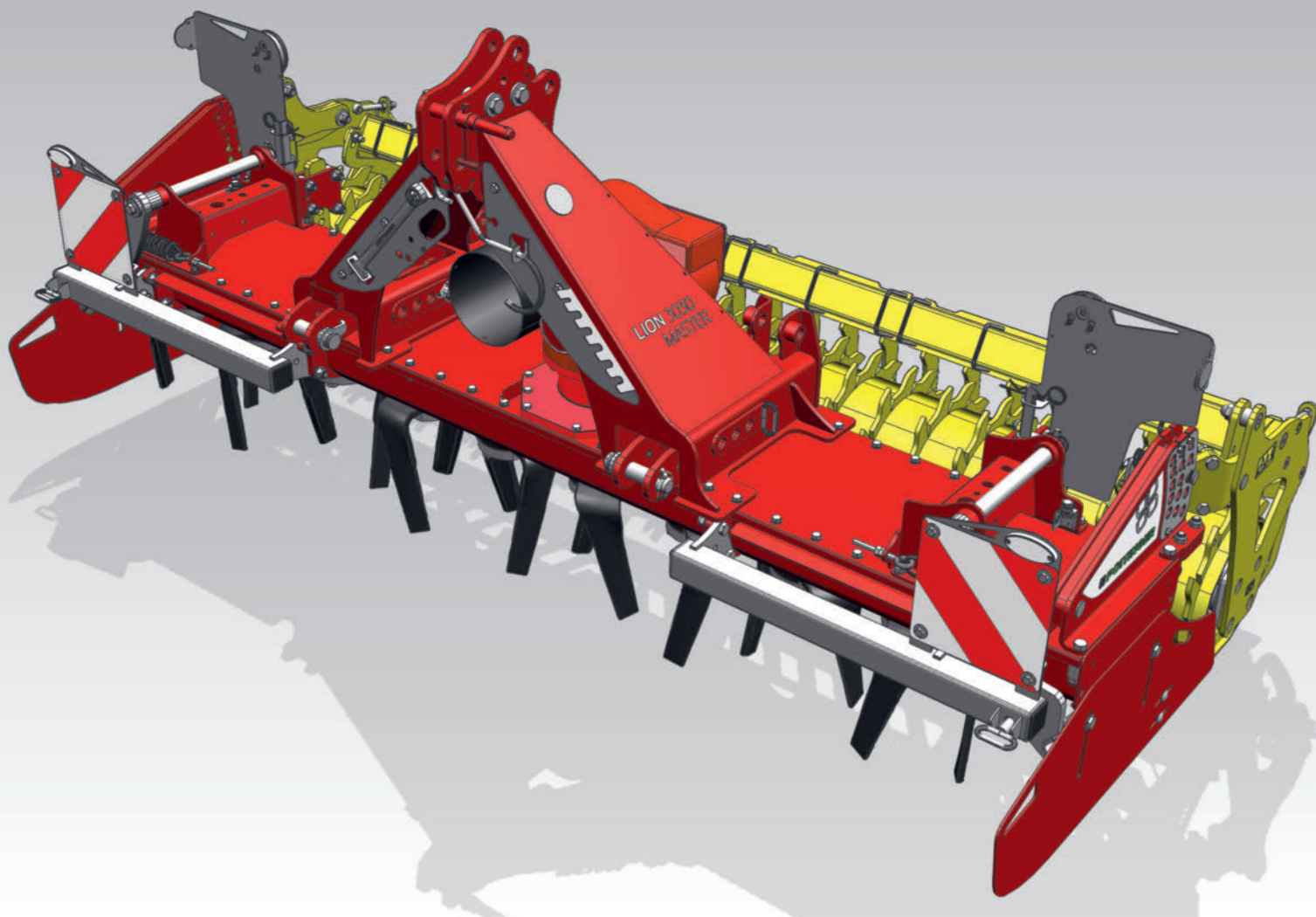


# Rotary harrow

## LION 3030 Master

8787

Machine No.: +..00001



## Technical alterations

As we are constantly developing our products, there may be deviations between these documents and the implement. Therefore no claims may be derived from the data, illustrations and descriptions. Please contact your Specialist Service Centre for any binding information about specific features of your machine.

## Legal notes

Please note that only the operating instructions written in German constitute the original operating instructions regarding EU Directive 2006/42/EC. Operating instructions in all other languages are translations of the original operating instructions written in German.

We would ask you to please understand that changes to the scope of supply with regard to form, equipment and technical specifications are possible at any time.

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## MyPÖTTINGER – Simple. Anytime. Anywhere.

- Scan QR code on identification plate with Smartphone / tablet or type in [www.mypottinger.com](http://www.mypottinger.com) on the Internet.
- Spare parts lists can be obtained exclusively via MyPÖTTINGER.
- Individual information, such as operating instructions and maintenance information for your machines, is available on MyPÖTTINGER in "My Machines" at any time after registration.

## **Dear Customer,**

"Quality pays for itself." That is why we apply the highest quality standards to our products, which are permanently monitored by our in-house quality management team and our management board. Because the safety, trouble-free functionality, highest quality and absolute reliability of our machines in operation are the core competencies for which we stand.

These Operating Instructions are intended to make it easier for you to familiarise yourself with your machine and to clearly advise you on the safe and correct handling of the machine, as well as its care and maintenance. So, please take some time to read these instructions.

These Operating Instructions are a part of the machine. They are to be kept in a suitable place and be accessible to personnel at any time throughout the entire service life of the machine. Instructions based on existing national regulations on accident prevention, road traffic regulations and environmental protection are to be supplemented.

Any persons commissioned with the operation, maintenance or transport of the machine must read and understand these instructions prior to starting work, particularly the safety information. If these instructions are not observed, the warranty claim will be forfeited.

If there are any questions regarding the contents of these Operating Instructions or further questions regarding the machine, contact your PÖTTINGER service partner.

Ensure correct machine operational and road safety, and reliability through timely and meticulous care and maintenance, according to the specified maintenance intervals.

Use only original spare parts or spare parts and accessories that are approved by PÖTTINGER Landtechnik GmbH. Only the original spare parts approved by us have been tested by us and therefore have the appropriate prerequisites for use in your machine. The use of any unapproved parts forfeits any warranty claim. Even after the warranty period has expired we recommend the use of genuine replacement parts in order to ensure the continuous performance of the machine.

Product liability legislation obliges the manufacturer and the authorised dealer to issue Instructions when selling implements and to instruct customers in the use with reference to the safety, operating and maintenance regulations. Confirmation in the form of a Declaration of Transfer is required to verify that the implement and Instructions have been transferred correctly. The handover declaration is completed electronically by the dealer.

For the purposes of the Product Liability Act, every self-employed person and farmer is an entrepreneur. Entrepreneurial property damage under the terms of the Product Liability Act is therefore excluded from liability by PÖTTINGER. Property damage under the terms of the Product Liability Act is damage caused by a machine, but not to it.

The operating instructions are part of the machine, therefore pass them on to any new owner when transferring the machine. Instruct the new owner and make them aware of the regulations mentioned.

Your PÖTTINGER service team wishes you every success.

## Representation conventions

This section contains explanations for a better understanding of the illustrations, safety and warning notes and textual descriptions used in these operating instructions.

### Safety instructions / warnings

Safety instructions of a general nature are always placed at the beginning of a section. They warn of dangers that may occur during machine operation or when preparing to work on the machine. Warnings alert to hazards that may occur directly during an operation or work step on the machine. Warnings are listed together with the relevant procedures / work steps in the written instructions.

Safety instructions and warnings are presented as follows:

#### DANGER

**If you do not follow the instructions in a text section with this marking, there is a *risk of fatal or life-threatening injury*.**

- ▶ All instructions in such text sections must be followed!

#### WARNING

**If you do not follow the instructions in a text section with this marking, there is a *risk of severe injury*.**

- ▶ All instructions in such text sections must be followed!

#### CAUTION

**If you do not follow the instructions in a text section with this marking, there is a *risk of injury*.**

- ▶ All instructions in such text sections must be followed!

#### NOTICE

**If you do not follow the instructions in a text section with this marking, there is a *risk of damage to property*.**

- ▶ All instructions in such text sections must be followed!

#### TIP

Text sections marked in this way contain recommendations and advice for handling the machine.

#### ENVIRONMENT

Text sections marked in this way contain advice on the subject of environmental protection.

### Directions

Directions (such as left, right, front, rear) are given based on the normal "working travel direction" of the machine.

Orientation information for an illustration of a machine detail refers to this illustration only, and is only to be understood as relative to the direction of travel in certain cases. The meaning of the orientation information (if required) is clearly evident from the accompanying text.

## Designations

These operating instructions designate the interchangeable equipment for agricultural vehicles (in line with the EU Directive 2006/42/EC) as **machine**.

Vehicles intended to drive the existing machine are designated as **tractor**.


Equipment designated as **optional** is available only for certain machine models or only in certain countries.


Protective goggles, work gloves, safety shoes, tight fitting, long work clothing, hair nets in the case of long hair, hearing protection as well as suitable equipment to protect against seed treatment dusts (such as dust masks etc.) are designated as **personal protective equipment**. The complete selection of suitable personal protective equipment for the respective purpose remains the responsibility of the machine operator.

## Cross-references

Cross-references to another location in the operating instructions or another document are provided in the text, specifying the chapter and subchapter, or section. The naming of subchapters or sections is in inverted commas. (Example: Check all screws on the machine for tightness. See "Tightening torques" on page xxx). A subchapter and/or section can be found in the document via an entry in the table of contents.

## Action steps

An arrow  or sequential numbering indicates action steps you should take.

A black bordered, indented arrow  or sequential, indented numbering indicates intermediate results or intermediate steps that should be performed.

## Illustrations

Illustrations may differ in detail to your machine and should only be considered as a principle diagram/symbol illustration.

## Use of colours

Illustrations in the printed document provided by PÖTTINGER Landtechnik GmbH are shown only in grey scale or black and white.

Illustrations in electronically distributable documents (PDF) are displayed in colour also and can be printed out in colour if required.

## Use of symbols

Illustrations may contain additional symbols, arrows and other lines that serve to improve the comprehensibility of the image content or are intended to draw attention to a specific area of the image.

## Instructions for product handover

Please verify the listed items in accordance with the product liability obligation



Please place a cross where appropriate.

Machine checked according to delivery note. All packaged parts removed, all safety equipment, cardan shaft and operating equipment is present.

Machine operation, commissioning and maintenance discussed with and explained to the clients using the operational instructions.

Tyre air pressure verified.

Tightness of wheel nuts verified.

The correct p.t.o. speed and direction of rotation pointed out.

Adaptation to tractor completed; three point adjustment, drawbar height, handbrake lever installed in tractor cab, forced steering linkage adjusted, compatibility of all necessary electrical, hydraulic and pneumatic connectors to tractor checked and established.

Cardan shaft correctly cut to length.

Test run of all machine functions in addition to parking brake and operating brake completed and no defects noted.

Function explanation during test run.

Pivoting to transport and working position explained.

Information regarding optional equipment provided.

The importance of reading the operating instructions has been pointed out.

Confirmation is required to prove that the machine and the operating instructions have been properly handed over. For this purpose you have received a confirmation e-mail from PÖTTINGER. If you have not received this mail, please contact your local dealer. Your dealer can fill in the handover declaration online.

### Austria

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4710 Grieskirchen

Phone+43 7248 600-0

Fax+43 7248 600-2513

info@poettinger.at

**Amendment index**

Date	Index	Amendment reason	Amended chapter
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## Supplement to USA / CANADA operating instructions

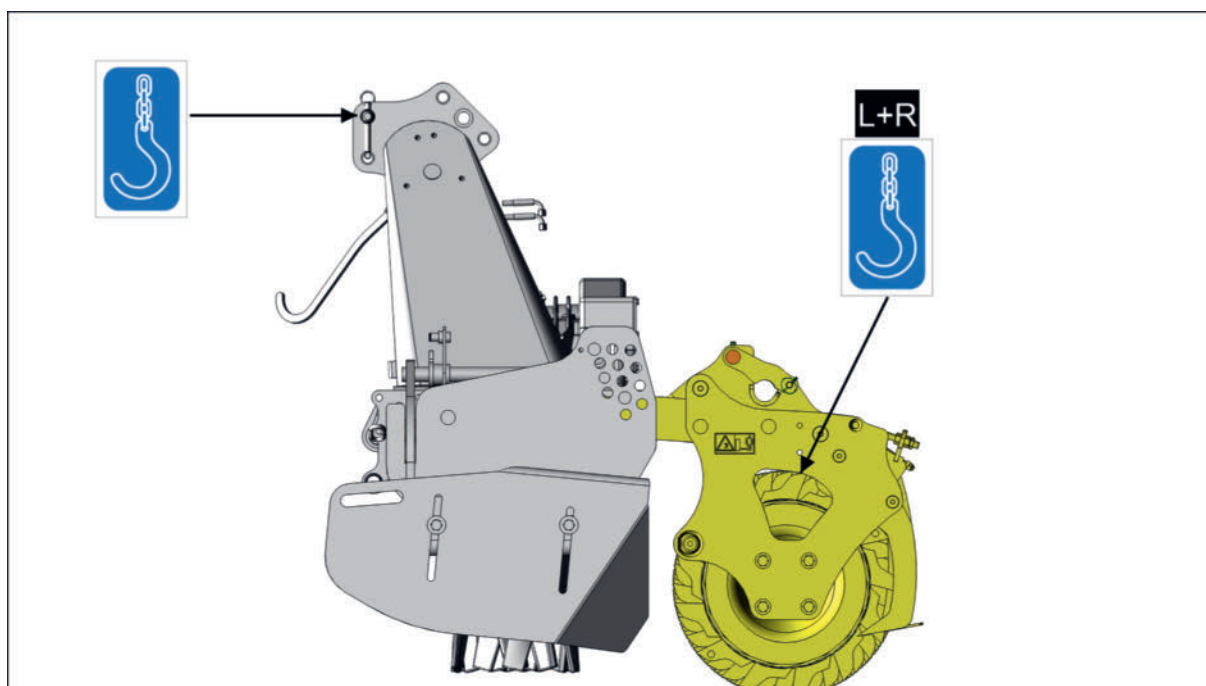
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## Unload the machine by crane

### Prerequisite

- Take note of technical information (weight)!
- Only use a lifting device with adequate dimensions.
- Make sure that the positioning bolt is properly secured at the top attachment point of the rotary harrow.
- Locking pins locked for working depth so that follow-on devices cannot swing upwards while the machine is being raised.

### Attachment points for lifting gear



L+R = attach lifting gear on left and right sides of follow-on device.

### Implementation

- ▶ Carefully attach and secure hoists to the attachment points.

#### **CAUTION**

#### **Falling of machine!**

- ▶ Do not stand under the suspended load!
  - ▶ Maintain sufficient lateral distance from the suspended load.
- 
- ▶ Remove the fastenings from the loading surface.
  - ▶ Lift the machine horizontally from the loading surface.
    - ▷ Park the machine on a level and stable surface, and secure against rolling away.
  - ▶ Remove hoist.

## Tightening torque

This factory standard applies to all metric bolts for which no special tightening torque is specified in the drawing/manual. The relevant grade is visible on the bolt head.

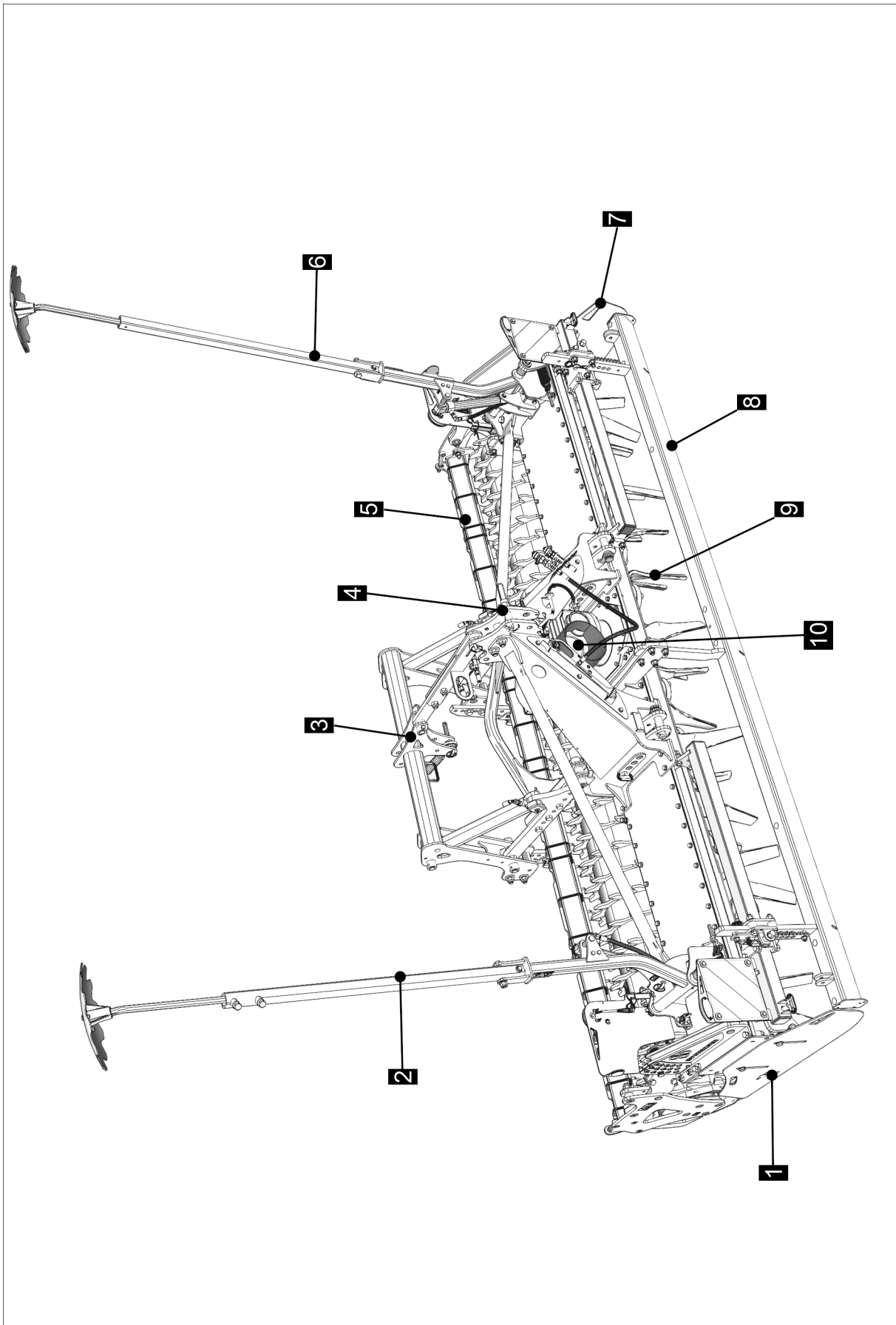
- The values given are nominal and are valid for a head friction rate of  $IJ=0.14$  and a thread friction of  $IJ=0.125$ . Slight tensioning force differences can exist through differing friction rates. The values given are to be kept to a tolerance of  $\pm 10\%$ .
- By using the given tightening torque and the existing friction rate used, then up to 90% of the minimum yield strength of the bolt material is used in accordance with DIN ISO 898.
- If a specific tightening torque is given for a bolt connection, then all these bolt connections are to be tightened to the specified tightening torque using a torque wrench.

Metric thread	Grade 8.8		Grade 10.9	
	Tightening torque	Tensioning force	Tightening torque	Tensioning force
M 4	3,1 Nm	4000 N	4,4 Nm	5700 N
M 5	6,2 Nm	6600 N	8,7 Nm	9300 N
M 6	10,5 Nm	9300 N	15 Nm	13000 N
M 8	25 Nm	17000 N	36 Nm	24000 N
M 10	50 Nm	27000 N	70 Nm	38000 N
M 12	86 Nm	39500 N	121 Nm	56000 N
M 14	135 Nm	54000 N	195 Nm	76000 N
M 16	215 Nm	75000 N	300 Nm	105000 N
M 20	410 Nm	117000 N	580 Nm	164000 N
M 24	710 Nm	168000 N	1000 Nm	237000 N
M 30	1400 Nm	270000 N	2000 Nm	380000 N
M 8 x 1	27 Nm	18700 N	38 Nm	26500 N
M 10 x 1.25	53 Nm	29000 N	74 Nm	41000 N
M 12 x 1.25	95 Nm	44500 N	130 Nm	63000 N
M 14 x 1.5	150 Nm	60000 N	210 Nm	85000 N
M 16 x 1.5	230 Nm	81000 N	320 Nm	115000 N
M 20 x 1.5	460 Nm	134000 N	650 Nm	189000 N
M 24 x 2	780 Nm	188000 N	1090 Nm	265000 N

# Functional elements

## Designation and function

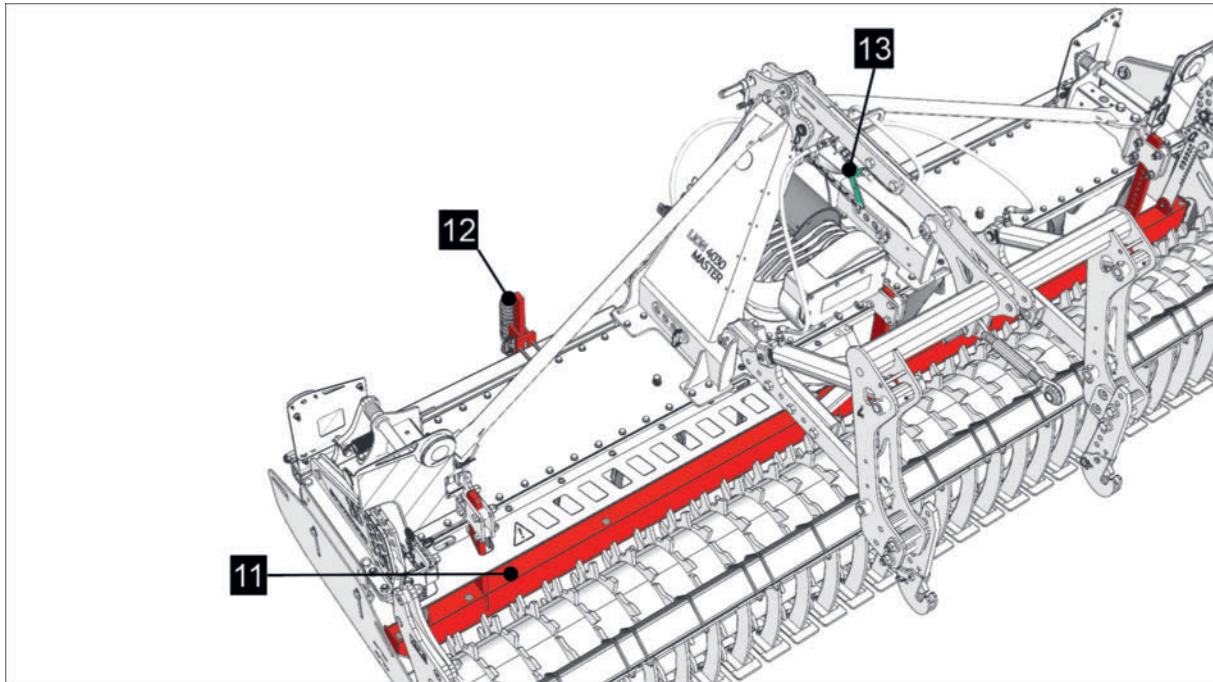
Pos.	Element	Function
1	Right side guard	Prevents the lateral ejection of soil from the seed bed.
2	Right track marker (optional)	Marks the lane.
3	Hydrolift (optional)	Attaching Vitasem seed drills to the rotary harrow The weight of the seed drill is shifted further forward to the rotary power harrow in headland / transport position.
4	Headstock	Solid mounting frame for attaching the machine to the tractor.
5	Trailing machine	Adjusting the working depth of the rotary power harrow, crushing the top layer of arable land and levelling the seedbed.
6	Left track marker (optional)	Marks the lane.
7	Right side guard	Prevents the lateral ejection of soil from the seed bed.
8	Front levelling bar (optional)	Levelling uneven surfaces.
9	Rotor with tines	Loosening and crushing the top layer of arable land.
10	Input gearing	Power train from tractor via PTO shaft.
without illustration	Rear levelling bar	Levelling uneven surfaces.



## Design and function

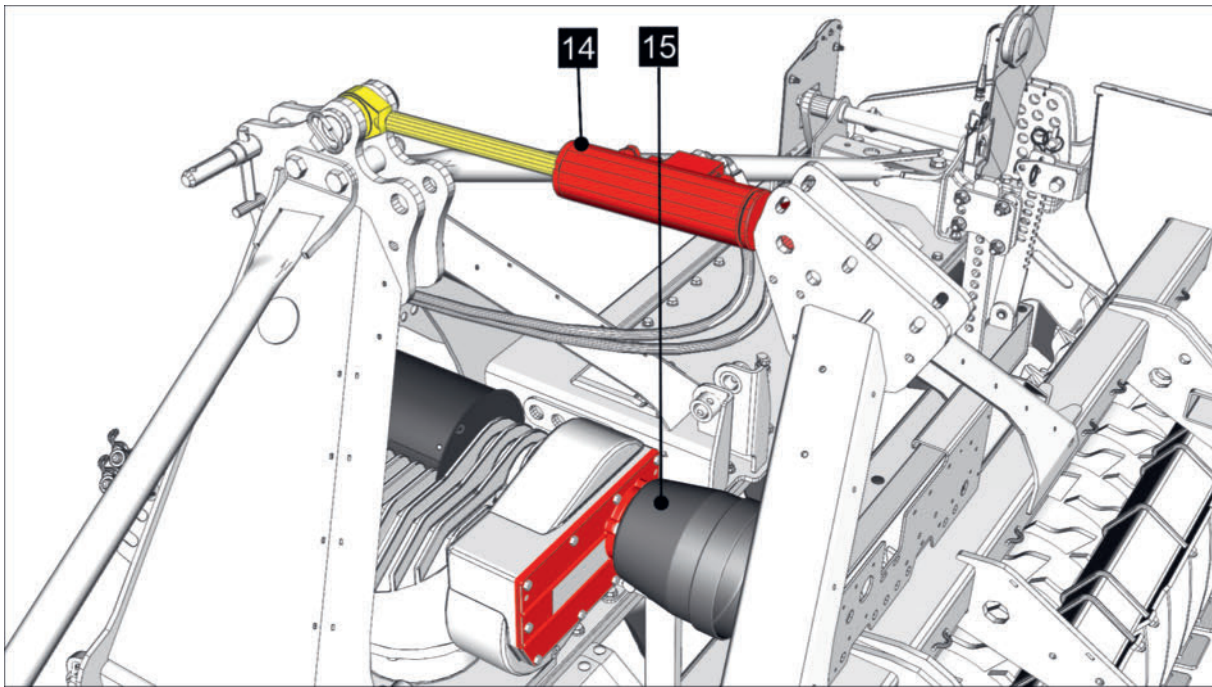
### Designation and function

Pos.	Element	Function
11	Rear levelling bar	Levelling uneven surfaces.
12	Wheel mark eradicator (option)	Loosen the tractor track (number and position of wheel mark eradicators as required) Not for machines with front levelling bar.
13	Lift limiter (optional)	Only together with Hydrolift because it limits the adjustable lifting height of the Hydrolift.



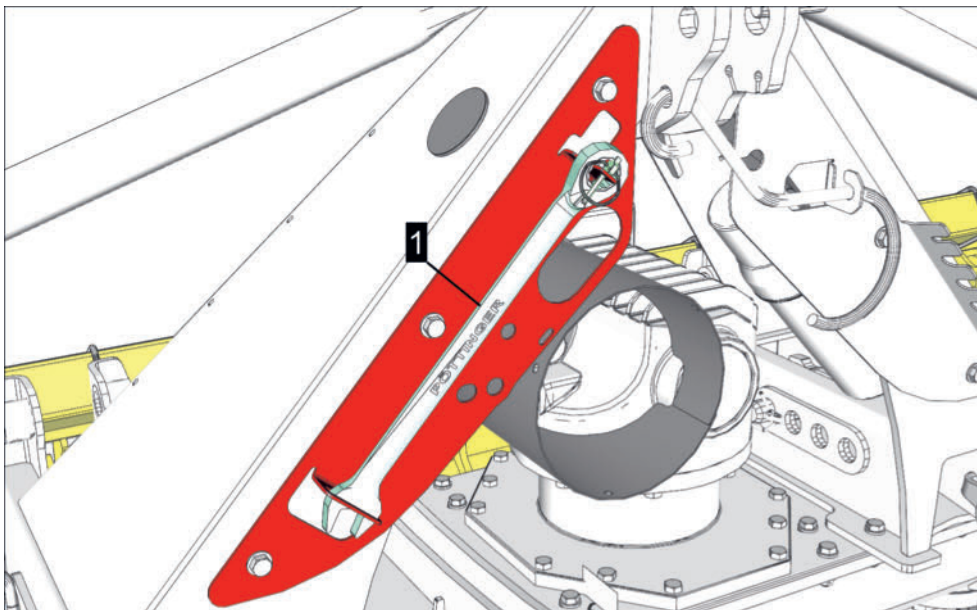
### Designation and function

Pos.	Element	Function
14	Hydraulic top link (optional)	Lifts the mounted seed drill separately in head-land or road transport position (similar to hydro-lift). Seed drill inclination adjustment.
without illustration	Manual upper link (optional)	Seed drill inclination adjustment.
15	Through-drive (optional)	PTO for drive shaft mounted seed drills



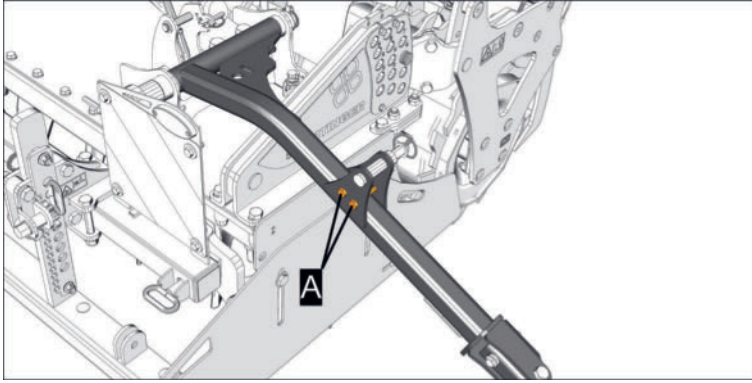
## Accessories included in the scope of delivery

- Operating instructions
- Ratchet brace ring spanner (1)



- 4x shearable screws for track marker (option)

## Design and function

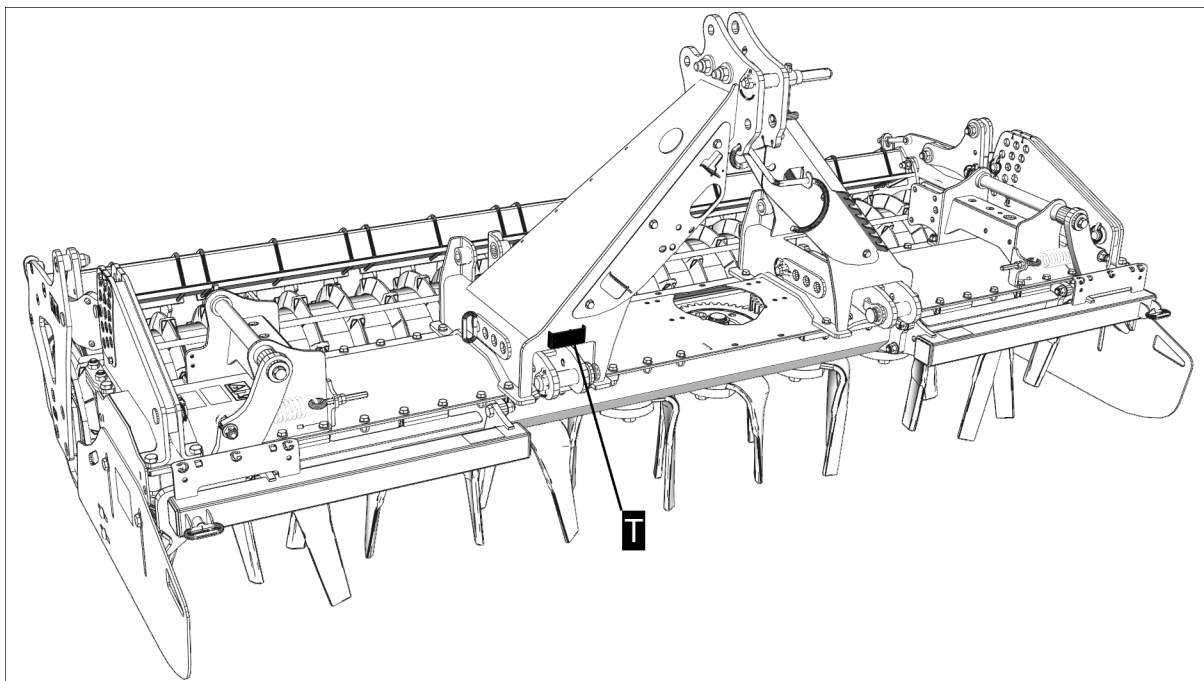


## Upgrade program

The PÖTTINGER Landtechnik GmbH upgrade program offers many upgrade possibilities. You can receive additional information from your service dealer.

## Identification

### Type plate



T = Vehicle type plate position

### Type plate

Before making any enquiries about the machine or technical details, note down the model and type (!) from the type plate and keep them handy. Chassis no. and/or serial no. are required for ordering spare parts.

Upon receipt of the machine, note the complete chassis no. and / or serial no. on the title page of these operating instructions so that these instructions can be assigned correctly to the appropriate machine.

### CE marking

The CE mark on the nameplate confirms that the machinery conforms to the provisions of the Machinery Directive (valid at the time of placing the machinery on the market).

### Included data

The following data can be read on the nameplate, depending on the machine type and version.

Data	Data
Chassis number	Year of mfr.
Model	Model year
Vehicle ID number	Axle load per axle
Type	Bearing load
Serial number	Permissible total weight

**At a glance**

Data	Data
Basic weight	

# Declaration of Conformity



## Declaration of conformity

*Name and address of the manufacturer:*

**PÖTTINGER Landtechnik GmbH  
Industriegelände 1  
AT - 4710 Grieskirchen**

*Machine (interchangeable equipment):*

<b>rotary harrow</b>	<b>LION 3030 MASTER</b>
<b>Type</b>	<b>8787</b>
<b>Serial no.</b>	

*This declaration of conformity is issued under the sole responsibility of the manufacturer.*

*The object described above complies with the following statutory requirements :*

**Supply of Machinery (Safety) Regulations 2008, 2008 NO. 1597  
Electromagnetic Compatibility Regulations 2016, 2016 NO. 1091**

*The following designated standards were applied:*

EN ISO 12100:2010	EN ISO 4254-1:2015
EN ISO 14982:2009	EN ISO 4254-5:2018

*The following standards and technical specifications were applied:*

*Person authorised to compile the technical documentation*

Melanie Jane Gardner  
St. Marks Road 15  
GB - NN188AN Corby

Markus Baldinger  
CTO R&D

Jörg Lechner  
CTO Production

Grieskirchen, 14.03.2023

## Description

The EC norm is not valid in the United States and Canada.



## EU declaration of conformity

*Name and address of the manufacturer:*

**PÖTTINGER Landtechnik GmbH  
Industriegelände 1  
AT - 4710 Grieskirchen**

*Machine (interchangeable equipment):*

<b>rotary harrow</b>	<b>LION 3030 MASTER</b>
<b>Type</b>	<b>8787</b>
<b>Serial no.</b>	

*This declaration of conformity is issued under the sole responsibility of the manufacturer.*

*The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:*

**machinery 2006/42/EG  
Electromagnetic compatibility 2014/30/EU**

*Source of applied, harmonised norms:*

EN ISO 12100:2010	EN ISO 4254-1:2015
EN ISO 14982:2009	EN ISO 4254-5:2018

*Source of applied miscellaneous technical norms and / or specifications:*

*Person authorised to compile the technical file:*

Wilhelm Meindlhumer  
Industriegelände 1  
AT - 4710 Grieskirchen

Handwritten signature of Markus Baldinger in black ink.

Markus Baldinger  
CTO R&D

Handwritten signature of Jörg Lechner in black ink.

Jörg Lechner  
CTO Production

Grieskirchen, 13.03.2023

## Intended use

- The machine is designed for operation as a stand-alone machine and for operation in combination with mounted seed drills.
- The machine must only be used to prepare the top layer of the soil for subsequent sowing.
- Intended use also includes compliance with all the contents of these instructions and observance of the warning signs (pictograms) on the machine.

## Non-intended useage

### **The following uses of the machine may void the warranty**

- Storage and transport of seed/fertiliser or other materials/substances on the machine.
- Keeping animals on the machine.
- Working on roads and paths with the machine.
- Immersion in liquids during transport, operation or storage of the machine.
- Use of the machine as a play object / climbing frame.

## Dimensions

Designation		LION 3030 MASTER Type 8787	
Length:	with packer roller	1,4 m	
	with cage roller	1,2 m	
Height:	Standard	1,3 m	
	with Hydrolift	2,2 m	
Working width:	3,0 m		
Transport width:	< 3,0 m		
Number of rotors:	10		
Working depth/tine length:	24 cm / 34 cm		
Speed:	1000 U/min		
Weight:	Basic unit	1067 kg	
	Toothed packer roller	ø 420	-
		ø 500	510 kg
		ø 550	550 kg
	Cage roller	ø 420	195 kg
		ø 540	325 kg
	Cutting packer roller	ø 550	550 kg
	Topsoil packer roller	ø 525	580 kg
	Prism packer roller	ø 500/12,5	615 kg
		ø 500/15	577 kg
		ø 600/12,5	760 kg
		ø 600/15	710 kg
	Rubber packer roller	ø 590	635 kg
	Hydrolift	200 kg	
	Front levelling board	45 kg	
Power requirements	< 132 kW		
Linkage	CAT III / width II and III		

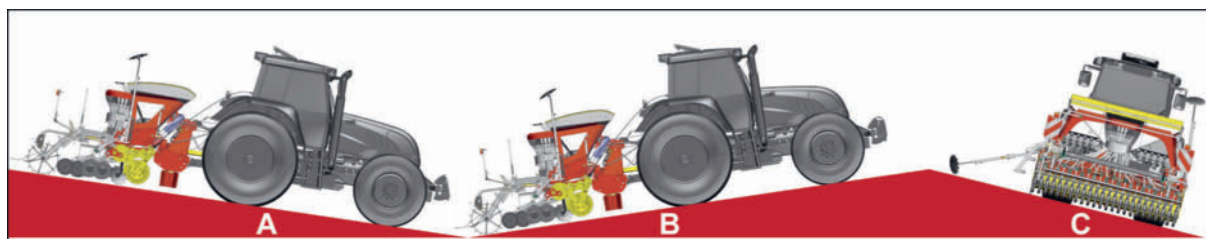
### TIP

If your machine is equipped with additional equipment, the indicated weight may differ!

## Application limits when used as a machine combination

### TIP

Together with PÖTTINGER Vitasem / Aerosem / Tegosem seed drills.



Terrain gradient A	max. 15 %
Terrain incline B	max. 15 %
Terrain slope C	max. 25 %

## Application limits when used as a stand-alone machine

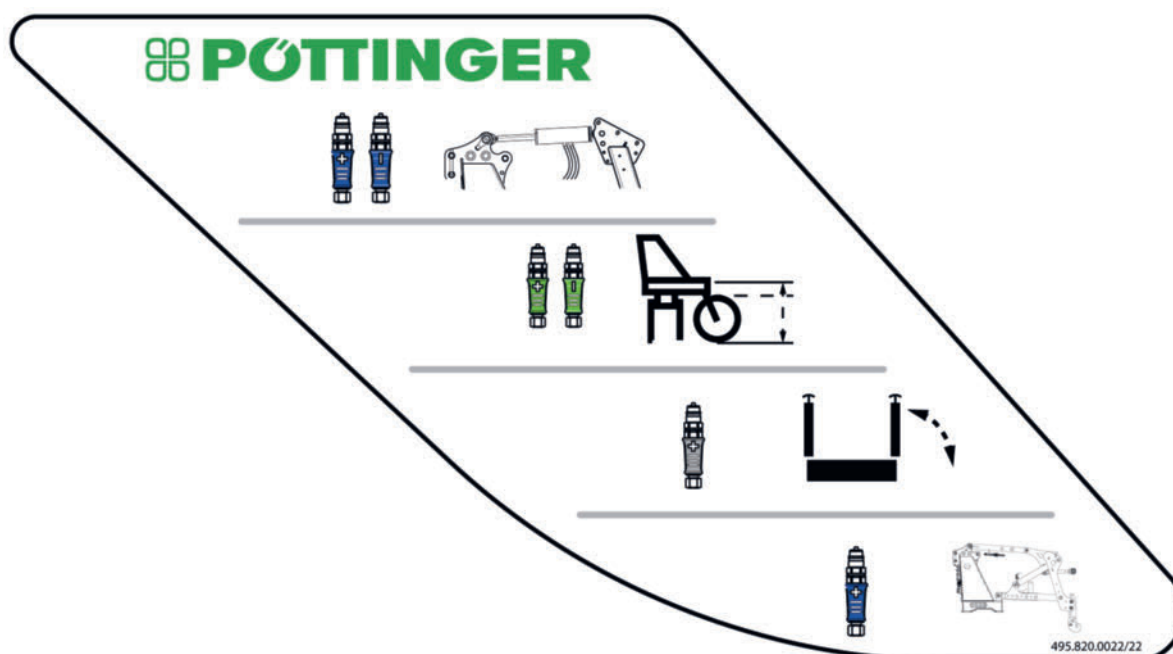
No information available at present.

## Hydraulics

### NOTICE

#### Damage to hydraulics due to incompatible hydraulic oils!

- ▶ Do not mix mineral oils with organic oils!
- ▶ Check hydraulic oil compatibility before connecting the machine to the tractor.



Hydraulic oil specification	DIN 51524 Part 1 and 2
Oil temperature	Max. 80 °C
Operating pressure	140 up to max. 200 bar

## Technical data

Connections for single-acting tractor control valves	1x plug size 3 - track marker (optional); grey marking 1x plug size 3 - hydrolift (optional); blue marking
Connections for double-acting tractor control valves	2x plugs size 3 - hydraulic depth adjustment (optional); green marking 2x plugs size 3 - hydraulic top link (optional) for seeder; blue marking 2x plugs - hydraulic top link on tractor (optional)

## Electrics

Voltage	12 VDC
Connections	1x 7-pin plug - according to DIN-ISO 1724

## Noise emission

Continuous noise level	< 70 dB (A)
------------------------	-------------

## Safety advice

The safety instructions warn of dangers to life and limb, and of improper machine operation. Read these instructions carefully before putting machine into operation and/or before working with or on the machine, and observe the safety information given in the operating instructions as well as the warnings displayed on the machine. If the warnings on the machine are not observed, the machine operator is then fully responsible for any resulting injuries and damage!

## Personnel qualification

- The only persons permitted to work with the machine are those who have reached the legal minimum age, are physically and mentally competent and have been appropriately trained and/or instructed. Personnel who still need to be trained, are partly trained or under instruction, may only work on/with the machine under the constant supervision of an experienced person.
- Testing and adjustment work may only be performed by authorised specialists. Authorised specialists are people who have been trained by PÖTTINGER Landtechnik GmbH or a PÖTTINGER Service Specialist.
- Assembly, repair and modification work can only be carried out by specialists. A specialist is a person who, on the basis of their professional training, knowledge and experience, can assess and properly perform the tasks assigned to them. The specialist has an understanding of all relevant standards and risks associated with their activity.

## Performing maintenance work

- This manual describes only the cleaning, maintaining and repair works that the operators can carry out themselves. All other work must be carried out in a specialist workshop.
- Repairs to the electrical or hydraulic system, to preloaded springs, to pressure tanks, etc. require sufficient knowledge and proper fitting tools, and may therefore only be carried out in a specialist workshop.
- Use appropriate tools and personal protection equipment.

## Organisational measures

- Always keep these instructions handy.
- Familiarise yourself with the functions of all the operating devices prior to starting work.
- In addition to the information in these instructions, also observe the relevant country-specific regulations on occupational health as well as the generally applicable, statutory or other binding regulations on accident prevention. Such obligations may pertain to the wearing of personal protective equipment or to road traffic regulations, for example.
- Appropriate workshop equipment is required to perform testing, adjustment and repair work.

### Maintaining operational safety

- Only use the machine when it is in faultless technical condition, in accordance with its intended use, and in a safety-conscious and hazard-conscious manner.
- Immediately repair any defects that could impair safety or have them repaired by a workshop.
- Observe the warning signs on the machine.
- The operator must ensure that all warning signs are present and legible throughout the entire operating life of the machine.
- Do not undertake any unauthorized machine modifications. This also applies to the installation and adjusting of safety devices as well as welding or drilling in stress-bearing parts.
- Use only spare parts and accessories that are genuine parts or that are specifically approved by PÖTTINGER Landtechnik GmbH. For these parts, reliability, safety and suitability have been proven specifically for PÖTTINGER machines. We cannot evaluate other products and therefore cannot vouch for them.
- Maintenance work, as described in these instructions, must be fully carried out at the given time intervals or have them completed in a specialist workshop.
- Do not make any software alterations to the programmable control system.

## Special hazards

### DANGER

#### **Body parts can become crushed or caught by powered machine components!**

- ▶ No long, loose hair or loose clothing is permitted. Use personal protective equipment if necessary or as required by regulation.
- ▶ Only operate the machine when all safeguards are properly fitted, undamaged and in the protective position.
- ▶ No-one is permitted to reach into the area of moving machine parts during operation!
- ▶ Do not approach the switched-off machine before all moving machine parts have stopped.
- ▶ Only perform cleaning, maintenance and repair work when the drive is stationary. Always secure the machine against accidental switching on, rolling and/or tipping over.

### WARNING

#### **Damage to health due to noise!**

- ▶ If the noise level exceeds 80 dB(A), hearing protection is highly recommended.
- ▶ If the noise level exceeds 85 dB(A), hearing protection is compulsory.

### WARNING

#### **Fire or explosion!**

Dirt created by combustible materials in the vicinity of grinding and welding work may catch fire due to flying sparks.

- ▶ Before any welding or grinding work, clean dust and flammable substances from the machine and the surroundings, and ensure that there is sufficient ventilation.
- ▶ Do not carry out grinding and welding work over combustible surfaces.

### WARNING

#### **Skin, eye or respiratory tract irritation!**

Oils, fats, solvents and cleaning agents may present a health risk.

- ▶ Observe the safety regulations applicable to the respective product.
- ▶ Provide sufficient ventilation.
- ▶ Use personal protective equipment such as protective clothing, gloves /safety goggles.

### **WARNING**

#### **Infections due to leaking hydraulic oil!**

Hydraulic oil that is discharged under pressure may penetrate the skin, enter bodily orifices and cause severe infection.

- ▶ Depressurize the hydraulic system before carrying out maintenance work.
- ▶ Wear personal protective equipment such as goggles and gloves when working on the hydraulic system.
- ▶ Before starting operation, always check the hydraulic system for wear and damage.
- ▶ Only search for leaks with suitable aids (e.g. special spray for leak detection). Have any defects dealt with immediately in a specialist workshop.
- ▶ Do not seal off leaks using your hands or other body parts.
- ▶ Seek medical advice immediately in case of injury caused by hydraulic oil.

### **WARNING**

#### **Ejection of stones and soil!**

During operation, foreign objects can fly past the machine's protective devices at high speed and hit distant areas.

- ▶ During operation, take special care near buildings, grazing animals and areas of pedestrian traffic.
- ▶ Brake, reduce p.t.o. speed and continue at reduced speed until the danger zone can be exited.
- ▶ If in doubt, stop and switch off the p.t.o. until the possibility of danger can be eliminated.

## Warning pictograms

Listed below are the positions and meanings of all warning signs used.

### **TIP**

Warning signs (symbols) point to residual risks and how to avoid them.

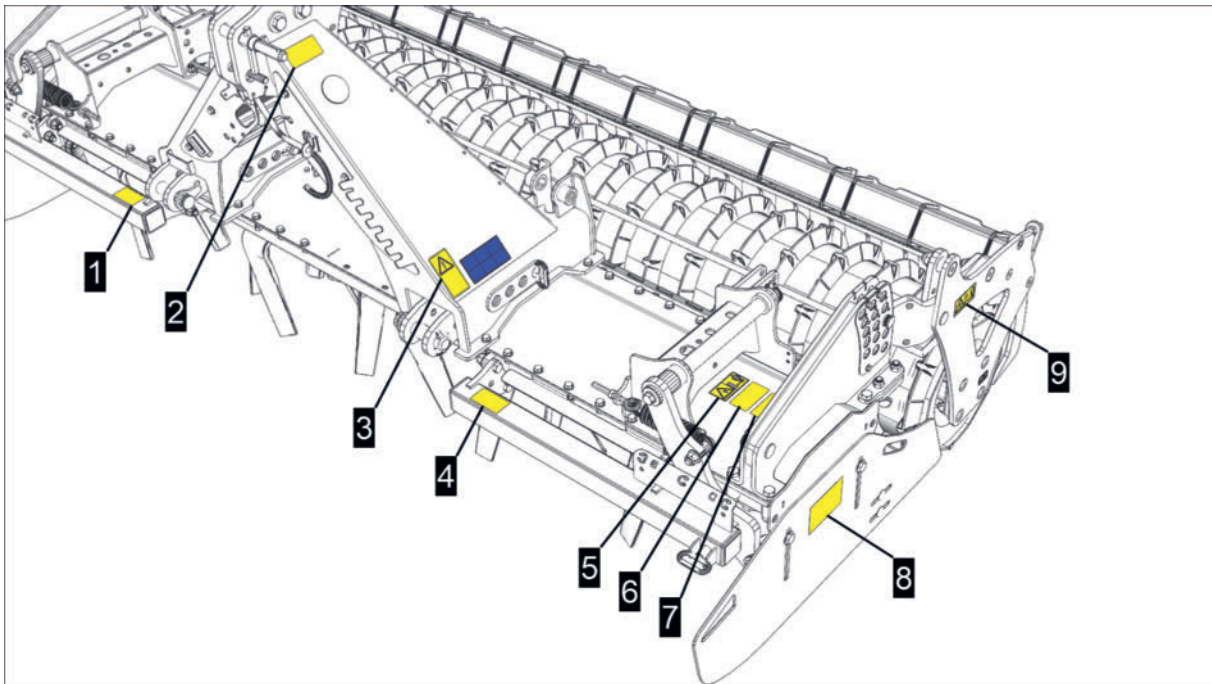
Damaged or lost warning signs must be replaced.

