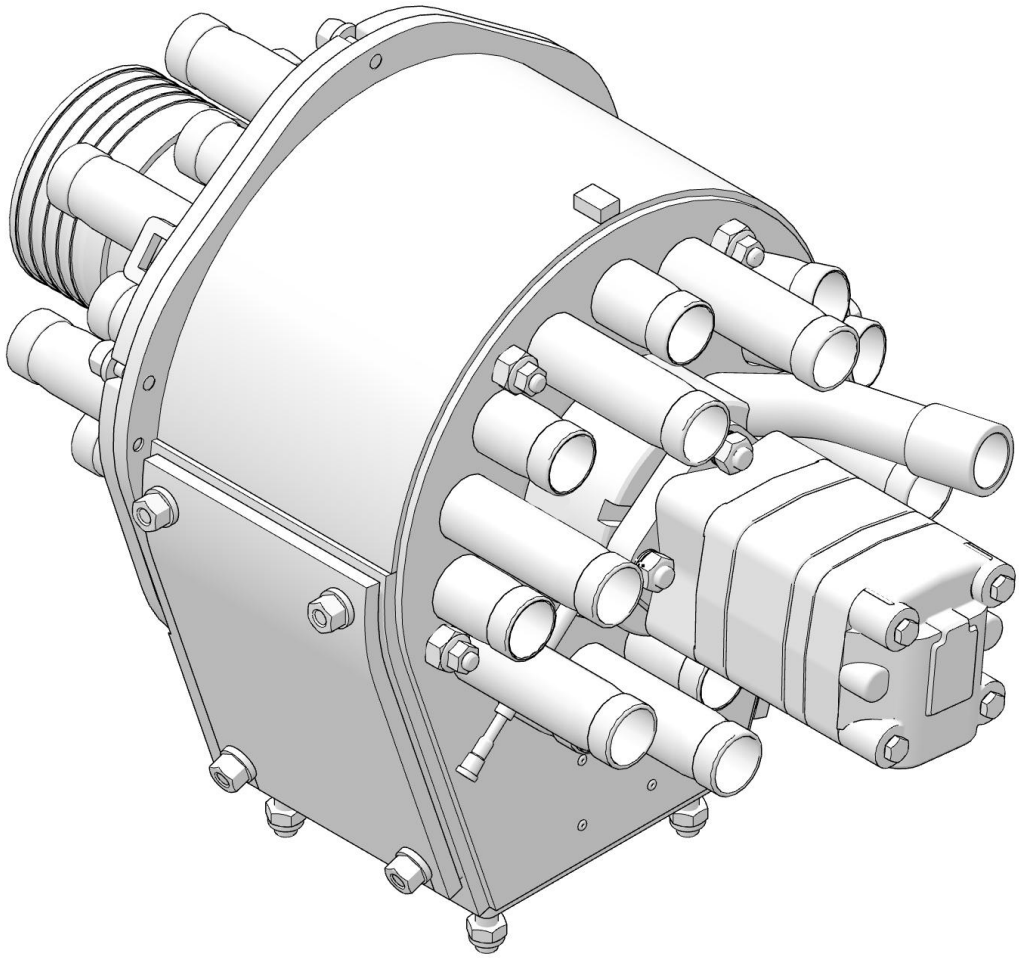

ExaCut

ECL30-40

Operating instructions example

This manual has been written as an example of a defined product type.
It does not contain all of the available options.
V1.0

Date of issue: 09.09.2024
Part number: DPK0000005

VOGELSANG

Original operating instructions

Manufacturer

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Table of contents

1 About this manual

1.1 Information about this manual

This manual contains all of the information needed to use the machine properly, effectively and safely.

- This manual must always be available to anyone who works with the machine.
- You must read the manual before you start to operate the machine.
- This manual is an integral part of the machine. If the machine changes hands, then this manual must be passed on to the new owner.

Additional copies of the manual are available upon request.

Vogelsang will not accept any liability for damage resulting from failure to comply with this manual.

1.2 Conventions used in this document

1.2.1 Warning messages

⚠DANGER!

"Danger" indicates a dangerous situation which directly leads to death or serious injury.

⚠WARNING!

"Warning" indicates a dangerous situation which can directly lead to death or serious injury.

⚠CAUTION!

"Caution" indicates a potentially hazardous situation which may result in minor to moderate injury.

NOTICE!

"Attention" indicates a situation which can lead to material damage and environmental damage.

1.2.2 Symbols

Symbol	Meaning
	Instructions for use and useful information
	Environmental protection notices

1.2.3 Figures

The figures used in this manual are only intended for the purposes of understanding and illustration.

If original drawings are supplied, the information and illustrations which they contain are binding. In the event of any discrepancies, the original drawings take precedence over the figures in this manual.

1.3 Other applicable documents

All of the documents which are mentioned or attached to this manual are considered an integral part of it. You must observe and follow the instructions in the other applicable documents.

If you do not have access to some of the other applicable documents, contact Service.

- Drawing
- Supplier documents for drive technology
- Spare parts list

1.4 Directional information

Directional information in these operating instructions, such as front, back, right and left are always relative to the direction of motion when the attachment is in its working position.

1.5 Target group

These operating instructions are intended for the following persons:

- The person who bears the responsibility for the system (i.e. its operator)
- Service technician, installer
- Operator
- Service personnel

Personnel qualifications

The activities described in this manual may be carried out only by persons

- who have been trained for the activities concerned and who possess the necessary knowledge.
- who have been informed about the possible dangers when using the machine.

Qualifications for particular tasks

- Transport and loading: crane operators and forklift drivers with appropriate authorization
- Work on the electrical system: qualified electricians
- Work on the hydraulic system: qualified hydraulic personnel
- Connecting and checking safety devices: qualified technical personnel, (e.g. mechanics, metalworkers, technicians or persons with comparable training)

If specific additional qualifications are required to carry out work, these will be specified in the section concerned.

2 Safety

Notice

- Follow all of the safety instructions in this manual and in the other applicable documents. Following these instructions provides for your own safety.
- Please contact us immediately in the event of any irregularities in connection with the safety of the delivered product:
  produktsicherheit@vogelsang.info

2.1 General safety information

2.1.1 Intended use

The distributor is a machine for the precise distribution of natural fertilizer , e.g. liquid manure, biogas manure and digestate (referred to as the "medium" in the following)—to varying numbers of discharge hoses.

The distributor can be operated on a spreader vehicle, or stationary as a fixed installation under a roof or canopy.

The distributor can be operated on vacuum tankers and pump tankers.

The permissible range of temperature for the medium is 0 °C to 45 °C.

NOTICE!

If the distributor is operated on a pump tanker, the operating pressure must be limited to 3 bar. Otherwise the distributor could burst.

► Limit the operating pressure to 3 bar (e.g. with a pressure relief valve).
We recommend using a pressure gauge on the supply line to monitor the pressure.

In addition to the specifications in this chapter, those in the "Specifications" chapter must be complied with as well, → *4 Specifications*.

2.1.2 Foreseeable misuse

The following points are contrary to the intended use and represent misuse:

- The distributor is used otherwise than as described in the "Intended use" section.
- The safety notes in this manual are ignored.
- The specified maintenance and inspection work has not been done at the required times.
- The medium is above or below the permissible temperature.
- The distributor is:
  - used in a potentially explosive atmosphere.
  - used in the food industry.
  - used to spread flammable fluids.
  - used to spread non-pumpable media.
  - used in a closed space.
  - operated by persons who are not trained or instructed.
  - improperly changed or modified.
  - operated with spare parts or accessory parts that are not approved by the manufacturer.

The manufacturer is not liable for damage resulting from improper use.

2.2 Operator's responsibilities

The machine is used commercially. The machine's operator is thus subject to the local statutory regulations on occupational safety and environmental protection.

The operator must ensure that

- the machine remains in full working order at all times.
- the machine is only operated within its technical limits.
- all of the maintenance intervals specified in this manual are adhered to and documented.
- the instructions in this manual are followed.

In addition, the operator must

- inform the personnel about the nature and operating temperature of the medium and about hazardous substances, e.g. in working materials, and take appropriate safety measures.
- define which persons are responsible for which actions performed on the machine.
- ensure that all persons who handle the machine,
  - have been trained in the tasks they are expected to perform.
  - and have been informed of the potential risks involved in working with the machine.

Notice

Take the opportunity to have your staff trained by Vogelsang.

2.2.1 Personal protection equipment

The following personal protective equipment must be available to the personnel:

Personal protective equipment	Meaning
	Safety goggles
	Safety helmet
	Hearing protection
	Safety gloves
	Safety shoes

2.3 Safety notes

2.3.1 Safety notes for particular phases in the life of the product

Transport

- Only use suitable personnel for loading and transport, → Target audience.
- Observe the weights and dimensions, → Drawing.
- Use only hoists designed for the weight of the units to be transported when lifting and moving heavy parts.
- Before lifting, note the machine's centre of gravity.
- During transportation, secure the machine from slipping, tilting and falling down.
- Use the specified slinging points.

Installation

- When lifting and moving heavy parts, use appropriate hoists.
- Only use hoists designed for the weight concerned.
- Use the specified slinging points.

Operation

- Before starting work, familiarise yourself with all of the machine's equipment, controls and functions.
- Operate the machine only
  - if all protective and safety devices are functional.
  - if access to the danger areas is not possible.
- Do not work in any way that could pose a risk to safety.

Service, repair

- Do the specified maintenance work punctually.
- Switch off the machine before doing any maintenance or repair work.
- Use only genuine spare parts or parts approved by Vogelsang.
- Install spare parts correctly.
- Once the work has been completed, install and check any removed safety devices.

Malfunctions

- In case of malfunctions, stop the machine immediately.
- Clear the malfunctions immediately.

Disposal

- Sort residual media, pollutants and replacement parts according to their type and dispose of them in an environmentally-friendly manner.
- When handling a medium, always observe the valid safety instructions for the substance concerned.
- Avoid contact with pollutants. Wear suitable protective clothing.

2.3.2 Safety notes for particular types of dangers

Electrical energy

- Allow only qualified electricians to work on electrical systems or equipment.
- In the event of malfunctions in the electric power supply, immediately shut down the machine or the system.

Hydraulics, pneumatics

- Only persons with special knowledge and experience in hydraulics may work on hydraulic equipment.
- Hydraulic and compressed air lines must be routed and installed correctly.
- Do not mix up connections.
- Valves, fittings, and the length and quality of the hoses must comply with the requirements.

Oils, grease, chemical substances

- When handling oils, greases and other chemical substances, observe the applicable safety regulations.
- Wear suitable protective clothing when handling hot or hazardous operating or auxiliary materials or the medium to be spread.
- Dispose of oils, greases and other chemical substances in an environmentally friendly manner.

Heavy parts

- Use an appropriate hoisting device and tools to lift and move heavy parts.

Special ambient conditions

Risk of frost
In case of frost, the medium in the distributor may freeze. This could cause damage to the distributor.

- Clean the distributor before long periods of shutdown, → *10.10.2 Cleaning the distributor*.

Conversion and spare parts

- Modifications or changes to the machine are permissible only after consultation with Vogelsang.
- Only accessory parts and spare parts approved by Vogelsang may be used. Vogelsang assumes no liability for damage resulting from the application of other parts.

Periods of hot weather
If downtimes and periods of hot weather coincide, fermentation processes may occur in closed pipes. The pressure in the distributor may increase considerably due to the gas created. The increased pressure can cause damage to the distributor and, in the worst-case scenario, injuries.

- Clean the distributor before long periods of shutdown, → *10.10.2 Cleaning the distributor*.

2.4 Danger areas

Die Umgebung des Verteilers ist ein Gefahrenbereich, in dem permanent oder unerwartet Gefährdungen für Personen auftreten können:

- Due to pressure in the distributor
- Due to pressure in the hydraulic system

No one should be in the danger area of the distributor

- when the distributor is in operation.
- as long as the motor of the spreader vehicle is in operation with the hydraulic system connected.
- while the spreader vehicle and the attachment are not secured to prevent unintended starting or rolling.

Danger areas with regard to the distributor are as follows:

- In the area under the cleaning port
- Inside the distributor
- Around the inlet
- In the area around the service ports

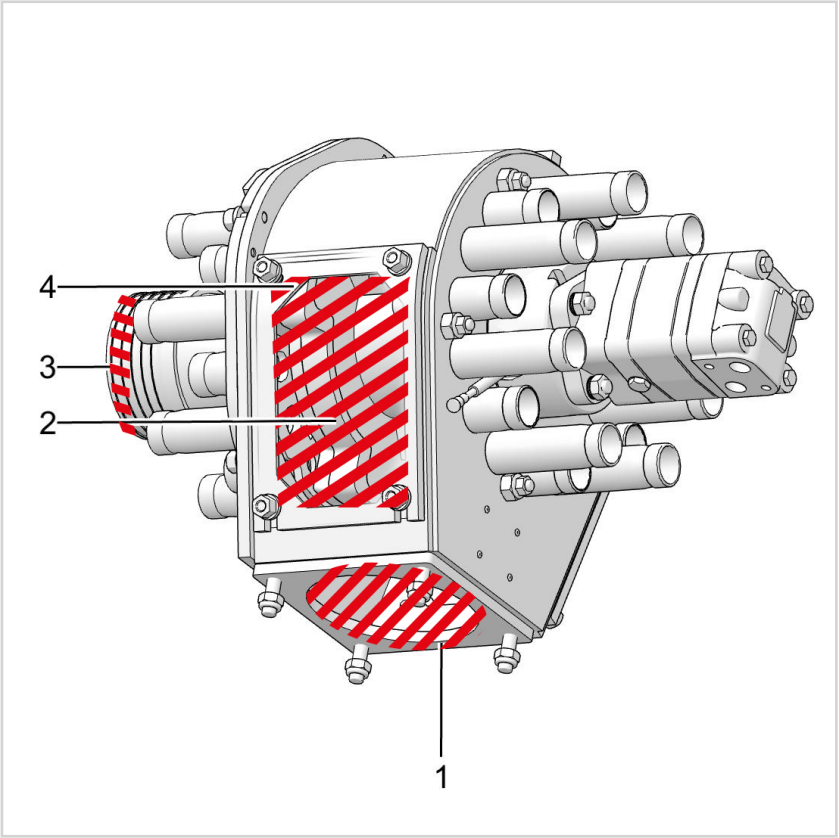


Fig. 1: Danger areas

1	Cleaning port	3	Inlet
2	Interior of the distributor	4	Service port

Do not put the distributor into operation until

- The service ports are mounted.
- The hoses are connected to the inlet connector, to the outlet connector, to the ventilation connector and to the cleaning port.

2.5 Warning and safety stickers

On the machine, there are a variety of warning and safety labels (order number and description, → Spare parts list).

Notice

- Pay attention to the stickers on the machine.
- Keep the stickers in a legible condition and do not remove them.
- Replace any missing stickers.

Contact Service for orders.

