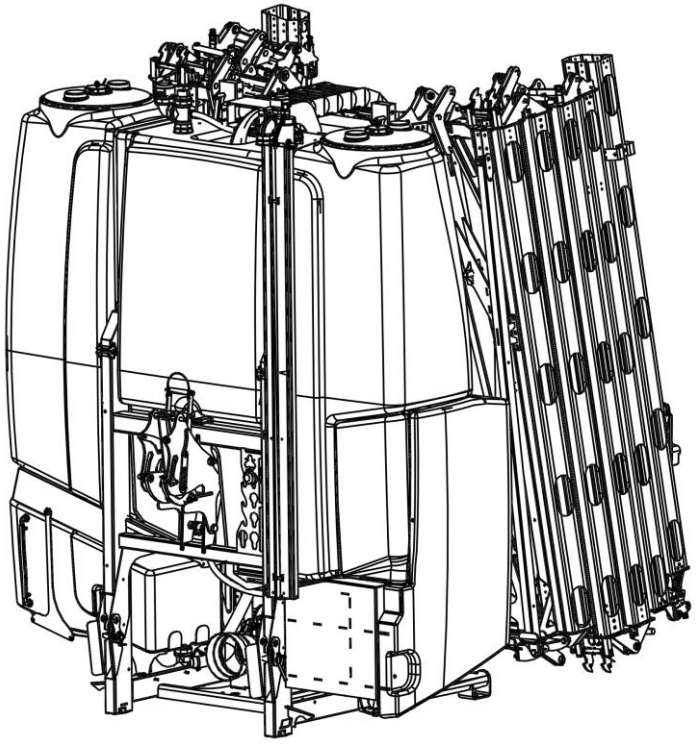
Operating Instructions

Mounted Field Sprayers

Sirius 10/12



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LEMKEN GmbH & Co. KG

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Dear customer,

Thank you for the trust you have placed in us by purchasing this device. The device can only be used to its full advantage when operated and used properly. When the device was delivered, you will already have been instructed in operation, adjustment and maintenance by your dealer. However, this brief instruction is not a substitute for thorough study of the operating instructions.

These operating instructions will help to familiarise you with the LEMKEN GmbH & Co. KG device and the options available for using it.

The operating instructions contain important information about how to operate the device safely, properly and efficiently. Following the instructions will help to prevent hazards, faults and down times and will increase reliability and service life. Read the operating instructions carefully and attentively before commissioning.

Make sure that the operating instructions are always available at the location where the device is used.

The operating instructions must be read and followed by anyone who is involved in carrying out the following work:

- Coupling and uncoupling
- Adjustments
- Operation
- Maintenance and repairs
- Troubleshooting, and
- Final shutdown and disposal.

Spare parts ordering

This device is supplied with a specification listing all assemblies that are relevant for the product. The spare parts list valid for your device includes both those assemblies relevant to you and those that are not intended for your device. Make sure that you only order spare parts that belong to the assemblies that can be found on your specification or the enclosed print out. When ordering spare parts, state the type designation and serial number of the device. This information can be found on the type plate. Enter this data in the fields below so that it is always to hand.

Type designation:	
Serial number:	

Remember that you should only use genuine LEMKEN spare parts. Reproduction parts have a negative influence on the function of the device, have a shorter service life and present risks and hazards that cannot be estimated by LEMKEN GmbH & Co. KG. They also increase the maintenance costs.

Service and spare parts

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

CONTENTS

1 GENERAL INFORMATION

1.1 Liability

The "Standard Terms and Conditions of Sales and Delivery" of LEMKEN GmbH & Co. KG, in particular Section IX, shall apply. Liability. In line with the dimensions cited in these conditions the LEMKEN GmbH & Co. KG shall not be held liable for any personal or material damage, when such damage is caused by one or more of the following reasons:

- improper use of the device, see also section entitled "Intended use",
- non-compliance with the operating instructions and the enclosed safety instructions,
- unauthorised changes to the device,
- inadequate monitoring of parts which are subject to wear,
- maintenance work that has not been conducted properly or in good time,
- the use of spare parts that are not original LEMKEN GmbH & Co. KG spare parts,
- accidents or damage through outside influences or force majeure

1.2 Guarantee

The "Standard Terms and Conditions of Sales and Delivery" of LEMKEN GmbH & Co. KG shall apply at all times.

The guarantee period shall be one year from the date of receipt of the implement. We shall rectify any implement faults in accordance with the LEMKEN guarantee guidelines.

1.3 Copyright

These operating instructions represent a document in terms of the law on unfair competition.

Copyright is retained by

LEMKEN GmbH & Co. KG

Weseler Strasse 5

D-46519 Alpen, Germany

These operating instructions are intended to be used by the user of the implement. They contain texts and drawings which must not be

- reproduced,
- divulged or
- communicated in any other way in whole or in part without the express permission of the manufacturer.

Infringements will result in a claim for damages.

1.4 Optional accessories

LEMKEN implements may be equipped with various accessories. The operating instructions below describe both series components and optional accessories.

Please note: These accessories will vary depending on the type of equipment.

1.5 Type plate

The implement carries a type plate.

The type plate can be found at front right on the implement.

The operating instructions may apply to different implement types or variants of the implement.

The operating instructions indicate information which only applies to a specific implement type or a specific variant of the implement.

The type plate will help you to identify the implement type and variant.

Layout of the type plate

Illustration: Example of a type plate

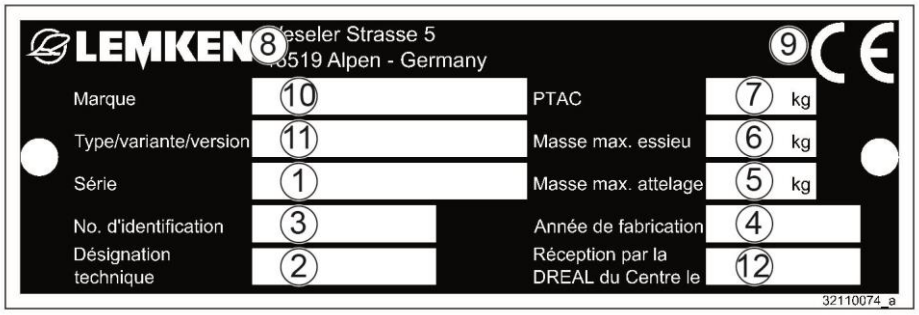


Illustration: Example of a type plate, France only

1 Series
2 Type designation
3 Serial number
4 Year of manufacture
5 Permissible drawbar load [kg]
6 Permissible axle load [kg]
7 Permissible gross weight [kg]
8 Company logo and address
9 CE marking
(only within the European Union)
10 Name of manufacturer
11 Type, variant, version
12 Type approval date

2 SYMBOLS USED IN THE OPERATING INSTRUCTIONS

2.1 Hazard classes

The following symbols are used in the Operating Instructions for particularly important information:

DANGER

Denotes an imminent hazard with high risk, which will result in death or severe physical injury, if not avoided.

WARNING

Denotes a possible hazard with medium risk, which could result in death or severe physical injury, if not avoided.

CAUTION

Denotes a low-risk hazard, which could cause light or medium physical injury or property damage, if not avoided.

2.2 Information

Denotes special user tips and other particularly useful or important information for operation and efficient utilisation.

2.3 Environmental protection

Indication of special recycling and environmental protection measures.

2.4 Indication of passages

The following symbols are used for particular passages in the operating instructions:

– Indicates work steps

- Indicates enumerations

3 SAFETY MEASURES AND PRECAUTIONS

General safety instructions for the operator are specified in the chapter entitled «Safety measures and precautions». At the start of some main chapters the safety instructions, which refer to all work to be carried out in this chapter, are listed together. Each safety-relevant work step includes other safety instructions specific to the work step.

3.1 Target group

These operating instructions are restricted exclusively to the use of the device by trained technicians and instructed persons.

3.2 Intended use

The device is manufactured in accordance with state-of-the-art standards and the recognised safety rules. However, the use of the device may result in a risk to life and limb of the user or third parties, or cause damage to the device and other material property. The device may be operated in a technically perfect condition only, in accordance with its designated use and by safety-conscious persons in compliance with the operating instructions.

Intended use also includes:

- compliance with the operating instructions and implementation of the work steps indicated in the operating instructions,
- compliance with the safety and warning signs on the device,
- observance of the power limits of the tractor and device,
- observance of all maintenance specifications and additional checks,
- the use of original spare parts,
- the use of the listed auxiliary and operating materials as well as their environmentally friendly disposal.

Safe operation is not guaranteed unless all instructions, settings and power limits applicable to the device are observed.

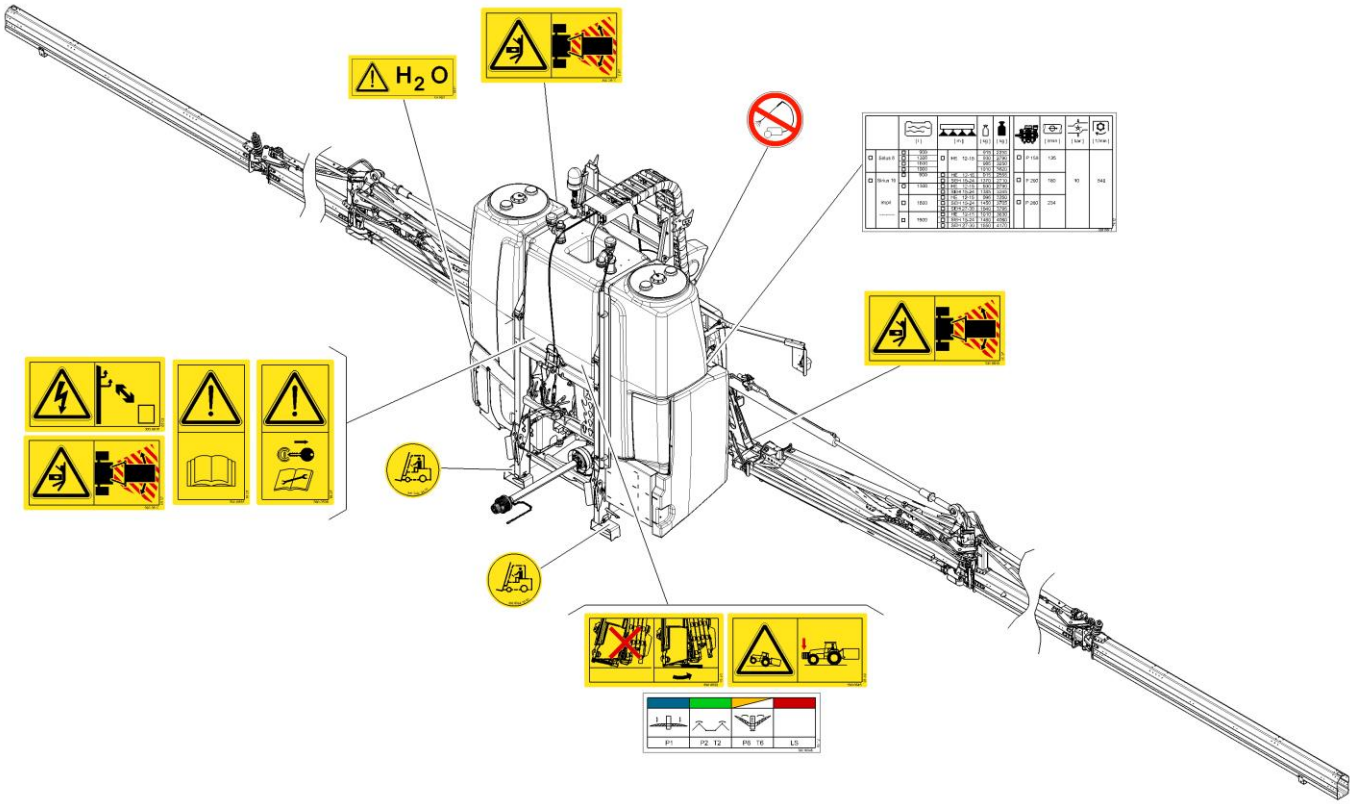
The machine is only suitable for the usual agricultural use.

3.3 Safety and warning signs

3.3.1 General information

The implement features all equipment which ensures safe operation. If hazardous areas could not be completely secured with respect to operational safety, warning signs are affixed which indicate these residual risks. Damaged, lost or illegible warning signs must be replaced immediately.

3.3.2 Position of safety and warning stickers

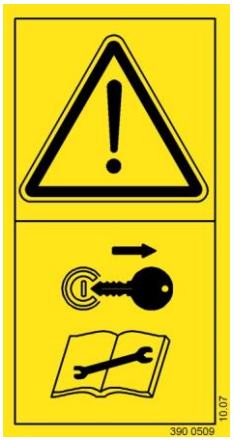


3.3.3 Meaning of warning signs

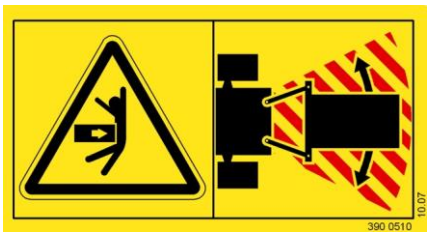
– Please familiarise yourself with the meaning of the warning signs.

The following explanations provide detailed information.

Please read and observe the operating instructions and safety instructions before starting up the implement for the first time.

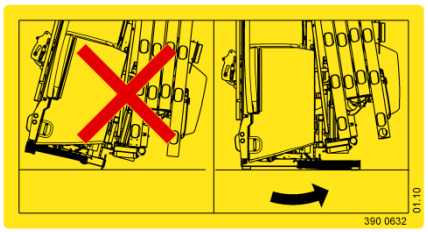


Before carrying out maintenance or repair work, switch off the engine and remove key.

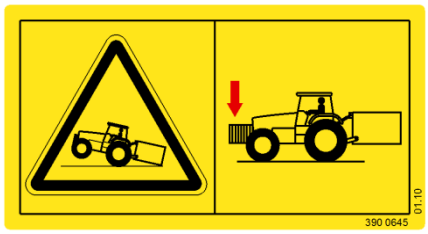


Do not remain in the operating and swivel area of the implement.

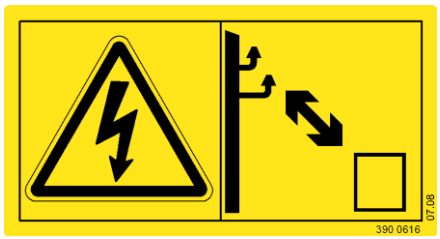
Danger of crushing.



Never park implement with parking supports retracted.



The front axle of the tractor must always be loaded with at least 20% of the tractor's curb weight.



Keep a sufficient distance away from electric high-voltage lines.

Fill with clear water only.

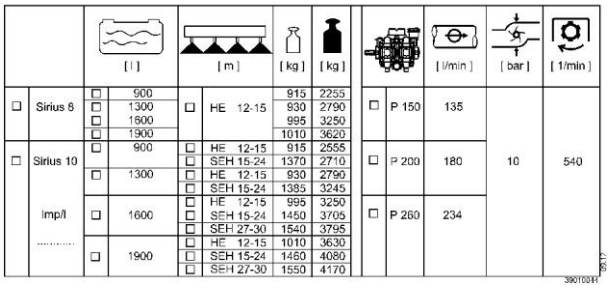
3.3.4 Meaning of other symbols.

Do not clean with high-pressure cleaner.

Load-securing points

Sling points

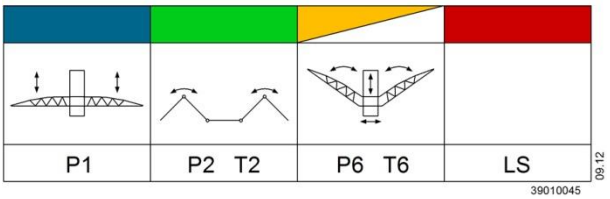
Locating points for fork-lift



The sticker contains:

- the data for testing the implement
- the maximum empty and full weights of the implement

Test certificate



Overview of connections for hydraulic hoses

3.4 Special safety instructions

Risk of injury due to non-observance of the currently valid occupational safety guidelines

WARNING

If the currently valid occupational safety guidelines are bypassed or safety equipment is rendered unusable when handling the device, there is a risk of injury.

- The operator must personally monitor all work on and with the device.
- The operator instructs his personnel in occupational safety according to the currently valid occupational safety guidelines.

Risk of injury in hazard zone

WARNING

While working with the machine, there is a risk of injury to the face and body through moving implement parts.

- During work there must be nobody directly in front of, behind or next to the implement.
- During work nobody must accompany the implement.

Risk of injury when freeing casualties

When rescuing people trapped or injured by the implement, there is a risk of additional serious injury to the casualty if the hydraulic connections were not connected according to their colour coding as described in the section entitled “Required hydraulic equipment”. As a result, functions may run in the opposite direction or may be inverted.

WARNING

– Before actuating the hydraulics, check that the hydraulic connections of the implement are connected to the tractor according to the colour coding.

- If there is no identification on the tractor and on the implement or if the connections are not connected to the tractor according to their identification, it may not be possible to free the person safely.
- If in doubt, leave casualties to be freed by specially trained rescue personnel.

3.5 Danger areas

WARNING

Moving danger areas – mechanical

The danger area of the implement moves with the implement during operation.

While the implement is being operated, persons are not permitted in front of the actual danger area because the danger area moves with the implement.

WARNING

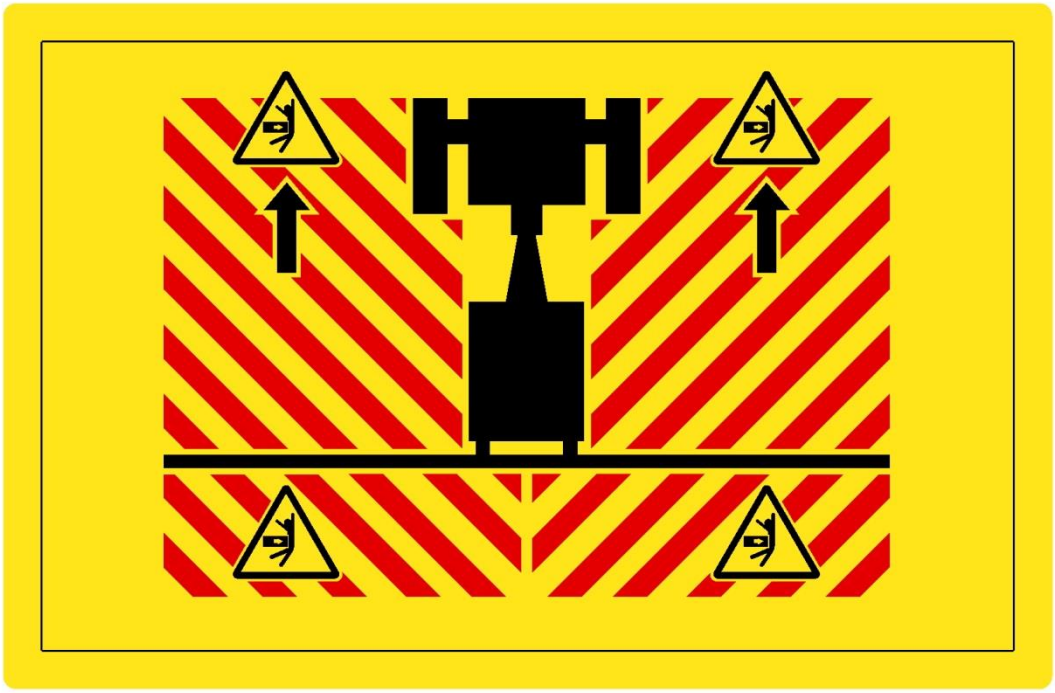
Moving danger areas – spraying liquid

There is a danger of injury to the operator and nearby persons and animals due to contact with, and/or inhaling of, spraying agents and liquid fertilisers.

In addition, there is also a danger to the environment due to incorrect handling and use of spraying agents.

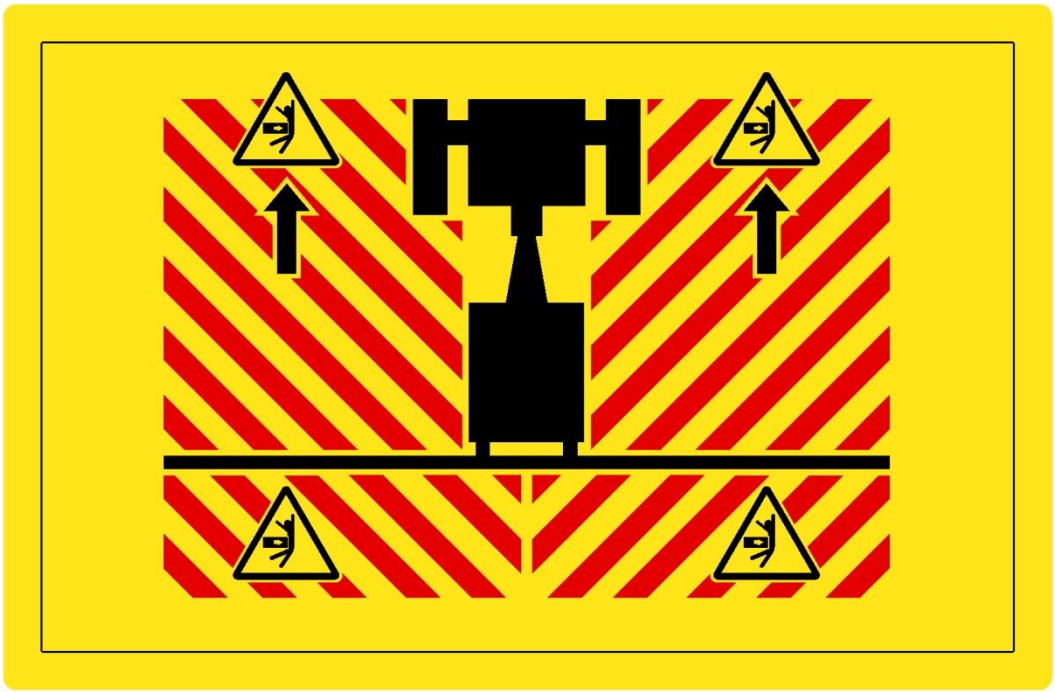
- Always take care to use and handle agricultural chemicals and liquid fertilisers in a proper manner.
- Take care that there are no persons or animals in the danger area while working.
- Be aware that there is a larger hazard area in adverse weather conditions. According to the weather conditions, sprayed liquid may evaporate and drift, causing damage persons, animals and the environment.

3.5.1 Danger areas when operating the implement



16 m – 34 m

3.5.2 Danger area when folding in and out



2 m

5 m

16 m – 34 m

WARNING

Risk of injury through contact with and inhalation of pesticide and liquid fertiliser

There is a risk of poisoning or pollution contact with or inhaling of pesticides and liquid fertiliser for anyone in the implement's danger zone as well as for the environment.

Spray agents and liquid fertiliser must always be handled properly.

3.6 Residual risks

Residual risks are particular hazards which occur when handling the device and which cannot be eliminated despite a design in accordance with safety requirements.

Residual risks are not usually obvious and may be the source of a potential injury or health hazard.

3.6.1 Hazard caused by mechanical systems

There is a risk of accidents due to crushing, cutting and striking body parts

- on abruptly moving machine parts,
- on moving machine parts caused by stored mechanical energy in elastic parts, such as springs,
- on an inadequately stable device,
- on the general shape or mounting location of components.

3.6.2 Dangers from the oil hydraulic system

There is a danger of injury, especially to the face, eyes and unprotected skin due to burns and contamination with hydraulic oil due to

- spraying out of hot or pressurised hydraulic oil from connection points or pipes which have leaks;
- bursting of pipes or components which are under pressure.

3.7 Applicable Rules and Regulations

The following section lists the specific national regulations which must be observed during operation of the implement:

- the highway code.
- the health and safety laws and regulations.
- the laws and regulations for operational safety.
- the laws and regulations for protection of the operator.
- the laws and regulations for protection of the environment.
- the laws and regulations for handling agricultural chemicals
- the laws and regulations for plant protection methods.

3.8 Operation on public highways

3.8.1 Lighting system and identification

A proper lighting system, identification and equipment must be on the device if it is to be transported on public roads. Further information can be requested from the appropriate authorities.

3.8.2 Requirements of the tractor

– Ensure that the tractor with mounted device always reaches the stipulated braking deceleration.

Observe the permitted axle loads, gross weights and transportation dimensions, see also section entitled "Axle loads"!

Observe the permitted power limit of the tractor!

WARNING

Risk of accidents due to inadequate steerability

A tractor which is too small or which has inadequate front ballast cannot be manoeuvred safely or steered with adequate tracking stability. As a result, the driver or other road users may be injured or killed.

– Only use a tractor which can be adequately ballasted and safely manoeuvred.

– Ensure that the front axle of the tractor is always loaded with at least 20% of the net weight of the tractor. See section on "Axle loads".

3.8.3 Axle loads

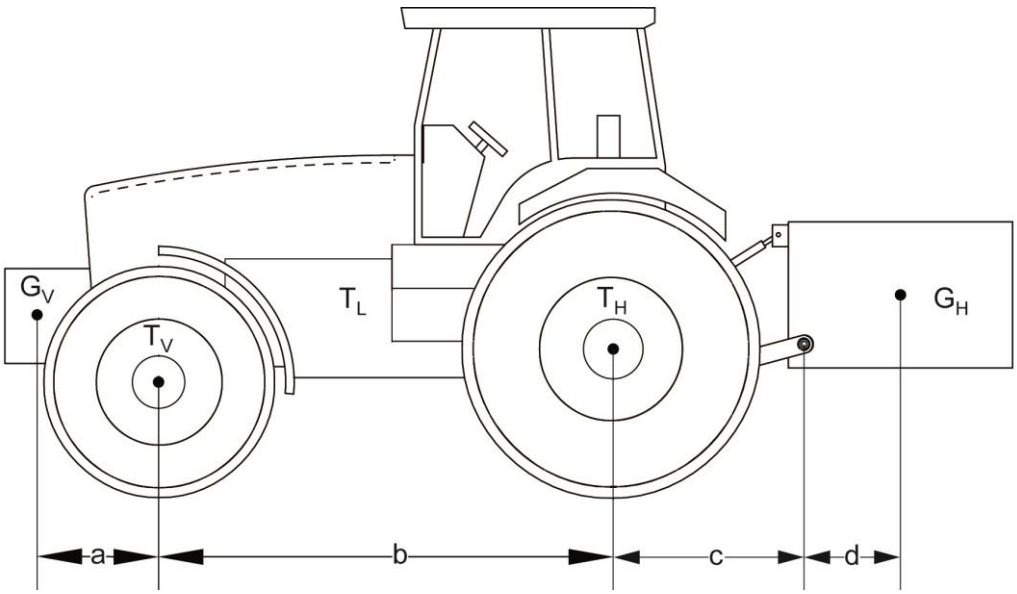
Implements mounted to the front and rear three-point linkage must not result in the following being exceeded:

- permissible gross weight of tractor,
- permissible axle loads of tractor,
- the tractor's tyre load-carrying capacities.

The tractor's front axle must always be loaded with at least 20 % of the tractor's curb weight.

The following data are required for the calculation:

- from the tractor operating instructions,
- from the implement operating instructions,
- which are to be documented through remeasuring.



Data from tractor operating instructions

– Take the following data from your tractor's operating instructions:

Abbreviation		Data
T_L	Tractor kerb weight (kg)	_____ kg
T_V	Front axle load (kg) of empty tractor	_____ kg
T_H	Rear axle load (kg) of empty tractor	_____ kg

Data from implement operating instructions

– Take the following data from these operating instructions or from the documents for the front weight or rear weight:

Abbreviation		Data
G_H	Gross weight (kg) for rear mounting implement or rear weight	_____ kg
G_V	Gross weight (kg) for front mounting implement or front weight	_____ kg
d	Distance (m) between centre of lower control link ball and centre of gravity for rear mounting implement or rear weight	_____ m

Data to be determined through remeasuring are

– Determine the following data through remeasuring:

Abbreviation		Data
a	Distance (m) between centre of gravity for front mounting implement or front weight and centre of front axle	_____ m
b	Tractor wheelbase (m)	_____ m
c	Distance (m) between centre of rear axle and centre of lower control link	_____ m

Calculation of minimum ballasting value at front $G_{V\ min}$ for rear mounting implement

$$G_{V\ min} = \frac{G_H \times (c + d) - T_V \times b + (0.2 \times T_L \times b)}{a + b}$$

– Enter the calculated minimum ballasting value, as required at the front of the tractor, into the table.

Calculation of minimum ballasting value at rear $G_{H\ min}$ for front mounting implement

$$G_{H\ min} = \frac{G_V \times a - T_H \times b + (0.45 \times T_L \times b)}{b + c + d}$$

– Enter the calculated minimum ballasting value, as required at the rear of the tractor, into the table.

Calculation of actual gross weight G_{tat}

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

– Enter the value for the calculated actual gross weight and the permissible gross weight as given in the tractor's operating instructions into the table.

Calculation of actual front axle load $T_{V\ tat}$

$$T_{V\ tat} = \frac{G_V \times (a + b) + T_V \times b - G_H \times (c + d)}{b}$$

– Enter the value for the calculated actual front axle load and the permissible front axle load as given in the tractor's operating instructions into the table.

Calculation of actual rear axle load $T_{H\ tat}$

$$T_{H\ tat} = G_{tat} - T_{V\ tat}$$

– Enter the value for the calculated actual rear axle load and the permissible rear axle load as given in the tractor's operating instructions into the table.

Tyre load-carrying capacity

– Enter double the value (for two tyres) for the permissible tyre load-carrying capacity (see, e.g. tyre manufacturer's documentation) into the table.

Table	Actual value according to calculation		Permissible value according to tractor operating instructions				Double permissible tyre load-carrying capacity [two tyres]	
Minimum ballasting, front	$G_{V\ min}$	kg	-				-	
Minimum ballasting, rear	$G_{H\ min}$	kg	-				-	
Gross weight	G_{tat}	kg	≤	T_L	kg		-	
Front axle load	$T_{V\ tat}$	kg	≤	T_V	kg	≤	kg	
Rear axle load	$T_{H\ tat}$	kg	≤	T_H	kg	≤	kg	

3.8.4 Check before departure

- Before driving with the device lifted off, lock the control lever, otherwise it may drop and the device may be unintentionally lowered.
- Check that the fold-out safety device for the side parts is locked correctly!
- Attach and check the transport equipment such as the lighting system, warning signs and protective devices!
- The actuating cables for the quick-release couplings of the tractor must hang loose and must not actuate themselves in any position!
- Before starting up and operating the device, check the immediate vicinity around the device! There must be nobody here! Ensure that visibility is adequate!
- Observe permitted axle loads, total weights and transportation dimensions!

3.8.5 Correct behaviour in road traffic

- When driving on public highways, observe the relevant statutory national regulations.
- Driving behaviour, steering and braking performance are influenced by ballast weights. Ensure that the tractor has adequate steering and braking performance.
- When driving around corners, take into account the wide radius and the inertia of the device.
- It is prohibited to transport people on the device.

3.9 Obligation of the operator

- Before switching on the device, read the operating instructions.
- Follow the safety instructions!
- Wear appropriate protective clothing when carrying out any work on the device. Protective clothing must be tight-fitting!
- Observe generally accepted and other obligatory regulations for the prevention of accidents and protection of the environment and add them to the operating instructions!

The operating instructions are an important component of the device.

- Ensure that the operating instructions are always ready available at the installation location of the device and are kept for the entire service life of the device.
- If the device is sold or the operating company changes, pass on the operating instructions with the device!
- Keep all safety instructions and danger warnings on the device in a completely legible state. The affixed safety and warning signs provide important information on safe operation. Comply with them to ensure your safety!
- Do not alter, retrofit or modify the device, potentially impairing safety, without the approval of the manufacturer. The manufacturer is not liable for any damage resulting from arbitrary modifications to the device!
- Operate the device only in compliance with all connection and default values provided by the manufacturer!
- Use original spare parts only!

3.10 Safe use of the implement

3.10.1 General

- Before starting work, familiarise yourself with all the equipment and controls and how they work.
- Do not operate the implement unless all the safety guards are in place and correctly positioned. For field work: remove safety guards that are designed for transport only.
- Always attach the implement correctly and only attach it to the equipment provided for that purpose.
- Always take great care when attaching the implement to and detaching it from the tractor.

There is a risk of injury due to crush and shear points in the area around the three-point linkage.

- Before attaching or detaching the implement to/from the three-point linkage, move the control device to the position where the implement cannot be raised or lowered accidentally.

– Do not stand between the tractor and implement when operating the external controls for the three-point linkage.

Do not stand in the danger area around the implement or climb onto the implement during operation.

There is a risk of injury in the wider operating area around the implement, e.g. from flying stones.

– Before operating the hydraulic equipment, ensure that nobody is standing in the danger area. There is a risk of crushing and shearing from power-operated components.

– Do not stand between the tractor and the implement. This is only permitted when the tractor is secured by the parking brake and wheel chocks to prevent it from rolling away.

– Always keep the implement clean to avoid the risk of fire.

– Lower the implement onto the ground before leaving the tractor.

– Switch off the engine.

– Remove the ignition key.

3.10.2 Personnel selection and qualifications

- The tractor driver must have the appropriate driving licence.
- All work on the implement must be carried out by properly trained and instructed personnel. The personnel must not be under the influence of drugs, alcohol or medication.
- All maintenance and servicing work must be carried out by trained technicians or persons who have received appropriate instruction.
- All work on electrical components must be carried out by an electrician in accordance with the electrical safety regulations.

3.11 Activate Street Mode

DANGER

The implement must only be driven on public roads when the operating terminal is switched on and Street Mode is activated.

This ensures that no safety-relevant functions can be performed while driving on public roads.

– See the separate operating instructions for the Megaspray electronic control system: Street Mode

4 EFFECTS OF CERTAIN PLANT PROTECTION PRODUCTS ON THE IMPLEMENT

Certain authorised plant protection products and product mixtures may have an adverse effect on the materials used to manufacture the sprayer. These spray products and mixtures usually contain solvents.

IMPORTANT!

If mixtures are to be prepared using spray products which are known to damage implements, we recommend that the above-mentioned materials should be tested by immersing them in the product for several hours before starting work. The implement must not be used with plant protection products or other products which have a tendency to solidify or set.

WARNING!

Before starting work, always read the instructions for use from the relevant plant protection product manufacturer and ensure that they are followed.

The following implement components may be affected: hoses, spray lines, seals, tanks, pump diaphragms and nozzle valve diaphragms.

Signs of damage include hoses becoming particularly soft and swelling of the seals or diaphragms. The affected parts must then be replaced immediately. These adverse effects can be often be avoided if the implement is flushed intensively immediately after spray application (e.g. flushing and disposal of the technical residues on the field).

5 HANDING OVER THE IMPLEMENT

– As soon as the implement is delivered, ensure that it corresponds with the order package.

– Also check the type and completeness of any supplied accessories.

When the device is handed over, your dealer will explain how it works.

– As soon as the implement is handed over, familiarise yourself with the implement and its functions.

6 STRUCTURE AND DESCRIPTION

6.1 Overview

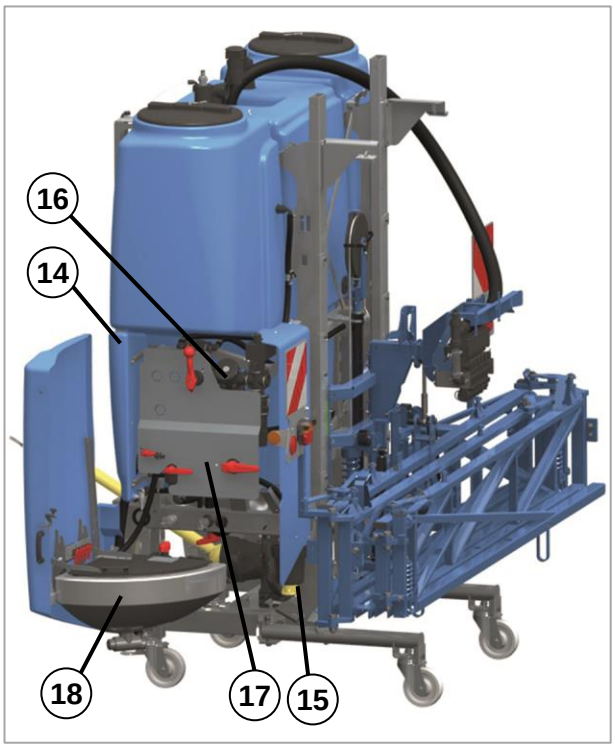
The implement is fitted with one of the following booms:

- HE (HorizontalExtended)
- SEH (SectionExtended rear-folding)
- RA (Rear Aluminium)

The structure of the implement varies depending on the installed equipment.

6.1.1 HE

1 Frame
2 Stands
3 Transport wheels or pockets (not shown)
4 Top link connection point
5 Lower link connection point
6 Main tank
7 Level indicator
8 Clean water tank
9 Storage compartment (not shown)
10 Pump (not shown)
11 PTO shaft (not shown)
12 Lights and warning board
13 Operating terminal (not shown)
14 Hand wash canister
15 Suction filter

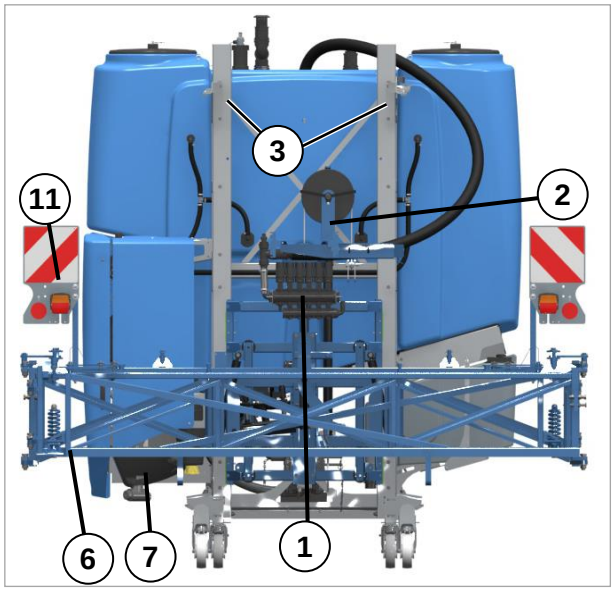


16 Pressure filter

17 Control and connection centre

18 Chemical inductor

19 Filler hose (not shown)



1 Section control unit

2 Height adjustment

3 End stops

4 Pendulum lock (not shown)

5 Slope compensation (not shown)

6 HE boom

7 Nozzle holder with nozzles

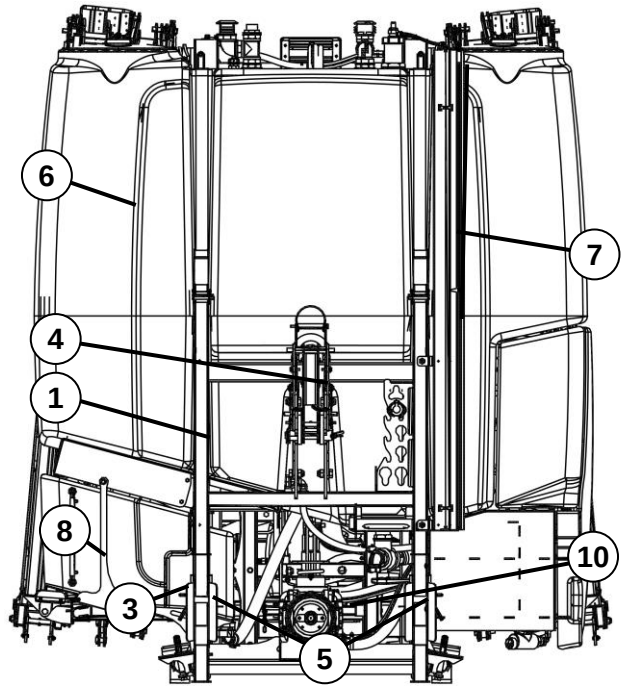
8 Boom lighting (not shown)

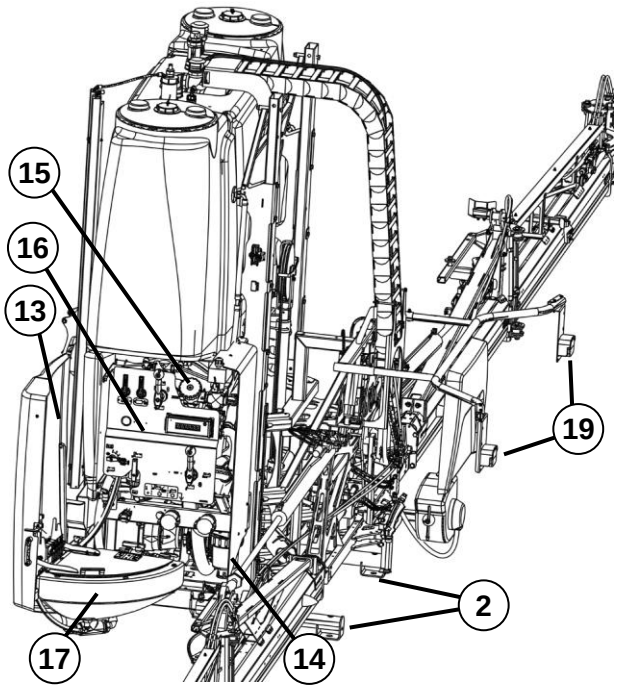
9 Flashing alarm lamp (not shown)

10 External cleaning (not shown)

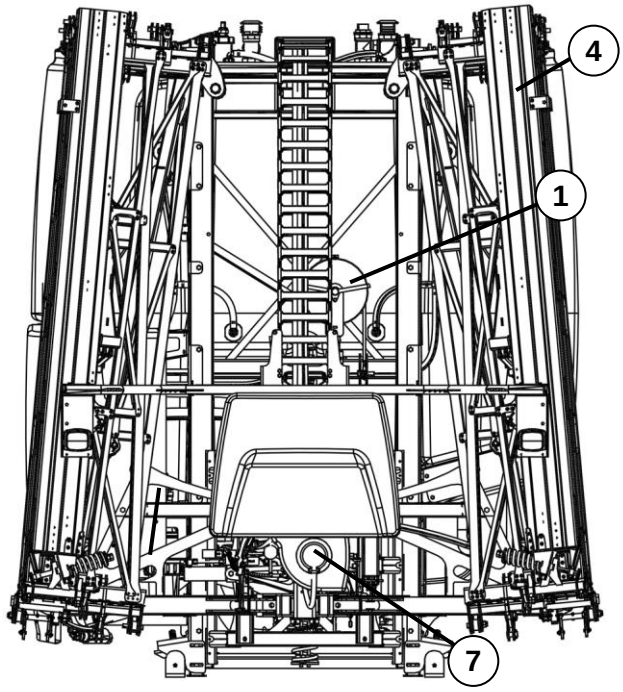
11 Lights and warning board

6.1.2 SEH/RA



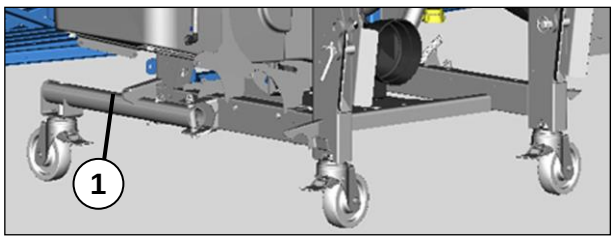


1 Frame
2 Stands
3 Transport wheels or pockets (not shown)
4 Top link connection point
5 Lower link connection point
6 Main tank
7 Level indicator
8 Clean water tank
9 Storage compartment (not shown)
10 Pump
11 PTO shaft (not shown)
12 Operating terminal (not shown)
13 Hand wash canister
14 Suction filter
15 Pressure filter
16 Control and connection centre
17 Chemical inductor
18 Filler hose (not shown)
19 Lighting



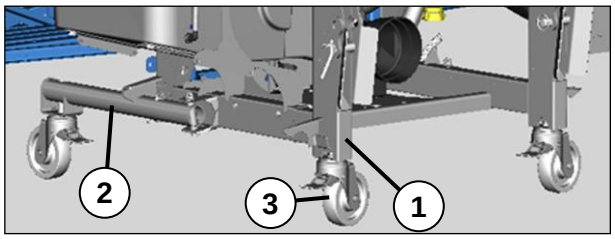
1 Height adjustment
2 Pendulum lock (not shown)
3 Slope compensation (not shown)
4 SEH boom
5 Boom lighting (not shown)
6 Flashing alarm lamp (not shown)
7 External cleaning

6.2 Stands



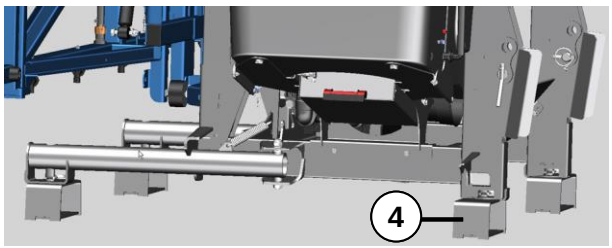
The implement has two foldable stands (1). The stands ensure stability when the implement is removed.

