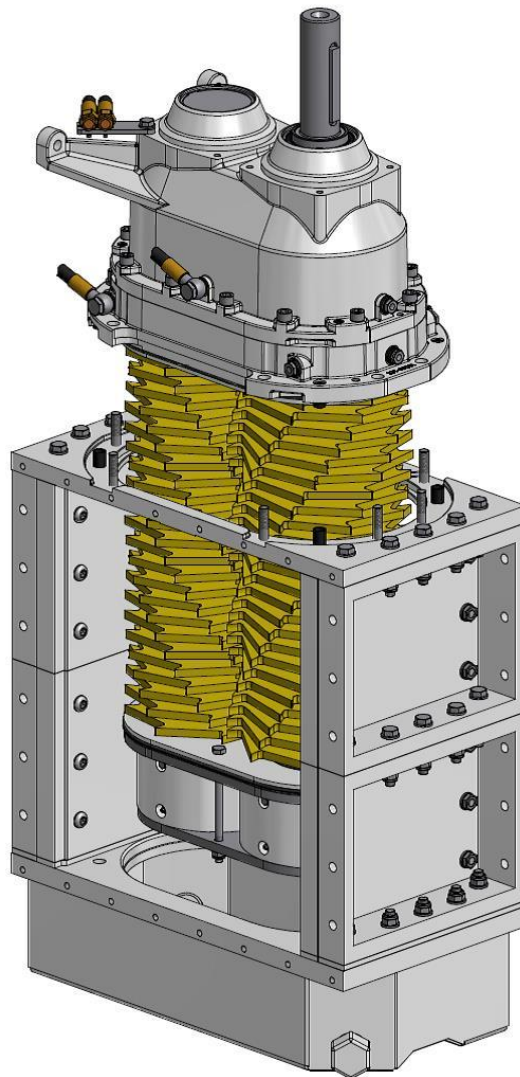




# Operating Instructions

**XRipper**  
**XRP186QD**

ENGINEERED TO WORK



## Original operating instructions

### Issuer

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We reserve the right to make technical modifications to the diagrams and information presented in this document in the event that such modifications become necessary for the enhancement of the machine.

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Dear customer,

in every one of our products, you will see the entirety of our competence and our power of innovation at work. Each product is developed and built so that you can work more successfully.

We call it quite simply: ENGINEERED TO WORK

If you want to know more about our company or put forward requests or suggestions, a wealth of information can be found at [www.vogelsang.info](http://www.vogelsang.info)

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### **Relevant documents**

- Dimension sheet / drawing
- EC declaration
- Characteristic line

Optional:

- Technical information on drive system
- Technical information on safety devices

Please read and adhere to the information and instructions in the relevant documents.

## 1 User information

### 1.1 Using the operating instructions

These instructions contain information concerning operating elements, handling, start-up and maintenance and repair work, as well as the relevant specifications.

The operating instructions are a component of the machine.

#### **IMPORTANT READ CAREFULLY BEFORE USE**

Read the operating instructions thoroughly. All of the points presented in these instructions must be understood and observed by those persons responsible for the installation, operation, maintenance and repair of the machine.



Vogelsang does not accept any liability for damage resulting from failure to comply with these operating instructions.

#### **KEEP FOR FUTURE REFERENCE**

Please keep the manual ready at hand to ensure easy access to the necessary information at all times.

Additional copies of the manual are available upon request. ☎️✉️

### 1.2 Presentation convention

Presentation	Meaning
•	Listing
–	Sublisting
1. 2.	Carry out these actions in the described sequence
→ Fig. "Caption"	Reference to a figure for additional information
→ Chapter "Chapter heading"	Reference to a chapter for additional information
→ Table "Table caption"	Reference to a table for additional information
 "Relevant document"	Reference to a document for additional information
 Technical support	Contact our technical support

### 1.3 Explanation of symbols

The following symbols and signal words are used in this manual:

- 1 If personal protective equipment is needed to work with and on the machine, that is indicated by the following symbols:



Indicates that protective gloves must be worn for subsequent tasks.



Indicates that protective goggles must be worn for subsequent tasks.



Indicates that safety shoes must be worn for subsequent tasks.

- 2 This symbol draws attention to the use of tools:



Tools, mounting devices and resources required for the following work tasks.

- 3 General notices and information about environmental protection are marked by these symbols:



**NOTE**

Refers to further information and useful notes.



**ENVIRONMENTAL PROTECTION**

Refers to measures to be observed to prevent damage to the environment.

### 4 Safety notes are introduced by these symbols and words:



---

#### **CAUTION**

Refers to a dangerous situation in which failure to comply with the safety note could result in light injuries.



---

#### **WARNING**

Refers to a dangerous situation in which failure to comply with the safety note could result in death or serious injuries.



---

#### **DANGER**

Refers to an (extremely) dangerous situation in which failure to comply with the safety note will result in death or serious injuries.



---

#### **RISK OF ELECTRIC SHOCK**

Touching live parts leads to dangerous electrocution.

This can result in electric shock, burns or death.



---

#### **ATTENTION**

Refers to possible damage to machinery or property as a result of failure to comply with this note.