If machine parts with warning stickers are replaced, the relevant warning stickers must be stuck onto the new components.

### **TIP**

#### **USA / CANADA**

For machines to be operated in the USA / CANADA, a conversion kit with warning stickers (to adapt to local applicable regulations) is available from PÖTTINGER in English or French! See also "Supplement to the Operating Instructions USA / CANADA".




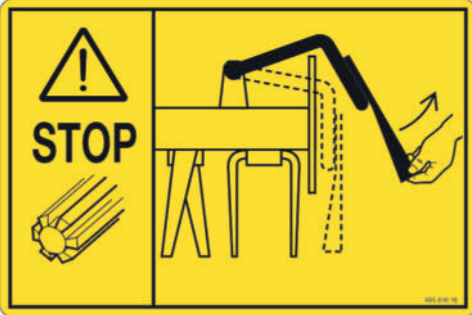

Front left view

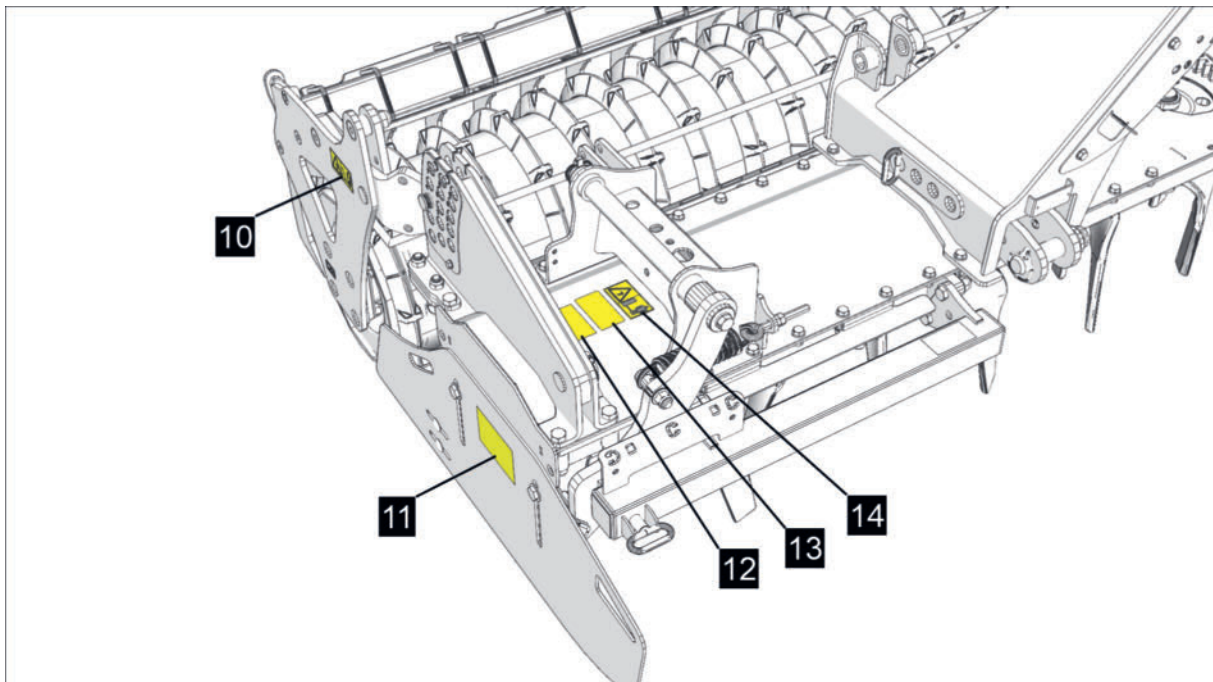
**Explanation**

Pos.	Warning signs	Meaning
1		Risk of severing fingers Never access the machine as long as parts can move there.
2		Danger of hands being crushed! Never reach into the crushing danger area as long as parts are able to move there.

## Safety and the environment

Pos.	Warning signs	Meaning
3		Read the operating manual thoroughly before putting the machine into operation.
4		Risk of severing fingers Never access the machine as long as parts can move there.
5		Keep a safe distance as danger exists through parts being ejected while motor is running.
6		Danger of hands being crushed! Never reach into the crushing danger area as long as parts are able to move there.
7		Risk of severing fingers Never reach into the danger area as long as parts can move there.

Pos.	Warning signs	Meaning
8		Danger of being pulled in and danger of parts being ejected when the PTO shaft is engaged. Only raise side guard if PTO is stationary.
9		Keep a safe distance as danger exists through parts being ejected while motor is running.

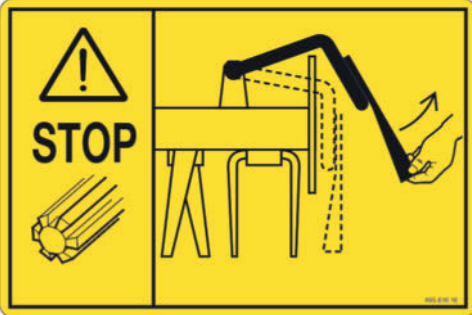





Front right view

**Explanation**

Pos.	Warning signs	Meaning
10		Keep a safe distance as danger exists through parts being ejected while motor is running.

## Safety and the environment

Pos.	Warning signs	Meaning
11		Danger of being pulled in and danger of parts being ejected when the PTO shaft is engaged. Only raise side guard if PTO is stationary.
12		Risk of severing fingers Never reach into the danger area as long as parts can move there.
13		Danger of hands being crushed! Never reach into the crushing danger area as long as parts are able to move there.
14		Keep a safe distance as danger exists through parts being ejected while motor is running.

## Operational danger area

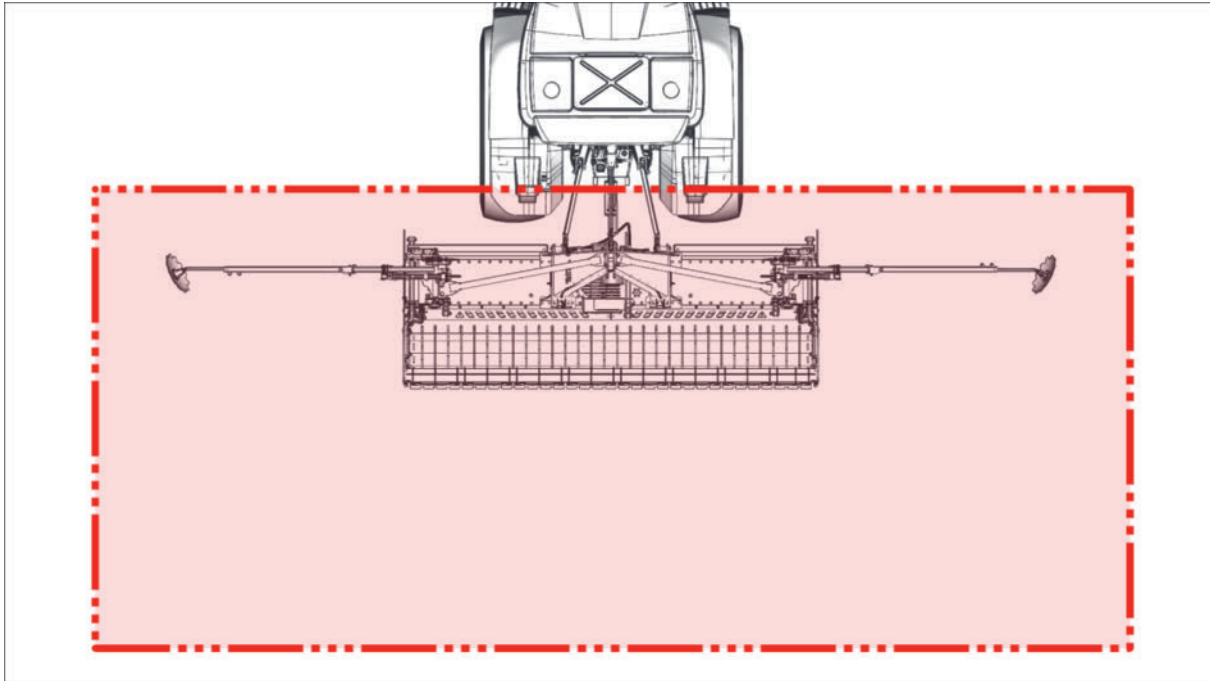
Entering the danger area whilst the machine is in operation and / or the tractor motor is running is prohibited!

### DANGER

#### Crushing, pulling in and severing of body parts!

When approaching moving machine parts, clothing, hair and body parts can become caught, which means an escape is not possible without sustaining serious to fatal injuries.

- ▶ Do not access the machine's danger area as long as machine parts can move there.
- ▶ Check that protective devices are complete and ready for operation before start-up.
- ▶ Before start-up and during operation, direct individuals away from the danger zone in and around the machine.



Marking = The danger area of the attached / mounted seed drill (see seed drill operating instructions) is to be added to the danger area of this soil tillage machine and taken into account according to the respective dimensions of the seed drill.

## Traffic safety equipment

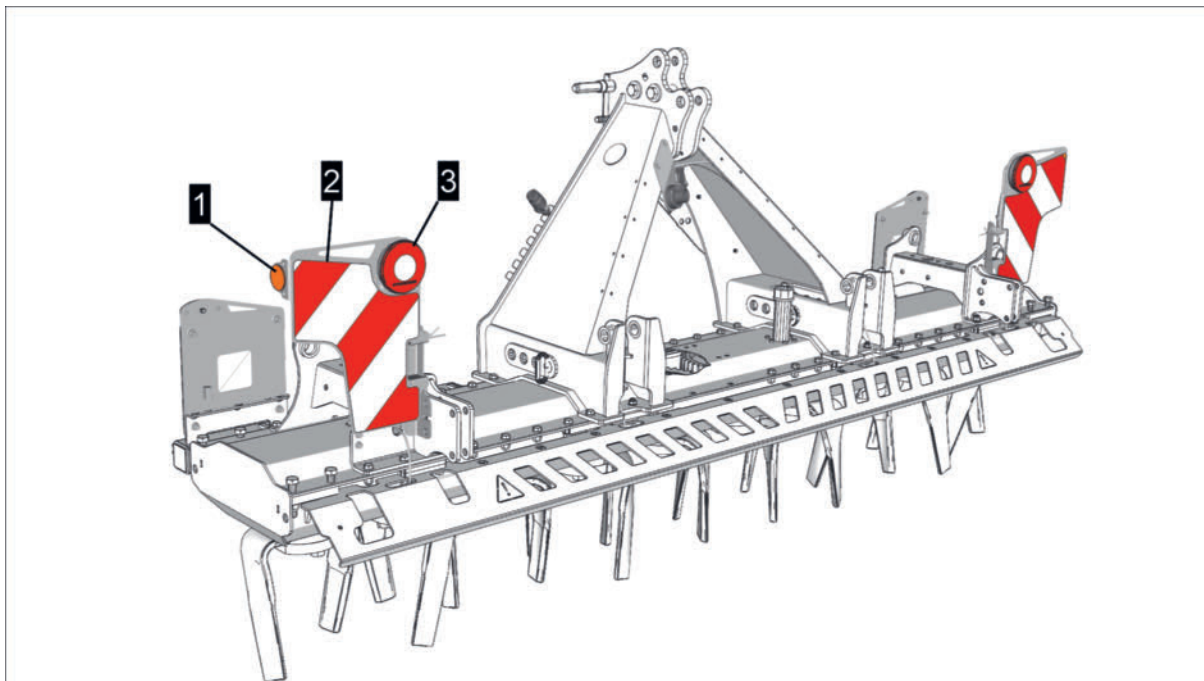
Traffic safety equipment is required when travelling on public roads. The equipment may vary depending on the country of destination.

### TIP

#### **USA / CANADA**

For machines which are operated in the USA / CANADA, a "Flasher Control Module" (to adapt the direction indicator blinking frequency to the current applicable regulations) is available!

**"Standard" rear lighting**



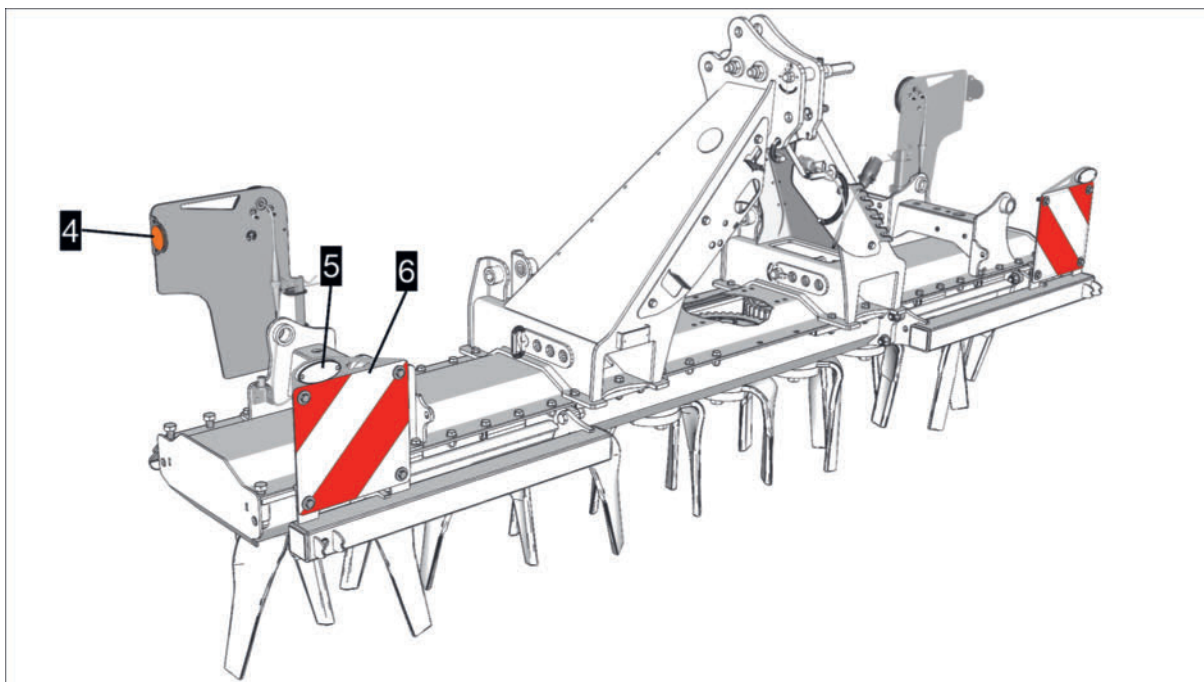
Pos.	Equipment
------	-----------

1	Orange reflectors on both sides of the machine
---	--

2	Warning signs on both sides of the machine
---	--

3	LED rear lights / brake lights / indicator lights on both sides of the machine
---	--

**"Standard" front lights**

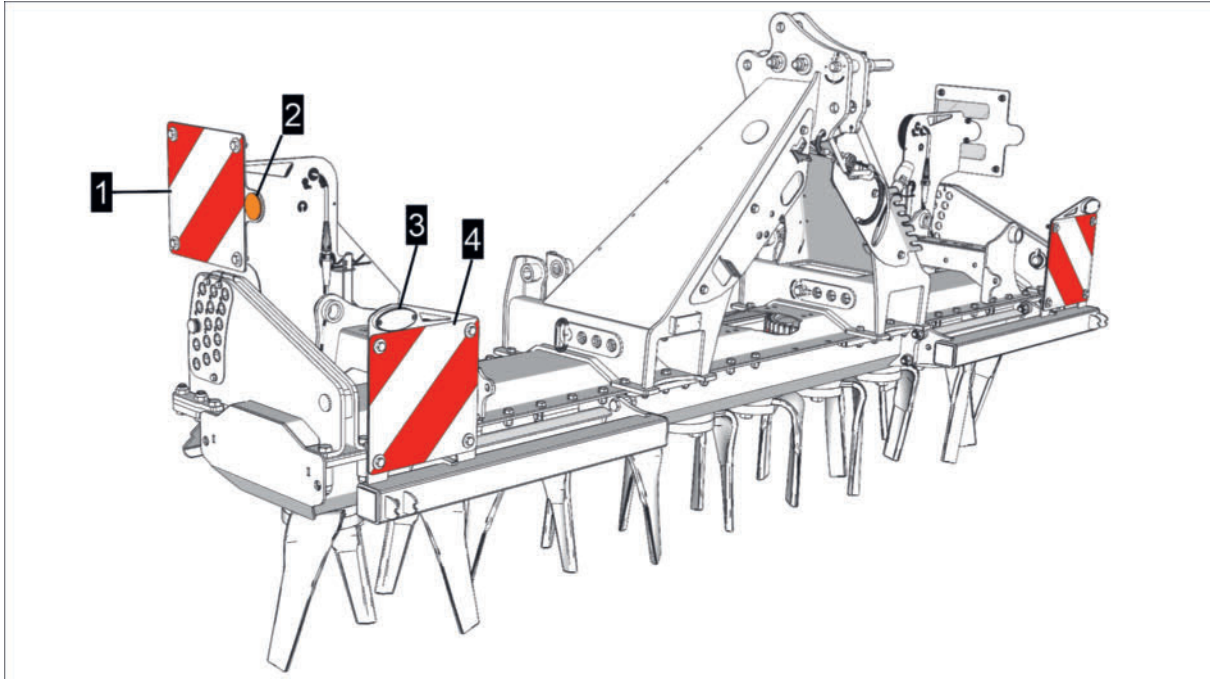


Pos.	Equipment
------	-----------

4	Orange reflectors on both sides of the machine
---	--

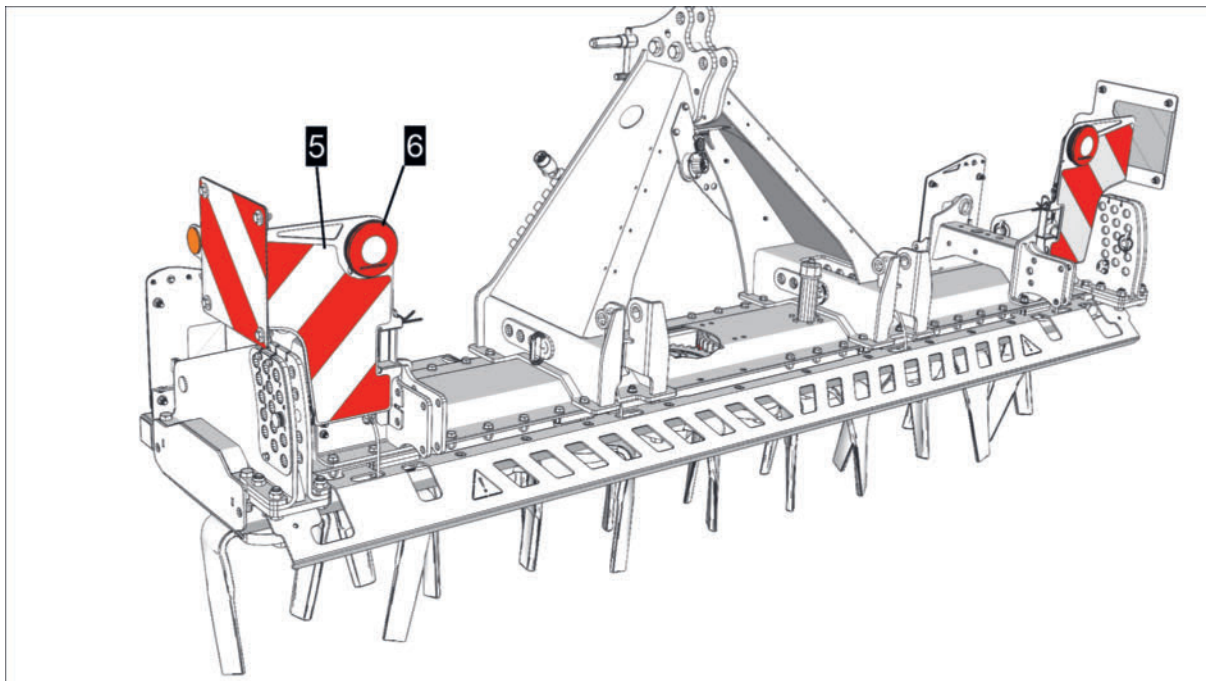
Pos.	Equipment
5	Warning sign on both sides of the machine
6	LED marker lights to both sides of the machine

**Front lights "France"**



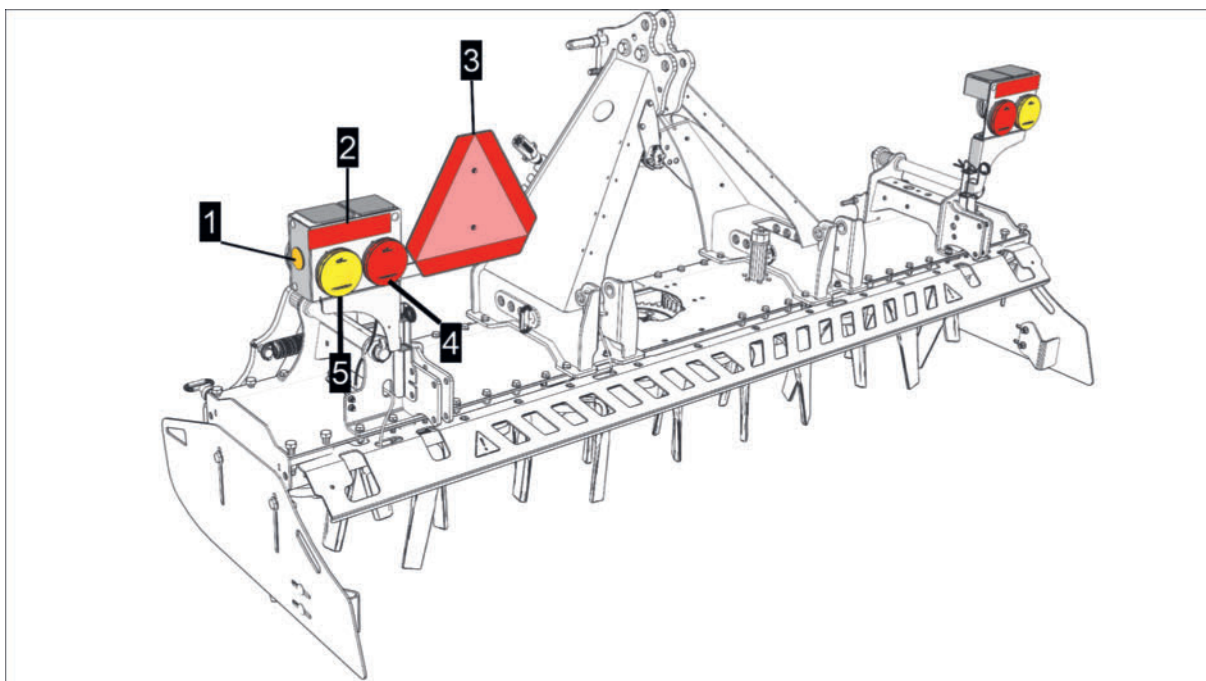
Pos.	Equipment
1	Warning sign on both sides of the machine
2	Orange reflectors on both sides of the machine
3	LED marker lights to both sides of the machine
4	Warning sign to both sides of the machine

Rear lights "France"



Pos.	Equipment
5	Warning sign on both sides of the machine
6	LED rear lights / brake lights / indicator lights on both sides of the machine

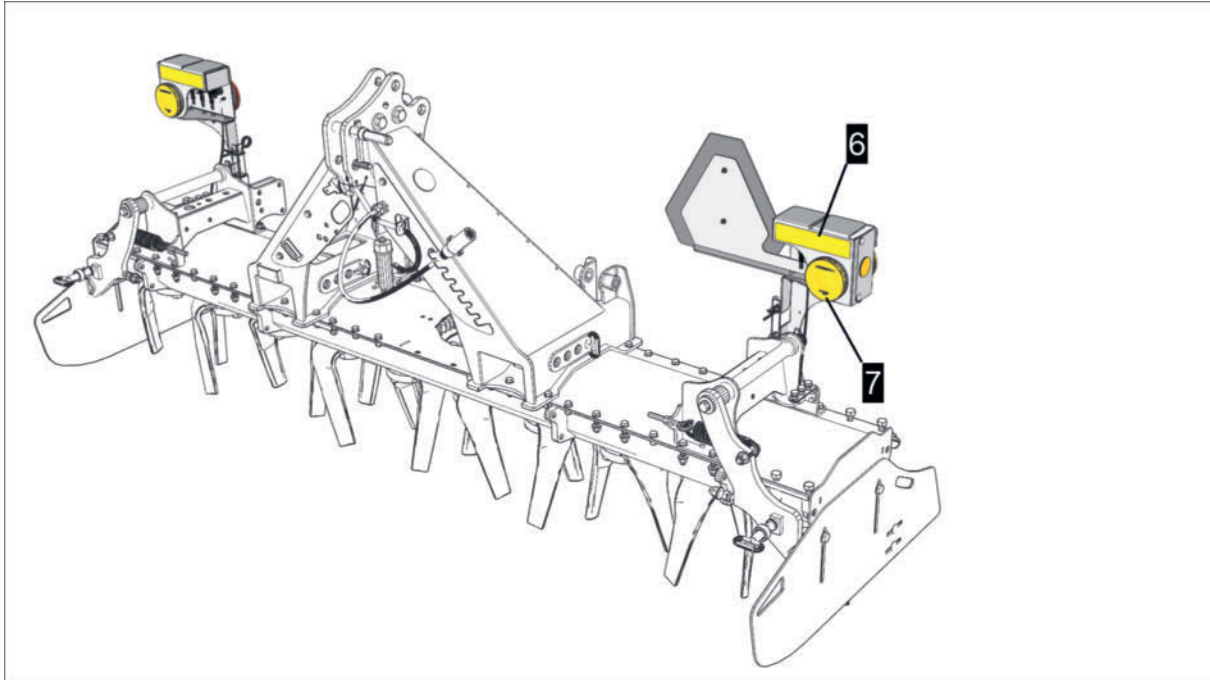
Rear lights USA / CANADA



Pos.	Equipment
1	Orange reflectors on both sides of the machine
2	Red reflective transfer on both sides of the machine

Pos.	Equipment
3	Warning triangle (SMVI emblem)
4	LED rear lights / red brake lights to both sides of the machine
5	Yellow LED indicator lights to both sides of the machine

### Front lights USA / CANADA



Pos.	Equipment
6	Red reflective transfer on both sides of the machine
7	Yellow LED indicator lights to both sides of the machine

## Handling hazardous substances

In addition to the information in these Instructions, the generally applicable, statutory or otherwise binding regulations on environmental protection are to be observed.

## Disposal of the machine

### ENVIRONMENT

At the end of its service life, the machine should be taken to a legally regulated waste material recycling center.

#### **Pressure tanks, shock absorbers, gas springs, etc.**

- Depending on the machine, there are built-in hydraulic pressure tanks under high gas pressure (nitrogen) which must be discharged via a special device before the machine is scrapped.
- Depressurize airbrake compressed air tanks via the condensate drain before disposing of them.
- Gas pressure springs, gas pressure dampers or oil pressure dampers are under high pressure and must be removed before scrapping the machine and, if necessary, disposed of separately from metal scrap.

#### **Dispose of lubricants and operating materials**

- Drain, collect and dispose of gear lubricants and hydraulic oils appropriately.
- Empty lubricant containers of central lubrication systems and dispose of the lubricant appropriately.

#### **Dispose of electrical and electronic components**

- Remove lighting equipment, job computer, sensors and cables and take them to the recycling facility separately.

#### **Dispose of plastic parts**

- Plastic parts are supplied with a label which provides information on the material composition. Plastic parts can therefore be correctly sorted before being taken to the recycling centre.

#### **Disposal of metal parts**

- All metal parts must be brought to the relevant recycling plant, sorted as purely as possible.
- Remove lubricants such as gear oil, hydraulic oil, etc. from components before they are scrapped.

#### **Disposal of rubber parts / tyres**

- Take tyres with and without rims, and other rubber components to the relevant recycling point.

#### **Disassembly of heavy parts of the machine**

- Lift parts of the machine whose weight exceeds 25 kg only by crane.

 **WARNING**

**Health hazard due to heavy, manual lifting!**

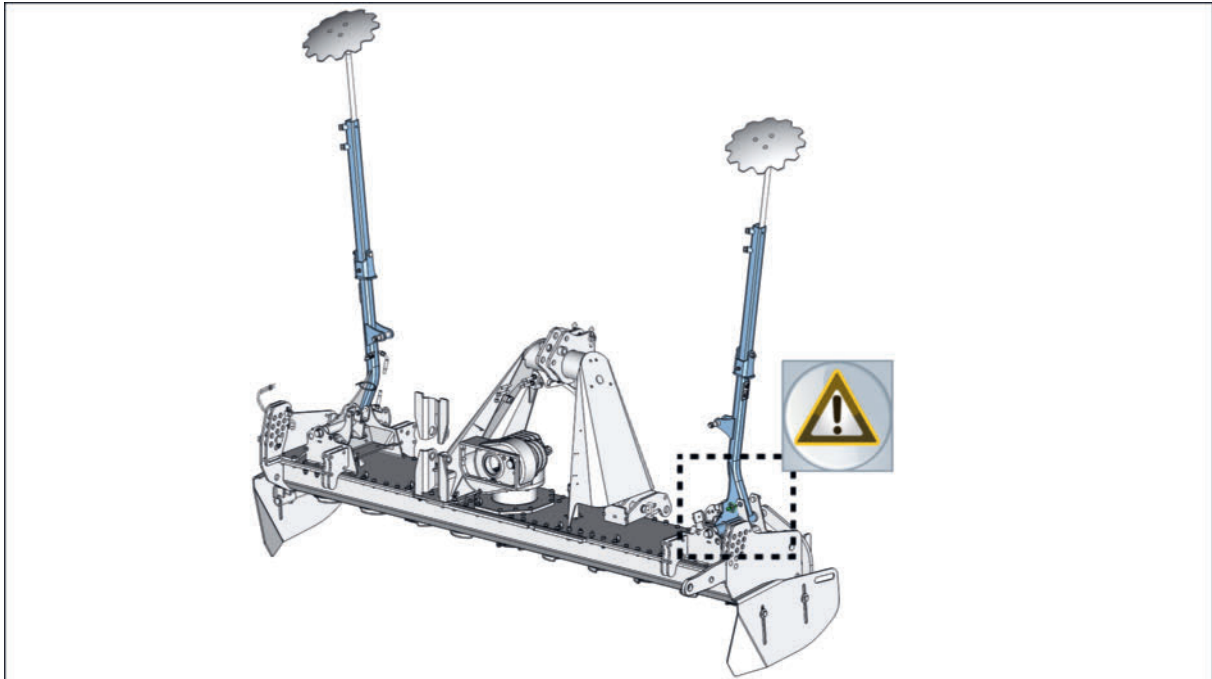
- ▶ Do not manually lift parts of the machine whose weight exceeds 25 kg.
- ▶ Use a crane, forklift or similar to remove or dismantle these parts.

## Transport safeguards

Transport safeguards are safety devices on the machine which prevent machine components from moving unintentionally during transport runs.

## Track marker (Optional)

The track markers must be secured with lynch pins before travelling on public roads as described below.



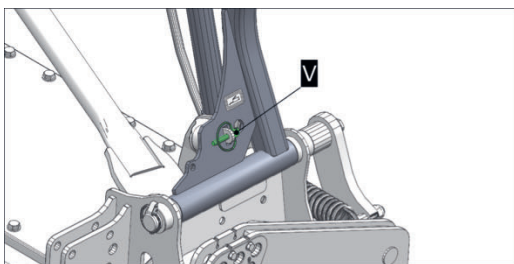
### Remove / fit track marker transport safeguard

#### Prerequisite

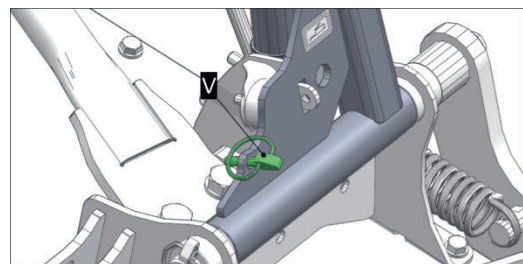
- Machine is fully attached and secured to a suitable tractor.
- Park tractor and machine on level, stable ground and secure against rolling.
- Guide persons out of the danger area.

#### Implementation

- ▶ Remove transport safeguard: Remove lynch pins (V) on both sides of the machine and attach to both sides of the machine in park position as shown.



Example: right track marker. Lynch pin (V) in working position

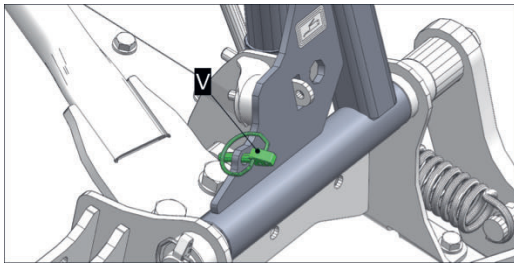


Example of right track marker: Lynch pin (V) in working position

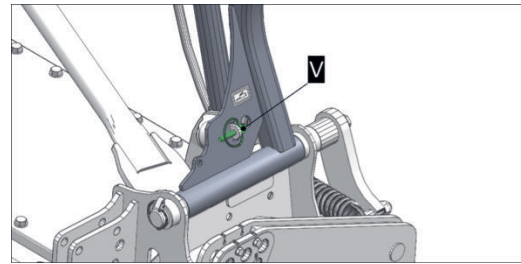
**TIP**

If the lynch pin cannot be removed, then set the tractor control valve gently to "Raise" and then remove the lynch pin.

- ▶ Fit transport safeguard: Set tractor control device to "raise" and swing the lowered track marker up as far as it will go.
- ▶ Remove lynch pins (V) on both sides of the machine and attach to both sides of the machine in park position as shown.



Example of right track marker: Lynch pin (V) in working position



Example of right track marker: Lynch pin (V) in working position

## Hydrolift (optional)

The hydrolift must be deactivated with the stopcock before travelling on public roads in road transport position.

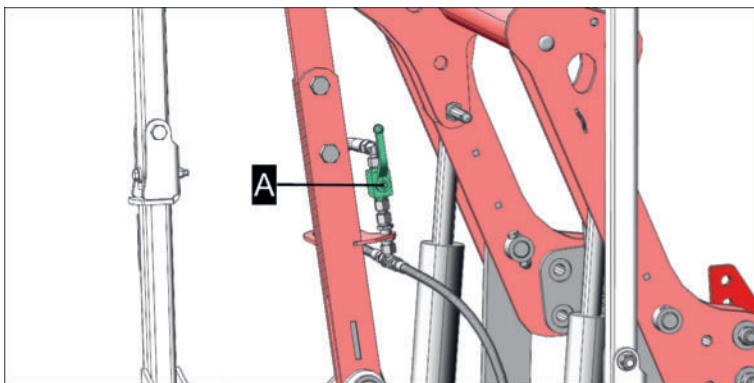


Fig.: Stopcock (A) open.

**⚠ WARNING**

**Unintentional swiveling of machine parts!**

If transport safeguards cannot be properly attached / activated, unintentional swiveling in machine parts may occur.

- ▶ Always fit activate transport safety devices before travelling on public roads as stipulated.

## Transport safeguards

### Activate / Deactivate Hydrolift transport safeguard

#### Prerequisite

- Park tractor and machine on level and stable ground in working position.
- Hydrolift connected to a single-acting tractor control unit.
- Hydrolift raised in road transport position.

#### Implementation

- ▶ Close stopcock (A).

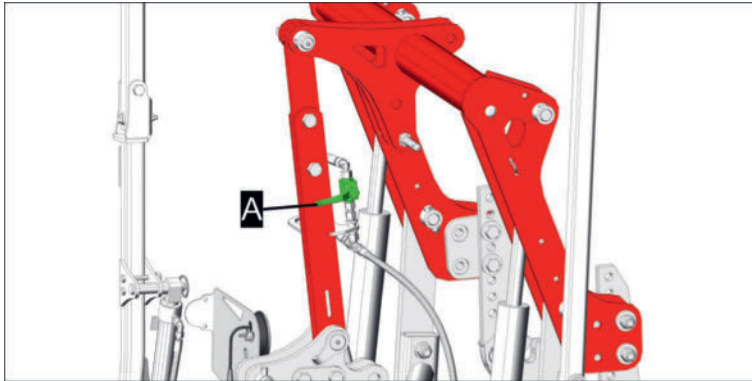


Fig.: Stopcock (A) closed

- ▶ Deactivate the transport safeguard before operation: Open stopcock (A).

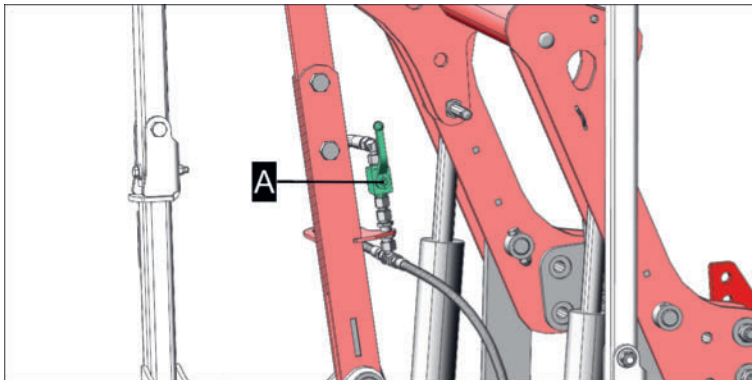


Fig.: Stopcock (A) open.

## Hydraulic depth adjustment transport safeguard

The transport safeguard is to be activated as described below to prevent the uncontrolled raising or lowering of the trailer when travelling in road transport position.

### Activate / deactivate transport safeguard

#### Requirements

- Machine is fully attached and secured to a suitable tractor.
- Park tractor and machine on level and stable ground in working position and secure against rolling.

- Tractor motor turned off, PTO switched off, parking brake applied, ignition key removed and stored during the work.

### Implementation

- ▶ Activate tractor control device and lower the trailer as far as it will go to the lowest possible working depth according to scale.

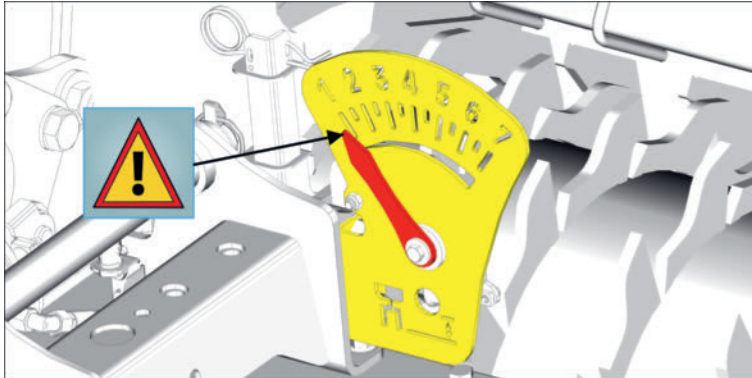


Fig.: lowest possible working depth according to scale

- ▶ Close stopcock on hydraulic supply line (if available) and lock tractor control device if possible to prevent unintentional operation.
- ▶ Deactivate transport safeguard: Carry out process in the reverse order.

## Manual depth adjustment transport safeguard

The trailer is to be secured as described below to prevent the uncontrolled raising or lowering of the trailer when travelling in road transport position and swinging open to parking position.

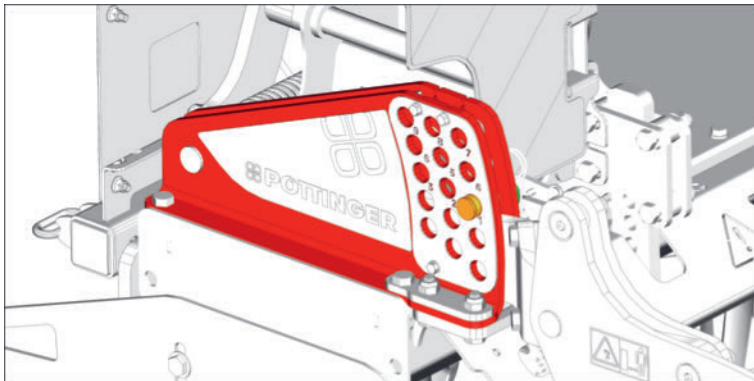


Fig.: Hole pattern on the left side of the machine

### Activate / deactivate transport safeguard

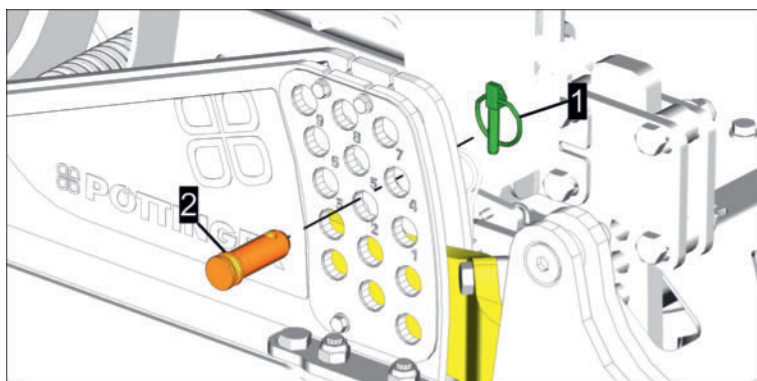
#### Requirements

- Machine is fully attached and secured to a suitable tractor.
- Park tractor and machine on level and stable ground in working position and secure against rolling.
- Tractor motor turned off, PTO switched off, parking brake applied, ignition key removed and stored during the work.

## Transport safeguards

### Implementation

- ▶ Activate rear power lift and raise the machine so that the trailer is completely lowered and can be freely turned manually.
- ▶ Remove the linchpins (1) and locking bolts (2).



- ▶ Insert locking bolts (2) in hole pattern in hole (1) and secure with linch pin (1) as shown.

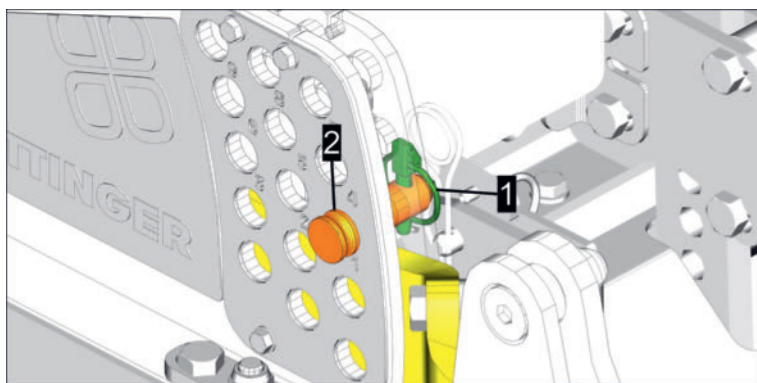


Fig.: Hole pattern represented as partially transparent

- ▶ Repeat procedure correspondingly on both sides of the machine.
- ▶ Deactivate transport safeguard: Repeat procedure in reverse or adjust working depth to the required value at the same time. See "Manually adjust the working depth" on page 66.

**⚠ WARNING**

**Unclear work distribution!**

If more than one person is working with and on the machine, the different areas of responsibility may become unclear, which can create risks for everyone involved.

- ▶ Clearly define the areas of responsibility of the helpers present and coordinate all work procedures before carrying out any work on or with seeders.
- ▶ If helpers are called in or withdrawn during the work, the areas of responsibility of the helpers present must be clearly redefined and all planned work procedures must be discussed.

**⚠ WARNING**

**Not wearing personal protective equipment!**

- ▶ Use personal protective equipment (protective clothing, work gloves)

## Lift or lower the machine / machine combination

Function control through the Rear Power Lift control valve.

### *Implementation*

- ▶ Raise the machine / machine combination to road transport position: Move rear power lift to "Raise" position.
- ▶ Lower the machine / machine combination in working position: Switch the rear power lift control valve to the "Lower" position and carefully put the machine combination on the ground.

## Track marker operation (optional)

### **Requirements**

- Machine is fully attached and secured to a suitable tractor.
- Park tractor and machine on level and stable ground in working position.

## Operation of machine function elements

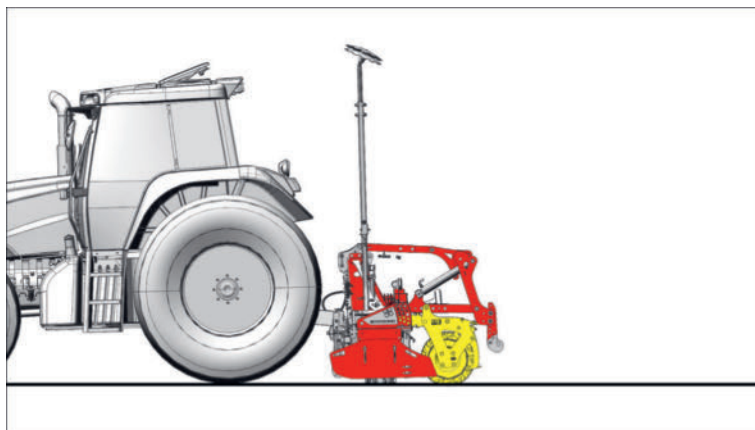


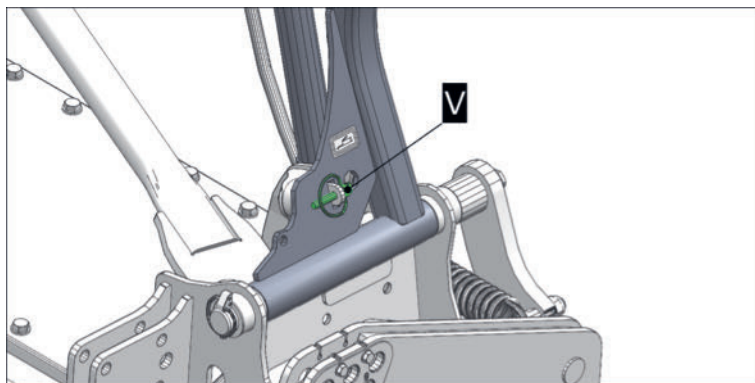
Fig.: Working position

- Track marker connected to a single-acting tractor control unit.
- Refer people out of the danger area of the machine.

### Move the track marker to working position

#### Prerequisite

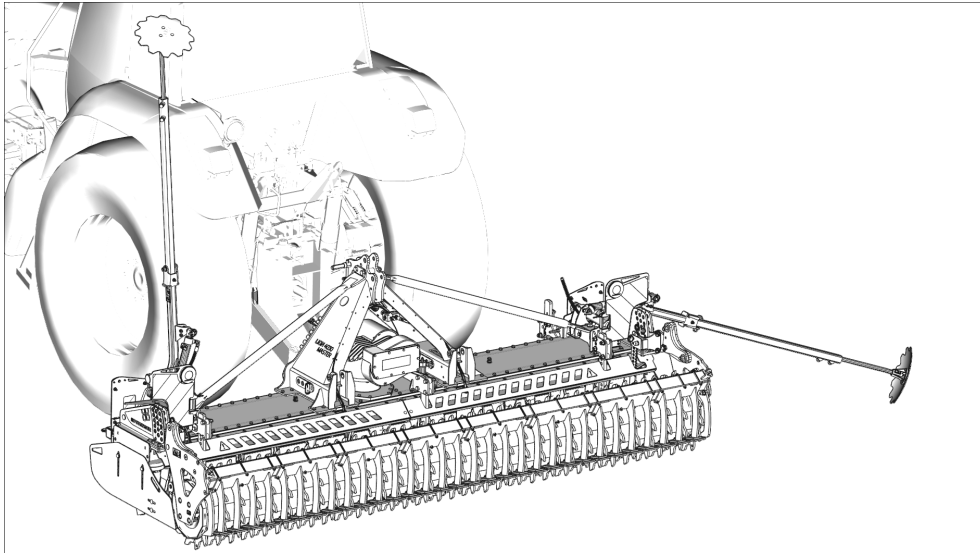
- Linch pins (V) removed from transport safeguard of both track markers.



Example: right track marker linch pin (V) not yet removed.

#### Implementation

- ▶ Set tractor control device of track marker to "Lower".
  - ▷ One of the track markers is lowered as far as it will go independently from the temporary setting of the shuttle valve.



**TIP**

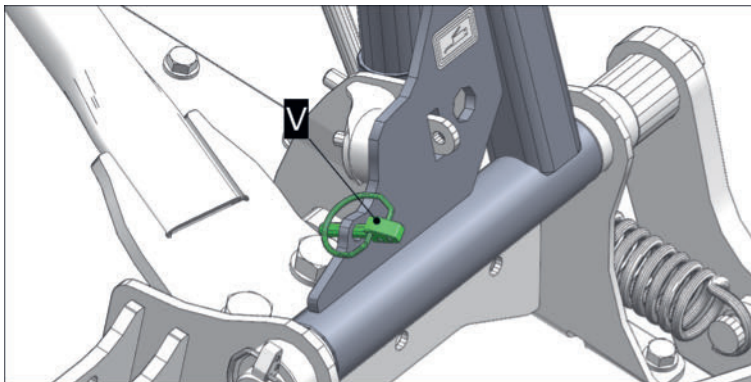
**If the opposite track marker is required first:** Set the tractor control device to "Lift" to lift the corresponding track marker as far as it will go. Then set the tractor control device back to "Lower" to lower the required track marker as far as it will go.

- ▶ Then set the tractor control device to "float position".

**Move track marker to road transport position:**

**Implementation**

- ▶ Set tractor control device to "Raise" and raise the track marker that is already in working position as far as it will go.
  - ▷ Secure the track marker on both sides of the machine with linch pins (V).



Example: right track marker secured with linch pin (V).

- ▷ Then set the double-acting tractor control device to float position.

## Hydrolift operation (optional)

**Prerequisite**

- Machine is fully attached and secured to a suitable tractor.