6.3 Transport apparatus



The following can be attached to the chassis (1) and the stand (2) of the implement to facilitate transportation of the implement:

- Transport rollers (3)

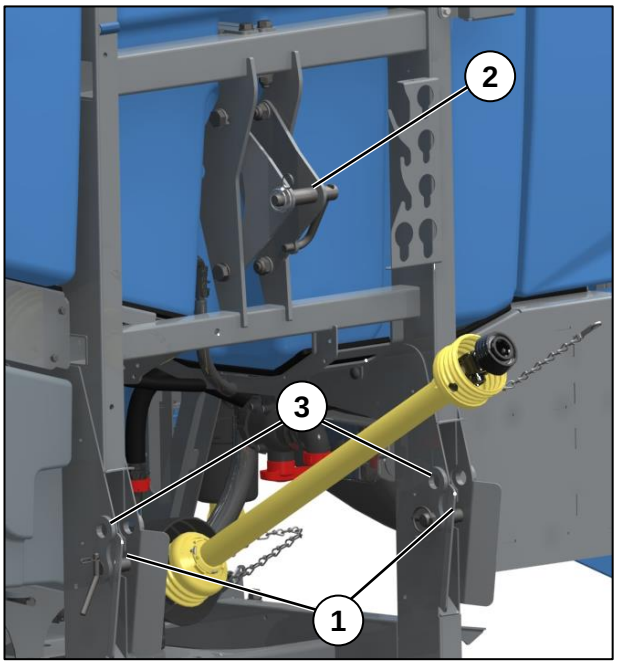


- Receptacles for forklift truck tines (4)

The front transport rollers are steerable and have a parking brake. The rear transport rollers are designed with a catch as the fixed roller.

6.4 Three-point connection

6.4.1 Headstock



The three-point connection on the headstock corresponds to the following connection points on the tractor:

- (1) Lower links: Category 2
- (2) Top link:

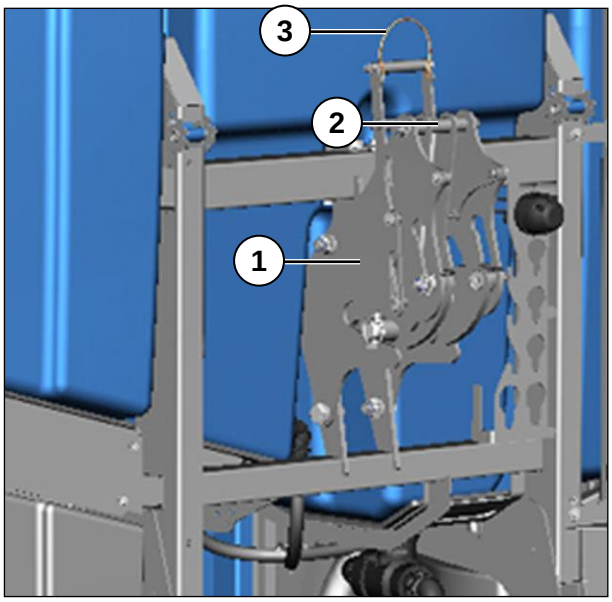
  Sirius 900 and 1300: Category 2

  Sirius 1600 and 1900: Category 3

Two coupling points are provided for the lower links to allow a good fit between the tractor and implement:

Lower link pin:	Category:
(3) Top:	2
(1) Bottom:	3 N

6.4.2 QuickConnect coupling system



In the QuickConnect coupling system (1) the coupling point for the top link (2) is pulled towards the tractor.

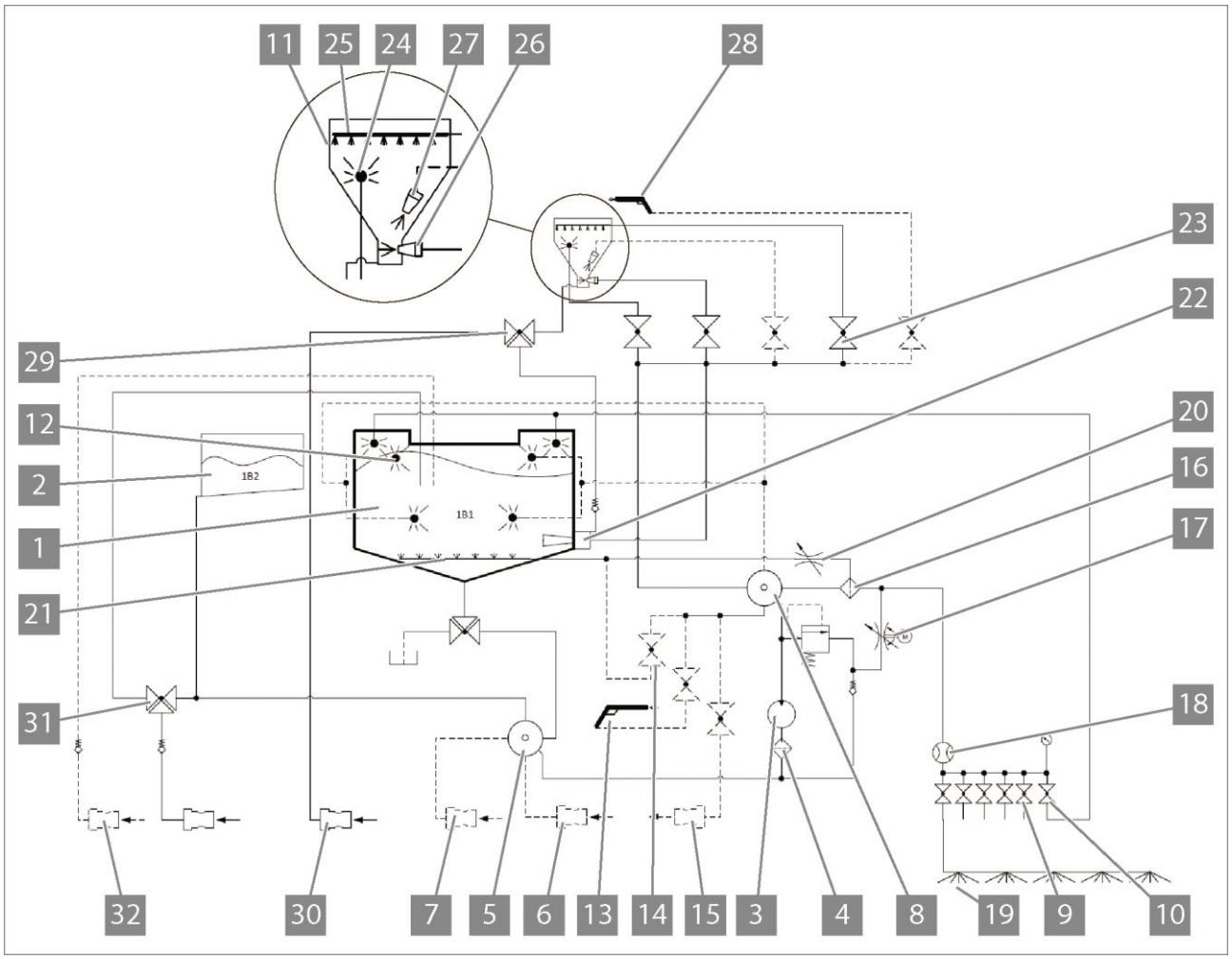
QuickConnect (1) is operated by a cable (3).

CAUTION

The correct lower link balls must be used when the tractor has category 3 attachment points.

6.5 Fluid circuit

6.5.1 Overview of the HE boom



1 Main tank
2 Clean water tank
3 Pump
4 Suction filter
5 Selector valve
- With 2 options
- With 4 options

6 Pump suction connection, left-hand side in direction of travel
7 Pump suction connection, right-hand side in direction of travel
8 Distribution valve
9 Section valve with pressure relief
10 Circulation valve
11 Induction tank
12 Internal cleaning
13 External cleaning
14 Intensive agitator
15 Recirculation
16 Pressure filter
17 Control valve
18 Flowmeter
19 Nozzles
20 Agitator control
21 Agitator
22 Injector
23 Induction control unit
24 Canister rinsing jet
25 Edge moistening
26 Proflow nozzle
27 Agitator nozzle
28 Cleaning gun
29 Suction valve
30 Suction connection, external tank
31 Filler valve
32 Filling connection, right

*) Pump suction connections (6) and (7) are not present when the selector valve with 2 options is installed.

6.5.2 Description of the HE boom

The pump (3) draws in liquid through the suction filter (4) and the selector valve (5).

The selector valve (5) gives 2 or 4 suction options.

Selector valve 2:

- Main tank (1)
- Clean water tank (2)

Selector valve 4:

- Main tank (1)
- Clean water tank (2)
- External, left (6)
- Optional: external, right (7)

The liquid is pumped to the distribution valve (9) via a pressure control valve.

The distribution valve (8) can distribute the spray liquid to:

- Spraying
- Induction (11)
- Internal cleaning (12)
- Other valves for:
  - External cleaning (13)
  - Intensive agitator (14)
  - Recirculation (16)

For spraying, the liquid is pumped from the distribution valve (8) via

- the pressure filter (16)
- the control valve (17)
- the flowmeter (18)
- and the single-nozzle valves for the sections (9)
- to the nozzles (19)

The section valves (9) close when spraying is switched off. All the fluid is then pumped into the main tank (1) through the circulation valve (10). The control valve (17) adjusts the distribution rate. When automatic control is switched on at the operating terminal, the distribution rate is controlled proportionally in relation to for-

ward speed. Manual, infinitely variable pressure adjustment is also possible. The section valves (9) have a pressure relief device which stop nozzle drip faster when the nozzles are switched off (19).

The pressure filter (16) is self-cleaning.

The agitator controller (20) is supplied with liquid via the cleaning line for the pressure filter (16). The agitator controller (20) adjusts the intensity of the agitator (21).

The intensive agitator (14) can also be activated for more intensive agitation.

For induction, the liquid is pumped

- from the distribution valve (8)
- to the injector (22)
- and the induction control unit (23) using the following valves:
    - Canister rinsing jet (24)
    - Edge moistening (25)
    - Proflow nozzle (26)
    - Agitator nozzle (27)
    - Cleaning gun (28)

The suction valve (29) provides suction from

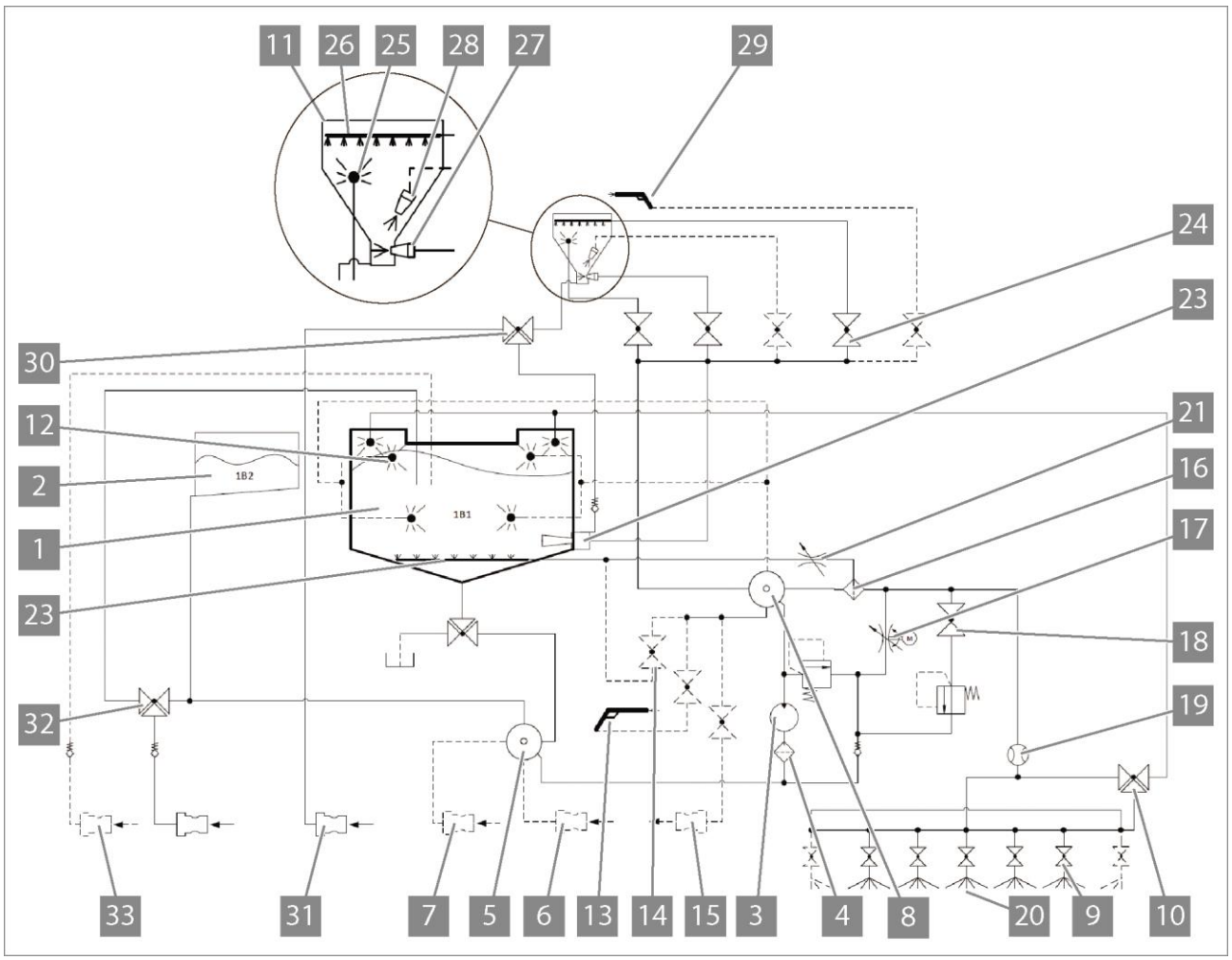
- the induction tank (11)
- external tanks (30)

The filler valve (31) can be used to fill:

- the clean water tank (2)
- the main tank (1)

The main tank can also be filled from the right-hand side via a filling connection (32).

6.5.1 Overview of the SEH/RA boom



1 Main tank

2 Clean water tank

3 Pump

4 Suction filter

5 Selector valve

- With 2 options*
- With 4 options

6 Pump suction connection, left-hand side in direction of travel

7 Pump suction connection, right-hand side in direction of travel

8 Distribution valve

9 Single-nozzle valves

Illustration: Part of a section with boundary nozzles

10 Circulation valve

11 Induction tank

12 Internal cleaning

13 External cleaning

14 Intensive agitator

15 Recirculation

16 Pressure filter

17 Pressure relief valve

18 Control valve

19 Flowmeter

20 Nozzles

21 Agitator control

22 Agitator

23 Injector

24 Induction control unit

25 Canister rinsing jet

26 Edge moistening

27 Proflow nozzle

28 Agitator nozzle

29 Cleaning gun

30 Suction valve

31 Suction connection, external tank

32 Filler valve

33 Filling connection, right

*) Pump suction connections (6) and (7) are not present when the selector valve with 2 options is used.

6.5.2 Description of the SEH/RA boom

The pump (3) draws in liquid through the suction filter (4) and the selector valve (5).

The selector valve (5) gives 2 or 4 suction options.

Selector valve 2:

- Main tank (1)
- Clean water tank (2)

Selector valve 4:

- Main tank (1)
- Clean water tank (2)
- External, left (6)
- Optional: external, right (7)

The liquid is pumped to the distribution valve (8) via a pressure control valve.

The distribution valve (8) can distribute the spray liquid to:

- Spraying
- Induction (11)
- Internal cleaning (12)
- Other valves for:
  - External cleaning (13)
  - Intensive agitator (14)
  - Recirculation (15)

For spraying, the liquid is pumped from the distribution valve (8) via

- the pressure filter (16)
- the pressure relief valve (17)
- the control valve (18)
- the flowmeter (19)
- the circulation valve (10)
- the single-nozzle valves (9)
- to the nozzles (20)

When spraying is switched off completely, all the single-nozzle valves (9) close and the circulation valve (10) opens.

When spraying is switched off completely, the pressure relief valve (17) ensures that no overpressure develops in the hoses immediately after the nozzles (20) close. The pressure relief valve (17) also ensures that the fluid in the boom is maintained at a pressure of 3 bar. This means that the required spray pressure is available immediately when spraying continues.

After spraying is switched off, the fluid flows through the circulation valve (10) to the main tank (1) instead of to the nozzles. Depending on the equipment installed, the single-nozzle valves (9) and associated nozzles (20) are grouped by section and can be switched on or off from the operating terminal. During spraying with one or several nozzles, the circulation valve (10) also directs some of the fluid to the ends of the boom.

When single nozzles are switched off, the fluid circulates in the lines from the distribution valve (8) to the main tank (1). The control valve (18) adjusts the distribution rate. When automatic control is switched on at the operating terminal, the distribution rate is controlled proportionally in relation to forward speed. Manual, infinitely variable pressure adjustment is also possible.

The pressure filter (16) is self-cleaning.

The agitator controller (21) is supplied with liquid via the cleaning line for the pressure filter (16). The agitator controller (21) adjusts the intensity of the agitator (22).

The intensive agitator (15) can also be activated for more intensive agitation.

For induction, the liquid is pumped

- from the distribution valve (8)
- to the injector (23)
- and the induction control unit (24) using the following valves:
  - Canister rinsing jet (25)
  - Edge moistening (26)
  - Proflow nozzle (27)
  - Agitator nozzle (28)
  - Cleaning gun (29)

The suction valve (30) provides suction from

- the induction tank (11)
- external tanks (31)

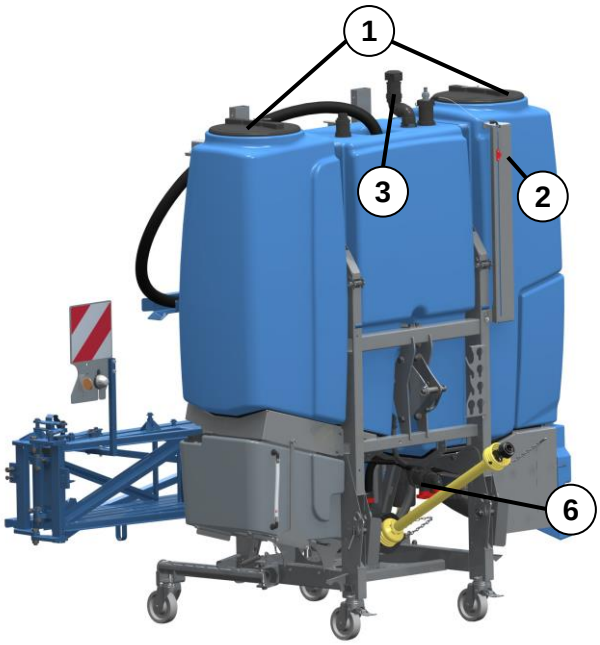
The filler valve (32) can be used to fill:

- the clean water tank (2)
- the main tank (1)

Optionally, the main tank can also be filled from the right-hand side via a filling connection (33).

6.6 Main tank

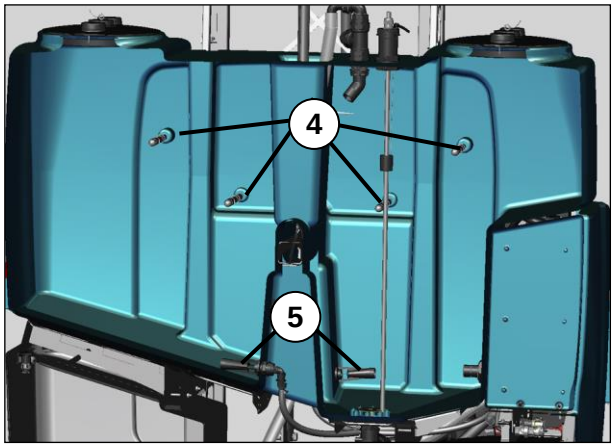
The main tank is designed to hold water, sprays and fertilisers.



The main tank is equipped with covers (1) which form a tight seal. The tank openings are intended for repair work only.

The fill level in the main tank is shown by:

- The indirect level indicator (2) or
- The TankPilot at the control and adjustment centre and on the operating terminal.



The ventilation/venting system (3) ensures that the main tank is ventilated during spraying and vented during filling.

The nozzles for internal cleaning (4) are intended for cleaning the inside of the main tank.

The main tank has a hydraulic agitator (5). Recirculation of the liquid mixes the spray in the main tank and maintains a uniform concentration.

More intensive agitation of the main tank can be achieved by using the intensive agitator nozzles.

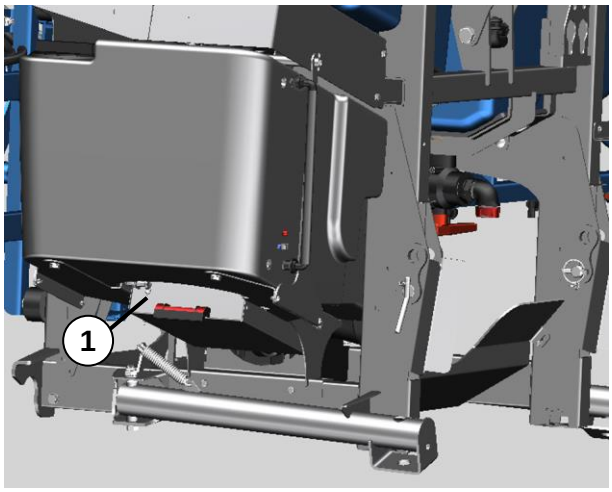
The contents of the main tank can be drained into a suitable container through the drain valve (6) or can be extracted by means of an external pump.

6.7 Fresh water tank

The fresh water tank is provided for the storage of fresh water. The fresh water can be used for:

- internal cleaning
- dilution of the technical residual quantities
- system cleaning with empty and partially filled main tank.
- cleaning of canisters
- external cleaning

6.8 Storage compartment



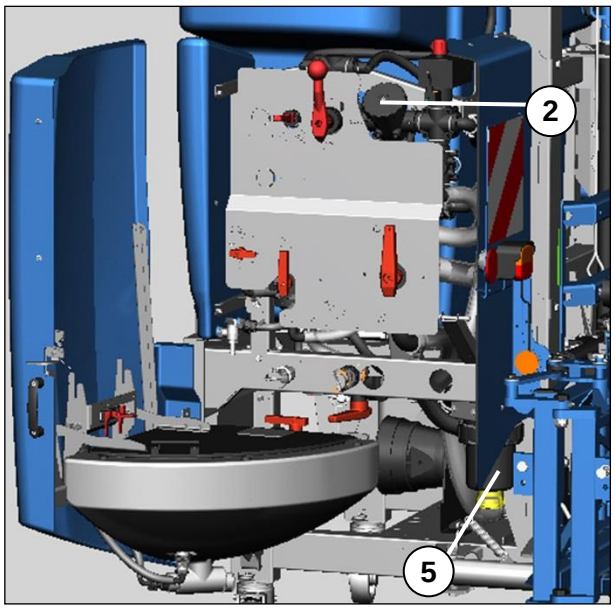
A storage compartment (1) can be located on the right-hand side of the implement.

6.9 Hand washing container

The hand washing container is provided for the storage of fresh water,

for example for washing hands.

6.10 Filter



Clean and functional filters are essential for fault-free work.

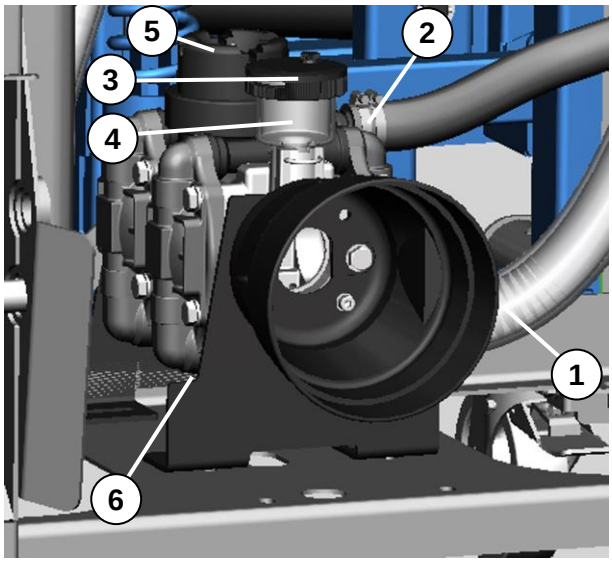
The implement is equipped with:

- a suction filter (1)
- a pressure filter (2)

The suction filter (1) filters the volume flow to the pump on the suction side.

The pressure filter (2) filters the volume flow to the nozzles on the pressure side.

6.11 Pump



The pump is intended for pumping spraying agents and liquid fertiliser.

1 Suction area

2 Pressure area

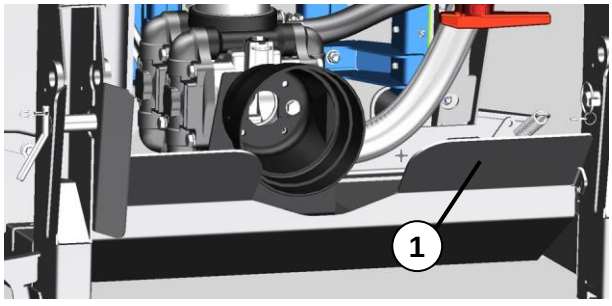
3 Oil filling opening

4 Oil level indicator

5 Pressure reservoir

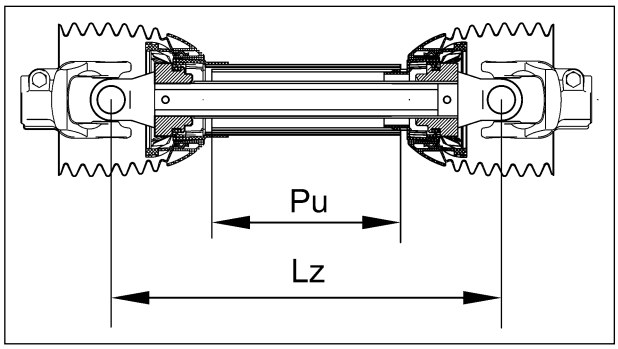
6 Drain plug (not illustrated)

6.11.1 Deflector



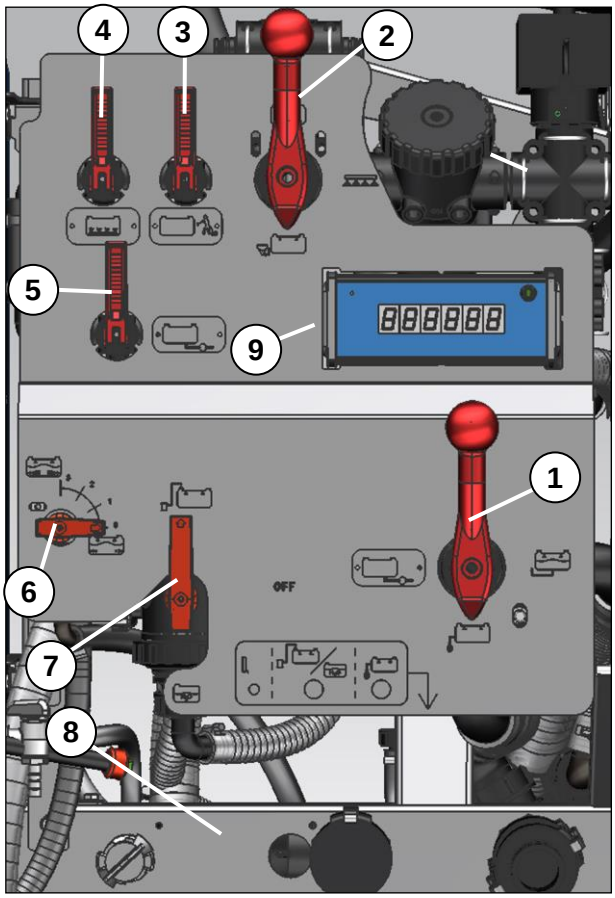
The deflector (1) protects the plants being sprayed from possible damage by the implement.

6.11.2 Cardan shaft

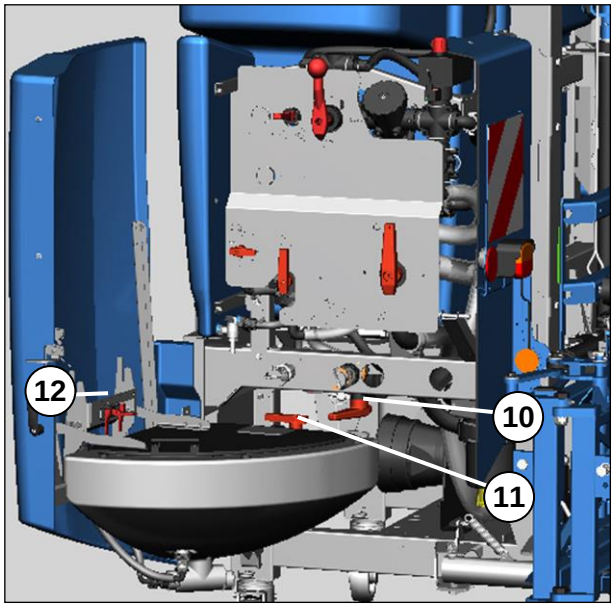


The implement is equipped as standard with a cardan shaft.

6.12 Control and connection centre



1 Selector valve
2 Distribution valve
3 External cleaning
4 Agitation, intensive
5 Recirculation
5 Pressure filter
6 Agitator control
7 Filler valve
8 Connections
9 TankPilot level indicator

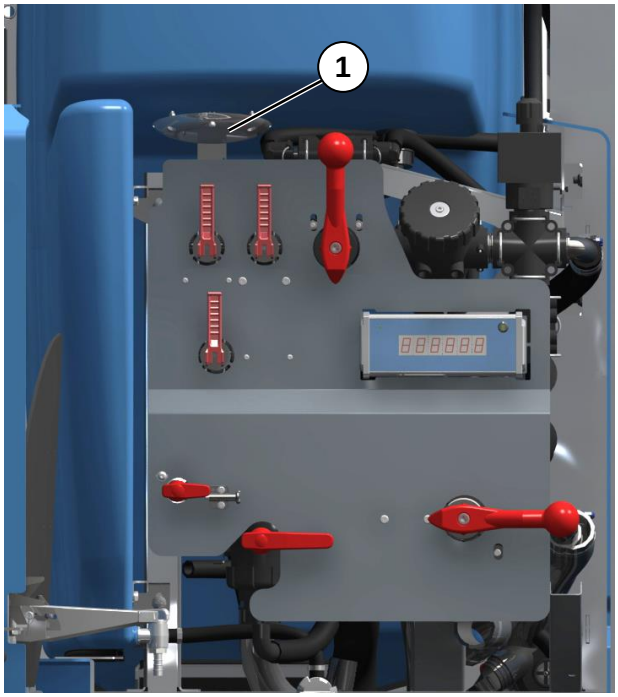


10 Drain valve

11 Suction valve

12 Induction control unit

6.13 Lighting



The lighting (1) illuminates the control and connection centre.

A brightness sensor switches the lighting (1) on and off automatically.

6.14 TankPilot electronic level indicator

The TankPilot electronic level indicator displays the fill level on the implement. The TankPilot electronic level indicator is located on the implement control centre.

The TankPilot electronic level indicator is connected to the job computer on the implement and consists, amongst other things, of a display, a button and an LED.

6.14.1 Overview

Element	Function
POWER 	LED
	• Acknowledge alarm • Select the electronic selector valve position

6.14.2 Function

The TankPilot electronic level indicator can show the following displays:

- Current fill level
- Maximum fill level alarm
- Minimum fill level alarm
- Selector valve position (option)

Alarm

An alarm is displayed when the fill level specified on the operating terminal for that alarm is reached. The alarm is displayed on the operating terminal and on the TankPilot electronic level indicator display.

To acknowledge an alarm on the TankPilot electronic level indicator display:

– Press the button.

To acknowledge an alarm on the operating terminal:

– Press the rotary encoder.

Selector valve

The electronic selector valve can be set from the TankPilot.

To set the position of the selector valve on the TankPilot:

– Press the button.

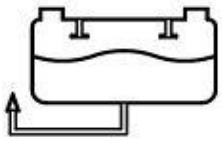
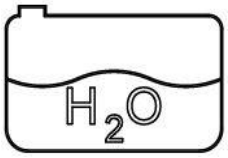
  The current selector valve position is shown on the display.

– Press the button until the required selector valve position is shown.

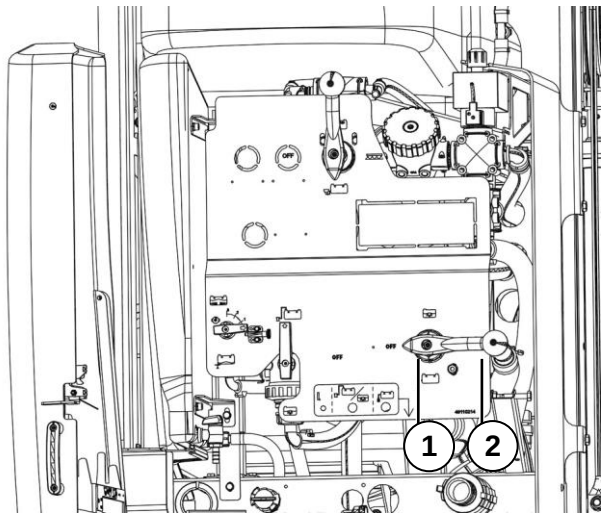
After selection, the selector valve sets itself automatically. This may take 2 to 3 seconds.

6.15 Selector valve

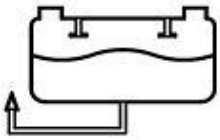
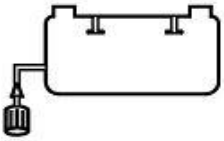
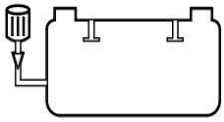
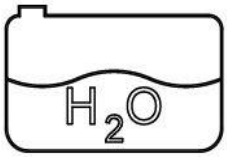
6.15.1 Selector valve with 2 options

Pictogram	Function	Description
	Main tank	The pump sucks spray fluid out of the main tank.
	Clean water tank	Clean water is sucked out of the clean water tank for cleaning.

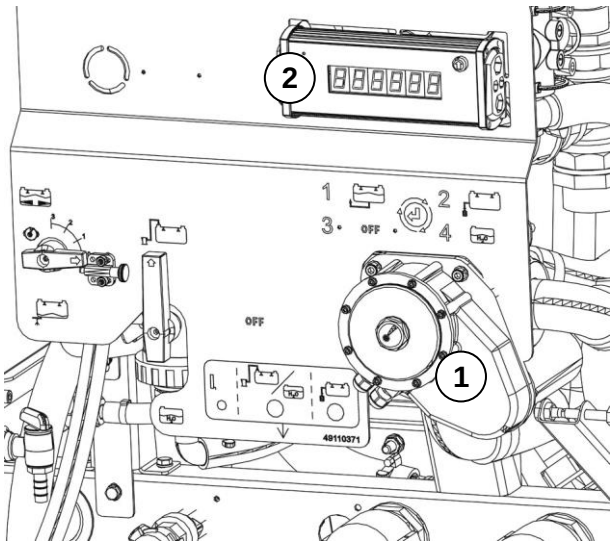
6.15.2 Manual selector valve with 4 options



The manual selector valve (1) is operated with the lever (2).

Pictogram	Function	Description
	Main tank	Suctioning spray fluid from the main tank.
	External, left	Suctioning spray fluid with the pump and a filling hose from the left external connection.
	External, right	Suctioning spray fluid with the pump and a filling hose from the right external connection. The connection is also designed to connect a front mounted implement.
	Clean water tank	Suctioning clean water for cleaning.

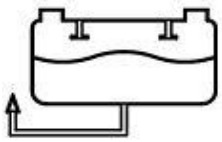
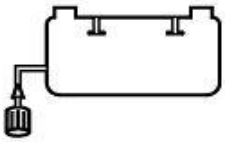
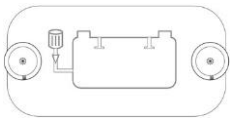
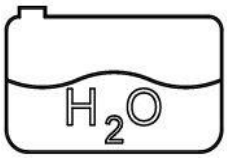
6.15.3 Electronic selector valve with 4 options



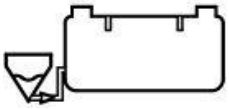
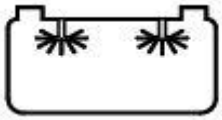
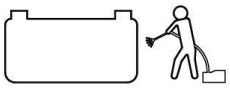
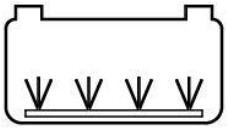
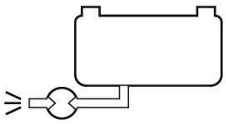
The electronic selector valve (1) is operated by:

- TankPilot (2) at the control and adjustment centre
- Operating terminal in the tractor

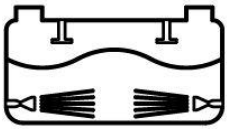
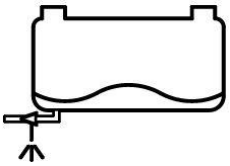
The selector valve position is shown on the TankPilot (2) and on the operating terminal.

Pictogram	Function	Description
1 	Main tank	Suctioning spray fluid from the main tank.
2 	External, left	Suctioning spray fluid with the pump and a filling hose from the left external connection.
3  	External, right	• Suctioning spray fluid with the pump and a filling hose from the right external connection. The connection is also designed to connect a front mounted implement. • If this pictogram is shown, the right-hand connection is not available.
4 	Clean water tank	Suctioning clean water for cleaning.

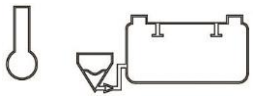
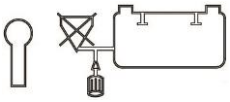
6.15.4 Distribution valve

Pictogram	Function	Description
	Spraying	The spraying liquid is pumped to the boom.
	Induction	The spraying liquid is pumped to the injector of the induction hopper and to the induction hopper valve.
	Internal cleaning	Fresh water from the fresh water tank is pumped to the cleaning nozzles in the main tank.
Optional:		
	External cleaning	Fresh water from the fresh water tank is pumped for external cleaning.
	Intensive agitator	Spraying agent in the main tank which has settled or is poorly soluble can be dissolved and homogenised using the intensive agitator.
	Circulation pumping	Spraying agent can be pumped from the main tank into another external container.

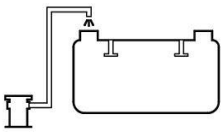
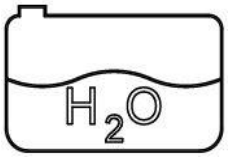
6.15.5 Agitator control

Pictogram	Function
	Maximum agitation in the main tank and maximum pressure filter flushing. Dirt particles are collected by the pressure filter and flushed into the main tank via the agitator.
3	
2	Approximately 2/3 of the maximum agitation and pressure filter flushing.
1	Approximately 1/3 of the maximum agitation and pressure filter flushing.
0	No agitation in the main tank and no pressure filter flushing. Dirt particles are collected by the pressure filter and retained in the pressure filter.
	Emptying the filter: No agitation in the main tank, liquid escapes from the drain hose. When the pump is switched off, the contents of the pressure filter and the piping system can be de-pressurised and drained from the pressure filter drain line.

6.15.6 Suction valve

Pictogram	Function	Description
	Induction hopper	Suction from the induction hopper
OFF	Closing	The suction valve is closed
	Suction, external	Spraying liquid is sucked from external containers using a filler hose.