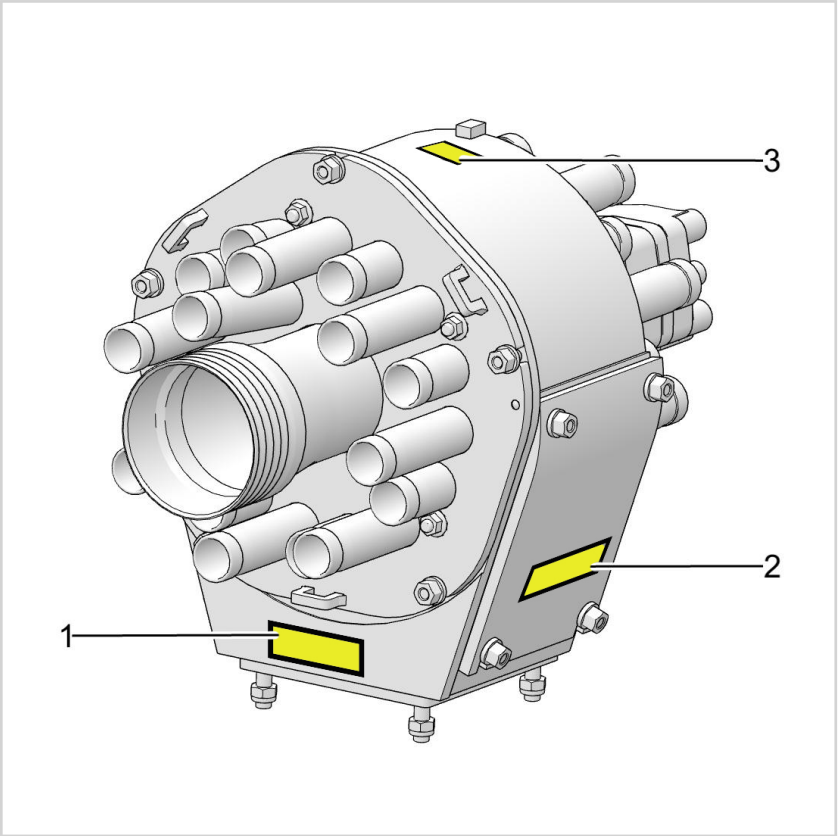


Fig. 2: Positions of the warning and safety stickers on the distributor

1	VAU.133	3	VAU0398
2	VAU0760		

Part	Sticker	Description
VAU.133		Before starting the machine, read the operating instructions.
VAU0760		• Caution: Risk of hand injuries! • Before maintenance work, depressurise the machine and switch off the drive! • Read the operating manual.
VAU0398		Hydraulic oil volume flow

3 Product description

3.1 Overview

The overview shows the main parts and functional units of the distributor.

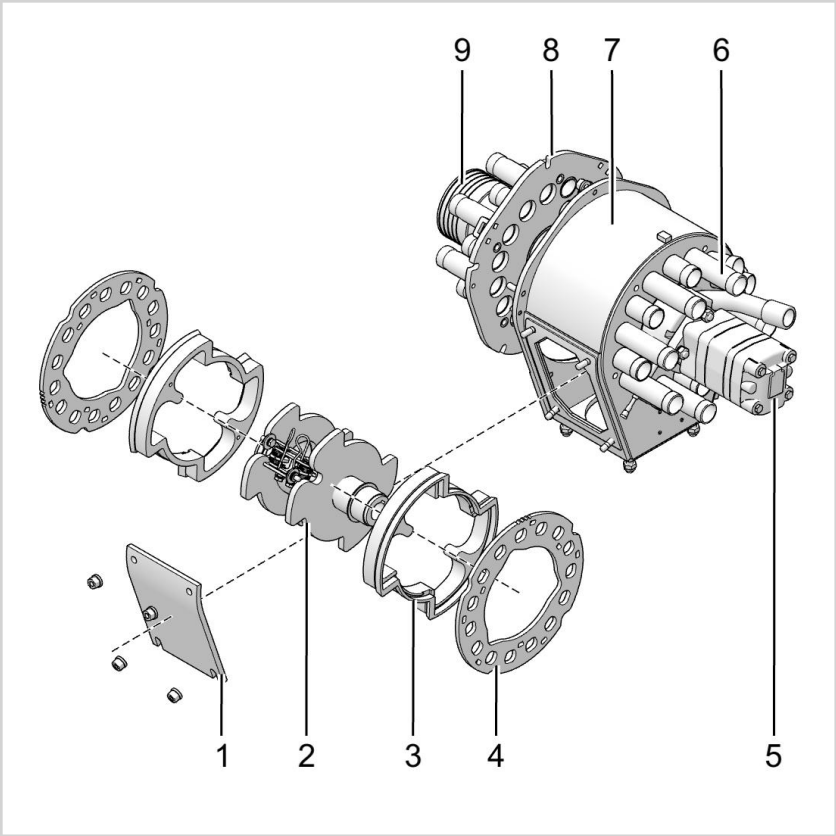


Fig. 3: Overview of parts

1	Service port
2	Rotor
3	Cutting system
4	Cutting ring
5	Hydraulic motor
6	Outlet connector
7	Housing
8	Housing cover
9	Inlet

4 Specifications

4.1 Distributor

Information on dimensions and weights can be found in the enclosed drawings.

ExaCut ECL30-40	
Inlet connector diameter:	DN 125
Outlet connector diameter:	DN 40
Quantity of outlet connectors:	30
Number of ventilation pipes:	1 per side
Maximum internal pressure:	3 bar
Permissible medium temperature:	0 °C to 45 °C
Noise emission:	< 70 dB (A)

4.2 Requirements for the vehicle hydraulics

Minimum volume flow:	50 l/min
Maximum volume flow:	70 l/min
Optimum volume flow with low-viscosity medium:	50 l/min
Minimum continuous oil pressure:	125 bar
Maximum continuous oil pressure:	175 bar

Notice

Spreader vehicles only reach their specified volume flow for hydraulic oil at their nominal motor speed. The larger the volume flow, the greater the insensitivity to foreign matter and fibrous matter.

4.3 Hydraulic motor

Nominal displacement	250 cm³/U
Shaft diameter	32 mm
Max. rotational speed in continuous operation	300 min-1
Max. rotational speed in intermittent operation[1]	360 min-1
Max. drop in pressure in continuous operation	200 bar
Maximum drop in pressure in intermittent operation[1]	250 bar
Max. drop in pressure at peak load[2]	270 bar
Max. torque in continuous operation	720 Nm
Max. torque in intermittent operation[1]	870 Nm
Optimum volume flow	**50 - 70** l/min
Maximum volume flow in continuous operation	75 l/min
Maximum volume flow in intermittent operation[1]	90 l/min
Maximum inlet pressure in continuous operation	230 bar
Max. inlet pressure in intermittent operation[1]	295 bar
Max. inlet pressure at peak load[2]	300 bar

1) Intermittent operation: the permissible values may occur for a maximum time of 10 % per minute.

2) Peak load: the permissible values may occur for a maximum time of 1 % per minute.

Maximum return pressure with overflow oil line in continuous operation	140 bar
Max. return pressure with overflow oil line in intermittent operation[1]	175 bar
Max. return pressure with overflow oil line at peak load[3]	210 bar
Maximum return pressure without overflow oil line in continuous operation	45 bar
Max. return pressure without overflow oil line in intermittent operation[1]	75 bar

1) Intermittent operation: the permissible values may occur for a maximum time of 10 % per minute.

3) Peak load: the permissible values may occur for a maximum time of 1 % per minute.

4.4 Hydraulic oil

Temperature

Minimum ambient temperature	-30 °C
Maximum ambient temperature	90 °C
Minimum oil temperature (normal operation)	30 °C
Maximum oil temperature (normal operation)	60 °C

NOTICE!

If the oil temperature rises above 60 °C, it will considerably reduce the lifetime of the hydraulic oil.

Viscosity

Minimum viscosity (operating temperature)	20 mm²/s [100 SUS]
Maximum viscosity (operating temperature)	75 mm²/s [370 SUS]

We recommend using an oil grade with a viscosity of 35 mm²/s [165 SUS] at operating temperature.

The oil should have purity higher than 20/16 (ISO 4406).

We recommend mineral hydraulic oil with anti-wear additives, type HLP (DIN 51524) or HM (ISO 6743/4).

Notice

When adding oil, always use a filter.

4.5 Oil filter

Maximum permissible degree of contamination: 20/16
(ISO 4406)

System environment	Recommended filters
Normal contaminant load	Return filter 40 µm absolute / 25 µm nominal (or finer)
High contaminant load Complex systems Closed circuits	Return filter 20 µm absolute / 10 µm nominal
Systems with quick latch couplings	Pressure filter directly before the motor 40 µm absolute / 25 µm nominal

4.6 Name plate

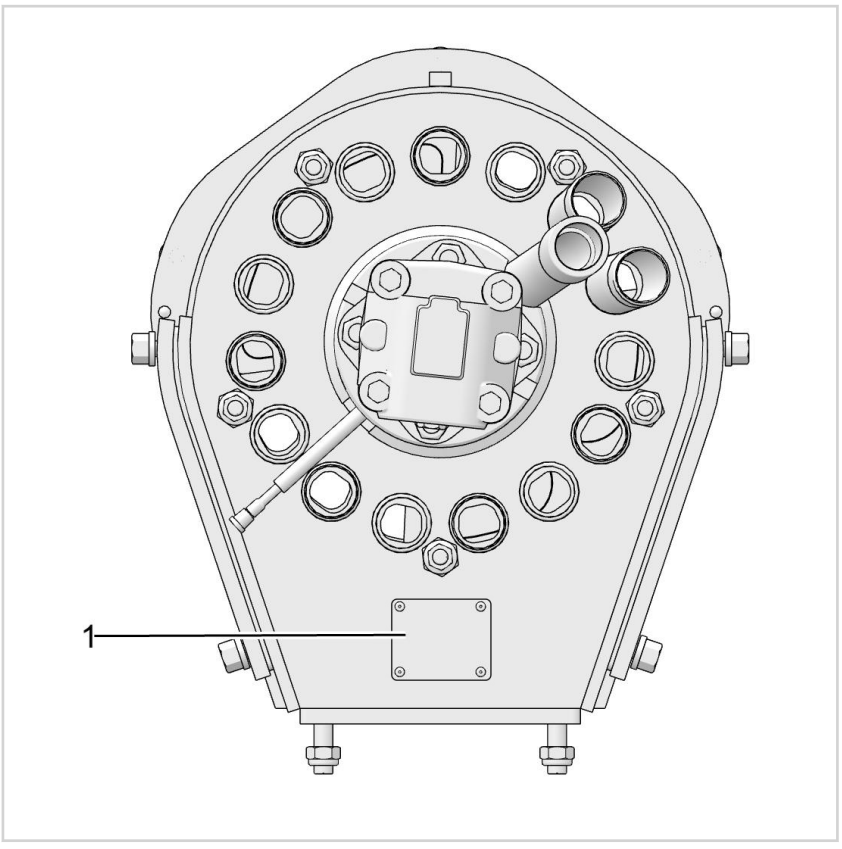


Fig. 4: Positioning of the name plate

1 | Nameplate

The nameplate contains the following details:

Fig. 5: Details on the nameplate

1	QR code
2	Year of manufacture
3	Weight
4	Conformity designation (optional)
5	Vogelsang address
6	Other information (optional)
7	Part number
8	Serial number
9	Series (design)
10	Product

5 Storage

NOTICE!

Damage to rubber parts

O-rings, gaskets and similar products can be rendered unusable by unfavourable storage conditions.

They could harden or soften, become permanently damaged or suffer surface damage.

► Observe the storage instructions.

Risk of frost
In case of frost, the medium may freeze in the distributor. This could cause damage to the distributor.

- Before long periods of shutdown, clean the distributor.

No particular measures need to be taken in the case of short-term storage of up to four weeks.

The following conditions apply to long-term storage:

- The storage location must be dry (relative humidity below 65 %).
- The temperature of the storage location must be in the range between 5 °C and 30 °C.

If the distributor has already been put into operation, proceed as follows:

► Remove any foreign matter through the cleaning port.
► Clean the distributor by spreading water with it.
► Spray water into the air connectors while the distributor is running slowly. This keeps the air ducts in the interior of the distributor free.
► Clean, drain and dry the distributor with the maintenance ports open and cleaning port open.
► Check the cutting components for wear.
► Lubricate the drive adapter after cleaning it via the grease nipple, using plenty of grease. This protects the seal faces of the sealing ring and displaces moisture.
► Spray or grease all the cutting surfaces with biodegradable oil.
► Turn the rotor with a mounting lever by at least one full revolution at least once every 3 months.

6 Transport

6.1 Safety notes

⚠WARNING!

Risk of crushing or concussion due to falling machine

The centre of gravity of the machine could shift. When lifting, the machine could become unbalanced and fall down to one side.

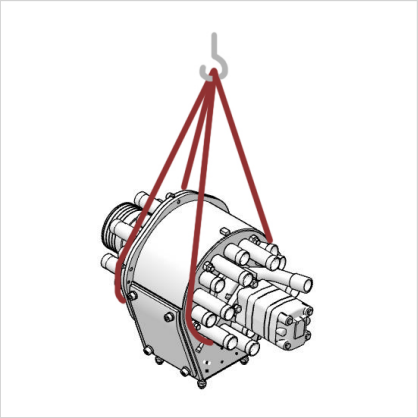
► Before lifting the machine, note its centre of gravity. See, for example, the dimension drawing or the Transport chapter.
► Staying beneath lifted loads is prohibited. Have everyone leave the danger zone.
► Note and comply with the transport instructions.

Note:

- Only use suitable personnel for loading and transport, → Target audience.
- Observe the weights and dimensions, → Drawing.
- Use only hoists designed for the weight of the units to be transported when lifting and moving heavy parts.
- Before lifting, note the machine's centre of gravity.
- During transportation, secure the machine from slipping, tilting and falling down.
- Use the specified slinging points.

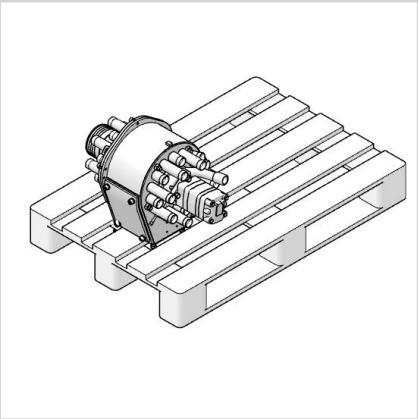
6.2 Permissible transport options

6.2.1 Transporting the machine while suspended



- ► Position a crane with hoisting gear over the distributor.
- ► Place the slings (e. g. ropes or lifting straps) close to the distributor housing on both sides around the outlet connectors.
- ► Transport the distributor.

6.2.2 Transporting the machine on a Euro pallet



- ► Attach the distributor to the Euro pallet.
- ► Secure the distributor against slipping and tipping.
- ► Pick up and transport the Euro pallet.

7 Installation

7.1 Safety notes

⚠WARNING!

Risk of cutting on sharp-edged parts

If the rotor can be freely accessed, there is a risk of cutting on the sharp edges of the cutting components.

- ► Operate the distributor only if the supply hose, the discharge hoses and the foreign matter hose are connected.
- ► Only operate the distributor if the maintenance port is mounted and screwed on.
- ► Before dismounting the maintenance port, switch the hydraulic valve to "floating position".
- ► Switch off the engine of the tractor or spreader vehicle.
- ► Before installation, maintenance and repair work, secure moving parts so that they cannot move.
- ► Wear protective clothing.

⚠WARNING!

Risk of crushing or concussion due to falling distributor

The distributor must not be held in position by means of the connected supply hose. That could cause bolt connections to break or fail. The distributor could fall.

- ► Securely screw the distributor to the spreader linkage or holder.
- ► Check the screwed connections fastening the distributor in accordance with the maintenance plan to ensure they are firmly tightened. Tighten any loose screwed or bolted connections.
- ► Wear protective clothing.

⚠WARNING!

Risk of crushing or concussion due to falling machine

The centre of gravity of the machine could shift. When lifting, the machine could become unbalanced and fall down to one side.

► Before lifting the machine, note its centre of gravity. See, for example, the dimension drawing or the Transport chapter.
► Staying beneath lifted loads is prohibited. Have everyone leave the danger zone.
► Note and comply with the transport instructions.

⚠WARNING!

Beware the risk of injury from falling from high locations

Some installation and maintenance work has to be done in higher locations. There is a risk of falling down.

► Use suitable equipment to climb up, e.g. a scaffold or ladder.
► Make sure the scaffold or ladder is stable.

⚠CAUTION!

Danger of crushing and trapping from spring energy

Tensioning the eccentric disc builds up spring energy.

► Wear protective gloves.

Note:

- Use appropriate hoists to lift and move heavy parts.
- Use only hoists designed for the weight concerned.