## 1.4 Overview drawing

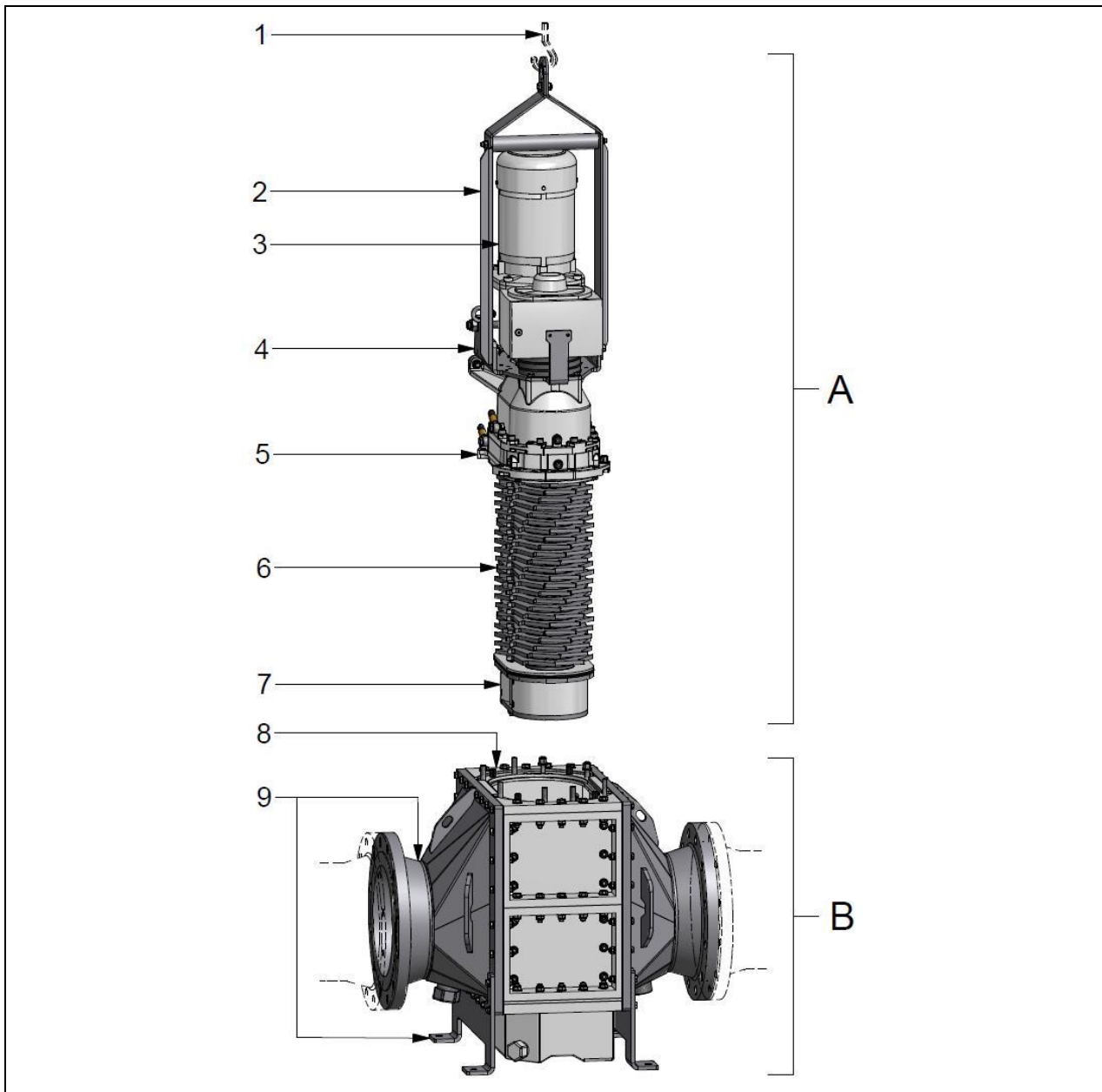


Fig. 1: Overview drawing

1	Hoisting gear	7	Storage
2	Lifting frame with lifting lug	8	XRipper housing
3	Geared motor	9	Connector with mounting foot
4	Torque bracket		
5	Buffer chamber	A	Functional unit
6	XRipper rotor	B	Housing unit

## 1.5 Machine versions described here

The "Installation" chapter contains important assembly instructions and warning and safety notes that the operator must always comply with.

The following optional machine versions are described in the "Installation" chapter:

Machine version	Chapter reference
• With or without connectors	→ Chapter "Connectors"
• With the following drive options:	→ Chapter "Drive"
– Electric drive	
– Hydraulic drive	
• With or without system control	→ Chapter "System control"

## 2 EC declaration

(sample printout)

# EC Declaration of conformity

According to Machinery Directive 2006/42/EC; annex II A

---

**Manufacturer:** Hugo Vogelsang  
Maschinenbau GmbH  
Holthöge 10-14  
D-49632 Essen/Oldb.

We hereby declare that the machine described below meets the basic health and safety requirements of the Machinery Directive 2006/42/EC in its design and construction and in the version marketed by us. If a change is made to the machine without our agreement, this declaration loses its validity.

**Product:** XRipper

**Applied harmonised standards:**

DIN EN ISO 12100:2010  
DIN EN 1037:1995+A1:2008  
DIN EN 349:1993+A1:2008  
DIN EN ISO 13857:2008

**Applied national standards and technical specifications:**

DIN EN 82079-1:2012  
DIN 4844-1:2012  
DIN 4844-2:2012  
DIN ISO 3864-1:2012

The person authorized to compile the technical documentation is:  
Hugo Vogelsang Maschinenbau GmbH; Holthöge 10-14; 49632 Essen (Oldb.), Germany

49632 Essen, 2015-04-27



Harald Vogelsang (Managing Director)

### 3 Specifications


Series XRP186/size	260QD	520QD	780QD
Max. permissible pressure [bar]	2	2	2
Blade widths [mm]	8 / 10 / 16	8 / 10 / 16	8 / 10 / 16
Max. permissible operating torque [Nm]	2400	2400	2400
Max. throughput* [m³/h]	550**	1140**	1700**
Weight*** [kg]	550	700	850

\* With pressure loss of 0.15 bar


\*\* The throughput is based on water as the medium

\*\*\* Without connectors

### Dimensions

For the machine's dimensions: see  "Dimension sheet"

### Characteristic lines

For the machine's characteristic lines (curve charts), see  "Characteristic line"