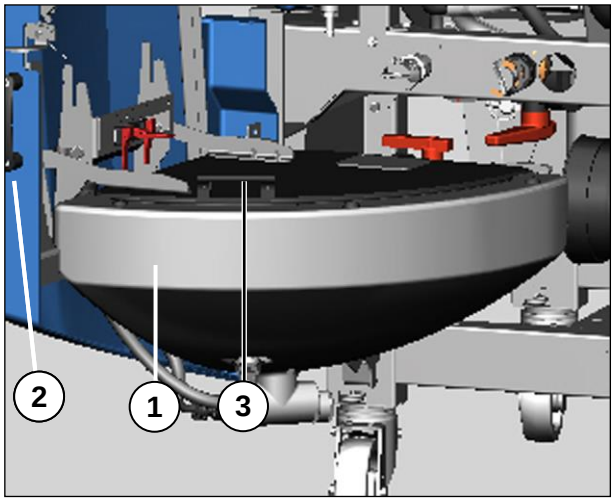
6.16 Filler valve

Pictogram	Function	Description
	Main tank	Backflow-safe filling of the main tank
OFF	Closing	The filler valve is closed
	Fresh water tank	Filling the fresh water tank

6.17 Chemical inductor

6.17.1 Components

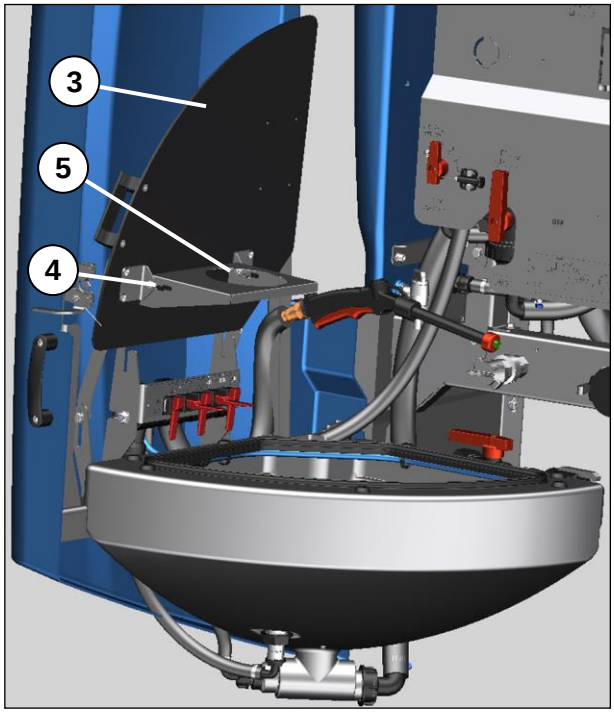
The chemical inductor transfers sprays into the main tank. The chemical inductor consists of:



- **Tank (1)**

The tank (1) is turned into the working position or transport position with the door (2).

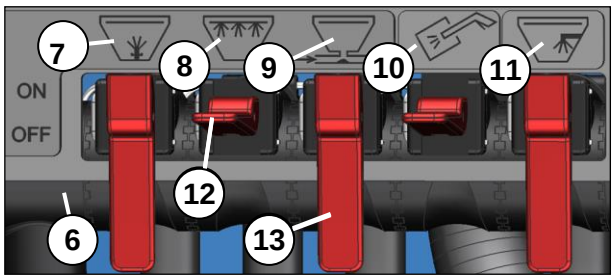
There is a cover (3) on the tank (1).



- **Holder (4) for measuring beaker**

The holder (4) is under the cover (3).

The LEMKEN measuring beaker is placed in the hole (5).



- **Control unit (6)**

The control unit has valves for the:

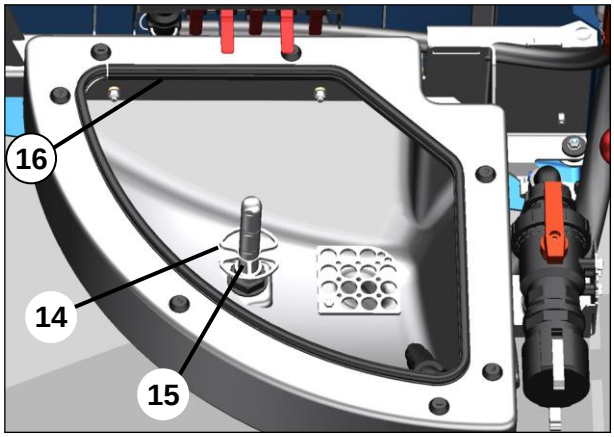
- Canister rinsing jet (7)
- Edge moistening (8)
- Proflow nozzle (9)
- Cleaning gun (10)
- Agitator nozzle (11)

ON

(Lever (12) horizontal): Valve open

OFF

(Lever (13) vertical): Valve closed



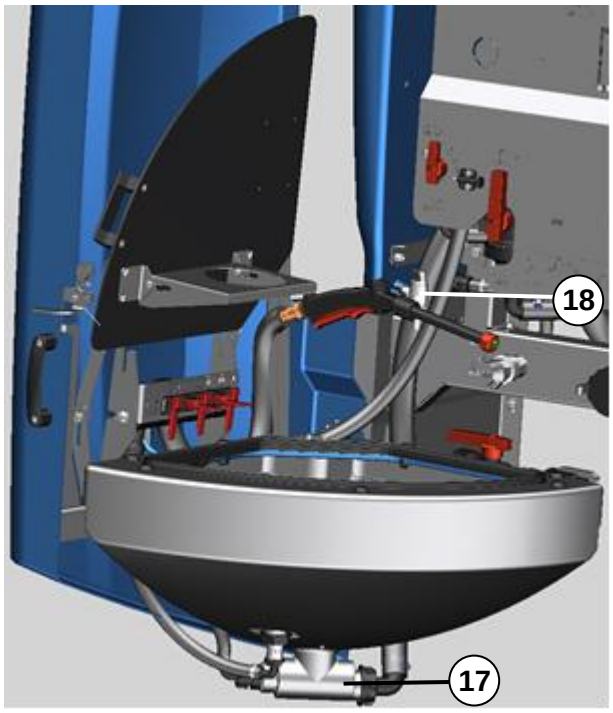
- **Canister rinsing jet (14)**

The canister rinsing jet (14) is used to rinse empty spray canisters. The valve (7) on the control unit is used to preselect the canister rinsing jet (14).

Press the valve (15) downwards to activate the canister rinsing jet.

- **Edge moistening (16)**

Edge moistening (16) prevents the spray from adhering to the induction tank.

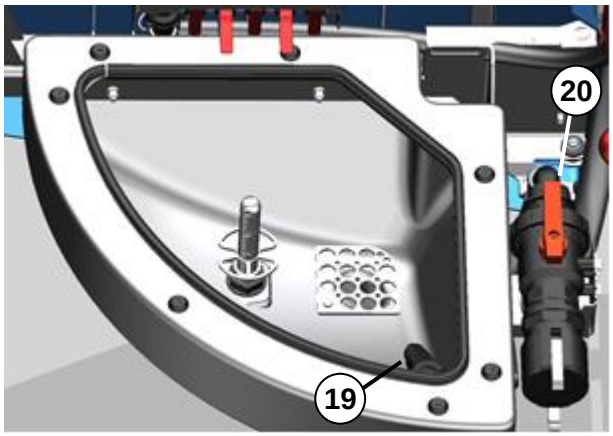


- **Proflow nozzle (17)**

The Proflow nozzle (17) helps to mix poorly soluble sprays.

- **Cleaning gun (18)**

The cleaning gun (18) is used to clean the induction tank and larger spray canisters.



- **Agitator nozzle (19)**

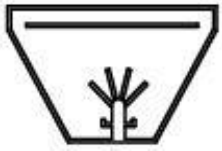
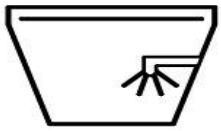
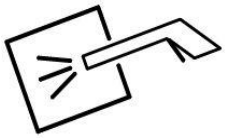
The agitator nozzle (19) is used to dissolve and pre-mix the spray.

- **Suction valve (20)**

The suction valve (20) is used for continuous adjustment of suction from

- the induction tank
- external tanks

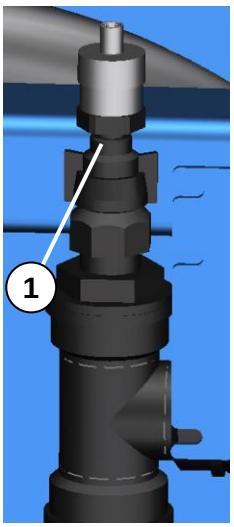
6.17.2 Induction hopper valve

Pictogram	Function	Description
	Canister flushing nozzle	Cleaning of empty spraying agent canisters.
	Edge wetting	Supports the induction of spraying agent and cleaning of the induction hopper.
	Proflow nozzle	Supports the mixing of poorly soluble spraying agent.
	Agitator nozzle	Dissolving and premixing of spraying agent.
	Cleaning gun	Cleaning of the induction container and larger spraying agent canisters.

6.18 Filler hose

Water or spraying agent can be sucked in from external containers by means of a filler hose (1).

6.19 Pressure measuring device



The pressure measuring device (1) is provided for monitoring the spray pressure and for the indirect indication of filter contamination.

The pressure measuring device (1) measures the spray pressure and displays this on the control terminal.

6.20 Distance measurement

Automatic metering of the distribution rate is based on the forward speed.

This can be selected in the electronic control system from the:

- TECU tractor
- TECU radar
- GPS
- SIM

See also the separate operating instructions for the electronic control system in the chapter «Configuring automatic metering of the distribution rate».

Alternatively , the forward speed can also be calculated by the electronic control system.

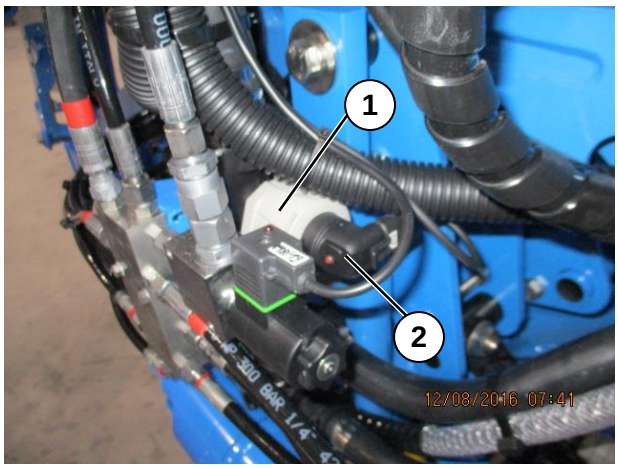
This calculation is made on the basis of impulses from the tractor:

- Distance sensor

or

- 7-pin signal socket

6.21 Flowmeter



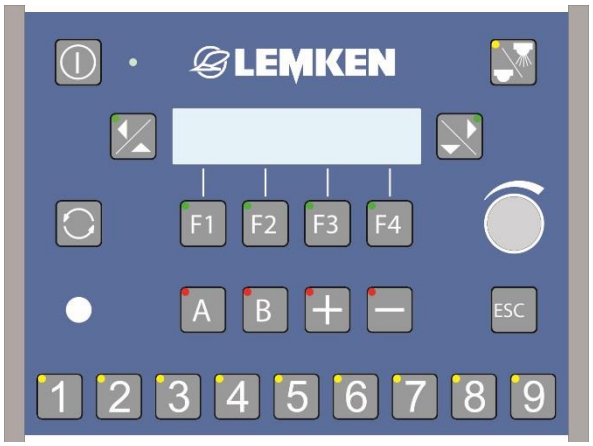
The flowmeter (1) converts the flow to the nozzles into impulses. The operating terminal calibrates the impulses and carries out further calculations.

The LED (2) lights up when there is a power supply to the flowmeter. The LED (2) flashes when liquid is flowing through the flowmeter. The flow [l/m] is measured.

6.22 Electronic control system

The electronic control system is used to configure and operate the main implement functions.

6.22.1 Non-ISOBUS



- Ecospray operating terminal

The following auxiliary control units can be added for easier implement operation:

- Width section box

- Joystick box

- Matrix

– See the separate operating instructions for the Ecospray operating terminal.

6.22.2 ISOBUS LEMKEN Megaspray

Every ISOBUS operating terminal which complies with IL4 and the ISO 11783 standard is compatible with the Megaspray control software from LEMKEN.

Example:

LEMKEN CCI-200 operating terminal

Operation of the Megaspray control software is described in the separate Megaspray operating instructions.

Auxiliary control units can be added for easier implement operation.

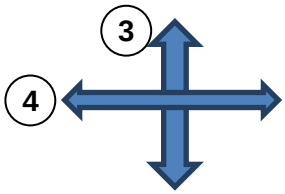
LEMKEN ISOBUS joystick box A10

(1) The 9 buttons can be configured individually.

– See the separate Megaspray operating instructions, section heading: “Auxiliary control elements – Buttons”.
The name and INFO, GO and END are not significant.

(2) The 3 joysticks can be configured individually.

– See the separate Megaspray operating instructions, section heading: “Auxiliary control elements – Joystick”.



The joysticks (2) can only be moved:

(3) Up / down

(4) Right / left

The joystick movement corresponds to the relevant function.

Example:

- Joystick up (3) or down (4) corresponds to raise or lower the boom.
- Joystick left (4) or right (4) corresponds to unfold or fold the boom.

LEMKEN ISOBUS width section box A20

The width section box can be used to:

- Operate up to 13 sections (3) of the boom.
- Assign 6 more implement functions to the buttons (1).

(1) The 6 buttons can be configured individually.

– See the separate Megaspray operating instructions, section heading: “Auxiliary control elements – Buttons”.
The name and INFO, GO and END are not significant.

(2) This switch is used to switch the nozzles on activated sections (3) on or off.

– See the separate Megaspray operating instructions, section heading: “Auxiliary control elements – Switch with 3 locking positions”.
Switch up: nozzles on activated sections (3) switched on. The control lamp (4) lights up.
Switch down: all nozzles (3) switched off. The control lamp (4) is not lit.

(3) These switches are used to switch the sections of the boom on or off.

– See the separate Megaspray operating instructions, section heading: “Auxiliary control elements – Switch with 2 locking positions”.
Switch up: sections (3) switched on. The control lamp (4) lights up.
Switch down: sections (3) switched off. The control lamp (4) is not lit.

To configure the sections:

– See the separate Megaspray operating instructions, section heading: “Job-specific section configuration”.

LEMKEN ISOBUS multi-function lever

Eight functions can be operated with the buttons (1). Three button levels can be selected with the switch (2). The multi-function lever can therefore be freely configured with 24 functions.

For the functions, see the separate Megaspray operating instructions, section heading: “Auxiliary control elements – Buttons”.

The switch (2) is designed so that it must be held in the up or down position to activate the 1st and 3rd button level.

The button level selected is indicated by a coloured control lamp:

- 2nd button level (neutral position): Yellow
- 1st button level (up): Red
- 3rd button panel (down): Green

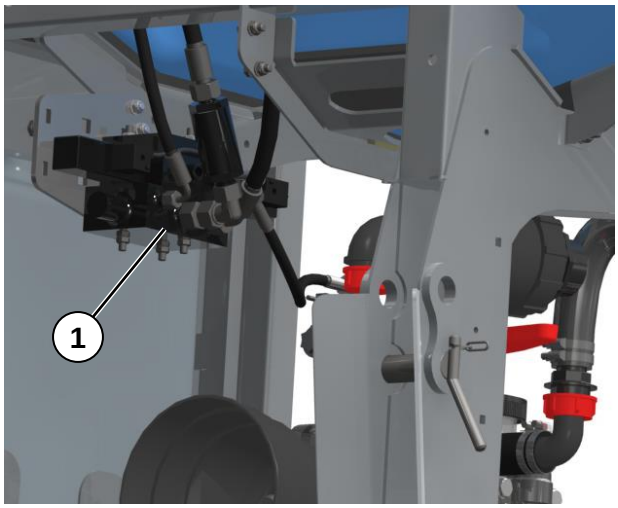
See also the separate installation and operating instructions for the multi-function lever III.

6.23 Electrohydraulic SEH boom

Model	Activation and functions
Standard (*) • Non-ISOBUS • Ecospray	Manual activation from a hydraulic spool valve on the tractor: • Height adjustment • Slope adjustment • Folding in the maximum working position or maximum transport position
Premium (**) • ISOBUS	• Automatic boom folding and unfolding • Manual execution of the operating function from the operating terminal and automatic electrohydraulic execution of the function: all other oil hydraulic functions

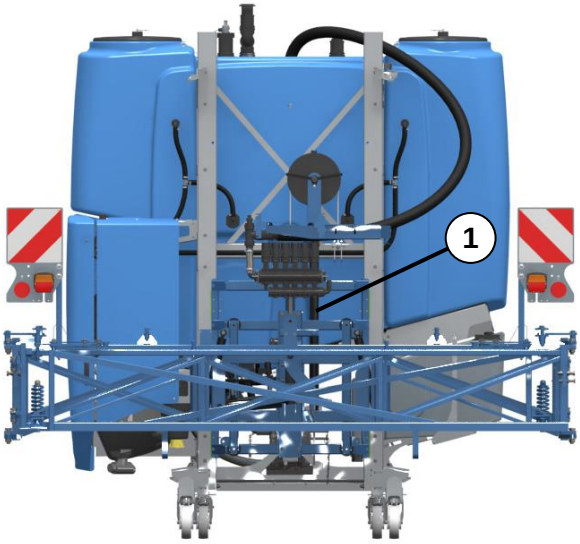
(*) Only in combination with a Closed Center hydraulic system

(**) Only in combination with an Open Center or load-sensing hydraulic system

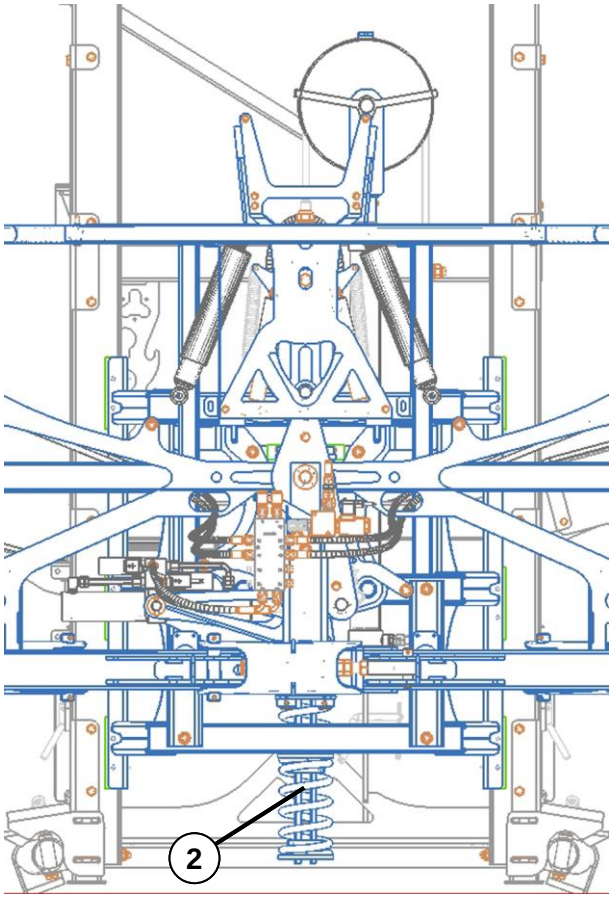


The proportional valve (1) is responsible for automatic electrohydraulic execution of functions in the Standard and Premium models.

6.24 Height adjustment

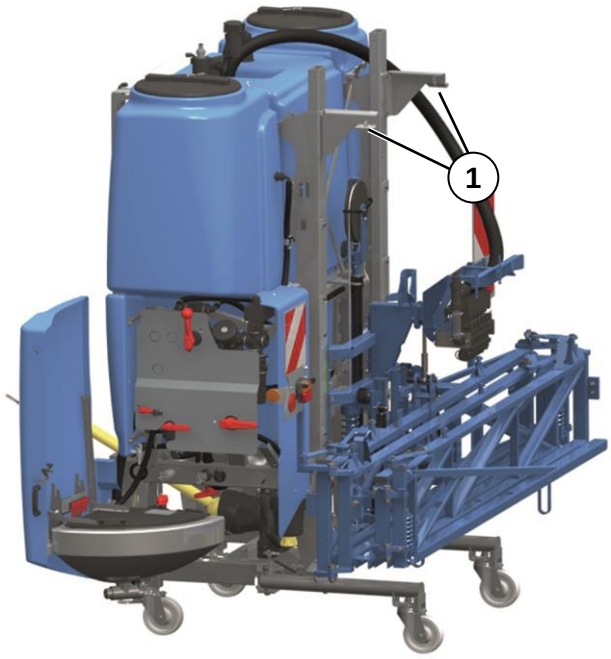


The boom height is adjusted by means of a hydraulic ram (1) on the lift mast.



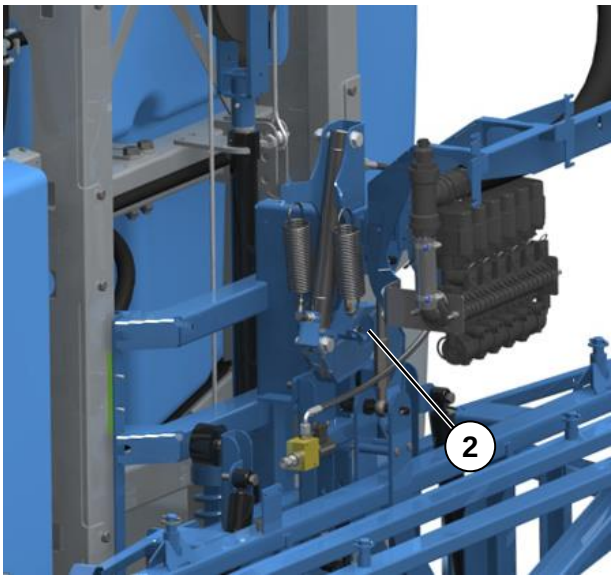
Vertical boom vibration is absorbed by a spring (2).

6.24.1 HE boom



Basic and Advanced version

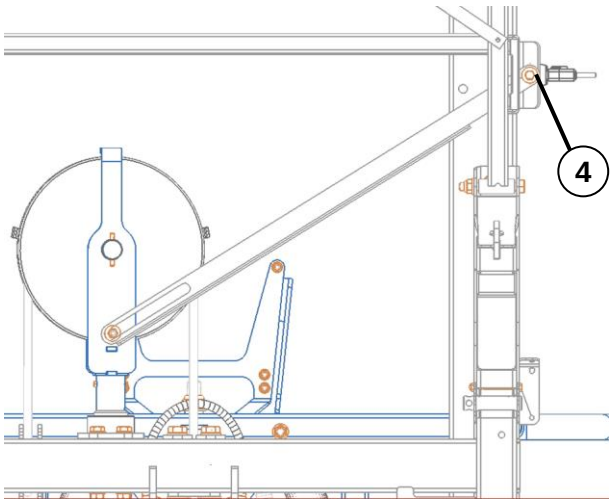
For folding, the boom must be raised as far as the stops (1).



Full version

Symmetrical and asymmetrical boom folding can take place at any boom height when the pendulum lock (2) is closed.

6.24.2 SEH/RA boom



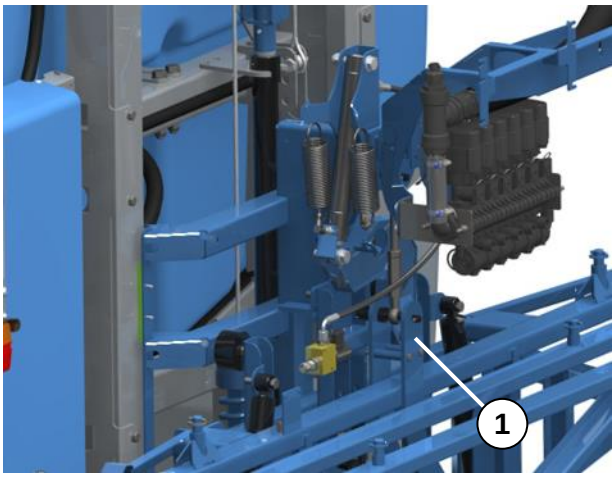
The sensor S4 (4) detects the boom height.

Various functions can be displayed on and controlled by the operating terminal, depending the implement model.

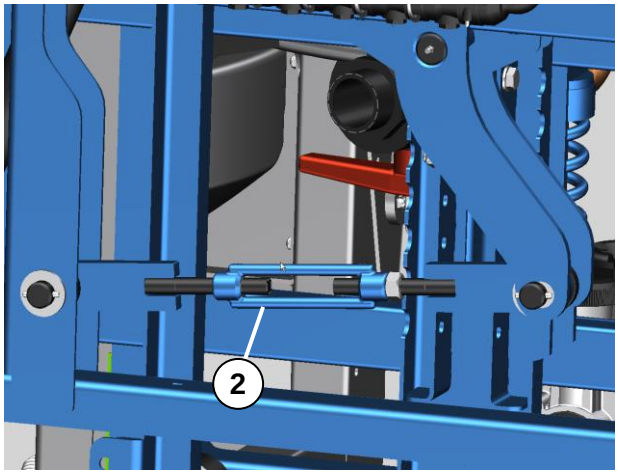
– See also the separate operating instructions for the electronic control system and operating terminal.

6.25 Pendulum suspension and slope compensation

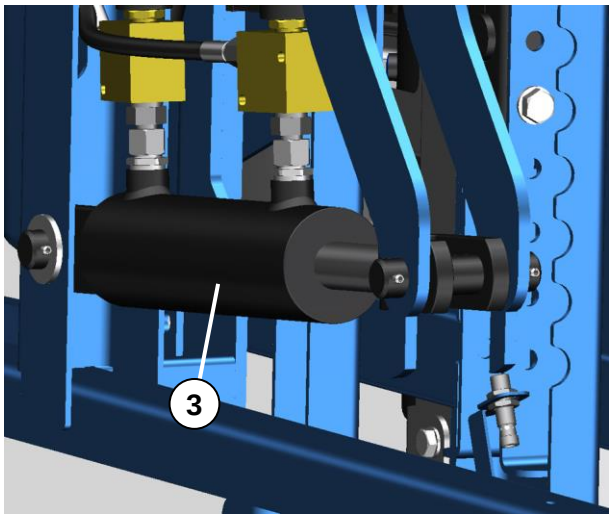
6.25.1 HE boom



The pendulum suspension (1) keeps the boom parallel to the ground.

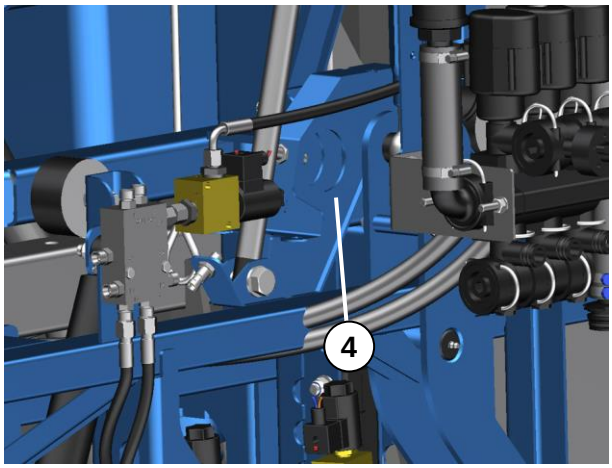


In the **Basic version**, the centre of gravity of the boom is adjusted with a turnbuckle (2).



Advanced version

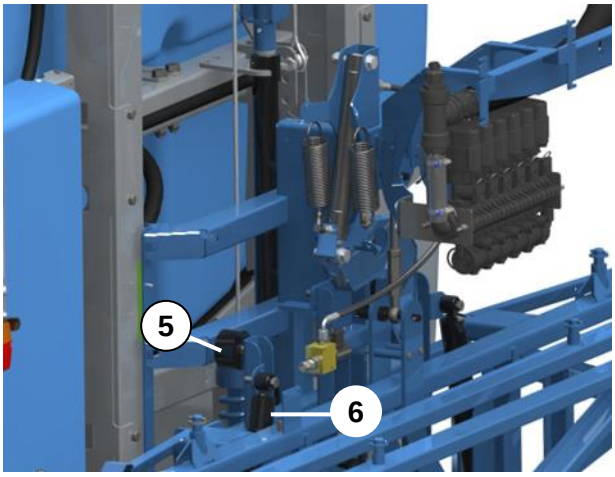
On highly changeable or uneven ground the slope compensation system can be used to adjust the centre of gravity of the boom manually during operation (3). The slope compensation system (3) is controlled from the implement's operating terminal.



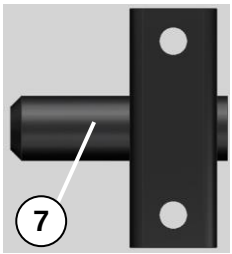
Full version

With the pendulum lock, (4) the boom can be folded symmetrically and asymmetrically at any boom height.

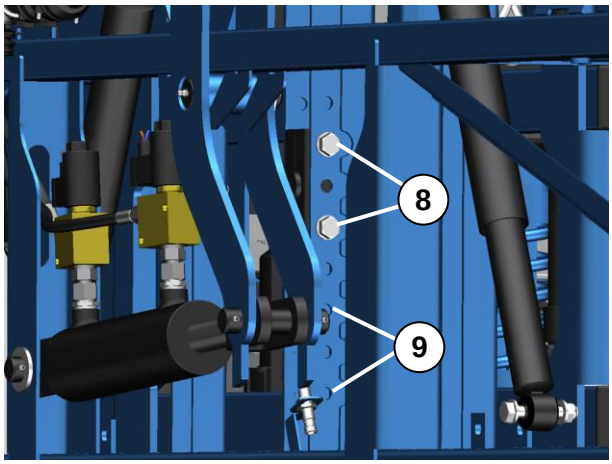
The boom can only be folded when it is raised and the pendulum lock is closed.



Buffers (5) are provided for damping of horizontal movements. Vertical movements are damped by shock absorbers (6).



The pendulum bolt (7) carries out basic boom adjustment to suit different terrain conditions.



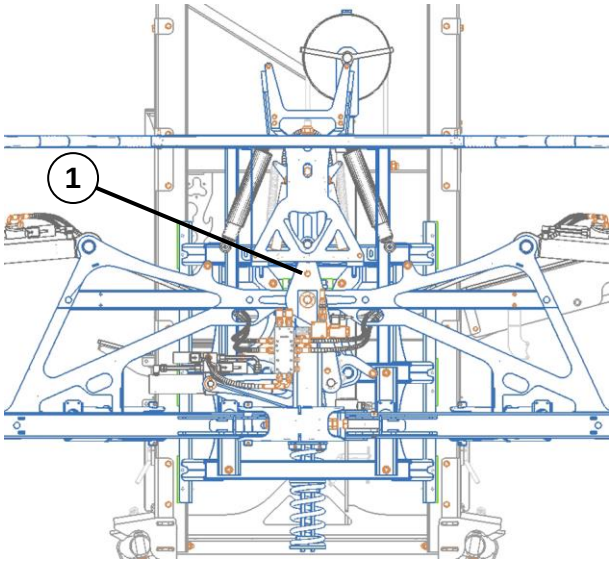
The pendulum bolt (7) can be fitted in 5 positions:

- Top position (8): flat terrain
- Bottom position (9) = standard position: firm ground, slope, one side folded.

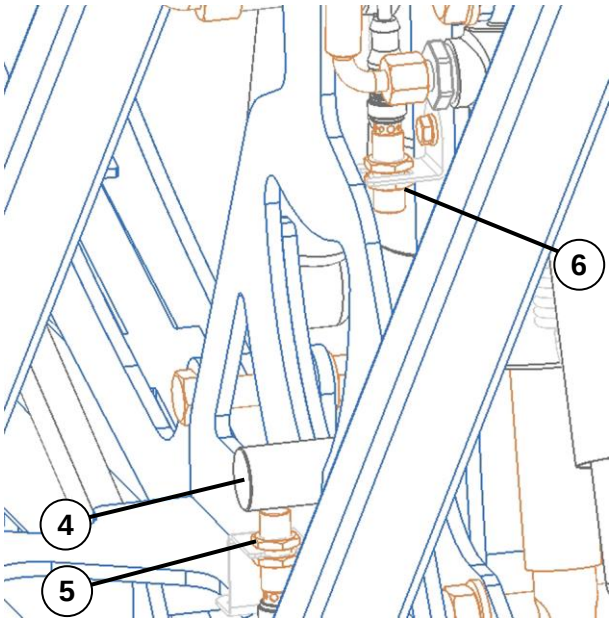
The pendulum bolt (7) should be moved to a lower position as the ground becomes firmer and/or on slopes.

The turnbuckle (2) must be set so that the boom is automatically aligned horizontally when it is fully unfolded and the pendulum bolt is in the top position (8).

6.25.2 SEH/RA boom



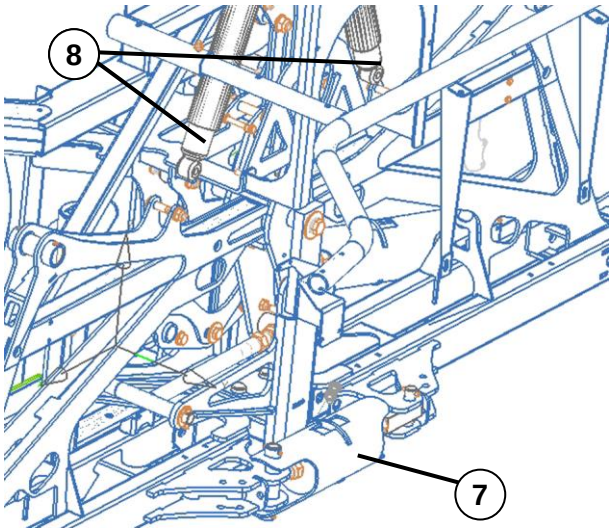
The pendulum suspension (1) keeps the boom parallel to the ground.



The boom can only be folded when the pendulum lock (4) is closed.

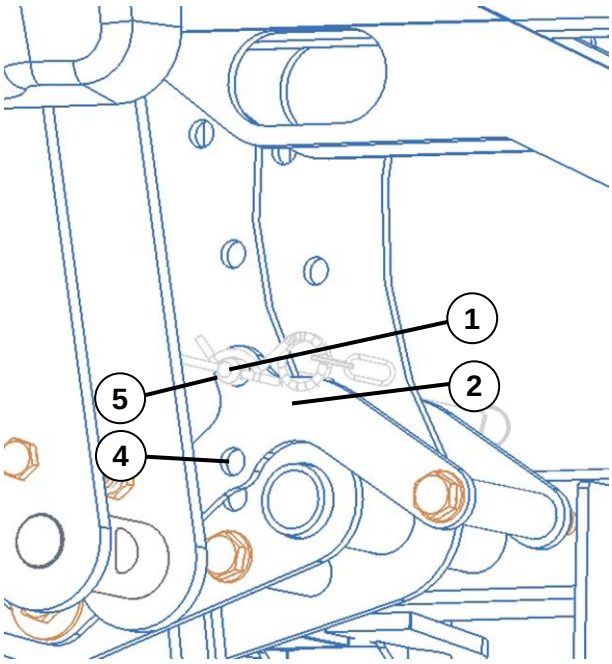
Sensor S3 (5) detects that the pendulum lock is closed.

Sensor S11 (6) detects that the pendulum lock is open.



Springs (7) are provided for damping of horizontal movements. Vertical movements are damped by shock absorbers (8).

Safety pin



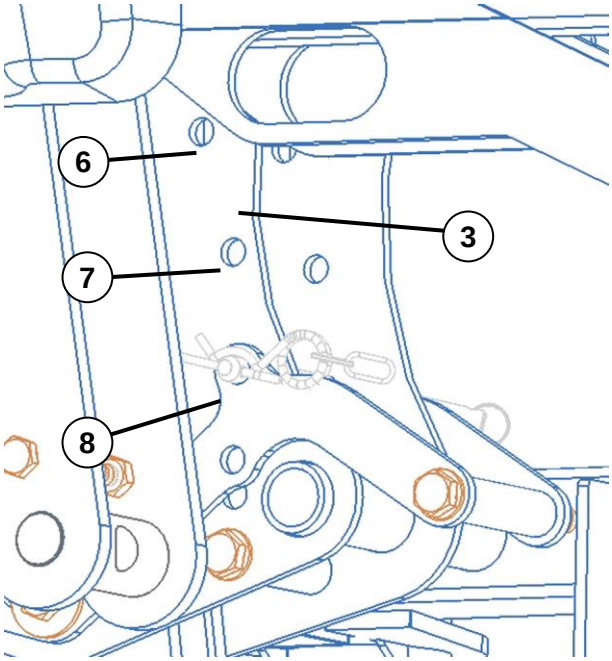
The pendulum system on the boom is set by means of a safety pin (1).

The safety pin (1) can only be inserted towards the rear of the implement.

Safety pin (1) positions:

Lever (2):

- Top (5)
- Bottom (4)



Pivoted guide (3):

- (6)
- (7)
- (8)

Any combination of positions (6), (7) and (8) on the pivoted guide (3) and positions (5) and (4) on the lever (2) can be used.

Safety pin (1) in top positions:

Flat terrain

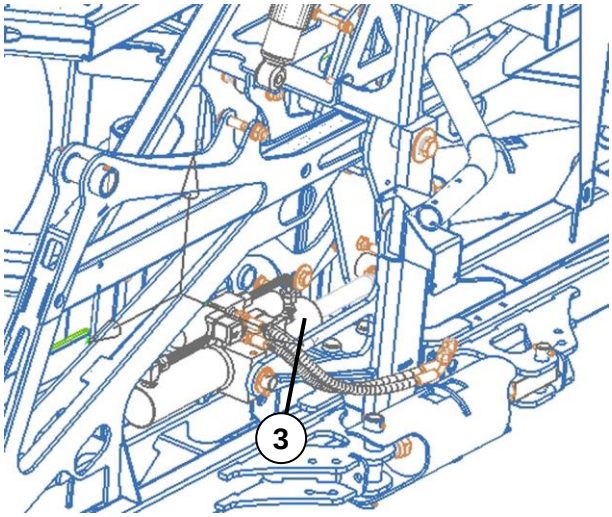
The safety pin (7) should be moved to a lower position as the ground becomes firmer and/or on slopes.

Safety pin (1) in bottom positions:

Firm ground, slope, one side folded.

Before folding one side of the boom, the safety pin (1) must be in place in the following positions:

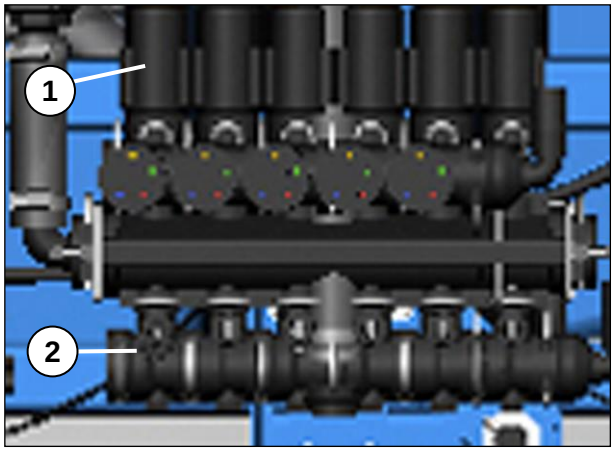
- (5) on the lever (2) and
- (8) on the pivoted guide (3)



On highly changeable or uneven ground, the centre of gravity of the boom can be reset during operation by adjusting the slope compensation system (3) from the operating terminal.

6.26 Section control

6.26.1 HE boom



The section valves (1) switch the entire boom or individual sections of the boom on and off.

The SPRAYING ON function is indicated by a green LED on the section valves (1) and the SPRAYING OFF function by a red LED on the section valves (1).

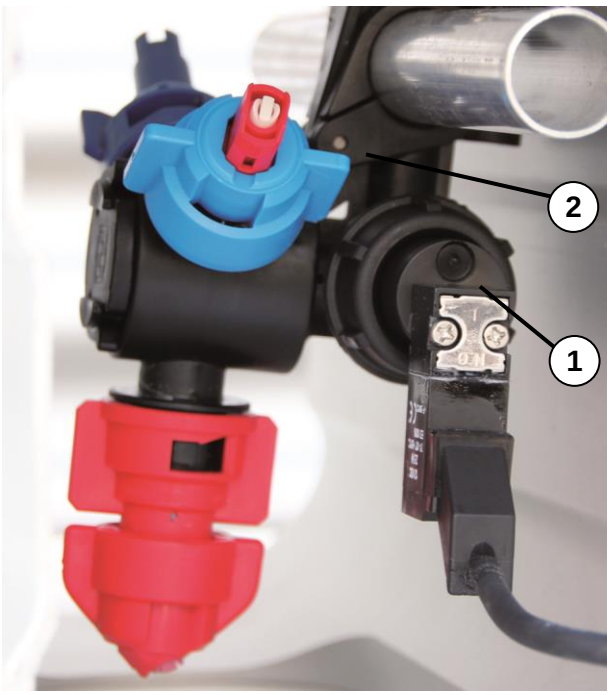
The relief valves (2) open when individual sections are switched off.

When all sections are switched off, the circulation valve on the implement opens in addition to the relief valves (2).

The open relief valves (2) and open circulation valve accelerate pressure reduction in the line to the nozzles and dripping therefore stops faster.

In automatic mode, the application rate (l/ha) set on the operating terminal is retained even when sections are switched on and off.

6.26.2 SEH/RA boom



This boom is fitted with the EltecBase individual nozzle control system (1).

Depending on the implement model, the individual nozzle holders (2) on the boom are grouped into sections.

When individual sections are switched off, the nozzle holders (2) in that section are closed.

When all sections are switched off, the nozzle holders (2) close and the circulation valve on the implement opens.

In automatic mode, the application rate (l/ha) set on the operating terminal is retained even when sections are switched on and off.

6.27 Boom

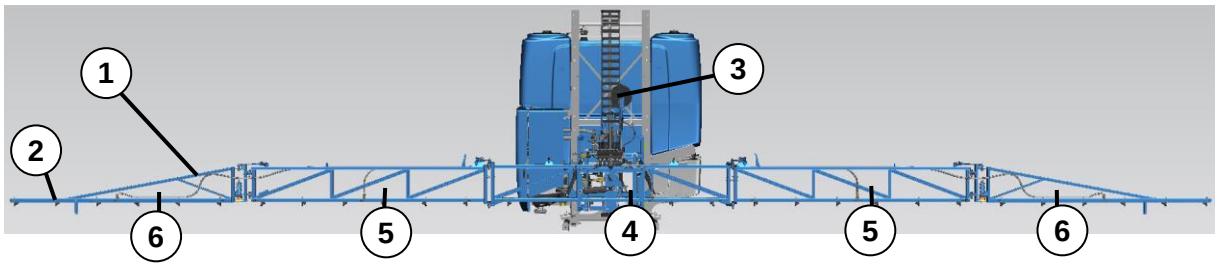
The implement is fitted with one of the following booms:

- HE
- SEH
- RA

The boom (1) is designed to carry the nozzle holders (2) with the nozzles.