7.2 Assembly instructions

Notice

In the case of lubricated screws, bolts and threaded rods, the permissible tightening torque is reduced by 20 %.

Thread	Property class			Stain-less steel	Stain-less steel
	8.8	10.9	12.9	A2/A4 70	A2/A4 80
	Tightening torque [Nm]				
M6	10	15	18	8	10
M8	25	35	40	20	25
M10	50	70	80	40	50
M12	80	120	140	60	80
M14	135	200	235	95	135
M16	210	310	360	160	210
M20	425	610	710	335	425
M24	740	1050	1230	565	740
M30	1450	2050	2450	1135	1450

Tab. 1: Tightening torques for screws, bolts and threaded rods

7.3 Mounting the distributor on the spreader vehicle

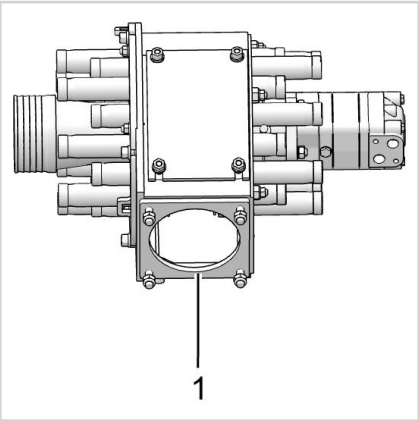
When mounting, allow sufficient space for operation, maintenance, cleaning, and remedying of malfunctions, → Drawing.

Procedure

Warning!
The cleaning port is clear. There is a risk of injury from the sharp-edged cutting blades inside the distributor.

- ► Lift the distributor with a crane and position it on the spreader linkage.
- ► Align the distributor so that the boreholes in the mounting flange of the distributor are above the corresponding boreholes on the spreader linkage or holder.
- ► Seal the cleaning port with a flexible hose (DN 150, 1 m length).
- ► Fold back the hose and clamp it off.
- ► Tighten all screwed connections that fasten the distributor.

7.4 Closing the cleaning port



Close the cleaning port (1) at the bottom so that

- either access to the blades is not possible even when open (for example, by attaching a flexible hose, DN 100, 1 m long, which is clamped shut)

or

- the hydraulic motor is safely switched off on opening (e.g. using a mechanically operated valve).

7.5 Connecting the hydraulics

7.5.1 Safety notes

Notice

The hydraulic connections for the machine must be carried out by qualified technical personnel.

⚠WARNING!

Risk of injury due to the failure of hydraulic parts if the maximum permissible hydraulic oil pressure is exceeded

If the maximum permissible hydraulic oil pressure is exceeded, there is a risk of high pressure injection due to failure of hydraulic parts.

► Observe the maximum permissible hydraulic oil pressure for the distributor: max. 200 bar.
► Observe the maximum permissible hydraulic oil pressure for the hydraulic motor: 200 bar.
► Wear protective clothing.

⚠WARNING!

Beware of skin and eye irritation and the risk of infection from contact with hydraulic oil

Leaks may occur when coupling and uncoupling hydraulic lines or due to faulty seals. Leaking hydraulic oil can cause skin and eye irritation as well as infections.

- ► Have hydraulic lines connected by qualified personnel.
- ► Wear the appropriate protective clothing.
- ► In the event of injuries with hydraulic oil, see a doctor immediately!

⚠WARNING!

Beware of skin and eye irritation and the risk of infection from contact with hydraulic oil

Store hydraulic oil somewhere where it is safe from unauthorised access.

- ► Only instructed persons may carry out the connection to the energy supply.
- ► Work may only be carried out on the hydraulic system by qualified technical personnel.
- ► Wear protective clothing during all maintenance and repair work on the hydraulic system.

⚠CAUTION!

Scalding or burning by hot medium

Contact with hot media or working materials over 60 °C can cause scalding or burns.

- ► Avoid contact with hot media and working materials.
- ► Before maintenance and repair work, flush out the distributor and release the pressure.
- ► Wear protective clothing.

Notice

Dispose of the waste oil in an environmentally friendly manner.

Note:

- Only persons with special knowledge and experience in hydraulics may work on hydraulic equipment.
- Hydraulic and compressed air lines must be routed and installed correctly.
- Do not mix up connections.
- Valves, fittings, and the length and quality of the hoses must comply with the requirements.

7.5.2 Connecting hydraulic hoses

Please note

- Only use genuine hydraulic hoses supplied by the manufacturer.
- Before connecting hydraulic hoses, check that they are undamaged and clean.
- Check the date of manufacture of the hydraulic hoses. **Info** The date of manufacture can be found on the pressed part of the connection. The hydraulic hoses should not be older than 6 years, including a storage period of 2 years maximum.
- Depressurise the hydraulic system.
- Pay attention to cleanliness.
- Install the hydraulic hoses in such a way that under all operating conditions:
  - they are not under tension apart from the tension created by their own weight.
  - there is no compressive stress for short hoses.
  - the hydraulic hoses are not exposed to external, mechanical influences.
  - the hoses are prevented from chafing against other parts or against each other.
    If necessary, protect hydraulic hoses with protective covers and cover sharp-edged parts.
- The length of the hydraulic hoses must be selected so that over their entire range of movement:
  - the minimum permissible bending radius is not violated.
  - the hydraulic hoses are not put under tension.
- Secure hydraulic hoses at the specified mounting points.
- Painting hydraulic hoses is prohibited.

Notice

We recommend installing pressure gauges in the hydraulic lines so that malfunctions can be detected and remedied at an early stage.

Requirements for the hydraulic hoses:

- Nominal diameter of at least DN 16
- Nominal pressure of at least PN 200

Requirements for the overflow oil line:

- Nominal diameter of at least DN 6

Notice

With a distributor, no overflow oil line needs to be connected.
If there are two or three distributors, the overflow oil connectors must be connected to each other.
If there are four distributors, a maximum of two distributors may be connected to each other.

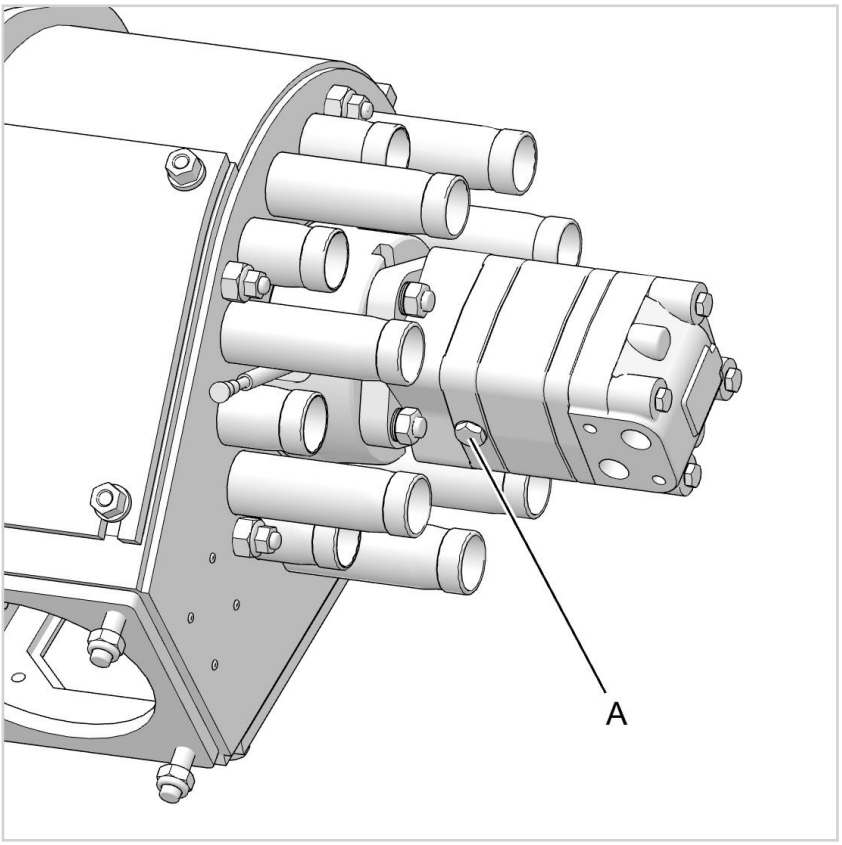
Please note

Maximum pressure in the return line: 15 bar

Notice

The hydraulic connections for the machine must be carried out by qualified technical personnel.

Procedure



- ► Connect the hydraulic hoses to the connectors of the hydraulic motor.
- ► Connect the hydraulic hoses to a double-acting hydraulic valve of the vehicle hydraulics.
- ► Connect a hydraulic hose (at least DN 6) to the overflow oil connector of the hydraulic motor (A).
- ► If two distributors are installed:
  - ► Connect the hydraulic motors of both distributors in series.
  - ► Connect the overflow oil line between the two distributors.

NOTICE!

Depressurised return

- ► If you cannot ensure a depressurised return, then connect the overflow oil line of the two series-connected distributors to a separate, reliably depressurised return pipe.
- ► An additional pressure relief valve with an outlet to the depressurised return is installed between the two distributors to help reduce pressure peaks in case of blockage.

Notice

We recommend an additional T-fitting for unpressurised return flow into the tank.

Notice

The overflow oil line conveys the pressure that builds up on the shaft seal away into the tank (in the case of 3-chamber motors) Chap. "Hydraulic motors". → *4.3 Hydraulic motor*.

- •An overflow oil line is recommended if the maximum permissible pressure on the shaft seal is exceeded otherwise the lifetime of the shaft seal could be reduced significantly.
- •The use of an overflow oil line increases the maximum return pressure.

7.6 Reversing function

For the reversing function

- Connect the distributor to a double-acting hydraulic valve.
- install a time relay which switches over about once a minute, automatically sharpening the cutting blades.
- install a pressure gauge in the discharge line to the distributor.

7.7 Installing sensors

Qualified technical personnel

- ► Connect the speed sensor and the internal pressure sensor to the control, → Datasheet.

7.8 Installing the supply hose

NOTICE!

Risk of breakage due to excessive flange loads

Flange connections can exert excessive force on the machine. Risk of breakage.

► Mount the flanges with low stress.
Maximum horizontal flange loads: 1275 N
Maximum vertical flange loads: 1275 N
Maximum bending moments: 350 Nm

Please note

► With two ExaCuts, use DN 150 hose at minimum as far as the T-fitting.
► After that, use 2 x DN 125 hoses or 2 x DN 100 hoses.
► The ideal arrangement is optionally two separate connections directly on the tank with DN 150 hoses attached, which are tapered shortly before the ExaCut.
► This prevents excessive pressure loss and clogging in the T-fitting and enables a high spreading capacity, even with viscous media.

Notice

We recommend installing a pressure gauge in the supply line so that malfunctions can be detected and remedied at an early stage.

7.9 Mounting ventilation hoses

The hose supports pointing towards the centre of the distributor are used for ventilation.

► To prevent contamination of the machine, attach hoses to the air intake pipes using hose clamps.

7.10 Mounting the discharge hoses

Notice
When laying the hoses, avoid kinks, chafe points and sagging.

Notice
If the guidelines for connecting the discharge hoses are not observed, this can reduce the precision of the distribution.

Notice

Opposing and adjacent hoses on the ExaCut should have the same length when possible.
The longest and shortest hose should be arranged at a 90° angle.

Notice

If several discharge hoses are blocked in order to vary the part-width section, this reduces spreading accuracy.

Notice

To prevent the medium from escaping, also shut off the air intake pipes!
If **all** hoses are shut off on one side of the ExaCut, ensure that the ventilation pipes on this side are also shut off.

Please note

- When laying hoses, follow the sequence outlined in the hose connection diagram.
- All hoses should be the same length.
- The hoses that go to the ground near the distributor should be laid in a large curve.

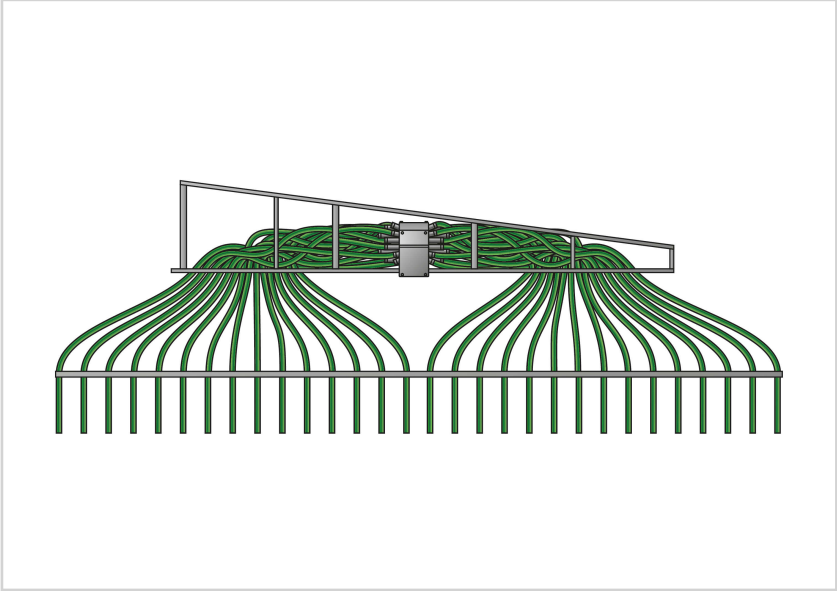


Fig. 6: Right boom hose layout diagram (example illustrated)

The left boom structure is a mirror image of this.

Procedure

► Route the discharge hoses from the distributor to the spreader linkage according to the hose connection diagram.
► Secure the discharge hoses to the outlet connector using hose clamps.

Notice
The hose connection diagram shown below only applies if the hoses are routed doubled and symmetrically according to the hose layout diagram. Hoses are counted in ascending order, from the middle of the linkage outwards in each case.
If a different hose installation is required, please contact Vogelsang-Service.

