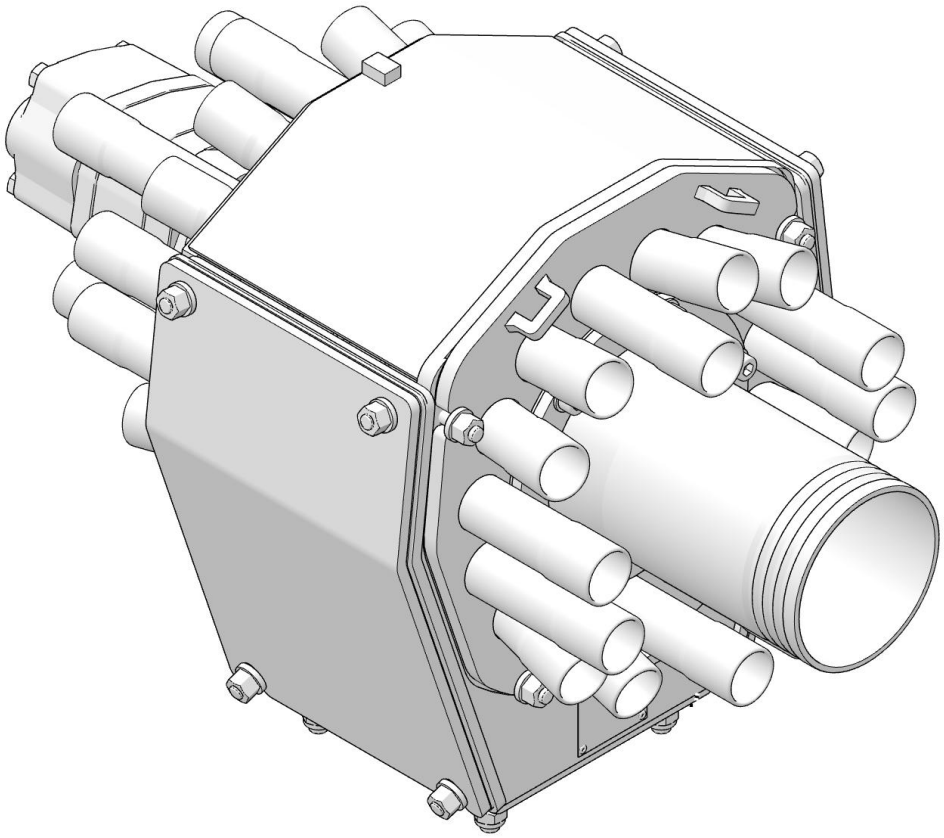

ExaCut

ECQ30-40

Operating instructions example

V1.3

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

Date of issue: 02.10.2024
Part number: DPK1193

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.

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 fertiliser—including 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 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 2 bar. Otherwise the distributor could burst.

► Limit the operating pressure to 2 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, → *10.9.2 Cleaning the distributor*.

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, → *10.9.2 Cleaning the distributor*.

2.4 Danger areas

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

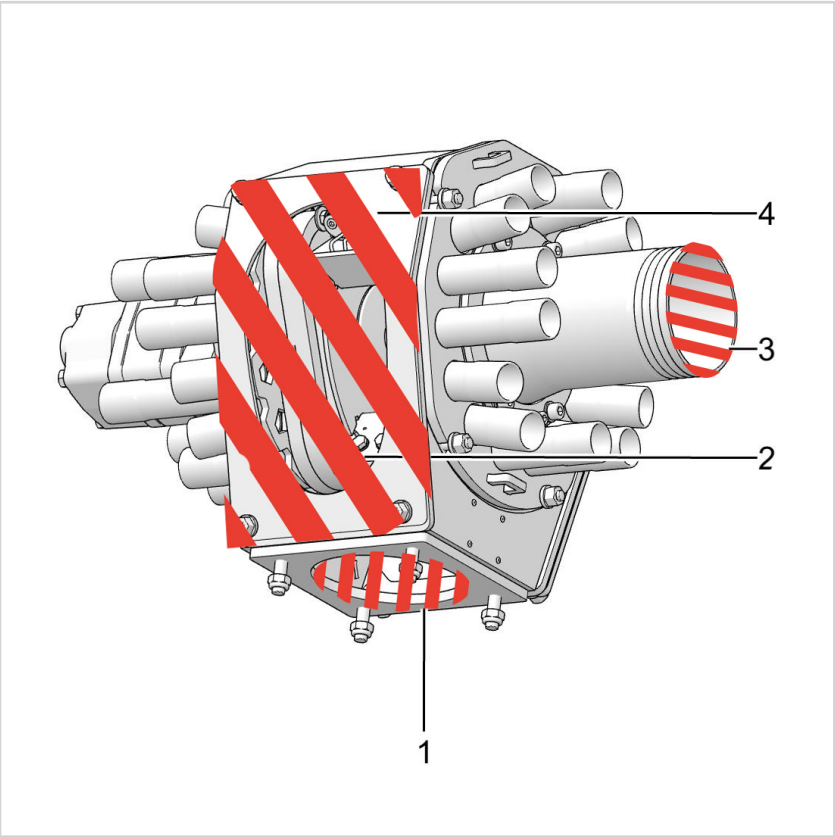


Fig. 1: Danger areas

1	Cleaning port	3	Inlet
2	Interior of the distributor	4	Maintenance hatches

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.

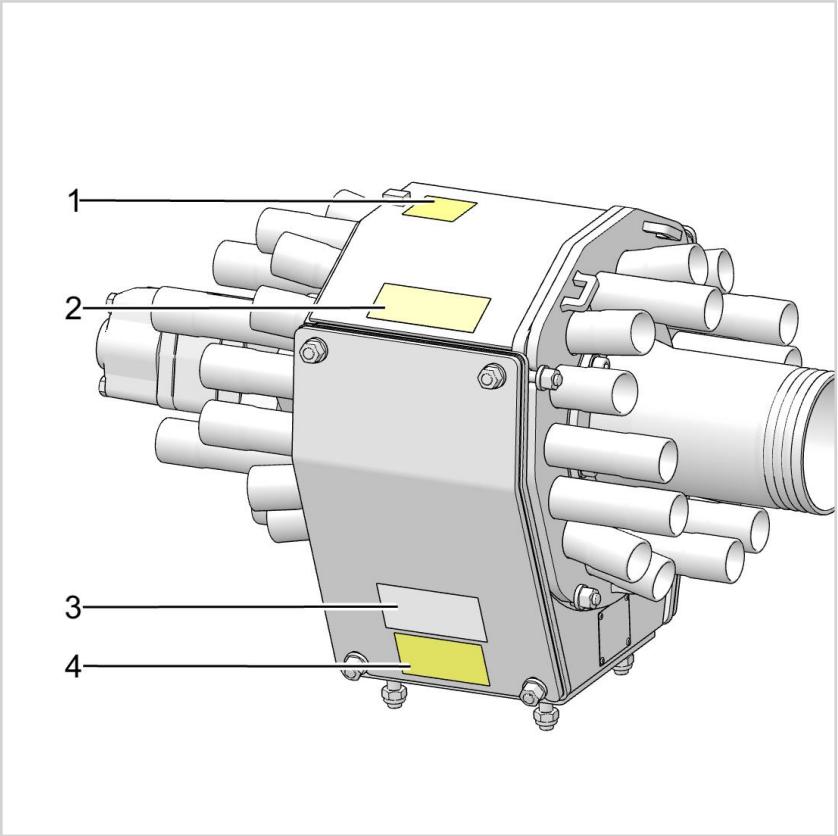
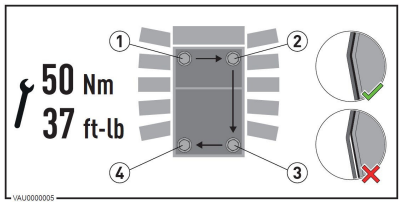


Fig. 2: Position of warning and safety stickers

1	VAU0398	3	VAU0000005
2	VAU0760	4	VAU.133

Part	Sticker	Description
VAU0398		Hydraulic oil volume flow
VAU0760		• Caution: Risk of hand injuries! • Before maintenance work, depressurise the machine and switch off the drive! • Read the operating manual.
VAU0000005		Service port ECQ assembly instructions
VAU.133		Before starting the machine, read the operating instructions.