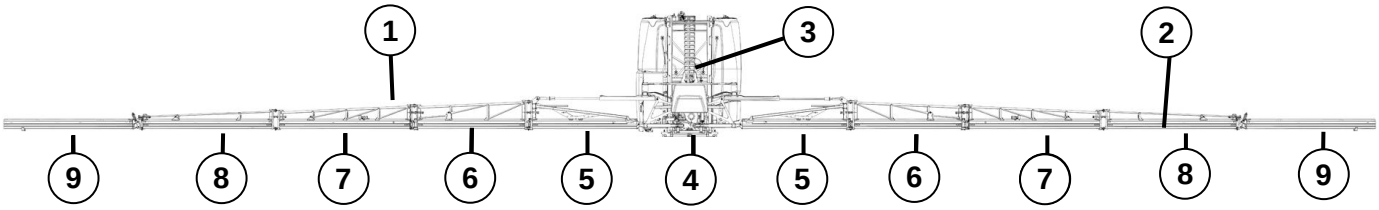
Two nozzle holders (2) are provided for each metre of boom working width.

6.27.1 HE boom



1	Boom	4	Arm 0
2	Nozzle holder	5	Arm 1
3	Height adjustment	6	Arm 2

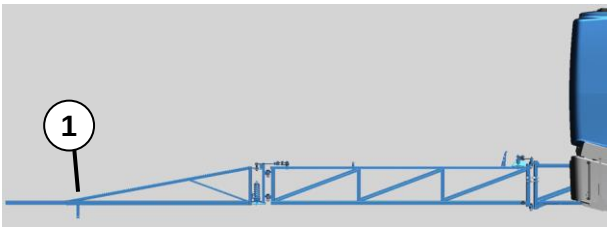
6.27.2 SEH/RA boom



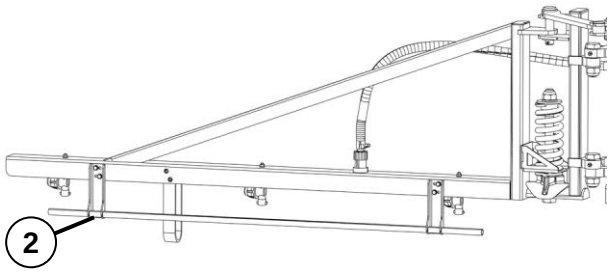
1	Boom	6	Arm 2
2	Nozzle holder (not shown)	7	Arm 3
3	Height adjustment	8	Arm 4
4	Arm 0	9	Arm 5
5	Arm 1		

6.28 Ground distance spacer

6.28.1 HE boom

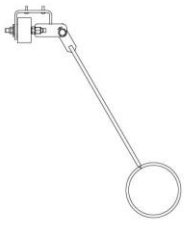


Ground distance spacer (1).



A nozzle protector (2) is available for use with single nozzle holders.

6.28.2 SEH/RA boom



A ground distance spacer is recommended for booms from 18 m – standard from 24 m.

6.29 Nozzle holder

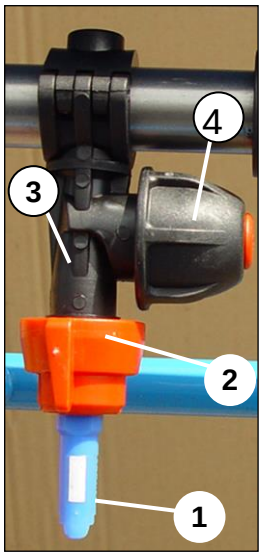
6.29.1 HE spraying booms

The dripping prevention valve (4) on the nozzle (1) prevents dripping of spraying liquid when switching off the nozzle.

If the nozzle (1) is switched off with the operating terminal via the segment valves:

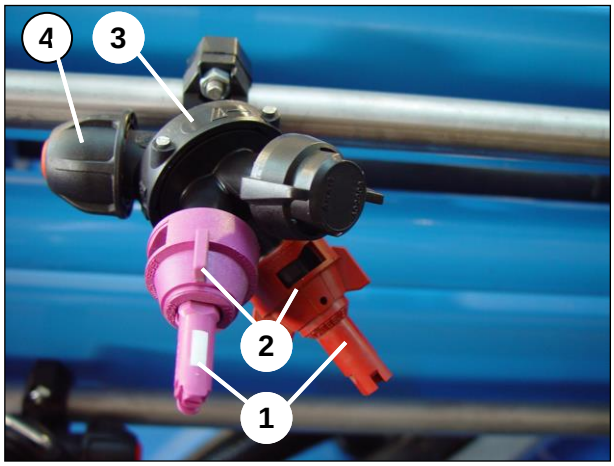
- the pressure in the supply line to the nozzle holder (3) decreases
- the dripping prevention valve (4) is used to automatically close the supply line to the nozzle (1).

Single nozzle holder



One nozzle (1) can be fitted to each of the single nozzle holders (3). The nozzle (1) is fastened to the nozzle holder (3) with a bayonet cap (2).

Three-nozzle holder



Up to three nozzles can be fitted to the three-nozzle holders (3). The required nozzle (1) is selected by rotating the nozzle holder (3).

There is a locking position between the individual nozzles (1) in order to close the nozzle holder (3).

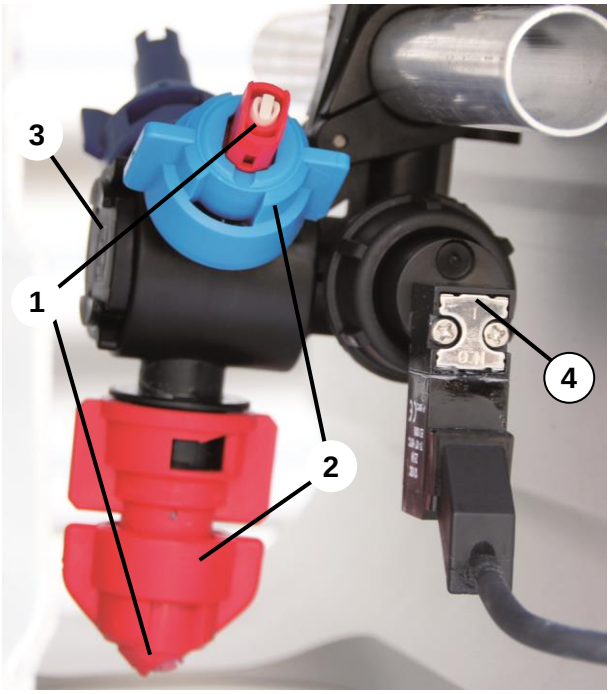
The nozzle (1) is fastened to the nozzle holder (3) with a bayonet cap (2).

6.29.2 SEH/RA spraying boom

The EltecBase nozzle switching is used to:

- close the supply line to the nozzle holder (3).
- prevent the nozzle (1) from dripping.

The valve (4) is controlled via the electronic control unit of the implement at the operating terminal.



Up to three nozzles (1) can be fitted to the three-nozzle holders (3).

Up to five nozzles can be fitted to the five-nozzle holders (5).

The required nozzle (1) is selected by rotating the nozzle holder (3).

There is a locking position between the individual nozzles (1) in order to close the nozzle holder (3).

The nozzle (1) is fastened to the nozzle holder (3) with a bayonet cap (2).

6.30 Nozzles

6.30.1 General

Various nozzles can be fitted to the nozzle holders. Each nozzle type has a different volume flow, spray pattern, drop size and nozzle characteristics. The liquid which is to be sprayed, the environmental conditions, the nozzle characteristics and official regulation such as distance conditions, drift reduction classes etc. must be taken into account for the selection of the nozzles.

A universal nozzle table and special nozzle tables for liquid fertilizer are listed in the Appendix.

6.30.2 Liquid fertilizer nozzles

Liquid fertilizer nozzles are designed for the application of large drops of liquid fertilizer.

The implement can be equipped with the following liquid fertilizer nozzles:

- Five-hole nozzle
- Six-hole nozzle ESI
- Liquid fertilizer FD
- Liquid fertilizer SJ-7

6.30.3 Drop hose

HE boom (not shown)

SEH/RA boom (not shown)

The drop hoses are used to apply liquid fertiliser. Very little leaf burn occurs as the fertiliser is applied directly to the ground.

6.31 Boom lighting

Not shown

The boom lighting is designed to illuminate the boom when spraying in the dark.

7 PREPARATIONS ON THE TRACTOR

DANGER

Lowering or lifting the three-point linkage

Incorrect setting or operation of the three-point linkage may cause uncontrolled movements. This may cause serious injury to the operator.

– To attach the implement, switch the tractor hydraulics to position control.

7.1 Overview

The following preparations must be made before attaching the implement to the tractor:

- Check the pressure in the tyres of the tractor
- Set the length of the lifting rod
- Lock the lower linkage
- Provide and check the necessary electronic connections
- Provide and check the necessary hydraulic connections
- Install operating terminals and detect distance
- Set tractor hydraulics
- Set upper linkage length

The individual preparations on the tractor are explained below.

7.1.1 Check tractor tire pressure

The air pressure in the tractor tyres must be identical, in particular, on the rear wheels.

– Check the air pressure in the tractor's tyres.

– If necessary, adjust the air pressure in the tractor's tyres.

7.1.2 Set length of lifting rods

The tractor's lifting rods are to be set to an identical length.

– Check the length of the tractor's lifting rods.

– If necessary, adjust the length of the lifting rods.

7.1.3 Lock lower control link

The lower control links on the tractor's three-point linkage are to be stabilised using stabilisers.

– Set the the three-point linkage's stabilisers such that they do not permit any lateral movement of the tractor's lower control links.

7.1.4 Required electronic connections

CAUTION

Damage to electrical components

The tolerance range for the power supply lies between 10 V and 15 V. Overvoltage and undervoltage can result in malfunctions, and - under certain circumstances - they may destroy electrical or electronic components.

– Make sure that:

- the implement's power supply always lies between 10 V and 15 V and that
- the power supply has a fuse of at least 25 A fitted.

The following power sources are required on the tractor for the electronic consumers.

Consumers	Volts	Power socket
Lighting system	12	In line with DIN-ISO 1724
Control terminal	12	In accordance with DIN 9680
Linkage lighting	12	In accordance with DIN 9680

If a power socket in accordance with DIN 9680 is not given, a separate battery connection cable must be routed.

– Connect the following consumers:

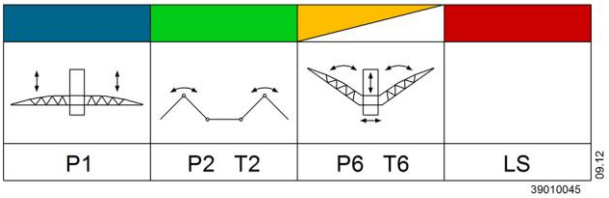
- lighting system,
- electronic control,
- linkage lighting.

7.1.5 Providing and checking the necessary hydraulic connections

The connectors on the tractor must match the connectors on the implement.

The implement is supplied with hydraulic connectors.

The protecting caps on the hydraulic connections are colour-coded and the hydraulic connections themselves are marked alphanumerically.



There is also a sticker on the implement showing all the hydraulic connections.

To activate the individual hydraulic consumers listed below, the tractor must be equipped with the following spool valves:

Consumer	**SA**	**DA**	**UR**	**LS**	**Tractor/implement**	
					Colour	**Code**
Height adjustment on HE, SEH and RA boom in Basic and Comfort versions	X				Blue	P1
Pendulum lock, slope adjustment and folding on HE, SEH and RA boom in Basic and Comfort versions		X			Green	P2/T2
All hydraulic functions with a constant power hydraulic system on SEH and RA boom in Comfort and Premium versions Optionally with load-sensing hydraulic system (LS)	X		X		Yellow/ White	P6/T6
				X	Red	LS

SA = Single-acting spool valve

DA = Double-acting spool valve

UR = Unpressurised return line

LS = Sensing line, load sensing

7.1.6 Installation of operating terminals and distance detection

– Install the bracket for the operating terminal within sight and easy reach of the user.

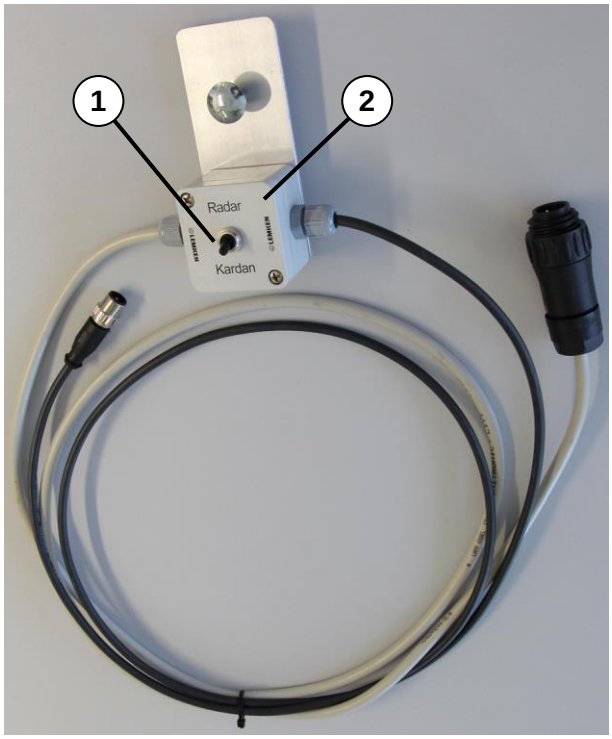
– Take care that no electric cables or fluid lines are damaged when drilling the holes.

The power supply to the job computer is provided via a plug connector.

A BUS cable is used to connect the implement to the operating terminal.

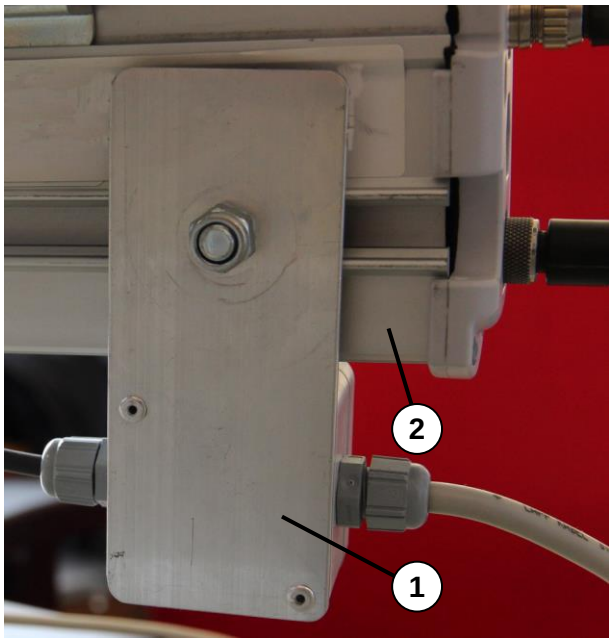
The distance pulses for automatic implement feeding can be detected by the tractor.

Tractor signal socket

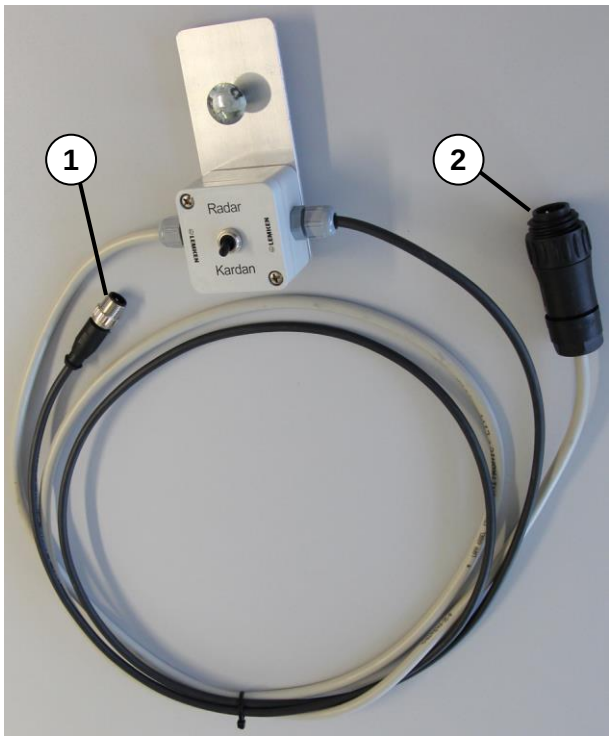


The switch (1) on the switch box (2) enables the detection of tractor distance pulses by:

- the wheel shaft
- the radar sensor



– Fit the operating terminal of the implement (2) to the bracket on the tractor.
– Fit the switch box (1) to the operating terminal of the implement (2).



– Connect the plug connector (1) to the operating terminal of the implement.
– Connect the plug connector (2) to the 7-pin signal socket on the tractor.
– Select the speed signal from:
- Cardan or
- Radar

– See also the operating instructions for the operating terminal.

Sensor on the wheel shaft

– Fit the operating terminal of the implement to the bracket on the tractor.
– See the separate:
- speed sensor kit installation instructions
- operating instructions for the operating terminal

Matrix operating terminal

– See the separate operating instructions:

- the implement
- Matrix

7.1.7 Three-point coupling

For this implement, the only approved lower control link pin (1) and upper link pin (2) are those listed in the table below and that match the category of the tractor's three-point linkage.

If they do not match, then either the tractor's three-point linkage or the implement's lower control link pin (1) and the upper link pin (2) must be replaced with a suitable, authorised version.

WARNING

Loss of implement

The category of the tractor's three-point linkage and the category of the lower control link pin and the upper link pin must match.

Otherwise, the lower control link pin and the upper link pin may slip out of the linkage when driving over uneven ground or due to vibrations.

– Always ensure that the category of the three-point coupling exactly matches the diameter of the lower control link pin and the upper link pin.

The maximum permissible tractor powers and dimensions in accordance with ISO 730-1 must be observed for each category.

DANGER

Risk of fatal injury if the three-point connection category is too small

If the category of lower link pin or top link pin used is too small, this component can be overloaded and may break. As a result, the implement may drop and people in the immediate vicinity may be injured or killed. The machine may also be damaged.

This may cause death or injury to other road users while the implement is being transported.

– Always ensure that the category of the top link pins used corresponds to the tractor power in accordance with ISO 730-1.

7.1.8 Setting the top link for QuickConnect

– Pull the handle on the QuickConnect coupling system so that the top link coupling point automatically moves into the vertical resting position.

– Drive the tractor to the implement slowly with the lower links lowered.

– Connect the lower links to the implement.

– Ensure that the lower link hooks are locked properly.

– Measure the distance in mm from the top link coupling point on the tractor to the top link coupling point on the implement (measured from the centre of the coupling point on the tractor to the centre of the top link coupling point on the implement coupling system).

– Disconnect the tractor lower links from the machine.

– Drive forwards for approx. 30 cm.

– Secure the tractor to prevent it from rolling away.

– Switch off the tractor engine.

– Remove the ignition key.

– Connect the top link to the top link coupling point.

– Add 60 mm to the measured top link length.

Example:

Measured length of top link [mm]:	600
plus [mm]:	+ 60
Length to be set for top link [mm]:	= 660

– Record the calculated position and top link length in the table in the annex.

– Set the length of the top link to the calculated top link length (e.g. 660 mm).

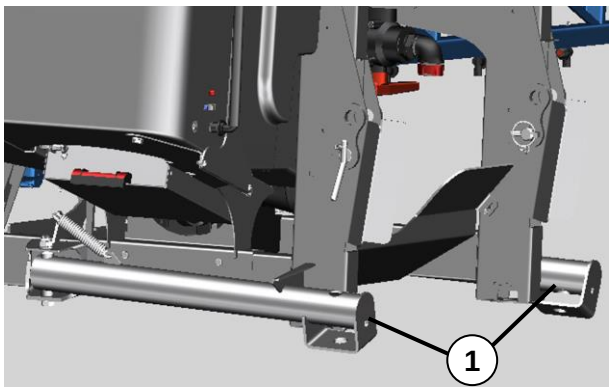
8 ATTACHING THE IMPLEMENT WITH THE THREE-POINT CONNECTION

- Before attaching the implement, secure the tractor to prevent it from rolling away.
- Switch off the tractor engine.
- Remove the ignition key.
- Fit the ball bush on the top link coupling point and secure it.
- Fit the ball bushes on the lower link coupling points on the implement and secure them.
- Drive the tractor to the implement slowly with the lower links lowered until it is approx. 30 cm away from the implement.
- Connect the PTO shaft.
- Connect the hydraulic lines.
- Connect the electronic lines.
- Drive the tractor closer to the implement.
- Connect the lower links to the implement and secure them.
- Connect the top link to the top link coupling point.
- Lift the implement off the ground slightly using the three-point linkage.
- Ensure that the release cables for the lower link connection hooks are not snagged and can release automatically.

– Lock the lower links so that they do not swing sideways.
– Lift the implement to the required spraying height using the three-point linkage.
– Check that the implement is horizontal.

The lift mast should be at 90° to the ground.

If necessary, correct the length of the top link.



The implement has two folding stands (1) on the left and right sides of the frame. These stands (1) must be folded forwards completely once the implement is attached.

The transport rollers or forklift pockets must be removed once the implement is attached.

– Remove the securing pin for the transport rollers or pockets.
– Release the transport rollers or pockets.
– Remove the transport rollers or pockets.
– Store the transport rollers or pockets in a clean place.

9 ATTACHING THE IMPLEMENT WITH QUICKCONNECT

- Before attaching the implement, secure the tractor to prevent it from rolling away.
- Switch off the tractor engine.
- Remove the ignition key.
- Fit the ball bush on the top link coupling point and secure it.
- Fit the ball bushes on the lower link coupling points on the implement and secure them.

CAUTION

- During attachment, ensure that the top link coupling point swivels downwards. If the top link coupling point swivels upwards, the implement cannot be attached and there is a risk of breakage.
- Attach the tractor top link again with the top link coupling point on the implement swivelled downwards.

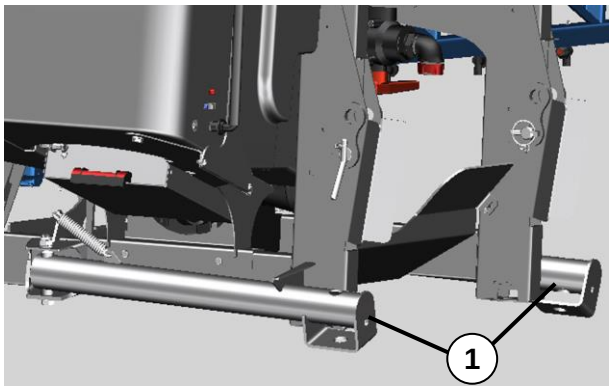
- Drive the tractor to the implement slowly with the lower links lowered.
- Set the top link to the required length.
- Connect the top link to the top link coupling point.
- Connect the PTO shaft.
- Connect the hydraulic lines.
- Connect the electronic lines.

- Connect the lower links to the implement and secure them.
- Place the cable for the QuickConnect coupling system within the driver's reach.
- Lift the implement off the ground slightly using the three-point linkage.
- Ensure that the release cables for the lower link connection hooks are not snagged and can release automatically.
- Lock the lower links so that they do not swing sideways.
- Lift the implement to the required spraying height using the three-point linkage.
- Check that the implement is horizontal.

The lift mast should be at 90° to the ground.

If necessary, correct the length of the top link.

- Lower the implement onto the ground.
- Release the top link.
- Lower the lower links.
- Drive forwards for approx. 30 cm.
- Set the top link to the required length.
- Reconnect the top link and lower links.



The implement has two folding stands (1) on the left and right sides of the frame. These stands (1) must be folded forwards completely once the implement is attached.

The transport rollers or forklift pockets must be removed once the implement is attached.

- Remove the securing pin for the transport rollers or pockets.
- Release the transport rollers or pockets.
- Remove the transport rollers or pockets.
- Store the transport rollers or pockets in a clean place.

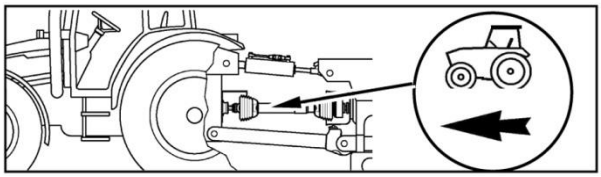
10 PREPARING THE IMPLEMENT

10.1 Overview

After the implement has been attached to the tractor, the following preparations must be made:

- Connect and check the PTO shaft.
- Install the specified nozzles.
- Measure the nozzle output and check the forward speed detection system.
- Install the drop hoses.

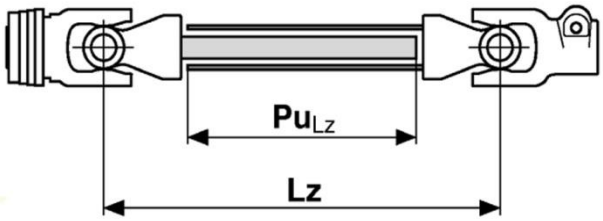
10.2 Installing and checking the PTO shaft



The end of the PTO shaft with the tractor symbol must be installed on the tractor.

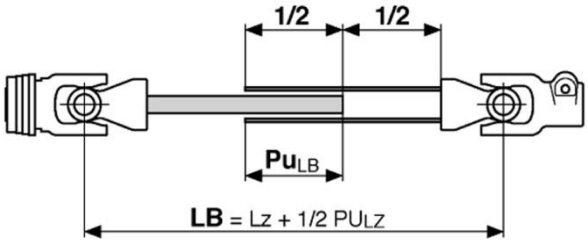
If the PTO shaft has a wide-angle joint at one end, the wide-angle joint must be installed on the tractor.

After attaching the implement, check that the PTO shaft is the correct length. This also applies to telescopic PTO shafts.



The PTO shaft must not be compressed when it is pushed in (PuLZ).

– If necessary, shorten the PTO shaft.



The aim is to achieve maximum profile overlap (PuLb) on the PTO shaft.

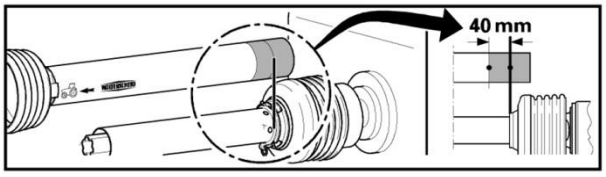
– If necessary, use a longer PTO shaft.

– Attach the operating instructions attached to the PTO shaft on delivery to these operating instructions.

10.2.1 Shortening a non-telescopic PTO shaft

– Pull the two halves of the PTO shaft apart.

– Hold the two halves next to each other at the shortest distance between the tractor and the implement.

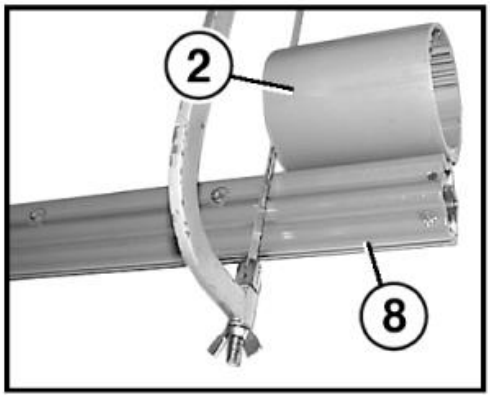


– On the outer protection tube, mark the length that needs to be cut off.

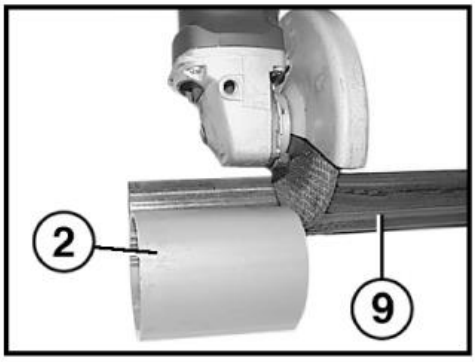
– Remove the outer protection tube and inner protection tube.

– Cut off the marked piece of the outer protection tube.

– Shorten the inner protection tube to the same length as the outer protection tube.



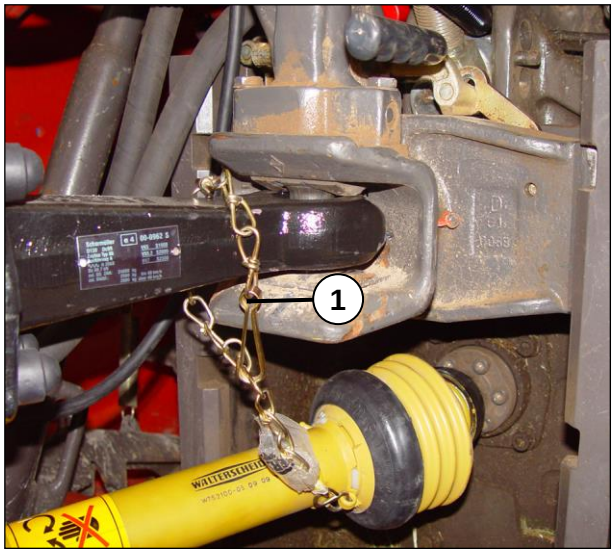
– Hold the removed piece of the outer protection tube (2) above the outer profile tube (8) and cut the outer profile tube (8) at right angles.



– Hold the removed piece of the inner protection tube (2) above the inner profile tube (9) and cut the inner profile tube (9) at right angles.

– Deburr and clean the inner and outer profile tubes.

– Grease the inner profile tube with multi-purpose grease.



– Hook the chains (1) onto a fixed point to ensure that the PTO shaft protection tube is secured so that it cannot rotate with the shaft.

10.2.2 Shortening a telescopic PTO shaft

Special skills and tools are needed to shorten a telescopic PTO shaft. Therefore, this activity must only be carried out by service personnel.

– If the telescopic PTO shaft is too long, arrange for it to be shortened by service personnel.

10.3 Installing the correct nozzles

The mesh size of the pressure filter and the nozzle filter must always be the same as or smaller than the flow cross-section of the nozzles which are used.

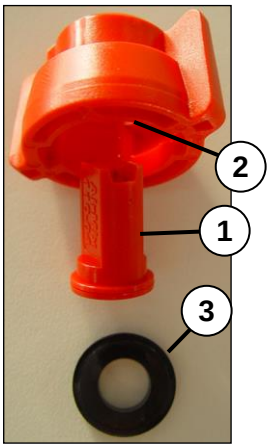
The details from the agricultural chemical manufacturer with regard to suitable mesh sizes must be observed.

The correct nozzles must be selected and installed before spraying.

Only nozzles of the same type and size may be installed on the nozzle holders.

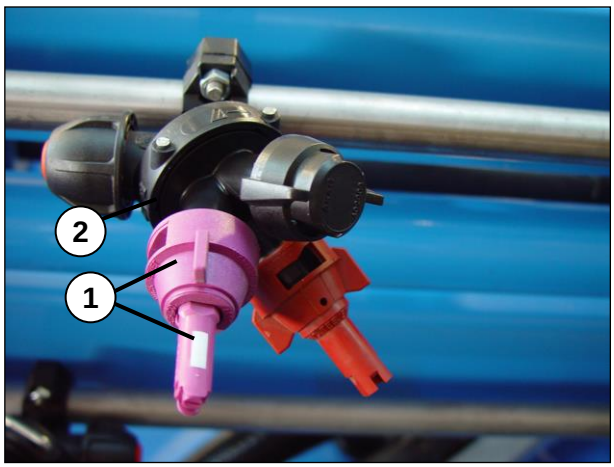
Worn or defective nozzles may only be replaced by nozzles of the same type.

Always follow the dosage table specific to the nozzle.



The nozzles are mounted on the nozzle holders with bayonet caps. It is recommended that a separate set of bayonet caps is used for each set of nozzles.

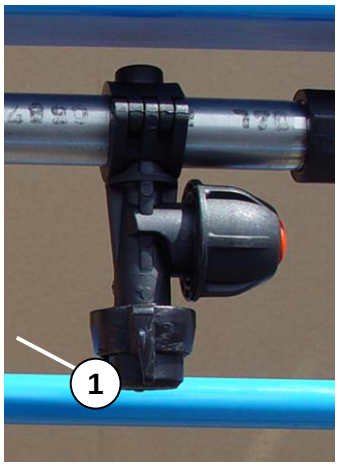
- Be aware that different bayonet caps must be used for each type of nozzle.
- Insert the nozzle (1) into the bayonet cap (2).
- Place the seal (3) onto the nozzle (1).
- Mount the correct nozzles on the nozzle holder (2) with the bayonet caps (1).



Rotating the multi-nozzle holder is only permitted when the nozzles are switched off.

– Adjust the multi-nozzle holder to the correct nozzles.

– If not all nozzles of a segment are required:

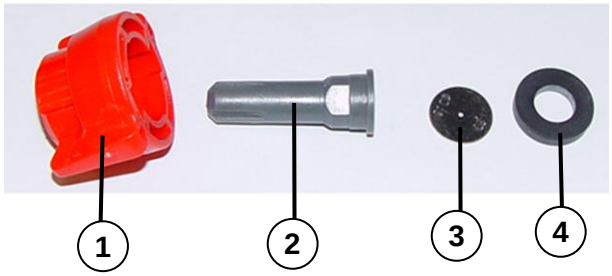


– In case of single nozzle holders, close the individual nozzles with caps (1).

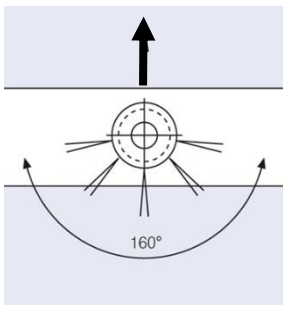
– In case of multiple nozzle holders, place these in the closed position between the individual nozzles.

Five-hole nozzles

The five-hole nozzles are used in the following combination:



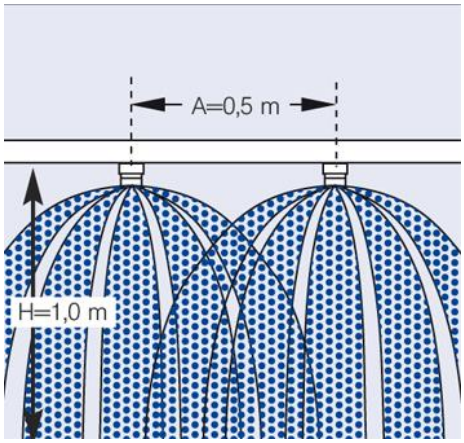
- Bayonet cap (1)
- Five-hole nozzle (2)
- Metering disc (3)
- Seal (4)



– Ensure correct installation.

The five-hole nozzles are correctly installed when the holes are pointing backwards, against the direction of travel.

The arrow shows the direction of travel of the implement.



A = nozzle spacing 0.5 m

H = spraying height 1.0 m

10.3.1 Inspection of nozzle emission

To determine an exact value for the nozzle emission, at least 3 nozzles should undergo volumetric metering. A hose can be slipped over the nozzle for collection or a suitable vessel can be placed by a second person under each nozzle to ensure that nothing flows past the vessel.

Nozzle emission is to be inspected at a standstill.

- Fill the implement with water.
- Operate the pump at the prescribed speed.
- Move the linkage into the spraying position.
- Switch the key to manual operation.
- Set the specified pressure or the application quantity through the control valve.
- Take the set value from the nozzle table.
- Hold the metering apparatus for 30 seconds under the collector hose or immediately under the nozzle. Repeat the procedure on at least two nozzles.
- Switch off the implement.
- Divide collected fluid by number of volumetric meterings = l/min for single nozzle (e.g. 4.5 l : 3 volumetric meterings = 1.5 l/min/nozzle).

If the determined value deviates from the desired specified value, then a correction to the adjustment and another test of the nozzle emission is necessary.

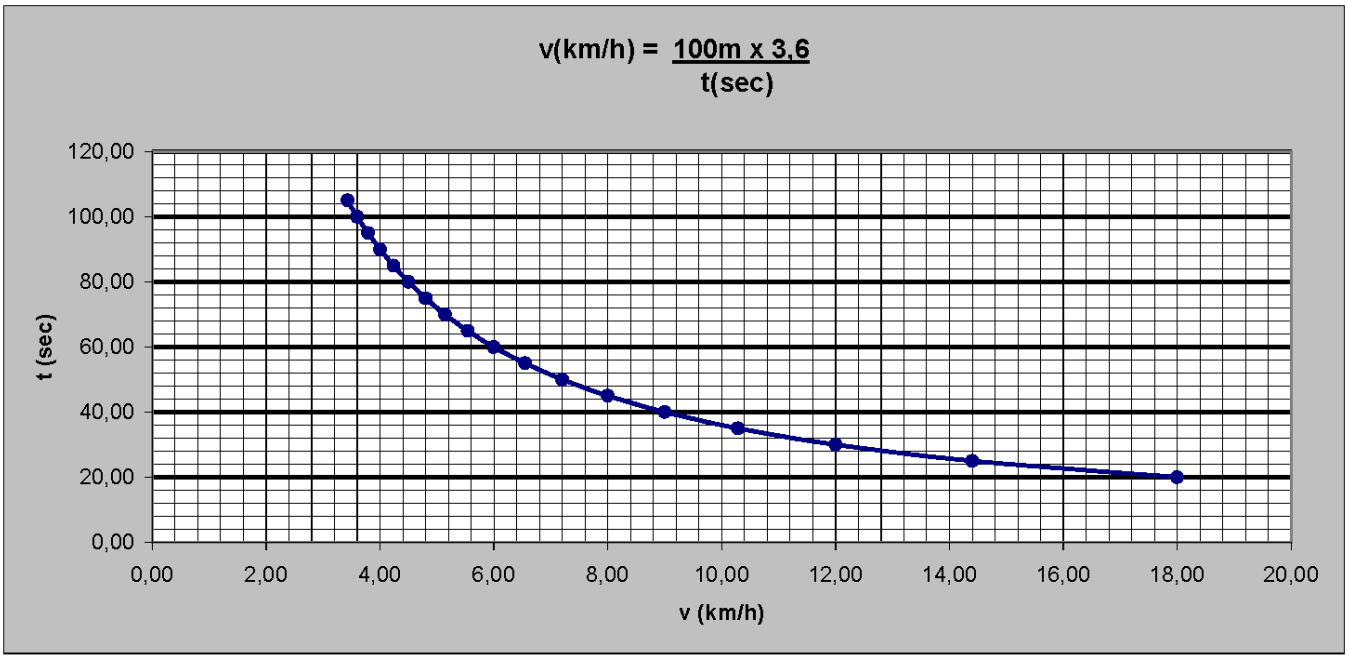
10.3.2 Calibrating the distance pulses

For automatic feeding with the operating terminal, the distance pulses from the implement must be received and calibrated to 100 m.

– See the separate operating instructions for the operating terminal.

10.3.3 Vehicle speed sensing

Speed curve for 100 m distance in accordance with following table



– Measure the 100 m test distance using a measuring tape at the service location.

– Drive over the test distance at specified constant speed and measure the time taken using a stopwatch.

– Enter the determined value into the formula above.

Example: 60 seconds = 100 / 60 x 3.6 = 6 km/h

10.4 Installing the drop hoses

Not shown

Each group of 2 drop hoses has an adapter for a nozzle holder.

The adapters are assembled into modules:

- Module 1 for 2 adapters (= 2 nozzle holders)
- Module 2 for 3 adapters (= 3 nozzle holders)

10.4.1 Preparations

Not shown

– Place the dosage disc in the union nut on the drop hose.

– Place the seal on the dosage disc.

– Fit the drop hose onto the adapter.

– Fit drop hoses at the other free positions in this module.

– Prepare all the modules.

– Place the seal in the bayonet cap.

– Complete all the adapters.

Note about the SEH/RA boom

When drop hoses are installed, the external width of the implement is > 2.55 m.

– Always comply with the national road traffic regulations.

If the implement is supplied with factory-fitted drop hoses, it will be fitted with warning markers as follows:

- Warning foil at the front
- Warning signs at the rear

If drop hoses are retrofitted, corresponding signs must be installed on the implement.

10.4.2 Unfolding the boom

Not shown

– Raise the boom to approx. 1.50 m using the tractor hydraulics.

– Remove the plugs from the holder.

– Plug them into the lift mast underneath the raised boom.

– Secure the plugs using the splint pins.

– Lower the boom onto the plugs using the tractor hydraulics.

10.4.3 Attachment

Preparing the nozzle holders

Boom with single nozzle holders:

– Remove the bayonet caps with the nozzles.

Boom with multiple nozzle holders:

– Turn the nozzle holders to a free position.

– If all the nozzle holder positions are fitted with nozzles, remove one bayonet cap with the nozzle.

Module installation

The modules are different widths:

Module A corresponds to 2 nozzle holders = 4 hoses

Module B corresponds to 3 nozzle holders = 6 hoses

Not shown

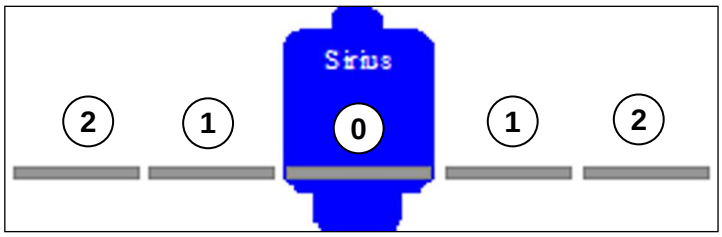
– Install modules A and B on the nozzle holders in the order described, working from right to left.

– Install the modules according to the arm widths.

