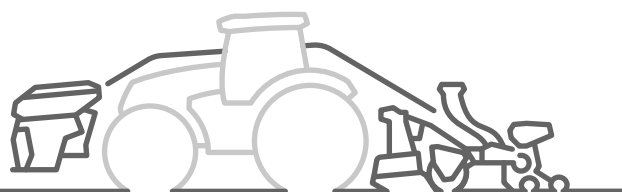




Original operating manual

Pack top precision airplanter

Precea 6000-2AFCC



SmartLearning



AMAZONE

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

Maschinen-Nr.

Fahrzeug-Ident-Nr.

Produkt



zul. technisches Maschinengewicht kg
Modelljahr

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



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About this operating manual

1

CMS-T-00000081-I.1

1.1 Copyright

CMS-T-00012308-A.1

Reprinting, translation and reproduction in any form, including excerpts, require the written approval of AMAZONEN-WERKE.

1.2 Diagrams

CMS-T-005676-F.1

1.2.1 Warnings and signal words

CMS-T-00002415-A.1

Warnings are marked with a vertical bar with a triangular safety symbol and the signal word. The signal words "*DANGER*", "*WARNING*" or "*CAUTION*" describe the severity of the potential danger and have the following meanings:



DANGER

- Indicates a direct threat with high risk for severe physical injury, such as loss of limbs or death.



WARNING

- Indicates a possible threat with moderate risk for severe physical injury or death.



CAUTION

- Indicates a threat with low risk for light or moderately severe physical injuries.

1.2.2 Further instructions

CMS-T-00002416-A.1



IMPORTANT

- Indicates a risk for damage to the implement.



ENVIRONMENTAL INFORMATION

- Indicates a risk for environmental damage.



NOTE

Indicates application tips and instructions for optimal use.

1.2.3 Instructions

CMS-T-00000473-D.1

1.2.3.1 Numbered instructions

CMS-T-005217-B.1

Actions that have to be performed in a specific sequence are represented as numbered instructions. The specified sequence of the actions must be observed.

Example:

1. Instruction 1
2. Instruction 2

1.2.3.2 Instructions and responses

CMS-T-005678-B.1

Reactions to instructions are marked with an arrow.

Example:

1. Instruction 1
- ➡ Reaction to instruction 1
2. Instruction 2

1.2.3.3 Alternative instructions

CMS-T-00000110-B.1

Alternative instructions are introduced with the word "or".

Example:

1. Instruction 1

or

Alternative instruction

2. Instruction 2

1.2.3.4 Instructions with only one action

CMS-T-005211-C.1

Instructions with only one action are not numbered, but rather shown with a arrow.

Example:

► Instruction

1.2.3.5 Instructions without sequence

CMS-T-005214-C.1

Instructions that do not require a specific sequence are shown as a list with arrows.

Example:

► Instruction

► Instruction

► Instruction

1.2.3.6 Workshop work

CMS-T-00013932-B.1



WORKSHOP WORK

- Identifies maintenance work that must be performed at a workshop that is adequately equipped in terms of agricultural technology, safety and environmental technology by specialist personnel with appropriate training.

1.2.4 Lists

CMS-T-000024-A.1

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

Example:

- Point 1
- Point 2

1.2.5 Item numbers in figures

CMS-T-000023-B.1

A framed number in the text, e.g. a 1, indicates an item number in an adjacent figure.

1.2.6 Direction information

CMS-T-00012309-A.1

Unless otherwise specified, all directions are always seen in the direction of travel.

1.3 Other applicable documents

CMS-T-00000616-B.1

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

1.4 Digital operating manual

CMS-T-00002024-B.1

The digital operating manual and e-learning can be downloaded from the Info Portal on the AMAZONE website.

1.5 Your opinion is important

CMS-T-000059-D.1

Dear reader, our documents are updated on a regular basis. Your suggestions for improvement help us to create ever more user-friendly documents. Please send us your suggestions by post, fax or email.

AMAZONEN-WERKE H. Dreyer SE & Co. KG
Technische Redaktion
Postfach 51
D-49202 Hasbergen

Fax: +49 (0) 5405 501-234
E-Mail: tr.feedback@amazone.de

CMS-I-00000638

Safety and responsibility

2

CMS-T-00007640-C.1

2.1 Basic safety instructions

CMS-T-00007641-C.1

2.1.1 Meaning of the operating manual

CMS-T-00006180-A.1

Observe the operating manual

The operating manual is an important document and a part of the implement. It is intended for the user and contains safety-related information. Only the instructions provided in the operating manual are reliable. If the operating manual is not observed, it can result in serious injury or death.

- ▶ The safety section must be completely read and observed before initial operation of the implement.
- ▶ Before starting work, also read and observe each section of the operating manual.
- ▶ Keep the operating manual in a safe place.
- ▶ Keep the operating manual available.
- ▶ Hand over the operating manual to the subsequent user.

2.1.2 Safe operating organisation

CMS-T-00002302-D.1

2.1.2.1 Personnel qualification

CMS-T-00002306-B.1

2.1.2.1.1 Requirements for persons working with the implement

CMS-T-00002310-B.1

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

the implement must meet the following minimum requirements:

- The person is physically and mentally capable of checking the implement.
- The person can safely perform work with the machine within the scope of this operating manual.
- The person understands the functioning of the machine within the scope of their work and can recognise and prevent dangers arising during operation.
- The person had understood the operating manual and can implement the information that is conveyed in the operating manual.
- The person must be familiar with safe driving of vehicles.
- For road travel, the person knows the relevant road traffic regulations and has the prescribed driving permit.

2.1.2.1.2 Qualification levels

CMS-T-00002311-A.1

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

- Farmer
- Agricultural helper

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

2.1.2.1.3 Farmer

CMS-T-00002312-A.1

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

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

Farmers can be e.g.:

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

Activity example:

- Safety training for agricultural helpers

2.1.2.1.4 Agricultural helpers

CMS-T-00002313-A.1

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

Agricultural helpers can be e.g.:

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

Activity examples:

- Driving the machine
- Adjusting the working depth

2.1.2.2 Workplaces and passengers

CMS-T-00002307-B.1

Passengers

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

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

2.1.2.3 Danger for children

CMS-T-00002308-A.1

Danger for children

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

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

2.1.2.4 Operational safety

CMS-T-00002309-D.1

2.1.2.4.1 Perfect technical condition

CMS-T-00002314-D.1

Only use properly prepared machines

Without correct preparation according to this operating manual, operational safety of the machine is not ensured. This can result in accidents and serious personal injury or even death.

- ▶ Prepare the machine according to this operating manual.

Danger due to damage to the machine

Damage to the machine can impede the operational safety of the machine and cause accidents. This can result in serious injury or death.

- ▶ *If you suspect or observe damage:*
Secure the tractor and machine.
- ▶ Repair safety-relevant damage immediately.
- ▶ Fix the damage according to this operating manual.
- ▶ *If you are not able to fix the damage according to this operating manual yourself:*
Have the damage repaired by a qualified specialist workshop.

Observe the technical limit values

Non-observance of the technical limits values of the machine can result in accidents and serious personal injury or even death. Moreover, the machine can be damaged. The technical limit values can be found in the Technical Data.

- ▶ Comply with the technical limit values.

2.1.2.4.2 Personal protective equipment

CMS-T-00002316-B.1

Personal protective equipment

Wearing personal protective equipment is an important safety element. Missing or unsuitable personal protective equipment increases the risk of damage to health and personal injury. Personal protective equipment includes: work gloves, safety shoes, protective clothing, breathing protection, hearing protection, face protection, and eye protection

- ▶ Determine the personal protective equipment required for each job and have it ready.
- ▶ Use only protective equipment that is in proper condition and offers effective protection.
- ▶ Adjust the personal protective equipment to the person, e.g. the size.
- ▶ Observe the manufacturer's instructions regarding operating materials, seed, fertiliser, crop protection products, and cleaning agents.

Wear suitable clothing

Loosely worn clothing increases the risk of getting caught or entangled on rotating parts and getting stuck on protruding parts. This can result in serious injury or death.

- ▶ Wear close-fitting, snag-free clothes.
- ▶ Never wear rings, necklaces and other jewellery.
- ▶ *If you have long hair,*
wear a hairnet.

2.1.2.4.3 Warning symbols

CMS-T-00002317-B.1

Keep warning symbols legible

Warning symbols on the machine warn you of risks in danger areas and are an important element of the machine's safety equipment. Missing warning symbols increase the risk of serious and lethal personal injury.

- ▶ Clean dirty warning symbols.
- ▶ Immediately replace any damaged and illegible warning symbols.
- ▶ Put the intended warning symbols on spare parts.

2.1.3 Knowing and preventing dangers

CMS-T-00007642-B.1

2.1.3.1 Safety hazards on the implement

CMS-T-00002318-F.1

Liquids under pressure

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

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

Risk of injury on the universal joint shaft

Persons can be caught, pulled in and severely injured by the universal joint shaft and driven components. If the universal joint shaft is overloaded, the implement can be damaged, parts can be ejected at high speed, and persons can be injured.

- ▶ Maintain sufficient coverage of the profile tube, universal joint shaft guard and PTO shaft protective cap.
- ▶ Maintain the direction of rotation and the permissible speed of the universal joint shaft.
- ▶ *If the universal joint shaft is angled down too strongly:*
Switch off the universal joint shaft drive.
- ▶ *If you do not need the universal joint shaft:*
Switch off the universal joint shaft drive.

Risk of injury on the PTO shaft

Persons can be caught, pulled in and severely injured by the PTO shaft and driven components. If the PTO shaft is overloaded, the implement can be damaged, parts can be ejected at high speed, and persons can be injured.

- ▶ Maintain sufficient coverage of the profile tube, universal joint shaft guard and PTO shaft protective cap.
- ▶ Allow the locks on the PTO shaft to engage.
- ▶ *To secure the universal joint shaft guard against rotating:*
Hook on the safety chains.
- ▶ *To secure the coupled hydraulic pump against rotating:*
Put on the torque support.
- ▶ Maintain the direction of rotation and the permissible speed of the PTO shaft.
- ▶ *To prevent implement damage due to torque peaks:*
Slowly couple the PTO shaft at low tractor engine speed.

Danger due to machine parts still running

When the drives are switched off, machine parts can continue running and cause serious personal injury or death.

- ▶ Before approaching the machine, wait until any machine parts that are still running have come to a stop.
- ▶ Only touch machine parts that are standing still.

2.1.3.2 Danger areas

CMS-T-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.

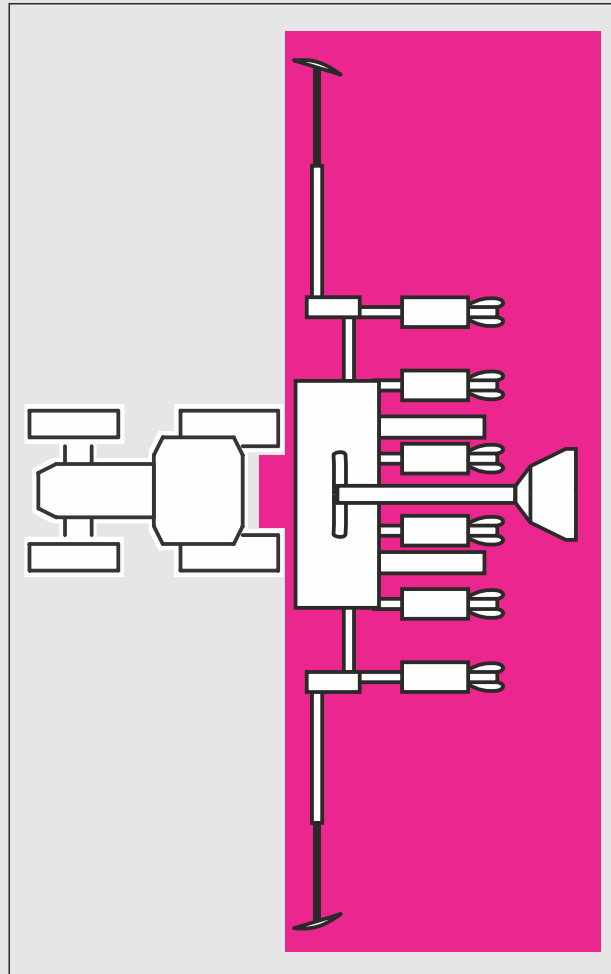
Hydraulically raised implement parts can descend unnoticed and slowly.

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-H.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-G.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.
- ▶ Have maintenance work that is labelled as "*WORKSHOP WORK*" performed at a workshop that is adequately equipped in terms of agricultural technology, safety and environmental technology by specialist personnel with appropriate training.
- ▶ Never perform welding, drilling, sawing, grinding, and cutting work on the frame, running gear or coupling devices of the implement.
- ▶ Never modify safety-related components.
- ▶ Never drill out existing holes.
- ▶ Perform all maintenance work at the prescribed maintenance intervals.

Raised implement parts

Raised implement parts can descend unintentionally and crush or kill people.

- ▶ Never linger under raised implement parts.
- ▶ *If you have to work on or under raised machine parts,*
lower the implement parts or secure the raised implement parts with a mechanical support or hydraulic locking device.

Danger due to welding work

Improper welding work, particularly on or close to safety-related components, endangers the operational safety of the implement. This can result in accidents and serious personal injury or even death. Safety-related components include, for example, hydraulic components and electronic components, frames, springs, coupling devices to the tractor such as the 3-point mounting frame, drawbar, trailer support, trailer coupling or tensioned crosspiece as well as axles and axle suspensions, lines and tanks containing flammable substances.

- ▶ Allow only qualified specialist workshops with suitably approved personnel to perform welding work on safety-related components.
- ▶ Only allow qualified personnel to perform welding work on all other components.
- ▶ *If you have doubts as to whether a component can be welded:*
Ask a qualified specialist workshop.
- ▶ *Before welding on the implement:*
Uncouple the implement from the tractor.
- ▶ Do not weld close to a crop protection sprayer that was previously used to spread liquid fertiliser.

2.1.5.3 Operating materials

CMS-T-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.

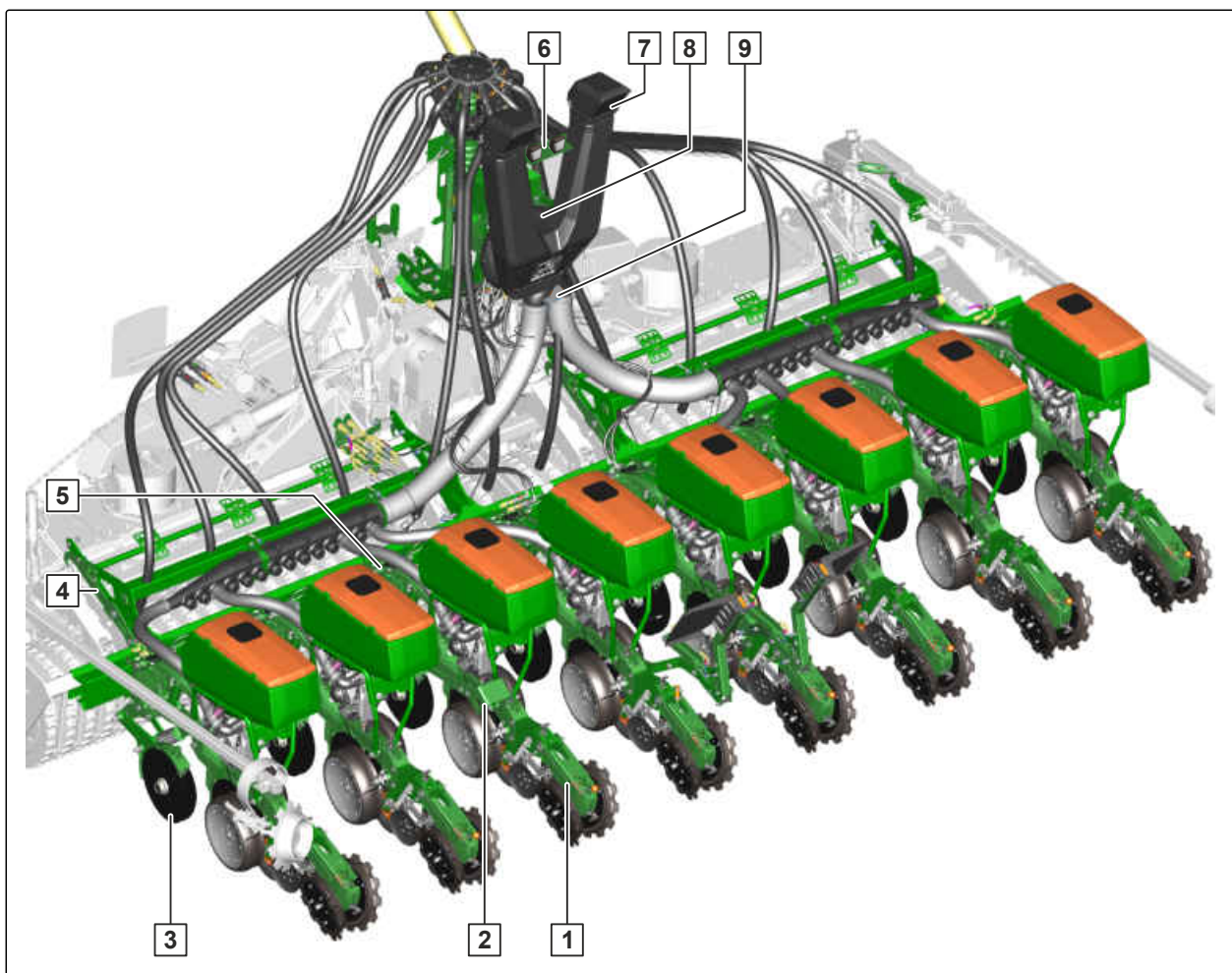
Product description

4

CMS-T-00010716-B.1

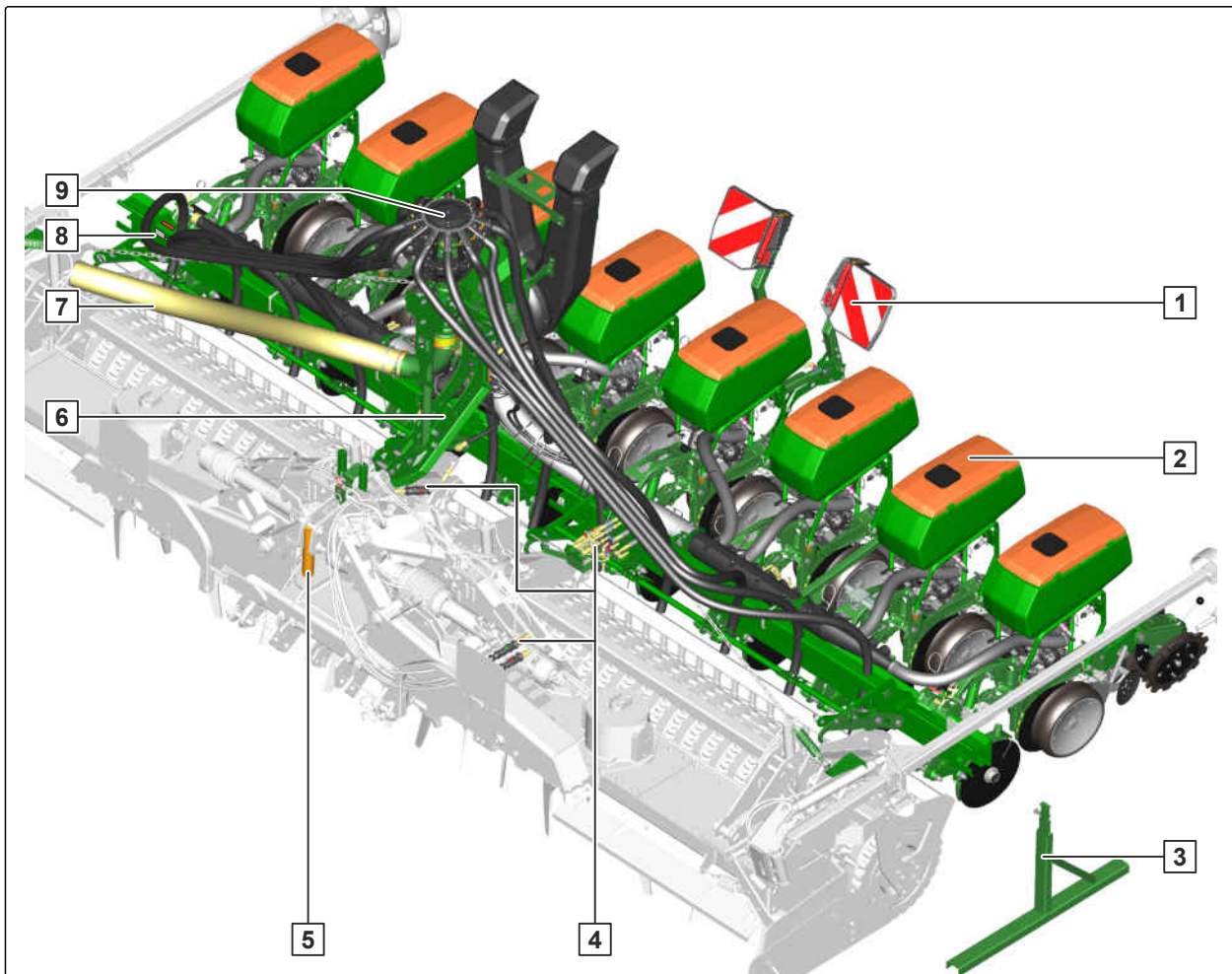
4.1 Implement overview

CMS-T-00010721-A.1



CMS-I-00007393

- | | |
|--|--------------------------|
| 1 Seeding unit | 2 Radar sensor |
| 3 Fertiliser coultter | 4 Implement frame |
| 5 Hydraulic coultter displacement | 6 Work lights |
| 7 Suction basket | 8 Fan |
| 9 Air distributor | |



CMS-I-00007394

- | | |
|---|-------------------------|
| 1 Lighting and identification for road travel | 2 Seed hopper |
| 3 Parking support | 4 Hydraulic connections |
| 5 Hopper for implement documents | 6 Central bracket |
| 7 Conveyor hose | 8 Rating plates |
| 9 Distributor head | |

4.2 Function of the implement

CMS-T-00005720-C.1

A soil tillage implement is required to carry and use the implement.

The basic version of the implement consists of a frame with the coupling system, 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. The fertiliser is

carried in the front-mounted hopper. The hose package connects the front-mounted hopper to the rear-mounted implement.

4.3 Special equipment

CMS-T-00012117-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.

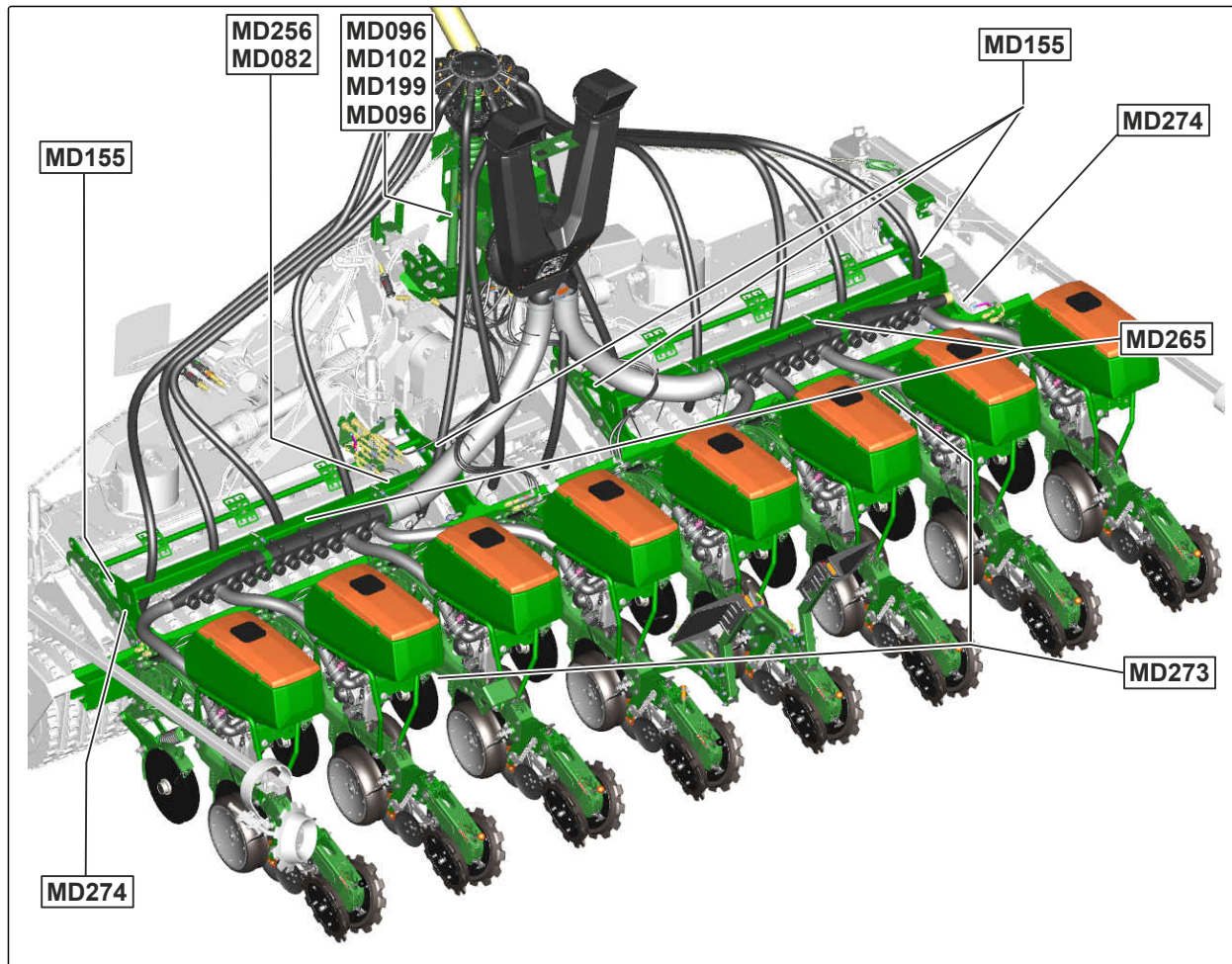
- Disc closer
- Star closer
- Mono press roller
- Integrated fertiliser system
- FertiSpot
- Light
- Micropellet spreader
- Multi-placement tester
- Hydraulic coulter pressure system
- Contact force regulation
- Calibration kit
- Cyclone separator
- Parking supports
- Hydraulic coulter displacement
- Work lights

4.4 Warning symbols

CMS-T-00010718-B.1

4.4.1 Position of the warning symbols

CMS-T-00010719-B.1



CMS-I-00007810

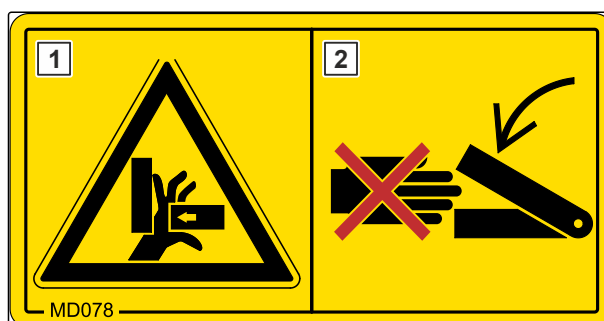
4.4.2 Layout of the warning symbols

CMS-T-000141-D.1

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

A warning symbol consists of two fields:

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



CMS-I-00000416

4.4.3 Description of the warning symbols

CMS-T-00010720-B.1

MD 082

Risk of falling from tread surfaces and platforms

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



CMS-I-000081

MD095

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

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



CMS-I-000138

MD 096

Risk of infection from escaping hydraulic fluid under high pressure

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



CMS-I-000216

MD 102

Risk due to unintentional starting and rolling away of the machine

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

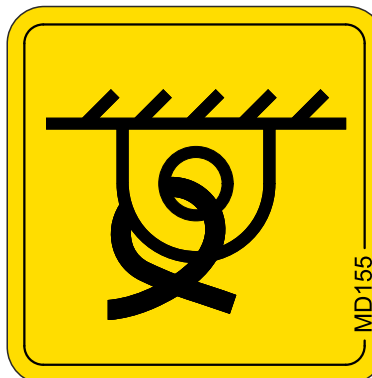


CMS-I-00002253

MD 155

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

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

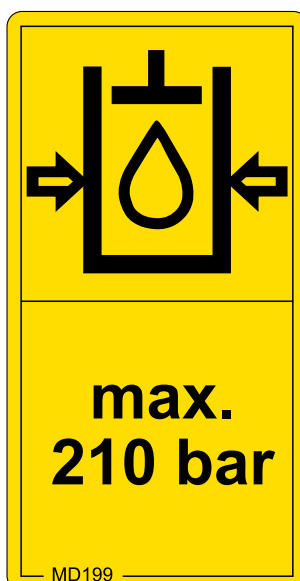


CMS-I-00000450

MD 199

Risk of accident if the hydraulic system pressure is too high

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

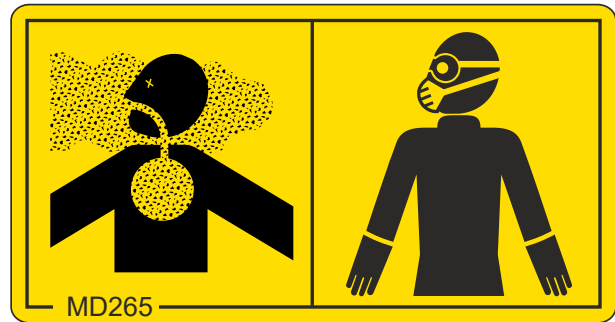


CMS-I-00000486

MD 265

Risk of chemical burns by dressing dust

- ▶ Do not breathe in the harmful substance.
- ▶ Avoid contact with eyes and skin.
- ▶ Before working with hazardous materials, put on the protective clothing recommended by the manufacturer.
- ▶ Follow the manufacturer's safety instructions for handling harmful substances.

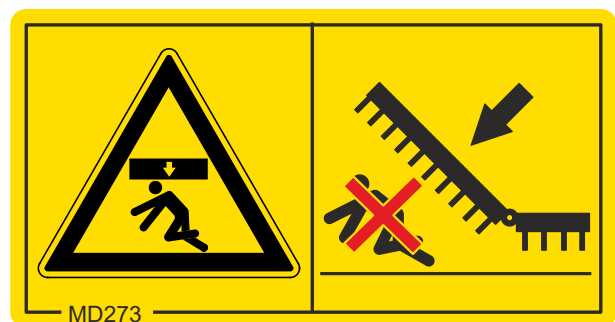


CMS-I-00003659

MD 273

Risk of crushing for the whole body from lowering implement parts

- ▶ Make sure that there is nobody standing in the danger area.



CMS-I-00004833

MD 274

Risk of crushing due to the implement falling over

- ▶ Empty the seed hopper.
- ▶ *Before you park the empty pack top implement, install the parking supports.*



CMS-I-00004664

4.5 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

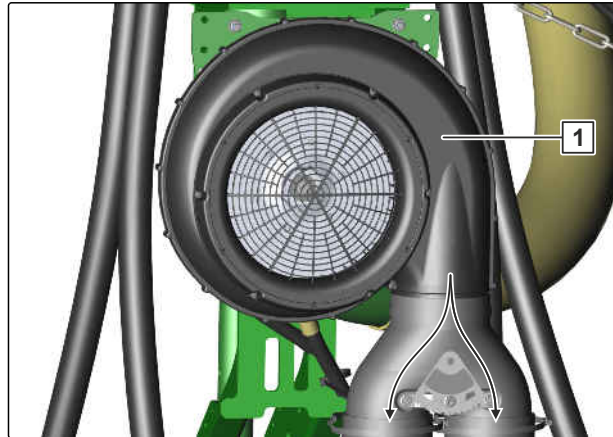


CMS-I-00004294

4.6 Compressed air fan

CMS-T-00012133-A.1

The compressed air fan **1** produces overpressure, which causes the seed grains to adhere to the singling discs. The fan is driven by 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-00007820

4.7 Grain singling unit

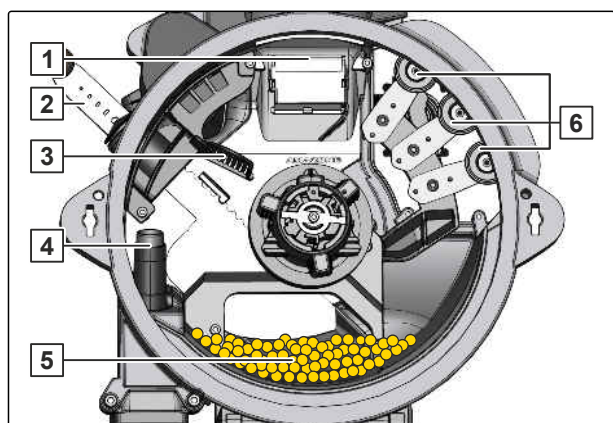
CMS-T-00001990-G.1

4.7.1 Layout and function of the grain singling unit

CMS-T-00001773-E.1

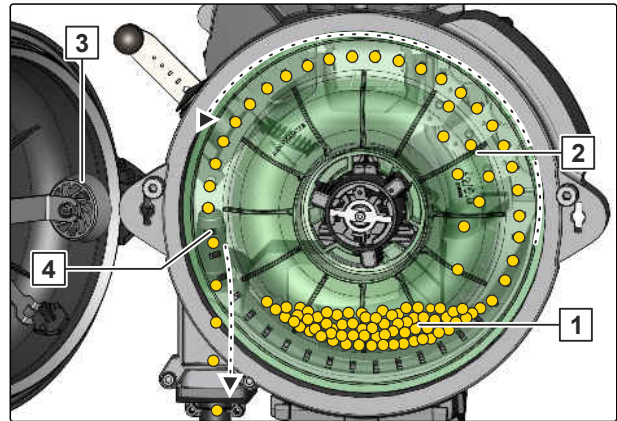
The grain singling unit singles the seed with air overpressure. The spread rate determines the required grain spacing. The type of singling disc and the singling disc speed determine the spread rate. Depending on the implement equipment, the speed of the singling discs is set in the mechanical setting 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

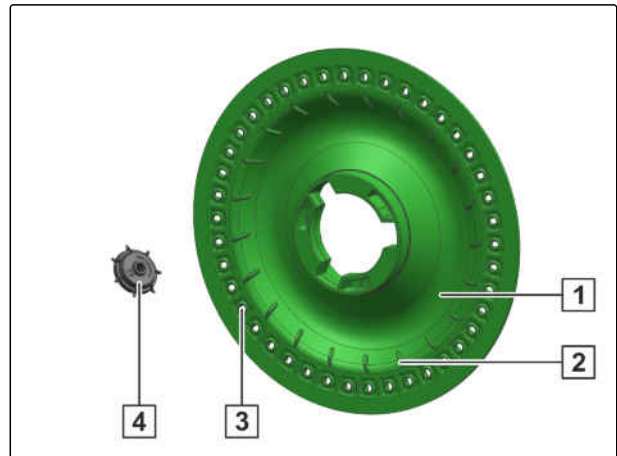
The compressed air fan produces the overpressure in the grain singling unit. The grains from the supply area **1** adhere to the holes of the singling disc due to the overpressure. The rotating singling disc guides the singled seed past the scrapers. The scrapers remove excess seed grains **2**. The 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

4.7.2 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-I-00001947

4.8 PreTeC mulch seeding coulters

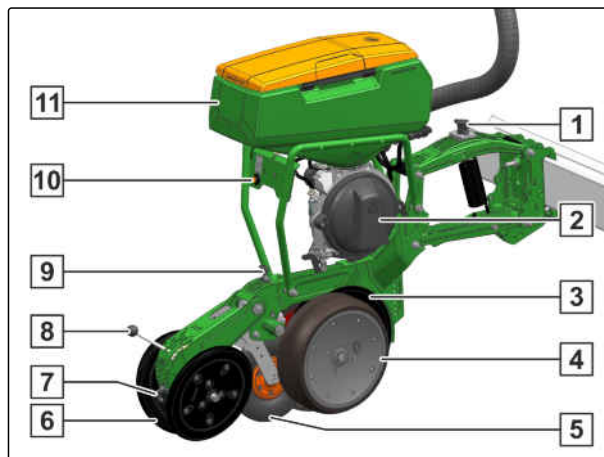
CMS-T-00005814-E.1

4.8.1 Seeding unit

CMS-T-00001771-F.1

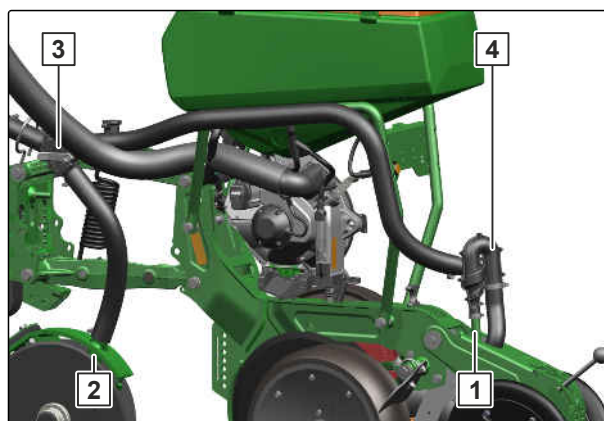
The seeding unit is used on ploughed or mulched soils. The seeding unit includes the grain singling unit, the seed hopper and the seeding coulters. The seed placement depth and the seeding coulters pressure can be adjusted. The seeding coulters are guided over the soil with the depth control wheel. The cutting discs 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. Depending on the implement equipment, the seed furrow will either be closed by a press roller or the V press rollers.

- 1** Coulters pressure adjustment, mechanical or hydraulic
- 2** Grain singling unit
- 3** Cutting discs
- 4** Depth control wheels
- 5** Catch roller
- 6** V press rollers
- 7** V press roller pitch adjustment
- 8** V 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.

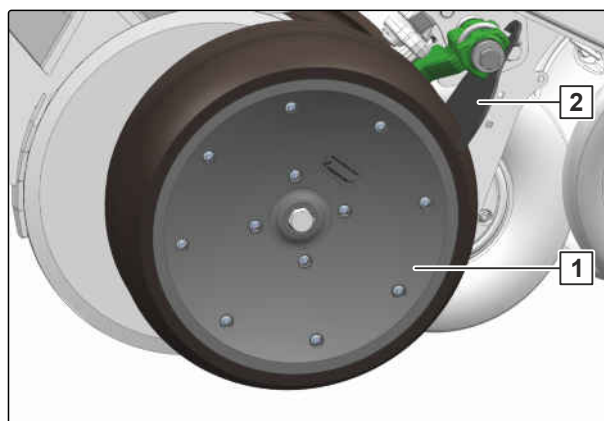


CMS-I-00007255

4.8.2 Depth control wheels

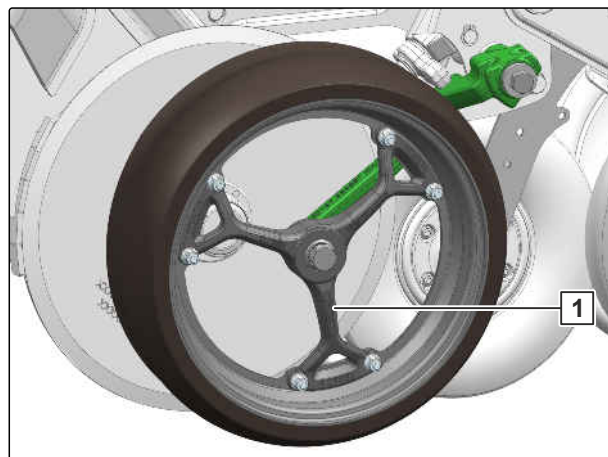
The depth control wheels guide the seeding coulters over the soil.