## Operation of machine function elements

- Park tractor and machine on level and stable ground in working position.  
Hydrolift in road transport position / headland position

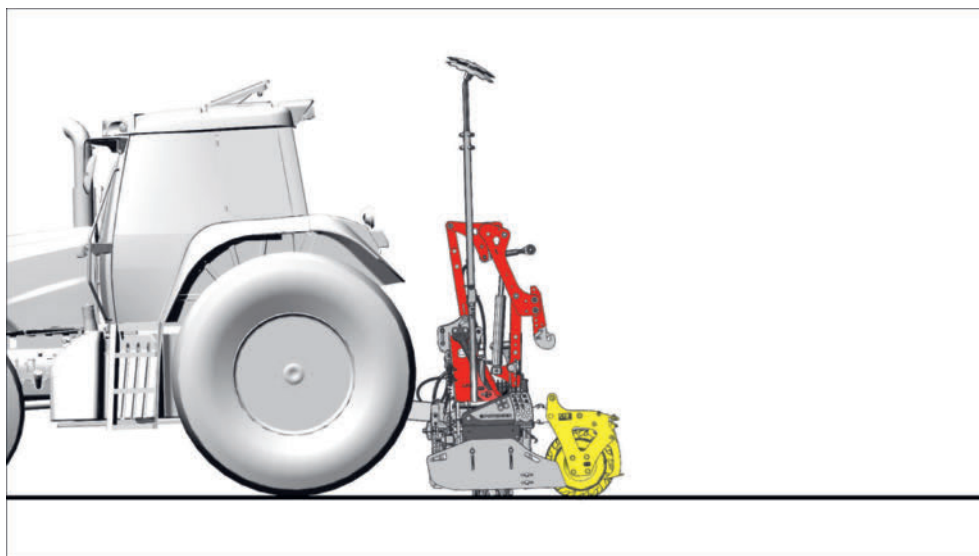


Fig.: Working position; hydrolift in road transport position / headland position

- Stopcock (A) open on hydrolift as shown.

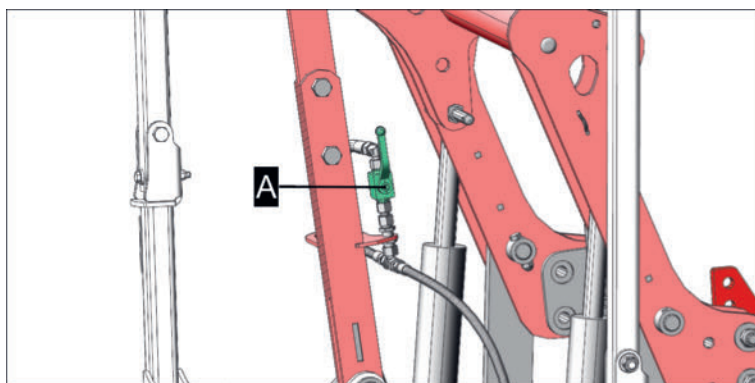


Fig.: Stopcock open [lift limiter hidden (option)]

- Hydrolift connected to a single-acting tractor control unit.
- Refer people out of the danger area of the machine.

### ***Implementation***

#### **Move the hydrolift to working position**

### ***Implementation***

- ▶ Set tractor control device to "lower" and lower the hydrolift as far as it will go.

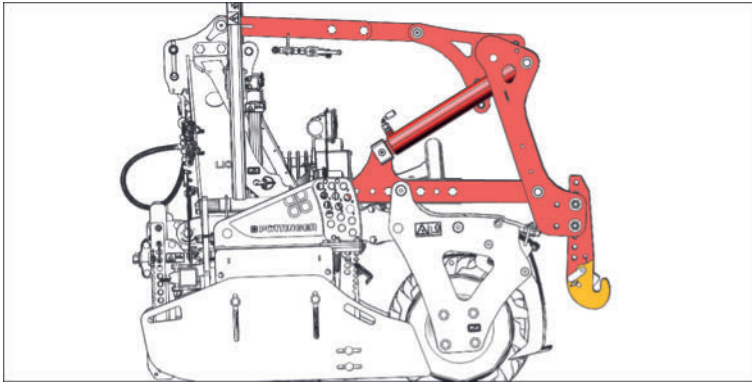


Fig.: Hydrolift in working position:

### Move hydrolift to road transport position / headland position

#### Prerequisite

- Park tractor and machine on level and stable ground in working position.

Hydrolift in working position:

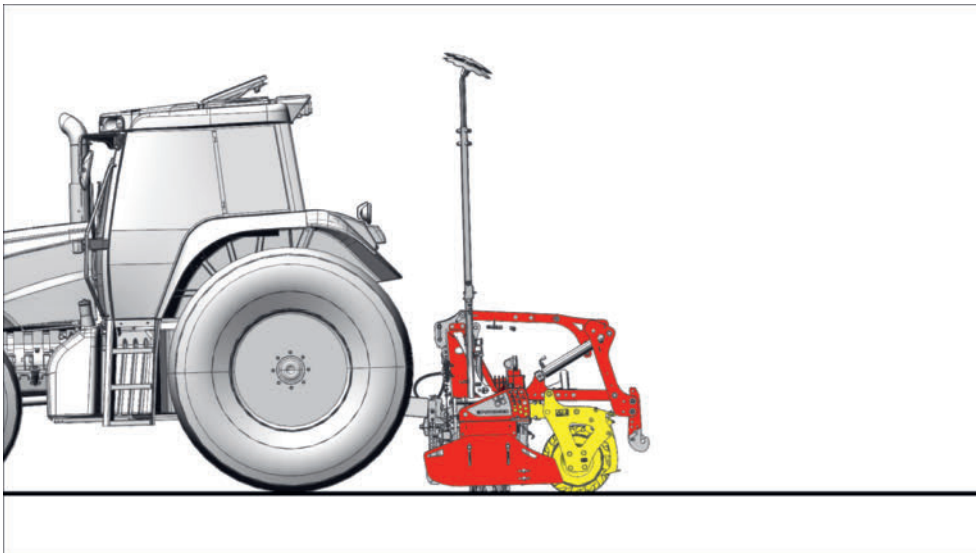


Fig.: Hydrolift in working position:

#### Implementation

- ▶ Raise hydrolift to road transport position / headland position Set tractor control unit to "Raise".
  - ▷ The lifting process is stopped at the position set in the optional lift limiter.

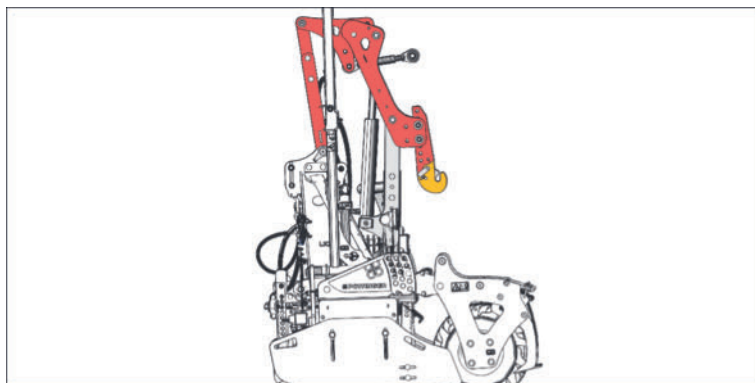


Fig.: Hydrolift in transport position

## Hydraulic top link for seed drills (option) operation / setting

### The hydraulic top link is used to ...

- ... incline seed drills forward so that the drill coulters have no contact with the ground (= harrow operation without sowing).
- ... move seed drills in road transport position closer to the tractor to shift the centre of gravity further forwards.

### Prerequisite

- Top link connected to a double-acting tractor control unit.
- Refer people out of the danger area of the machine.

### Move the top link to working position

#### *Implementation*

- ▶ Set tractor control device to "Lower" until the seed drill is lying on the ground.

### Move top link to road transport position / headland position

#### *Implementation*

- ▶ Set tractor control device to "raise" and raise the machine as far as it will go.

## Side shield operation

Work can be carried out on the field in both possible side shield positions if required (working position / road transport position).

### TIP

The most appropriate setting is determined during operation.

Depending on the preferred position, the adjustment of the side shield must be checked and adapted if necessary during field work. See "Side shield settings" on page 69.

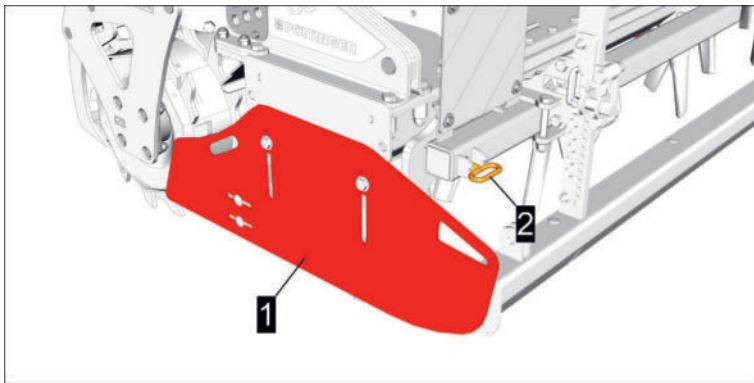


Fig.: Right side shield

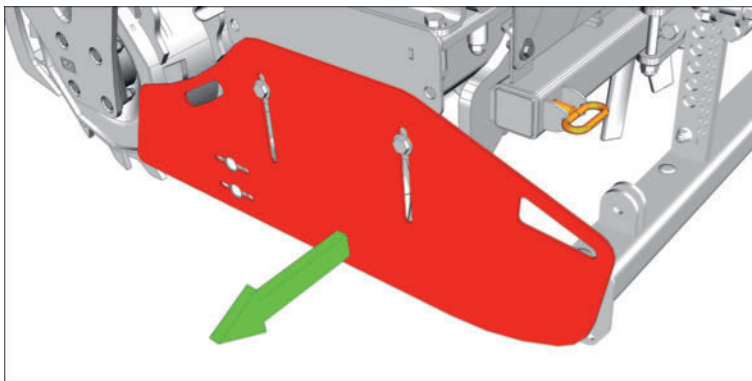
1 = side shield

2 = Positioning pin

### Establish working position

#### **Implementation**

- ▶ Swing the spring-loaded side shield slightly outwards using the handle.

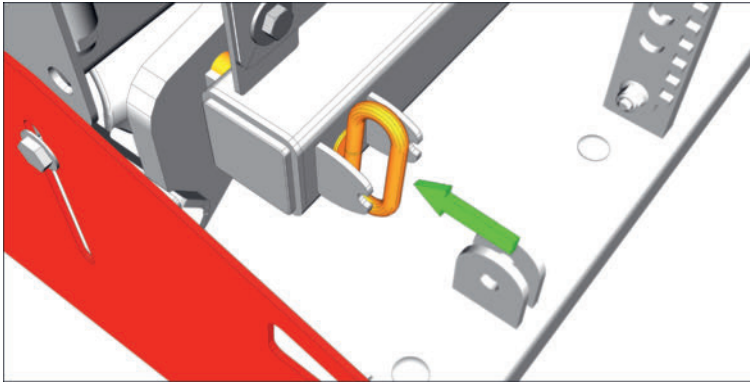


- ▶ Pull the spring-loaded locking pin forwards.



- ▶ Turn the locking pin 90 ° and release.

## Operation of machine function elements



- ▶ Swing the side shield in slowly and then release.
  - ▷ The spring-loaded side shield may swing outwards in operation and is stopped on the inside with locking pins.

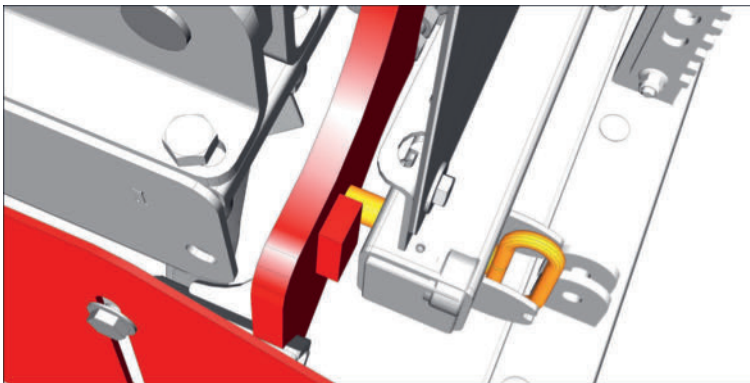
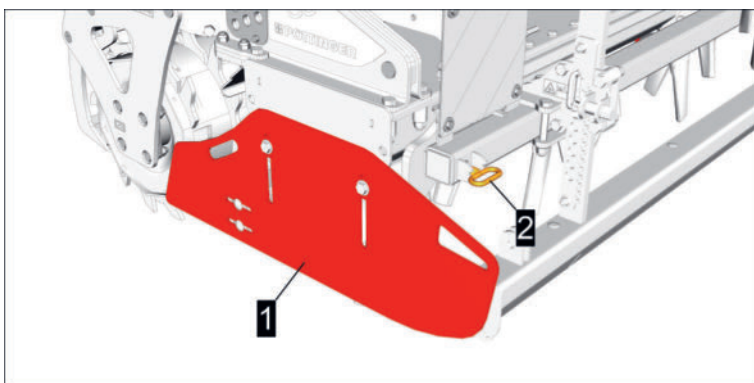


Fig.: Locking pin position in standard operation

- ▶ Carry out the procedure in the same way on both sides of the machine.

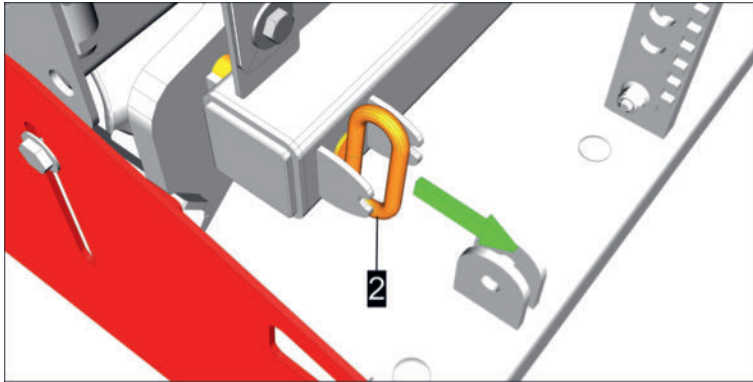
### Establish road transport position

The side shields (1) must be completely folded inwards on both sides of the machine before travelling on public roads and the locking pins (2) must be pulled out and locked in place in road transport position.

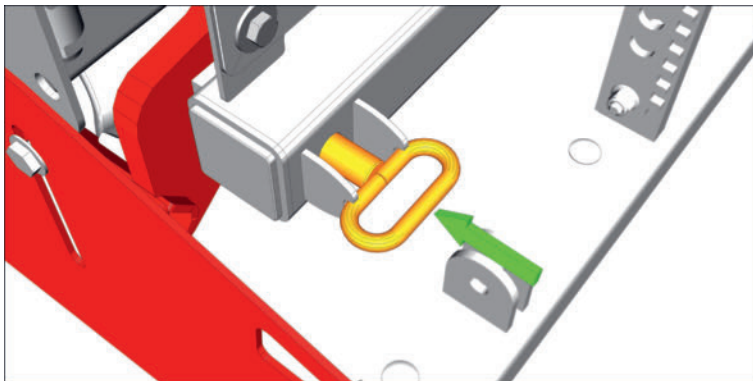


### Implementation

- ▶ Pull the spring-loaded locking pins (2) forwards with the handle.



- ▶ Turn locking pins and use the handle to insert in the lugs on both sides as shown below.



- ▷ If the pin is very tight, raise the corresponding side shield slightly so that the locking pin can be operated more easily.
- ▶ Carry out procedure similarly on both sides of the machine.

### Initial operation

- Before initial operation, make sure the tractor is suitable for use with the machine. Compare the machine data with the corresponding data in the tractor's operating instructions.
- Ensure that any transport safeguards have been removed.
- Check that any mounted seed drill (with track markers in transport position) does not touch either the tractor or the cultivator during lifting.
- Ensure that the (supplied) cardan shaft has been adapted to the tractor before start-up.

### Tractor ballast

#### CAUTION

##### **Danger of accident due to ballasting errors!**

With ballasting errors, the steering and braking ability of the tractor is impaired.

- ▶ Machines that are operated in various coupling modes, as a solo machine or as a machine combination, must be weighed in the respective mode.
- ▶ For weighing, establish the position of the machine / machine combination that extends furthest to the rear / to the front.
- ▶ After ballasting, carry out a brake test.

At least 20% of the tractor's net weight must be used as front axle load to ensure that the tractor can be steered and braked. Axle loads, total weight and tyre load capacity must not be exceeded.

For correct tractor ballasting, refer also to the tractor operating manual.

Two different methods can be used to determine the necessary ballasting.

#### **Methods to determine tractor ballast weights**

- *Weighing method*  
The most accurate result is achieved through the weighing method. Possible deviations from specified weights are also taken into account.
- *Calculation method*  
The calculation method only provides the calculated results from the weights in the technical data of the machine and tractor, at the time of delivery. These figures may differ from the actual weight due to subsequent technical changes.

#### TIP

Always use the weighing method if possible!

The correct ballasting must be re-determined each time the tractor and machine are changed.

## Table of values to be filled out

	Actual value	Permissible value	Permissible tyre load capacity
Minimum front ballast	kg ( $G_{V \min}$ )	-	-
Total weight	kg ( $G_{act}$ )	$\leq$ kg ( $G_{perm}$ )	-
Front axle load	kg ( $T_{V act}$ )	kg ( $T_{V perm}$ )	$\leq$ kg
Rear axle load	kg ( $T_{H act}$ )	$\leq$ kg ( $T_{H perm}$ )	$\leq$ kg

## Operation

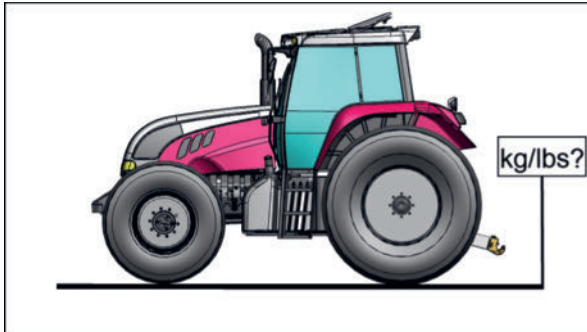
### Determine the required tractor ballast weights using the weighing method

This method (preferred) can be used to check the tractor ballasting determined purely by calculation. See "Determine the required tractor ballast weights using calculation" on page 60.

#### Implementation

##### Weigh the tractor

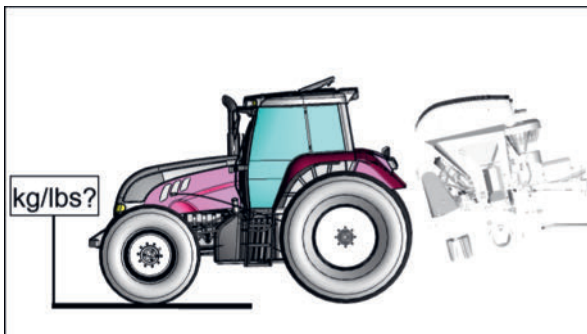
- ▶ Remove mounted machines and ballast weights from the tractor, if any.
- ▶ Drive the tractor onto the scales with the front and rear axle on the scales.



- ▶ Note weight as tractor tare weight ( $T_L$ ) and enter in the table of figures.

##### Weigh the front axle load

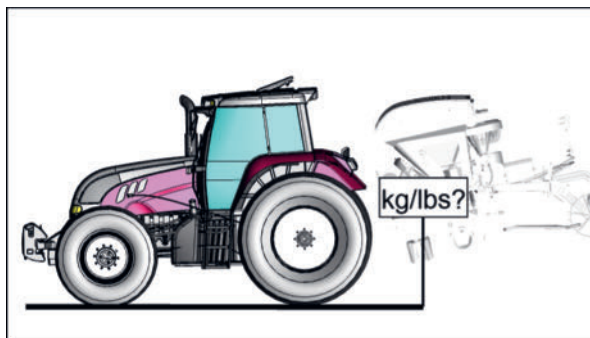
- ▶ Attach the machine to the tractor and put in transport position.
- ▶ Drive the tractor onto the scales with the front axle on the scales.



- ▶ Write down weight as actual front axle load ( $T_{V_{act}}$ ) and enter in the value table.
- ▶ Calculate whether the actual front axle load ( $T_{V_{act}}$ ) still corresponds to at least 20% of the tractor tare weight ( $T_L$ ). If the front axle load is insufficient, add ballast until the actual front axle load ( $T_{V_{act}}$ ) corresponds to at least 20% of the tractor tare weight ( $T_L$ ).
- ▶ Check that the maximum permissible front axle load ( $T_{V_{perm}}$ ) is not exceeded, taking into account the tyre load capacity. See the tractor operational instructions.

##### Weigh the total weight

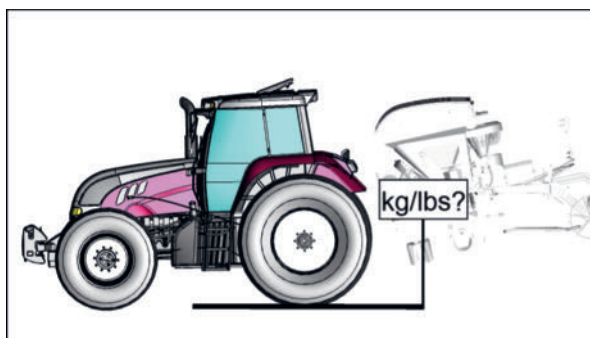
- ▶ Drive the tractor onto the scales together with the machine in transport position and the ballast weights, with the front and rear axle on the scales.



- ▶ Write down weight as total weight ( $G_{act}$ ) and enter in the value table.
- ▶ Check to determine whether the measured value exceeds the maximal permissible total weight ( $G_{perm}$ ) of the tractor. See the tractor operational instructions.

### Weigh the rear axle load

- ▶ Drive the tractor onto the scales together with the machine and the ballast weights with the rear axle on the scales.



- ▶ Enter weight as actual rear axle load  $T_H$  in the value table.
- ▶ Check to determine whether the measured value exceeds the maximum authorized rear axle load ( $T_{Hperm}$ ) taking the tyre bearing capacity into account. See the tractor operational instructions.
- ▶ Verify if the technical data for the tyres and rims corresponds to the tractor manufacturer requirements. See the tractor operational instructions.

## Determine the required tractor ballast weights using calculation

### Implementation

- ▶ Distance (a) from centre of gravity of front ballast ( $G_V$ ) to centre of front axis:  
 $a = \dots\dots\dots$  mm (see tractor operational instructions or measure)
- ▶ Tractor centre distance (b):  
 $b = \dots\dots\dots$  mm (see tractor operational instructions or measure)
- ▶ Distance (c) from centre of rear axle to the coupling point:  
 $c = \dots\dots\dots$  mm (see tractor operational instructions or measure)
- ▶ Distance (d) from the rear coupling point to the centre of gravity ( $G_H$ ) of the machine combination:  
 $d = \dots\dots\dots$  mm (measure)
- ▶ Front axle load of unloaded tractor ( $T_V$ ):  
 $T_V = \dots\dots\dots$  kg (see tractor operational instructions)
- ▶ Rear axle load of unloaded tractor ( $T_H$ ):  
 $T_H = \dots\dots\dots$  kg (see tractor operational instructions)
- ▶ Tare weight of the tractor ( $T_L$ ):  
 $T_L = \dots\dots\dots$  kg (see tractor operational instructions)
- ▶ Calculate minimum front ballast ( $G_{V\min}$ ) and enter it in the table of values above.  
 $G_{V\min} = (G_H * (c + d) - T_V * b + 0.2 * T_L * b) / (a + b)$   
.....
- ▶ Calculate the actual front axle load ( $T_{V\text{act}}$ ) and enter it in the table of values.  
 $T_{V\text{act}} = G_V * (a + b) + T_V * b - G_H * (c + d) / b$   
.....
- ▶ Enter the value for the permissible front axle load ( $T_{V\text{perm}}$ ) according to the tractor operating instructions in the table of values.
- ▶ Calculate the actual total weight ( $G_{\text{act}}$ ) and enter it in the table of values.  
 $G_{\text{act}} = G_V + T_L + G_H$   
.....
- ▶ Enter the value for the permissible total weight ( $G_{\text{perm}}$ ) according to the tractor operating instructions in the table of values.
- ▶ Calculate the actual rear axle load ( $T_{H\text{act}}$ ) and enter it in the table of values.  
 $T_{H\text{act}} = G_{\text{act}} - T_{V\text{act}}$   
.....
- ▶ Enter the value for the permissible rear axle load ( $T_{H\text{perm}}$ ) according to the tractor operating instructions in the table of values.
- ▶ Double the permissible tyre load capacity according to the tractor operating manual or from the tyre manufacturer's documentation (two tyres per axle) and enter in the table of figures.

## Adjustment / conversion

Before starting work, carry out the adjustment and conversion work described below and/or check the machine for correct adjustment and equipment.

### TIP

Careful adjustment of the machine preserves machine / soil and saves fuel!

### DANGER

**Catching and drawing in of the entire body can occur through moving machine parts when working on the machine.**

- ▶ All work must be carried out only when the drive is at a complete standstill.
- ▶ Before performing any work on the machine, secure against switching back on.
- ▶ Long, loose hair or loose clothing is not permitted while working.
- ▶ Direct people out of the danger area.
- ▶ Only operate the machine when all safeguards are properly fitted, undamaged and in the protective position.
- ▶ During operation, never allow anyone to enter the danger zone of the moving machine parts.

### WARNING

**Crushing, cutting, getting caught and knocks possible over the whole body!**

Danger exists during all adjustment work due to heavy machine components, some of which are under spring pressure, as well as sharp-edged components.

- ▶ Adjustment work must only be carried out by suitably qualified staff.
- ▶ Wear the appropriate personal protective equipment (such as work gloves, protective goggles, etc.) when working.
- ▶ Observe operating safety and accident prevention regulations.
- ▶ Direct people out of the danger area.

### WARNING

**Danger of burns!**

During operation, machine parts (such as the gearbox, bearings, etc.) can become very hot (>45 °C) and remain hot for a long time!

- ▶ During operation and directly after operation, do not touch the gearbox and bearings etc. without personal protective equipment (such as gloves, long work clothes, etc.).

## Lower link rocker setting

To adapt the machine optimally to the tractor, the headstock is equipped with adjustable lower link rocker arms.

## Operation

### TIP

To move the centre of gravity of the combination as far forward as possible, the cultivator must be mounted as close to the tractor as possible.

## Determining the optimum mounting position

### Prerequisite

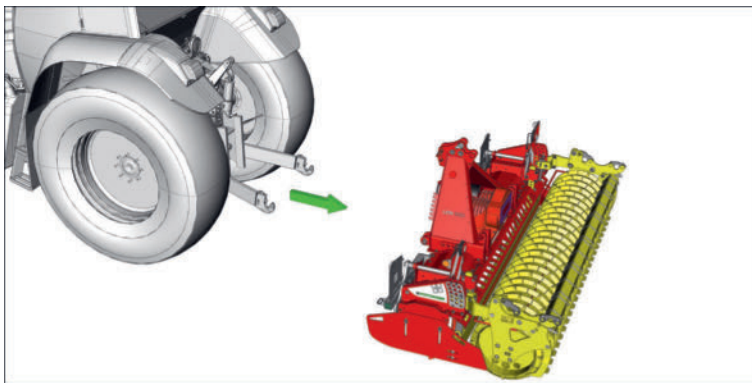
- Hitching up cat. III, width II or III
- Suitable tractor (see chapter Technical Data)
- Secure tractor's lower link against lateral swinging.
- Machine parked on flat, load-bearing ground.
- Track markers (optional) raised and transport safeguard fitted.
- Hydrolift (optional) raised and transport safeguard activated.
- Hydraulic top link (seed drill) (option) raised and tractor control device secured against unintentional operation.

### Implementation

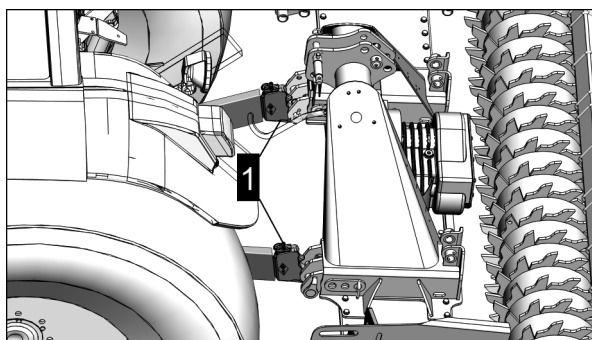
### CAUTION

#### Danger of injury through crushing!

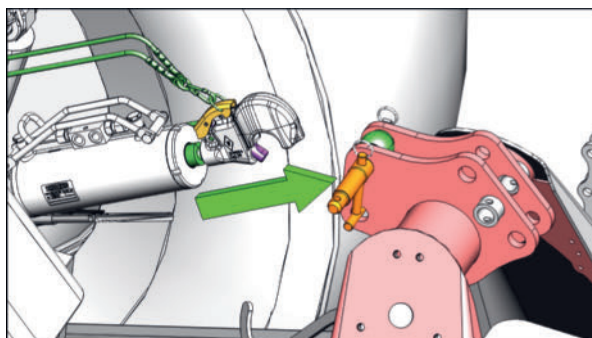
- ▶ Direct persons away from the danger area between tractor and machine as long as the tractor or machine parts can move.
- ▶ Install the top link and lower link balls on the top and lower link positioning pins.
  - ▷ Secure upper and lower link pins as stipulated.
- ▶ Drive the tractor up to the machine.



- ▶ Hook the lower link onto the lower link rocker arms (1) and secure as stipulated.



- ▶ Hook the top link on and secure as stipulated.

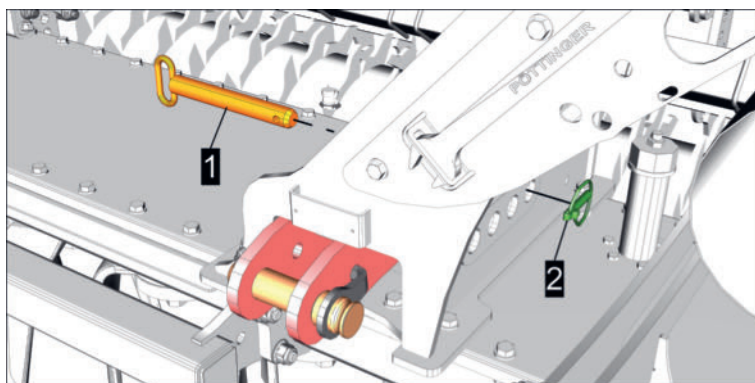


- ▶ Raise machine / machine combination slightly.
- ▶ Adjust the top link until the machine / machine combination is level with the ground.
  - ▷ Continue by raising the machine slowly and determine whether there is a risk of machine parts (especially hinged windows) colliding with the tractor.
  - ▷ Determine whether the distance of the machine from the tractor can be reduced without the machine parts colliding with the tractor.
- ▶ Lower the machine to the ground, uncouple the tractor from the machine and move it away from the machine.
- ▶ Then adjust the lower link rocker arms of the cultivator to the given minimum level.

### Adjust the lower link rocker arms

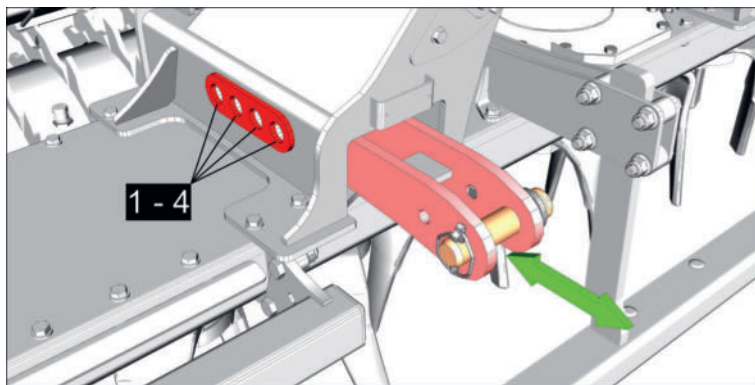
The setting is shown in the example of the right lower link rocker arm.

- ▶ Remove the linchpins (1) and locking bolts (2).



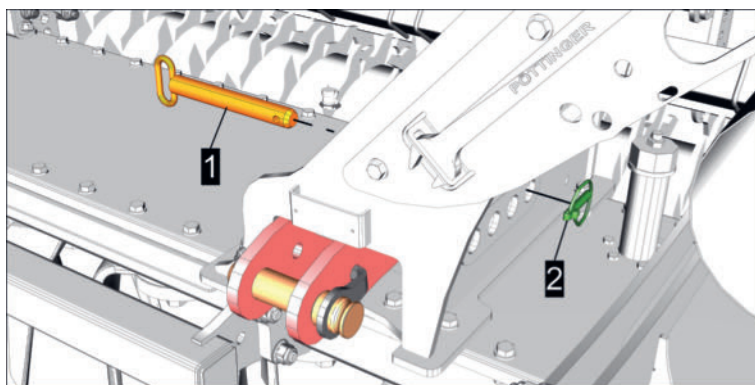
- ▶ Adjust the 4-way adjustable lower link rocker arm to the pre-determined distance.

## Operation



1 - 4 = possible locking positions

- ▶ Re-insert locking pins (1) and secure with linch pin (2).



- ▶ Carry out identical adjustments at both sides of the machine.

## Rotor speed setting

The rotor speed setting is selected via the PTO speed depending on the tractor output and the PTO speed.

### TIP

Recommended PTO speed = 1000 U/min The lowest torque occurs at this speed and this protects the drive components.

### Rotor speed adjustment with changeable gear set

The rotor speed can only be adjusted to personal requirements by means of a gear set with input gearboxes that can be fitted with a "through-drive" (not with CLASSIC gears).

### Change rotor speed

#### *Preparation*

- Gear set as required.
- Cleaning paper or similar
- Waste oil collecting pan

#### **Requirements**

- Machine is fully attached and secured to a suitable tractor.

- If a seed drill is attached, remove it from the rotary power harrow to be able to work on the rear side of the rotary power harrow gearbox.
- Hydrolift (if available) folded up and secured in road transport position. See "Hydrolift operation (optional)" on page 49.

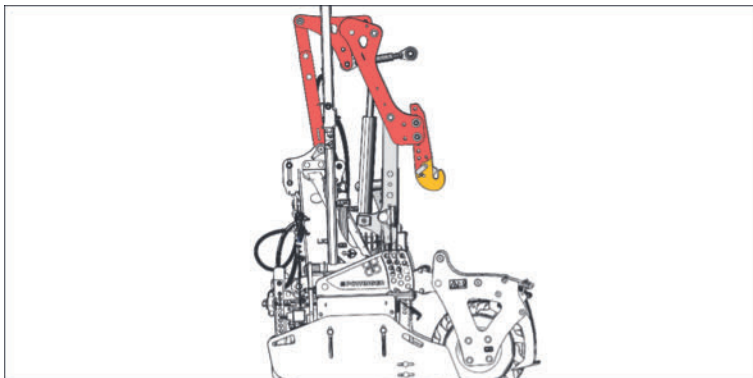
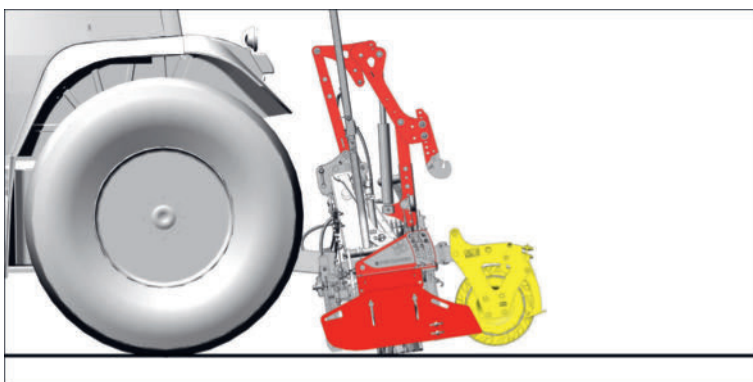


Fig.: Hydrolift in road transport position

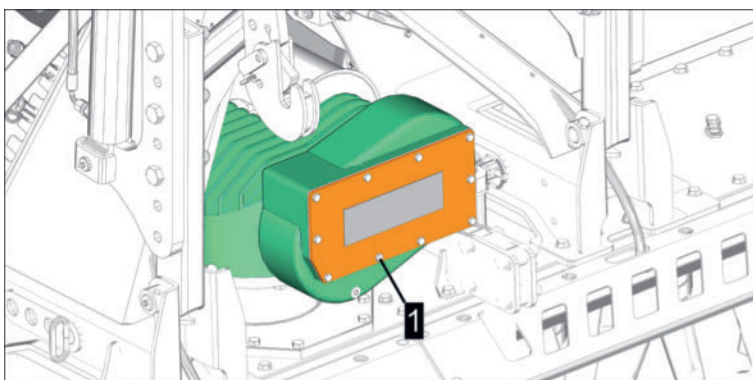
- Machine parked on level, stable ground in the working position, inclined slightly forwards and secured against rolling.



- Tractor motor turned off, parking brake applied, ignition key removed and stored.
- Drive shaft uncoupled from tractor.

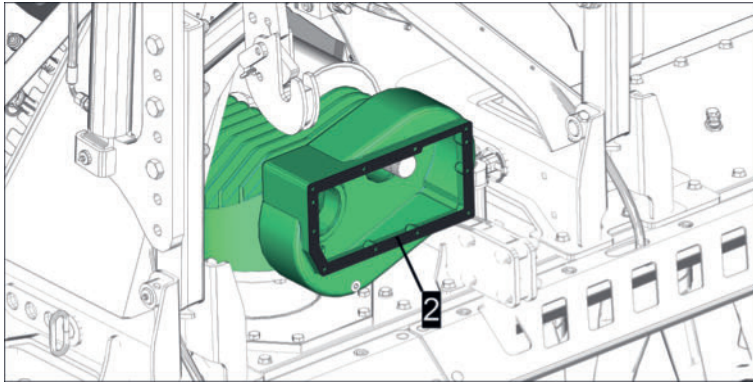
### Implementation

- ▶ Remove dirt from around the gearbox cover.
- ▶ Place waste oil collecting pan underneath the gearbox cover.
- ▶ Remove 10 screws (1) on the gearbox cover and remove the cover.



- ▶ Carry out a visual inspection on the gearbox cover (2).

## Operation



- ▷ Replace the seal with a new part if necessary. See the spare parts list.
- ▶ Remove gearwheels as required and replace with appropriate gearwheels from the gear set. See sticker on gearbox cover.


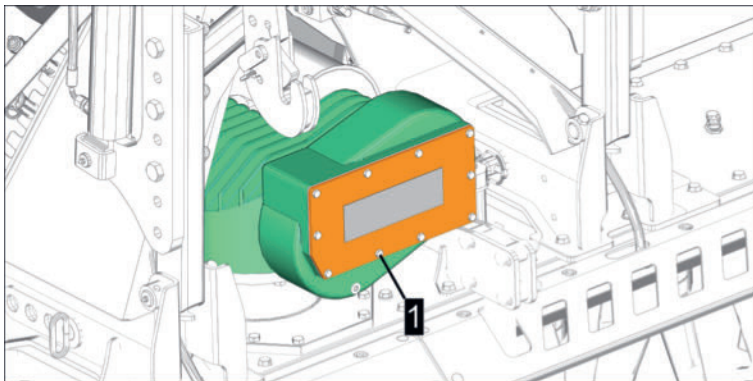
U/min (rpm)	495 790						U/min (rpm)
	Z 1	Z 2	Z 1	Z 2	Z 1	Z 2	
540	—	343	185	285	209	251	
750	212	—	256	395	290	349	
1000	283	—	342	527	387	465	

Fig.: Sticker on gearbox cover

Z1 / Z2 = gearwheel1 / 2

The numbers in the gearwheel symbols indicate the number of gear teeth.

- ▶ Replace gearbox cover paying attention to the cover seal (new if required).
- ▶ Tighten 10 screws (1) on gearbox cover.



### ENVIRONMENT

Remove old oil / oily impurities, etc. and dispose of them correctly.

## Manually adjust the working depth

The rotary harrow working depth is determined by the swing range of the mounted trailing implement. The upward swing range is limited by positioning bolts in the hole pattern of the frame.

### Prerequisite

- Machine is fully attached and secured to a suitable tractor.
- Any attached seed drill is raised and secured in road transport position via Hydrolift or hydraulic top link.
- Machine must be parked on level, stable ground in the working position and secured against rolling.
- Clean adjusting device / hole pattern if necessary.

### Implementation

- ▶ Raise machine with the rear power lift until the follow-on device can rotate freely.
- ▶ Secure the machine with suitable supports against unforeseen lowering and let it rest on the supports.



#### TIP

Support machine on frame or rear power lift, not on follow-on device!

- ▶ Turn tractor off, apply park brake, remove ignition key and keep safe.
- ▶ Adjust locking pins (2) on both sides of the machine to the same required working depth in the hole pattern and secure with linch pin (1).

#### ! NOTICE

#### Damage to follow-on device and fitting parts!

If the working depth is not set to the same level on both sides of the machine, the follow-on device guides and associated brackets on the soil tillage machine may be damaged during operation.

- ▶ Adjust follow-on devices to the same working depth on both sides of the machine.

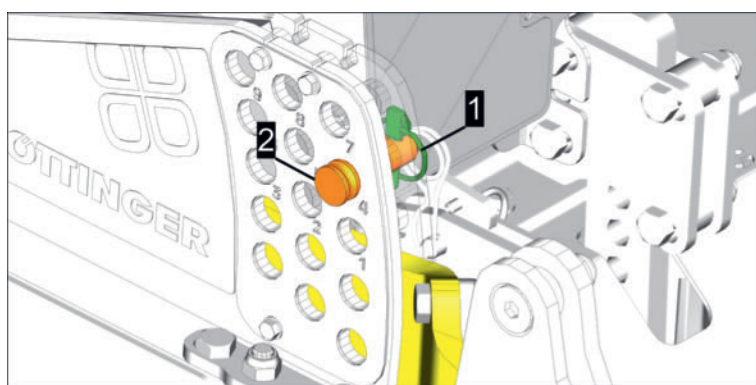


Fig.: Example setting here at level [4] in hole pattern

- ▷ The hole pattern allows the working depth of the machine to be adjusted (beginning at level [1] = lowest working depth to level [9] = greatest working depth) in steps of 25 mm.

## Operation

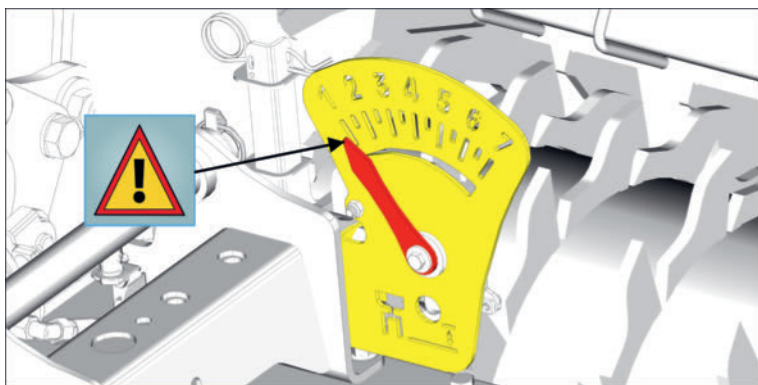
### Hydraulically adjust the working depth

The rotary harrow working depth is determined by the swing range of the attached trailing implement. In machines with hydraulic working depth adjustment, the swing range is set from the driver's seat using the tractor control device. The set working depth is shown by a pointer on the scale on the right side of the machine.

#### **⚠ WARNING**

##### **Risk of crushing!**

- ▶ Bystanders must keep a distance of at least 2 m from the machine when the working depth is being adjusted.



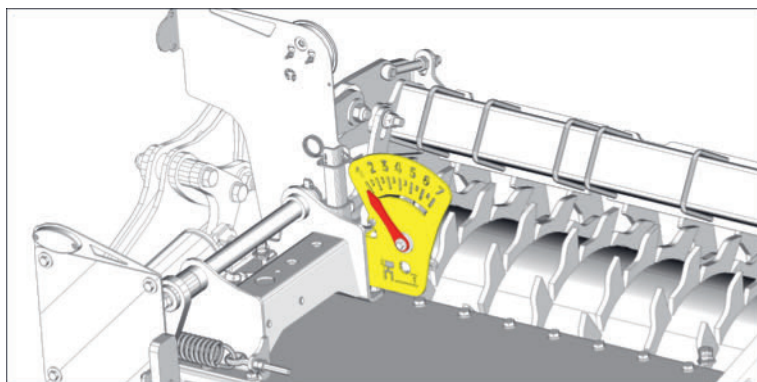
Scale and pointer

#### **Prerequisite**

- Machine is fully attached and properly secured to a suitable tractor.
- Park machine on level and stable ground in working position.
- Clean adjusting device if necessary.

#### **Implementation**

- ▶ Activate tractor control device and set follow-on device to the required value according to the pointer on the scale.



Pointer position 1 = lowest working depth

Pointer position 7 = greatest working depth

## Side shield settings

The side shields protect access to the outer rotor units and support seedbed preparation.

### TIP

Adjustments must be made in the field, because the working depth of the side guards should be adapted to the actual working depth of the soil cultivator.

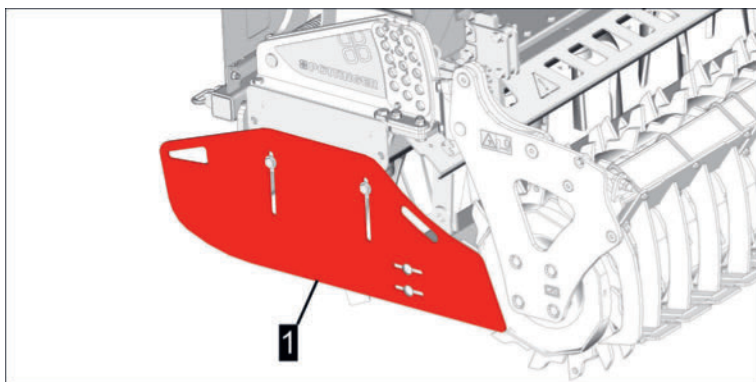


Fig.: 1 = left side shield

### Prerequisite

- Machine is fully attached and secured to a suitable tractor.
- Machine in field in working position and selected working depth.
- The machine must be in the field and already operating in the working position at the desired working depth.

### TIP

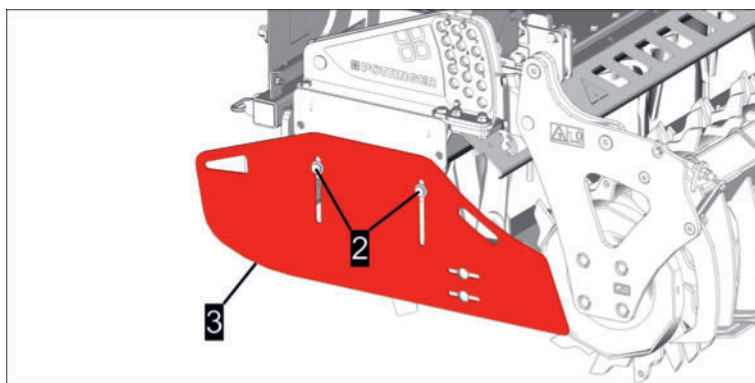
Carry out the adjustment on as level a piece of land as possible.

- Side shield in working position See "Side shield operation" on page 52.
- Tractor motor turned off, parking brake applied, ignition key removed and stored.

### Set the working depth

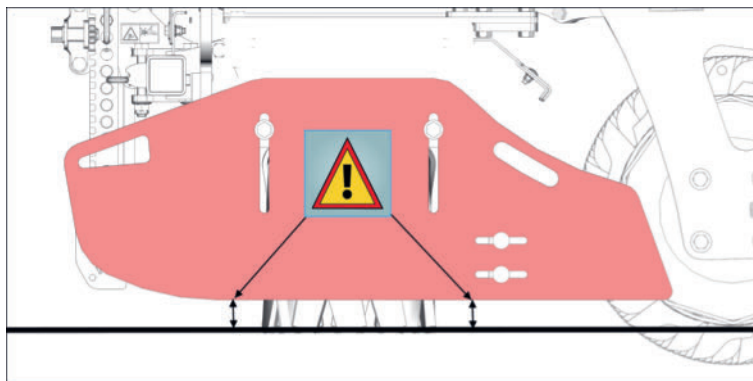
#### Implementation

- ▶ Loosen the screws (2) on the side guard and adjust the plate (3) vertically as required.

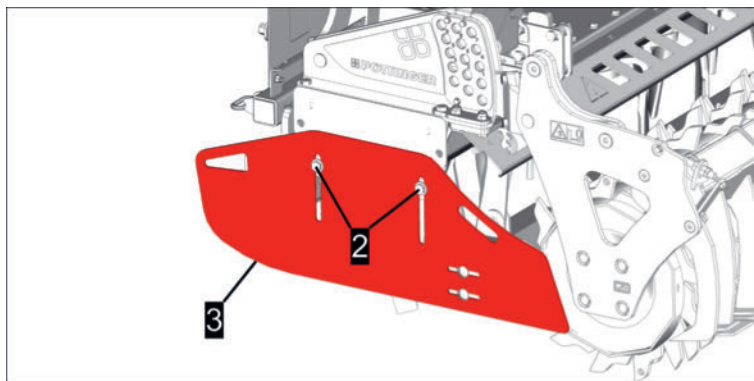


## Operation

- ▶ The side guard basic setting should be so that the lower edge of the side guard is set to a working depth of approx. 20 mm.



- ▶ Retighten bolts (2).



- ▶ Carry out the adjustment similarly on both sides of the machine.
- ▶ Check the setting after the first few metres of field work and repeat the setting procedure if necessary.

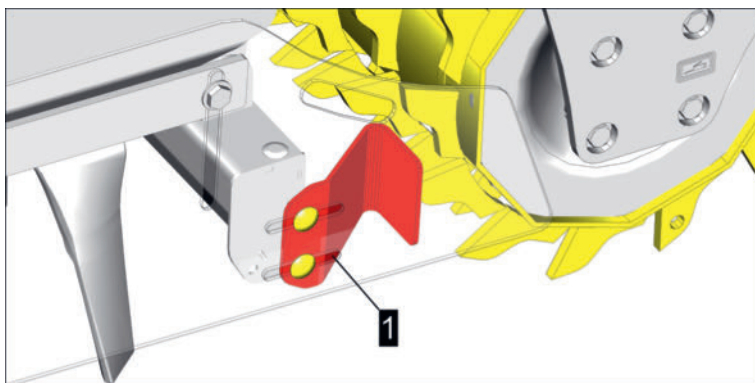
### Set the guide plate

The guide plate (1) prevents ridging in the edge area of the trailer, can be adjusted horizontally on the side shields and must be adapted to the trailer when the latter is changed.

