1

In the **P** position, the lowered depth control wheels protect the furrow formers **1** and catch roller **2**.

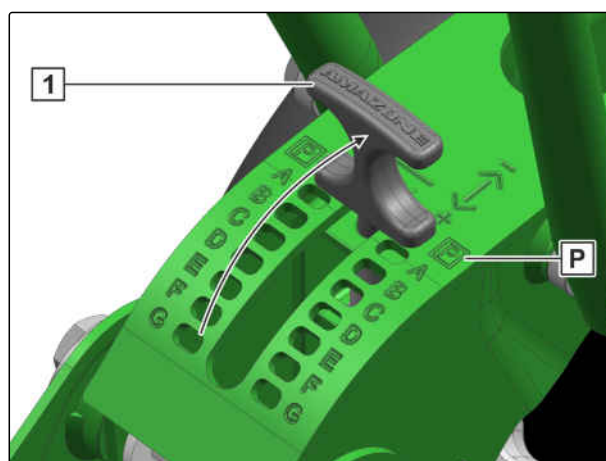


CMS-I-00001999



### REQUIREMENTS

- ✓ The implement is raised
  - ✓ The fan is switched off
1. Move the setting lever **1** to the topmost position **P**.
  2. Lock the setting lever in the grid.



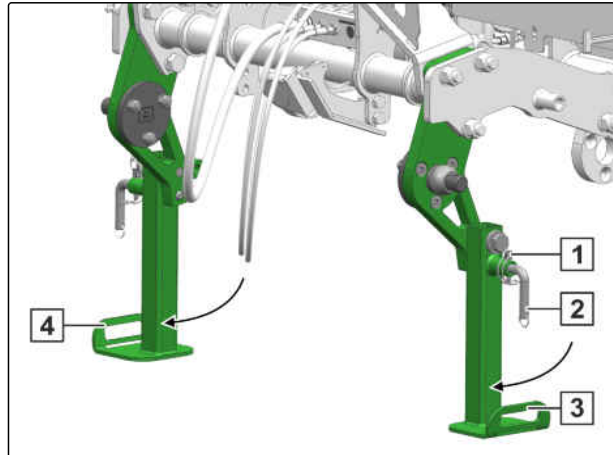
CMS-I-00001998

## 9.10 Lowering the jacks

CMS-T-00005563-A.1

The Precea 6000-2CC has swivelling jacks.

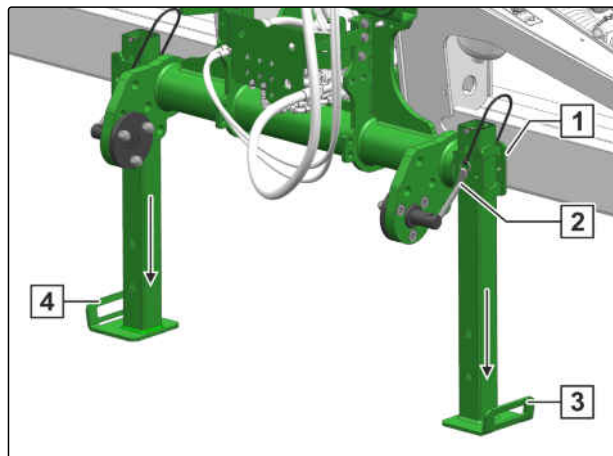
1. *To relieve the jacks,*  
Raise the implement.
2. Pull out the spring cotter pin **1**.
3. Remove the pin **2**.
4. Swivel the jack down by the handle **3**.
5. Secure the jack with a pin.
6. Secure the pin with a spring cotter pin.
7. Repeat the procedure for the second jack **4**.



CMS-I-00004099

The Precea 6000-2 or 6000-2FCC has sliding jacks.

8. *To relieve the jacks,*  
Raise the implement.
9. Pull out the spring cotter pin **1**.
10. Remove the pin **2**.
11. Push the jack down by the handle **3**.
12. Secure the jack with a pin.
13. Secure the pin with a spring cotter pin.
14. Repeat the procedure for the second jack **4**.



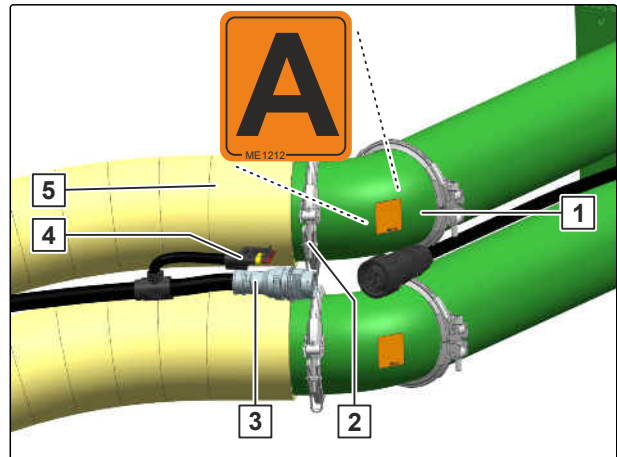
CMS-I-00004100



## 9.11 Disconnecting the supply lines from the front-mounted hopper

CMS-T-00004440-B.1

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

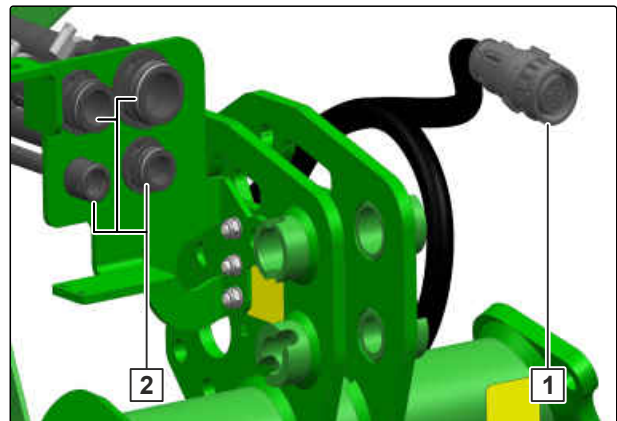


CMS-I-00003124

## 9.12 Disconnecting the supply lines from the front hopper

CMS-T-00010804-A.1

1. Disconnect the plug for the ISOBUS line **1** from the front hopper.
2. Disconnect the supply lines **2** from the conveyor hoses of the front hopper.

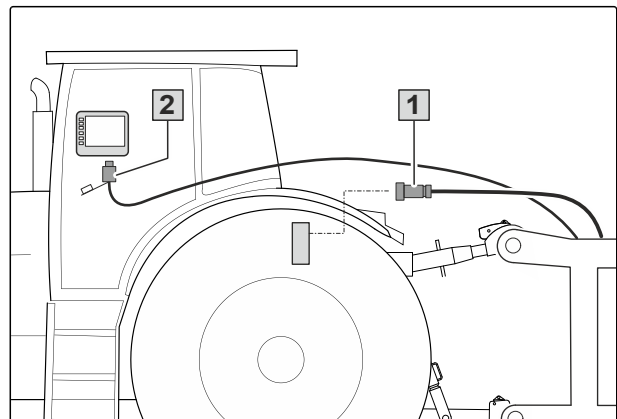


CMS-I-00007399

## 9.13 Uncoupling the ISOBUS or control computer

CMS-T-00006174-D.1

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

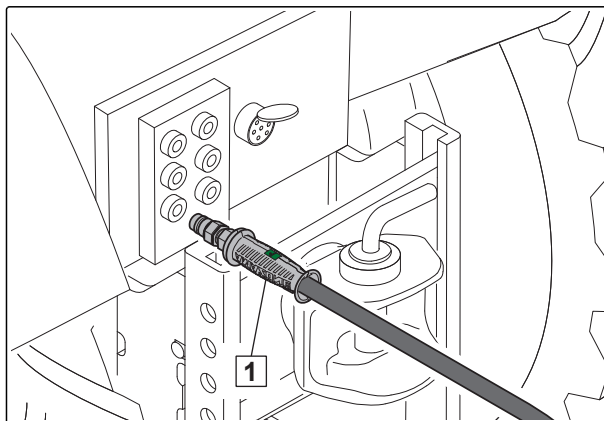


CMS-I-00006891

## 9.14 Disconnecting the hydraulic hose lines

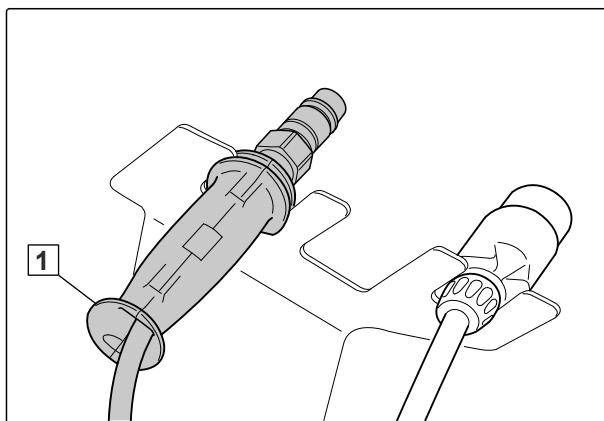
CMS-T-00000277-E.1

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



CMS-I-00001065

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

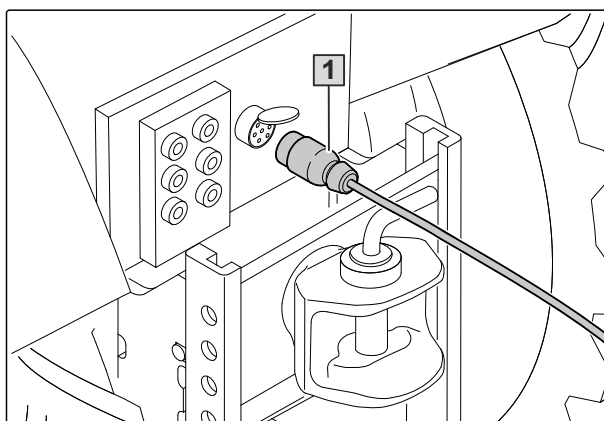


CMS-I-00001250

## 9.15 Uncoupling the power supply

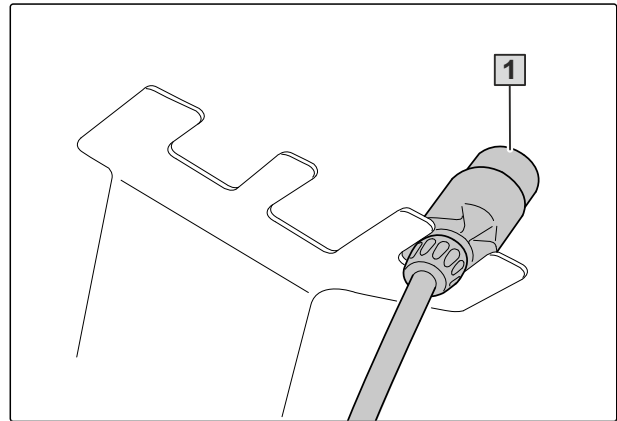
CMS-T-00001402-G.1

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



CMS-I-00001048

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

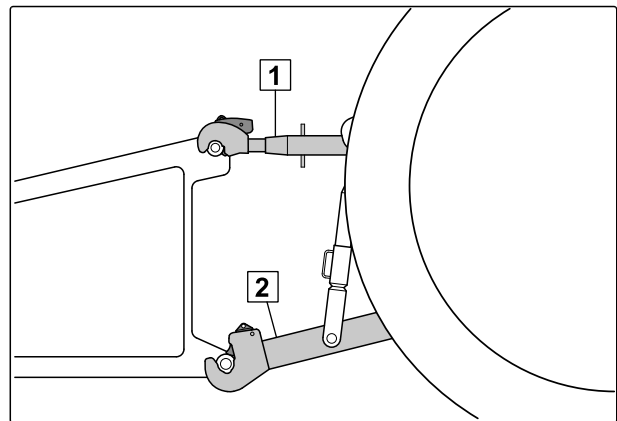


CMS-I-00001248

## 9.16 Uncoupling the 3-point mounting frame

CMS-T-00001401-C.1

1. Park the implement on a level surface with solid ground.
2. Release the top link **1**.
3. Uncouple the top link **1** from the implement.
4. Release the lower links **2**.
5. Uncouple the lower links **2** from the implement from the tractor seat.

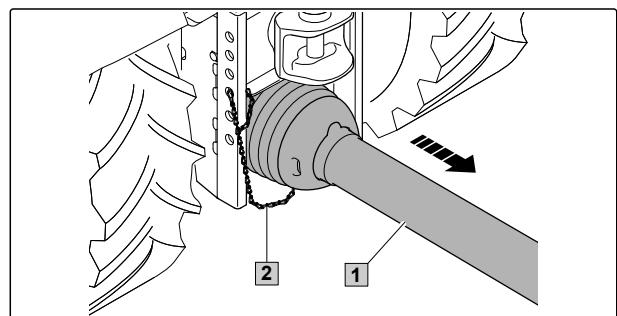


CMS-I-00001249

## 9.17 Uncoupling the universal joint shaft

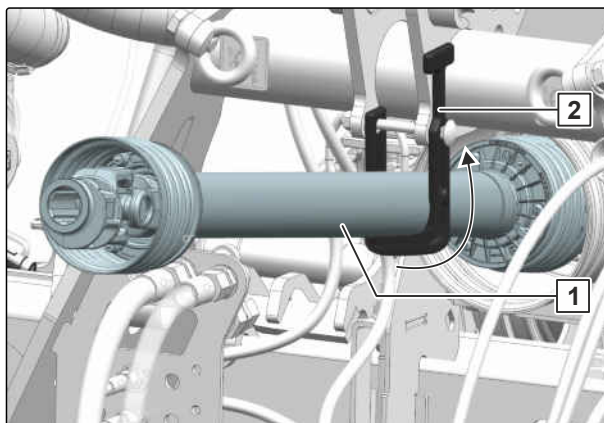
CMS-T-00001843-B.1

1. Remove the safety chain **2** from the tractor.
2. Release the lock of the universal joint shaft **1**.
3. Pull off the universal joint shaft from the tractor PTO shaft.



CMS-I-00001069

4. Put the universal joint shaft **1** into the parking position with the rubber strap **2**.

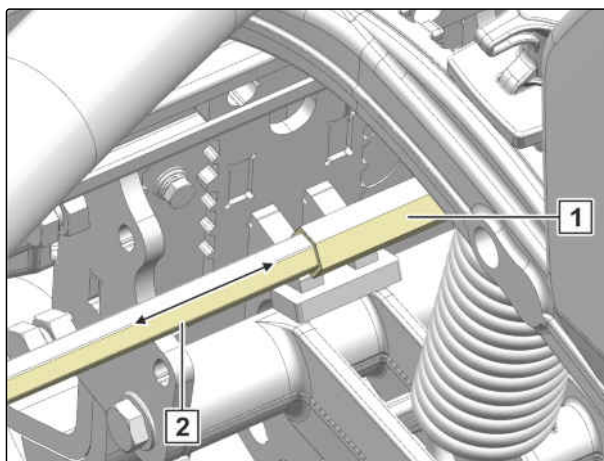


CMS-I-00001935

### 9.18 Conserving the drive shaft

CMS-T-00003870-A.1

- *To ensure that the drive shafts can be smoothly telescoped,*  
seal the shafts with a non-adhesive conservation agent after washing.



CMS-I-00002825

# Repairing the machine

# 10

CMS-T-00005547-D.1

## 10.1 Maintaining the machine

CMS-T-00005899-D.1

### 10.1.1 Maintenance schedule

<b>After initial operation</b>	
Checking the wheel bolt tightening torque	see page 201
Checking the tightening torque for the radar sensor bolts	see page 202
Checking the frame connection tightening torque	see page 202
Checking the coulter connection tightening torque	see page 203
Checking the running gear connection tightening torque	see page 203
Checking the hydraulic hose lines	see page 204
<b>After the first 250 operating hours</b>	
Checking the tyre inflation pressure	see page 203
<b>at the end of the season</b>	
Cleaning the distributor head	see page 220
<b>as required</b>	
Emptying the folding cylinder hydraulic accumulator	see page 221
<b>daily</b>	
Checking the top link pin and lower link pin	see page 204

<b>Every 12 months</b>	
Checking the tightening torque for the radar sensor bolts	see page 202
Checking the frame connection tightening torque	see page 202
Checking the coulter connection tightening torque	see page 203
Checking the running gear connection tightening torque	see page 203

<b>Every 50 operating hours</b>	
Checking the wheel bolt tightening torque	see page 201

<b>Every 10 operating hours / daily</b>	
Cleaning the cyclone separator	see page 206
Cleaning the suction basket	see page 206
Cleaning the fertiliser metering unit	see page 210
Cleaning the micropellet metering unit	see page 211
Clean the singling unit	see page 214

<b>Every 50 operating hours / weekly</b>	
Checking the hydraulic hose lines	see page 204

<b>Every 50 operating hours / as required</b>	
Cleaning the fan rotor	see page 205
Cleaning the opto-sensor	see page 215

<b>Every 50 operating hours / Every 3 months</b>	
Adjusting the cutting disc drive on the PreTeC mulch seeding coulter	see page 197
Checking the wheel mark eradicator coulter	see page 220

<b>Every 100 operating hours / as required</b>	
Adjusting the cutting disc distance on the PreTeC mulch seeding coulter	see page 196
Adjusting the cutting disc distance on the FerTeC Twin coulter	see page 200

Every 100 operating hours / Every 3 months	
Checking and replacing the cutting discs on the PreTeC mulch seeding coulters	see page 195
Checking and replacing the closer discs on the PreTeC mulch seeding coulters	see page 198
Checking and replacing the cutting disc on the FerTeC Twin coulters	see page 199
Checking and replacing the inner scraper on the FerTeC Twin coulters	see page 200

Every 100 operating hours / Every 12 months	
Cleaning the filling auger	see page 207
Cleaning the fertiliser hopper	see page 208
Adjusting the micropellet metering unit bottom flap	see page 213

### 10.1.2 Checking and replacing the cutting discs on the PreTeC mulch seeding coulters

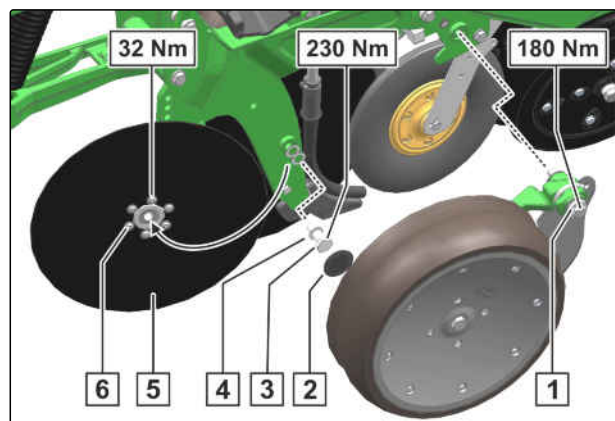
CMS-T-00002375-F.1



#### INTERVAL

- Every 100 operating hours  
or  
Every 3 months

1. Determine the cutting disc diameter.
2. *If the diameter of the cutting discs is less than 360 ml:*  
replace the cutting discs.
3. Remove the depth control wheel along with the bracket **1**.
4. Remove the dust caps **2**.