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-I-00001954

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

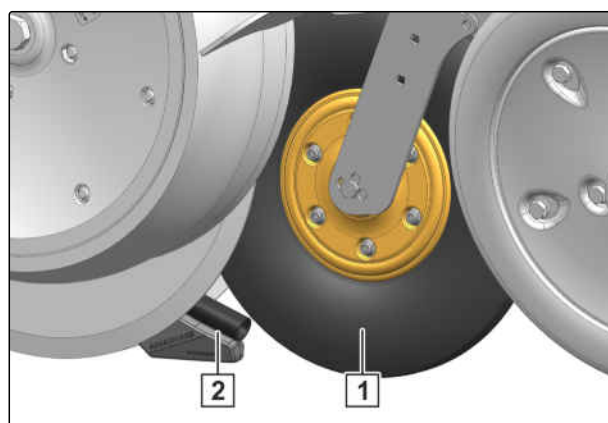


CMS-I-00005367

4.8.3 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.

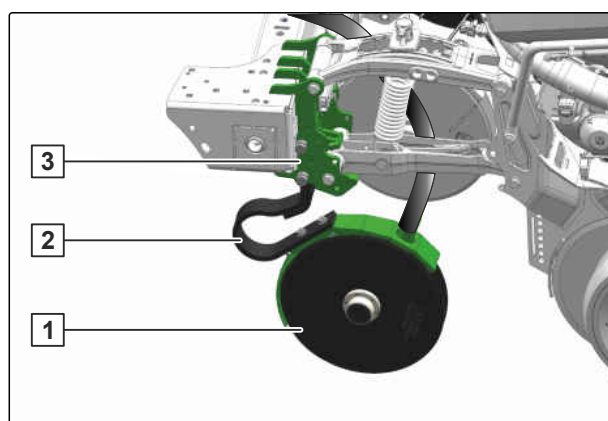


CMS-I-00001955

4.9 FerTeC Twin coulter

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 coulter compression spring
- 3** Coulter mount



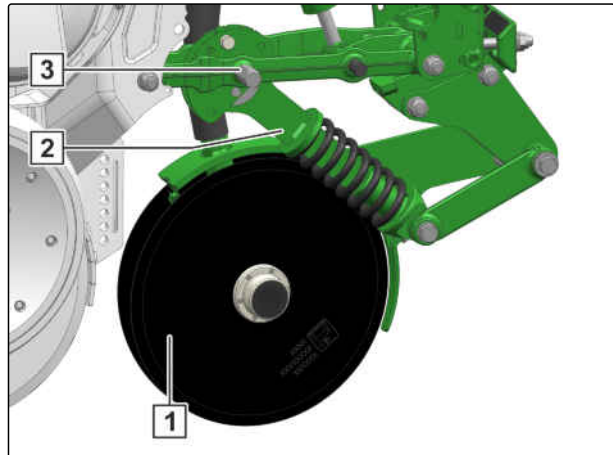
CMS-I-00001963

4 | Product description

FertiSpot

The coupled fertiliser coulters are guided via the PreTeC mulch seeding coulters. The placement depth is adjusted with an eccentric.

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



CMS-I-00003934

- 1 Liquid fertiliser connection
- 2 Liquid fertiliser outlet



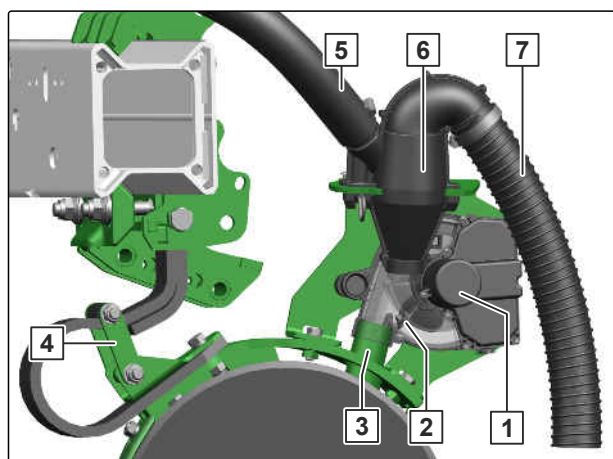
CMS-I-00002728

4.10 FertiSpot

CMS-T-00014355-A.1

The FertiSpot metering unit enables spot application of pre-metered fertiliser. The pre-metered fertiliser is conveyed via the hose [5] into the air separator [6]. In FertiSpot mode, the fertiliser portion is applied at the same time as the seed. In MultiSpot mode, a maximum number of fertiliser portions can be applied.

The exhaust air is discharged close to the ground via the hose [7]. The fertiliser is collected in the metering unit housing [1] and is conveyed in portions into the FerTeC coulters [3] by means of the rotor [2]. The leaf spring is pre-tensioned with the spring tensioner [4] to reduce vibrations of the FertiSpot metering unit.



CMS-I-00009102

4.11 Micropellet spreader

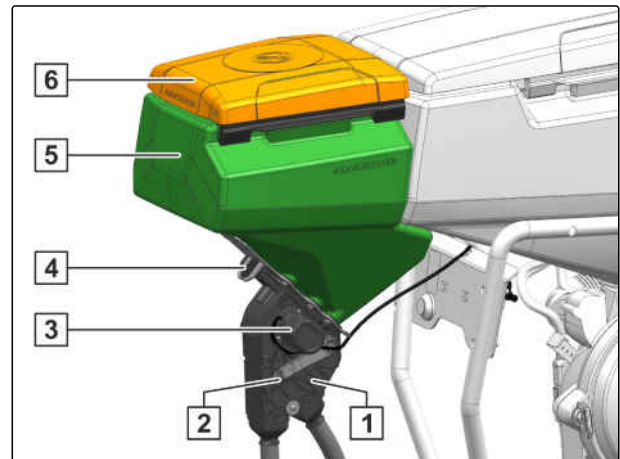
CMS-T-00003594-C.1

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

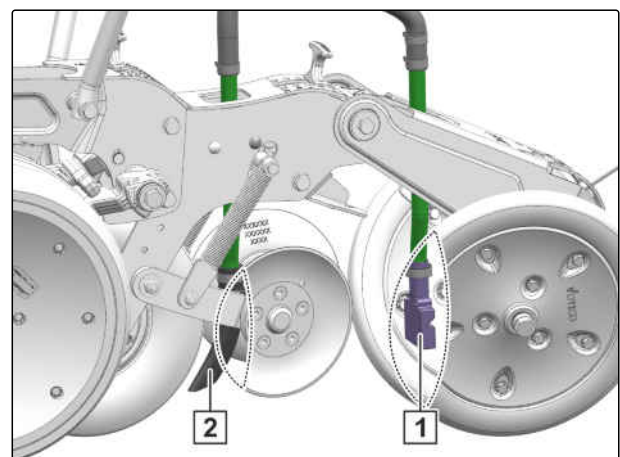
- 1** Micropellet metering unit
- 2** Bottom flap
- 3** Drive
- 4** Sliding shutter
- 5** Micropellet hopper
- 6** Hopper cover



CMS-I-00002590

PreTeC coulter with closer

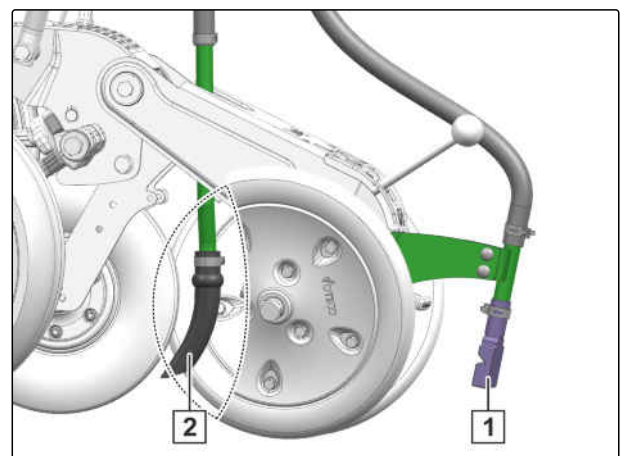
- 1** Application in the closing seed furrow, for slug pellet applications.
- 2** Application in the seed furrow, for insecticide and micro-fertiliser applications.



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.

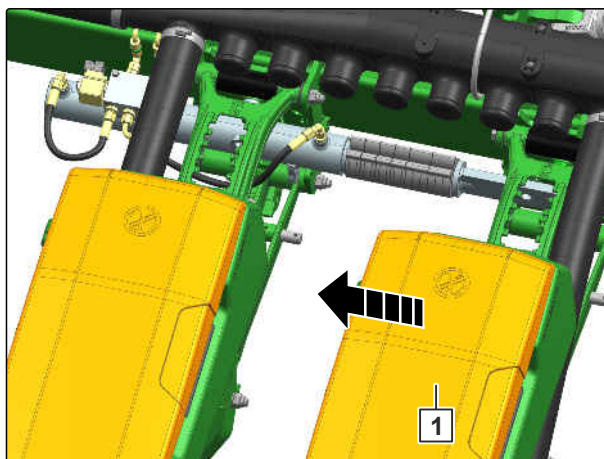


CMS-I-00003849

4.12 Hydraulic coulters displacement

CMS-T-00010896-A.1

To be able to couple the transport frame onto the soil tillage implement, defined coulters **1** must be hydraulically moved towards the adjacent coulters.



CMS-I-00007418

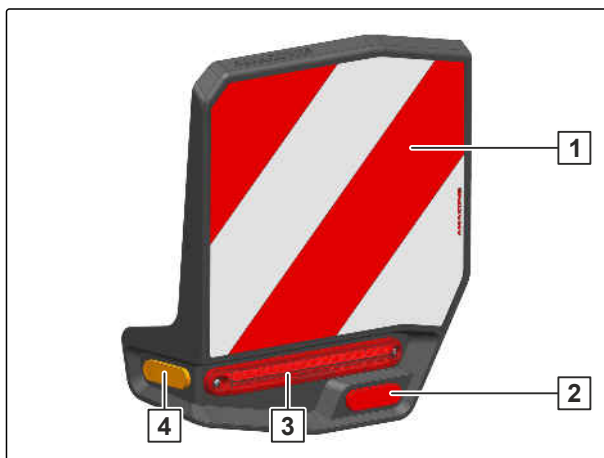
4.13 Lighting and identification for road travel

CMS-T-00006398-C.1

4.13.1 Rear lighting and identification for road travel

CMS-T-00001498-F.1

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



CMS-I-00004545

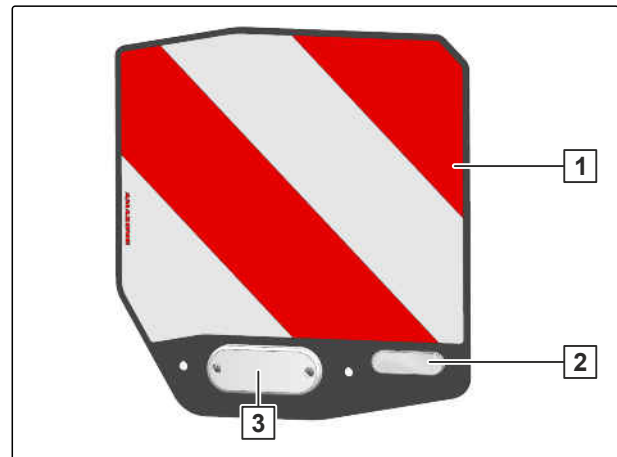


NOTE

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

4.13.2 Front lighting and identification

- 1 Warning signs
- 2 Reflector, white
- 3 Side marker lights



NOTE

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

4.14 Work lights

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



CMS-I-00002218

4.15 Electronic monitoring

CMS-T-00010717-A.1

4.15.1 Radar sensor

CMS-T-00001778-C.1

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.

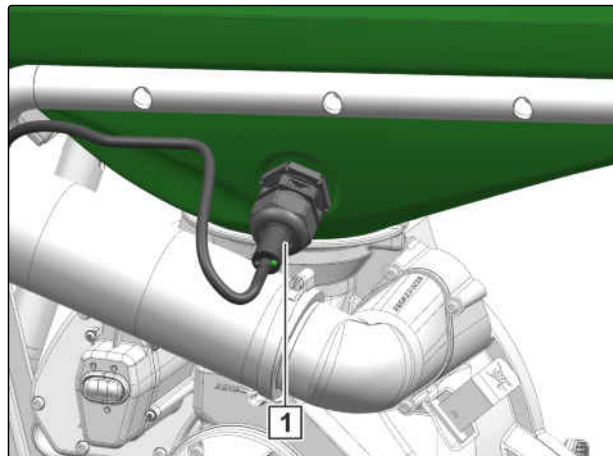


CMS-I-00002221

4.15.2 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.



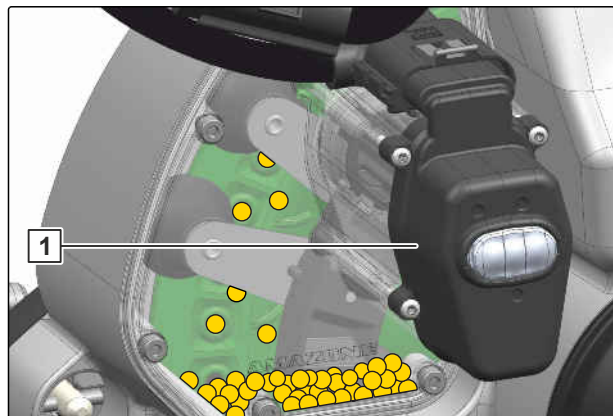
CMS-I-00001986

4.15.3 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-D.1

With the TwinTerminal, the following functions are possible:

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



CMS-I-00003079

Technical data

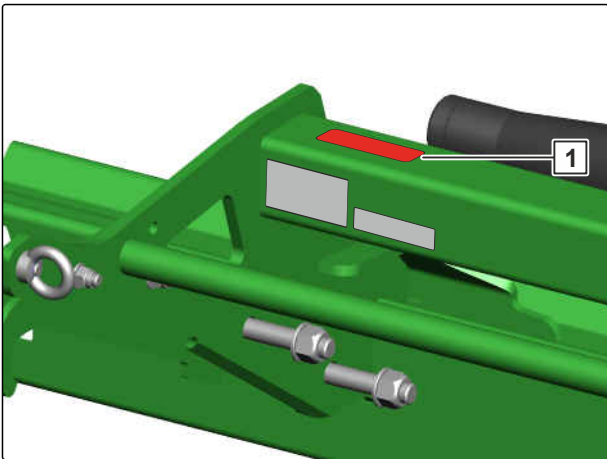
5

CMS-T-00010696-B.1

5.1 Serial number

CMS-T-00010700-A.1

The serial numbers **1** of the implement are stamped onto the mounting frame for identification.



CMS-I-00007484

5.2 Dimensions

CMS-T-00010698-A.1

	Equipment feature	Precea 6000-A / -AFCC
Transport width	Hydraulic coulter pressure	3 m
	Mechanical coulter pressure	3.3 m
Transport height		< 4 m
Total length, depending on the equipment	Length	2.75 m
Working width	Row spacing 70 cm	5.6 m
	Row spacing 75 cm	6 m
Centre of gravity distance, depending on the equipment	From the lower link mounting	103 cm

5.3 Permitted mounting categories

CMS-T-00004351-D.1



NOTE

Only in conjunction with a rotary cultivator that is equipped with a 2-tube roller frame.

Pack top frame of the pack top seed drill	Mounting frame of the soil tillage implement
Integrated mounting frame	Category 4 N

5.4 Permissible payload

CMS-T-00011018-E.1

Permissible payload for operation
Permissible payload = $G_Z - G_L =$ _____ kg

- G_Z : Permissible technical implement weight according to the rating plate [kg]
- G_L : Determined tare weight [kg]

5.5 Seed metering unit

CMS-T-00005919-C.1

The target spacing depends on the spreading material. On implements with electric metering drives, 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.

Target spacing
3.1 cm to 86.9 cm

Precea	Seed volume		
	Decentralised seed hopper	Central seed hopper	Additional hopper – Central Seed Supply
3000/4500/6000 4500-2/6000-2 3000-AFCC	55 l or 70 l	/	/
6000-2AFCC	55 l	/	/
6000-TCC	55 l or 70 l	1,200 l	8 l
9000-TCC	/	2,200 l	2x 8 l

5.6 Micropellet metering unit

CMS-T-00005413-C.1

The maximum spread rate depends on the spreading material.

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

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

Micropellet hopper
17 l

5.7 PreTeC mulch seeding coulter

CMS-T-00005570-D.1

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

Position	Load	Coulter pressure	Tare weight	Placement depth
Beside the track	Spring	1 kg to 100 kg	120 kg	0 cm to 10 cm
In the track		1 kg to 115 kg	120 kg	0 cm to 10 cm
Beside the track	Hydraulic system	1 kg to 180 kg	120 kg	0 cm to 10 cm
In the track		1 kg to 230 kg	120 kg	0 cm to 10 cm

5.8 FerTeC Twin couler

CMS-T-00002365-E.1



NOTE

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

Couler	Load	Couler pressure	Tripping force of the overload safety	Placement depth
FerTeC Twin couler	Spring	80 kg	/	3 cm to 12 cm

5.9 Row spacings

CMS-T-00010703-A.1



NOTE

It is not possible to subsequently convert the number of rows.

Precea	Number of rows	Seeding couler spacing	Working width
6000-A/-AFCC	8	70 cm	5.6 m
	8	75 cm	6 m

5.10 Forward speed

CMS-T-00014421-A.1



NOTE

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

The working speed must be adjusted to the soil tillage implement.

Optimal working speed for implements with ElectricDrive	2 km/h to 15 km/h
Permissible transport speed on carrier systems without transport frame	25 km/h
Permissible transport speed on carrier systems with transport frame	40 km/h

5.11 Performance characteristics of the tractor

CMS-T-00010702-A.1

Engine rating	
Precea 6000-A /-AFCC	Starting at 265 kW / 360 hp

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 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.

5.12 Noise development data



CMS-T-00002296-D.1

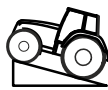

The workplace-related emission sound pressure level is lower than 70 dB(A), measured in operating condition at the ear of the tractor driver with the cab closed.

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

5.13 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 %	

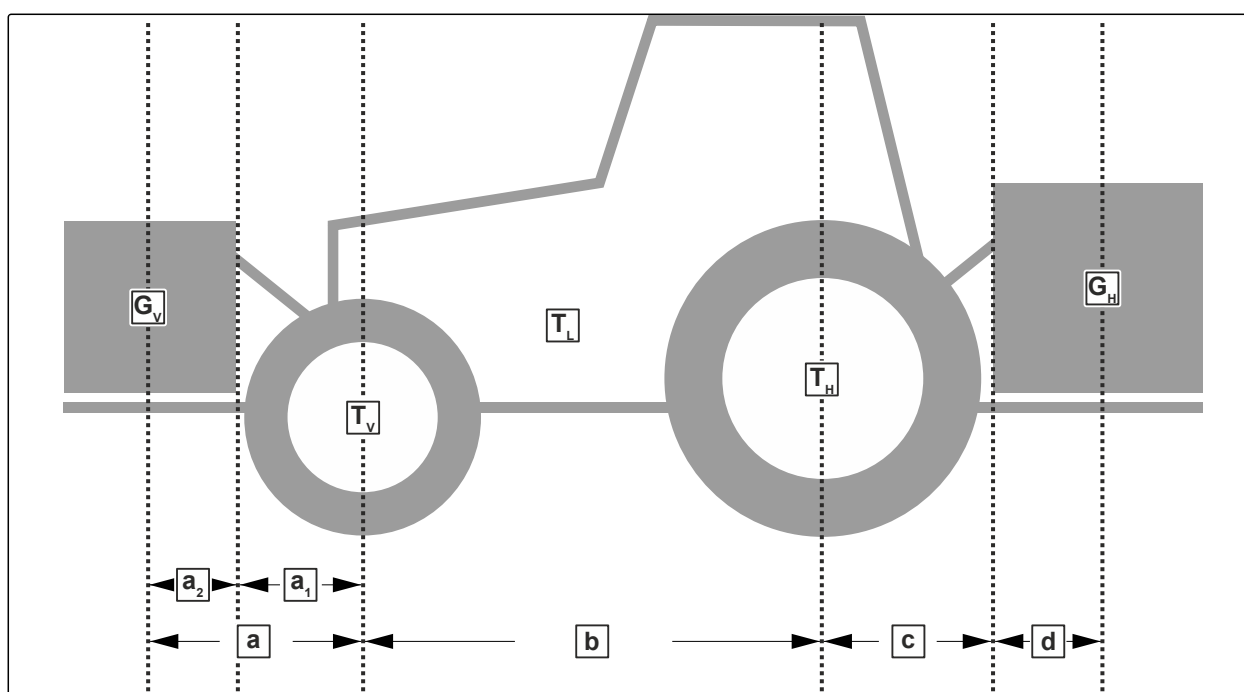
Preparing the machine

6

CMS-T-00010706-B.1

6.1 Calculating the required tractor characteristics

CMS-T-00000063-F.1



CMS-I-00000581

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

6 | Preparing the machine

Calculating the required tractor characteristics

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

1. Calculate the minimum front ballasting.

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

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

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

CMS-I-00000513

2. Calculate the actual front axle load.

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

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

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

CMS-I-00000516

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

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

$$G_{tat} =$$

$$G_{tat} =$$

CMS-I-00000515

4. Calculate the actual rear axle load.

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

$$T_{Htat} =$$

$$T_{Htat} =$$

CMS-I-00000514

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



IMPORTANT

Danger of accident due to implement damage caused by excessive loads

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

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

6.2 Coupling the implement

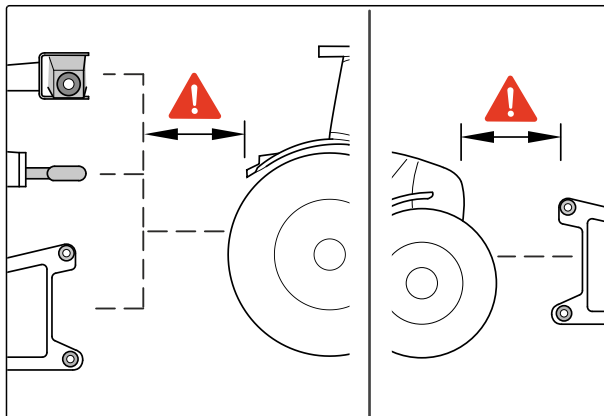
CMS-T-00010707-B.1

6.2.1 Driving the tractor towards the implement

CMS-T-00005794-D.1

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

- Drive the tractor towards the implement, leaving a sufficient distance.

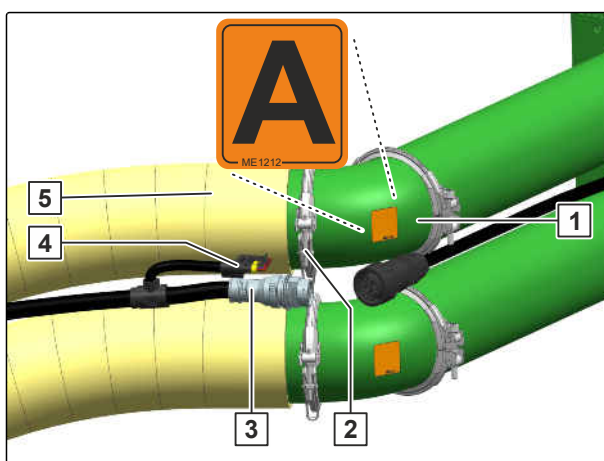


CMS-I-00004045

6.2.2 Coupling the supply lines to the front-mounted hopper

CMS-T-00004439-C.1

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



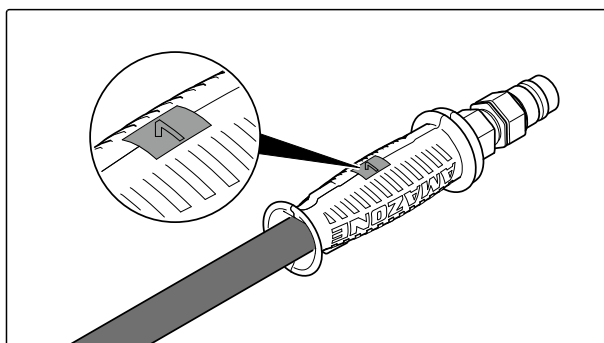
CMS-I-00003124

6.2.3 Coupling the hydraulic hose lines




CMS-T-00010708-B.1









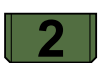




All hydraulic hoses are equipped with handles. The handles have colour markings with a code number or a code letter. The markings are assigned to the respective hydraulic functions of the pressure line of a tractor control unit. Stickers are applied on the implement for the markings, which illustrate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

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



CMS-I-00000121

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

Designation		Function			Tractor control unit	
Red		Pressure-free return flow. The pressure-free return flow must always be coupled!			Maximum line pressure less than 5 bar	
			Fan hydraulic motor	Switching on	Single-acting	
			Coulter pressure	Increase Reduce		
Green			Soil tillage implements	Unfold	Double-acting	
			Hydraulically folded lighting	Fold		
			Coulter displacement	Telescope out	Double-acting	
				Telescope in		



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.

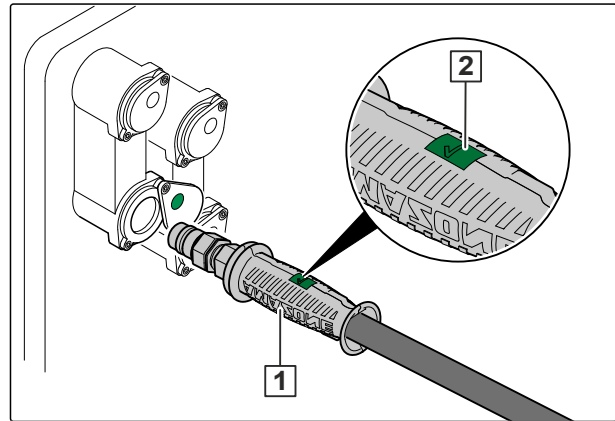
1. Depressurise the hydraulic system between the tractor and the implement using the tractor control unit.
2. Clean the hydraulic plugs.



IMPORTANT

Implement damage due to insufficient hydraulic oil return flow

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

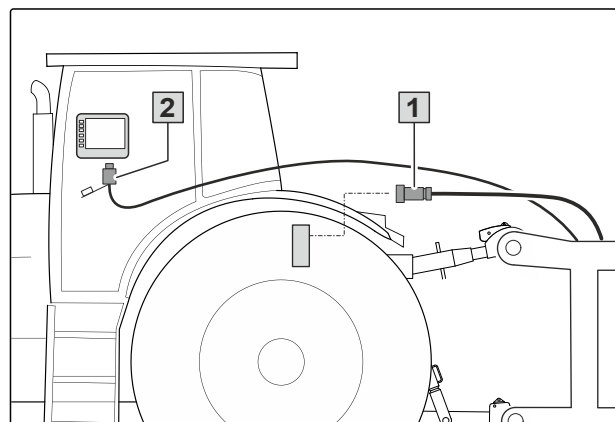


CMS-I-00001045

3. First couple the "red T" hydraulic hose line with the corresponding hydraulic socket on the tractor.
 4. Couple the "red 1" hydraulic hose line with the corresponding hydraulic socket on the tractor.
 5. Couple the remaining hydraulic hose lines **1** to the hydraulic sockets on the tractor according to the marking **2**.
- ➔ The hydraulic plugs lock perceptibly.
6. Route the hydraulic hose lines with sufficient freedom of movement and without chafing points.

6.2.4 Coupling the ISOBUS or control computer

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

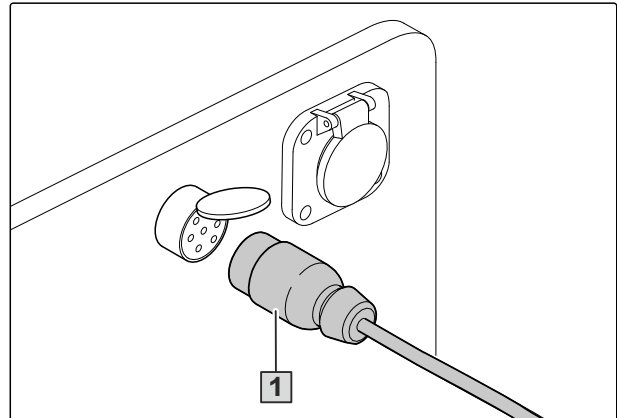


CMS-I-00006891

6.2.5 Coupling the power supply

CMS-T-00001399-G.1

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

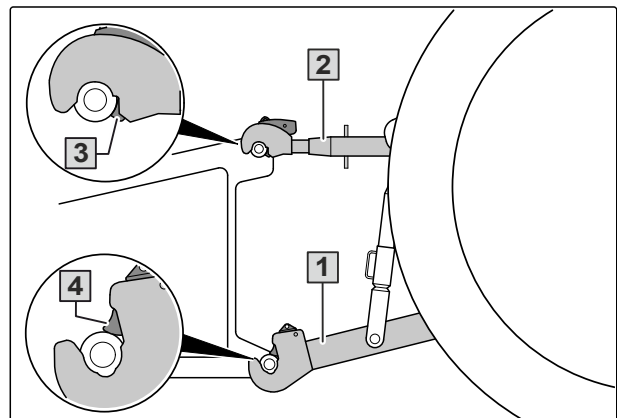


CMS-I-00001048

6.2.6 Coupling the 3-point mounting frame

CMS-T-00001400-G.1

1. Set the tractor lower links **1** to the same height.
2. Couple the lower links **1** from the tractor seat.
3. Couple the top link **2**.
4. Check whether the top link catch hooks **3** and lower link catch hooks **4** are correctly locked.



CMS-I-00001225

6.2.7 Coupling the pack top seed drill

CMS-T-00010725-B.1



NOTE

The pack top seed drill may only be combined with the listed implements.

Roller	KG 6002-2
Tooth packer roller with 2-tube frame	2x PW 3000-600
Wedge ring roller with 2-tube frame	2x KW 3000-580-125 2x KW 3000-580-150
Wedge ring roller with matrix tyre profile and 2-tube frame	2x KWM 3000-600-125 2x KWM 3000-600-150

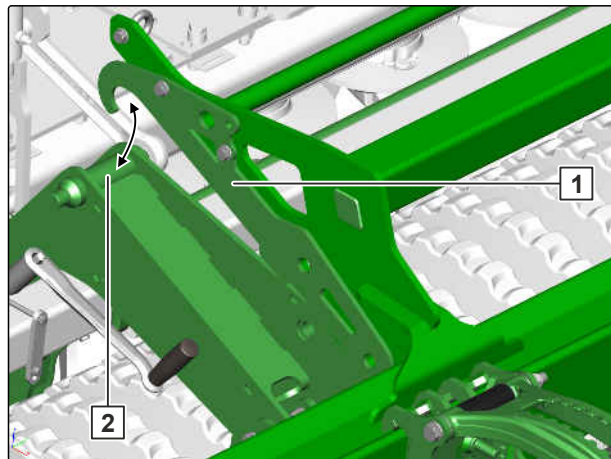
6 | Preparing the machine Coupling the implement

Roller	KG 6002-2
Trapeze ring roller with 2-tube frame	2x TRW 3000-500-125
	2x TRW 3000-500-150
	2x TRW 3000-600-125
	2x TRW 3000-600-150

1. Slowly drive the tractor with the coupled soil tillage implement under the pack top seed drill.

2. Slowly lift the soil tillage implement.

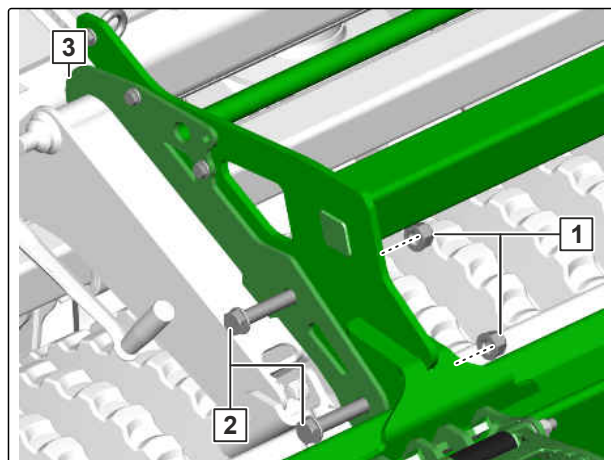
➔ The bracket **1** is resting on the roller frame **2** of the soil tillage implement.



CMS-I-00007386

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

4. Install the washers and nuts **1** on all of the brackets.

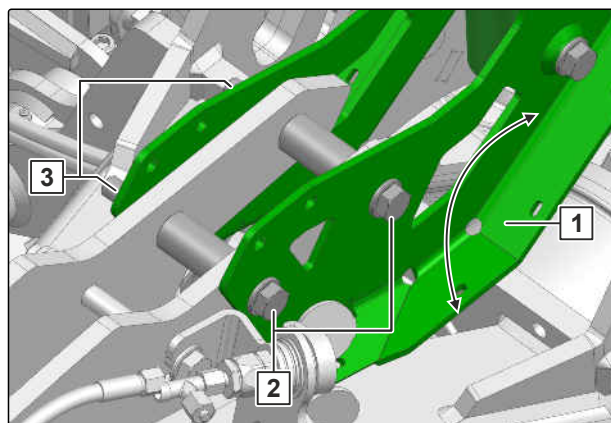


CMS-I-00007387

5. Swivel the central bracket **1** onto the soil tillage implement.

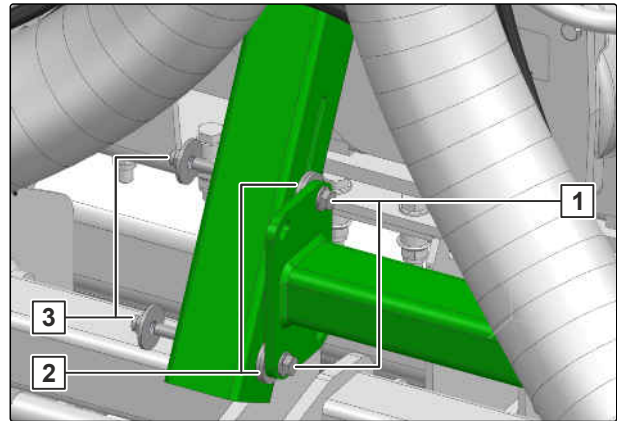
6. Install the bolts **2**.

7. Install washers and nuts **3**.



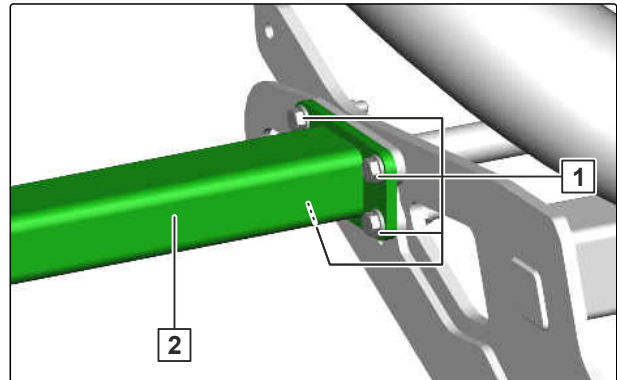
CMS-I-00007372

8. Remove the washers and nuts **3**.
9. Remove the spacer discs **2**.
10. Remove the bolts **1**.



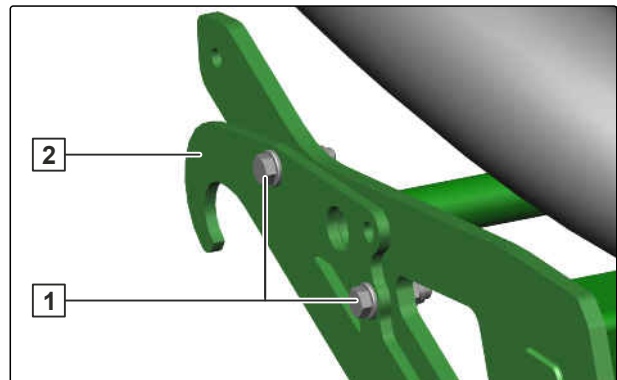
CMS-I-00007385

11. Remove the bolted connection **1**.
12. Remove the carrier tube **2**.



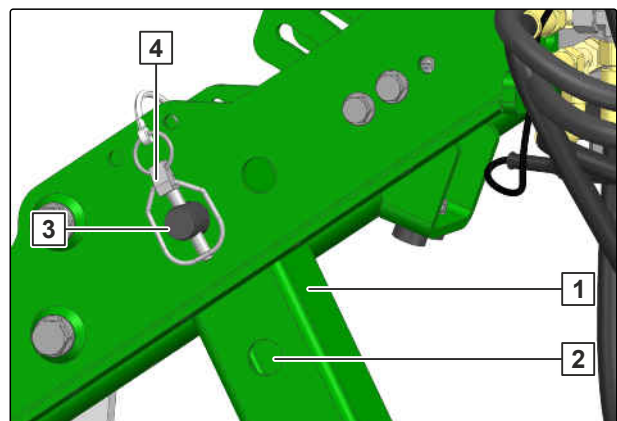
CMS-I-00007821

13. *To fix the interface **2** onto the frame:*
Install the bolted connection **1**.



CMS-I-00007822

14. Open the linch pin **4**.
15. Remove the pin **3**.
16. Install the pin in parking position **2**. Secure with the linch pin.
17. Remove the retaining tube **1**.



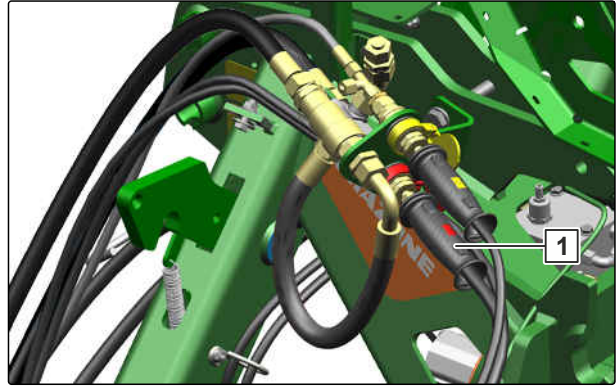
CMS-I-00007373

6 | Preparing the machine

Coupling the implement

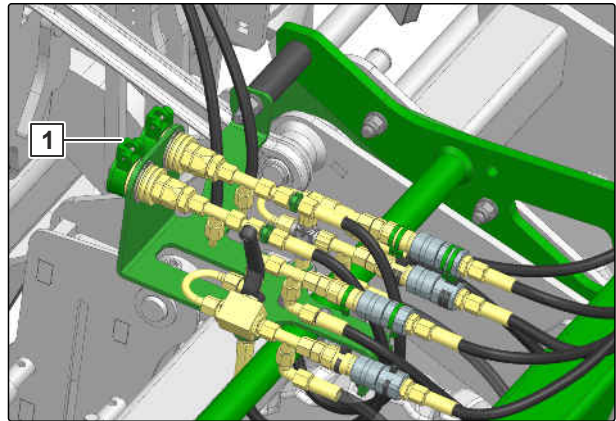
18. To couple the hydraulic system to the tractor:
see page 46

19. Couple the "red T" pressureless return flow of the pack top seed drill **1** onto the soil tillage implement.



CMS-I-00007383

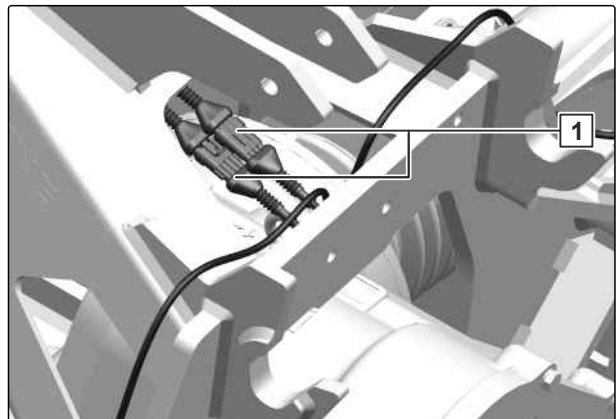
20. Couple the "green" folding function of the soil tillage implement onto the pack top seed drill **1**.