#### ! NOTICE

##### Damage to guide plates, side shields and trailers!

- ▶ Adjust the distance between the guide plates and the trailer so that the guide plates cannot collide with the trailer.

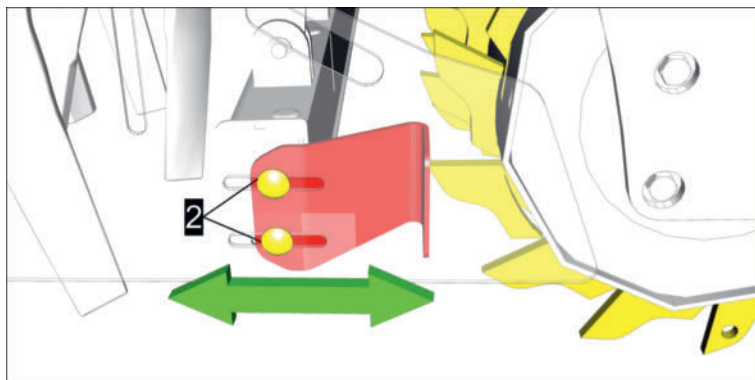


 TIP

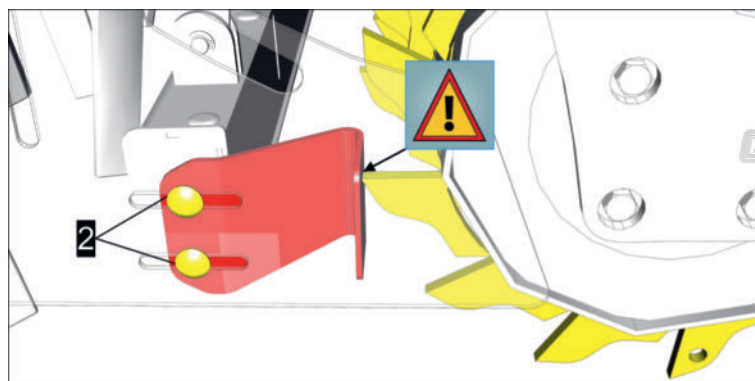
The guide plate setting is presented below as an example on the left side of the machine based on a trailer with a packer roller.

**Implementation**

- ▶ Loosen screws (2) and move guide plate horizontally (1) as required.



- ▷ Move the guide plate so that it does not collide with the trailer in operation!  
Retighten bolts (2).



- ▶ Carry out the procedure in the same way on both sides of the machine

**Levelling board working depth setting**

The machine is factory fitted with a rear levelling bar (front levelling bar is optional). The levelling bar height is manually adjustable in the hole pattern (in 30 mm increments).

 TIP

The rear levelling bar serves to keep coarse lumps of soil (clods) in the area of the rotors until they have been sufficiently crushed.

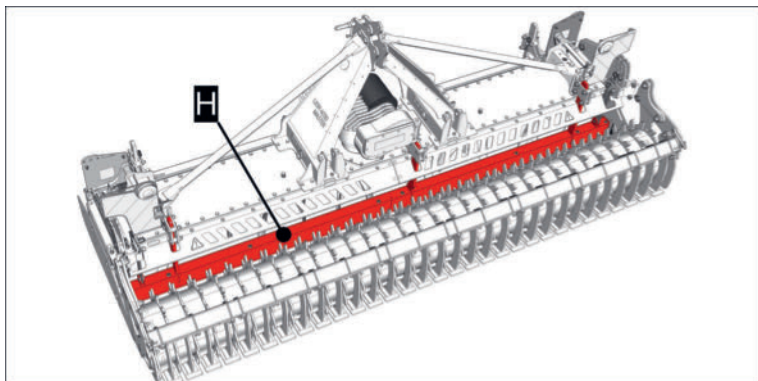
The working depth of the rear levelling bar must be set so that the desired degree of crumbling is achieved, and soil levelling keeps the drive torque on the trailing implement as low as possible.

## Operation

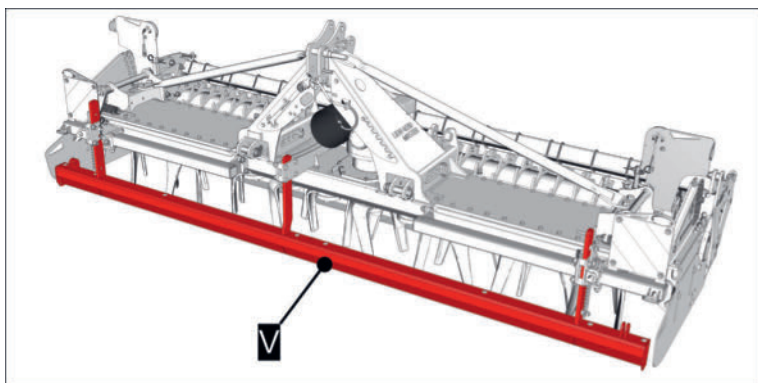
### TIP

The front levelling bar is used to level out uneven ground surfaces.

The front levelling bar working depth must be set so that it always pushes a small earth wall in front of it in the middle. This means that there is always material available to level out any unevenness.



Rear levelling bar (standard)

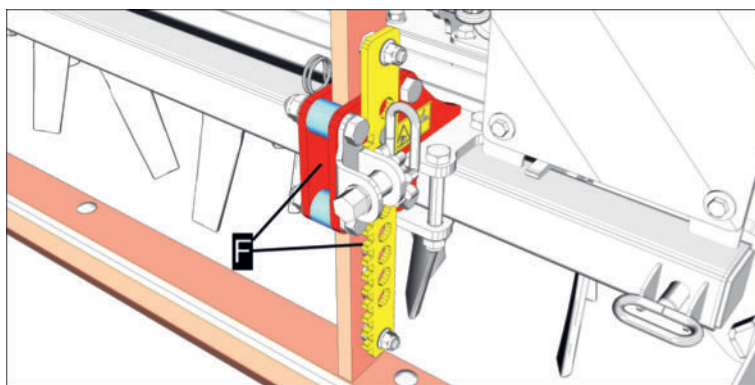


1 = front levelling bar (option)

Cannot be used together with wheel mark eradicator

### Requirements

- Machine is fully attached and secured to a suitable tractor.
- Any attached seed drill is swivelled into working position.
- The machine must be in the field and already operating in the working position at the desired working depth.  
Carry out the adjustment on as level a piece of land as possible.
- Machinery parked in operating position, and secured against rolling and unintentional operation.
- Levelling bar guides (F) cleaned on both sides of the machine. This makes the adjustment easier and prevents clamping.



### Adjust levelling bars

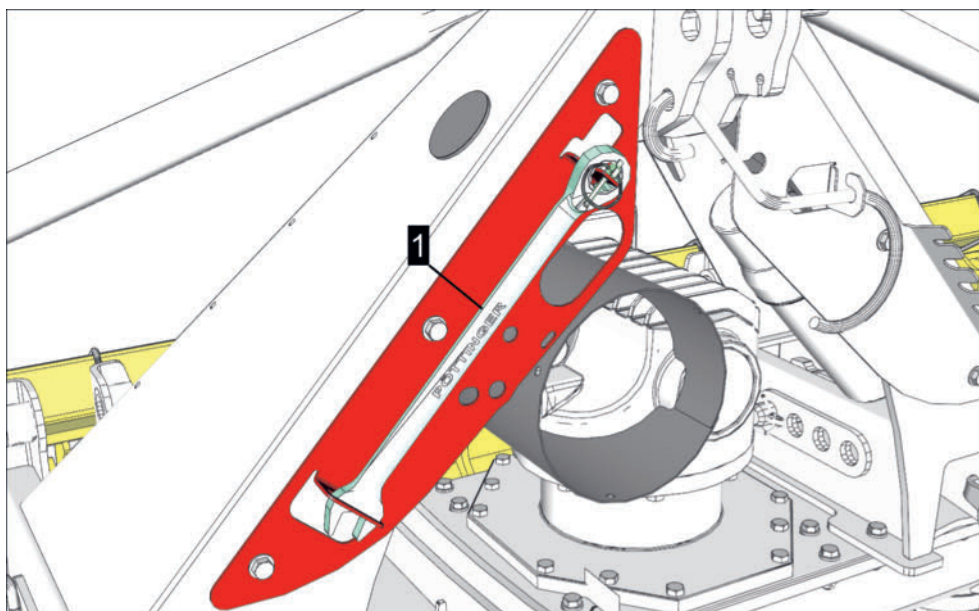


**TIP**

The levelling bar adjustment is shown below as an example with the front levelling bar. The rear levelling bar is adjusted in the same way.

### Implementation

- ▶ Take ratchet brace ring spanner (1) out of park position, keep linch pin handy.



- ▶ Remove linch pins (2) on both sides of the machine.

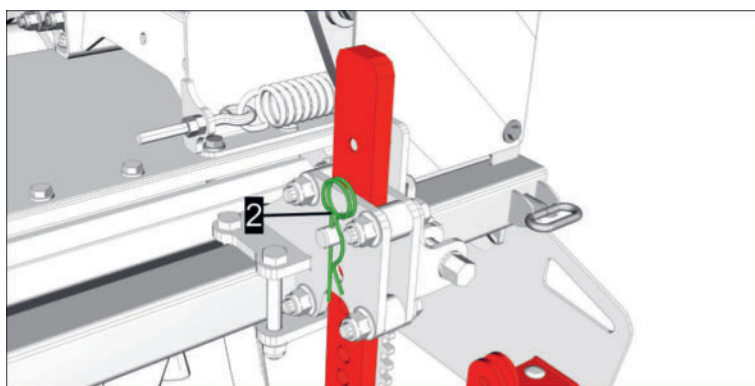
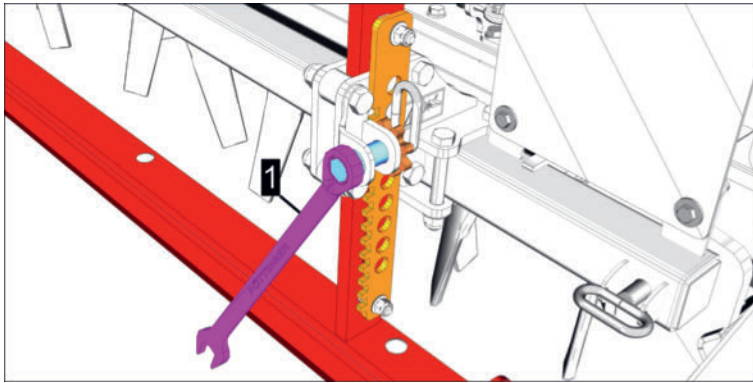


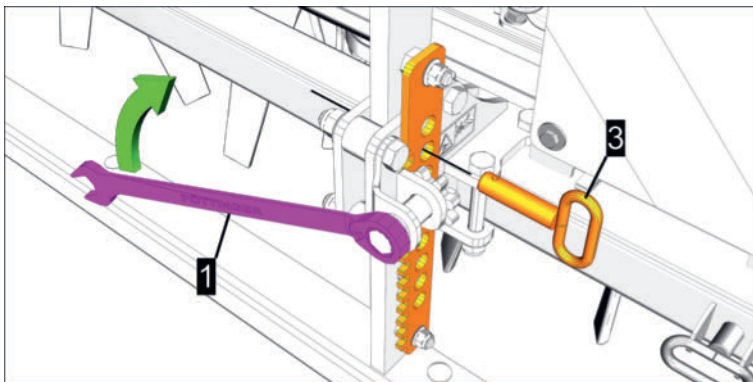
Fig.: Example of front impact bar on left side of the machine

## Operation

- ▶ Insert ratchet brace ring spanner (1) as shown and hold with one hand.



- ▶ Remove the locking pin (3) with the other hand.



- ▷ If the locking pin cannot be removed, release the locking pin (3) by slightly raising the impact bar with the ratchet brace ring spanner (1).
- ▶ Activate ratchet brace ring spanner as required and raise / lower the impact bar in small increments.

### TIP

If the impact bar is shifted in large increments, it may tilt in the guide!

- ▷ Insert the locking pin in the desired position.
- ▶ Remove ratchet brace ring spanner and carry out the adjustment on the opposite side of the machine in the same way and at the same pinning height.
- ▶ Re-attach the linch pin to the locking pin.
- ▶ After the adjustment work has been completed, return the ratchet brace ring spanner to park position and secure it with a linch pin.

## Adjust Hydrolift

To prevent collisions between an attached PÖTTINGER seed drill and the rotary power harrow follow-on device, the Hydrolift can be adapted to the soil tillage machine and the follow-on device used.

### TIP

The setting must be carried out again when changing the trailing implement or the seed drill.

**Prerequisite**

- Machine is parked on level, stable ground and secured against rolling away.
- Hydrolift lowered in working position.
- Seeder removed (if present).

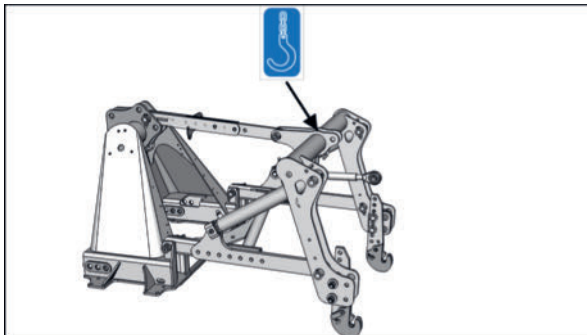
**Implementation**



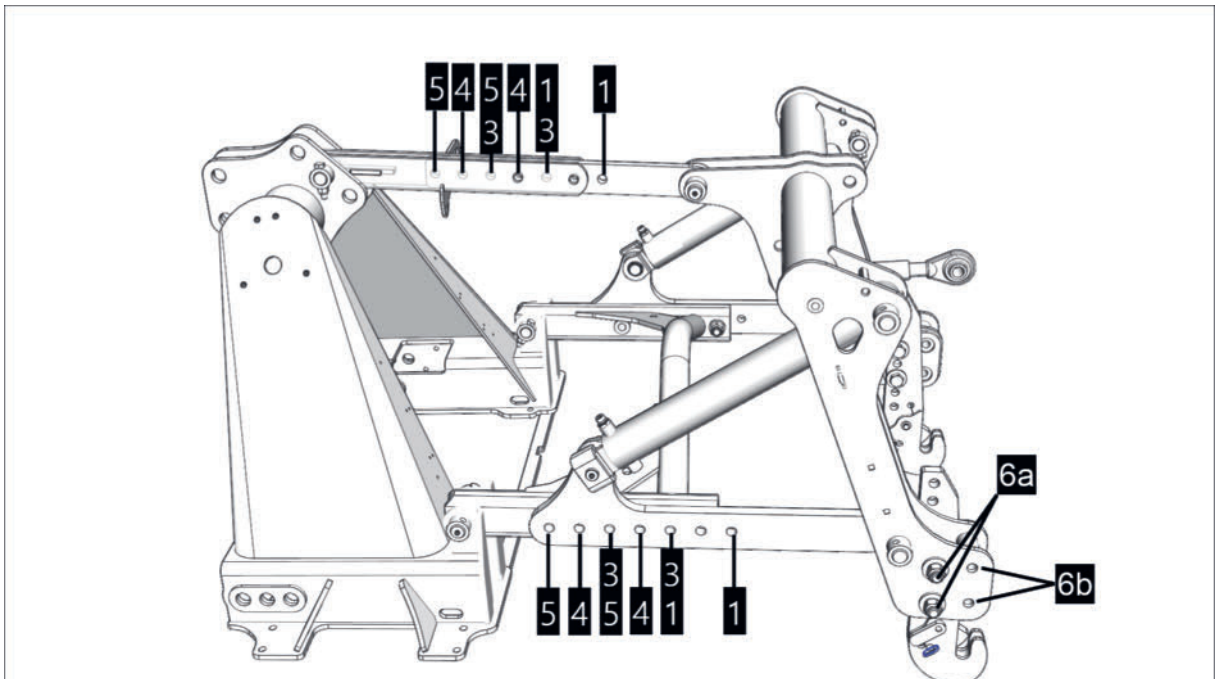
**TIP**

Always set the same hole distances on the upper and both lower support arms!

- ▶ When mounting, secure the Hydrolift against accidental lowering at the point shown with a sling or a suitable support stand.



- ▶ Change the distances if necessary, as shown in the illustration.



1 - 6b = see table below for hole allocation

## Operation

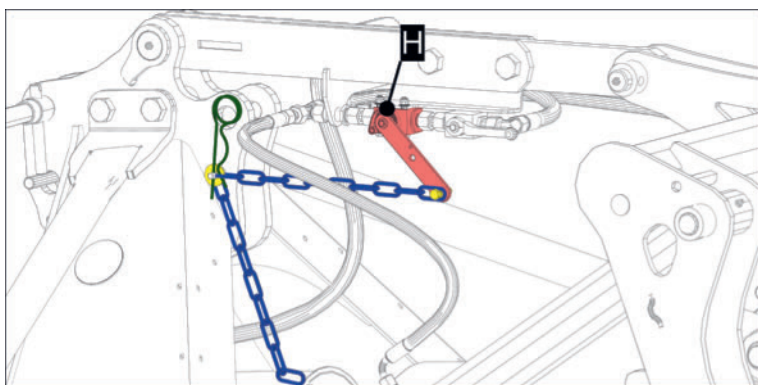
### Allocation of holes to machines and follow-on devices

Hole nos.	Machine	Trailing implement type	Follow-on device dimensions
1	LION / FOX Tine	Toothed packer roller	420
		Cage roller	420
		Cage roller	540
3	LION / FOX Tine	Toothed packer roller	500
		Cutting packer roller	550
		Prism packer roller	500
	FOX Disc	Toothed packer roller	420
		Cage roller	420
		Cage roller	540
4	LION / FOX Tine	Toothed packer roller	550
		Topsoil packer roller	525
5	LION / FOX Tine	Rubber packer roller	585
		Prism packer roller	600
	FOX Disc	Toothed packer roller	500
		Cutting packer roller	550
		Toothed packer roller	550
		Prism packer roller	500
	Topsoil packer roller	525	
6a	Can be used with all the machines referred to above	Can be used with all the follow-on devices referred to above	Can be used with all the dimensions referred to above
6b	FOX Disc	Toothed packer roller	550
		Prism packer roller	500
		Topsoil packer roller	525
	LION	Prism packer roller	600

- Tighten the screws to 500 Nm using a torque wrench.

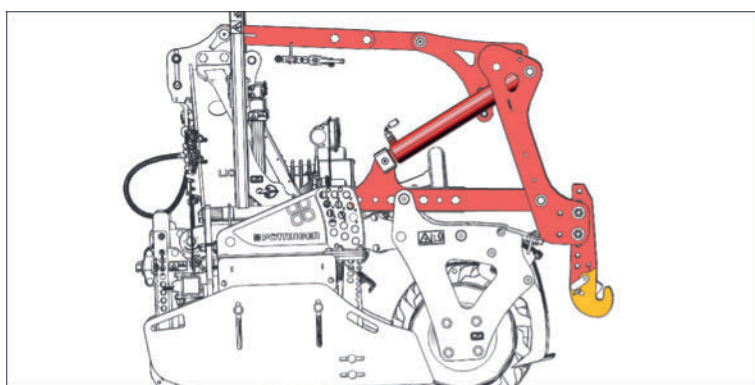
#### Adjust lift limiter (optional)

The lift limiter (H) enables the maximum Hydrolift travel to be limited to an adjustable range.



### Requirements

- Machinery parked in working position.
- Hydrolift lowered in working position.



- Machiner secured against rolling.
- Hydrolift assembled (optional).
- Lift limiter assembled (optional).

### Implementation

- ▶ Secure the transport safeguard locking lever (A).

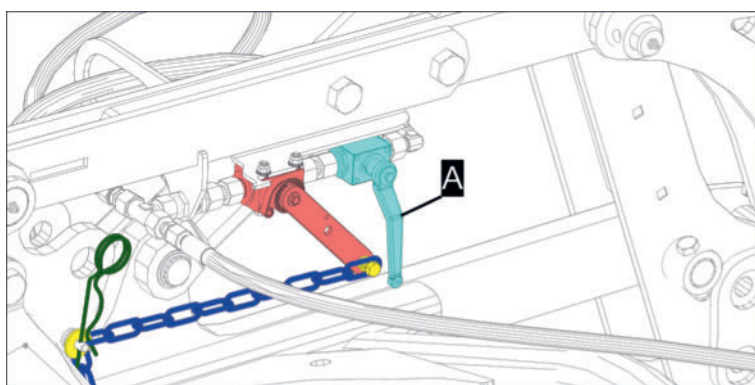
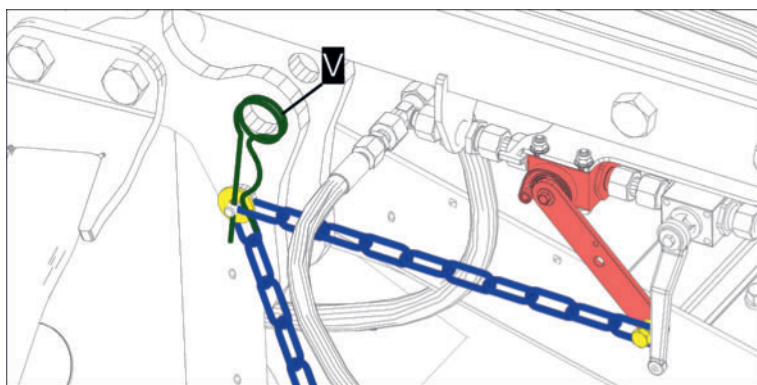


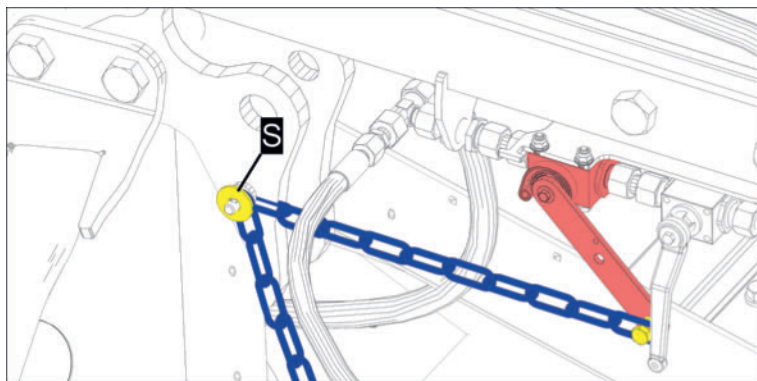
Fig.: Locking lever closed

- ▶ Remove the linchpin (V).

## Operation



- ▶ Remove washer (S).

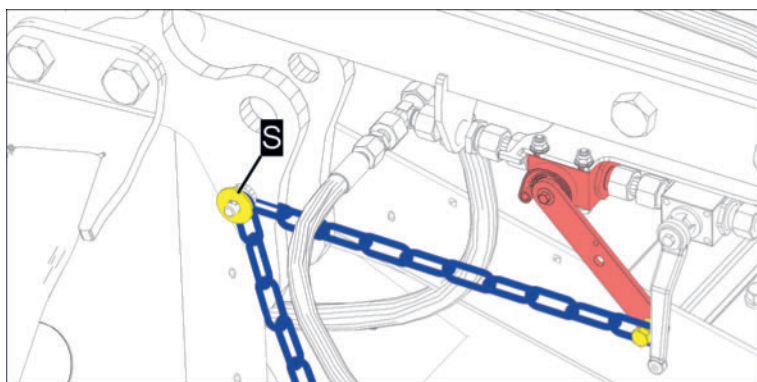


- ▶ Unhook the chain and hook it up again one link longer / shorter.

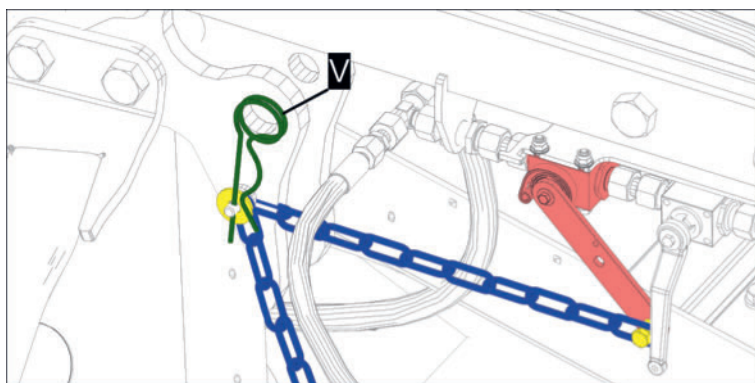
### TIP

The longer the chain between the locking position and the valve lever, the later the valve switches off and the higher the lifting height of the Hydrolift.

- ▶ Insert washer (S) again.



- ▶ Replace linchpin (V).



- ▶ Open shut-off lever (A) for transport safeguard and check the setting by carrying out a test run on the Hydrolift.

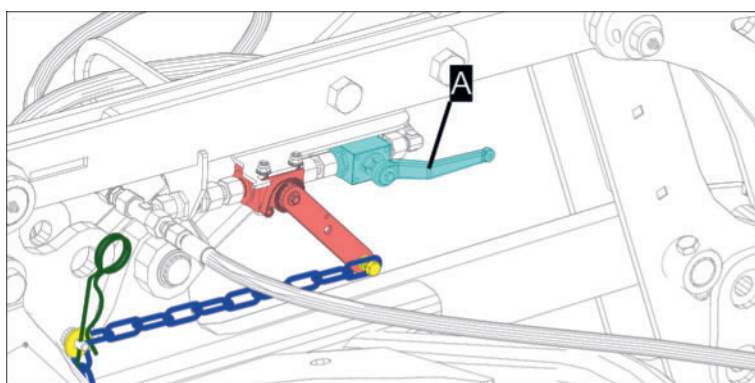


Fig.: Shut-off lever (A) open.

**NOTICE**

**Danger of machine parts colliding!**

- ▶ Carry out test run slowly whilst constantly observing potential collision points.

- ▷ Repeat the adjustment process if potential collision points remain.

**Deactivate / activate lift limiter**

In order to deactivate the lift limiter, the chain must be re-suspended as described below.

- ▶ Secure the transport safeguard locking lever (A).

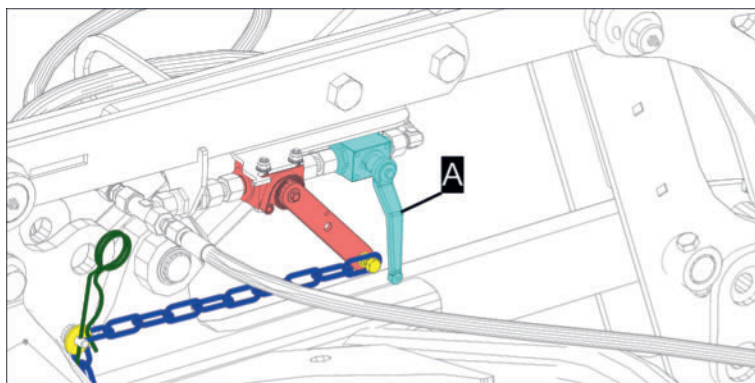
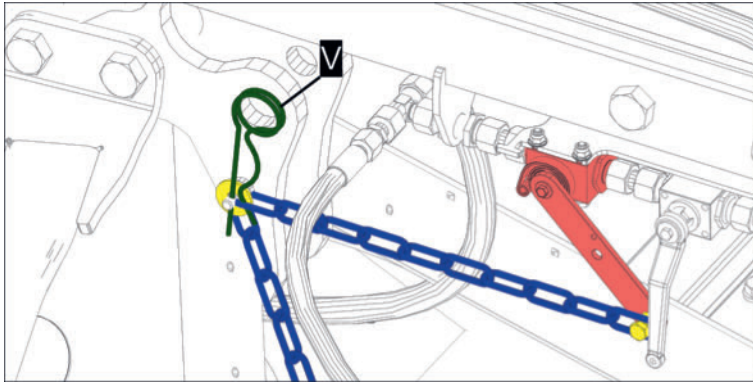


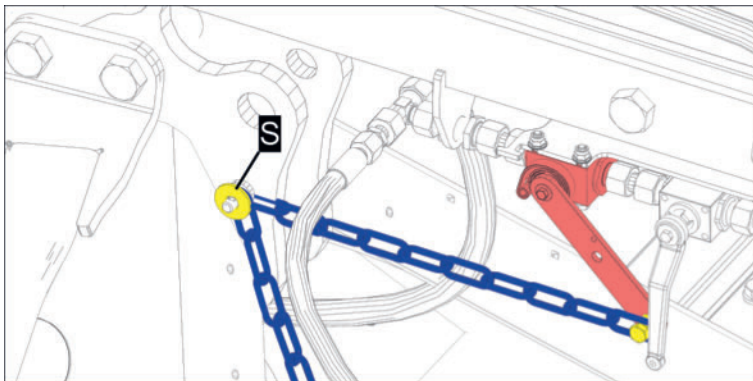
Fig.: Locking lever closed

- ▶ Remove the linchpin (V)

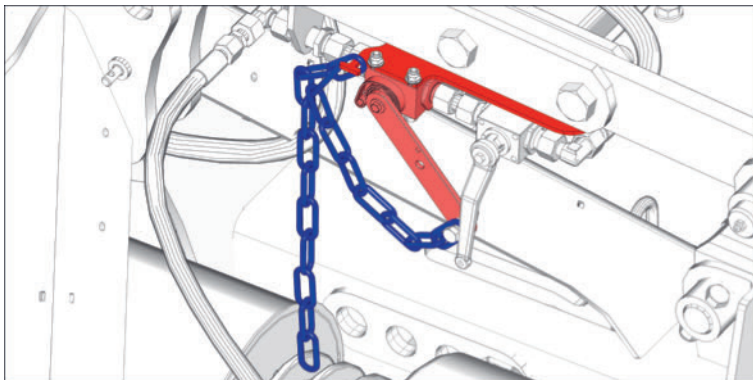
## Operation



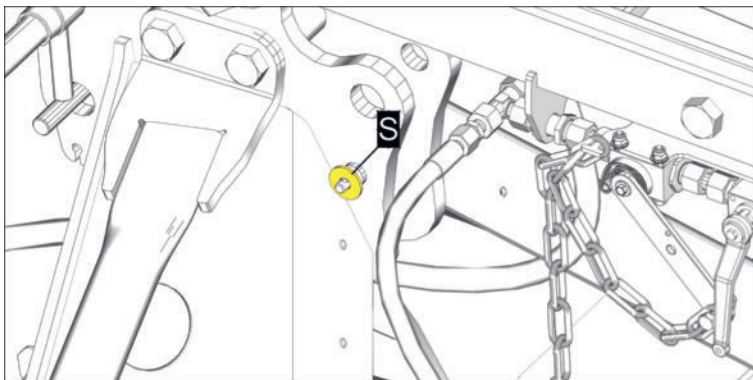
- ▶ Remove washer (S).



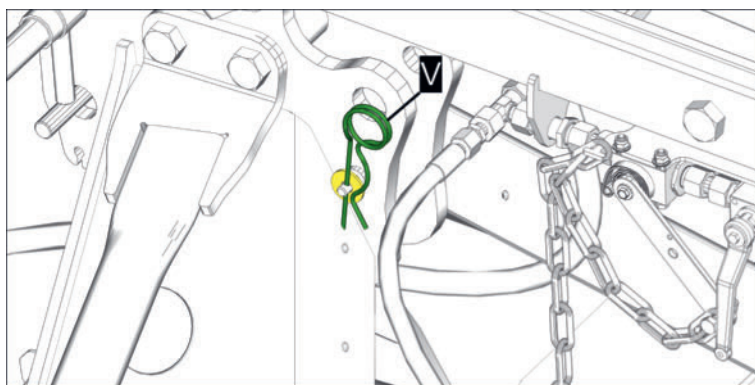
- ▶ Unhook the chain and hook it on the hook (H) above the lift limiter so that it cannot work loose and catch on other machine parts.



- ▶ Insert washer (S) again.



- ▶ Replace linchpin (V).



- ▶ Release the transport safeguard locking lever (A) if necessary.

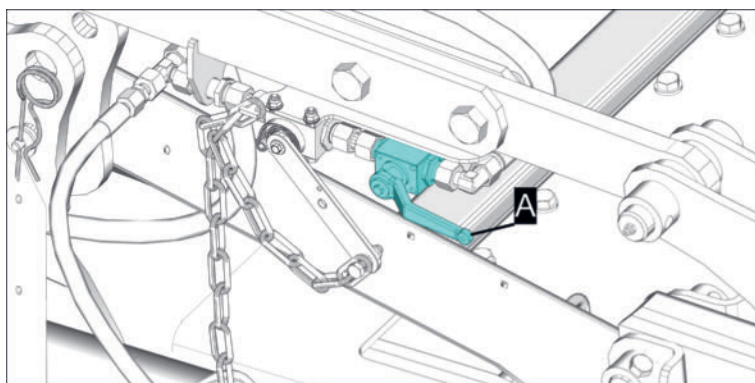


Fig.: Locking lever open

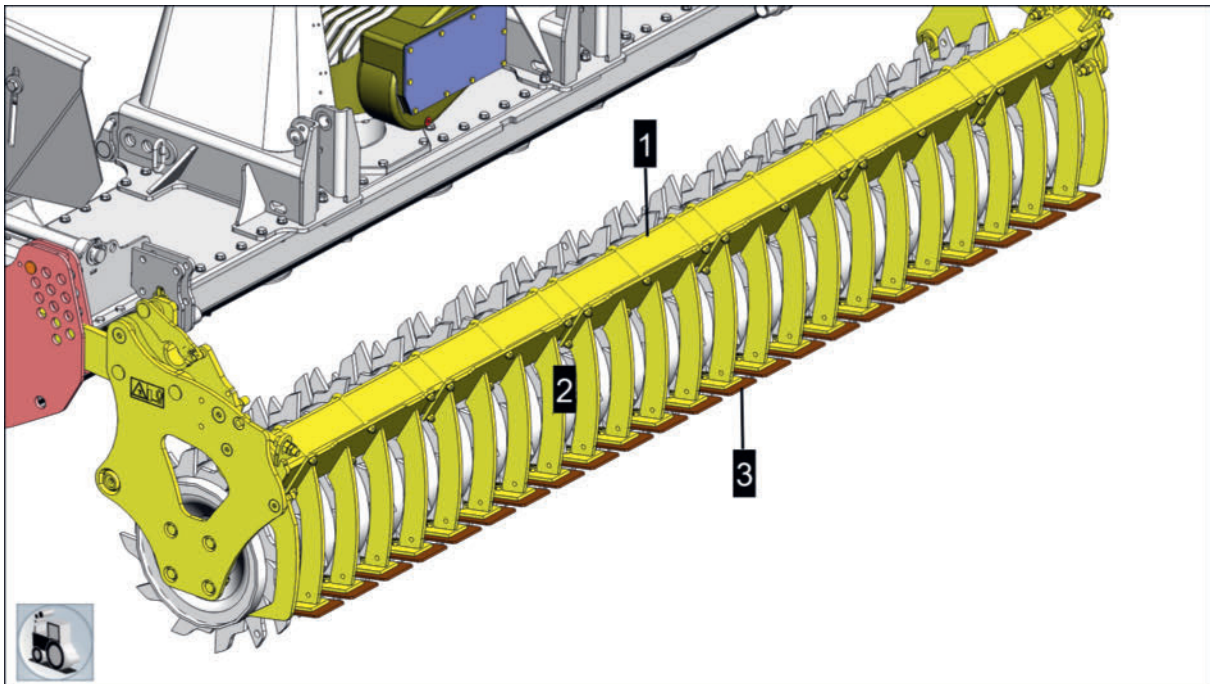
- ▷ Activate lift limiter: Carry out process in the reverse order.

## Adjust the scraper plates on the trailing roller

Scraper plates prevent soil from sticking in the roller gaps.

The scraper plates can all be adjusted simultaneously via the adjustment mechanism on the scraper crossmember or individually for each scraper

## Operation



- 1 = Scraper crossmember  
2 = Scraper holder  
3 = Scraper plate

### TIP

Adjustment is recommended when the cleaning effect of the scrapers visibly decreases.

The individual adjustment of scraper plates is normally only carried out if individual scraper plates have to be replaced.

## Adjust scraper plate crossmember

### Prerequisite

- Machine is attached correctly to a suitable tractor and properly secured.
- Any attached seed drill is raised and secured in transport position via Hydrolift or hydraulic top link.
- Any attached seed drill with manual top link has been removed from the cultivator.
- Park the machine on level and load-bearing ground in the working position, and secure it against rolling.

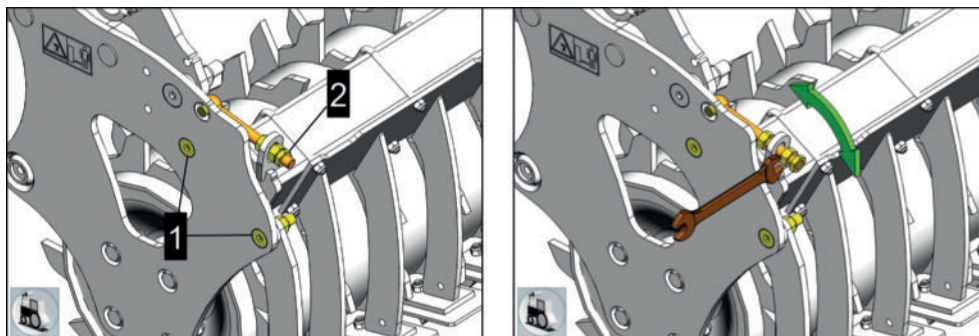
### Implementation

- ▶ Raise the machine using rear power lift.
  - ▷ This relieves the load on the trailing implement and it lowers.
- ▶ Raise the machine so far until the trailing implement is freely suspended and no longer rests on the ground.
- ▶ Secure the machine with suitable supports against unforeseen lowering and let it rest on the supports.

**TIP**

Support the machine and not the trailing implement, otherwise in some circumstances the trailing implement may not be able to be turned to check the setting.

- ▶ Turn tractor off, apply park brake, remove ignition key and keep safe.
- ▶ Loosen bolts (1) on both sides of the machine.  
Loosen lock nuts (2) on both sides of the trailing roller.



- ▶ Turn the adjusting nuts on both sides of the machine and set the desired (smallest possible) distance between the scraper plates and the roller.
- ▶ Rotate the roller to check. The scraper plate must not touch the roller.
- ▶ If necessary, reset and recheck.
- ▶ If the setting is correct, then retighten the lock nuts (2) and the loosened bolts (1).

**Adjust scraper plates individually**

**Implementation**

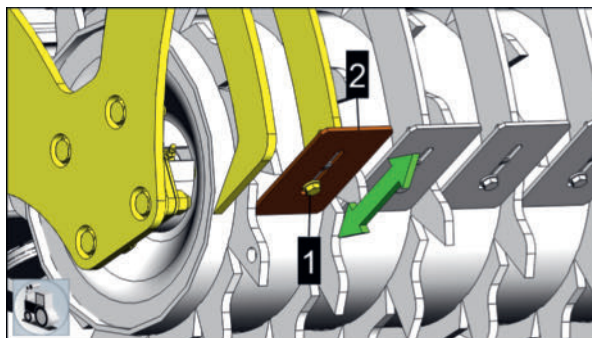
- 1 Raise the machine and release the trailing implement until it is no longer resting on the ground.
- 2 Secure the machine with suitable supports against unforeseen lowering and let it rest on the supports.

**TIP**

Support the machine and not the trailing implement, otherwise in some circumstances the trailing implement may not be able to be turned to check the setting.

- 3 Turn tractor off, apply park brake, remove ignition key and keep safe.
- 4 Loosen the bolts (1) on the scraper plate.  
Set the scraper plates (2) to the closest possible distance from the roller without touching the roller.

## Operation



Symbol illustration

- 5 Turn the rollers manually several times to check. The scraper plate must not touch the roller.
- 6 If necessary, reset and recheck.
- 7 Correct setting: Tighten bolts (1).
- 8 Carry out the same procedure on every scraper plate.

### Adjusting the track marker (optional)

Adjustments may be necessary if the seed type is changed or a switch is made from precision seeding to drill seeding, or vice versa.

The track marker (option) alternately marks the next lane during the sowing operation.

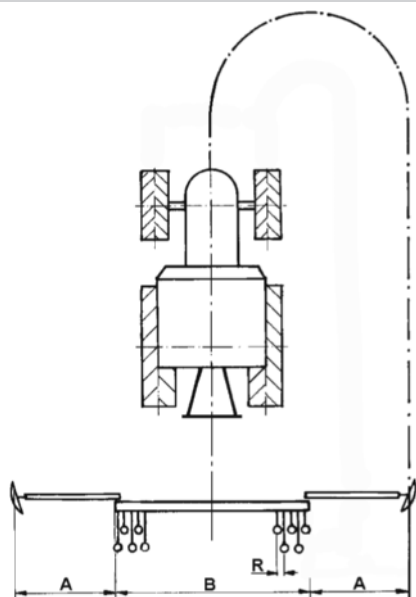
To adjust the track marker, first calculate the marking distance and then adjust the track marker to the calculated dimension.

#### TIP

Track markers (option) mounted on the cultivator serve as a replacement for any missing track markers on the seed drill. When the cultivator is used alone, the track markers are normally not required / used.

## Track marker- marking distance calculation

### Marking distance to "Tractor middle"



#### Calculation example:

Distance setting  $A = (B + R) / 2$

Working width  $B = 300$  cm

Row distance  $R = 12.5$  cm

$A = (300 + 12.5) / 2 = 156.25$

Distance setting is approx. 156 cm

## Adjusting the track marker marking distance

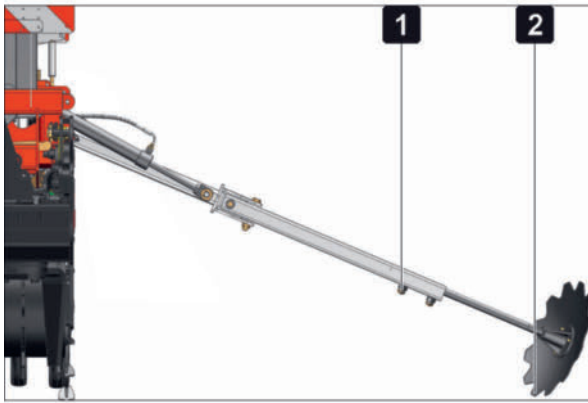
### Requirements

- Machine is fully attached and secured to a suitable tractor.
- Park tractor and machine on level and stable ground in working position and secure against rolling.
- One of the track markers is lowered in working position.
- Transport safeguard deactivated on both track markers.
- Tractor motor turned off, parking brake applied, ignition key removed and stored before working on the machine.

### Implementation

- 1 Remove transport safeguard from both track markers.
- 2 Loosen the fixing screws (1) of the marker disc.

## Operation



Symbol illustration

- 3 Adjust the marker disc (2) to the calculated marking distance for these machine sides.
- 4 Re-tighten the previously loosened attachment (1).
- 5 Carry out similar adjustments with the opposite track marker.
  - ▷ The shearing action of the marker disc can then be adapted to the soil conditions.

### TIP

The most appropriate setting is determined during operation.

### Adjusting the bout marker disc

If the marked track is poorly visible, then adjust the marker disc in a deeper position.

### TIP

By adjusting the marker disc, the marked bout width is also changed. Measure the marking distance and correct if necessary.

### NOTICE

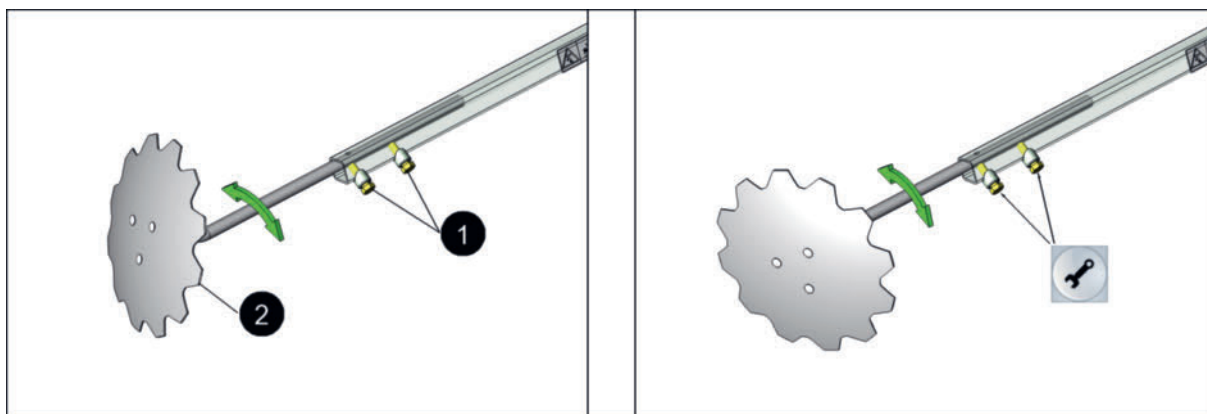
#### **Danger of machine parts colliding!**

If the seed drill is equipped with a seed hopper extension, collisions can occur between the marker disc and the seed tank at certain marker disc settings.

- ▶ When folding up the bout marker, watch out for possible collisions. Change the marker disc setting so that the marker disc cannot collide with the seed hopper extension.
- ▶ Adjust the marker disc so that it does not rest on the seed tank in road transport / head-land position.

### Implementation

- 1 Loose the hexagonal bolt (1) on one of the two track markers.



- 2 Adjust marker disc (2) as required.
- 3 Tighten the hexagonal bolt (1).
- 4 Carry out the adjustment similarly on both sides of the machine.

#### TIP

The most appropriate setting is determined during operation.

## Functional enhancement with additional machines

Assemble possible additional machines according to the manufacturer's specifications.

#### NOTICE

##### Damage due to overloading!

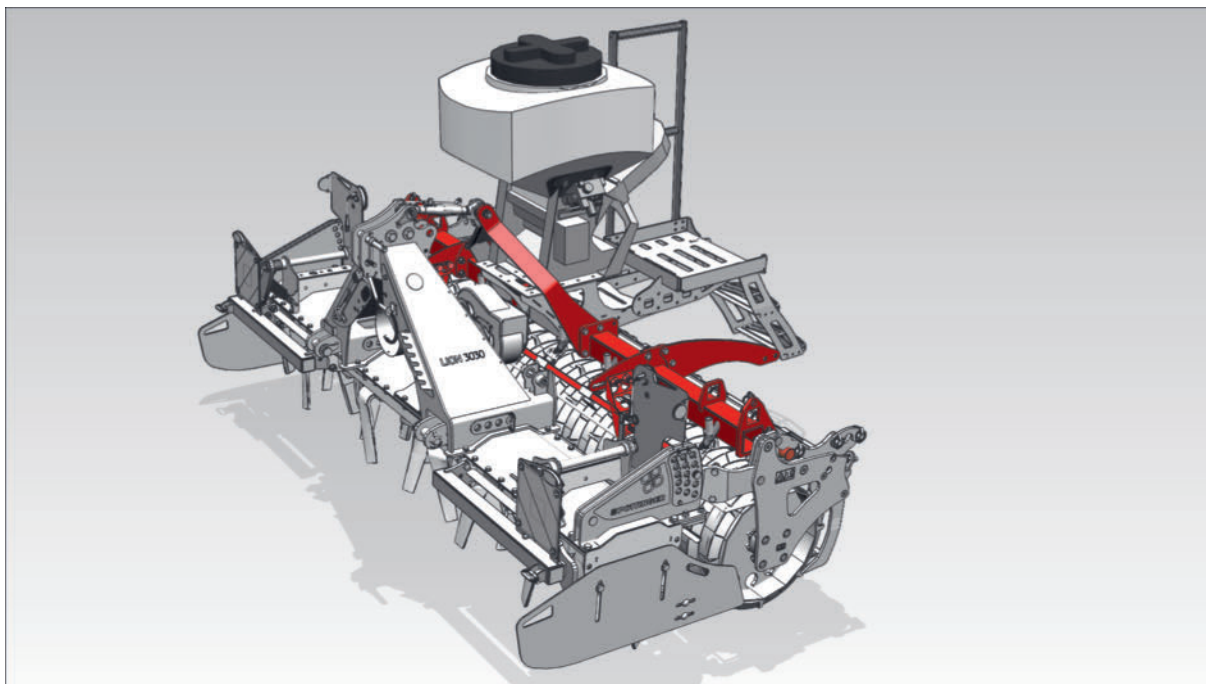
- ▶ Do not overload the machine Contact PÖTTINGER customer service for advice in case of doubt.
- ▶ Observe the power limits of the tractor used.

#### Set up TEGOSEM cover crop seed drill on follow-on device

The setting up of a TEGOSEM seed drill (with manual top link) on a soil tillage machine with prism packer roller is described below.

The set-up is more or less the same for all types of PÖTTINGER follow-on device.

## Operation



### TIP

A top link suitable for the corresponding PÖTTINGER seed drill and the follow-on device roller diameter must be used in the set-up according to the table below.

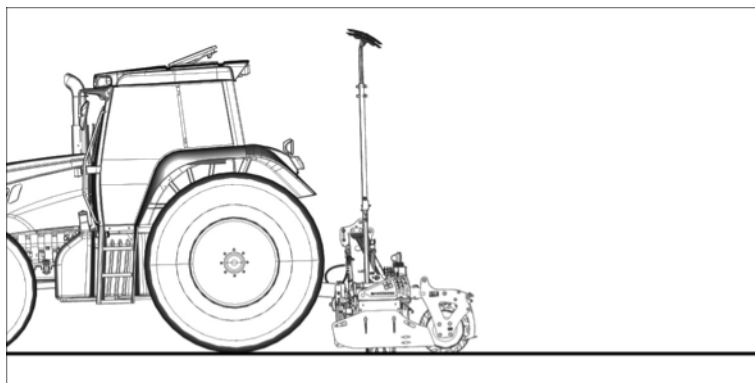
### Mechanical top link

	Follow-on device roller diameter	VITASEM	AEROSEM	TEGOSEM
LION	up to 550 mm	452 mm - 680 mm	300 mm - 380 mm	452 mm - 680 mm
	From 560 mm		452 mm - 680 mm	300 mm - 380 mm

### Mounting the seed drill

#### Requirements

- Machine is fully attached and secured to a suitable tractor.
- Hydraulic / mechanical top link (option) assembled on the seed drill.
- Park tractor and machine on level and stable ground in working position and secure against rolling.