CMS-I-00002044



#### NOTE

The central bolts have different threads:

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

5. Unscrew and remove the central bolts **3**.
6. Remove worn cutting discs **5**.



7. Unscrew and remove the bolts on the bearing seat **6**.
8. Replace worn cutting discs with new cutting discs.
9. Put on and tighten the bolts on the bearing seat.
10. Install new cutting discs.
11. *To ensure that the cutting discs touch slightly,* adjust the spacing of the cutting discs with the spacer discs **4**.
12. Install spacer discs that are not required on the opposite side of the cutting disc bearing with the central bolt.
13. Put on and tighten the central bolt.
14. Install the dust caps.
15. Install the depth control wheel along with the bracket.
16. Put on and tighten the bolt.

### 10.1.3 Adjusting the cutting disc distance on the PreTeC mulch seeding coulters

CMS-T-00002376-E.1



#### INTERVAL

- Every 100 operating hours  
or  
as required

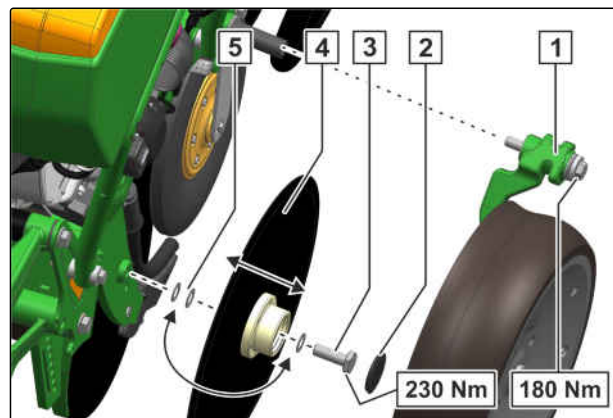
1. Remove the depth control wheel along with the bracket **1**.
2. Remove the dust caps **2**.
3. Unscrew and remove the central bolts **3**.



#### NOTE

The central bolts have different threads:

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



CMS-I-00002017

4. *To ensure that the cutting discs touch slightly,*  
remove **5**  
  
or  
  
add the spacer discs as required.
5. Install spacer discs that are not required on the opposite side of the cutting disc bearing with the central bolt.
6. Put on and tighten the central bolt.
7. Install the dust caps.
8. Install the depth control wheel along with the bracket.

#### 10.1.4 Adjusting the cutting disc drive on the PreTeC mulch seeding coulter

CMS-T-00002377-G.1

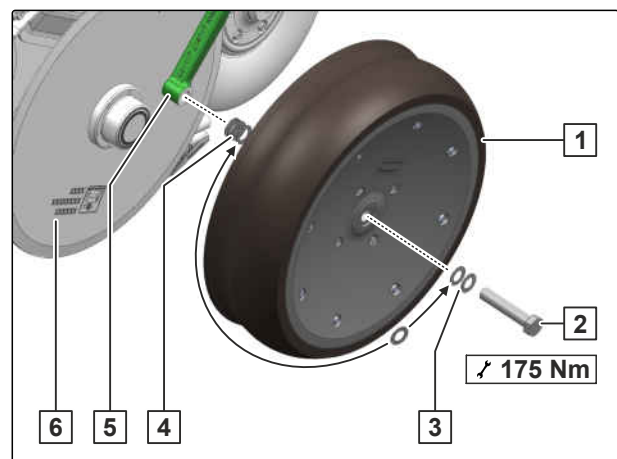
**INTERVAL**

- Every 50 operating hours
- or
- Every 3 months

1. Remove the bolt **2**.
2. Remove the depth control wheel **1**.

The depth control wheel drives the cutting disc through rotation.

3. *To ensure that the depth control wheel **1** slightly touches the cutting disc **6**,*  
adjust the distance of the depth control wheel with the spacer discs **3** and **4**.
4. *Spacer discs that are not needed are fastened to the depth control wheel arm **5**.*  
Fasten the discs on the opposite side using the bolt.



CMS-I-00002016

### 10.1.5 Checking and replacing the closer discs on the PreTeC mulch seeding coulters

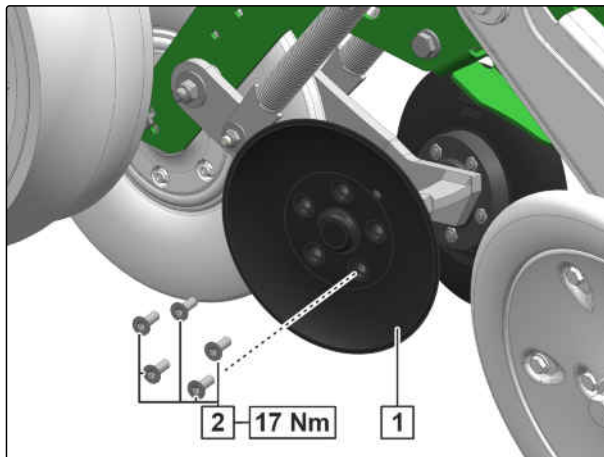
CMS-T-00008304-C.1



#### INTERVAL

- Every 100 operating hours  
or  
Every 3 months

1. Determine the diameter of the closer discs.
2. *If the diameter of the closer discs is smaller than 180 mm,*  
replace the closer discs in pairs.
3. Loosen and remove the bolts **2**.
4. Replace worn closer discs **1** with new closer discs.
5. Put on and tighten the bolts.



CMS-I-00005666

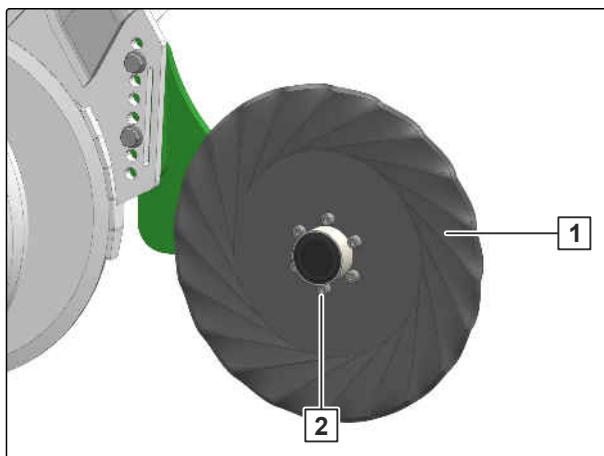
### 10.1.6 Checking and replacing the rigid cutting disc on the PreTeC mulch seeding coulters

CMS-T-00007650-C.1



#### INTERVAL

1. Determine the cutting disc diameter.
2. *If the diameter of the cutting discs is less than 320 mm,*  
replace the worn cutting discs **1**.
3. Remove the bolts **2**.
4. Replace worn cutting discs with new cutting discs.
5. Install the bolts.



CMS-I-00005361

### 10.1.7 Checking and replacing the cutting disc on the FerTeC Twin couler

CMS-T-00002379-E.1



#### INTERVAL

- Every 100 operating hours  
or  
Every 3 months

1. Determine the cutting disc diameter.
2. *If the diameter of the cutting disc is smaller than 340 mm,* replace the cutting disc.
3. Remove the dust caps **3**.
4. Unscrew and remove the central bolts **4**.

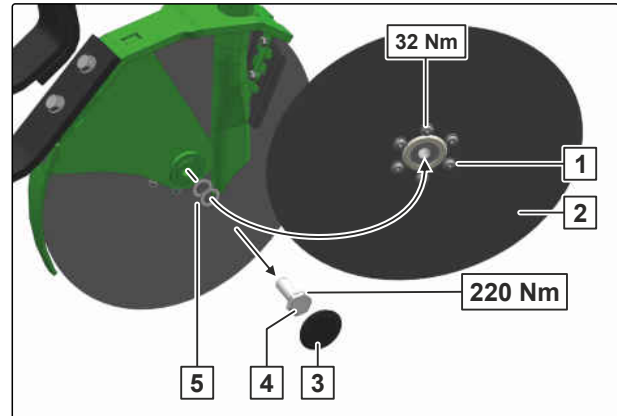


#### NOTE

The central bolts have different threads:

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

5. Remove the worn cutting disc **2**.
6. Unscrew and remove the bolts on the bearing seat **1**.
7. Replace the worn cutting disc with a new cutting disc.
8. Put on and tighten the bolts on the bearing seat.
9. Install the new cutting disc.
10. *To ensure that the cutting discs touch slightly,* adjust the spacing of the cutting discs with the spacer discs **5**.
11. Install spacer discs that are not required on the opposite side of the cutting disc bearing with the central bolt.
12. Put on and tighten the central bolt.
13. Install the dust caps.



CMS-I-00002043

### 10.1.8 Adjusting the cutting disc distance on the FerTeC Twin coulter

CMS-T-00002380-E.1



#### INTERVAL

- Every 100 operating hours  
or  
as required

With increasing wear of the cutting discs, the distance between the cutting discs also increases.

1. Remove the dust caps **1**.
2. Unscrew and remove the central bolts **2**.

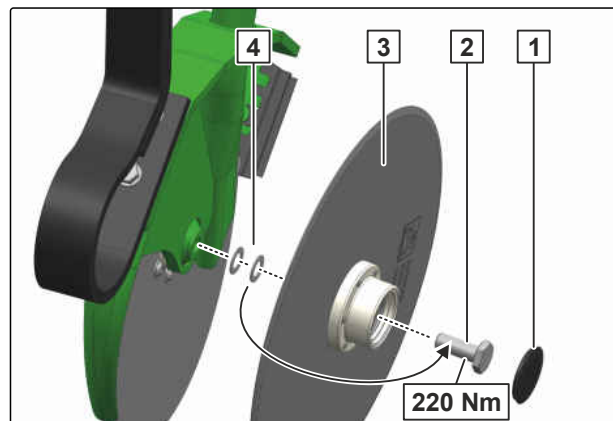


#### NOTE

The central bolts have different threads:

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

3. *To ensure that the cutting discs **5** touch slightly,*  
remove or add spacer discs **4** as required.
4. Install spacer discs that are not required on the opposite side of the cutting disc bearing with the central bolt.
5. Put on and tighten the central bolt.
6. Install the dust caps.



CMS-I-00002019

### 10.1.9 Checking and replacing the inner scraper on the FerTeC Twin coulter

CMS-T-00002381-D.1



#### INTERVAL

- Every 100 operating hours  
or  
Every 3 months

The inner scrapers ensure smooth coulter running and are subject to wear.



## REQUIREMENTS

- ✓ The tractor and implement are secured

1. Remove the dust caps **1**.
2. Unscrew and remove the central bolts **2**.

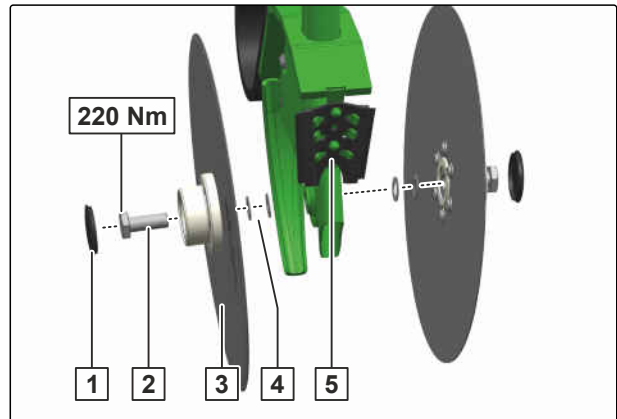


## NOTE

The central bolts have different threads:

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

3. Remove the cutting discs **3**.
4. Pay attention to the number of spacer discs **4**.
5. Replace inner scrapers **5** if worn.
6. Install the cutting discs.
7. Put on and tighten the central bolt.
8. Install the dust caps.



CMS-I-00002020

## 10.1.10 Checking the wheel bolt tightening torque

CMS-T-00002382-D.1



## INTERVAL

- After initial operation
- Every 50 operating hours

Tyres	Wheel bolt tightening torque
Tyres 6.5/80x15-AS	325 Nm
Tyres 26x12-12 AS	325 Nm

- Check the wheel bolt tightening torque.

### 10.1.11 Checking the tightening torque for the radar sensor bolts

CMS-T-00002383-E.1



#### INTERVAL

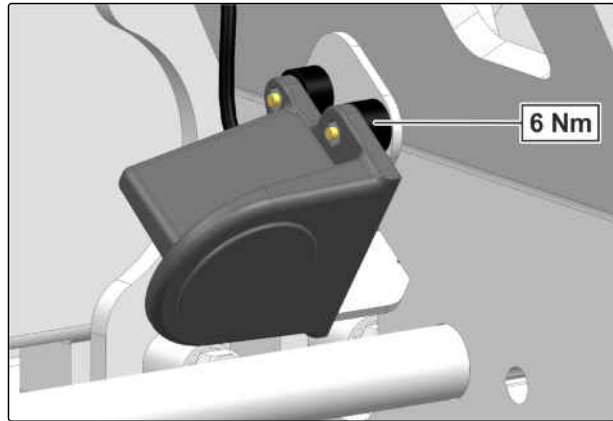
- After initial operation
- Every 12 months



#### NOTE

When the tightening torque is too high, the spring-suspended sensor mount is warped and the radar sensor does not work properly.

- Check the tightening torque on the radar sensor.



CMS-I-00002600

### 10.1.12 Checking the frame connection tightening torque

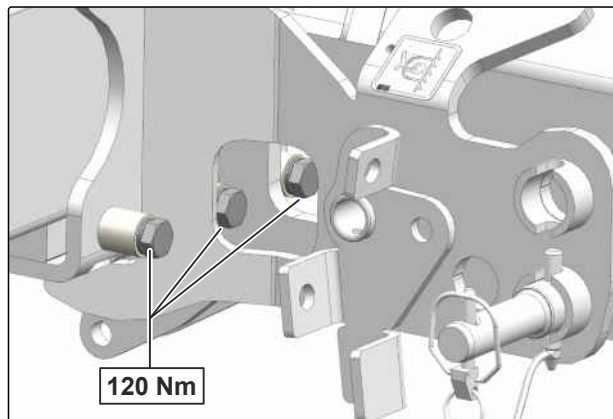
CMS-T-00002384-B.1



#### INTERVAL

- After initial operation
- Every 12 months

- Check the tightening torque on both sides.



CMS-I-00002037

### 10.1.13 Checking the coulter connection tightening torque

CMS-T-00002385-C.1



#### INTERVAL

- After initial operation
- Every 12 months

- *On telescopic coulters*  
Tighten the bolts to 160 Nm -180°

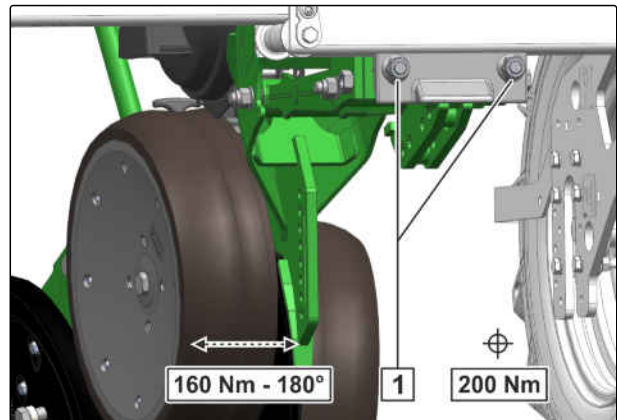
or

*On non-telescopic coulters*  
Tighten the bolts to 200 Nm.



#### NOTE

The tightening torques must be checked when the coulters are unloaded.