CMS-I-00007376

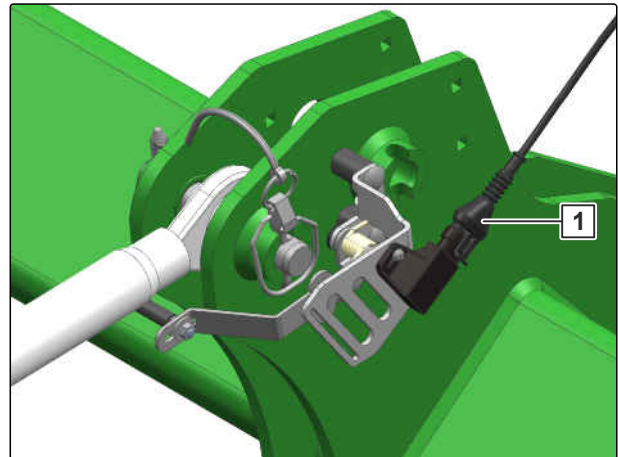
21. Connect the lighting cable **1**.

22. Depending on the implement equipment
Connect the lighting cable for the licence plate lighting.



CMS-I-00007384

23. Connect the sensor cable **1**.



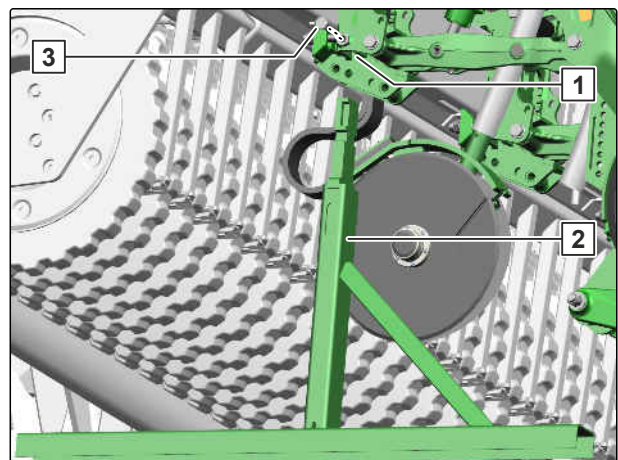
CMS-I-00007388

24. Lift the seeding combination.

25. Unscrew the bolts **3** on rows 1 and 8. Remove the parking supports **2** from the holder **1**.

26. Fold the seeding combination.

27. Also unscrew the bolts on rows and 4 and 5. Remove the parking supports from the holder.

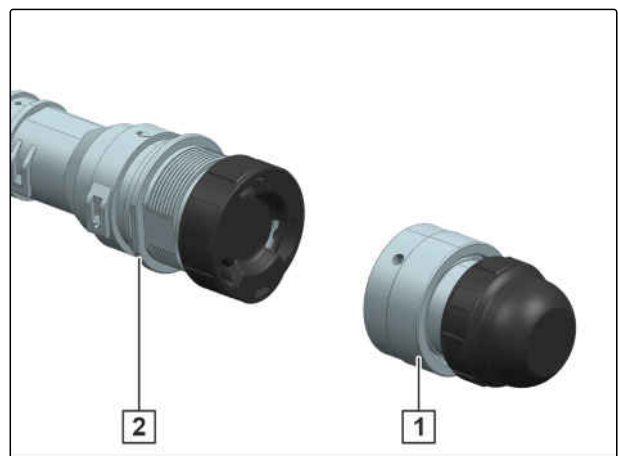


CMS-I-00007382

6.2.8 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

6.3 Preparing the implement for operation

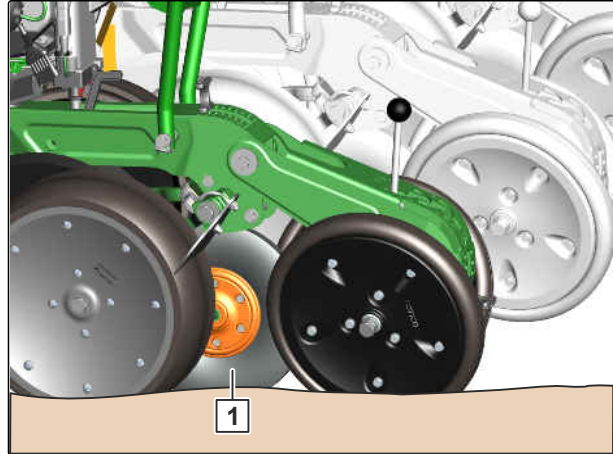
CMS-T-00010710-B.1

6.3.1 Aligning the implement horizontally

CMS-T-00014683-A.1

For precise seed placement, the implement must be aligned horizontally. The catch roller **1** can still be turned by hand in the formed furrow, but does not bend to the side.

- Set the top link to the desired length.



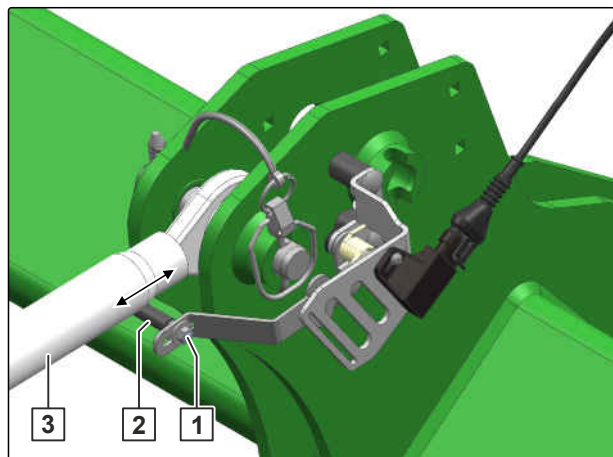
CMS-I-00007970

6.3.2 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"*



CMS-I-00002608

or

see "control computer" operating manual.

6.3.3 Filling the seed hopper

CMS-T-00001914-D.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

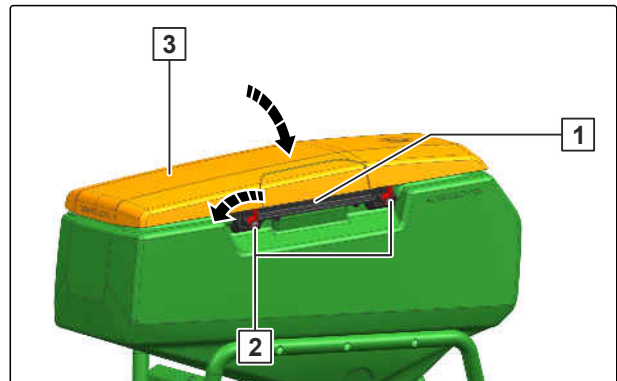


IMPORTANT

Hopper cover damage caused by people walking on it

If the hopper cover is damaged, the hopper is not sealed. Metering will be faulty.

- ▶ Do not step on the hopper cover.



CMS-I-00001886

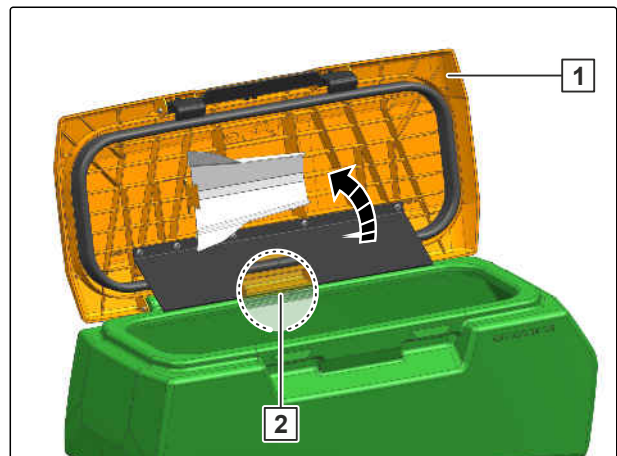
1. Open the fastener **2**.
 2. *To relieve the fastener:*
Press the hopper cover **3** down.
 3. Unlock the **1** fastener.
 4. Open the hopper cover **1** completely.
- ➔ The cover fastener **2** latches.



WARNING Risk of chemical burns by dressing dust

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

5. Fill the seed hopper.



CMS-I-00001887

6 | Preparing the machine

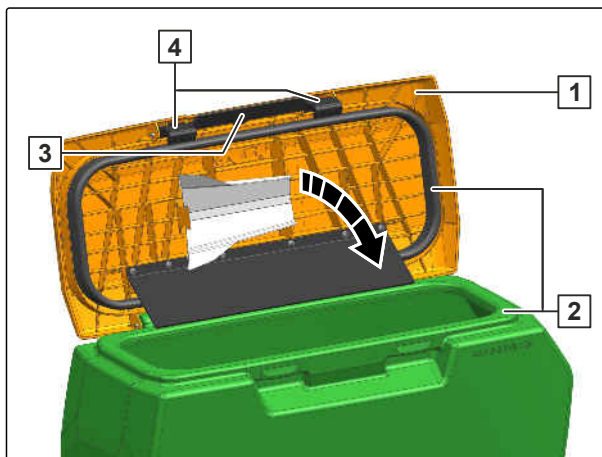
Preparing the implement for operation

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

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

➔ The fastener **3** is locked.

8. Close the lock **4**.



CMS-I-00001889

6.3.4 Preparing FertiSpot for operation

CMS-T-00014356-A.1

6.3.4.1 Changing the rotor

CMS-T-00014360-A.1

Depending on the desired forward speed, the single rotor, double rotor or the strip placement unit is required.

Single rotor						
Spread rate	Row width					
	45 cm	50 cm	60 cm	70 cm	75 cm	80 cm
60,000 Körner/ha to 100,000 Körner/ha	to 15 km/h	to 15 km/h	to 15 km/h	to 15 km/h	to 15 km/h	to 14 km/h
> 100000 Körner/ha to 120,000 Körner/ha	to 15 km/h	to 15 km/h	to 15 km/h	to 13 km/h	to 13 km/h	to 11 km/h
> 120000 Körner/ha to 150,000 Körner/ha	to 15 km/h	to 15 km/h	to 12 km/h	to 12 km/h	to 10 km/h	up to 9 km/h
> 150000 Körner/ha	Conversion to double rotor necessary.					

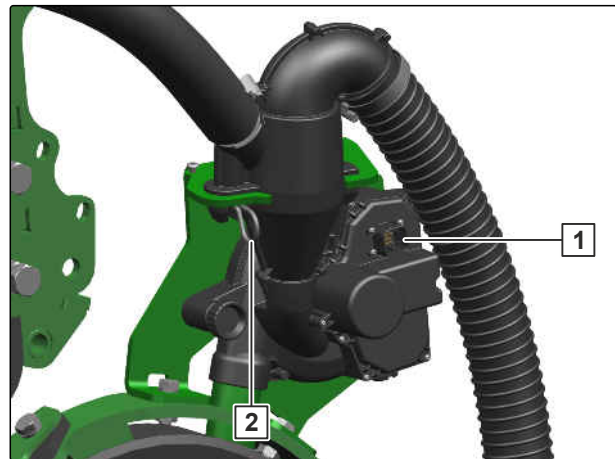
Double rotor						
Spread rate	Row width					
	45 cm	50 cm	60 cm	70 cm	75 cm	80 cm
60,000 Körner/ha to 100,000 Körner/ha	10 km/h to 15 km/h	9 km/h to 15 km/h	8 km/h to 15 km/h	7 km/h to 15 km/h	7 km/h to 15 km/h	6 km/h to 15 km/h
> 100000 Körner/ha to 120,000 Körner/ha	7 km/h to 15 km/h	6 km/h to 15 km/h	5 km/h to 15 km/h	5 km/h to 15 km/h	to 15 km/h	to 15 km/h
> 120000 Körner/ha to 150,000 Körner/ha	to 15 km/h	to 15 km/h	to 15 km/h	to 15 km/h	to 15 km/h	to 15 km/h
> 150000 Körner/ha to 300,000 Körner/ha	to 15 km/h	to 15 km/h	to 12 km/h	to 10 km/h	to 10 km/h	to 9 km/h

Double rotor						
Spread rate	Row width					
	45 cm	50 cm	60 cm	70 cm	75 cm	80 cm
> 300000 Körner/ha to 380,000 Körner/ha	to 13 km/h	to 12 km/h	to 10 km/h	to 8 km/h	to 8 km/h	to 7 km/h
> 380000 Körner/ha to 500,000 Körner/ha	to 10 km/h	to 9 km/h	to 7 km/h	up to 6 km/h	Conversion to strip placement necessary.	



WORKSHOP WORK

1. Disconnect the energy supply from the metering unit housing **1**.
2. Remove the cotter pin **2**.

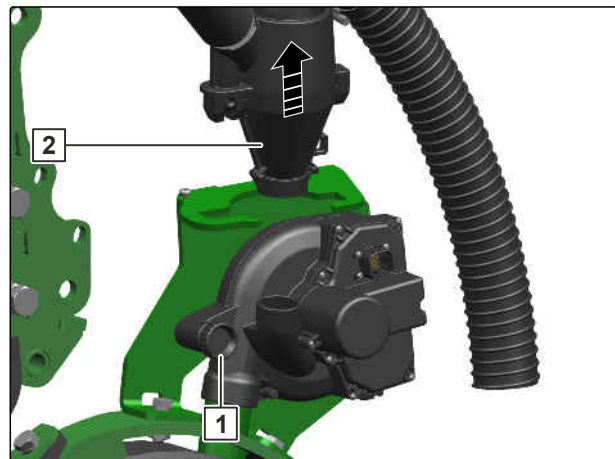


CMS-I-00009105



WORKSHOP WORK

3. Remove the air separator **2**.
4. Loosen the knurled nut **1**.

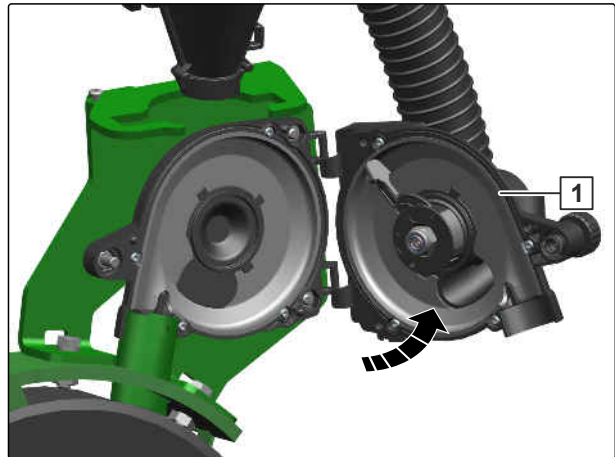


CMS-I-00009104



WORKSHOP WORK

5. Open the cover **1** of the metering unit housing.



CMS-I-00009103



WORKSHOP WORK

6. Remove the nut **3**.



NOTE

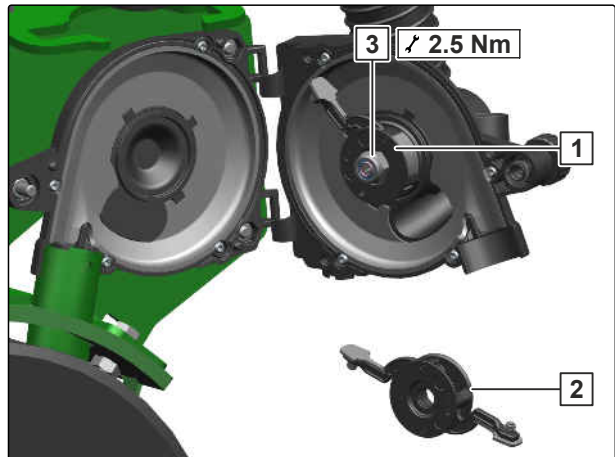
Pay attention to the rotor direction of rotation.

7. Install the desired rotor

or

*To switch to strip placement:
see page 58.*

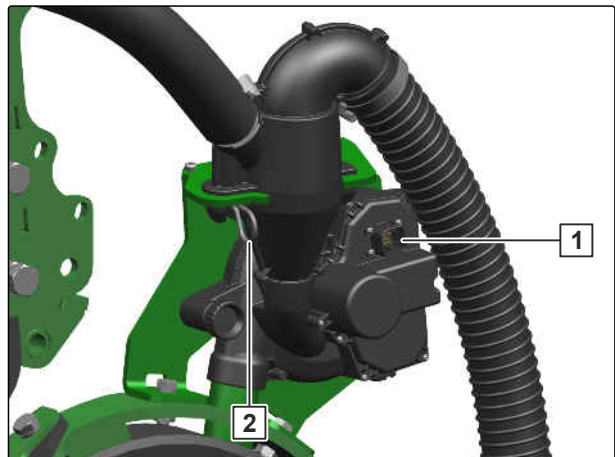
8. Put on the nut.



CMS-I-00009106

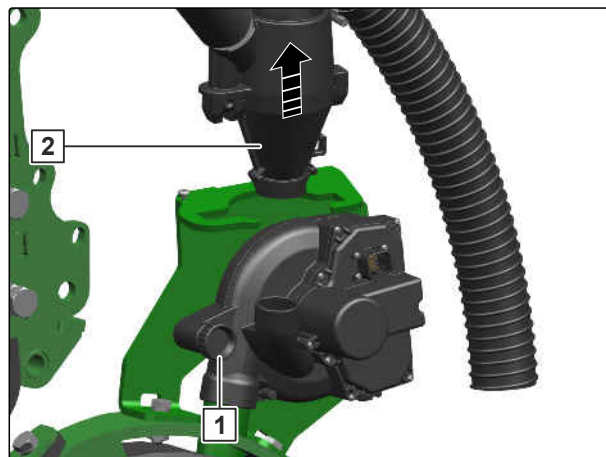
6.3.4.2 Converting FertiSpot to strip placement

1. Disconnect the energy supply from the metering unit housing **1**.
2. Remove the cotter pin **2**.



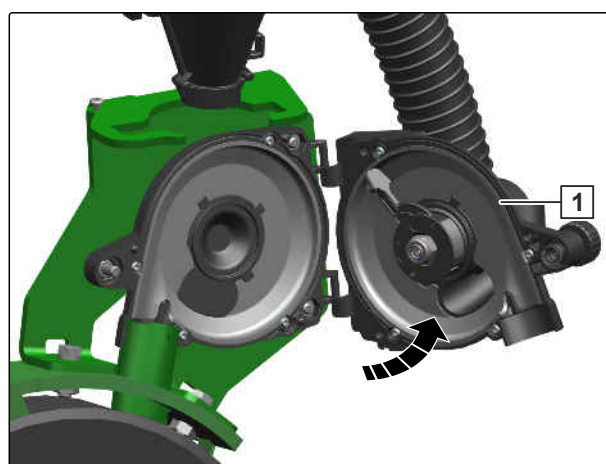
CMS-I-00009105

3. Remove the air separator **2**.
4. Loosen the knurled nut **1**.



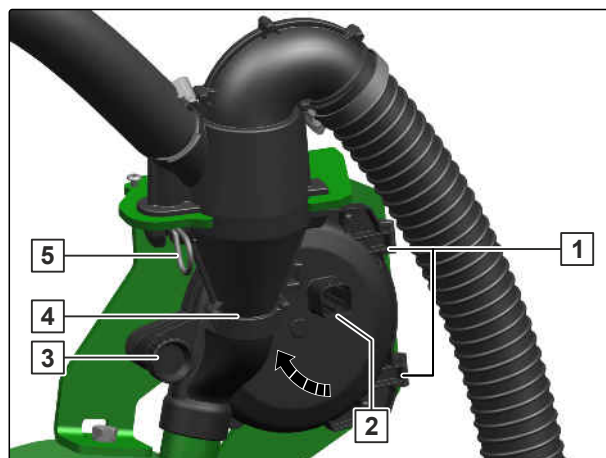
CMS-I-00009104

5. Open the cover **1** of the metering unit housing.



CMS-I-00009103

6. Install the cover **1** for strip placement.
7. Install the knurled nut **3**.
8. Install the air separator **4**.
9. Install the cotter pin **5**.
10. *To protect the energy supply from moisture:*
Install the plug on the cover for strip placement **2**.



CMS-I-00009314

6.3.5 Preparing the micropellet spreader for operation

CMS-T-00012137-B.1

6.3.5.1 Filling the micropellet hopper

CMS-T-00003595-E.1



REQUIREMENTS

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



IMPORTANT

Hopper cover damage caused by people walking on it

If the hopper cover is damaged, the hopper is not sealed. Metering will be faulty.

- Do not step on the hopper cover.

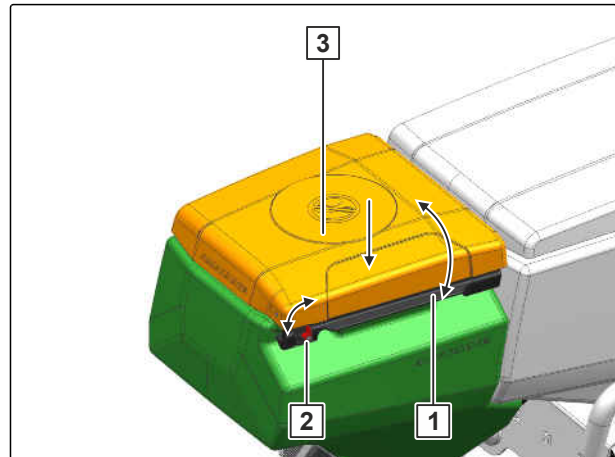
1. Open the fastener **2**.
2. Press the hopper cover **3** down.
3. Unlock the **1** fastener.
4. Open the hopper cover **1**.



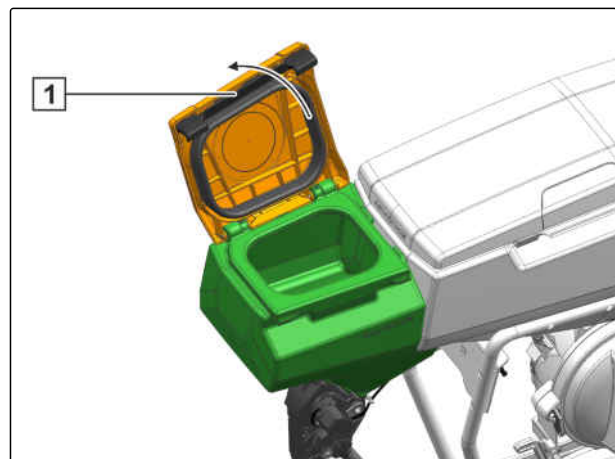
WARNING Risk of chemical burns by dressing dust

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

5. Fill the micropellet hopper.

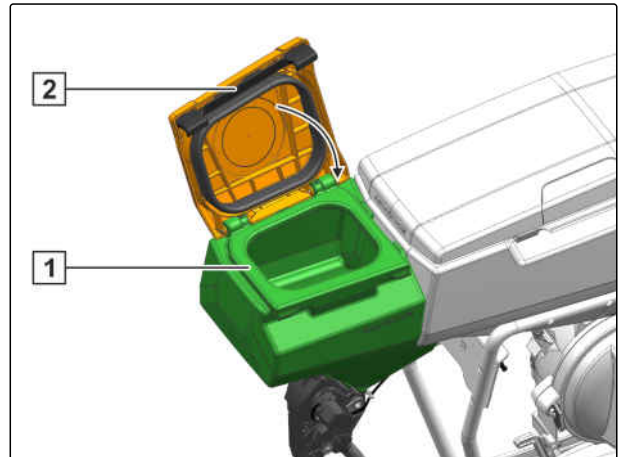


CMS-I-00002595



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

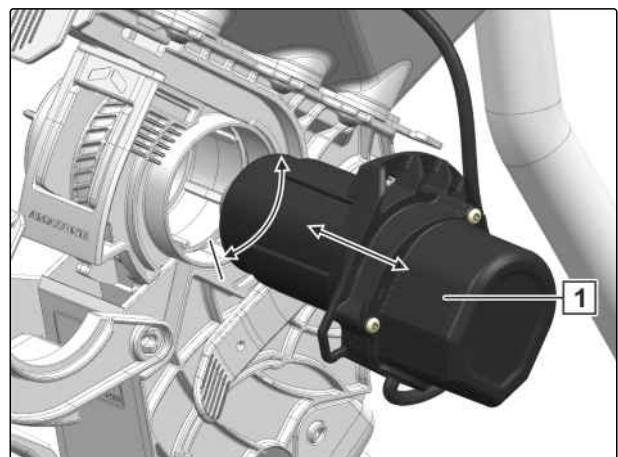
6.3.5.2 Changing the metering wheel

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



CMS-I-00002586

2. Turn the drive unit **1** counterclockwise.
3. Pull the drive unit out of the metering housing.



CMS-I-00002585

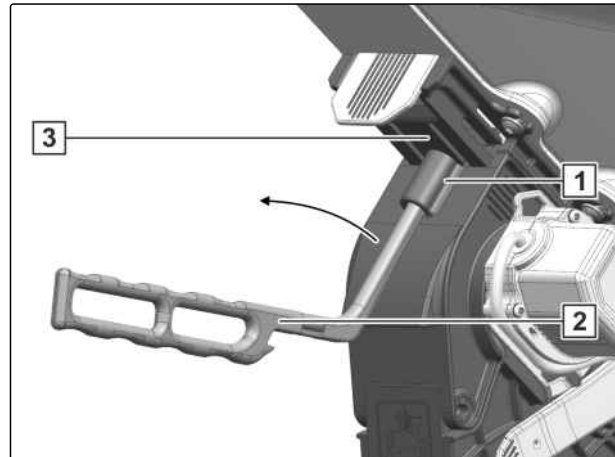
6 | Preparing the machine

Preparing the implement for operation

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

⚠ WARNING Risk of chemical burns by dressing dust

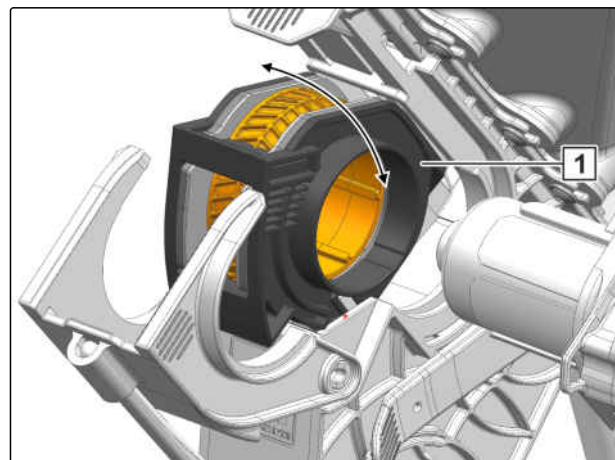
- Before working with hazardous materials, put on the protective clothing recommended by the manufacturer.



CMS-I-00002582

6. Open the metering unit cover.
7. Take the metering roller **1** out of the metering unit housing.

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



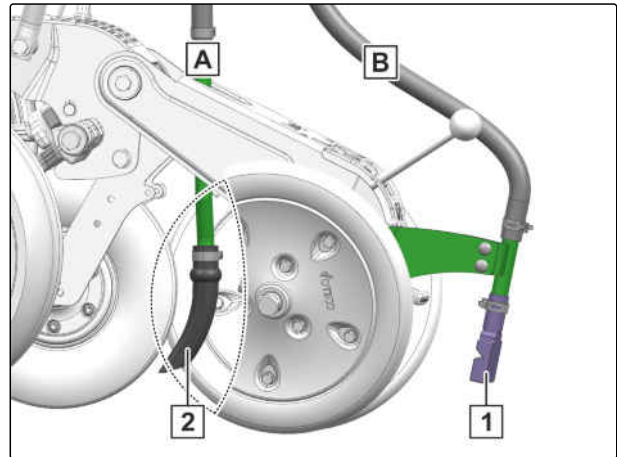
CMS-I-00002584

8. Insert the desired metering roller in the metering unit housing.
9. Close the metering unit cover.
- ➔ The locking mechanism engages.
10. Set the sliding shutter to the top position.
11. Insert the drive unit **1** into the metering roller.
12. Rotate the drive unit clockwise.

6.3.5.3 Changing the application point

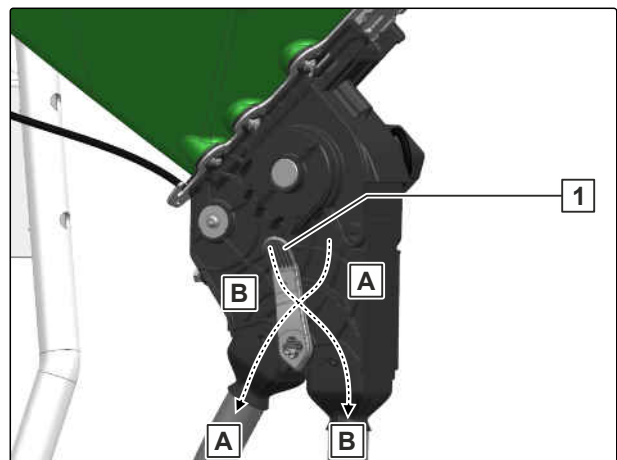
CMS-T-00012138-A.1

Application on the closed seed furrow **1** can be performed with the diffuser. Depending on the case, application can also be performed with a targeted outlet or diffuser in the seed furrow **2** **erfolgen**.



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

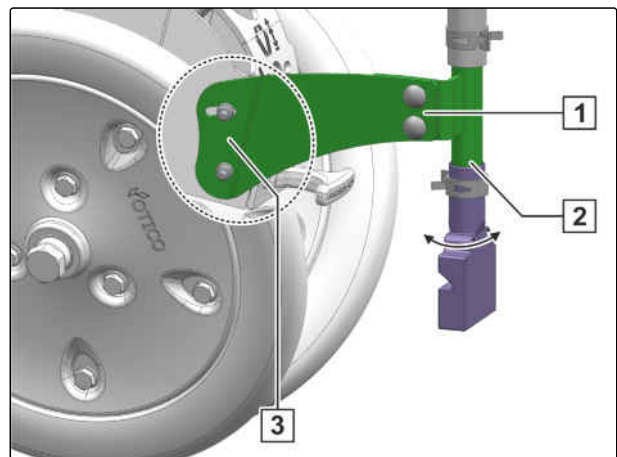
6.3.5.4 Adjusting the diffuser angle

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

6.3.6 Determining the seed settings

CMS-T-00007715-D.1

Seed		Seed singling unit							PreTeC mulch seeding coulter		
Variety	Thousand grain weight	Holes	Hole Ø	Colour	Sliding shutter	Air pressure	Filling block	Opto-sensor Ø	Feed channel Ø	Diameter of the furrow former	Seed press roller
Rapeseed	Maximum working speed 10 km/h.										
	< 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			16 mm	16 mm	12 mm	20 mm
	> 7 g	120	1.6 mm	Black	B/C			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	<ul style="list-style-type: none"> Silver-grey singling disc: maximum working speed 8 km/h. Violet singling disc: maximum working speed 12 km/h. Deviations can occur in the distribution along the row. 45 cm or 50 cm row width with max. 50 Körner/m². Depending on the seed, the actual spread rate can deviate strongly from the target rate. 										
	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			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	16 mm	16 mm

Seed		Seed singling unit							PreTeC mulch seeding coulter			
Variety	Thousand grain weight	Holes		Hole Ø	Colour	Sliding shutter	Air pressure	Filling block	Opto-sensor Ø	Feed channel Ø	Diameter of the furrow former	Seed press roller
Maize	< 220 g	42	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	42	5 mm	Green	E/F/G			16 mm	16 mm	16 mm	16 mm
	> 300 g	42	42	5.5 mm	Purple	E/F/G			16 mm	16 mm	16 mm	16 mm
Sugar beet		34	34	2.2 mm	Blue	B/C	35 mbar ± 5 mbar	Orange	16 mm	16 mm	12 mm	20 mm
Sunflower	For seeds larger than 15 mm: use an opto-sensor, feed channel, and furrow former with a diameter of 20 mm and preferably the pink singling disc.											
	70 g to 85 g	34	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	34	3.5 mm	Brown	E/F/G			16 mm	16 mm	16 mm	16 mm
	<95 g	34	34	4 mm	Pink	E/F/G			16 mm	16 mm	16 mm	16 mm
Squash		10	10	4 mm	Opal green	F/G	45 mbar ± 5 mbar	Green	20 mm	20 mm	20 mm	16 mm



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.

1. The seed settings can be found in the table.
2. Adjust the fan speed.
3. Adjust the seed singling unit.
4. Adjust the PreTeC mulch seeding coulter.

6.3.7 Adjusting the fan speed

CMS-T-00012129-B.1

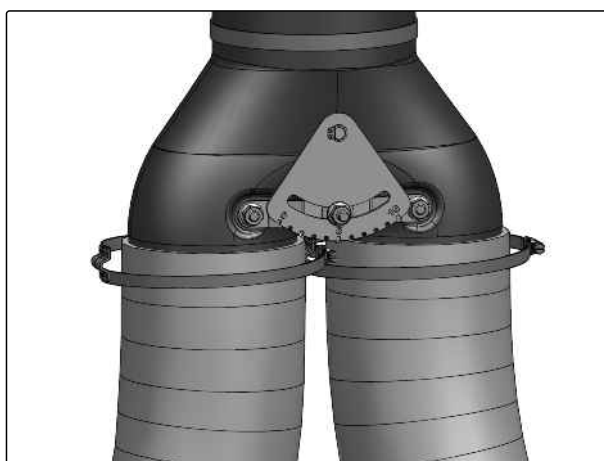


REQUIREMENTS

- ✓ 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. The fan pressure is displayed on the control terminal. 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



CMS-I-00007816



NOTE

To ensure that the singling units on the left and right implement sections are evenly supplied with air, the setting on the air distributor may not be changed.



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 5,000 1/min.

1. *To correct the fan pressure:*
adjust the oil quantity on the tractor control unit.



NOTE

Use of the cyclone separator requires a higher fan speed.

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

For more information, contact your specialist workshop.

2. *To monitor the fan:*
Refer to "Configuring the fan speed monitoring" in the ISOBUS operating manual

6.3.8 Setting up the speed sensor on the implement

CMS-T-00001908-D.1

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.

- *To set up the speed sensor on the implement:*
See control computer operating manual
"Determining the pulses per 100 m"

or

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

6.3.9 Adjusting the grain singling unit

CMS-T-00005516-F.1

6.3.9.1 Changing the singling disc

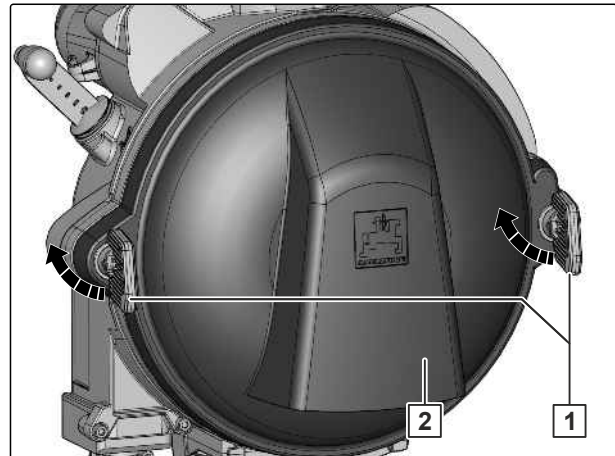
CMS-T-00005572-E.1



REQUIREMENTS

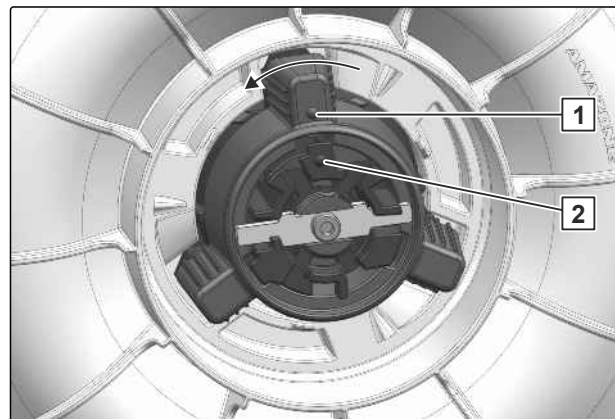
- ✓ The ideal hole diameter is known

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



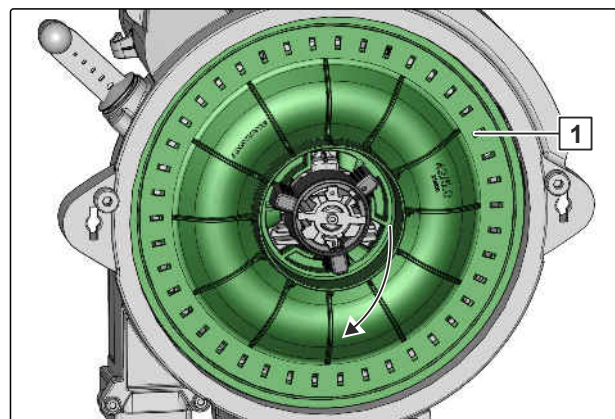
CMS-I-00007543

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



CMS-I-00001910

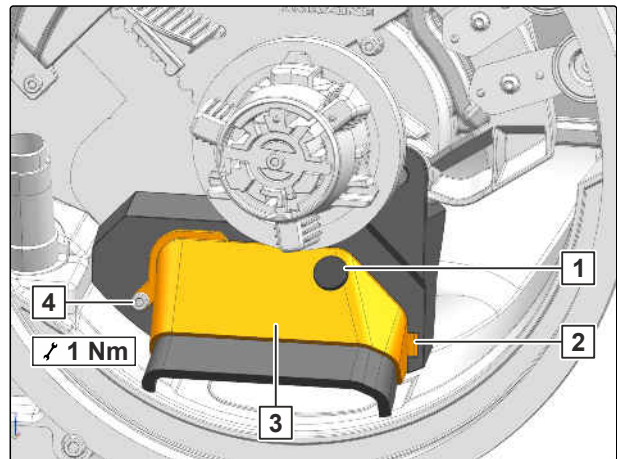
5. remove the singling disc **1** from the drive hub.



CMS-I-00001912

The orange filling block is required for use in rapeseed, beets, or sorghum.

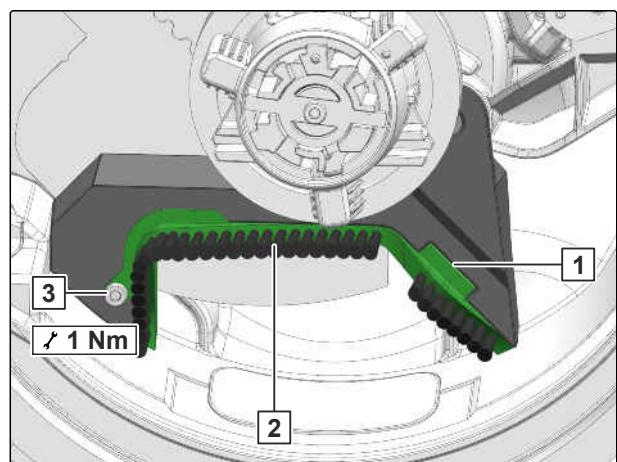
6. Remove the bolt **4**.
7. Install the orange filling block **3** in the mount **2**.
8. Install the bolt.
9. For use in rapeseed, beets, or sorghum, remove the cap **1**.



CMS-I-00003937

The green filling block is required for use in soybean, field bean, maize or sunflower.