- Tractor motor turned off, PTO switched off, parking brake applied, ignition key removed and stored during all work.
- Auxiliary bolts (for solo operation of the soil tillage machine without attached AERO-SEM / VITASEM seed drill) inserted on both sides of the machine and secured with the linch pin as shown.

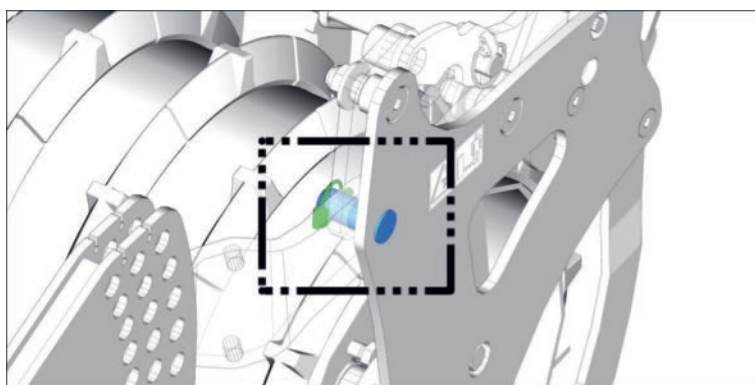
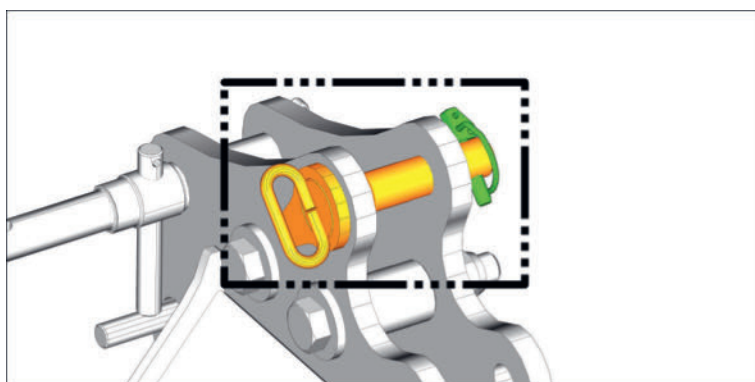


Fig.: Example of left side of machine.

- Locking pins provided for the top link on the hitch-on rack of the soil tillage machine and secured with the linch pin as shown.



- Mounting for the seed drill fitted on both sides of the machine as shown.

## Operation

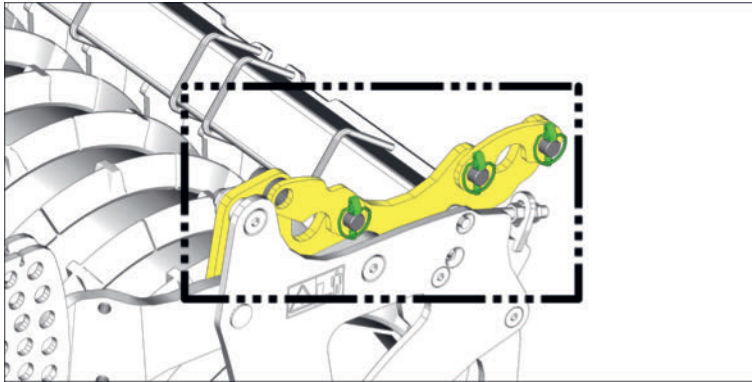
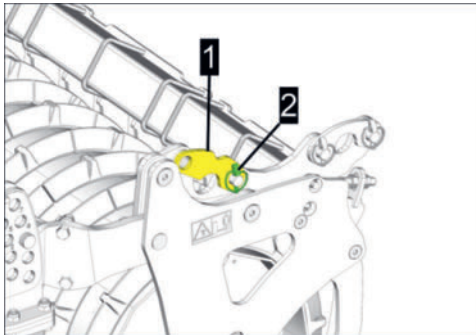


Fig.: Example of left side of machine.

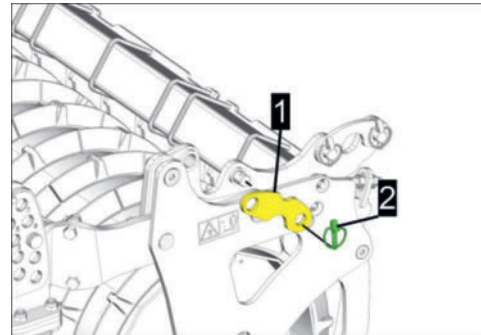
- Rear light (if required) removed from soil tillage machine. See "Reposition lighting carrier" on page 117.

### Implementation

- 1 Open lock on follow-on device on both sides of the machine: Remove the linch pin (2) and lock (1) and keep them handy.

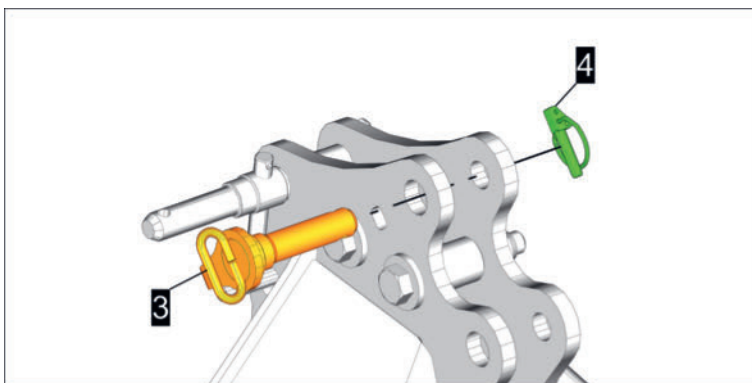


Lock closed

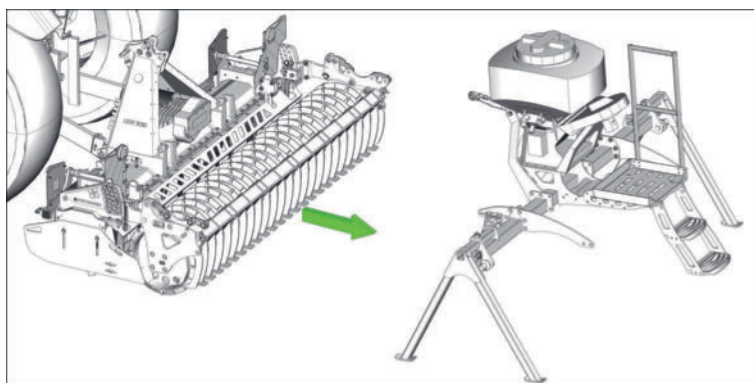


Lock removed

- 2 Remove linch pin (4) and lower link locking pins (3) on hitch-on rack of soil tillage machine and keep them handy.



- 3 Raise the soil tillage machine slightly with the rear power lift and bring it put to the seed drill as shown.



- 4 Attach the soil tillage machine slowly underneath the seed drill, taking care to prevent possible collisions, and align the guide pin on the seed drill with the guide recess of follow-on device on both sides of the machine.

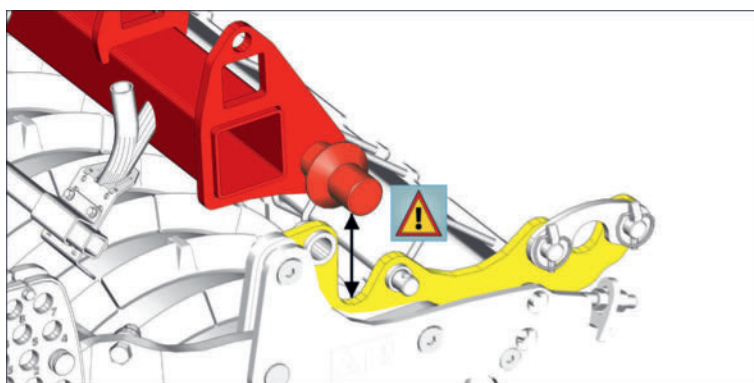


Fig.: Example of left side of machine.  
Seed drill parking support hidden.

- 5 Raise the soil tillage machine with the rear power lift so that the guide pin on the seed drill is fully aligned with the guide recess on both sides of the machine.

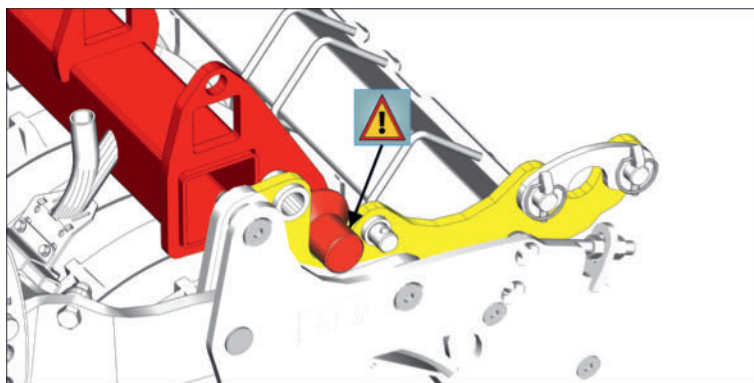
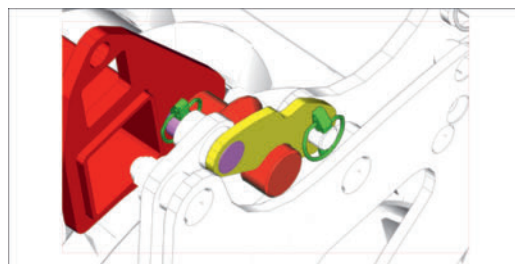
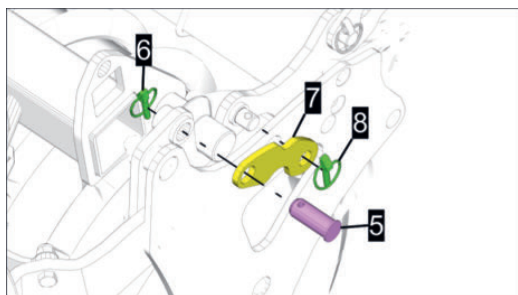


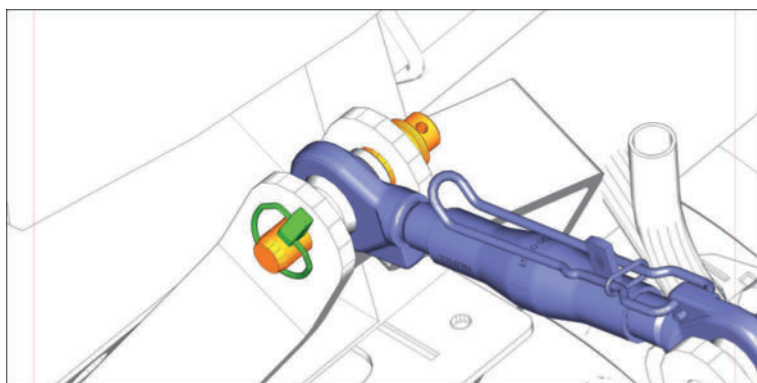
Fig.: Example of left side of machine.

- 6 Fit bolt (5) and lynch pin (6) [in scope of supply of seed drill], lock (7) and lynch pin (8) on both sides of the machine as shown.

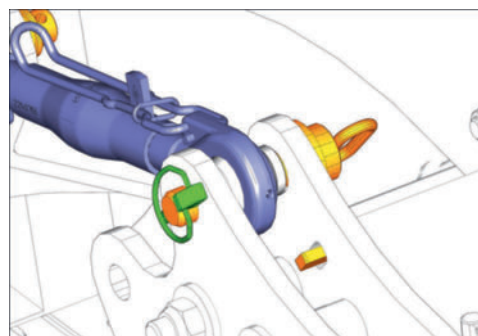
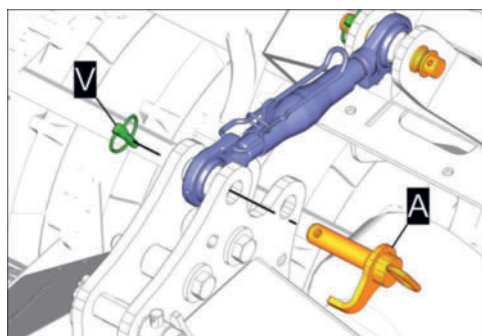
## Operation



- 7 Attach top link on the seed drill, fit locking pin and secure with linch pin as shown.



- ▷ Attach top link on hitch-on rack of soil tillage machine , fit locking pin (A) and secure with linch pin (V) as shown.



- 8 Create all hydraulic, electrical and mechanical connections between the seed drill and the tractor and the soil tillage machine. See seed drill operating manual.
- 9 Attach rear light to seed drill. See "Reposition lighting carrier" on page 117.
- 10 Raise soil tillage machine with the rear power lift / tractor top link so that the seed drill parking support is no longer standing on the ground.
- 11 Remove linch pin (V) on both sides of the machine so that the parking support (A) can be removed.

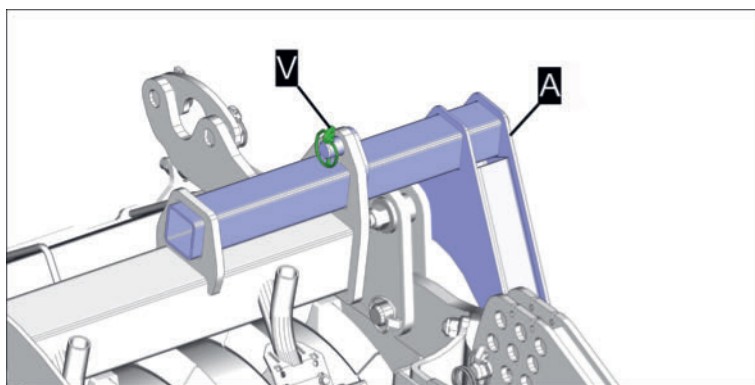


Fig.: Example of left side of machine.

- 12 Remove the parking supports to the side on both sides of the machine and keep with the linch pins that have already been removed.

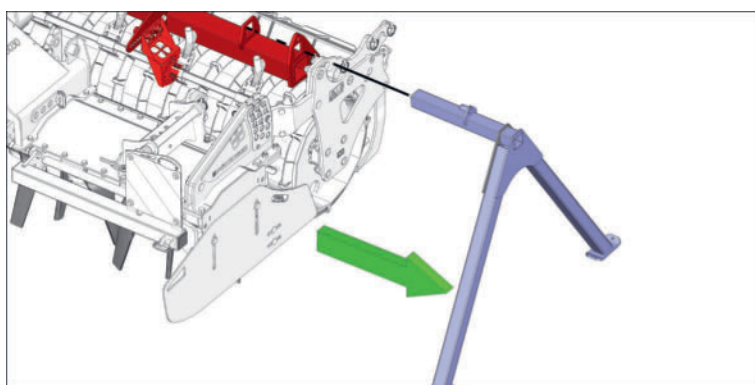


Fig.: Example of left side of machine.

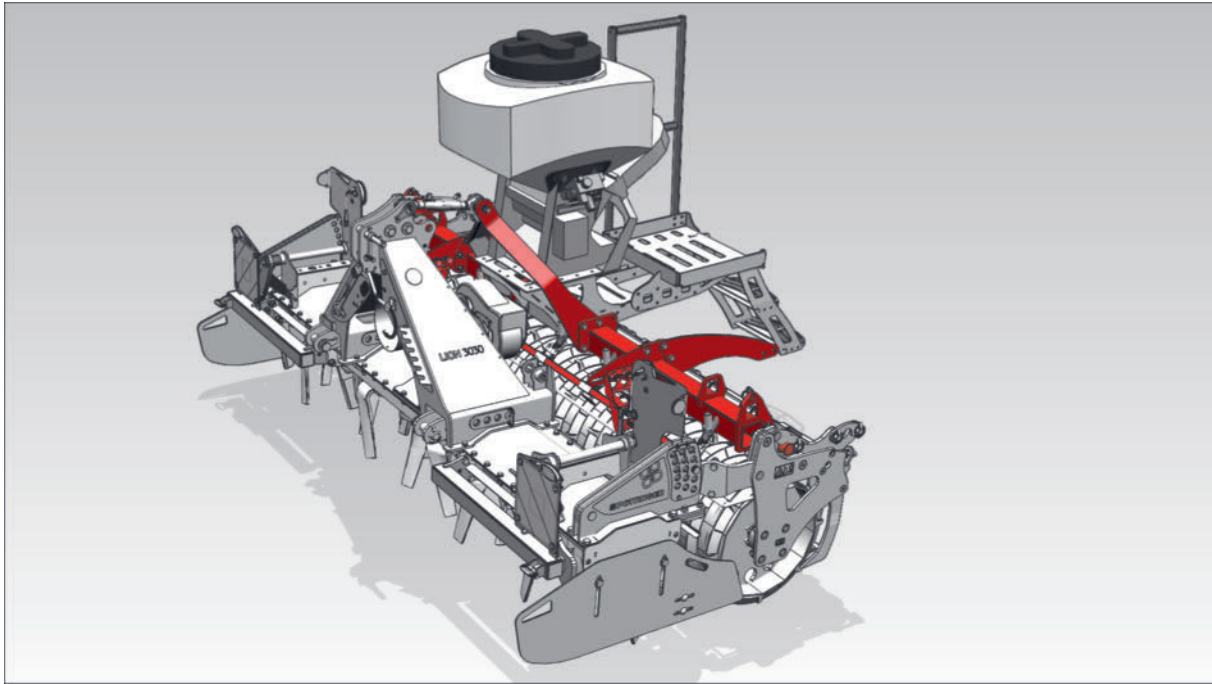
- ▷ The inclination of the seed drill against the soil tillage machine can then be adjusted with the top link. See seed drill operating manual.

### Unhitch TEGOSEM cover crop seed drill from follow-on device

The setting up of a TEGOSEM seed drill (with manual top link) on a soil tillage machine with prism packer roller is described below.

The set-up is more or less the same for all types of PÖTTINGER follow-on device.

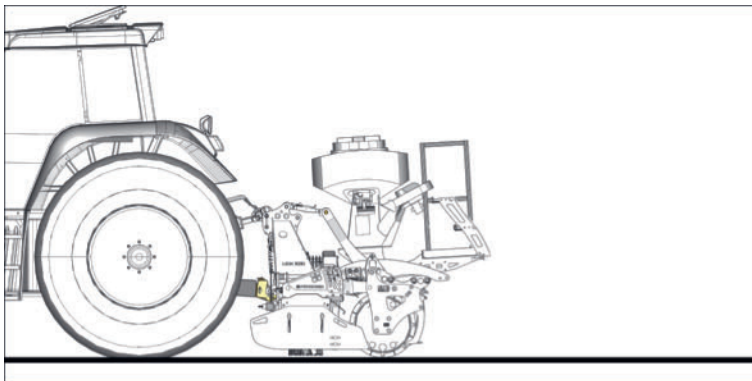
## Operation



### Unhitching drill

#### Requirements

- Machine combination is fully attached and secured to a suitable tractor.
- Park tractor and machine combination on level and stable ground in working position and secure against rolling away.



- Auxiliary bolts (for solo operation of the soil tillage machine without attached AERO-SEM / VITASEM seed drill) inserted on both sides of the machine and secured with the linch pin as shown.

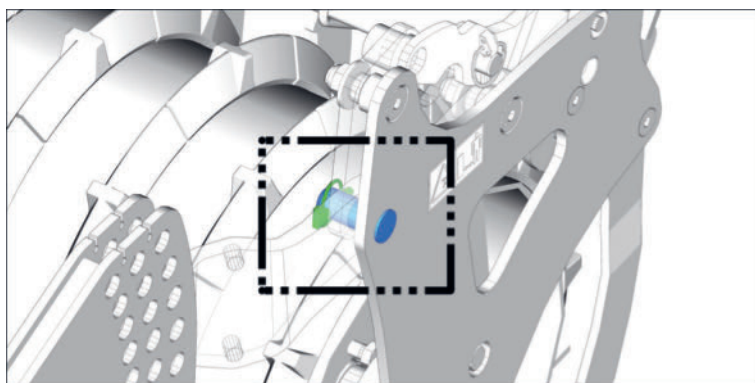
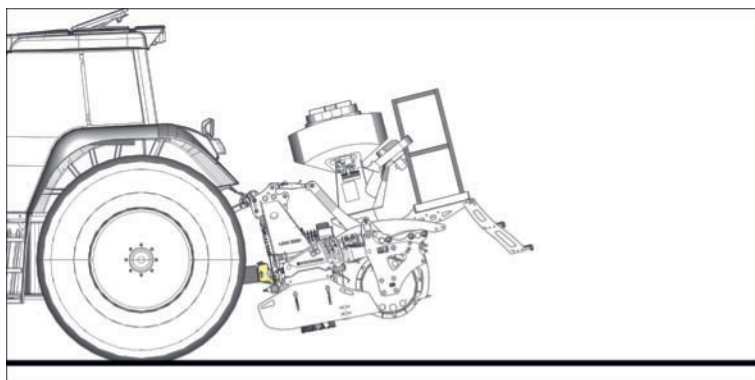


Fig.: Example of left side of machine.

- Rear light (if required) removed from soil tillage machine. See "Reposition lighting carrier" on page 117.
- Tractor motor turned off, PTO switched off, parking brake applied, ignition key removed and stored during all work.

### Implementation

- 1 Raise the machine combination using rear power lift.



- 2 Lift supporting legs (at both sides of the machine (Optional)) and secure with linchpins.

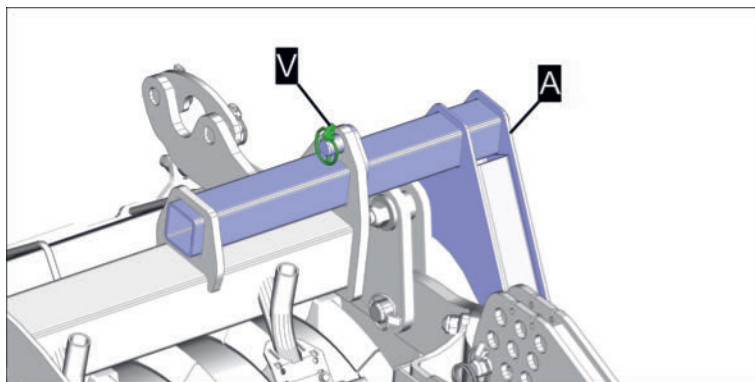
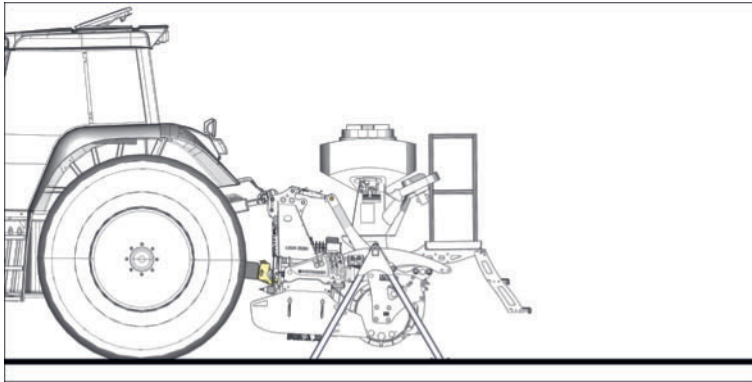


Fig.: Example of left side of machine.

- 3 Activate rear power lift / tractor top link and rest machine combination on the parking supports.

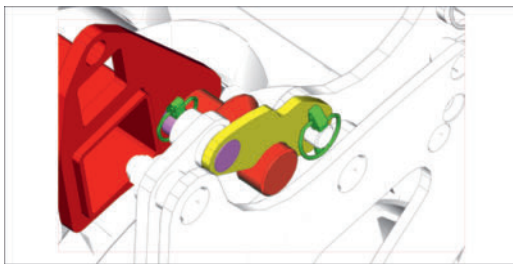
## Operation



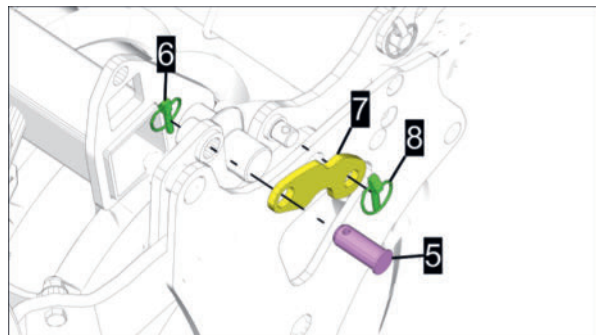
- 4 Break all hydraulic, electrical and mechanical connections between the seed drill and the tractor and the soil tillage machine (e.g. PTO shaft). See seed drill operating manual.
- 5 Remove linch pin (6), bolt (6) [in scope of supply of seed drill], linch pin (8) and lock (7) on both sides of the machine as shown.

### TIP

Raise machine combination slightly with the rear power lift if necessary to release the lock.

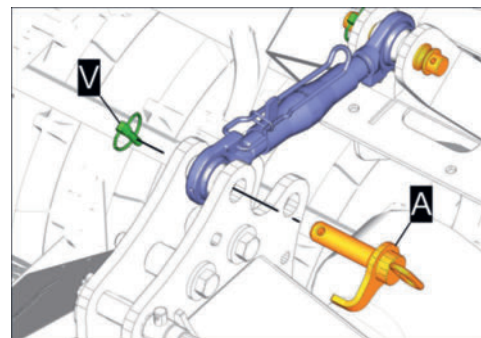
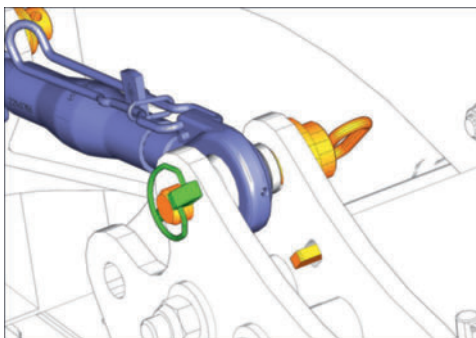


Example of left side of machine.



Example of left side of machine.

- 6 Release top link, linch pin (V) and locking pin (A) on hitch-on rack of the soil tillage machine and pivot top link towards seed drill.



- 7 Activate the rear power lift / tractor top link and lower the soil tillage machine so that the guide pins on the seed drill are loosened from the guide recesses on both sides of the machine.

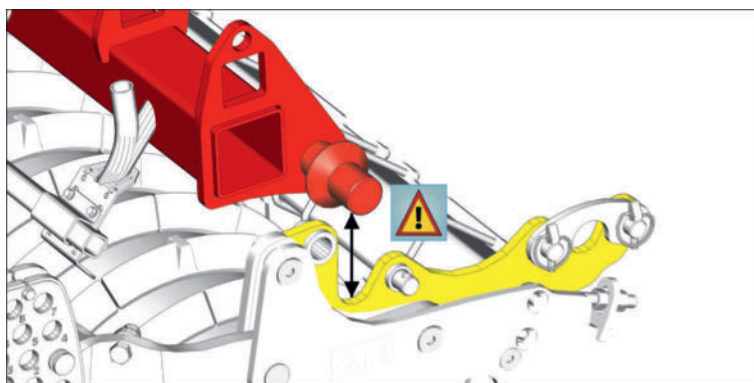
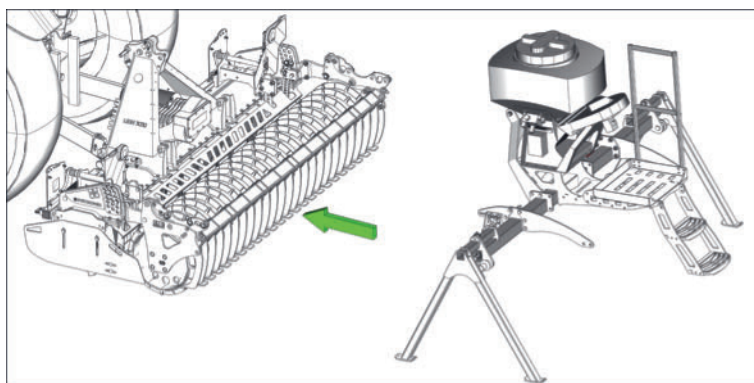
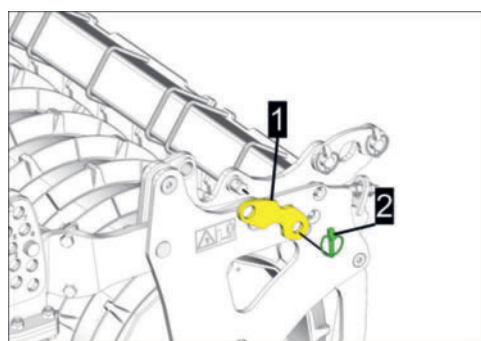


Fig.: Example of left side of machine.  
Seed drill parking support hidden.

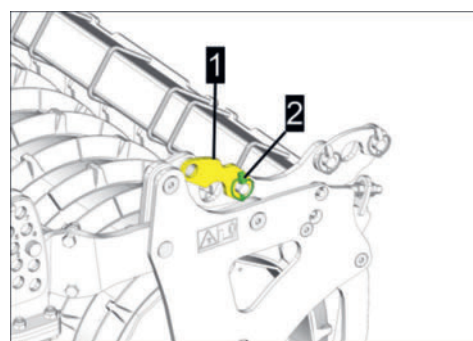
- 8 Drive away from the seed drill taking care to avoid potential collisions.



- 9 Re-attach linch pin (2) and lock (1) on follow-on device on both sides of the machine as shown.



Lock removed



Lock assembled

- 10 Rear light (if required) attached to soil tillage machine. See "Reposition lighting carrier" on page 117.

#### Attach the seed drill to the trailer

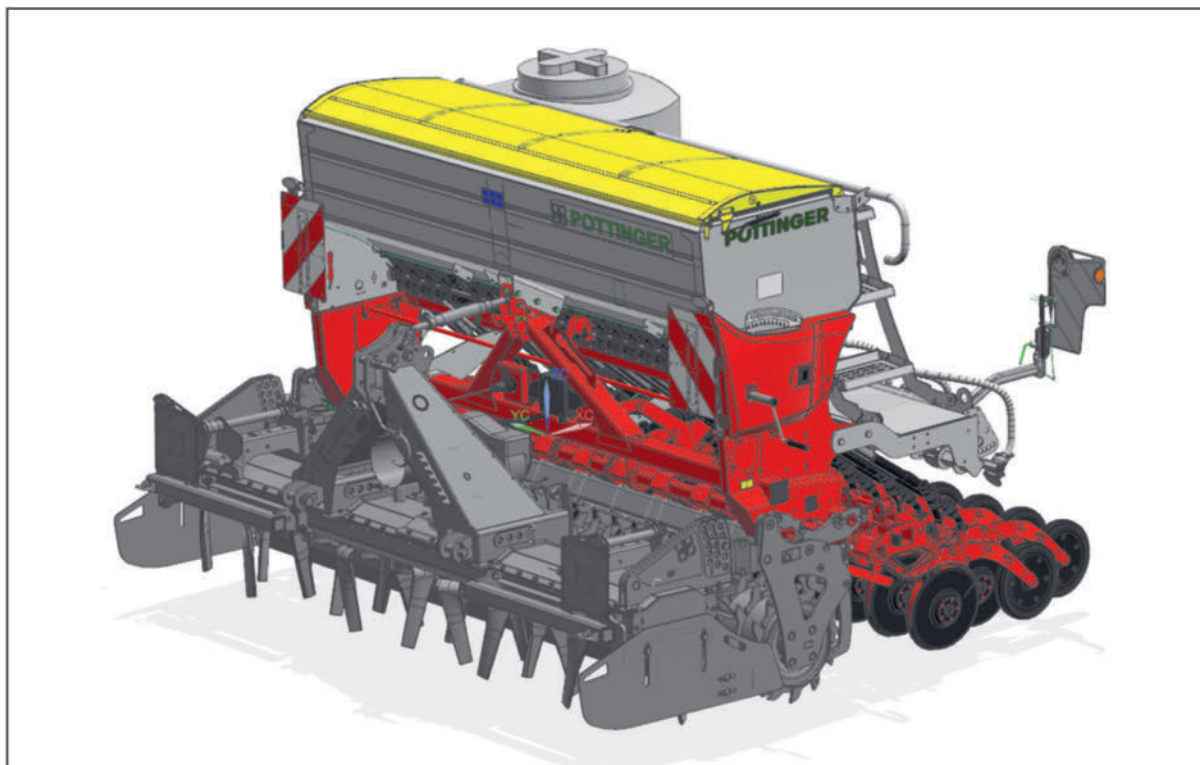
The setting up of a Vitasem seed drill (with hydraulic top link) on a soil tillage machine with prism packer roller is described below.

#### TIP

The hitching up of third-party seed drills is not planned with this hitch-up method.

## Operation

Attachment is possible on all PÖTTINGER trailer types, with all PÖTTINGER seed drills intended for this attachment method with mechanical or hydraulic top link.



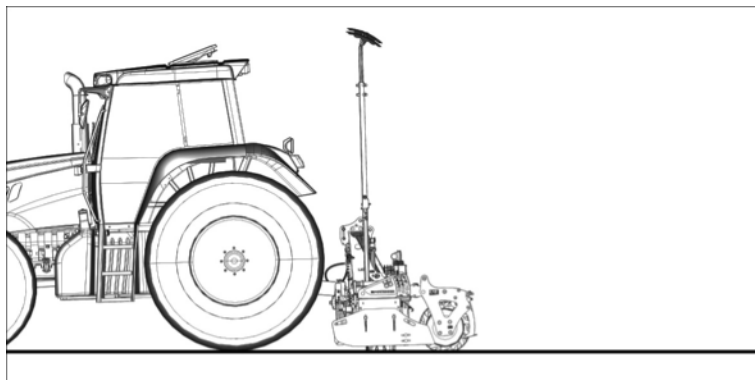
### TIP

We recommend using a hydraulic top link between the soil tillage machine and the seed drill!

## Mounting the seed drill

### Requirements

- Soil tillage machine is fully attached and secured to a suitable tractor.
- Hydraulic / mechanical top link (option) assembled on the seed drill.
- Park tractor and machine on level and stable ground in working position and secure against rolling.



- Tractor motor turned off, PTO switched off, parking brake applied, ignition key removed and stored during all work.

- Auxiliary bolts (for solo operation of the soil tillage machine without attached AERO-SEM / VITASEM seed drill) inserted on both sides of the machine and secured with the linch pin as shown.

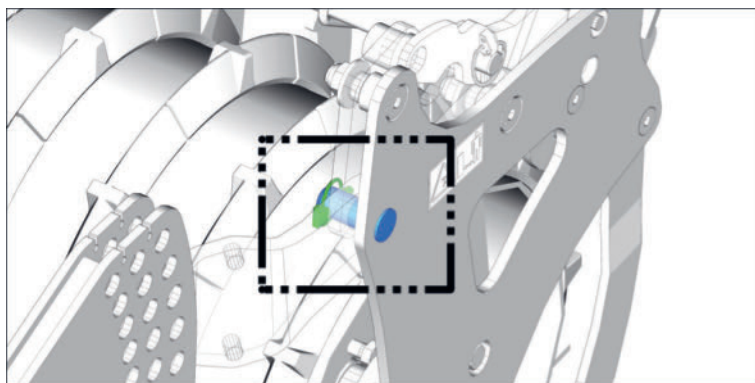
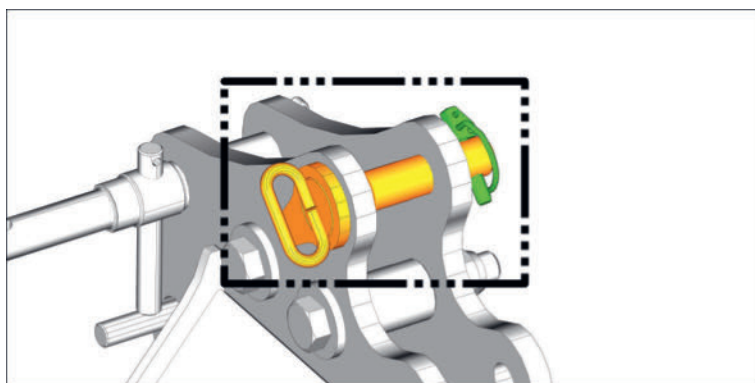


Fig.: Example of left side of machine.

- Locking pins provided for the top link on the hitch-on rack of the soil tillage machine and secured with the linch pin as shown.



- Mounting for the seed drill fitted on both sides of the machine as shown.

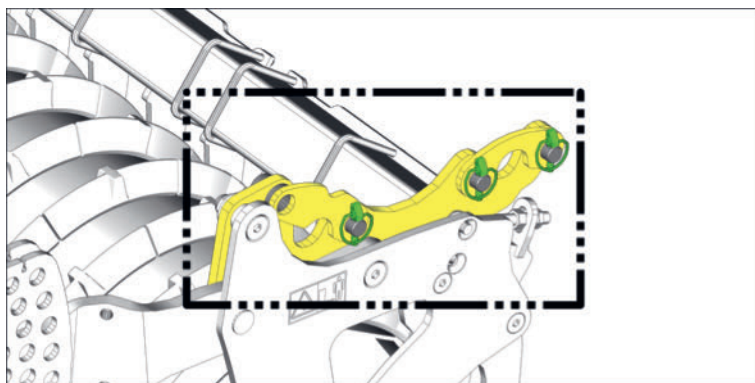


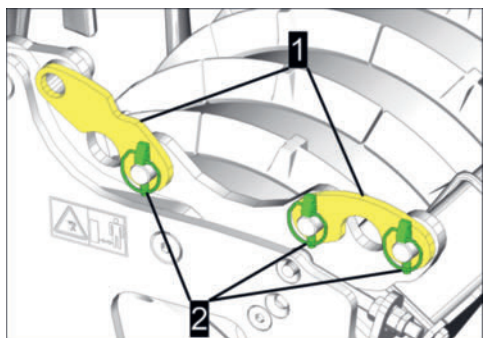
Fig.: Example of left side of machine.

- Rear light removed from soil tillage machine. See "Reposition lighting carrier" on page 117.

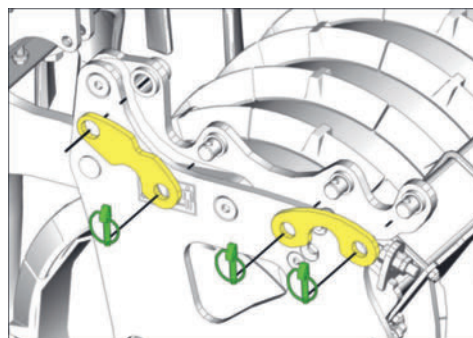
### **Implementation**

- 1 Open lock on follow-on device on both sides of the machine: Remove the linch pin (2) and lock (1) and keep them handy.

## Operation

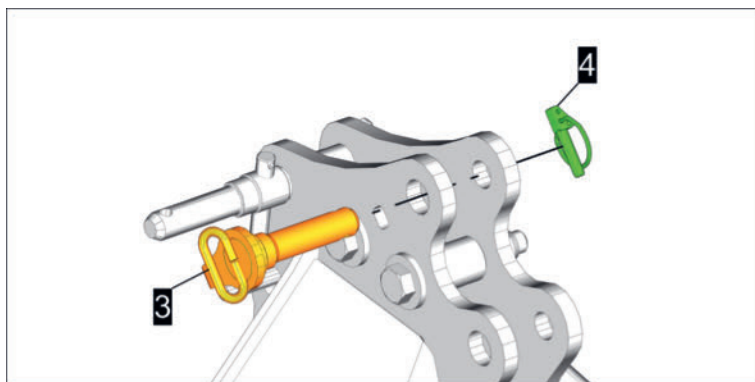


Lock closed

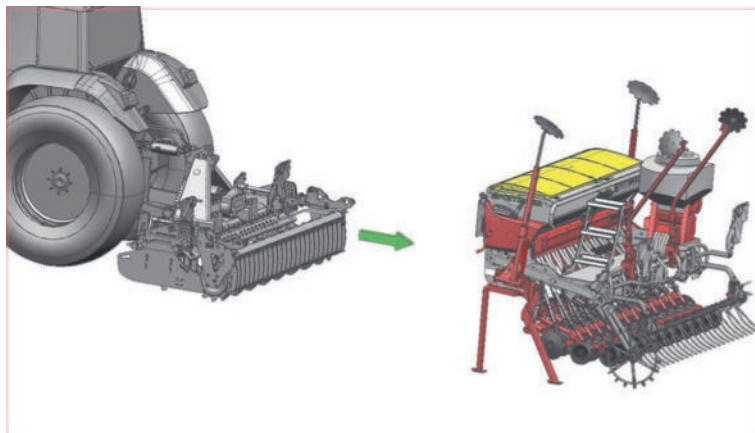


Lock open

- 2 Remove linch pin (4) and lower link locking pins (3) (if available) on hitch-on rack of soil tillage machine and keep them handy.



- 3 Raise the soil tillage machine slightly with the rear power lift and bring it put to the seed drill as shown.



- 4 Attach the soil tillage machine slowly underneath the seed drill, taking care to prevent possible collisions, and align the guide pin on the seed drill with the guide recess of follow-on device on both sides of the machine.

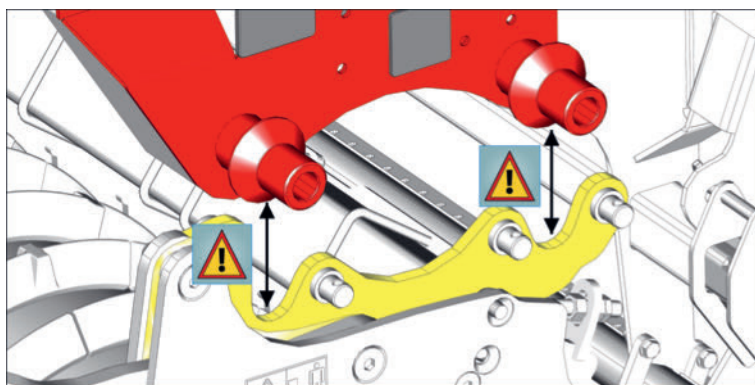


Fig.: Example of left side of machine.  
Seed drill parking support hidden.

- 5 Raise the soil tillage machine with the rear power lift / tractor top link so that the guide pin on the seed drill is fully aligned with the guide recess on both sides of the machine.

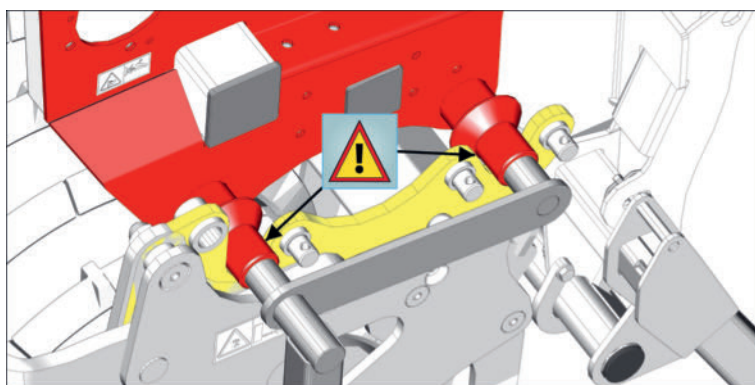


Fig.: Example of left side of machine.

- 6 Close the rear lock (1b) and reinsert the linch pin (on both sides of the machine) as shown below.

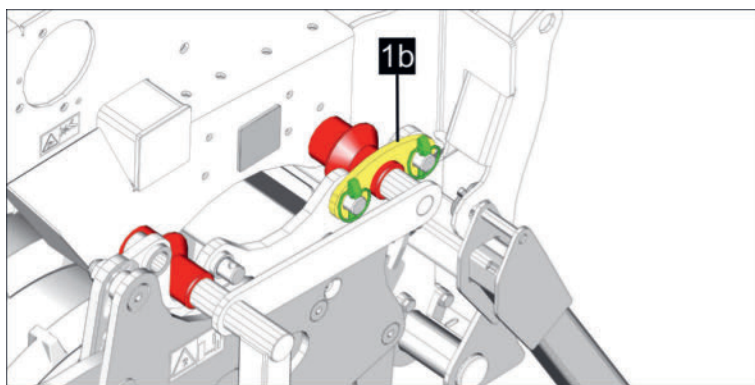


Fig.: Example of left side of machine.

- 7 Remove linch pin (V) on both sides of the machine so that the parking support (VA) can be removed.

## Operation

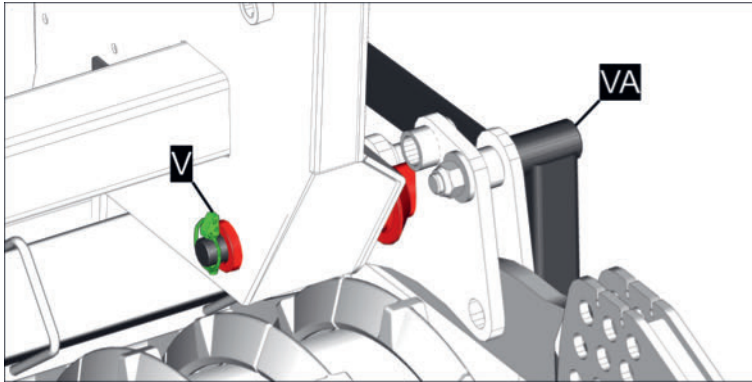


Fig.: Example of left side of machine.

- ▷ Pull front support stand (VA) out to the side on both sides of the machine and keep it handy.



Fig.: Example of left side of machine.

- 8 Set the rear power lift / tractor top link to "Lower" and lower the soil tillage machine until the rear support stand is lying on the ground.
- 9 Remove linch pins (5) and auxiliary bolts (6) on both sides of the machine and keep them handy. Release the bolts with the rear power lift / tractor top link if necessary so that they can be removed.

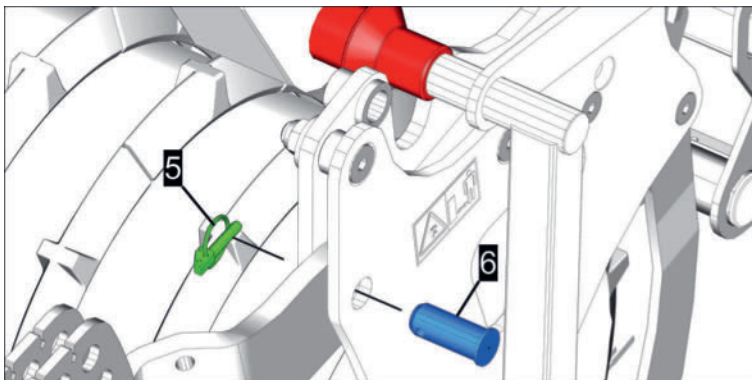


Fig.: Example of left side of machine.

- 10 Activate rear power lift / tractor top link and raise the soil tillage machine so that the front guide pin on the seed drill rests fully in the front guide recess on the follow-on device.

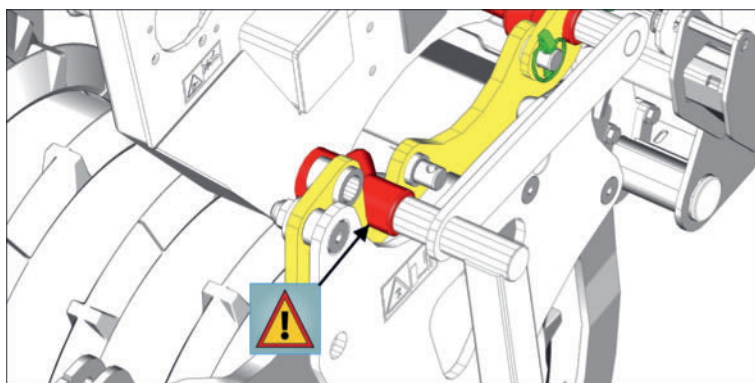


Fig.: Example of left side of machine.

- 11 Fit the front lock (1a) on both sides of the machine with the auxiliary bolt (6) and linch pin (5) provided and secure with the linch pin as shown below.

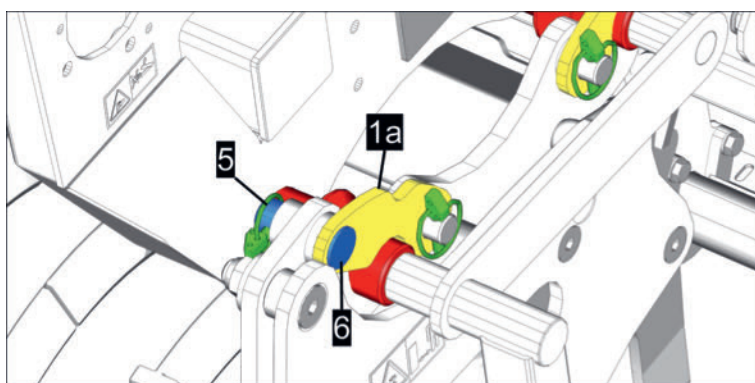


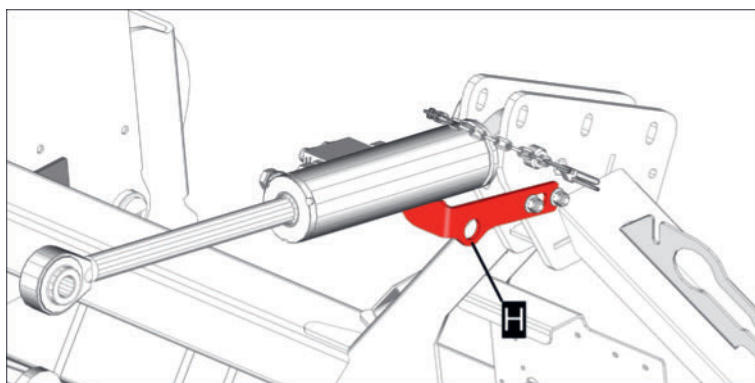
Fig.: Example of left side of machine.

- 12 Set the rear power lift to "Lower" and lower the soil tillage machine until the top link can be attached to the hitch-on rack of the soil tillage machine.