Examples:

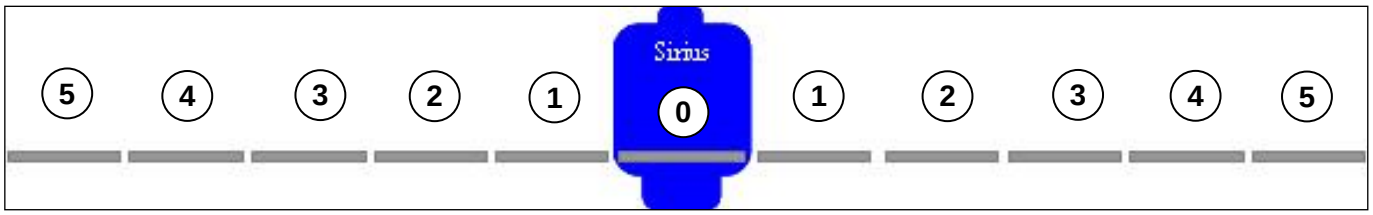
Arm width	Nozzle holder	Modules	Notation	Hoses
3 m	6	2 x module B	(B/B)	12
2.5 m	5	1 x module A 1 x module B	(A/B)	10

HE boom



HE boom	Segments	left			right	
		Arm 2	Arm 1	Arm 0	Arm 1	Arm 2
12	5	B	B/B	B/B	B/B	B
15	5	B/B	B/B	B/B	B/B	B/B

SEH/RA boom



SEH/RA boom	Segments	left						right				
		Arm 5	Arm 4	Arm 3	Arm 2	Arm 1	Arm 0	Arm 1	Arm 2	Arm 3	Arm 4	Arm 5
15	7			A/A	A/A	A/B	A/A	B/A	B/A	A/A		
18	7			B/B	A/B	A/B	A/A	B/A	B/A	B/B		
20/15	9		A/B	A/A	A/A	A/B	A/A	B/A	B/A	A/A	B/A	
21/15	9		B/B	A/A	A/A	A/B	A/A	B/A	B/A	A/A	B/B	
21/17	9		A/A	A/B	A/B	A/B	A/A	B/A	B/A	B/A	A/A	
24	9		B/B	B/B	A/B	A/B	A/A	B/A	B/A	B/B	B/B	
27/21	11	B/B	B/B	A/A	A/A	A/B	A/A	B/A	A/A	A/A	B/B	B/B
27/22	11	A/B	A/B	A/B	A/B	A/B	A/A	B/A	B/A	B/A	B/A	B/A
28	11	A/A	B/B	B/B	A/B	A/B	A/A	B/A	B/A	B/B	B/B	A/A
30	11	B/B	B/B	B/B	A/B	A/B	A/A	B/A	B/A	B/B	B/B	B/B

Not shown

- Raise the boom slightly using the tractor hydraulics.
- Remove the plugs from the lift mast.
- Plug them into the holder.
- Secure the plugs using the splint pins.
- Carry out test spraying with water to check for leaks and correct functioning.

11 OPERATION

11.1 Operation below freezing point

Components of the implement may freeze when spraying below freezing point.

– Only spray under these conditions if:

- sufficient braking of the tractor with the implement is ensured.
- the spraying agent is suitable for these conditions of use.
- appropriate components, e.g. foaming agent are protected against freezing with antifreeze.
- cleaning with fresh water is possible after use.

11.2 Operation with drop hoses

– Ensure that you do not damage the drop hoses when lowering the boom or implement.

– With the boom in the transport position, raise the implement until the drop hoses are not dragging along the ground.

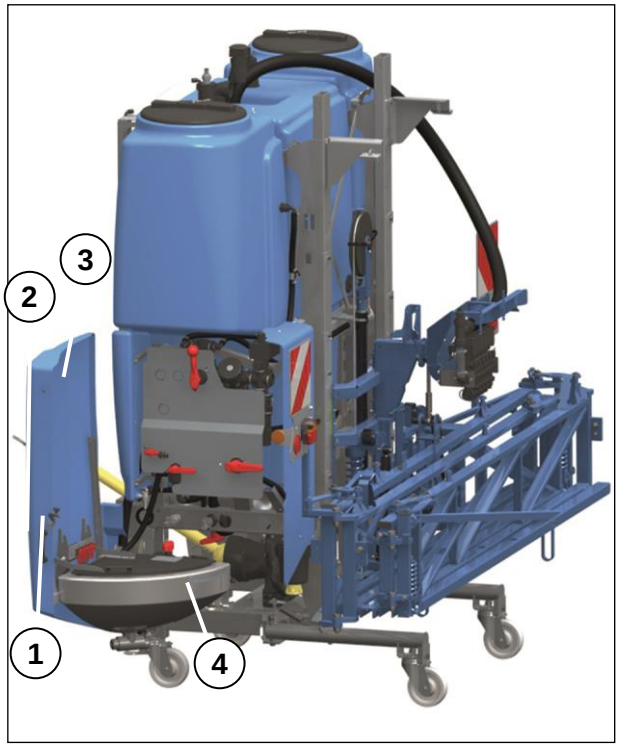
Remove the drop hoses if the implement cannot be raised far enough.

Depending on the ambient conditions, the drop hoses may become permanently distorted if they are left in a bent position.

– Remove the drop hoses if they are likely to remain bent for more than 3 days in the transport position.

11.3 Opening and closing the door

The door has to be opened and closed again to perform various tasks.



Opening the door

– Push the bar (1) downwards.

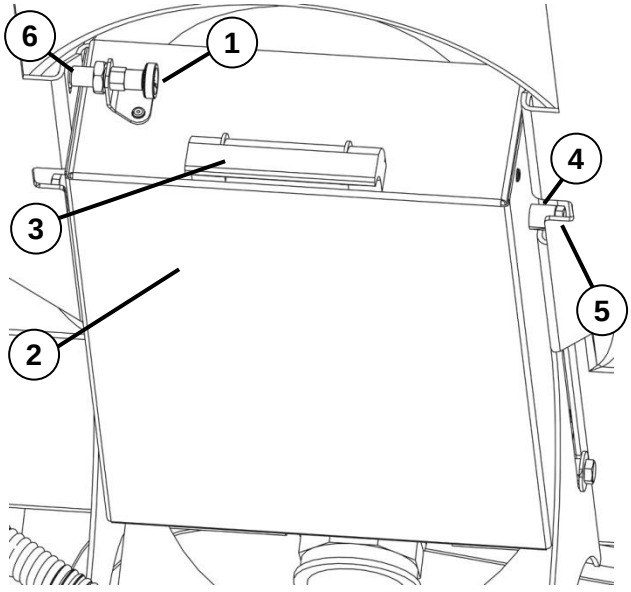
– Open the door (3) using the handle (2).

When the door (3) is opened, the induction hopper is pivoted into the working position at the same time.

Closing the door

– Use the handle (2) to pivot the door (3) to the implement until the bar (1) engages.

11.4 Storage compartment



Opening

– When the bolt (1) is tightened, pull the storage compartment (2) out using the handle (3).

– Fold the storage compartment (2) downwards.

Closing

– Lift the storage compartment (2) using the handle (3).

– Pull the bolt (1).

– Guide the storage compartment (2) over the rail (5) using the guide (4).

– Push the storage compartment (2) all the way in.

– Secure the storage compartment (2) by engaging the bolt into the hole (6).

11.5 Operating terminal

The operating terminal operates and controls the:

- Oil hydraulic functions of the boom.
- Electrical spraying functions.

Implements with the HE boom: electrical spraying functions need a short lead time.

– Switch the valves on or off in good time.

See the separate operating instructions for the implement operating terminal.

11.6 Filling and emptying the hand washing container

WARNING

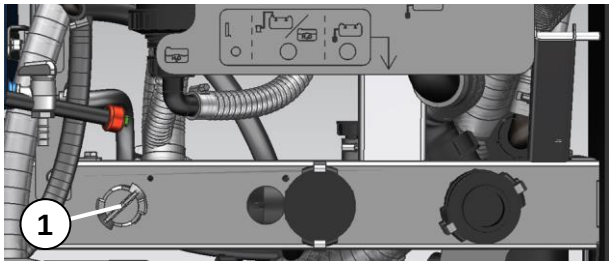
The contents of the hand washing container is only for cleaning purposes.

If the contents of the hand washing container is filled with cleaning or spraying agent, injury may be caused to the user or the environment.

– Only fill the hand washing container with fresh water.

– Do not drink the water from the hand washing container, as it may contain traces of cleaning or spraying agent.

11.6.1 Filling the hand washing container



– Remove the cap (1).

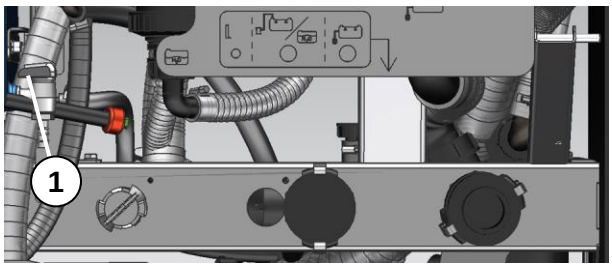
– Connect a filler hose.

– Fill the hand washing container.

– Remove the filler hose.

– Close the cap (1).

11.6.2 Emptying the hand washing container



To wash your hands or to empty the hand washing container:

– Open the valve (1).

After washing your hands or emptying the hand washing container:

– Close the valve (1).

11.7 Filling and emptying the clean water tank

WARNING

The contents of the clean water tank are intended for cleaning purposes only

There is a risk to the user and the environment if the clean water tank is filled with a cleaning agent or spray.

- Only fill the clean water tank with clean water.
- Do not leave the implement unattended during filling.
- Observe all relevant national and country-specific regulations and standards relating to the handling and use of sprays, in particular those concerning water protection zones, filling of implements, etc.

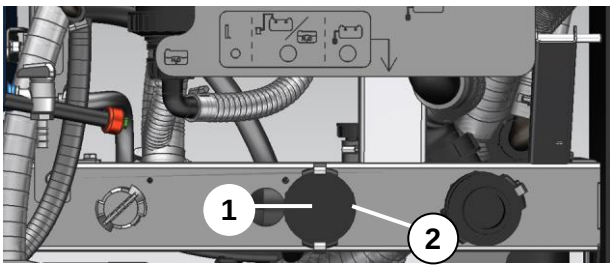
Algae may form in the clean water tank.

- Empty the clean water tank every day.

The volume in the clean water tank is shown on the level indicator (1).

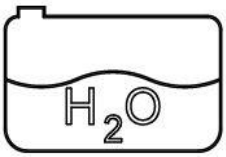
The clean water tank must only be filled when the ventilation/vent valve (2) is functioning correctly.

11.7.1 Filling the clean water tank



– Remove the cap (1).

– Connect the filling hose to the filling connection (2).



– Switch the filling valve to the clean water tank.

The filling speed can be continuously adjusted with the filling valve.

– Fill the clean water tank.

– Monitor filling of the clean water tank on the level indicator.

To prevent the clean water tank from overflowing:

– Stop filling the clean water tank in good time.

OFF

– Switch the filling valve to OFF to close it.

– Remove the filling hose.

– Replace the cap (1).

11.7.2 Emptying the clean water tank

– Empty the clean water tank every day to prevent the growth of algae.

– To empty the clean water tank:

- Spray off the water until the clean water tank is empty.
- Loosen the screw fitting.

11.8 Filling the main tank with water

Prevent the escape or back-flow of spraying agent

Spraying agent must not escape into the environment from the main tank or flow back into the filling pipe when filling the main tank.

NOTICE

Spraying agent which escapes or flows back can damage the environment or affect the health of persons or animals by polluting drinking water.

– Do not leave the implement unattended during filling.

– Observe the applicable national and state regulations.

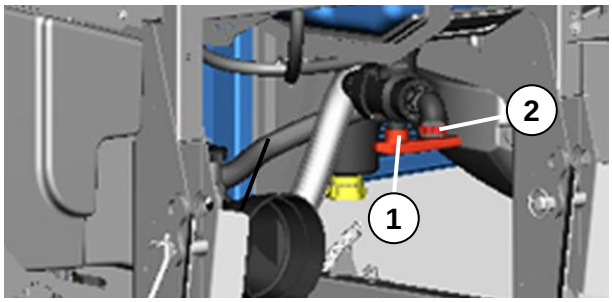
Depending on the spraying agent used, the main tank must be filled with approx. 100 litres of water. Only then may the spraying agent be added. After this, the main tank can be filled further.

The following options are provided for filling the main tank with water:

- filler valve connection
- selector valve connection with 4 options
- suction valve connection

The main tank must only be filled up to the nominal volume.

The excess of the nominal volume above the actual volume is intended to accommodate foam and spraying agent on slopes.



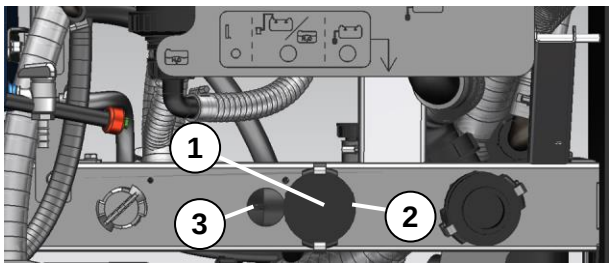
The drain valve (1) must be closed and secured with the cap (2) before filling the main tank.

– Open the door for the following operating functions.

– Close the door again when the work is complete.

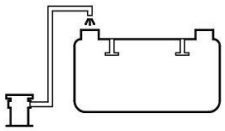
– See the separate operating instructions for the operating terminal for detecting quantities and monitoring functions.

11.8.1 Filler valve connection



– Remove the cap (1).

– Attach the filler hose to the filling connector (2) or (3).



– Switch the filler valve to the main tank.

The filling speed can be continuously adjusted with the filler valve.

– Fill the main tank.

– Monitor the filling of the main tank with the fill level display.

To prevent the main tank from overflowing:

– Stop filling the main tank in good time.

– Switch the filler valve to OFF to close.

– Remove the filler hose.

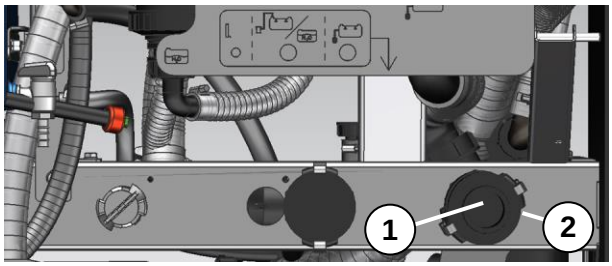
– Fit the cap (1).

Spraying agent can also be pumped into the main tank via the filling connection using an external pump.

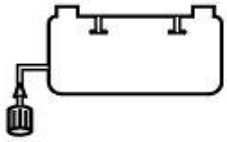
– Observe the relevant national regulations and standards for the handling of spraying agents, in particular with regard to water protection zones, filling of implements etc.

11.8.2 Selector valve connection

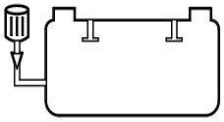
The main tank can be filled via the selector valve with 4 options.



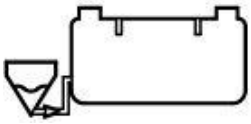
- Remove the cap (1).
- Attach the filler hose to the filling connector (2).
- Hold the filler hose in an external container, or
- attach the filler hose to the intended water supply connection.
- Switch on the pump.
- Operate the pump at a maximum of 540 rpm.



- Switch the selector valve to External, left.



Optionally, liquid can also be sucked from the right-hand side of the implement.



- Switch the distributor valve to induction for maximum filling effect.

The main tank will now be filled.

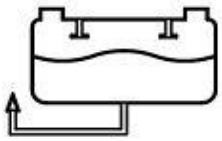
Filling of the main tank must be stopped in good time to prevent it from overflowing.

- Monitor the filling of the main tank with the fill level display.

To prevent the main tank from overflowing:

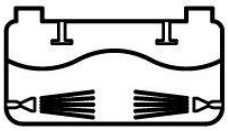
- Stop filling the main tank in good time.

- Remove the filler hose from the external water source, or
- detach the filler hose from the external water connection.
- Remove the filler hose.
- Close the suction connection with the cap.



- Switch the selector valve to the main tank.

- Switch the distributor valve to spraying.

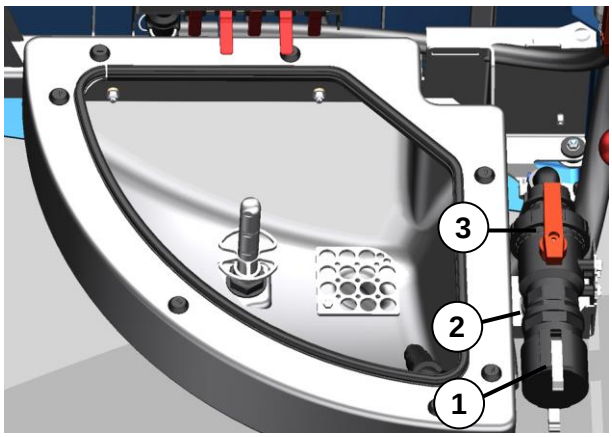


- Switch the agitator control to the required position.

Spraying agent may also be sucked into the main tank via the suction connection.

After filling with spraying agent, the contents of the main tank must be agitated according to the operating instructions for the spraying agent.

11.8.3 Suction valve connection

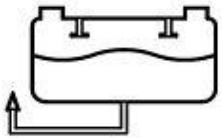


To activate the induction system:

– Fill the main tank with at least 100 l of liquid.

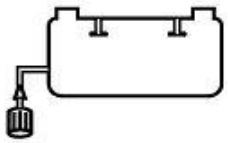
– Remove the cap (1).

– Attach the filler hose to the connector (2).

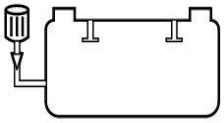


– Switch the selector valve to the main tank.

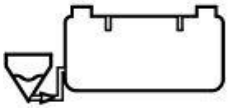
At the same time, or alternatively, liquid can be sucked via the selector valve connection with 4 options:



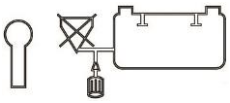
- External, left



- External, right



– Switch the distributor valve to induction.



– Switch the suction valve to External suction.

– Fill the main tank.

The filling speed can be continuously adjusted with the suction valve (3).

– Monitor the filling of the main tank with the fill level display.

To prevent the main tank from overflowing:

– Stop filling the main tank in good time.

– Close the suction valve.

– Remove the filler hose.

– Fit the cap (1).

11.9 Cleaning empty canisters

Spraying agent may cause damage to health and pollute the environment.

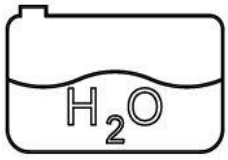
CAUTION

If the canister flushing nozzle is activated without a canister or locking device on the canister flushing nozzle, the user may be sprayed by the canister flushing nozzle. The user and the environment may become contaminated with residual particles of spraying agent.

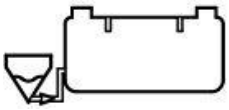
– Deactivate the canister flushing nozzle.

– Secure the canister flushing nozzle when it is not required.

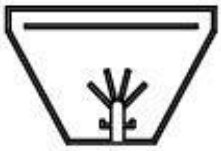
After filling with spraying agent, the empty canisters can be flushed with fresh water.



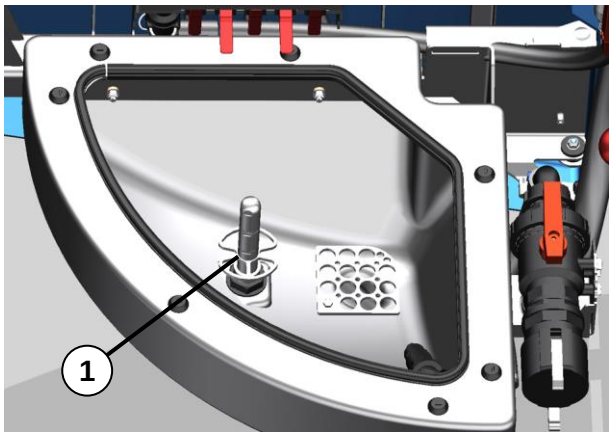
– Switch the selector valve to the fresh water tank.



– Switch the distributor valve to induction.

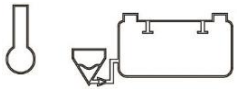


– Open the canister flushing nozzle valve by switching it upwards to ON.



The valve (1) is opened by pressing the valve (1) downwards with the canister.

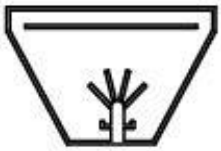
– Flush the empty spraying agent canisters by pressing the valve (1).



– Open the suction valve so that the liquid which flows out of the spraying agent canister is directly sucked up.

The escaping liquid must not overflow from the induction hopper.

After cleaning the spraying agent canister:



– Close the valve of the canister flushing nozzle by switching it down to OFF.

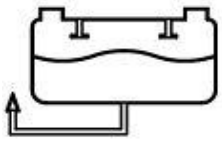
– If necessary, clean further empty canisters.

– Flush the induction hopper as required.

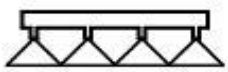
– Suction the induction hopper until empty.

OFF – Close the suction valve.

– Close the cover (1).



– Switch the selector valve to the main tank.



– Switch the distributor valve to spraying.

– Close the door.

In order to use the water in the fresh water tank as effectively as possible, we recommend that for canister cleaning and cleaning of the induction system, fresh water is sucked in with a filler hose via the filler connection of the selector valve with 4 options.

It may be possible to return empty, clean canisters to the supplier of the spraying agent.

– Please ask your spraying agent supplier about this.

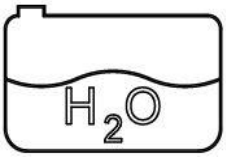
If return is not possible:

– Recycle the empty, clean spraying agent canisters.

11.10 Cleaning gun on the induction hopper

– Observe the relevant standards and regulations for cleaning the implement.

The cleaning gun must only be operated with fresh water.

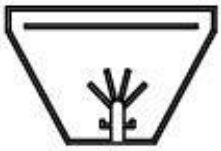


– Switch the selector valve to the fresh water tank.

– Switch on the pump.

– Operate the pump at approximately 400 rpm.

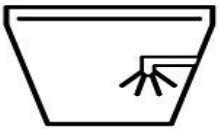
For a maximum cleaning effect of the cleaning gun, the canister flushing nozzle, the edge wetting, the proflow nozzle and the agitator nozzle should be switched off.



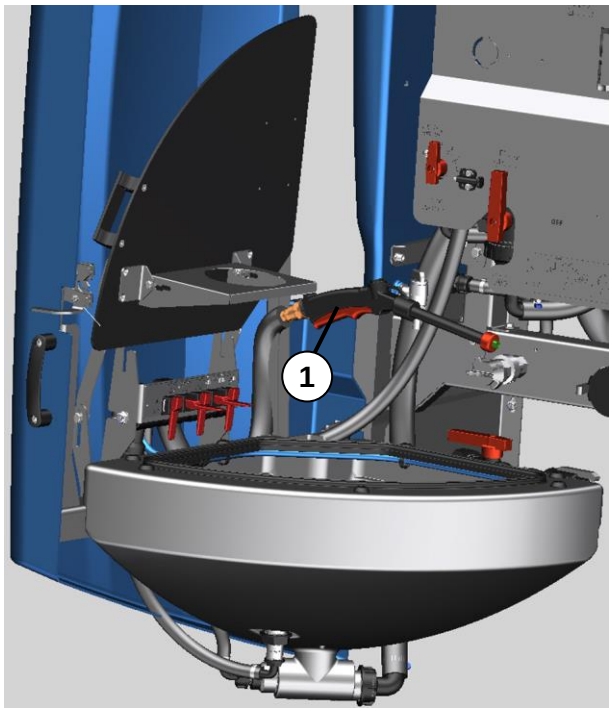
– Close the valve of the canister flushing nozzle by switching it down to OFF.

– Close the edge wetting valve by switching it down to OFF.

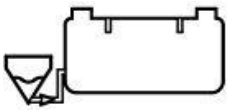
– Close the proflow nozzle valve by switching it down to OFF.



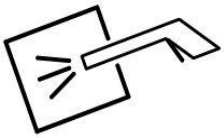
– Close the agitator nozzle valve by switching it down to OFF.



– Remove the cleaning gun (1) from the holder.



– Switch the distributor valve to induction.

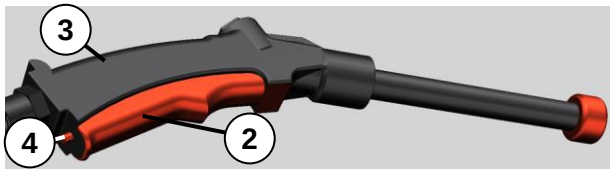


– Open the cleaning gun valve by switching it upwards to ON.

– Press the handle (2) to activate the cleaning gun (3).

Spraying is stopped immediately when the handle (2) is released.

For continuous operation of the cleaning gun:

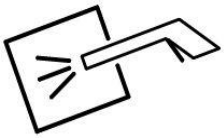


– Press the handle (2) together.
– Push in the plunger (4).
– Release the handle (2).

The cleaning gun is now in continuous operation.

If the handle (2) is pressed again, the plunger (4) is released from the catch and the cleaning gun is deactivated.

– Clean empty canisters or the induction hopper container.



After cleaning:

– Close the cleaning gun valve by switching it down to OFF.
– Place the cleaning gun in the holder (2).

Due to the limited contents of the fresh water tank, we recommend the following for cleaning empty spraying agent canisters and flushing the induction system with fresh water:

– Fresh water is sucked in with a filler hose via the selector valve with 4 options.

11.11 Flushing the induction system

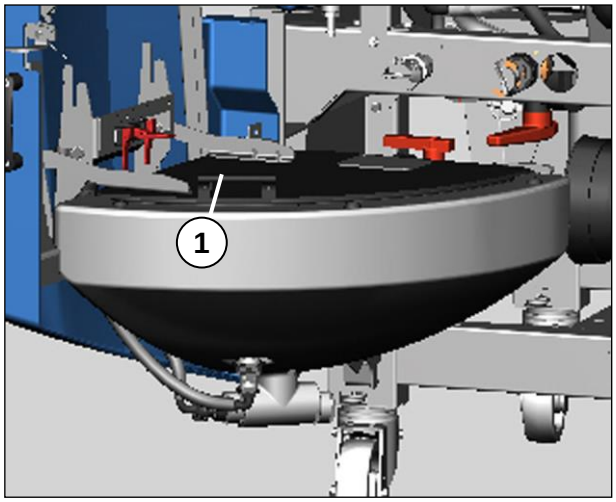
After cleaning empty spraying agent canisters, the induction system can be flushed with fresh water.

CAUTION

Spraying agent may cause damage to health and pollute the environment.

When the cover is open, residual particles of spraying agent may escape and cause a hazard to the operator and the environment.

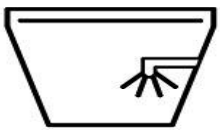
The cover must be kept closed during flushing of the induction system.



– Close the cover (1) of the induction container.

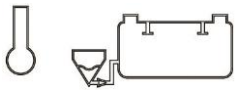
– To flush the induction system, switch the following valves up into the ON position:

- Edge wetting



- Agitator nozzle

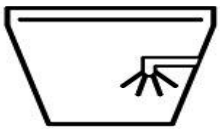
- Proflow nozzle



– Open the suction valve far enough that no liquid can escape from the induction container.

– After flushing the induction system, set the following levers down to the OFF position in order to close the valves:

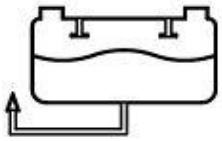
- Edge wetting



- Agitator nozzle

- Proflow nozzle

OFF – Close the suction valve.



– Switch the selector valve to the main tank.

– Switch the distributor valve to spraying.

Due to the limited contents of the fresh water tank, we recommend the following for cleaning empty spraying agent canisters and flushing the induction system with fresh water:

– Fresh water is sucked in with a filler hose via the selector valve with 4 options.

11.12 Folding out the spraying boom

11.12.1 General

DANGER

No persons or animals in the folding area

– Take care that there are no persons or animals in the folding area when folding the spraying boom.

Partial folding of the spraying boom is not permitted. The individual arms must always be completely folded.

The spraying boom must:

- only be folded when stationary.
- only be operated with the swing lock open if the spraying boom is completely folded out or symmetrically folded.

– When folding the spraying boom, ensure that the spraying boom is at a sufficient distance from the ground.

If this is not the case, a sufficient distance must be set, for example, through the following measures:

– Raise the spraying boom further.

– Drive the tractor to a different position (out of the furrow or out of the contour line into the fall line).

– Adjust the spraying boom using the slope compensation (FULL version).

11.12.2 Operation

See the separate operating instructions for the operating terminal.

11.13 Trial operation of the implement

Trial operation of the implement with water is necessary:

- for commissioning
- for familiarisation with the individual control functions
- before the first use with spraying agents
- after maintenance work
- after repairs

Nozzles on the spraying boom

Only nozzles of the same type and size may be installed on the spraying boom.

Worn or defective nozzles may only be replaced by nozzles of the same type.

– Always follow the dosage table specific to the nozzle.

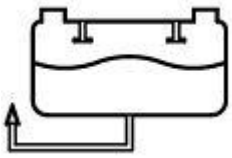
See also the separate operating instructions for the operating terminal.

– Fill the implement with water.

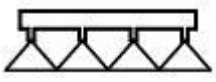
– Fold out the spraying boom.

– Switch on the pump.

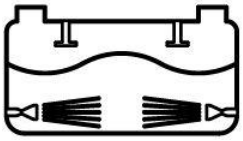
– Operate the pump at a maximum of 540 rpm.



– Switch the selector valve to the main tank.



– Switch the distributor valve to spraying.



– Switch the agitator control to maximum agitation.

A trial spraying run should now be performed.

During trial operation, check that all components are functioning correctly and that there are no leaks.

11.14 Boom lighting

– Switch off the boom lighting:

- during transport on public roads
- if other people could be dazzled

See also the separate operating instructions for the operating terminal.

11.15 All-round light

– Observe the applicable national regulations for use of the all-round light.

See also the separate operating instructions for the operating terminal.

11.16 Working with the implement

Do not start work until the sprayer has been properly calibrated and the spray has been mixed or dissolved uniformly. When working with the sprayer, always follow:

- The spray manufacturer’s instructions
- The nozzle manufacturer’s instructions
- The information in these operating instructions
- Other regulations relating to the handling and use of sprays

For operation, see also the separate operating instructions for the operating terminal.

The pumps should not be allowed to run dry for a long period. The permitted pump operating speed is 540 rpm. The maximum suction depth with a filler hose is 3.00 m.

If the spray produces too much foam during filling and sprayer operation:

- Reduce the agitation level,
- Reduce the chemical inductor suction level until a minimum liquid level of 5 cm remains
- Use an anti-foaming agent if this is permitted by the spray manufacturer, or
- Do not fill the main tank completely.

The individual sprays are mixed and the concentration is maintained by recirculation with the agitator.

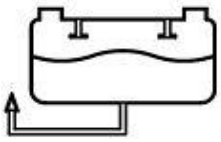
The agitation level should be set according to the instructions for use of the spray in question.

The fill level of the main tank is shown on the level indicator.

– Configure the operating terminal according to the type of spraying required.

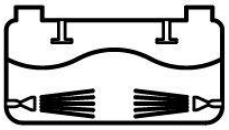
– Unfold the boom.

– Before spraying, adjust:
  - The pendulum bolt, see «Pendulum suspension and slope compensation, page 85»
  - The turnbuckle, see «Pendulum suspension and slope compensation, page 85»



– Switch the selector valve to the main tank.

– Switch the distribution valve to spraying.



– Switch the agitator controller to the agitation intensity required.

– Switch the pump on.

– Operate the pump at max. 540 rpm.

– Start spraying.

– Constantly check:

- The safety zone around the sprayer
- The monitoring displays on the operating terminal
- Sprayer performance

To prevent drift, it is generally recommended that the outer field boundary should be sprayed first using low-drift nozzles.

– Use low-drift nozzles or boundary nozzles in this area

or

– Switch off the outer nozzle on each side.

The spray passes within the field can then be carried out using application-specific nozzles.

– Switch off the nozzles before turning on the headland.

If you notice pressure fluctuations as the main tank empties:

– Stop spraying.

– Refill the sprayer or

– Clean the sprayer.

– When you have finished spraying for the day, or before a break in spraying, flush the sprayer with clean water.

– Check the sprayer in the event of a malfunction.

11.17 Folding in the spraying boom

DANGER

No persons or animals in the folding area

– Take care that there are no persons or animals in the folding area when folding the spraying boom.

Partial folding of the spraying boom is not permitted. The individual arms must always be completely folded.

The spraying boom may only be folded when stationary.

– When folding the spraying boom, ensure that the spraying boom is at a sufficient distance from the ground.

If this is not the case, a sufficient distance must be set, for example, through the following measures:

– Raise the spraying boom further.

– Drive the tractor to a different position (out of the furrow or out of the contour line into the fall line).

– Adjust the spraying boom using the slope compensation (FULL version).

In the FULL version, we recommend bringing the spraying boom to the middle position before folding in the spraying boom.

HE spraying boom:

In order to maintain a transport width of 3 m, we recommend transportation with the swing lock closed.

– Observe national regulations for lighting and identification.

11.17.1 Operation

See the separate operating instructions for the operating terminal.

11.18 Spraying with drag hoses

– Fit the drag hoses.

In order for the drag hoses to better penetrate the crop instead of being pulled over it, the speed of travel should be kept as low as possible.

– Only use metering discs of the same size.

11.19 System cleaning with partially filled main tank

In case of longer interruptions to spraying, the contents of the main tank must be circulation pumped or drained into another external container.

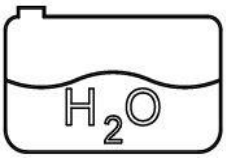
If the implement cannot be sprayed until empty in the event of short interruptions to spraying, the system must be cleaned with the tank partially filled.

– When actuating valves and switches, take care that no fresh water flows into the main tank and alters the concentration of the spraying agent.

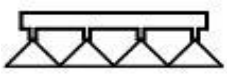
– See also the separate operating instructions for the operating terminal.

– Switch off the pump.

0 – Switch the agitator control to 0.



– Switch the selector valve to the fresh water tank.



– Switch the distributor valve to spraying.

– Switch all nozzles on.

– Switch on the pump.

– Spray about 50% of the contents of the fresh water tank onto an unsprayed area.

CAUTION

– Take care that the spraying boom is switched off, for example at the headland, only by switching off the pump.

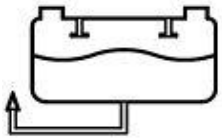
When switching off nozzles with the operating terminal, fresh water may be pumped into the main tank and alter the concentration of the spraying agent.

– Switch off the pump after cleaning the system with a partially filled tank.

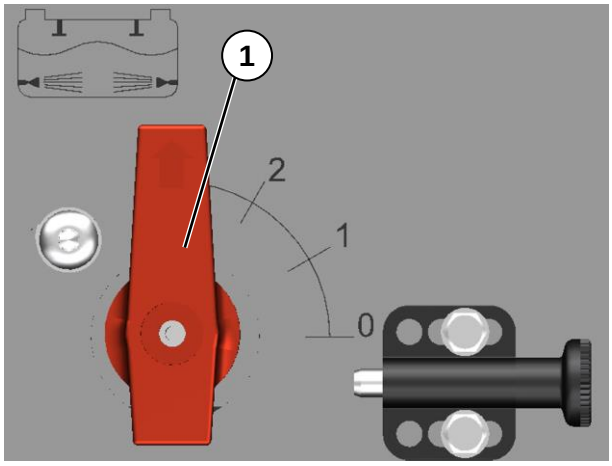
– Switch off the nozzles with the operating terminal.

– Refill the fresh water tank, see «Filling the clean water tank, page 129»

If you wish to continue spraying after an interruption and cleaning of the system with a partially filled main tank, the contents of the main tank must first be intensively agitated by circulation pumping.



– Switch the selector valve to the main tank.



– Switch the agitator control to maximum agitation (1).

– Observe the information in the instructions for the use of the spraying agent.

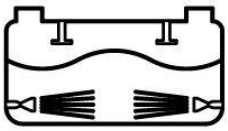
– Switch the distributor valve to spraying.

Version with intensive agitation

– Switch the distributor valve to the options.

- Switch the intensive agitator valve upwards to activate the intensive agitator.
- Switch on the pump.
- Operate the pump at a maximum of 540 rpm.
- Agitate the contents of the main tank for at least 10 minutes.

Before spraying, settled spraying agent must be completely dissolved and evenly mixed again.



After agitation:

- Switch the agitator control to the required agitation position.

- Switch the distributor valve to spraying.

Version with intensive agitation

- Switch the intensive agitator valve downwards to deactivate the intensive agitator.

- Switch the distributor valve to spraying.

Work can now be resumed.

12 CLEANING

12.1 General

WARNING

Spraying agent must not be drained on the edge of paths or passed into the sewage system.

Collected spraying agent must be transferred to the prescribed waste disposal facility (enquire from the relevant official agency) or re-used (after consultation with the relevant manufacturer of the spraying agent).

The service life and reliability of the implement essentially depends on the time of effect of the spraying agent on the materials of the implement. The mixed spraying agent must be used as quickly as possible in order to reduce the time of effect. If longer times are foreseeable, e.g. overnight or after rain, the spraying agent should be pumped out or drained.

The implement must be completely cleaned after work and before winter storage.

Cleaning comprises the following steps:

- Emptying the main tank
- Emptying the fresh water tank
- Completely emptying the implement
- Internal cleaning
- External cleaning
- Cleaning the filter

12.2 Emptying the main tank

12.2.1 General

If the contents of the main tank cannot be properly sprayed, the spraying agent must be appropriately disposed of.

To empty the main tank:

- The spraying agent must be pumped into an external container.
- The remaining contents of the main tank must be drained.

Pumping and draining from the main tank is also required if spraying agent remains in the main tank during breaks in spraying and cannot be agitated in the main tank due to settling or agglutination.

See also the separate operating instructions for the operating terminal.

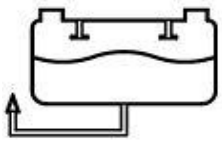
12.2.2 Pumping residual quantities from the main tank

If the implement is equipped for circulation pumping, the contents of the main tank can be pumped into another container.

– Switch the nozzles on with the operating terminal.

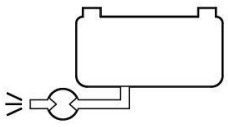
– Remove the cap.

– Attach a hose for pumping.



– Switch the selector valve to the main tank.

– Switch the distributor valve to the options.



– Switch the circulation pumping valve upwards to activate the circulation pumping.

The contents of the main tank can now be pumped into another container.

– Switch on the pump.

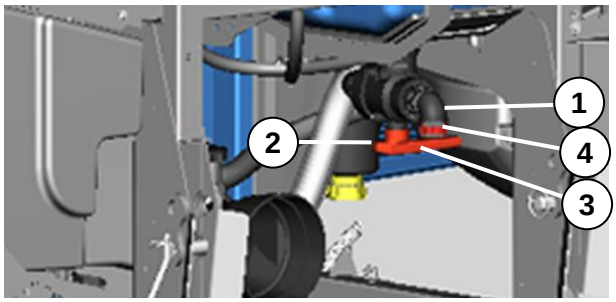
– Operate the pump at the specified speed.

After pumping:

- Switch off the pump.
- Uncouple the pumping hose.
- Close the connection with the cap.
- Carry out internal cleaning.

12.2.3 Draining spray fluid out of the main tank

- Before draining the spray fluid, uncouple the implement from the tractor.
- Drive the tractor forwards for a few metres.
- If installed, loosen the fastening on the divider and remove the divider.



- Place a collecting tray under the drain connection (1).
- Close the drain valve (2) by moving the lever (3) to the horizontal position.
- Remove the cap (4).

If you need to drain large volumes out of the main tank, an external pump with a suction hose with 1 1/2" external thread can be connected directly to the drain connection.

- Open the drain valve (2) by moving the lever (3) to the flow direction.
- Drain off the contents of the main tank.

- Close the drain valve (2) by moving the lever (3) to the horizontal position.
- Fit the cap (3).
- Pull the cap to ensure that the connection is watertight.
- Carry out internal cleaning.

If necessary:

- Carry out external cleaning.
- Carry out filter cleaning.
- Install the divider.

12.3 Emptying the fresh water tank

The fresh water tank can be emptied by:

- draining
- circulation pumping
- spraying

If there are traces of spraying or cleaning agent in the fresh water tank, the contents of the fresh water tank may only be sprayed on the last area to be sprayed. Alternatively, the contents can be drained into a separate container and then re-used or properly disposed of.

12.3.1 Draining

To empty the fresh water tank without leaving any residues, proceed as follows:

- Uncouple the implement from the tractor.
- Drive the tractor forwards a few metres.
- Place a collecting container under the implement.
- Loosen the screw connection at the fresh water tank drain.
- Remove the hose.The fresh water tank will empty automatically.
- After emptying, attach the hose and the screw connection.

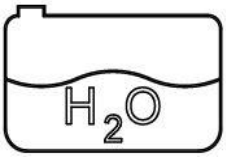
12.3.2 Circulation pumping

– See also the operating instructions for the operating terminal.

– Switch off the nozzles with the operating terminal.

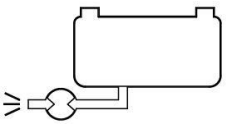
– Remove the cap.

– Attach a hose for pumping.



– Switch the selector valve to the fresh water tank.

– Switch the distributor valve to the options.



– Switch the circulation pumping valve upwards to activate the circulation pumping.

The contents of the fresh water tank can now be pumped into another container.

– Switch on the pump.

– Operate the pump at the specified speed.

After pumping:

– Switch off the pump.

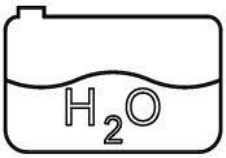
– Uncouple the hose.

– Close the connection with the cap.

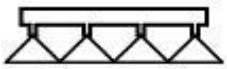
12.3.3 Spraying

The fresh water tank must only be emptied by spraying if the implement is fully coupled to the tractor.

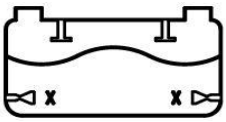
– Fold out the spraying boom.



– Switch the selector valve to the fresh water tank.



– Switch the distributor valve to spraying.



– Switch the agitator control to minimum agitation.

0

– Switch on the pump.

– Operate the pump at a maximum of 540 rpm.

– Switch the nozzles on with the operating terminal.

– Spray the fresh water tank onto the last sprayed area until the tank is empty.

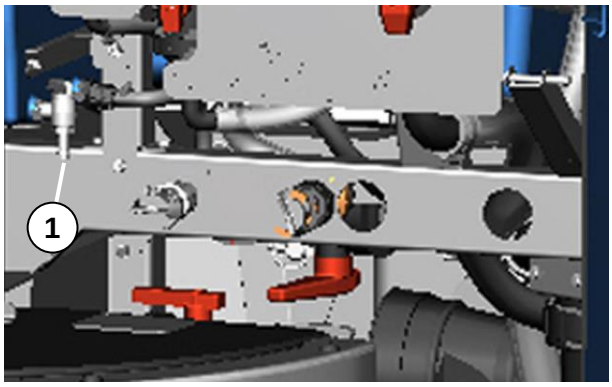
– Adjust the implement for the next work.

See also the separate operating instructions for the operating terminal.

12.4 Emptying the hand washing container

CAUTION

The hand washing container does not contain drinking water.



– Open the door

– Open the drain valve (1).

If the hand washing container is empty:

– Close the drain valve (1).

– Close the door.

12.5 Internal cleaning

12.5.1 General

Internal cleaning must only be carried out with fresh water.