#### 3.1 Name plate

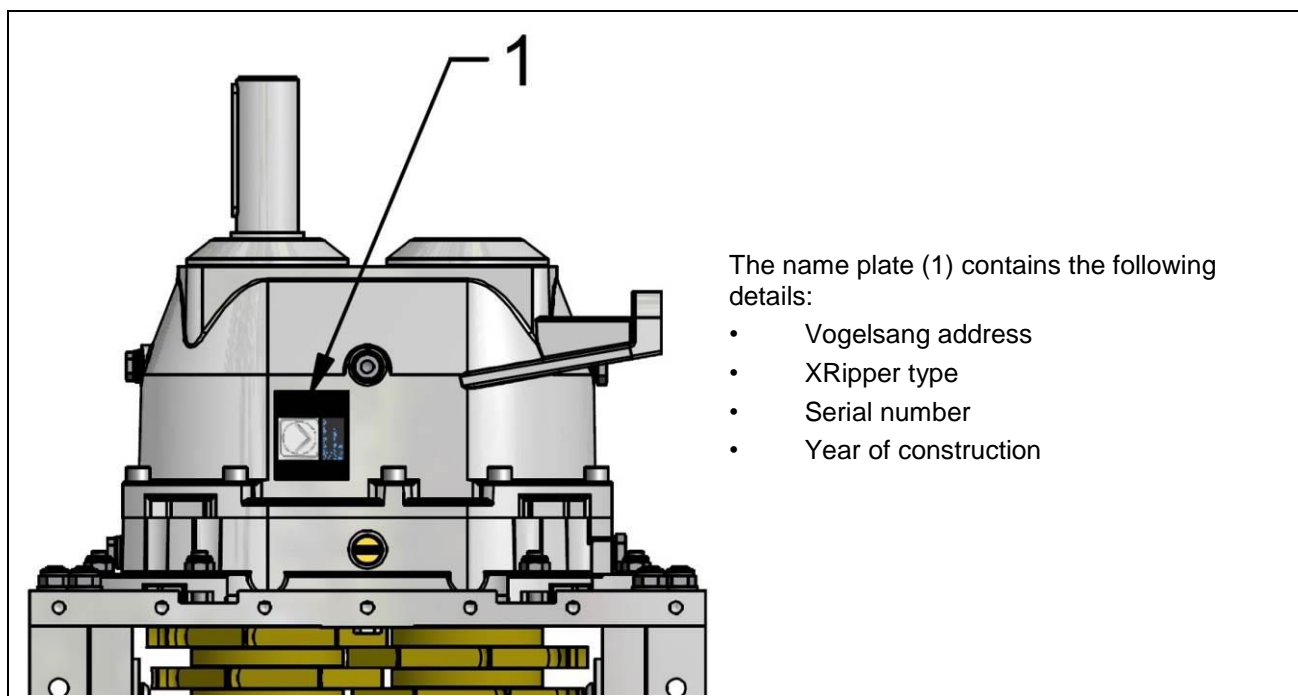


Fig. 2: Name plate

## 4 Safety

This section gives you an overview of important safety aspects needed to ensure optimum protection of personnel and to ensure safe and trouble-free operation.

Failure to comply with the instructions and safety information specified in this manual may result in serious hazards.

In the event of any abnormalities and/or signs relating to the safety of the product supplied by Vogelsang, please contact us without delay via:

produktsicherheit@vogelsang-gmbh.com

### 4.1 Operator's responsibilities

The machine is used commercially. The operator of the machine is therefore subject to the statutory occupational safety regulations.

In addition to the safety information provided in this manual, the relevant safety, accident prevention and environmental protection requirements for the area in which the machine is used must be complied with.

This includes the following, in particular:

- The operator shall ensure that all persons who handle the machine have read and understood this manual. If necessary, the operator shall train personnel and inform them of possible hazards. To improve tracking, we recommend creating a training log.
- The operator shall clearly regulate and define responsibilities for transport, installation, start-up, operation, maintenance, repair, cleaning, troubleshooting, shutdown and disposal.
- The operator shall instruct personnel to always wear the necessary protective equipment and shall monitor usage.

The operator is responsible for ensuring that the machine is always in perfect technical condition.

The following therefore applies:

- The operator shall ensure that maintenance intervals described in this manual are complied with and are documented in the service plan.
- The operator shall have all safety devices checked at regular intervals to ensure that they are fully functioning and complete.

## 4.2 Personnel qualification



### WARNING

#### **Risk of injury due to insufficient qualification!**

Handling the machine improperly can result in serious injuries and property damage.

For this reason, all activities must be performed by qualified technical personnel only.

Only persons who can be expected to perform their work reliably are permitted as personnel. Persons whose ability to respond is impaired, for example due to drugs, alcohol or medication, are not approved.

### 4.2.1 Qualifications

The following qualifications are required for different fields of activity:

#### **Instructed person**

Has been instructed by the operator to perform the tasks for which the instructed person is responsible and has been informed of possible hazards in the event of improper behaviour.

#### **Qualified technical personnel**

Is able, due to his or her specialist training, skills, experience and knowledge of the relevant provisions, to perform the work for which he or she is responsible, and is able to identify and avoid possible hazards independently.

#### **Qualified electrician**

Is able, due to his or her specialist training, skills, experience and knowledge of the relevant standards and provisions, to perform work on electrical systems, and is able to identify and avoid possible hazards independently.

### 4.2.2 Fields of activity

- The activities described in this manual may be performed by instructed persons unless explicit mention is made of a special qualification that is necessary.
- If activities may only be performed by qualified technical personnel, this fact will be clearly stated in this manual. Safety devices may only be connected and checked by qualified technical personnel.
- Electrical work and work on the electrical system may only be performed by qualified electricians.

Vogelsang must always be consulted prior to any system-specific activities that are not described in this manual. ☎️✉️

Training in the activities described in this manual may be provided by Vogelsang on request. ☎️✉️

### 4.3 Intended use

The Vogelsang XRipper (referred to hereinafter as the "machine") is a twin-shaft macerator. The counter-rotating XRipper rotors are positioned on the two shafts.

The XRipper is designed for installation in a pipe, to shred the coarse matter contained in the fluid flow, such as textiles, wood or plastic waste, and to dissolve clumps and entangled material.

The XRipper is designed for the medium to be macerated, according to the customer's specifications; if necessary, test runs are carried out with the medium in question.

Any other use is contrary to the intended purpose. The manufacturer is not liable for damages resulting from incorrect use.



#### WARNING

The XRipper described in these operating instructions is **not** intended for use in potentially explosive environments.

### 4.4 General safety notes



#### WARNING

#### Risk of injury due to sharp-edged XRipper rotors!

If the XRipper rotors are freely accessible or fall off, the sharp blades of the XRipper rotors can result in cuts.



- Personnel must wear suitable protective clothing.
- Note and comply with the transport instructions.



#### WARNING

#### Risk of injury due to rotating, sharp-edged XRipper rotors!

Accidental contact with the rotating XRipper rotors when the machine is running can result in cutting injuries, amputation or the person being dragged in.

- Start-up of the machine can only take place once the inlet and outlet pipes are connected. This ensures that access to the XRipper rotors is not possible under any circumstances.
- Before maintenance and repair work, switch the machine OFF and secure it against being turned on again.
- In the case of an XRipper with control, the control must fulfil performance level "c" or higher in accordance with EN ISO 13849, in order to prevent unintentional starting.



## WARNING

### Skin and eye irritation caused by contact with hazardous working materials or media!

All work on the machine can lead to contact with working materials or media.



- Personnel must wear suitable protective clothing.
- The operator must inform his or her staff about any potentially hazardous substances in working materials or media.



## WARNING

### Risk of injury from medium escaping under high pressure!

If the maximum housing pressure is exceeded, XRipper parts may burst and medium may spray out.

- The maximum housing pressure must not be exceeded → **Chap. "Specifications"**.
- Protect the XRipper system against overpressure. For example, the following **safety devices** can be used:
  - A pressure relief valve
  - Cut-off with a pressure control switch



## CAUTION

### Risk of burning due to exposed host surfaces!

If the medium temperature is greater than 60°C or gas accumulates in the XRipper system, the XRipper and connected pipes can become very hot.