3 Product description

3.1 Overview

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

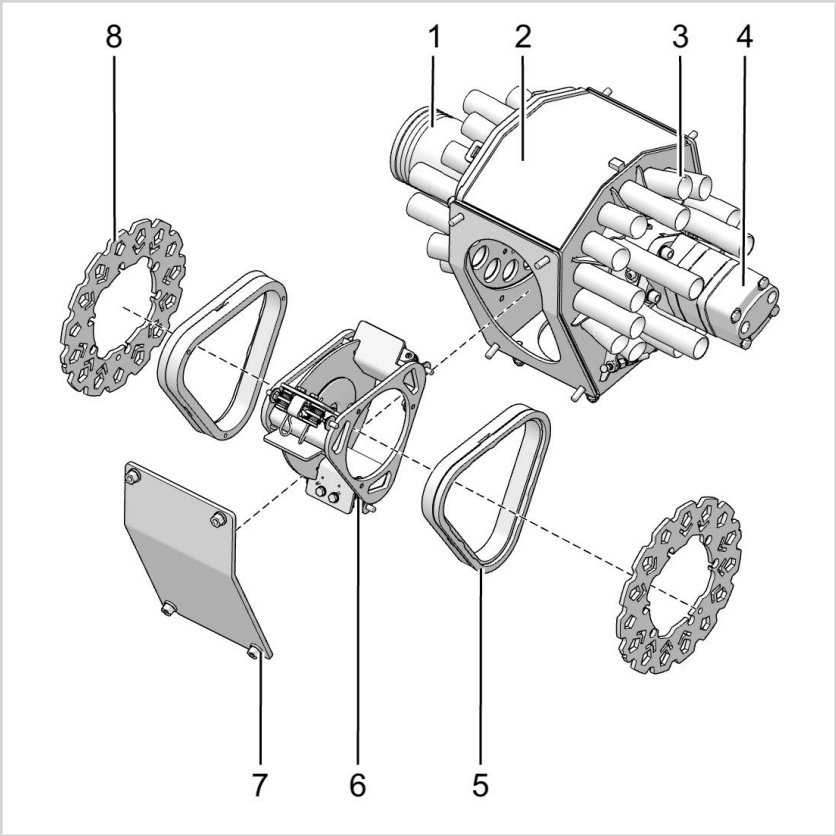


Fig. 3: Overview of ECQ parts

1	Inlet connector
2	Distributor housing
3	Outlet connector
4	Hydraulic motor with drive adapter
5	Blade holder with cutting blade
6	Rotor
7	Service port
8	Cutting ring

4 Specifications

4.1 Distributor

ExaCut ECQ30-40	
Inlet connector diameter:	DN 125
Outlet connector diameter:	DN 40
Quantity of outlet connectors:	30
Number of ventilation pipes:	4 on engine side
Maximum internal pressure:	2 bar
Medium temperature range:	0 °C...+45 °C
Noise emission:	< 70 dB (A)

4.2 Requirements for the vehicle hydraulics

Minimum volume flow:	30 l/min
Maximum volume flow:	40 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	**30 - 40** 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	175 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

NOTICE!

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

Ambient temperature:	-30 °C...+90 °C
Hydraulic oil temperature (normal operation):	+30 °C...+60 °C
Viscosity (operating temperature):	+20 mm²/s...+75 mm²/s (100 SUS...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

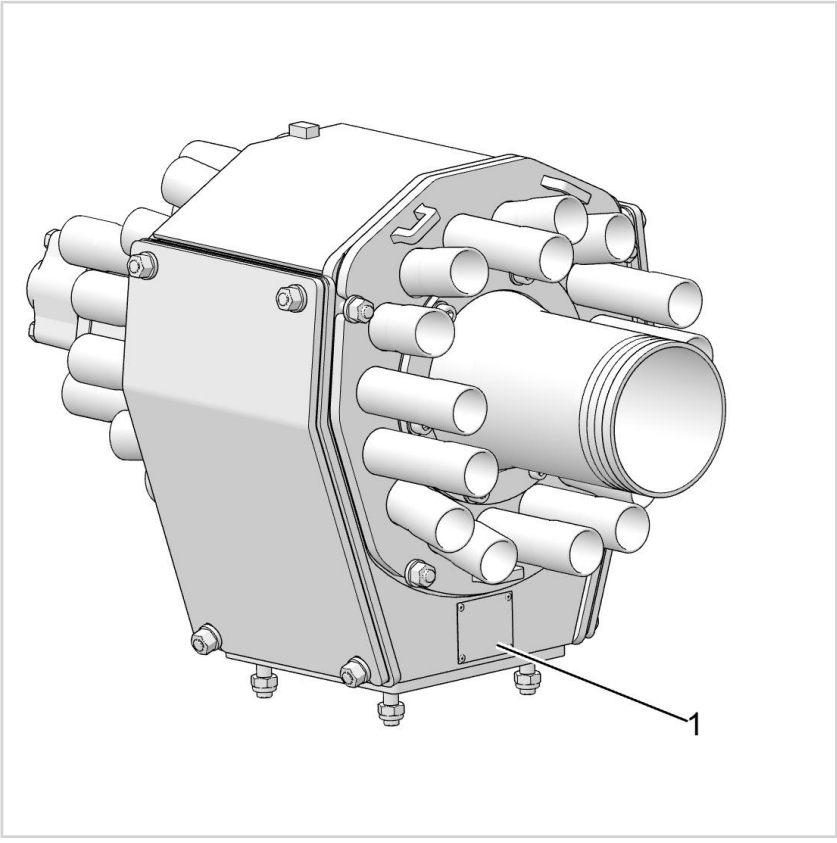


Fig. 4: Positioning of the nameplate

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.

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.

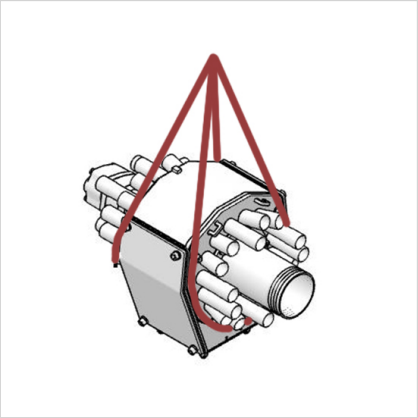
► Before lifting the machine, note its centre of gravity. See, for example, the dimension drawing or the Transport chapter.
► Staying beneath lifted loads is prohibited. Have everyone leave the danger zone.
► Note and comply with the transport instructions.

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.

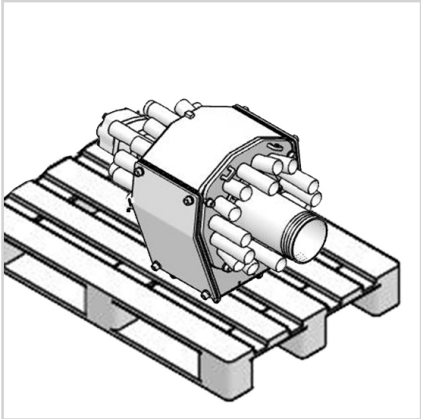
6.2 Permissible transport options

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 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 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.

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 Connecting the hydraulics

7.4.1 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!

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.

7.4.2 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 12
- 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.

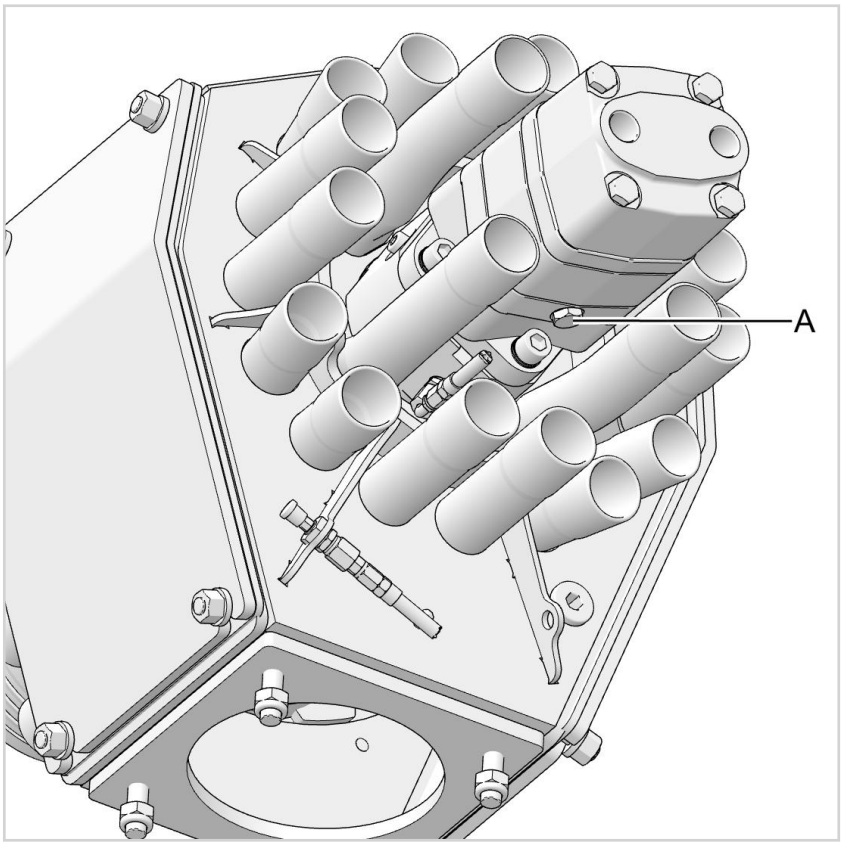
Please note

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

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

7.5 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.

7.6 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

The supply hose must be selected with a generous length.

► Mount the supply hose on the filling pipe using a hose clamp.

Notice

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

7.7 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.

7.8 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.

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.