7.10.1 Hose connection diagram, standard hose switch-off

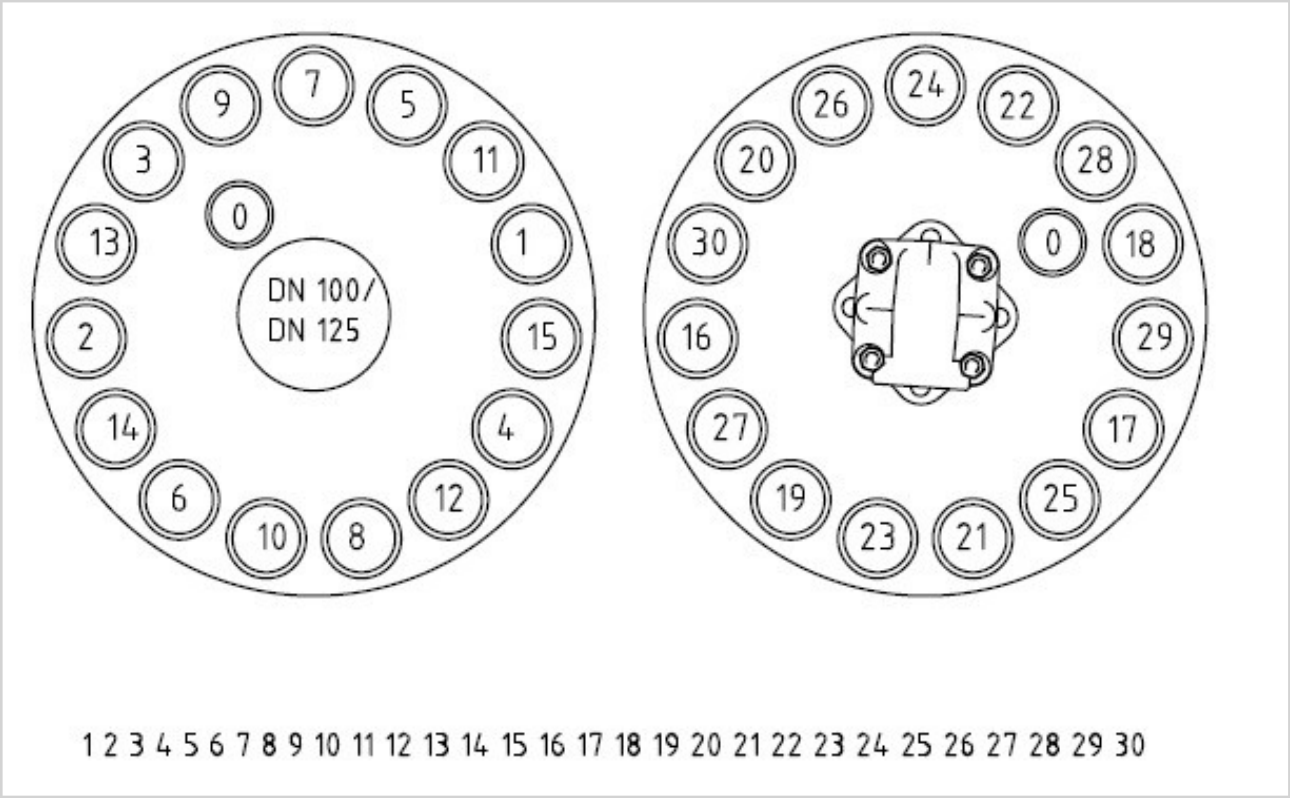


Fig. 7: Hose connection diagram, ECL 30-40/30-4045/30-4050, right boom

0 | Ventilation pipe

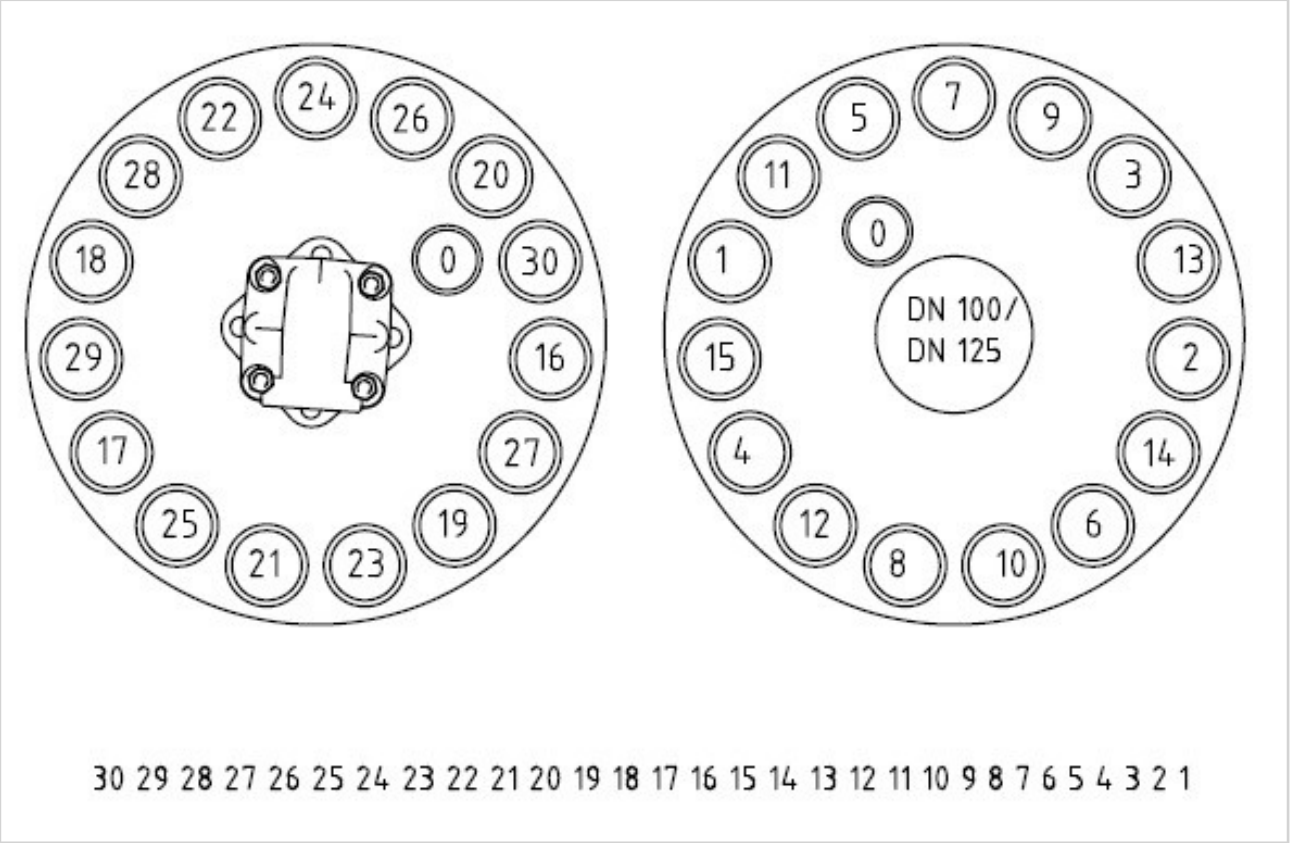


Fig. 8: Hose connection diagram ECL30-40/30-4045/30-4050 left boom

0 | Ventilation pipe

7.10.2 Hose connection diagram for central distributor

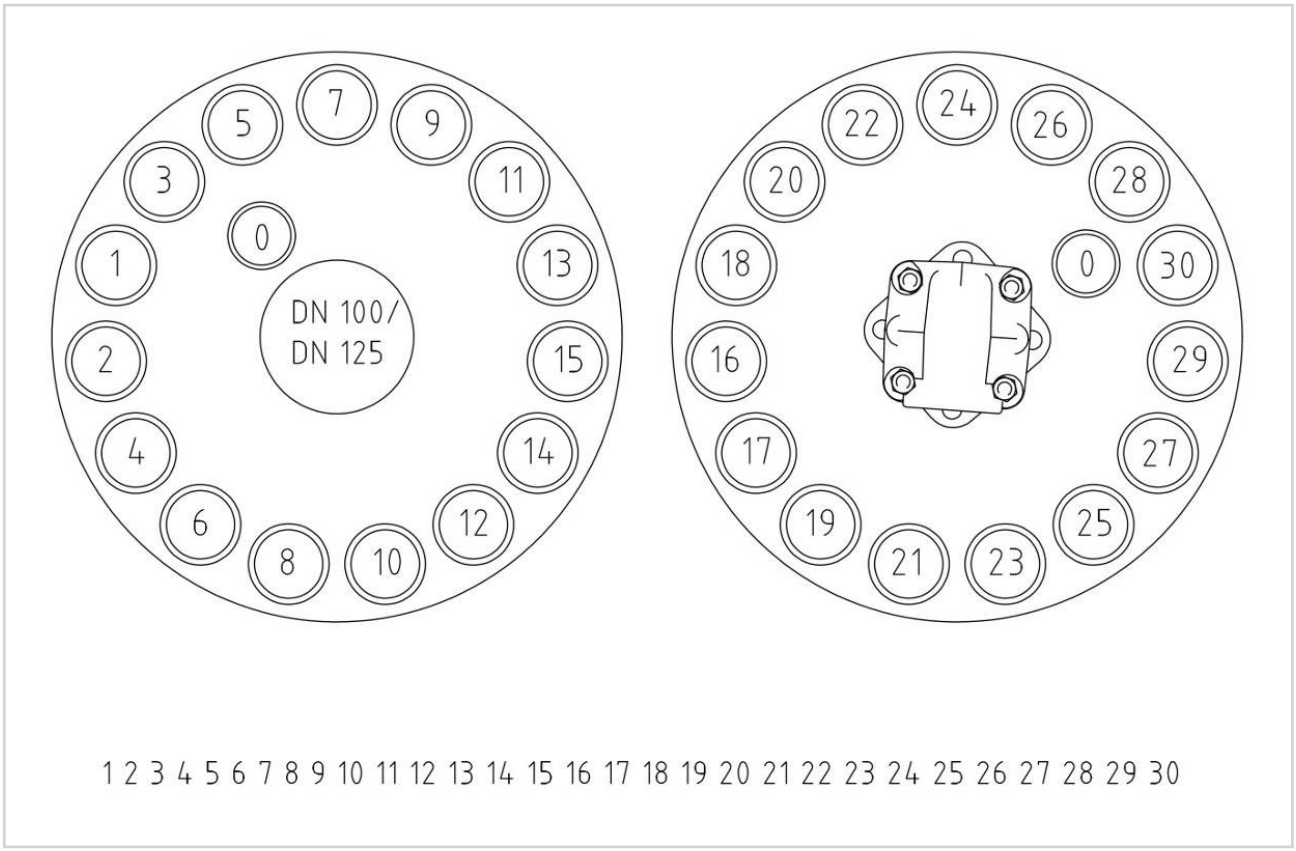


Fig. 9: Hose connection diagram for central distributor ECL30-40/30-4045/30-4050

0 | Ventilation pipe

8 Start-up

8.1 Safety notes

Notice

The machine must be started up by qualified technical personnel.

⚠WARNING!

Beware the risk of injury from falling from high locations

Some installation and maintenance work has to be done in higher locations. There is a risk of falling down.

- ► Use suitable equipment to climb up, e.g. a scaffold or ladder.
- ► Make sure the scaffold or ladder is stable.

⚠WARNING!

Risk of cutting on sharp-edged parts

If the rotor can be freely accessed, there is a risk of cutting on the sharp edges of the cutting components.

- ► Operate the distributor only if the supply hose, the discharge hoses and the foreign matter hose are connected.
- ► Only operate the distributor if the maintenance port is mounted and screwed on.
- ► Before dismounting the maintenance port, switch the hydraulic valve to "floating position".
- ► Switch off the engine of the tractor or spreader vehicle.
- ► Before installation, maintenance and repair work, secure moving parts so that they cannot move.
- ► Wear protective clothing.

⚠WARNING!

Risk of cutting on sharp-edged parts during functional test

If the rotor can be freely accessed, there is a risk of cutting on the sharp edges of the cutting components.

- ► A functional test (e.g. to check the safety device or the rotational action of the rotor) may only be carried out by qualified technical personnel.
- ► Before switching on the machine for functional tests, make sure that there are no persons in the danger area.
- ► Wear protective clothing.

⚠WARNING!

Danger from bursting distributor housing

If the maximum permissible internal pressure is exceeded, the distributor housing may burst. This may result in injuries.

- ► Be sure to observe the maximum permissible internal pressure of the distributor: 3 bar.

⚠WARNING!

Risk of injury due to the failure of hydraulic parts if the maximum permissible hydraulic oil pressure is exceeded

If the maximum permissible hydraulic oil pressure is exceeded, there is a risk of high pressure injection due to failure of hydraulic parts.

- ► Observe the maximum permissible hydraulic oil pressure for the distributor: max. 200 bar.
- ► Observe the maximum permissible hydraulic oil pressure for the hydraulic motor: 200 bar.
- ► Wear protective clothing.

⚠WARNING!

Beware of the risk of injury due to a liquid manure feed pipe bursting

If the maximum permissible pressure in the liquid manure supply line is exceeded, the lines may burst and the medium may spurt out. This may result in injuries.

► Only operate the machine up to its maximum permissible pressure of 2.5 bar.

⚠WARNING!

Beware of skin and eye irritation and the risk of infection from contact with hydraulic oil

Leaks may occur when coupling and uncoupling hydraulic lines or due to faulty seals. Leaking hydraulic oil can cause skin and eye irritation as well as infections.

► Have hydraulic lines connected by qualified personnel.
► Wear the appropriate protective clothing.
► In the event of injuries with hydraulic oil, see a doctor immediately!

NOTICE!

If the liquid manure pressure is too high, the distributor may crack.

When pump tankers are used, the pressure must be limited to 3 bar .

► The pressure can be limited by use of a pressure relief valve (optional).
► A pressure gauge on the liquid manure pipe is recommended for checking purposes.

NOTICE!

Dry running of the distributor not permissible

Prolonged dry running of the distributor can result in increased wear.

► Dry running of the distributor is not permissible.

NOTICE!

Avoid contamination from escaping medium at the ventilation pipes

A small amount of medium may escape from the ventilation pipes.

► Connect short hoses to the ventilation pipes that are routed with the drain hoses.

Notice

In order to achieve good average distribution, a pressure of ≥0.5 bar is required in the distributor.
When using low-viscosity media, you achieve better average distribution with a higher throughput.

Notice

Personnel for start-up and operation

- We recommend starting up the machine in the presence of persons who are responsible for further operation of the machine.

Note:

- Only start the machine up
  - if all protective and safety devices are functional.
  - if access to the danger areas is not possible.

8.2 Start-up sequence

1. Work through the checklist, → *8.3 Checklist*.
2. Start the hydraulic system, → *8.4 Starting the hydraulic system*.
3. Start the distributor.

8.3 Checklist

Installation on the linkage or spreader device

☐ The distributor is firmly bolted to the linkage or spreader device.

Hydraulic drive

- ☐ There is no air in the system.
- ☐ The hydraulic motor is bolted firmly in place.
- ☐ The mounting flanges on the hydraulic motor and its counterpart are in full contact.
- ☐ The hydraulic motor is connected correctly.
- ☐ The hydraulic oil tank is filled with oil up to the upper mark.

Eccentric adjuster

- ☐ The cotter pins have been tightened.

Hose system

- ☐ The outlet hoses, the post-suction air hoses and the supply hose are connected.
- ☐ The hose clamps are firmly in place.
- ☐ There is free flow through the hoses.
- ☐ The hoses are protected against abrasion and flexure points.
- ☐ The service ports are securely mounted.
- ☐ The cleaning port is sealed.
- ☐ Access to the cutting components is not possible.
- ☐ The hose system and the ExaCut are sealed and free from leakage.
- ☐ The gaskets have been lubricated via the grease nipple.
- ☐ Good average distribution is provided.

8.4 Starting the hydraulic system

- ► Fill the oil tank with hydraulic oil up to the upper level mark through a fine filter.
- ► Start the hydraulic motor and run it briefly at the lowest speed.
- ► If the hydraulic motor is fitted with a vent screw, leave the screw open until oil emerges free of bubbles.
- ► Close the vent screw.

9 Operation

9.1 Safety notes

⚠WARNING!

Risk of cutting on sharp-edged parts

If the rotor can be freely accessed, there is a risk of cutting on the sharp edges of the cutting components.

- ► Operate the distributor only if the supply hose, the discharge hoses and the foreign matter hose are connected.
- ► Only operate the distributor if the maintenance port is mounted and screwed on.
- ► Before dismounting the maintenance port, switch the hydraulic valve to "floating position".
- ► Switch off the engine of the tractor or spreader vehicle.
- ► Before installation, maintenance and repair work, secure moving parts so that they cannot move.
- ► Wear protective clothing.

⚠WARNING!

Skin and eye irritations as well as risk of infection due to contact with working materials or the medium

All work on the machine can lead to contact with working materials or media. Contact may cause skin or eye irritation.

- ► Inform staff about hazardous substances.
- ► Wear protective clothing.
- ► Before working on the machine, depressurise it to prevent lubricants and media from squirting out.

⚠WARNING!

Danger from bursting distributor housing

If the maximum permissible internal pressure is exceeded, the distributor housing may burst. This may result in injuries.

- ► Be sure to observe the maximum permissible internal pressure of the distributor: 3 bar.

⚠WARNING!

Risk of injury due to the failure of hydraulic parts if the maximum permissible hydraulic oil pressure is exceeded

If the maximum permissible hydraulic oil pressure is exceeded, there is a risk of high pressure injection due to failure of hydraulic parts.

- ► Observe the maximum permissible hydraulic oil pressure for the distributor: max. 200 bar.
- ► Observe the maximum permissible hydraulic oil pressure for the hydraulic motor: 200 bar.
- ► Wear protective clothing.

⚠WARNING!

Beware of the risk of injury due to a liquid manure feed pipe bursting

If the maximum permissible pressure in the liquid manure supply line is exceeded, the lines may burst and the medium may spurt out. This may result in injuries.