After spraying, the damp inner walls of the main tank must be flushed with fresh water. The flushing water must then be agitated and sprayed onto the last area which was sprayed.

Cleaning agents may be required, depending on the spraying agent and the later use of the implement.

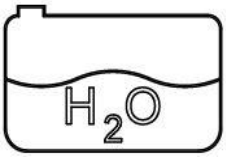
See the instructions for use of the spraying agent and cleaning agent used.

See also the separate operating instructions for the operating terminal.

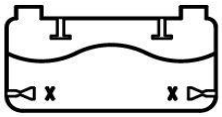
– Switch off all nozzles with the operating terminal.

– Switch on the pump.

– Operate the pump at 400 rpm.

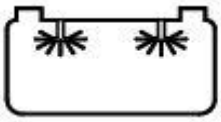


– Switch the selector valve to the fresh water tank.



– Switch the agitator control to 0.

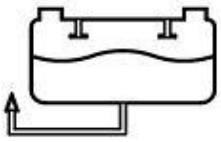
0



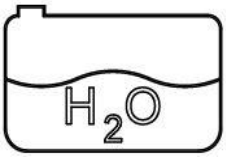
– Switch the distributor valve to internal cleaning for 5 seconds.

– If necessary, add cleaning agent to the main tank.

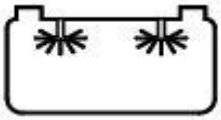
– Switch the distributor valve to spraying for approximately 1 minute.



– At the same time, switch the selector valve to the main tank.

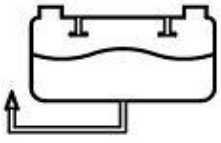


– Switch the selector valve to the fresh water tank for 5 seconds.

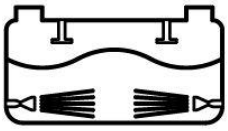


– At the same time, switch the distributor valve to internal cleaning for 5 seconds.

– Switch the distributor valve to spraying for 10 seconds.



– Switch the selector valve to the main tank.



– Switch the agitator control to 2.

2

– Agitate the contents of the main tank for approx. 2 minutes.

– Spray the contents of the main tank onto the last sprayed area:

  - with reduced spraying pressure
  - with increased speed of travel

To reduce the spraying pressure:

– Switch the operating terminal on:

- manual pressure setting
- minimum spray pressure

– Also switch all segment valves during spraying.

– Repeat the internal cleaning cycle at least twice.

12.6 External cleaning

The implement must be externally cleaned as necessary.

External cleaning should ideally be carried out on the last area treated.

Only fresh water may be used for external cleaning.

The cleaning water should not seep into the groundwater or sewer systems.

Cleaning must only be carried out on an unsealed and planted area.

– Never spray directly onto electrical components.

– Wear suitable protective gear when carrying out external cleaning.

– Use appropriate cleaning agents.
– Observe the instructions for use of the spraying agent and the cleaning agent.

Cleaning removes unwanted dirt and prevents accidental dripping/drainage of adhered spraying agent.

The external surface of the implement can be cleaned with a spray gun.

The following must be observed when cleaning:

- The instructions of the spraying agent manufacturer.
- Regulations for handling spraying agents.
- These operating instructions.

External cleaning is definitely required:

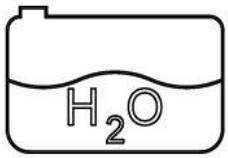
- If the implement is contaminated with spraying agent
- When changing the spraying agent, if the spraying agent has an effect on the next area to be sprayed
- Before winter storage
- Before inspection of the implement

See also the separate operating instructions for the operating terminal.

– Switch off the nozzles with the operating terminal.

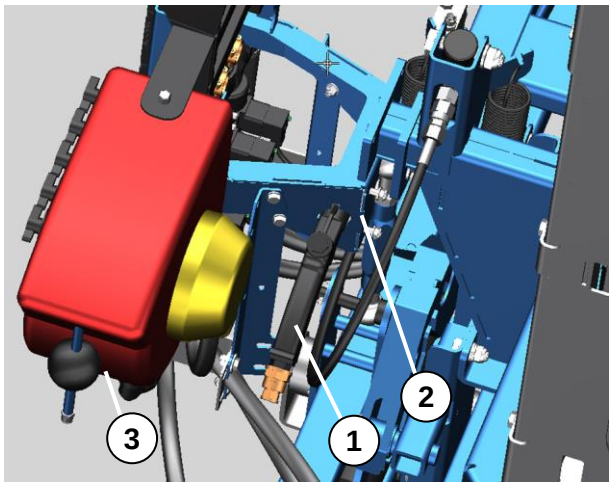
– Switch on the pump.

– Operate the pump at 400 rpm.



– Switch the selector valve to the fresh water tank.

– Switch the distributor valve to external cleaning.

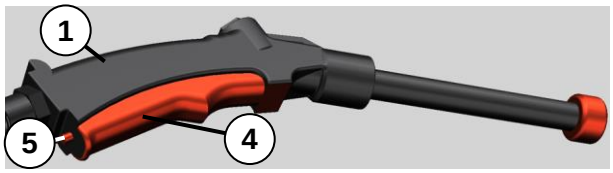


– Remove the cleaning gun (1) from the holder (2).

– Remove the required length of hose from the hose reel (3).

– Press the handle (4) to activate the cleaning gun (1).

Spraying is stopped immediately when the handle (4) is released.



For continuous operation of the cleaning gun:

– Press the handle (4) together.

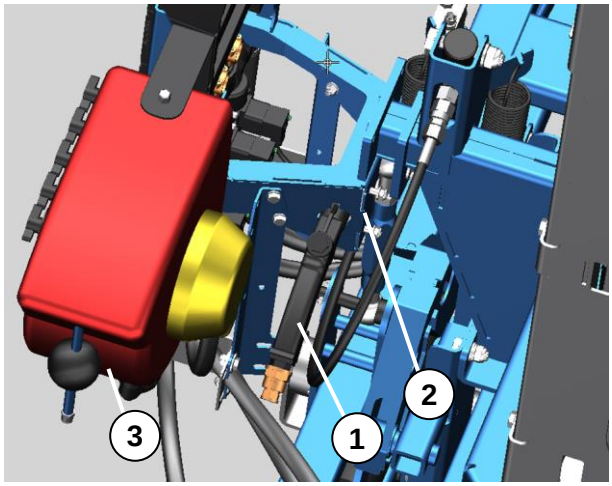
– Push in the plunger (5).

– Release the handle (4).

The cleaning gun is now in continuous operation.

If the handle (4) is pressed again, the plunger (5) is released from the catch and the cleaning gun is deactivated.

– Carry out external cleaning.

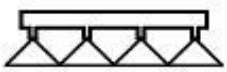


After external cleaning:

– Jerk the hose with the spray gun and then release it again directly.

The hose automatically winds onto the hose reel (3).

– Place the spray gun (1) in the holder (2).



– Switch the distributor valve to spraying.

– Adjust the implement for the next work.

12.7 Cleaning the filter

DANGER

There is danger of contact with agricultural chemicals when cleaning the filter.

– Always wear suitable protective gear when carrying out cleaning.

12.7.1 General

When the implement is filled, the filter may only be cleaned when the pump is switched off. Escaping liquid must be collected in a collection container.

– Before cleaning, place a collection container (1) under the filter.

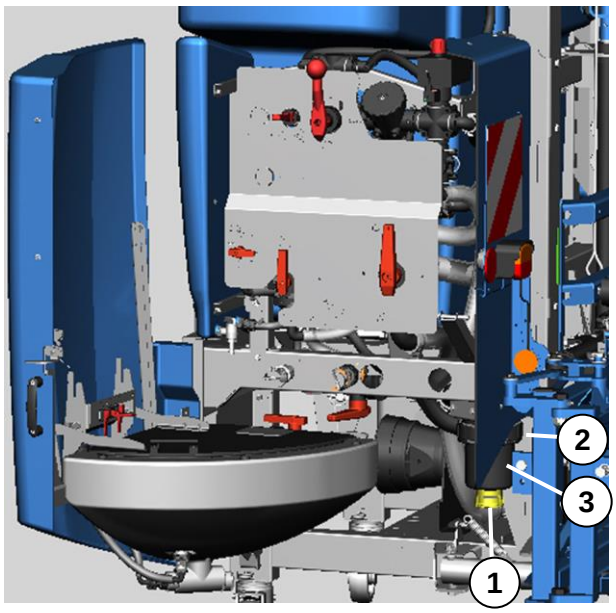
– Clean the filter regularly.

– Open the door when cleaning the filter.

– Adjust the implement for the further intended functions after cleaning the filter.

– Dispose of the dirt particles and residual liquids removed from the filters in an environmentally friendly manner.

12.7.2 Suction filter

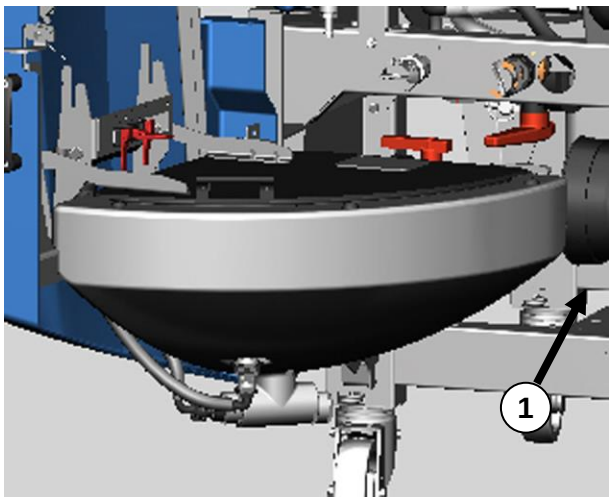


- Remove the lock (1).
- Loosen the union nut (2).
- Remove the suction filter (3).
- Clean the individual components of the suction filter with water and a soft brush.
- Fit the suction filter (3).
- When fitting, take care that the seal is correctly inserted and is not crushed.

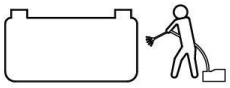
12.7.3 Pressure filter

In order to remove particles of dirt from the system, we recommend that the agitator control is closed before the last spraying run of the day.

- Remove and clean the pressure filter after the last spraying run of the day.

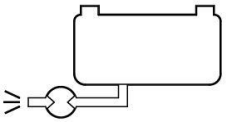


- Place a collection container under the drain line of the pressure filter (1).

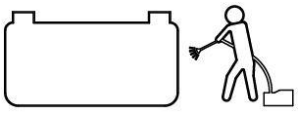


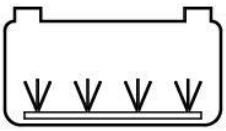
- Close the external cleaning valve.

– Close the intensive agitator valve.

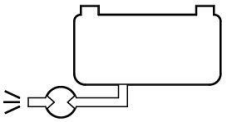


– Close the external cleaning valve





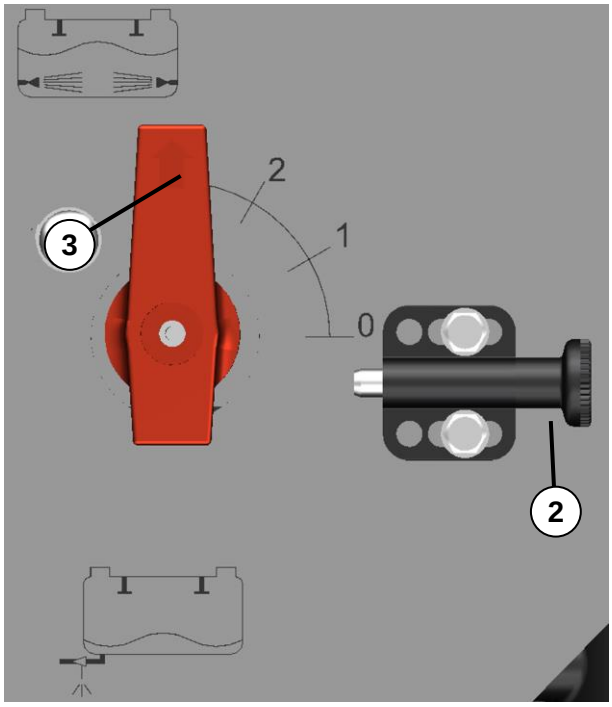
– Switch the distributor valve to the options.



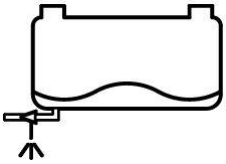
See also the separate operating instructions for the operating terminal.

– Switch the operating terminal to manual pressure setting.

– Reduce the spraying pressure until the control valve is completely closed (approximately 15 seconds).

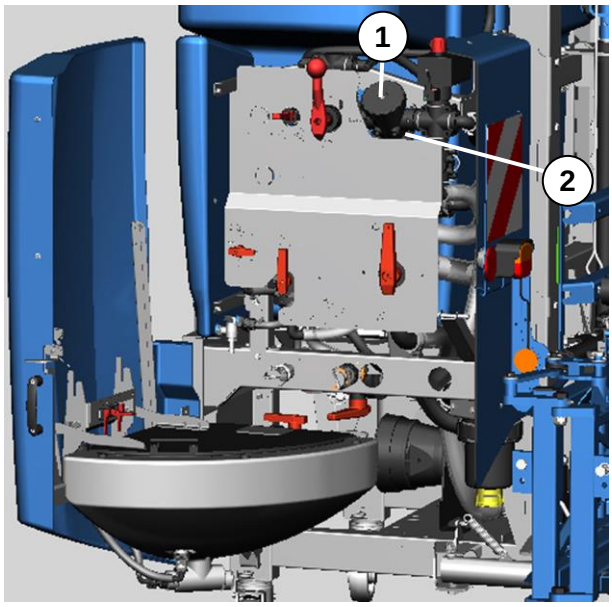


– Pull the bolt (2).



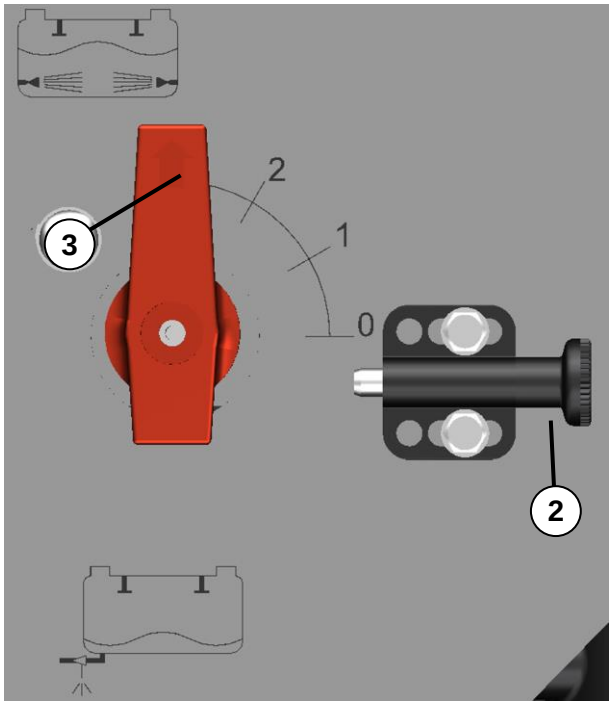
– When the bolt (2) is tightened, switch the agitator control (3) to empty filter.

The pressure filter can now be removed.



– Loosen the union nut (1).
– Remove the guide with the filter from the pressure filter (2).
– Remove the filter from the guide.
– Clean the individual components with water and a soft brush.
– Remove the contamination from the pressure filter (2).

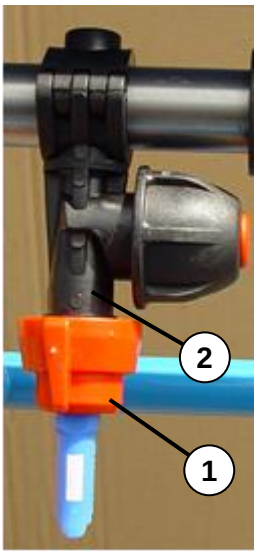
– Install the pressure filter (2).
– When installing the pressure filter (2), ensure that the filter and guide are in the prescribed installation position.



To close the pressure filter drain line and set the intended agitation intensity:

– Pull the bolt (2).
– When the bolt (2) is tightened, switch the agitator control (3) to the intended agitation intensity.

12.7.4 Nozzle filter



- Switch off the nozzles with the operating terminal.
- Remove the bayonet cap (1) with the nozzle.
- Remove the nozzle filter from the nozzle holder (2).
- Clean the nozzle filter.

13 DETACHING THE IMPLEMENT

13.1 General information

Lowering or lifting the three-point linkage

WARNING

Uncontrolled movements, incorrect setting or operation of the three-point linkage may result in injury to the operator.

– Before detaching the implement, switch the tractor hydraulics to position control.

– Take suitable measures to ensure that the implement cannot be lowered during detachment.

WARNING

Risk of implement overturning

– Fold out the stands to prevent the implement from overturning.

Before the implement is uncoupled

- all tanks must be empty.
- the spraying boom must be in the transport position.

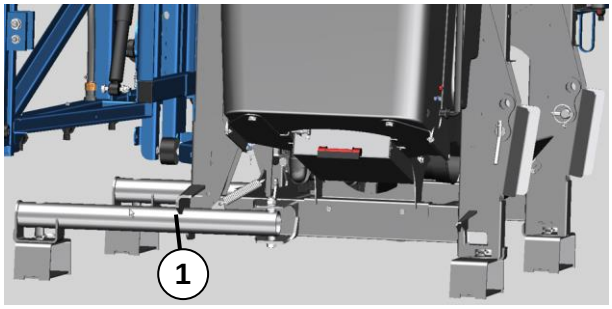
– Only park the implement on a surface which as far as possible complies with the following requirements:

- level
- firm
- ventilated
- dark
- roofed

13.2 Before the implement is detached

– Empty all containers properly and completely.

– Fold the spraying boom into the transport position.



– Pivot the stand (1) fully backwards.

13.3 Attaching transport rollers or receptacles

WARNING

When transport rollers or receptacles are attached, the implement may only be parked:

- with empty containers.
- on level, firm ground.

Pushing the implement with transport rollers may only be done by hand.

The transport rollers or receptacles can be fitted before detaching the implement.

13.3.1 Front transport rollers

– Turn the bolts of the transport rollers with the brake in the direction of travel.

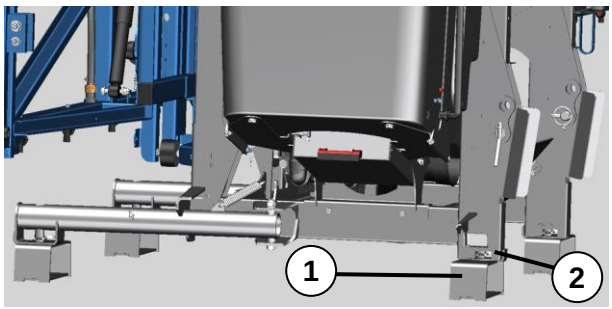
– Fit the transport rollers (1) and secure them with the splints (2).

– Activate the brakes(3).

13.3.2 Rear transport rollers

- Turn the bolts of the transport rollers with the anti-rotation device across the direction of travel.
- Ensure that the anti-rotation device of the transport rollers is inserted between the longitudinal profiles of the stands.
- Fit the transport rollers and secure them with the splints.

13.3.3 Receptacles for forklift truck tines



- Fit the receptacles for forklift truck tines (1).
- Secure them with the splints (2).

13.4 Detaching the implement

– Disconnect the top link.

  With QuickConnect:

  - Pull the cable and at the same time lower the implement right down to the ground using the three-point linkage.
    CAUTION: When you stop pulling, there is a risk of breakage as the coupling system is not released.
  - Release the cable.

– Disconnect the lower links.

– Pull the cable and at the same time drive approx. 30 cm forwards.

– Release the cable.

– Secure the tractor to prevent it from rolling away.

– Switch off the tractor engine.

– Remove the ignition key.

– Release the pressure in the hydraulic spool valves.

– Disconnect the PTO shaft from the tractor and place it in the holder on the implement.

– Disconnect the hydraulic lines and secure them in the holder on the implement.

– Disconnect the electronic lines and place them in the holder on the implement.

– Move the top link coupling point into the resting position.

– Pull the handle forwards as far as the stop.

– Swivel the top link coupling point backwards as far as the stop.

– Release the handle and let go of the top link coupling point.

– The top link coupling point engages in the locking device.

14 WINTER STORAGE

WARNING

- Only use bio-degradable antifreeze without alcohol.
- Do not use liquid fertiliser.
- Observe the instructions for use and the safety data sheet of the antifreeze which is used.

Light (UV radiation) and the effects of weather accelerate the ageing process of the implement materials.

- Park the implement in an area which is as dark as possible and is covered by a roof.

- For information on how to clean the implement, see«Cleaning, page 152».

To prevent frost damage to components after cleaning:

- Park the implement in a frost-free area which is as dark as possible and is covered by a roof.

If it is not possible to park in a frost-free area:

- Empty and dry all components which carry liquids.
- Treat all components which carry liquids with antifreeze.
- After preparing for the winter, park the implement in a darkened area. Light (UV radiation) accelerates the ageing of plastics.
- Store the operating terminal in a dry, frost-free place.

To prepare the implement for winter storage, the contents of the fresh water tank must be fully drained.

14.1 Before the start of the season

If the implement has been put into winter storage with antifreeze, the antifreeze must be drained into a collection vessel before the next spraying session.

The drained antifreeze can:

- be reused for the next winter storage or
- be appropriately recycled.

– When doing this, observe the information for the use of the antifreeze.

– Carry out cleaning after draining the antifreeze.

– Carry out a test spray run before using spraying agent.

15 MAINTENANCE AND REPAIRS

15.1 Special safety instructions

15.1.1 General

WARNING

Risk of injury when carrying out maintenance and repair work

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

- Use suitable tools, suitable climbing aids, platforms and support elements.
- Always wear protective clothing.
- Carry out maintenance and repair work only on an extended and deposited device or on a device secured by suitable support elements to prevent it from extending or dropping.

15.1.2 Personnel qualifications

CAUTION

Risk of accident due to inadequate qualifications of the maintenance and repair personnel

Maintenance and repair work require appropriate training.

All maintenance and repair work may only be carried out by trained and instructed personnel.

15.1.3 Protective equipment

CAUTION

Risk of accident due to working without protective equipment

There is always an increased risk of accidents when carrying out maintenance work and repairs.

- Always wear appropriate protective equipment.

15.1.4 Immobilise the implement for maintenance and repairs

Risk of accidents when tractor starts up

Injuries may occur if the tractor starts moving during maintenance and repair work.

WARNING

- Switch off the tractor engine before carrying out any work on the implement.
- Secure the tractor against unintentional starting.
- Remove the ignition key.
- Affix a warning sign in front of the implement and in front of the tractor to advise outsiders of maintenance work.
- Secure the tractor against rolling away using wheel chocks.

15.1.5 Work on the hydraulics

Risk of accident due to spraying hydraulic fluid

WARNING

Hydraulic oil which escapes under high pressure may penetrate your skin and cause severe injuries. In case of injury, seek medical attention immediately.
Prior to any work on the hydraulic system, it must always be depressurised.

- When carrying out any work on the hydraulic system, you must always wear appropriate protective clothing.

Risk of accidents due to pressurised pressure reservoirs

WARNING

Pressure reservoirs remain under high pressure even if the hydraulic system has been depressurised.
During work on hydraulic systems with pressure reservoirs, parts of the hydraulic system may be under high pressure.

- Make sure that the hydraulic system is only maintained and repaired by trained personnel.

15.1.6 Working on the electrics

CAUTION

The device will be damaged if it is connected to the power supply while work is being carried out on it

If the device is still connected to the power supply of the tractor, the device will be damaged if work is carried out on the electrics.

– Before carrying out any work on the electrics of the device, always disconnect the power supply from the tractor.

15.1.7 Working under the raised device

WARNING

Risk of accident due to lowering and extending of components and devices

It is extremely dangerous to work under raised or next to retracted components and devices.

– Always secure the tractor to prevent it from rolling away.

– Remove the ignition key.

– Secure the tractor to prevent it from being started up by unauthorised persons.

– Support and secure raised or retracted components and devices with suitable support elements.

15.1.8 Utilised tool

WARNING

Risk of accident due to use of unsuitable tool

If working with an unsuitable or defective tool, there is a risk of accidents and injuries.

– Perform all work on the device with a suitable and functional tool only. This applies in particular to the use of lifting gear.

WARNING

Risk of back injuries

If your posture is not correct when installing or fixing heavy or cumbersome components, you may suffer back injuries which require long convalescence.

Installation and maintenance work may be carried out by trained and instructed personnel only.

– Perform all work on the device with a suitable and functional tool only. This applies in particular to the use of lifting gear.

WARNING

Risk of accident due to tool slipping off

If applying a large force, e.g. when loosening bolts, the tool may slip off. This may result in hand injuries on sharp-edged parts.

– Avoid applying a large force by using suitable auxiliary equipment (e.g. extensions).

Check nuts and bolt heads, etc. for wear and, if required, consult an expert.

15.2 Environmental protection

– Ensure that all materials and operating supplies used to maintain and care for the device are disposed of in line with environmental regulations.

– All recyclable components should be recycled.

– Observe the national regulations applicable in your country.

15.3 Greasing

WARNING

Eye injuries from grease

When greasing the lubrication points, grease may escape at high pressure from between the components and cause eye injuries. Seek advice from a doctor immediately in the event of injury.

– Wear protective clothing, especially eye protection when greasing.

- Only use environmentally compatible lubricants with the stated specifications for all greasing work.
- Ensure that all chain links, bolts, guides etc. can move freely.
- Lubricate all moving parts with high quality multi-purpose grease or multi-purpose oil.

The grease nipples are protected from dirt with protective caps.

- Replace missing or damaged protective caps immediately.
- Service the implement according to the section "Maintenance intervals".

In addition, at the end of the season:

- Grease all cotter pins.
- Grease all piston rods of the hydraulic cylinders with an acid-free grease compliant with DIN 51 502.
- Grease all surfaces which could rust.
- Push the protective caps onto the connection couplings of the hydraulic lines.

15.4 Maintenance intervals

	Interval								Activity							
	Before use	After the first 2 operating hours	Every 8 operating hours	Every 20 operating hours	Every 50 operating hours	After a season	After external cleaning	After 6 years	Tighten	Check	Replace	Grease	Adjust	Change the oil	Maintenance	Carried out by a specialist
Hose connections					X					X						
									X							
Pins, etc.						X	X					X				
Piston rods, hydraulic rams						X	X					X				

		Interval								Activity							
		Before use	After the first 2 operating hours	Every 8 operating hours	Every 20 operating hours	Every 50 operating hours	After a season	After external cleaning	After 6 years	Tighten	Check	Replace	Grease	Adjust	Change the oil	Maintenance	Carried out by a specialist
Hydraulic hoses				X							X						
									X			X					
PTO shaft	Sliding tubes				X								X				
	Joints					X	X						X				
Rope				X							X						
Sliding surfaces, pendulum system				X									X				
Pendulum lock				X									X				
Slope compensation				X									X				
Rod eyes on hydraulic rams				X									X				
Joints on HE boom				X									X				
Swivelling joint						X							X				
Lashing straps							X			X	X						
Bolted connections			X			X				X							
Pump				X			X				X				X	X	X
Pressure accumulator, pump						X					X			X			
Nozzle valve diaphragms							X					X					

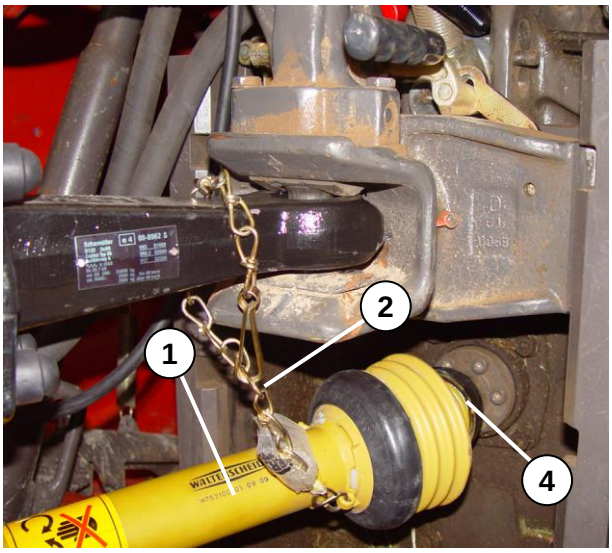
15.5 Oils and lubricants

Component	Oil/Lubricant	Quantity per service
Pump	SAE 15W40	P 150/P 200: approx. 1.3 l P 260: approx. 1.7 l
Grease nipples and open lubrication points	Multi-purpose grease	Dependent on lubrication point
Drive shaft	Lithium-lubricated grease, consistency class NL-G12.	As required
Swinging system sliding surfaces	Dry lubricant spray	As required

15.6 Drive shaft

– Use lithium-lubricated grease, consistency class NL-G12.

The drive shaft must be serviced on the tractor side and the implement side.



1 Protective tube

2 Safety chain

3 Sliding tube not illustrated (inside the protective tube)

4 Joints

15.6.1 Protective tube

The protective tubes of the drive shaft must be checked for damage and wear.

– Replace damaged protective tubes.

15.6.2 Safety chain

The drive shaft safety chains must be checked for damage and wear.

– Replace damaged safety chains.

15.6.3 Sliding tube

The sliding tubes of the drive shaft must be lubricated according to the service intervals.

– Lubricate the sliding tubes every 20 operating hours.

15.6.4 Joints

The joints of the drive shaft must be lubricated according to the service intervals.

– Lubricate the joints every 50 operating hours.

15.7 Lubrication points

All the lubrication points and grease nipples described below must be lubricated with multi-purpose grease.

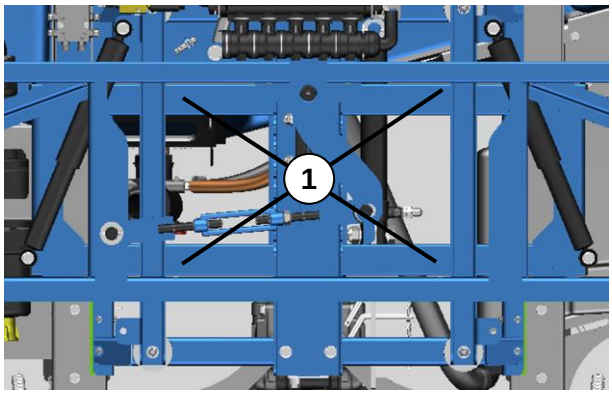
– Remove the caps from the grease nipples before lubrication.

– Replace the caps when lubrication is complete.

– Replace lost caps immediately.

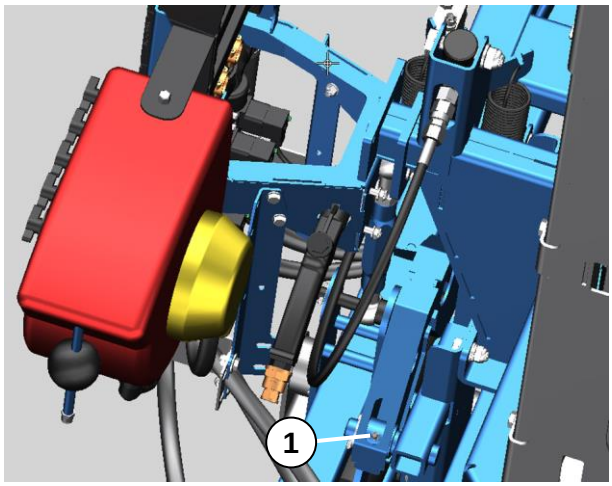
15.7.1 HE boom

Sliding surfaces, pendulum system



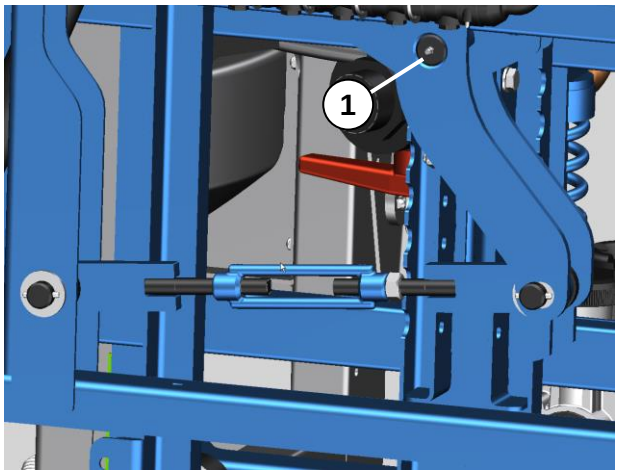
– Lubricate the sliding surfaces in the pendulum system (1) after every 8 operating hours using dry lubricant spray.

Pendulum lock



– Lubricate the grease nipples for the pendulum lock (1) after every 8 operating hours.

Slope compensation



– Lubricate the grease nipples for the slope compensation system (1) after every 8 operating hours.

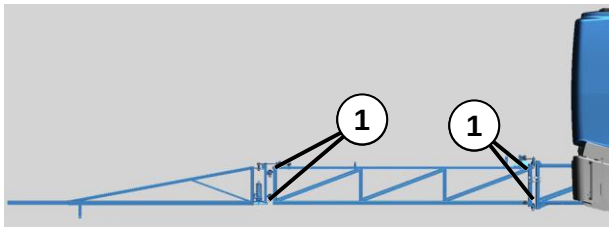
Rod eyes on hydraulic rams

– Lubricate the 2 grease nipples (1) on the 4 folding cylinders after every 8 operating hours.

Boom

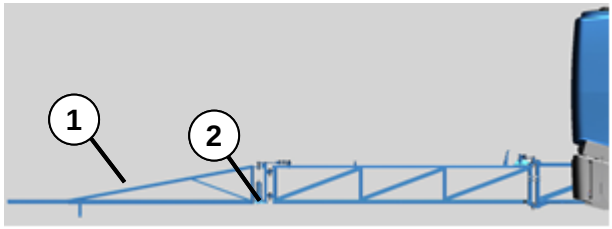
The lubrication points listed below are located on the left- and right-hand sides of the boom. However, the pictures of the lubrication points show just one side of the boom. The number of lubrication points stated refers to the total number on both sides of the boom.

Joints on the boom



– Lubricate the 8 grease nipples on the boom joints (1) after every 8 operating hours.

Swivelling joint



The sliding surfaces on the swivelling joints must be lubricated with multi-purpose grease after every 50 operating hours.

– Fold left arm 2 (1) manually through approx. 45°.

  This exposes the sliding surfaces of the swivelling joint (2).

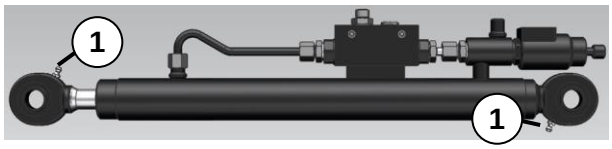
– Lubricate the sliding surfaces.

– Return left arm 2 (1) to its original position.

– Repeat this process for right arm 2.

15.7.2 SEH boom

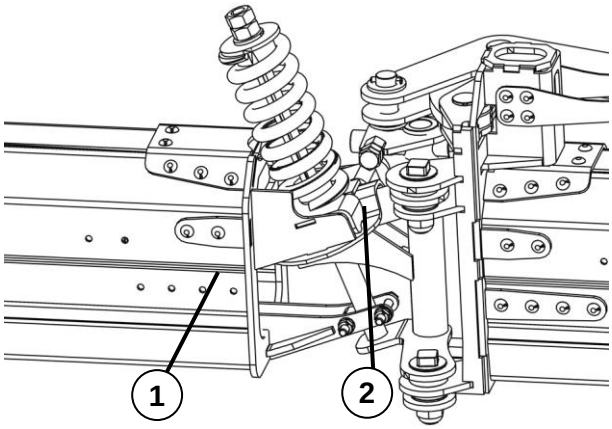
Rod eyes on hydraulic rams



– Lubricate the grease nipples (1) on each hydraulic ram on the boom after every 8 operating hours.

Boom	Folding cylinder	Lubrication points
SEH 15 - 18	6	12
SEH 20 - 24	8	16
SEH 27 - 30	10	20

Swivelling joint



The sliding surfaces on the swivelling joints must be lubricated with multi-purpose grease after every 50 operating hours.

– Fold the left outer arm (1) manually through approx. 45°.

  This exposes the sliding surfaces of the swivelling joint (2).

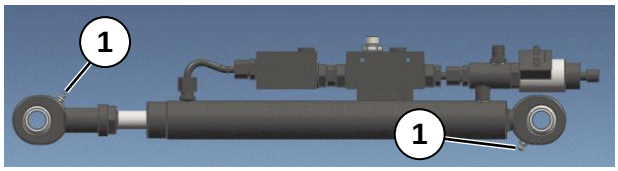
– Lubricate the sliding surfaces.

– Return the left outer arm (1) to its original position.

– Repeat this process for the right outer arm.

15.7.3 RA boom

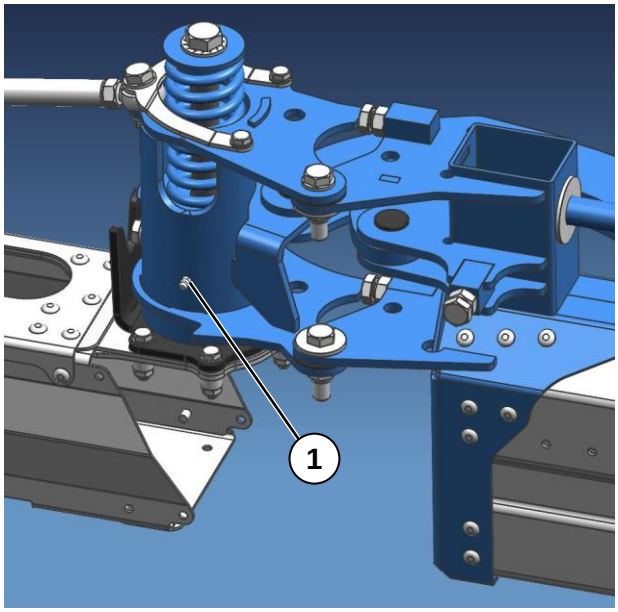
Rod eyes on hydraulic rams



– Lubricate the grease nipples (1) on each hydraulic ram on the boom after every 8 operating hours

Boom	Folding cylinder	Lubrication points
RA 15 - 18	6	12
RA 20 - 24	8	16
RA 27 - 30	10	20

Swivelling joint

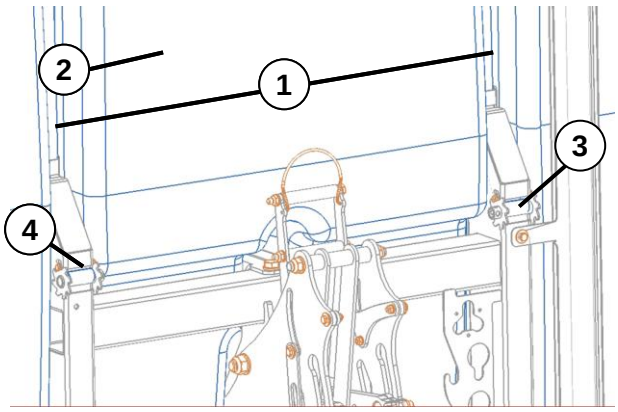


Each swivelling joint has two grease nipples:

- Front (1)
- Rear (not shown)

– Lubricate the grease nipples (1) on the swivelling joints on the boom after every 8 operating hours.

15.8 Safety straps



The safety straps (1) must be slightly tensioned and in contact with the main tank (2).

– Check the tension of the safety straps (1) after each spraying season.

– Tighten the safety straps (1) as required.

Tightening the safety straps

– Fill the main tank (2) with fresh water to the nominal content.

– Insert a suitable tool into the left ratchet (3).

– Use the tool to tighten the safety strap (1).

– Repeat the procedure for the right ratchet (4).

15.9 Tightening torques

15.9.1 General

– Secure self-locking nuts that have been loosened against working themselves loose again by:

- Replacing them against new self-locking nuts
- Using lock washers
- Using locking compounds such as Loctite

The tightening torques set out below refer to screw connections that are not specifically mentioned in these operating instructions. Specific tightening torques to be applied are mentioned in the text.

– Identify the relevant screw connection by means of the spare-parts list or the markings on the screw head.

15.9.2 Bolts and nuts made of steel

Diameter	Strength category		
	8.8 [Nm*]	**10.9 [Nm*]**	**12.9 [Nm*]**
M 6	9,7	13,6	16,3
M 8	23,4	32,9	39,6
M 10	46,2	64,8	77,8
M 12	80,0	113	135
M 14	127	178	213
M 16	197	276	333
M 20	382	538	648
M 24	659	926	1112
M 30	1314	1850	2217

*μ_g = 0,12

15.9.3 Bolts and nuts made of V2A

Diameter	[Nm]
M 4	1.37
M 5	2.7
M 6	4.6
M 8	11.0
M 10	22
M 12	39
M 14	62
M 16	95
M 18	130
M 20	184
M 22	250
M 24	315
M 27	470

15.10Check the connections to the tractor

15.10.1 Hydraulic connections

Risk of accidents due to escaping hydraulic fluid

WARNING

Hydraulic fluid which is ejected under high pressure (hydraulic oil) can penetrate the skin and cause serious injuries. In the event of injuries, consult a doctor immediately.

- Due to the risk of injury, always use suitable tools when looking for leaks.
- Always wear appropriate protective clothing.

- Carry out a visual inspection of the hydraulic couplings.
- Look for leaking hydraulic oil at the hydraulic couplings.
- Connect the hydraulic lines to the tractor.
- Check that the hoses are leak-free when under pressure.

Faulty or leaking couplings must be repaired or replaced immediately by a specialist workshop.

15.10.2 Electrical connections

- Carry out a visual inspection of the plugs and cables.
- Look for bent or broken contact pins on the plugs and exposed areas on the cables.
- Apply anti-corrosion spray to the electrical contacts.

Faulty plugs or cables must be repaired or replaced immediately by a specialist workshop.

15.11 Sensors

See also the separate operating instructions for the operating terminal.

No.	Sensor/display	Setting
S3	Pendulum lock closed	The switching distance between each sensor and its contact must be 2 mm - 2.5 mm. – Loosen the nut. – Set the correct switching distance. – Secure the sensor by tightening the nut.
S11	Pendulum lock open	
S2	HE boom, Full	
S8	HE boom, arm	

15.12 Pump

15.12.1 General

Requirements for pump operation:

- Adequate oil level
- Correct pressure at the pressure accumulator
- Correct diaphragms
- Properly functioning valves

Annual maintenance by a qualified and authorised person:

- Check the pump.
- Change the diaphragm.
- Change the oil.

