Operating manual

Compact disc harrow
Rubin
9 KUA

- EN - CDN-

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LEMKEN GmbH & Co. KG
Weseler Straße 5, D-46519 Alpen / Postfach 1160 60, D-46515 Alpen
Telephone (0 28 02) 81-0, Fax (0 28 02) 81-220
email: lemken@lemken.com, Internet: http://www.lemken.com

Dear Customer!

We would like to thank you for the confidence you have shown us with the purchase of this machine. The advantages the machine provides only take effect when the machine used and operated properly. On delivery of the machine, your dealer already familiarized you with its operation, settings and maintenance. However, this brief introduction requires further in-depth study of the operating manual. This operating manual will help you to better familiarize yourself with this machine made by LEMKEN GmbH & Co. KG and to use it properly in accordance with its intended use.
The operating manual provides important information on how to operate the machine safely, properly and economically. Complying with the manual will help to avoid dangers, reduce disruptions and downtime and increase the reliability as well as the life of the machine. Read the entire operating manual thoroughly and carefully before commissioning the machine for the first time!
Make sure that the operating manual is always available where it is in operation. The operating manual must be read and observed by every person assigned the following tasks:

- Assembly and disassembly
- Settings
- Operation
- Maintenance and repair
- Troubleshooting
- Final decommissioning and disposal

Ordering replacement parts

This machine is provided with an equipment card which lists all the assembly groups which are relevant for the product. In addition to the relevant assembly groups intended for your machine, the valid replacement parts list for your machine also includes those not intended for your machine. Make sure that you only order replacement parts from the assembly groups listed on your equipment card and/or listed on the computer printout. Please provide the type designation and machine's serial number when ordering replacement parts. This information is found on the type plate. Enter this information in the following fields so that you always have them at hand.

Type of machine:	
Serial number:	

Please remember to only use original LEMKEN replacement parts. Non-original replacement parts negatively affect the function of the machine, do not last as long and are the source of risks and hazards which LEMKEN GmbH & Co. KG is not in a position to evaluate. They also increase the cost of maintenance.

Service and replacement parts

Information on service and replacement parts is available from your local dealer or on our website at www.lemken.com.

CONTENTS

1 GENERAL INFORMATION

1.1 Liability

As a basic principle, the general terms of business and delivery of the LEMKEN GmbH & Co. KG apply.

LEMKEN GmbH & Co. KG rejects all liability claims for personal injury and property damage if they were caused by one or more of the following:

- using the machine other than as intended, see the chapter on "intended use"
- failure to comply with the operating manual or the safety information provided there,
- unauthorized structural changes to the machine,
- deficient monitoring of parts subject to wear,
- repair work carried out improperly or not on time,
- the use of non-original replacement parts,
- disasters caused by third parties or by acts of higher power.

1.2 Warranty

As a basic principle, the general terms of business and delivery of the LEMKEN GmbH & Co. KG apply.

The warranty period extends for one year beginning on the date of delivery. We will remedy any faults on the machine in accordance with the LEMKEN warranty guidelines.

1.3 Copyright

This operating manual is a document in the sense of the law regulating unfair competition.

Its copyright remains the property of

LEMKEN GmbH & Co. KG

Weseler Straße 5

D-46519 Alpen

This operating manual is intended for the operator of the machine. It includes texts and drawing, which without express permission of the manufacturer, may neither completely nor in part be

- reproduced,
- disseminated or
- otherwise communicated.

Violations are subject to claims for damages

1.4 Optional accessories

LEMKEN products are provided with series of optional accessories. The operating manual describes all accessories below.

Please note: These vary according to the type of equipment.

2 SYMBOLS USED IN THE OPERATING MANUAL

2.1 Hazard classification

The following symbols are used for especially important information in the operating manual:

DANGER

Identifies an immediate, high-risk hazard which will result in death or serious bodily injury if it is not avoided.

WARNING

Identifies a possible hazard of medium risk which could result in death or serious bodily injury if it is not avoided.

CAUTION

Identifies a low-risk hazard which could result in slight or moderate bodily injury or property damage if it is not avoided.

2.2 Tips

Identifies special user tips and other especially useful or important information to facilitate efficient work flows and economic use of the machine.

2.3 Environmental protection

	Identifies special measures for recycling and environmental protection.

2.4 Designation of text passages

The following symbols are used for special text passages in the operating manual:

– Identifies work processes

- Identifies listings

3 SAFETY AND PROTECTIVE MEASURES

General safety tips for the operator are provided in the chapter "Safety and protective measures". At the beginning of some of the sections, safety tips are listed that apply for all of the tasks discussed in this chapter. For every step involved in the task where precautions must be taken, further safety tips specifically relevant to the task are also provided.

3.1 Intended audience

The operating manual is intended exclusively for the use of the machine by qualified specialists and those specifically trained to use it.

3.2 Intended use

The machine was built in accordance with current standards (MRL 2006/42/EC) and recognized health and safety requirements. However, hazards to life and limb for the machine operator or third parties or the risk of damage to the machine and to other property arising from the use of the machine still remain. Operate the machine only if it is in perfect working order and then only as intended, in accordance with the operating manual, taking care to work safely and avoid hazards.

Operating the machine as intended also includes:

- working and completing tasks as described in the operating manual,
- paying attention to the safety and warning signs on the machine,
- staying within the performance limits of the tractor and the machine,
- complying with maintenance requirements and additional inspections,
- the use of original replacement parts,
- the use of the listed auxiliary and operating materials as well as their environmentally correct disposal.

A reliable and safe function is only ensured if all directions, settings and performance limits for the machine are complied with.

3.3 The machine's safety equipment

The machine is fitted with special safety equipment to protect both the operator and the machine. Always maintain the safety equipment in good working order.

Lighting / wheel chocks

Support leg

Hydraulic transport lock for the lateral sections

Lateral safety guard

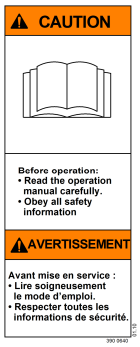
3.4 Safety and warning symbols

3.4.1 General information

The machine is fitted with all the equipment necessary to ensure that it can be operated safely. Warning symbols draw attention to any remaining danger where danger zones could not be completely secured because of functional concerns. Damaged, lost or illegible symbols must be replaced immediately. The indicated item numbers also serve as order numbers.

3.4.2 Importance of the warning symbols

Please familiarize yourself with the meaning of the warning symbols . The following explanations provide detailed information.



390 0640

WARNING

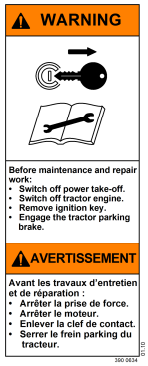
Before commissioning:

- Read the operation manual carefully.
- Follow all safety instructions.

390 0643

WARNING

Loss of control and stability during operation must be avoided.
To ensure the necessary stability and contact with the ground, the tractor must be correctly ballasted.

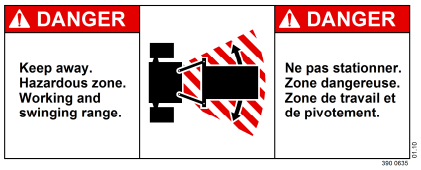


WARNING

Before performing maintenance and repair work:

- Switch off power take-off.
- Switch off tractor engine.
- Remove ignition key.
- Engage the tractor's parking brake.

390 0634



DANGER
Hazardous zone. Working and swinging range.

390 0635

WARNING
Moving parts can crush and cut.
Keep hands and fingers away from moving parts.

390 0633

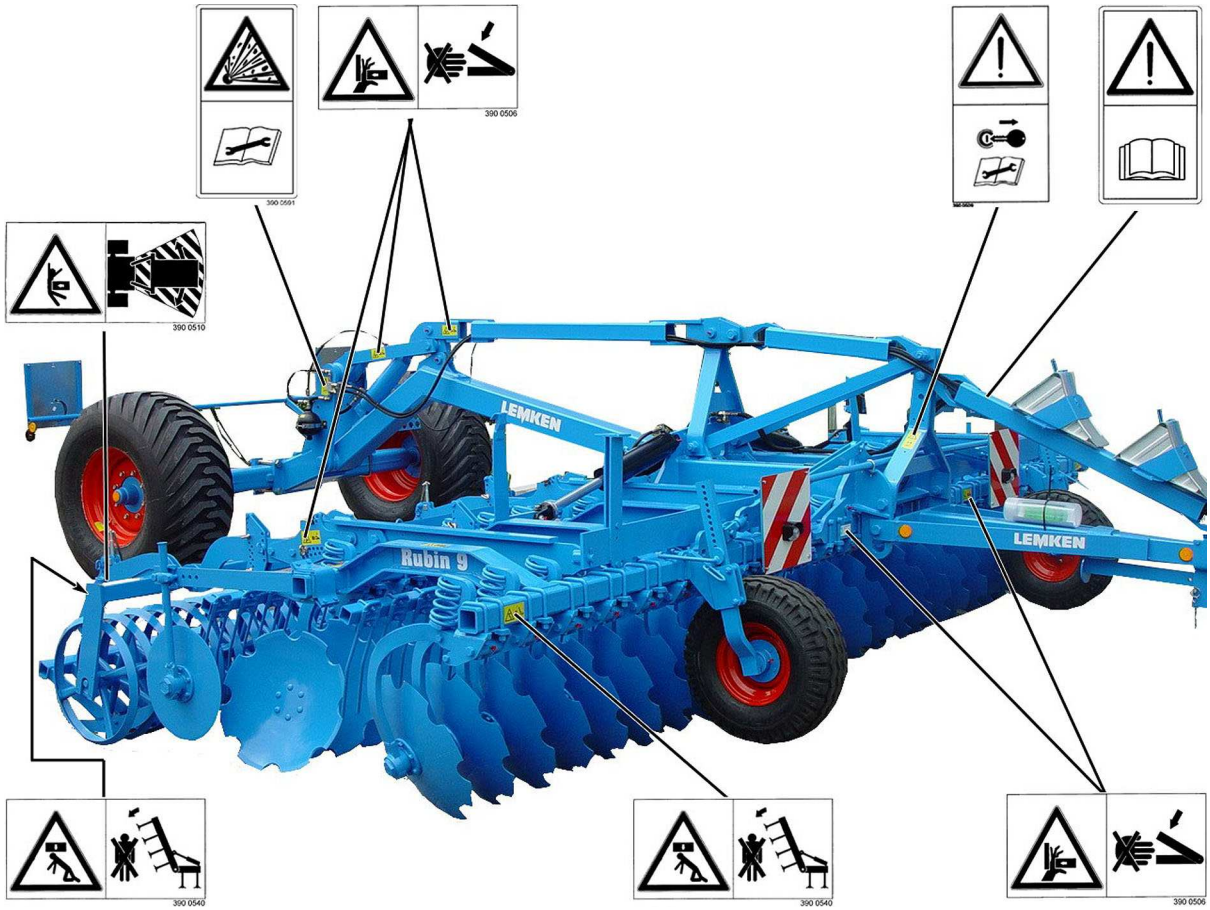
DANGER
Keep away from folding area.
Serious or deadly injuries can occur.

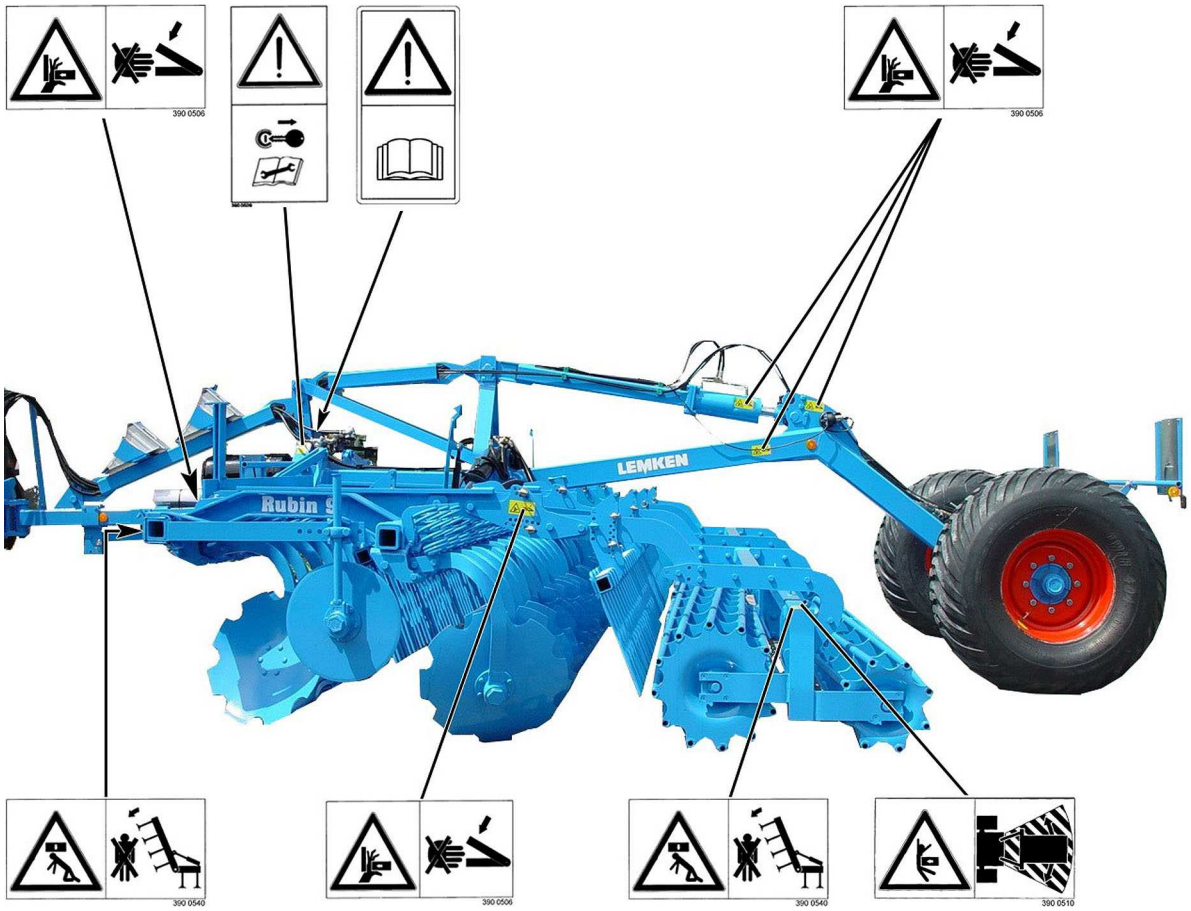
390 0639

WARNING
Accumulator is pressurized and can explode and can explode.
Service, repair or maintenance work to be carried out by qualified technicians only.
Heavy personal injuries can occur.

390 0642

3.4.3 Where safety and warning symbols are located

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3.5 Special safety instructions

WARNING

Risk of injury arising from a failure to follow applicable health and safety regulations

When the machine is in use, the risk of injury exists whenever applicable health and safety regulations are ignored or safety equipment is disabled.

- The operator must personally monitor all work on and with the machine.
- The operator trains his personnel with regard to work safety in accordance with applicable health and safety regulations.

WARNING

Risk of injury arising from objects being thrown upwards by the machine

When working with the machine, there is a risk of injury to the face and body from stones, rocks or dirt being thrown upwards.

- When working with the machine, no person is permitted to be in the areas immediately in front of, behind or next to the machine.
- No one may accompany the machine when it is in use.

WARNING

Risk of injury when extricating persons involved in an accident

When freeing injured persons or persons jammed in the machine, there is serious additional risk of injury to the accident victim, if the hydraulic connections are not connected in accordance with their color code as described in the section on "Required hydraulic equipment". As a result, functions could be performed from the wrong direction or in reverse.

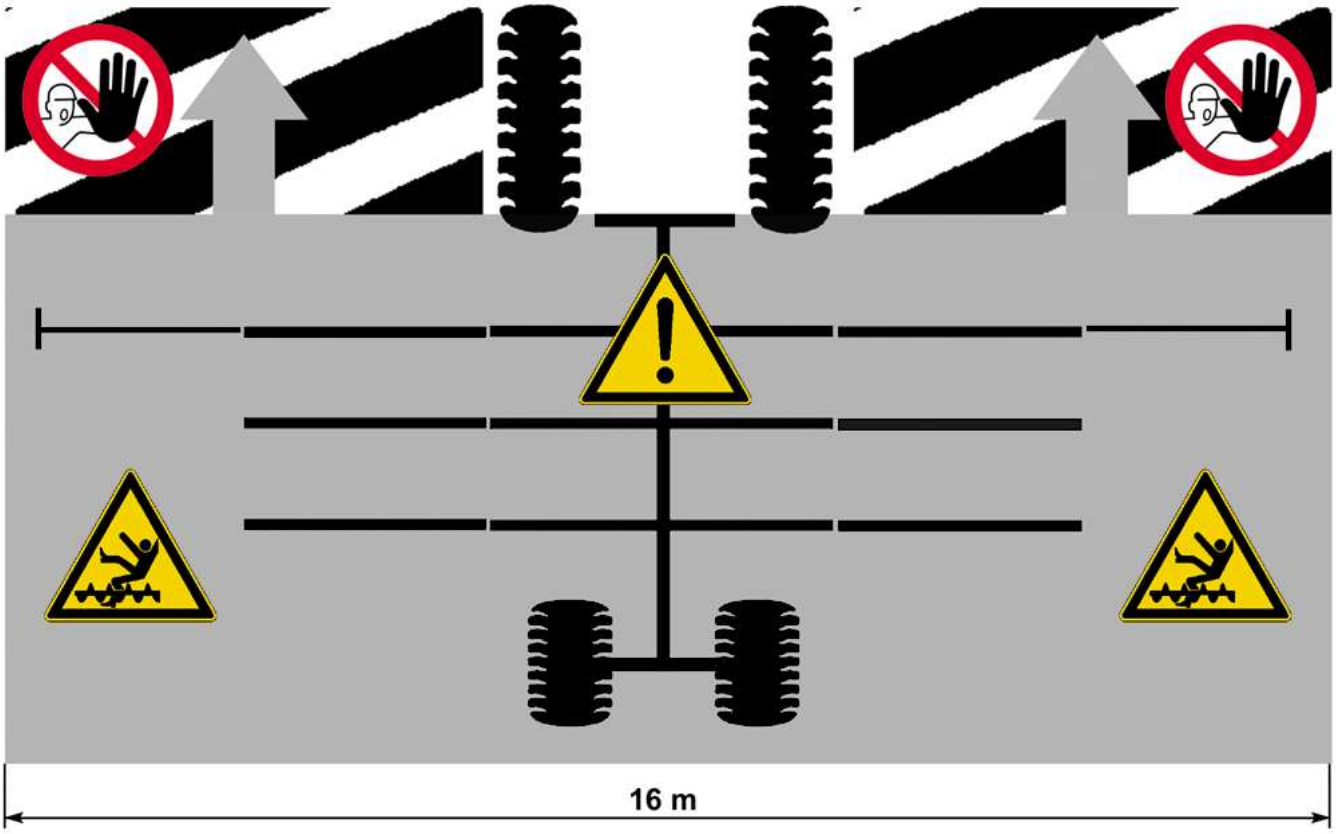
– Before operating the hydraulics, check whether the machine's hydraulic connections are connected in accordance with the color coding on the tractor.

Safely freeing accident victims cannot be ensured if the tractor and machine are not color coded or the connections are not connected in accordance with their color code on the tractor.
In case of doubt:

– leave the freeing of accident victims to trained rescue workers.

3.6 Danger zones

3.6.1 Danger zones when operating the machine



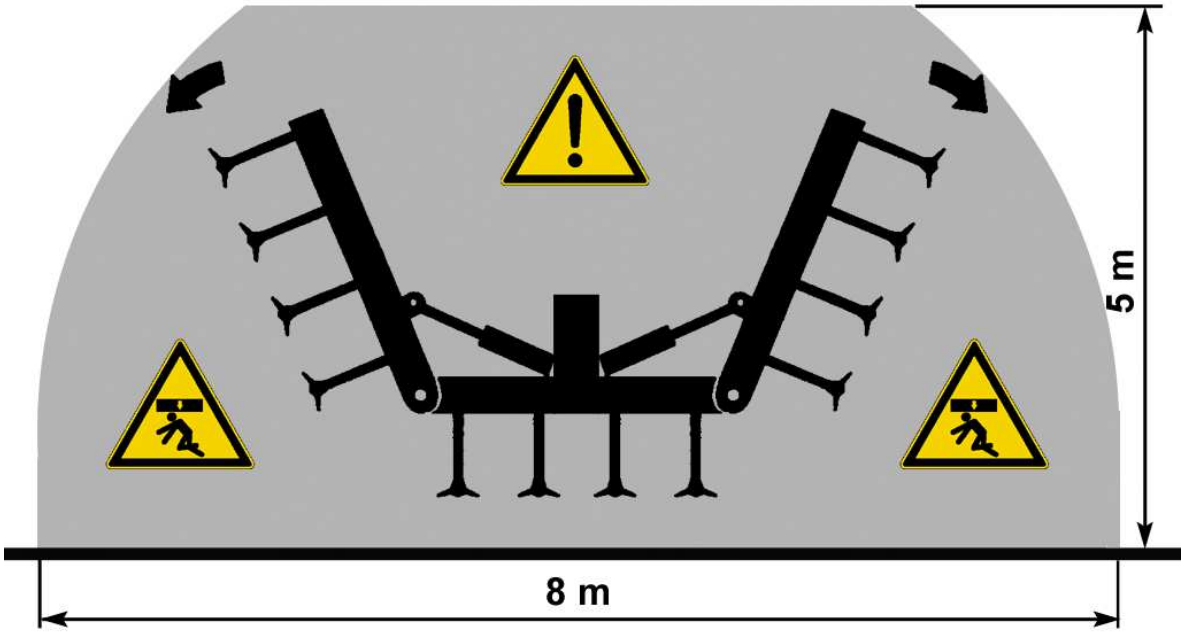
WARNING

The danger zone moves with the machine

The machine's danger zone moves with the machine during operation!

- When the machine is in operation, non one may be in front of actual the danger zone because the danger zone moves with the machine.

3.6.2 Danger zone when folding in and out



3.7 Residual risks

Residual risks are special hazards when working with the machine that could not be avoided despite safe construction.

Residual risks are often not obviously recognizable and can be the source of possible injuries and health hazards.

3.7.1 Hazards from mechanical systems

There is a risk of crushing, cutting and impact injuries to the body

- from machine parts moving unexpectedly,
- from machine parts moved by accumulated mechanical energy in elastic elements, such as springs, being released,
- from inadequately secure positioning of the machine,
- from the shape or location of structural components.

3.7.2 Hazards from hydraulic systems

There is a risk of injury especially to the face, eyes and unprotected skin from burning or contamination with hydraulic fluid

- caused by hot, pressurized hydraulic fluid spraying from leaking lines or connections,
- from the bursting of pressurized pipes and lines and structural components.

3.7.3 Hazards in connection with the operation

During operation, there is a risk of injury, especially to the face, from stones and dirt being thrown upward.

3.8 Applicable rules and regulations

The following applicable rules must be observed during operation of the machine:

- The applicable traffic laws are to be followed!
- The applicable laws and regulations on health and safety in the workplace are to be followed.
- The applicable laws and regulations governing safe operating practices are to be followed!

3.9 Operating on public roads

3.9.1 Lighting equipment and ensuring that you are seen

Lighting equipment in accordance with regulations and measures to ensure that the machine is visible are necessary in any case if the machine is to be transported on public roads. Further information can be requested from the responsible authorities.