- Avoid contact with hot surfaces.
- Avoid gas accumulation in the pipe system, note the recommendations in → **Chapter "Installation in pipes"**.



## ATTENTION

Stones or other hard objects in the medium result in heavy wear of or even damage to the XRipper.



## ATTENTION

### Risk of frost!

To protect the XRipper against damage caused by frozen medium, drain the XRipper chamber when there is a risk of frost. To do so, remove the cover → **Chapter "Repair"**.



## 4.5 Safety devices

### 4.5.1 EMERGENCY STOP shutdown (main switch)

For shutdown in the event of an emergency, an emergency stop must be present and freely accessible at all times.

### 4.5.2 Maintenance and repair switch



#### **DANGER**

---

Danger if the machine starts up unexpectedly!

To safely exclude the possibility of unexpected machine start-up in accordance with DIN EN 1037, a maintenance and repair switch must be installed in the immediate vicinity of the electric drive so that the electrical power can be safely isolated for maintenance purposes.

The maintenance and repair switch must be secured in its OFF position to prevent it being switched back on again, using a padlock for example.



#### **NOTICE**

---

Switching "OFF" in points 1 and 2 means "all-pole disconnection".



#### **WARNING**

---

Qualified technical personnel must connect and check the safety devices on a regular basis for proper function, especially after performing maintenance and repair work and before start-up.

## 4.6 Warning and safety stickers on the machine

Warning and safety stickers on the machine

- provide important information for the safe operation of the machine. Observing the stickers is for the safety of persons who work with and on the machine.
- must remain legible, remove any contamination, if required.
- may not be removed and must be replaced immediately if damaged or lost.

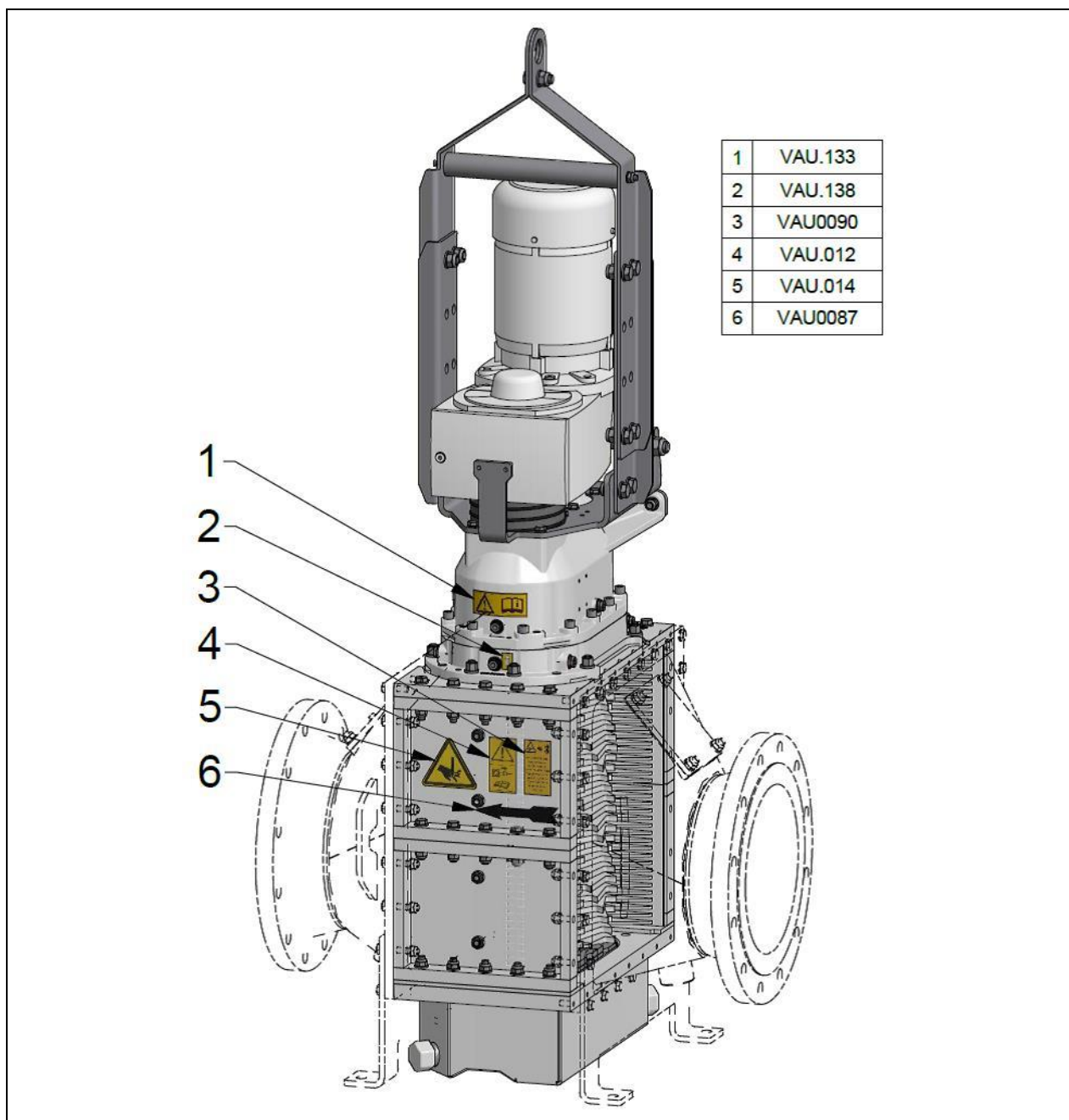



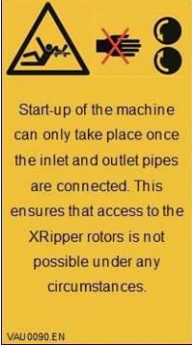





Fig. 3: Positions of the warning and safety labels

(example only, the position of the stickers can vary depending on the size)

VAU.133	 	Before machine start-up, operating instructions must be read!
---------	---	---

VAU.138		Buffer or quenching fluid tank
VAU0090	 <p>Start-up of the machine can only take place once the inlet and outlet pipes are connected. This ensures that access to the XRipper rotors is not possible under any circumstances.</p> <p>VAU 0090 EN</p>	<i>(Start-up of the machine can only take place once the inlet and outlet pipes are connected. This ensures that access to the XRipper rotors is not possible under any circumstances.)</i>
VAU.012		Before carrying out maintenance and repair work, pull the maintenance and repair switch.
VAU.014		Caution: risk of hand injuries!
VAU0087		Direction arrow