15.12.2 Checking the oil level

The pump oil level can be checked at the sight glass during operation.

Warning: The pump is powered by a drive shaft. Bystanders may be caught by the drive shaft, drawn in and seriously injured.

– Always stand at a safe distance when checking the oil level in the sight glass for the pump.

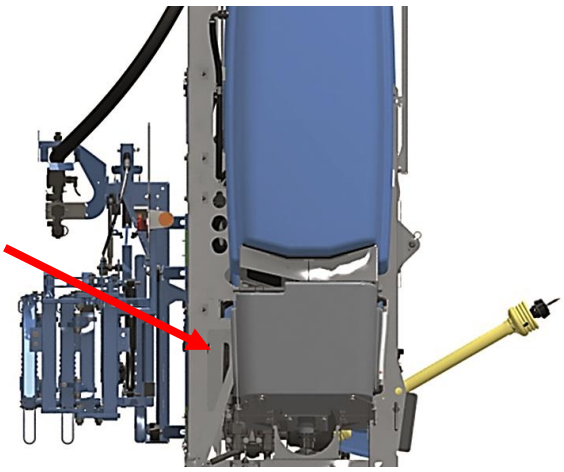
To check the oil level safely:

– Secure the tractor to prevent it from rolling away.

– Run the pump for at least 1 minute.

  The oil heats up. The water pressure in the boom makes the diaphragm bulge. The true oil level is not displayed until this happens.

  Note: If the oil level is checked when the pump is stationary, the level displayed will be incorrect.



– Check the sight glass on the right in the direction of travel through the viewing triangle in the frame.

  It is easy to check the sight glass safely from this point.

- Check the oil level every day, after every 8 hours of operation at the latest.
- If the oil level falls below the arrows during operation, top up the oil safely.

15.12.3 Topping up the oil

To top up the oil safely:

- Switch off the PTO.

  The PTO shaft stops turning.

- Switch off the tractor engine.
  Warning: If the tractor engine is switched on, the PTO can be switched on even though somebody is topping up the oil.

- Top up the oil in small quantities.
  Note: Do not overfill with oil.

- Switch on the tractor engine.
  Warning: Switch on the tractor engine first, then the PTO, otherwise the PTO shaft will start turning as soon as the tractor engine is switched on.

- Switch on the PTO.

- Run the pump for 1 minute.

- Check the oil level again.

- If necessary top up with oil and check again until the correct oil level is reached.

If a large amount of oil has been lost or the oil is white in colour, arrange for the pump to be checked by a qualified and authorised person.

15.12.4 Changing the diaphragms

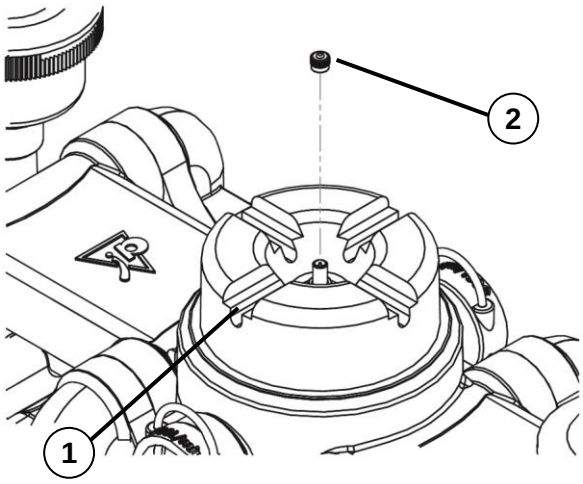
If the oil in the sight glass is white in colour, this means that the pump diaphragms are damaged.

- If the oil is white in colour, stop spraying immediately.
  Caution: Continued use of the pump will cause damage to the pump.
- If the diaphragm is damaged, it must be changed within 24 hours.
  Caution: Downtime can result in corrosion inside the pump.
- All the diaphragms must be changed, even if only one is damaged.

If the repair cannot be carried out within 24 hours, the following steps must be taken:

- Remove the spraying fluid mixture or oil mixture.
- Fill the pump with oil or corrosion inhibitor.

15.12.5 Checking the pressure at the pressure accumulator



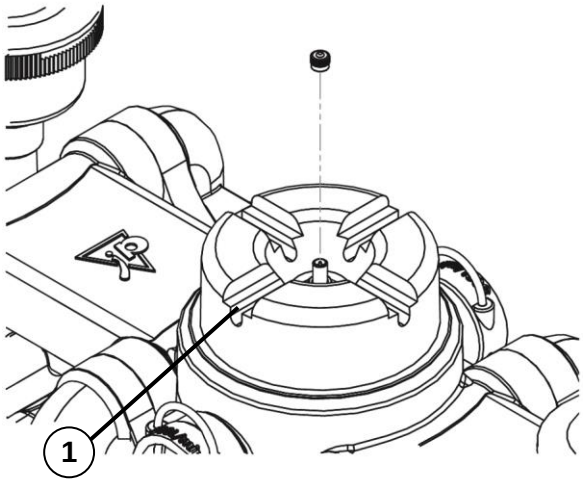
– Check the pressure at the pressure accumulator (1):
  - If the pressure gauge on the implement is showing large fluctuations
  - If the pressure hoses on the implement are vibrating strongly
  - After 50 operating hours

  Optimum pressure in the pressure accumulator:
  - Approx. 4 bar at 1 – 10 bar spray pressure
  - Approx. 6 bar at 5 – 15 bar spray pressure

– Remove the cap (2).

– Check the pressure using a filling device with a tyre inflation valve.

– If the pressure at the pressure accumulator (1) is too low, fill the pressure accumulator to the specified pressure using a filling device with a tyre inflation valve.



Alternatively

– Fill the pressure accumulator (1) to approx. 10 bar.

– Run the pump at the specified speed.

Watch the pressure hoses on the pump.

– If the pressure hoses vibrate or the pressure at the pressure gauge on the implement fluctuates greatly, release the pressure using a filling device with a tyre inflation valve.

  If the pressure hoses on the pump only vibrate slightly or the pressure no longer fluctuates, the pressure set at the pressure accumulator is correct.

– Fit the cap (2).

15.13 Filter

Clean filters are a prerequisite for smooth operation. Therefore, the given filters must undergo regular maintenance.

CAUTION

The use of pressure and nozzle filters with 80 meshes/inch or more may result in spraying agent being filtered out for some spray agents. If necessary, please ask your pesticide manufacturer.

The mesh width for the pressure or nozzle filter must always be less than the flow cross-section for the relevant nozzles used.

The specifications of the pesticide manufacturer with regard to mesh width must always be observed.

15.14 Test connections

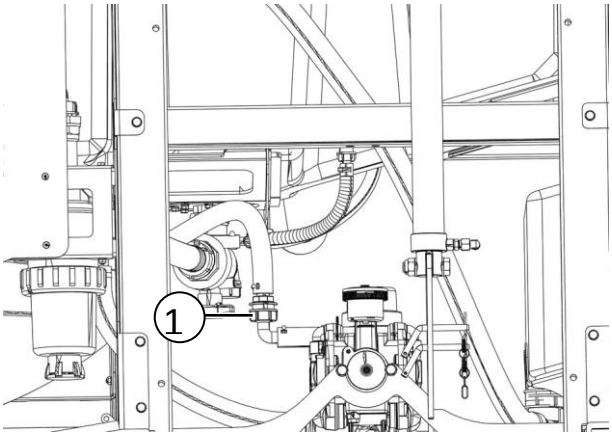
15.14.1 General

Connections for testing devices are provided for checking the implement.

The connection points for the testing devices are marked with red union nuts or cable ties.

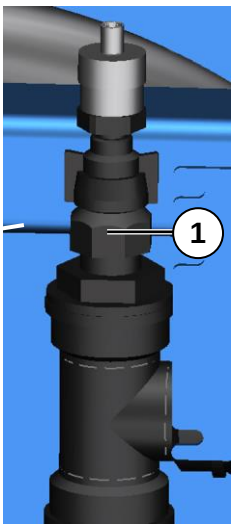
Checking of the implement must only be performed by qualified, authorised persons.

15.14.2 Pump output

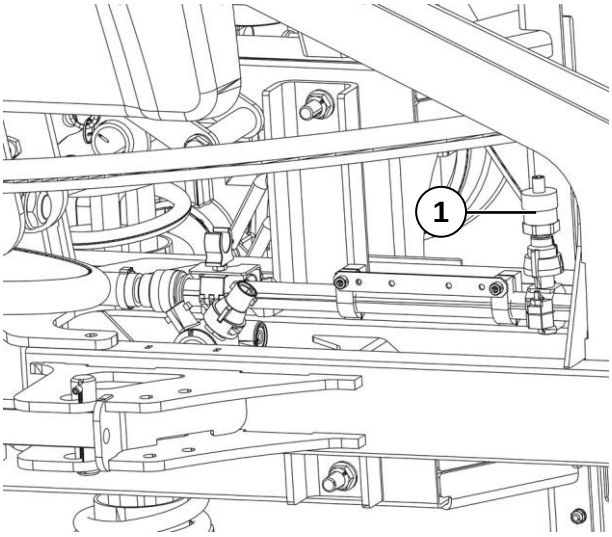


Connection (1) for pump output reading.

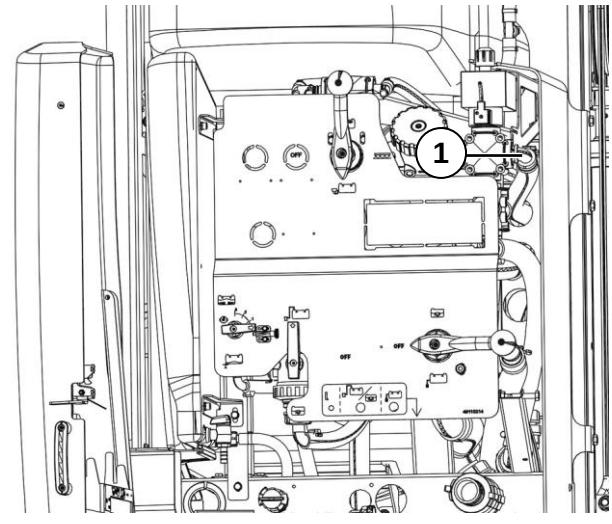
15.14.3 Pressure measuring device



Connection (1) for pressure measuring device reading.

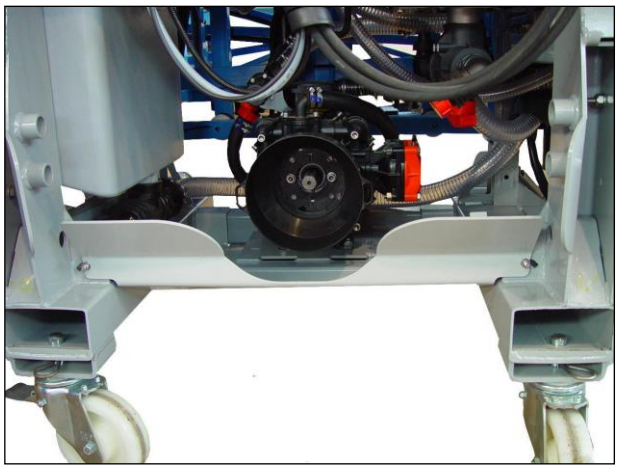


15.14.4 Flow meter



Connection (1) for flow meter reading.

15.15 Deflector



The deflector can be dismantled for maintenance work.

15.15.1 Dismantling the deflector

- Release both wing nuts slightly.
- Slide the deflector up to the end stop on the bolt at the left.
- Unscrew the left wing nut.
- Remove the deflector.

15.15.2 Mounting the deflector

- Mount the deflector.
- Screw the left wing nut back on.
- Slide the deflector to the right.
- Tighten both wing nuts.

15.16 Information in case of faults and malfunctions

- See also the separate operating instructions for the operating terminal.

Fault	Reason	Remedy
White colouring of the oil in the pump	Diaphragms defective	Stop spraying immediately and replace the diaphragms

16 TROUBLESHOOTING

When one of the functions of the implement fails, the cause of the failure must immediately be established.

Any necessary repair measures must be performed immediately.

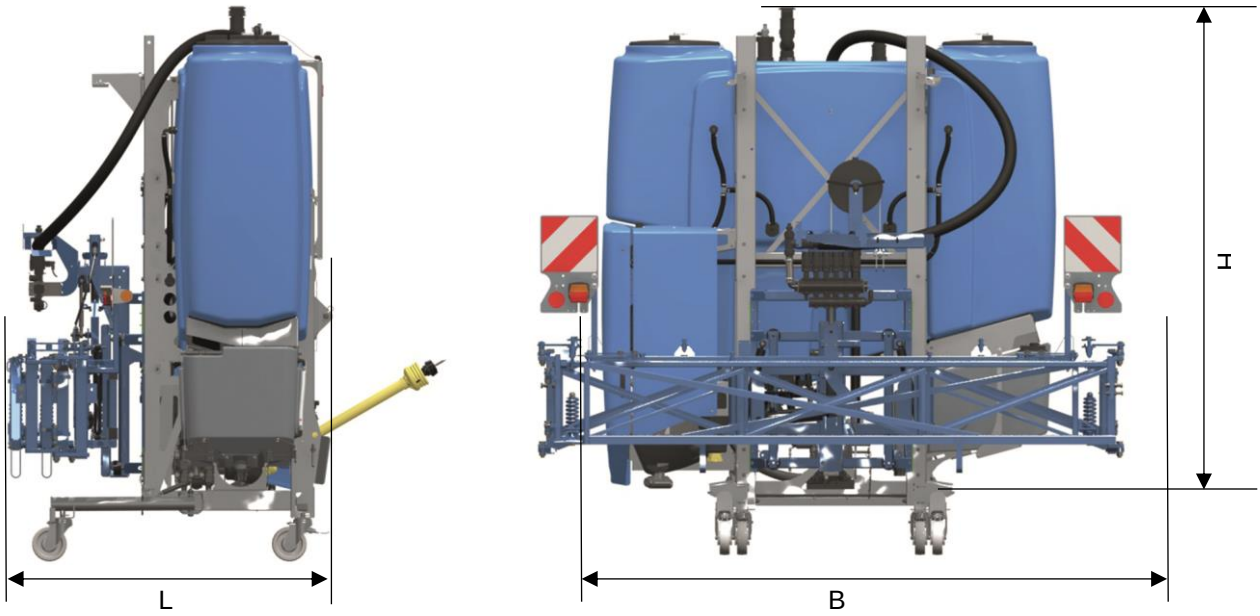
16.1 Emergency switch

See the separate operating instructions for the operating terminal.

17 TECHNICAL DATA

17.1 Dimensions and weights – basic implement

17.1.1 HE spraying booms

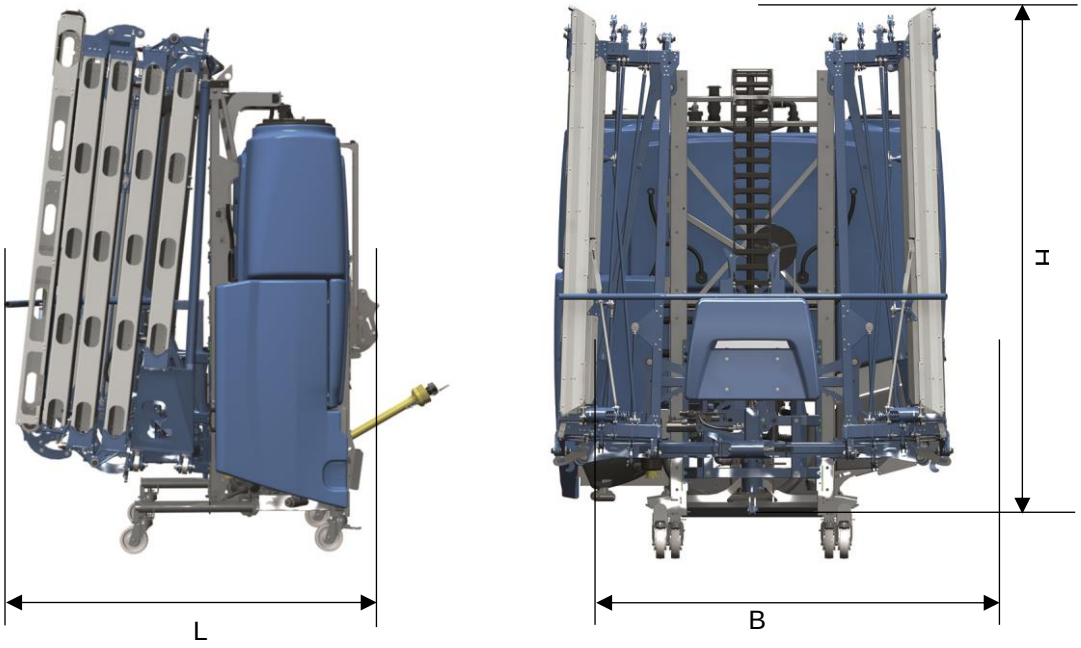


Sirius	Width (W) [mm]	Length (L) [mm]	Height (H) [mm]	Weight maximum empty [kg]	Weight maximum filled [kg] (1)
10/900	2950	1790	2800	915	2255
10/1300				930	2790
10/1600				995	3250
10/1900				1010	3620

The actual weights may deviate from the table, depending on the equipment of the implement.
Weighing is necessary to determine the precise weight.

(1)
- With the fresh water tank and hand washing container filled.
- Filling volume up to nominal content and density 1.3.

17.1.2 SEH/RA spraying boom



Sirius	Spraying boom	Width (W) [mm]	Length (L) [mm]	Height (H) [mm]
10/900	15/11	2500	2000	2900
	18/12	2500	2000	3250
	20/15	2500	2200	3250
	21/15	2500	2200	3250
	21/17	2500	2200	2900
	24/18	2500	2200	3250

Weight maximum empty [kg]	Weight maximum filled [kg] (1)
1370	2710

Sirius	Spraying boom	Width (W) [mm]	Length (L) [mm]	Height (H) [mm]	Weight maximum empty [kg]	Weight maximum filled [kg] (1)
10/1300	15/11	2500	2000	2900	1385	3245
	18/12	2500	2000	3250		
	20/15	2500	2200	3250		
	21/15	2500	2200	3250		
	21/17	2500	2200	2900		
	24/18	2500	2200	3250		

Sirius	Spraying boom	Width (W) [mm]	Length (L) [mm]	Height (H) [mm]	Weight maximum empty [kg]	Weight maximum filled [kg] (1)
10/1600	15/11	2500	2000	2900	1450	3705
	18/12	2500	2000	3250		
	20/15	2500	2200	3250		
	21/15	2500	2200	3250		
	21/17	2500	2200	2900		
	24/18	2500	2200	3250		
	27/21	2500	2400	3250	1540	3795
	27/22	2500	2400	2900		
	28/24	2500	2400	3400		
	30/24	2500	2400	3400		

Sirius	Spraying boom	Width (W) [mm]	Length (L) [mm]	Height (H) [mm]	Weight maximum empty [kg]	Weight maximum filled [kg] (1)
10/1900	15/11	2500	2000	2900	1460	4080
	18/12	2500	2000	3250		
	20/15	2500	2200	3250		
	21/15	2500	2200	3250		
	21/17	2500	2200	2900		
	24/18	2500	2200	3250		
	27/21	2500	2400	3250	1550	4170
	27/22	2500	2400	2900		
	28/24	2500	2400	3400		
	30/24	2500	2400	3400		

The actual weights may deviate from the table, depending on the equipment of the implement.
Weighing is necessary to determine the precise weight.

(1)
- With the fresh water tank and hand washing container filled.
- Filling volume up to nominal content and density 1.3.

17.2 Receptacles for forklift truck tines

Receptacle width [mm]	195
Receptacle height [mm]	80
Minimum length of forklift tines [mm]	1700

The implement may only be gripped by a forklift from the front.

17.3 Three-point connection

	Tank	
	900 l / 1300 l	1600 l / 1900 l
Maximum permissible speed [km/h]	40	
Top link connection [category]	2	3 N
Lower link connection [category]	Top: Bottom:	2 3 N
Permissible usage range [%]	Folding the boom: Unfolding the boom: Spraying:	 ≤15

17.4 Tank volume

Tank	**Volume [l]**	**Range of use (density)**	**Tank**			
			900	**1300**	**1600**	**1900**
Main tank	Nominal volume	Agricultural chemicals and liquid fertilisers (up to 1.3)	900	1300	1600	1900
	Actual volume		1030	1430	1760	2030
Fresh water tank	Nominal volume	Water (1.0)	160			
Hand washing container	Actual volume	Water (1.0)	20			

17.5 Drive shaft

Version	Connection	
	To tractor	To implement
Standard	1 ⅜ (6)	1 ⅜ (6)
Telescopic	1 ⅜ (8)	1 ⅜ (6)

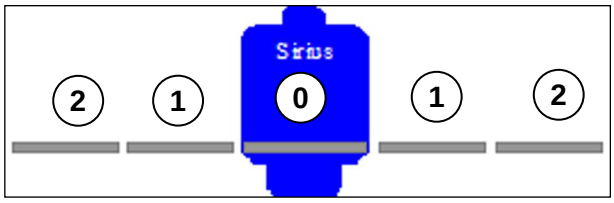
Maximum permissible angle [°]:

	Without wide angle joint
Working angle	25
Short-period operation with reduced power	45
Stationary	90

17.6 Boom

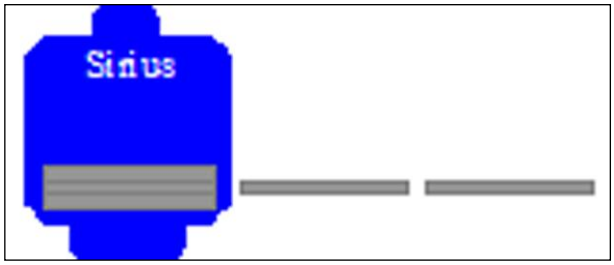
Operating pressure, approx. [bar]	10	
Maximum nozzle distance from ground, approx. [m] (when implement is parked)	1.50	
Pendulum range [°]	HE boom	17.7
	SEH boom	14.0

17.6.1 HE boom



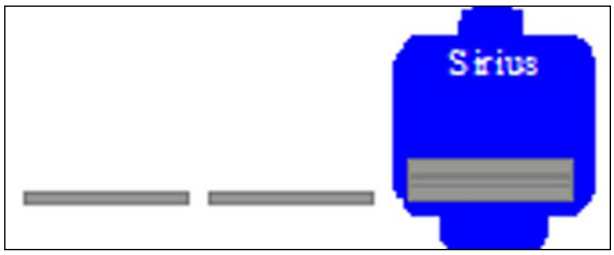
0	Arm 0
1	Arm 1
2	Arm 2

		Arm			Total	Folded on one side, left or right	Arm 2 reduced symmetrically
		0	1	2			
HE 12	Width [m]	3	3	1.5	12	7.5	9
	Nozzles	6	6	3	30	15	18
HE 15	Width [m]	3	3	3	15	9	9
	Nozzles	6	6	6	30	18	18

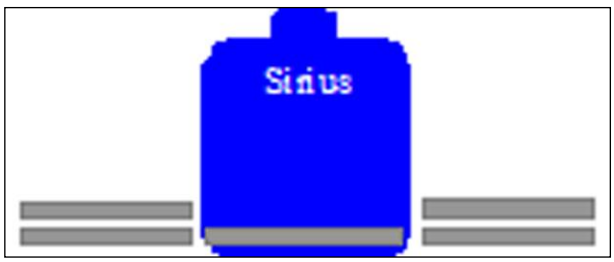


These booms may be folded as follows:

- Right side only

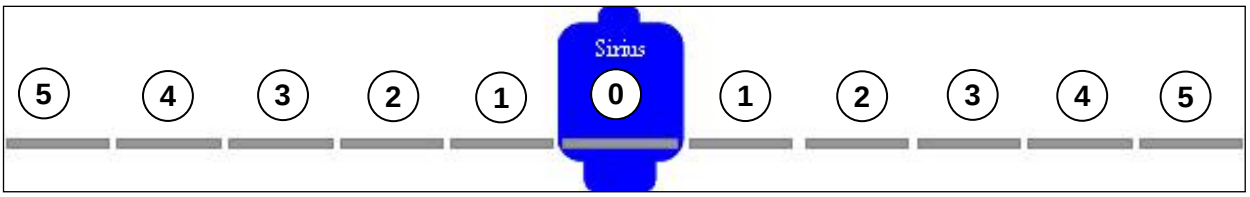


- Left side only



- Symmetrically with arm 2

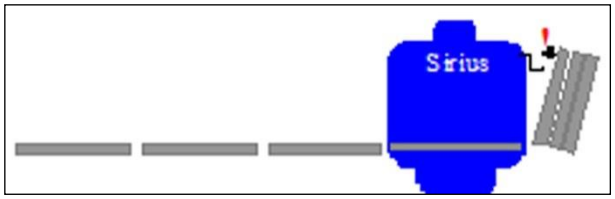
17.6.2 SEH/RA boom



		Working width [m] (reduced symmetri-cally)					Nozzles						
Working width [m] (maximum)	Segments	(5) Arm 5	(4) Arm 4	(3) Arm 3	(2) Arm 2	(1) Arm 1	(0) Arm 0	(1) Arm 1	(2) Arm 2	(3) Arm 3	(4) Arm 4	(5) Arm 5	Total
15	7			11	7	2	4	5	4	4			30
18	7			12	7	2	4	5	5	6			36
20/15	9		15	11	7	2	4	5	4	4	5		40
21/15	9		15	11	7	2	4	5	4	4	6		42
21/17	9		17	12	7	2	4	5	5	5	4		42
24	9		18	12	7	2	4	5	5	6	6		48
27/21	11	21	15	11	7	2	4	5	4	4	6	6	54
27/22	11	22	17	12	7	2	4	5	5	5	5	5	54
28	11	24	18	12	7	2	4	5	5	6	6	4	56
30	11	24	18	12	7	2	4	5	5	6	6	6	60

Reducing the working width

SEH/RA 15 and 18



The working width of these booms may be reduced as follows:

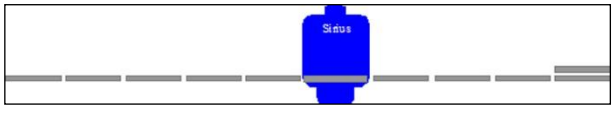
- Symmetrically with arms 3, 2 and 1.
- On one side (left) with arms 3, 2 and 1.
- On one side (right) with arms 3, 2 and 1.
- All combinations of one-sided and symmetrical.

SEH/RA20, 21 and 24

The working width of these booms may be reduced as follows:

- Symmetrically with arms 4, 3, 2 and 1.
- One one side (left) with arms 4, 3 and 2, if arm 1 (- 4) on the right is unfolded.
- One one side (right) with arms 4, 3 and 2, if arm 1 (- 4) on the left is unfolded.
- All combinations of symmetrical, one-sided (left) and one-sided (right).

SEH/RA27, 28 and 30

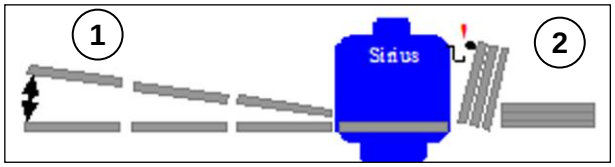


The working width of these booms may be reduced as follows:

- Symmetrically with arms 5, 4, 3 and 2.
- Arm 5 asymmetrically, if arm 5 on the opposite side is unfolded.

Angling the arms

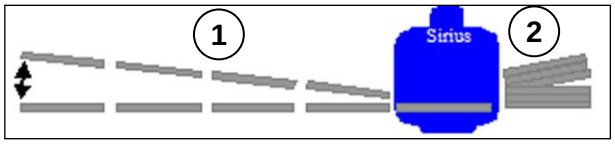
SEH/RA 15 and 18



These booms may be angled as follows:

- Up to 20° with arms unfolded or reduced (1).
- Up to 80° with arms 1 folded (-3) (2).

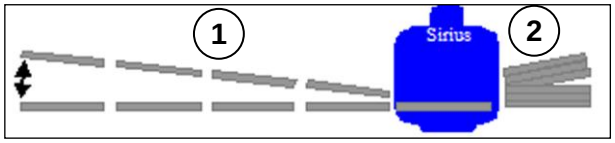
SEH/RA20 and 21



These booms may be angled as follows:

- Up to 20° with arms unfolded or folded (1) and (2).

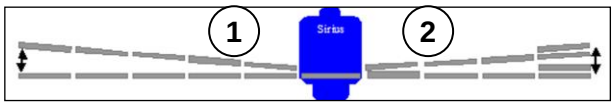
SEH/RA24



These booms may be angled as follows:

- Up to 17° with arms unfolded or folded (1) and (2).

SEH/RA27, 28 and 30



These booms may be angled as follows:

- Up to 15° with arms 5 unfolded or folded (1) and (2).

Sections

Boom	Quantity	Distribution [m]
HE 12	5	1.5 / 3 / 3 / 3 / 1.5
HE 15	5	5 x 3
SEH/RA15	5	5 x 3
	5	3 / 3.5 / 2 / 3.5 / 3
SEH/RA18	5	4.5 / 3.5 / 2 / 3.5 / 4.5
	6	6 x 3
SEH/RA20/15	5	5 x 4
SEH/RA21/15	7	7 x 3
	9	3 / 2 / 2 / 2.5 / 2 / 2.5 / 2 / 2 / 3
SEH/RA21/17	7	7 x 3
	9	2 / 2.5 / 2.5 / 2.5 / 2 / 2.5 / 2.5 / 2.5 / 2
SEH/RA24	6	6 x 4
	8	8 x 3
	9	3 / 3 / 2.5 / 2.5 / 2 / 2.5 / 2.5 / 3 / 3
SEH/RA27/21	9	9 x 3
SEH/RA27/22	9	9 x 3
SEH/RA28	7	7 x 4
SEH/RA30	9	3 / 4.5 / 2.5 / 2.5 / 2 / 2.5 / 2.5 / 4.5 / 3
	9	3 / 3.5 / 3.5 / 3.5 / 3 / 3.5 / 3.5 / 3.5 / 3
	9	3 / 3 / 3 / 4 / 4 / 4 / 3 / 3 / 3

17.7 Pumps

Model	**P 150**	**P 200**	**P 260**
PTO	DIN 9611 / ISO 500		
Type	Piston diaphragm pump		
Number of pistons	4		
Connection	Hose		
• Internal Ø suction side, minimum [mm]	39	46	50
• Internal Ø pressure side, minimum [mm]	25	25	30
Operating pressure [bar]	15		
Nominal pressure [bar]	20		
Permissible vacuum pressure [bar]	0.3		
Maximum suction height [m]	3		
Maximum pumping height [m] with 0 bar spraying pressure	3		
Pressure in pressure reservoir [bar]	Ideally: Pressure in pressure reservoir = spraying pressure Approx.: • 4 bar at spraying pressure 1 - 10 bar • 6 bar at spraying pressure 5 - 15 bar		
Nominal speed [rpm]	540		
Speed range [rpm]	450 - 700		
Volume flow at 5 bar and nominal speed [l/min]	150	200	260

Power consumption [KW] at nominal speed and 5 bar	3	4	6.6
Oil type	SAE 15W40		
Oil quantity [l] approx.	1.3		1.7
Weight [kg] approx.	16.2	22.0	30.0
Diaphragm material	Rubber		
Number of pressure reservoirs	1		

17.8 Spraying fluid system

Spraying pressure range of the implement with water [bar]: 1.0 – 8.0

Permissible system pressure [bar]: 10

Application rate depending on pump, nozzles and travel speed [l/ha]: 200 – 600

Connections, left

Hand wash canister:
- Outlet: Hose adapter Ø 13 mm
- Filling: GeKa connection

Clean water tank and main tank:

(filling via filler valve)
- GeKa connection
- 2" Kamlok coupling
- C-coupling

Recirculation: GeKa connection

Suction connection:
- 2" Kamlok coupling
- C-coupling

Connections, right

Suction connection: 2" Kamlok coupling

Pressure connection: 1 1/2" Kamlok coupling

Fill main tank 2" Kamlok coupling

Filling connection, performance

Maximum fill volume [l/min] of main tank:	500
Maximum filling pressure [bar]:	5

Suction connection, performance

Maximum underpressure [bar]:	- 0.3
Maximum suction depth [m]:	3
Minimum suction hose diameter [mm]:	2"
Maximum suction hose length with hose running at ground level [m]:	20

Filler hose

Connection to the implement:	2" Kamlok coupling
Hose length:	5 m or 8 m
Hose end:	Filter screen (4) or 2" Kamlok coupling

17.9 Flowmeter

Available flowmeter ranges:

- 5 – 00 l/min
- 10 – 200 l/min

17.10 Oil hydraulics

Pressure required in the tractor hydraulic system for implement cylinders in the oil hydraulic system [bar]:	160
Maximum permissible pressure [bar]:	200

The hydraulic system on the implement is filled with HLP 46 hydraulic oil in accordance with ISO VG 46; DIN 51 524 T.2.

The pressure control valves are set at the factory and must not be adjusted.

17.11 Electronic pressure display

Type:	Liquid crystal display
Pressure detection:	Electronic pressure sensor before segment valve
Maximum measuring error [bar]:	0.08
Resolution [bar]:	0.1
Display range [bar]:	0 - 10
Display area [mm]	60 x 25
Height of characters in display [mm]	20
Damping:	Electronic

17.12 Filter

	Diameter [mm]	**Length/Depth** [mm]	**Sieve area** [cm²]	**Mesh width** [mm]
Suction filter	78	165	22,500	0.36
Filter on filler hose	175	60	32,987	1.00
Pressure filter	50	210	19,200	0.25
Nozzle filter	10	13	408	0.25

18 APPENDIX

18.1 General information about nozzles

Each nozzle type has a different volume flow, spray pattern, drop size and nozzle characteristics. The liquid to be sprayed, the environmental conditions, the nozzle characteristics and official regulations such as distance conditions, drift reduction classes etc. must be taken into account for the selection of the nozzles.

The volume flow of a nozzle changes with the spraying pressure. If the volume flow of a nozzle (l/min) is doubled, four times the spraying pressure (bar) is required.

18.2 Nozzle field of application

Designation	Material (1)	Spray angle	Spray height above target area (cm)	Optimum spray height (cm)	Size (2)	Pressure range (bar)	Optimum spray pressure (bar)
Standard flat jet nozzles							
LECHLER LU	POM/Cer.	120º	40 - 60	50	.01 - .08	1,5 - 5	1,5 - 2,5
TEEJET XRC	VP	110°	40 - 60	50	.025 - .20	1 - 4	1,5 - 2,5
TEEJET XRC	VS	110°	40 - 60	50	.025 - .05	1 - 4	1,5 - 2,5
TEEJET XRC	VK	110°	40 - 60	50	.02 - .08	1 - 4	1,5 - 2,5
TEEJET XR	VP/VS/VK	110°	40 - 60	50	.02 - .08	1 - 4	1,5 - 2,5
AGROTOP TipCap TCP	POM	110°	40 - 60	50	.02 - .20	1 - 4	1,5 - 4
AGROTOP TipCap TCC	Cer.	110°	40 - 60	50	.015 - .08	1,5 - 4	1,5 - 4
Air injector-nozzles							
LECHLER ID	POM	120º	40 - 60	50	.01 - .08	3 - 8*	4 - 6
LECHLER ID	C	120º	40 - 60	50	.01 -. 06	3 - 8*	4 - 6
LECHLER IDN	POM	120º	40 - 60	50	.025 - .03	2 - 8	4 - 6
LECHLER IDK	POM	120º	40 - 60	50	.01 - .05	1,5 - 6**	1,5 - 3
LECHLER IDK	C	120º	40 - 60	50	.01 -. 05	1,5 - 6**	1,5 - 3
LECHLER IDKN	POM	120°	40 - 60	50	.03 - .04	1 - 6	2 - 4
TEEJET AIC	VP	110°	40 - 90	50	.02 - .05	2 - 8	4 - 6
TEEJET AIC	VK	110°	40 - 90	50	.025 - .05	2 - 8	4 - 6
TEEJET AIC	VS	110°	40 - 90	50	.015 - .10	2 - 8	4 - 6
TEEJET AI	VS	110°	40 - 90	50	.015 - .08	2 - 8	4 - 6
TEEJET TTI	VP	110°	40 - 90	50	.015 - .06	1 - 7	4 - 6
AGROTOP AIRMIX	POM	110°	40 - 90	50	.01 - .06	1 - 6	2 - 4
AGROTOP Albuz AVI	Cer.	110°	40 - 90	50	.015 - .10	3 - 7	3 - 7
AGROTOP AirMIX OC	POM	80° (15°+65°)	(4)	(4)	.02 - .05	1 - 6	2 - 4
Dual flat jet nozzles (3)							
LECHLER DF	V2A	120º	40 - 60	50	.02 -. 06	2 - 5	2 - 3
LECHLER IDKT	POM	120°	40 - 60	50	.03 - .05	1,5 - 6**	1,5 - 3
TEEJET TTJ 60	VP	110°	40 - 60	50	.02 - .06	1 - 6	2,0 - 3,5
AGROTOP Albuz AVI TWIN	Cer.	110°	40 - 60	50	.01 -. 05	2 - 8	4 - 7

Designation	Material (1)	Spray angle	Spray height above target area (cm)	Optimum spray height (cm)	Size (2)	Pressure range (bar)	Optimum spray pressure (bar)
AGROTOP TD-HiSpeed	Cer.	110°	40 - 60	50	.015 -. 05	2 - 10	4 - 8
Liquid fertiliser nozzles							
LECHLER FD	POM	130º	50 - 70	60	.10/.15/.20	1,5 - 4	1,5 - 4
TEEJET SJ7	VP	170°	75 - 100	75 - 100	.015 - .15	1,5 - 4	1,5 - 4
AGROTOP Albuzz ESI	Cer.	Six-hole	60	60	.015 -.06	1 - 4	1 - 4

(1) POM + VP: Plastic, VK + C + Cer.: Ceramic, VS, SS + V2A: Stainless steel.

(2) Sizes are available in the general-purpose table for nozzle sizes.

(3) The spray jets must not make contact with any implement parts.

(4) As for the installed nozzles with standard spray angle

Further nozzle models and nozzle sizes are available on request

Refer to the individual data sheets for those cases where other nozzles or nozzles with a different spray angle are used!

* 2 bar at .05 - .08

**1 bar at .04 - .05

18.3 Nozzle tables

18.3.1 Nozzle sizes 01 - 05

Nozzle spacing:							50 cm											
l/ha											Flow							
100	125	150	175	200	225	250	300	350	400	500	l/min	01	015	02	025	03	04	05
4.2											0.35	2.3	1.0					
4.8											0.40	3.0	1.3					
5.4	4.3										0.45	3.8	1.7					
6.0	4.8	4.0									0.50	4.7	2.1	1.2				
6.6	5.3	4.4									0.55	5.7	2.5	1.4				
7.2	5.8	4.8	4.1								0.60	6.7	3.0	1.7	1.1			
7.8	6.2	5.2	4.5								0.65	7.9	3.5	2.0	1.3			
8.4	6.7	5.6	4.8	4.2							0.70	9.2	4.1	2.3	1.5	1.0		
9.0	7.2	6.0	5.1	4.5	4.0						0.75		4.7	2.6	1.7	1.2		
9.6	7.7	6.4	5.5	4.8	4.3						0.80		5.3	3.0	1.9	1.3		
10.2	8.2	6.8	5.8	5.1	4.5	4.1					0.85		6.0	3.4	2.2	1.5		
10.8	8.6	7.2	6.2	5.4	4.8	4.3					0.90		6.8	3.8	2.4	1.7		
11.4	9.1	7.6	6.5	5.7	5.1	4.6					0.95		7.5	4.2	2.7	1.9	1.1	
12.0	9.6	8.0	6.9	6.0	5.3	4.8	4.0				1.00		8.4	4.7	3.0	2.1	1.2	
12.6	10.1	8.4	7.2	6.3	5.6	5.0	4.2				1.05		9.2	5.2	3.3	2.3	1.3	
13.2	10.6	8.8	7.5	6.6	5.9	5.3	4.4				1.10		10.1	5.7	3.6	2.5	1.4	
13.8	11.0	9.2	7.9	6.9	6.1	5.5	4.6				1.15			6.2	4.0	2.8	1.5	1.0
14.4	11.5	9.6	8.2	7.2	6.4	5.8	4.8	4.1			1.20			6.7	4.3	3.0	1.7	1.1
15.0	12.0	10.0	8.6	7.5	6.7	6.0	5.0	4.3			1.25			7.3	4.7	3.3	1.8	1.2
15.6	12.5	10.4	8.9	7.8	6.9	6.2	5.2	4.5			1.30			7.9	5.1	3.5	2.0	1.3
16.2	13.0	10.8	9.3	8.1	7.2	6.5	5.4	4.6	4.1		1.35			8.5	5.5	3.8	2.1	1.4
16.8	13.4	11.2	9.6	8.4	7.5	6.7	5.6	4.8	4.2		1.40			9.2	5.9	4.1	2.3	1.5
17.4	13.9	11.6	9.9	8.7	7.7	7.0	5.8	5.0	4.4		1.45				6.3	4.4	2.5	1.6
18.0	14.4	12.0	10.3	9.0	8.0	7.2	6.0	5.1	4.5		1.50				6.8	4.7	2.6	1.7
19.2	15.4	12.8	11.0	9.6	8.5	7.7	6.4	5.5	4.8		1.60				7.7	5.3	3.0	1.9
20.4	16.3	13.6	11.7	10.2	9.1	8.2	6.8	5.8	5.1	4.1	1.70				8.7	6.0	3.4	2.2
21.6	17.3	14.4	12.3	10.8	9.6	8.6	7.2	6.2	5.4	4.3	1.80				9.7	6.7	3.8	2.4
22.8	18.2	15.2	13.0	11.4	10.1	9.1	7.6	6.5	5.7	4.6	1.90					7.5	4.2	2.7
24.0	19.2	16.0	13.7	12.0	10.7	9.6	8.0	6.9	6.0	4.8	2.00					8.3	4.7	3.0
	20.2	16.8	14.4	12.6	11.2	10.1	8.4	7.2	6.3	5.0	2.10					9.2	5.2	3.3
	21.1	17.6	15.1	13.2	11.7	10.6	8.8	7.5	6.6	5.3	2.20					10.1	5.7	3.6
	22.1	18.4	15.8	13.8	12.3	11.0	9.2	7.9	6.9	5.5	2.30						6.2	4.0
	23.0	19.2	16.5	14.4	12.8	11.5	9.6	8.2	7.2	5.8	2.40						6.7	4.3
	24.0	20.0	17.1	15.0	13.3	12.0	10.0	8.6	7.5	6.0	2.50						7.3	4.7

Nozzle spacing:											50 cm							
l/ha											Flow							
100	125	150	175	200	225	250	300	350	400	500	l/min	01	015	02	025	03	04	05
		20.8	17.8	15.6	13.9	12.5	10.4	8.9	7.8	6.2	2.60						7.9	5.1
		21.6	18.5	16.2	14.4	13.0	10.8	9.3	8.1	6.5	2.70						8.5	5.5
		22.4	19.2	16.8	14.9	13.4	11.2	9.6	8.4	6.7	2.80						9.2	5.9
		23.2	19.9	17.4	15.5	13.9	11.6	9.9	8.7	7.0	2.90						9.9	6.3
		24.0	20.6	18.0	16.0	14.4	12.0	10.3	9.0	7.2	3.00							6.7
			21.3	18.6	16.5	14.9	12.4	10.6	9.3	7.4	3.10							7.2
			21.9	19.2	17.1	15.4	12.8	11.0	9.6	7.7	3.20							7.7
			22.6	19.8	17.6	15.8	13.2	11.3	9.9	7.9	3.30							8.2
			23.3	20.4	18.1	16.3	13.6	11.7	10.2	8.2	3.40							8.7
			24.0	21.0	18.7	16.8	14.0	12.0	10.5	8.4	3.50							9.2
				21.6	19.2	17.3	14.4	12.3	10.8	8.6	3.60							9.7
				22.2	19.7	17.8	14.8	12.7	11.1	8.9	3.70							10.3

- - - = Example: 200 l/ha at 7.2 km/h requires 1.20 l/min per nozzle, i.e. 6.7 bar in size -02, 4.3 bar in size -025, 3.0 bar in size -03, etc.