- ► Only operate the machine up to its maximum permissible pressure of 2.5 bar.

⚠WARNING!

Beware of skin and eye irritation and the risk of infection from contact with hydraulic oil

Leaks may occur when coupling and uncoupling hydraulic lines or due to faulty seals. Leaking hydraulic oil can cause skin and eye irritation as well as infections.

- ► Have hydraulic lines connected by qualified personnel.
- ► Wear the appropriate protective clothing.
- ► In the event of injuries with hydraulic oil, see a doctor immediately!

⚠CAUTION!

Beware of the risk of burns due to exposed hot surfaces

During operation the hydraulic oil can reach a temperature of more than 60 °C.
The hydraulic motor reaches high temperatures in normal operation.
The distributor housing can become very hot during dry running of the cutting blades.

► Avoid contact with hot surfaces.
► Avoid dry running of the cutting blades.
► Operate the distributor only when it is filled with the medium to be distributed.
► Allow the distributor to cool down to ambient temperature before starting maintenance and repair work.
► Wear protective clothing.

Note:

- Before starting work, familiarise yourself with all of the machine's equipment, controls and functions.
- Operate the machine only
  - if all protective and safety devices are functional.
  - if access to the danger areas is not possible.
- Do not work in any way that could pose a risk to safety.

9.2 Operating instructions

NOTICE!

Dry running of the distributor not permissible

Prolonged dry running of the distributor can result in increased wear.

► Dry running of the distributor is not permissible.

NOTICE!

Preventing foreign matter from entering the distributor

Stones, metal parts and other foreign matter that cannot be cut can result in increased wear and hinder smooth operation if they enter the distributor.

► Prevent foreign matter that cannot be cut from entering the distributor.

Notice

In order to achieve good average distribution, a pressure of ≥0.5 bar is required in the distributor.
When using low-viscosity media, you achieve better average distribution with a higher throughput.

9.3 Flow rate

The maximum flow rate depends on the following parameters:

- Max. dry matter content
- Liquid manure type
- Supply line pressure
- Geometry of the cutting system

9.4 Reverse

For the reversing function, the distributor must be connected to a double-acting hydraulic valve.

The reversing function (reversal of rotation):

- can be used to rectify almost all malfunctions caused by foreign matter and high fibre content in the medium.
- results in optimum self-sharpening of the cutting blades.

To achieve a high level of operational safety and trouble-free operation:

- reverse at least in every headland.
- install a time relay which switches over about once a minute, automatically sharpening the cutting blades.
- install a pressure gauge in the discharge line to the distributor. This allows malfunctions to be detected at an early stage and corrected by reversing.

NOTICE!

Hydraulic valve with "lock position"

To prevent damage in the hydraulic system, never set the hydraulic valve to "lock position" when the rotor is rotating at high speed. Reduce the speed of the rotor before the switch-off.

► The hydraulic valve should always have an intermediate setting with "floating position". A valve with "lock position" is not recommended.

9.5 Flushing

Um ein Verkleben mit Gülle zu verhindern, das Schleppschlauchsystem und den Verteiler nach dem Arbeitsende mit Wasser durchspülen.
Spray all cutting surfaces and contact surfaces between the cutting blades, the rotor and the cutting screens with biodegradable oil before longer shutdown periods.

9.6 Switching off the distributor

Procedure

- ► Set the hydraulic valve to "floating position".
- ► Switch off the motor of the spreader vehicle and secure it to prevent it from being switched on again.

NOTICE!

Both hydraulic hoses at the distributor must be depressurised.

10 Maintenance

10.1 Safety notes

⚠WARNING!

Beware of the risk of injury due to the attachment starting unexpectedly

If the attachment starts unexpectedly, it may cause injury by crushing or impact.

- ► Switch off the spreader vehicle's engine.
- ► Secure the spreader vehicle so that it cannot roll.
- ► Depressurise the hydraulic hoses. Switch the hydraulic valve to its floating position.
- ► Lock the drive, so that it cannot be switched back on.

⚠WARNING!

Risk of cutting on sharp-edged parts

If the rotor can be freely accessed, there is a risk of cutting on the sharp edges of the cutting components.

- ► Operate the distributor only if the supply hose, the discharge hoses and the foreign matter hose are connected.
- ► Only operate the distributor if the maintenance port is mounted and screwed on.
- ► Before dismounting the maintenance port, switch the hydraulic valve to "floating position".
- ► Switch off the engine of the tractor or spreader vehicle.
- ► Before installation, maintenance and repair work, secure moving parts so that they cannot move.
- ► Wear protective clothing.

⚠WARNING!

Risk of crushing or concussion due to falling distributor

The distributor must not be held in position by means of the connected supply hose. That could cause bolt connections to break or fail. The distributor could fall.

- ► Securely screw the distributor to the spreader linkage or holder.
- ► Check the screwed connections fastening the distributor in accordance with the maintenance plan to ensure they are firmly tightened. Tighten any loose screwed or bolted connections.
- ► Wear protective clothing.

⚠WARNING!

Beware the risk of injury from falling from high locations

Some installation and maintenance work has to be done in higher locations. There is a risk of falling down.

- ► Use suitable equipment to climb up, e.g. a scaffold or ladder.
- ► Make sure the scaffold or ladder is stable.

⚠WARNING!

Risk of injury due to the liquid manure supply hose bursting

If the maximum permissible pressure in the liquid manure supply hose is exceeded, the hose can burst and the medium can splash out. This may result in injuries.

- ► Note the maximum permissible pressure in the liquid manure supply hose: 2.5 bar.
- ► Wear protective clothing.

⚠WARNING!

Danger from bursting distributor housing

If the maximum permissible internal pressure is exceeded, the distributor housing may burst. This may result in injuries.

► Be sure to observe the maximum permissible internal pressure of the distributor: 3 bar.

⚠WARNING!

Risk of injury due to the failure of hydraulic parts if the maximum permissible hydraulic oil pressure is exceeded

If the maximum permissible hydraulic oil pressure is exceeded, there is a risk of high pressure injection due to failure of hydraulic parts.

► Observe the maximum permissible hydraulic oil pressure for the distributor: max. 200 bar.
► Observe the maximum permissible hydraulic oil pressure for the hydraulic motor: 200 bar.
► Wear protective clothing.

⚠WARNING!

Skin and eye irritations as well as risk of infection due to contact with working materials or the medium

All work on the machine can lead to contact with working materials or media. Contact may cause skin or eye irritation.

► Inform staff about hazardous substances.
► Wear protective clothing.
► Before working on the machine, depressurise it to prevent lubricants and media from squirting out.

⚠WARNING!

Beware of skin and eye irritation and the risk of infection from contact with hydraulic oil

Leaks may occur when coupling and uncoupling hydraulic lines or due to faulty seals. Leaking hydraulic oil can cause skin and eye irritation as well as infections.

- ► Have hydraulic lines connected by qualified personnel.
- ► Wear the appropriate protective clothing.
- ► In the event of injuries with hydraulic oil, see a doctor immediately!

⚠CAUTION!

Danger of crushing and trapping from spring energy

Tensioning the eccentric adjuster builds up spring energy.

- ► Clamp the mounting bracket in a vice before tensioning the springs.
- ► Wear protective gloves.

⚠CAUTION!

Beware of the risk of burns due to exposed hot surfaces

During operation the hydraulic oil can reach a temperature of more than 60 °C.
The hydraulic motor reaches high temperatures in normal operation.
The distributor housing can become very hot during dry running of the cutting blades.

- ► Avoid contact with hot surfaces.
- ► Avoid dry running of the cutting blades.
- ► Operate the distributor only when it is filled with the medium to be distributed.
- ► Allow the distributor to cool down to ambient temperature before starting maintenance and repair work.
- ► Wear protective clothing.

⚠CAUTION!

Scalding or burning by hot medium

Contact with hot media or working materials over 60 °C can cause scalding or burns.

► Avoid contact with hot media and working materials.
► Before maintenance and repair work, flush out the distributor and release the pressure.
► Wear protective clothing.

Notice

Treat cleaning agents, solvents and lubricants as hazardous waste and dispose of them properly.

Note:

- Carry out the specified repair work to schedule.
- Switch off the machine before performing any service and repair work.
- Use only genuine spare parts or parts approved by Vogelsang.
- Install spare parts correctly.
- Once the work has been completed, install and check any removed safety devices.

Notice

In order to avoid endangering any warranty claims, document all scheduled repair work in the maintenance schedule, → *13.1 Maintenance plan*

10.2 Operating materials

Notice

Dispose of waste oil and lubricants in an environmentally friendly manner.

10.2.1 Lubricants

Renolit GP 2		
Part number	BSS.008	
Description	Lithium soap grease with a mineral oil base	
Characteristics		**Test according to**
Identification	K2K-30 ISO-L-X-CCEA 2	DIN 51502 ISO 6743-9
Intrinsic viscosity		DIN 51562-1
At 40 °C	110 mm^2/s	
At 100 °C	9.5 mm^2/s	
Dropping point	≥ 180 °C	IP 396
Temperature range for use	-30 °C - +120 °C	DIN 51825

10.3 Operating materials quantity

	Filling quantity
Lubricant	4 strokes

Notice

With a centralised lubrication system, lubricate every 50 operating hours with approx. 1 g per stroke.

10.4 Tightening torques

10.4.1 Generally valid tightening torques

Notice

The tightening torques apply for dry-mounted screws and threaded rods.
For lubricated screws and threaded rods, the permissible tightening torque is reduced by a maximum of 20 %.

Thread	Property class			Stainless steel	Stainless steel
	8.8	**10.9**	**12.9**	**A2/A4 70**	**A2/A4 80**
	Tightening torque [Nm]				
M6	10	15	18	8	10
M8	25	35	40	20	25
M10	50	70	80	40	50
M12	80	120	140	60	80
M14	135	200	235	95	135
M16	210	310	360	160	210
M20	425	610	710	335	425
M24	740	1050	1230	565	740
M30	1450	2050	2450	1135	1450

Tab. 2: General tightening torques

10.4.2 Specific tightening torques

The following bolts and nuts are tightened to a specific tightening torque:

- Hose clamps for the drain hoses: 5 +1 / 0 Nm
- Nuts on the cutting rings: 28 +1 / 0 Nm
- Rotor mount: 28 +1 / 0 Nm
- Nuts on the hydraulic motor: 60 +1 / 0 Nm

10.5 Spare parts

Contact Service for order-specific spare parts lists and spare parts orders.

► Have the serial number of the machine ready.

Refer to the name plate for the serial number, → *4.6 Name plate*.

10.6 Inspection plan

10.6.1 Before start-up

Part	Inspection
Eccentric adjuster	► Remove the cotter pins of the eccentric adjusters through the service port openings.
Hydraulic motor	► Check that the nuts on the hydraulic motor are firmly in place. ► Tighten any loose nuts.
Hose clamps	► Check the hose clamps on the supply hose and on the drain hoses for tightness. ► If any hose clamps are loose, tighten the adjusting screw.

10.6.2 After the first 20 operating hours

Part	Inspection
Machine mounting	► Check that the screwed and bolted connections fastening the machine are tight. ► Tighten any loose screwed or bolted connections.
Hydraulic motor	► Check that the nuts on the hydraulic motor are firmly in place. ► Tighten any loose nuts.
Hose clamps	► Check the hose clamps on the supply hose and on the drain hoses for tightness. ► If any hose clamps are loose, tighten the adjusting screw.

10.6.3 Every 50 operating hours

Part	Inspection
Drive adapter	► Check the drive adapter for leaks. ► If medium is leaking out, replace the gaskets on the distributor. ► If oil is leaking out, replace the hydraulic motor (qualified technical personnel).
Cutting ring	► Check that the nuts for the cutting rings on the housing and housing cover are tight. ► Tighten the loose nuts.
Eccentric adjuster	► Check the movability of the eccentrics. ► Remove eccentrics that do not move and make sure they can move.
Hydraulic system	***Qualified technical personnel*** ► Check the hydraulic system for leaks. ► Replace any leaking parts.
Hydraulic unit	► Check the hydraulic oil level. ► Top up any missing hydraulic oil.
Hydraulic oil tank	► Check the hydraulic oil for contamination. ► If the oil is contaminated, change it and dispose of it in an environmentally friendly manner.
Hydraulic oil filter	► Check the oil filter for contamination. ► If the oil filter is contaminated, replace it.

10.6.4 Every 2000 operating hours, at least every 12 months

Part	Inspection
Machine mounting	► Check that the screwed and bolted connections fastening the machine are tight. ► Tighten any loose screwed or bolted connections.
Hose clamps	► Check the hose clamps on the supply hose and on the drain hoses for tightness. ► If any hose clamps are loose, tighten the adjusting screw.
Hydraulic hoses and fittings	***Qualified technical personnel*** ► Check that the hydraulic hoses and fittings are in safe working condition. ► If any hydraulic hoses or fittings are not in safe working condition, replace them.

10.6.5 Before longer periods of shutdown

Part	Inspection
Eccentric adjuster	► Check the movability of the eccentrics. ► Remove eccentrics that do not move and make sure they can move.

10.6.6 After long periods of shutdown

Part	Inspection
Hydraulic motor	► Check that the nuts on the hydraulic motor are firmly in place. ► Tighten any loose nuts.
Drive adapter	► Check the drive adapter for leaks. ► If medium is leaking out, replace the gaskets on the distributor. ► If oil is leaking out, replace the hydraulic motor (qualified technical personnel).
Cutting ring	► Check that the nuts for the cutting rings on the housing and housing cover are tight. ► Tighten the loose nuts.

10.7 Service plan

10.7.1 Every 50 operating hours

Part	Service
Seals in the drive adapter and hydraulic motor adapter	► To protect the running surfaces of the sealing ring and to eliminate moisture, lubricate the receptacle for the hydraulic motor on the grease nipple with plenty of grease.
Cleaning port	► Remove the foreign matter through the cleaning port. ► Clean the distributor.
Distributor interior and ventilation pipes	► To keep the air duct (rotor) in the distributor interior clear, spray water into the ventilation pipes while the distributor is running slowly.
Wear parts	► Check the condition and wear of the wearing parts. ► Replace the worn wearing parts.

10.7.2 Before longer periods of shutdown

Part	Service
Distributor interior and ventilation pipes	► To keep the air duct (rotor) in the distributor interior clear, spray water into the ventilation pipes while the distributor is running slowly.
Distributor interior	► Flush the distributor by applying water. ► Clean the distributor with the housing cover open. ► Checking the distributor for wear
Seals in the drive adapter and hydraulic motor adapter	► To protect the running surfaces of the sealing ring and to eliminate moisture, lubricate the receptacle for the hydraulic motor on the grease nipple with plenty of grease.
Wear parts	► Check the condition and wear of the wearing parts. ► Replace the worn wearing parts.
Cutting blade, cutting screen, rotor	► Uncover the contact surfaces between the cutting blades and the cutting screens. ► Spray all cutting surfaces and contact surfaces between the cutting blades, the rotor and the cutting screens with biodegradable oil.

10.8 Repair plan

10.8.1 Every 6 years

Part	Repair
Hydraulic hoses	***Qualified technical personnel*** ► Replace the hydraulic hoses.

10.9 Inspection

Note:

Observe the warning and safety notes prior to performing inspection work, → *10.1 Safety notes*.

10.9.1 Tightening screw and bolt connections

Part	Entire machine

Preparatory activities

► Switch off the distributor.

Procedure

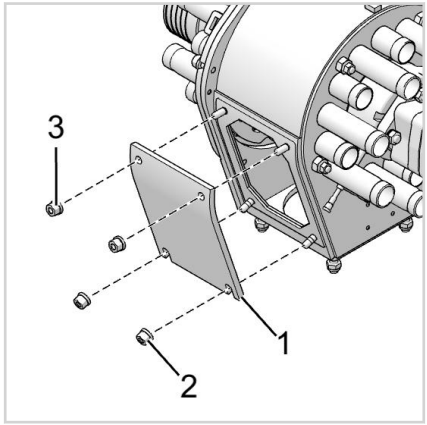
► Check the screw connections for tight fitting.
► Tighten any loose screw connections.