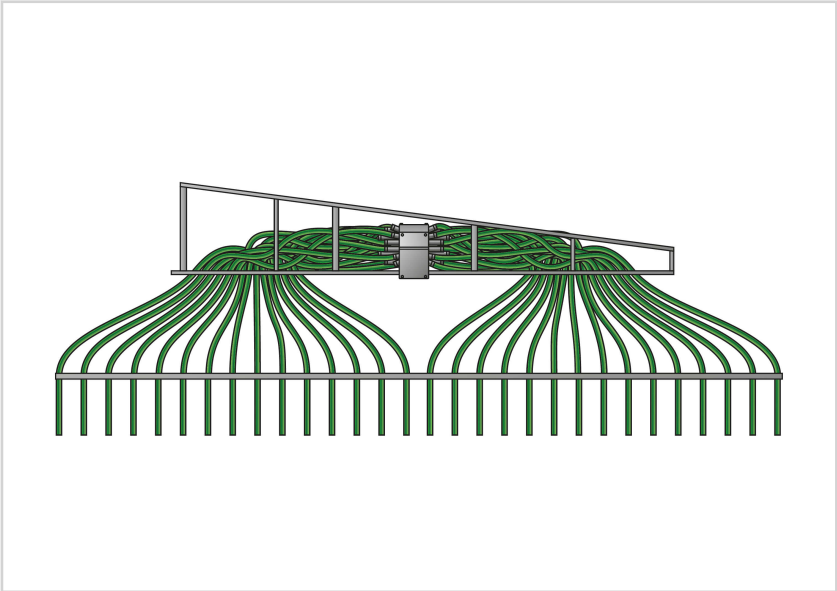


Fig. 6: Right boom hose layout diagram (example illustrated)

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.

7.8.1 Hose connection diagram

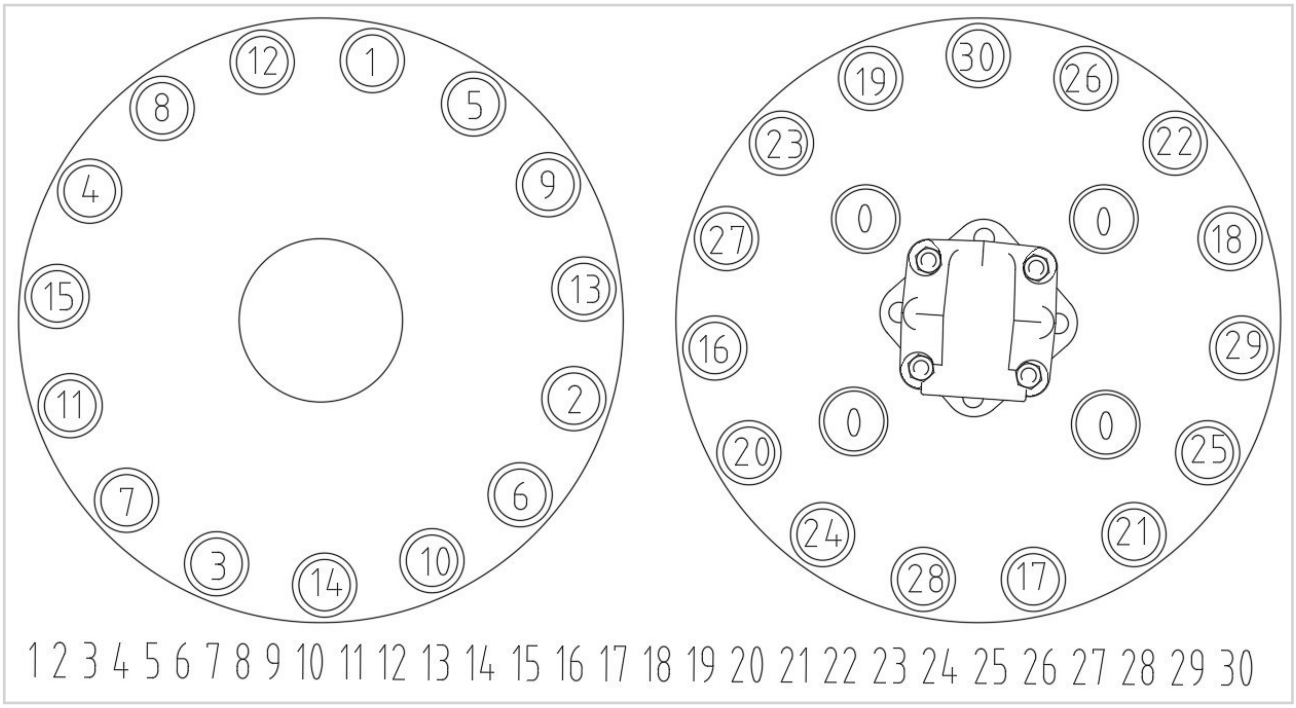


Fig. 7: Hose connection diagram ECQ30-40 right boom

0 | Ventilation

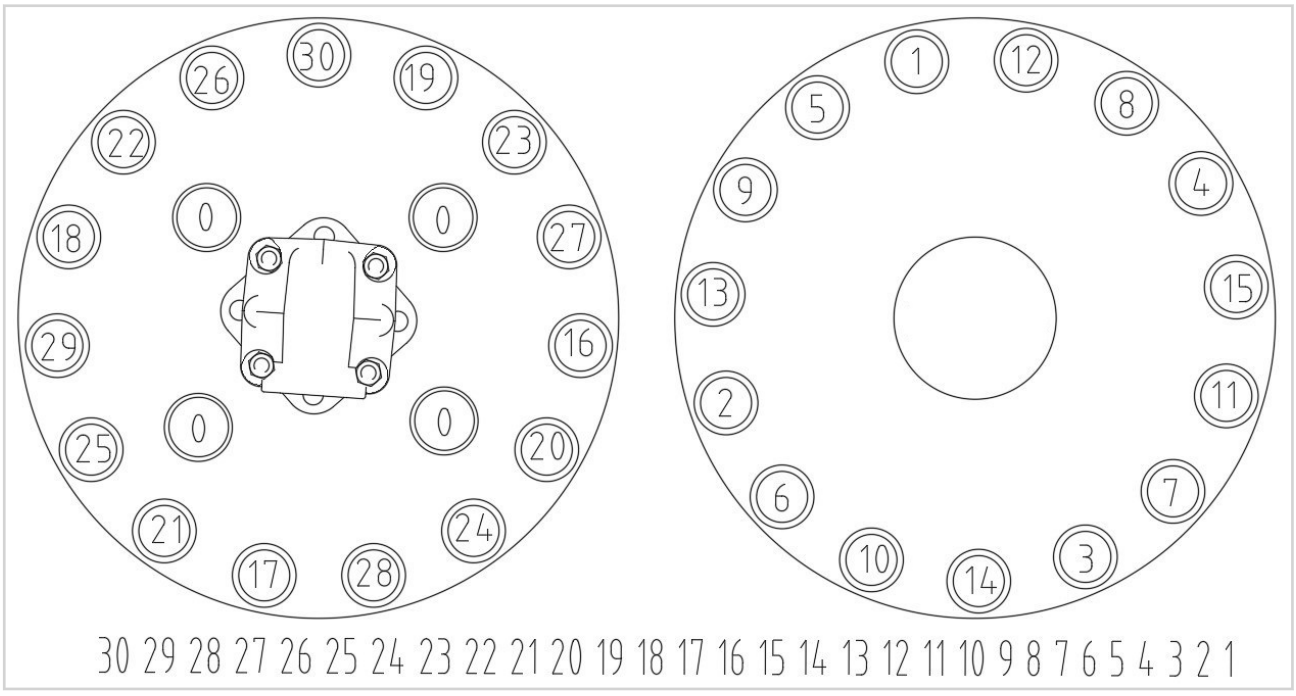


Fig. 8: Hose connection diagram ECQ30-40 left boom

0 | Ventilation

8 Start-up

8.1 Safety notes

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

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 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!

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!

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!

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

In order to achieve good average distribution, a pressure in the distributor of ≥0.3 bar is required.
When using low-viscosity media, you achieve better average distribution with a higher throughput.

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.

Hose system

- ☐ The foreign matter hoses is connected and clamped off.
- ☐ The supply hose is connected.
- ☐ The ventilation hoses are connected.
- ☐ The discharge hoses are connected.
- ☐ The hose clamps are firmly in place.
- ☐ There is free flow through the hoses.
- ☐ 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: 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!

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!

Avoiding dry running of the distributor

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

► Limit dry running of the distributor to 3 minutes at the most.

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 in the distributor of ≥0.3 bar is required.
When using low-viscosity media, you achieve better average distribution with a higher throughput.

9.3 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.

9.4 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 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: 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!

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, → *14.2 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

10.2.2 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.

10.3 Tightening torques

10.3.1 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

10.3.2 Specific tightening torques

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

- Screws on the hydraulic motor: 90 Nm
- Drive adapter mounting screws: 60 Nm
- Screws for positioning the cutting rings: 50 Nm
- Fastening screws of the eccentric adjuster: 30 Nm
- Flow plate fastening screws: 30 Nm
- Rotor adapter mounting screws: 40 Nm
- Screws for fixing the seal carrier: 20 Nm

10.4 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*.

10.5 Inspection plan

10.5.1 Before start-up

Part	Inspection
Hydraulic motor	► Check that the screws on the hydraulic motor are tight. ► Tighten any loose screws.
Hose clamps of the discharge hoses and the ventilation hoses	► Check that the hose clamps are securely in place on the discharge hoses and the ventilation hoses. ► If any hose clamps are loose, tighten the adjusting screw.
Hose clamps on the supply hose	► Check that the hose clamps are securely in place on the supply hose. ► If any hose clamps are loose, tighten the adjusting screw.