3.9.2 Requirements with respect to the tractor

– Make sure that the tractor with the attached or trailed machine, with or without a braking system, always reaches the prescribed braking deceleration.
– The permissible axle loads, the total weight and the transport dimensions must be adhered to.
– The permissible capacity of the tractor must be adhered to!

DANGER

Risk of accident because of inadequate braking deceleration

If braking deceleration is inadequate, the combination of the tractor and the machine will not be able to be stopped or will not be able to be stopped fast enough. Rear-end collisions can result, and the driver or others may be injured or killed. On slopes, the combination of the tractor and the machine will not be able to be stopped or not stopped fast enough resulting in damage to the tractor and machine and death or injury to the driver.

- Only use a tractor with reaches an adequate braking deceleration when combined with the machine.
- Make sure that the machine is equipped with a fully functional braking system.

3.9.3 Permissible transport speed

Refer to the following table for permissible transport speeds in depending on the tires and the machine's equipment. Applicable traffic laws must also be observed.

Equipment	Max. permissible transport speed		
	30 km/h	40 km/h	50 km/h
Tires 12/80-18 with braking system		X	
Tires 550/60-22.5 with braking system			X
Tires 560/60-22.5 with braking system			X
Tires 700/50-22.5 with braking system*	X		
Tires 16.0/70-20 with braking system		X	
Machine with braking system and three-point linkage	X		
Machine without braking system**	X		

*with the 700/50-22.5 tires, the machine is wider that 3m and might, in some locations, only be permitted for transportation on public roads with special authorization.

**only if a braking deceleration of at least 35% is reached for the combination of the tractor and the machine and applicable traffic laws permit operation without a braking system.

3.9.4 Permissible side inclination during road transport

The permissible side inclination during road transport with side sections folded in is 15°.

CAUTION

Overturning of the machine

The machine or tractor will overturn if the permissible side inclination is exceeded.

- Never exceed the permissible side inclination.
- When driving on slopes, drive across the slope at a reduced speed appropriate for the slope.

3.9.5 Monitoring the descent

– Check the machine's brake function before starting downhill.
– Before transport with a raised machine, lock the control lever to prevent unintentional lowering of the machine.
– Check that the fold-out safety lock for the side sections works correctly!
– Install and check the transport equipment such as the lighting system, warning signs and safety equipment.
– The release rope for the tractor's quick release couplings must hang loose and may not release independently in any position!
– Check the immediate area around the machine before starting and before commissioning! No persons may be present in this area! Make sure that you can see adequately!
– Permissible axle loads, total weight and transport dimensions must be adhered to!

3.9.6 Correct operation in road traffic

- Make sure to follow applicable laws when driving on public roads!
- Handling, steering and braking ability are influenced by ballast weights. Make sure that the ability to steer and brake the tractor is adequate!
- Take into account the amount of overhang and the machine's centrifugal mass when driving on curves.
- Lower the machine to the ground before leaving the tractor. Turn the motor off and remove the ignition key!
- Passengers may not be transported on the machine!

3.10 Duties of the operator

- Read the operating manual before commissioning the machine for the first time and observe the safety instructions!
- Wear appropriate protective clothing whenever working on the machine. Protective clothing must fit snugly!
- Supplement the operating manual with general legal and otherwise binding regulations with respect to accident prevention and protection of the environment and make sure to follow these.
- This operating manual is an important and integral part of the machine. Make sure that the operating manual is always at hand wherever the machine is in use and that it is kept for the entire lifetime of the machine. Deliver the operating manual together with the machine when the machine is sold or the operator changes!
- Keep all warnings and safety instructions located on the machine in complete and legible condition. Safety and warning symbols provide important information to facilitate risk-free operation. Observe them for own your safety!
- Make no alterations to the machine which could impact the safe use of the machine without authorization from the manufacturer. Unauthorized changes to the machine void any manufacturer liability for resulting damage!
- Only operate the machine when connection and setting values match those provided by the manufacturer!
- Only use original replacement parts!

3.11 Operating the machine safely

3.11.1 General information

- Before beginning work, familiarize yourself with all of the equipment and the control elements and their functions!
- Do not commission the machine until all protective equipment is installed and in safety position!
- Always assemble the machine according to instructions and only attach the prescribed devices. Work with extreme care when attaching anything to or unattaching from the tractor!
- There is a risk of injury from crush and shear zones around the three-point linkage!
- Before mounting or removing the three-point linkage, place the control device into the position from which absolutely no unintentional raising or lowering is possible!
- Do not step between the tractor and the machine when operating the three-point linkage's external control!
- Presence in the machine's danger zone is strictly prohibited when the machine is in operation!
- Hazards also exist in the machine's general working area, for example, stones being thrown into the air!
- Do not operate hydraulic systems (such as folding devices) if anyone is present in the folding range! There is a risk of crushing or shearing in connection with the operation of power-operated components!
- Never stand between the tractor and the machine. This is only allowed if the tractor has been secured with the parking brake and a wheel chock has been put in place to prevent it from rolling!
- To prevent the machine from catching fire, always keep the machine clean!

3.11.2 Selection and qualification of personnel

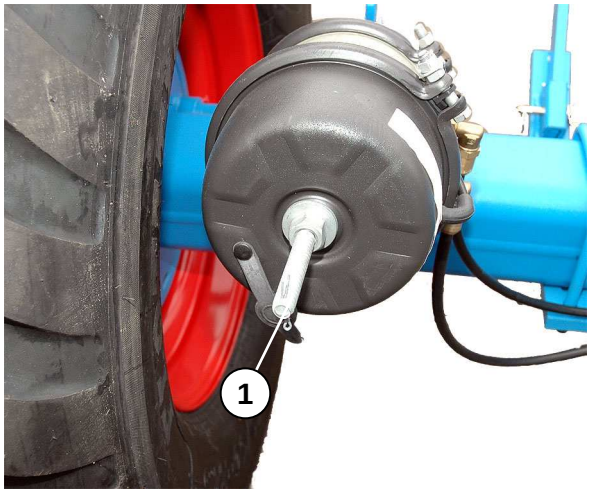
– The tractor operator must have the appropriate driver's license!
– Work on the machine may only be performed by qualified and trained personnel. Personnel may not be under the influence of drugs, alcohol or medications!
– Maintenance and upkeep may only be performed by specialized personnel with the appropriate qualification or persons specifically trained to do this work!
– Work on the electrical components may only be performed by a certified electrician in accordance with regulations governing electrical work!

4 DELIVERY OF THE MACHINE

On delivery, immediately ensure that everything which was ordered was delivered. Also check for any possible accessories to confirm their type and that they are complete.

Your dealer will brief you at the time of delivery. Familiarize yourself with the machine and its functions immediately after delivery.

Only machines with air brake system:



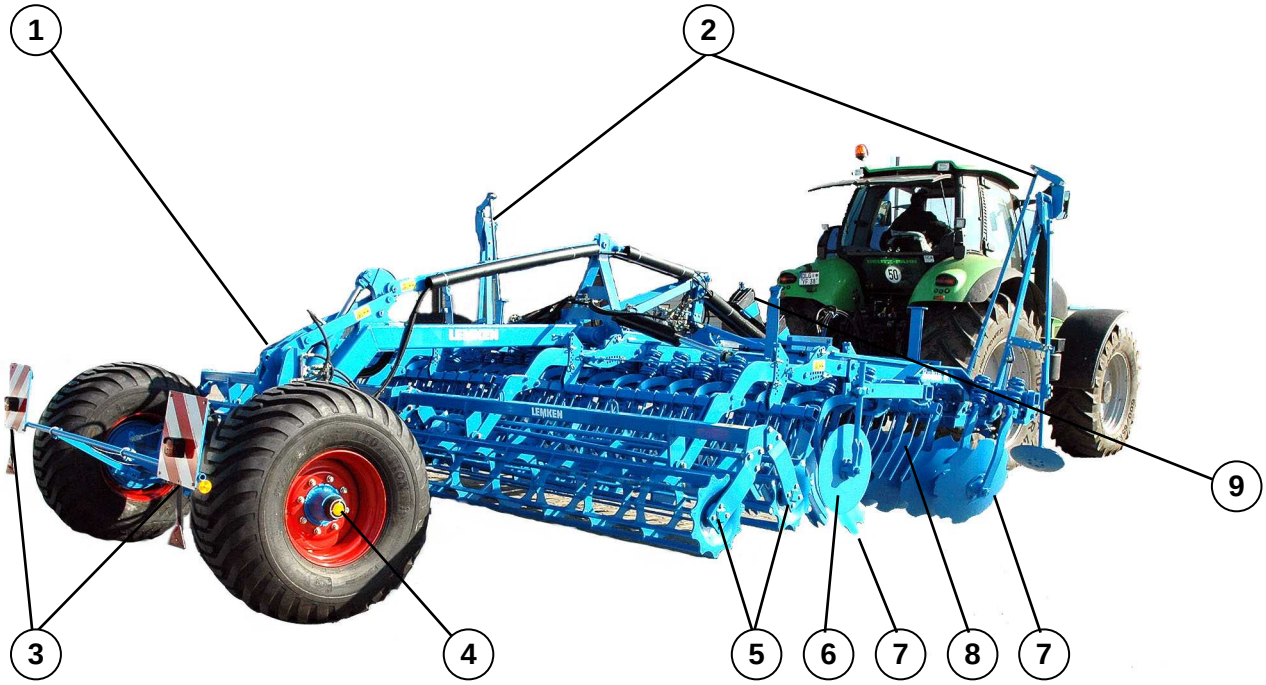
1 Guiding screw

– Before commissioning for the first time, check whether the spring brake cylinder's guiding screws (1) have been removed, see section on "spring brake cylinders".

5 DESIGN AND FUNCTION

5.1 Overview

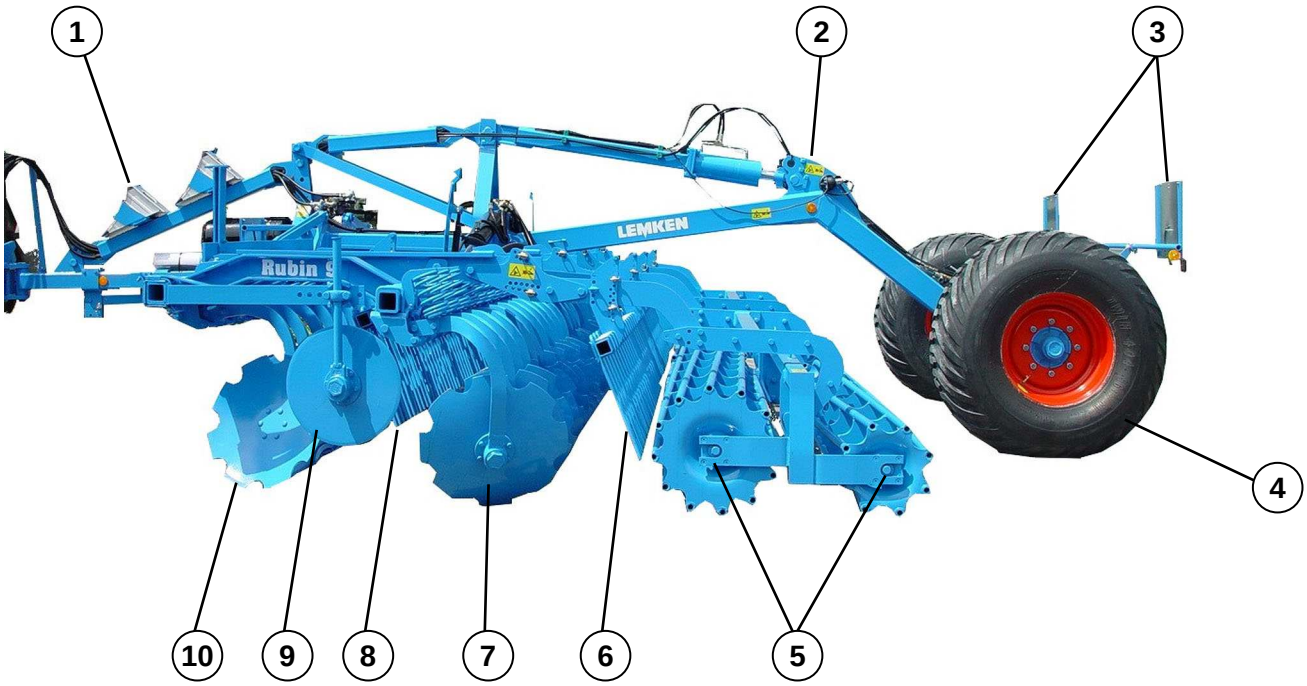
Rubin 9 KUA with combination semi-mounted installation



1 Combination semi-mounted installation
2 Lane scriber (folded in)
3 Warning signs with lights, rear
4 Chassis
5 Rollers
6 Edge limiters
7 Scalloped discs (edging discs)
8 Comb
9 Wheel chock

5.2 Overview

Rubin 9 KUA with transport semi-mounted installation



1 Wheel chock
2 Transport semi-mounted installation
3 Warning signs with lights, rear
4 Chassis
5 Rollers
6 Comb
7 Scalloped discs (edging discs)
8 Comb
9 Edge limiters
10 Scalloped discs

5.3 Function

5.3.1 Semi-mounted installation

The machine can be equipped with a combination semi-mounted installation or with a transport semi-mounted installation.

Combination semi-mounted installation

The combination semi-mounted installation is necessary if a Lemken Solitair 9 KA seed drill is to be mounted on the machine using coupling elements, or another accessory is to be mounted on the machine using the three-point linkage. Both the coupling elements and the hydraulic three-point linkage are available as accessories and can be fastened to the combination semi-mounted installation. The hydraulic three-point linkage complies with Cat 2 in accordance with ISO 730-1.

Transport semi-mounted installation

The transport semi-mounted installation serves as a pure transport axle and may not be used in connection with equipment that is either mounted or attached.

5.3.2 Lane scriber

In their extended positions, the lane scribers draw a marker line in the soil. This marker line serves as a guideline for the subsequent pass and is aligned to the center of the tractor tracks.

A hydraulic cylinder alternatingly raises the lane scribers and lowers them into scribing position.

In connection with the headland management system, the lane scribers are operated using the operation terminal of Solotronic electronic seed drill controller.

5.3.3 Warning signs with lighting

The lighting system and warning signs must be in place during road transport on public roads.

5.3.4 Chassis

The chassis is part of the semi-mounted installation. Trailed machines are carried by the chassis. The trailed machine is raised above the chassis for the return run on the headland and for travel on public roads. When working, the chassis is in the raised position, in single-user mode. In connection with a mounted seed drill, the chassis, when working, carries a share of the seed drill's weight to prevent excess coulter pressure or an excess pressure load on the depth guide rollers.

5.3.5 Rollers

The rollers provide for recompacting and further tilling of the soil. When in operation, they carry the weight of the machine if it is lowered in operating mode and provide for precise depth control. If necessary, the weight of the rollers also supports the machine's intake behavior. The machine can be equipped with various types of rollers. At the time of printing of this operating manual, the following types of rollers were available:

- Cage rollers RSW 400, RSW 540 or RSW 600
- Twin rollers DRF 400/400, DRR 400/400 or DRR 540/400
- Dual tread ring rollers DPW 540/540
- Knife rollers MSW 600
- Rubber ring rollers GRW 590
- Trapezoidal rollers TPW 500 or TSW 500
- Toothed packing roller ZPW 500

5.3.6 Edge limiters

The edge limiters prevent the right rear and the front left edging discs from leaving grooves to the outside and from carving embankments.
They are, with their respective supports, fastened directly to the frame and are adjustable laterally.

5.3.7 Edging discs

The compact disc harrow is made of two rows of arced and scalloped edging discs arranged separately on the frame.
The edging discs are protected against overloading by pre-tensioned spring elements.

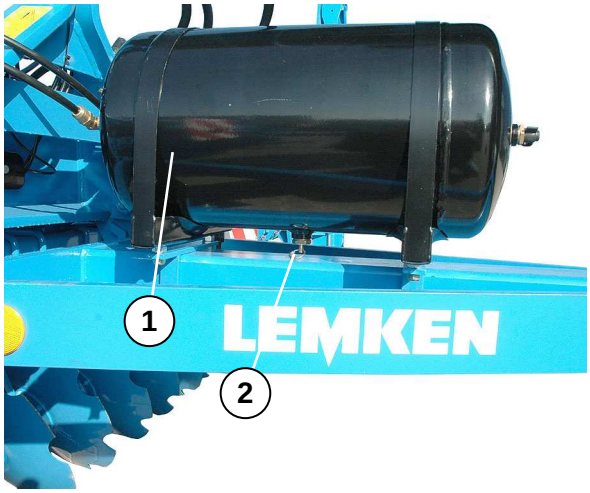
5.3.8 Comb

The two combs located behind the edging discs, adjustable in their height and pitch, control the deposits from the stripped soil and prevent subsequent tools from being hindered by turned up soil.

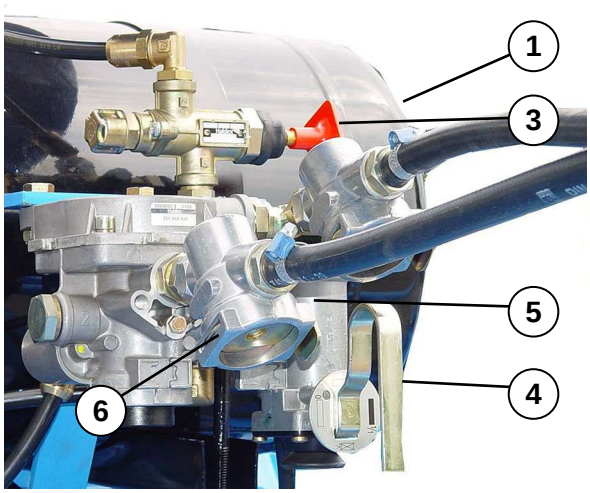
6 BRAKE SYSTEM

6.1 Air brake system

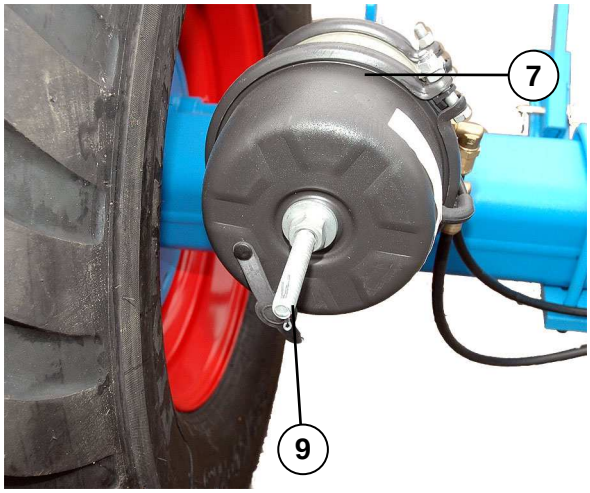
6.1.1 Overview

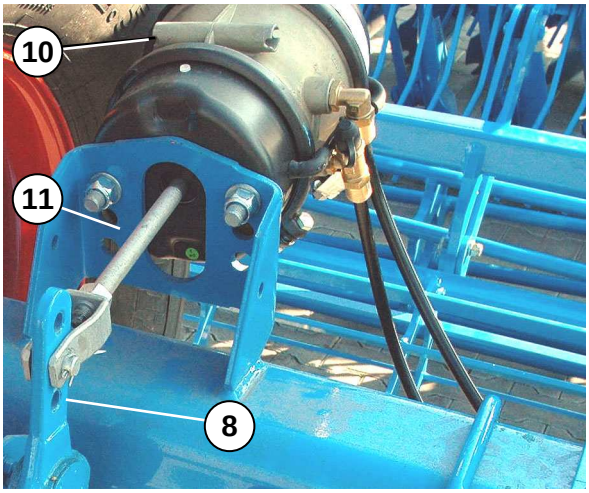


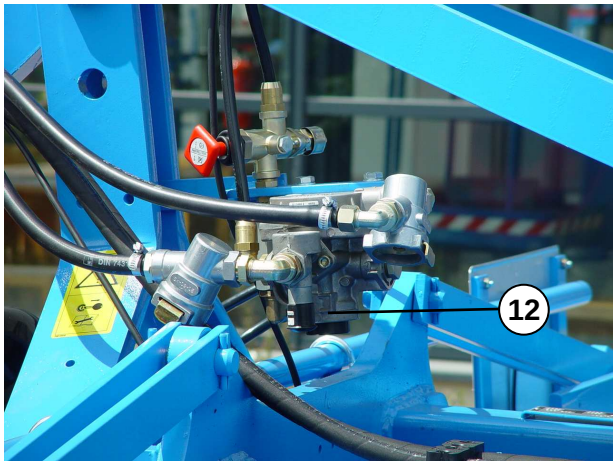
1. Compressed air tank
2. Bleed valve
3. Park valve (parking brake)
4. Brake force regulator (for combination semi-mount installation)
5. Emergency relay brake valve
6. Filter



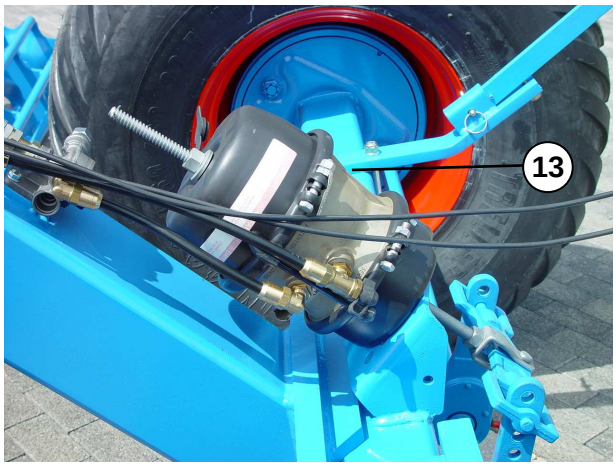
7. Spring brake cylinder (for combination semi-mount installation)
8. Brake lever
9. Guiding screw
10. Holder for guiding screw
11. Brake rod







12. Trailer brake valve with release valve (for transport semi-mount installation)



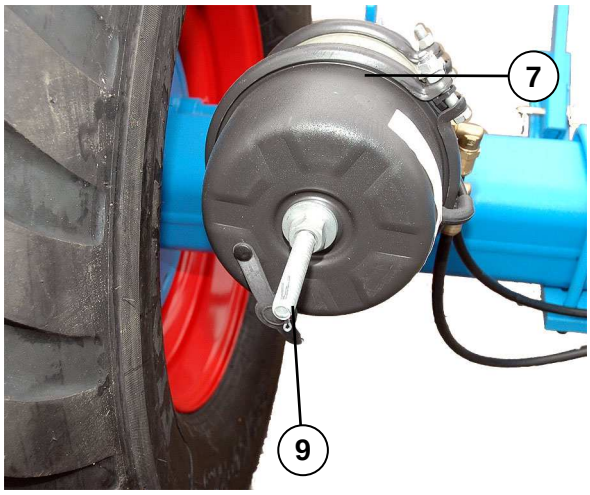
13. Spring brake cylinder (for transport semi-mount installation)

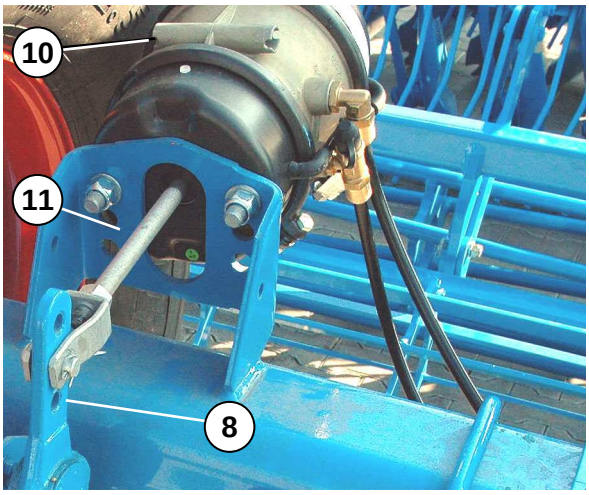
6.1.2 Description of functions

Parking brake

The parking brake is not operational until the carriage bolt (9) has been removed and inserted and secured in the holder (10).