10.9.2 Dismounting the service port

Preparatory activities

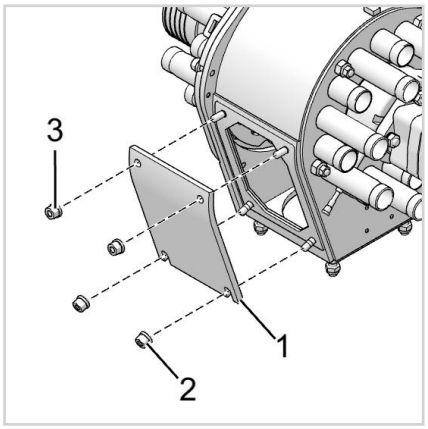
► Switch off the distributor.
► Empty the distributor through the foreign body hose.

Procedure



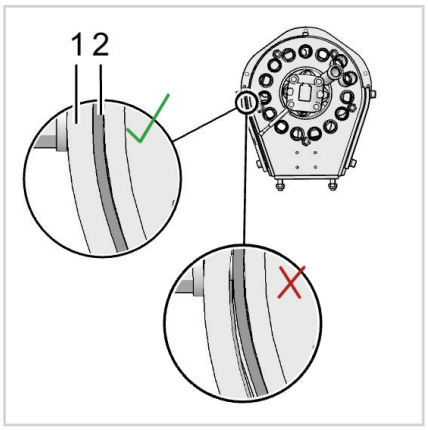
► Dismount the top nuts (3) on the service port (1).
► Loosen the lower nuts (2) on the service port (1).
► Dismount the service port (1).

10.9.3 Installing the service port



Procedure

- ► Position the service port (1).
- ► Screw the two top nuts (3) onto the stud bolts and tighten them.
- ► Tighten the two lower nuts (2).



Attention!

- ► To ensure that the service port is tight, make sure that the flat gasket (2) and the maintenance flap (1) are in the correct position.

10.9.4 Tensioning the eccentric adjusters

Tool	• Hook spanner WKZ0829 • Hook spanner WKZ0828

Tool overview

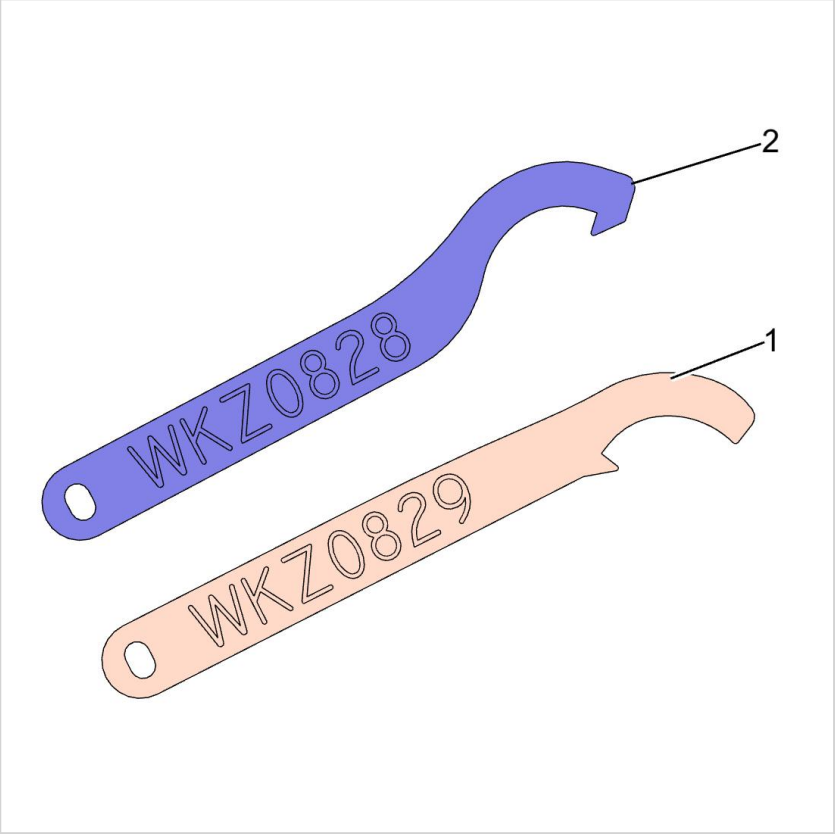


Fig. 10: Overview hook spanner

1	WKZ0829	2	WKZ0828

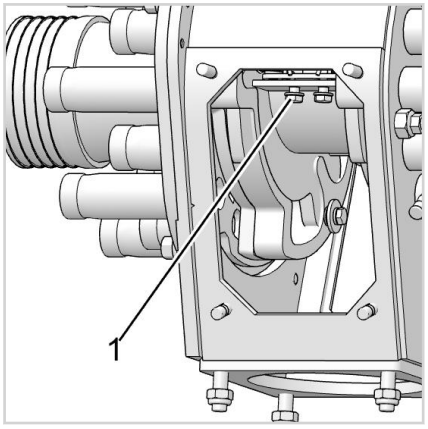
Notice

The tool is not included in the scope of delivery.

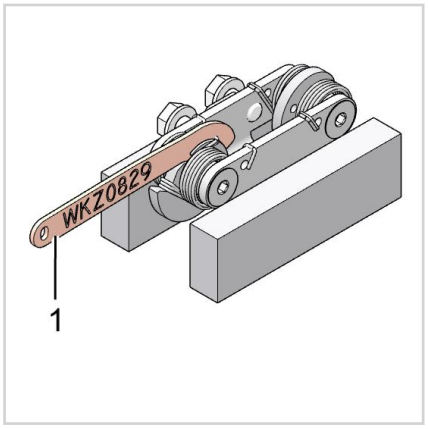
Preparatory activities

► Switch off the distributor.
► Empty and clean the distributor.
► Dismount the service ports.

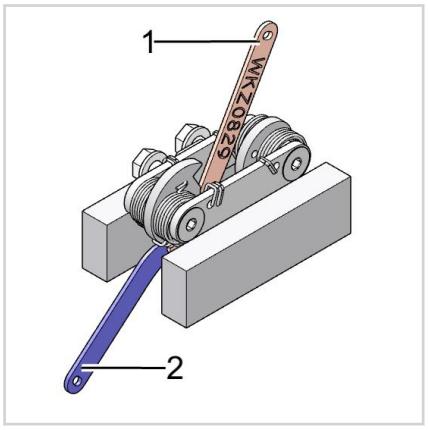
Procedure



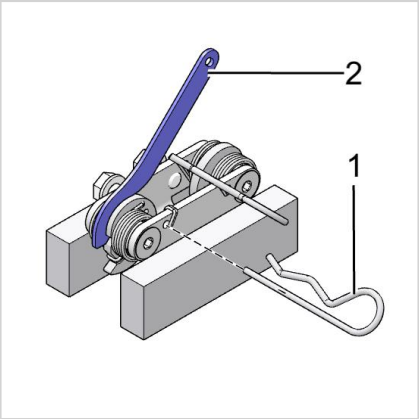
► To dismount the eccentric adjuster from the rotor, loosen the two hexagon head screws with washers and remove them (1).



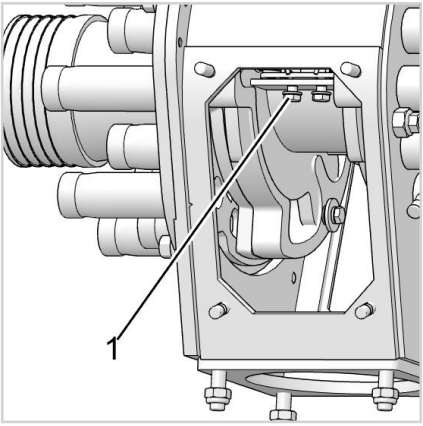
► Clamp the eccentric adjuster in a bench vice.
► First pre-load the eccentric adjuster using the hook spanner (1).



► Replace the hook spanner (1) with the hook spanner (2).



- ► Continue tensioning using hook spanner (2) until the holes in the eccentric and mounting bracket are aligned.
- ► Secure the eccentric adjuster with the cotter pin (1).



- ► Fasten the eccentric adjuster to the rotor using the hexagon head screws and washers (1).
- ► Remove the cotter pins through the opening in the service port.

NOTICE!

Only remove the cotter pin through the opening in the service port once the housing-cover has been installed.

Concluding activities

- ► Install the service ports.

10.9.5 Checking the eccentric adjuster

Preparatory activities

- ► Switch off the distributor.
- ► Empty and clean the distributor.
- ► Dismount the service ports.
- ► Dismount the eccentric adjusters.

Procedure

- ► Check the eccentric adjusters for functionality and wear. Replace if necessary.

Concluding activities

- ► Tension the eccentric adjuster.
- ► Install the eccentric adjusters.
- ► Remove the cotter pins from the eccentric adjusters.
- ► Install the service ports.

10.9.6 Tightening the nuts on the hydraulic motor

Tool	• Torque wrench

Preparatory activities

► Switch off the distributor.

Procedure

► Check that the screw connections on the hydraulic motor are tight.
► Tighten any loose screwed connections with 60 Nm.

10.9.7 Checking hydraulic hoses and fittings

Procedure

NOTICE!

Hydraulic hoses and fittings are pressurised.

Hydraulic hoses and fittings that are not in safe working condition pose a risk.

Qualified technical personnel

► Check that the hydraulic hoses and fittings are in safe working condition.

Test criteria:

- Damage to the outer layer causing the inner lining to be exposed (e.g. chafe marks, cuts, cracks)
- Deformation (e.g. crushing, kinks)
- Blistering
- Leaks
- Overageing of the hoses (over 6 years)
- Hoses working their way out of the fittings
- Damage or deformation of the fittings
- Corrosion of the fittings

► If any hydraulic hoses or fittings are not in safe working condition, replace them.

10.9.8 Checking the drive adapter for leaks

Preparatory activities

► Switch off the distributor.

Caution!
There is risk of burns due to exposed hot surfaces.

Procedure

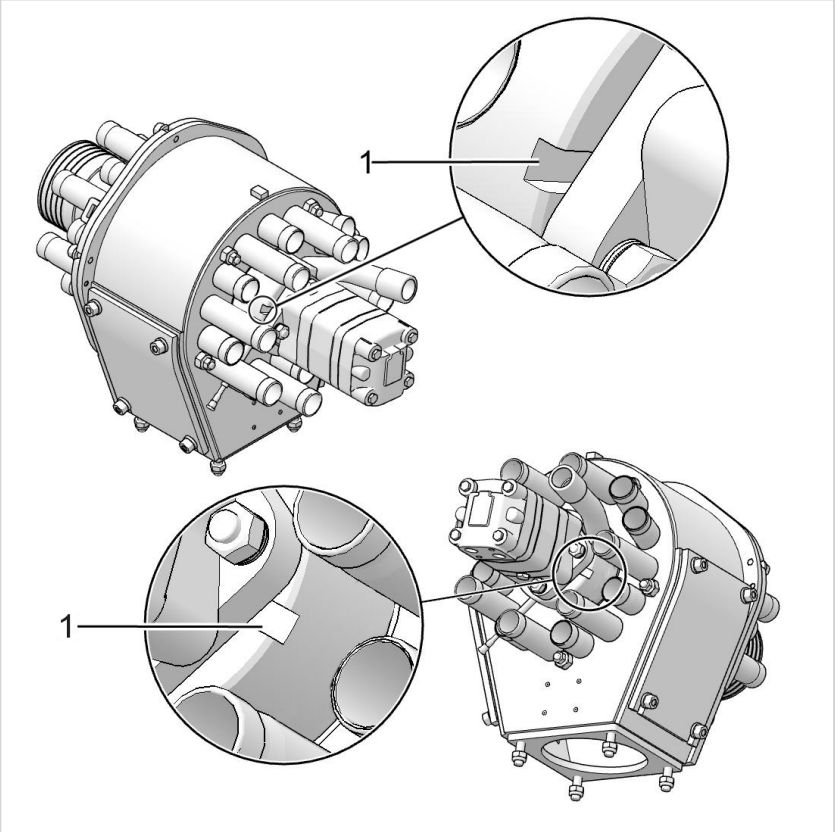


Fig. 11: Leakage seal indicator pipe

► Check the drive adapter for leak tightness at the leakage seal indicator pipes (1).
► If medium is coming out, replace the faulty gaskets, → *10.11.6 Replacing the seals in the drive adapter*.
► If oil is coming out, replace the hydraulic motor (Vogelsang service, qualified technical personnel).

10.10 Service

Note:

Observe the warning and safety notes prior to performing maintenance work, → *10.1 Safety notes*.

10.10.1 Lubricating drive adaptor

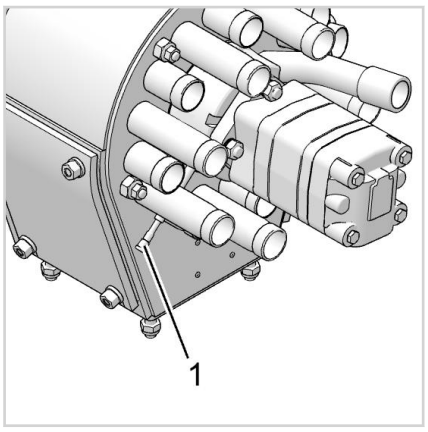
Information	We recommend connecting to the central lubrication system.
Equipment	• Lube gun
Operating materials	Operating materials type and quantity: → Operating materials.

Caution!
There is risk of burns due to exposed hot surfaces.

Procedure

Notice

To ensure effective distribution of the lubricant, lubricate only when the machine is running.



► Take off the grease nipple cap (1).
► Lubricate the drive adapter via the grease nipple.
► Put on the grease nipple cap (1).

10.10.2 Cleaning the distributor

Equipment	• Foreign matter separator

Preparatory activities

► Switch off the distributor.

Procedure

► Empty the distributor.
  ► Place a collecting container under the foreign matter hose.
  ► Release the hose clamp on the foreign matter hose.
  ► Collect the medium and foreign matter in the collecting container and dispose of them in an environmentally friendly manner.
► Dismount the service port, → *10.9.2 Dismounting the service port*.
► Clean the distributor housing with water.
► Clean the air ducts above the ventilation hoses with water.

Concluding activities

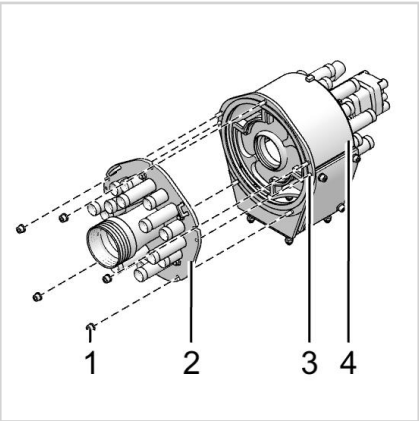
► Install the service ports.
► Close the cleaning port.

10.10.3 Dismounting the housing cover

Preparatory activities

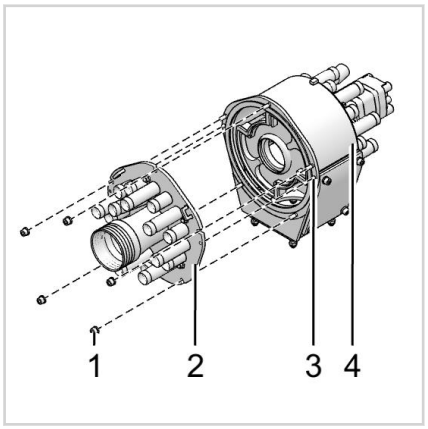
► Switch off the distributor.
► Empty and clean the distributor.

Procedure



► Undo and remove the nuts (1).
► Remove the housing cover including the cutting ring (2) from the housing (4).