10.5.2 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 screws on the hydraulic motor are tight. ► Tighten any loose screws.
Hose clamps of the discharge hoses and the ventilation hoses	► Check that the hose clamps are securely in place on the discharge hoses and the ventilation hoses. ► If any hose clamps are loose, tighten the adjusting screw.
Hose clamps on the supply hose	► Check that the hose clamps are securely in place on the supply hose. ► If any hose clamps are loose, tighten the adjusting screw.

10.5.3 Every 50 operating hours

Part	Inspection
Distributor housing	► Remove foreign matter from the foreign matter hoses and the distributor housing. ► Clean the distributor. ► Clean the air duct connections via the ventilation hoses.
Cutting blades, cutting rings and gaskets	► Check the cutting blades, the cutting rings and the gaskets for wear. ► Replace worn cutting blades, cutting rings and gaskets.
Eccentric adjuster	► Check the preload of the cutting blades. ► If the preload is too low, remove the eccentric adjuster and make it operable.
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).
Hydraulic oil tank	► Check the oil level. ► Top up oil as needed.
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.
Hydraulic system	***Qualified technical personnel*** ► Check the hydraulic system for leaks. ► Replace any leaking parts.

10.5.4 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 of the discharge hoses and the ventilation hoses	► Check that the hose clamps are securely in place on the discharge hoses and the ventilation hoses. ► If any hose clamps are loose, tighten the adjusting screw.
Hose clamps on the supply hose	► Check that the hose clamps are securely in place on the supply hose. ► 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.

10.5.5 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.

10.5.6 After long periods of shutdown

Part	Inspection
Hydraulic motor	► Check that the screws on the hydraulic motor are tight. ► Tighten any loose screws.
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).

10.6 Service plan

10.6.1 Every 50 operating hours

Part	Service
Drive adaptor	► Lubricate the drive adaptor via the grease nipple.
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.

10.6.2 Before longer periods of shutdown

Part	Service
Distributor housing	► Remove foreign matter from the foreign matter hoses and the distributor housing. ► Clean the distributor. ► Clean the air duct connections via the ventilation hoses.
Wear parts	► Check the condition and wear of the wearing parts. ► Replace the worn wearing parts.
Cutting blade, cutting ring, rotor	► Uncover all contact surfaces and cutting surfaces between the cutting blades, the rotor and the cutting rings and spray them with biodegradable oil.
Drive adaptor	► Lubricate the drive adaptor via the grease nipple.

10.7 Repair plan

10.7.1 Every 6 years

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

10.8 Inspection

Note:

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

10.8.1 Tightening screw and bolt connections

Part	Entire machine
Tool	• Torque wrench

Preparatory activities

► Switch off the distributor.

Procedure

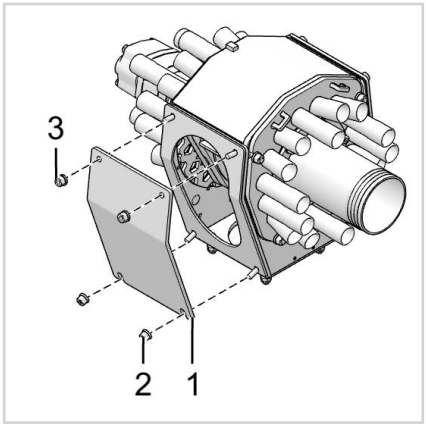
► Check the screw connections for tight fitting.
► Tighten any loose screw connections.

10.8.2 Dismounting the service port

Preparatory activities

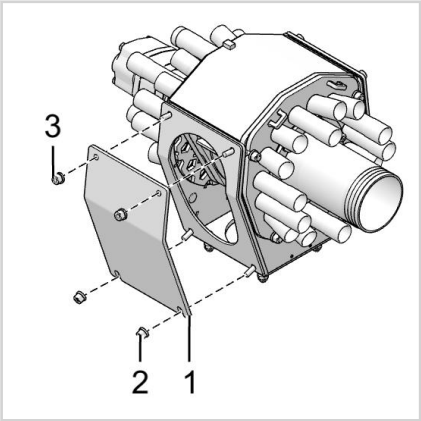
► Switch off the distributor.
► Empty the distributor through the foreign body hose.

Procedure



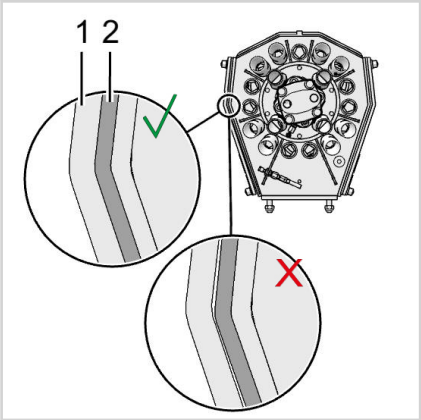
► Dismount the top nuts (3) on the service port (1).
► Loosen the lower nuts (2) on the service port (1).
► Dismount the service port (1).

10.8.3 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 secure the leak tightness of the service port,

- observe the tightening sequence.
- Make sure the flat gasket (2) and service port (1) are in the correct position.

10.8.4 Slackening the eccentric adjuster

Preparatory activities

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

Procedure

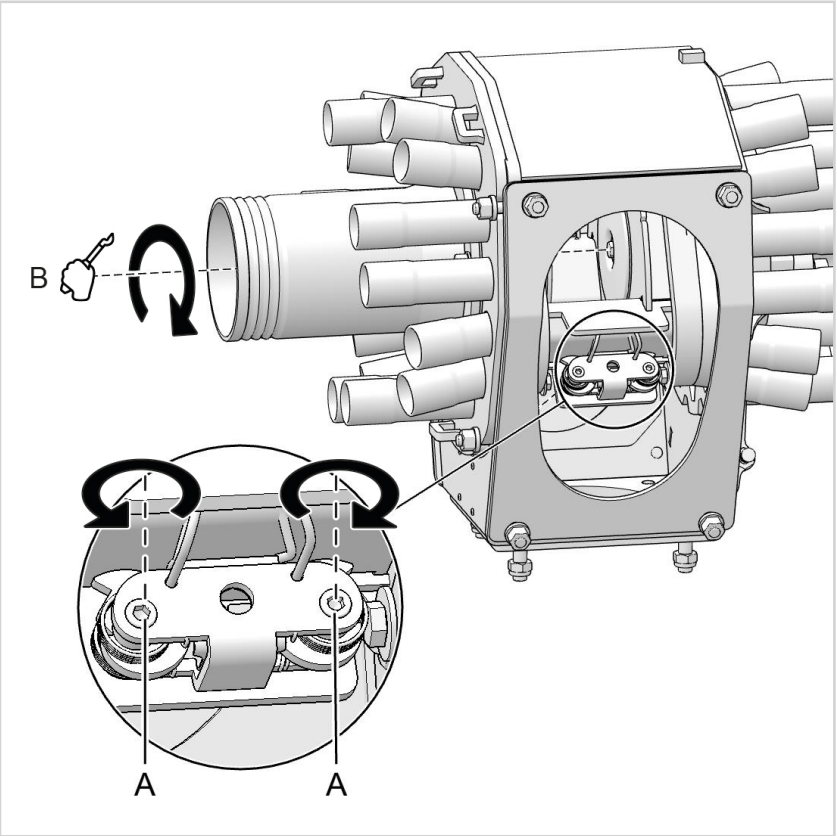


Fig. 9: Slackening the eccentric adjuster

- ► Release the preload of the cutting blades by slackening the three eccentric adjusters in the rotor.
  - ► Carefully turn the rotor with a mounting lever so that an eccentric adjuster is accessible (B).
  - ► Loosen the two hexagon socket head bolts on the eccentric adjuster with a hexagon socket wrench (max. 360°) until you can hear the eccentric washers releasing (A).
  - ► Also slacken the other two eccentric adjusters.

10.8.5 Checking the eccentric adjuster

Preparatory activities

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

Procedure

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

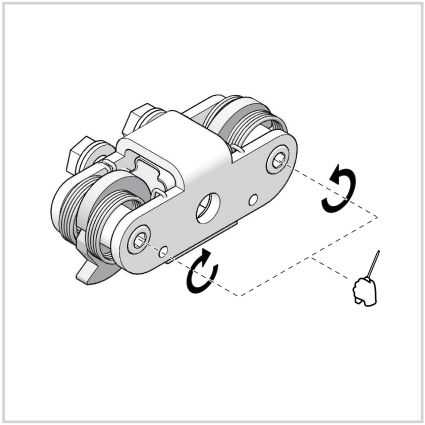
Concluding activities

- ► Install the eccentric adjusters.
- ► Tighten and activate the eccentric adjusters.
- ► Install the service ports.