10. Remove the bolt **3**.
11. Install the green filling block **2** in the mount **1**.
12. Install the bolt.

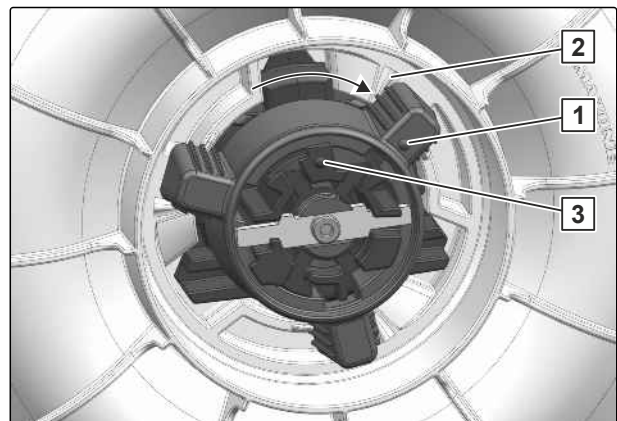


CMS-I-00003936

13. *To select the singling disc:*
See "Determining the seed settings".
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

6 | Preparing the machine

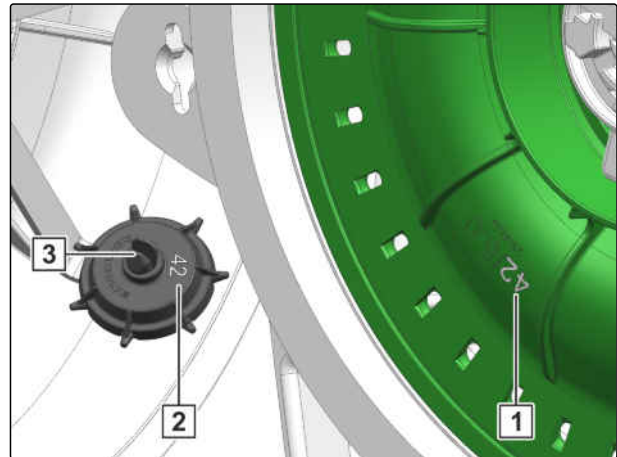
Preparing the implement for operation

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

17. 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.

18. 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.

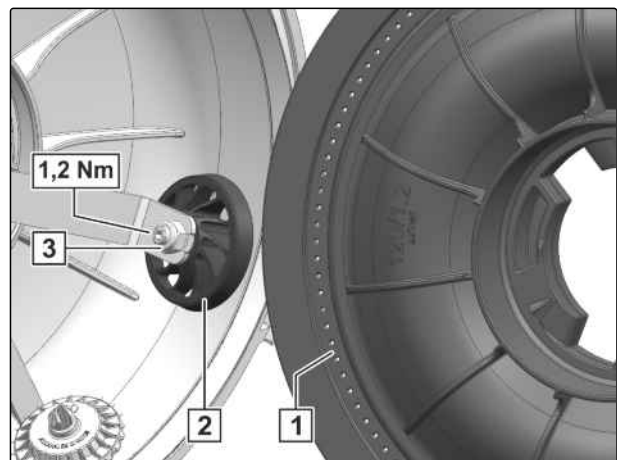
19. Remove the nut **3**.

20. Remove the wide hole covering roller.

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

22. Put on the nut.

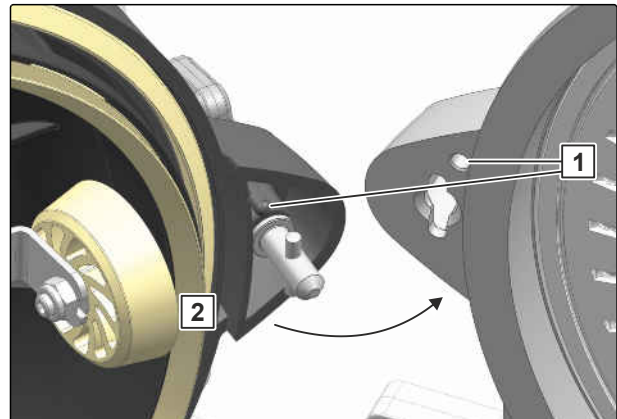
23. *If the singling unit is converted to fine seed:*
see page 149.



CMS-I-00003868

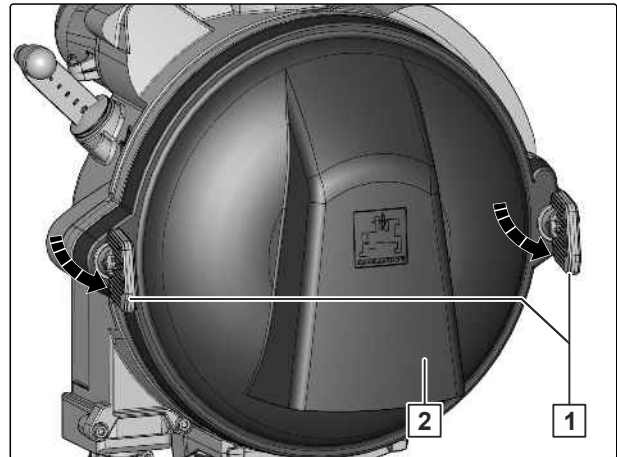
24. Align the guide pin **1**.

25. Close the cover **2**.



CMS-I-00001913

26. Close the locks **1**.



CMS-I-00007542

6.3.9.2 Adjusting the sliding shutter

CMS-T-00001901-F.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, more time elapses until the fill level is reached.



NOTE

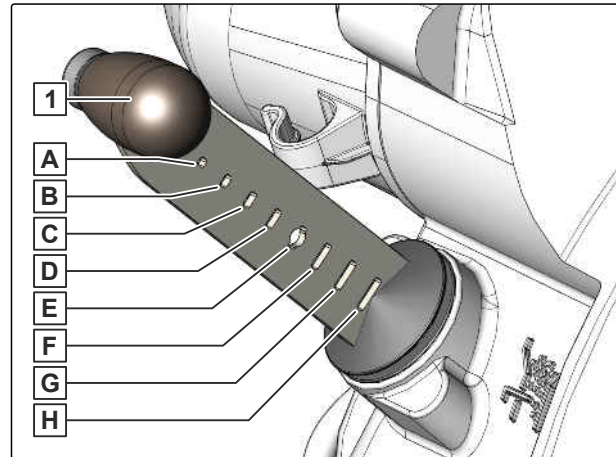
The factory setting of the sliding shutter is marked with a circular cut-out.

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

6 | Preparing the machine

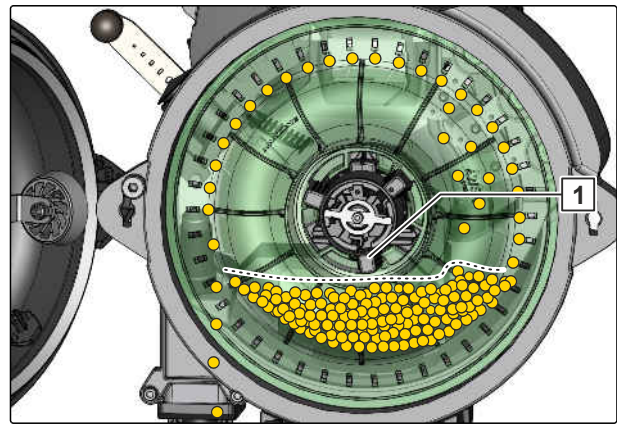
Preparing the implement for operation

1. Move the sliding shutter **1** to the desired position.
2. Check the fill level.



CMS-I-00001915

➔ The fill level must be just under the drive hub.



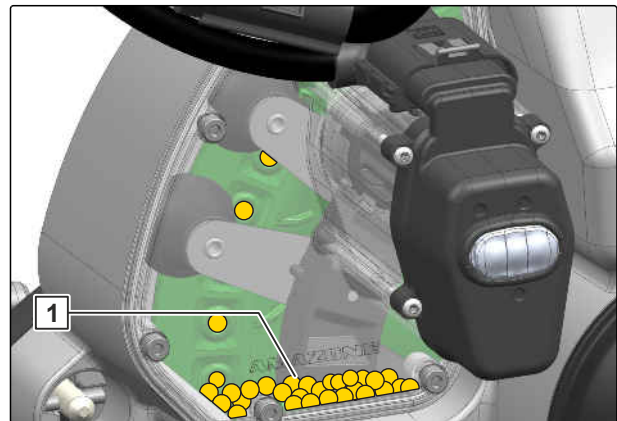
CMS-I-00008639

3. When the fill level **1** rises above the drive hub:
Gradually close the sliding shutter

or

If empty spaces occur:
Gradually open the sliding shutter.

4. To check the setting:
drive for 30 m at working speed and then check
the work pattern.



CMS-I-00001916

6.3.9.3 Changing the opto-sensor and shot channel

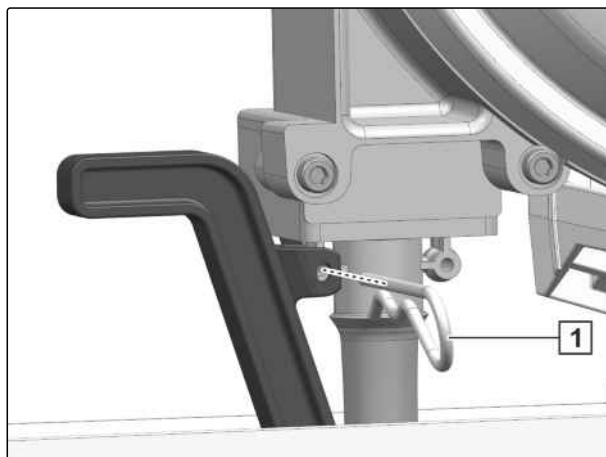
CMS-T-00005387-C.1



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

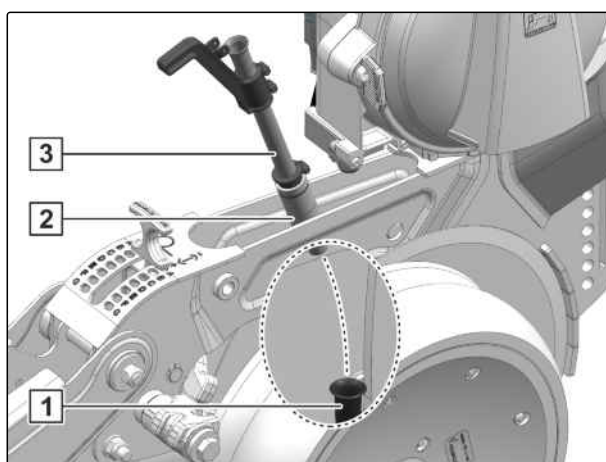


WARNING

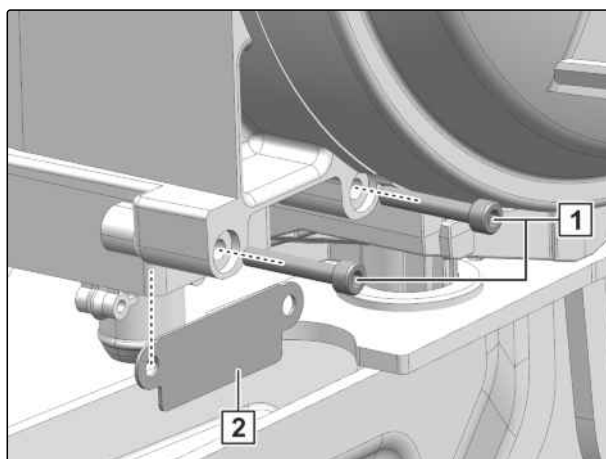
Risk of chemical burns by dressing dust

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

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



CMS-I-00003815

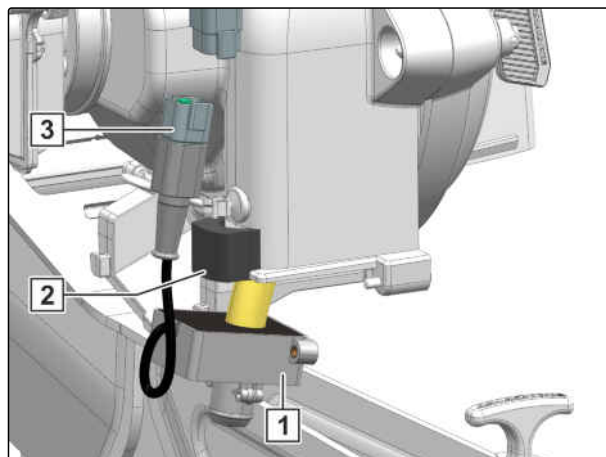


CMS-I-00003816

6 | Preparing the machine

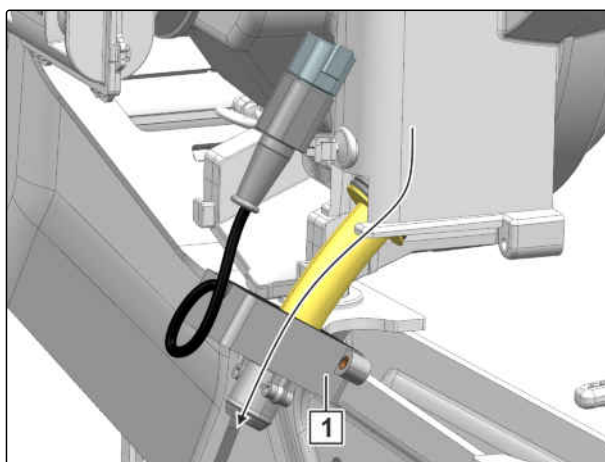
Preparing the implement for operation

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



CMS-I-00003817

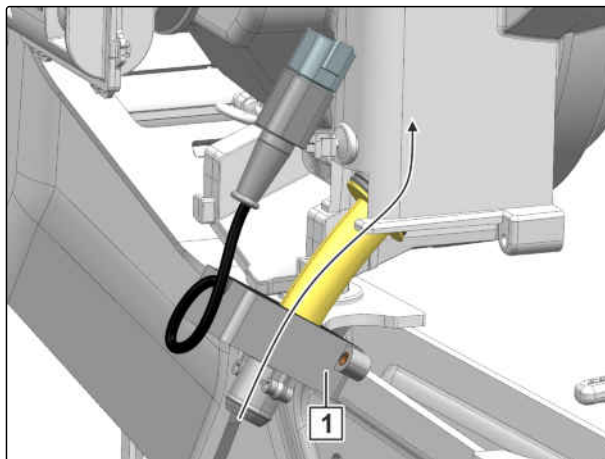
10. Remove the opto-sensor **1**.



CMS-I-00002827

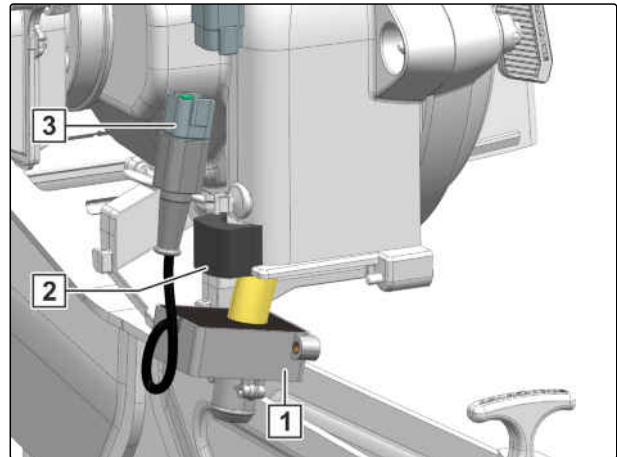
11. *To select the opto-sensor:*
See "*Determining the seed settings*".

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



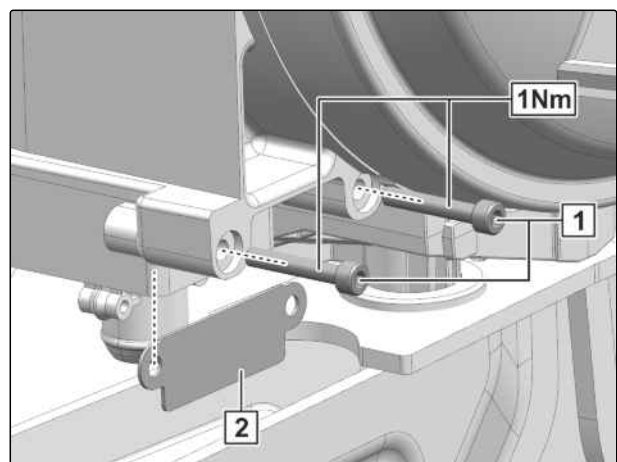
CMS-I-00002826

13. Move the opto-sensor **1** up.
14. Put on the gasket **2**.
15. Establish the plug connection **3**.



CMS-I-00003817

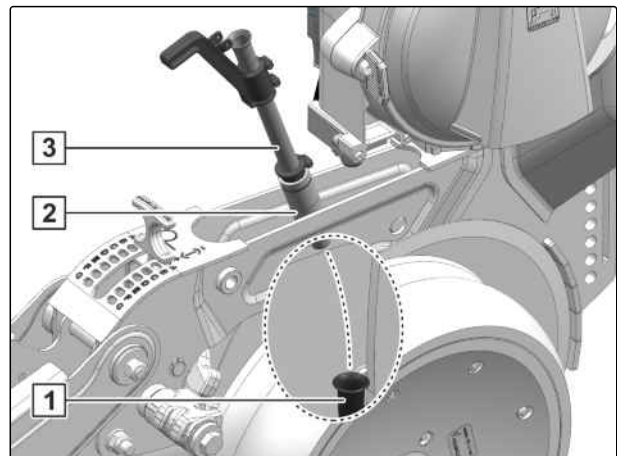
16. Install the spacer plate **2**.
17. Install the bolts **1**.



CMS-I-00003818

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

18. *To select the feed channel:*
See "Determining the seed settings".
19. Press the shot channel against the gasket **2** in the funnel **1**.
20. Swivel the shot channel under the opto-sensor.

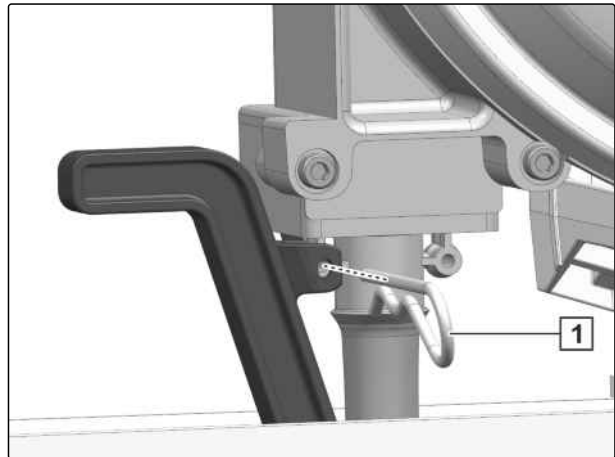


CMS-I-00003815

6 | Preparing the machine

Preparing the implement for operation

21. Install the shot channel with the spring cotter pin **1**.
22. Couple the ISOBUS line.
23. Restart the implement.



CMS-I-00003814

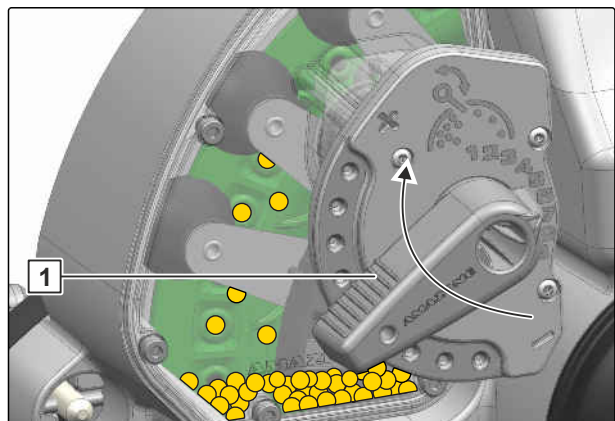
6.3.9.4 Adjusting the scraper mechanically

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.

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

6.3.9.5 Adjusting the scraper electrically

CMS-T-00001897-D.1

NOTE

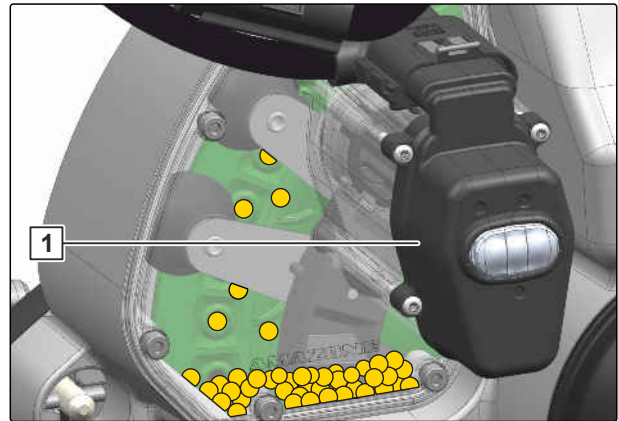
The adjustment of the scraper must be adapted to the respective operating conditions. The optimum adjustment can only be determined during field operation.

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. *To check the setting:*
drive for 30 m at working speed and then check the work pattern.



CMS-I-00001917

6.3.10 Adjusting the spread rate for seed

CMS-T-00003742-E.1

6.3.10.1 Manually calculating the grain spacing

CMS-T-00003838-C.1

Formula symbol	Designation
G	Grains
G/ha	Spread rate per hectare
R _w	Row width m
K _{AB}	Grain spacing cm

- Determine the grain spacing using the equation.

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

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

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

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

CMS-I-00002047

NOTE

For grain spacing ≤ 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.

6.3.10.2 Adjusting the electrically driven grain singling unit

CMS-T-00002038-G.1

6.3.10.2.1 Adjusting the spread rate

CMS-T-00001886-C.1

NOTE

For grain spacing ≤ 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

6.3.10.2.2 Determining the working speed

CMS-T-00002251-G.1

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 Körner/m ²	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 Körner/m ²	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 Körner/m ²	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 Körner/m ²	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 Körner/m ²	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 Körner/m ²	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 Körner/m ²	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
10 Körner/m ²	15 km/h	15 km/h	15 km/h	13.5 km/h	12.6 km/h
11 Körner/m ²	15 km/h	15 km/h	15 km/h	12.2 km/h	11.5 km/h
12 Körner/m ²	15 km/h	15 km/h	15 km/h	11.2 km/h	10.5 km/h
13 Körner/m ²	15 km/h	15 km/h	12.9 km/h	10.4 km/h	9.7 km/h
14 Körner/m ²	15 km/h	14.4 km/h	12 km/h	9.6 km/h	9 km/h
15 Körner/m ²	15 km/h	13.5 km/h	11.2 km/h	9 km/h	8.4 km/h
16 Körner/m ²	14 km/h	12.6 km/h	10.5 km/h	8.4 km/h	7.9 km/h
17 Körner/m ²	13.2 km/h	11.9 km/h	9.9 km/h	7.9 km/h	7.4 km/h
18 Körner/m ²	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 Körner/m ²	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
11 Körner/m ²	15 km/h	15 km/h	15 km/h	15 km/h	14.2 km/h
12 Körner/m ²	15 km/h	15 km/h	15 km/h	13.9 km/h	13 km/h
13 Körner/m ²	15 km/h	15 km/h	15 km/h	12.8 km/h	12 km/h
14 Körner/m ²	15 km/h	15 km/h	14.9 km/h	11.9 km/h	11.1 km/h
15 Körner/m ²	15 km/h	15 km/h	13.9 km/h	11.1 km/h	10.4 km/h
16 Körner/m ²	15 km/h	15 km/h	13 km/h	10.4 km/h	9.7 km/h
17 Körner/m ²	15 km/h	14.7 km/h	12.2 km/h	9.8 km/h	9.2 km/h
18 Körner/m ²	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 Körner/m ²	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 Körner/m ²	13 km/h	11.7 km/h	9.7 km/h	7.8 km/h	7.3 km/h
32 Körner/m ²	11.3 km/h	10.2 km/h	8.5 km/h	6.8 km/h	6.4 km/h
36 Körner/m ²	10.1 km/h	9.1 km/h	7.6 km/h	6.1 km/h	5.7 km/h
40 Körner/m ²	9.1 km/h	8.2 km/h	6.8 km/h	5.4 km/h	5.1 km/h
44 Körner/m ²	8.3 km/h	7.4 km/h	6.2 km/h	5 km/h	4.6 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
48 Körner/m ²	7.6 km/h	6.8 km/h	5.7 km/h	4.5 km/h	4.3 km/h
52 Körner/m ²	7 km/h	6.3 km/h	5.2 km/h	4.2 km/h	3.9 km/h
56 Körner/m ²	6.5 km/h	5.8 km/h	4.9 km/h	3.9 km/h	3.6 km/h
60 Körner/m ²	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 Körner/m ²	15 km/h	14.9 km/h	12.4 km/h	9.9 km/h	9.3 km/h
36 Körner/m ²	14.7 km/h	13.2 km/h	11 km/h	8.8 km/h	8.3 km/h
40 Körner/m ²	13.2 km/h	11.9 km/h	9.9 km/h	7.9 km/h	7.4 km/h
44 Körner/m ²	12 km/h	10.8 km/h	9 km/h	7.2 km/h	6.8 km/h
48 Körner/m ²	11 km/h	9.9 km/h	8.3 km/h	6.6 km/h	6.2 km/h
52 Körner/m ²	10.2 km/h	9.1 km/h	7.6 km/h	6.1 km/h	5.7 km/h
56 Körner/m ²	9.4 km/h	8.5 km/h	7.1 km/h	5.7 km/h	5.3 km/h
60 Körner/m ²	8.8 km/h	7.9 km/h	6.6 km/h	5.3 km/h	5 km/h
64 Körner/m ²	8.3 km/h	7.4 km/h	6.2 km/h	5 km/h	4.6 km/h
68 Körner/m ²	7.8 km/h	7 km/h	5.8 km/h	4.7 km/h	4.4 km/h
72 Körner/m ²	7.3 km/h	6.6 km/h	5.5 km/h	4.4 km/h	4.1 km/h
76 Körner/m ²	6.9 km/h	6.3 km/h	5.2 km/h	4.2 km/h	3.9 km/h
80 Körner/m ²	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 Körner/m ²	15 km/h	15 km/h	15 km/h	15 km/h	15 km/h
32 Körner/m ²	15 km/h	15 km/h	15 km/h	14.9 km/h	13.9 km/h
36 Körner/m ²	15 km/h	15 km/h	15 km/h	13.2 km/h	12.5 km/h
40 Körner/m ²	15 km/h	15 km/h	14.9 km/h	11.9 km/h	11.1 km/h
44 Körner/m ²	15 km/h	15 km/h	13.5 km/h	10.8 km/h	10.2 km/h
48 Körner/m ²	15 km/h	14.9 km/h	12.5 km/h	9.9 km/h	9.3 km/h
52 Körner/m ²	15 km/h	13.7 km/h	11.4 km/h	9.1 km/h	8.6 km/h
56 Körner/m ²	14.1 km/h	12.8 km/h	10.7 km/h	8.6 km/h	7.9 km/h
60 Körner/m ²	13.2 km/h	11.9 km/h	9.9 km/h	7.9 km/h	7.5 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
64 Körner/m ²	12.5 km/h	11.1 km/h	9.3 km/h	7.5 km/h	6.9 km/h
68 Körner/m ²	11.7 km/h	10.5 km/h	8.7 km/h	7.1 km/h	6.6 km/h
72 Körner/m ²	10.9 km/h	9.9 km/h	8.3 km/h	6.6 km/h	6.2 km/h
76 Körner/m ²	10.4 km/h	9.5 km/h	7.8 km/h	6.3 km/h	5.9 km/h
80 Körner/m ²	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.

6.3.11 Adjusting the PreTeC mulch seeding coulter

CMS-T-00010895-B.1

6.3.11.1 Adjusting the star clearers

CMS-T-00001933-E.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 .

6 | Preparing the machine

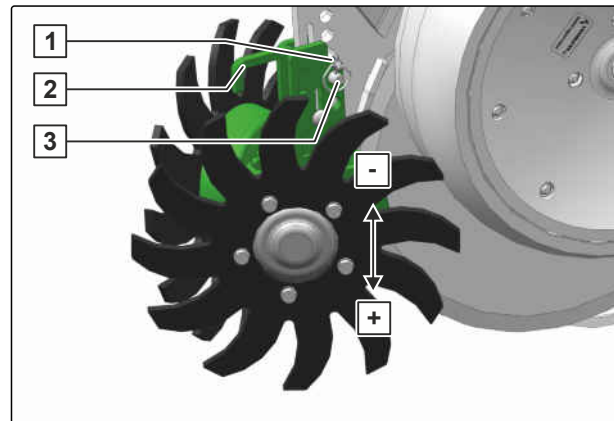
Preparing the implement for operation

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.



CMS-I-00002084

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.

6.3.11.2 Adjusting the clod clearers

CMS-T-00001934-E.1

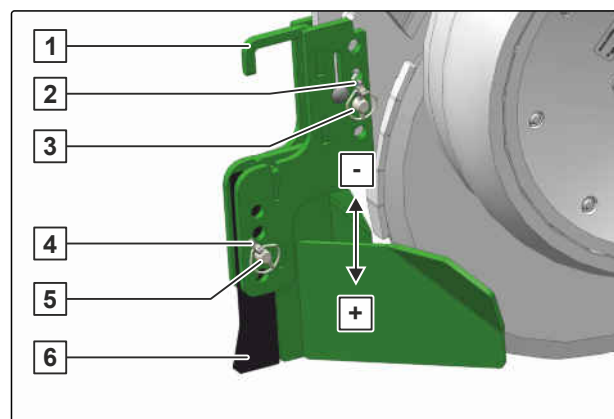
The clod clearers allow the seeding unit to run smoothly on soils with coarse surface structures. The clod clearer and the clod clearer tip should only move large clods or stones to the side. The clod clearer tip may not work deeper than the coulter. If the soil is moved completely by the clod clearer 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**.
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.



CMS-I-00002086

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.



NOTE

Do not position the coulter tip too deep.

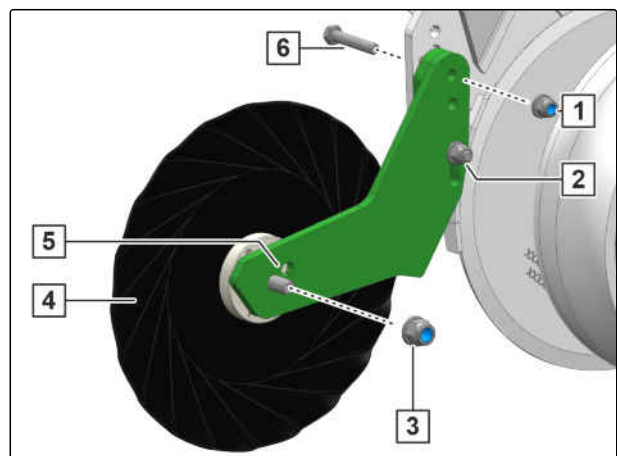
14. Insert the positioning pin in the adjuster segment.
15. Secure the pin with the linch pin.
16. *To check the setting:*
drive for 30 m at working speed and then check the work pattern.

6.3.11.3 Adjusting the rigid cutting disc

CMS-T-00007646-C.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

6 | Preparing the machine

Preparing the implement for operation

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.

6.3.11.4 Adjusting the seed placement depth

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

NOTE

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

4. *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**.

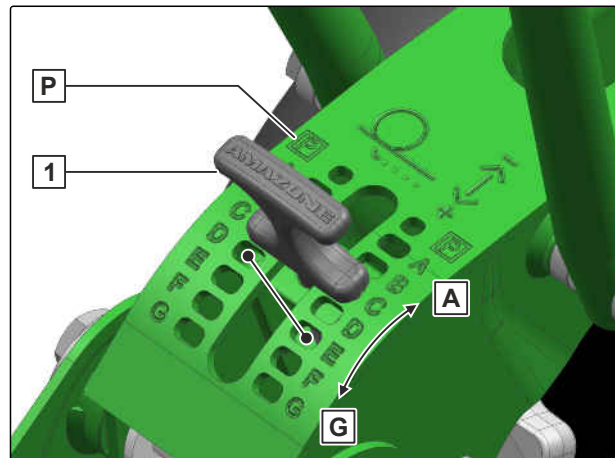
5. *To park the implement:*
Move the seed placement depth on all rows into the position **P**.

NOTE

Beyond seed placement depth positions F-G, the contact force regulation has no function.

6. *To change from contact force regulation to coulter pressure control:*
See "Configuring the coulter pressure monitoring" in the ISOBUS operating manual.
7. *To check the setting:*
Drive for 30 m at working speed and "check the seed placement depth".

CMS-T-00005825-E.1

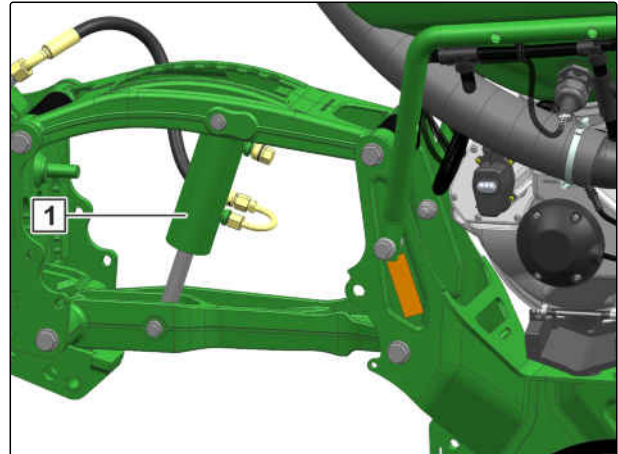


CMS-I-00001919

6.3.11.5 Adjusting the coulter pressure hydraulically

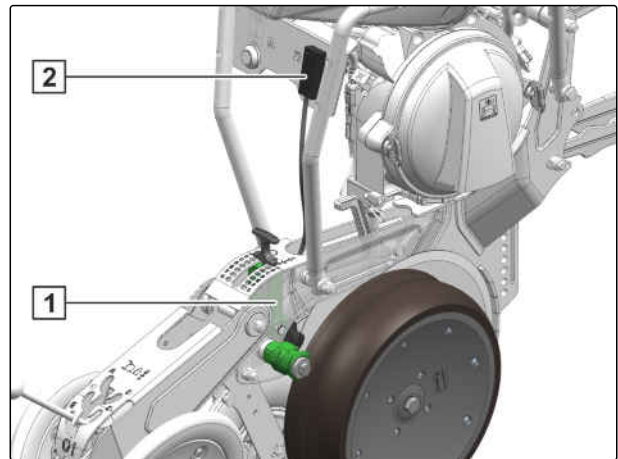
CMS-T-00005524-E.1

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.



NOTE

The working range is between 5 bar and 100 bar.

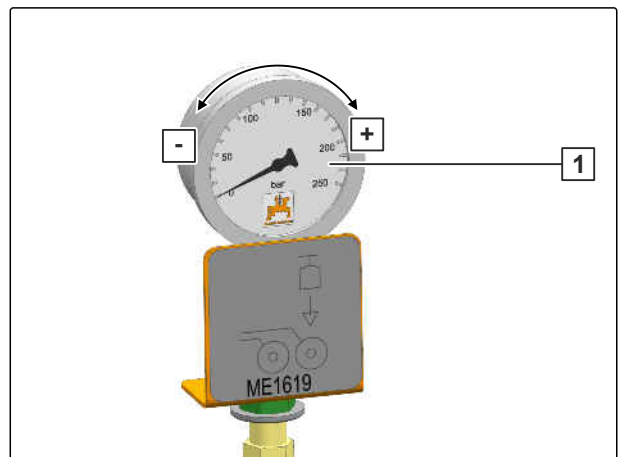
2. To increase the coulter pressure for heavy soils **+** or reduce it for light soils **-**:
Refer to the ISOBUS operating manual, "Adjusting the coulter pressure".



NOTE

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

Only use the contact force regulation up to seed placement depth position F-F.



CMS-I-00005409

6 | Preparing the machine

Preparing the implement for operation

3. *To increase the coulter pressure specifically in the tracks:*
See section "Adjusting the coulter pressure in the track".
4. *To check the setting:*
drive for 30 m at working speed and "check the seed placement depth".

6.3.11.6 Adjusting the coulter pressure mechanically

CMS-T-00001905-E.1

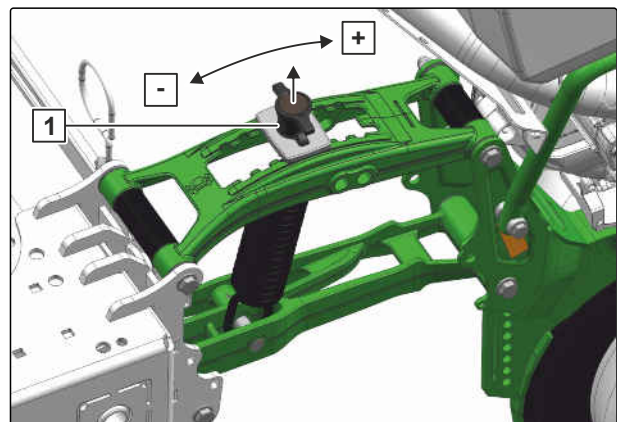
Operating conditions	Coulter pressure
Heavy soils	Increase the coulter pressure: <input data-bbox="651 712 683 745" type="button" value="+"/>
Light soils	Reduce the coulter pressure: <input data-bbox="651 801 683 835" type="button" value="-"/>

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

6.3.11.7 Adjusting the disc closer

CMS-T-00001932-G.1

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

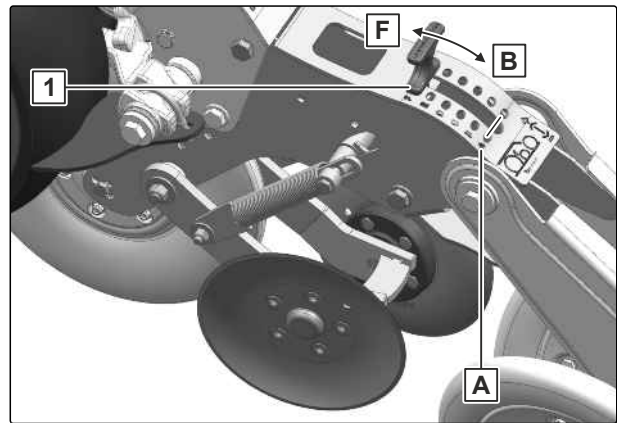
1. Lift the implement.
2. Secure the tractor and implement.
3. Unlock the setting lever **1**.
4. *On heavy soils:*
Increase the closer pressure towards **F**

or

On light soils:
Reduce the closer pressure towards **B**.
5. Make the same adjustment for all disc closers

or

Put the disc closer pressure in the tracks to the desired position
6. *To park the implement:*
Move the disc closers on all rows into the position **A**.
7. Lock the setting lever in the grid.
8. *To check the setting:*
drive for 30 m at working speed and then check the work pattern.



CMS-I-00001926

6.3.11.8 Adjusting the star closer

CMS-T-00012662-A.1

The start closers are used on ploughed or mulched soils. They cover the seed furrow with fine soil. The working depth, the position of the star closers, and the spacing between the press rollers can be adjusted.

6 | Preparing the machine

Preparing the implement for operation

1. Lift the implement.
2. Secure the tractor and implement.

The star closers must not move the seed in the soil. Adjust the working depth to maximum 1 cm from the bottom of the furrow. If the star closers push up soil, reduce the working depth or increase the clearance between the star closers.