## 5 Transport, storage

### 5.1 Transport

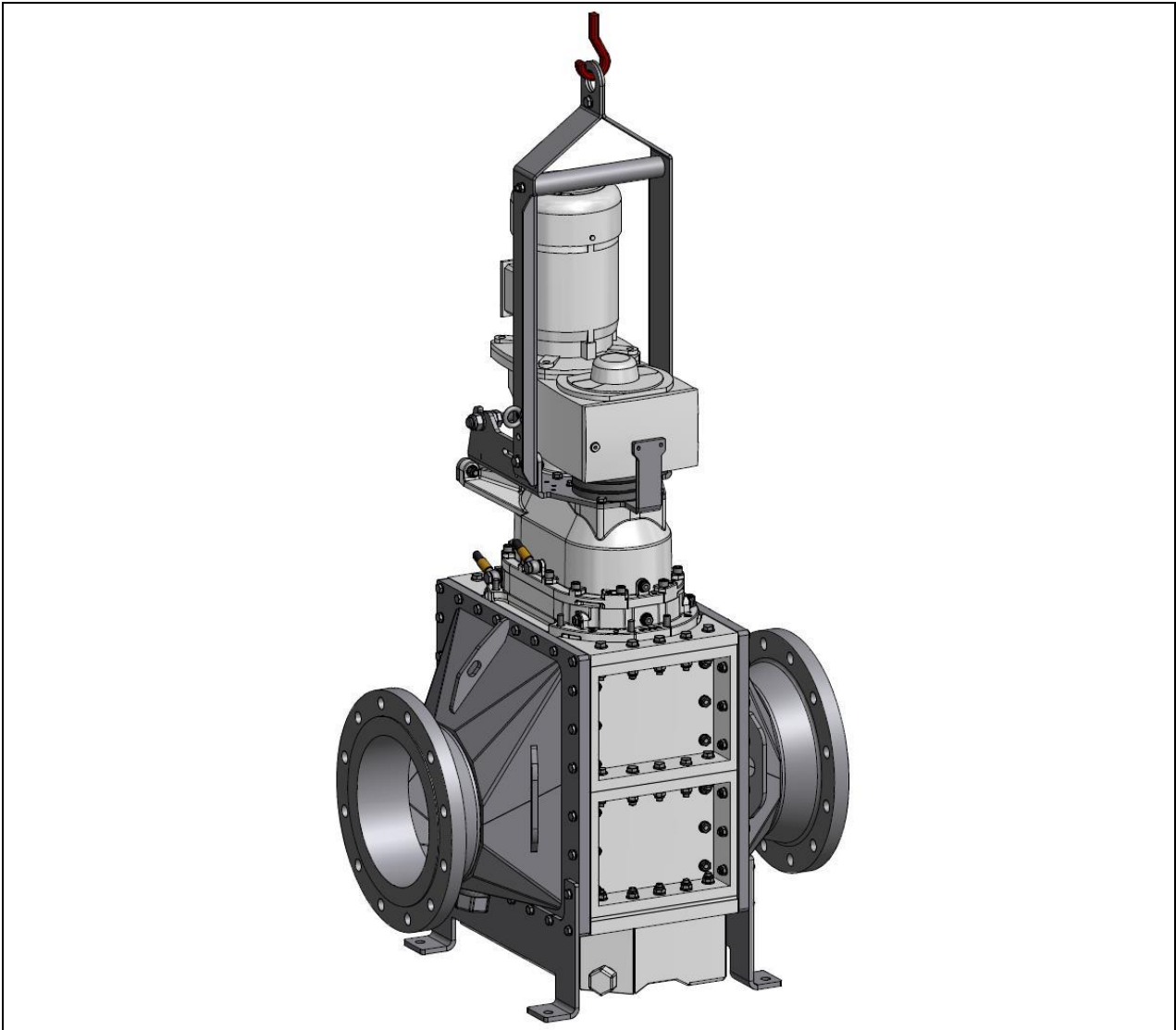


Fig. 4: Transport aids (example only)



#### WARNING

##### Risk of crushing or concussion due to falling machine!

The machine may start to sway or topple when it is transported, loaded or set down. To ensure safe transport, observe the following:

- Loading and transporting may only be carried out by qualified technical personnel. In other words: The operator of a crane or forklift must be able to show an appropriate authorisation.
- Cranes and hoists as well as forklifts must be designed for the weight of the transport units.
- Standing under raised loads is prohibited. Have people leave the danger area.
- Permissible transport options for the machine:
  - Suspended with suitable hoisting gear for the lifting lug on the lifting frame.  
Weight: → **Chap.** "Specifications"
  - Bolted to a Euro-pallet

### 5.2 Storage

#### Long-term storage

of complete XRipper, individual O-rings and seal components

If not stored and handled properly, the physical characteristics of products made of rubber may change. Possible consequences include excessive hardening, softening, lasting deformation, peeling, cracking or other surface damage.

Long-term storage is possible under the following conditions (longer than 6 months to a maximum of 5 years):

- The storage area should be dry (relative humidity under 65%) and the temperature should be between 5 °C and 30 °C.
- The XRipper chamber can be sealed with a preservative that is suitable for the sealing material.
- The products should be protected against light, especially direct sunlight and strong artificial light with a high proportion of ultraviolet.

After a storage period of five years or more and before start-up we recommend:

- Checking and renewing (if necessary) all wetted gaskets and rotary lobes
- Changing the gear oil

## 6 Assembly



### WARNING

#### Risk of injury due to sharp-edged XRipper rotors!

If the XRipper rotors are freely accessible or fall off, the sharp blades of the XRipper rotors can result in cuts.



- Personnel must wear suitable protective clothing.
- Note and comply with the transport instructions.

### 6.1 Installation in pipe systems

- When installing the XRipper, ensure that there is easy access for disassembly and assembly of the functional unit.
- Flow direction: Note the flow direction indicated by the red direction arrows on the XRipper housing when installing the unit.
- Ensure that the XRipper is tension-free upon installation and also during operation.

### 6.2 Pipes

- The sealing material must be compatible with the medium.
- The pipe at the outlet side must be laid with an upward slope, especially in the case of a positive medium pressure, to prevent gas accumulation in the XRipper.
- When designing the XRipper system, note that installing an XRipper in a pipe causes an additional pressure loss. If you have any questions, please contact us. ☎️✉️



### ATTENTION

Before installing stainless steel bolts and stainless steel nuts:

Clean threads and contact surfaces. Apply anti-seize paste (part no. BKL.014/BAS.001) evenly and in sufficient quantity to the screw head face and bearing face and to the thread using a brush or filling knife etc. to avoid seizing of stainless steel.