10.8.6 Tightening and activating the eccentric adjusters

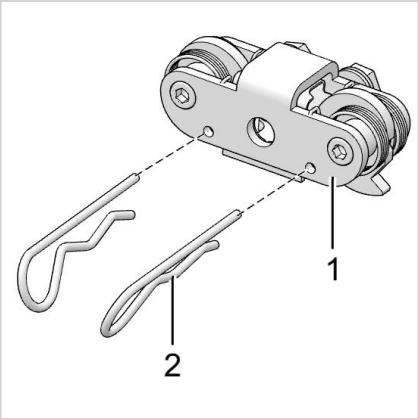
Preparatory activities

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

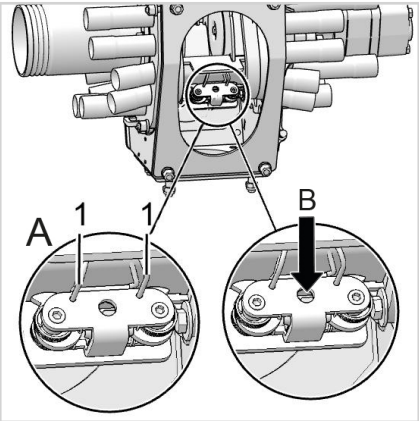


Procedure

- ► Carefully turn the rotor with a mounting lever so that an eccentric adjuster is accessible.
- ► Use a hexagon socket screw key to tension the hexagon socket head bolts along with the eccentric discs by one entire revolution until the spring pins can be heard to click into place behind the spring steel sheets.
  The eccentric discs are now preloaded.
  If a spring pin does not engage, readjust its position.



► Secure the eccentric adjuster (1) with the cotter pins (2).
► Also tension the other eccentric adjusters.



► Pull the cotter pins (1) (A).
► Insert the long side of an Allen key into the middle borehole of the eccentric adjuster and press against the spring plates to release the dowel pins (B).
The eccentric adjusters roll off and hit the cutting blades abruptly and audibly.
The eccentric adjuster is activated.
► Activate the other eccentric adjusters as well.

Concluding activities
► Install the service ports.

10.8.7 Tighten screws 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 95 Nm.

10.8.8 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 (eg chafe marks, cuts, cracks)
- Deformation (eg crushing, kinks)
- Blistering
- Leaked
- Overageing of the hoses (over 6 years)
- Hoses work 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.

10.8.9 Checking the drive adapter for leaks

Preparatory activities

► Switch off the distributor.

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

Procedure

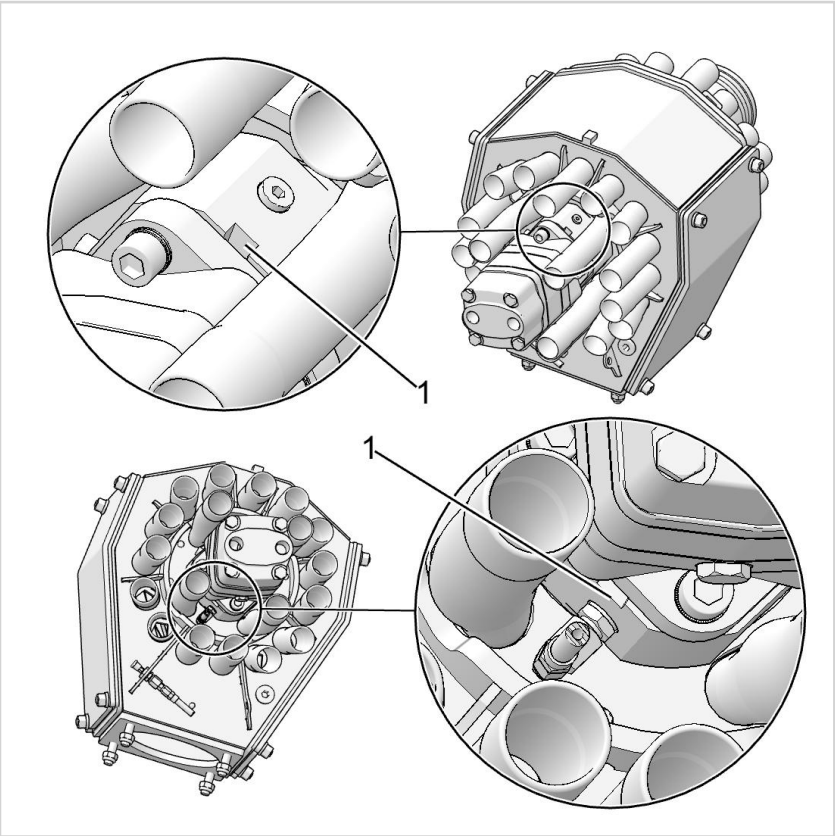


Fig. 10: Leakage seal indicator pipe

- ► Check the drive adapter for leak tightness at the leakage seal indicator pipes (1).
- ► If medium is coming out, replace the faulty gaskets, → *10.10.4 Replacing seals*.
- ► If oil is coming out, replace the hydraulic motor (Vogelsang service, qualified technical personnel).

10.9 Service

Note:

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

10.9.1 Lubricating drive adaptor

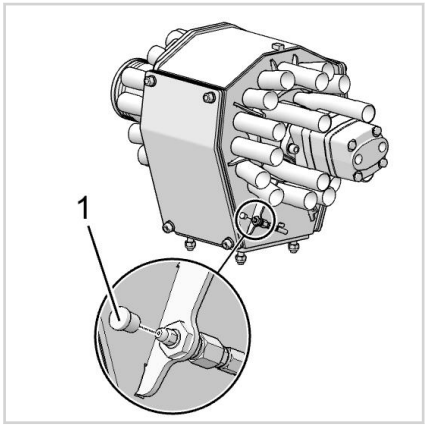
Information	We recommend connecting to the central lubrication system.
Equipment	• Lube gun
Operating materials	Operating materials type and quantity: → Operating materials.

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

Procedure

Notice

Only lubricate when the machine is running to ensure effective distribution of the lubricant.



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

10.9.2 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.
► Clean the distributor housing with water.
► Dismount the rotor.
► Clean the air ducts above the ventilation hoses with water.

Concluding activities

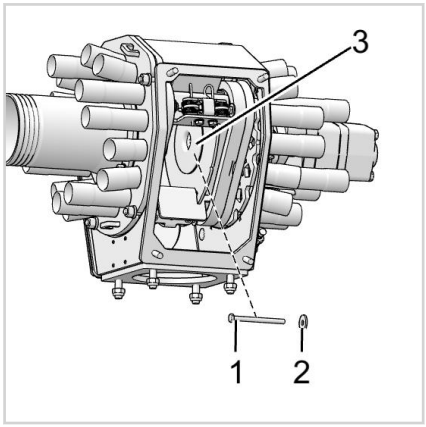
► Mount the rotor.
► Tighten and activate the eccentric adjusters.
► Install the service ports.
► Close the cleaning port.

10.9.3 Dismounting the rotor

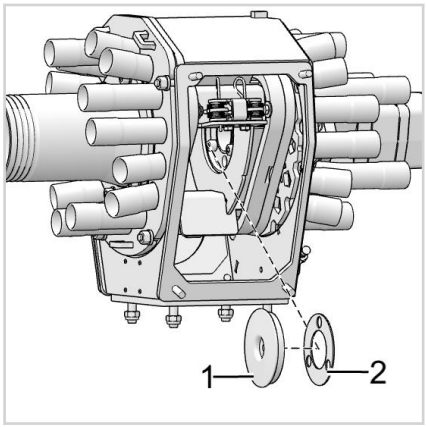
Preparatory activities

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

Procedure



► Undo the centring bolt (1).
► Remove the centring bolt (1) and the washer (2) from the flow plate (3).



► Remove the flow plate (1) and the flat gasket (2).

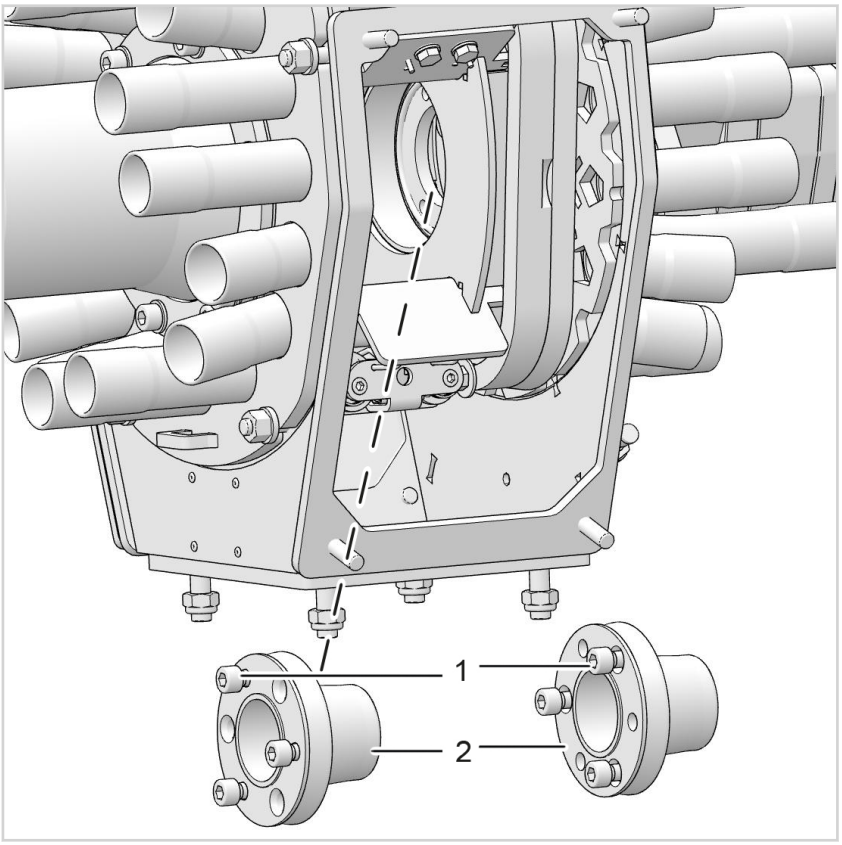


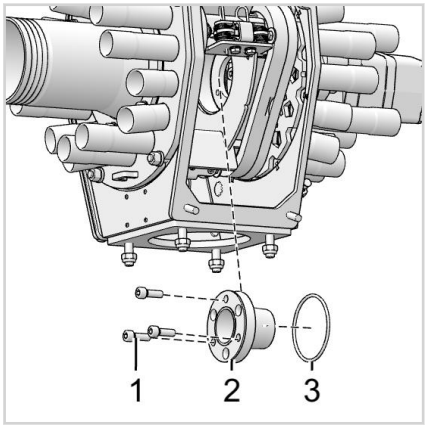
Fig. 11: Dismounting the rotor

► Unscrew the three hexagon socket head bolts (1) from the rotor adapter (2) and remove them.