3. Unlock the setting lever **1**.
4. *To increase the working depth:*
Move the setting lever towards **+**

or

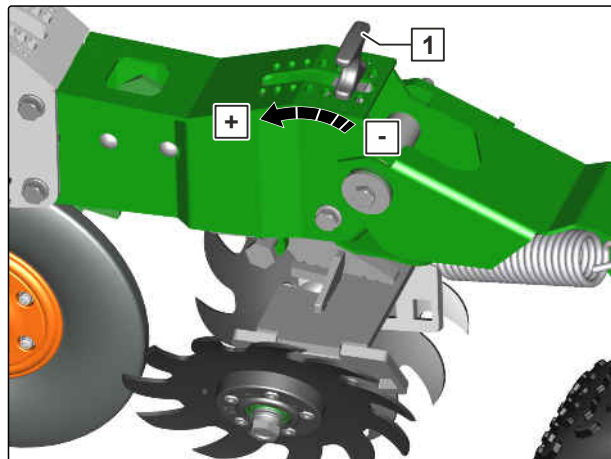
To reduce the working depth:
Move the setting lever towards **-**

5. Make the same adjustment for all star closers.

or

Put the star closers in the tracks to the desired position.

6. *To park the implement:*
Move the star closers on all rows into the topmost position.
7. Lock the setting lever in the grid.
8. *To check the setting:*
drive for 30 m at working speed and then check the work pattern.

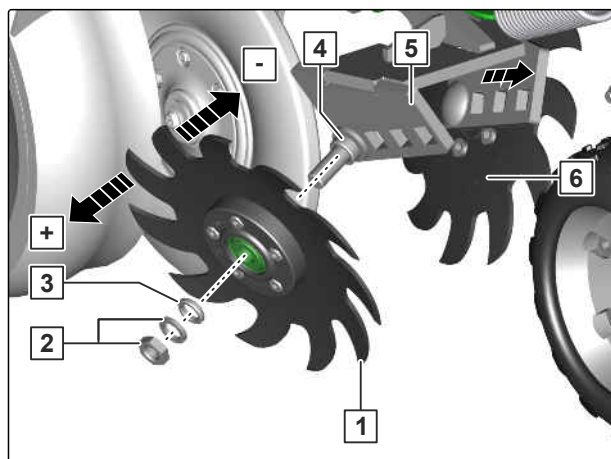


CMS-I-00008069

NOTE

To adjust the star closers at the centre of the furrow, there are setting bushings at different distances.

9. Remove the nut and locking washers **2**.
10. *To align the star closers so that they are centred relative to the furrow:*
Move the setting bushings **3** and **4** into the desired position.



CMS-I-00008763

11. *If the star closers push up soil or organic material:*

Increase the distance between the star closers

1 and **6** in the holder **5**.

or

If the star closers do not adequately cover the seed with fine soil:

Reduce the distance between the star closers.

12. *To check the setting:*

drive for 30 m at working speed and then check the work pattern.

6.3.11.9 Adjusting the mono press roller

The mono press roller closes the seed furrow. The roller pressure can be adjusted.

1. Lift the implement.
2. Secure the tractor and implement.

3. Unlock the setting lever **1**.

4. *To increase the roller pressure:*

Move the setting lever towards **+**

or

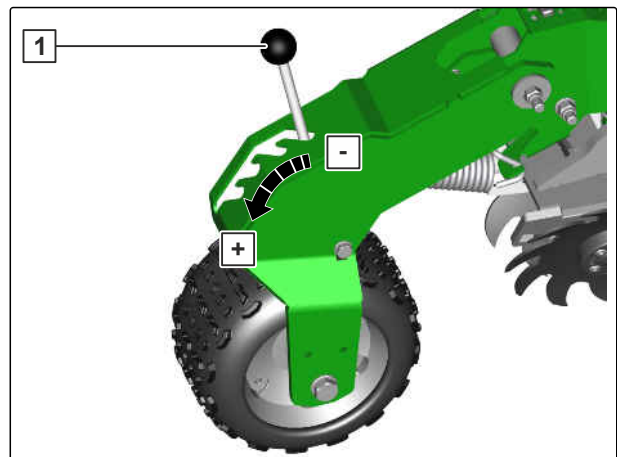
To reduce the roller pressure:

Move the setting lever towards **-**.

5. Lock the setting lever in the grid.

6. *To check the setting:*

Drive for 30 m at working speed. Check the work pattern.



CMS-T-00012663-A.1

CMS-I-00008070

6.3.11.10 Adjusting the V press rollers

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

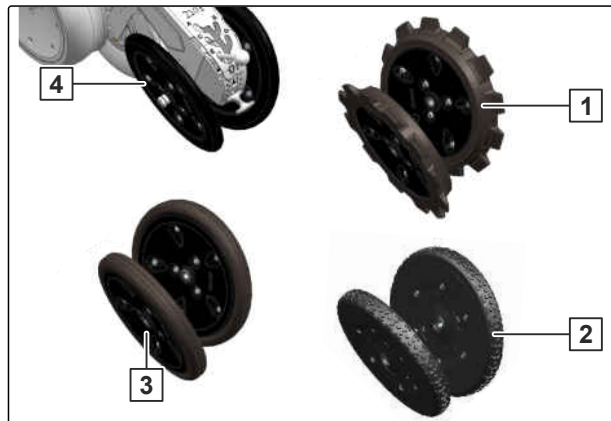
CMS-T-00001931-H.1

6 | Preparing the machine

Preparing the implement for operation

Press rollers

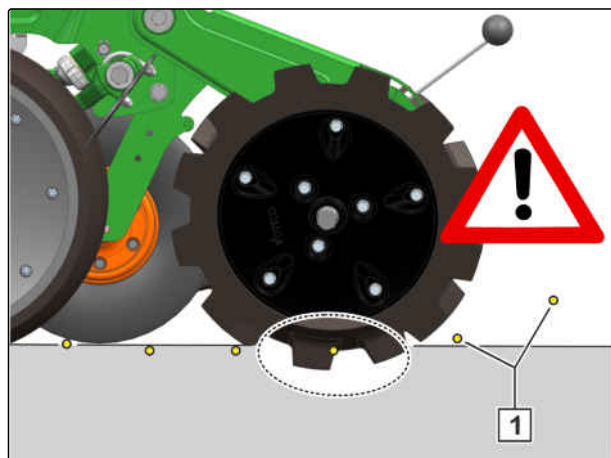
- 1** 350x50 serrated, for heavy soils
- 2** 350x50 profiled, for light to medium soils. Suitable for reducing the risk of erosion
- 3** 350x50 smooth, for light to medium soils
- 4** 350x33 smooth, for medium to heavy soils



CMS-I-00009090

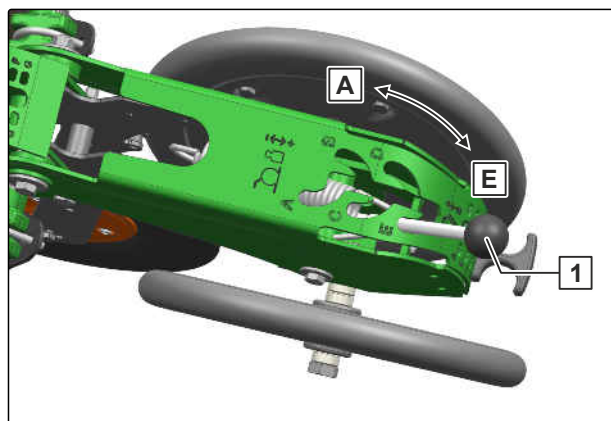
NOTE

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.



CMS-I-00002743

1. Lift the implement.
2. Secure the tractor and implement.
3. Unlock the setting lever **1**.
4. *To increase the roller pressure:*
Move the setting lever towards **E**
- or
- To reduce the roller pressure:*
Move the setting lever towards **A**.
5. Lock the setting lever in the grid.
6. *To check the setting:*
Drive for 30 m at working speed. Check the work pattern.
7. *If the seed furrow is not closed at the set roller pressure:*
Adjust the pitch.



CMS-I-00001927

8. *On light soils:*

Move the setting lever towards **A**

or

On heavy soils:

Move the setting lever towards **E**.

9. *To check the setting:*

Drive for 30 m at working speed. Check the work pattern.

10. *If the seed furrow is not closed at the set pitch:*

Adjust the press roller distance.

11. Loosen the inner lock nut and remove it.

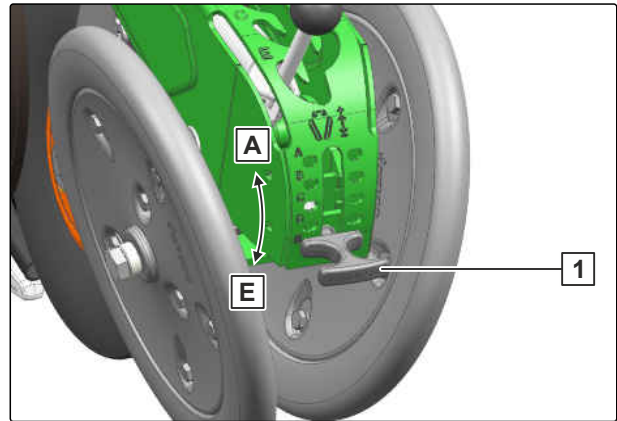
12. Remove the bolt **1** with the press roller.

Move the press roller **3** with the setting bushing **2** to the desired position.

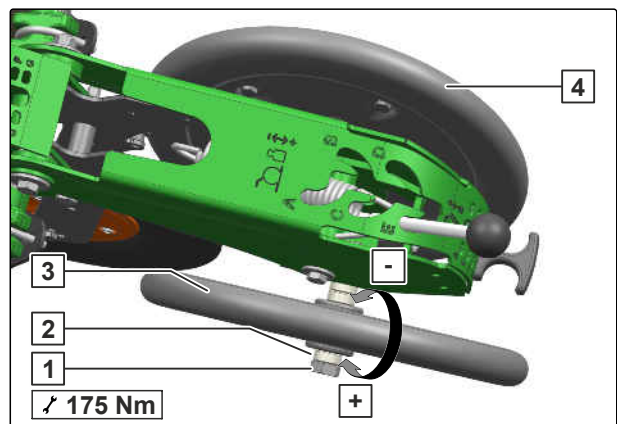


NOTE

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



CMS-I-00001929



CMS-I-00001928

13. *On light soils:*

Increase the press roller distance **+**

or

On heavy soils:

Reduce the press roller distance **-**.

14. Install the press roller with bolts.

15. Move the opposite press roller **4** to the desired position.

16. *To check the setting:*

Drive for 30 m at working speed. Check the work pattern.

17. *If the seed furrow is not closed at the set press roller distance:*

Adjust the press roller offset.

6 | Preparing the machine

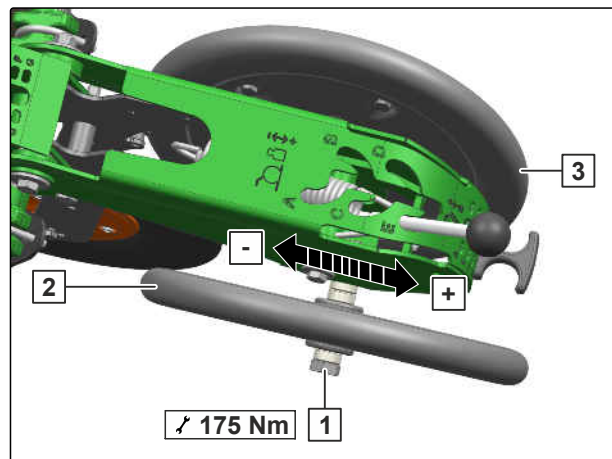
Preparing the implement for operation

18. Loosen the inner lock nut and remove it.
19. Remove the bolt **1** with the press roller.

NOTE

For implements with disc closers, install the press rollers in the rear position.

20. *For more throughput:*
Enlarge the offset of the press roller **2**.
21. Install the press roller.
22. Move the opposite press roller **3** to the desired position.
23. *To check the setting:*
Drive for 30 m at working speed. Check the work pattern.



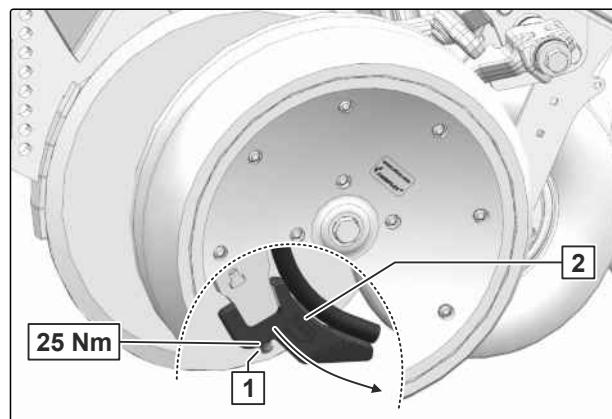
CMS-I-00009418

6.3.11.11 Changing the furrow former

NOTE

The PreTeC mulch seed coulters are only partially shown for better understanding. The depth control wheel and the cutting disc do not need to be removed to change the furrow former or furrow clearer.

1. Lift the implement.
2. Secure the tractor and implement.
3. Remove the bolt **1** and the bolt lock.
4. Pull the furrow former or furrow clearer downward and out.
5. *To select the furrow former:*
See "Determining the seed settings".
6. *If the tothing of the bolt lock is worn:*
Replace the bolt lock.
7. Install the bolt and bolt lock and tighten.
8. *To install the suitable catch roller for the furrow former:*
See "Determining the seed settings".



CMS-I-00002045

6.3.11.12 Adjusting the depth control wheel scraper

CMS-T-00001936-G.1



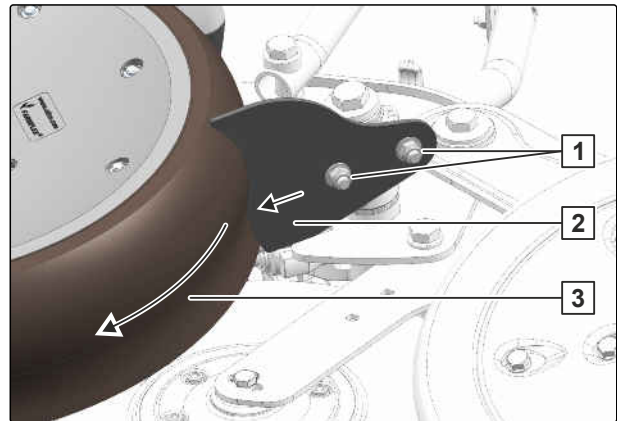
IMPORTANT

Damage to the wheel due to abrasion by the scraper

- *To check the distance:*
rotate the wheel.

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.
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.

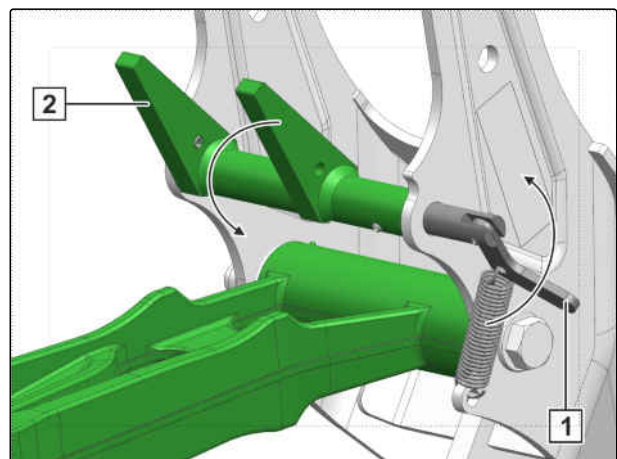


CMS-I-00001930

6.3.11.13 Using the coulter raised position

CMS-T-00003679-C.1

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



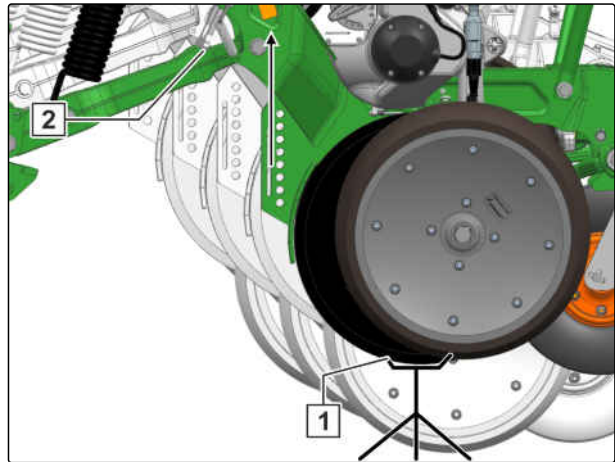
CMS-I-00002700

6 | Preparing the machine

Preparing the implement for operation

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

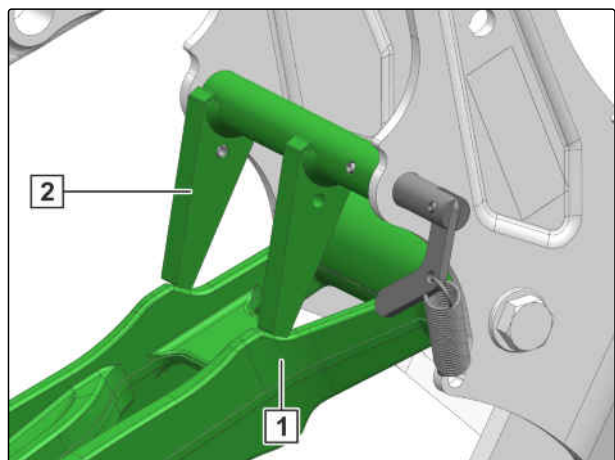
➔ The coulter is fixed in the parking position.



CMS-I-00002706

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.

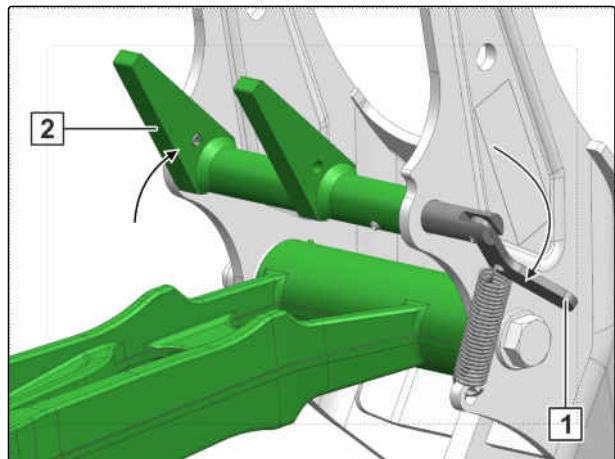


CMS-I-00002697

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

6.3.11.14 Adjusting the catch roller scraper

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

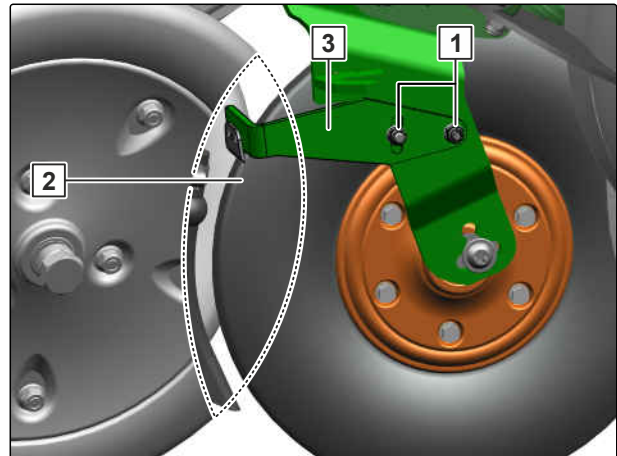
1. Lift the implement.
2. Secure the tractor and implement.
3. Loosen the nuts **1**.
4. Adjust the scraper **3** to a distance of 1 mm.



IMPORTANT Damage to the wheel due to abrasion by the scraper

► *To check the distance:*
rotate the wheel.

5. Tighten the nuts.
6. *To check the setting:*
drive for 30 m at working speed and then check the work pattern.



CMS-T-00003720-E.1

CMS-I-00009085

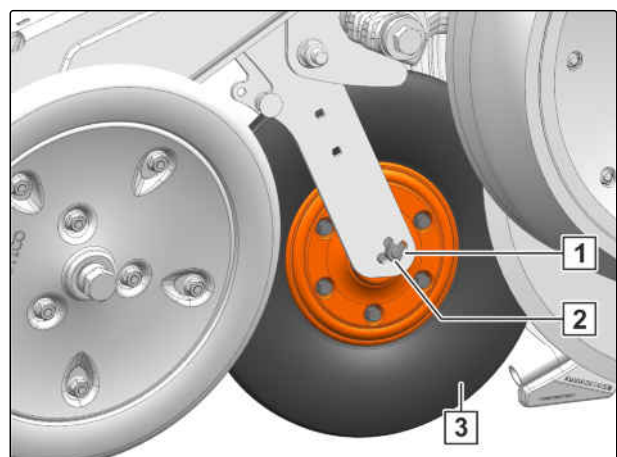
6.3.11.15 Changing the catch roller



NOTE

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

1. Lift 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 seed settings".



CMS-T-00003902-E.1

CMS-I-00002876

8. Install the desired catch roller.
9. *To install the suitable furrow former for the catch roller:*
See "Changing the furrow former".

6.3.12 Creating tramlines

CMS-T-00001881-A.1

6.3.12.1 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.

6.3.13 Adjusting the placement depth on the leaf spring-guided fertiliser coulter

CMS-I-00002061-D.1

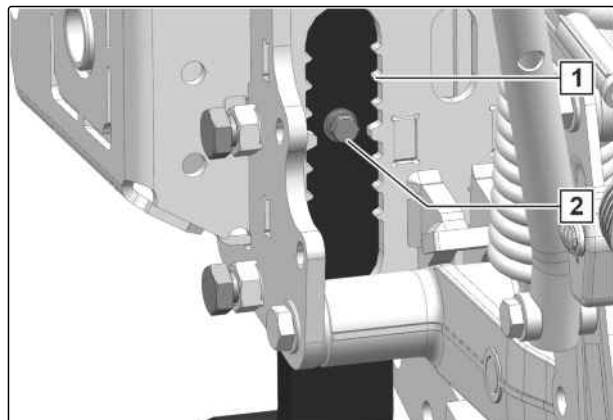


NOTE

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



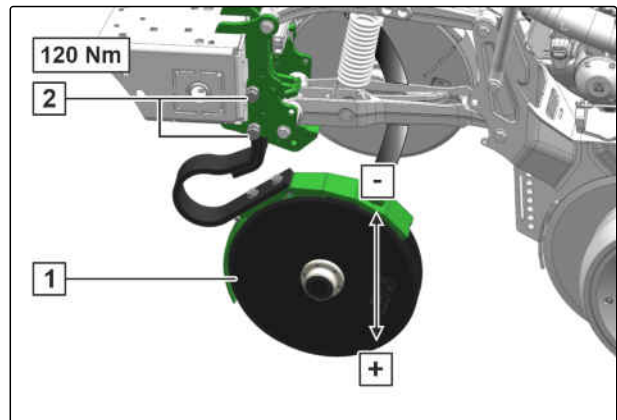
REQUIREMENTS

- ☑ 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

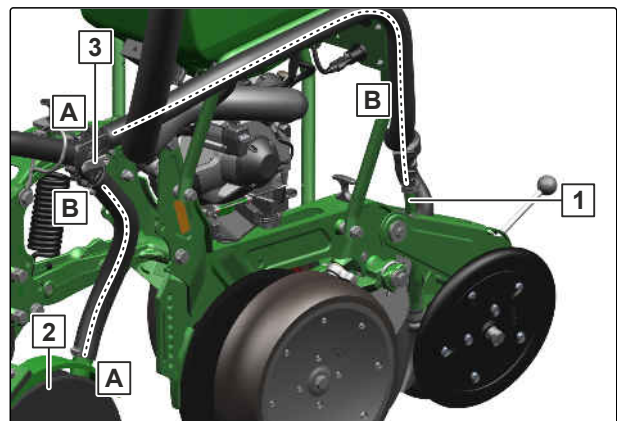
Put the fertiliser placement depth in the tracks in the desired position.



CMS-I-00001934

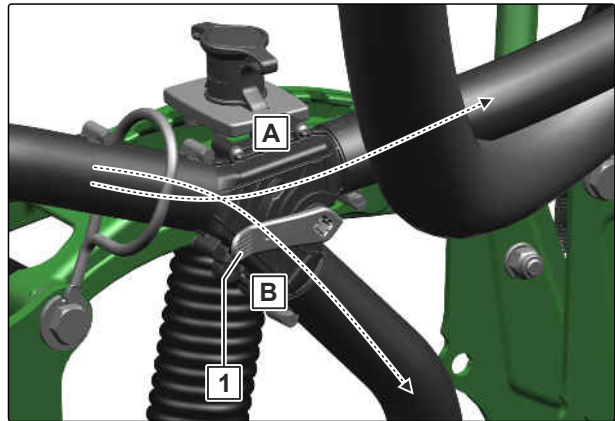
6.3.14 Adjusting the fertiliser application point

Depending on implement equipment, the fertiliser application point can be switched over. Use the switch 3 to change between the fertiliser coulter 2 or seedbed 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

6.3.15 Using the hydraulic coulters displacement

CMS-T-00010722-A.1

To be able to couple the transport frame onto the soil tillage implement, defined coulters must be hydraulically moved towards the adjacent coulters. To do so, the hydraulic coulters displacement must be activated.

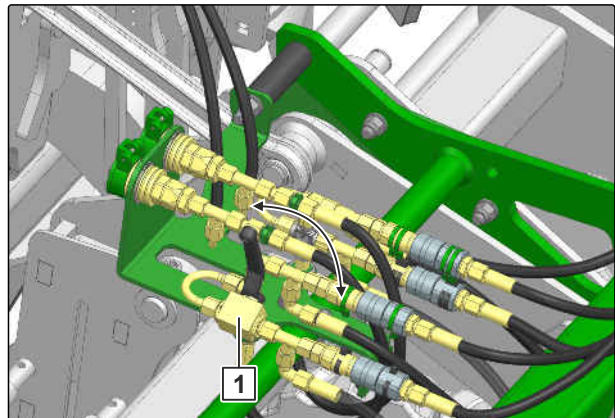
NOTE

As soon as the implement is unfolded, the coulters are moved into working position.

- *To activate the coulters displacement:*
Close the valve **1**

or

If the hydraulic coulters displacement is not required:
Close the valve.



CMS-I-00007370

6.4 Preparing the machine for road travel

CMS-T-00003745-E.1

6.4.1 Increasing the mechanical coulters 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 coulters pressure.*

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

6.4.2 Folding the implement

1. *To ensure that the coulters are not moved through the soil:
Lift the implement.*

To be able to couple the transport frame after folding, the hydraulic coulter displacement must be activated.

2. Actuate the "green 2" tractor control unit.

- ➔ The implement sections are folded.
- ➔ The coulters are hydraulically shifted.
- ➔ The lighting is unfolded.

3. *When the transport lock **1** is engaged,
Release the pull rope and put the tractor control unit to the neutral position.*
4. *To couple the transport frame:
Observe the "soil tillage implement" operating manual.*

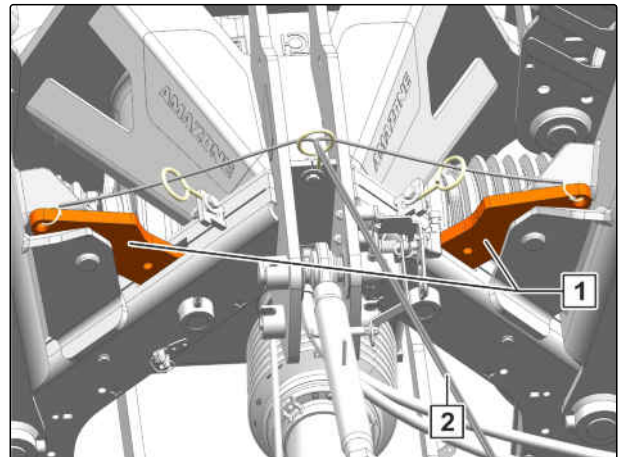
The roller transport lock **1** secures the carrying arms **2** of the trailing roller in a folded state.

5. Before driving off, check that the roller transport lock is engaged.

or

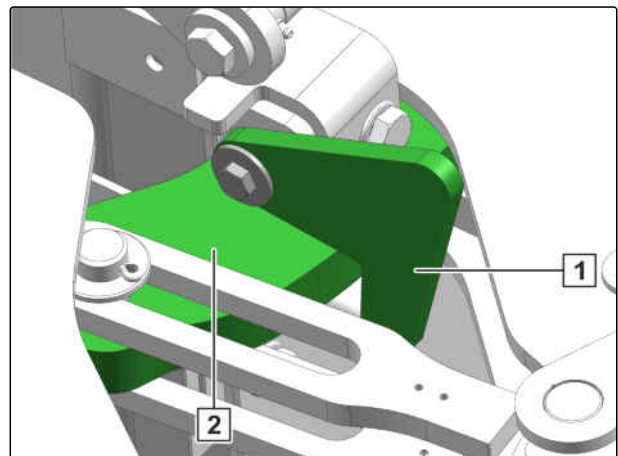
*If the roller transport lock is not engaged:
Move the rollers outward until the roller transport locks engage.*

6. *If the permitted transport height of the folded implement is exceeded:
Lower the implement according to the national regulations.*



CMS-T-00010892-C.1

CMS-I-00002993



CMS-I-00002932

6.4.3 Locking the tractor lower links laterally

CMS-T-00007550-C.1

- ▶ *To prevent uncontrolled lateral motions of the implement:*
Lock the tractor lower links before road travel.

6.4.4 Locking the tractor control units

CMS-T-00006337-D.1

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

6.4.5 Switching off the work lights

CMS-T-00013341-B.1

- ▶ *To switch off the work lights:*
refer to the *"ISOBUS"* operating manual

or

refer to the *"Control computer"* operating manual.

Using the machine

7

CMS-T-00010705-B.1

7.1 Spreading fine seeds

CMS-T-00014754-A.1



REQUIREMENTS

For smooth running of the coulters and reliable embedding of fine seeds:

- ☑ The seed bed must be worked at least to the application depth of the fine seed or fertiliser
- ☑ Seedbed is sufficiently reconsolidated and load-bearing
- ☑ Seedbed has sufficient fine soil

1. *If the fine seed will be sown with a thin covering height:*
Adapt the working speed to the ground contour.
2. *For smooth running of the coulters and reliable embedding of the fine seed:*
Seeding direction parallel to the soil tillage
3. *If the conveyor air blows away structureless soil:*
Correct the air pressure in the singling unit.
4. *If a load-bearing soil structure is not present for reliable embedding at the desired placement depth:*
Increase the placement depth: see page 84.
5. *If the fine seed is placed too deep with the selected setting:*
Heap-up less cover: see page 89.

7.2 Unfolding the implement

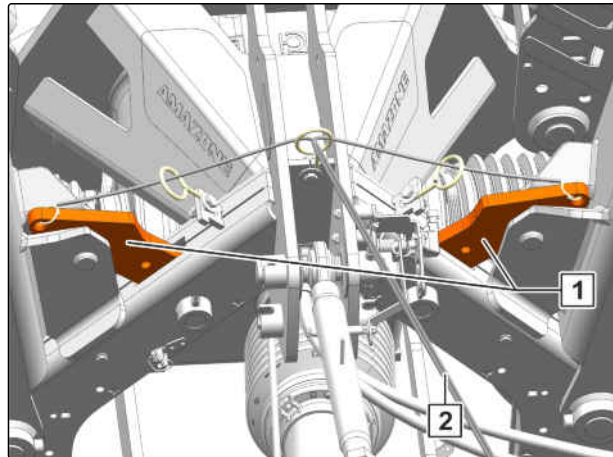
CMS-T-00010893-A.1



REQUIREMENTS

- ☑ The transport frame is uncoupled

1. Raise the implement.
2. actuate the "green 2" tractor control unit.
 - ➔ The transport lock is unloaded.
3. Actuate the pull rope and actuate the "green 1" tractor control unit.
 - ➔ The implement sections are unfolded.
 - ➔ The coulters will be moved into working position.
 - ➔ Lighting will be folded.
4. *When the implement sections have reached the end position,*
Release the pull rope and put the tractor control unit into float position.



CMS-I-00002993

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 Using the implement

CMS-T-00001921-C.1

1. Lower the implement on the field.
2. Align the implement parallel to the ground.
3. Unfold the track markers.
4. Move the hydraulic system of the 3-point power lift into float position.
5. *For implements with universal shaft drive:*
Switch on the tractor PTO shaft. Slowly couple the tractor PTO shaft only at an idle or at low tractor engine speed.
6. 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.

7. *To check the placement depth after the first 30 m:*
see page 104

or

With the multi-placement tester:
see page 107

8. *Check the grain spacing after the first 30 m:*
see page 104

or

With the multi-placement tester:
see page 106

7.5 Performing maintenance work during operation

CMS-T-00013986-A.1

During operation with high amounts of organic residues on the field, the fan intake opening must be cleaned regularly.

- *To clean the suction guard screen:*
see page 141

7.6 Turning on the headlands

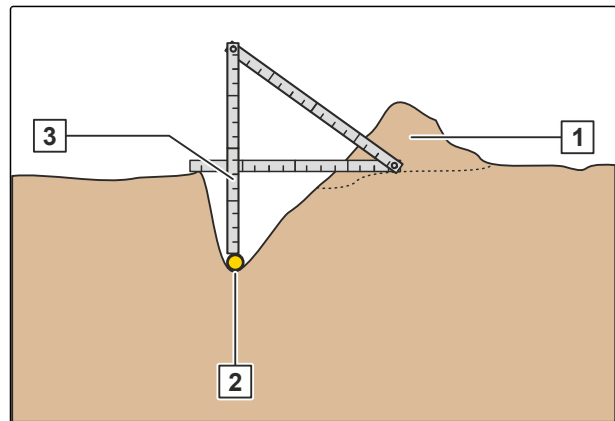
CMS-T-00001922-B.1

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.

7.7 Checking the placement depth

CMS-T-00004517-D.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.

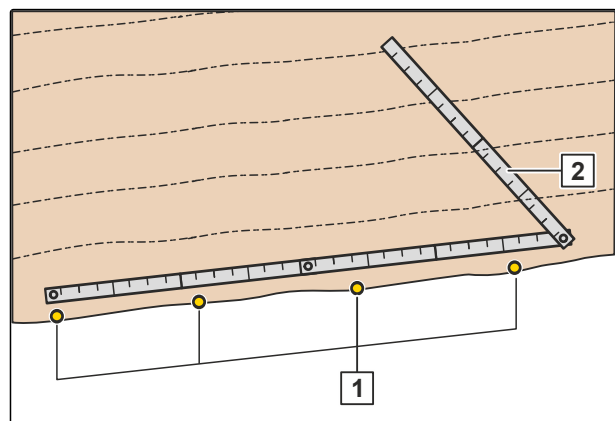


CMS-I-00003257

7.8 Checking the grain spacing

CMS-T-00012307-A.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-00007922

1. Remove the fine soil over the seed.

2. Expose 11 grains **1** in one row.
3. Measure 10 grain spacings with the ruler **2**.
4. Calculate the average grain spacing.
5. Cover the seed with fine soil again.

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

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

$$K_{Ab1-10} = \frac{\text{[]} + \text{[]} + \text{[]} + \dots + \text{[]}}{10}$$

CMS-I-00002066

7.9 Using the multi-placement tester

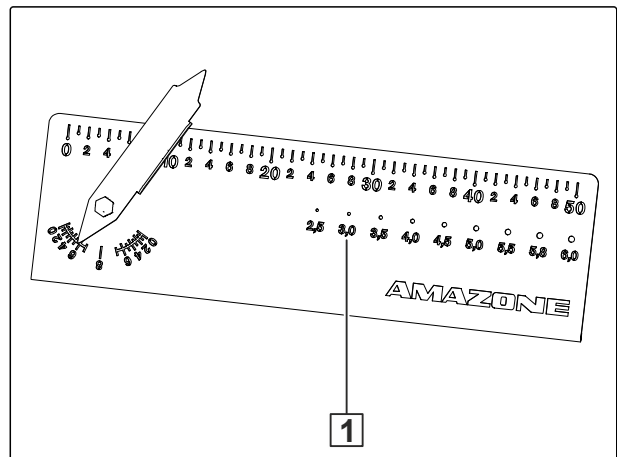
CMS-T-00005293-D.1

7.9.1 Determining the grain size

CMS-T-00001888-D.1

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

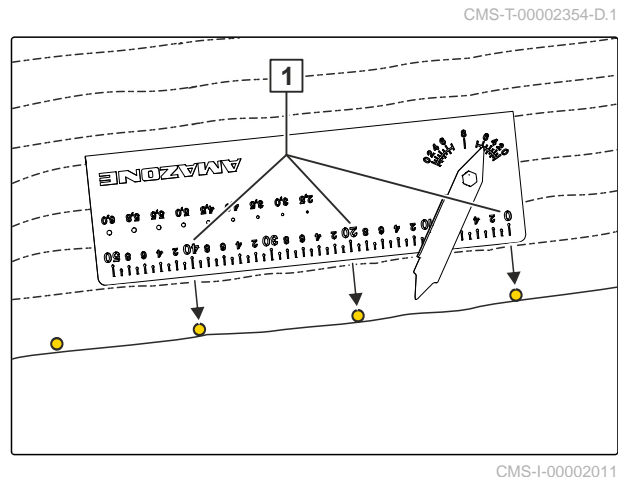
1. Put the seed in the reference holes **1**.
2. *If the seed lies loosely on the reference hole, read the hole diameter.*



CMS-I-00001217

7.9.2 Checking the grain spacing

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



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.

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

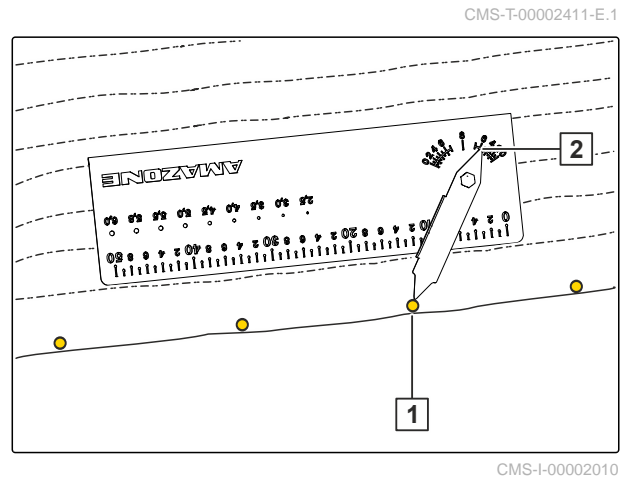
$$K_{Ab1-10} = \frac{K_{Ab1} + K_{Ab2} + K_{Ab3} + \dots + K_{Ab10}}{10}$$

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

CMS-I-00002066

7.9.3 Checking the placement depth

1. *To check the placement depth after the first 30 m:*
Expose the grains at several points using the multi-placement tester.
2. Use the read-off edge of the multi-placement tester to remove the earth in layers.
3. Place the multi-placement tester horizontally on the ground.
4. Set the pointer **1** on the seed grain.
5. Read the placement depth on the scale **2**.



Eliminating faults

8

CMS-T-00003759-E.1

Errors	Cause	Solution
Gaps can be caused by insufficient seed in the grain singling unit.	The grain shape or the dressing can cause the seed to be poorly conveyed.	► see page 110
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 110
The control terminal shows a spread rate error.	The shot channel is blocked.	► see page 111
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 111
Blocking the depth control wheels.	Soil gets stuck between the cutting discs and the depth control wheels with closed rim.	► see page 112
	Organic residues get stuck on the open rims.	► see page 112
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 several singling discs.	The fuse for the electric drive is defective.	► see page 112
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 113

Errors	Cause	Solution
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>
Micropellets are not emerging	The outlet of the micropellet spreader is clogged with soil	► see page 113
The universal joint shaft is not running smoothly.	The universal joint shaft is angled down too strongly:	► Only use original and intended universal joint shafts.
The universal joint shaft is not running smoothly.	The universal joint shaft is angled down too strongly:	► Only use original and intended universal joint shafts.
Blockages in the feed channel	Seed is too large or flows poorly.	► see page 114

Gaps due to insufficient seed in the grain singling unit

CMS-T-00002346-B.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.