CMS-I-00002039

### 10.1.14 Checking the running gear connection tightening torque

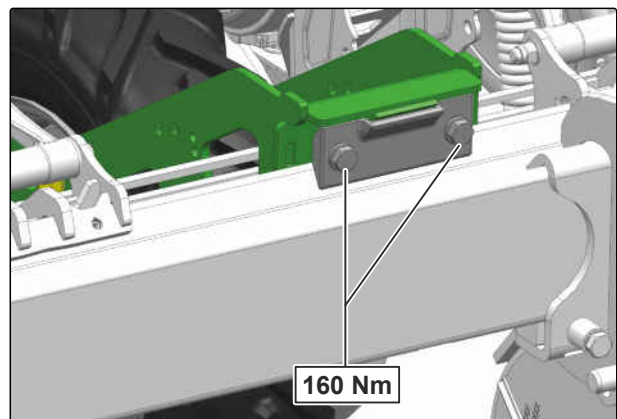
CMS-T-00002386-B.1



#### INTERVAL

- After initial operation
- Every 12 months

- Check the tightening torque on both sides.



CMS-I-00002038

### 10.1.15 Checking the tyre inflation pressure

CMS-T-00004972-C.1



#### INTERVAL

- After the first 250 operating hours

There are stickers attached in the rims of the wheels, which specify the required tyre inflation pressure.



- Check the tyre inflation pressure according to the specifications on the stickers.

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

CMS-T-00002330-H.1



#### INTERVAL

- daily

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

Permissible wear	2 mm
------------------	------

2. Replace the pins if there is significant wear.

### 10.1.17 Checking the hydraulic hose lines

CMS-T-00002331-C.1



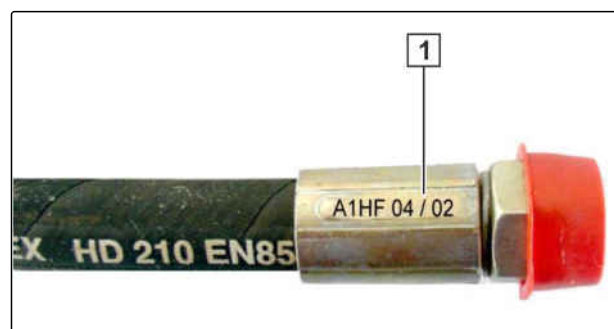
#### INTERVAL

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

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

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

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



CMS-I-00000532

4. Have any worn, damaged or aged hydraulic hose lines immediately replaced at a specialist workshop.
5. Retighten loose bolted connections.

### 10.1.18 Cleaning the fan rotor

CMS-T-00002390-B.1



#### INTERVAL

- Every 50 operating hours  
or  
as required

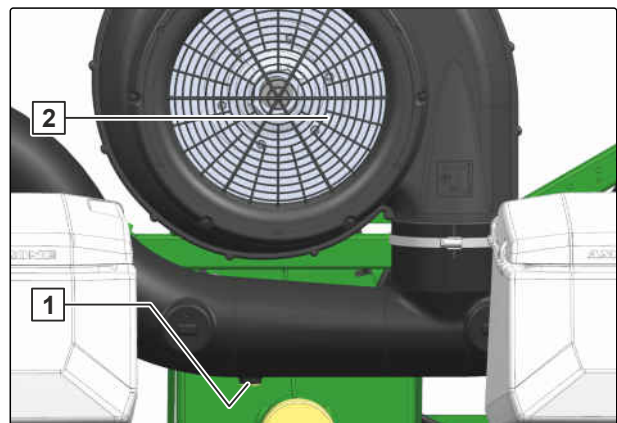
The air drawn by the fan can contain fertiliser dust or sand. These impurities can accumulate on the fan rotors and cause imbalance of the fan. This can destroy the fan.



#### REQUIREMENTS

- ✓ The implement is coupled to the tractor
- ✓ The singling unit housings are open
- ✓ The singling discs are removed

1. Open the water drain **1** on the air distributor.
  2. *To wash the deposits from the blower fan rotors,*  
Direct a jet of water into the suction opening **2**.
  3. *When most of the water has escaped through the air distributor,*  
run the fan for about 5 minutes.
- ➔ The air supply is blown dry.
4. Switch off the fan.
  5. Close the water drain on the air distributor.



CMS-I-00002024

### 10.1.19 Cleaning the cyclone separator

CMS-T-00003779-D.1

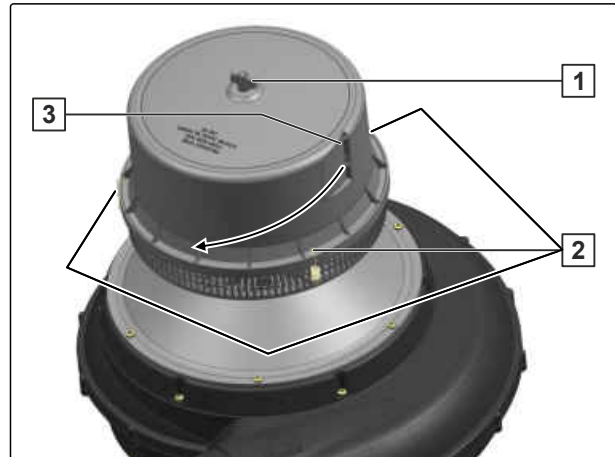


#### INTERVAL

- Every 10 operating hours  
or  
daily

For the cyclone separator to work, the separator opening **3** must be free of impurities.

1. Check the separator opening **3**.
2. *If the separator opening is clogged,* open the clips **2**.
3. Loosen the wing nut **1**.
4. Remove the cover and clean it.
5. Install the cover with the wing nut.
6. Fasten the suction cage with the clips.



CMS-I-00002765

### 10.1.20 Cleaning the suction basket

CMS-T-00003836-A.1



#### INTERVAL

- Every 10 operating hours  
or  
daily

- Clean the suction baskets **1**.



CMS-I-00002793

### 10.1.21 Cleaning the filling auger

CMS-T-00002391-A.1



#### INTERVAL

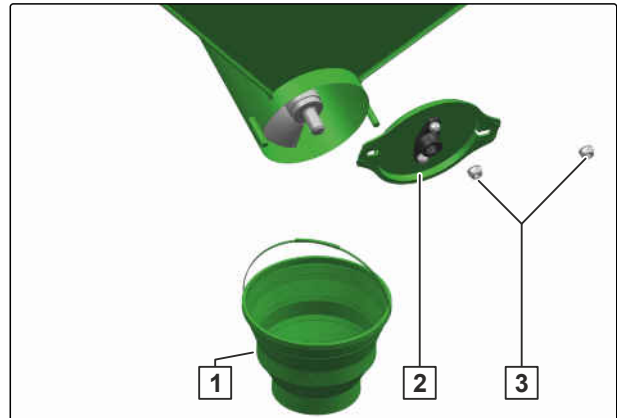
- Every 100 operating hours  
or  
Every 12 months



#### REQUIREMENTS

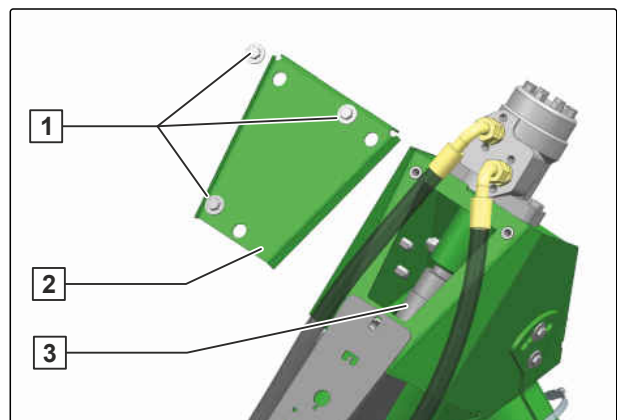
- ✓ The implement is coupled to the tractor
- ✓ The fan is switched off
- ✓ The filling auger is switched off
- ✓ The tractor and implement are secured

1. Place a collection bucket **1** under the conveyor tube.
2. Loosen the nuts **3** and remove them.
3. Remove the cover **2**.
4. Knock out the fertiliser residue from the conveyor tube and collect it.



CMS-I-00002026

5. Unscrew and remove the bolts **1**.
6. Remove the installation flap **2**.
7. Thoroughly clean the filling auger **3** with a water jet.
8. Put on the installation flap.
9. Put on the bolts and tighten them.
10. Install the cover.
11. Put on the nuts and tighten them.



CMS-I-00002027

### 10.1.22 Cleaning the fertiliser hopper

CMS-T-00002392-B.1



#### INTERVAL

- Every 100 operating hours  
or  
Every 12 months



#### REQUIREMENTS

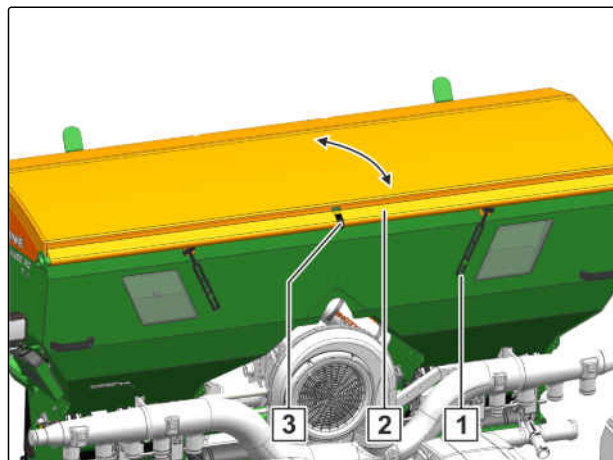
- ✓ The implement is coupled to the tractor
- ✓ The tractor and implement are secured

1. Switch off the filling auger
2. Switch off the fan.
3. Climb onto the loading board using the steps.  
or

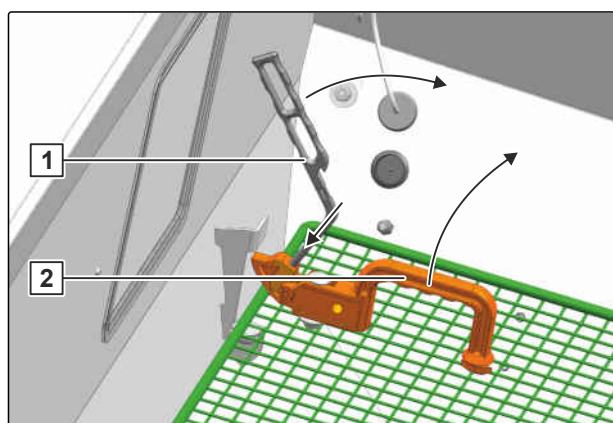
*To unfold the ladder, see "Operating the loading board with ladder".*

Climb onto the loading board using the ladder.

4. Open the rubber straps **1**.
5. Open the fertiliser hopper tarpaulin **2**.
6. Remove residues or foreign objects from the fertiliser hopper.
7. Insert the unlocking tool **1** into the lock.
8. *To open the protective screens,*  
unlock the lock and swivel the protective screen  
upwards by the handle **2**.
9. Remove residues or foreign objects from the  
fertiliser hopper.
10. Close the protective screen.
11. Park the unlocking tool on the fertiliser hopper.



CMS-I-00001892



CMS-I-00002028

12. Release the lock **1** and swivel it downwards.

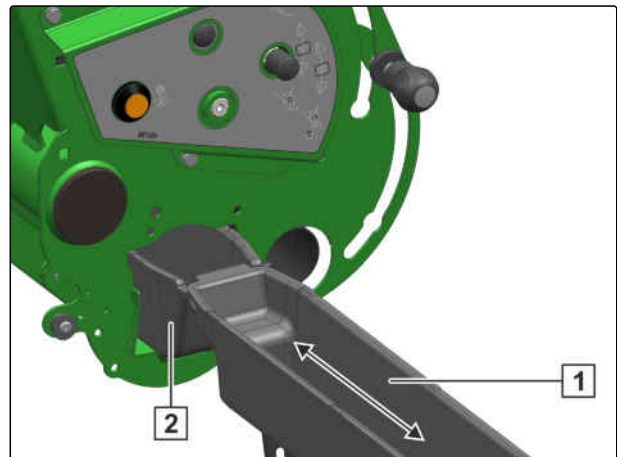
13. *To move the calibration buckets into calibration position on an implement with hydraulic fan drive,*

pull out the interlocked calibration buckets **2** by 10 cm to the side.

or

*To move the calibration buckets into calibration position on an implement with mechanical fan drive,*

pull out the calibration buckets **2** individually by 10 cm to the side.



CMS-I-00001931

14. Turn the calibration bucket upwards and align the opening with the guide marks **3**.

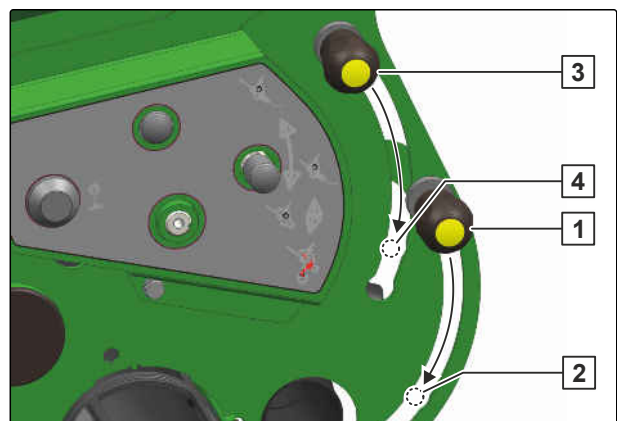
15. Insert the calibration bucket.

16. *To move the calibration flap lever to the calibration position,*

press and hold the lock button **1** and push it down **2**.

17. *To move the bottom flap lever to the emptying position,*

press and hold the lock button **3** and push it down **4**.



CMS-I-00001994

18. Clean the metering units thoroughly with a water jet.

19. Clean the calibration buckets.

20. Push in the the calibration bucket **2** with the opening facing down.

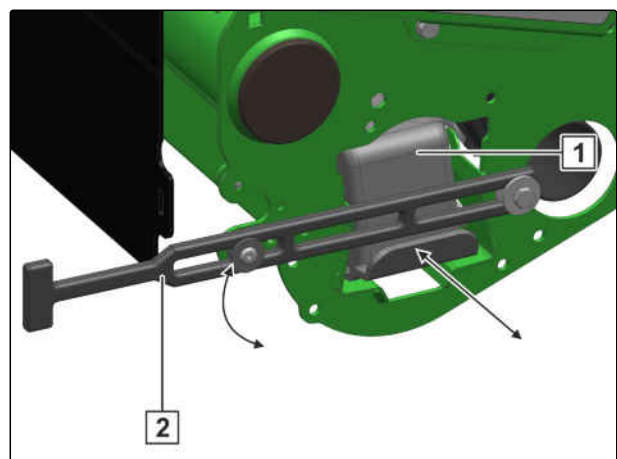
21. Swivel up the lock **1** and close it.

22. *To move the calibration flap lever into working position,*

press and hold the lock button and push it upwards.

23. *To move the bottom flap lever into working position,*

press and hold the lock button and push it upwards.



CMS-I-00001932

24. Close the fertiliser hopper tarpaulin.
25. Secure the fertiliser hopper tarpaulin with rubber straps.

### 10.1.23 Cleaning the fertiliser metering unit

CMS-T-00002473-C.1



#### INTERVAL

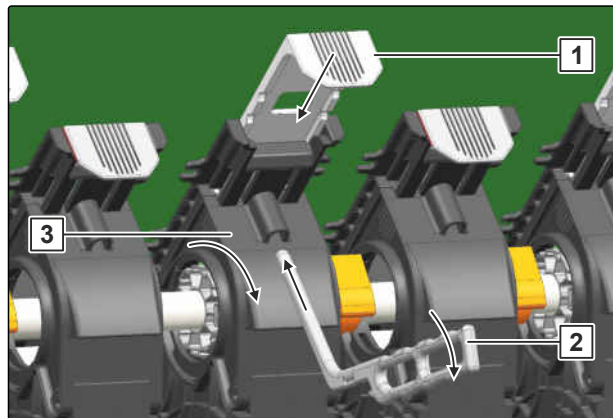
- Every 10 operating hours  
or  
daily



#### REQUIREMENTS

- ✓ The implement is coupled to the tractor
- ✓ The fan is switched off
- ✓ The filling auger is switched off

1. *To close the fertiliser hopper on the metering housing,*  
close the sliding shutter **1**.
2. Take the unlocking tool from the threaded cartridge or the parking position on the fertiliser hopper.
3. *To unlock the metering unit cover,*  
insert the unlocking tool **2** into the metering unit cover.
4. Open the metering unit cover **3** with the unlocking tool.
5. Remove residues or foreign objects from the metering housing.
6. Close the metering unit cover **3**.
7. Park the unlocking tool from the threaded cartridge or the parking position in the fertiliser hopper.