**TIP**

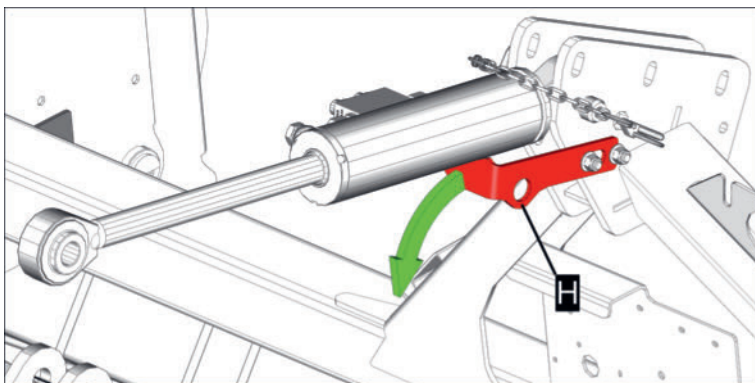
The seed drill rests on the rear parking support, which pivots the follow-on device upwards.

Activate the tractor control device for the top link of the seed drill if necessary and extend / retract the top link so that it is easier to attach or adjust the top link manually (if available).

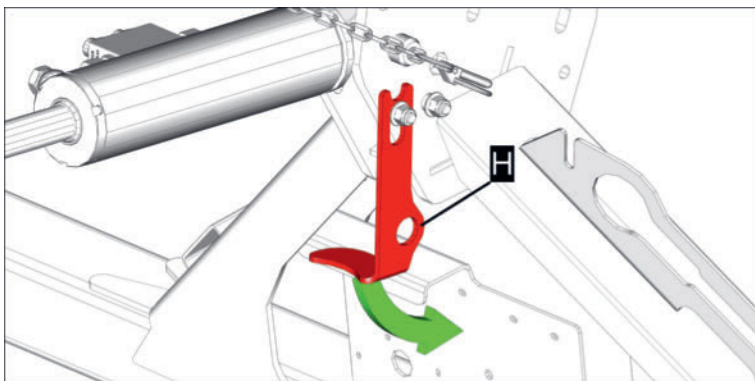


- 13 Hold the top link with one hand, raise slightly and pull the top link bracket (H) towards the tractor to unlock it.

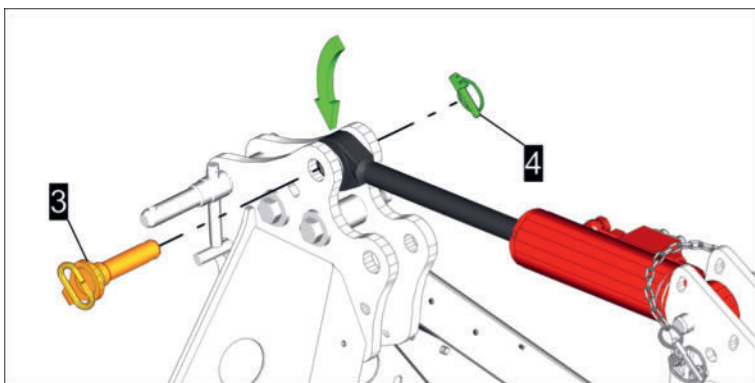
## Operation



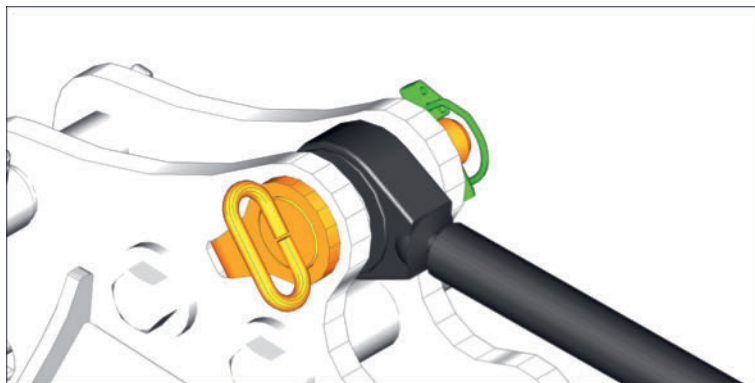
- 14 Keep hold of the top link and pivot the bracket (H) downwards as shown.



- 15 Pivot the top link of the hitch-on rack on the soil tillage machine inwards.



- ▷ Insert locking pins (3) and secure with linch pin (4).



- 16 Break all hydraulic, electrical and mechanical connections between the seed drill and the tractor and the soil tillage machine (e.g. PTO shaft). See seed drill operating manual.  
17 Attach rear light to seed drill. See "Reposition lighting carrier" on page 117.

- 18 Raise soil tillage machine with the rear power lift / tractor top link so that the seed drill parking support is no longer standing on the ground.

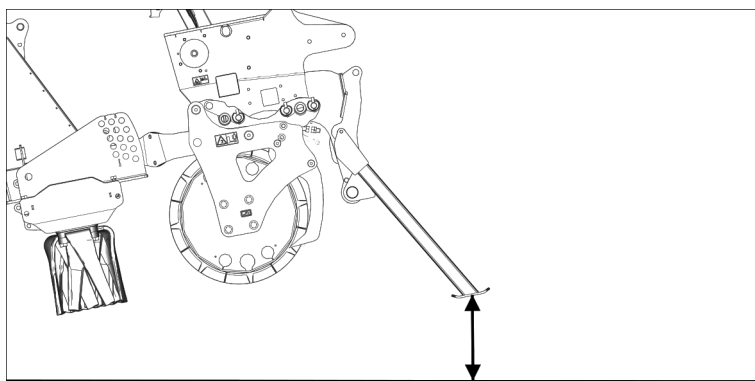


Fig.: Example of left side of machine.

- 19 Remove lynch pins (V) on both sides of the machine.

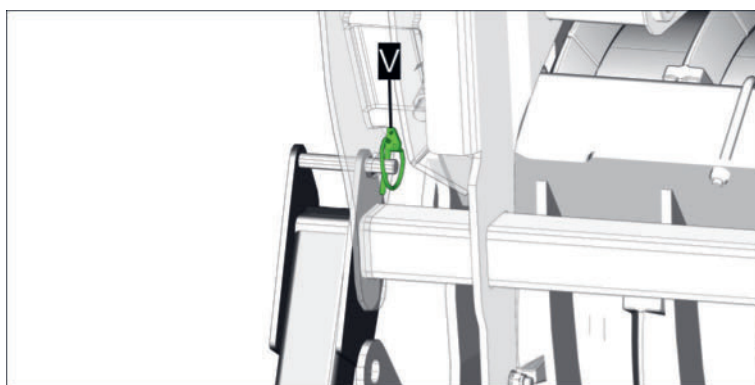


Fig.: Example of left side of machine.

- 20 Pull support stands out to the side on both sides of the machine and keep them handy.

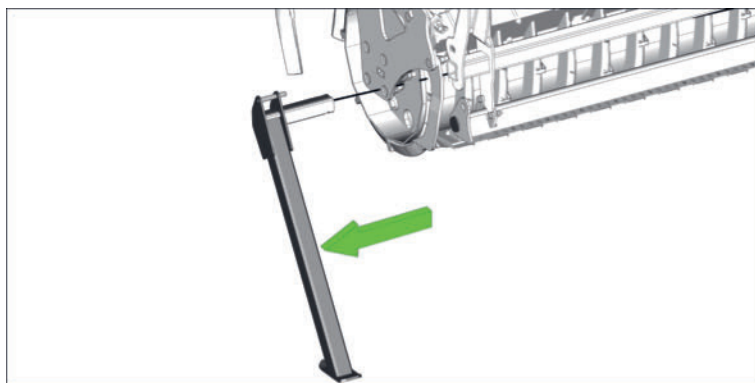
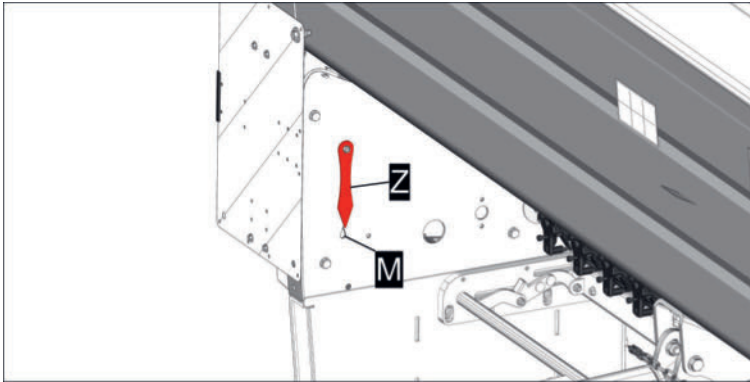


Fig.: Example of left side of machine.

- ▷ Pay attention to the alignment of the seed drill with the soil tillage machine during operation. To do so, check the position of the pointer (Z) and adjust so that it is pointing directly to the marking (M) or slightly behind it, creating a slight inclination in the seed drill to the rear.

## Operation



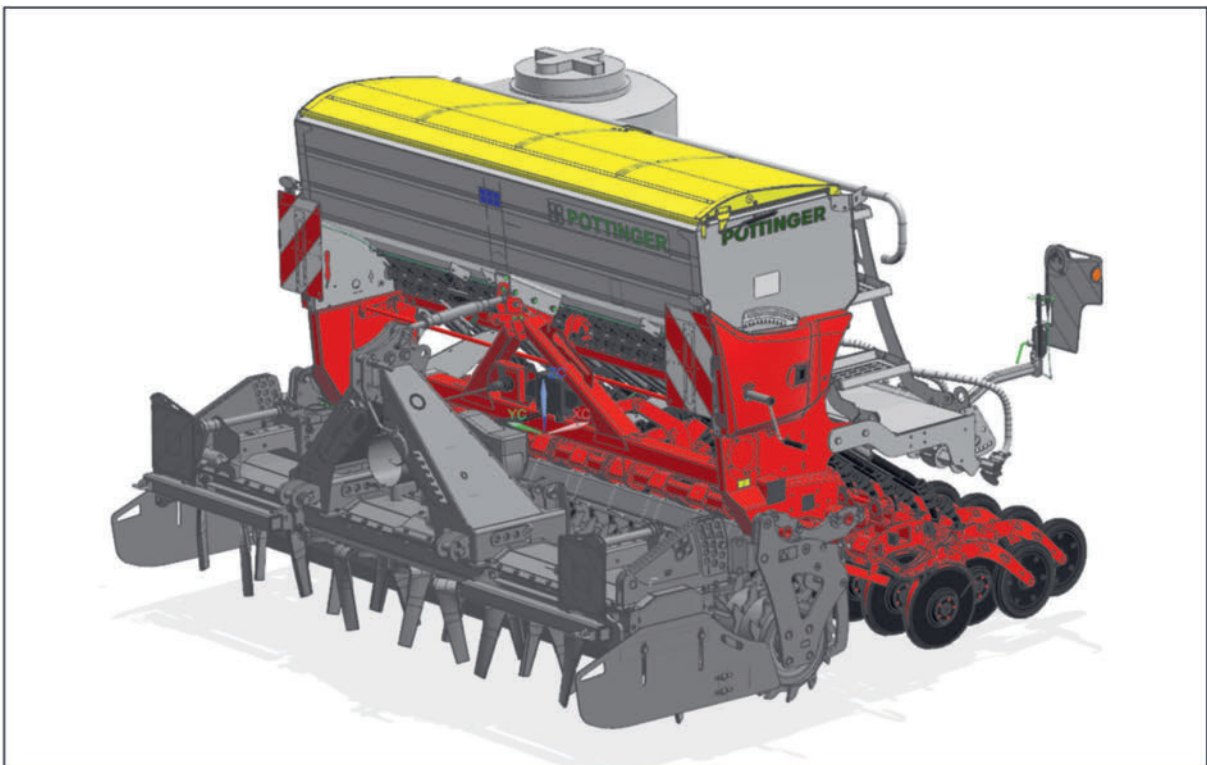
More detailed information can be obtained from the seed drill operator's manual.

### Remove the seed drill from the trailer

The unhitching of the Vitasem seed drill (with hydraulic top link) is described below.

#### TIP

Unhitching is more or less the same for all types of PÖTTINGER follow-on device with all the PÖTTINGER seed drills with mechanical or hydraulic top links intended for this hitch-up method.



## Unhitching drill

### Requirements

- Machine is fully attached and secured to a suitable tractor.
- Park machine combination on level and stable ground in working position and secure against rolling.

- Transport safeguard fully mounted and secured on the seed drill. See seed drill operating manual.
- Rear light removed from seed drill. See "Reposition lighting carrier" on page 117.
- Tractor motor turned off, PTO switched off, parking brake applied, ignition key removed and stored during all work.

### Implementation

- ▶ Raise the machine combination using rear power lift.
- ▶ Insert the rear supports at both sides of the machine in the holders and secure with linch pins (V).

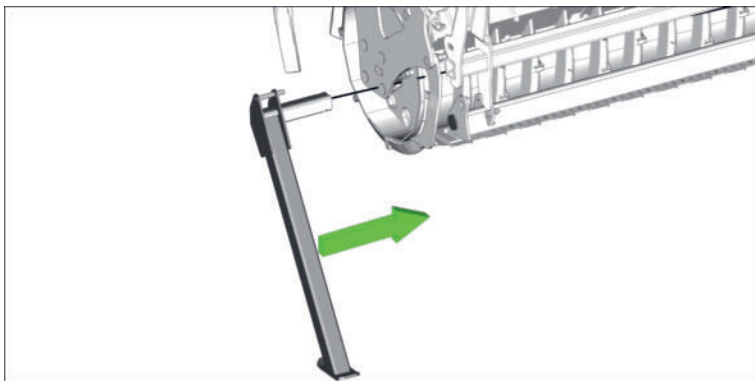
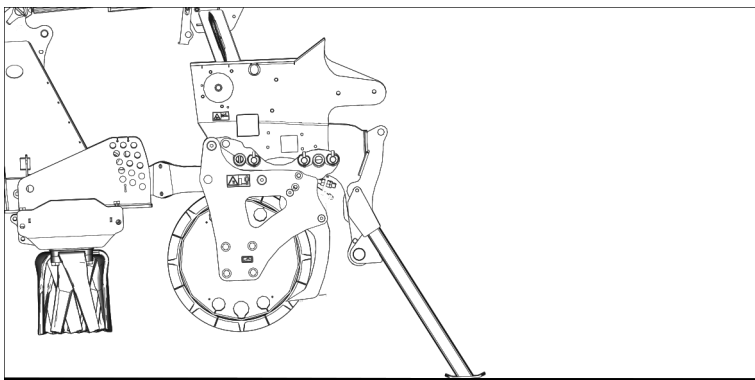


Fig.: Example of left side of machine.

- ▶ Lower machine combination onto the parking supports with the rear power lift.



- ▶ Remove the top link of the seed drill from the soil tillage machine. If necessary, activate the rear power lift / tractor control device for the hydraulic top link or the hydraulic top link to release the top link.

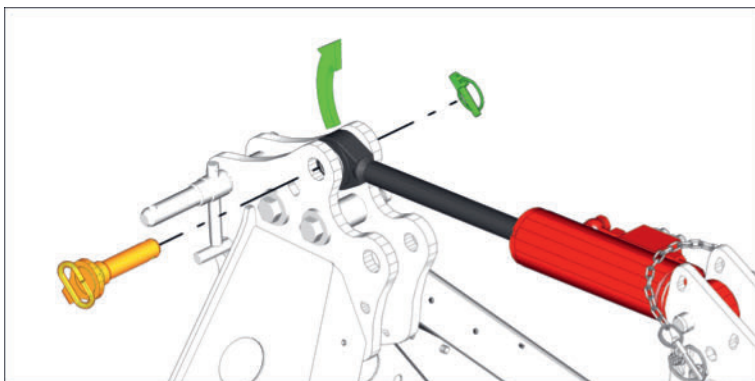
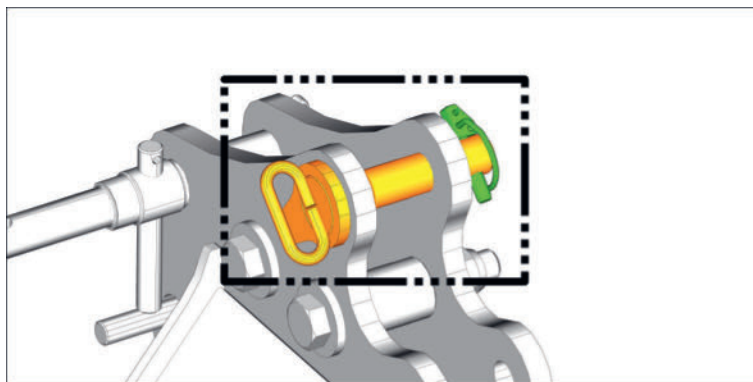


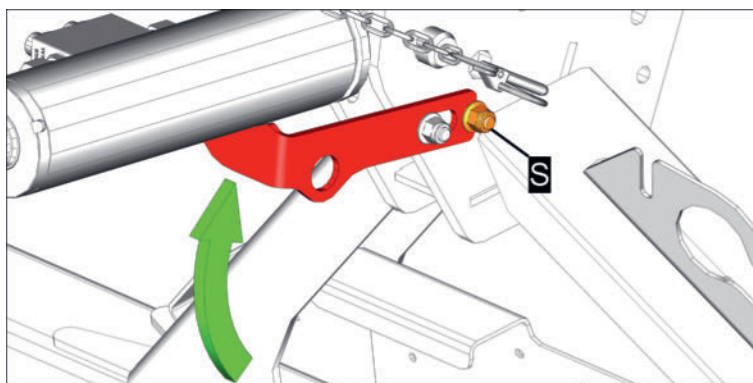
Fig.: Example of hydraulic top link

## Operation

- ▷ Replace the linchpins and locking bolts.



- ▷ Hold top link in one hand, pivot the top link bracket upward with the other hand and press backwards until it engages with the screw (S) as shown.



- ▷ Make sure that the bracket is fully engaged and place the top link in the bracket.

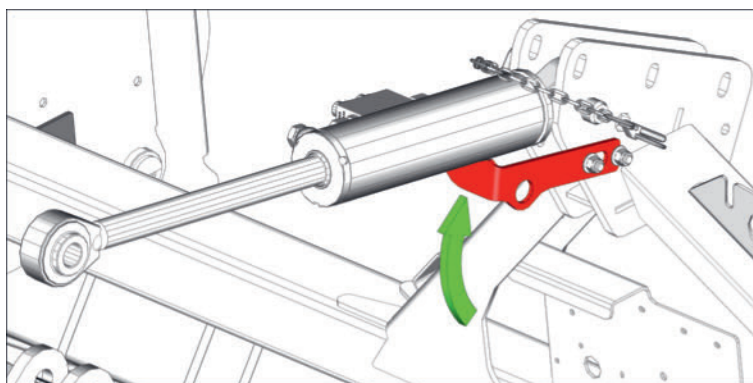


Fig.: Example of hydraulic top link

- ▶ Remove the front lock (1a) including linch pin (5) and bolt (6) on both sides of the machine.

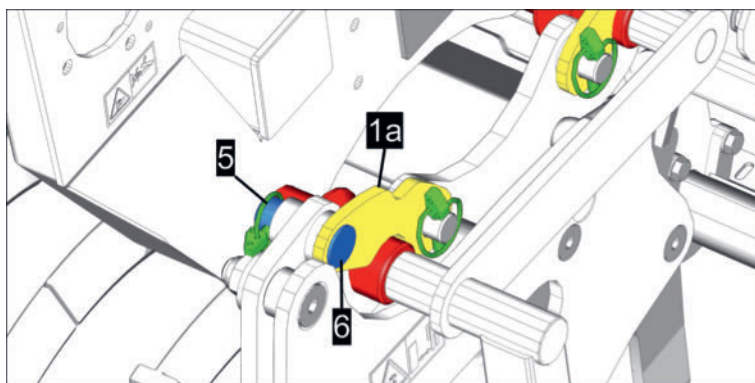
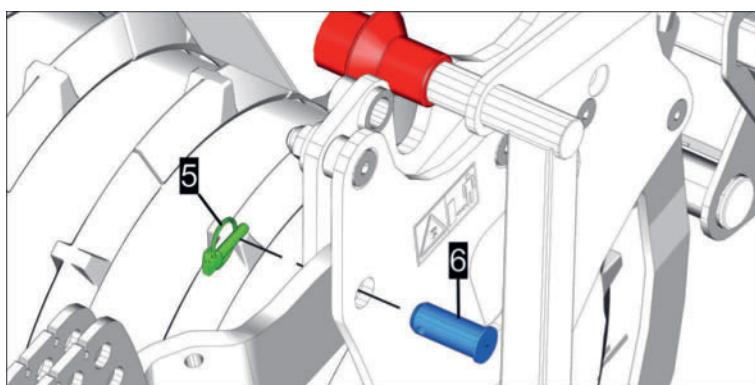


Fig.: Example of left side of machine.

- ▶ Attach lynch pins (5) and auxiliary bolts (6) on both sides of the machine as shown. If necessary, activate the rear power lift to insert the auxiliary bolts.

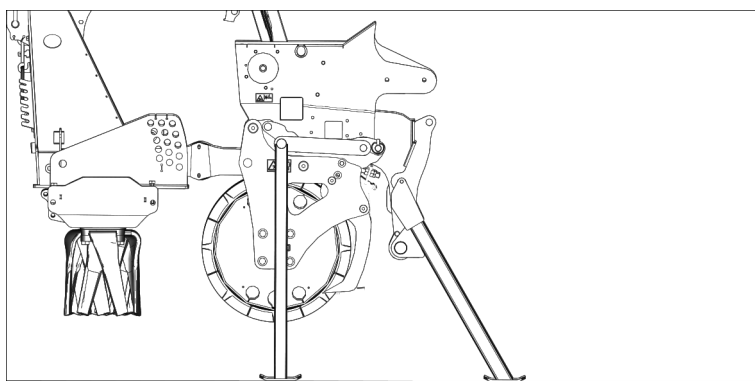


- ▶ Raise the machine combination with the rear power lift, attach the front parking supports on both sides of the machine and secure with the lynch pin.



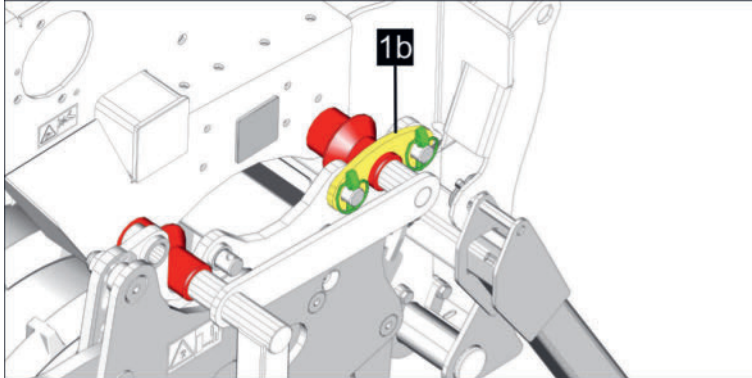
Fig.: Example of left side of machine.

- ▶ Activate rear power lift and rest machine combination on the parking supports.

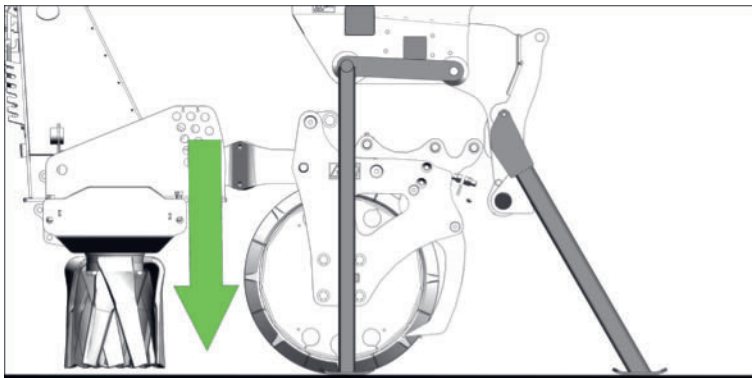


## Operation

- ▶ Depressurize the hydraulic connections between the tractor and the seed drill.
  - ▷ Break all electrical and hydraulic connections between the soil tillage machine and the seed drill and place hoses / lines in the hose holder of the seed drill (rolled up if necessary).
- ▶ Remove linch pin and open the rear lock (1b) on both sides of the machine.



- ▶ Activate rear power lift and lower the soil tillage machine.



- ▶ Then drive the soil tillage machine out from under the seed drill taking care to avoid potential collisions.
- ▶ Fit rear light removed on soil tillage machine. See "Reposition lighting carrier" on page 117.

### Assemble AEROSEM / VITASEM seed drill on Hydrolift.

The hitching-up of the Vitasem seed drill on the rotary power harrow is described below.

#### TIP

The hitch-up procedure is the same for all PÖTTINGER seed drill machine types intended for this type of hitch-up method).

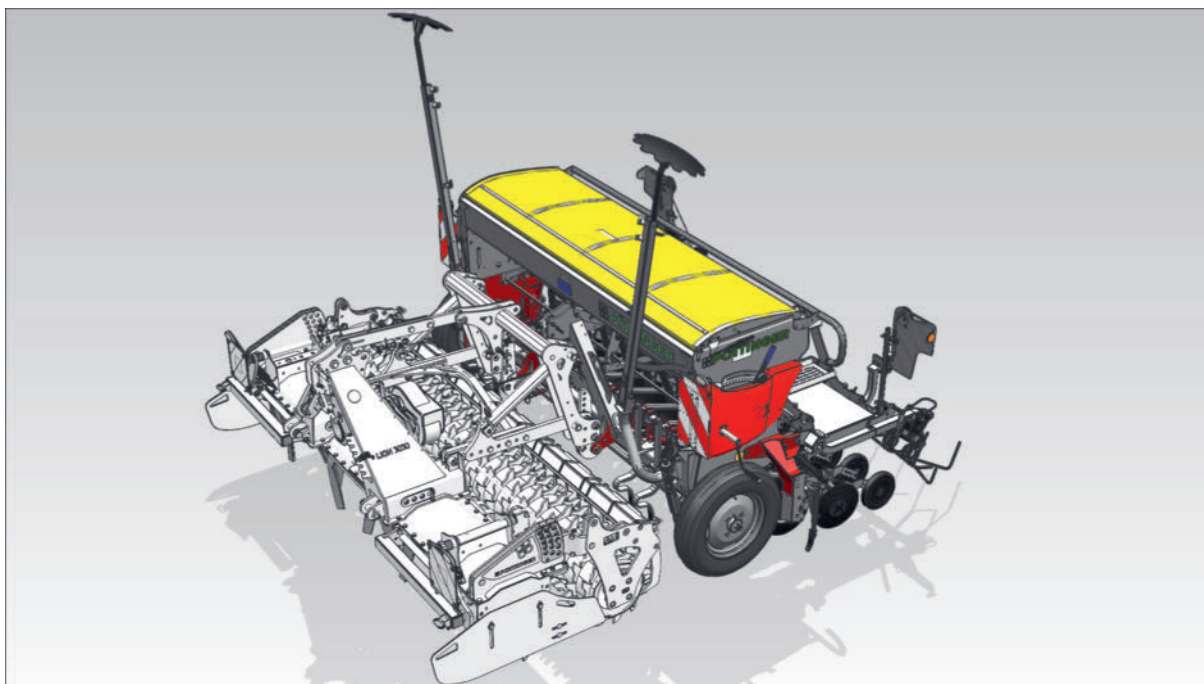
If a third-party seed drill is to be fitted to the LION rotary power harrow, the procedure described here may differ from the one required for the corresponding seed drill. In all events, the operator's manual for the corresponding seed drill should also be referred to in order to avoid any danger caused by the hitch-up.

#### TIP

A top link suitable for the corresponding PÖTTINGER seed drill and the follow-on device roller diameter must be used in the set-up according to the table below.

**Mechanical top link**

	Follow-on device roller diameter	VITASEM	AEROSEM	TEGOSEM
LION	up to 550 mm	452 mm - 680 mm	300 mm - 380 mm	452 mm - 680 mm
	From 560 mm		452 mm - 680 mm	300 mm - 380 mm



**Fitting the seed drill**

**Requirements**

- Machine is fully attached and secured to a suitable tractor.
- Hydrolift assembled on the soil tillage machine and adapted accordingly for use with the follow-on device and seed drill. See "Adjust Hydrolift" on page 74.
- Park tractor and machine on level and stable ground in working position and secure against rolling.

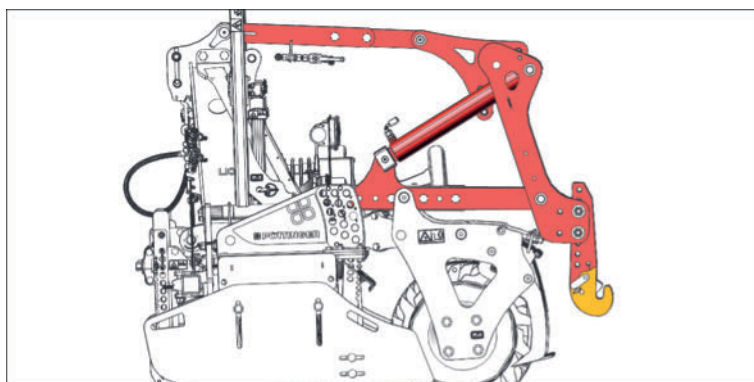


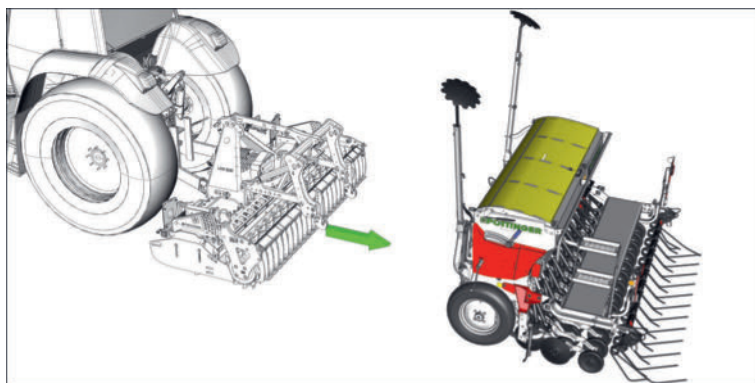
Fig.: Machine and Hydrolift in working position

## Operation

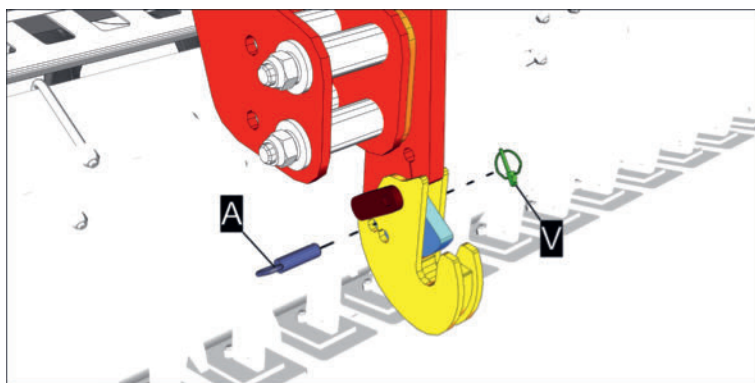
- Tractor motor turned off, PTO switched off, parking brake applied, ignition key removed and stored during all work.
- Rear light removed from soil tillage machine. See "Reposition lighting carrier" on page 117.

## Implementation

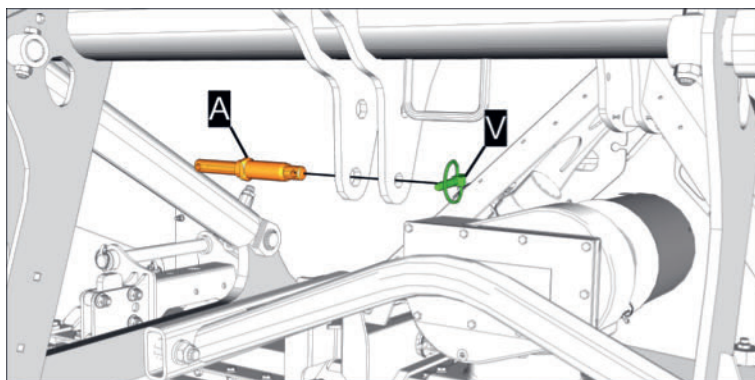
- ▶ Raise the soil tillage machine slightly with the rear power lift and bring it put to the seed drill as shown.



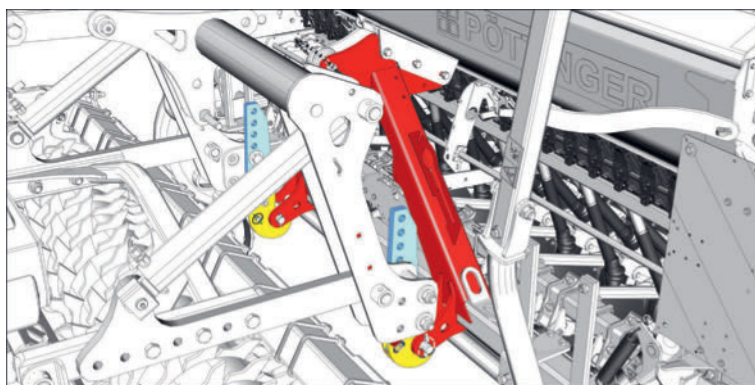
- ▶ Remove linch pin (V) and locking pin (A) on the arresting hook on the Hydrolift lower link (on both sides of the machine) and keep them handy.



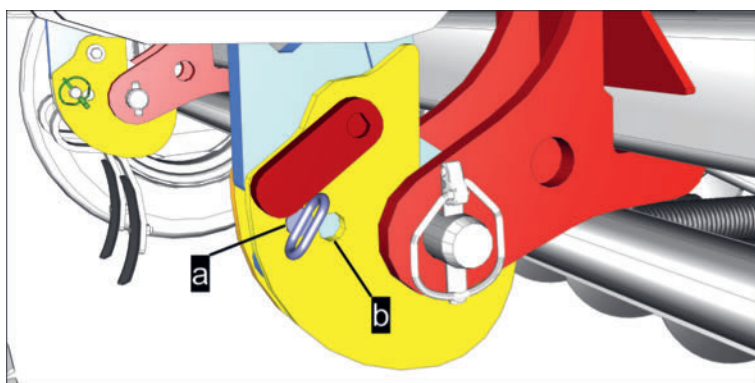
- ▶ Remove linch pin (V) and locking pin (A) for the top link on the Hydrolift and keep them handy.



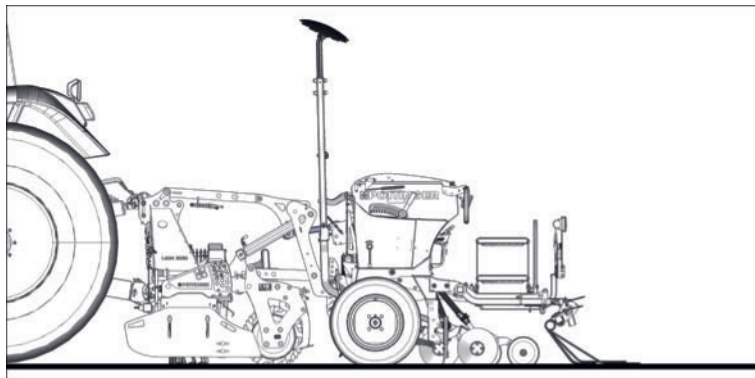
- ▶ Approach the soil tillage machine, activate the rear power lift and attach the lower link of the Hydrolift to the lower link bolt.



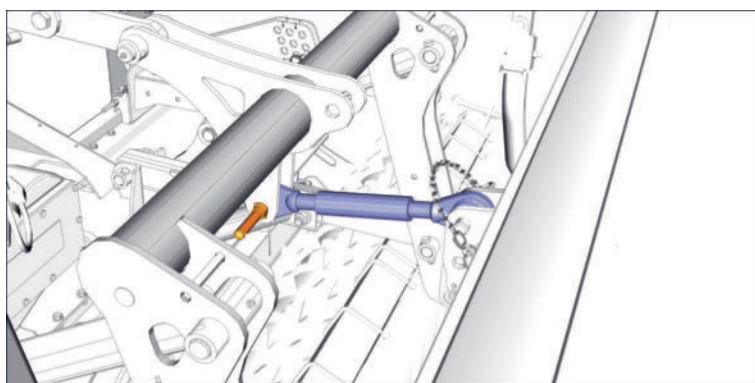
- ▶ Attach locking pin (A) and linch pin (V) on both sides of the machine so that the bolt in the lower link arresting hook cannot move. The selected locking position (a or b) is dependent on the bolt diameter on the seed drill hitch-on rack.



- ▶ Activate rear power lift and park the soil tillage machine on the ground.



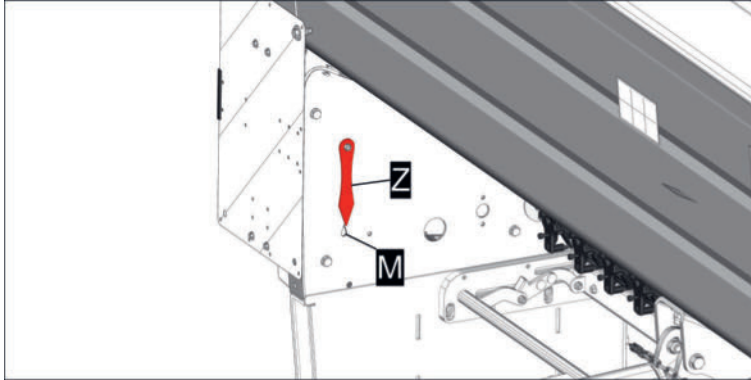
- ▶ Insert the top link in the Hydrolift and attach the locking pin (A) and linch pin (V).



- ▶ Break all hydraulic, electrical and mechanical connections between the seed drill and the tractor and the soil tillage machine (e.g. PTO shaft). See seed drill operating manual.

## Operation

- ▶ Attach rear light of soil sillage machine to seed drill. See "Reposition lighting carrier" on page 117.
  - ▷ Pay attention to the alignment of the seed drill with the soil tillage machine during operation. To do so, check the position of the pointer (Z) and adjust so that it is pointing directly to the marking (M) or slightly behind it, creating a slight inclination in the seed drill to the rear.



More detailed information can be obtained from the seed drill operator's manual.

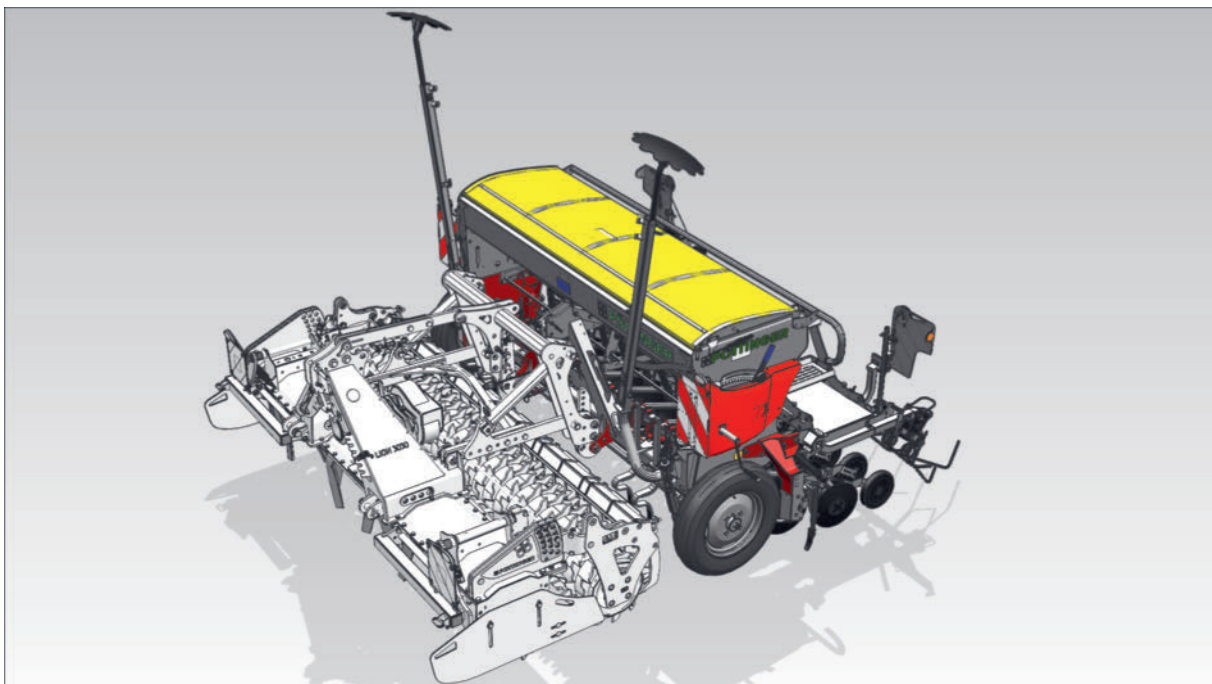
### Unhitch AEROSEM / VITASEM seed drill from Hydrolift.

The unhitching of a PÖTTINGER-VITASEM seed drill is described below.

#### TIP

The unhitching procedure is the same for all PÖTTINGER seed drill machine types intended for this type of hitch-up method).

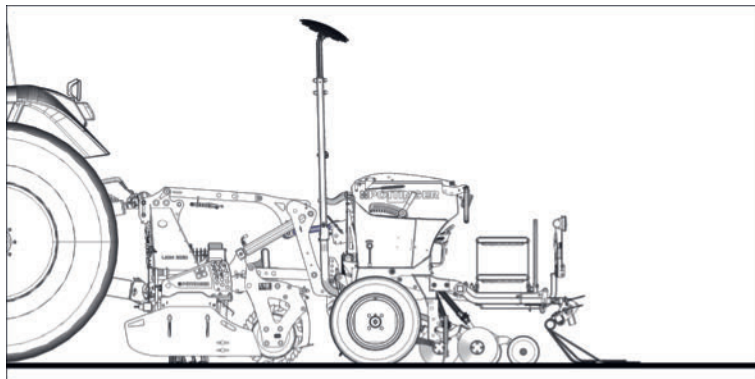
If a third-party seed drill is to be unhitched, the procedure described here may differ from the one required for the corresponding seed drill. In all events, the operator's manual for the corresponding seed drill should also be referred to in order to avoid any danger caused by unhitching.



## Unhitching drill

### Requirements

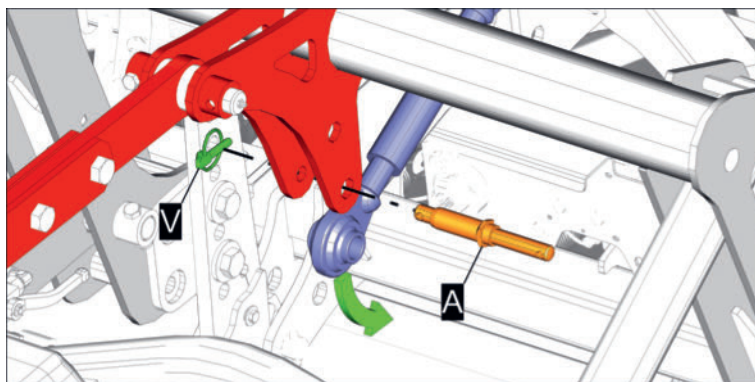
- Machine combination is fully attached and secured to a suitable tractor.
- Park tractor and machine on level and stable ground in working position and secure against rolling.



- Rear light removed from seed drill. See "Reposition lighting carrier" on page 117.
- Transport safeguard fully mounted and secured on the seed drill. See seed drill operating manual.
- Tractor motor turned off, PTO switched off, parking brake applied, ignition key removed and stored during all work.

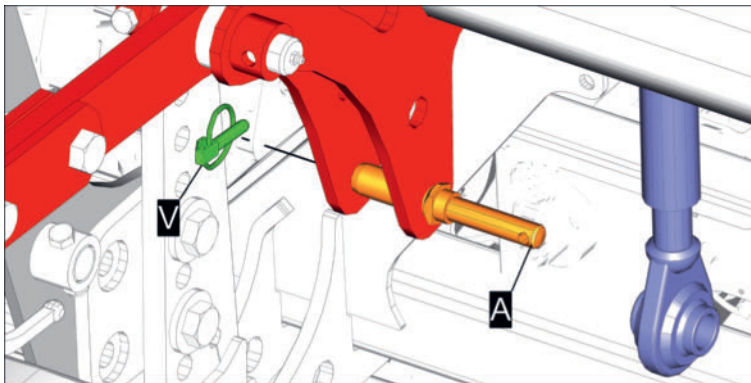
### Implementation

- ▶ Break all electrical, hydraulic and mechanical connections to the tractor and soil tillage machine. See seed drill operating manual.
- ▶ Unhitch top link. To do so, hold the top link in one hand, remove the linch pin (V) and locking pin (A) and pivot the top link slowly downwards towards the seed drill. If necessary, adjust the top link to remove the locking pin.



- ▷ Replace locking pin (A) and linch pin (V).

## Operation



- ▶ Activate the tractor control device and raise the Hydrolift slightly to release the locking hook in the lower link arresting hook. The seed drill should not be visibly raised during this process.
- ▶ Remove lynch pin (V) and locking pin (A) on both sides of the machine and keep them handy.

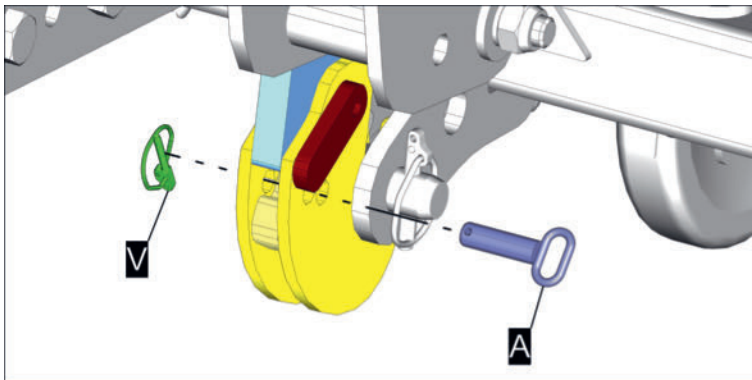
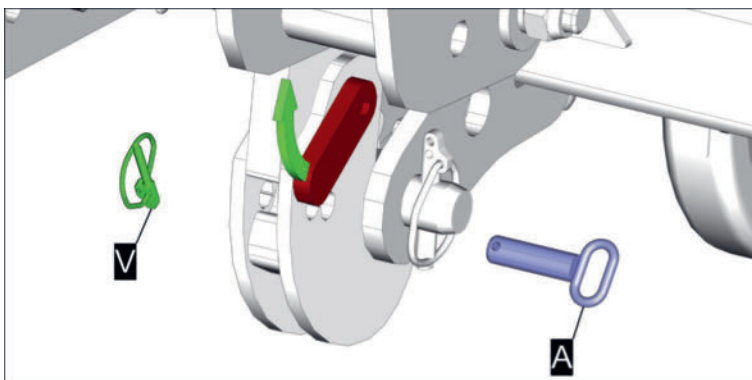


Fig.: Example of left side of machine.

- ▶ Press the adjusting lever for the inner locking hooks on both sides of the machine upwards as far as it will go.



- ▷ Replace the locking pin (A) and lynch pin (V) to lock the locking hook on both sides of the machine in an open position as shown.

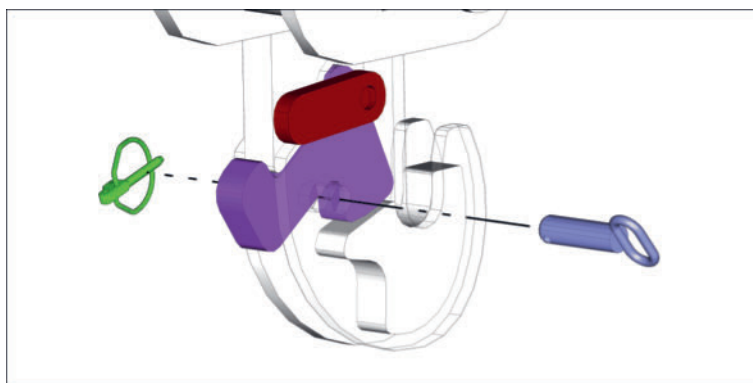
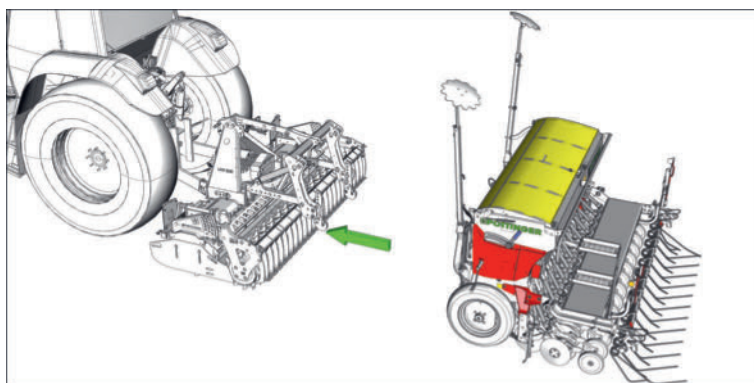


Fig.: Example of left side of the machine; arrester hook presented partially transparently

- ▶ Activate tractor control device and completely lower the Hydrolift.
- ▶ Activate rear power lift and raise soil tillage machine slightly.
- ▶ Drive away from the seed drill taking care to avoid potential collisions.



- ▷ Replace lynch pin (V) and locking pin (A) on both sides of the machine.

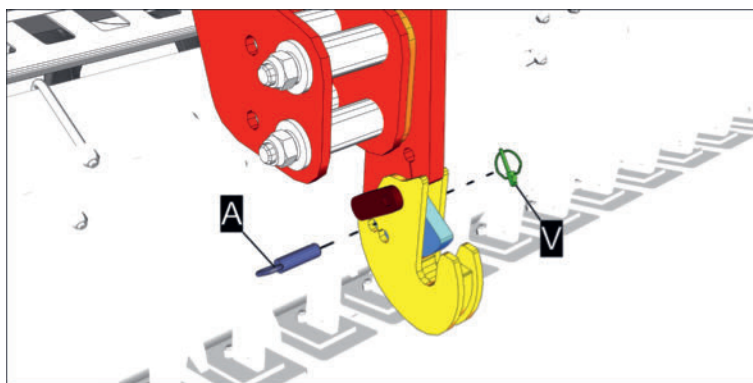


Fig.: Example of left side of machine.