18.3.2 Nozzle sizes 06 - 10

Nozzle spacing:											50 cm			
l/ha											Flow			
100	125	150	175	200	225	250	300	350	400	500	l/min	06	08	10
				22.8	20.3	18.2	15.2	13.0	11.4	9.1	3.80	7.5	4.2	2.7
				23.4	20.8	18.7	15.6	13.4	11.7	9.4	3.90	7.9	4.5	2.9
				24.0	21.3	19.2	16.0	13.7	12.0	9.6	4.00	8.3	4.7	3.0
					21.9	19.7	16.4	14.1	12.3	9.8	4.10	8.8	4.9	3.2
					22.4	20.2	16.8	14.4	12.6	10.1	4.20	9.2	5.2	3.3
					22.9	20.6	17.2	14.7	12.9	10.3	4.30	9.6	5.4	3.5
					23.5	21.1	17.6	15.1	13.2	10.6	4.40	10.1	5.7	3.6
					24.0	21.6	18.0	15.4	13.5	10.8	4.50		5.9	3.8
						22.1	18.4	15.8	13.8	11.0	4.60		6.2	4.0
						22.6	18.8	16.1	14.1	11.3	4.70		6.5	4.1
						23.0	19.2	16.5	14.4	11.5	4.80		6.8	4.3
						23.5	19.6	16.8	14.7	11.8	4.90		7.0	4.5
						24.0	20.0	17.1	15.0	12.0	5.00		7.3	4.7

18.4 Correction factors for spraying liquids with different densities

Density of the spraying liquid	0.84	0.96	1.00	1.11	1.24	1.28	1.32	1.38	1.44	1.50
			Water	Urea	ASL	AHL (28) AHL + S	AHL (30)	NP solution		
Correction factor	1.09	1.02	1.00	0.95	0.90	0.88	0.87	0.85	0.83	0.81

For conversion:

Volume flow of water **(value on the basis of water with density 1.0)** X Correction factor = actual volume flow of the spraying liquid

After calculation of the actual volume flow of the spraying liquid, adjustment of implement and the output of the individual nozzles can be obtained from the dosage table.

- Measurement of the implement nozzles is required for the correct adjustment of the working pressure.
- At low temperatures there is a greater pressure drop between the pressure display and the nozzles. When applying tank mixtures consisting of AHL + water + agricultural chemicals, the spraying tables based on water apply.

18.5 Dosage tables for liquid fertilisers

18.5.1 Dosage table for drop hoses with 25 cm hose spacing:

Metering washer Ø 14.5 mm	bar	l/min		L UAN (*)/ha										
		Water	UAN (*)	5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	9.0 km/h	10.0 km/h	11.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
0.8 / 32	1	0.31	0.27	130	108	93	82	73	66	60	54	46	41	36
	2	0.43	0.38	182	152	130	113	100	90	82	76	65	57	51
	3	0.53	0.47	226	188	161	140	124	112	102	94	81	71	63
	4	0.62	0.55	264	220	188	164	146	131	119	110	94	83	73
	5	0.69	0.61	293	244	209	183	163	147	134	122	105	92	81
	6	0.76	0.67	322	268	229	201	179	161	146	134	115	101	89
	7	0.82	0.72	346	288	247	217	193	174	158	144	123	108	96
	8	0.87	0.77	370	308	264	231	205	185	168	154	132	116	103
	10	0.96	0.85	408	340	291	255	227	204	185	170	146	128	113
1.0 / 39	1	0.46	0.41	197	163	139	122	108	98	89	81	70	62	55
	2	0.65	0.57	274	230	197	172	153	138	125	115	98	86	76
	3	0.80	0.70	336	218	241	211	188	169	154	141	120	105	93
	4	0.92	0.81	389	325	279	244	217	195	177	163	139	122	108
	5	1.03	0.91	437	363	311	273	242	218	198	182	156	137	121
	6	1.13	1.00	480	398	341	299	265	239	217	199	171	150	133
	7	1.22	1.07	514	430	369	322	287	258	235	215	183	161	143
	8	1.30	1.15	552	460	394	345	306	276	251	230	197	173	153
	10	1.45	1.27	610	508	435	381	339	305	277	254	218	191	169
	8	3.92	3.45	1656	1380	1183	1035	920	828	753	690	591	518	460

(*) The application rates indicated apply to UAN (density 1.28 kg).

Metering washer Ø 14.5 mm	bar	l/min		L UAN(*)/ha										
		Water	UAN (*)	5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	9.0 km/h	10.0 km/h	11.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
1.2 / 48	2	0.95	0.84	403	336	288	252	224	202	183	168	144	126	112
	4	1.34	1.18	566	237	405	354	315	283	258	236	202	177	157
	6	1.65	1.45	696	580	497	435	387	348	316	290	249	218	193
	8	1.9	1.67	802	668	573	501	445	401	364	334	286	251	223
1.5 / 59	2	1.38	1.22	586	480	418	366	325	288	266	244	209	183	163
	4	1.95	1.72	826	688	590	516	459	413	375	344	295	258	260
	6	2.39	2.1	1008	840	720	630	560	504	458	420	360	315	280
	8	2.76	2.43	1166	972	833	729	648	583	530	486	417	365	368
1.8 / 72	2	1.96	1.73	415	692	593	519	461	415	377	346	297	260	231
	4	2.77	2.44	1171	976	837	732	651	586	532	488	418	366	325
	6	3.39	2.98	1430	1192	1022	894	795	715	650	596	511	447	397
	8	3.92	3.45	1656	1380	1183	1035	920	828	753	690	591	518	460

(*) The application rates indicated apply to UAN (density 1.28 kg).

18.5.2 Dosage table – SJ-7 liquid fertiliser nozzle

Nozzle (Colour)	Pressure [bar]	Water [l/ha] at 50 cm nozzle spacing							
		[l/min] per nozzle	[km/h]						
			4	6	8	10	12	16	20
015 (Dark green)	1.5	0.39	117	78.0	58.5	46.8	39.0	29.3	23.4
	2.0	0.46	138	92.0	69.0	55.2	46.0	34.5	27.6
	2.5	0.52	156	104	78.0	62.4	52.0	39.0	31.2
	3.0	0.57	171	114	85.5	68.4	57.0	42.8	34.2
	4.0	0.67	201	134	101	80.4	67.0	50.3	40.2
02 (Yellow)	1.5	0.55	165	110	82.5	66.0	55.0	41.3	33.0
	2.0	0.64	192	128	96.0	76.8	64.0	48.0	38.4
	2.5	0.72	216	144	108	86.4	72.0	54.0	43.2
	3.0	0.80	240	160	120	96.0	80.0	60.0	48.0
	4.0	0.93	279	186	140	112	93.0	69.8	55.8
03 (Dark blue)	1.5	0.87	261	174	131	104	87.0	65.3	52.2
	2.0	1.00	300	200	150	120	100	75.0	60.0
	2.5	1.10	330	220	165	132	110	82.5	66.0
	3.0	1.18	354	236	177	142	118	88.5	70.8
	4.0	1.31	393	262	197	157	131	98.3	78.6
04 (Red)	1.5	1.17	351	234	176	140	117	87.8	70.2
	2.0	1.33	399	266	200	160	133	99.8	79.8
	2.5	1.45	435	290	218	174	145	109	87.0
	3.0	1.55	465	310	233	186	155	116	93.0
	4.0	1.72	516	344	258	206	172	129	103
05 (Brown)	1.5	1.49	447	298	224	179	149	112	89.4
	2.0	1.68	504	336	252	202	168	126	101
	2.5	1.83	549	366	275	220	183	137	110
	3.0	1.95	585	390	293	234	195	146	117
	4.0	2.16	648	432	324	259	216	162	130

Nozzle (Colour)	Pressure [bar]	Water [l/ha] at 50 cm nozzle spacing							
		[l/min] per nozzle	[km/h]						
			4	6	8	10	12	16	20
06 (Grey)	1.5	1.77	531	354	266	212	177	133	106
	2.0	2.01	603	402	302	241	201	151	121
	2.5	2.19	657	438	329	263	219	164	131
	3.0	2.35	705	470	353	282	235	176	141
	4.0	2.61	783	522	392	313	261	196	157
08 (White)	1.5	2.28	684	456	342	274	228	171	137
	2.0	2.66	798	532	399	319	266	200	160
	2.5	2.94	882	588	441	353	294	221	176
	3.0	3.15	945	630	473	378	315	236	189
	4.0	3.46	1038	692	519	415	346	260	208
10 (Light blue)	1.5	2.84	852	568	426	341	284	213	170
	2.0	3.32	996	664	498	398	332	249	199
	2.5	3.67	1101	734	551	440	367	275	220
	3.0	3.94	1182	788	591	473	394	296	236
	4.0	4.33	1299	866	650	520	433	325	260
15 (Light green)	1.5	4.09	1227	818	614	491	409	307	245
	2.0	4.82	1446	964	723	578	482	362	289
	2.5	5.40	1620	1080	810	648	540	405	324
	3.0	5.87	1761	1174	881	704	587	440	352
	4.0	6.58	1974	1316	987	790	658	494	395

Notes:

- Spray height above the crop 75 - 100 cm.
- Pressure range 1.5 - 4.0 bar.
- Jet direction against the direction of travel.

For accurate dosing, volumetric metering is recommended on first use and annually thereafter .

18.5.3 Dosage table, five-hole nozzle FL

Nozzle	Permissible metering washer
POM (black)	0.8/1.0/1.2 mm Ø
POM (grey)	1.2/1.5/1.8 mm Ø

Nozzle caps required	SW 10
Metering washer diameter	15 mm

Metering washer Ø/mm	Pres-sure [bar]	[l/min]		UAN [l/ha]										
		H^2O	UAN	[km/h]										
				5	6	7	8	9	10	11	12	14	16	18
0.8/32	1.0	0.31	0.27	65	76	47	41	37	33	30	27	23	20	18
	2.0	0.43	0.38	91	94	65	57	51	46	41	38	33	29	25
	3.0	0.53	0.47	113	110	80	70	62	56	51	47	40	35	31
	4.0	0.62	0.55	132	122	94	82	73	66	60	55	47	41	37
	5.0	0.69	0.61	146	81	105	91	81	73	67	61	52	46	41
1.0/39	1.0	0.46	0.41	98	115	70	61	54	49	44	41	35	31	27
	2.0	0.65	0.57	137	141	98	86	77	69	63	57	49	43	38
	3.0	0.80	0.71	170	163	121	106	94	85	77	71	61	53	47
	4.0	0.92	0.81	194	182	139	122	108	98	89	81	69	61	54
	5.0	1.03	0.91	218	118	156	137	121	109	99	91	78	68	61
1.2/48	1.0	0.67	0.59	142	168	102	89	79	71	65	59	51	44	39
	2.0	0.95	0.84	202	205	144	126	112	101	92	84	72	63	56
	3.0	1.16	1.03	247	237	176	154	137	123	112	103	88	77	69
	4.0	1.34	1.18	283	171	203	178	158	142	129	118	101	89	79
1.5/59	1.0	0.97	0.86	206	244	147	129	114	103	94	86	74	65	57
	2.0	1.38	1.22	293	299	209	183	163	146	133	122	105	92	81
	3.0	1.69	1.49	358	244	256	224	199	179	163	149	128	112	99
1.8/72	1.0	1.38	1.22	293	346	209	183	163	146	133	122	105	92	81
	2.0	1.96	1.73	415	424	297	260	231	208	189	173	148	130	115
	3.0	2.40	2.12	509	76	364	318	283	255	231	212	182	159	141

Operating pressure at the nozzle measured with diaphragm valve.

Lateral nozzle spacing = 0.5 m.

The distribution rates indicated apply to UAN (28/1.28 kg/l).

A conversion factor must be applied to liquid fertilisers with a different density.

For accurate dosing, volumetric metering is recommended on first use and annually thereafter .

18.5.4 UAN dosage table (28/1.28 kg/l) for nozzles ID, IDN, IDK, IDKN and FD

Nozzle (Colour)	Pressure [bar]	l/min		UAN l/ha								
		H2O	UAN	km/h								
				5	6	7	8	10	12	14	16	18
-015 (Dark green)	1.5	0.42	0.37	89	74	63	56	44	37	32	28	25
	2.0	0.48	0.42	101	84	72	63	50	42	36	32	28
	2.5	0.54	0.48	115	96	82	72	58	48	41	36	32
	3.0	0.59	0.52	125	104	89	78	62	52	45	39	35
	4.0	0.68	0.60	144	120	103	90	72	60	51	45	40
-02 (Yellow)	1.5	0.56	0.49	118	98	84	74	59	49	42	37	33
	2.0	0.65	0.57	137	114	98	86	68	57	49	43	38
	2.5	0.73	0.64	154	128	110	96	77	64	55	48	43
	3.0	0.80	0.70	168	140	120	105	84	70	60	53	47
	4.0	0.92	0.81	194	162	139	122	97	81	69	61	54
-025 (Violet)	1.5	0.70	0.62	149	124	106	93	74	62	53	47	41
	2.0	0.81	0.71	170	142	122	107	85	71	61	53	47
	2.5	0.91	0.80	192	160	137	120	96	80	69	60	53
	3.0	0.99	0.87	209	174	149	131	104	87	75	65	58
	4.0	1.15	1.01	242	202	173	152	121	101	87	76	67
-03 (Dark blue)	1.0*	0.69	0.60	144	120	103	90	72	60	51	45	40
	1.5	0.84	0.74	178	148	127	111	89	74	63	56	49
	2.0	0.97	0.85	204	170	146	128	102	85	73	64	57
	2.5	1.08	0.95	228	190	163	143	114	95	81	71	63
	3.0	1.19	1.05	252	210	180	158	126	105	90	79	70
	4.0	1.37	1.21	290	242	207	182	145	121	104	91	81

Nozzle (Colour)	Pressure [bar]	l/min		UAN l/ha								
		H2O	UAN	km/h								
				5	6	7	8	10	12	14	16	18
-04 (Red)	1.0	0.91	0.80	192	160	137	120	96	80	69	60	53
	1.5	1.12	0.99	238	198	170	149	119	99	85	74	66
	2.0	1.29	1.14	274	228	195	171	137	114	98	86	76
	2.5	1.44	1.27	305	254	218	191	152	127	109	95	85
	3.0	1.58	1.39	334	278	238	209	167	139	119	104	93
	4.0	1.82	1.60	384	320	274	240	192	160	137	120	107
-05 (Brown)	1.0	1.14	1.00	240	200	171	150	120	100	86	75	67
	1.5	1.39	1.22	293	244	209	183	146	122	105	92	81
	2.0	1.61	1.42	341	284	243	213	170	142	122	107	95
	2.5	1.80	1.58	379	316	271	237	190	158	135	119	105
	3.0	1.97	1.73	415	346	297	260	208	173	148	130	115
	4.0	2.28	2.01	482	402	345	302	241	201	172	151	134
-06 (Grey)	1.5	1.67	1.47	353	294	252	221	176	147	126	110	98
	2.0	1.93	1.70	408	340	291	255	204	170	146	128	113
	2.5	2.16	1.90	456	380	326	285	228	190	163	143	127
	3.0	2.36	2.08	499	416	357	312	250	208	178	156	139
	4.0	2.73	2.40	576	480	411	360	288	240	206	180	160
-08 (White)	1.5	2.23	1.96	470	392	336	294	235	196	168	147	131
	2.0	2.58	2.27	545	454	389	341	272	227	195	170	151
	2.5	2.88	2.53	607	506	434	380	304	253	217	190	169
	3.0	3.16	2.78	667	556	477	417	334	278	238	209	185
	4.0	3.65	3.21	770	642	550	482	385	321	275	241	214
-10 (Light blue)	1.5	2.83	2.49	598	498	427	374	299	249	214	187	166
	2.0	3.27	2.88	691	576	494	432	345	288	246	216	192
	2.5	3.65	3.21	771	642	551	482	385	321	275	241	214
	3.0	4.00	3.52	845	704	604	528	422	352	302	264	235
	4.0	4.62	4.07	976	813	697	610	488	407	348	305	271

Nozzle (Colour)	Pressure [bar]	l/min		UAN l/ha								
		H2O	UAN	km/h								
				5	6	7	8	10	12	14	16	18
-15 (Light green)	1.5	4.24	3.73	896	746	640	560	448	373	319	280	249
	2.0	4.90	4.31	1035	862	739	647	517	431	370	324	288
	2.5	5.48	4.82	1157	964	826	723	579	482	414	362	321
	3.0	6.00	5.28	1267	1056	906	792	634	528	452	396	352
	4.0	6.93	6.10	1463	1220	1045	915	732	610	523	458	407
-20 (Black)	1.5	5.66	4.98	1195	996	854	747	598	498	427	374	332
	2.0	6.53	5.75	1379	1149	985	862	690	575	493	431	383
	2.5	7.30	6.42	1542	1285	1101	964	771	642	551	482	429
	3.0	8.00	7.04	1690	1408	1206	1056	845	704	604	528	469
	4.0	9.24	8.13	1952	1626	1394	1220	976	813	697	610	542

(*) 1.0 bar applies to IDKN only

-01 ID/IDK: 20-90 l/ha (5-18 km/h)

Notes:

- Spray pressure measured at the nozzle.
- Lateral nozzle spacing 50 cm.
- Spray height above the crop approx. 50 cm.
- Spray pressure range:

ID nozzles: 2 – 3.5 bar

IDN nozzles: 2 – 4 bar

IDK nozzles: 1.5 – 2.5 bar

IDK nozzles (04/05/06): >1.0 bar – 2.5 bar

IDKN nozzles: 1.0 – 2.2 bar

FD nozzles: 1.5 - 4 bar

The data and applications listed in the nozzle tables must always be taken into account.

For accurate dosing, volumetric metering is recommended on first use and annually thereafter .

18.5.5 Dosage table, liquid fertiliser nozzle FD

Nozzle (Colour)	Pressure [bar]	l/min		UAN l/ha				
		H2O	UAN	km/h				
				6	8	10	14	18
03 (Dark blue)	1.5	0.85	0.75	150	113	90	64	50
	2.0	0.98	0.86	172	129	103	74	57
	3.0	1.20	1.06	212	159	127	91	71
	4.0	1.39	1.22	244	183	146	105	81
04 (Red)	1.5	1.13	1.00	200	150	120	86	67
	2.0	1.31	1.15	230	173	138	99	77
	3.0	1.60	1.41	282	211	169	121	94
	4.0	1.85	1.63	326	245	196	140	109
05 (Brown)	1.5	1.41	1.24	248	186	149	106	83
	2.0	1.63	1.44	288	216	173	123	96
	3.0	2.00	1.76	352	264	211	151	117
	4.0	2.31	2.03	406	305	244	174	135
06 (Grey)	1.5	1.70	1.49	298	224	179	128	99
	2.0	1.96	1.72	344	258	206	147	115
	3.0	2.40	2.11	422	317	253	181	141
	4.0	2.77	2.44	488	366	293	209	163
08 (White)	1.5	2.26	1.99	398	299	239	171	133
	2.0	2.61	2.30	460	345	276	197	153
	3.0	3.20	2.82	563	422	338	241	188
	4.0	3.70	3.25	650	488	390	279	217
10 (Light blue)	1.5	2.83	2.49	498	374	299	214	166
	2.0	3.27	2.88	576	432	345	246	192
	3.0	4.00	3.52	704	528	422	302	235
	4.0	4.62	4.07	813	610	488	348	271
15 (Dark green)	1.5	4.24	3.73	746	560	448	319	249
	2.0	4.90	4.31	862	647	517	370	288
	3.0	6.00	5.28	1056	792	634	452	352
	4.0	6.93	6.10	1220	915	732	523	407

Nozzle (Colour)	Pressure [bar]	l/min		UAN l/ha				
		H2O	UAN	km/h				
				6	8	10	14	18
20 (Black)	1.5	5.66	4.98	996	747	598	427	332
	2.0	6.53	5.75	1149	862	690	493	383
	3.0	8.00	7.04	1408	1056	845	604	469
	4.0	9.24	8.13	1626	1220	976	697	542

Notes:

- The table relates to a nozzle spacing of 50 cm and l/ha values based on a UAN solution (28/1.28 kg/l).
- A conversion factor must be applied to liquid fertilisers with a different density.
- Jet direction against the direction of travel.
- Spray pressure measured at the nozzle.
- Lateral nozzle spacing 50 cm.
- Spray height above the crop approx. 50 to 70 cm.
- Spray pressure range 1.5 to 4.0 bar
- The data and applications listed in the nozzle tables must always be taken into account.

For accurate dosing, volumetric metering is recommended on first use and annually thereafter .

18.5.6 Dosage table, six-hole nozzle ESI

Nozzle (Colour)	Pressure [bar]	l/min	UAN l/ha						
			km/h						
			4	5	6	7	8	10	12
-015 (Green)	1.0	0.30	91	73	61	52	46	37	30
	1.5	0.37	112	90	75	64	56	45	37
	2.0	0.43	129	103	86	74	65	52	43
	2.5	0.48	143	114	95	81	71	57	48
	3.0	0.53	158	127	106	91	79	63	53
	3.5	0.56	169	135	113	97	84	68	56
	4.0	0.61	182	146	121	104	91	73	50
-02 (Yellow)	1.0	0.41	122	98	81	70	61	49	41
	1.5	0.50	149	120	100	85	75	60	50
	2.0	0.57	172	138	115	99	86	69	57
	2.5	0.64	193	154	128	110	96	77	64
	3.0	0.70	211	169	141	121	106	84	70
	3.5	0.76	227	182	151	130	114	91	76
	4.0	0.80	240	192	160	137	120	96	80
-03 (Blue)	1.0	0.61	183	146	122	105	91	73	61
	1.5	0.75	224	179	149	128	112	90	75
	2.0	0.86	259	207	172	148	129	103	86
	2.5	0.96	289	231	193	165	145	116	96
	3.0	1.06	317	253	211	181	158	127	106
	3.5	1.14	343	275	229	196	172	137	114
	4.0	1.22	367	294	245	210	183	147	122

Nozzle (Colour)	Pressure [bar]	l/min	UAN l/ha						
			km/h						
			4	5	6	7	8	10	12
-04 (Red)	1.0	0.81	244	195	163	139	122	98	81
	1.5	1.00	299	239	199	171	149	119	100
	2.0	1.15	345	276	230	197	172	138	115
	2.5	1.29	386	309	257	220	193	154	129
	3.0	1.41	422	338	282	241	211	169	141
	3.5	1.52	457	365	304	261	228	183	152
	4.0	1.63	488	391	326	279	244	195	163
-05 (Brown)	1.0	1.01	304	243	202	173	152	121	101
	1.5	1.24	373	299	249	213	187	149	124
	2.0	1.44	431	345	287	246	216	172	144
	2.5	1.60	480	384	320	275	240	192	160
	3.0	1.76	528	422	352	302	264	211	176
	3.5	1.90	570	456	380	326	285	228	190
	4.0	2.02	607	486	405	347	304	243	202
-06 (Grey)	1.0	1.22	365	292	244	209	183	146	122
	1.5	1.49	447	358	298	256	224	179	149
	2.0	1.72	517	413	344	295	258	207	172
	2.5	1.92	577	462	385	330	289	231	192
	3.0	2.11	633	506	422	361	316	253	211
	3.5	2.28	683	547	456	391	342	273	228
	4.0	2.43	730	584	487	417	365	292	243

Notes:

- The values in the table apply to UAN liquid fertiliser at 1.30 kg/l and 10°C.
- A conversion factor must be applied to liquid fertilisers with a different density.
- Spray pressure measured at the nozzle.
- Lateral nozzle spacing 50 cm.

- Spray height above the crop approx. 60 cm.
- Spray pressure range 1.0 to 4.0 bar
- The data and applications listed in the nozzle tables must always be taken into account.

18.6 Checks and official implement inspections

Special skills and tools are needed to check the test connections. Therefore these activities must only be carried out by service personnel.

– Arrange for the following assembly groups to be checked by service personnel:
  - Pump
  - Pressure gauge
  - Flowmeter
– Official implement inspections must always be carried out by qualified and authorised persons.

19 NOISE, AIRBORNE SOUND

The noise level of the implement does not exceed 70 dB (A) during work.

20 NOTES

As the version of equipment is depending from the order, the equipment of your implement and its description concerned may deviate in some cases. To ensure a continuously updating of the technical features, we reserve the right to modify the design, equipment and technique.

20.1 Implement-specific data

- Determine the following data to find the respective settings.
- Enter the data in the following fields.

20.1.1 Upper linkage setting

Tractor		**Upper linkage length [mm]**		**Upper linkage position [mm]**
		mechanical	hydraulic	
1				
2				
3				
4				
5				

20.2 Sirius 10/12 – types

Key

* LEMKEN Ecospray (Sirius 10)
** LEMKEN Megaspray in conjunction with any ISOBUS operating terminal (Sirius 12)

(1) Optional equipment:

1 Matrix
2 External cleaning
3 Intensive agitator
4 Recirculation
5 Cleaning gun
6 Agitator nozzle
7 Ground distance spacer
8 Nozzle protection (with single nozzle holders)
9 Triple nozzle holder (HE)
10 Five-way nozzle holder (SEH/RA)
11 Nozzles
12 Nozzle extension
13 FULL version (electrohydraulic slope compensation)
14 Boundary nozzles
15 End nozzles (RA)

20.2.1 Matrices – pump P 150

HE and SEH boom

No.	Tank				Pump			Control unit		Boom												Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	12 m HE	15 m HE	SEH 15	SEH 18	SEH 20/15	SEH 21/15	SEH 21/17	SEH 24	SEH 27/21	SEH 27/22	SEH 28	SEH 30	
1	x				x			x		x												x
2	x				x			x			x											x
3	x				x			x				x										x
4	x				x			x					x									x
5		x			x			x		x												x
6		x			x			x			x											x
7		x			x			x				x										x
8		x			x			x					x									x
9			x		x			x		x												x
10			x		x			x			x											x
11			x		x			x				x										x
12			x		x			x					x									x
13				x	x			x		x												x
14				x	x			x			x											x
15				x	x			x				x										x
16				x	x			x					x									x
I 1	x				x				x	x												x
I 2	x				x				x		x											x
I 3	x				x				x			x										x
I 4	x				x				x				x									x
I 5		x			x				x	x												x
I 6		x			x				x		x											x
I 7		x			x				x			x										x
I 8		x			x				x				x									x
I 9			x		x				x	x												x
I 10			x		x				x		x											x
I 11			x		x				x			x										x
I 12			x		x				x				x									x
I 13				x	x				x	x												x
I 14				x	x				x		x											x
I 15				x	x				x			x										x
I 16				x	x				x				x									x

RA boom

No.	Tank				Pump			Control unit		Boom										Optional equipment
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	RA 15	RA 18	RA 20/15	RA 21/15	RA 21/17	RA 24	RA 27/21	RA 27/22	RA 28	RA 30	
RA 3	x				x			x		x										x
RA 4	x				x			x			x									x
RA 7		x			x			x		x										x
RA 8		x			x			x			x									x
RA 11			x		x			x		x										x
RA 12			x		x			x			x									x
RA 15				x	x			x		x										x
RA 16				x	x			x			x									x
RA-I 3	x				x				x	x										x
RA-I 4	x				x				x		x									x
RA-I 7		x			x				x	x										x
RA-I 8		x			x				x		x									x
RA-I 11			x		x				x	x										x
RA-I 12			x		x				x		x									x
RA-I 15				x	x				x	x										x
RA-I 16				x	x				x		x									x

20.2.2 Matrices – pump P 200

HE and SEH boom

No.	Tank				Pump			Control unit		Boom												Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	12 m HE	15 m HE	SEH 15	SEH 18	SEH 20/15	SEH 21/15	SEH 21/17	SEH 24	SEH 27/21	SEH 27/22	SEH 28	SEH 30	
17	x					x		x		x												x
18	x					x		x			x											x
19	x					x		x				x										x
20	x					x		x					x									x
21	x					x		x						x								x
22	x					x		x							x							x
23	x					x		x								x						x
24		x				x		x		x												x
25		x				x		x			x											x
26		x				x		x				x										x

No.	Tank				Pump			Control unit		Boom												Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	12 m HE	15 m HE	SEH 15	SEH 18	SEH 20/15	SEH 21/15	SEH 21/17	SEH 24	SEH 27/21	SEH 27/22	SEH 28	SEH 30	
27		x				x		x					x									x
28		x				x		x						x								x
29		x				x		x							x							x
30		x				x		x								x						x
31			x			x		x		x												x
32			x			x		x			x											x
33			x			x		x				x										x
34			x			x		x					x									x
35			x			x		x						x								x
36			x			x		x							x							x
37			x			x		x								x						x
38				x		x		x		x												x
39				x		x		x			x											x
40				x		x		x				x										x
41				x		x		x					x									x
42				x		x		x						x								x
43				x		x		x							x							x
44				x		x		x								x						x
I 17	x					x			x	x												x
I 18	x					x			x		x											x
I 19	x					x			x			x										x
I 20	x					x			x				x									x
I 21	x					x			x					x								x
I 22	x					x			x						x							x
I 23	x					x			x							x						x
I 24		x				x			x	x												x
I 25		x				x			x		x											x
I 26		x				x			x			x										x
I 27		x				x			x				x									x
I 28		x				x			x					x								x
I 29		x				x			x						x							x
I 30		x				x			x							x						x
I 31			x			x			x	x												x
I 32			x			x			x		x											x
I 33			x			x			x			x										x
I 34			x			x			x				x									x
I 35			x			x			x					x								x
I 36			x			x			x						x							x
I 37			x			x			x							x						x

No.	Tank				Pump			Control unit		Boom												Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	12 m HE	15 m HE	SEH 15	SEH 18	SEH 20/15	SEH 21/15	SEH 21/17	SEH 24	SEH 27/21	SEH 27/22	SEH 28	SEH 30	
I 38				x		x			x	x												x
I 39				x		x			x		x											x
I 40				x		x			x			x										x
I 41				x		x			x				x									x
I 42				x		x			x					x								x
I 43				x		x			x						x							x
I 44				x		x			x							x						x

RA boom

No.	Tank				Pump			Control unit		Boom										Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	RA 15	RA 18	RA 20/15	RA 21/15	RA 21/17	RA 24	RA 27/21	RA 27/22	RA 28	RA 30	
RA 19	x					x		x		x										x
RA 20	x					x		x			x									x
RA 21	x					x		x				x								x
RA 22	x					x		x					x							x
RA 23	x					x		x						x						x
RA 26		x				x		x		x										x
RA 27		x				x		x			x									x
RA 28		x				x		x				x								x
RA 29		x				x		x					x							x
RA 30		x				x		x						x						x
RA 33			x			x		x		x										x
RA 34			x			x		x			x									x
RA 35			x			x		x				x								x
RA 36			x			x		x					x							x
RA 37			x			x		x						x						x
RA 40				x		x		x		x										x
RA 41				x		x		x			x									x
RA 42				x		x		x				x								x
RA 43				x		x		x					x							x
RA 44				x		x		x						x						x

No.	Tank				Pump			Control unit		Boom										Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	RA 15	RA 18	RA 20/15	RA 21/15	RA 21/17	RA 24	RA 27/21	RA 27/22	RA 28	RA 30	
RA-I 19	x					x			x	x										x
RA-I 20	x					x			x		x									x
RA-I 21	x					x			x			x								x
RA-I 22	x					x			x				x							x
RA-I 23	x					x			x					x						x
RA-I 26		x				x			x	x										x
RA-I 27		x				x			x		x									x
RA-I 28		x				x			x			x								x
RA-I 29		x				x			x				x							x
RA-I 30		x				x			x					x						x
RA-I 33			x			x			x	x										x
RA-I 34			x			x			x		x									x
RA-I 35			x			x			x			x								x
RA-I 36			x			x			x				x							x
RA-I 37			x			x			x					x						x
RA-I 40				x		x			x	x										x
RA-I 41				x		x			x		x									x
RA-I 42				x		x			x			x								x
RA-I 43				x		x			x				x							x
RA-I 44				x		x			x					x						x

20.2.3 Matrices – pump P 260

HE and SEH boom

No.	Tank				Pump			Control unit		Boom												Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	12 m HE	15 m HE	SEH 15	SEH 18	SEH 20/15	SEH 21/15	SEH 21/17	SEH 24	SEH 27/21	SEH 27/22	SEH 28	SEH 30	
45	x						x	x		x												x
46	x						x	x			x											x
47	x						x	x				x										x
48	x						x	x					x									x
49	x						x	x						x								x
50	x						x	x							x							x

No.	Tank				Pump			Control unit		Boom												Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	12 m HE	15 m HE	SEH 15	SEH 18	SEH 20/15	SEH 21/15	SEH 21/17	SEH 24	SEH 27/21	SEH 27/22	SEH 28	SEH 30	
51	x						x	x								x						x
52	x						x	x									x					x
53	x						x	x										x				x
54	x						x	x											x			x
55	x						x	x												x		x
56	x						x	x													x	x
57		x					x	x		x												x
58		x					x	x			x											x
59		x					x	x				x										x
60		x					x	x					x									x
61		x					x	x						x								x
62		x					x	x							x							x
63		x					x	x								x						x
64		x					x	x									x					x
65		x					x	x										x				x
66		x					x	x											x			x
67		x					x	x												x		x
68		x					x	x													x	x
69			x				x	x		x												x
70			x				x	x			x											x
71			x				x	x				x										x
72			x				x	x					x									x
73			x				x	x						x								x
74			x				x	x							x							x
75			x				x	x								x						x
76			x				x	x									x					x
77			x				x	x										x				x
78			x				x	x											x			x
79			x				x	x												x		x
80			x				x	x													x	x
81				x			x	x		x												x
82				x			x	x			x											x
83				x			x	x				x										x
84				x			x	x					x									x
85				x			x	x						x								x
86				x			x	x							x							x
87				x			x	x								x						x
88				x			x	x									x					x
89				x			x	x										x				x
90				x			x	x											x			x

No.	Tank				Pump			Control unit		Boom												Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	12 m HE	15 m HE	SEH 15	SEH 18	SEH 20/15	SEH 21/15	SEH 21/17	SEH 24	SEH 27/21	SEH 27/22	SEH 28	SEH 30	
91				x			x	x												x		x
92				x			x	x													x	x
I 45	x						x		x	x												x
I 46	x						x		x		x											x
I 47	x						x		x			x										x
I 48	x						x		x				x									x
I 49	x						x		x					x								x
I 50	x						x		x						x							x
I 51	x						x		x							x						x
I 52	x						x		x								x					x
I 53	x						x		x									x				x
I 54	x						x		x										x			x
I 55	x						x		x											x		x
I 56	x						x		x												x	x
I 57		x					x		x	x												x
I 58		x					x		x		x											x
I 59		x					x		x			x										x
I 60		x					x		x				x									x
I 61		x					x		x					x								x
I 62		x					x		x						x							x
I 63		x					x		x							x						x
I 64		x					x		x								x					x
I 65		x					x		x									x				x
I 66		x					x		x										x			x
I 67		x					x		x											x		x
I 68		x					x		x												x	x
I 69			x				x		x	x												x
I 70			x				x		x		x											x
I 71			x				x		x			x										x
I 72			x				x		x				x									x
I 73			x				x		x					x								x
I 74			x				x		x						x							x
I 75			x				x		x							x						x
I 76			x				x		x								x					x
I 77			x				x		x									x				x
I 78			x				x		x										x			x
I 79			x				x		x											x		x
I 80			x				x		x												x	x
I 81				x			x		x	x												x

No.	Tank				Pump			Control unit		Boom												Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	12 m HE	15 m HE	SEH 15	SEH 18	SEH 20/15	SEH 21/15	SEH 21/17	SEH 24	SEH 27/21	SEH 27/22	SEH 28	SEH 30	
I 82				x			x		x		x											x
I 83				x			x		x			x										x
I 84				x			x		x				x									x
I 85				x			x		x					x								x
I 86				x			x		x						x							x
I 87				x			x		x							x						x
I 88				x			x		x								x					x
I 89				x			x		x									x				x
I 90				x			x		x										x			x
I 91				x			x		x											x		x
I 92				x			x		x												x	x

RA boom

No.	Tank				Pump			Control unit		Boom										Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	RA 15	RA 18	RA 20/15	RA 21/15	RA 21/17	RA 24	RA 27/21	RA 27/22	RA 28	RA 30	
RA 47	x						x	x		x										x
RA 48	x						x	x			x									x
RA 49	x						x	x				x								x
RA 50	x						x	x					x							x
RA 51	x						x	x						x						x
RA 52	x						x	x							x					x
RA 53	x						x	x								x				x
RA 54	x						x	x									x			x
RA 55	x						x	x										x		x
RA 56	x						x	x											x	x
RA 59		x					x	x		x										x
RA 60		x					x	x			x									x
RA 61		x					x	x				x								x
RA 62		x					x	x					x							x
RA 63		x					x	x						x						x
RA 64		x					x	x							x					x
RA 65		x					x	x								x				x

No.	Tank				Pump			Control unit		Boom										Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	RA 15	RA 18	RA 20/15	RA 21/15	RA 21/17	RA 24	RA 27/21	RA 27/22	RA 28	RA 30	
RA 66		x					x	x									x			x
RA 67		x					x	x										x		x
RA 68		x					x	x											x	x
RA 71			x				x	x		x										x
RA 72			x				x	x			x									x
RA 73			x				x	x				x								x
RA 74			x				x	x					x							x
RA 75			x				x	x						x						x
RA 76			x				x	x							x					x
RA 77			x				x	x								x				x
RA 78			x				x	x									x			x
RA 79			x				x	x										x		x
RA 80			x				x	x											x	x
RA 83				x			x	x		x										x
RA 84				x			x	x			x									x
RA 85				x			x	x				x								x
RA 86				x			x	x					x							x
RA 87				x			x	x						x						x
RA 88				x			x	x							x					x
RA 89				x			x	x								x				x
RA 90				x			x	x									x			x
RA 91				x			x	x										x		x
RA 92				x			x	x											x	x
RA-I 47	x						x		x	x										x
RA-I 48	x						x		x		x									x
RA-I 49	x						x		x			x								x
RA-I 50	x						x		x				x							x
RA-I 51	x						x		x					x						x
RA-I 52	x						x		x						x					x
RA-I 53	x						x		x							x				x
RA-I 54	x						x		x								x			x
RA-I 55	x						x		x									x		x
RA-I 56	x						x		x										x	x
RA-I 59		x					x		x	x										x
RA-I 60		x					x		x		x									x
RA-I 61		x					x		x			x								x
RA-I 62		x					x		x				x							x
RA-I 63		x					x		x					x						x
RA-I 64		x					x		x						x					x

No.	Tank				Pump			Control unit		Boom										Optional equipment (1)
	900 l	1300 l	1600 l	1900 l	P 150	P 200	P 260	Non-ISOBUS*	ISOBUS**	RA 15	RA 18	RA 20/15	RA 21/15	RA 21/17	RA 24	RA 27/21	RA 27/22	RA 28	RA 30	
RA-I 65		x					x		x							x				x
RA-I 66		x					x		x								x			x
RA-I 67		x					x		x									x		x
RA-I 68		x					x		x										x	x
RA-I 71			x				x		x	x										x
RA-I 72			x				x		x		x									x
RA-I 73			x				x		x			x								x
RA-I 74			x				x		x				x							x
RA-I 75			x				x		x					x						x
RA-I 76			x				x		x						x					x
RA-I 77			x				x		x							x				x
RA-I 78			x				x		x								x			x
RA-I 79			x				x		x									x		x
RA-I 80			x				x		x										x	x
RA-I 83				x			x		x	x										x
RA-I 84				x			x		x		x									x
RA-I 85				x			x		x			x								x
RA-I 86				x			x		x				x							x
RA-I 87				x			x		x					x						x
RA-I 88				x			x		x						x					x
RA-I 89				x			x		x							x				x
RA-I 90				x			x		x								x			x
RA-I 91				x			x		x									x		x
RA-I 92				x			x		x										x	x

20.3 Technical residues

Sirius	Nominal tank volume [l]	HE boom width, maximum [m]	SEH boom width, maximum [m]	Residue [l]				
				Level ground	Slope			
					Contour line		Line of slope	
					Left, 8.5°	Right, 8.5°	Uphill 8.5°	Downhill, 8.5°
900	900	15		15.4	19.7	10.2	12.9	15.7
1300	1300	15		15.4	19.7	10.2	12.9	15.7
1600	1600	15		15.4	19.7	10.2	12.9	15.7
1900	1900	15		15.4 (1)	19.7	10.2	12.9	15.7
900	900		24	19.4	23.7	14.2	19.6	19.7
1300	1300		24	19.4	23.7	14.2	19.6	19.7
1600	1600		30	21.8	26.1	16.5	19.3	22.15
1900	1900		30	21.8	26.1	16.5	19.3	22.15

(1) Dilutable element of the technical residue [l]: 9.2

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