1. Check the position of the sliding shutter.
2. *To improve the sliding capacity of the seed:*
Mix 1.6 g of talcum powder into 1 kg of seed

or

Mix 500 g of talcum with 40 units of 50,000 grains each.

Seed is not caught and jumps out of the furrow

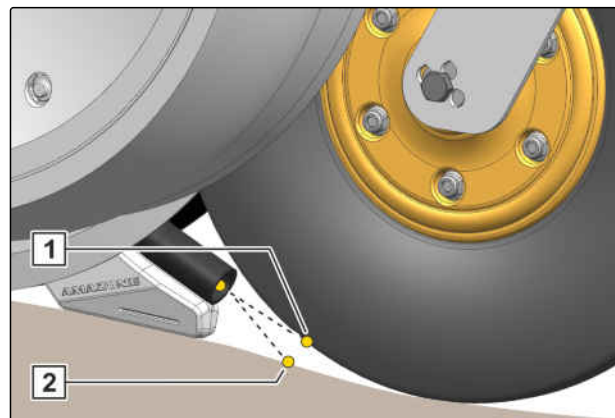
CMS-T-00002347-C.1

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.

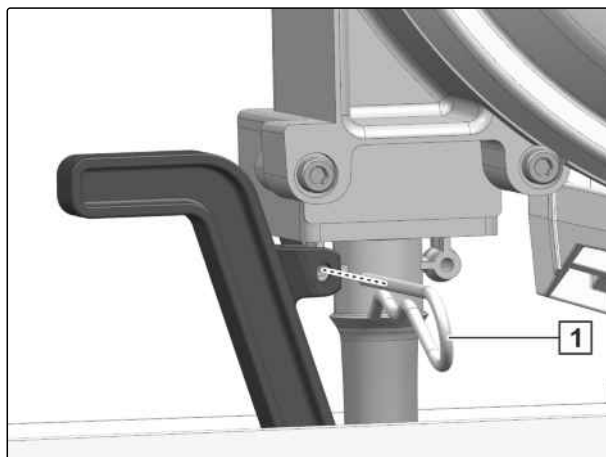


CMS-I-00001925

Control terminal shows a spread rate error

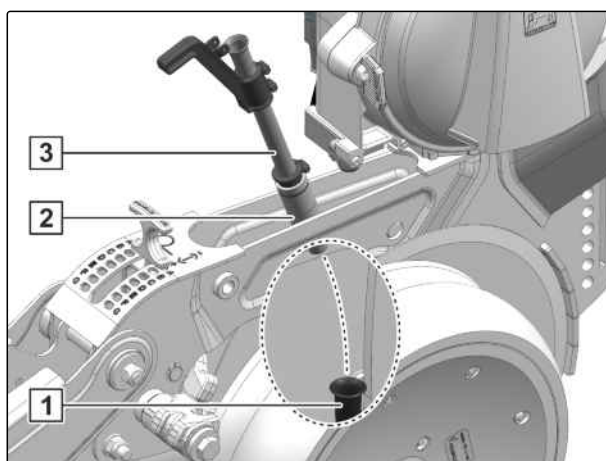
CMS-T-00002348-C.1

1. Remove the spring cotter pin **1**.



CMS-I-00003814

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



CMS-I-00003815

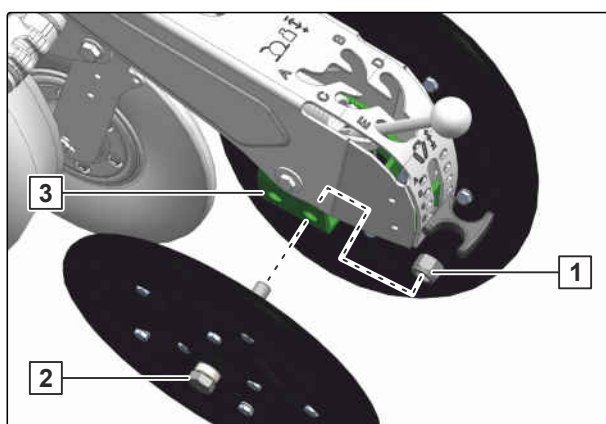
Blocking of the press rollers

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



CMS-I-00002041

Blocking the depth control wheels

CMS-T-00007530-C.1

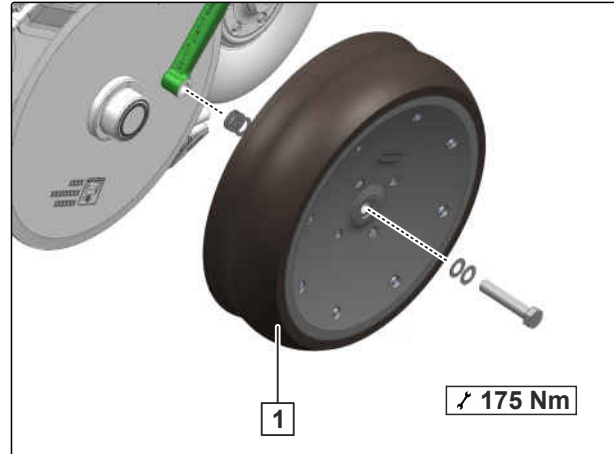
Soil gets stuck between the cutting discs and the depth control wheels with closed rim.

- 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

Organic residues get stuck on the open rims.

- Clean the depth control wheels

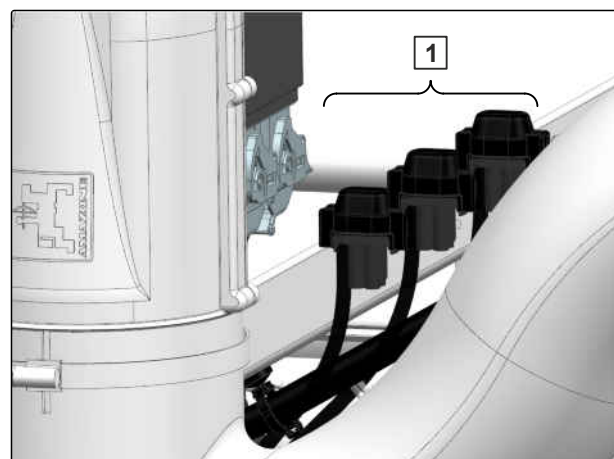
or

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 several singling discs

CMS-T-00003760-C.1



CMS-I-00002695

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

- Replace defective fuses.

Fill level in the singling unit housing is too high

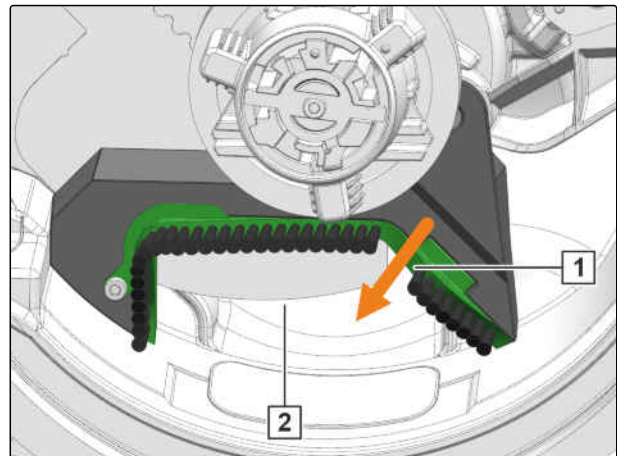
CMS-T-00008170-A.1

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.

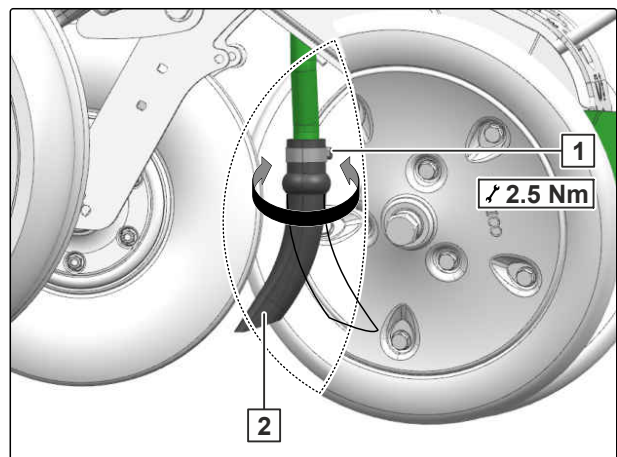


CMS-I-00005635

Micropellet outlet in the seed furrow is clogged

CMS-T-00014556-A.1

1. Open the clamp **1**.
2. Install the micropellet outlet **2** towards the rear.
3. Tighten the clamp.



CMS-I-00009204

Blockages in the feed channel

CMS-T-00014766-A.1



NOTE

If diameters larger than specified in the section "*Determining the seed settings*", restrictions can occur in the distribution along the row.

- *To increase feed reliability:*
Install an opto-sensor, feed channel, and furrow former with a larger diameter.

Parking the machine

9

CMS-T-00010693-B.1

9.1 Emptying the seed hopper through the residual quantity flap

CMS-T-00001917-C.1



REQUIREMENTS

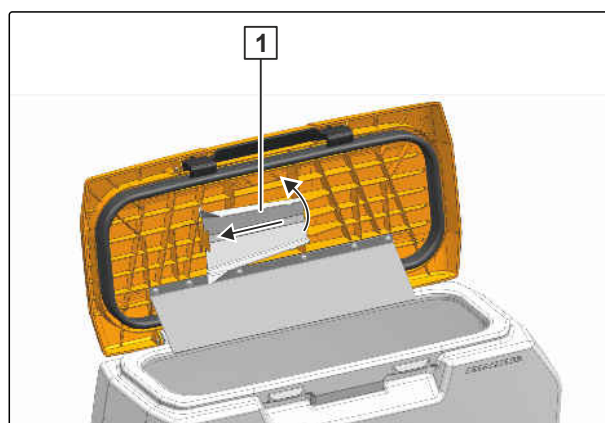
- ☑ The implement is coupled to the tractor
- ☑ The tractor and implement are secured



NOTE

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

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



CMS-I-00001888

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



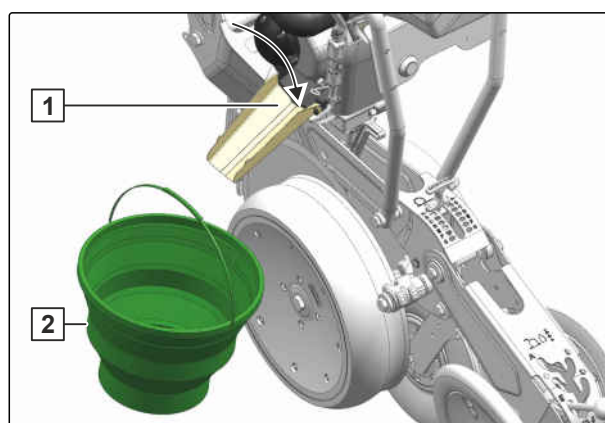
NOTE

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

3. Put the collection bucket **2** under the chute

or

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

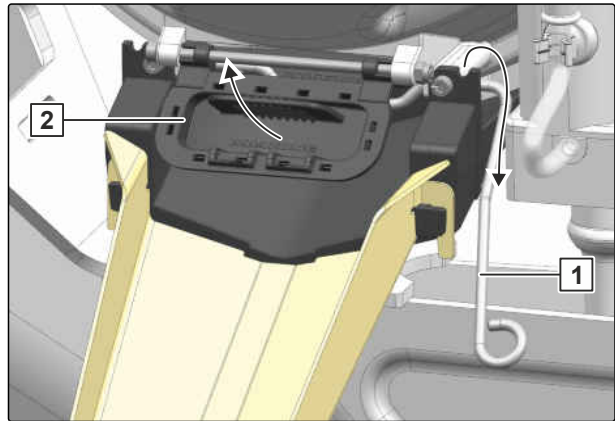


CMS-I-00001995

9 | Parking the machine

Emptying the seed hopper through the singling disc

4. Open the locking spring **1**.
- ➔ The flap **2** is opened and the residual quantity is collected.
5. *When the residual quantity has been collected, park the chute back into the hopper cover.*
6. Close the flap.
7. Lock the locking spring.



CMS-I-00001996

9.2 Emptying the seed hopper through the singling disc

CMS-T-00002194-D.1



REQUIREMENTS

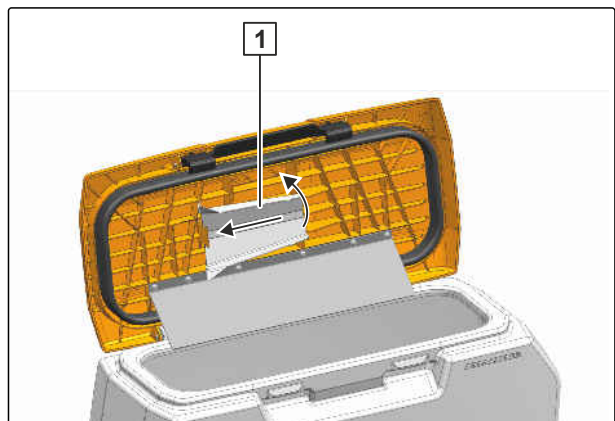
- ✓ The implement is coupled to the tractor
- ✓ The tractor and implement are secured



NOTE

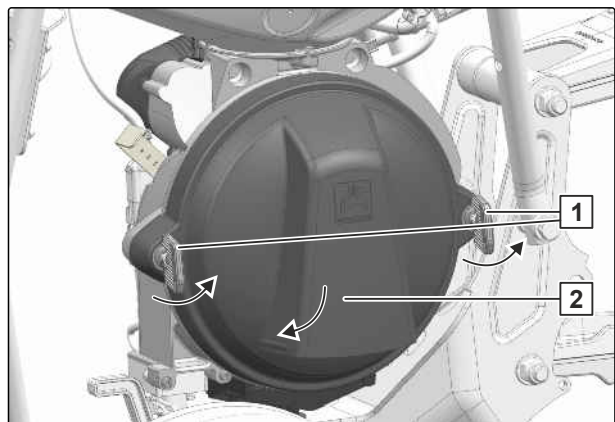
The parking position for the chute is in the hopper cover for row 1.

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



CMS-I-00001888

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



CMS-I-00001909

4. 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.

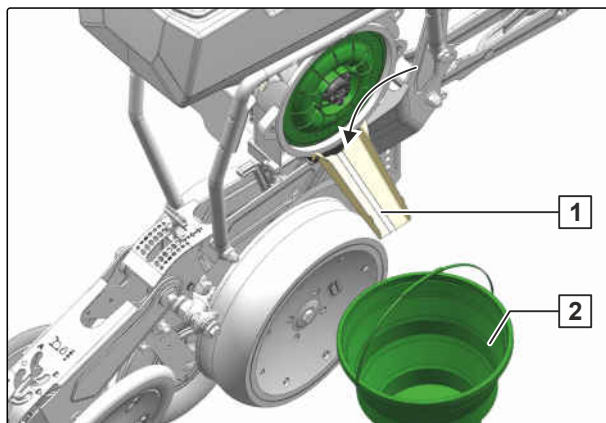
5. Put the collection bucket **2** under the chute.

or

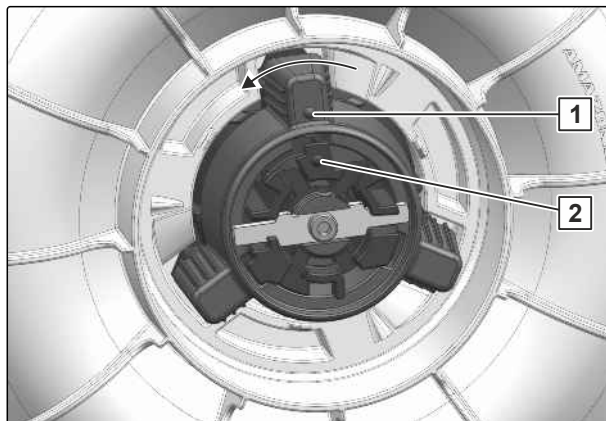
Hook the collection bucket **2** onto the chute.

6. Put the collection bucket **2** under the chute.

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



CMS-I-00001997



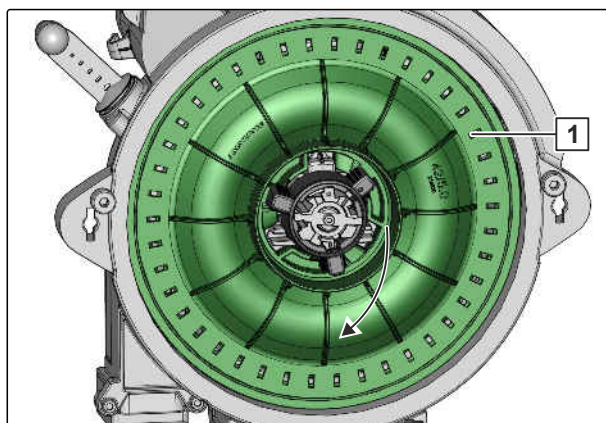
CMS-I-00001910

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

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

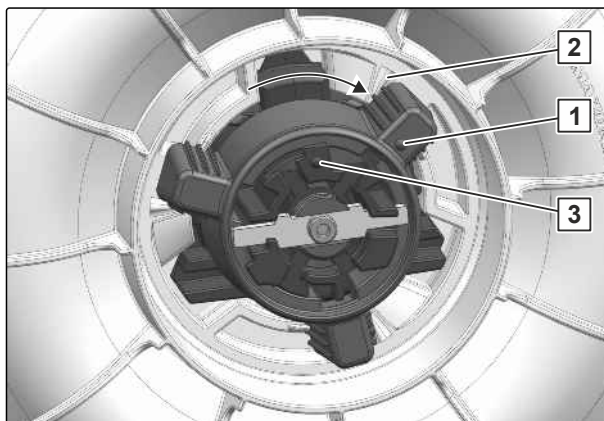
9 | Parking the machine

Emptying the micropellet hopper

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

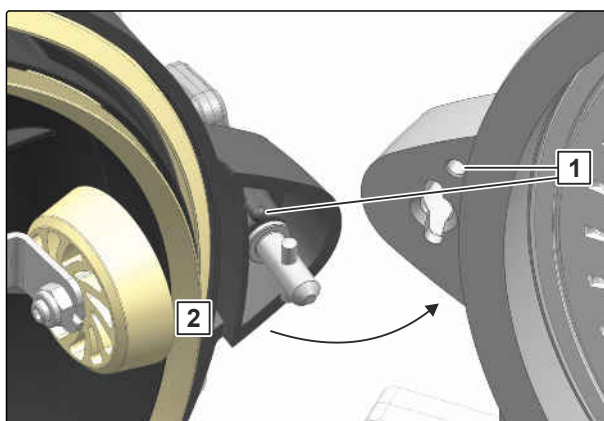
12. Close the cover **2**.



NOTE

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

13. Close the locks.



CMS-I-00001913

9.3 Emptying the micropellet hopper

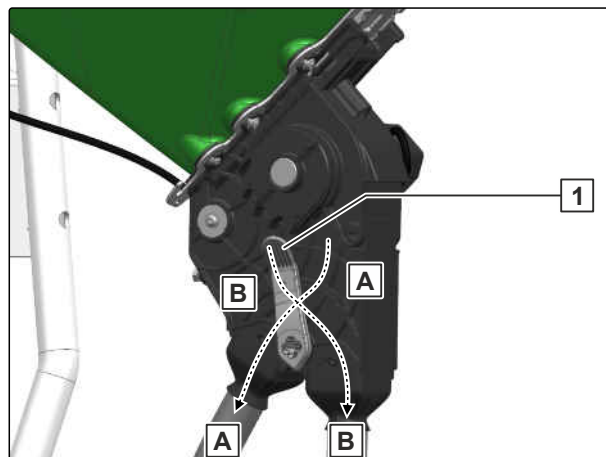
CMS-T-00003603-B.1

1. Close the sliding shutter **1** on the micropellet hopper.



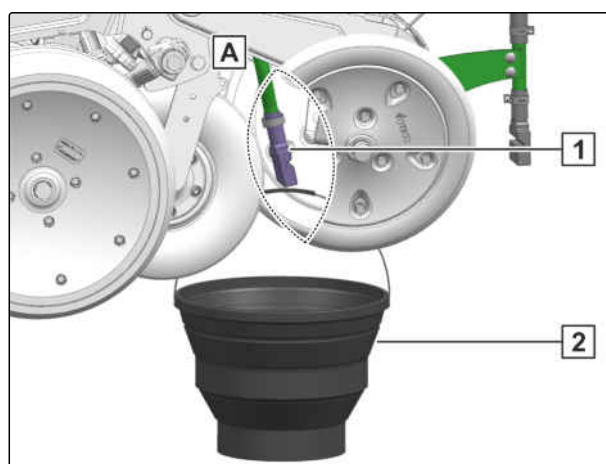
CMS-I-00002586

2. Move the switchover flap **1** to position **A**.



CMS-I-00002580

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

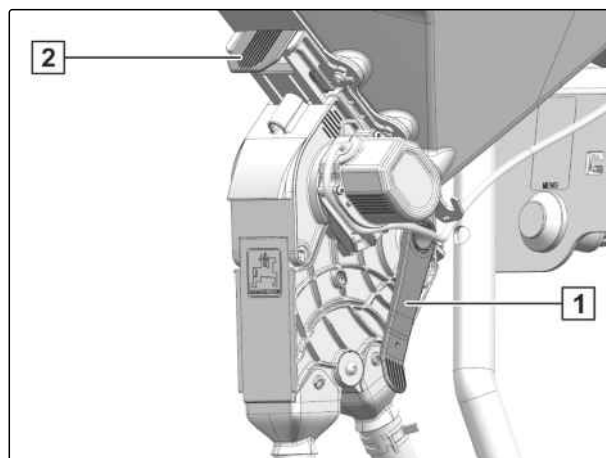


CMS-I-00002621

4. Relieve the bottom flap lever **1**.

5. Slowly open the sliding shutter **1**.

➔ The micropellets are collected in the collapsible bucket.

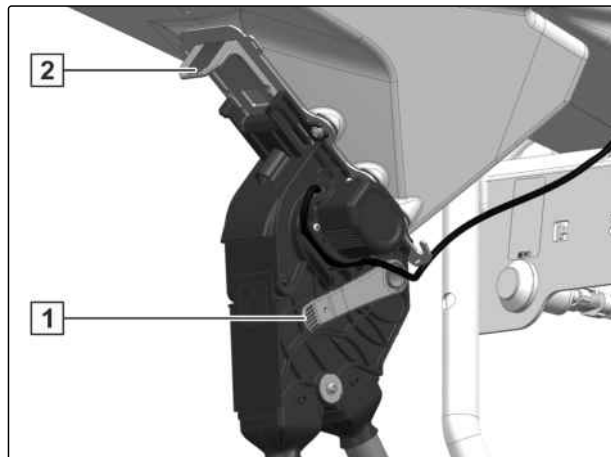


CMS-I-00002576

9 | Parking the machine

Relieving the hole covering rollers

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.

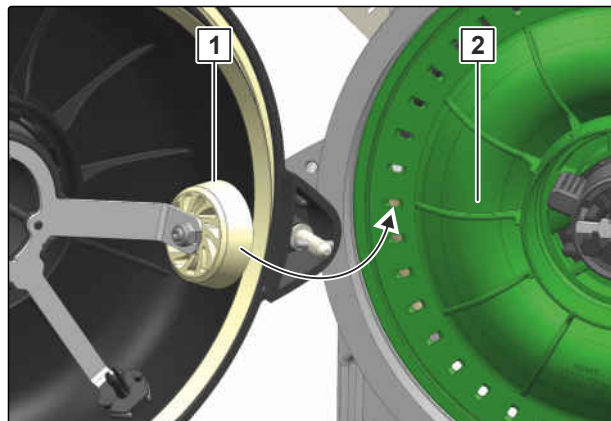


CMS-I-00002622

9.4 Relieving the hole covering rollers

CMS-T-00002211-C.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.



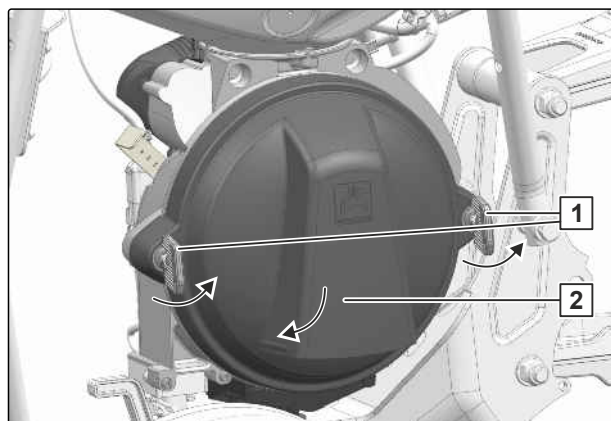
CMS-I-00002023



REQUIREMENTS

- ✓ The implement is in working position
- ✓ 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

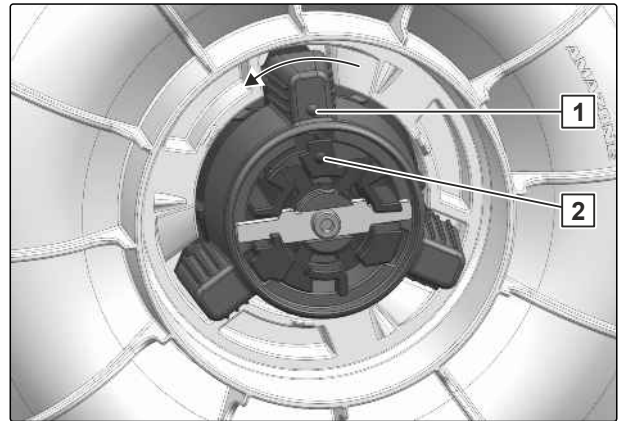


WARNING

Risk of chemical burns by dressing dust

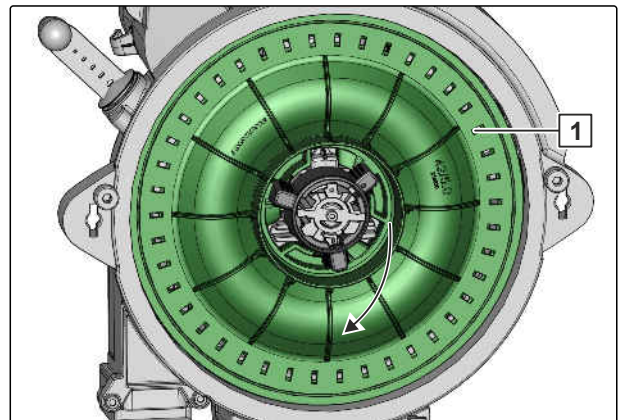
- Before working with hazardous materials, put on the protective clothing recommended by the manufacturer.

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

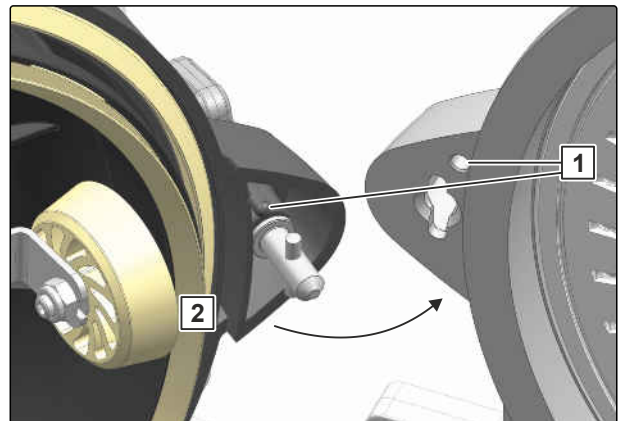
6. Close the cover **2**.



NOTE

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

7. Close the locks.

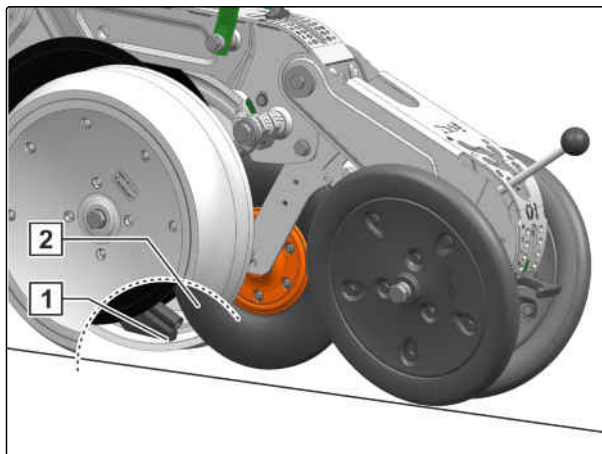


CMS-I-00001913

9.5 Parking the PreTeC mulch seeding coulters

CMS-T-00001920-E.1

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



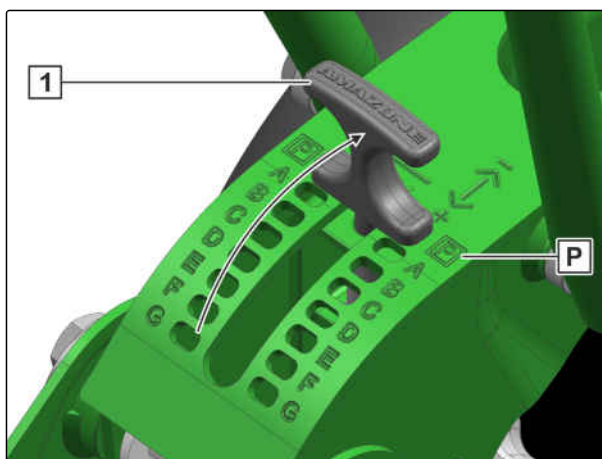
CMS-I-00001999



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.
3. Move the disc closers or star closers into the topmost position.

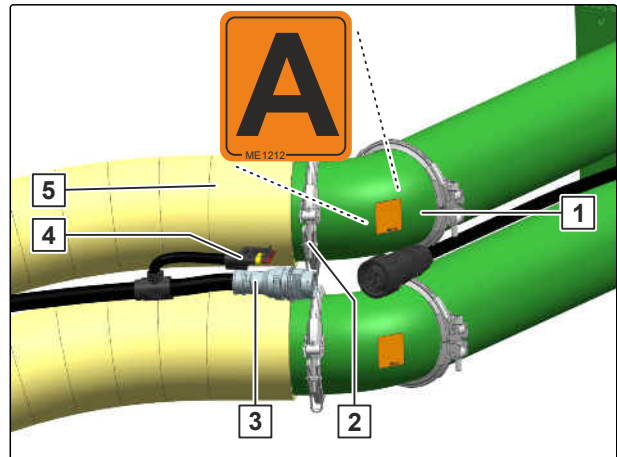


CMS-I-00001998

9.6 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.

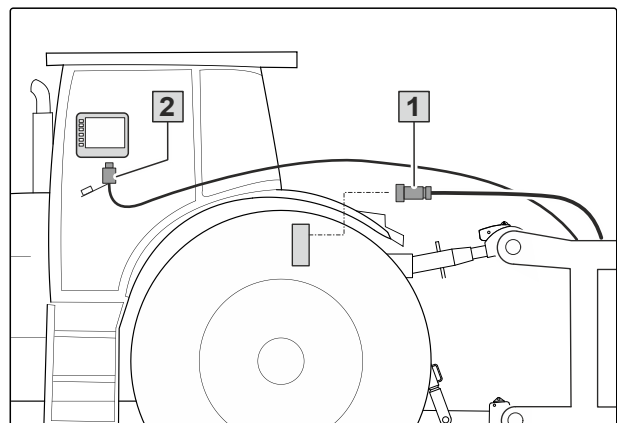


CMS-I-00003124

9.7 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.

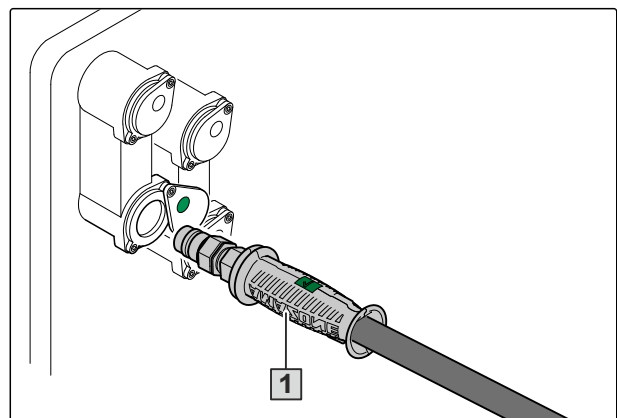


CMS-I-00006891

9.8 Disconnecting the hydraulic hose lines

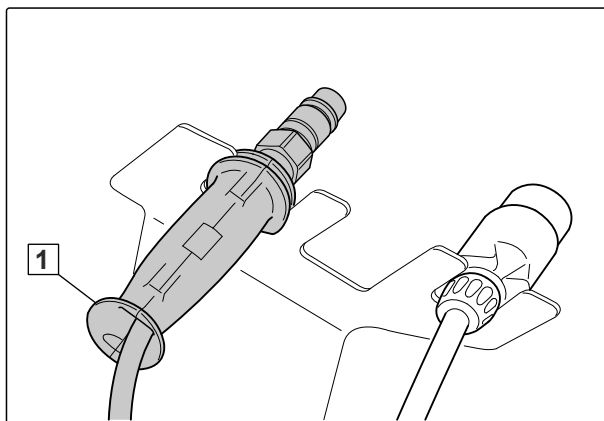
CMS-T-00000277-F.1

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



CMS-I-00001065

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

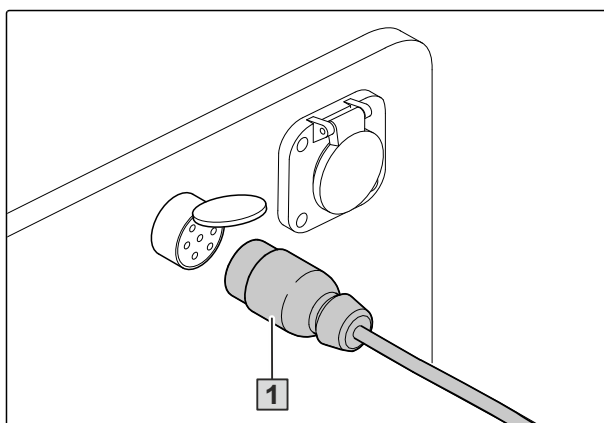


CMS-I-00001250

9.9 Uncoupling the power supply

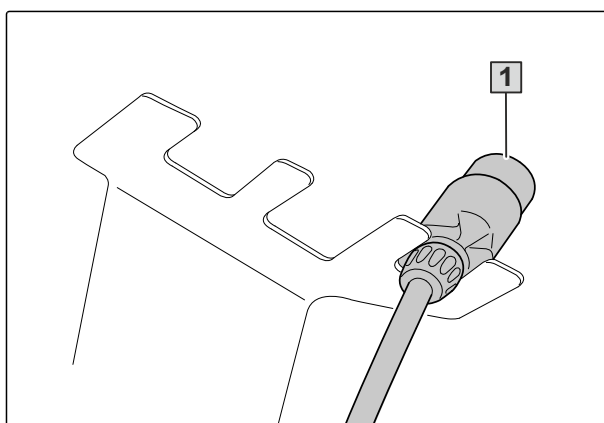
CMS-T-00001402-H.1

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



CMS-I-00001048

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



CMS-I-00001248

9.10 Parking the pack top seed drill separately

CMS-T-00010723-A.1



WARNING

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

- ▶ Park the implement on stable and even ground.

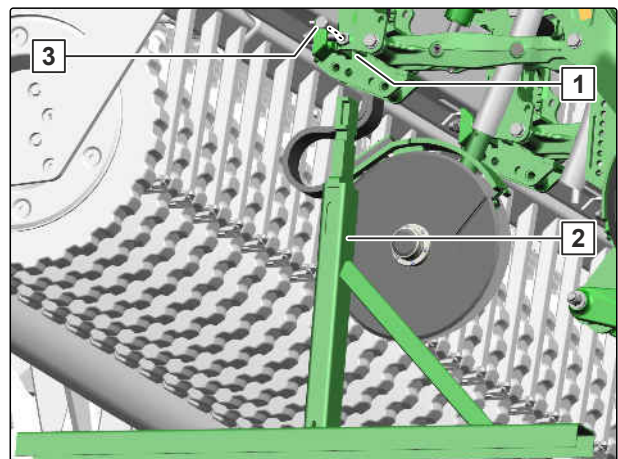


WARNING

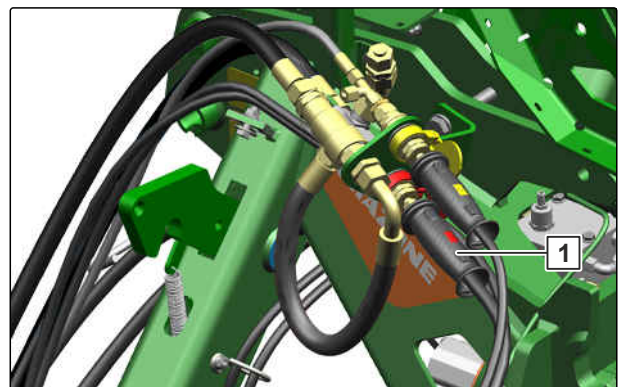
Risk of injury or even death due to tipping over of the seeding combination

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

1. Fold the seeding combination.
2. On rows 4 and 5, slide the parking supports **2** into the holder **1**.
3. Secure the parking supports with bolts **3**.
4. Unfold the seeding combination.
5. On rows 1 and 8, slide the parking supports into the holder.
6. Secure the parking supports with bolts.
7. Uncouple the "red T" pressureless return flow of the pack top seed drill **1** from the soil tillage implement.



CMS-I-00007382

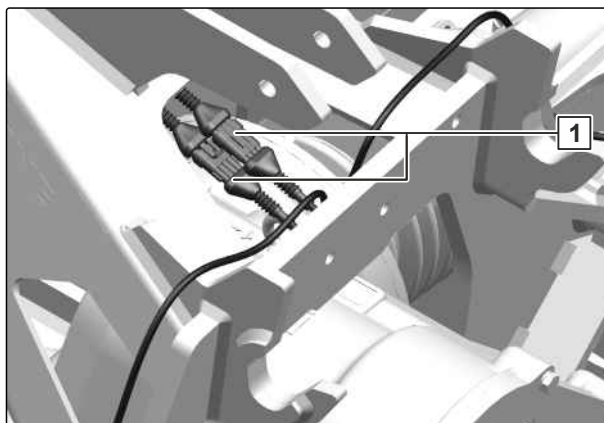


CMS-I-00007383

9 | Parking the machine

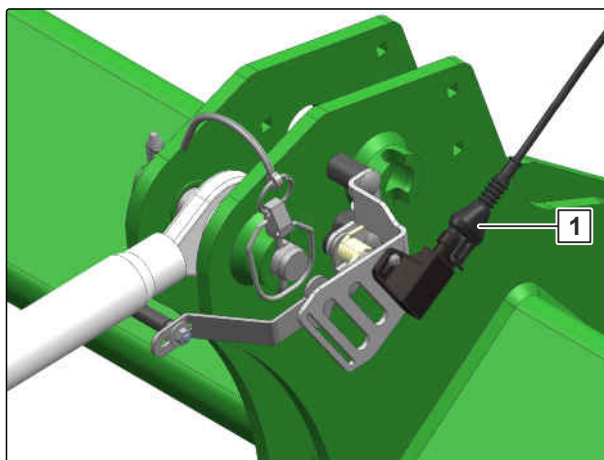
Parking the pack top seed drill separately

8. Disconnect the lighting cable **1**.
9. *Depending on the implement equipment*
Disconnect the lighting cable for the licence plate lighting.