Notice

After the three bolts have been loosened, the rotor is only held in position by the seal carrier.

► Screw the three hexagon socket head bolts (1) into the pressure-test threading in the rotor adapter (2) as a disassembly tool.



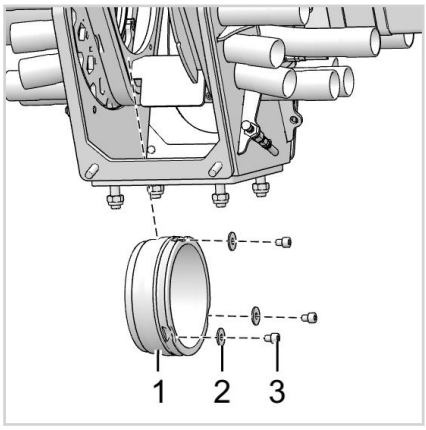
► Remove the rotor adapter (2) and the O-ring (3) using the hexagon socket head bolts (1).

⚠WARNING!

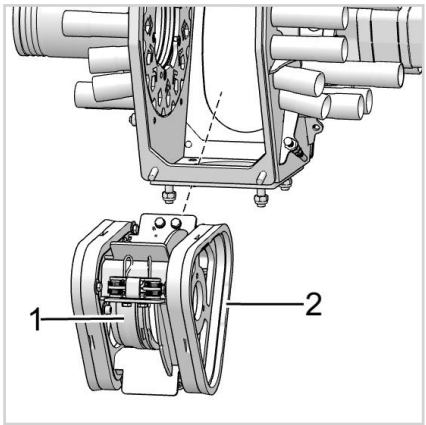
Risk of crushing due to the rotor falling down

The rotor is no longer held in position after the rotor adapter is pulled out.
The rotor weighs approx. 17 kg.

► Hold the rotor tightly when unscrewing the bolts.
► Wear protective clothing.



► Release the three hexagon socket screws (3) on the seal carrier (1).
► Remove the hexagon socket screws (3) and the discs (2).
► The seal carrier (1) out of its seat using a mounting lever.

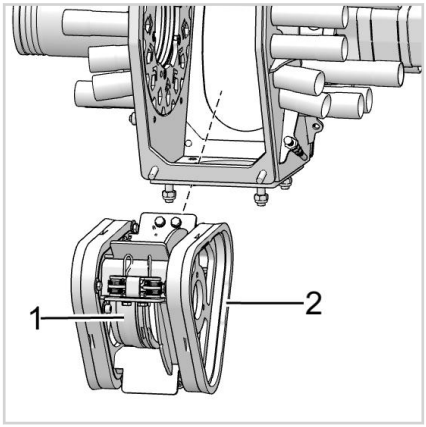


► Remove the rotor (2) and the seal carrier (1) from the housing.

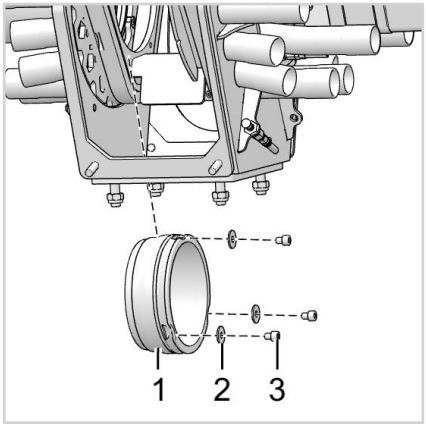
10.9.4 Mounting the rotor

Tool	• Torque wrench
Equipment	• Adhesive, e. g. Loctite
Spare parts	→ Spare parts list

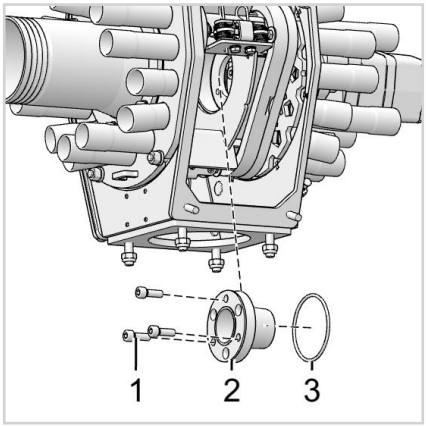
Procedure



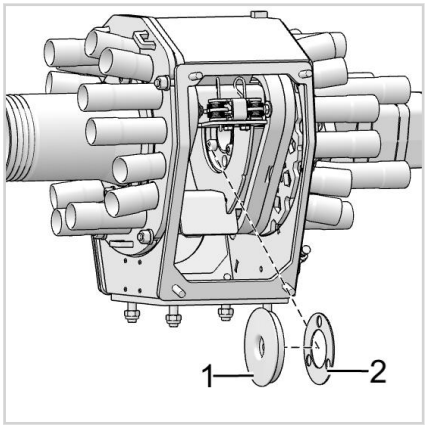
► Insert the rotor (2) and the seal carrier (1) into the distributor housing.



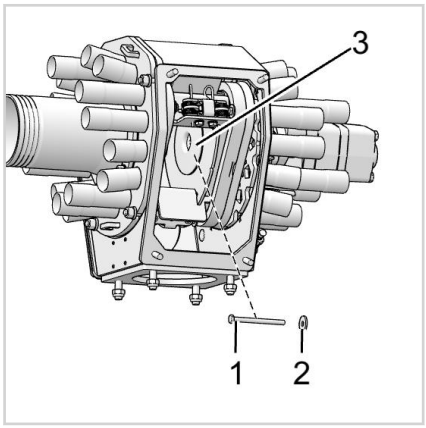
► Insert the seal carrier (1) in its seat.
► Fix the seal carrier (1) with the three hexagon socket screws (3) and washers (2) with a tightening torque of 20 Nm.



► Remove the three hexagon socket screws (1) from the pressure-test threading in the rotor adapter (2).
► Check the O-ring (3) for wear and replace if necessary.
► Secure the rotor adapter (2) and the O-ring (3) with the three hexagon socket screws (1) with a tightening torque of 40 Nm.



► Check the flat gasket (2) for wear and replace if necessary.
► Insert the flat gasket (2) and the flow plate (1).



► Moisten the thread of the centring bolt (1) with adhesive.
► Secure the flat gasket and the flow plate (3) with the centring bolt (1) and the washer (2) with a tightening torque of 30 Nm.

Concluding activities

► Tighten and activate the eccentric adjusters.
► Install the service ports.

10.10 Repair

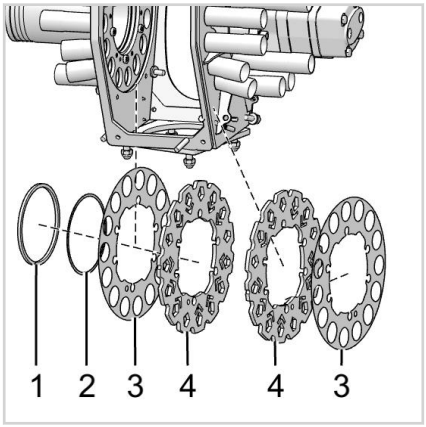
Observe the warning and safety notes prior to performing repair work, → *10.1 Safety notes*.

10.10.1 Replace cutting rings

Spare parts	→ Spare parts list

Preparatory activities

- ► Switch off the distributor.
- ► Empty and clean the distributor.
- ► Dismount the service ports.
- ► Slacken the eccentric adjuster.
- ► Dismount the rotor,



Procedure

- ► Lever out the cutting rings (4) on the inlet side and the engine side.
- ► Remove the flat gaskets (3).
- ► Clean the contact surfaces.
- ► Check the support ring (2) and the stuffing box seal (1) on the inlet side for wear and replace if necessary.
- ► Place the new flat gaskets (3) and the new cutting rings (4) into the housing.

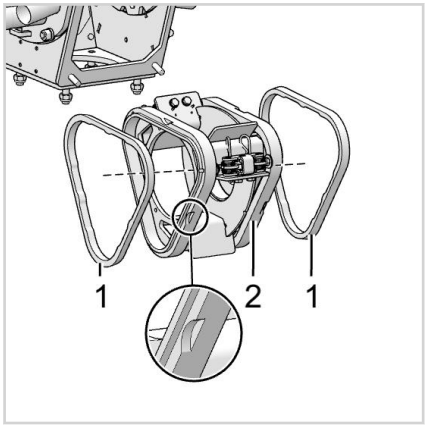
Concluding activities

- ► Mount the rotor.
- ► Tighten and activate the eccentric adjusters.
- ► Install the service ports.