CMS-I-00002256

### 10.1.24 Cleaning the micropellet metering unit

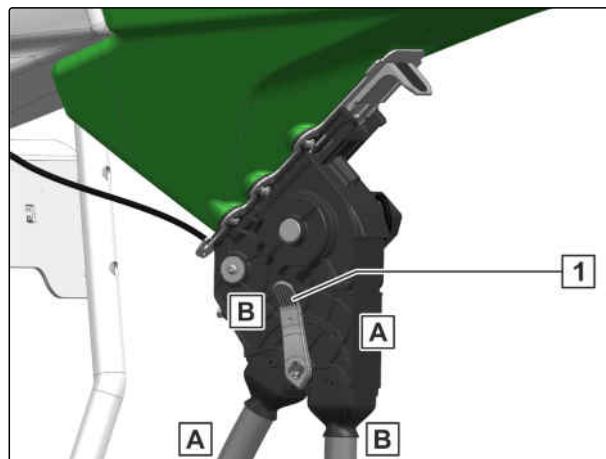
CMS-T-00003601-B.1



#### INTERVAL

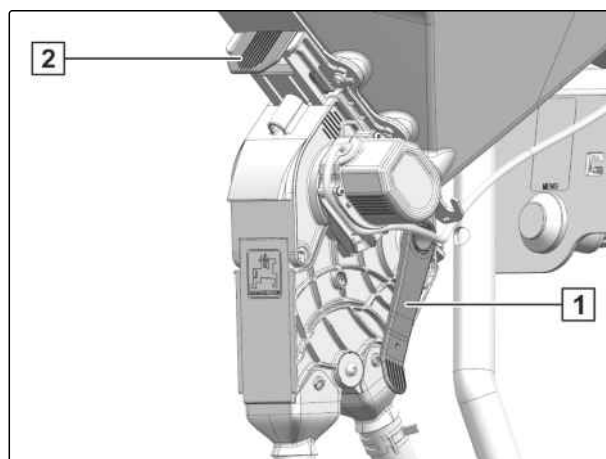
- Every 10 operating hours  
or  
daily

1. Move the switchover flap **1** to position **A**.



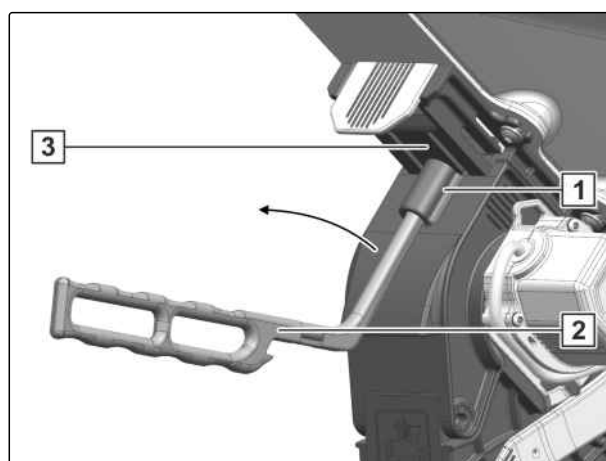
CMS-I-00002580

2. Close the the sliding shutter **2** on the micropellet hopper.
3. Relieve the bottom flap lever **1**.



CMS-I-00002576

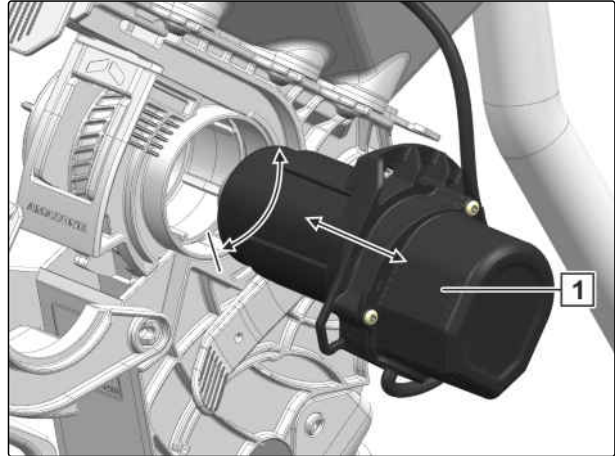
4. Insert the unlocking tool **2** into the metering unit cover **1**.
5. Unlock the metering unit cover on the metering housing **3**.
6. Open the metering unit cover.



CMS-I-00002582

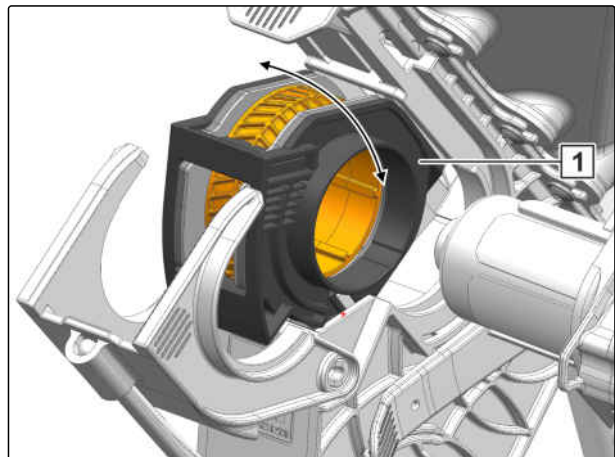


7. Turn the drive unit **1** counterclockwise.
8. Pull the drive unit out of the metering housing.



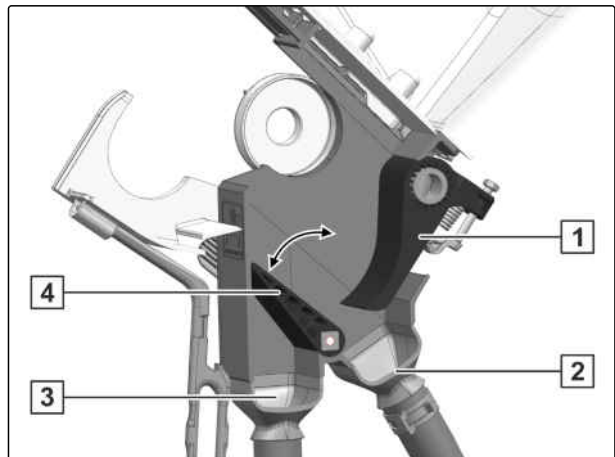
CMS-I-00002585

9. Take the roller cage **1** along with the metering roller out of the metering housing.



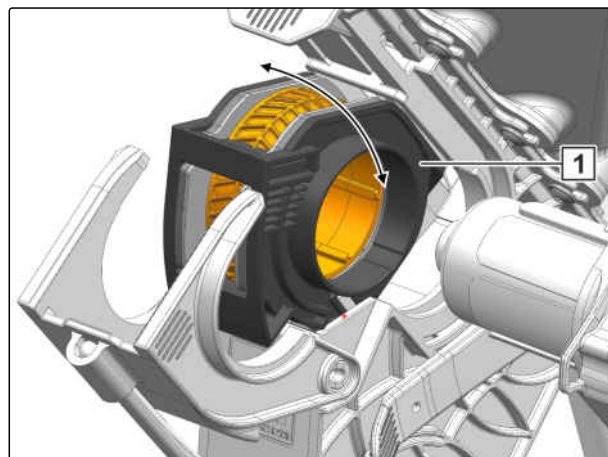
CMS-I-00002584

10. Clean the metering housing
11. Actuate the switchover flap **4** several times.
12. Actuate the bottom flap lever **1** several times.
13. Clean the outlets **2** and **3**.



CMS-I-00002577

14. Insert the roller cage **1** along with the metering roller into the metering housing.



CMS-I-00002584

15. Insert the drive unit **1** into the metering roller.

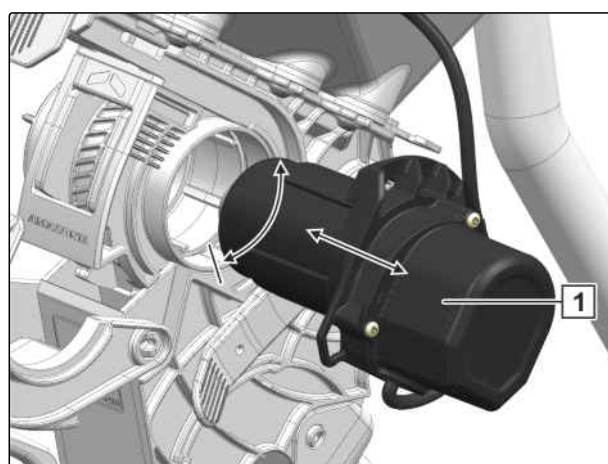
16. Rotate the drive unit clockwise.

17. Close the metering unit cover.

➔ The locking mechanism engages.

18. Set the sliding shutter to the top position.

19. Move the bottom flap lever to the working position.



CMS-I-00002585

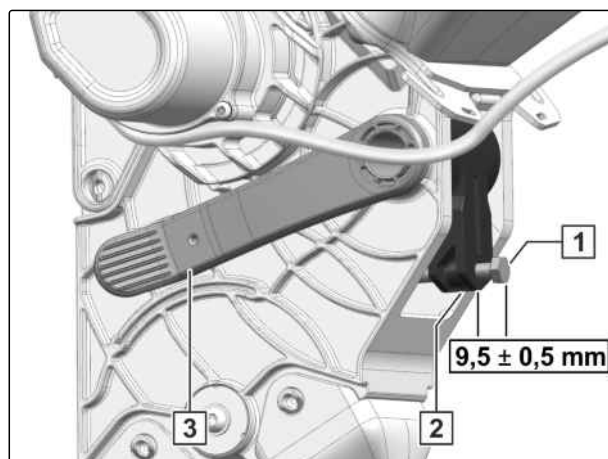
### 10.1.25 Adjusting the micropellet metering unit bottom flap

CMS-T-00003602-A.1

#### INTERVAL

- Every 100 operating hours  
or  
Every 12 months

1. Move the bottom flap lever **3** into working position.
2. *To adjust the pre-tension,*  
the bolt head **1** should be 9 -10 mm above the  
clamping lever **2**.



CMS-I-00002581

### 10.1.26 Clean the singling unit

CMS-T-00003718-A.1



#### INTERVAL

- Every 10 operating hours  
or  
daily

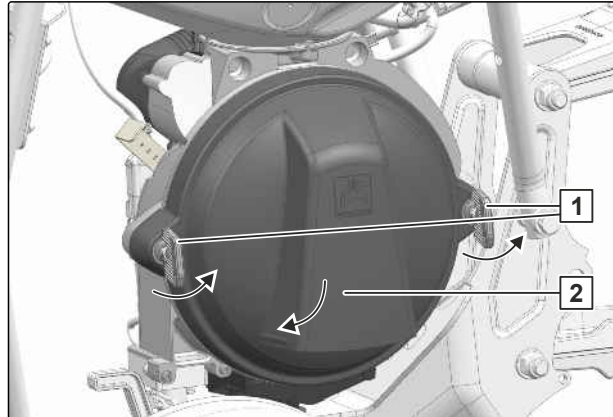
Keep the singling unit head free of dust, deposits, and foreign objects.



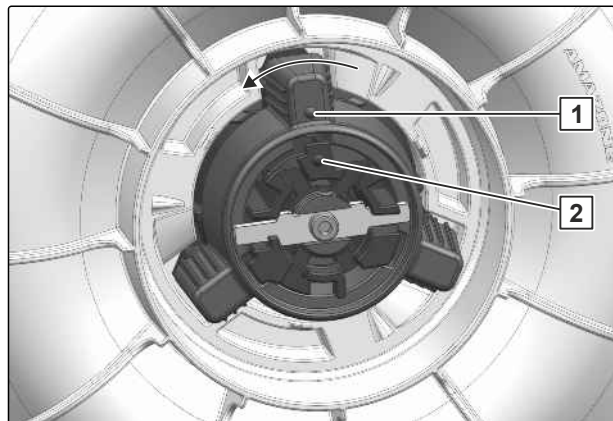
#### NOTE

Under very dusty operating conditions, the inspection interval must be shortened.

1. Open the locks **1**.
2. Remove the cover **2**.
3. Clean the inside of the cover with a brush.
4. Release the lock **1** until the points **2** are aligned.

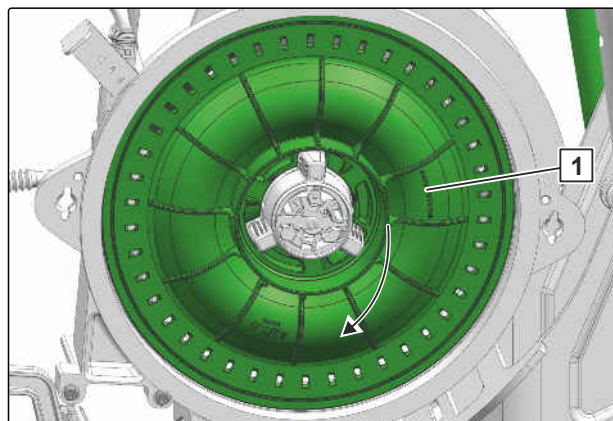


CMS-I-00001909



CMS-I-00001910

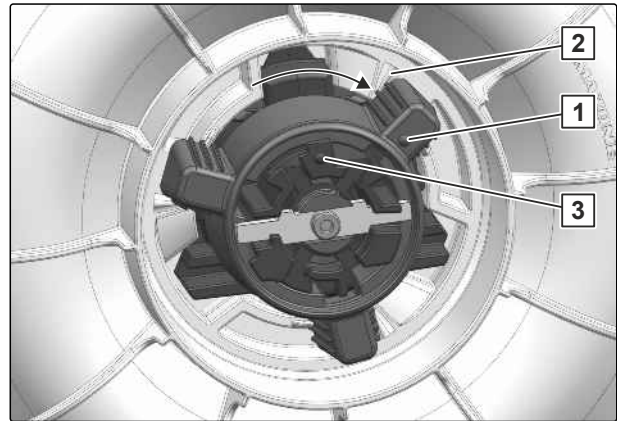
5. remove the singling disc **1** from the drive hub.
6. Clean the singling unit housing.
7. Install the singling disc.



CMS-I-00001912

8. Turn the lock beyond the notch **2**.

➔ The points **1** and **3** are no longer aligned.



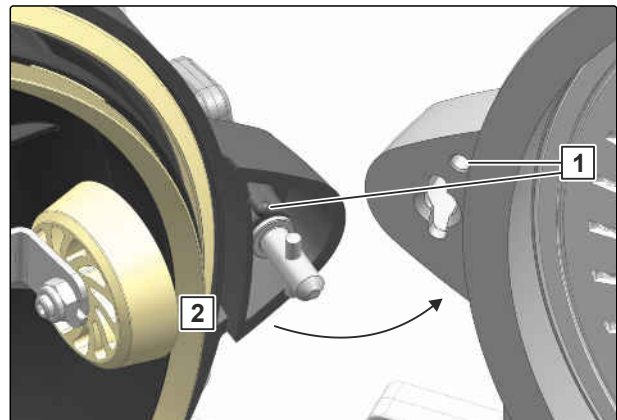
CMS-I-00001911

9. Close the cover **2**.

### NOTE

Pay attention to the guide pin **1**.

10. Close the locks.



CMS-I-00001913

## 10.1.27 Cleaning the opto-sensor

CMS-T-00002393-C.1

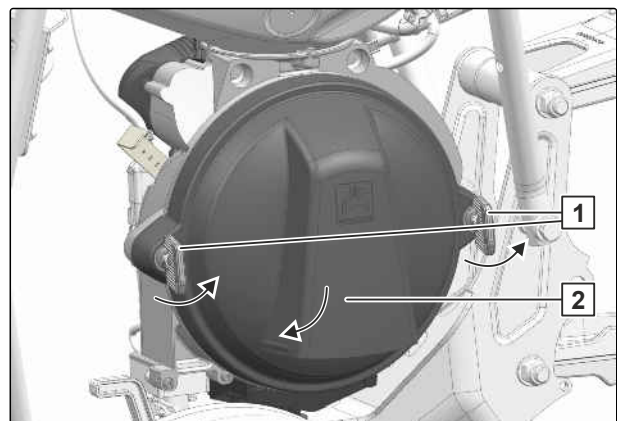
### INTERVAL

- Every 50 operating hours  
or  
as required

1. Disconnect the ISOBUS connection to the tractor.

2. Open the locks **1**.

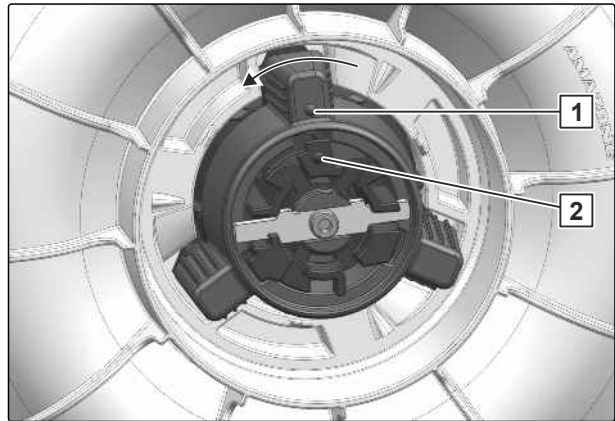
3. Remove the cover **2**.



CMS-I-00001909

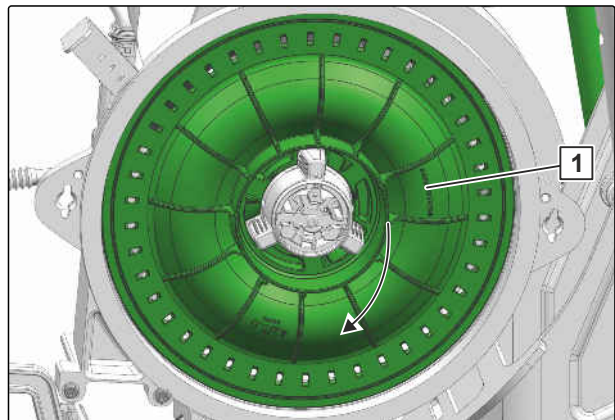


4. Release the lock **1** until the points **2** are aligned.



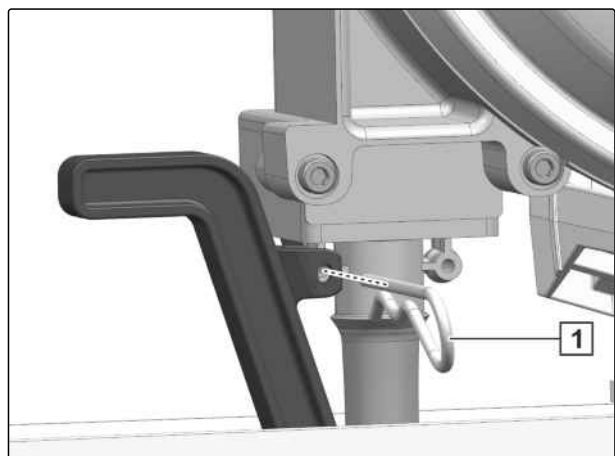
CMS-I-00001910

5. remove the singling disc **1** from the drive hub.