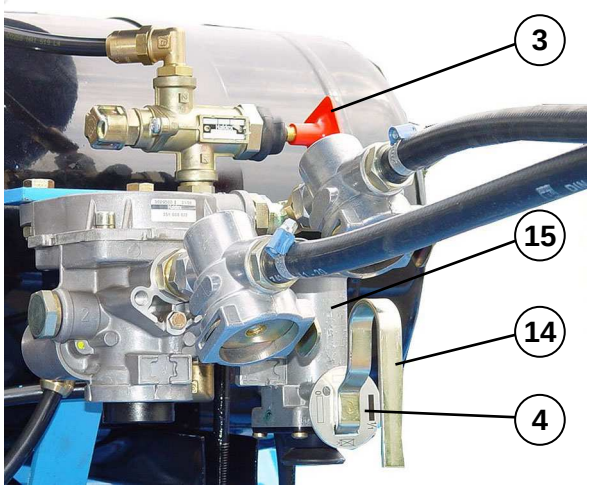
The park valve (3) serves as the parking brake. To set the parking brake, pull out the red knob of the park valve (3). You release the parking brake by pressing the red knob back in again.





After disconnecting the brake hose with the red coupling head, the braking is initiated = automatic braking. After that, maneuvering is no longer possible.

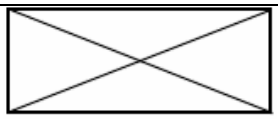
Brake force regulator



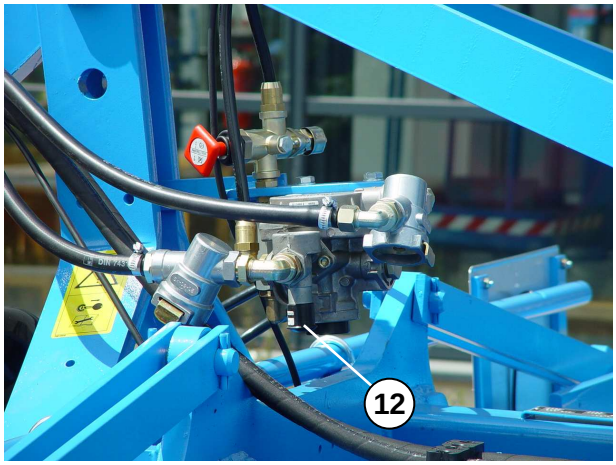
Depending on the axle load, the braking action of the brake system can be adjusted properly using the brake force regulator (4).
Too little braking action increases the braking distance. Too much braking action leads to locking of the wheels.

– Depending on the respective axle load, use the lever (14) to set the brake force in accordance with the following table by means of the brake force regulator (4).

There are a total of four possible settings for the brake force regulator (4). The setting which the arrow (15) on the housing of the brake force regulator (4) points towards is the active setting.

Axle load	Symbol	Explanation
up to 3,000 kg		Maneuvering with a tractor without compressed air supply. The brake system must first be pressurized to an operating pressure of at least 3.5 bar.
3,000kg up to 4,000 kg	0 	Low axles load
4,000 kg up to 6,000 kg	1/2 	Medium axles load
6,000 kg up to 8,000 kg	1 	Full axles load

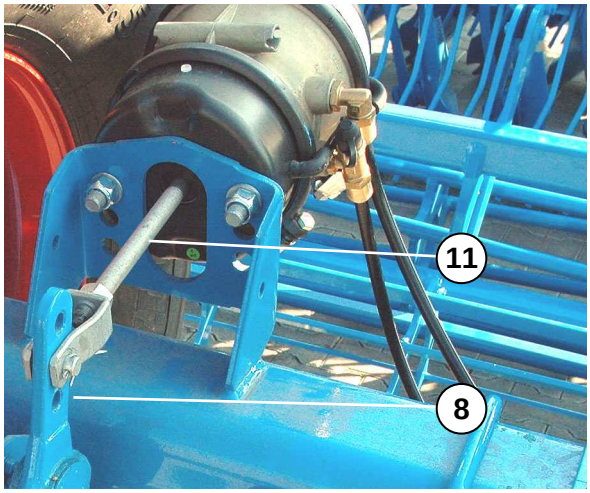
Trailer brake valve with release valve



The engaged brake can be released with the release valve (12). To do so, press the black button on the release valve (12). Pull out the black button of the release valve (12) in order to re-engage the released brake.

If the operating pressure drops below 3.0 bar, the black button on the release valve (12) is automatically pushed out and the brake is engaged.

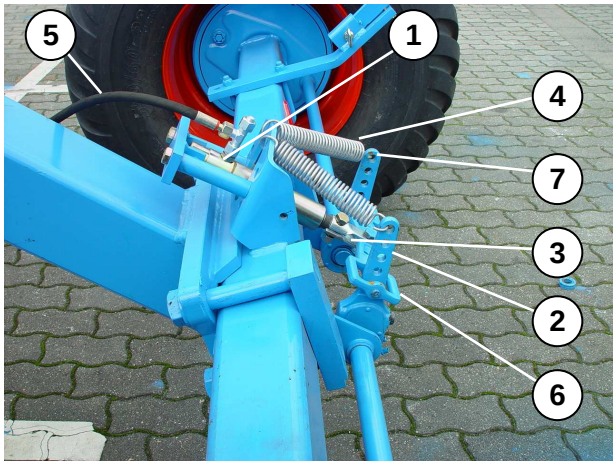
Spring brake cylinder



If the operating pressure of the brake system falls below 3.0 bar, the brake will engage by means of the spring in the spring brake cylinder. The brake rod extends (11) outward and engages the brake by means of the brake lever (8). If the brake lever (8) is pivoted more than 40 mm, the brake must be readjusted. See section "MAINTENANCE".

6.2 Hydraulic brake system

6.2.1 Overview



1. Brake cylinder
2. Brake lever
3. Brake rod
4. Return spring
5. Hose line
6. Scale

WARNING

Danger from a poorly maintained brake system

A poorly maintained brake system has little or no braking effect. This results in long braking distances, rear-end collisions or even the overturning of the tractor.

- Maintain the brake on a regular basis.
- Check the function of the brake system before every use.

6.2.2 Description of functions

Brake cylinder

The brake cylinder (1) operates the brake lever (2) for the left and right wheels by means of a scale (6).

If the brake lever (2) in the area of the upper most opening (7) pivots more than 45 mm when braking, the brakes must be adjusted.

See section "Maintenance".

7 PREPARING THE TRACTOR

7.1 Tires

The air pressure in the tractor's tires must be identical - especially in the rear. In difficult conditions, additional wheel weights must be used or the tires filled equally with water. See tractor manufacturer's operating manual.

7.2 Lifting rods

– Adjust the lifting rods of the tractor's three-point linkage to equal lengths and lock them, e.g. block the elongated hole. See tractor manufacturer's operating manual.

WARNING

Overturning of the machine

The tilt angle limiter will not be able to prevent the machine from tipping over in borderline situations if the three-point linkage lifting rods are not locked.

– Adjust the lifting rods of the tractor's three-point linkage to the same length using the adjusting device.

– Lock and secure the lifting rods.

Refer to the tractor manufacturer's operating manual for further information.

7.3 Retaining chains, stabilizers for the three-point linkage

The retaining chains and stabilizers must be adjusted so that no lateral movement of the tractor's lower hitch arm is possible while in operation.

7.4 Required power sources

The following power sources must be available to power the machine's electrical consumers:

Consumer	Volts	Direct connection to the tractor battery	Electrical socket
Lighting system	12	-	in accordance with DIN ISO 1724
Electric seed drill controller (for attached or mounted Solitair 9 K or – KA)	12	X	-
Electromagnetic control	12	-	in accordance with DIN 9680
Electronic control	12	X	-

CAUTION

Damage to electrical components

The power supply's range of tolerance lies between 10 V and 15 V. Over or under voltages lead to operational faults and can cause irreparable damage to electrical and electronic components.

- Make sure that the machine's power supply is always in the prescribed range of tolerance.
- Provide at least a 40 A breaker/fuse.

7.5 Required hydraulic equipment

By standard, the machine is outfitted with a separate hydraulic connection for each consumer. If the machine is equipped with a combination semi-mount installation, it can, on request, be outfitted with an additional 6/2 directional control valve, an electromagnetic control with control block or with an electronic control with control block. The protective covers for the hydraulic connections are color coded and the hydraulic connections themselves are identified alphanumerically.
The 6/2 directional control valve, the electromagnetic or the electronic control are recommended if the machine is used, for example, with the Solitair pneumatic seed drill and not every consumer on the tractor is equipped with a suitable controller.
The 6/2 directional control valve is a manually operated switching valve with which two consumers can be alternately selected on a two function controller.
A two-function controller on the tractor is then less necessary.
The electromagnetic control is a control box with four operating levers and controls all of the equipment from one control block.
As a result, there is less need for the tractor to have up to three two-function controllers and one single-function controller. The control block is permanently supplied with hydraulic fluid, as necessary (constant pressure, constant flow or load-sensing-system with load-sensing signal line).

The electronic control can only be used in connection with a Solitair 9 electronic seed drill control. It includes a headland management system with which the lane scriber, the soil cultivating machine and also the coulter bar of an attached or mounted Solitair can be raised automatically and timed precisely and can lowered again under control at the touch of a button on the Solitair 9 operation terminal. At the same time, the electronic control constantly monitors and controls the weight load on the rollers and the pressure of the coulter bar. A hydraulic device will be required in order to operate in single-user mode if the machine is operated with an electronic control but without a Solitair. This hydraulic device has a separate hydraulic connection for each consumer.
For the operation of the hydraulic devices listed below, the following controllers must be available on the tractor.

7.5.1 Semi-mounted devices with individual hydraulic connections

Consumer	**single-function controller**	**double-function controller**	**Tractor/device**	
			Color	**Code**
Folding	-	X	red	P1 T1
Chassis, semi-mount installation	-	X	green	P2 T2
Lane scriber	-	X	black	P4 T4
Hydraulic three-point linkage	X	-	blue	P3 T3

7.5.2 Semi-mount devices with hydraulic equipment for single-user mode

If a machine equipped with the Solitair 9, equipped with an electronic control and a headland management system, is outfitted with an electronic Solitronic seed drill control and is to be used in single-user mode, the hoses for the hydraulic equipment must be connected to separate controllers on the tractor. This is necessary because the electronic control for the the headland management system is mounted on the Solitair.

Consumer	**single-function controller**	**double-function controller**	**Tractor/device**	
			Color	**Code**
Folding	-	X	red	P1 T1
Chassis, semi-mount installation	-	X	green	P2 T2
Lane scriber	-	X	black	P4 T4
Hydraulic three-point linkage	X	-	blue	P3 T3

7.5.3 Semi-mounted devices with 6/2 direction control valve for the Solitair 9

Consumer	**single-function controller**	**double-function controller**	**Tractor/device**		**Connection consoles**	
			Color	**Code**	**Color**	**Code**
Hydraulic motor for fans	X with pressureless return connection	-	Supply = yellow Return = white	P6 T6	Supply = yellow Return = white	P6 T6
Folding	-	X	red (with 6/2 direction control valve)	P1 T1	-	-
Folding of the coulter bar	-				red	P1 T1
Pocket for the coulter bar or the hydraulic three-point linkage	-				blue	P3 T3
Chassis, semi-mount installation	-	X	green	P2 T2	-	-
Lane scriber	-	X	black	P4 T4	-	-

7.5.4 Semi-mounted devices with electromagnetic controls

Consumer	**single-function controller**	**Hydraulic system with constant pressure, power or load-sensing**	**Tractor/device**		**Connection consoles**	
			Color	**Code**	**Color**	**Code**
Hydraulic motor for fans	X with pressureless return	-	Supply = yellow Return = white	P6 T6	Supply = yellow Return = white	P6 T6
Folding	-	X	red	P1 T1	-	-
Folding of the coulter bar					red	P1 T1
Pocket for the coulter bar or the hydraulic three-point linkage					blue	P3 T3
Chassis, semi-mount installation					-	-
Lane scriber					-	-

7.5.5 Semi-mounted devices with electronic controls

Consumer	**single-function controller**	**Hydraulic system with constant pressure, power or load-sensing**	**Tractor/device**		**Connection consoles**	
			Color	**Code**	**Color**	**Code**
Hydraulic motor for fans	X with pressureless return	-	Supply = yellow Return = white	P6 T6	Supply = yellow Return = white	P6 T6
Folding	-	X	red	P1 T1	-	-
Folding of the coulter bar					red	P1 T1
Pocket for the coulter bar or the hydraulic three-point linkage					blue	P3 T3
Chassis, semi-mount installation					-	-
Lane scriber					-	-

7.6 Hydraulic lines

If a pneumatic seed drill or another device is attached or mounted to the tiller, the tiller must be equipped with the necessary hydraulic lines.

7.7 Brake system

7.7.1 Air brake system

For the machine's air brake system, the tractor must be equipped with a two line air brake system with coupling heads in accordance with ISO 1728.

7.7.2 Hydraulic brake system

In connection with a hydraulic brake system, the tractor must be equipped with a hydraulic coupling in accordance with ISO 5676.

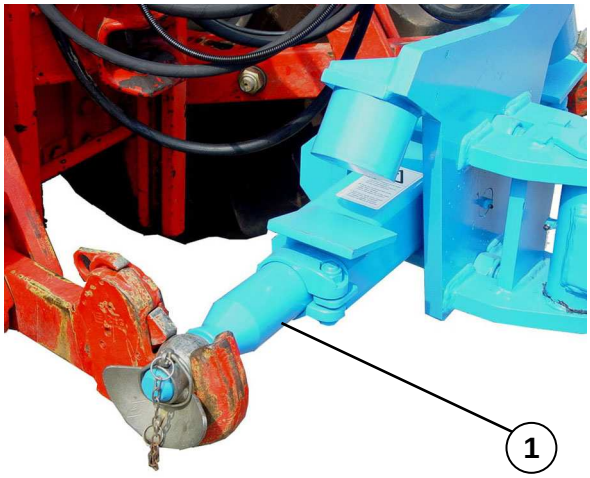
DANGER

Danger because of the incompatibility of brake systems

The brakes systems of the tractor and the machine must be compatible and in good working order. If the systems are not compatible or there is a malfunction in the system, it will not be possible to achieve adequate brake deceleration. This could cause damage to the tractor and/or machine. The driver or others could be injured or killed.

– Always make sure that the brake systems of the tractor and machine are compatible.
– Check the machine's brake function before every use.

7.8 Lower arm hitch



For this machine, only drawbars (1) in category 3, 3N or 4N in accordance with ISO-730-1 and the special category K700 are approved.

- Make sure that the category for the tractor's lower arm and for the drawbar match. In the event that they do not match, either the three-point linkage will need to be adjusted or the drawbar (1) replaced with an approved tow bar.

Please refer to the following table for more information.

WARNING

Loss of the machine

The category for the tractor's three-point linkage and the category for the drawbar must match. The drawbar could otherwise release itself from the hitch when driving over uneven surfaces or because of vibration.

- Always make sure that the category for the three-point linkage and the category for the drawbar are the same

Refer to the following table for maximum permissible tractor output and measurements for the respective category in accordance with ISO 730-1.

Tractor output		Cat.	Trunnion diameter of the drawbar (mm)	Length of the drawbar (shoulder setting) (mm)
kW	HP			
60 - 185	80 - 247	3	36,6	965
60 - 185	80 - 247	3N	36,6	825
110 - 350	147 - 470	4N	50,8	952 - 965
150 - 350	201 - 470	K 700*	58	1100

*The category K 700 is a special category that does not correspond with ISO 730-1.

DANGER

Using a three-point linkage with a lower than approved category can result in death.

A drawbar with a lower than approved category can be overburdened and break. There is risk to life and limb of persons who might be in the area when the machine breaks loose.

This could cause damage to the machine.

During transport, this could cause loss of life or limb to others.

- Only use drawbars of a category that corresponds with the tractor output in accordance with ISO 730-1.

7.9 Hydraulic system

7.9.1 During transport

Switch the tractor's hydraulic system to "position control" during transport.

CAUTION

Lowering the three-point linkage

Lowering the tractor's three-point linkage because of an incorrect setting or because of incorrect operation can damage the machine.

- Always switch the tractor's hydraulic system to "position control" during transport.

See tractor manufacturer's operating manual.

7.9.2 During operation

Switch the tractor's hydraulic system to "position control" for operation on the field.

See tractor manufacturer's operating manual.

7.9.3 Assembly and disassembly

CAUTION

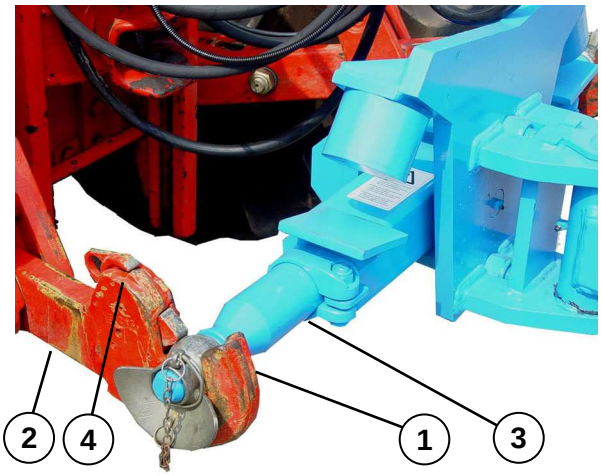
Lowering or raising the three-point linkage

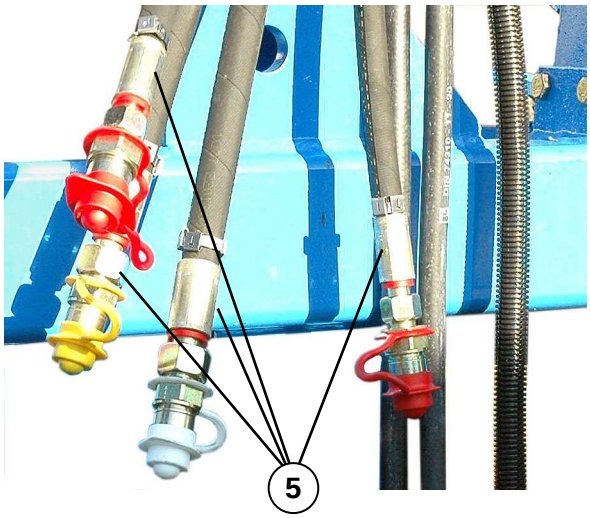
Uncontrolled movement of the three-point linkage, because of incorrect settings or operation, can result in injury to the operator.

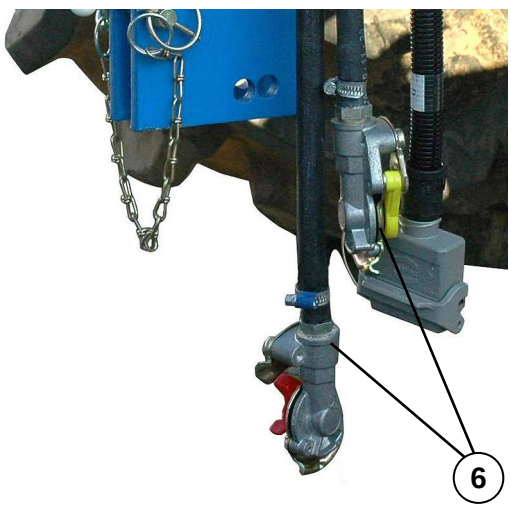
- Always set the tractor's hydraulics to "position control" when mounting or removing the machine.

8 ASSEMBLY AND DISASSEMBLY

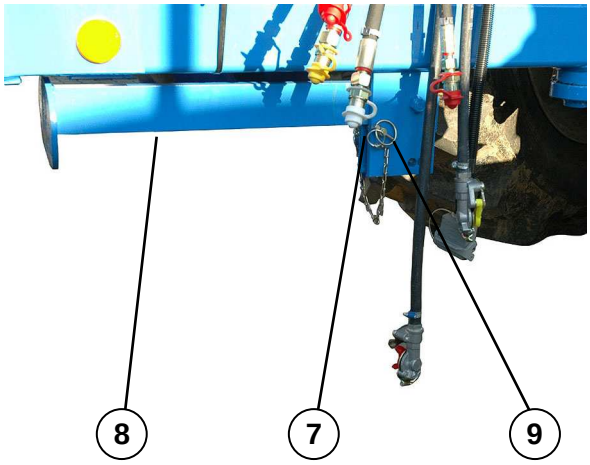
8.1 Assembly



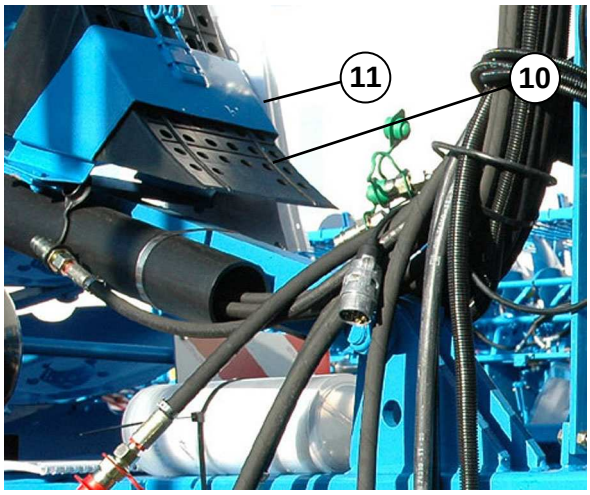




- Switch the tractor's hydraulic system to position control when mounting the machine.
- Back the tractor up to the machine so that it is positioned directly in from of the machine so that the lower arm's (2) catch hook (1) can be coupled with the drawbar (3).
- Connect the tractor's lower arm (2) to the drawbar (3).
- Secure the drawbar in place (3) with the safety latch (4). Also see the tractor manufacturer's operating manual.
- Connect the hydraulic hoses (5) to the tractor in accordance with the table in the section "Required hydraulic equipment".
- Connect the electric cable to the tractor in accordance with the section "Required power sources".
  If available, run and connect the control box or operation terminal with cable so that it is easily accessible in the tractor cab.
- Connect the brake hoses (6).
- Using the lower arm (2) raise the machine several centimeters.



– Release and remove the pin (7) and swing the parking support leg up (8).
– Secure the parking support leg with the pin (8) and secure the pin (7) with the linch pin (9).



– Remove the wheel chocks (10) from the wheels and place them in their holders (11).

– Release the parking brake by actuating the red button (12) on the parking valve.
– Raise the machine completely both in front and in back.
– Lock the tractor's controller.

– Close the shut-off valve (13) for transport.

In connection with the combination semi-mount installation, the setting for the brake force regulator must be checked and the axle load of the machine adjusted accordingly. See section "Brake force regulator".

– Fold the side sections in. See section "Folding side sections in".

In the event that the transport takes place on public roads, a mandatory lighting system with warning signs must be put in place and the protective devices installed. See section "Protective devices".

WARNING

Risk of injury when mounting the machine

There is a risk of being crushed between the tractor and the machine. The drawbar's connection to the shaft is pendular. It can both swing and turn vertically and horizontally during mounting and removal. Injuries caused by crushing can be the result.

- The tractor and machine must be secured against unintentional rolling.
- Never operate the tractor's hydraulic system if people are between the tractor and the machine.
- Keep your distance from the oscillating movements of the drawbar when mounting and removing the machine (Tilt angle limiter).