10.10.4 Mounting the housing cover



Procedure

► Position the housing cover incl. cutting ring (2) on the housing (4) using the two dowel pins (3).
► Fasten the housing cover (2) with the nuts (1).

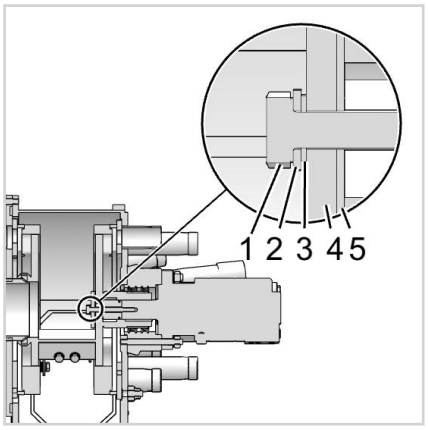
10.10.5 Dismounting the rotor

Equipment	• Hexagon head bolt M30

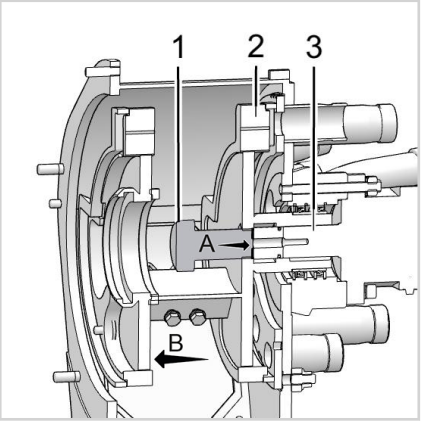
Preparatory activities

► Switch off the distributor.
► Empty and clean the distributor.
► Dismount the service ports.
► Dismount the housing cover.

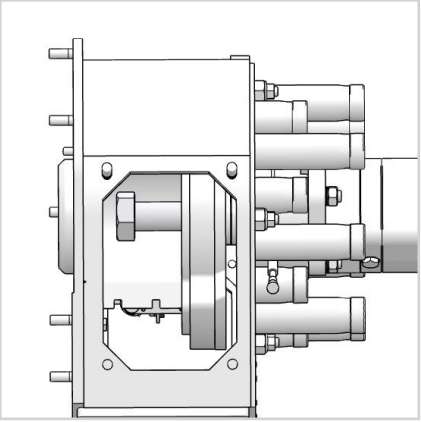
Procedure



► To dismount the rotor fastening, loosen the hexagon head bolt (1) and remove it with the washer (2), the sealing ring (3), the preload disc (4) and the flat gasket (5).



► To remove the rotor (2), screw a lubricated M 30 (1) hexagon head bolt into the rotor. When the hexagon head bolt (1) is inserted far enough, the rotor (2) will be released from the motor (3).



► Remove the rotor including the lid-side and motor-side cutting system.

Concluding activities

► Mount the rotor.
► Tension the eccentric adjuster.
► Install the eccentric adjusters.
► Mount the housing cover.
► Remove the cotter pins from the eccentric adjusters.
► Install the service ports.

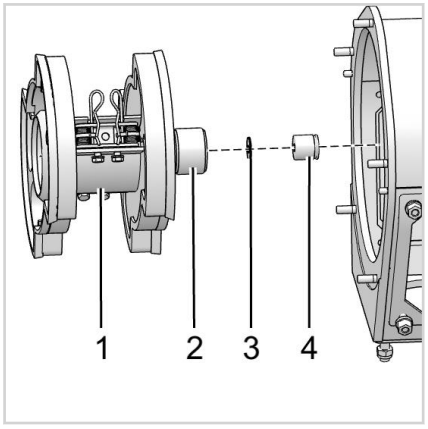
10.10.6 Mounting the rotor

Tool	• Torque wrench

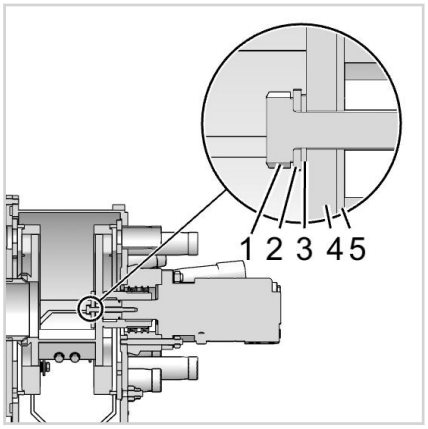
Preparatory activities

► Tension the eccentric adjuster.
► Install the eccentric adjusters.

Procedure



- ► Grease the bushing (2) on the rotor (1).
- ► To protect the radial shaft seals, mount the rotor (1), including the cutting system and the clamped eccentric adjusters, with a slight rotational movement. Pay attention to the shim discs (3) and the spacer sleeves with the O-ring (4) between the rotor (1) and the hydraulic motor.



- ► To fasten the rotor with the rotor fastening, place the flat gasket (5), the preload disc (4), the sealing ring (3) and the washer (2) and tighten with the hexagon head bolt (1). **Attention!** Be sure to install the parts in the right sequence. **Attention!** Observe the specified tightening torque. → *10.4 Tightening torques*.
- ► Mount the housing cover.
- ► Check that the rotor is centred between the cutting rings and compensate with shims if necessary.

Concluding activities

- ► Remove the cotter pins from the eccentric adjusters.
- ► Install the service ports.

10.11 Repair

Note:

Observe the warning and safety notes prior to performing repair work, → *10.1 Safety notes*.

10.11.1 Wear travel

If the washer (1) is in contact with the rotor (2), replace the cutting blade and the cutting ring.

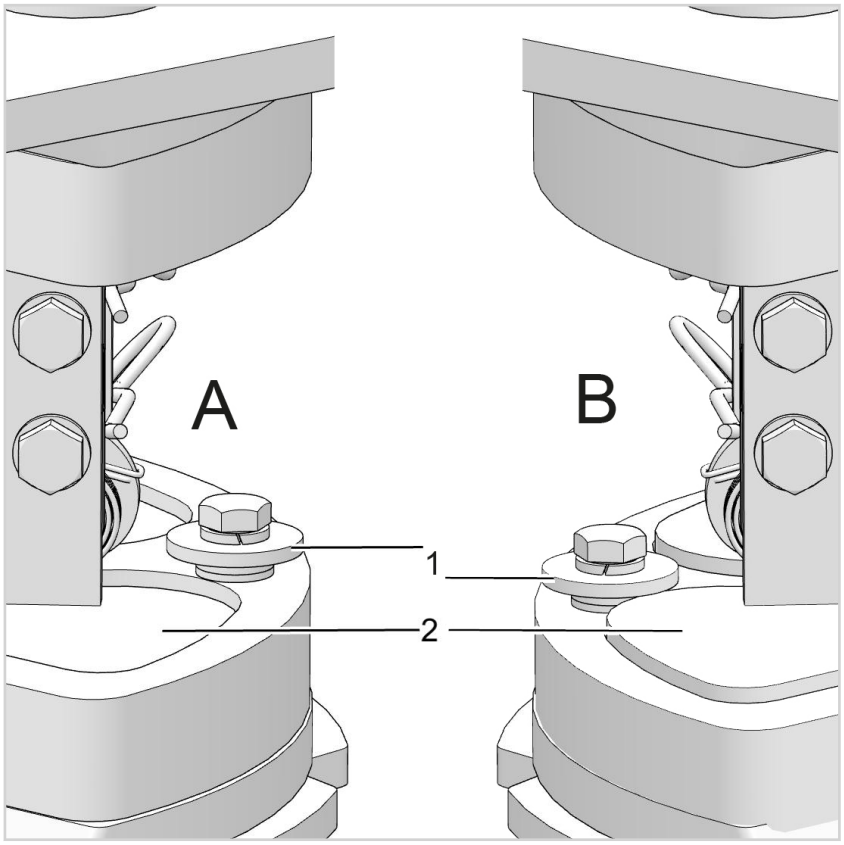


Fig. 12: Wear travel

A | When delivered

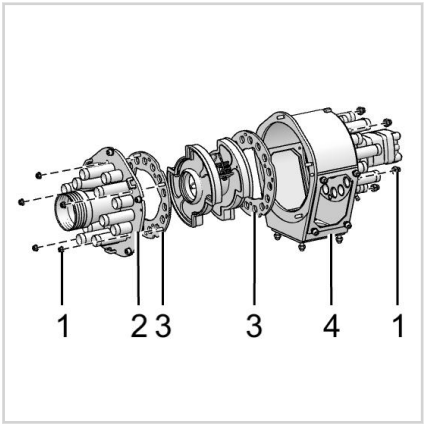
B | Wear limit

10.11.2 Replace cutting rings

Tool	• Torque wrench

Preparatory activities

► Switch off the distributor.
► Empty and clean the distributor.
► Dismount the service ports.
► Dismount the housing cover.
► Dismount the rotor,



Procedure

► Remove the nuts (1) from the housing (4) and from the housing cover (2).
► Remove the cutting rings (3).
► Clean the contact surfaces and wet with sealant, e.g. e.g. silicone.
► Position the new cutting rings (3) and secure with the nuts (1).
Attention! Observe the specified tightening torque. → *10.4 Tightening torques*.

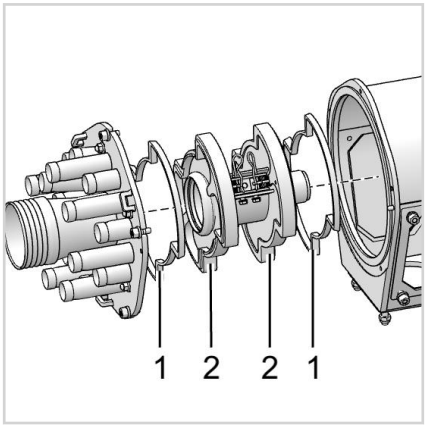
Concluding activities

► Tension the eccentric adjuster.
► Install the eccentric adjusters.
► Mount the rotor.
► Mount the housing cover.
► Remove the cotter pins from the eccentric adjusters.
► Install the service ports.

10.11.3 Replacing the cutting blade

Preparatory activities

► Switch off the distributor.
► Empty and clean the distributor.
► Dismount the service ports.
► Dismount the housing cover.
► Dismount the rotor,



Procedure

- ► Dismount the cutting blades (1) from the cutting blade holders (2).
- ► Mount the new cutting blades (1) to the cutting blade holders (2).

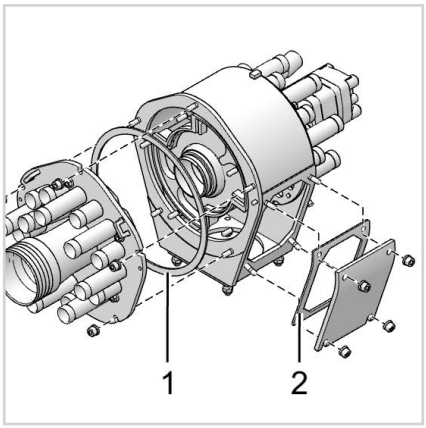
Concluding activities

- ► Tension the eccentric adjuster.
- ► Install the eccentric adjusters.
- ► Mount the rotor.
- ► Mount the housing cover.
- ► Remove the cotter pins from the eccentric adjusters.
- ► Install the service ports.

10.11.4 Replacing seals on the housing

Preparatory activities

- ► Switch off the distributor.
- ► Empty and clean the distributor.
- ► Dismount the service ports.
- ► Dismount the housing cover.



Procedure

- ► Remove the flat seals (2) from the service ports.
- ► Remove the cover seal (1) and remove the adhesive residue.
- ► Fit the new cover seal (1).
- ► Place the new flat gaskets (2) on the housing.

Concluding activities

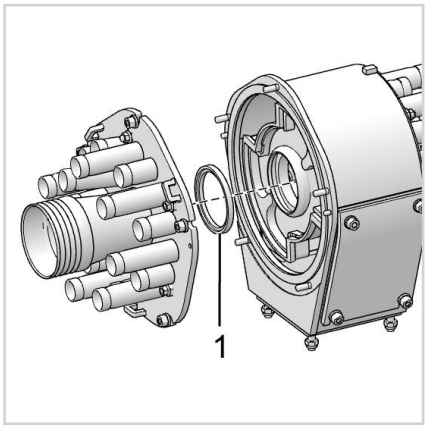
- ► Tension the eccentric adjuster.
- ► Install the eccentric adjusters.
- ► Mount the rotor.
- ► Mount the housing cover.
- ► Remove the cotter pins from the eccentric adjusters.
- ► Install the service ports.

10.11.5 Replacing the foam-PU ring gasket

Preparatory activities

- ► Switch off the distributor.
- ► Empty and clean the distributor.
- ► Dismount the service ports.
- ► Dismount the housing cover.

Procedure



- ► Remove the foam-PU ring gasket (1).
- ► Insert the new foam-PU ring gasket (1) into the rotor.

Concluding activities

- ► Tension the eccentric adjuster.
- ► Install the eccentric adjusters.
- ► Mount the housing cover.
- ► Remove the cotter pins from the eccentric adjusters.
- ► Install the service ports.

10.11.6 Replacing the seals in the drive adapter

Preparatory activities

- ► Switch off the distributor.
- ► Empty and clean the distributor.
- ► Dismount the service ports.
- ► Dismount the housing cover.
- ► Dismount the rotor,

Procedure

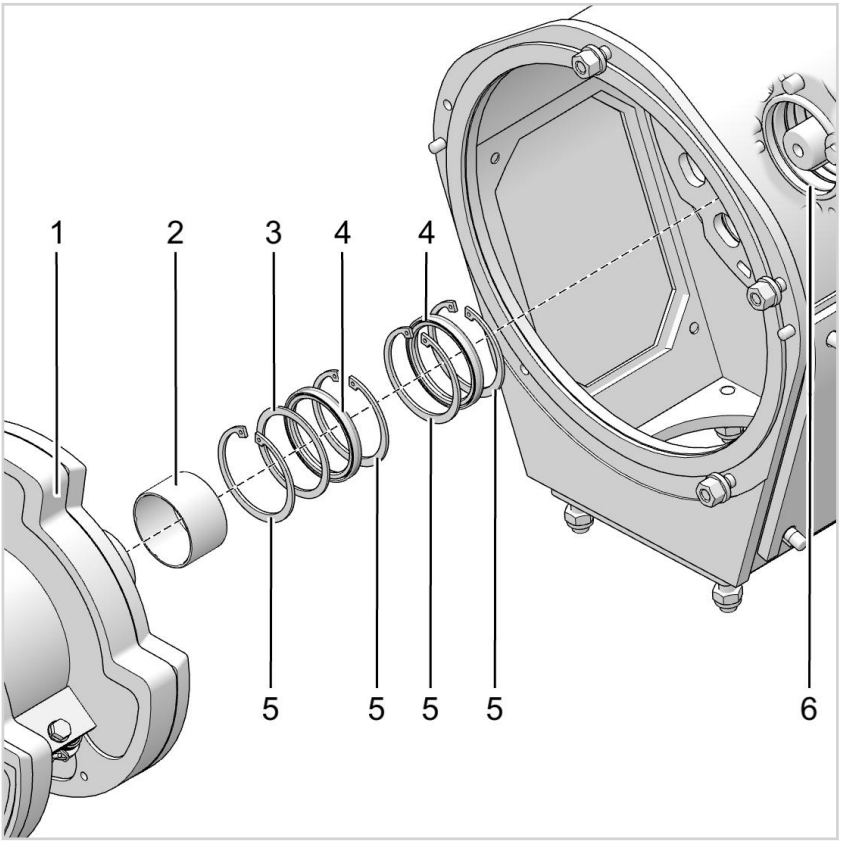
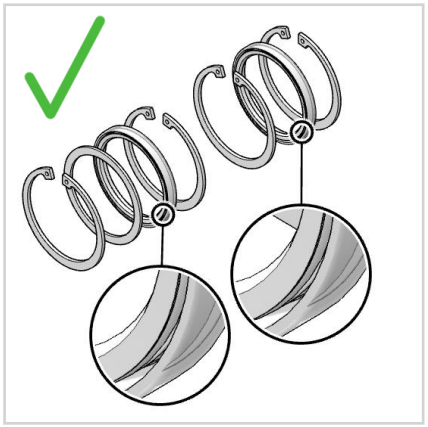
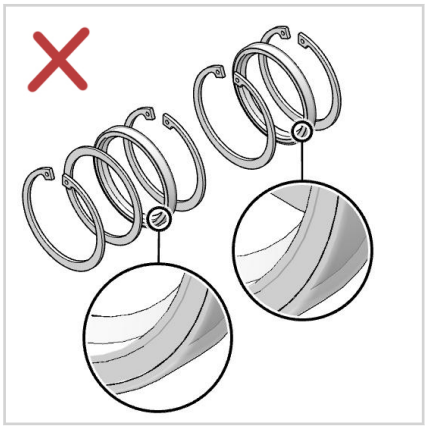


Fig. 13: Seals in the drive adapter

- ► Replace the bushing (2).
- ► To dismount the two radial shaft seals (4) from the rotor (1), remove the retaining rings (5) and the spacer washer (3).
- ► Clean the contact surface.
- ► Insert the new radial shaft seals (4) with the retaining rings (5) and the spacer washer (3) into the drive adapter (6).