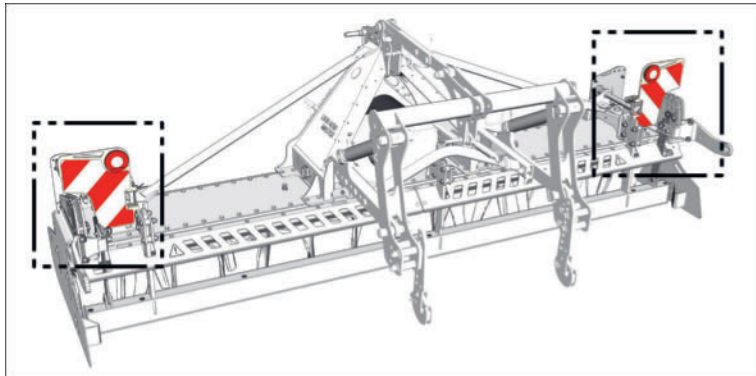
## Reposition lighting carrier

If the rear light of the soil tillage machine is completely or partially covered (possibly by an attached seed drill in road transport position), it must be switched to the corresponding seed drill before driving on public roads as shown below.

## Operation

### TIP

The suitability of third-party seed drills for the attachment of PÖTTINGER warning signs and lights must be checked before driving on public roads for the first time and manufactured if necessary or obtained from an authorized service dealer according to the local legal requirements.



### Implementation

- ▶ Disconnect the bayonet plug on the lighting cable from the connection to the soil tillage machine: to do so, turn the bayonet connection on the plug to the left as far as it will go and remove the plug by pulling upwards.

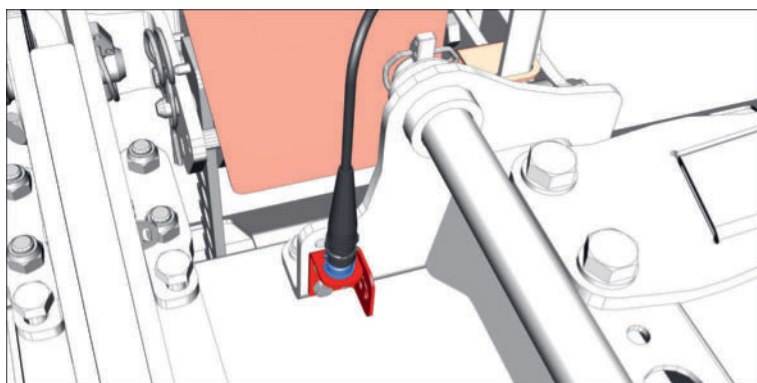
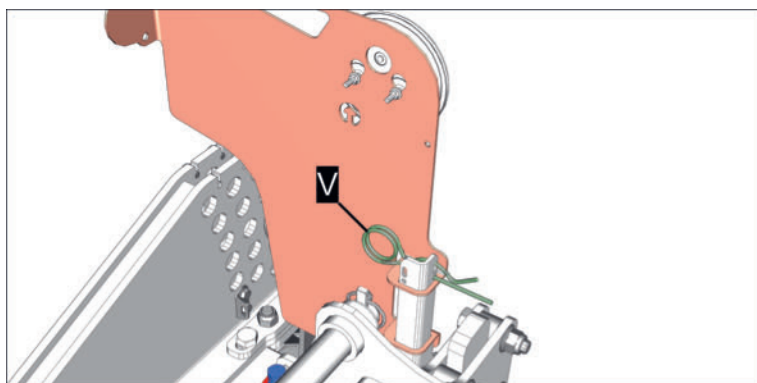
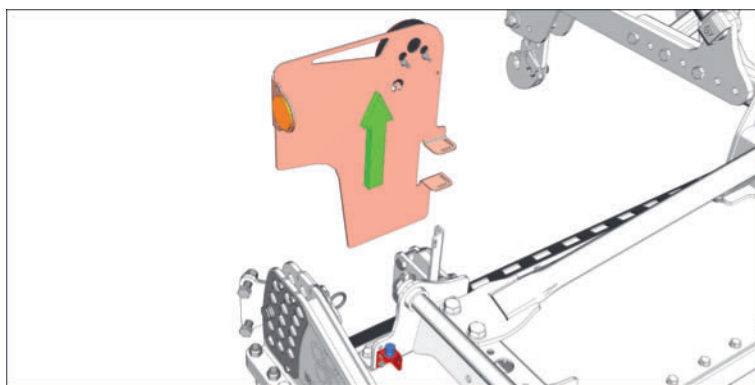


Fig.: Example of rear right lighting bracket ("standard" lighting).

- ▶ Remove linch pin (V) and keep it in a safe place.



- ▶ Pull lighting bracket upwards and remove.



- ▶ Attach lighting bracket to seed drill in reverse order.

**TIP**

Attach right lighting bracket to soil tillage machine on the right side of the seed drill, secure with linch pin and connect the bayonet plug.

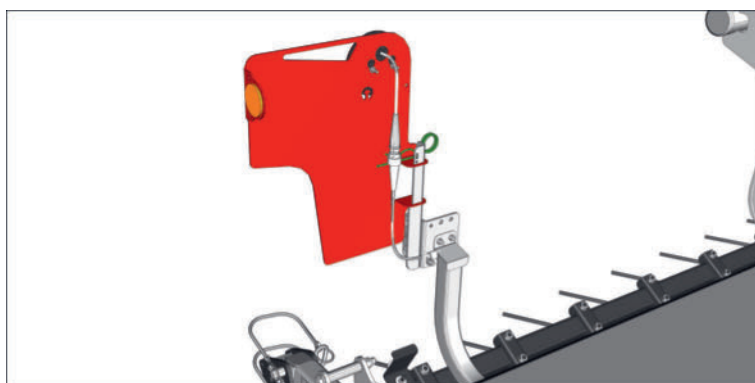


Fig.: Attachment situation VITASEM example

- ▶ Carry out procedure in the same way on the opposite lighting bracket.
- ▶ Carry out test run on lighting.
  - ▷ If the lighting works as specified, no further action is required.
  - ▷ If the lighting does not work as specified, carry out fault rectification for the lighting or replace lamps / lights. See "Lighting" on page 160. See "Check / change lighting / illuminants" on page 150.

## Coupling

**NOTICE**

**Collisions with other road users!**

Collisions may occur with other road users when travelling with machines whose components are not secured in road transport position.

- ▶ Move all machine components to road transport position before transportation on public roads and secure as stipulated.
- ▶ Before driving in traffic areas with other road users, bring the machine into road transport position.

## Operation

### DANGER

#### **Pulling in and severing of body parts!**

- ▶ Secure the PTO drive against unintentional starting.

### WARNING

#### **Crush hazard over the entire body!**

Do not remain in the danger area around the tractor and the machine unless the mower combination has been secured against rolling and accidental operation.

- 1 Instruct bystanders to leave the danger area around the tractor and the machine.
- 2 Make sure that bystanders do not enter the danger area.
- 3 Park the machine on flat, firm ground.
- 4 Apply the emergency brake.
- 5 Turn off tractor engine, remove ignition key and keep safe.
- 6 Insert wheel chocks on the tractor and on the machine.

### WARNING

#### **Danger of whole body being crushed when activating the power lift!**

- ▶ Direct people away from the danger area around the power lift.
- ▶ Do not stand between the tractor and the power lift when operating the power lift via external buttons.

## Couple the machine / machine combination with the tractor.

### NOTICE

#### **Damage to machine components during attachment!**

- ▶ Ensure easy access.
- ▶ Always place hoses, cables and chains outside the hitching area.

### CAUTION

#### **Risk of crushing!**

- ▶ Instruct people to leave the hazard area while the tractor or hydraulic functions are moving.
- ▶ Instruct people to leave the hazard area if the tractor is not secured against rolling away.

### CAUTION

#### **Crushing and rolling over!**

- ▶ Ensure that the machine or tractor is not unexpectedly operated by another person before entering the danger area.

## Requirements

- Cat. II or Cat. III 3-point attachment.
- Tractor ballast completely affixed.
- Machine / machine combination parked on level and stable ground in working position and secured.

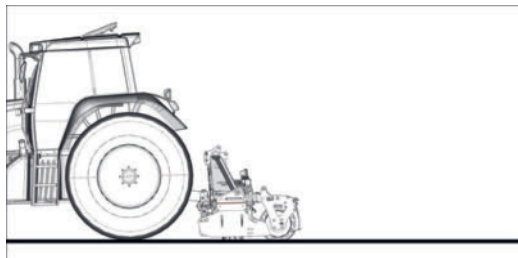


Fig.: Seed drill in working position

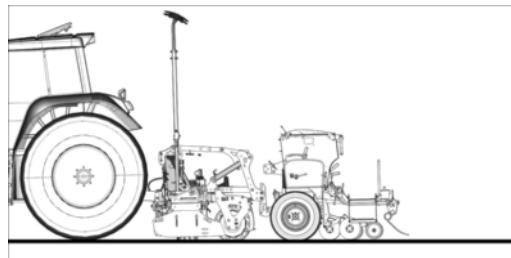


Fig.: Machine combination in working position

- All transport safeguards properly activated / attached.
- Top link and lower link balls are fitted to the coupling points, and positioning pins are secured with linch pins.

## Attaching the soil tillage machine

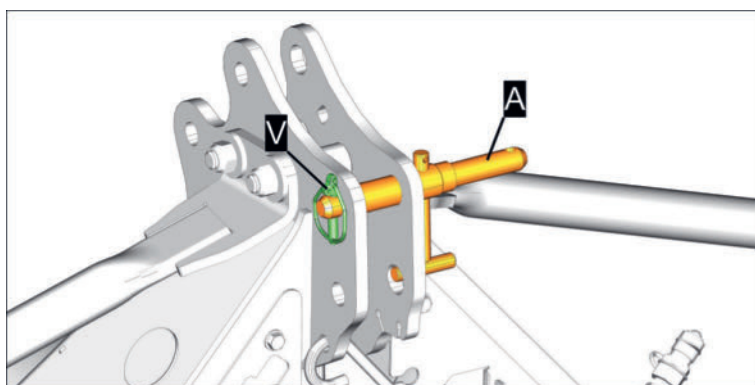
The soil tillage machine can be attached to a tractor as a stand-alone machine or together with suitable seed drills in a machine combination.

### TIP

Attachment to the tractor as a stand-alone machine is described below. Procedures for attachment to a tractor, which affect any seed drills that may be attached (hydraulic connections, etc.), can be obtained from the seed drill operator's manual.

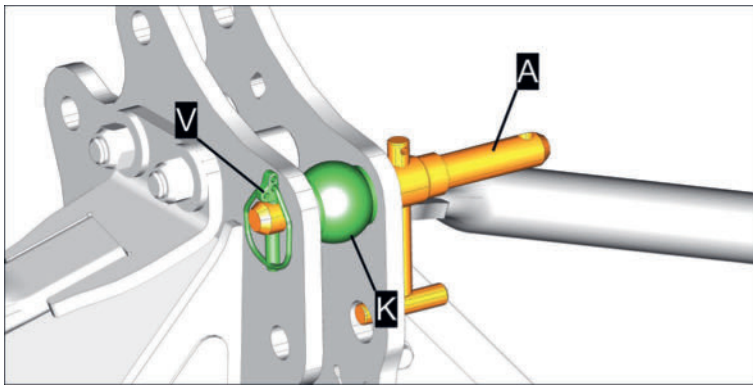
## Implementation

- ▶ Remove linch pin (V) and locking pin (A) for the top link.

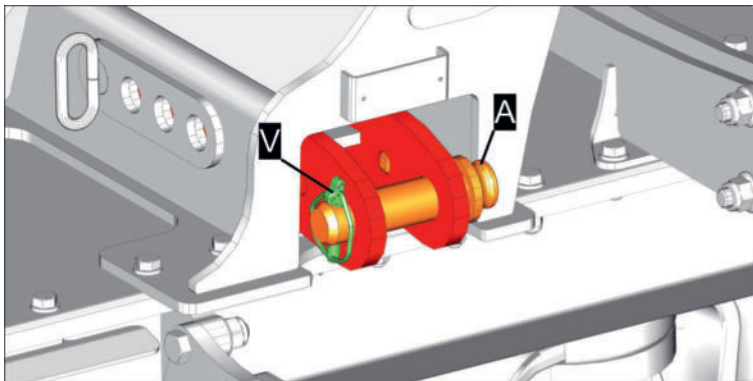


- ▶ Attach upper link ball (K) corresponding to the attachment category (CAT II / CAT III) and secure locking pin (A) with linch pin (V) as shown.

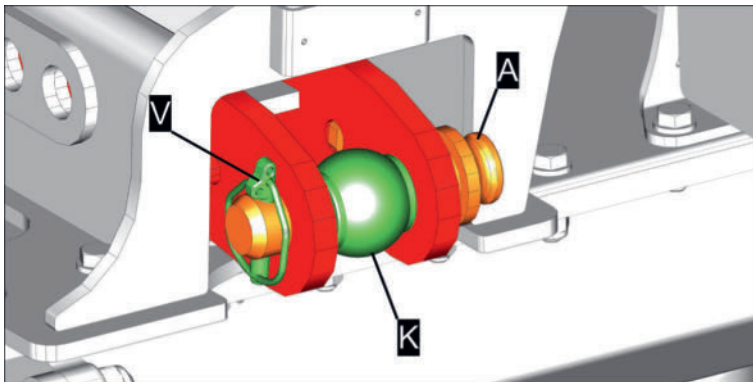
## Operation



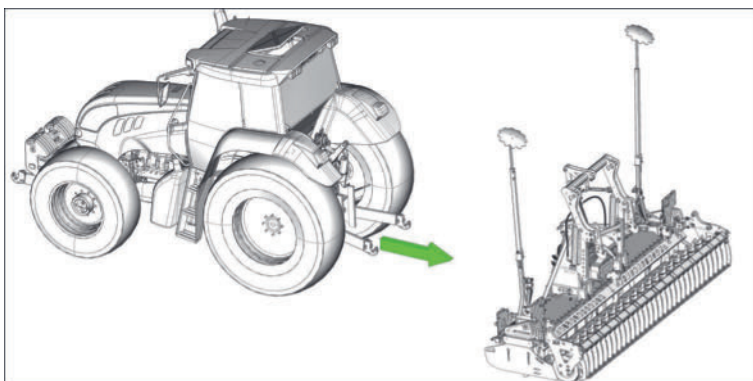
- ▶ Remove linch pin (V) and locking pin (A) on both sides for the lower link.



- ▶ Attach lower link ball corresponding to the attachment category (CAT II / CAT III) to the lower link brackets on both sides of the machine and secure locking pin (A) with linch pin (V) as shown.



- ▷ Make sure that the lower link brackets on the machine are correctly adjusted for attachment to the corresponding tractor. See "Lower link rocker setting" on page 61.
- ▶ Bring the tractor up until it is just in front of the machine.



- ▷ Adjust lower link on tractor to width and height of drawbar.
- ▷ Fix the hydraulic lower links on the tractor so that the machine cannot swivel out sideways.
- ▶ Bring the tractor up to the machine, attach the lower link of the tractor to the lower link balls and secure.

**⚠ CAUTION**

**Risk of crushing!**

- ▶ When attaching / detaching the machine, do not reach into the crushing danger area.

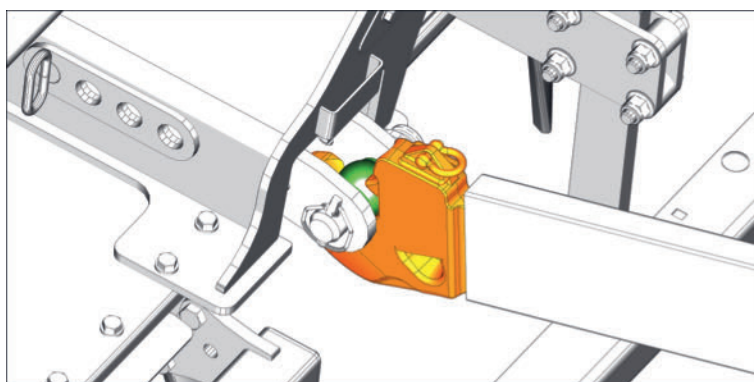


Fig.: Example of right lower link bracket.

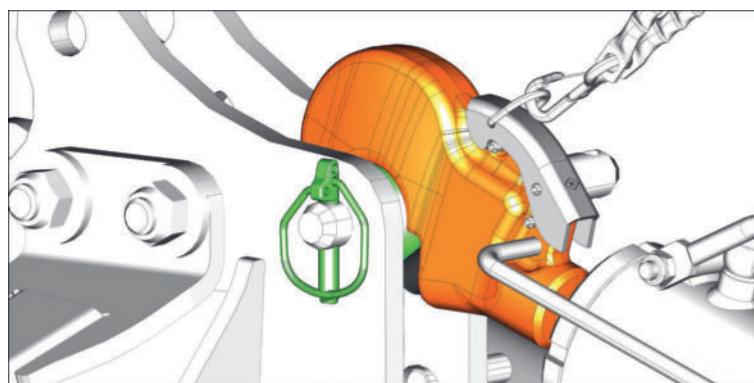
- ▶ Attach top link to tractor and secure. Refer to the tractor operating instructions.

**⚠ CAUTION**

**Risk of crushing!**

- ▶ When attaching / detaching the machine, do not reach into the crushing danger area.

- ▷ Attach top link to machine and secure.  
Make sure that the top link is pointing upwards slightly.



- ▶ Couple the PTO shaft as specified in the PTO shaft manufacturer's operating instructions.
- ▶ Attach PTO shaft holder (G) in working position as shown.

## Operation

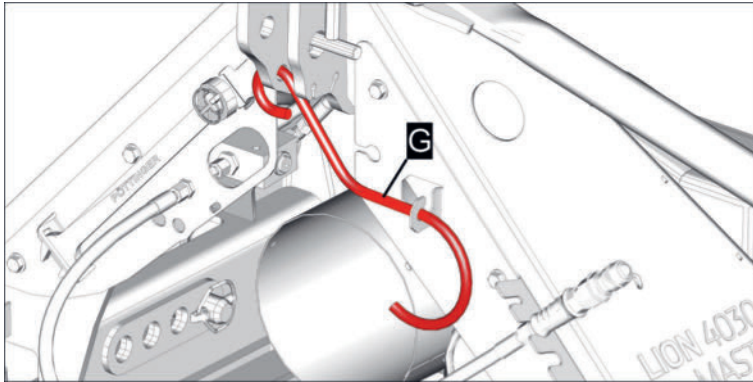


Fig.: PTO shaft holder in working position.

It may then be necessary to connect the seed drill hydraulics, PTO shaft and power with the tractor / soil tillage machine. See seed drill operating manual.

## Connect hydraulic hose to tractor

### WARNING

**Hydraulic oil that is discharged under pressure may pierce the skin and cause severe infection!**

- ▶ The hydraulic system must be de-pressurised on the tractor as well as on the machine.
- ▶ The hydraulic hoses connected to the machine must give slightly with all movements between the machine and the tractor without stretching, kinking or chafing.
- ▶ Should injuries occur, contact a doctor immediately.

### WARNING

**Crushing and severing of body parts when hydraulic function is reversed!**

- ▶ Hydraulic connections are marked in colour and must be allocated correctly when the connecting is made.

### ENVIRONMENT

Collect and correctly dispose of oils and oil mixtures.

### **Implementation**

- 1 Select a single-acting control valve for each function and move control valve to "Neutral".
  - Tramline marker (Optional)
  - Hydrolift (optional)
- 2 Select a double-acting control valve for each function and set the control valve to the float position.
  - Hydraulic top link (optional).
  - Hydraulic depth adjustment (option)
- 3 Connect the hydraulic hose for each function.

- 1 Remove the pressure cable plug (marked "P", protective cap-"red") from the hose cabinet.
- 2 Open the protection caps on the plug and socket of the selected control valve.
- 3 Clean the plug and socket with a lint-free cloth.
- 4 Press the plug into the socket until the socket is firmly locked.

 **TIP**

Couple hydraulic connections of any attached seed drills with the tractor: see seed drill operating instructions!

## Connect cable to tractor

### Implementation

- 1 Remove cable from hose holder.
- 2 Remove the protective cap.
- 3 Connect the cable to the tractor for each function.

## Attaching cardan shaft

Ensure that the cardan shaft has been adapted to the tractor before start-up.

 **CAUTION**

### Ejected PTO shaft fragments!

If the cardan shaft has not been adapted to the tractor, it could be destroyed during operation.

- ▶ Before start-up, have the cardan shaft adapted to the prospective tractor by an authorized service dealer.
- ▶ When there is a change of tractor, the suitability of the cardan shaft must be checked and the cardan shaft adjusted if necessary.

 **NOTICE**

### Ejected shaft parts!

Incorrect attachment of the cardan shaft can seriously damage tractor, machine and the cardan shaft itself.

- ▶ Before installing the cardan shaft, carefully read the accompanying cardan shaft manufacturer's operating instructions.

### Implementation

- ▶ Connect PTO shaft according to the instructions in the PTO shaft manufacturer's operating instructions (with the side of the overload clutch if available) to the PTO stub of the machine's input gear and allow it to fully engage.
  - ▷ Depending on the cardan shaft version, insert and tighten the clamping screws.

## Operation

- ▷ Ensure that the gearbox-power take-off stub connection to the cardan shaft is tight.
- ▶ Attach protective retaining chain (according to PTO shaft design) at a suitable point (close to the coupling point) taking into account the maximum swivel angle of the cardan shaft.
  - ▷ The protective retaining chain must not wrap around the guard, therefore cut the length of the chain taking into account the possible maximum swivel angle.
- ▶ Attach the other end of the cardan shaft to the tractor and allow it to fully engage.
  - ▷ Move PTO shaft holder (if available) to its park position.
  - ▷ Depending on the cardan shaft version, insert and tighten the clamping screws.
  - ▷ Ensure that the gearbox-power take-off stub connection to the cardan shaft is tight.
- ▶ Attach protective retaining chain (according to PTO shaft design) at a suitable point (close to the coupling point) taking into account the maximum swivel angle of the cardan shaft.

### NOTICE

#### Damage to safeguards!

Over-long protective retaining chains can wrap around the drive shaft in operation and damage protection elements.

- ▶ Do not attach protective retaining chain to gear safety cover.
- ▶ Cut the protective re chain to length, taking into account the maximum possible swivel angle.

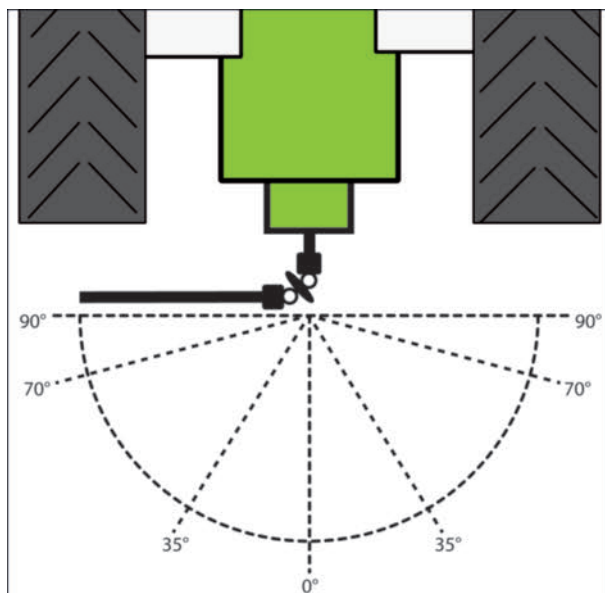
### Cardan shaft operating limits

When in operation, the permissible p.t.o. speed and the maximum permissible angle per joint fitting must not be exceeded.

When the p.t.o. is at a standstill, the permissible maximum angle for each joint fitting must likewise not be exceeded!

#### Maximum permissible angle per joint fitting

Joint fitting	Maximum angle during operation	Maximum angle when at standstill
Wide-angle joint	70 °	70 °
Normal joint	35 °	90 °



## Work assignment

### **⚠ WARNING**

#### **Danger of injury!**

- ▶ Check the machine for traffic and operational safety before starting work. Operate the machine only when all safety devices are properly installed and in working order.
- ▶ Couple the machine to the tractor. correctly and completely, before starting work.
- ▶ Before driving the machine, make sure that nobody is located in the danger area or behind the machine. If necessary, have a second person who is outside the danger area instruct you.
- ▶ Direct people out of the danger area.
- ▶ The driving performance is significantly impacted by ballast weights and the size of the attached/mounted machines. Avoid fast or sudden cornering, in particular when driving uphill or downhill or when driving transversely to the slope, because of the danger of tipping.
- ▶ Before leaving the tractor, apply the parking brake, turn motor off, remove ignition key and keep safe. If necessary, use wheel chocks.

### **⚠ WARNING**

#### **Damage to health due to noise!**

- ▶ If the noise level exceeds 80 dB(A), hearing protection is highly recommended.
- ▶ If the noise level exceeds 85 dB(A), hearing protection is compulsory.
- ▶ You can close the tractor cab to reduce the noise level further.

### **WARNING**

#### **Ejected material (e.g. stones, lumps of earth...) can hit and injure people!**

- ▶ Particular caution should be taken in stony fields, and near roads and paths.
- ▶ Place the protective covers in their operating positions.
- ▶ Keep a safe distance while engine is running!

No-one is permitted in the danger area during operation. Direct people out of the danger area.

No-one is permitted to travel on the machine during operation.

- ▶ Turn PTO shaft off and wait for the drive to come to a standstill before raising the machine.

### **NOTICE**

#### **Damage due to driving over obstacles!**

- ▶ Drive carefully.
- ▶ Remove known obstacles if possible before starting work.

### **ENVIRONMENT**

Avoid unnecessary change procedures. Before starting work, consider how the area could be optimally processed.

## Transport run

Transport runs are short trips on public roads, to and from the work site. Height, width and weight must not exceed the legally permitted values in the country where the machine is operated. Lighting must be clean and working during transport runs, and set vertically to the road.

### **CAUTION**

#### **Swinging of unsecured machine components!**

Machine components which have not been secured as stipulated prior to transport may swing out unexpectedly.

- ▶ Secure all swivelling machine components according to the instructions.

### **NOTICE**

#### **Damage to machine due to unsecured machine components!**

Machine components which have not been secured as stipulated prior to transport may swing out unexpectedly.

- ▶ Secure all swivelling machine components according to the instructions.

**Prerequisite**

- Machine / machine combination fully attached and secured to a suitable tractor. See "Couple the machine / machine combination with the tractor." on page 120.
- Ballast fully installed on the tractor. See "Tractor ballast" on page 56.
- PTO turned off.
- All foldable machine / machine combination components folded in road transport position.
- All transport safeguards activated. See "Transport safeguards" on page 42.
- Heavy dirt and grime removed from the machine / machine combination and all components
- Traffic safety equipment in faultless technical condition and fully operational. See "Reposition lighting carrier" on page 117. See "Traffic safety equipment" on page 35.

**Implementation**

- 1 Check the lateral swivel range of the tractor's lower link. Make any necessary correction so that the machine cannot swing when raised.
- 2 Lift the mounted seed drill to road transport position per Hydrolift or hydraulic top link and activate transport safeguards.
- 3 Raise the machine / machine combination to road transport position.
- 4 Turning lighting on.
- 5 Carry out transport run.

**Operation**** DANGER****Crushing, pulling in and severing of body parts!**

When approaching moving machine parts, clothing, hair and body parts can become caught, which means an escape is not possible without sustaining serious to fatal injuries.

- ▶ Do not access the machine's danger area as long as machine parts can move there.
- ▶ Check that protective devices are complete and ready for operation before start-up.
- ▶ Before start-up and during operation, direct individuals away from the danger zone in and around the machine.

** CAUTION****Danger of injury due to foreign bodies ejected at high speed!**

Foreign bodies such as stones (particularly to the rear of the machine) can be thrown out at high speed and over long distances if the machine is operated without a follow-on device.

- ▶ Do not operate the machine without a follow-on device.

## Operation

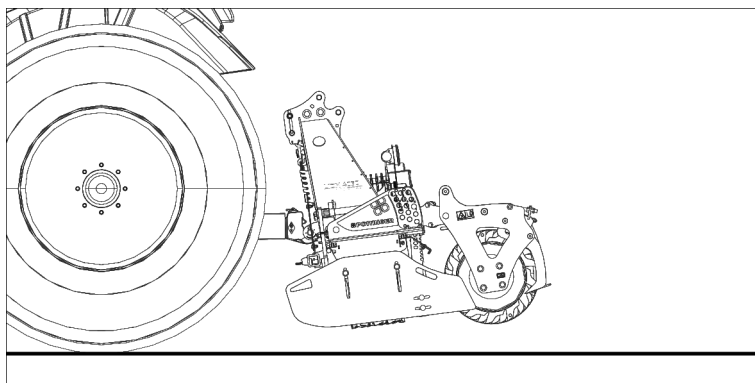
### Cultivate the soil

#### Prerequisite

- Machine / machine combination is fully attached and secured to a suitable tractor.
- Set the tractor lower link so that the machine can move sideways in working position without colliding with tractor parts.
- Ballast fully installed on the tractor.
- Transport safeguards removed. See "Transport safeguards" on page 42.
- All steps carried out for the operation of any attached seed drills as required. See seed drill operating manual.
- Side shields swung into working position.

#### Implementation

- 1 Lower the machine/machine combination to the ground.



- ▷ Lower any attached seed drill into working position using the hydraulic top link / Hydrolift.
  - ▷ Carry out all necessary work steps for the operation of any attached seed drill (e.g. switch on the control, switch on the blower fan, etc.)
- 2 Turn p.t.o. on and bring it up to the intended speed. See sticker on input gear.
- 3 Drive the tractor off slowly and lower the rotary harrow to the set working depth (trailing implement rests on the ground).
  - ▷ Adjust the soil tillage machine with the top link so that it is horizontal to the ground or tilted slightly forwards.
  - ▷ Check the inclination of any attached seed drills and adjust if necessary. See seed drill operating manual.
- 4 Accelerate tractor to operating speed and continue cultivating the soil / sowing.
- 5 Raise the rotary power harrow to headland position after travelling a short distance and stop the tractor to check the result.
  - ▷ Turn off the PTO.
  - ▷ Switch off current functions on any attached seed drills.
  - ▷ Switch off the tractor, remove and store the ignition key, apply the parking brake and secure the tractor against rolling using wheel chocks.
- 6 Check the result.

- ▷ If the result is not as required, adjust the settings of the machine to correspond to the desired result.
  - ▷ Adjust the setting of the side shields to the working depth as required. See "Side shield settings" on page 69.
  - ▷ Adjust the levelling effect via the levelling bar setting as required. See "Leveling board working depth setting" on page 71.
  - ▷ Adjust the working depth via the follow-on device setting as required. See "Manually adjust the working depth" on page 66. See "Hydraulically adjust the working depth" on page 68.
  - ▷ Adjust the track marker setting as required. See "Adjusting the track marker (optional)" on page 84.
  - ▷ Adjust the seed drill setting as required. See seed drill operating manual.
- 7 Put tractor back into operation.
- 8 Carry out all necessary work steps for the operation of any attached seed drill (e.g. switch on the control, switch on the blower fan, etc.)
- 9 Lower the machine / machine combination to the ground.
- 10 Turn p.t.o. on and bring it up to the intended speed.
- 11 Drive the tractor off slowly and lower the rotary harrow to the set working depth (trailing implement rests on the ground).
- 12 Accelerate tractor to operating speed and continue cultivating the soil / sowing.
- 13 In order to check the result again after travelling a short distance, raise the rotary power harrow in headland position and stop the tractor.
  - ▷ Turn off the PTO.
  - ▷ Switch off current functions on any attached seed drills.
  - ▷ Switch off the tractor, remove and store the ignition key, apply the parking brake and secure the tractor against rolling using wheel chocks.
- 14 Check the result again.
  - ▷ If the result does **not** correspond to requirements, repeat the process from point 6.
  - ▷ If the result corresponds to requirements, continue with the next steps.
- 15 Put tractor back into operation.
- 16 Carry out all necessary work steps for the operation of any attached seed drill (e.g. switch on the control, switch on the blower fan, etc.)
- 17 Lower the machine/machine combination to the ground.
- 18 Turn p.t.o. on and bring it up to the intended speed.
- 19 Drive the tractor off slowly and lower the rotary harrow to the set working depth (trailing implement rests on the ground).
- 20 Accelerate tractor to operating speed and continue cultivating the soil / sowing.

### Carry out turning operation

- ▶ Reduce tractor speed and stop.
- ▶ Turn p.t.o. drive off.

## Operation

### TIP

If the cultivator is only raised until the tines have been lifted completely out of the ground, the p.t.o. may remain switched on.

As a rule, if vibrations or noises occur on the cardan shaft when it is raised, switch the p.t.o. off before any turning manoeuvres.

- ▶ Lift the machine/machine combination to the headland position using the rear power lift.
- ▶ Carry out the turning operation.
- ▶ Carry out all necessary work steps for the operation of any attached seed drill (e.g. switch on the control, switch on the blower fan, etc.)
- ▶ Lower the machine/machine combination to the ground.
- ▶ Turn p.t.o. on and bring it up to the intended speed.
- ▶ Drive the tractor off slowly and lower the rotary harrow to the set working depth (trailing implement rests on the ground).
- ▶ Accelerate tractor to operating speed and continue cultivating the soil / sowing.

## Uncoupling

### DANGER

#### **Danger of tipping due to incorrect operation of support devices!**

If support devices such as support stands or parking supports are not used or not secured, the machine may tip over.

- ▶ Park the machine on flat, firm ground.
- ▶ Use support stands or parking supports when parking the machine.
- ▶ Secure support stands or parking supports as stipulated.

### DANGER

#### **Pulling in and severing of body parts!**

- ▶ Secure the PTO drive against unintentional starting.

### WARNING

#### **Danger of whole body being crushed when activating the power lift!**

- ▶ Direct people away from the danger area around the power lift.
- ▶ Do not stand between the tractor and the power lift when operating the power lift via external buttons.

### WARNING

#### **Crush hazard over the entire body!**

Do not remain in the danger area around the tractor and the machine unless the mower combination has been secured against rolling and accidental operation.

- 1 Instruct bystanders to leave the danger area around the tractor and the machine.
- 2 Make sure that bystanders do not enter the danger area.
- 3 Park the machine on flat, firm ground.
- 4 Apply the emergency brake.
- 5 Turn off tractor engine, remove ignition key and keep safe.
- 6 Insert wheel chocks on the tractor and on the machine.

### WARNING

#### **Falling due to slipping / tripping!**

Stepping on the parked machine can cause serious injuries.

- ▶ Do not step on the parked machine.
- ▶ Prevent children from stepping on the machine using suitable measures.

## Operation

### Unplug cable

#### Implementation

- ▶ Unplug the the cable from tractor and machine / machine combination for each function.
  - Machine / machine combination lighting plug.
  - Other plugs (e.g. control / power supply cable) for the attached seed rail.
- ▶ Install the covering caps.
- ▶ Roll up the cable and place in the tool box if possible, otherwise place it in the hose holder.

### Disconnect the hydraulic hoses

#### WARNING

**Hydraulic oil that is discharged under pressure may penetrate the skin and cause severe infection.**

- ▶ Depressurise the hydraulic system before connecting or disconnecting the hydraulic hoses.
- ▶ Depressurise the hydraulic system before disconnecting the hydraulic hoses, or carrying out maintenance or repair work.
- ▶ Should injuries occur, contact a doctor immediately.

#### ENVIRONMENT

Collect and correctly dispose of oils and oil mixtures.

#### Prerequisite

- Depressurize the hydraulics, otherwise it may not be possible to unplug the plug connections.
- Park tractor and machine on level, stable ground and secure against rolling.
- Cardan shaft uncoupled from the tractor and placed in the cardan shaft holder.
- Tractor motor turned off, parking brake applied, ignition key removed and stored during the work on the machine.

#### Implementation

- ▶ Switch the operating element of the tractor control valve to "Neutral or float position" for the following functions.
  - Tractor control valve of track marker (option) of soil tillage machine.
  - Tractor control valve of hydraulic depth adjustment of soil tillage machine.
  - Tractor control valve of Hydrolift (option).
  - Tractor control valve of hydraulic top link (option) for seed rail.
  - Tractor control valve for hydraulic seed rail operation. See seed drill operating manual.
  - Tractor control valve of hydraulic top link (option) for soil tillage machine.

- ▶ Disconnect the hydraulic hose for the corresponding function.
- ▶ Remove residual hydraulic oil from plug and bush using a clean, lint-free cloth.

 **ENVIRONMENT**

Dispose of residual oil correctly and do not allow it to be released into the environment.

- ▶ Attach the protective caps at the plug and socket.
- ▶ Place hydraulic hoses on hose holder (rolled up if necessary) on the soil tillage machine or seed drill.

## Unhitching the machine / machine combination.

The cultivator can be attached to a tractor as a stand-alone machine or together with suitable seed drills in a machine combination.

### Requirements

- Transport safeguards applied properly and completely.
- Tractor and machine / machine combination parked in working position as shown below and secured against rolling.

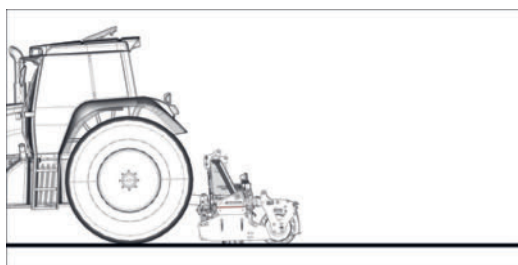


Fig.: Stand-alone machine (here without track marker)

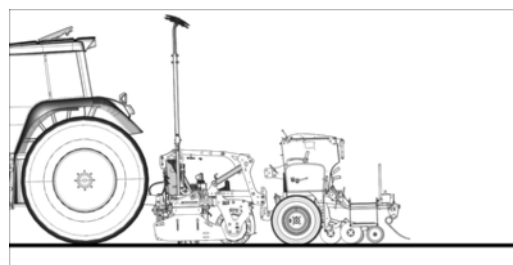
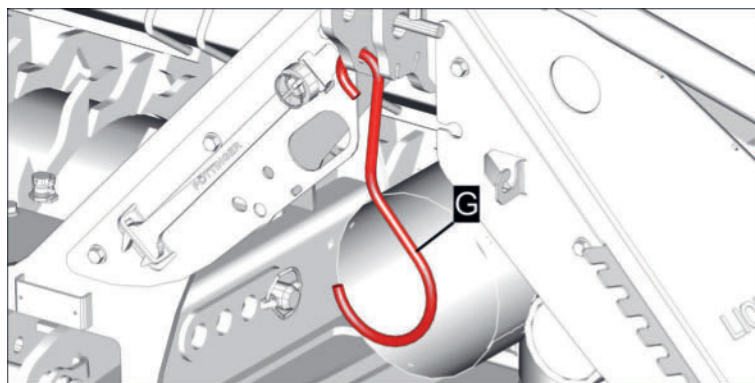


Fig.: LION machine combination with VI-TASEM on Hydrolift

- Hydraulic hoses disconnected.
- Electrical lines disconnected.
- Cardan shaft uncoupled from the tractor, pushed together and placed in the cardan shaft holder (G).



### Preparation

- Level, load-bearing and weather-protected parking space.

## Operation

- Preservative agent for bare machine parts (such as piston rods on hydraulic cylinders) if the machine is to be stored for a longer period of time.

### Unhitch the machine / machine combination.

#### Implementation

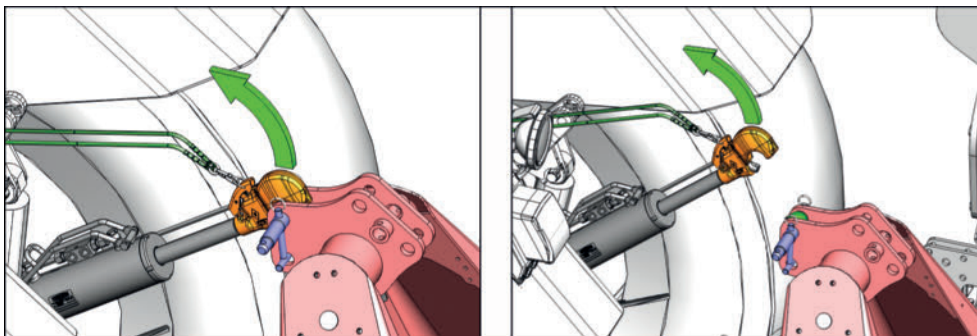
- ▶ Lower the soil tillage machine right to the ground with the rear power lift and place it horizontally on the tines and follow-on device if not already done.
  - ▷ Complete all the necessary steps for parking the seed drill in working position as described in the seed drill operating instructions and lower the seed drill as far as it will go in working position.
- ▶ Switch off the tractor, remove and store the ignition key, apply the parking brake and secure the tractor against rolling.

#### **⚠ CAUTION**

##### **Risk of crushing!**

- ▶ When attaching / detaching the machine, do not reach into the crushing danger area.

- ▶ Relieve and disconnect top link.



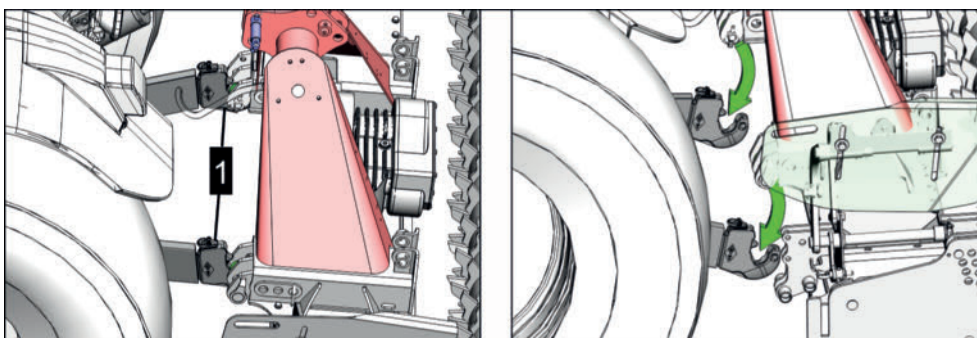
Symbol illustration

- ▶ Relieve and uncouple the lower link (1), and lower it using the rear power lift.

#### **⚠ CAUTION**

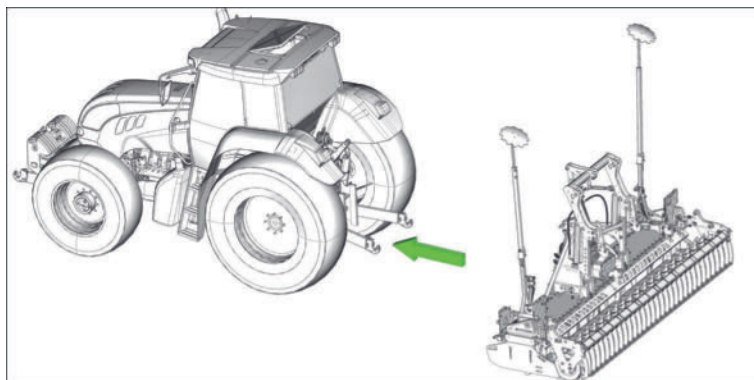
##### **Risk of crushing!**

- ▶ When attaching / detaching the machine, do not reach into the crushing danger area.



Symbol illustration

- ▶ Drive tractor away from cultivator.



- ▷ Remove top link and lower link if necessary.

## Put machine out of operation at end of season

### ! NOTICE

#### Damage due to unsuitable storage conditions!

- ▶ Store the machine in a clean, dry weather-protected area and not near artificial fertilizer or stabling.
- ▶ Apply rust protection to bare machine parts, e.g. hydraulic cylinder piston rods or similar.
- ▶ Disconnect drive shafts from the machine, push together fully lengthwise and store in dry weather-protected area

### ! WARNING

#### Falling due to slipping / tripping!

Stepping on the parked machine can cause serious injuries.

- ▶ Do not step on the parked machine.
- ▶ Prevent children from stepping on the machine using suitable measures.

### DANGER

#### **Catching, being drawn in, severing of limbs, as well as crushing and running over for the entire body!**

The danger zone between the tractor and the machine has to be entered during work.

- ▶ Switch off PTO and tractor engine during work, apply parking brake, remove ignition key and keep it safe.
- ▶ Wait until all machine components have stopped moving before entering the danger area between the tractor and the machine.
- ▶ Use support blocks during maintenance work under the machine!

### WARNING

#### **Rotating parts behind protective covers!**

Rotating parts behind protective covers can continue to run unnoticed for a long time!

- ▶ Wait for all rotating parts to come to a standstill.
- ▶ Make sure that third parties cannot inadvertently activate the machine.
- ▶ Make sure that third parties cannot inadvertently activate the tractor.

### WARNING

#### **Not wearing personal protective equipment!**

- ▶ Use personal protective equipment (protective clothing, work gloves)

## Maintain operational readiness

Regular care and maintenance is a basic requirement for the machine to remain functional and safe to operate.

**⚠ WARNING****Risk of injury when working on the machine!**

- ▶ Use personal safety equipment such as protective glasses, gloves, etc.
- ▶ Park machine on firm, level ground and secure against rolling.
- ▶ Turn tractor motor off, apply park brake, remove ignition key and keep safe.
- ▶ Secure the work area so that bystanders / unauthorized persons cannot enter it.
- ▶ All work must be carried out only when the drive is at a complete standstill.
- ▶ Close stop valve on all hydraulic lines before working in danger area or on hydraulically controlled machine parts.
- ▶ Remove all electrical plug connections between tractor and machine before working on electrically driven machine parts.
- ▶ Use suitable supports to prevent accidental lowering / swinging of hydraulically controlled machine parts.
- ▶ On completion of the work, check tightness of loosened screw connections and check that safety / protective equipment function correctly.

## General tips

Re-tighten all screws after the first hours of operation!

### Spare parts

**PÖTTINGER original parts and accessories** are specially designed for the respective machines.

Please be advised that spare parts and accessories not supplied by PÖTTINGER are not approved for use on PÖTTINGER machines.

The installation and use of such products may affect the given characteristics of your machine. The manufacturer accepts no responsibility for damages caused through the use of non-genuine parts and accessories.

The manufacturer accepts no liability for unauthorised modifications to the machine or the use of components and attachments that are not part of the machine ex works.

### Control terminals

Before wintering the machine, unplug the control terminals and store them in a dry, frost-proof area which is protected from direct sunlight. Fully charge battery-operated terminals before winter storage and then check the battery status regularly to prevent its destruction through deep discharge.

### Cardan shafts

In principle, the instructions in this manual apply for the maintenance of cardan shafts

If there are no special instructions in this manual, then the instructions in the manual supplied by the relevant cardan shaft manufacturer apply.

## Maintenance

### Repair welding

Prior to any welding work on the tractor while the machine is attached, unplug the connectors on the machine's job computer. Prior to any welding work directly on the machine, the job computer plug connections must also be disconnected.

### Battery charging and jump-start procedures

If the tractor battery is charged by means of a charger with the machine attached, all electrical plug connections to the machine must be disconnected beforehand.

If the tractor has to be started by means of a starting aid with the machine attached, all electrical plug connections to the machine must be disconnected beforehand.

## Cardan shaft

### TIP

The lubrication intervals for the cardan shaft are to be adjusted or halved in the case of dusty conditions or sharp operational angles.

### TIP

For full cardan shaft cleaning and maintenance information, observe its manufacturer's operating manual which is enclosed with this cardan shaft!

### Winter operation

If the cardan shaft is used in winter, the protection tubes must be greased with universal grease with lubricant code (IV) according to the equipment specification to prevent them from freezing. See page 158.

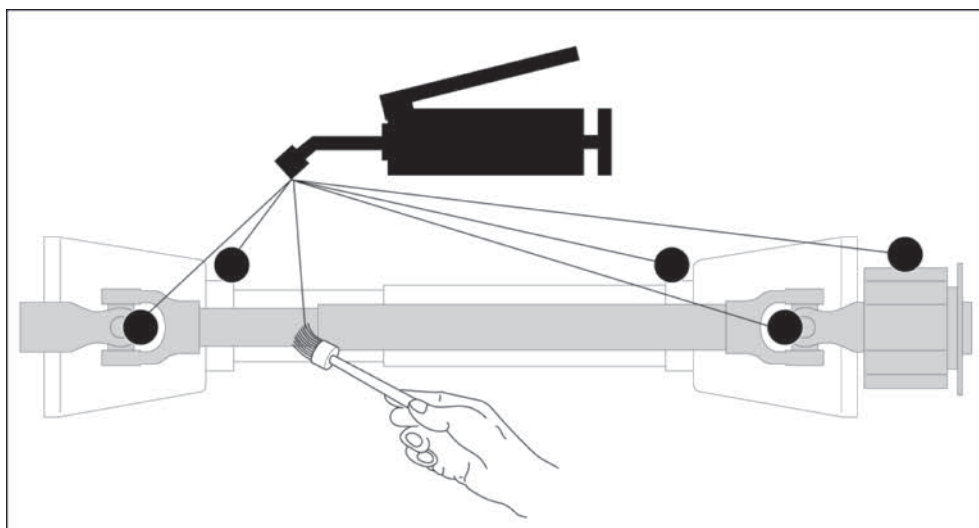
### Implementation

- ▶ Extend the cardan shaft without protective tube lubrication to the maximum possible length and apply a thin layer of universal grease to the inner protective tube.
  - ▷ Push the cardan shaft back together.
- ▶ Lubricate the cardan shaft with integrated protective tube lubrication at the lubricating points according to the cardan shaft manufacturer's operating instructions.

### Clean and grease cardan shaft

#### Implementation

- ▶ Brand-new cardan shafts or ones that have been stationary for a long time before commissioning should be cleaned and greased with universal grease with lubricant code (IV) until grease flows from the bearings. See "Equipment specification" on page 158.