WARNING

Risk of accident from spraying hydraulic fluid

Hydraulic fluid escaping under high pressure can penetrate the skin and cause serious injuries. Seek medical attention immediately in the event of injuries

- Before connecting the hydraulic hoses to the tractor's hydraulics, make sure that both tractor's and the machine's hydraulics are without pressure.
- Make sure that the hydraulic hoses are connected as prescribed.
- For the hydraulic function fittings between the tractor and the machine, the coupling sleeves and plugs must be labeled to avoid mistakes. Mixing up the connections leads to the reversal of functions (e.g. raising/lowering or folding in/folding out).

WARNING

Risk of accident from overturning of the machine

The tilt angle limiter will not be able to prevent the machine from tipping over in borderline situations if the three-point linkage lifting rods are not locked.

- Adjust the tractor's three-point linkage lifting rods to the same length using the adjusting device.
- Lock and secure the lifting rods. See tractor manufacturer's operating manual.

CAUTION

Damage to the machine arising from a unsecured parking support leg

Driving with an unsecured parking support leg can allow the leg to fall and catch on the ground. This leads to damage of the machine and the parking support leg.

- Drive only if the parking support leg is in its raised position and secured.
- Secure the pin with a linch pin.

DANGER

An unsecured connection between the lower arm and draw bar can result in death

The drawbar trunnion can release if the connection between the lower arm and drawbar is not secured.

During transport, this could cause loss of life or limb to others.

- The connection between the lower arm and the drawbar must always be secured.
- No one may be present in the immediate area when the machine is in the raised position.

DANGER

Risk of accident from an incorrectly adjusted brake force regulator

An incorrect adjustment of the brake force regulator leads either to too little braking force or to too much braking force. Braking distance increases if there is too little braking force. This can lead to rear-end collisions in which the driver and others can be injured or killed.

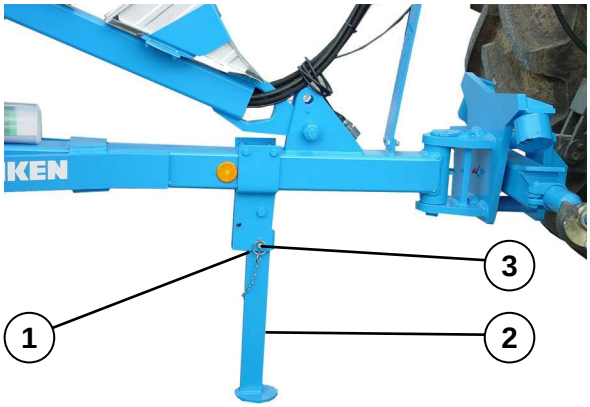
Too much braking force can lead to skidding and overturning. This can lead to rear-end collisions in which the driver and others can be injured or killed.

– Check the machine's brake function before commissioning. Adjustments are made on a device located on the tractor.

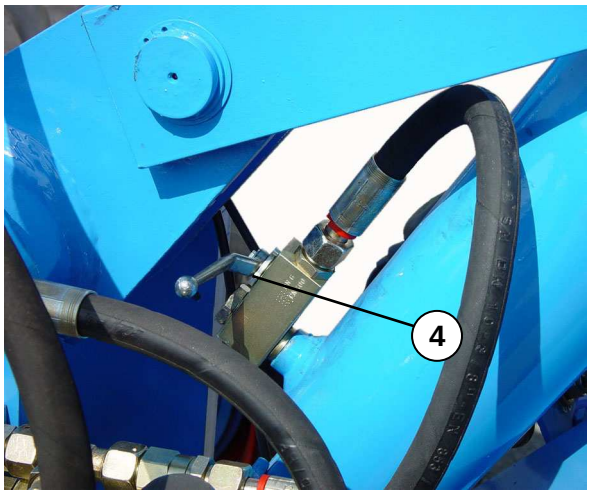
8.2 Removal

The machine should be parked in the folded in position; this saves space and reduces the need to install and remove protective equipment.

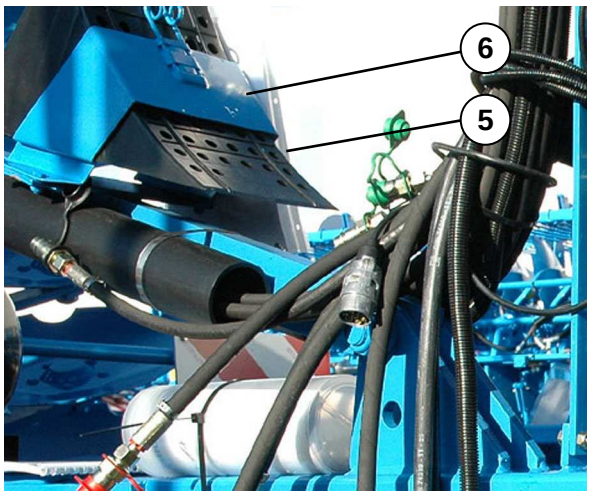
Only park the machine on firm and level ground.



- Always switch the tractor's hydraulic system to position control.
- Release and remove the pin (1) from the parking support (2).
- Swing the parking support leg downwards (2).
- Secure the parking support leg (2) with the pin (1) and secure the pin (1) with the linch pin (3).

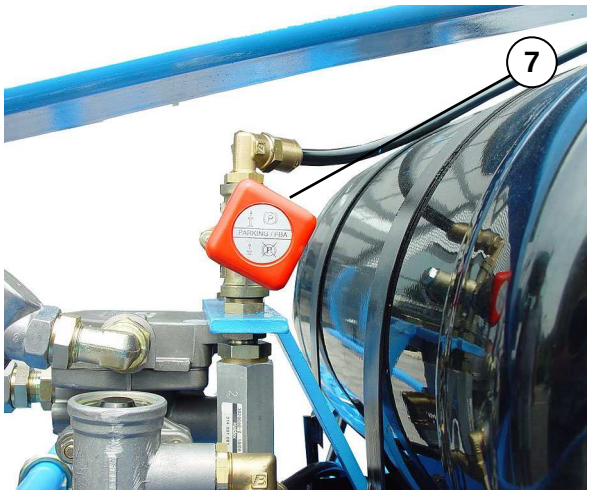


- Open the shut-off valve (4) and completely lower the machine both in front and in the rear.

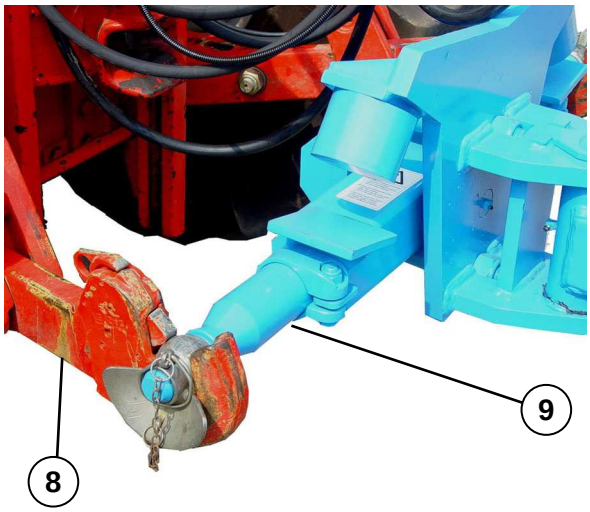


- Remove the wheel chock (5) from its holder (6).

– Secure the machine against rolling.
– Uncouple the brake hoses.



– Activate the parking brake using the red button (7) on the parking valve.
– Uncouple the electrical cables.



– Disconnect the lower arm (8) from the drawbar (9).
– Bring the operating lever into floating position in order to release all pressure from the hydraulic hoses.
– Uncouple the hydraulic hoses and put protective covers in place.
– Drive the tractor slowly away from the machine.

9 SAFETY EQUIPMENT

9.1 General information

Before every use, safety equipment must be checked for functionality and then only used and operated in accordance with the operating manual.

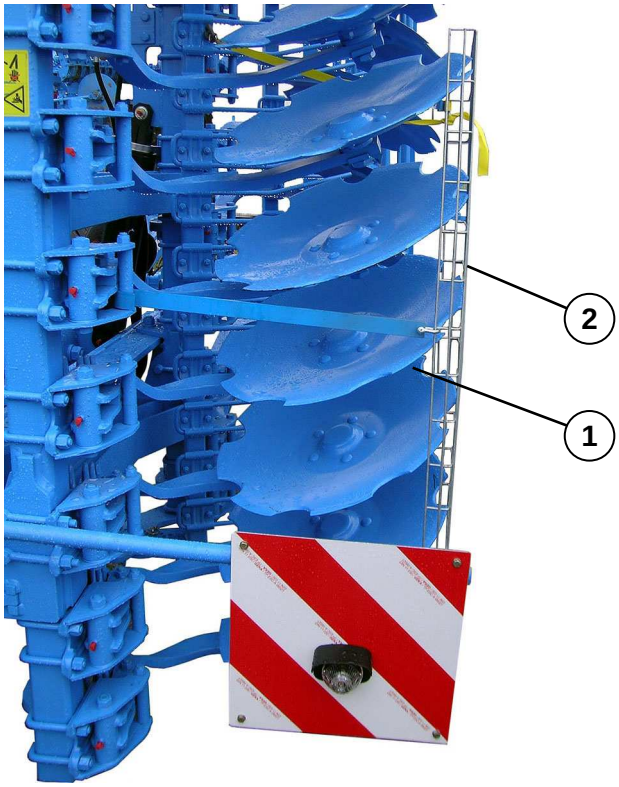
9.2 Protective devices

WARNING

Risk of injury

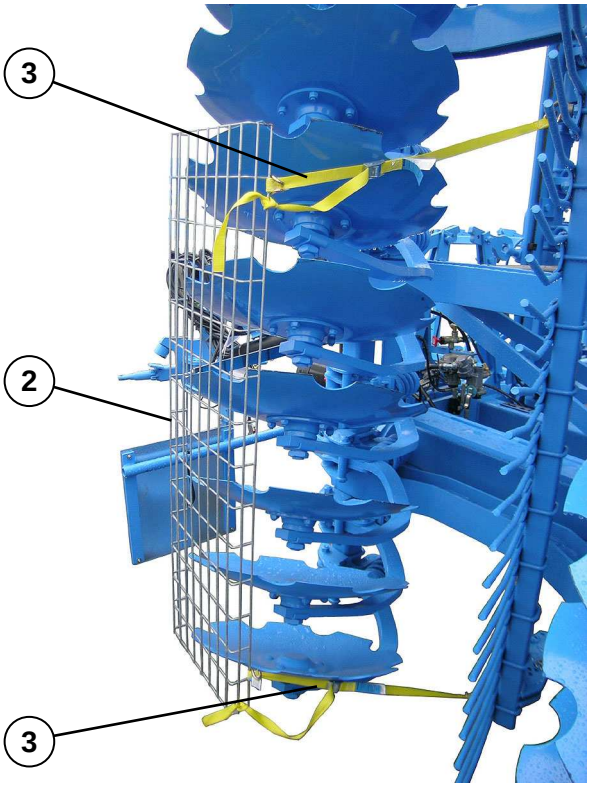
Others could injure themselves on the edging discs or following tines.

- Always install the protective guard before driving on public roads.



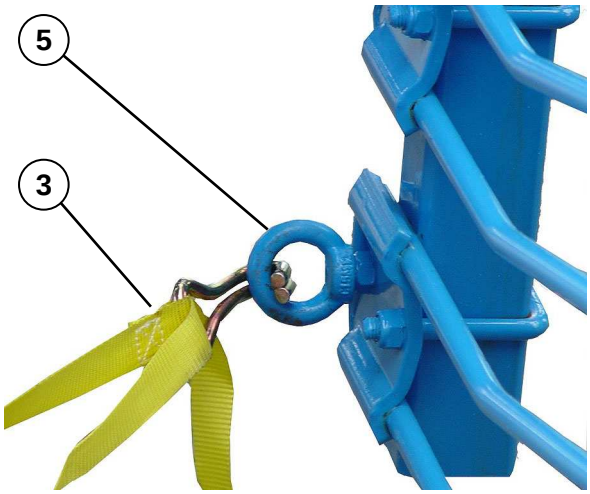
The edging discs (1) of the side elements must be covered with the protective guards (2) before transport on public roads.

– Fold the side elements in, see section "Folding in side elements".
– Install the protective guards as follows.



– Secure the tension bands (3) on the front side of the protective guards (2).

– Hang the protective guard in the hook (4) to the rear on the side element.



– Connect the protective guard to the front using the tension bands (3) into the comb's eyes (5).

The lower edge of the protective guard must also cover the lowermost cutting edge of the edging disc.

WARNING

Risk of injury

There is a risk of injury to hands and feet during installation and removal of the protective guard because of its weight.

- The protective guards may only be installed and removed by personnel trained to do so.

9.3 Transport dimensions

Before driving on public roads, it must be assured that the following maximum permissible dimensions are not exceeded:

3 m transport width

4 m transport height

– The width can exceed 3 meters at the rollers if the work setting is very flat. Adjust the roller setting to bring the width back into the permissible range.
– Raise the machine completely.
– Fold the side sections in. See section "Folding side sections in".

In connection with 6 meters working width

– Lower the machine in the front and rear as far as it goes in order not to exceed the permissible transport height of 4 meters.

WARNING

Danger from when the machine is raised too high

The height of the folded machine can be too high. There is an increased danger under bridges, gateways and high-voltage lines as a result.

– Make sure that the transport height of 4 meters is not exceeded.

WARNING

Danger when the machine is too wide

The width of the folded machine can be too wide. There is an increased danger in gateways, throughways and road traffic.

– Make sure that the transport width of 3 meters is not exceeded.

WARNING

Risk of accident from overturning of the machine

The center of gravity of the folded machine is too high. As a result, there is an increased danger of tipping.

– Adapt your driving and speed accordingly.
– Lock the pendulum balance of the tractor's three-point linkage.

10 FOLDING THE SIDE ELEMENTS IN AND OUT

10.1 Activate the side elements' folding equipment

Transport semi-mounted installation

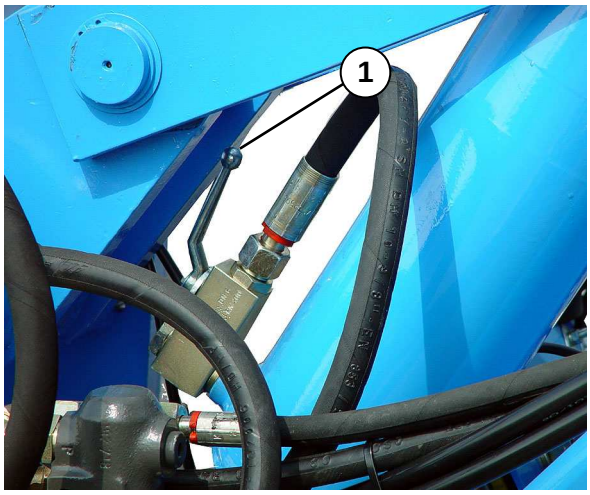
For the transport semi-mount installation, the folding equipment for the side elements is operated with the respective tractor controller.

Combination semi-mounted installation

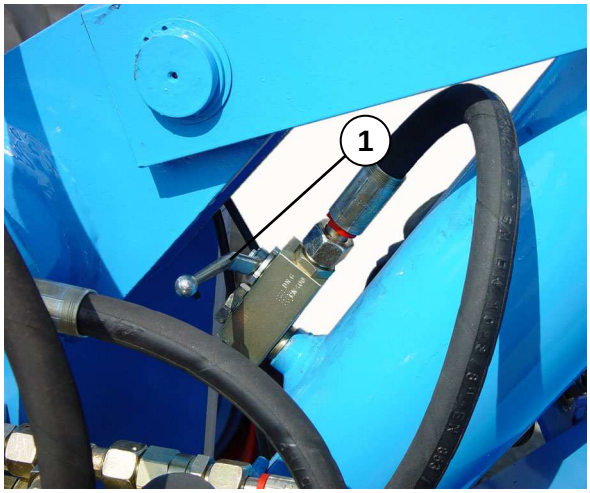
In connection with the combination semi-mount installation, the folding equipment for the side elements can be operated differently depending on the model of the hydraulic control:

- in single-user mode using the tractor controller,
- using a 6/2 direction control valve in one of its two switch positions through the tractor controller,
- with the electromagnetic control through a control box,
- with the electronic control through the operation terminal of the Solitair seed drill at the touch of a button.

See section "Required hydraulic controllers" and the operating manual for the Solitair 9 KA seed drill.



The combination semi-mount installation's shut-off valve (1) must be closed before transport on roads. The shut-off valve must be opened before the side elements are folded out again.



10.2 Folding in

DANGER

Risk of accident from incorrectly folding in the side elements

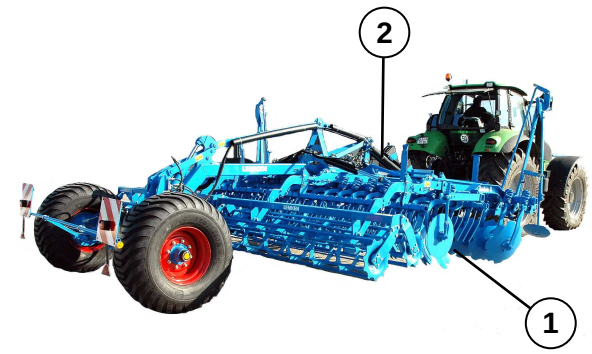
Folding in the side elements incorrectly leads to accidents if people are in the danger zone of the side elements or if high-voltage lines are in the danger zone of the side elements. See section "Danger zones".

– Make sure before folding in the side elements that no one is present in their pivoting or folding range.

- Never fold the side elements in if high-voltage lines are in the pivot and folding range of the side elements.

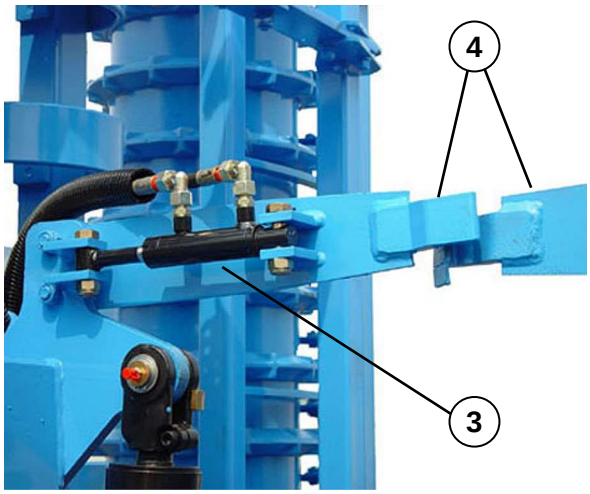
– The side elements may only be folded in if the lane scribers are also folded in.

– Only fold in the side elements if the machine is fully in the raised position.



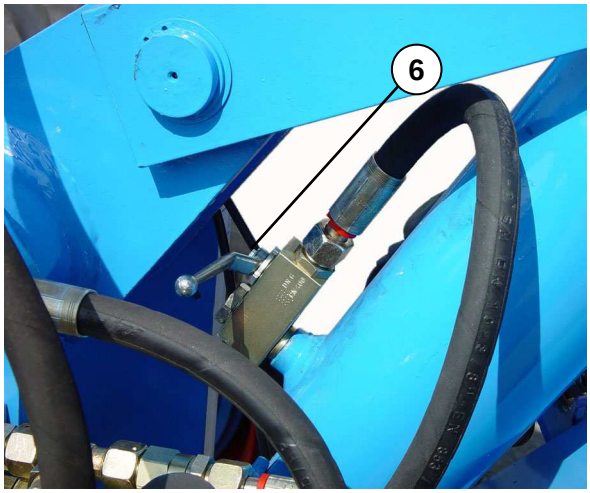
Fold the machine's side elements (1) in for transport.

– Fold the lane scribers in, see section "Folding in lane scribers".
– Before folding in the side elements (1), raise the machine fully both in front and in back.
– Operating the controller in the folded-in position (1st pressure position) folds the side elements of the machine frame and the roller above the folding cylinder (2) to the stop position. This results in the hydraulic transport lock automatically locking in.



– Check whether:
  the hooks (4) of the hydraulic transport lock are correctly locked
  the hydraulic cylinder (3) is fully extended (approx. 2 cm).

– In the tractor, lock the controller responsible for the folding cylinder to prevent the side elements from folding out unintentionally.
– Install the protective guards before driving on public roads. See section "Protective devices".



– With a machine in raised position with a combination semi-mount installation, close the shut-off valve (6) for transport.

DANGER

Risk of accident from unsecured side elements

Transport with unsecured tractor controllers can lead to the side elements unintentionally folding out during transport if the side elements are not locked with the hydraulic transport mechanism. During transport, this could cause loss of life or limb to others.

- Always lock the tractor's controller before transport.
- Make sure that the hydraulic transport lock is always locked when the machine is in transport position.

10.3 Folding out

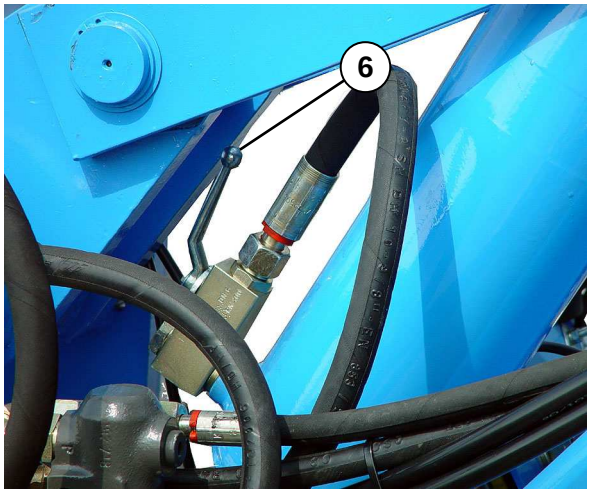
DANGER

Risk of accident from incorrectly folding out the side elements

Folding out the side elements incorrectly leads to accidents if people are in the danger zone of the side elements or if high-voltage lines are in the danger zone of the side elements. See section "Danger zones".

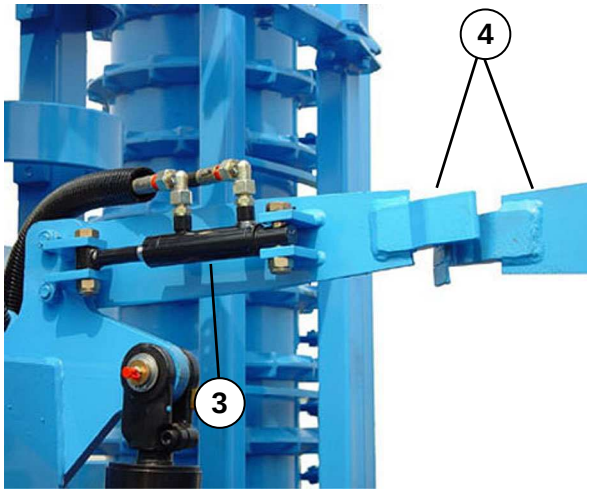
- Make sure before folding out the side elements that no one is in the danger zone of the side elements.
- Never fold the side elements out if high-voltage lines are in the pivot and folding range of the side elements.