CMS-I-00001912

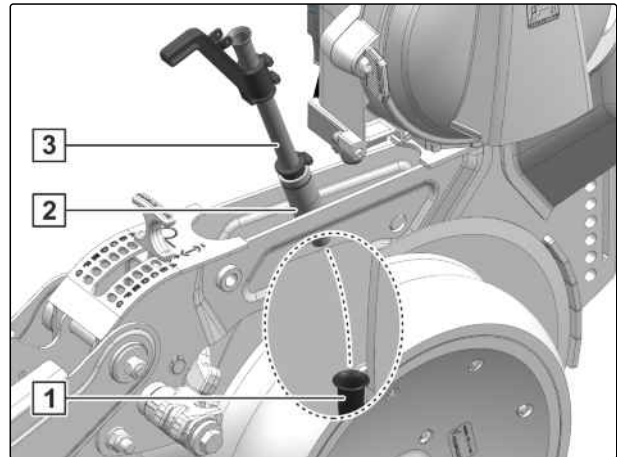
6. *To clean the opto-sensor, use tap water with dishwashing detergent.*  
Loosen contamination with the supplied brush for 1 minute
7. Rinse the opto-sensor with clear fresh water.
8. Install the singling disc.
9. Install the cover.
10. *To remove stubborn contamination, remove the opto-sensor.*  
Remove the spring cotter pin **1**.



CMS-I-00003814

11. Press the shot channel **3** against the gasket **2** in the funnel **1**.

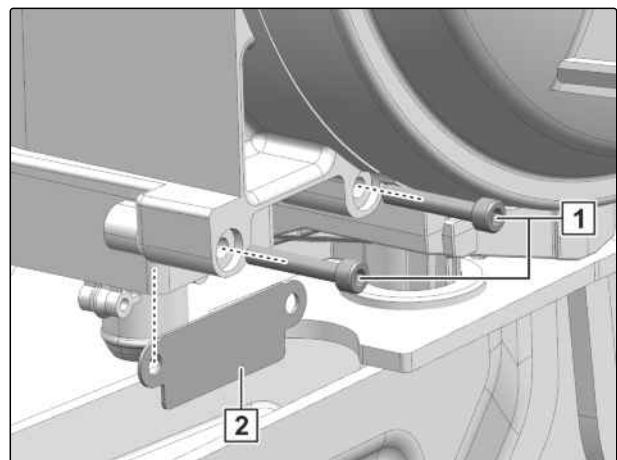
12. Swivel the shot channel away from the opto-sensor and pull it up.



CMS-I-00003815

13. Remove the bolts **1**.

14. Remove the spacer plate **2**.

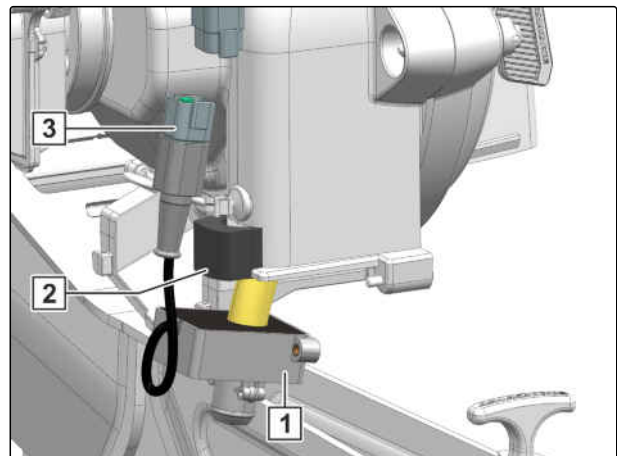


CMS-I-00003816

15. Disconnect the plug connection **3**.

16. Move the opto-sensor **1** down.

17. Remove the gasket **2**.



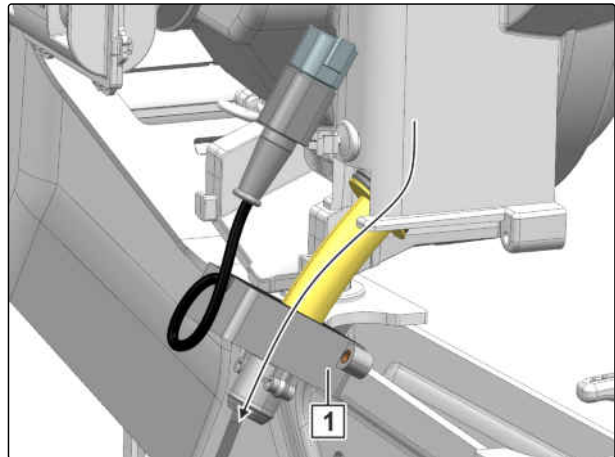
CMS-I-00003817



## IMPORTANT

### Damage to the opto-sensor due to cleaning

- To avoid damage to the sensors, only clean the opto-sensor with the supplied brush.
- To avoid damage to the electronics, never immerse the plug connector in liquids when it is unplugged.



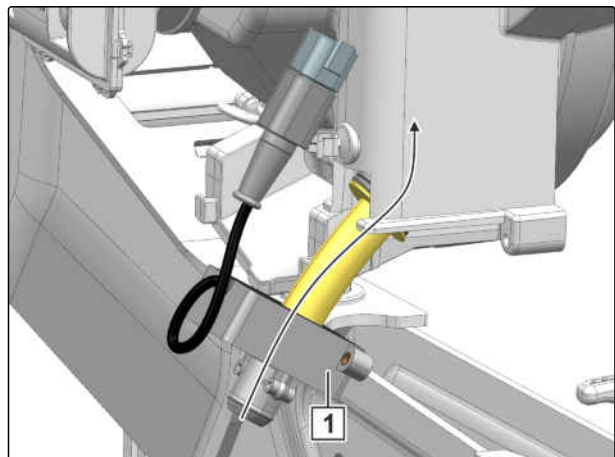
18. Remove the opto-sensor **1**.

19. Soak the opto-sensor for 1 minute.

20. Clean the opto-sensor with the supplied brush.

21. Rinse the opto-sensor with clear fresh water.

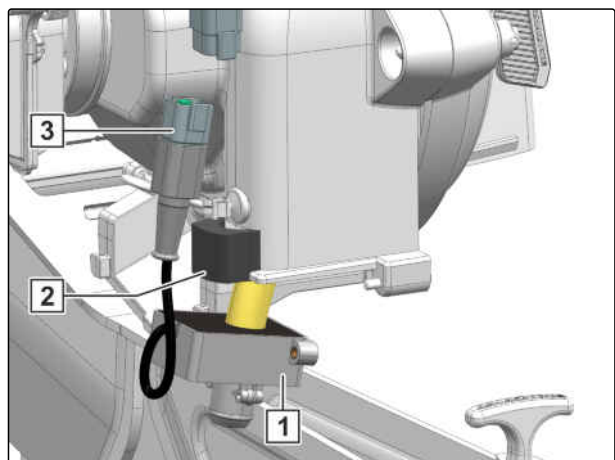
22. Insert the opto-sensor **1**.



23. Move the opto-sensor **1** up.

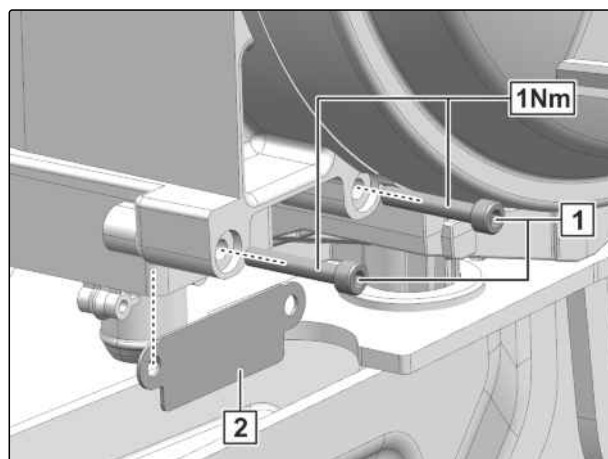
24. Put on the gasket **2**.

25. Establish the plug connection **3**.



26. Install the spacer plate **2**.

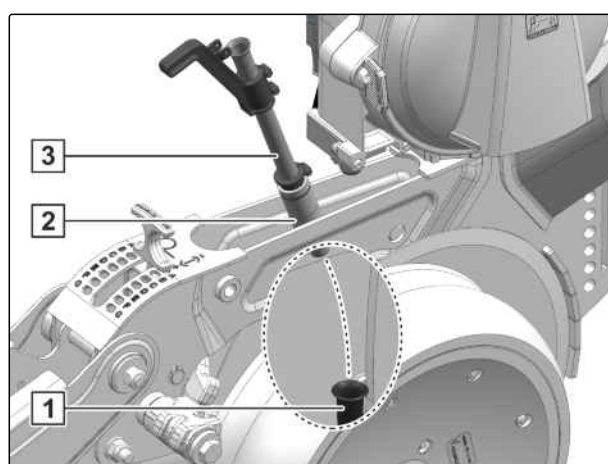
27. Install the bolts **1**.



CMS-I-00003818

28. Press the shot channel **3** against the gasket **2** in the funnel **1**.

29. Swivel the shot channel under the opto-sensor.

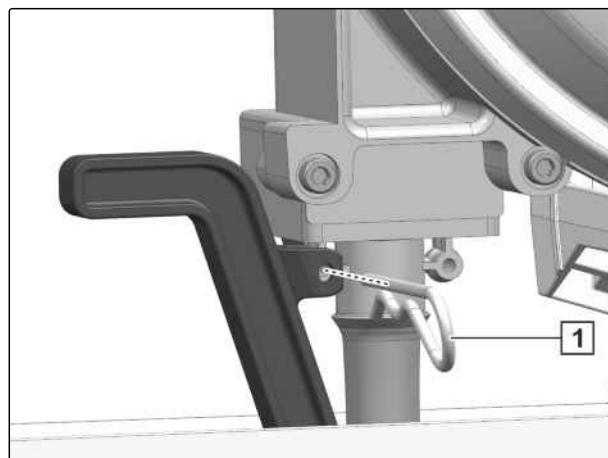


CMS-I-00003815

30. Install the shot channel with the spring cotter pin **1**.

31. Establish the ISOBUS connection to the tractor.

32. Restart the implement.



CMS-I-00003814



### 10.1.28 Checking the wheel mark eradicator coulter

CMS-T-00002497-E.1



#### INTERVAL

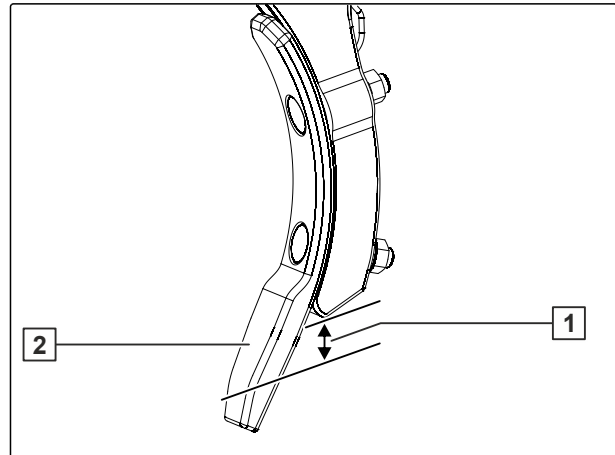
- Every 50 operating hours  
or  
Every 3 months



#### IMPORTANT

The tool carriers become worn when constantly working in the soil.

- When the wear limit of the wheel mark eradicator coulter has been exceeded, the tool carriers constantly work in the soil horizon.  
Replace the coulter when the wear limit has been reached.



CMS-I-00001081

1. If the distance **1** between the coulter tip and the tool carrier is less than 15 mm, replace the wheel mark eradicator coulter **2**.
2. To replace the wheel mark eradicator coulter, See section "Changing the wheel mark eradicator coulter".

### 10.1.29 Cleaning the distributor head

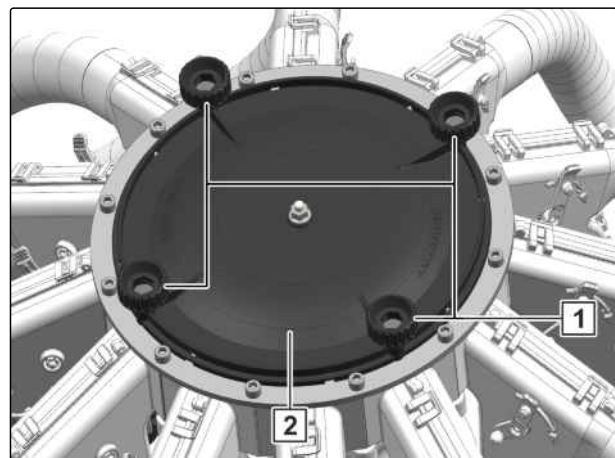
CMS-T-00005594-B.1



#### INTERVAL

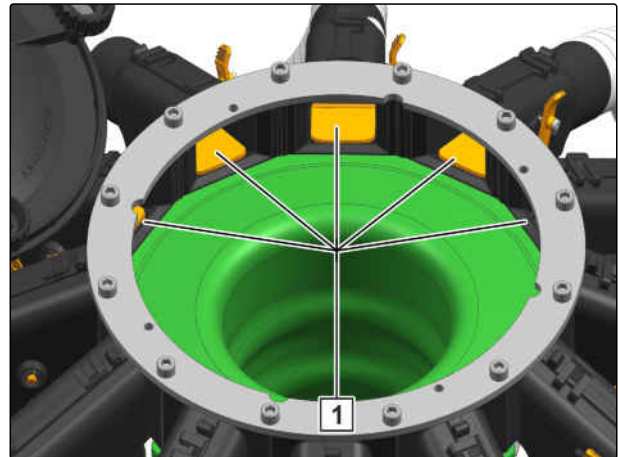
- at the end of the season

1. Use a suitable aid to safely reach the distributor head.
2. Loosen the knurled screws **1**.
3. Remove the cover **2**.



CMS-I-00003957

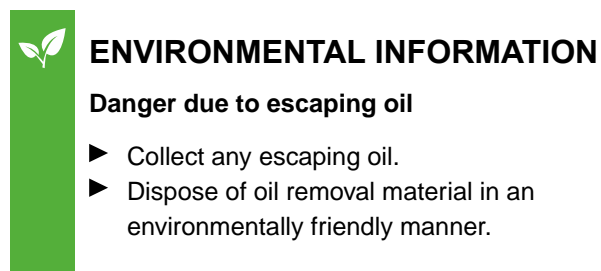
4. Clean all of the outlets **1**.
5. Install the cover.
6. Tighten the knurled screws.



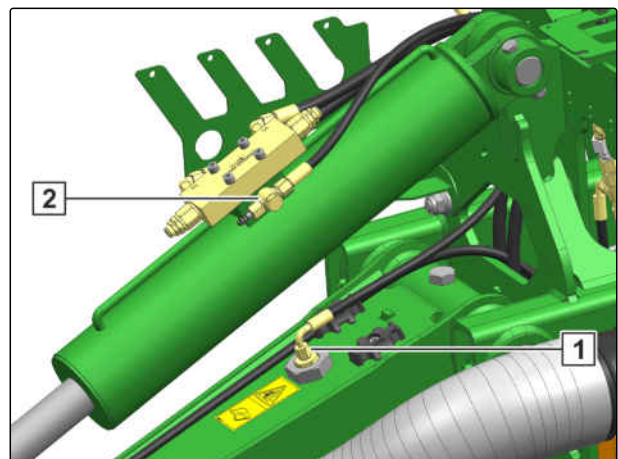
CMS-I-00003958

### 10.1.30 Emptying the folding cylinder hydraulic accumulator

CMS-T-00005827-A.1



- ▶ To empty the hydraulic accumulator **1** to perform maintenance work, open the ventilation valve **2**.