10.10.2 Replacing the cutting blade

Preparatory activities

- ► Switch off the distributor.
- ► Empty and clean the distributor.
- ► Dismount the service ports.
- ► Slacken the eccentric adjuster.
- ► Dismount the rotor,



Procedure

► Dismount both cutting blades (1).
To do this, insert e. g. a pin punch or a mounting lever in the groove of the cutting blade holder (2) and lever the cutting blades downwards (1).
► Place the new cutting blades (1) on the blade holder (2) and knock them with a soft-face hammer.

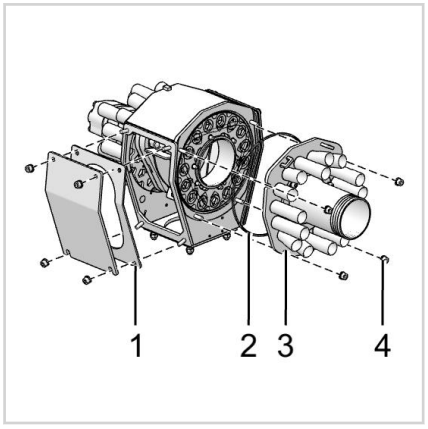
Concluding activities

► Mount the rotor.
► Tighten and activate the eccentric adjusters.
► Install the service ports.

10.10.3 Replacing seals on the housing

Preparatory activities

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



Procedure

► Remove the flat seals (1) from the service ports.
► Loosen the nuts (4) on the housing cover (3) and remove them.
► Remove the cover seal (2) .
► Place the new cover seal (2) on the housing.
► Assemble the housing cover (3) with the nuts (4).
► Place the new flat gaskets (1) on the housing.

Concluding activities

► Mount the housing cover.
► Tighten and activate the eccentric adjusters.
► Install the service ports.

10.10.4 Replacing seals

Equipment	• Hexagon head bolt M 16 x 60 • Adhesive, e. g. Loctite • Anti-seize paste • Lubricating grease • Surface sealant AN 305-74
Spare parts	→ Spare parts list

Preparatory activities

► Switch off the distributor.
► Empty and clean the distributor.
► Dismount the service ports.
► Slacken the eccentric adjuster.
► Dismount the rotor,
► Block the motor. To do this, pressurise the hydraulic system.

Overview of sealing elements

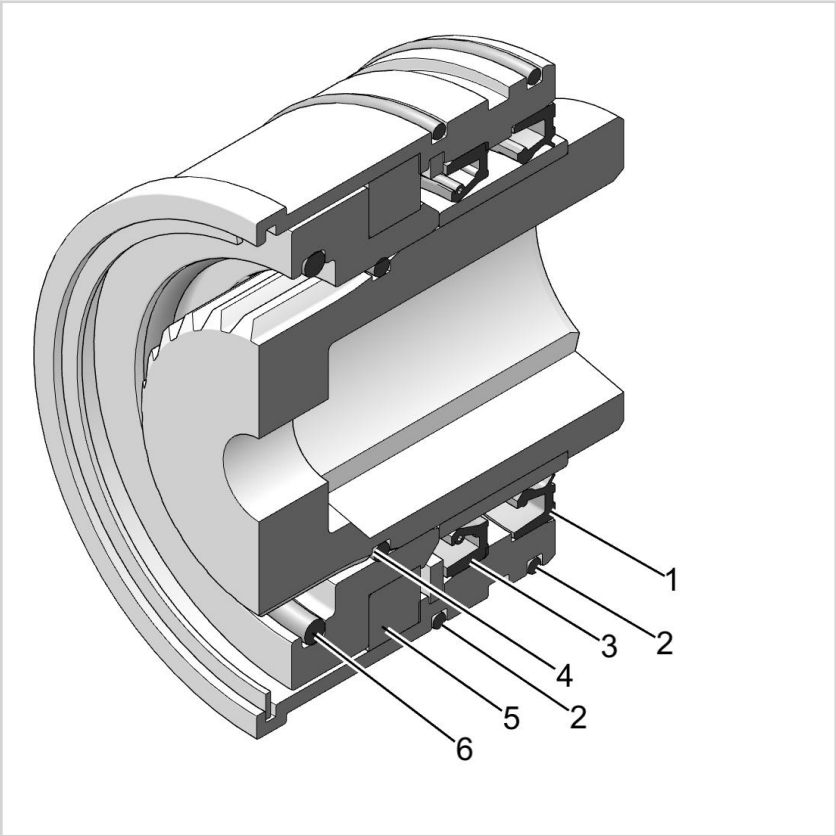
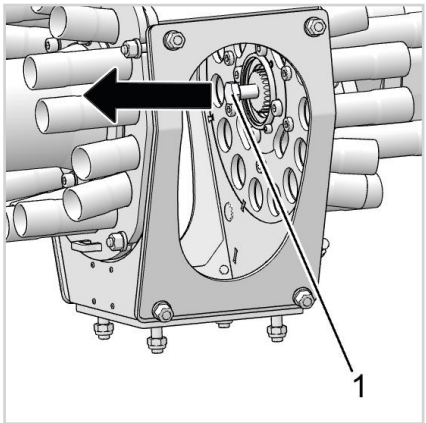


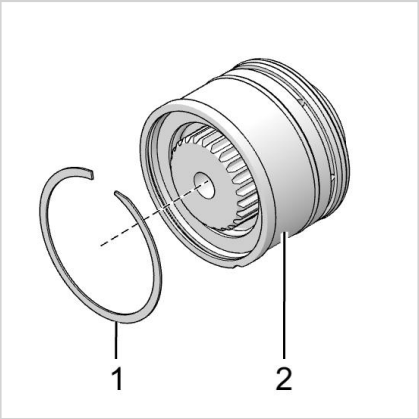
Fig. 12: Overview of sealing elements

1	Radial shaft seal ring with dust lip	4	O-ring
2	O-ring	5	Sealing ring
3	Radial shaft seal ring	6	O-ring

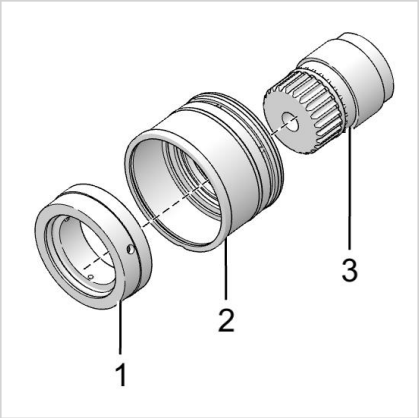
Procedure



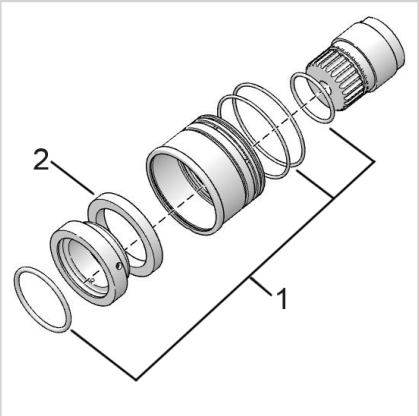
► Pull out the sealing set with an M 16 x 60 screw (1).
The shims are damaged in the process.
Note the number of shims.
► Remove the sealing set.



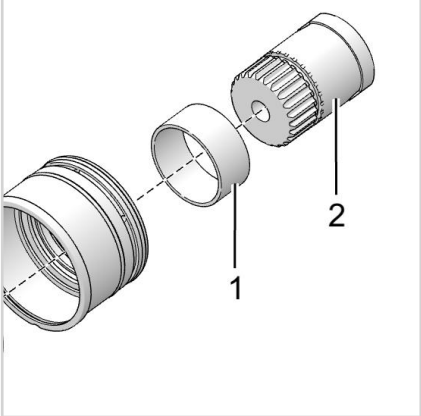
► Lever the lamella ring (1) out from the seal carrier using a screwdriver (2).



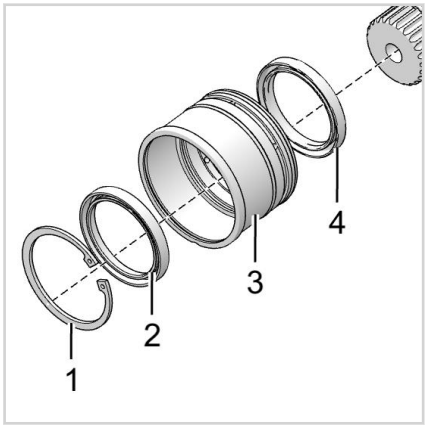
► Push the drive shaft (3) out of the static seal carrier (2).
► Push the rotating seal carrier (1) out of the static seal carrier (2).



► Remove all O-rings (1) and the sealing ring (2).



► Dismount the inner ring (1) from the drive shaft (2).



► Dismount the retaining ring (1) with retaining ring pliers from the static seal carrier (3).
► Remove the radial shaft seal rings (2, 4) from the static seal carrier (3).