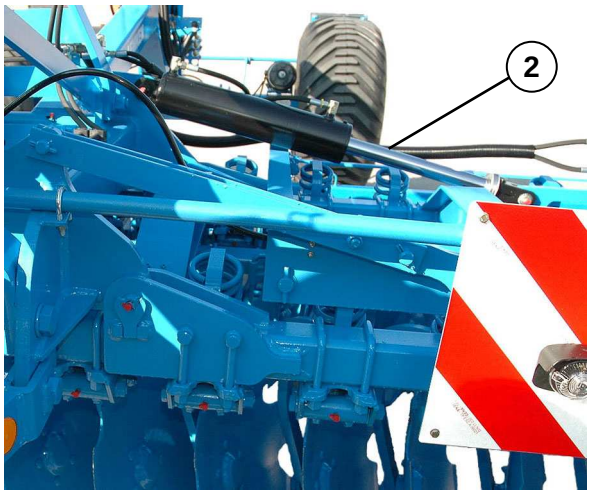
- The side elements may only be folded out using the device mounted on the tractor.
- For side elements with lane scribers, the side elements may only be folded out if the lane scribers are folded in.
- Only fold out the side elements if the machine is fully in the raised position.



– Open the shut-off valve (6).
– Raise the machine completely, both in front and in back, before folding out the side elements.
– Unlock the tractor's controller for the folding cylinder.
– Switch the controller to the fold-in position (1st pressure position) and then quickly to the fold-out position (2nd pressure position).

The hooks (4) of the hydraulic transport lock will unlock automatically through the hydraulic cylinder (3).





The side elements will then be folded out with the folding cylinder (2).

11 OPERATION

11.1 Lane scriber

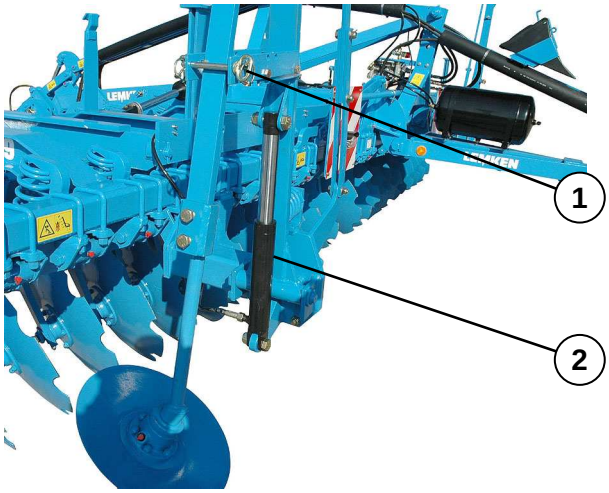
The lane scribers, depending on the model, are operated through either the respective tractor controller, in connection with the electromagnetic controller through a control box or in connection with the electronic control through an operation terminal of the electronic Solitronic seed drill.

11.1.1 Folding in

DANGER 	**Risk of accident from incorrectly folding in the lane scribers** Folding in the lane scribers incorrectly leads to accidents if persons are in the lane scriber's danger zone. - Make sure before folding in the lane scribers that no one is in the danger zone of the lane scribers. - Always fold in the lane scribers before folding in the side elements.

CAUTION 	**Exceeding the permissible transport height** The pins can be lost during transport if they are not secured with linch pins. As a result, the lane scribers will swing upwards and the maximum transport height of 400 cm will be exceeded. - Once inserted, the pins must be secured with linch pins.

The lane scribers must be folded in by means of the hydraulic cylinder (2) and secured with the pins (1). Fold in the lane scribers as follows:



– Switch the controller, control box and operation terminal to the operation position.

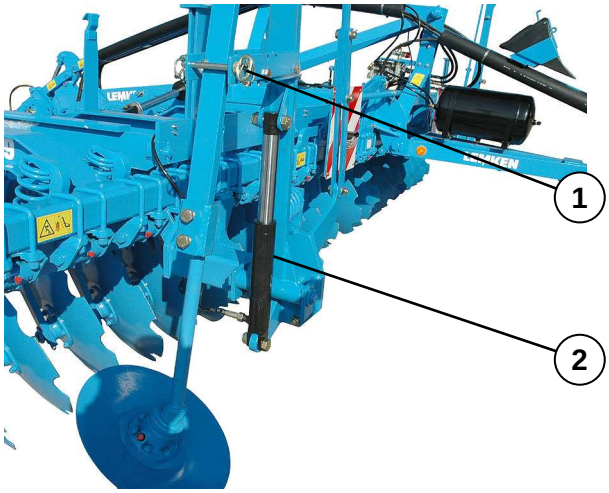
The lane scribers are folded in by means of the hydraulic cylinder (2).

- Insert the linch pins to secure the pins (1).

11.1.2 Folding out

DANGER 	**Risk of accident from incorrectly folding out the lane scribers** Folding out the lane scribers incorrectly leads to accidents if persons are in the lane scribers' danger zone. - Make sure before folding out the lane scribers that no one is in the danger zone of the lane scribers. - Never fold out the lane scribers if the side elements are folded in.

The lane scribers must be unlocked before being operated.



- Unlock the respective pins (1) by removing the linch pins.
- Remover the respective pins (1).
- Swing the lane scribers slightly outward.
- Insert the pins (1) again.
- Secure the pin (1) with the linch pin.
- Set the controller, control box and operation terminal to the appropriate position in order to operate the lane scribers.

By means of the hydraulic cylinder (2) the lane scribers are alternately raised and lowered into the scriber position.

12 SETTINGS

DANGER 	**Risk of accident when making adjustments** During all adjustment work on the machine, there is a risk to the hands, feet and body of being crushed, cut, jammed or rammed from heavy or partially under spring tension and/or sharp edged components. • Adjustments may only be performed by personnel specifically trained to do so. • Always wear appropriate protective clothing. • Make sure to follow the applicable rules for operating safety and accident prevention.

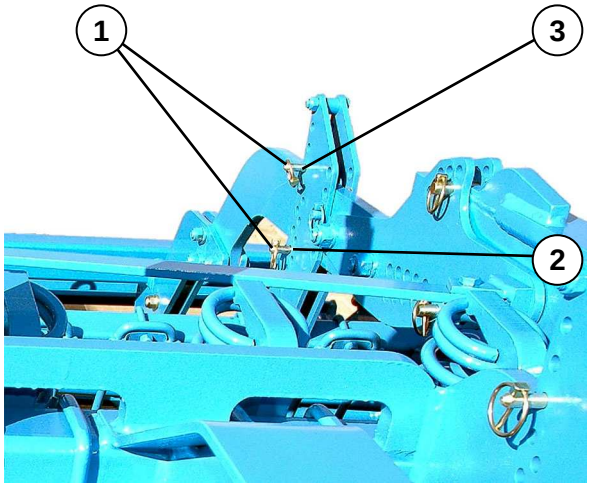
DANGER 	**Risk of accident from free-turning rollers** Climbing on free-turning rollers runs the risk of feet and legs being jammed and crushed between the turning rollers and stationary machine components. • Adjustments may only be performed by personnel specifically trained to do so. • Never climb on free-turning rollers.

DANGER 	**Rollers swiveling out** The pins can be lost if they are not secured with linch pins. The results are hazards and operational faults: • The rollers can swing out during transport and cause the maximum transport width of 3 meters to be exceeded. Others can be injured as a consequence. • When in operation, the machine works without depth guidance. This may achieve undesired results. - Secure all pins with the linch pins once the working depth has been set.

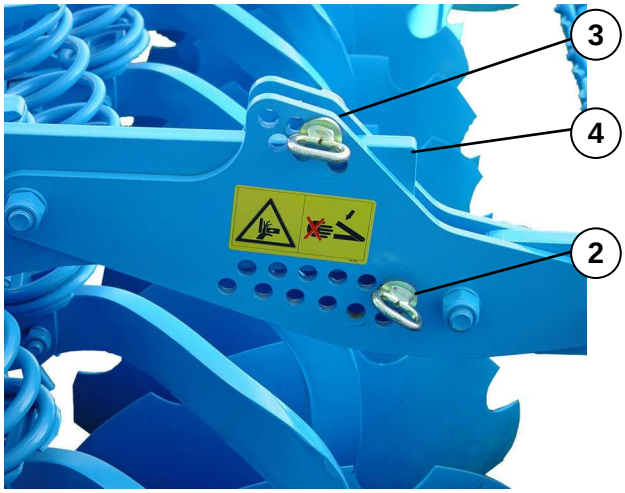
12.1 Working depth of the edging discs

The working depth of the edging discs can be adjusted in a range from 4 cm to 12 cm. The maximum possible working depth of 12 cm is slightly decreased as the edging discs show wear and tear.

Adjust the working depth of the edging discs as follows:



– Unlock the pins (2 and 3) by removing the linch pins (1).



– Place the lower pin (2) in one of the bores of the two bore rows for the lower bore group below the beam (4), depending on the desired depth.

– Place the upper pin (3) in one of the bores of the two bore rows for the upper bore group directly above the beam (4) so that the weight of the roller further supports the retraction of the equipment.
– Secure the pins (2) and (3) with the the linch pin (1).

In the process, the following applies:

- deeper bore = greater working depth.
- shallower bore = less working depth.

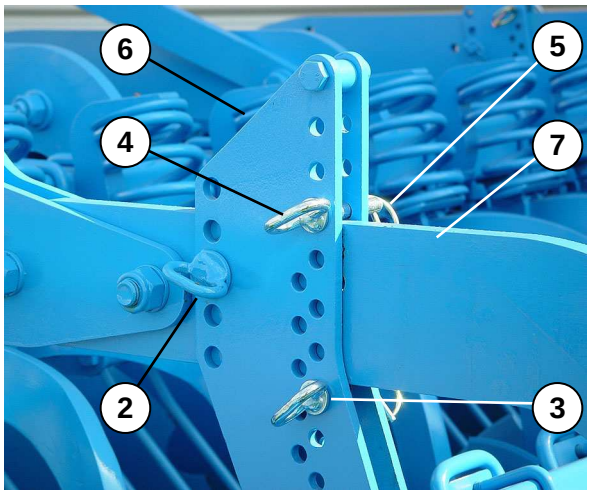
If the lower pin (2) is moved, the upper pin (3) must also be moved.

12.2 Comb

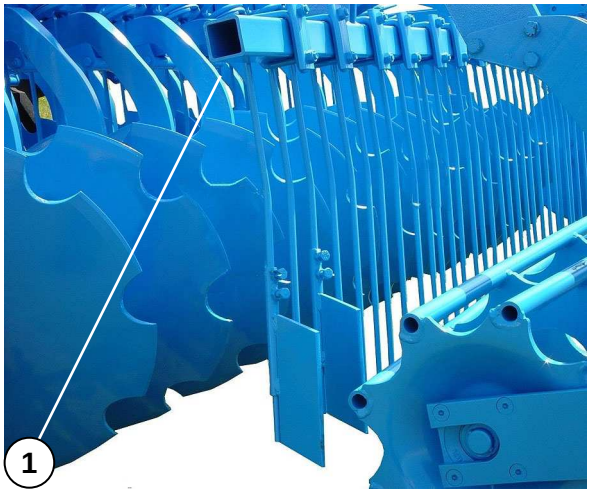
The comb (1) can be adjusted with respect to the distance to the edging disc as well as in its height and angle. The deeper and closer they are to the edging discs, the more effectively the turned-up soil can be picked up and dropped.

Setting the comb too deep and too close to the edging disc can cause blockages.

12.2.1 Distance adjustment



– Unlock the pins (2) by removing the linch pins (5).
– Remove the pins (2).

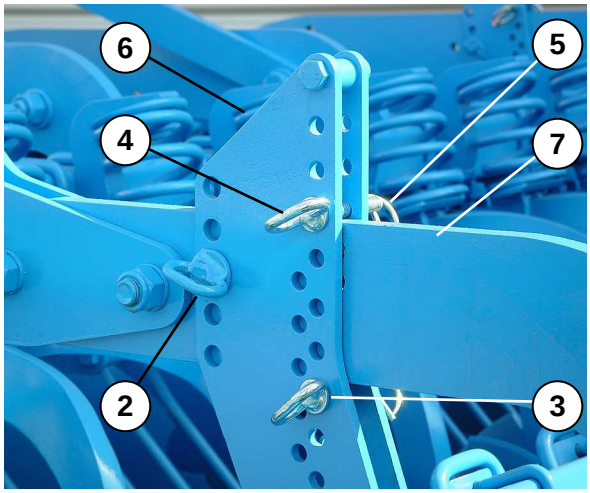


The respective comb (1) is held by the pin (4) .

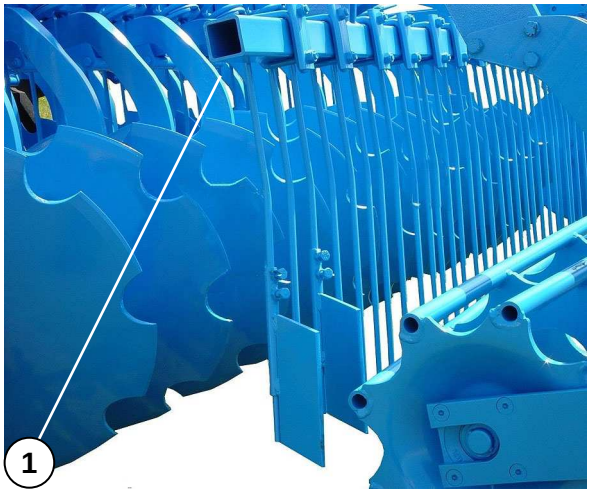
– Move the respective comb (1) so that the desired distance between the comb and the edging disc is reached and that bores in the front bore row of the console (6) correspond with bores in the beam (7).
– Set the plug (2) to fix the respective comb in position.

12.2.2 Setting the height

To keep the comb (1) from falling, either the pin (2) or the pin (4) must be placed when setting to the height.
If the comb (1) is to be set lower, before adjusting its height, the upper pins (4) must be placed accordingly in a higher bore of the rear bore row.
If the comb is to be set lower, before adjusting its height, the upper pins (3) must be placed accordingly in a higher bore of the rear bore row.



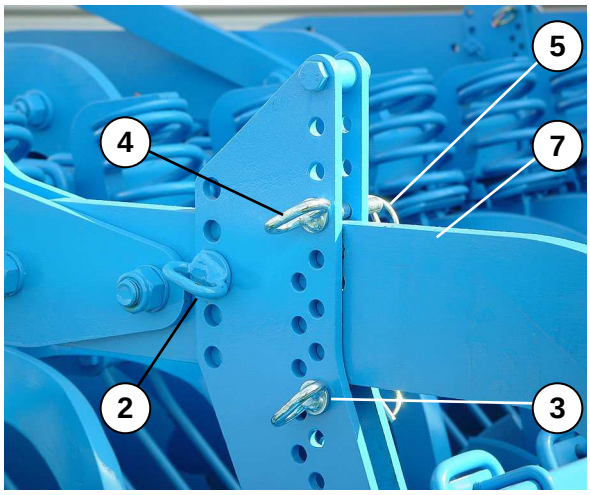
– Unlock the pins (2) by removing the linch pins (5).
– Hold the comb in position and remove the pins (2).



– Move the respective comb (1) so that the bores in the front bore row of the console (6) correspond with bores in the beam (7).
– Set the plug (2) to fix the respective comb in position.
– Secure the pin (2) with the linch pin (5).

12.2.3 Adjusting the angle

Adjust the angle for the comb (1) as follows.

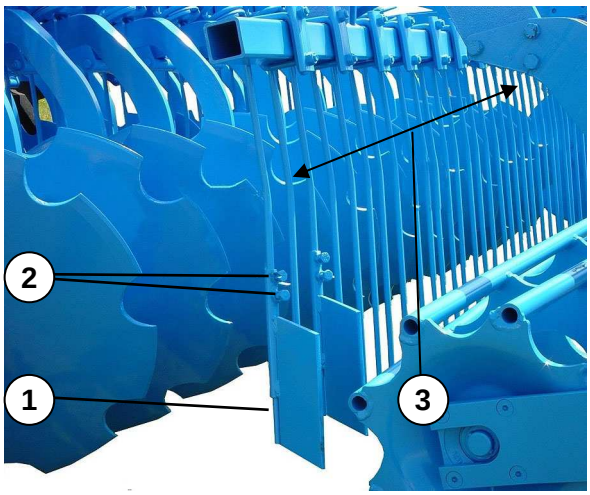


– Unlock the pins (3) and (4).
– Swing the respective comb (1) into the desired position.
– Place a pin (4) as high as possible directly below the beam (7) in a bore of the rear bore rows.
– Place a pin (3) as low as possible directly above the beam (7) in a bore of the rear bore rows.
– Secure the pins (3) and (4) with the the linch pin (5).

CAUTION	**Loss of components and collision of components**
	Pins in the comb can fall out as a result of vibration if they are not secured. This can lead to the combs hitting against the rollers. - The pins must always be secured with linch pins.

12.3 Guide plates

The guide plates re-fill the furrow left by the left rear edging disc with soil.
The angle and height of the guide plates are adjustable.



- Using the clamping screws (2), adjust the guide plate (1) accordingly.
- Make sure that the guide plates lie lower that comb's following tines (3).

12.4 Edge limiters

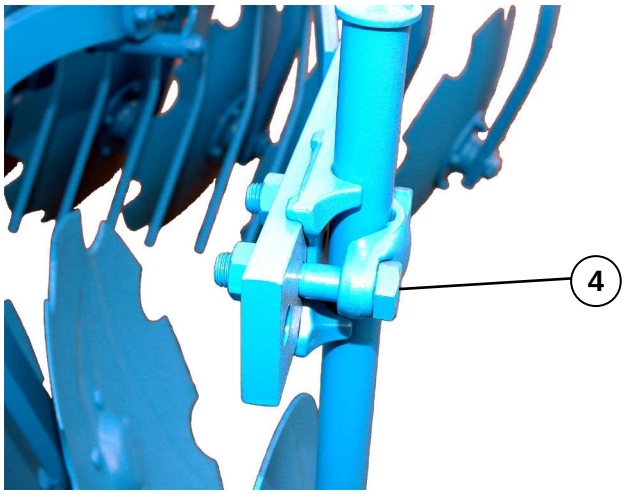
CAUTION 	**Risk of accident from a loose clamping device** If the screws holding the clamping device in place come loose, the edge limiter will slide down. This can cause injuries to hands and feet. Secure the edge limiters in place before loosening the screws. - Tighten the screws after adjustment.

The edge limiters (2) prevent the right rear and the front left edging discs from leaving grooves and from forming embankments.
They are fastened directly to the frame by clamping screws with their respective supports (1) and are laterally adjustable.
By moving the clamping device (3) with the side limiter (2), the edge limiters can be moved to the front and to the rear.
After loosening the fastening screws (4) of the clamping device (3), the angle and height of the respective side limiter (2) can be adjusted.
In the basic setting, the side limiters

- are set at an angle of 5°
- and, centered lengthwise, bolted to the support (1).
- In the basic setting, the left side limiter is approx. 23 cm and the right side limiter is approx. 14 cm above ground level.

If necessary, adjust the angle and height for the side limiter (2) as follows:

– Secure the respective side limiter (2) so that it can not slide downwards after loosening the screws (4) for the clamping device (3).



– Loosen the screws (4).
– Rotate and/or slide the side limiter (2) to the desired position.
– Then carefully tighten the fastening screws.

12.5 Lateral pull

The front and rear angled edging discs exert opposite lateral loads which cancel each other out. However, should lateral pull occur, it can be counteracted as follows:

For lateral pull to the right

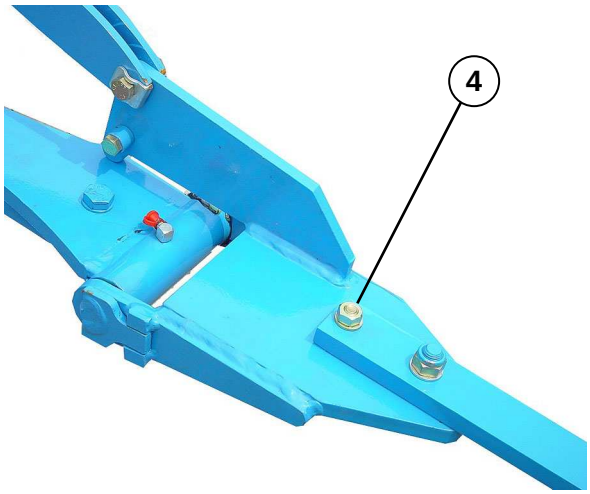
– Raise the lower arm slightly.

For lateral pull to the left

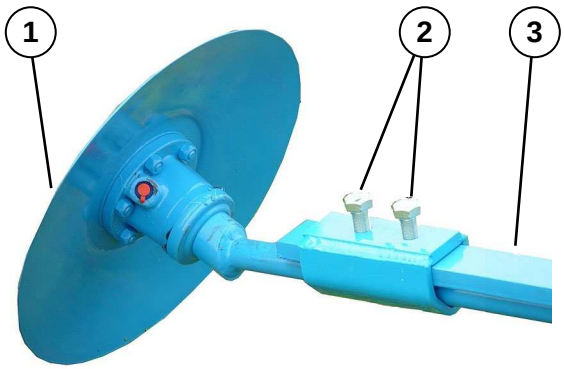
– Lower the lower arm slightly.

12.6 Lane scriber

CAUTION 	**Risk of accident from loosen clamping screws** If the clamping screws are not securely tightened, the lane scriber disc with axle support can be thrown off. This could injure or kill persons hit by the ejected equipment. This could cause property damage. - Always securely tighten the clamping screws. - Make sure that the clamping sleeves found at the end of the axle supports and the lane scriber arms are installed. These prevent ejection during folding in the event that the clamping screws are not securely tightened.



The edging discs are protected by shear bolts (4) against overloading. The length of the lane scriber arms (3) and the angle of the lane scriber discs are adjusted by moving or turning the axle support for the lane scriber discs (1).



Adjust the lane scriber before using it for the first time as follows:

– Fold the lane scribers out, see section "Folding out lane scribers".
– Loosen the clamping screws (2) and adjust the lane scribers according to the following table.

So that it is not necessary to loosen and tighten the clamping screws (2) twice:

– Set the desired angle for the lane scriber disc (1).
– The clamping bolts (2) must be tightened securely following the adjustment.

– Fold the lane scribers in again, see section "Folding in lane scribers".

Working width	Distance from the center of the seed drill to the rut	Distance from the outer seed share or seed row
400 cm	400 cm	200 cm + ½ distance between rows
450 cm	450 cm	225 cm + ½ distance between rows
500 cm	500 cm	250 cm + ½ distance between rows
600 cm	600 cm	300 cm + ½ distance between rows

12.7 Rollers

12.7.1 General information

The machine can be equipped with various types of rollers. See the following table for rollers. The rollers provide for the working depth. Depending on the roller type being used, the soil is more or less crumbed or repacked.