CMS-I-00004130

## 10.2 Lubricating the machine

CMS-T-00005548-C.1



### IMPORTANT

#### Implement damage due to improper lubrication

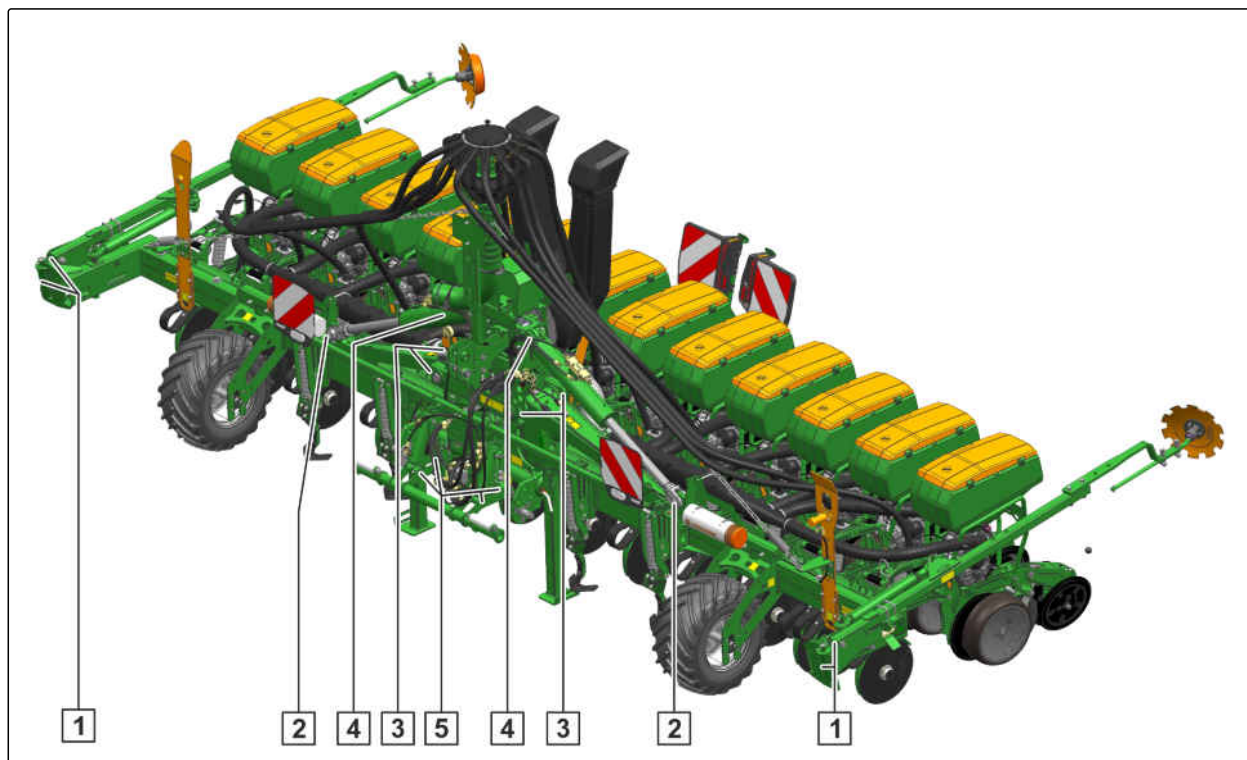
- ▶ Grease the implement at the marked lubrication points according to the lubrication schedule.
- ▶ *To ensure that dirt is not pressed into the lubrication points,* thoroughly clean the grease nipples and the grease gun.
- ▶ Only grease the implement with the lubricants listed in the technical data.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



CMS-I-00002270

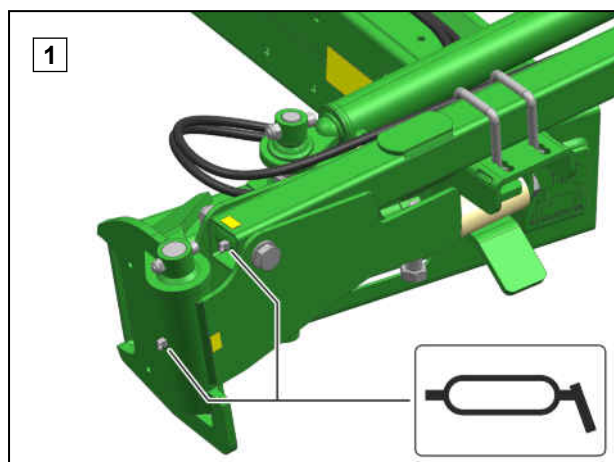
## 10.2.1 Overview of lubrication points

CMS-T-00005549-B.1

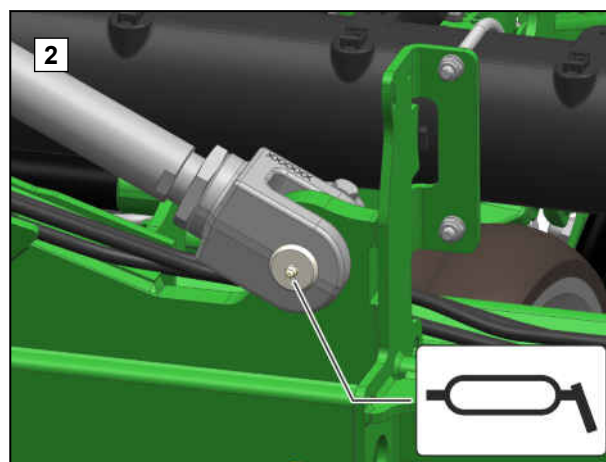


CMS-I-00004115

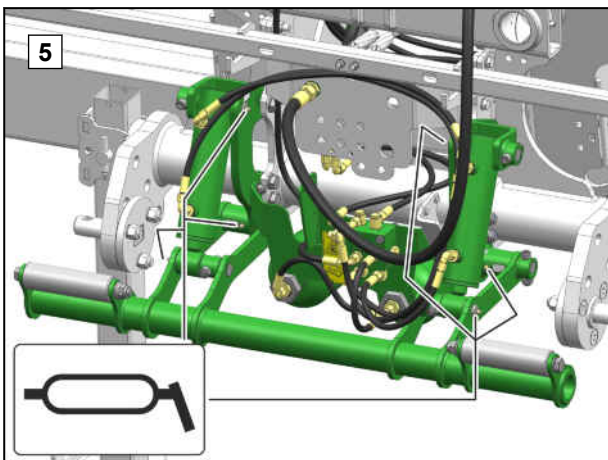
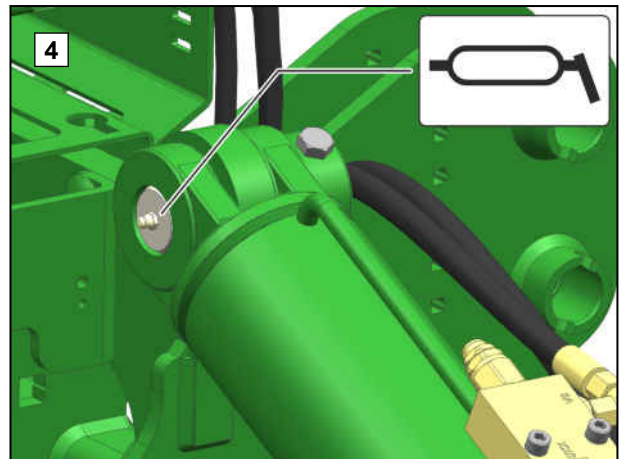
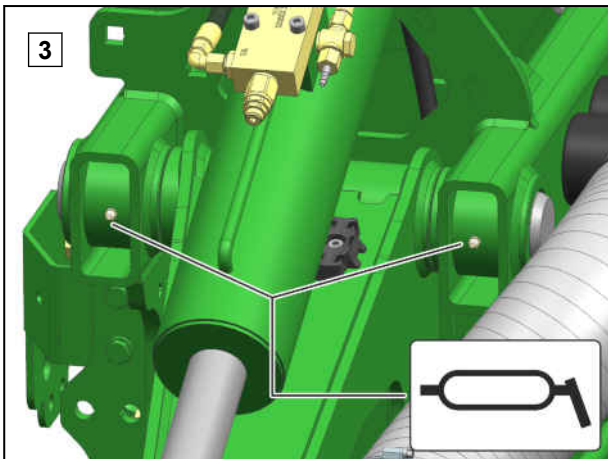
### Every 50 operating hours



CMS-I-00004114



CMS-I-00004111



## 10.3 Lubricating the roller chains

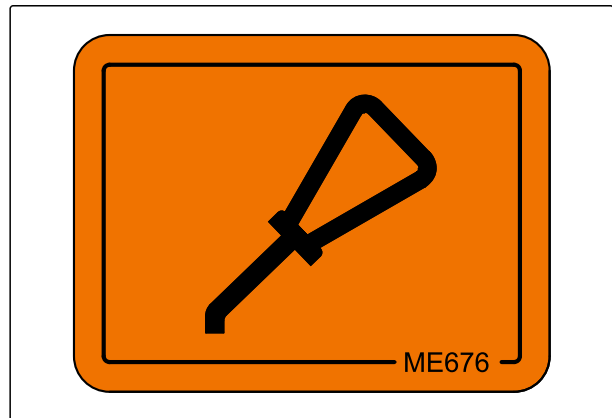
CMS-T-00007653-A.1



### IMPORTANT

#### Implement damage due to improper lubrication

- ▶ Grease the implement at the marked lubrication points according to the lubrication schedule.
- ▶ Before lubrication, clean the chain with only a penetrating oil and a brush.
- ▶ Only grease the implement with the lubricants listed in the technical data.
- ▶ Do not let the lubricants drip off of the chain.



CMS-I-00001879

### 10.3.1 Lubricating the roller chain in the leading wheel drive

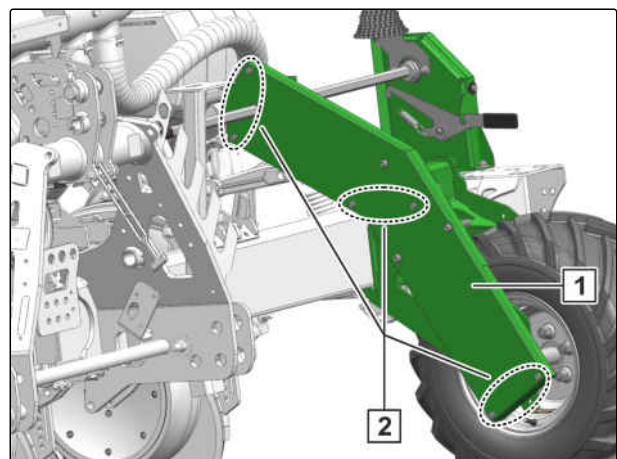
CMS-T-00005448-B.1



### INTERVAL

- After the first 10 operating hours
  - Every 50 operating hours
- or
- at the end of the season

1. Remove the bolts **2**.
2. Push the cover **1** to the side.
3. Swivel up the cover.



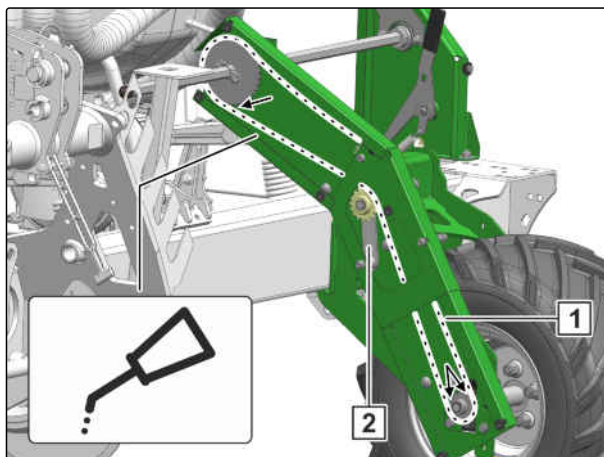
CMS-I-00002646



## 10 | Repairing the machine

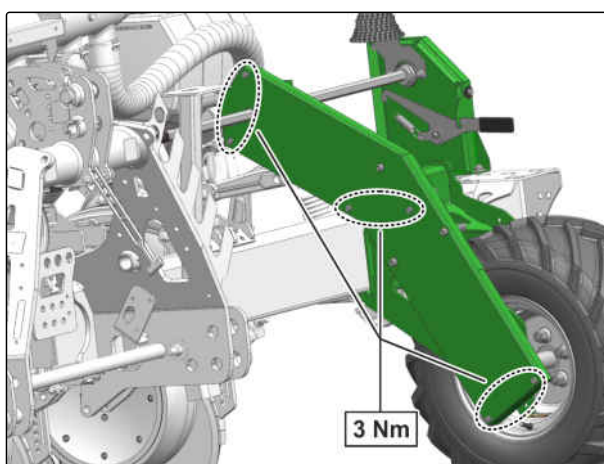
### Lubricating the roller chains

4. Lubricate the roller chain **1** from the inside going out.
5. Check chain tensioner **2** for ease of movement.



CMS-I-00003884

6. Install the cover.
7. Install the bolts and washers.



CMS-I-00002645



### 10.3.2 Lubricating the roller chain in the interchangeable wheel gear

CMS-T-00005449-B.1

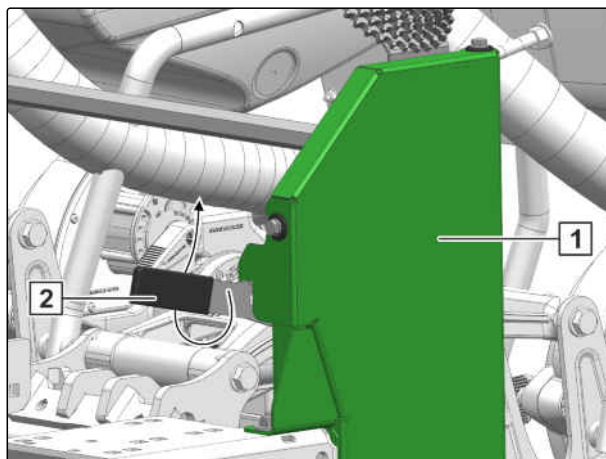


#### INTERVAL

- After the first 10 operating hours
- Every 50 operating hours
- or
- at the end of the season

1. Release the lever **2** and swivel it up.

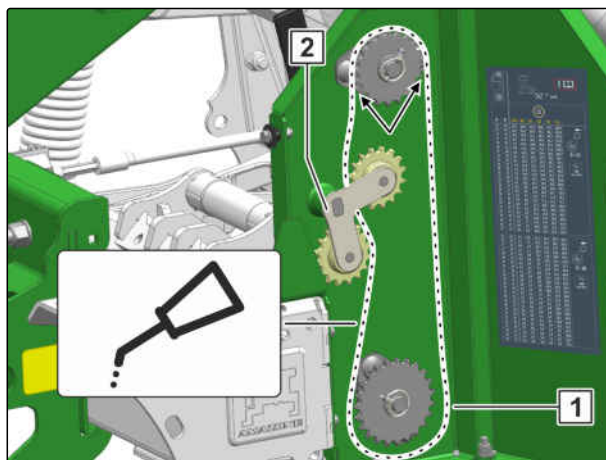
➔ The cover **1** opens automatically.



CMS-I-00002656

2. Lubricate the roller chain **1** from the inside going out.

3. Check chain tensioner **2** for ease of movement.

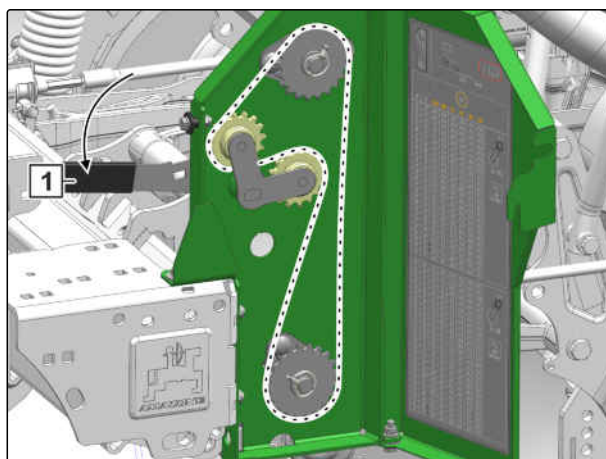


CMS-I-00003885

4. Actuate the lever **1**.

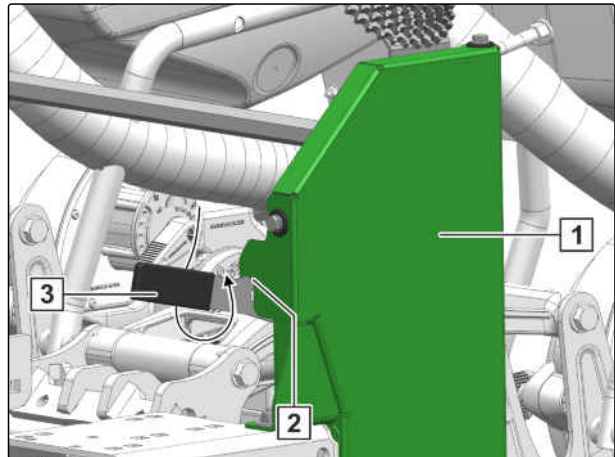
➔ The drive chain will be tightened.

5. Hold the lever.



CMS-I-00002651

6. Close the cover **1** against the spring pressure.
  7. *To lock the cover,*  
Continue actuating the lever **3**.
- ➔ The cover will be locked on the chain tensioner **2**.