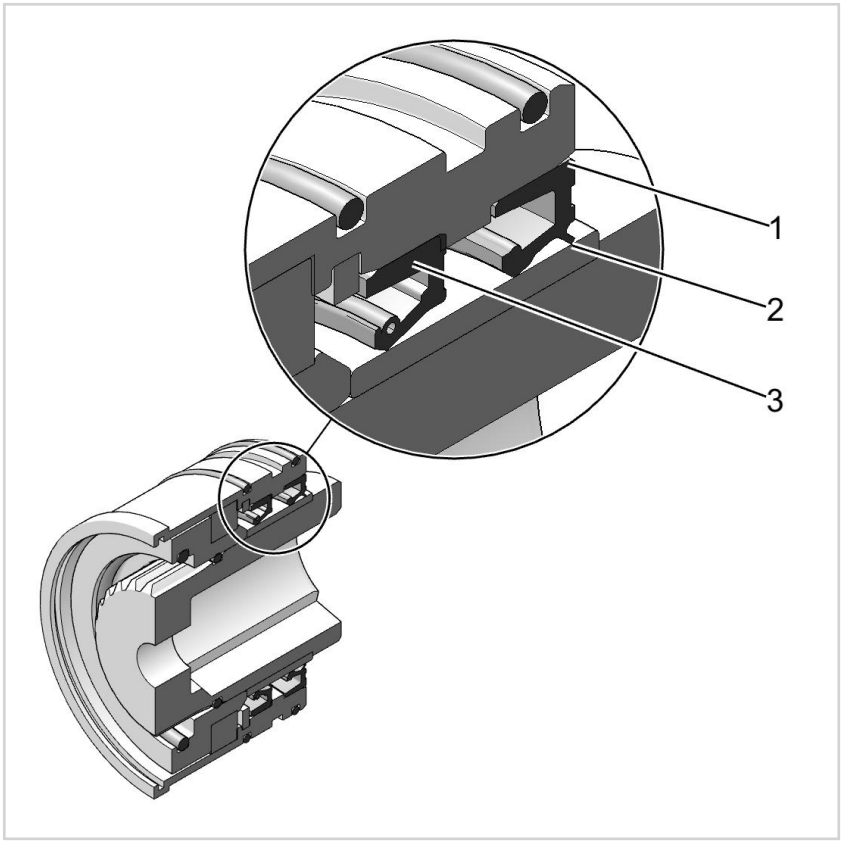


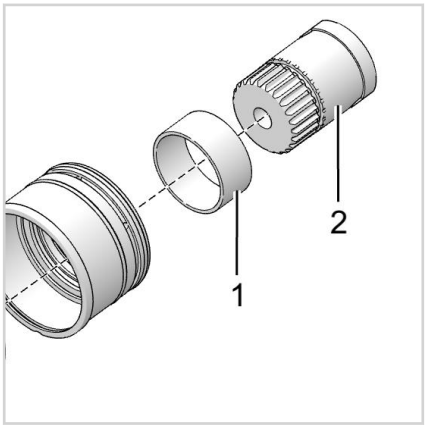
Fig. 13: Installing radial shaft seals

► Insert the two radial shaft seal rings (1, 3) in the static seal carrier.

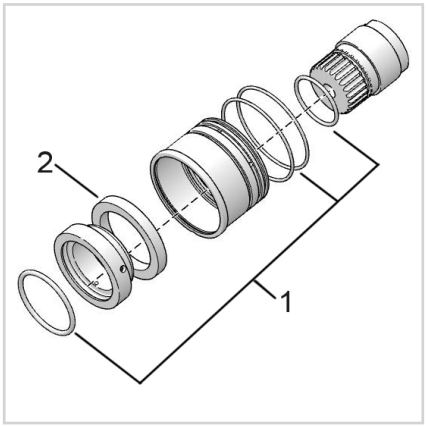
Notice

Pay attention to the correct position of the radial shaft seal rings. The dust lip (2) must be on the exterior of the seal carrier.

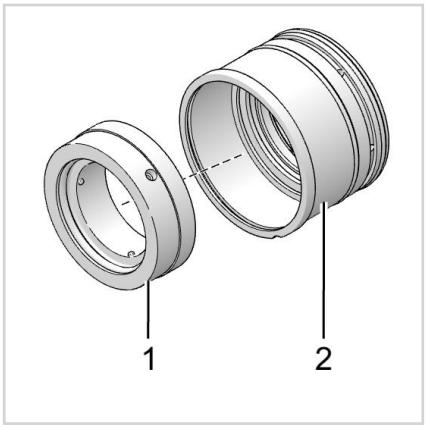
► Secure the inside radial shaft seal ring (3) with the retaining ring.



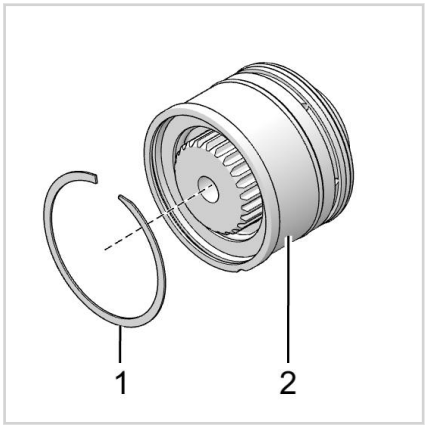
► Wet the inner ring (1) with adhesive and mount it on the drive shaft (2).



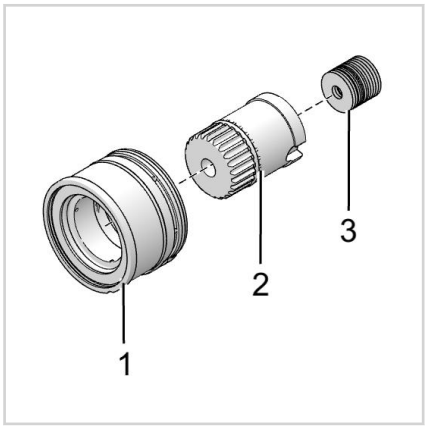
► Install the new O-rings (1) and the new sealing ring (2).



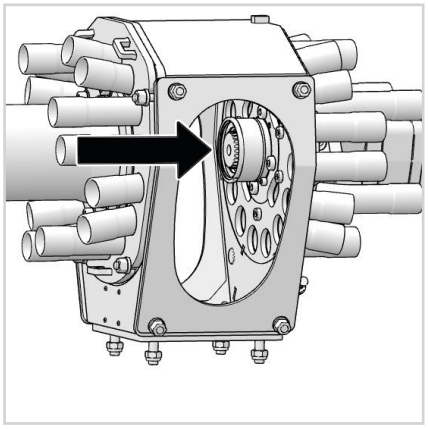
► Insert the rotating seal carrier (1) in the static seal carrier (2).



► Insert a new multi-disc ring (1) into the seal carrier (2).



► Moisten the drive shaft (2) on the toothing with grease or anti-seize paste and insert it in the seal carrier (1).
► Moisten the shaft seat in the drive shaft (2) with flange sealant.
► Moisten the new shims (3) with lubricant in order for them to stick together.



► Push in the sealing set (1) until the drive shaft and the seal carrier hit the back.

Concluding activities

► Mount the rotor.
► Tighten and activate 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.

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.
Hose layout incorrect	• Optimise the hose layout. Hoses of roughly similar length should be fed at every rotor position

Possible cause	Possible remedy
Sagging in the discharge hoses	• Eliminate the sagging.
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 Strong pulsation in the discharge hoses

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 high	• Reduce the pump speed. Too high a medium volume flow leads to poor average distribution.
Air ducts blocked	• Clean the air ducts with water. • If the hoses on the filling side vibrate, clean the air ducts in the rotor.

11.2.6 Noises in the hydraulic system

Possible cause	Possible remedy
Air in the hydraulic system	• Check the hydraulic system for leaks. • Replace the oil filter and top up oil if necessary. • Vent and clean the hydraulic system. • Connect the hydraulic system to a separate tank with filter (max. 10 µm). The tank capacity must be double the size of the maximum hydraulic oil volume flow. Allow the entire system to run unpressurised for about 30 minutes.

12 Disassembly

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.

⚠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!

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.

12.2 Dismounting the distributor

Qualifications	Qualified technical personnel
Material	Collecting container for waste oil

Preparatory activities

- ► Switch off the distributor, → *9.4 Switching off the distributor*.
- ► Clean the distributor, → *10.9.2 Cleaning the distributor*.

Procedure

- ► Dismount the hydraulic hose line from the grease nipple and the central lubrication system, and screw on the grease nipple cap.
- ► Dismount the overflow oil connector of the hydraulic motor. Collect the oil that comes out.
- ► Dismount the hydraulic hose line of the hydraulic motor. Collect the oil that comes out.
- ► Dismount the discharge hoses and the ventilation hoses.
- ► Dismount the foreign matter hose.

  Warning!
  The cleaning port is clear when the foreign matter hose has been dismounted. There is a risk of injury from the sharp-edged cutting blades inside the distributor.
- ► Dismount the supply hose.
- ► 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.
- ► Set the distributor down, for example, on a Euro pallet or place it in a skeleton box and secure it for transport.

Notice

Dispose of the waste oil in an environmentally friendly manner.

13 Disposal

13.1 Safety notes

⚠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.

13.2 Measures for disposal

- ► Dismantle 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	Scrap
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 regional disposal regulations and recycling options.

14 Appendix

14.1 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 ECQ

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)

14.2 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**