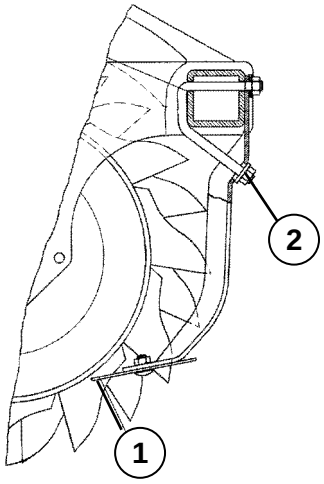
Roller type	Designation	Diameter (ca. mm)
Cage roller	RSW 400	400
	RSW 540	540
	RSW 600	600
Twin rollers (Tube/Flat)	DRF 400/400	400/400
Twin rollers (Tube/Tube)	DRR 400/400	400/400
	DRR 540/540	540/540
Dual tread ring rollers	DPW 540/540	540/540
Toothed packing roller	ZPW 500	500
Trapezoidal packing roller	TPW 500	500
Trapezoidal disk roller	TSW 500	500
Knife roller	MSW 600	600
Rubber ring roller	GRW 590	590

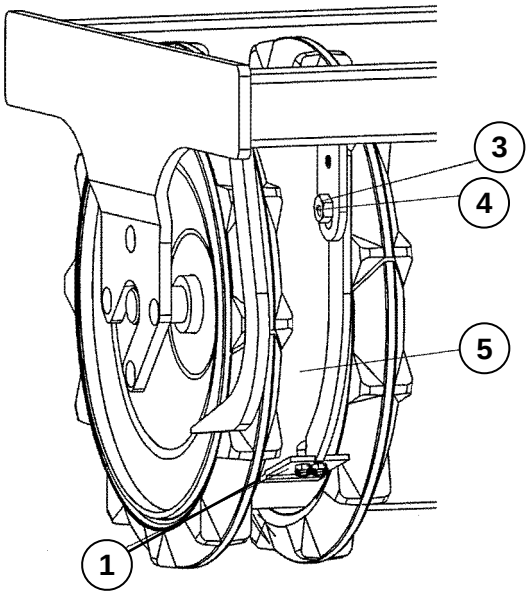
The cage rollers, twin rollers and dual tread ring rollers require no special adjusting.
The trapezoidal packing rollers, the trapezoidal disk rollers, the toothed packing rollers and rubber ring rollers are equipped with adjustable scrapers, which must be readjusted from time to time.
The knife roller is equipped with a cutter bar with knives as scrapers for multiple uses, see section on "Knife roller".

12.8 Scraper

12.8.1 Adjusting the scraper

The adjustable scrapers (1) of the 500 series rollers are adjusted using an adjusting nut (2) or eccentric nut (3).





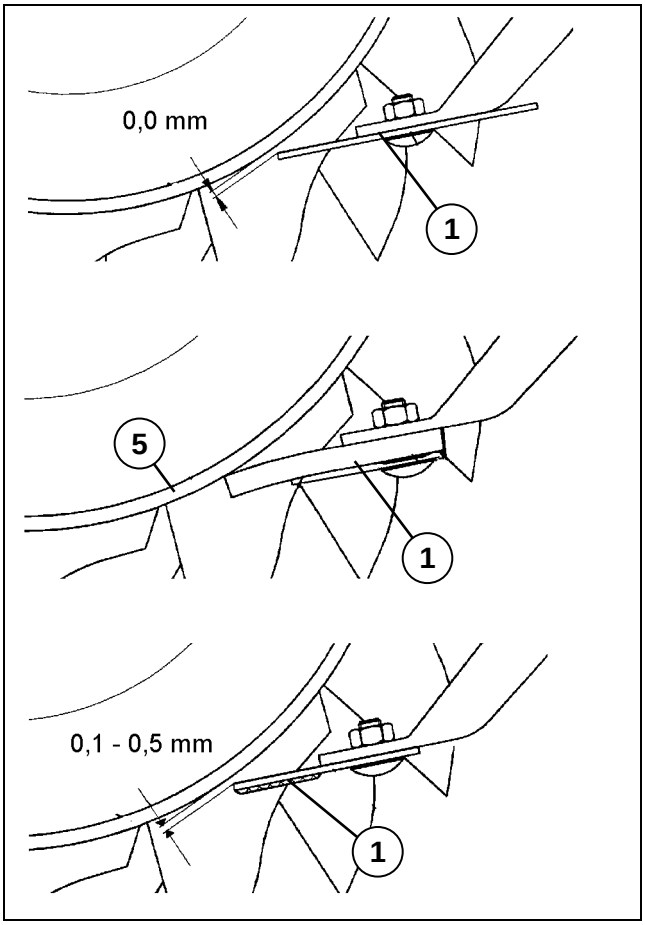
– Use a 19 mm wrench to adjust the adjusting nut (2) for the toothed packing roller.

Adjust the eccentric nut (3) as follows:

– Loosen the bolt (4) with using a 19 mm wrench.
– Use a 24 mm wrench to adjust the eccentric nut (3) as necessary.
– Hold the eccentric nut (3) to prevent it from rotating and tighten the bolt (4) securely.

12.8.2 Distance of the scraper to the roller sleeve

The distance of the scraper (1) to the roller sleeve (5) must be adjusted in accordance with the following list. The adjustment notes apply for all toothed packing rollers, trapezoidal packing rollers and trapezoidal disk rollers.



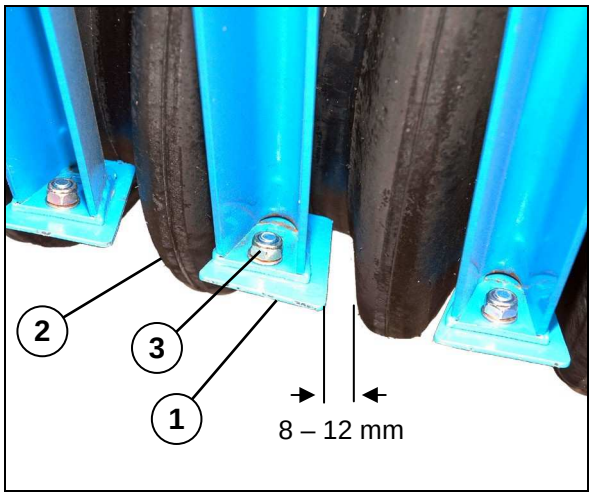
Annealed scrapers (1)

Plastic scrapers (1)
(must lie on the roller sleeve (5) with some tension)

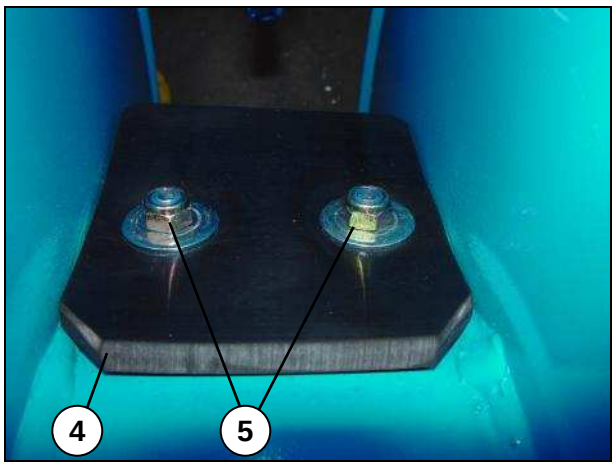
Armored scrapers
or carbide scrapers

12.8.3 Scrapers for the rubber ring rollers

The scrapers (1) for the rubber ring rollers (2) are provided with elongated holes which allow adjusting.



- Loosen the self-locking nuts (3).
- Adjust the respective scrapers for the rubber ring roller so that they have a distance of 8 – 12 mm to the rubber rings.
- Tighten the self-locking nuts securely.

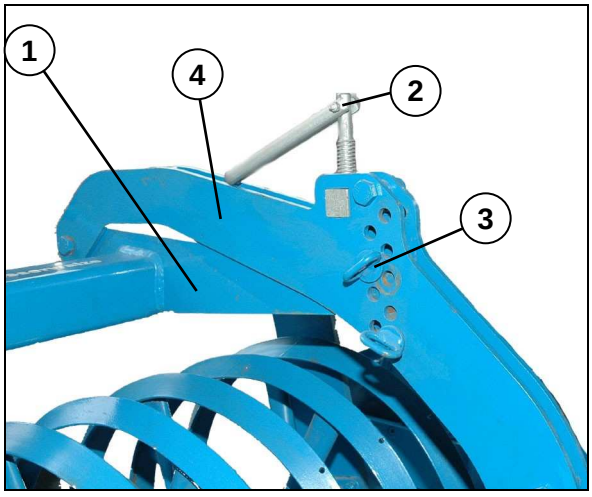


The scrapers (4) for the packer profile roller may be used once before it must be replaced.

- Loosen the nuts (5) on the bolts and remove the bolts.
- Reverse or replace the scrapers (4) if they are worn out.
- Replace the nuts (5) and tighten them.

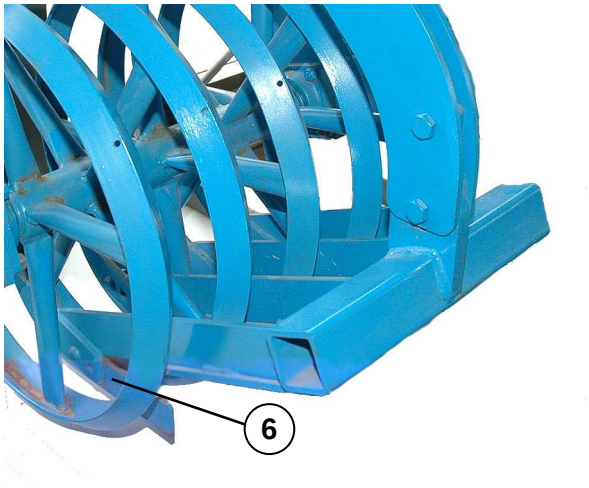
12.9 Knife roller

12.9.1 Working depth of the knives

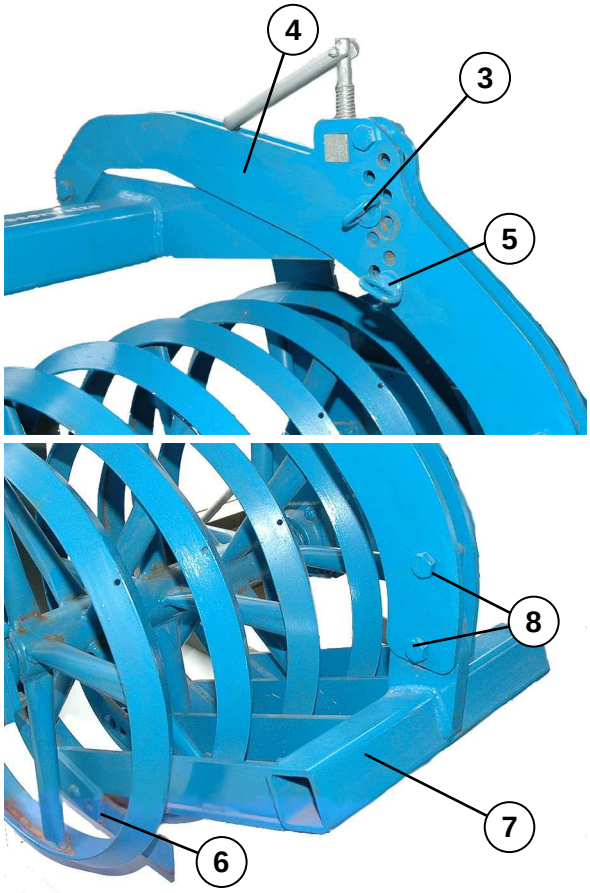


The working depth of the knives (6) is adjusted by means of the pins (3) as follows:

- Turn the spindles clockwise away from the stop until the pins (3) release.
- Release the safety and remove the pins (3) from above the support plate (1).
- Using the spindles (2), swing the support arms (4) to the desired position.
- Insert the pins (3) in one of the support arm's (4) free bores.



– Secure the pins (3) with linch pins.
– Move the spindles (2) counter-clockwise slightly to release them.



12.9.2 Range of motion of the knives

The upward range of motion of the knives (6) is limited by the pins (5). A limited range of motion upwards can be allowed, as need be.

12.9.3 Position of the knives

As a rule the knives are bolted to the cutter frame (7) in the forward position. When worn, the knives (6) can be positioned to the rear.

12.9.4 Adjusting the cutter frame

If there is not enough range available for adjustment by means of the pins (3), the cutter frame (7) can be set higher in relation to the support arm (4). This is done by removing the bolts from the bores (8) and moving the cutter frame (7).

The knives should be set in a higher position for extremely sticky or light soil.
If an work intensity is required, the knives (6) must be set to a deeper position.
This is done by moving the cutter frame (7) downwards.

Unsecured knives are life-threatening

DANGER

After setting the range of motion for the knives, the lower pins (5) can fall out due to vibration during operation if they have not been secured. The cutter frame could then swing outwards during transport and cause injuries to others.
The pins must always be secured with linch pins.

12.10 Adjusting pressure on the rollers

12.10.1 General information

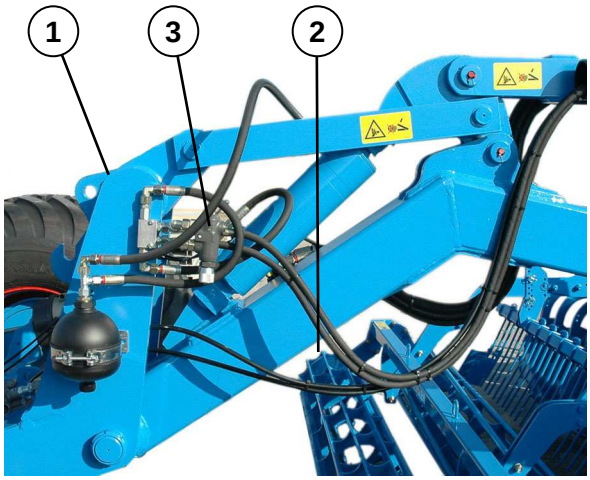
The chassis can be raised during operation, which puts additional pressure on the rollers. If pressure is too great, causing the rollers to clog or to sink too far into the soil, the chassis should be lowered. Because of the low weight, the tracks left in the soil by the chassis are not relevant. With an attached or mounted seed drill, the chassis can be released but not raised.

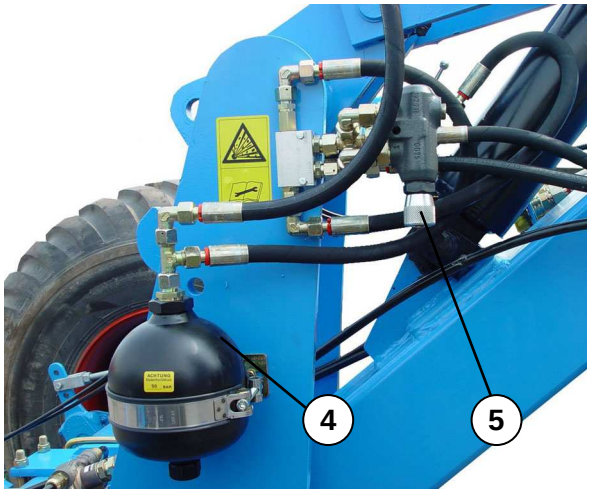
12.10.2 Adjusting the pressure device with a combination semi-mount installation

In connection with a combination semi-mount installation, the pressure load on the rollers is adjusted in accordance with the type of hydraulic control. The following hydraulic controls are available.

- Model with 6/2 direction control valve (without headland management system)
- Model with electromagnetic control (without headland management system)
- Model with electronic control (with headland management system, see section "headland management system").

12.10.3 Adjusting the pressure load device with a combination semi-mount installation without headland management system





Adjusting the pressure load on the rollers (2), and thereby the release of the pressure load on the chassis (1), is accomplished using the pressure relief valve (3) with adjuster wheel (5). In this way the entire weight of the chassis (1) can be transferred to the rollers (2). Using the adjuster wheel (5) an operating pressure from 20 bar to 80 bar can be set.

The respective settings for releasing the chassis can be read from the marked grooves on the pressure relief valve's adjuster wheel.
Turning the adjuster wheel (5) clockwise = greater release of the chassis and more pressure load on the rollers.

Turning the adjuster wheel (5) clockwise = less release of the chassis and less pressure load on the rollers.

The hydraulic accumulator (4) ensures that the compact disc harrow can adjust to the soil independently of the chassis. If the machine is lowered again after the return run on the headland, the controller must be switched to the lowered position for approx. 5 seconds to build up the preset pressure in the hydraulic system again.

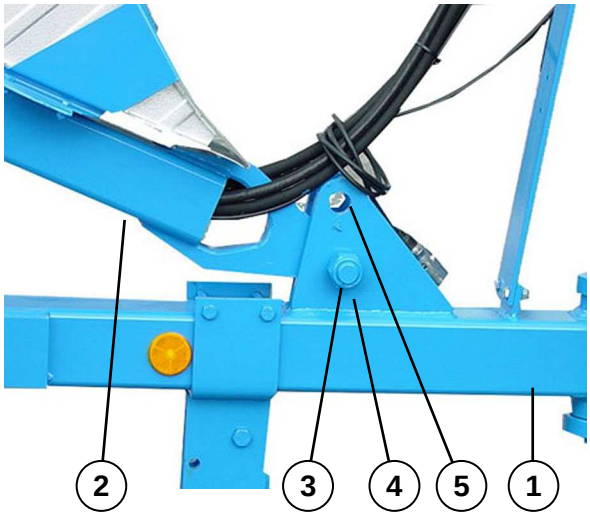
12.10.4 Adjusting the pressure load device with a combination semi-mount installation with headland management system

Adjusting the pressure on the rollers or adjusting pressure relief on the chassis is done using the operation terminal of the Solitronic electronic seed drill control.

Further information can be found in the operating manual for the Solitronic electronic seed drill control.

12.11 Adjusting the anchor point

The shaft (1) and the drawbar can be adjusted to two heights = anchor point settings.



To adjust the anchor point using the bolt (3), the brace (2) is attached either at the lower bore (4) or at the upper bore (5).

- Select the lower anchor point for tractors with a crawler chassis or in cases in which the front axle of tractor would be relieved too much.
- Select the higher anchor point if the tractor has too much slack.

The bolt (3) must be tightened securely after every anchor point adjustment.

Connection to the lower bore (4)	=	high anchor point
Connection to the upper bore (5)	=	low anchor point

13 OPERATION

13.1 Working speed

An adequate working speed is prerequisite for good results. Drive at a working speed of at least 10 km/h in order to effectively crumble, mix and level the soil.

13.2 Headland management system

The machine can be operated in connection with a hydraulic control in the electronic version for an attached or mounted Solitair 9 K or 9 KA seed drill using the operation terminal of the Solitair electronic seed drill control. (Only possible in connection with the Solitronic electronic seed drill from the version 1.17).

It carries out the following functions:
Raising and lowering of the machine and folding of the lane scriber.
The hydraulic three-point linkage is also operated using the operation terminal if the seed drill is not mounted, but instead attached to the three-point linkage of the tiller.
At the push of a button, all functions such as folding in the lane scriber, raising the tiller and the sowing share on the headland are automatically carried out program-controlled = headland management system. This works the same way for lowering and folding out operations.

See also the operating manual for the electronic seed drill control.

13.3 Attaching/mounting accessory equipment

DANGER

Dangers from attached or semi-mounted devices

Specific dangers must be taken into account when accessory equipment is attached or mounted.

- Refer to the operating manuals of the accessory equipment to be attached or mounted with regard to possible hazards.

Risk of accident from diminished braking performance

If a device is attached to or mounted on a machine without its own braking system, the braking performance will be greatly diminished because of the increased weight.

DANGER

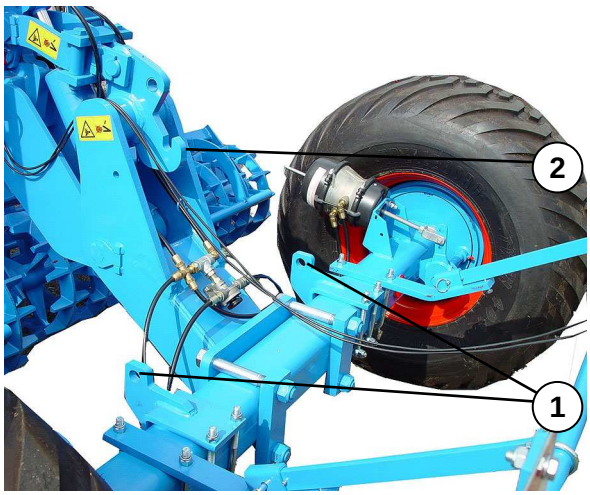
Rear-end collisions can result, and the driver or others may be injured or killed. On slopes, the combination of the tractor and the machine will not be able to be stopped or not stopped sufficiently, resulting in damage to the tractor and machine and death or injury to the driver.

- Only use a tractor that reaches an adequate braking deceleration together with the machine.
- No additional device or machine may be attached to or mounted on a machine without its own suitable braking system.

If the machine, in connection with a combination semi-mount installation, is equipped with coupling components or a hydraulic three-point linkage, it may be operated with a Solitair 9 KA seed drill (coupling components) or with another suitable attachment (hydraulic three-point linkage). Attaching or mounting accessory equipment is only allowed in connection with a combination semi-mount installation with a braking system.

13.3.1 Coupling components

The machine can be delivered with coupling components for the mounting of the Lemken Solitair 9 KA seed drill if it is equipped with a combination semi-mount installation.



The coupling components include an upper link hook (2) and two support plates (1) which are bolted to the combination semi-mount installation as shown in the illustration.

Further information can be found in the operating manual for the Solitair 9 KA seed drill.

13.3.2 Hydraulic three-point linkage

The machine can be delivered with a hydraulic three-point linkage with which accessory equipment is attached if it is equipped with a combination semi-mount installation. The hydraulic three-point linkage complies with Cat 2 in accordance with ISO 730-1.

13.3.3 Attaching accessory equipment

DANGER

Loss of the machine

The category for the hydraulic three-point linkage and the category for the drawbar and the top link pin for the accessory equipment must match.

The drawbar and the top link pin could otherwise release itself from the hitch while driving over uneven surfaces or because of vibration.

Always make sure that the category for the three-point linkage and the category for the drawbar and for the top link pin for the accessory equipment to be attached are the same.

DANGER

Risk of injury from an unsecured top link pin

The top link pin can fall out or be lost if not secured.

The machine can fall or be damaged as a result.

This could injure or kill persons.

- The top link pin must always be secured.
- No one may be present in the immediate area when the machine is in the raised position.

DANGER

An unsecured connection between the lower arm and drawbar can result in death

The drawbar trunnion can release if the connection between the lower arm unit and tow bar is not secured.

During transport, this could cause loss of life or limb to others.

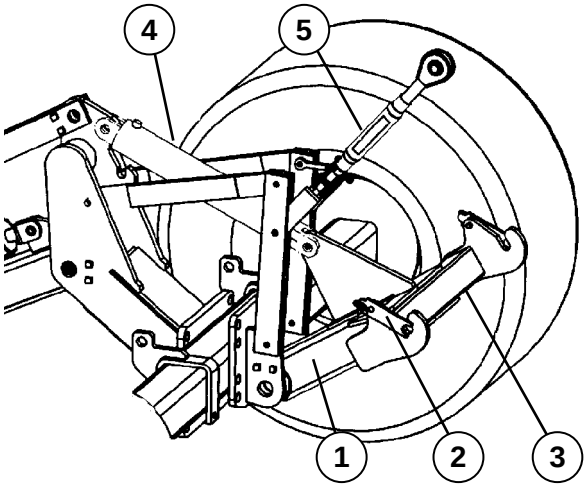
- The connection between the lower arm and the drawbar must always be secured.
- No one may be present in the immediate area when the machine is in the raised position.

Incorrect top link setting

CAUTION

Vibration during operation can cause the top link's thread elements to come loose. Undesired effects or malfunctions of the accessory equipment can arise from an unsuitable length in the top link.

- Tighten the adjuster spindle's lock nuts securely on the top link after every adjustment.



- Connect the drawbar of the accessory equipment to the lower arm unit (3) of the hydraulic three-point linkage (1).
- Secure the drawbar in place with the safety latch (2).
- Secure the safety latch (2) with its linch pin.
- Connect and secure the top link (5) with the connecting post of the accessory equipment.
- Connect hydraulic hoses and electric cables for the operation of the accessory equipment to the machine's console (6).

Further information can be found in the operating manual for the accessory equipment.

13.4 Operating accessory equipment

The controller for the hydraulic three-point linkage must, during operation, be switched to position control or floating position in accordance with the operating manual for the accessory equipment.

Raising the accessory equipment is done using the respective controller for the hydraulic three-point linkage. The device or machine is raised by retracting the hydraulic cylinder (4). The device or machine is lowered by extending the hydraulic cylinder (4).