### 6.3 Support surface for machine



### WARNING

#### Risk of crushing or concussion due to falling machine caused by insufficient stability!

- The machine must be securely fastened to the supporting surface. The machine must never be held in position by the connected pipe as this could result in the couplings breaking or failing.
- Retighten all machine fastening screws and nuts after 20 operating hours and then every 2000 operating hours (at least once a year).

## 6.4 Connectors



### ATTENTION

#### Risk of breakage due to connectors under tension!

Flange connections can exert excessive forces on the machine.

The connectors must be mounted stressless. In other words, the connectors have to be precisely one in front of the other, even when they are not screwed into place.

Note the **tightening sequence** when mounting the connectors:

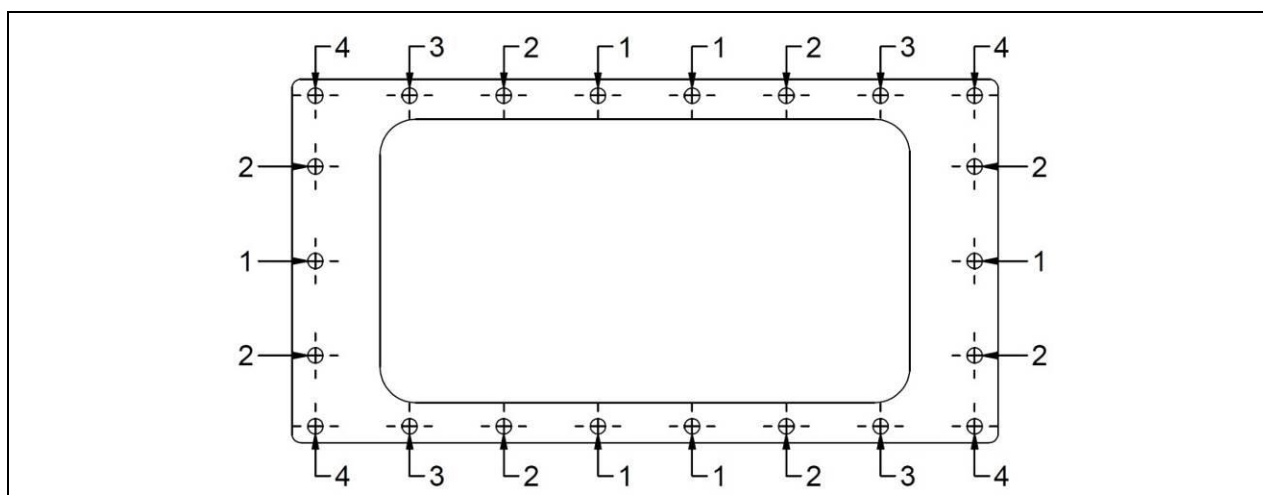


Fig. 5: Tightening sequence (example only)



### Tightening torques

M 10 hexagon head bolt (8.8, steel): 50 Nm

M 10 hexagon head bolt (A2, stainless steel): 40 Nm

Retighten all bolts for fastening the connections after 20 operating hours and then every 2000 operating hours (at least once a year).

## 6.5 Direction of flow

The XRipper is principally directional. The flow direction is basically set by installing the XRipper rotors. Replacing the XRipper rotors can change the direction of rotation and flow direction.

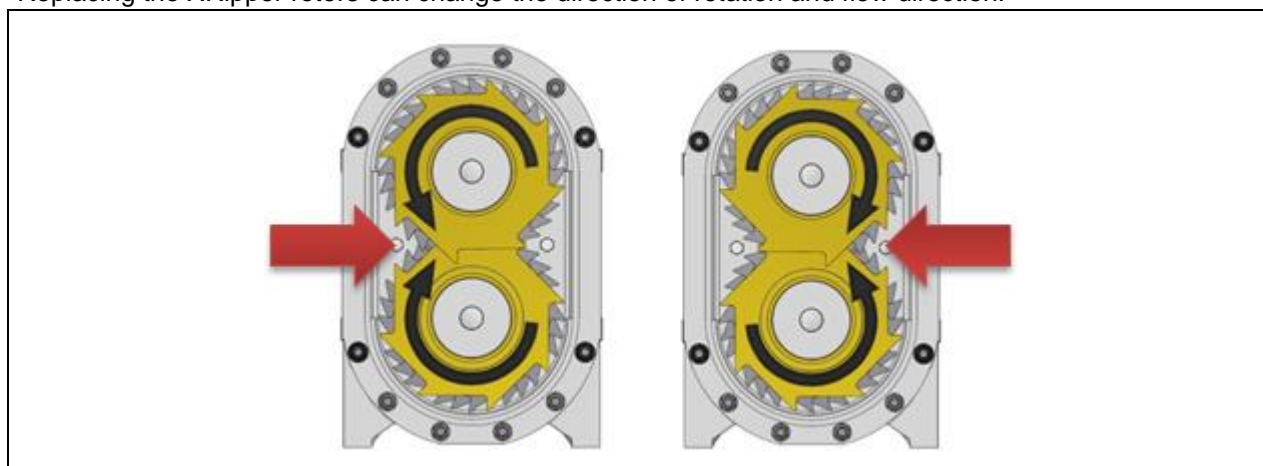


Fig. 6: Flow direction

## Checking the motor's direction of rotation



### WARNING

#### Risk of injury (dragging in, entangling) due to rotating output shaft!

Contact with the rotating output shaft when checking the motor's direction of rotation may lead to injuries due to dragging in or entangling.

- The motor's direction of rotation may be checked by qualified technical personnel only.



- Personnel must wear suitable protective clothing.
- Before switching on the machine to check the direction of rotation, make sure that there are no persons in the danger area.

#### Procedure

- Before setting the motor's direction of rotation, read the information in → **Chap. "Electric drive"**.
- Dismount the cover (1) and check the motor's direction of rotation → **Fig. "Motor's direction of rotation"**.