CMS-I-00002647

### 10.3.3 Lubricating the roller chain in the trailing wheel drive

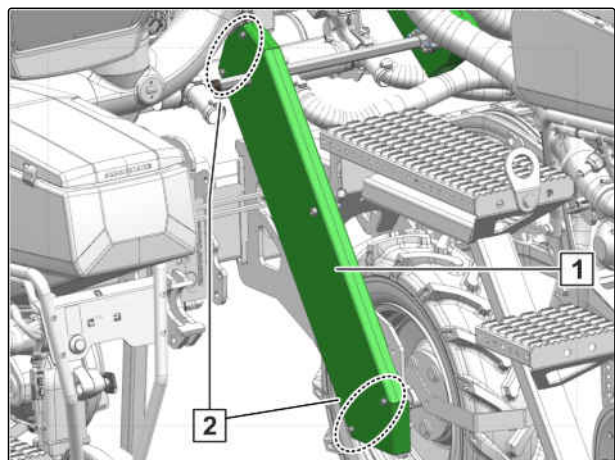
CMS-T-00005450-B.1



#### INTERVAL

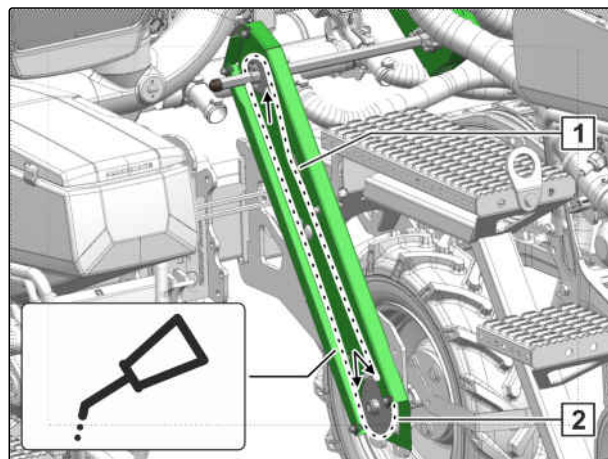
- After the first 10 operating hours
  - Every 50 operating hours
- or
- at the end of the season

1. Remove the bolts **2**.
2. Remove the cover **1**.



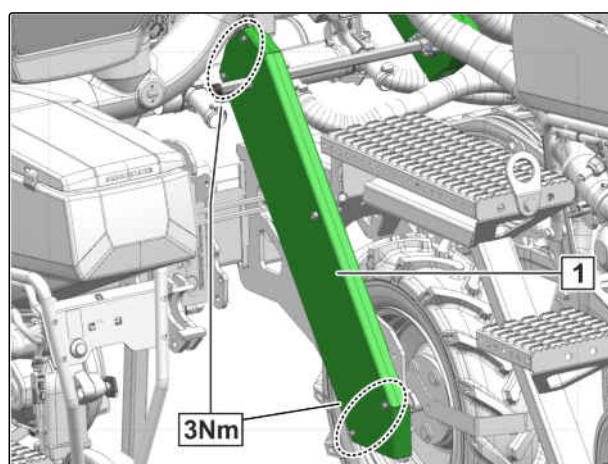
CMS-I-00002721

3. Lubricate the roller chain **2** from the inside going out.
4. Check chain tensioner **1** for ease of movement.



CMS-I-00003887

5. Install the cover.
6. Install the bolts and washers.



CMS-I-00002720

### 10.3.4 Lubricating the roller chain on the mechanical metering drive

CMS-T-00005877-B.1

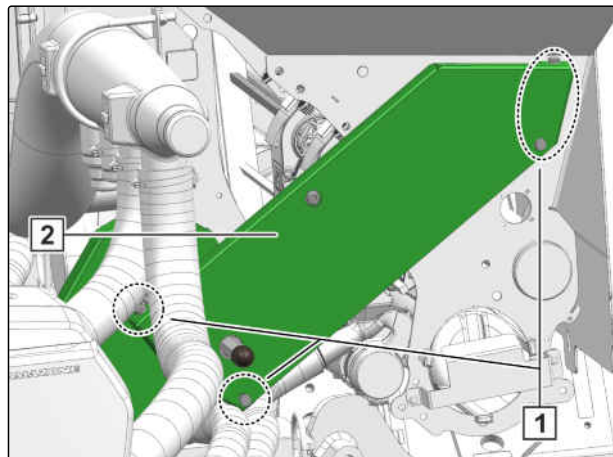


#### INTERVAL

- After the first 10 operating hours
- Every 50 operating hours
- or
- at the end of the season

1. Remove the bolts **1**.

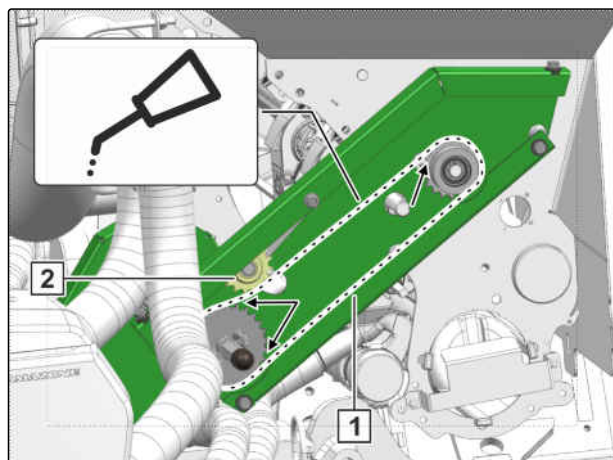
2. Remove the cover **2**.



CMS-I-00002724

3. Lubricate the roller chain **1** from the inside going out.

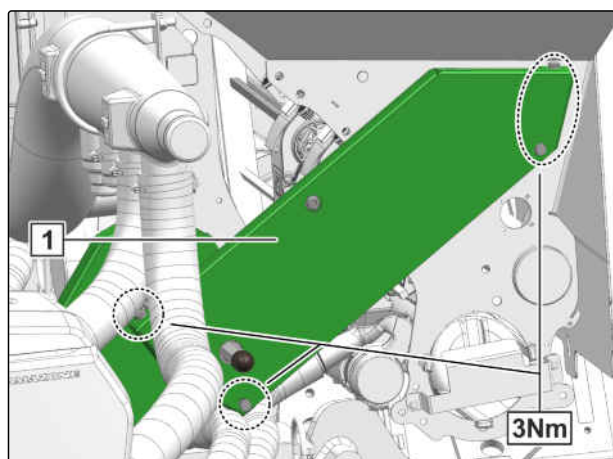
4. Check chain tensioner **2** for ease of movement.



CMS-I-00003886

5. Install the cover **1**.

6. Install the bolts.



CMS-I-00002723

### 10.3.5 Lubricating the roller chain on the central fertiliser metering drive

CMS-T-00005451-B.1



#### INTERVAL

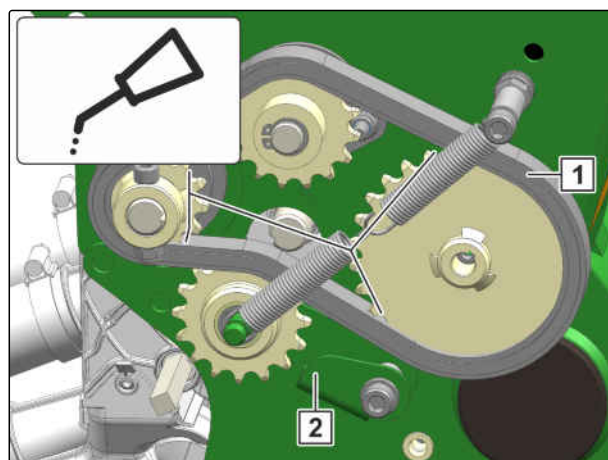
- After the first 10 operating hours
- Every 50 operating hours
- or
- at the end of the season

1. Remove the bolts **1**.
2. Remove the cover **2**.



CMS-I-00004157

3. Lubricate the roller chain **1** from the inside going out.
4. Check chain tensioner **2** for ease of movement.
5. Install the cover.
6. Install the bolts.



CMS-I-00004156



### 10.3.6 Lubricating the roller chain on the electric agitator shaft drive

CMS-T-00007652-A.1



#### INTERVAL

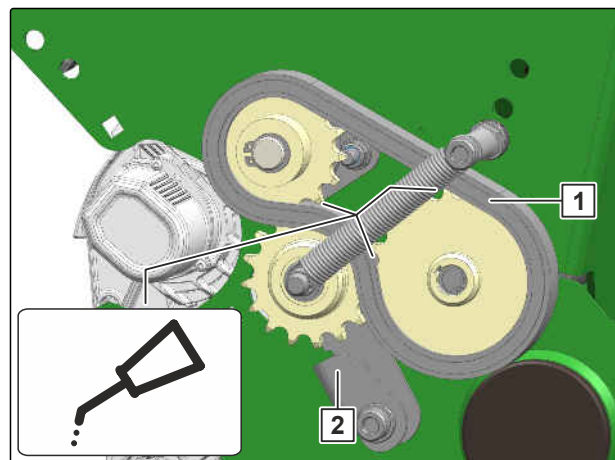
- After the first 10 operating hours
- Every 50 operating hours
- or
- at the end of the season

1. Remove the bolts **1**.
2. Remove the cover **2**.



CMS-I-00004157

3. Lubricate the roller chain **1** from the inside going out.
4. Check chain tensioner **2** for ease of movement.
5. Install the cover.
6. Install the bolts.



CMS-I-00005365

## 10.4 Eliminating faults

CMS-T-00005550-B.1

Errors	Cause	Solution
Track marker collision protection has been triggered.	The track marker has encountered a solid obstacle. The shear bolt is torn and the track marker folded to the rear.	see page 235
Gaps can be caused by insufficient seed in the grain singling unit.	Bridge formation disturbs the seed flow in the grain singling unit.	see page 235
An increased cleaning effort of the opto-sensor is observed.	Talc in the seed shortens the cleaning interval of the opto-sensor.	► Clean the opto-sensor.
The seed is not caught and jumps out of the furrow.	The seed collides against the catch roller or against the seed furrow.	see page 236
The control terminal shows a spread rate error.	The shot channel is blocked.	see page 236
The control terminal shows a speed error.	Check the gap on the inductive sensor. Defect on the mechanical drive.	► Adjust the distance between the inductive sensor and pulse wheel to 1-2 mm.
Press rollers get blocked.	Clods or stones get jammed between the press rollers.	see page 236
Blocking the depth control wheels.	Soil gets stuck between the cutting discs and the depth control wheels with closed rim.	see page 237
	Organic residues get stuck on the open rims.	see page 237
The electric drives do not run or start running at the wrong time.	The switch points of the working position sensor are wrong.	► <i>To configure the working position sensor, see "Configuring the working position sensor".</i>
The lighting for road travel has a malfunction.	Lamp or lighting supply line is damaged.	► Replace the lamp. ► Replace the lighting supply line.
Stopping of one or several singling discs.	The fuse for the electric drive is defective.	see page 237
	Fuse for the mechanical drive is defective.	see page 238
The grain spacings are larger than the setpoint.	Too much slip on the drive wheels.	► <i>To configure the working position sensor, see "Configuring the working position sensor".</i>
	Too much slip on the drive wheels.	► <i>To configure the working position sensor, see "Configuring the working position sensor".</i>



<b>Errors</b>	<b>Cause</b>	<b>Solution</b>
Speed fluctuations on the hydraulic drive.	Speed fluctuations occur on the hydraulic drive.	► Contact your specialist workshop.
The fill level in the singling unit housing is too high.	The brushes of the filling block are worn.	see page 238
The fertiliser coupling is leaky.	The funnels for the fertiliser coupling are misadjusted.	see page 239
The seed furrow is unstable or does not maintain its shape.	The furrow former is worn.	► <i>To replace the furrow former, see "Changing the furrow former".</i>

Track marker collision protection has been triggered

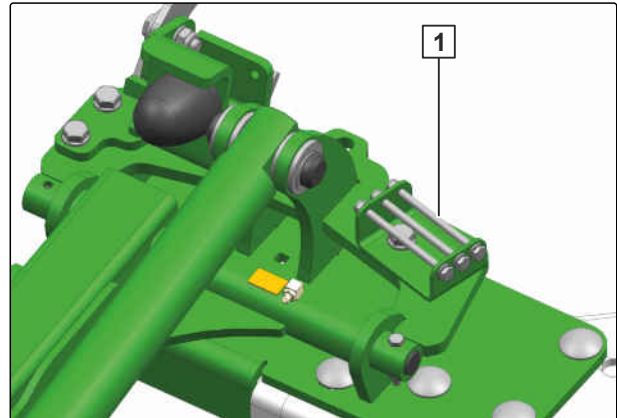
CMS-T-00005551-B.1



**NOTE**

Only use original bolts as a replacement. Refer to the online spare parts list. Spare bolts are in the track marker bracket **1**.

1. Remove the damaged bolt from the overload safety.
2. Insert the spare bolt in the track marker boom.
3. Tighten the spare bolt.



CMS-I-00002081

Gaps due to insufficient seed in the grain singling unit

CMS-T-00002346-A.1



**NOTE**

Talc in the seed shortens the cleaning interval of the opto-sensor.

Do not use graphite. Graphite disturbs the function of the opto-sensor.

- *To improve the flow of seed,*  
adjust the sliding shutter.

or

*If the grain shape and dressing cause the formation of bridges, improve the sliding capacity of the seed by adding 1.6 g of talc per 1 kg of seed.*

### Seed is not caught and jumps out of the furrow

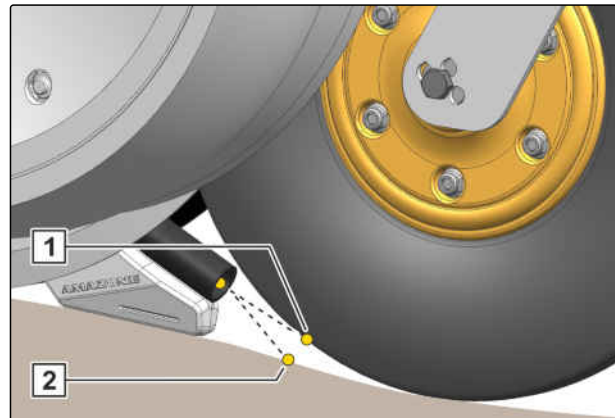
CMS-T-00002347-C.1

#### **i** NOTE

If the seed collides against the catch roller **1** or the seed furrow **2**, it is not reliably caught. The position of the catch roller can be adjusted.

The position of the catch roller must be adjusted by trained specialist personnel.

- Contact your specialist workshop.

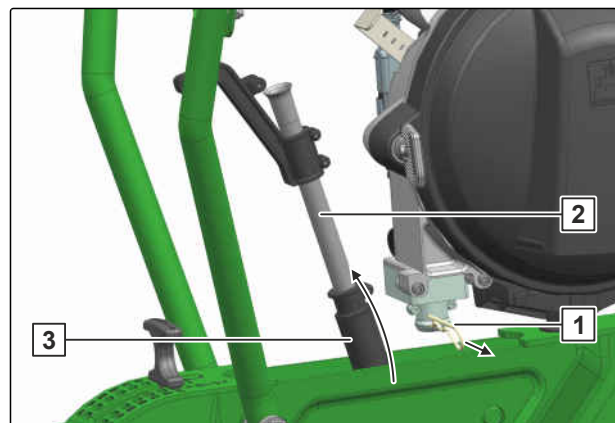


CMS-I-00001925

### Control terminal shows a spread rate error

CMS-T-00002348-B.1

1. Remove the spring cotter pin **1**.
2. Press the shot channel **2** down against the spring element **3**.
3. Remove the shot channel upwards.
4. Clean the shot channel.
5. Install the shot channel.
6. Secure the shot channel with a spring cotter pin **1**.



CMS-I-00002040

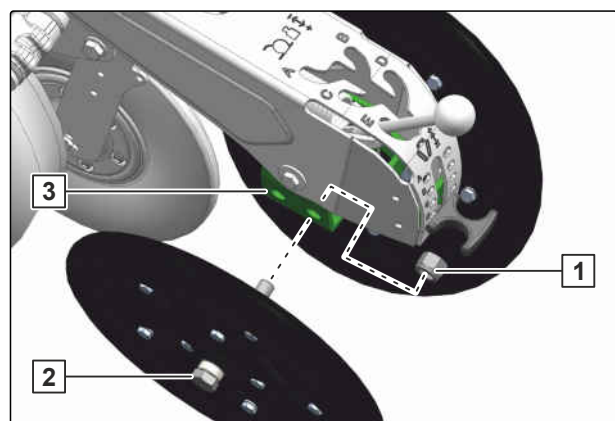
### Blocking of the press rollers

CMS-T-00002373-B.1

#### **i** NOTE

Offset installation is not possible in conjunction with disc closers.

1. Unscrew the nut **1** and remove it.
2. Remove the press roller.
3. *To increase the throughput on the press rollers, install the press roller with offset.*



CMS-I-00002041

4. Install the press roller with the bolt **2** in the hole **3**.
5. Put on the nut and tighten it.

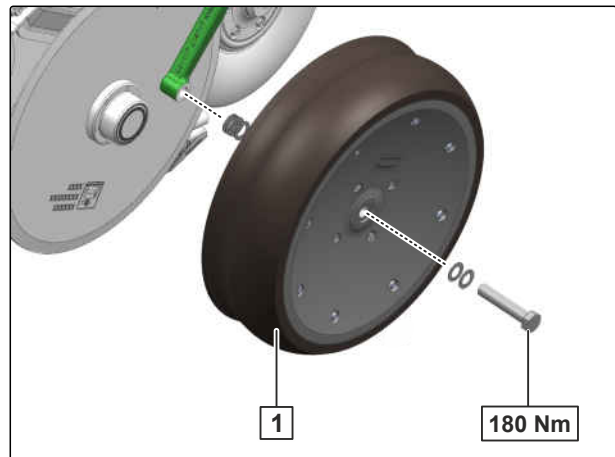
#### Blocking the depth control wheels

CMS-T-00007530-A.1

- Remove the depth control wheels **1** and clean them

or

*If the predominant operating conditions do not allow for continuous operation of the implement,*  
replace the depth control wheels with closed rim with depth control wheels with open rim.