Before transport, the accessory equipment must be fully raised and the shut-off valve (7) for the hydraulic cylinder (4) closed.

The accessory equipment must be equipped with an approved lighting system if public roads are used for transport.

Also see the operating manual for the accessory equipment.

13.5 Removing accessory equipment

WARNING

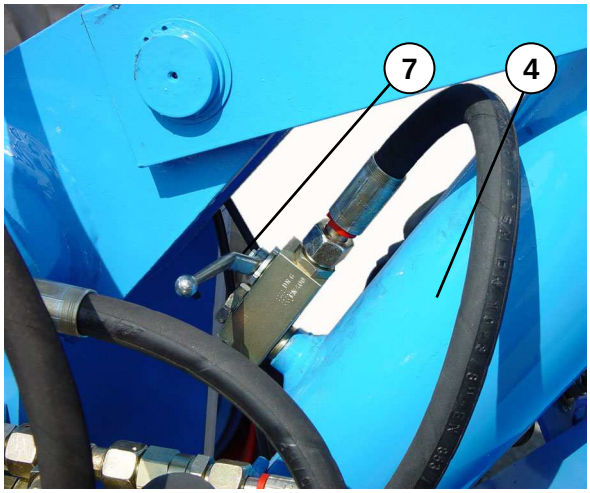
Dangers from attached devices or machines

Specific dangers must be taken into account when accessory equipment is removed.

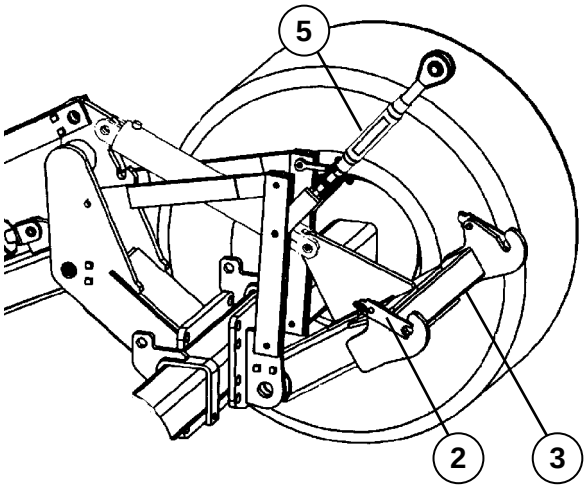
- Refer to the operating manuals for the accessory equipment with regard to possible hazards.

Also see the operating manual for the accessory equipment.

To remove the accessory equipment, it must be fully raised in the rear, and the shut-off valve (7) for the hydraulic cylinder (4) closed.



– Close the shut-off valve (7) for the hydraulic cylinder (4).



– Position the accessory equipment so that it can be parked securely.
– Lower the accessory equipment.
– Uncouple all of the supply lines.
– Uncouple the top link (5) from the accessory equipment and put it in its holder.
– Unlock the safety latch (2) and remove it.

– Lower the the lower arm unit (3) and slowly drive the machine away from the accessory equipment.

14 DECOMMISSIONING THE MACHINE

14.1 Stopping the machine in an emergency

– In an emergency, use the tractor to stop the machine.
– Turn the tractor's motor off.
– Remove the ignition key.

CAUTION

Damage caused by improper storage of the machine

Moisture or contamination resulting from improper storage of the machine can result in damage to the machine.

- The machine should only be parked on level and sufficiently stable surfaces.
- Always clean the machine before parking it.
- Lubricate the machine in accordance with the "lubrication schedule".

14.2 Disposal

Make sure to dispose of the machine, the components as well as the auxiliary materials and operating materials in an environmentally responsible way.

Metal and plastic components must be recycled.

15 MAINTENANCE AND REPAIR

15.1 Special safety instructions

15.1.1 General information

WARNING

Risk of injury when performing maintenance and repair work

There is always the risk of injury when performing maintenance and repair work.

- Only use suitable tools, climbing aids, platforms and supports.
- Always wear protective clothing.
- Only perform maintenance and repair work on folded-out and lowered machines or if the machine is secured against folding out or lowering through the use of suitable support elements.

15.1.2 Qualification of personnel

CAUTION

Risk of accident resulting from inadequate qualification of maintenance and repair personnel

Maintenance and repair work require appropriate training.

- All maintenance and repair work described in the section "MAINTENANCE/REPAIR" may only be performed by qualified and trained personnel.
- Adjusting and repair work on brake systems, in particular, may only be performed by specialty workshops or recognized brake services.
- Any maintenance and repair work not described in the section "MAINTENANCE AND REPAIR" may only be performed by specialty workshops.

15.1.3 Protective clothing

CAUTION

Risk of accident when working without protective clothing

There is always the risk of injury when performing maintenance and repair work.

- Always wear appropriate protective clothing.

15.1.4 Shut down equipment for maintenance and repair

WARNING

Risk of accident when starting the tractor

Injuries can occur when the tractor sets itself in motion during maintenance and repair work.

- Always turn the tractor motor off when working on the machine. Secure the tractor against unintentional starting. Remove the ignition key.
- Place warning signs in front of the machine and in front of the tractor, which informs others that maintenance work is being performed.
- Place wheel chocks under the wheels of the tractor and the machine to keep them from rolling.

15.1.5 Working on the hydraulic system

WARNING

Risk of accident from spraying hydraulic fluid

Hydraulic fluid escaping under high pressure can penetrate the skin and cause serious injuries. Seek medical attention immediately in the event of injuries.

- All pressure must be released from the hydraulic system before work can be performed on it.
- Protective clothing must always be worn when work is being performed on the hydraulic system.

15.1.6 Working on the electrical system

CAUTION

Damage to the machine during live working

Damage will result if the machine's electrical system is worked on and the machine is still connected to the tractor's power supply.

- Before working on the machine's electrical system, always disconnect it from the tractor's power supply.

15.1.7 Working under an elevated machine

WARNING

Risk of accident from lowering and folding out of components and machines

Working under an elevated machine or next to folded-in components and machines is hazardous to life and limb.

- Always secure the machine against rolling. Remove the ignition key and secure the tractor against unauthorized operation.

- Support and secure the elevated or folded-in components and machines with suitable support elements.

15.1.8 Tools to be used

WARNING

Risk of accident from the use of unsuitable tools

Working with unsuitable or defective tools causes accidents and injuries.

- Always use suitable tools in good working order when working on the machine. This applies especially for the use of lifting devices.

WARNING

Risk of back injuries

Incorrect posture when performing assembly work and when mounting heavy or bulky components can cause back injuries with long convalescence periods.

- Assembly and maintenance work may only be performed by qualified and trained personnel.
- Always use suitable tools in good working order when working on the machine. This applies especially for the use of lifting devices.

WARNING

Risk of accident caused by tools slipping away

When applying a lot of force, for example when loosening bolts, tools can slip. The result can be hand injuries from sharp edged objects.

- Use suitable works aids to avoid having to apply a lot of force (for example extensions).
- Check nuts and bolt heads, etc. for wear and tear and if necessary seek advice from a specialist.

15.2 Environmental protection

Make sure to dispose of the machine, the components as well as the auxiliary materials and operating materials in an environmentally responsible way.
Recycle all recyclable components. Observe applicable regulations.

15.3 Lubrication

WARNING

Eye injuries from grease

When lubricating the lubrication points, grease under high pressure can escape from between components and cause eye injuries. Seek medical attention immediately in the event of injuries.

- Wear protective clothing, especially eye protection, when lubricating.

– Lubricate all lubrication points in accordance with the lubrication schedule, see section "lubrication schedule".

In addition, before winter breaks and when not in operation for longer periods, always

– Grease all pins.
– Grease all piston rods of hydraulic cylinders with an acid free grease.
– Grease all surfaces subject to rusting such as shares, discs, guide plates, etc.
– Slide the protective covers onto the connection couplings for the hydraulic lines.

15.4 Maintenance intervals

15.4.1 After the initial commissioning (after no more than 2 hours)

Inspection	What should be done?
Wheel nuts	– Tighten all wheel nuts using the appropriate tightening torque. See section "Tightening torques".
Screw connections	– Tighten all remaining bolts and nuts on the machine using the appropriate tightening torque. See section "Tightening torques".

15.4.2 Daily inspection

Inspection	What should be done?
Tires	– Check tires for damage and wear. – Check air pressure and correct if necessary. See section "Tires and air pressure".
Hydraulic hoses	– Check hydraulic hoses for damage and leaks. Replace damaged or defective hydraulic hoses immediately. Hydraulic hoses are to be replaced at least once every 6 years according to the manufacturing date. Use only hydraulic hoses approved by Lemken.
Safety equipment	– Check that safety equipment is in good working order. See section "Safety equipment".
Tillers	– Check all tillers for damage and wear. Replace damaged or worn components.

15.4.3 Weekly inspection

Inspection	What should be done?
Wheel nuts	– Check to make sure that all wheel nuts sit tightly and, if necessary, re-tighten them using the correct tightening torque.
Screw connections	– Tighten all bolts and nuts on the machine using the appropriate tightening torque. – Secure screw connections as necessary with a bolt threadlocker. See section "Tightening torques".
Compressed air tank	– Drain the compressed air tank using the bleed val-

	ve. See section "Drain compressed air tank".
Compressed air filter	– Clean the filter for the brake system. See section "Clean filter".

15.4.4 Lubrication schedule

Only use the high-quality grease Olistamoly 2 or a comparable high quality grease for all lubrication work.

Item No.	Designation	Quantity
877 1620	Grease cartridge Olistamoly 2	400 g
877 1581	Grease Olistamoly 2	18 kg

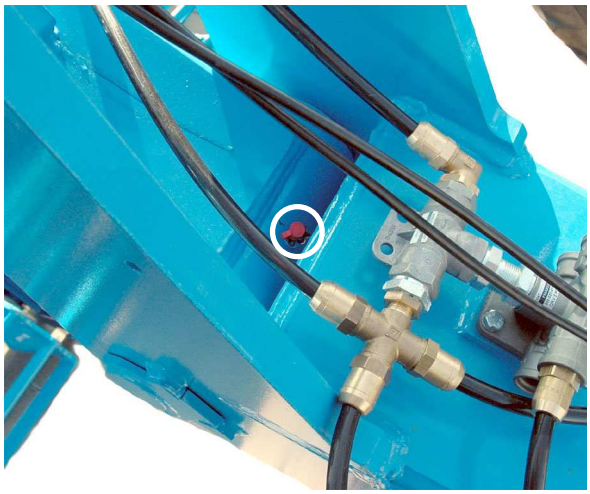
Position (see fig. XX)	Number of lubrication points	Every 50 hours of operation	Every 100 hours of operation	Before the winter break	After the winter break
Combination semi-mounted installation joints	5	X		X	X
Hydraulic cylinder bolts	6	X		X	X
Transport semi-mounted installation joints	3	X		X	X
Lane scriber joints/bearings	4	X		X	X
Lane scriber joints	2	X		X	X
Edging disc joints	1*		X	X	X
Universal joint	3	X			
Pivot joints	4	X			
Transport semi-mounted installation brake axle	2		X	X	X
Combination semi-mounted installation brake axle	6		X	X	X
Lower arm joints	1	X		X	X

15.4.5 Overview of the lubrication points

Combination semi-mounted installation joints.

Combination semi-mounted installation joints

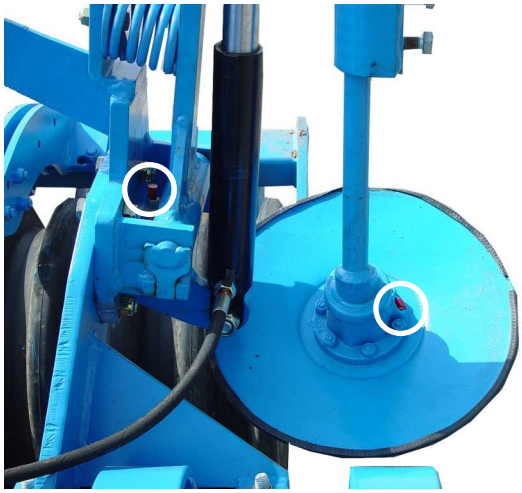
Combination semi-mounted installation joints



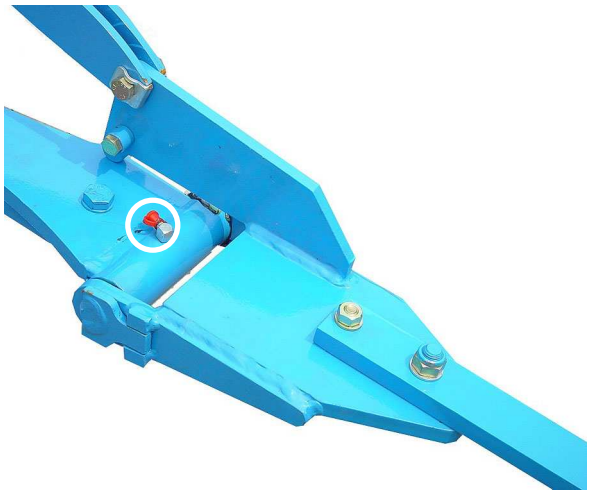
Hydraulic cylinder bolts

Hydraulic cylinder bolts

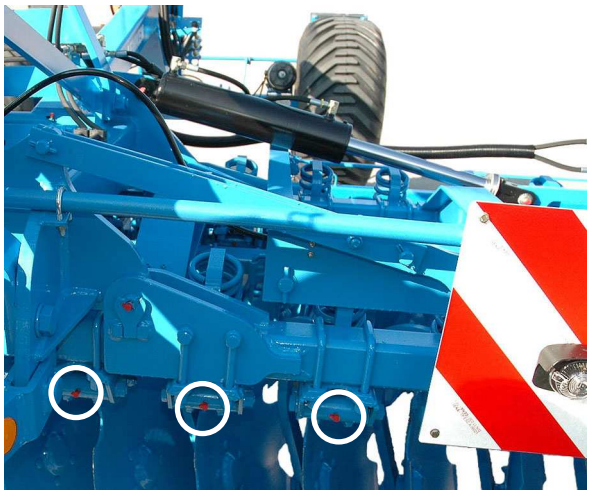
Transport semi-mounted installation joints



Lane scriber joints/bearings

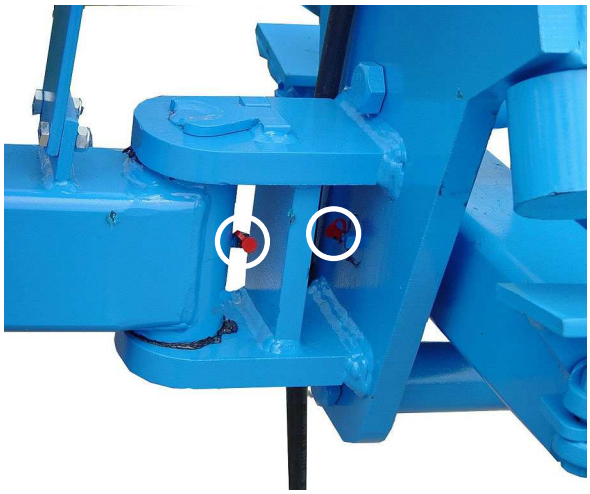


Lane scriber joints

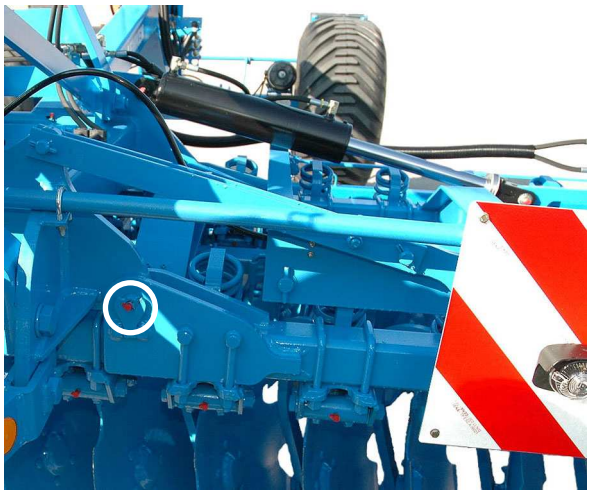


Edging disc joints

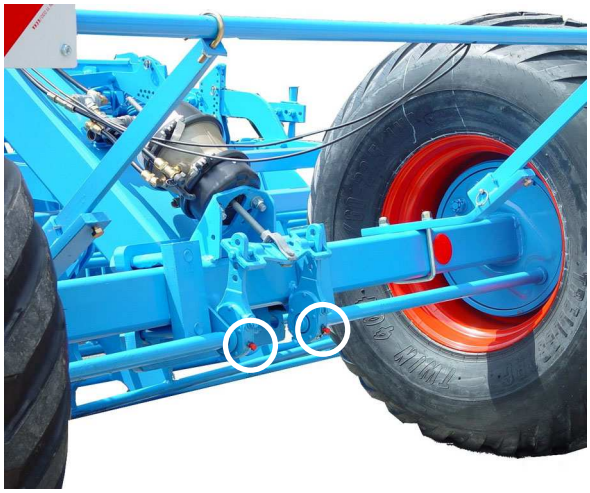
Universal joint



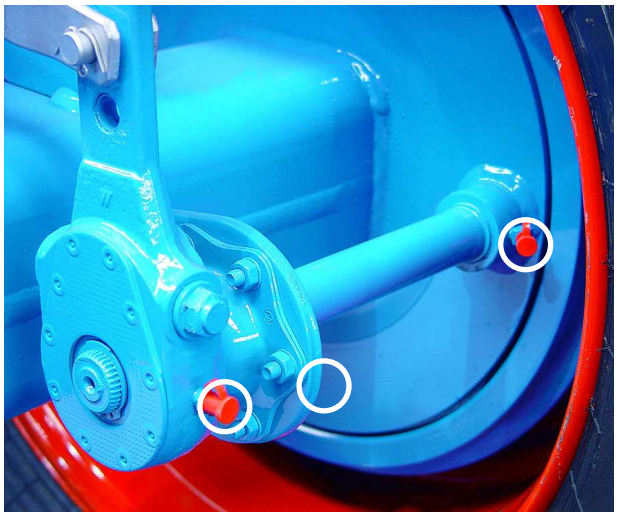
Universal joint



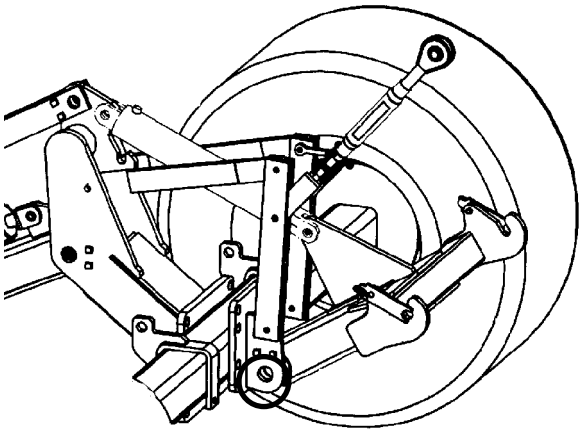
Pivot joints



Transport semi-mounted installation brake axle



Combination semi-mounted installation brake axle



Lower arm joints

15.5 Tightening torques

15.5.1 Wheel nuts

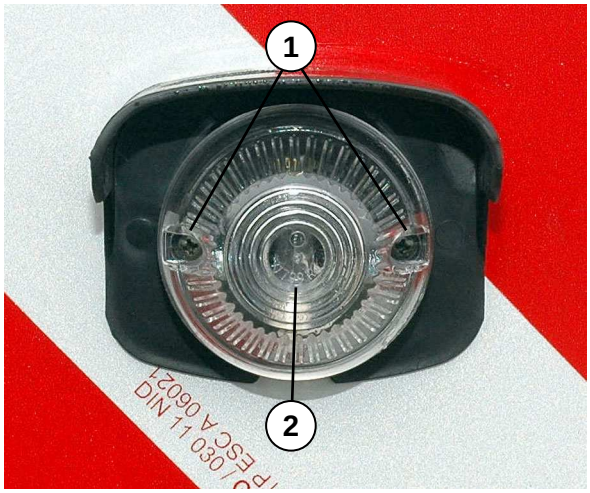
Diameter / thread	Tightening torque [Nm]
M12x1.5	80
M14x1.5	125
M18x1.5	290
M20x1.5	380
M22x1.5	510

15.5.2 Other screw connections

Diameter / thread	Strengthclass 8.8 [Nm]	Strengthclass 10.9 [Nm]	Strengthclass 12.9 [Nm]
M6	9,7	13,6	16,3
M8 / M8x1	23,4	32,9	39,6
M10 / M10x1.25	46,2	64,8	77,8
M12 / M12x1.25	80,0	113	135
M14	127	178	213
M16 / M16x1.5	197	276	333
M20	382	538	648
M24 / M24x2	659	926	1112
M30 / M30x2	1314	1850	2217

15.6 Lighting equipment

15.6.1 Replace light bulbs in the front position lamps

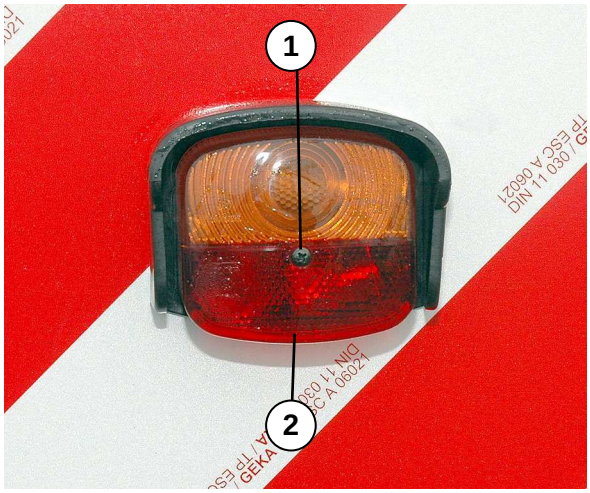


– Loosen the fastening screws (1) and remove the diffusing plate (2).

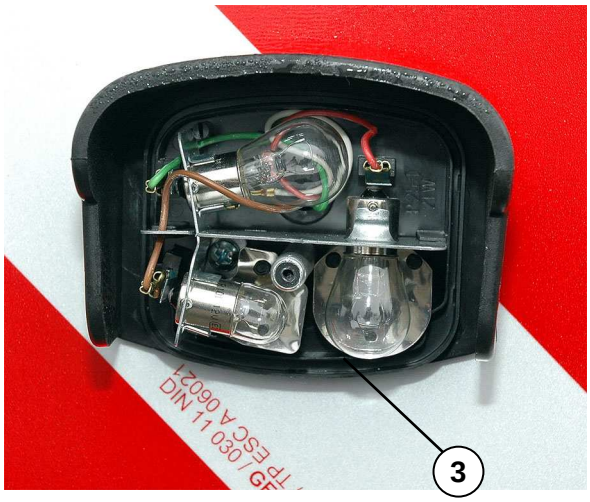
– Remove the light bulb (3) from the socket and replace it with a new light bulb of equal strength.
– Replace the diffusing plate and tighten the fastening screws.

15.6.2 Replace light bulbs in the front combination signal lamp

Replacing all of the light bulbs in the combination signal lamp is performed analogously to the following description.



– Loosen the fastening screws (1) and remove the diffusing plate (2).



– Press the light bulb (3) against the spring and at the same time turn it counter-clockwise to remove it from the socket.
– Place a new light bulb of equal strength in the socket and push it against the spring. Turn the light bulb clockwise at the same time.