Attention!
Ensure that the radial shaft seals seal as far as the hydraulic motor so that this does not get damaged.

Concluding activities

- ► Tension the eccentric adjuster.
- ► Install the eccentric adjusters.
- ► Mount the rotor.
- ► Mount the housing cover.
- ► Remove the cotter pins from the eccentric adjusters.
- ► Install the service ports.

11 Malfunctions and errors

11.1 Safety notes

The actions described in this table of malfunctions may be carried out only by persons

- who have been trained for the activities concerned and who possess the necessary knowledge.
- who have been informed about the possible dangers when using the machine.

If specific additional qualifications are required to remedy malfunctions, those will be specified in the section concerned.

⚠WARNING!

Beware the risk of injury from falling from high locations

Some installation and maintenance work has to be done in higher locations. There is a risk of falling down.

► Use suitable equipment to climb up, e.g. a scaffold or ladder.
► Make sure the scaffold or ladder is stable.

⚠WARNING!

Risk of cutting on sharp-edged parts

If the rotor can be freely accessed, there is a risk of cutting on the sharp edges of the cutting components.

► Operate the distributor only if the supply hose, the discharge hoses and the foreign matter hose are connected.
► Only operate the distributor if the maintenance port is mounted and screwed on.
► Before dismounting the maintenance port, switch the hydraulic valve to "floating position".
► Switch off the engine of the tractor or spreader vehicle.
► Before installation, maintenance and repair work, secure moving parts so that they cannot move.
► Wear protective clothing.

⚠WARNING!

Risk of cutting on sharp-edged parts during functional test

If the rotor can be freely accessed, there is a risk of cutting on the sharp edges of the cutting components.

- ► A functional test (e.g. to check the safety device or the rotational action of the rotor) may only be carried out by qualified technical personnel.
- ► Before switching on the machine for functional tests, make sure that there are no persons in the danger area.
- ► Wear protective clothing.

⚠WARNING!

Danger from bursting distributor housing

If the maximum permissible internal pressure is exceeded, the distributor housing may burst. This may result in injuries.

- ► Be sure to observe the maximum permissible internal pressure of the distributor: 2 bar.

⚠WARNING!

Risk of injury due to the failure of hydraulic parts if the maximum permissible hydraulic oil pressure is exceeded

If the maximum permissible hydraulic oil pressure is exceeded, there is a risk of high pressure injection due to failure of hydraulic parts.

- ► Observe the maximum permissible hydraulic oil pressure for the distributor: max. 200 bar.
- ► Observe the maximum permissible hydraulic oil pressure for the hydraulic motor: 200 bar.
- ► Wear protective clothing.

⚠WARNING!

Risk of injury due to the liquid manure supply hose bursting

If the maximum permissible pressure in the liquid manure supply hose is exceeded, the hose can burst and the medium can splash out. This may result in injuries.

► Note the maximum permissible pressure in the liquid manure supply hose: 2 bar.
► Wear protective clothing.

⚠WARNING!

Skin and eye irritations as well as risk of infection due to contact with working materials or the medium

All work on the machine can lead to contact with working materials or media. Contact may cause skin or eye irritation.

► Inform staff about hazardous substances.
► Wear protective clothing.
► Before working on the machine, depressurise it to prevent lubricants and media from squirting out.

⚠WARNING!

Beware of skin and eye irritation and the risk of infection from contact with hydraulic oil

Leaks may occur when coupling and uncoupling hydraulic lines or due to faulty seals. Leaking hydraulic oil can cause skin and eye irritation as well as infections.

► Have hydraulic lines connected by qualified personnel.
► Wear the appropriate protective clothing.
► In the event of injuries with hydraulic oil, see a doctor immediately!

⚠CAUTION!

Beware of the risk of burns due to exposed hot surfaces

During operation the hydraulic oil can reach a temperature of more than 60 °C.
The hydraulic motor reaches high temperatures in normal operation.
The distributor housing can become very hot during dry running of the cutting blades.

- ► Avoid contact with hot surfaces.
- ► Avoid dry running of the cutting blades.
- ► Operate the distributor only when it is filled with the medium to be distributed.
- ► Allow the distributor to cool down to ambient temperature before starting maintenance and repair work.
- ► Wear protective clothing.

⚠CAUTION!

Scalding or burning by hot medium

Contact with hot media or working materials over 60 °C can cause scalding or burns.

- ► Avoid contact with hot media and working materials.
- ► Before maintenance and repair work, flush out the distributor and release the pressure.
- ► Wear protective clothing.

11.2 Table of malfunctions

11.2.1 Distributor is vibrating

Possible cause	Possible remedy
Rotor speed too low	• Check the volume flow of the hydraulic oil on the spreader vehicle. • Check the hydraulic system.
Rotor speed too high	• Check the volume flow of the hydraulic oil at the spreader vehicle. • Check the hydraulic system.

Possible cause	Possible remedy
Rotor is blocked	• Clean the distributor.
Air ducts blocked	• Clean the air ducts with water. • If the hoses on the filling side vibrate, clean the air ducts in the rotor.

11.2.2 Cutting effect insufficient

Possible cause	Possible remedy
Flow rate too high	• Reduce the pump speed.
Cutting components worn	• Replace the cutting components.
Rotor speed too low	• Check the volume flow of the hydraulic oil on the spreader vehicle. • Check the hydraulic system.
Rotor speed too high	• Check the volume flow of the hydraulic oil at the spreader vehicle. • Check the hydraulic system.
Eccentric adjuster defective	• Replace the eccentric adjuster.
Cutting system not moving	• Operate the cutting system.

11.2.3 Poor distribution

Possible cause	Possible remedy
Rotor speed too low	• Check the volume flow of the hydraulic oil on the spreader vehicle. • Check the hydraulic system.
Rotor speed too high	• Check the volume flow of the hydraulic oil at the spreader vehicle. • Check the hydraulic system.
Volume flow of the medium is too low	• Increase the pump speed. Insufficient medium distribution leads to poor average distribution.
Volume flow of the medium is too high	• Reduce the pump speed. Too high a medium volume flow leads to poor average distribution.

Possible cause	Possible remedy
Pressure in the housing too low	• Increase the throughput rate. • Select a cutting ring with smaller openings. • Adjust the cutting system incl. rotor.
Hose layout incorrect	• Optimise the hose layout. Hoses of roughly similar length should be fed at every rotor position
Fibrous matter under the cutting blades	• Remove the fibrous matter.
Air ducts blocked	• Clean the air ducts with water. • If the hoses on the filling side vibrate, clean the air ducts in the rotor.

11.2.4 Only a few discharge hoses are being supplied with medium

Possible cause	Possible remedy
Rotor blocked	• Reverse the rotor several times. • Remove foreign matter. • Check the hydraulic system.

11.2.5 Housing cover cannot be installed

Possible cause	Possible remedy
Eccentrics are not preloaded	• Preload eccentrics.

11.2.6 Rotor does not run smoothly

Possible cause	Possible remedy
Housing cover not screwed on properly	• Tighten the nuts on the housing cover.
Cutting rings not parallel	• Clean cutting ring plate. • Check that the rotor and cutting system run smoothly and parallel.

11.2.7 Foam in hydraulic oil reservoir

Possible cause	Possible remedy
Air in the hydraulic system	• **Attention!** Do not load the hydraulic system until it has been completely vented and cleaned. **Qualified hydraulics technical personnel** • Check the hydraulic system for leak tightness. • Replace the oil filter and top up with oil if necessary. • Connect the hydraulic system to a separate tank with filter (filter unit max. 10 µm). The tank capacity must be double the size of the maximum hydraulic oil volume flow. Allow the entire system to run with no load (unpressurised) for about 30 minutes

11.2.8 Jerky movements of motor and cylinder

Possible cause	Possible remedy
Air in the hydraulic system	• **Attention!** Do not load the hydraulic system until it has been completely vented and cleaned. **Qualified hydraulics technical personnel** • Check the hydraulic system for leak tightness. • Replace the oil filter and top up with oil if necessary. • Connect the hydraulic system to a separate tank with filter (filter unit max. 10 µm). The tank capacity must be double the size of the maximum hydraulic oil volume flow. Allow the entire system to run with no load (unpressurised) for about 30 minutes

11.2.9 Noises in the hydraulic system

Possible cause	Possible remedy
Air in the hydraulic system	• **Attention!** Do not load the hydraulic system until it has been completely vented and cleaned. **Qualified hydraulics technical personnel** • Check the hydraulic system for leak tightness. • Replace the oil filter and top up with oil if necessary. • Connect the hydraulic system to a separate tank with filter (filter unit max. 10 µm). The tank capacity must be double the size of the maximum hydraulic oil volume flow. Allow the entire system to run with no load (unpressurised) for about 30 minutes

12 Disposal

12.1 Safety notes

⚠WARNING!

Beware the risk of injury from falling from high locations

Some installation and maintenance work has to be done in higher locations. There is a risk of falling down.

- ► Use suitable equipment to climb up, e.g. a scaffold or ladder.
- ► Make sure the scaffold or ladder is stable.

⚠WARNING!

Risk of crushing or concussion due to falling machine

The centre of gravity of the machine could shift. When lifting, the machine could become unbalanced and fall down to one side.

- ► Before lifting the machine, note its centre of gravity. See, for example, the dimension drawing or the Transport chapter.
- ► Staying beneath lifted loads is prohibited. Have everyone leave the danger zone.
- ► Note and comply with the transport instructions.

⚠WARNING!

Risk of crushing or concussion due to falling distributor

The distributor must not be held in position by means of the connected supply hose. That could cause screw connections to break or fail. The distributor could fall.

- ► Securely screw the fixing sheets of the distributor to the supports of the spreader linkage.
- ► Check the screw connections fastening the distributor in accordance with the maintenance plan to ensure they are firmly tightened, and tighten them if needed.
- ► Wear protective clothing.

⚠WARNING!

Risk of cutting on sharp-edged parts

If the rotor can be freely accessed, there is a risk of cutting on the sharp edges of the cutting components.

- ► Operate the distributor only if the supply hose, the discharge hoses and the foreign matter hose are connected.
- ► Only operate the distributor if the maintenance port is mounted and screwed on.
- ► Before dismounting the maintenance port, switch the hydraulic valve to "floating position".
- ► Switch off the engine of the tractor or spreader vehicle.
- ► Before installation, maintenance and repair work, secure moving parts so that they cannot move.
- ► Wear protective clothing.

⚠WARNING!

Risk of injury due to the failure of hydraulic parts if the maximum permissible hydraulic oil pressure is exceeded

If the maximum permissible hydraulic oil pressure is exceeded, there is a risk of high pressure injection due to failure of hydraulic parts.

- ► Observe the maximum permissible hydraulic oil pressure for the distributor: max. 200 bar.
- ► Observe the maximum permissible hydraulic oil pressure for the hydraulic motor: 200 bar.
- ► Wear protective clothing.

⚠CAUTION!

Danger of crushing and trapping from spring energy

Tensioning the eccentric disc builds up spring energy.

- ► Wear protective gloves.

⚠WARNING!

Beware of skin and eye irritation and the risk of infection from contact with hydraulic oil

Leaks may occur when coupling and uncoupling hydraulic lines or due to faulty seals. Leaking hydraulic oil can cause skin and eye irritation as well as infections.

- ► Have hydraulic lines connected by qualified personnel.
- ► Wear the appropriate protective clothing.
- ► In the event of injuries with hydraulic oil, see a doctor immediately!

⚠CAUTION!

Scalding or burning by hot medium

Contact with hot media or working materials over 60 °C can cause scalding or burns.

- ► Avoid contact with hot media and working materials.
- ► Before maintenance and repair work, flush out the distributor and release the pressure.
- ► Wear protective clothing.

⚠CAUTION!

Improper handling of oil, grease and other pollutants can pose health risks.

The consequences of this might be skin reactions, allergies and environmental damage.

- ► When handling pollutants and other chemical substances, observe the safety regulations applicable to the products concerned.
- ► Avoid skin contact with pollutants. Wear suitable protective clothing.
- ► Dispose of pollutants in an environmentally friendly manner.

Note:

- Sort residual media, pollutants and replacement parts according to their type and dispose of them in an environmentally-friendly manner.
- When handling a medium, always observe the valid safety instructions for the substance concerned.
- Avoid contact with pollutants. Wear suitable protective clothing.

12.2 Preparatory activities

► Disconnect the machine from the power supply.
► Disconnect the machine from the pipe or hose line.
► Drain the machine and remove residual medium.
► Dismount the parts which need to be disposed of separately (e.g. plastic parts).

12.3 Disposing of the machine

► Sort the working materials according to type and method of disposal.
► For scrapping, sort the individual parts according to materials and type of disposal.

Materials	Disposal
Metals	Repair uneconomical
Electric components	Electrical scrap
Plastic parts	Non-recyclable waste[4]
Gear oil, hydraulic oil	Collection point for waste oil

Tab. 3: Materials and disposal

Notice

Dispose of all working materials and other materials in an environmentally friendly manner.

4) Observe the regional disposal regulations and recycling options!

13 Appendix

13.1 Maintenance plan

Notice

To avoid endangering any warranty claims, all scheduled maintenance work that is performed must be documented.

Serial number:		
Maintenance work	**Date**	**Signature**

13.2 Declaration of installation

Declaration of incorporation for a partly completed machine (2006/42/EC annex II B)
We hereby declare that this delivery concerns the following partly completed machine. The start-up of the machine is prohibited until the machine into which this partly completed machine is incorporated is in conformity with the regulations of **Directive 2006/42/EC**.

Manufacturer
Vogelsang GmbH & Co. KG
Holthöge 10-14
49632 Essen (Oldenburg)
GERMANY

Product
Precision distributor for liquid manure spreader vehicles

Machine type
ExaCut ECL

The following basic health and safety requirements according to Annex I of Directive 2006/42/EC are applied and observed:
1.1.3; 1.1.5; 1.3.2; 1.5.3; 1.5.4; 1.6.1; 1.6.5; 1.7.1.1; 1.7.3; 1.7.4.1; 1.7.4.3

Applied harmonised standards
EN ISO 12100:2011
EN ISO 4413:2011

The special technical documents according to annex VII B have been prepared and can be obtained if necessary.

Vogelsang GmbH & Co. KG; Holthöge 10-14; 49632 Essen (Oldenburg), GERMANY is authorised to compile technical documentation
The manufacturer is obligated to electronically forward the relevant technical documentation for the partly completed machine to national authorities upon justified request.

49632 Essen (Oldenburg), 2020-12-02

ppa Paul Krampe

By procuration Paul Krampe (Head of Research & Development)