Symbol illustration of possible lubrication points

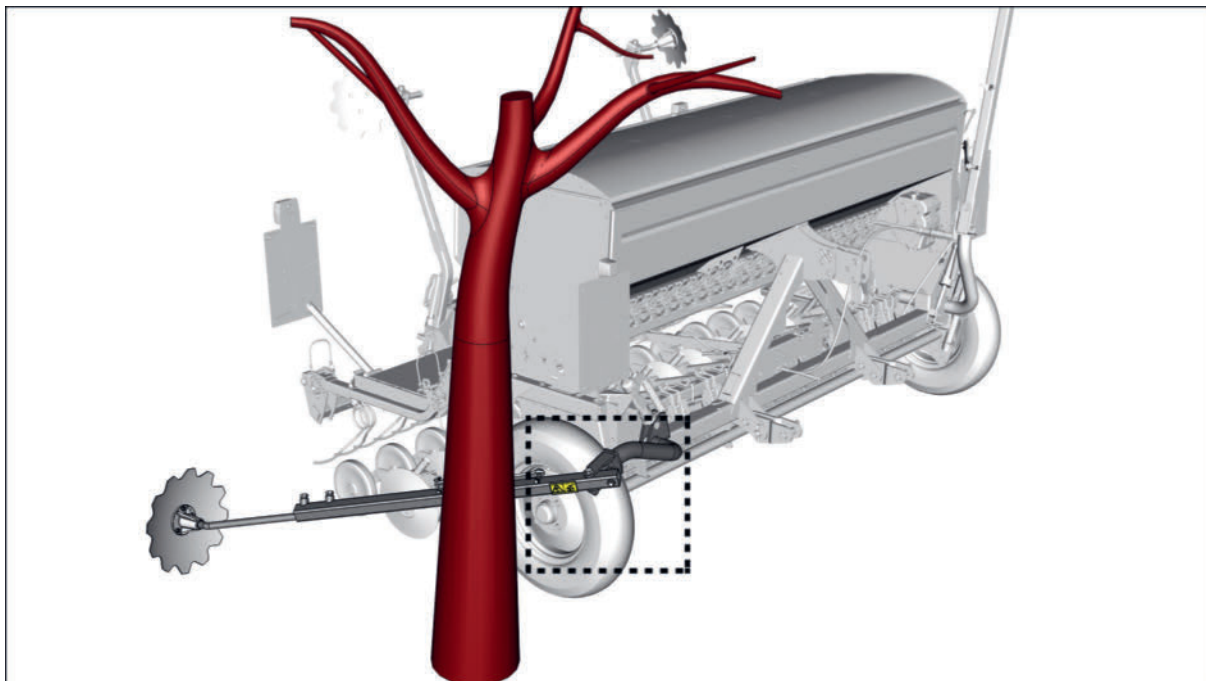
- ▷ Dispose of escaping lubricant correctly.
- ▶ Cardan shafts should then be greased regularly according to the manufacturer's instructions / lubrication plan.

## Maintenance based on actual condition

The activities described below are carried out after checking and evaluating the condition of certain machine areas / machine parts.

## Track marker collision safety

The track marker is equipped with protection against damage with a breakaway bolt. The screw is to be replaced after triggering the collision safety.



Symbol illustration of the right track marker

### Replace shear bolt

Two reserve shear bolts are fitted on each track marker-outrigger.

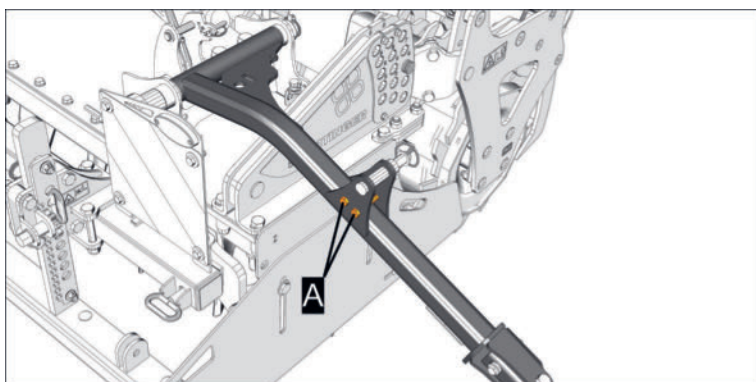
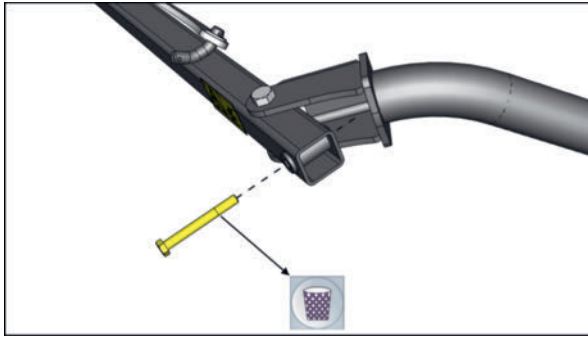


Fig.: Example of LION left boom

### Implementation

- ▶ Remove any torn screw residue.



- ▶ Press the track marker forward.

**! NOTICE**

**Danger of property damage**

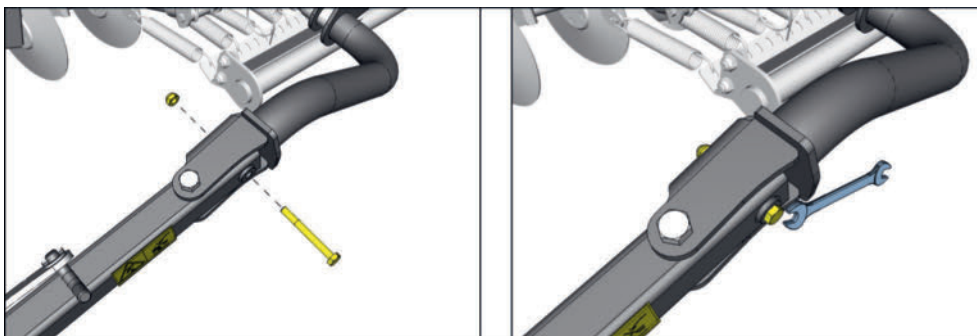
If an unsuitable screw without a predetermined breaking point is installed, there is a possibility that if a newly response of the collision safety happens there could be damage on the track marker.

- ▶ Only use PÖTTINGER original-spare parts.

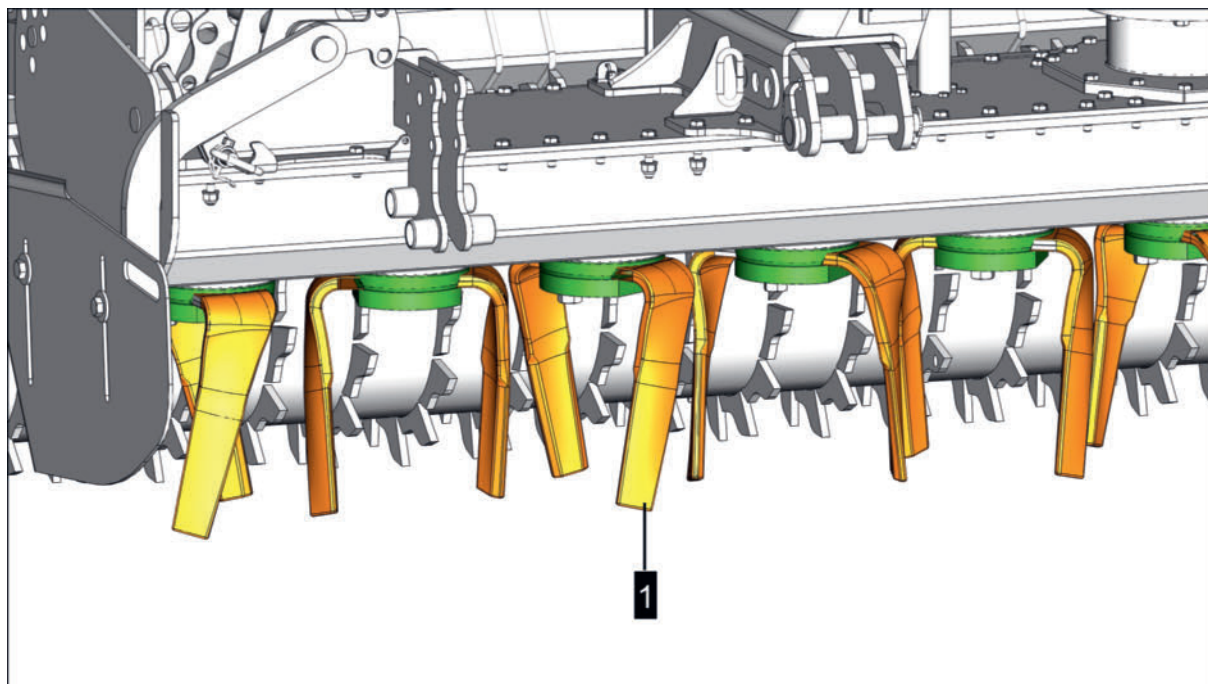


Symbol illustration

- ▶ Fit new washers and nuts, and tighten. See Spare Parts List also.



## Replace tines



1 = Tines

- In case of damage
- When the wear limit is reached

### Tine replacement with standard plate (series)

#### **⚠ DANGER**

**Danger of catching and pulling in a person's clothing or long hair.**

- ▶ Any mounted seed drills have been removed from the soil cultivator.
- ▶ Soil cultivator attached to a suitable tractor.
- ▶ Soil cultivator raised slightly, parked on level and load-bearing ground, secured against accidental lowering with suitable supports.
- ▶ Tractor motor turned off, ignition key removed and stored.

#### **Preparation**

- Medium-strength thread lock (e.g. Loctite 243)

#### **Implementation**

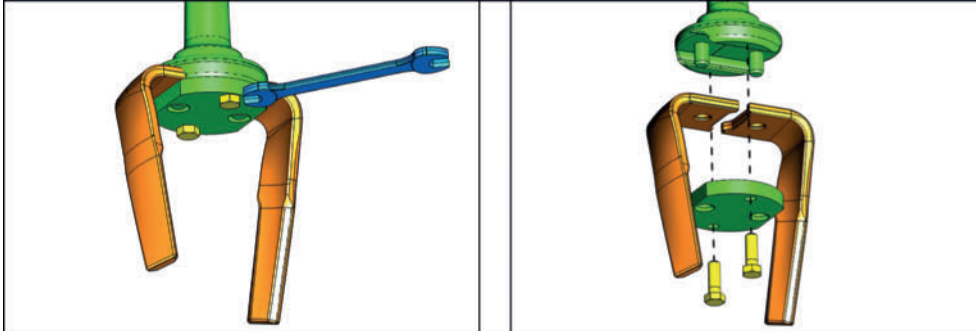
- ▶ Remove the screws, take off the plate and mark the mounting position of the plate.

**⚠ WARNING**

**Danger of machine parts falling!**

When removing the plate, the tines could drop.

- ▶ Loosen the plate gradually.
- ▶ Be aware that both tines release simultaneously with the plate and can be removed together with the screws or bolts.



- ▶ Clean tine carrier, plate and holder area (around the hole) of the tines.
- ▶ Apply thread lock to the screw threads (use new screws if necessary - see spare parts list).
- ▶ Fit the tines and plate, taking into account the mounting position of the plate (as removed).
- ▶ Replace screws and tighten to a torque of 290Nm.

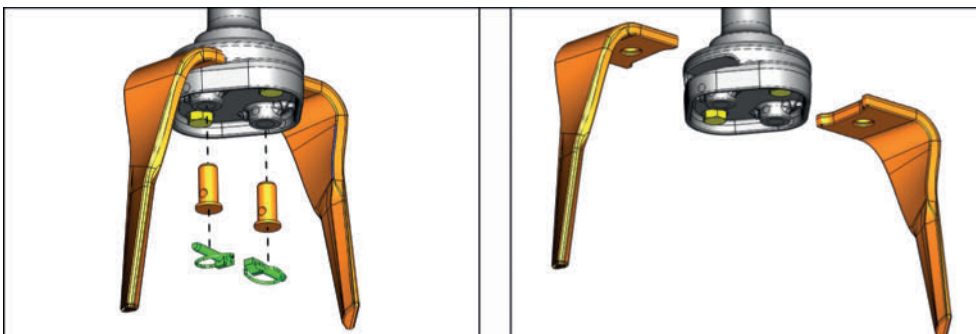
**Tine replacement with quick-release plate (optional)**

**Prerequisite**

- Any mounted seed drills have been removed from the soil cultivator.
- Soil cultivator attached to a suitable tractor.
- Soil cultivator raised slightly, parked on level and load-bearing ground, secured against accidental lowering with suitable supports.
- Tractor motor turned off, ignition key removed and stored.

**Implementation**

- ▶ Remove linch pins and bolts, then pull out the tines laterally.



- ▶ Clean (brush out, blow out) the spaces between the tine holders as required.

## **Maintenance based on actual condition**

- ▶ Refit tines in reverse order and secure with linch pin.

The activities described below are carried out at a specific time or at specific intervals.

## Before every season

### Bar lubrication

#### TIP

The bar contains fluid grease (Specification DIN51825 KP2K-20).

In normal operation it is not necessary to replace the fluid grease during the service life of the machine.

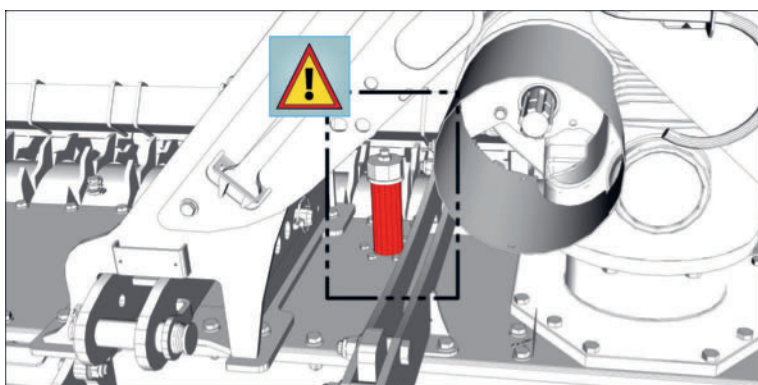


Fig.: Grease filler neck

#### Check the grease filling level.

#### TIP

If there is no obvious grease loss from the bar, then checking the level once per season is sufficient.

Check level when the machine is at operating temperature.

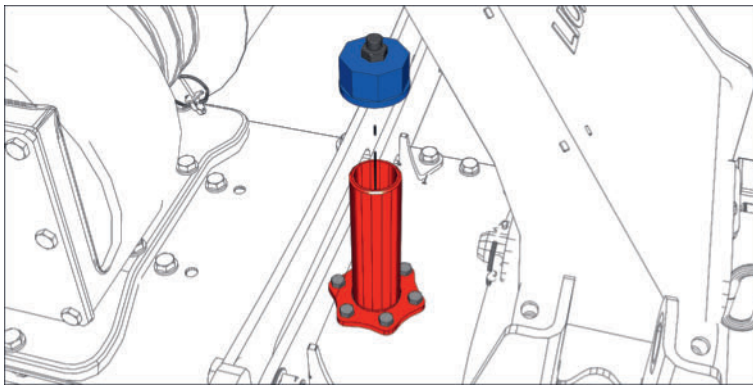
#### Prerequisite

- Park machine on level and stable ground in working position.
- Filler neck and surroundings are clean to prevent foreign matter from entering the bar gearing.
- Let intensely heated parts of the machine, such as the input gearbox, cool down before touching them.
- Use personal safety equipment (such as gloves, protective goggles and protective clothing).

#### Implementation

- ▶ Open the filler neck and check the grease level.

## Predetermined maintenance



- ▶ The fill level should be approx. between the middle of the gearwheels (MIN) and the upper edge (MAX) of the gearwheels.

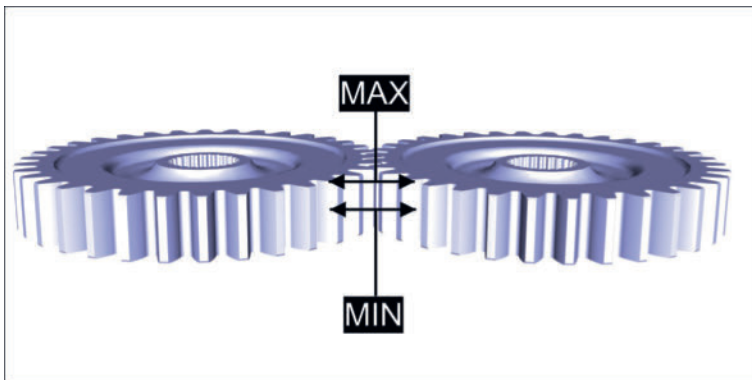


Fig.: Minimum and maximum fill level

- ▷ If the grease level no longer reaches the upper edge of the gearwheels, heat some fresh grease slightly to improve its flow properties and fill gradually until the fill level is at the upper edge of the gearwheels.

### **NOTICE**

#### **Overheated grease!**

If the grease is overheated, its lubrication properties may be impaired.

- ▶ Do not heat grease above 35 °C.

### **WARNING**

#### **Danger of burning with hot grease!**

- ▶ Do not heat grease above 35 °C.

- ▶ Close filler neck and tighten cover.

## Check the cardan shaft cam clutch

The cardan shaft cam clutch should be checked (pulled off) once a year. This inspection is important, especially if it never responds during normal operation.

**NOTICE****Overload in powertrain!**

If the cam clutch coupling never releases during operation, the release torque may increase sharply by itself or the cam clutch coupling may get stuck.

- ▶ Have the cardan shaft made part by an authorized service specialist annually!

A tolerance of +/- 10% release torque is permitted.

If the limit value is exceeded or not reached, the cardan shaft must be replaced.

**TIP**

For full cardan shaft cleaning and maintenance information, observe its manufacturer's operating manual which is enclosed with this cardan shaft!

## Daily maintenance

Maintenance is to be carried out at the beginning of each working day before using the machine.

### Check hydraulic system

**WARNING****Infections due to leaking hydraulic oil!**

Hydraulic oil that is discharged under pressure may penetrate the skin, enter bodily orifices and cause severe infection.

- ▶ Depressurize the hydraulic system before carrying out maintenance work.
- ▶ Wear personal protective equipment such as goggles and gloves when working on the hydraulic system.
- ▶ Before starting operation, always check the hydraulic system for wear and damage.
- ▶ Only search for leaks with suitable aids (e.g. special spray for leak detection). Have any defects dealt with immediately in a specialist workshop.
- ▶ Do not seal off leaks using your hands or other body parts.
- ▶ Seek medical advice immediately in case of injury caused by hydraulic oil.

### Check for damage and leaks

**NOTICE****Rupturing of old hydraulic hoses**

- ▶ Hydraulic hoses that are older than 6 years should be replaced. Use only replacement hoses with the same specifications. See the spare parts list.

## Predetermined maintenance

### Prerequisite

- Machine is parked on level, stable ground and secured against rolling away.
- Tractor motor turned off, ignition key removed and stored.

### Implementation

- ▶ Check hydraulic system (e.g. hydraulic hoses, pressure reservoir) for damage and leaks and replace components if necessary (see spare parts list).

#### TIP

##### Possible damage to hydraulic hoses

- Kinks
  - Blistering
  - Porous or cracked hose surface
  - Abrasion points and exposed mesh on the hose sheathing
- ▷ If a leak exists in the screw connection, then retighten each screw connection if possible. If this does not stop the leak, the hydraulic component concerned must be replaced immediately.
  - ▷ Depressurize the hydraulic system before carrying out any maintenance and repair work on the hydraulics.  
To do so, move the tractor control device several times between "Raise" and "Lower" with the hydraulic pressure supply turned off.

## Check / change lighting / illuminants

Faulty lights or lamps must be replaced before driving in public traffic areas (this does not apply to work lights)

#### TIP

##### LED light maintenance

Illuminants cannot be replaced with LED lights!

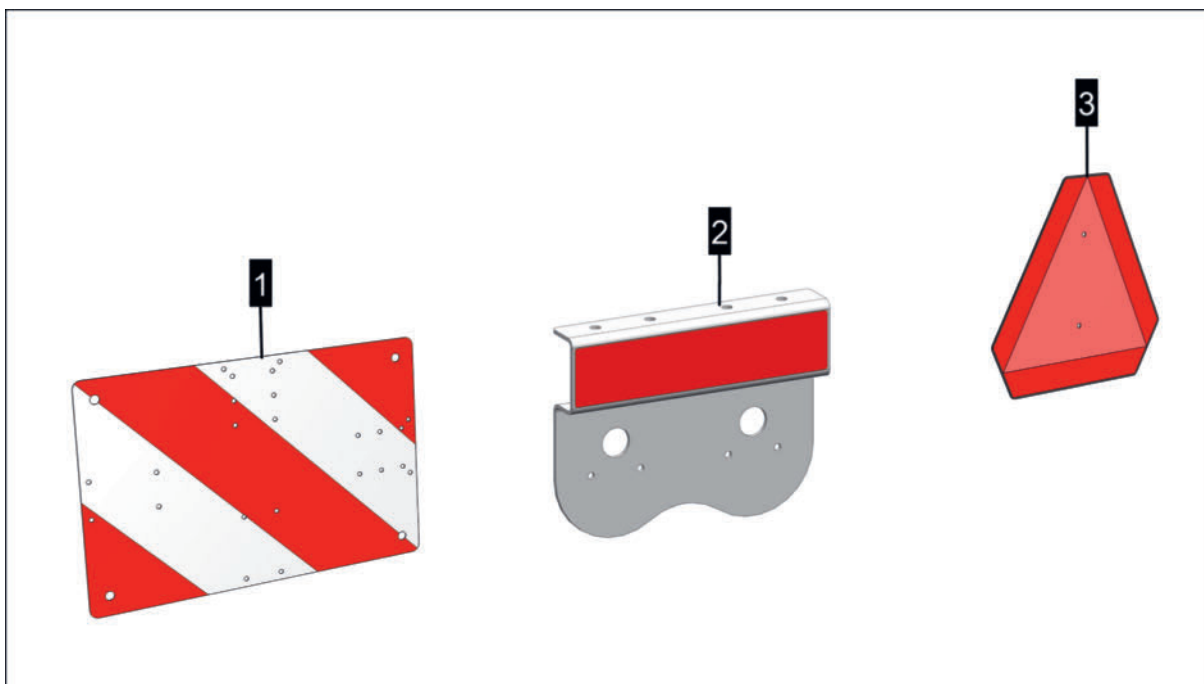
Change the LED lights when faulty.

## Check / replace warning signs, warning triangles, warning sheets

#### TIP

Warning signs, triangles and sheets consist of a slide (different materials) with a layer of light-reflecting material applied on top.

The design and assembly positions may differ depending on the machine and country of destination.



Symbol illustration

1 = Warning sign

2 = Warning sheets (red and yellow)

3 = Warning triangle (SMVI emblem)

#### **⚠ CAUTION**

**Danger of accident due to poor visibility of warning equipment.**

- ▶ Clean soiled warning signs, warning triangles, warning foils before travelling in public traffic areas with the machine.
- ▶ Replace damaged warning signs, warning triangles, warning foils before travelling on public roads with the machine.

#### **Implementation**

- ▶ Check that warning signs, triangles and sheets are clean.
  - ▷ Remove all dirt using an acid and alcohol-free cleaner, a smooth cloth or sponge and if possible a little warm water.
- ▶ Check warning signs, triangles and sheets for damage.
  - ▷ Replace all warning signs, triangles and sheets that have been damaged by adverse weather or mechanical influences (see spare parts list).

#### **🔧 TIP**

When replacing the warning signs, observe the mounting direction of the warning sign strips!

## Initially after 50 hours, then every 100 hours

### Oil change input gear

#### **⚠ WARNING**

##### **Risk of burning from hot gear oil or the hot gearbox housing!**

Machine operation may cause the gearbox housing and transmission oil to become hot.

- ▶ Allow gearing to cool.
- ▶ Use oil-proof gloves and protective eyewear.

#### **🧩 TIP**

Cold gear oil is thicker than warm oil.

It is best to change the oil immediately after operation, as long as the gear oil is still relatively thin.

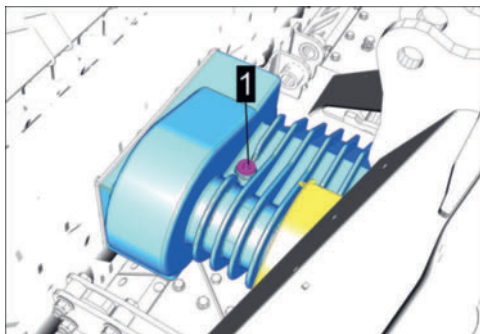
#### **Prerequisite**

- Any attached seed drill has been removed.
- The machine has been placed on an even, load-bearing surface.
- The areas around the opening filling plugs, fill level control plugs and filling plugs are cleaned to prevent dirt from entering the gearbox.

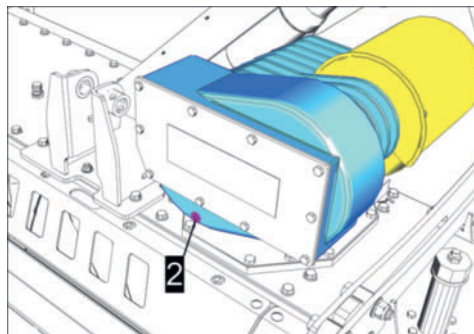
#### **Preparation**

- Waste oil collecting pan with a minimum capacity of 2 litres.
- Oil fill funnel
- Wastepaper or similar.
- Fresh gear oil according to operational materials list / lubrication plan.
- New sealing ring on oil drain screw / fill level plug / filling plug (see spare parts list).

#### **Input gear with through-drive / change gears**



1 = Oil filler plug



2 = Oil drain plug








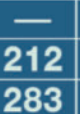

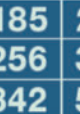
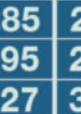
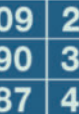

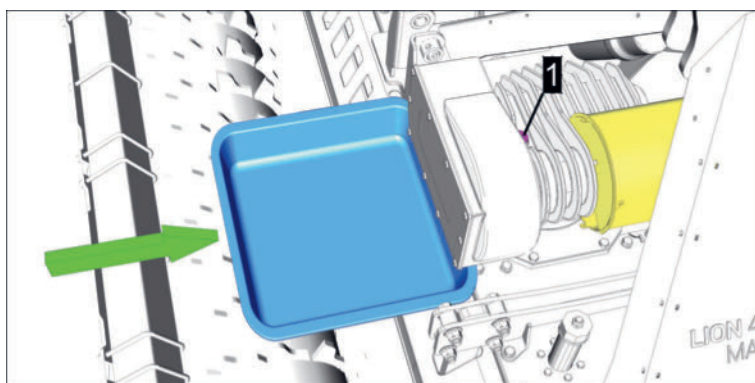
 U/min (rpm)	 26	 39	 29	 36	 31	 34	Z 1
	 39	 26	 36	 29	 34	 31	Z 2
	540	—	343	185	285	209	251
750	212	—	256	395	290	349	
1000	283	—	342	527	387	465	

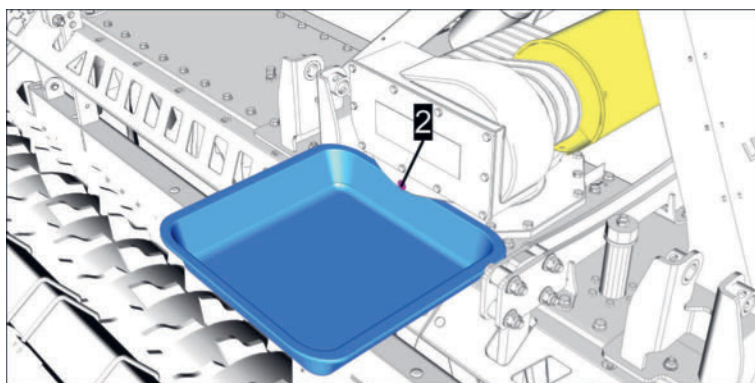
Fig.: The speed sticker on the gearbox represents the ratio of the PTO speed (left column) to the rotor speed depending on the gear wheel assembly used.

### Implementation

- ▶ Unscrew oil filler plug (1) with oil dipstick, wipe off and place oil pan under the oil drain plug.



- ▶ Unscrew the drain plug (2).



- ▶ Drain old oil completely.
- ▶ Screw in and tighten the oil drain plug (2) with a new sealing ring (see spare parts list).
- ▶ Gradually fill with fresh gear oil according to "lubricants and fill quantities" table (with small quantities in increments. See "Operating materials" on page 158.
  - ▷ Screw in the refill screw completely after each filling step but do not tighten it and unscrew it again to read the fill level on the dipstick. Then wipe the dipstick to take a new measurement.
  - ▷ Do not overfill the transmission! Fill gear oil up to the upper marking on the dipstick.
- ▶ Screw in and tighten the oil drain plug (1) with a new sealing ring (as required).
- ▶ Dispose of used oil and oil-contaminated waste paper responsibly.

### After every season (winter storage)

Machines that are stored without appropriate rust protection may sustain damage when they are put back into operation at the beginning of the season. Therefore, the machine must be protected from dust deposits (especially from artificial fertiliser and seed dressing), not be parked near stables and be protected from the weather.

#### NOTICE

##### **Rust damage on uncoated machine parts without rust protection!**

If uncoated machine parts are not protected, rust damage may appear when the machine is restarted after a long period of inactivity (e.g. after winter storage).

- ▶ Clean bare hydraulic cylinder piston rods before storing the machine for the winter and protect with universal grease.
- ▶ Clean shaft stubs on gearboxes and cardan shaft profiles before wintering the machine, and protect them with universal grease.
- ▶ Lubricate all greasing points according to the maintenance instructions before winter storage.

### Clean and protect the machine

#### **Prerequisite**

- Machine is parked on level and stable ground and secured against rolling away.
- Tractor motor turned off, ignition key removed and stored.

#### **Preparation**

- High-pressure cleaner
- Preserving oil

#### **Implementation**

- 1 Thoroughly clean with a high-pressure cleaner.

#### CAUTION

##### **Danger to eyes from using high-pressure cleaners!**

- ▶ Wear safety goggles when carrying out cleaning activities with high-pressure cleaners or compressed air.

**NOTICE**

**High-pressure cleaners can damage machine components.**

- ▶ Maximum water temperature 80 °C
- ▶ Do not use round jet nozzles, dirt blasters or power cleaner nozzles.
- ▶ Maintain a minimum distance of approx. 30 cm between the high-pressure nozzle and the surface.
- ▶ Always keep the water jet moving during cleaning.
- ▶ Do not direct water jet directly at electrical or hydraulic components, bearings, suction openings, cardan shafts, stickers and tyres.

- 2 After wet cleaning let the machine dry.
- 3 Touch-up any possible coating damage.
- 4 Oil/spray uncoated machine components with preservative oil.
- 5 Check that warning symbols are complete and replace if necessary.

## Every 6 years

### Replace hydraulic hoses

**WARNING**



**Hydraulic oil that is discharged under pressure may penetrate the skin and cause severe infection.**

- ▶ Depressurise the hydraulic system before connecting or disconnecting the hydraulic hoses.
- ▶ Depressurise the hydraulic system before disconnecting the hydraulic hoses, or carrying out maintenance or repair work.
- ▶ Should injuries occur, contact a doctor immediately.



Hydraulic hoses that are older than 6 years should be replaced. Only use replacement hoses of the same specification and use the attachment points and attachment method of the "old" hoses, or transfer them to the new hoses. See Spare Parts List also.

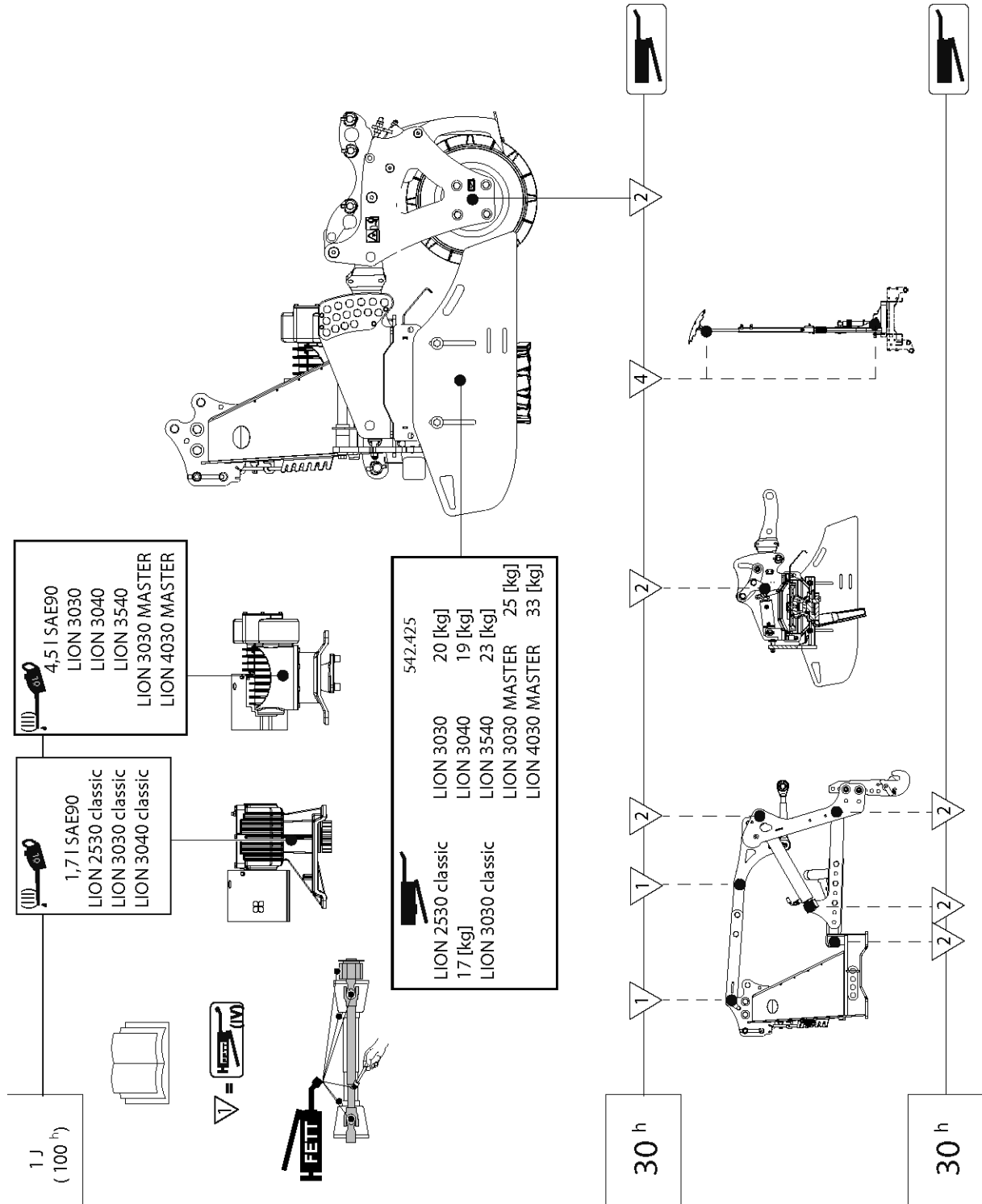
## Lubrication chart

### Lubrication plan symbol explanation

Symbol	Explanation
	Grease
	Oil

## Predetermined maintenance

Symbol	Explanation
	The number and position of the grease nipple
Roman numerals in curved brackets e.g. (III), (IV), etc.	See "operating material specification" section for the operating material code; see "lubricants and fill quantities" section for fill quantities
	Observe the manufacturer's safety instructions!
X <sup>h</sup>	Lubricate every "X" operating hours
_____	Solid connecting lines - standard part
- - - -	Dotted connecting lines - optional part



## Equipment specification

### TIP

Minimum quality standards specified by PÖTTINGER Landtechnik G.m.b.H. for equipment used on PÖTTINGER machines.

### NOTICE

#### Danger of machinery damage!

- ▶ If operating materials with lower quality standards than those specified are used, the machine may become damaged.

Equipment reference number According to lubrication plan	Designation	Specification
I	Hydraulic oil	HLP 46 DIN 51524 Section 2
II	Motor oil	SAE 30 according to API CD/SF
III	Gear oil	SAE 90 or SAE 85W - 140 according to API-GL 4 or API-GL 5
IV	Lithium grease	DIN 51 502, KP 2K
V	Liquid grease for gears	DIN 51 502:GOH
VI	Complex grease	DIN 51 502:KP 1R
VII	Gear oil	SAE 90 or SAE 85W - 140 according to API-GL 5
VIII	Gear oil	SAE 75W - 90 according to API-GL 5
IX	Gear oil	SAE 80W - 90 according to API-GL 5
X	Biological lubrication oil	SAE 15W-40
XI	Liquid grease for gears	DIN 51 825:KP2k-20

## Operating materials and filling quantities

Where	Operating materials code According to lubrication plan	Designation	Specification	LION 3030 MASTER / 8787
Lubricating points (also with grease nipples)	(IV)	Lithium universal grease	NLGI 12	If required
Bar	(XI)	Fluid grease	Li-grease DIN 51825 KP2K-20	25 kg

Where	Operating materials code According to lubrication plan	Designation	Specification	LION 3030 MASTER / 8787
Classic gearing	(III)	Gear oil	SAE 90 or SAE 85W - 140  according to API-GL 4 or API-GL 5	4,5 l

# Lighting

## Lighting complete without function

### *Causes and remedies*

- ▶ Defective fuse.
  - ▷ Replace with fuse of identical specification.
- ▶ Present contact error of the cable.
  - ▷ Turn lighting off and on again.
  - ▷ Verify correct connection of all cable connectors.
  - ▷ Defective cable. Have it replaced or repaired by the service workshop.

## Lighting partly without function

- ▶ Defective lamp.
  - ▷ Replace with lamps of identical specification.
  - ▷ With LED lighting the lamps may be impossible to exchange (for example, side marking lamps). In that case the lamps must be replaced in a service workshop.
- ▶ Present contact error of the cable.
  - ▷ Turn lighting off and on again.
  - ▷ Verify correct connection of all cable connectors.
  - ▷ Defective cable. Have it replaced or repaired by the service workshop.
- ▶ Defective fuse.
  - ▷ Replace with fuse of identical specification.
- ▶ Defective relay. Have it replaced by the service workshop.

# Blockages

The machine can be blocked by large rocks or wood. The blockage is generally noticed when the PTO overload protection responds and does not re-engage (even when the PTO speed is reduced). In this case, the PTO drive must be switched off completely and the blockage removed.

## Blockage removal

### *Implementation*

- 1 Stop tractor and turn p.t.o. off.
- 2 Activate rear power lift and raise machine / machine combination completely to head-land position.
  - ▷ Continue with the next step if the blockage cannot be removed by raising to head-land position.
- 3 Relocate the tractor and machine / machine combination to even, load-bearing ground.

- 4 Place the machine / machine combination onto suitable support stands using the rear power lift.

### CAUTION

#### Crush hazard over the entire body!

Unexpected moving machines / machine components can cause serious injury.

- ▶ Place suitable parking supports under the rear power lift before working on the raised machine / machine combination.
- ▷ Turn tractor motor off, switch PTO drive off, apply park brake, remove ignition key and keep safe.
    - ▷ Secure tractor and machine / machine combination against rolling.
  - 5 Remove blockage and check the machine for any visual damage by carrying out a visual inspection.
    - ▷ Remove support stands.
  - 6 Put machine / machine combination back into operation: Carry out process in the reverse order.
    - ▷ Monitor the "behaviour" of the machine acoustically and optically to check for any unusual sounds, vibrations, leaks, smoke formation, etc.
      - ▷ If unusual sounds, vibrations, leaks, smoke formation, etc. occur, stop the machine immediately and check independently or via a third party that all machine parts are operating correctly.
      - ▷ If **no** unusual sounds, vibrations, leaks, smoke formation, etc. occur, the field work can continue.

### TIP

For information on the overload protection function for cardan shafts, see the following sections.

## Cardan shaft cam clutch coupling operation

The cam clutch is an overload clutch that completely disengages the torque in the event of an overload. Therefore, no torque is transmitted at the moment of overload. The prerequisite for the intended function is that the cardan shaft with the overload clutch is run in the prescribed direction of rotation and in the prescribed installation position.

The disengaged clutch automatically engages again when the PTO speed drops to around 200 U/min, without the cardan shaft coming to a complete standstill.

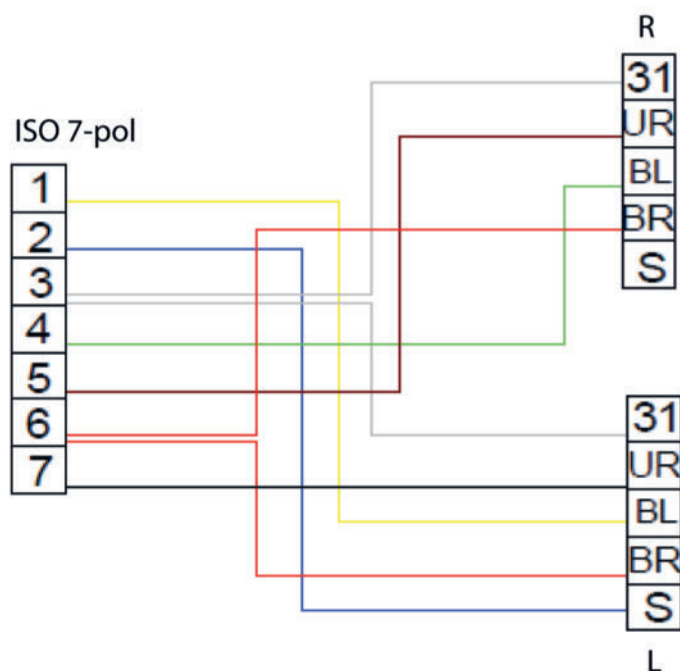
### TIP

Frequent cam clutch engagements reduce the service life due to increased wear.

As a rule, do not allow the cam clutch to rotate for more than 10 seconds.

## Electrics

### Lighting plug terminal assignment



Tractor connector plug ISO 7-pole

R = right bayonet plug 5-pole green

L = left bayonet plug 5-pole yellow

#### Legend

No.	Des.	Colour	Function
1	BL	Yellow	Left blinker
2	S	-	-
3	31	white	Mass
4	BL	green	Right blinker
5	UR	brown	Right parking light
6	BR	Red	Brake light
7	UR	black	Left parking light

## Warning signs, GB / USA / CANADA

Listed below are the positions and meanings of all warning signs used.

### TIP

Warning signs (symbols) point to residual risks and how to avoid them.

Damaged or lost warning signs must be replaced.

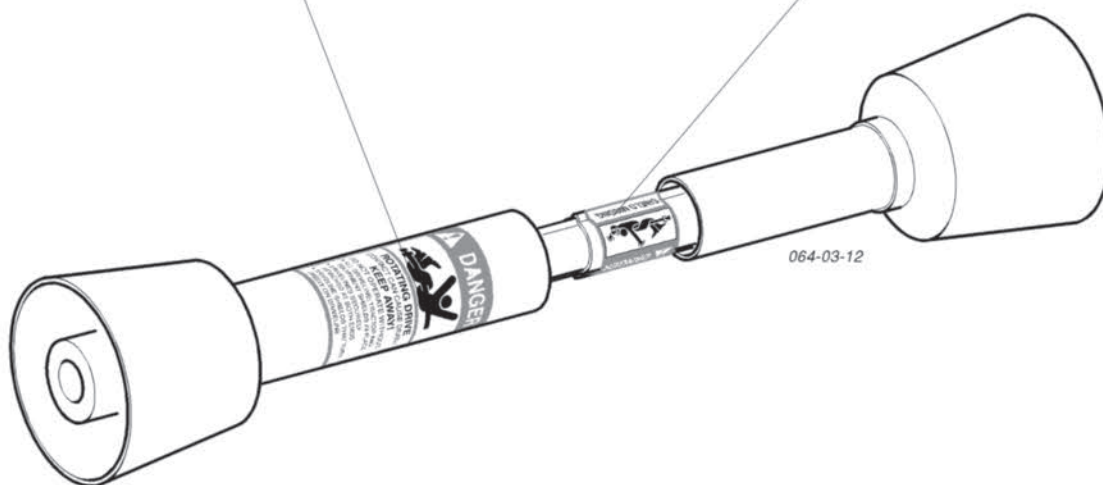
If machine parts with warning stickers are replaced, the relevant warning stickers must be stuck onto the new components.

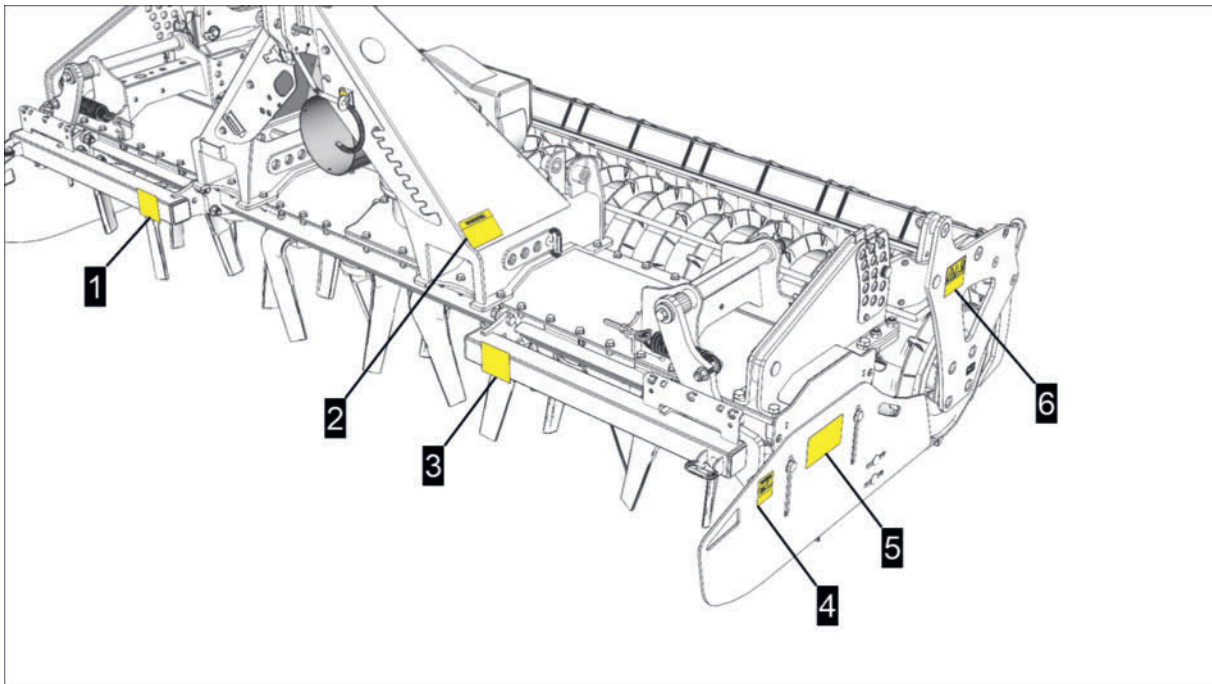
### TIP

#### **USA / CANADA**

For machines to be operated in the USA / CANADA, a conversion kit with warning stickers (to adapt to local applicable regulations) is available from PÖTTINGER in English or French! See also "Supplement to the Operating Instructions USA / CANADA".

Warning signs, GB / USA / CANADA





Pos. Warning signs

Pos. Warning signs

1



2



3



4



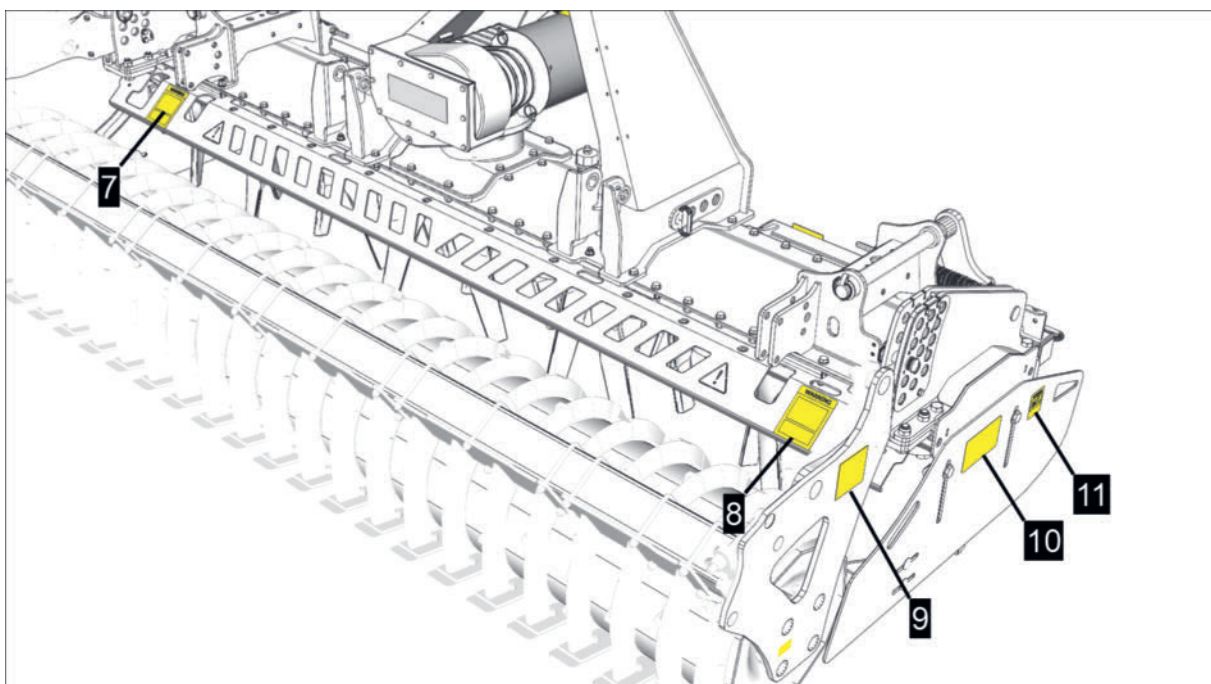
Pos. Warning signs

5



Pos. Warning signs

6



Pos. Warning signs

7



Pos. Warning signs

8



9



10



11



## Secure load towing

Stopping distance increases with speed and weight of towed loads, and on slopes. Towed loads, braked or unbraked, that are too heavy for the tractor or are towed too fast can lead to loss of control. Consider the total weight of the equipment and its load. Observe these recommended maximum road speeds, or local speed limits which may be lower. Also reduce your speed with poor road conditions or bad weather.

- If the towed implement does not have brakes, do not travel faster than 32 km/h and do not pull loads exceeding 1.5 times the tractor weight.
- If the towed implement has a brake system with a control line and an auxiliary line, do not travel faster than 40 km/h and do not pull loads exceeding 4.5 times the tractor weight.
- If the towed implement has a brake system with a control line only, do not travel more than 40 km/h and do not pull loads exceeding 1.5 times the tractor weight.

If you do not know which brake system your implement has, consult the manual, ask the owner or your dealer. While uncertain about the type of brake system, do not allow the tow load to exceed 1.5 times the tractor weight.

Ensure the load does not exceed the recommended weight ratio. Add ballast up to the maximum recommended for the tractor, reduce the load or get a heavier towing vehicle. The tractor must be heavy and powerful enough with adequate braking power for the towed load. Be especially careful when towing loads on unfavourable ground conditions, when turning and on slopes.

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