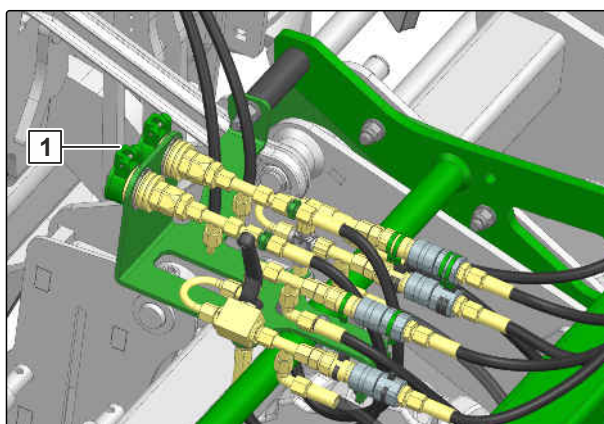
CMS-I-00007384

10. Disconnect the sensor cable **1**.
11. Seal the plug connection of the working position sensor with the dust cap.



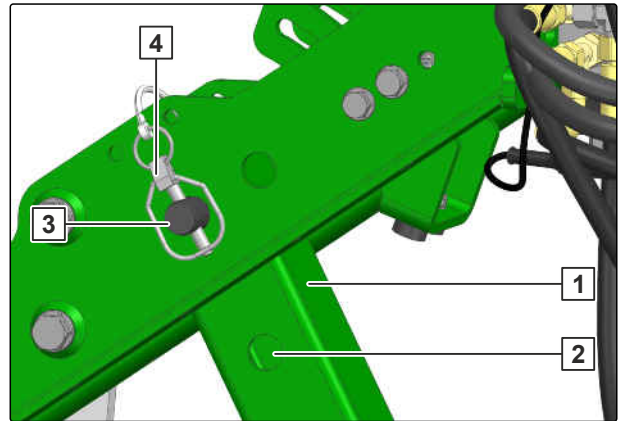
CMS-I-00007388

12. Disconnect the "green" folding function of the soil tillage implement from the pack top seed drill **1**.



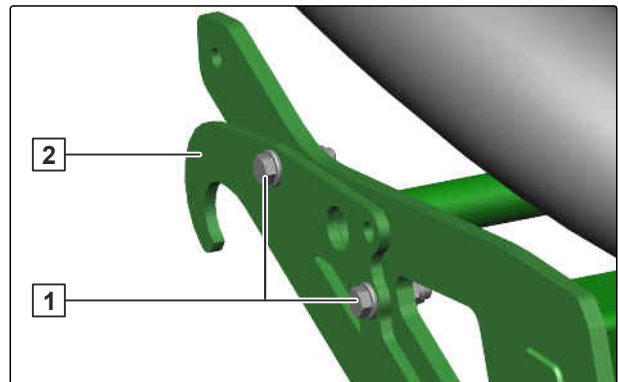
CMS-I-00007376

13. Insert the retaining tube **1**.
14. Take the pin from the parking position **2**.
15. Install the pin **3** and secure it with the linch pin **4**.



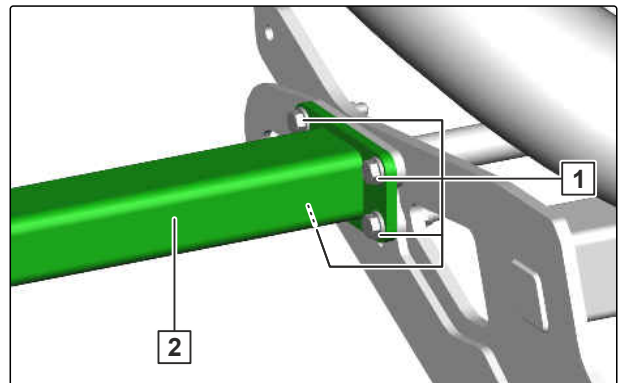
CMS-I-00007373

16. Remove the bolted connection **1** from the interface **2**.



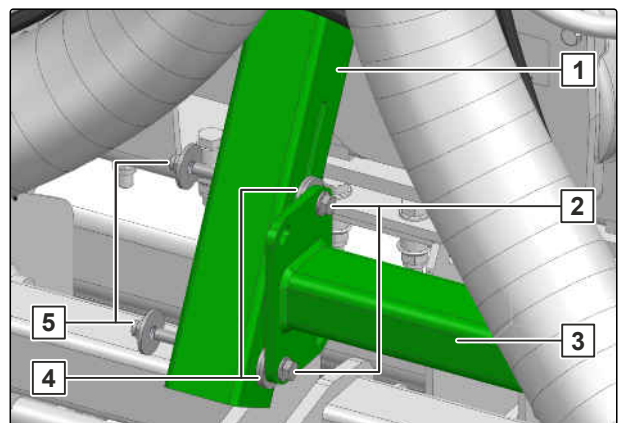
CMS-I-00007822

17. Install the carrier tube **2**.
18. Install the bolted connection **1**.



CMS-I-00007821

19. Install the retaining tube **1** on the carrier tube **3** with bolts **2**.
20. Close the gap with spacer discs **4**.
21. Install washers and nuts **5**.



CMS-I-00007374

9 | Parking the machine

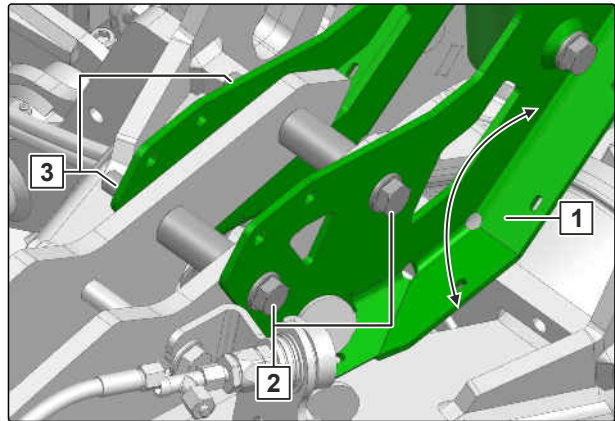
Parking the pack top seed drill separately

22. Remove the washers and nuts **3**.

23. Remove the bolts **2**.

24. Swivel the central bracket to the rear.

➔ The central bracket is resting on the retaining tube.

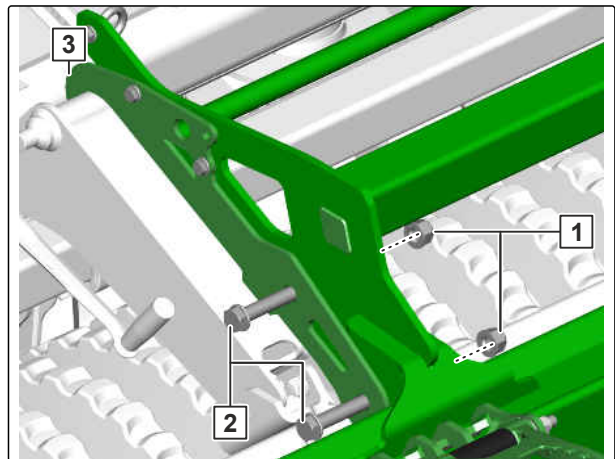


CMS-I-00007372

25. Remove the washers and nuts **1** on all of the brackets.

26. Remove the bolts **2** from all of the brackets **3**.

➔ The brackets are removed from the roller frame.



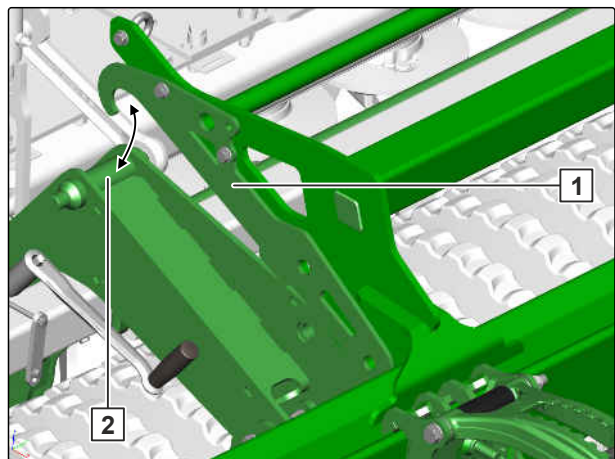
CMS-I-00007387

27. *To park the pack top seed drill,*
Slowly lower the soil tillage implement.

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

➔ The pack top seed drill is standing on the parking supports.

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



CMS-I-00007386

9.11 Parking the seeding combination

CMS-T-00010695-A.1



WARNING

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

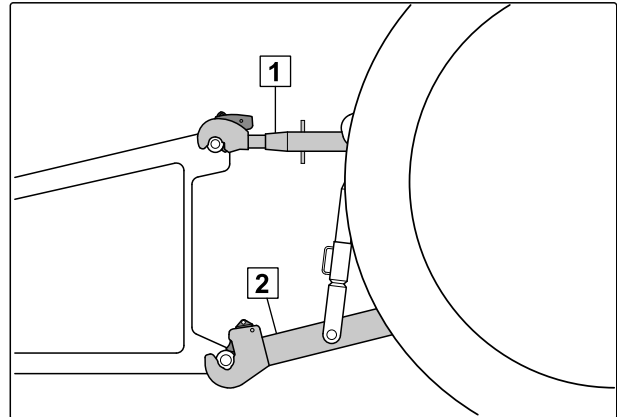
- ▶ Park the implement on stable and even ground.



WARNING

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

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



CMS-I-00001249

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

Repairing the machine

10

CMS-T-00010711-B.1

10.1 Maintaining the machine

CMS-T-00010712-B.1

10.1.1 Maintenance schedule

After initial operation	
Checking the tightening torque for the radar sensor bolts	see page 138
Checking the coulter connection tightening torque	see page 139
Checking the hydraulic hose lines	see page 140

At the end of the season	
Cleaning the fan rotor	see page 140
Cleaning the suction baskets	see page 142
Cleaning the cyclone separator	see page 143
Cleaning the FertiSpot	see page 154
Checking the FertiSpot rotor	see page 156
Cleaning the distributor head	see page 158

Daily	
Checking the lower link pins and top link pins	see page 139

Every 12 months	
Checking the tightening torque for the radar sensor bolts	see page 138
Checking the coulter connection tightening torque	see page 139

Every 10 operating hours / Daily	
Cleaning the suction guard screen	see page 141
Cleaning the micropellet metering unit	see page 144
Clean the singling unit	see page 147

Every 50 operating hours / Weekly	
Checking the hydraulic hose lines	see page 140

Every 50 operating hours / As required	
Cleaning the opto-sensor	see page 149

Every 50 operating hours / Every 3 months	
Adjusting the cutting disc drive on the PreTeC mulch seeding coulter	see page 134

Every 100 operating hours / As required	
Adjusting the cutting disc distance on the PreTeC mulch seeding coulter	see page 133
Adjusting the cutting disc distance on the FerTeC Twin coulter	see page 136

Every 100 operating hours / Every 3 months	
Checking and replacing the cutting discs on the PreTeC mulch seeding coulter	see page 132
Checking and replacing the cutting disc on the FerTeC Twin coulter	see page 135
Checking and replacing the inner scraper on the FerTeC Twin coulter	see page 137

Every 100 operating hours / Every 12 months	
Adjusting the micropellet metering unit bottom flap	see page 147

Every 250 operating hours / At the end of the season	
Checking furrow formers or furrow clearers on the PreTeC mulch seeding coulter	see page 134

10.1.2 Checking and replacing the cutting discs on the PreTeC mulch seeding coulters

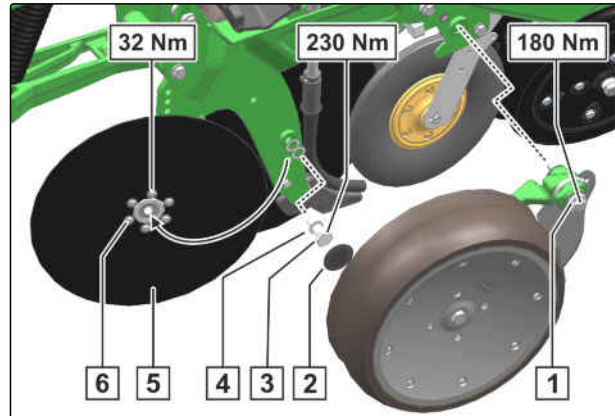
CMS-T-00002375-F.1



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:

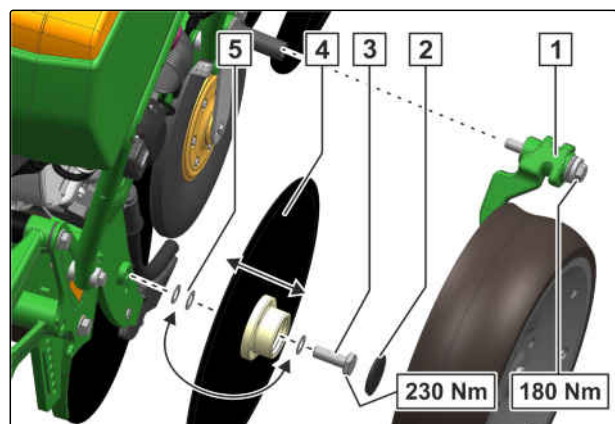
- The right central bolt has right-hand thread
- The left central bolt has left-hand thread

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.



CMS-I-00002017

10.1.4 Adjusting the cutting disc drive on the PreTeC mulch seeding coulters

CMS-T-00002377-G.1



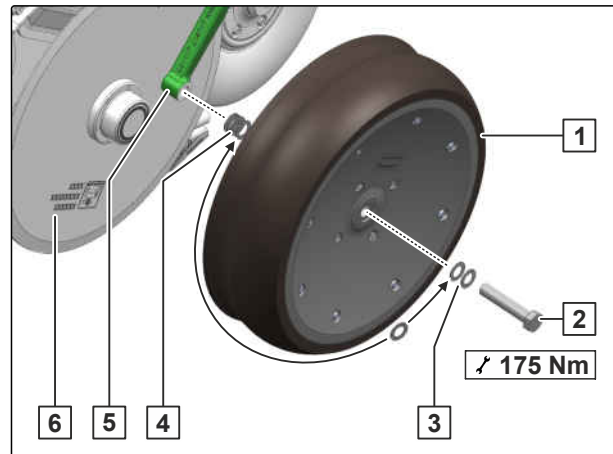
INTERVAL

- 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 furrow formers or furrow clearers on the PreTeC mulch seeding coulters

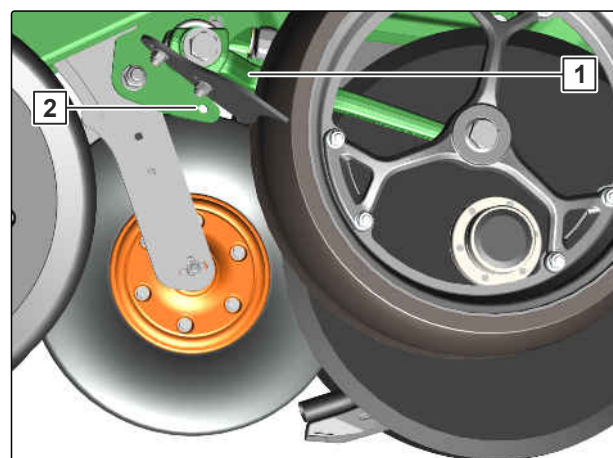
CMS-T-00013233-A.1



INTERVAL

- Every 250 operating hours
or
At the end of the season

1. *To arrest the carrier rollers **1** in the upper position:*
Swivel up the carrier rollers on both sides. Peg in the hole **2**.



CMS-I-00009426



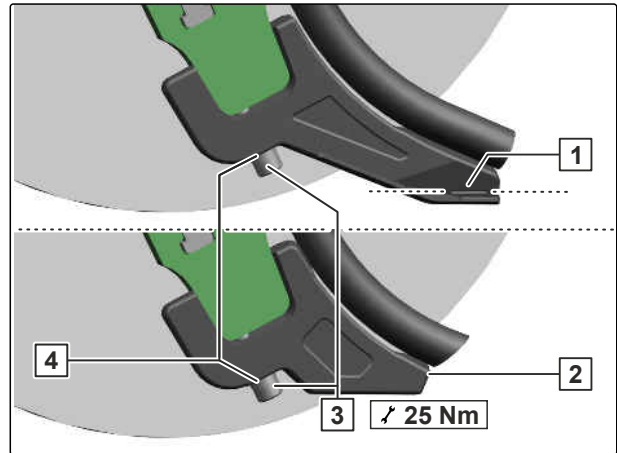
NOTE

The cutting disc does not need to be removed to change the furrow former or the furrow clearer.

2. If the indicator **1** is no longer visible:
Replace the furrow former

or

If the furrow clearer **2** is worn down to the feed channel:
Replace the furrow clearer.



CMS-I-00009428

3. Lift the implement.
4. Secure the tractor and implement.
5. Remove the bolt **3** and the bolt lock **4**.
6. Replace the furrow former or furrow clearer.
7. If the toothing of the bolt lock is worn:
Replace the bolt lock.
8. Install the bolt and bolt lock and tighten.

10.1.6 Checking and replacing the cutting disc on the FerTeC Twin coulter

CMS-T-00002379-F.1

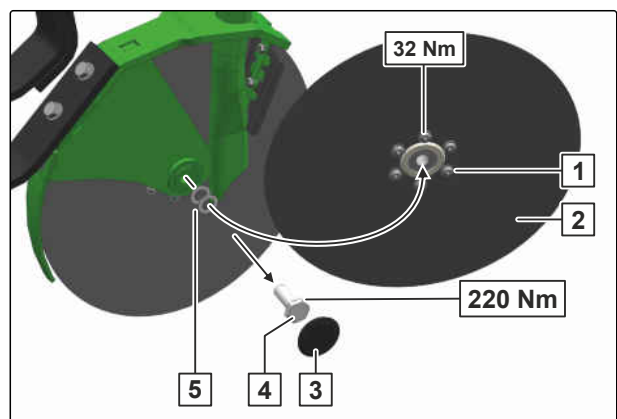


INTERVAL

- Every 100 operating hours
or
Every 3 months

Fertiliser coulter	Smallest diameter of the cutting disc
FerTeC Twin	340 mm
FerTeC Twin HD	360 mm

1. Determine the cutting disc diameter.
2. If the cutting disc is worn:
Replace the cutting disc as described in the following.



CMS-I-00002043

3. Remove the dust caps **3**.
4. Unscrew and remove the central bolts **4**.



NOTE

- 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.
12. Put on and tighten the central bolt.
13. Install the dust caps.

10.1.7 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.

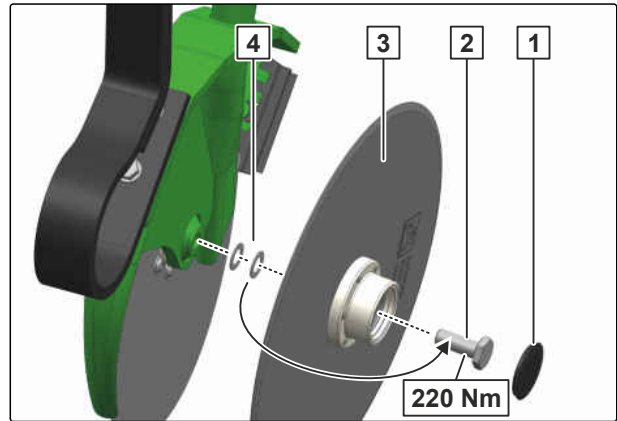
1. Remove the dust caps **1**.
2. Unscrew and remove the central bolts **2**.

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

10.1.8 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

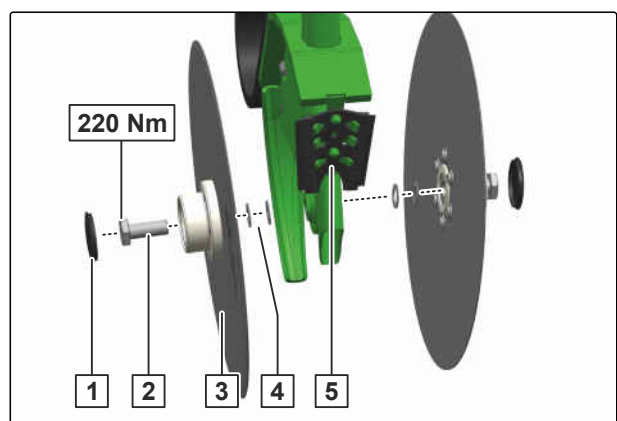
- ☑ The tractor and implement are secured

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



CMS-I-00002020

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.

10.1.9 Checking the tightening torque for the radar sensor bolts

CMS-T-00002383-H.1



INTERVAL

- After initial operation
- Every 12 months

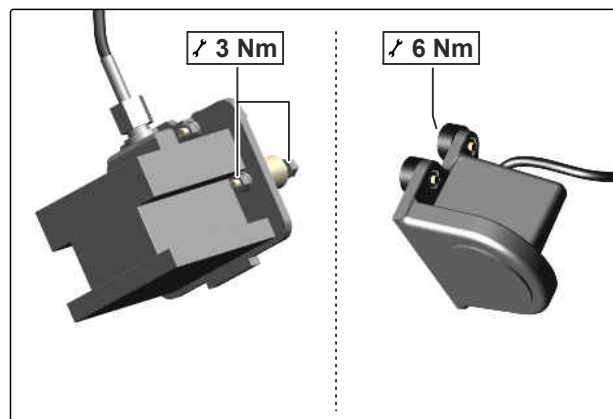


NOTE

When the tightening torque is too high, the spring-suspended sensor mount is warped. As a result, the radar sensor does not work properly.

Depending on the equipment of the implement, different radar sensors can be installed.

- Check the tightening torque on the radar sensor.



CMS-I-00002600

10.1.10 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°

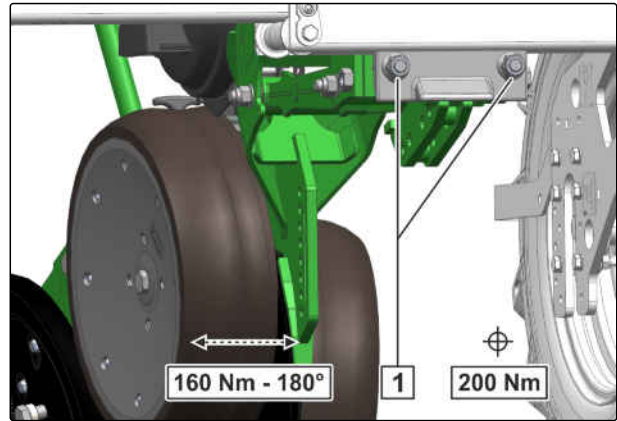
or

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

10.1.11 Checking the lower link pins and top link pins

CMS-T-00002330-J.1



INTERVAL

- Daily

Criteria for visual inspection of lower link pins and top link pins:

- Cracks
 - Fractures
 - Permanent deformations
 - Permissible wear: 2 mm
1. Check the lower link pins and top link pins for the listed criteria.
 2. Replace worn pins.

10.1.12 Checking the hydraulic hose lines

CMS-T-00002331-F.1



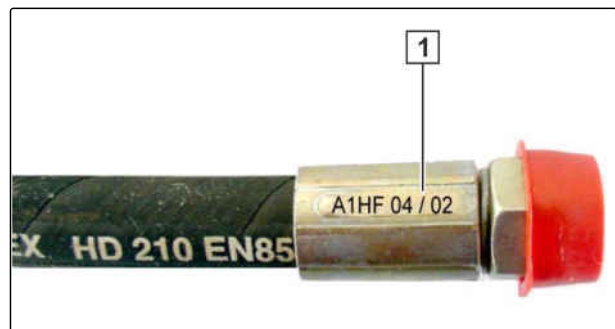
INTERVAL

- After initial operation
 - Every 50 operating hours
- or
- Weekly

1. Check the hydraulic hose lines for damage, such as chafing point, cuts, tears and deformation.
2. Check the hydraulic hose lines for leaks.
3. Retighten loose bolted connections.

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

4. Check the manufacturing date **1**.



CMS-I-00000532



WORKSHOP WORK

5. Replace worn, damaged or aged hydraulic hose lines.

10.1.13 Cleaning the fan rotor

CMS-T-00002390-C.1



INTERVAL

- At the end of the season

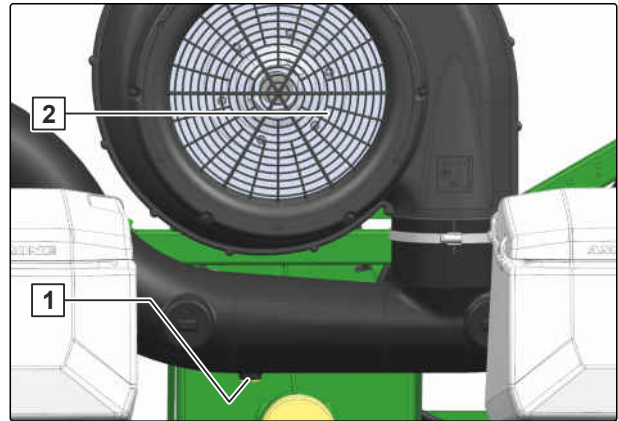
The air drawn by the fan can contain fertiliser dust or sand. These impurities can accumulate on the fan rotors and cause imbalance of the fan. This can destroy the fan.



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 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

10.1.14 Cleaning the suction guard screen

CMS-T-00006210-C.1

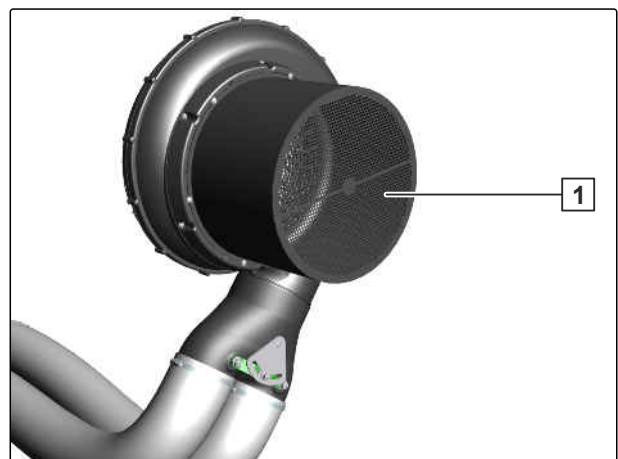


INTERVAL

- Every 10 operating hours
or
Daily

The suction guard screen **1** prevents plant residues from being drawn into the fan.

1. Switch off the fan.
2. Remove impurities from the suction guard screen **1** of the fan.



CMS-I-00002970

10.1.15 Cleaning the suction baskets

CMS-T-00003836-B.1



INTERVAL

- At the end of the season



WORKSHOP WORK



NOTE

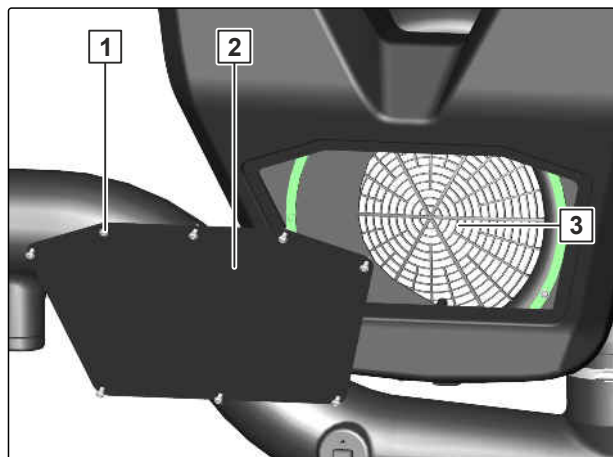
Depending on the implement equipment, enable safe access to the suction baskets.

1. Clean the suction baskets **1**.



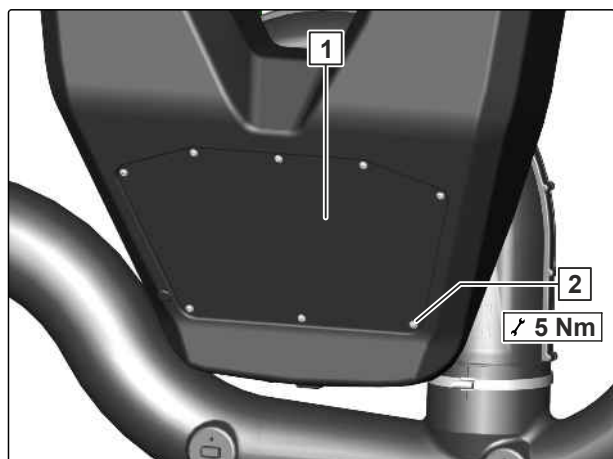
CMS-I-00002793

2. Remove the bolts **1**.
3. Remove the cover **2**.
4. *To clean the fan rotor **3**:*
see page 140



CMS-I-00009137

5. Remove the cover **1**.
6. Install the bolts **2**.



CMS-I-00009136

10.1.16 Cleaning the cyclone separator

CMS-T-00014661-A.1



INTERVAL

- At the end of the season



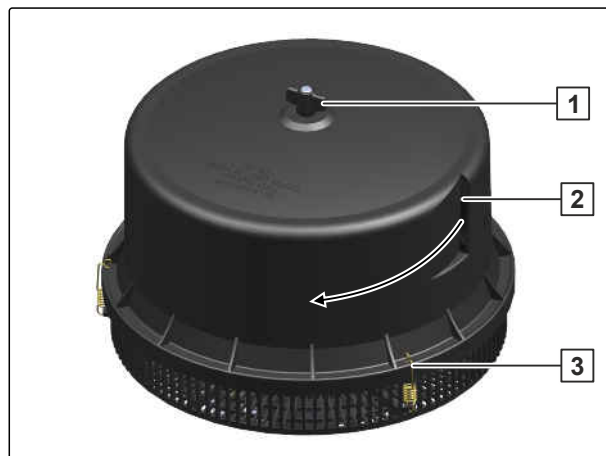
WORKSHOP WORK



NOTE

Depending on the implement equipment, enable safe access to the cyclone separators.

- Open the clips **3**.
- Loosen the wing nut **1**.

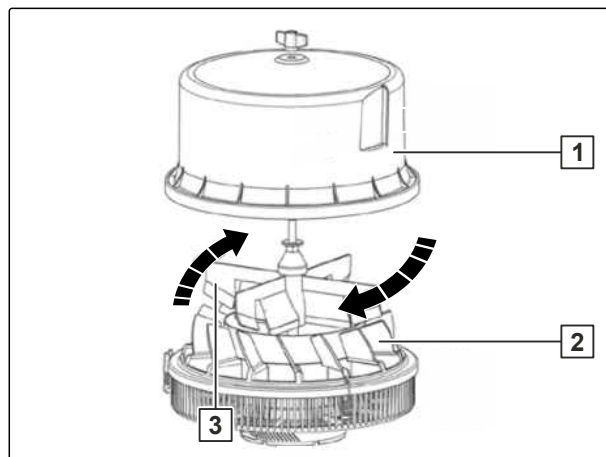


CMS-I-00002765

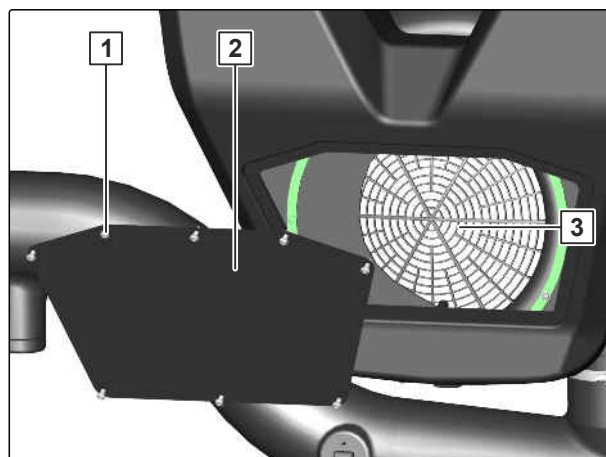


WORKSHOP WORK

- Remove the cover **1** and clean it.
- Clean the air guide elements **2**.
- Clean the impeller **3**. Make sure that it runs smoothly.
- Ensure that the impeller runs smoothly.
- Install the cover with the wing nut.
- Fasten the suction cage with the clips.
- Remove the bolts **1**.
- Remove the cover **2**.
- To clean the fan rotor **3**: see page 140



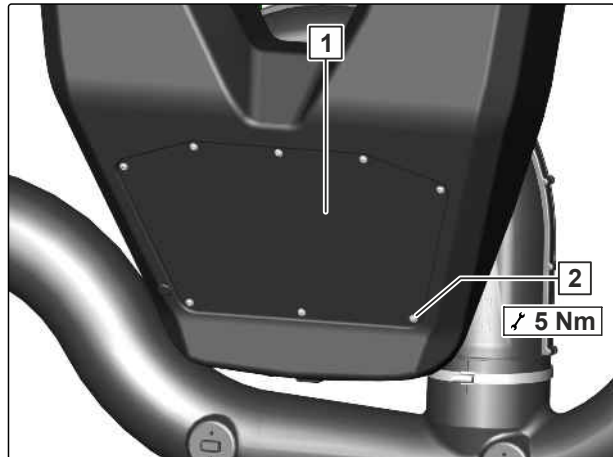
CMS-I-00009310



CMS-I-00009137

12. Remove the cover **1**.

13. Install the bolts **2**.



CMS-I-00009136

10.1.17 Cleaning the micropellet metering unit

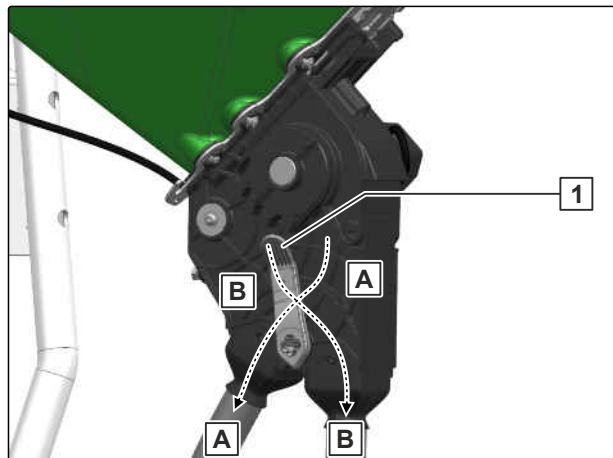
CMS-T-00003601-D.1



INTERVAL

- Every 10 operating hours
or
Daily

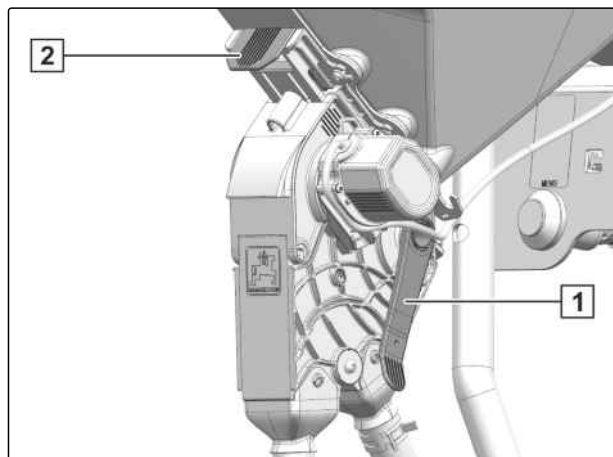
1. Move the switchover flap **1** to position **A**.



CMS-I-00002580

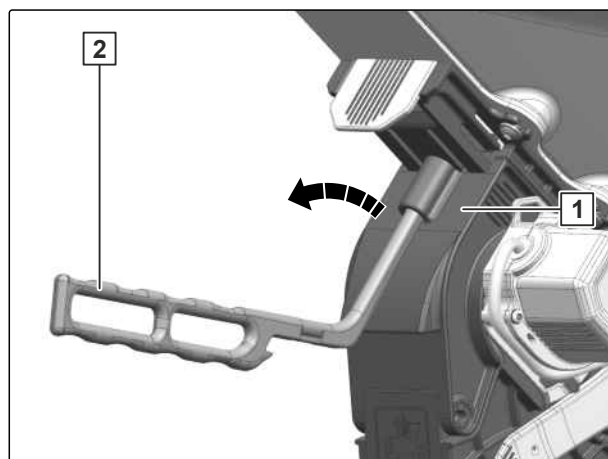
2. Close the the sliding shutter **2** on the micropellet hopper.

3. Relieve the bottom flap lever **1**.



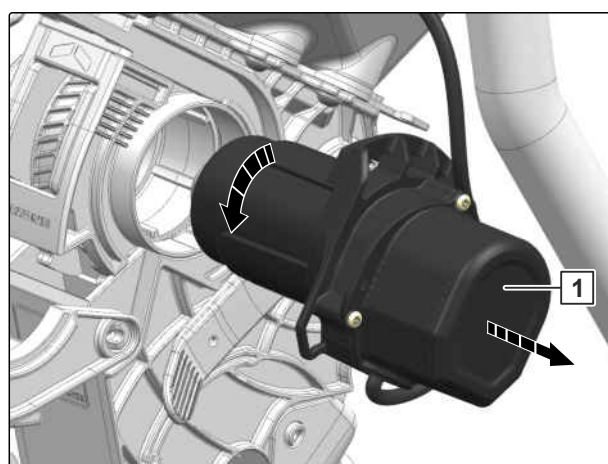
CMS-I-00002576

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.



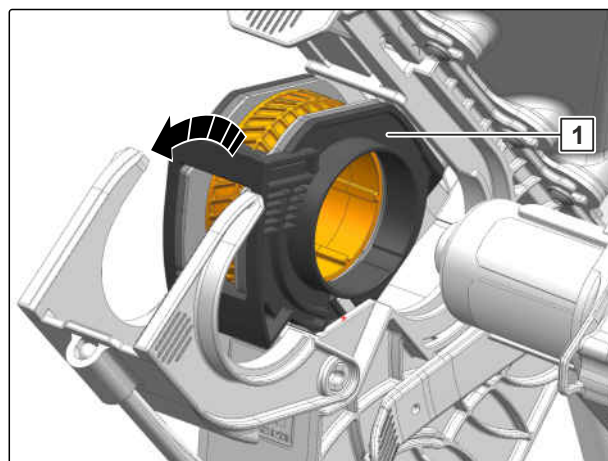
CMS-I-00002582

7. Turn the drive unit **1** counterclockwise.
8. Pull the drive unit out of the metering housing.



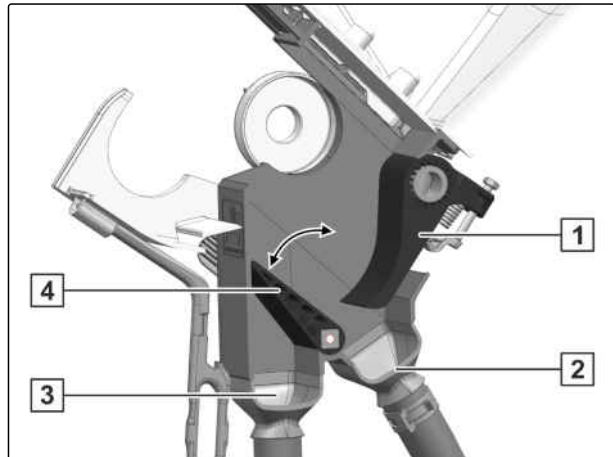
CMS-I-00002585

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



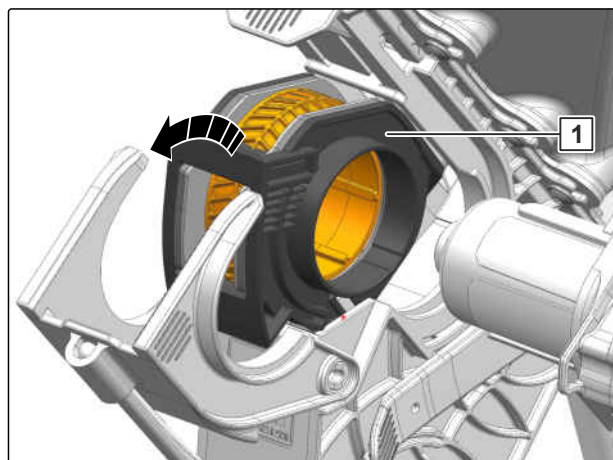
CMS-I-00002584

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**.