CMS-I-00005302

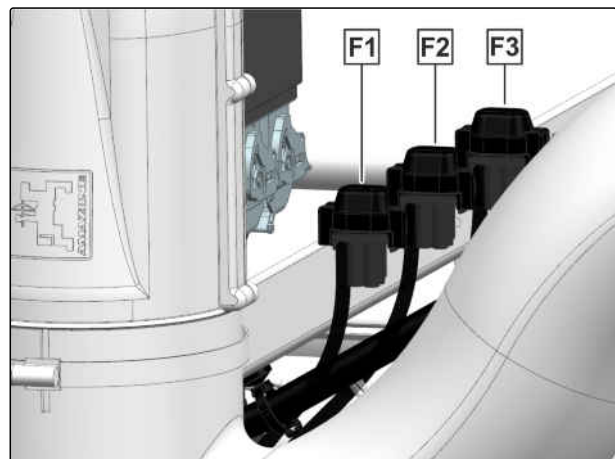
- Clean the depth control wheels

or

*If the predominant operating conditions do not allow for continuous operation of the implement,*  
replace the depth control wheels with open rim with depth control wheels with closed rim.

#### Stopping of one or several singling discs

CMS-T-00003677-B.1

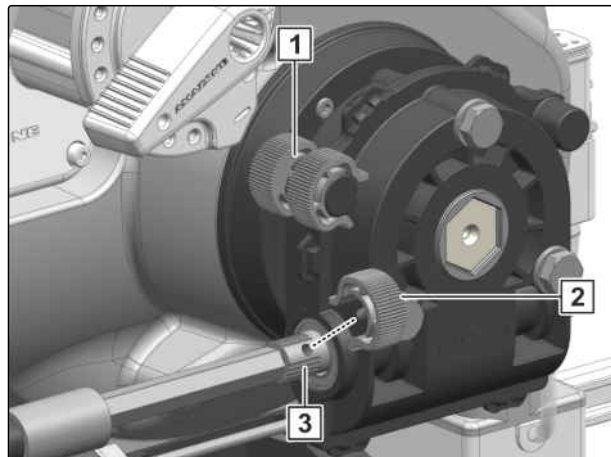


CMS-I-00002695

10-amp fuse	Protected rows
<b>F1</b>	Row 1 to 4
<b>F2</b>	Row 5 to 8
<b>F3</b>	Row 8 to 12

1. Clean the singling unit.
2. Check the singling disc for ease of movement.
3. Replace defective fuses.

1. Remove the defective shear pin **2**.
2. Remove the defective shear pin from the drive shaft **3**.
3. Clean the singling unit.
4. Check the singling disc for ease of movement.
5. Install the new shear pin **1**.



CMS-I-00002696

#### Fill level in the singling unit housing is too high

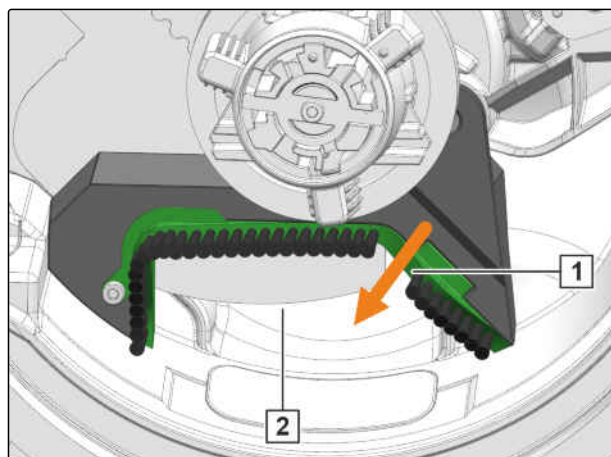
CMS-T-00008170-A.1

The scraper removes excess seed from the singling disc. If the brushes of the filling block are worn, the seed does not flow back into the storage area **2** within the filling block.

► To replace the defective filling block, see "Changing the singling disc"

or

contact your specialist workshop.



CMS-I-00005635

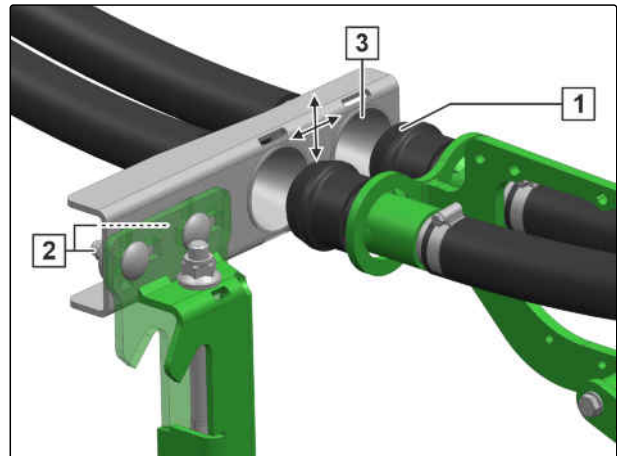
### The fertiliser coupling is leaky

CMS-T-00008171-A.1

As soon as the folding frame has been moved into working position, the funnels **3** move onto the conical mounts **1**.

If the conical mounts are not flush with the funnels and the conveyor section has leaks, the funnels need to be aligned.

1. Unfold the implement until the funnels are just in front of the conical mounts.
2. Loosen the bolts **2**.
3. Align the funnels centred in front of the conical mounts.
4. Tighten the bolts.



CMS-I-00005639

## 10.5 Cleaning the implement

CMS-T-00000593-F.1



### IMPORTANT

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

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



CMS-I-00002692

# Loading the implement

11

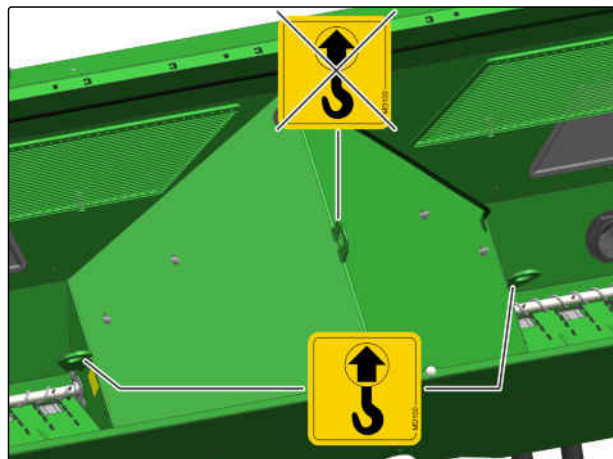
CMS-T-00005552-B.1

## 11.1 Lifting the implement

CMS-T-00005555-B.1

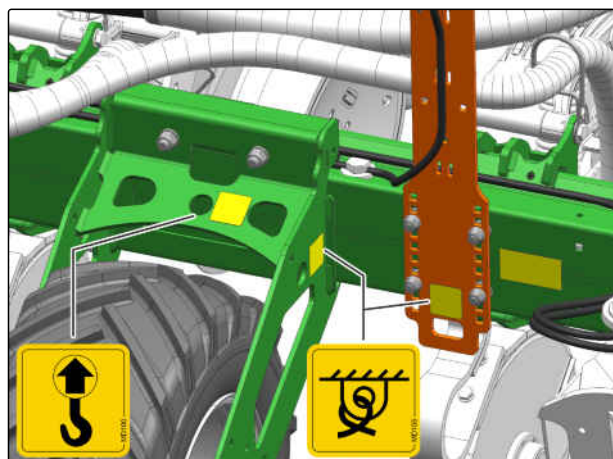
The implement has lashing points for slings.

For implements with fertiliser hopper, the lashing points are in the fertiliser hopper.



CMS-I-00004146

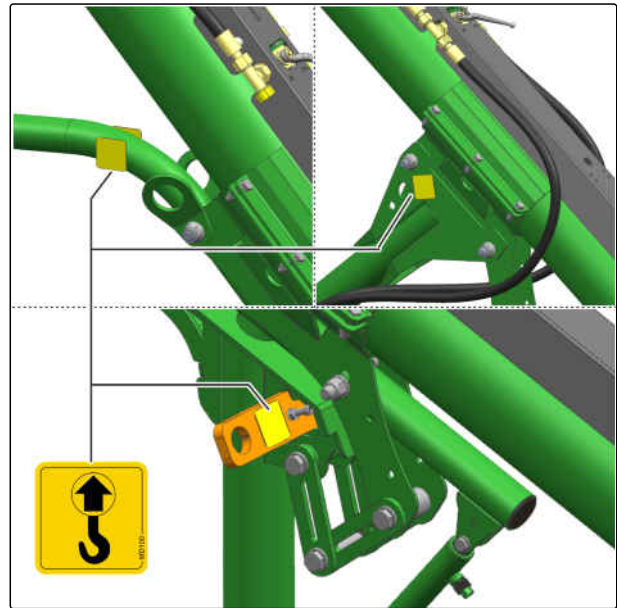
For implements without fertiliser hopper, the lashing points are on the swing arms.



CMS-I-00004150



On implements with a filling auger, the lashing points are on the filling auger.



CMS-I-00004148

On implements without a filling auger, there are lashing points on the centre seeding coulters **1**.

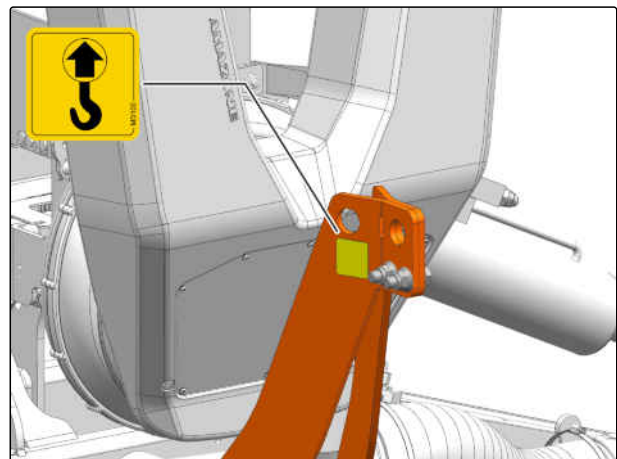


## WARNING

### Risk of accidents due to improperly attached slings for lifting

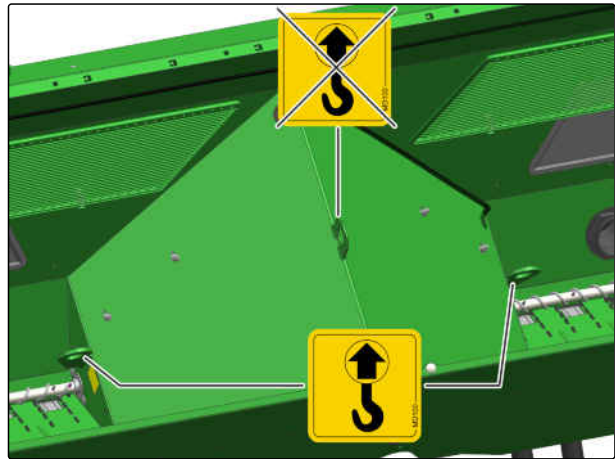
If the slings are not attached at the marked lashing points, the implement can be damaged during lifting and endanger safety.

- ▶ 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-00004151

Required load-bearing capacity per sling	2000 kg
--	---------



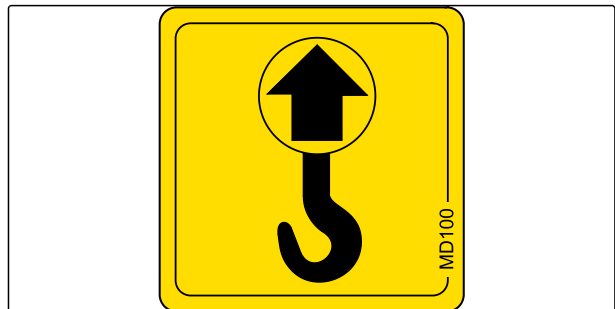
CMS-I-00004146

Improperly attached lifting gear in the fertiliser hopper.

#### ✓ REQUIREMENTS

- ✓ The implement is unfolded

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



CMS-I-000089

3. *When the implement has been unloaded, remove the lashing points on the centre seeding coulters* **1**.

- ➔ Store the removed parts in the threaded cartridge for later use.

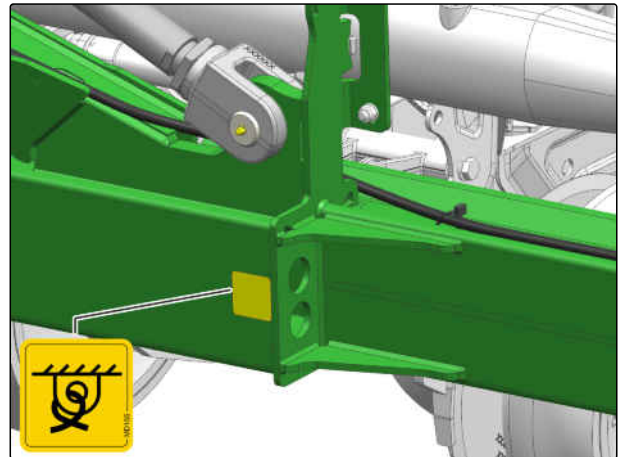


CMS-I-00003110

## 11.2 Lashing the implement

CMS-T-00005554-B.1

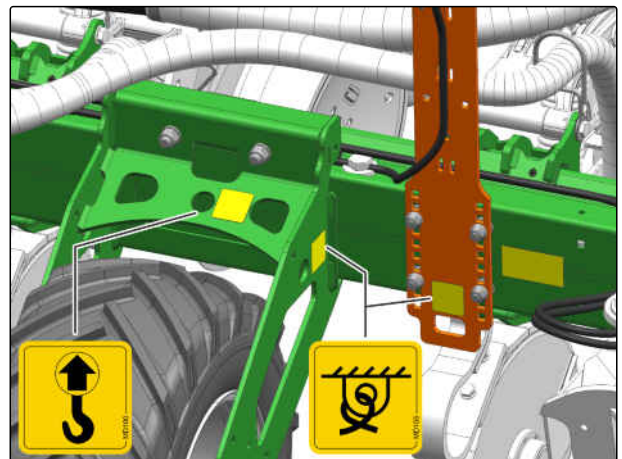
The implement has lashing points for securing the load.



CMS-I-00004149



CMS-I-00004147



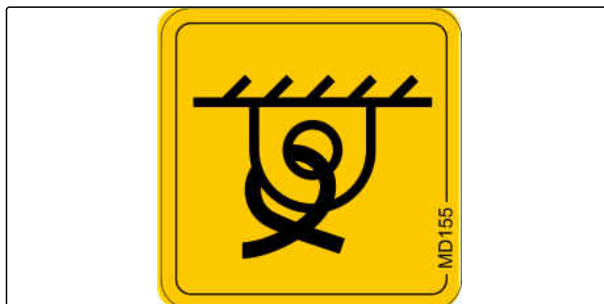
CMS-I-00004150



## REQUIREMENTS

✓ Implement is folded

1. Only attach the lifting gear at the marked positions.
2. Secure the implement in accordance with the regulations to the transport vehicle.



CMS-I-00000450

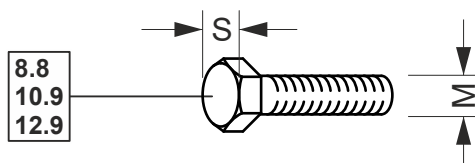
# Appendix

# 12

CMS-T-00001755-F.1

## 12.1 Bolt tightening torques

CMS-T-00000373-E.1



CMS-I-000260

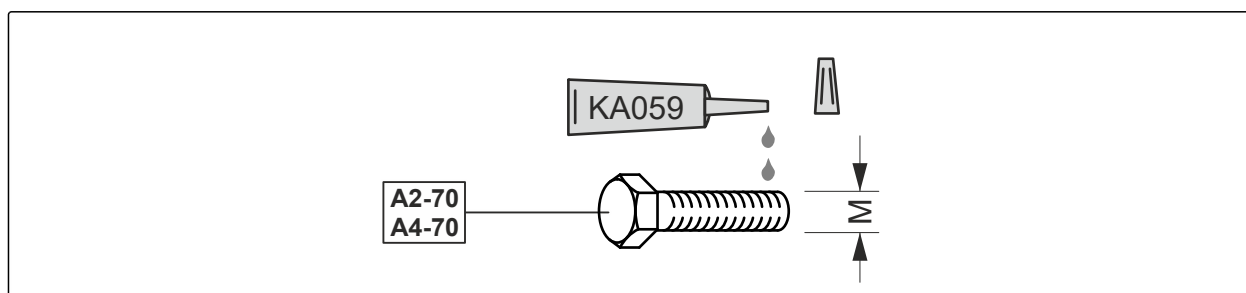


### NOTE

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

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

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



CMS-I-00000065

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

## 12.2 Other applicable documents

CMS-T-00001756-C.1

- Tractor operating manual
- ISOBUS software operating manual
- Control terminal operating manual

# Directories

# 13

## 13.1 Glossary

CMS-T-00000513-B.1

### M

#### Machine

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

### O

#### Operating materials

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

### T

#### Tractor

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



## 13.2 Index

<b>3</b>		Changing the spread rate	
3-point mounting frame		<i>Adjusting the grain spacing in the interchangeable wheel gear</i>	108
<i>adjusting</i>	56	<i>Determining the gear ratio with leading wheel drive</i>	103
<i>coupling</i>	61	<i>Determining the gear ratio with trailing wheel drive</i>	106
<i>uncoupling</i>	191	<i>Electrically driven fertiliser metering</i>	126
<b>A</b>		<i>Electrically driven grain singling unit</i>	99
Address		<i>Manually calculating the grain spacing</i>	98
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