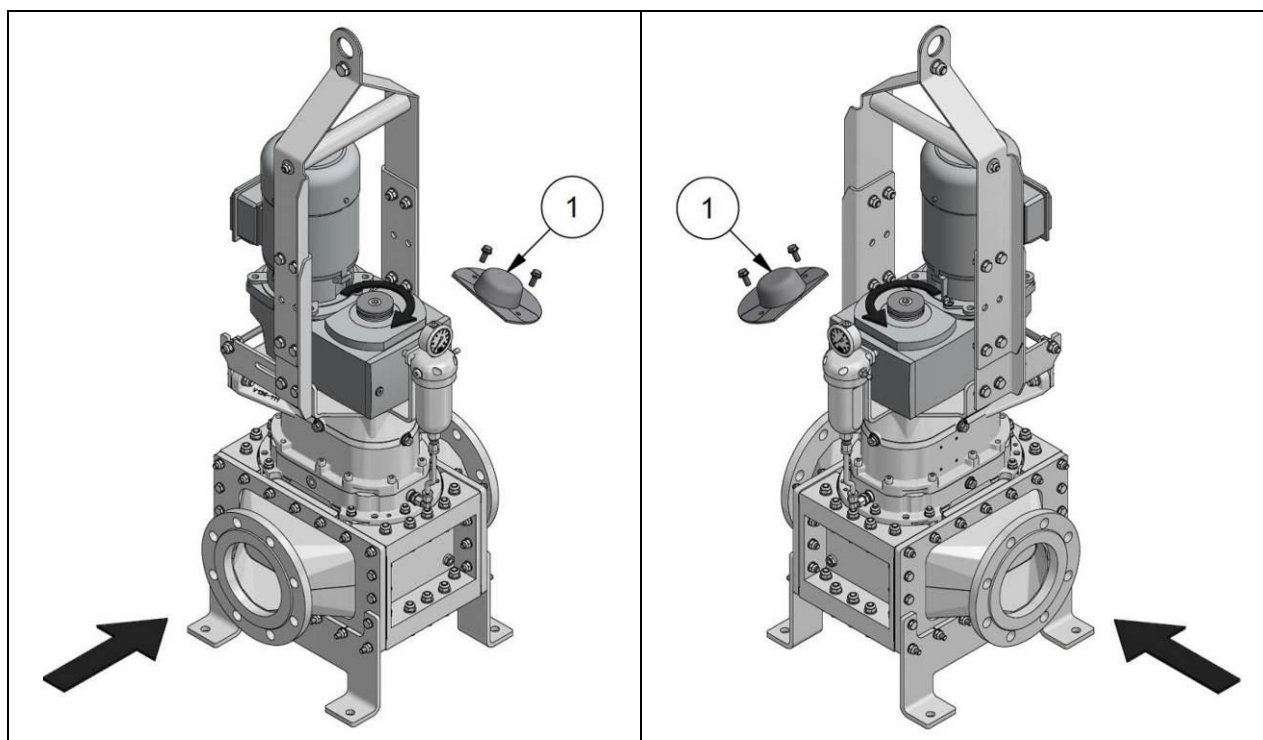


Fig. 7: Motor's direction of rotation



## 6.6 Drive

The technical specifications for the drive system to be installed are determined by the machine's specifications → **Chapter** "Specifications".

In addition, also read and note the following:  "Technical information for the drive system to be installed".

### 6.6.1 Electric drive

Connection to the energy supply may only be established by qualified technical personnel **following** installation in the pipe.



#### RISK OF ELECTRIC SHOCK

Touching live parts leads to dangerous electrocution.  
This can result in electric shock, burns or death.



#### RISK OF ELECTRIC SHOCK

The equipotential bonding shall be executed in accordance with standard EN 60204-1. In other words, all metallic parts of the machine or plant must be connected electroconductively to each other or to the signal ground.

In addition, also read and observe the following:  "Motor operating instructions"

#### Before connecting the geared motor (electric motor with gearbox)

- Check that the power supply is correct for the motor.
- Check that the power feed and fuse protection are adequately dimensioned to allow for multiple rotation direction changes and peak loads within a short period of time.
- Be sure to follow the cable layout diagram on the inside of the motor terminal box cover.
- Note that the PTC resistor of the geared motor must be connected to the terminals provided on the XRipper control or to a PTC control unit.
- Install a maintenance switch in close proximity to the machine (recommendation).

#### Before start-up or long-term storage

The seal on the vent screw must be removed in order to prevent overpressure build-up in the gearbox and thus leakage.

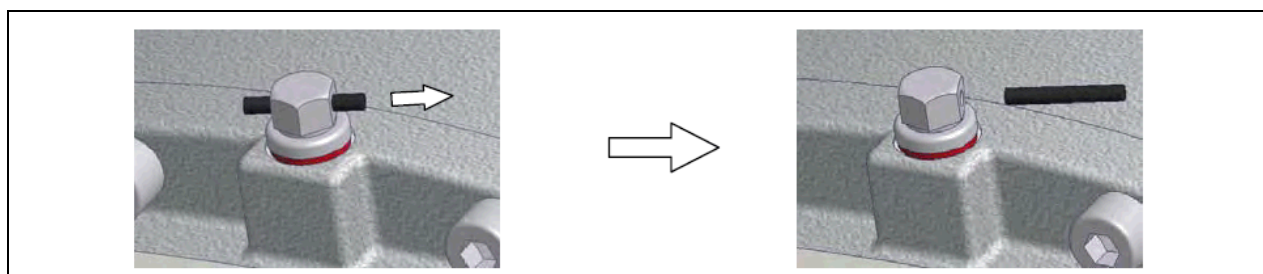


Fig. 8: Vent screw on the gearbox (removing the seal)

## 6.6.2 Hydraulic drive

Connection to the energy supply may only be established by qualified technical personnel **following** installation in the pipe.



### WARNING

#### Risk of infection from hydraulic oil!

Leakages can occur due to seal faults.



- Personnel must wear suitable protective clothing.
- The connection to the power supply must be established by qualified technical personnel.

**In the event of injuries with hydraulic oil, consult a doctor immediately!**

In addition, also read and observe the following:  "Technical information for hydraulic motor"

#### Hydraulic hose lines

- Before connecting hydraulic hoses, read and follow the manufacturer's specifications for hydraulic motors.
- Observe the permissible hydraulic pressure and the permissible delivery rate.
- Connect the overflow oil line in accordance with the manufacturer's instructions.
- Replace hydraulic hose lines that show signs of damage or ageing. Only use genuine Vogelsang hydraulic hose lines.
- The date of manufacture of the hydraulic hose line is displayed on the pressing component of the connector. The period of usage for the hydraulic hose line should not exceed 6 years (although 5 years is recommended), including a possible storage period of no more than 2 years.

#### Installing two hydraulic motors

When two hydraulic motors are installed, they are operated parallel and the torques of both motors are added.

#### Control unit

In the event of high hydraulic motor speeds, never suddenly set the control unit to "lock position" in order to avoid pressure peaks. Whenever possible, switch from "operation" to "floating position".

## 6.7 System control

We recommend our control that is specially designed for use with the XRipper in order to provide trouble-free operation and maximum performance and service life of the XRipper.