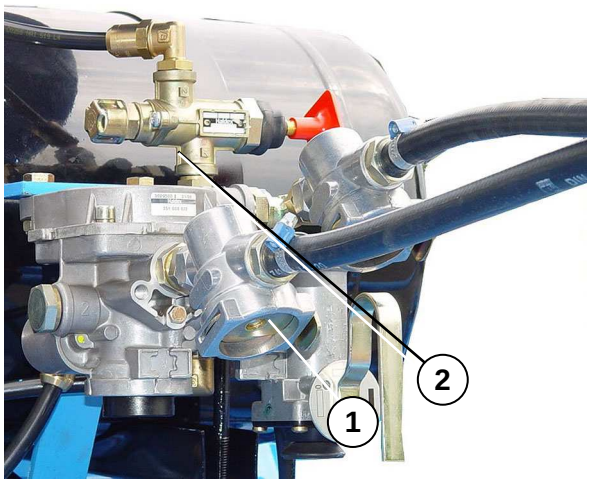
15.7 Drain compressed air tank

Drain condensate from the compressed air tank (2) on a regular basis.

– Pull or push the pin (1) on the bleed valve to the side.

The compressed air presses the condensate out of the compressed air tank.

15.8 Cleaning the filter



– Lower the machine and uncouple the brake lines.

– Remove the locking plate (1) and remove the filter insert from the filter housing (2). (The filter insert is held in place with a spring.)

– Blow compressed air through the filter insert.

– Replace the filter insert if necessary, depending how dirty it is.

– Replace the filter insert.

– Replace the locking plate.

15.9 Inspect connections to the tractor

Perform a visual inspection of the compressed air and hydraulic couplings.
Pay special attention to the sealing surfaces in the compressed air couplings and to escaping hydraulic fluid in the hydraulic couplings.
Connect the brake and hydraulic lines to the tractor and check their leak-tightness under pressure.
Defective or leaky couplings must be repaired or replaced immediately by a specialty workshop.
Perform a visual inspection of the coupler connector plug and cable. Pay special attention to bent or broken contact pins in the connectors and bare areas on the cable.
Defective plugs or cable must be repaired or replaced immediately by a specialty workshop.

WARNING

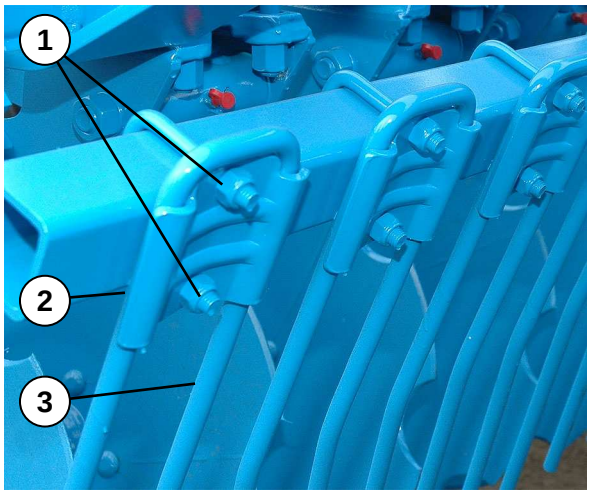
Risk of accident from spraying hydraulic fluid

Hydraulic fluid escaping under high pressure can penetrate the skin and cause serious injuries. Seek medical attention immediately in the event of injuries.

- Because of the risk of injury, use suitable aids when looking for leaks.
- Always wear appropriate protective clothing.

15.10 Replacing the comb's following tines

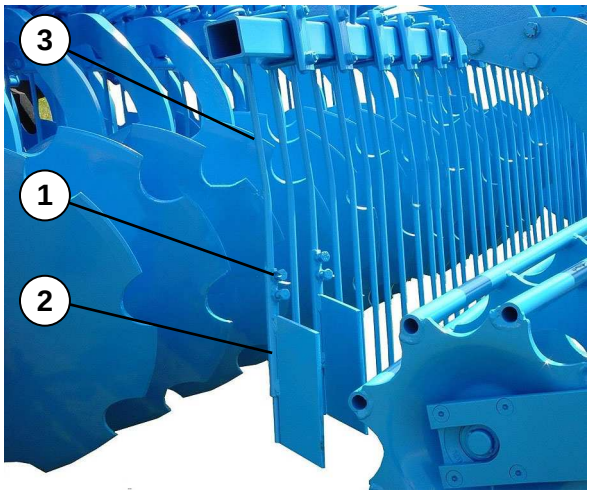
The replacement of following tines is performed with an elevated machine.



– Fold both side elements completely out.
– First remove the guide plate from the following tines as necessary (3). See section "Replacing guide plates".
– Loosen the clamping plates (2) by loosing the hexagon nuts (1).
– Pull the following tines (3) upward out of the clamping plates.
– Push the new following tines (3) from above into the tracks of the clamping plates (2) and tighten the hexagon nuts (1) securely.
– Replace the guide plate on the following tines as necessary.

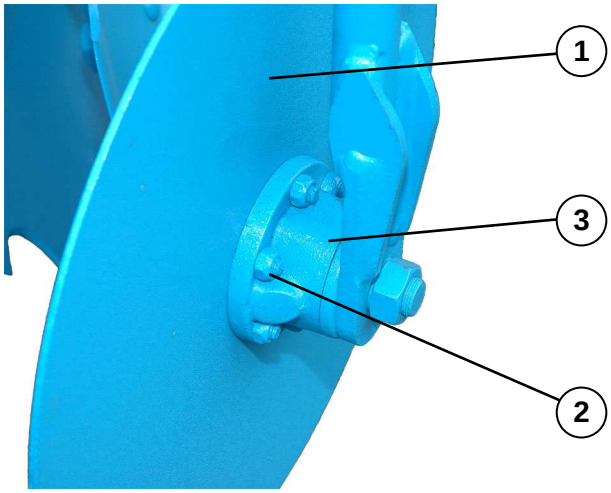
15.11 Replace guide plates

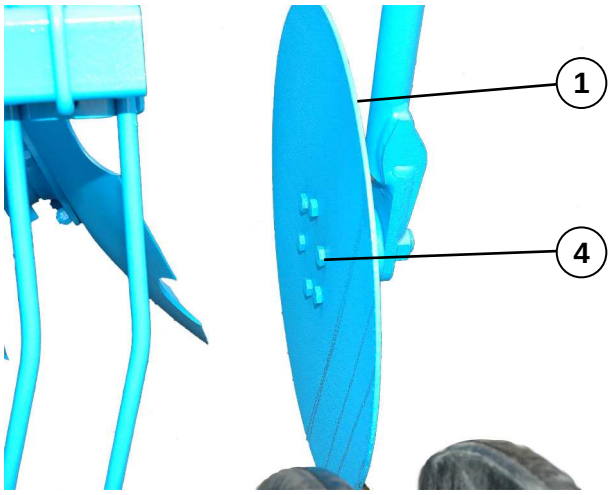
Replacement of the guide plates is performed with an elevated machine.



– Fold both side elements completely out.
– Make a note of the height and angle settings for the respective guide plates.
– Loosen the clamping screws (1) and pull the guide plates (2) away from the following tines (3).
– Push the new guide plate onto the following tines from below.
– Set the height and angle settings for the guide plates in accordance with the previously removed guide plates.
– Tighten the clamping screws (1) securely.

15.12 Replace edge limiters





– Fold both side elements completely out.
– Remove all six self-locking nuts (2) behind the edge limiter. Hold the respective bolt heads (4) tight with a wrench.
– Remove the coulter (1) from the bearing flange (3).
– Place the new disc coulter (1) on the bearing flange (3) and set new bolts in place.
– Place the new self-locking nuts (2) on the bolts and tighten securely.

WARNING

Risk of injury from worn-out edging discs and disc coulters

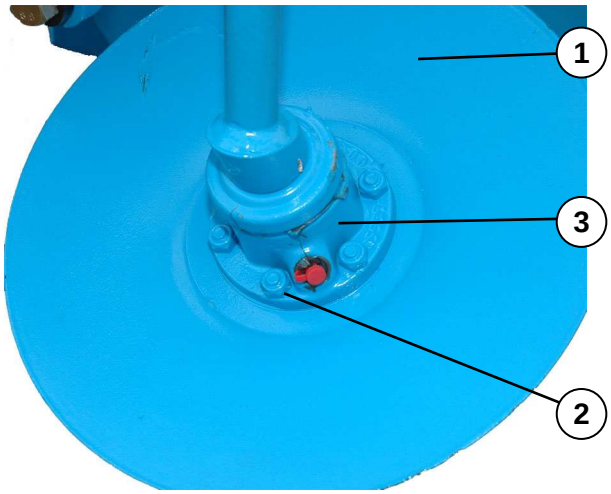
Worn edging disc and disc coulters can have sharp edges. This can result in cuts to the hands.

- Exercise caution when working with worn edging discs and disc coulters.
- Always wear suitable gloves and protective clothing.

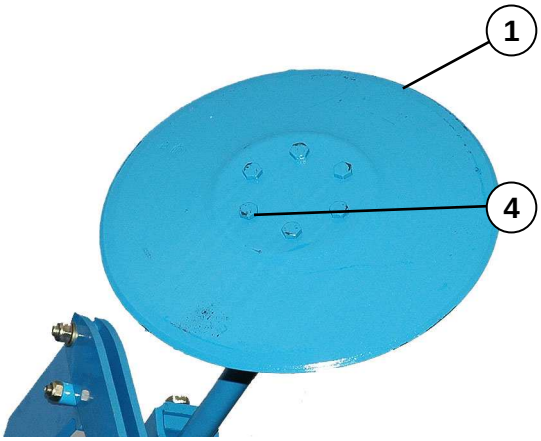
For tightening torques see section "Tightening torques".

Dispose of removed discs, bolts and nuts properly in accordance with applicable regulations.

15.13 Replace lane scriber plates



– Fold both side elements completely out.
– Fold the lane scribers out.
– Remove all six self-locking nuts (2) from the back side of the lane scriber disc. Hold the respective bolt heads (4) tight with a wrench.
– Remove the lane scriber disc (1) from the bearing flange (3).
– Place the new lane scriber disc on the bearing flange and insert new bolts.
– Place the new self-locking nuts on the bolts and tighten securely.



WARNING

Risk of injury from worn-out edging discs and disc coulters

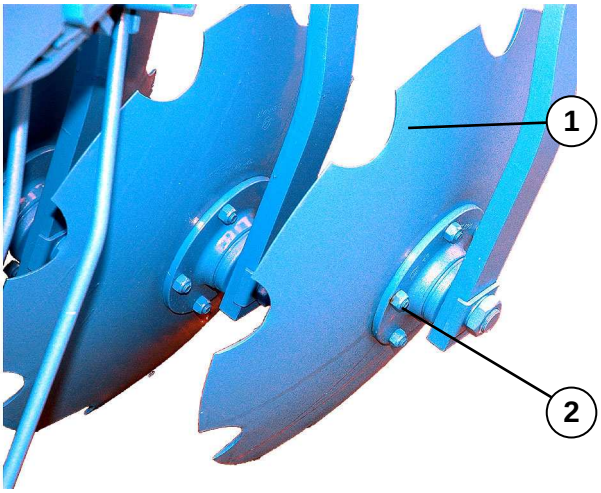
Worn edging disc and disc coulters can have sharp edges. This can result in cuts to the hands.

- Exercise caution when working with worn edging discs and disc coulters.
- Always wear suitable gloves and protective clothing.

For tightening torques see section "Tightening torques".

Dispose of removed discs, bolts and nuts properly in accordance with applicable regulations.

15.14 Replacing edging discs



– Fold both side elements completely out.
– Carefully clean the edging disc and bearing flange. (No dirt may penetrate into the area with the bearings which is exposed after removal of the edging disc.)
– Lower the machine completely, so that the edging discs can not be turned.
– Loosen the six self-locking nuts (2).
– Raise the machine slightly.
– Completely unscrew the self-locking nuts and remove the edging disc (1) from the bearing flange.
– Using a clean cloth, clean the old grease from the bearing flange as much as possible.
– Fill the bearing flange with new grease.
– Clean the flange surfaces of the bearing flange.
– Use a new flange gasket and new flat heat bolts and place the new edging disc on the bearing flange.
– Place new self-locking nuts on the flat head bolts and tighten them securely.

WARNING

Risk of injury from worn-out edging discs and disc coulters

Worn edging disc and disc coulters can have sharp edges. This can result in cuts to the hands.

- Exercise caution when working with worn edging discs and disc coulters.
- Always wear suitable gloves and protective clothing.

For tightening torques see section "Tightening torques".

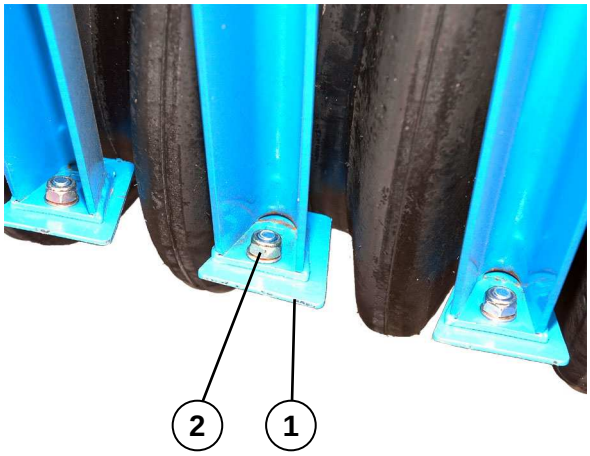
- Dispose of removed discs, bolts and nuts properly in accordance with applicable regulations.
- Dispose of the old grease and the cloth in accordance with applicable regulations.

15.15 Replacing the scraper on the rollers

Dispose of removed discs, bolts and nuts properly in accordance with applicable regulations.

15.15.1 Rubber ring roller

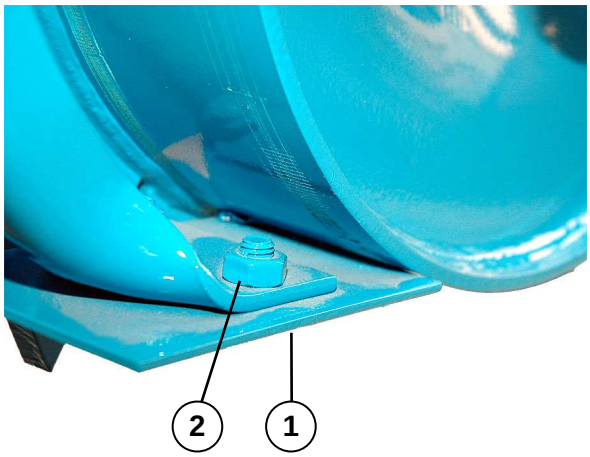
For the rubber ring roller, each scraper (1) is fastened with a bolt secured by a self-locking nut (2).



- Fold both side elements completely out.
- Remove the self-locking nut (2) from the scraper.
- Remover the scraper (1) and replace it with a new scraper.
- Replace the bolt and tighten the nut securely. Removed self-locking nuts (2) must always be replaced with new self-locking nuts.
- To adjust the distance of the scraper to the roller sleeve, see section "Adjust scraper".

15.15.2 Toothed packing roller

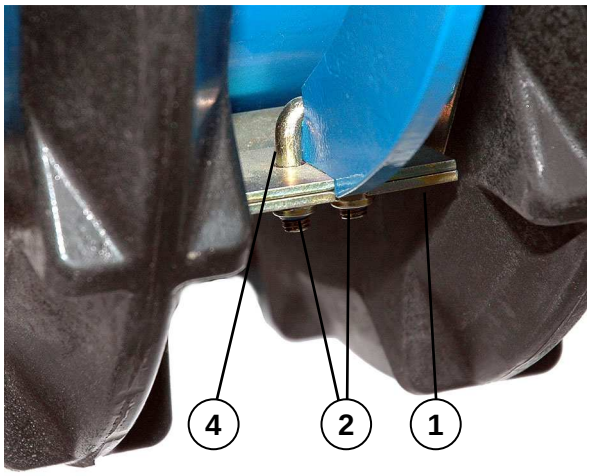
The scrapers (1) for the toothed packing roller are held by two bolts secured by hexagonal nuts (2).



- Fold both side elements completely out.
- Remove the hexagonal nuts (2) from the scraper.
- Remover the scraper (1) and replace it with a new scraper.
- Replace the bolts and tighten the hexagonal nuts (2) securely.
- To adjust the distance of the scraper to the roller sleeve, see section "Adjust scraper".

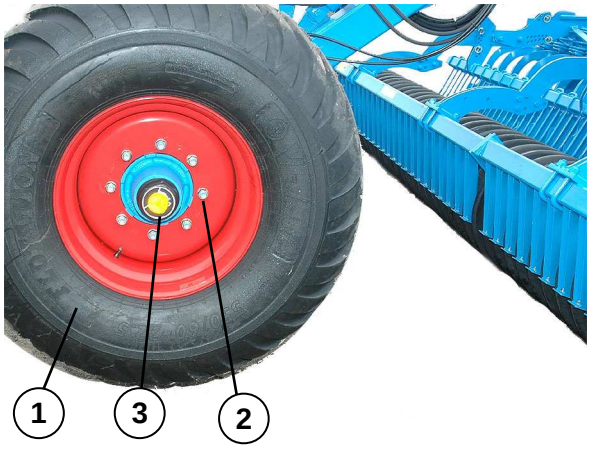
15.15.3 Trapezoidal packing roller / trapezoidal disk roller

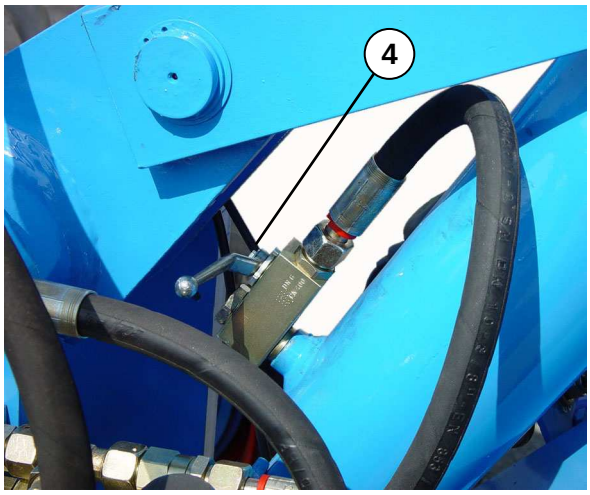
For the trapezoidal packing roller and the trapezoidal disc roller, the scrapers (1) are held by a stirrup bolt (4) with two self-locking nuts (2) .



- Fold both side elements completely out.
- Remove the self-locking nuts (2) from the scraper.
- Remover the scraper (1) and replace it with a new scraper.
- Replace the stirrup bolt (4) and tighten the nuts securely. Removed self-locking nuts (2) must always be replaced with new self-locking nuts.
- To adjust the distance of the scraper to the roller sleeve, see section "Adjust scraper".

15.16 Wheel replacement





- Loosen the wheel nuts (2) on the chassis with an elevated machine.
- Lower the machine completely and raise the chassis completely. If the machine is equipped with a combination semi-mount installation, the shut-off valve (4) must be closed after raising.
- Remove the wheel nuts and pull the wheel (1) from the threaded pins in the hub (3).
- Place the replacement wheel on the hub and replace the wheel nuts. Tighten them hand-tight.
- Raise the machine. If the machine is equipped with a combination semi-mount installation, the shut-off valve (4) must be opened again.
- Tighten all wheel nuts (2) using the appropriate tightening torque.

WARNING

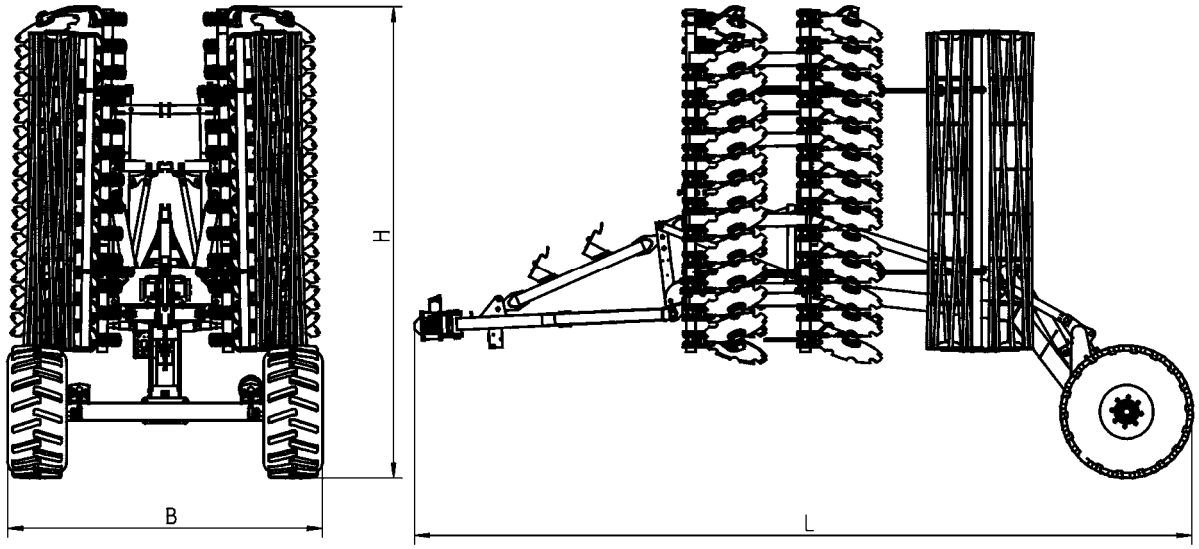
Danger from improperly fitted tires

Improperly fitted tires can burst and cause injuries arising from acoustic trauma. During road transport, control over the machine can also be lost.

- Only allow specialty workshops to mount the tires on the rims.

For the wheel nut tightening torques, see section "Tightening torques".

16 TECHNICAL DATA



Model	Weight [kg]	Length (L) [cm]	Width (W) [cm]	Height (H) [cm]
400 KUA	5320	7550* 7430**	300	290
450 KUA	5566	7550* 7430**	300	315
500 KUA	5812	7550* 7430**	300	340
600 KUA	6430	7550* 7430**	300	390

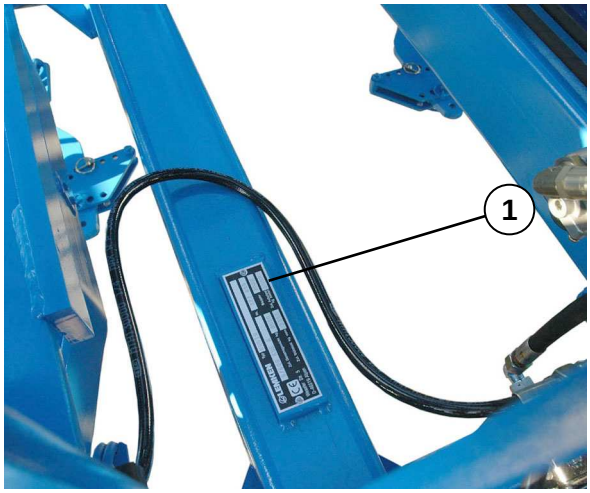
with twin roller DRR 400

*with combination semi-mounted installation

**with transport semi-mounted installation

Subject to technical modifications

17 TYPE PLATE



The type plate (1) is located on the front right of the frame.

In case of questions or for replacement part orders, always provide the information shown on the type plate.

18 NOISE, AIRBORNE SOUND

When in operation the machine's noise level is below 70 dB (A).

19 DISPOSAL

When the end of the machine's service life has been reached, it must be disposed of by a specialty company in an environmentally-friendly manner.

20 COMMENTS

We must point out that no rights can be derived from the information provided in this operating manual, especially with regard to matters of construction. In the course of time, changes occur which could not be taken into consideration at the time of printing.

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