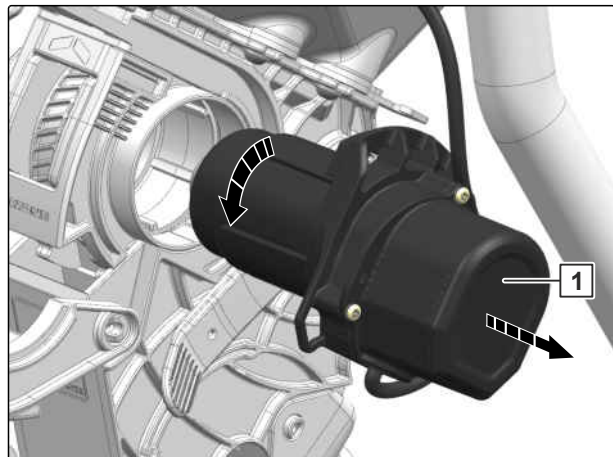
CMS-I-00002577

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

10.1.18 Adjusting the micropellet metering unit bottom flap

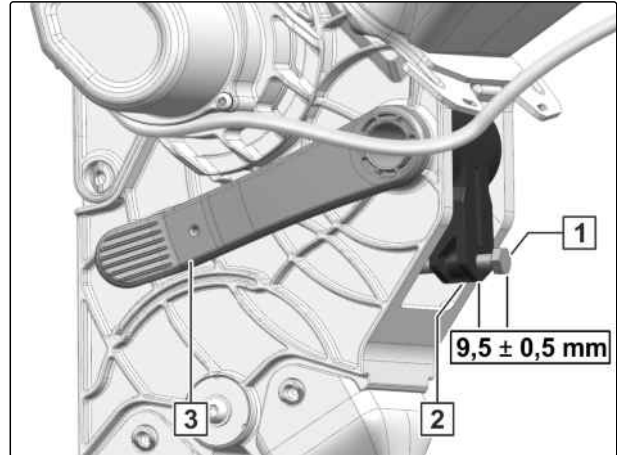
CMS-T-00003602-A.1



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

10.1.19 Clean the singling unit

CMS-T-00003718-C.1



INTERVAL

- Every 10 operating hours
or
Daily

Keep the singling unit head free of dust, deposits, and foreign objects.



NOTE

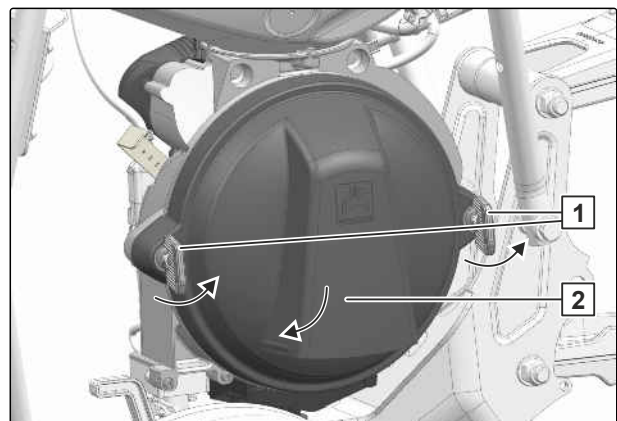
Under very dusty operating conditions, the inspection interval must be shortened.



WARNING

Risk of chemical burns by dressing dust

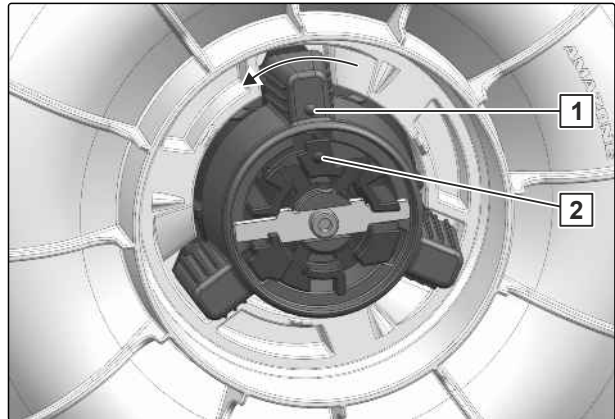
- Before working with hazardous materials, put on the protective clothing recommended by the manufacturer.



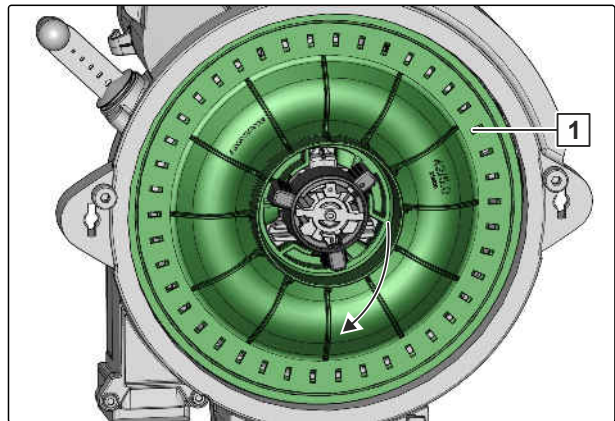
CMS-I-00001909

1. Open the locks **1**.

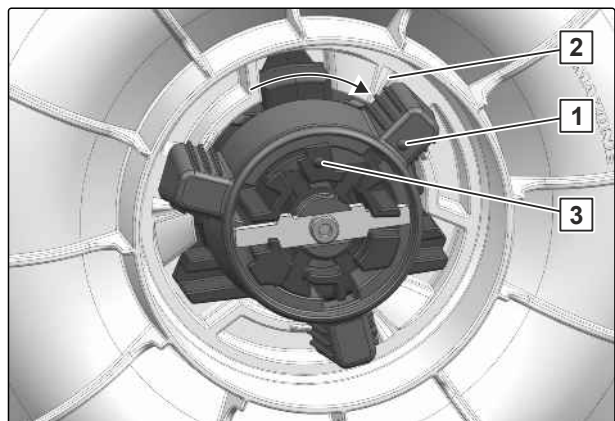
2. Remove the cover **2**.
3. Clean the inside of the cover with a brush.
4. Release the lock **1** until the points **2** are aligned.



5. remove the singling disc **1** from the drive hub.
6. Clean the singling unit housing.
7. Install the singling disc.



8. Turn the lock beyond the notch **2**.
- ➔ The points **1** and **3** are no longer aligned.



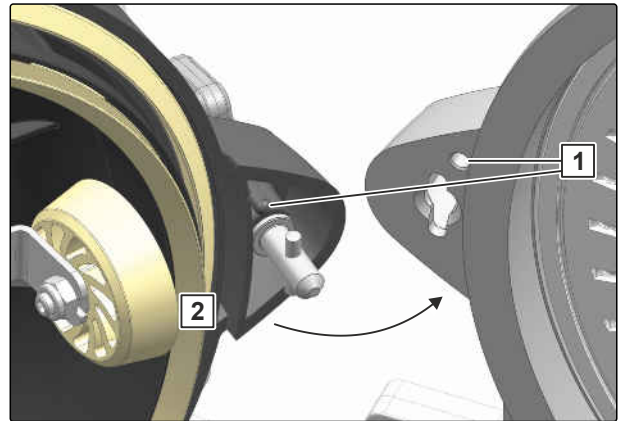
9. Close the cover **2**.



NOTE

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

10. Close the locks.



CMS-I-00001913

10.1.20 Cleaning the opto-sensor

CMS-T-00002393-E.1



INTERVAL

- Every 50 operating hours
or
As required

1. Disconnect the ISOBUS connection to the tractor.

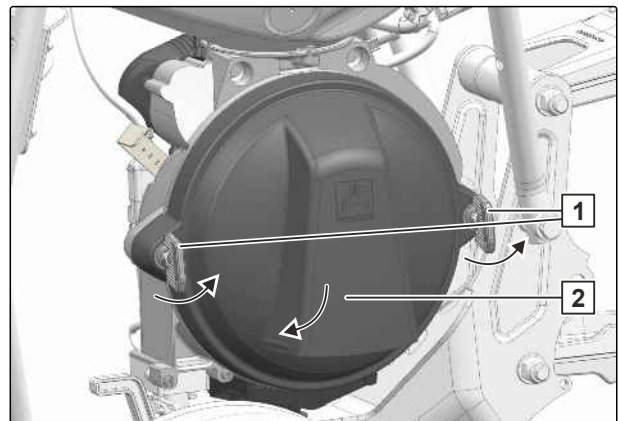


WARNING Risk of chemical burns by dressing dust

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

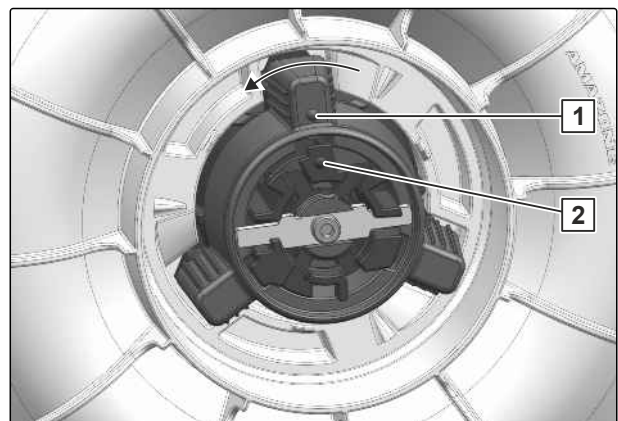
2. Open the locks **1**.

3. Remove the cover **2**.



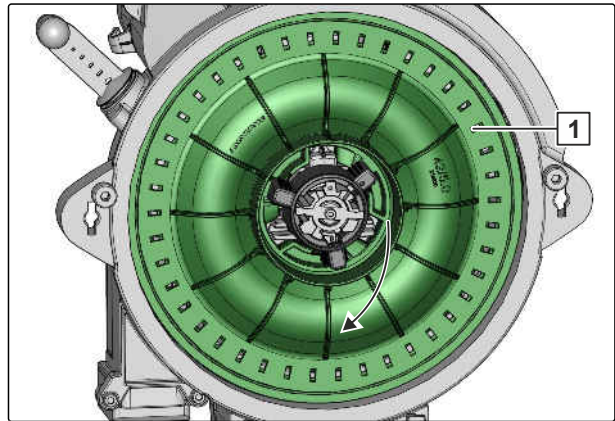
CMS-I-00001909

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



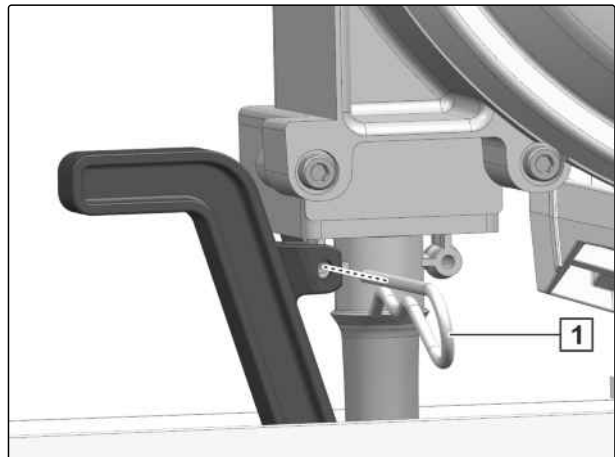
CMS-I-00001910

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



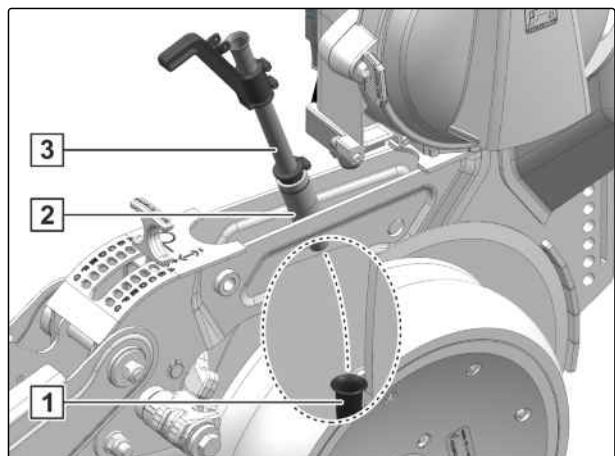
CMS-I-00001912

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

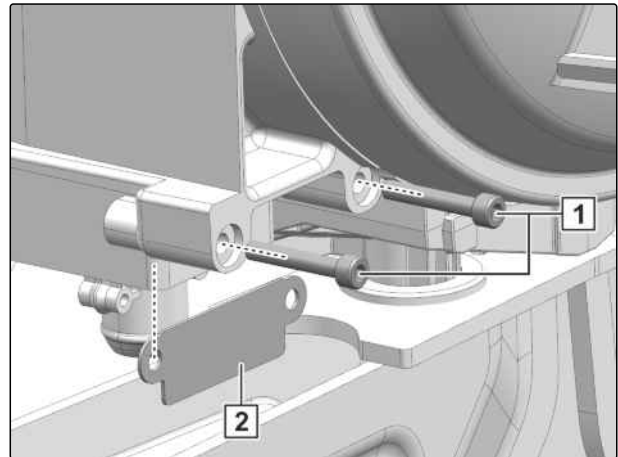
11. Press the shot channel **3** against the gasket **2** in the funnel **1**.
12. Swivel the shot channel away from the opto-sensor and pull it up.



CMS-I-00003815

13. Remove the bolts **1**.

14. Remove the spacer plate **2**.

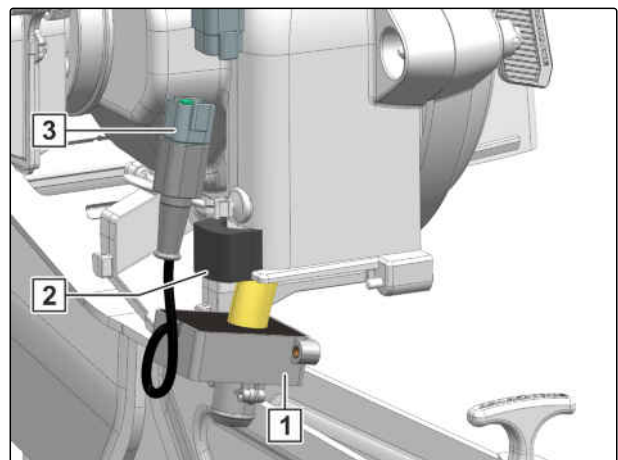


CMS-I-00003816

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

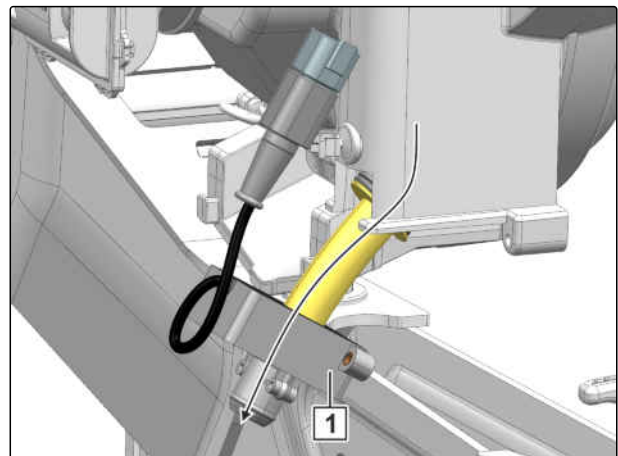
- ▶ To avoid damage to the sensors, only clean the opto-sensor with the supplied brush.
- ▶ To avoid damage to the electronics, never immerse the plug connector in liquids when it is unplugged.

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

19. Soak the opto-sensor for 1 minute.

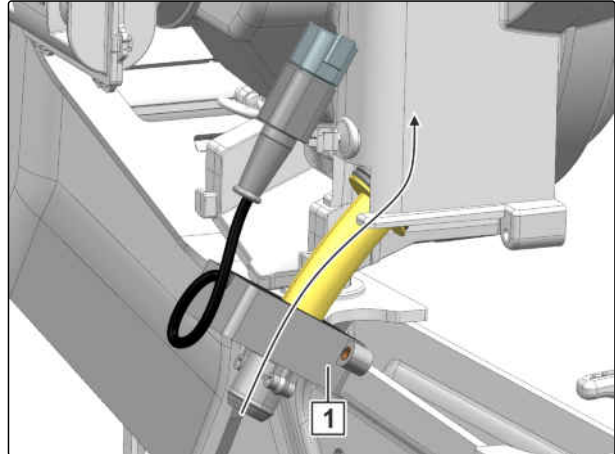
20. Clean the opto-sensor with the supplied brush.

21. Rinse the opto-sensor with clear fresh water.



CMS-I-00002827

22. Insert the opto-sensor **1**.

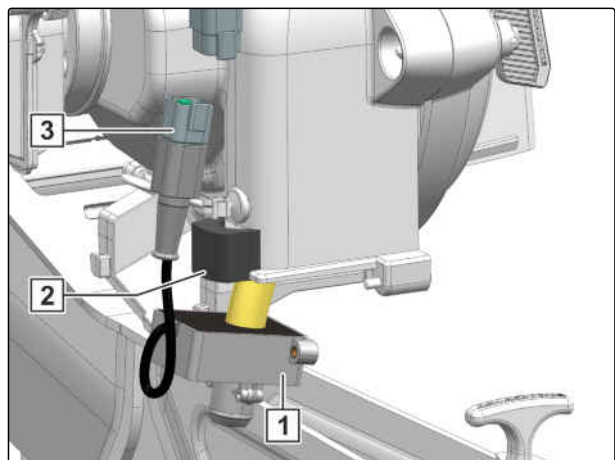


CMS-I-00002826

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

24. Put on the gasket **2**.

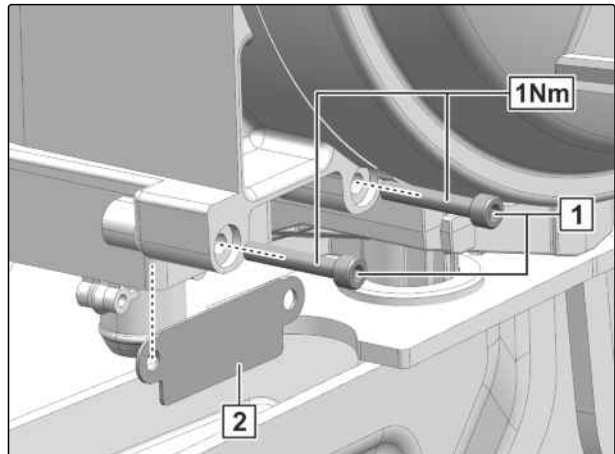
25. Establish the plug connection **3**.



CMS-I-00003817

26. Install the spacer plate **2**.

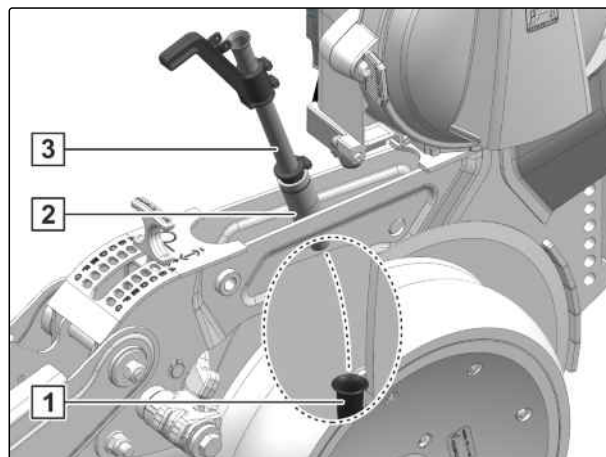
27. Install the bolts **1**.



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.

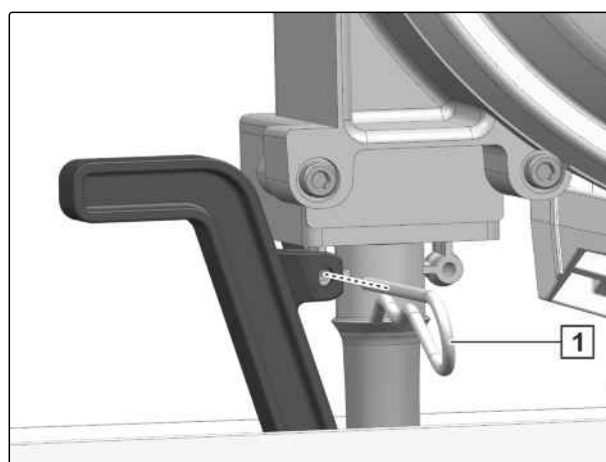


CMS-I-00003815

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

10.1.21 Cleaning the FertiSpot

CMS-T-00014404-A.1



INTERVAL

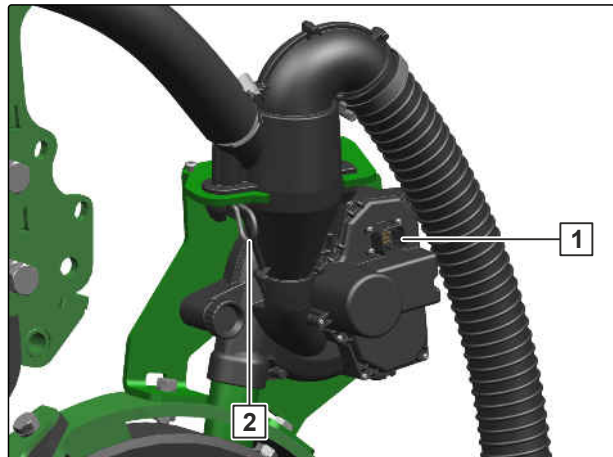
- At the end of the season



REQUIREMENTS

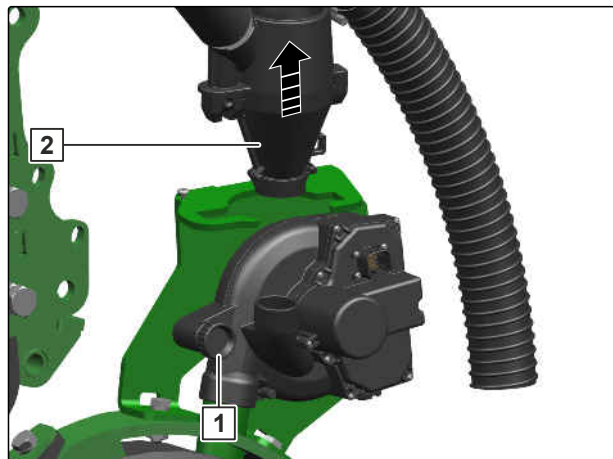
- ✓ The implement is coupled to the tractor
- ✓ The fan is switched off
- ✓ The filling auger is switched off

1. Disconnect the energy supply from the metering unit housing **1**.
2. Remove the cotter pin **2**.



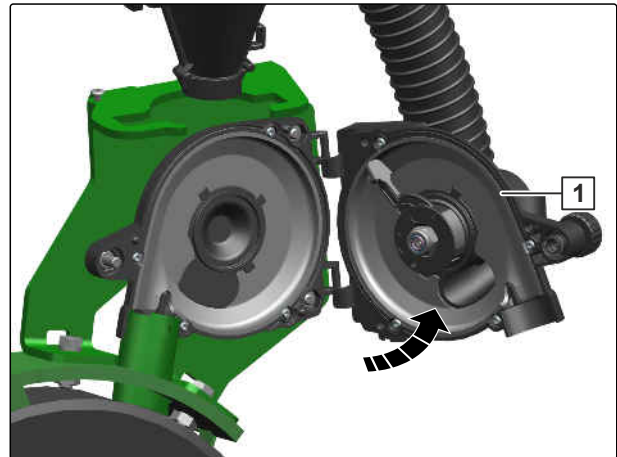
CMS-I-00009105

3. Remove the air separator **2**.
4. Loosen the knurled nut **1**.



CMS-I-00009104

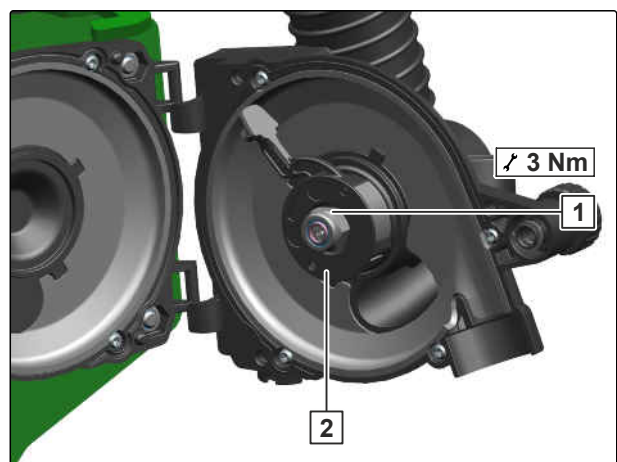
5. Open the cover **1** of the metering unit housing.
6. Clean the sheet metal tracks in the metering unit housing and rotor with a brush.
7. Check the rotor for ease of movement.



CMS-I-00009103

If the rotor does not spring back into the end position after deflecting, clean the rotor intensively.

8. Remove the nut **1**.
9. Remove the rotor **2** and clean it.
10. Install the rotor.
11. Put on the nut.
12. Close the cover of the metering unit housing.
13. Tighten the knurled nut.
14. Install the air separator.
15. Install the cotter pin.
16. Establish the energy supply.



CMS-I-00009405

10.1.22 Checking the FertiSpot rotor

CMS-T-00014405-A.1



INTERVAL

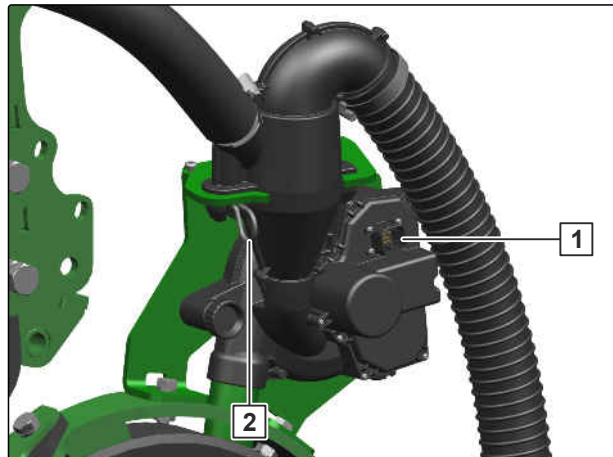
- At the end of the season



REQUIREMENTS

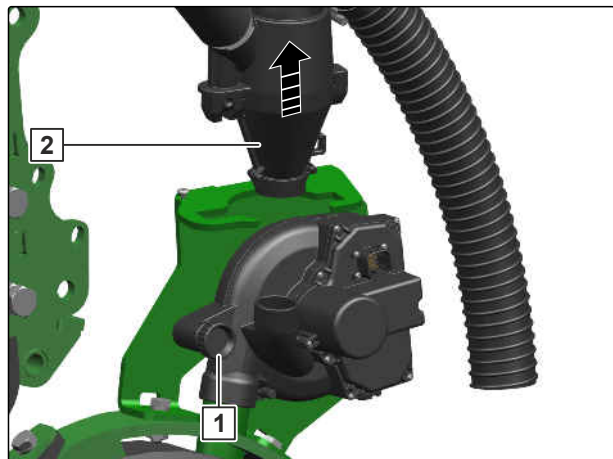
- ✓ The implement is coupled to the tractor
- ✓ The fan is switched off
- ✓ The filling auger is switched off

1. Disconnect the energy supply from the metering unit housing **1**.
2. Remove the cotter pin **2**.



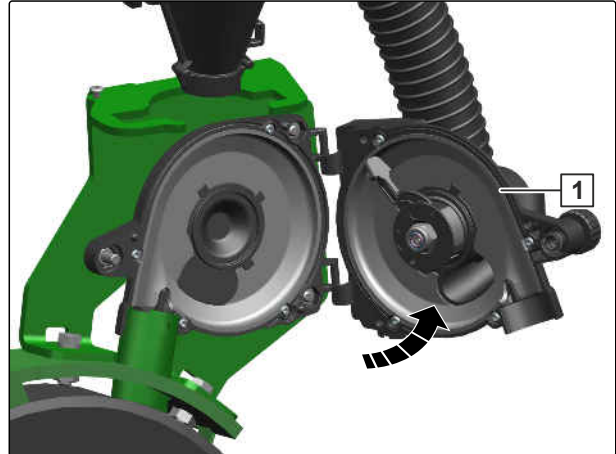
CMS-I-00009105

3. Remove the air separator **2**.
4. Loosen the knurled nut **1**.



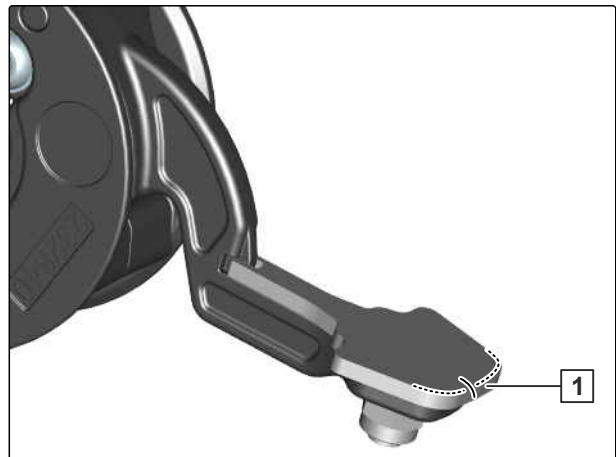
CMS-I-00009104

5. Open the cover **1** of the metering unit housing.



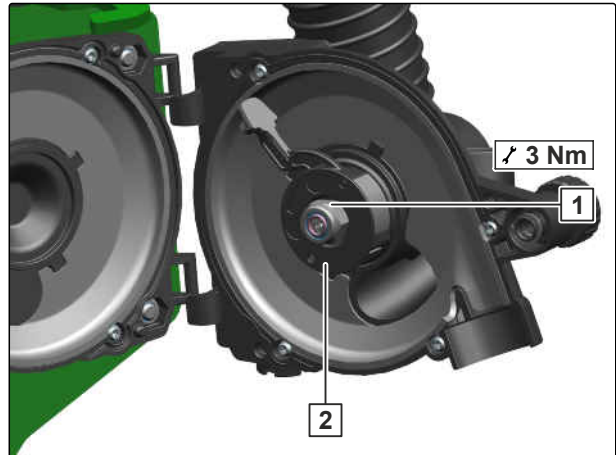
CMS-I-00009103

6. *If the sheet metal edge on the conveyor rotor **1** has taken on the shape of radius:*
Replace the conveyor rotor as follows.



CMS-I-00009397

7. Remove the nut **1**.
8. Replace the rotor **2**.
9. Put on the nut.
10. Close the cover of the metering unit housing.
11. Tighten the knurled nut.
12. Install the air separator.
13. Install the cotter pin.
14. Establish the energy supply.



CMS-I-00009405

10.1.23 Cleaning the distributor head

CMS-T-00005594-C.1



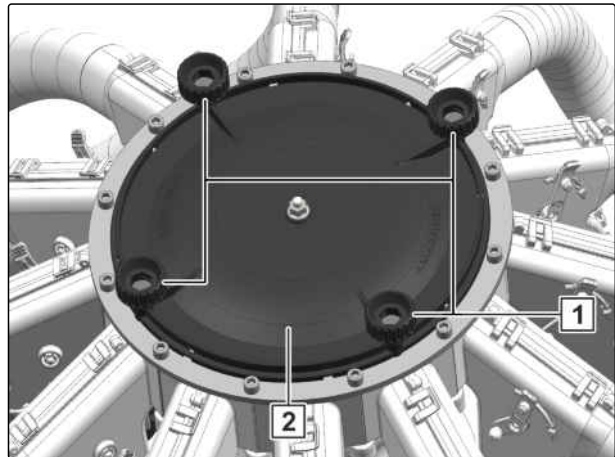
INTERVAL

- At the end of the season



WORKSHOP WORK

1. *To safely reach the distributor head:*
Use a suitable aid.
2. Loosen the knurled screws **1**.
3. Remove the cover **2**.

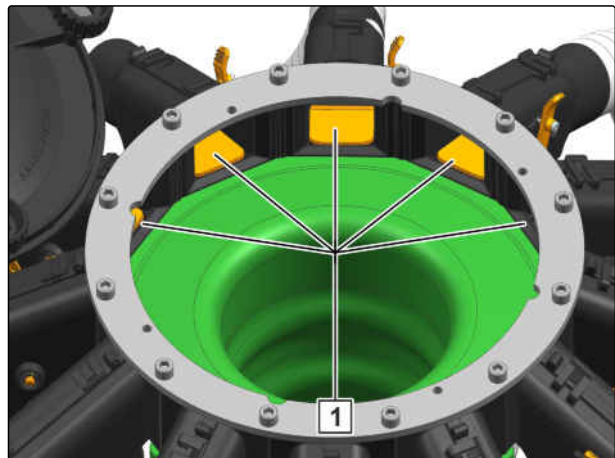


CMS-I-00003957



WORKSHOP WORK

4. Clean all of the outlets **1**.
5. Install the cover.
6. Tighten the knurled screws.



CMS-I-00003958

10.2 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-00010713-B.1

11.1 Loading the implement on a transport vehicle

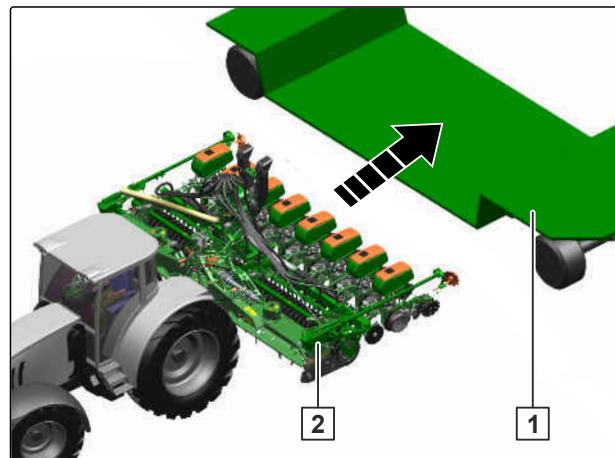
CMS-T-00010715-B.1



REQUIREMENTS

- ✓ The pack top seed drill is mounted onto the soil tillage implement
- ✓ The implement is unfolded
- ✓ The parking supports are removed
- ✓ The seeding combination is coupled

- Put the seeding combination on the transport vehicle.



CMS-I-00007389

11.2 Lashing the implement

CMS-T-00010714-B.1

The implement has 3 lashing points **1** for lashing straps.

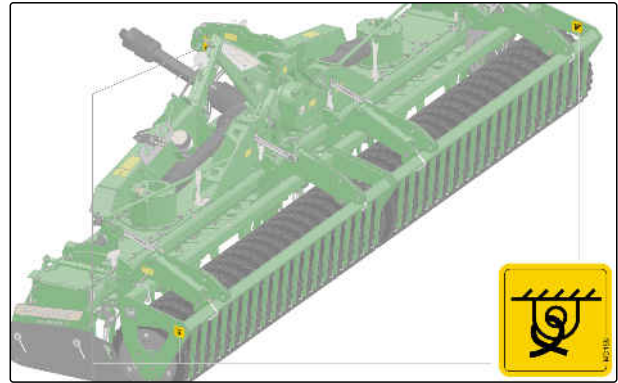


WARNING

Risk of accidents due to improperly attached lashing straps

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

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



CMS-I-00003251



REQUIREMENTS

- ☑ The implement is unfolded
1. Attach the lashing straps at the marked points.
 2. Lash down the implement in compliance with the national regulations for load securing.

Disposing of the implement

12

CMS-T-00010906-B.1

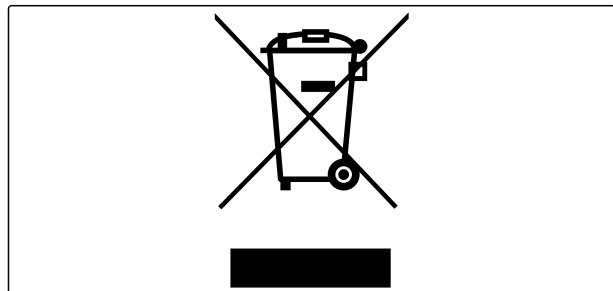


ENVIRONMENTAL INFORMATION

Environmental damage due to improper disposal

- ▶ Observe the regulations of the local authorities.
- ▶ Observe the symbols on the implement regarding disposal.
- ▶ Observe the following instructions.

1. Components with this symbol should not be disposed of with household waste.



CMS-I-00007999

2. Return batteries to the distributor
or
Dispose of batteries at a collection point.
3. Put recyclable materials in the recycling.
4. Treat operating materials like hazardous waste.



WORKSHOP WORK

5. Dispose of the coolant.

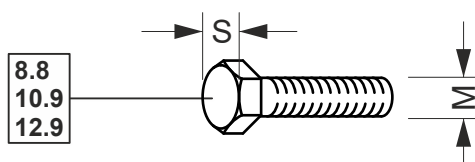
Appendix

13

CMS-T-00003775-D.1

13.1 Bolt tightening torques

CMS-T-00000373-E.1



CMS-I-000260

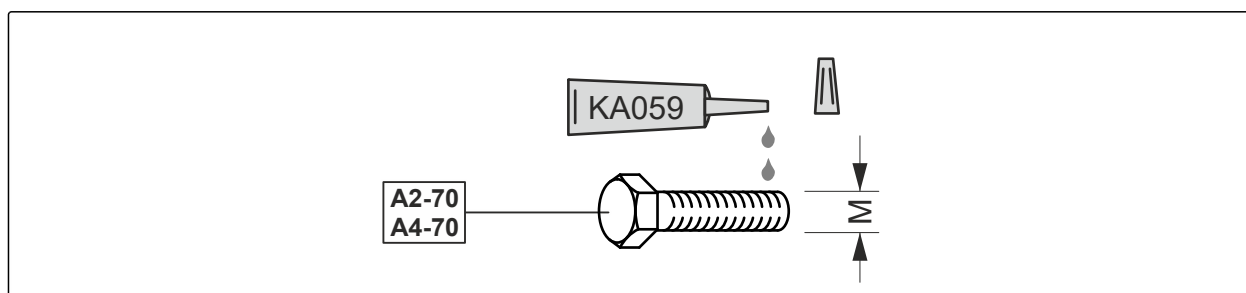


NOTE

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

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

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



CMS-I-00000065

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

13.2 Other applicable documents

CMS-T-00003776-A.1

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

Directories

14

14.1 Glossary

CMS-T-00000513-B.1

M

Machine

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

O

Operating materials

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

T

Tractor

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

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AMAZONE

AMAZONEN-WERKE

H. DREYER SE & Co. KG

Postfach 51

49202 Hasbergen-Gaste

Germany

+49 (0) 5405 501-0

amazone@amazone.de

www.amazone.de