The control can be adapted to the specific application, and significantly increases the range of application. The control can be retrofitted to existing units and can also be used to control pumps.

Note the following regarding the control of the XRipper:

- The control must at least fulfil PL “c” in accordance with EN ISO 13849.
- The load circuit provided for the XRipper must be suitable for heavy starting.
- A soft starter is sufficient for soft starting.
- A star-delta connection is not suitable for the XRipper.
- Mains contactors for direct starting must be designed for utilisation category AC-4.
- The soft starter must be suitable for high starting currents and at least 8 starts within a minute. Therefore, oversized units should be used for heavy starting. Acceleration and delay times should be kept above two seconds.
- Please generally observe the following in the context of XRipper controls: Reversing through excess current should remain an exception. If reversing is constantly performed, please check whether the parameters of the control match the motor size used.
- Please contact us with regards to the correct programming of the control.



### **Automatic mode requires monitoring equipment**

Machines that are operated in automatic mode must be equipped with a temperature and pressure monitoring system. This monitoring equipment can be obtained from us as an option.

## 7 Start-up



### 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.

### 7.1 Functional test



#### WARNING

---

##### **Risk of injury due to sharp-edged, rotating XRipper rotors!**

Accidentally inserting parts of the body into the XRipper chamber when the machine is running can result in cuts, amputation or the person being dragged in, due to the sharp-edged, rotating XRipper rotors.

- Any functional test before start-up, for example to check the direction of rotation, must be carried out by qualified technical personnel only.



- Personnel must wear suitable protective clothing.
- Before switching on the machine for functional tests, make sure that there are no persons in the danger area.

#### **Functional test procedure**

- Switch the main switch to OFF.
- Check the XRipper chamber for foreign matter and remove it before the functional test.
- Switch the main switch to ON and carry out the test, for example checking the direction of rotation.

## 7.2 Checklist before start-up

### Safety

- ☐ Are the inlet and outlet pipes connected, making it impossible to access the XRipper rotors under any circumstances?
- ☐ Are the main switch and maintenance and repair switch easy to reach?

### Machine mounting

- ☐ Are the mounting feet firmly mounted to the ground under the machine?

### Drive

- ☐ Is the motor connected correctly to the power supply, if applicable (→ documents provided by the motor manufacturer)?
  - ☐ Star or delta connection, voltage, frequency (see name plate and inside of terminal box)?
  - ☐ Motor protection ensured, e.g. by a circuit breaker?
    - A short switching time should be set for star-delta starting, if present.
    - A short start ramp should be set for the soft starter, if present.
  - ☐ Is the soft starter, if present, dimensioned and configured correctly?
    - Units should be suitable for heavy starting.
- ☐ Is the motor connected correctly to the hydraulic lines, if applicable (→ documents provided by the motor manufacturer)?

### Buffer chamber, XRipper gearbox

→ Chap. "Maintenance" – "Buffer chamber" – "Gearbox"

- ☐ Are the optional buffer chamber assemblies correctly installed? Are they correctly adjusted?  
Is the buffer chamber pressure OK, if applicable?
  - ☐ Is the type of buffer or quenching fluid OK?\*
  - Is the fluid level in the buffer chamber OK?\*
  - ☐ Are the oil grade and oil level in the XRipper gearbox OK?\*
- \*Requirements met by the XRipper when delivered*

### Flow direction, pipe system

→ Chap. "Flow direction"

- ☐ Is the flow direction OK?
- ☐ Is the pipe system sealed and free of leakage?

## 8 Maintenance



### WARNING

**Risk of injury (cutting, amputation) due to sharp-edged, rotating XRipper rotors if the machine starts up unexpectedly!**

Before starting maintenance and repair work (opening covers, disassembling connectors) and before trouble-shooting, switch the machine off and secure it against being switched on again.



### WARNING

**Risk of injury from working materials escaping under high pressure!**

When the drain plugs on the gearbox and buffer chamber are loosened or the buffer fluid tank cover is opened, working materials can spray out under high pressure.



- Personnel must wear suitable protective clothing.

Before carrying out maintenance and repair work, release the buffer chamber pressure.

- To protect against fluids spraying out, carefully and slowly open the buffer chamber and the gearbox. Cover the valves or screws to be removed with a cloth or similar item where appropriate.

### 8.1 Buffer chamber

In the following chapters, we describe the following possible **buffer chamber assemblies**:

- 1 → Chapter "Pressurisable buffer fluid tank"
- 2 → Chapter "Depressurised quenching fluid tank"
- 3 → Chapter "Pressure valve"

Buffer chamber assemblies are for checking the pump shaft seal more easily. The fluid level and the set pressure can be monitored, depending on the design.

Electronic buffer chamber monitoring is also possible. Ask us for more information. ☎️✉️

### 8.1.1 Pressurisable buffer fluid tank

The pressurisable buffer fluid tank (hereafter referred to as "tank") with manual air pump ensures a constant and defined buffer chamber pressure (buffer chamber pressure = tank pressure).  
The tank is for reliably monitoring the buffer chamber.

→ Fig. "XRipper with buffer fluid tank"

#### Installing the tank (before XRipper start-up)

1. Remove the plug from the buffer chamber.
2. Open the tank: Undo the upper coupling of the upper housing (hold the union nut firmly in place so that the lower coupling is not detached).
3. Screw the tank directly into the cast body of the buffer chamber. Fill the tank about one quarter full (when delivered, the buffer chamber is already filled).
4. Close the tank and use a manual air pump or a compressed-air supply outlet to set the required tank pressure.

#### Topping up buffer fluid (maintenance and inspection)

1. Position the XRipper vertically and keep it suspended for safety (1).
2. Release the pressure in the buffer chamber via the valve on the tank.
3. Open the tank: Loosen the upper coupling of the upper housing (hold the union nut tight so that the lower coupling does not come loose) and tilt the tank (2) slightly to the side.
4. Top up the buffer fluid in the tank. The tank must be one quarter full.
5. Close the tank and use a manual air pump or a compressed-air supply outlet to set the required tank pressure.

#### Tank pressure

The tank pressure should be about 0.5 bar higher than the average pressure in the XRipper.

$\text{Tank pressure} = 0.5 \text{ bar} + (\text{pressure at inlet side} + \text{pressure at outlet side}) / 2$

Regardless of this, the tank pressure should not exceed 5 bar with a single mechanical seal and should not exceed 10 bar with a double mechanical seal.



#### Changing the XRipper rotors

Before changing the XRipper rotors, release the **tank pressure** and build it up again after changing.

#### Trouble indication

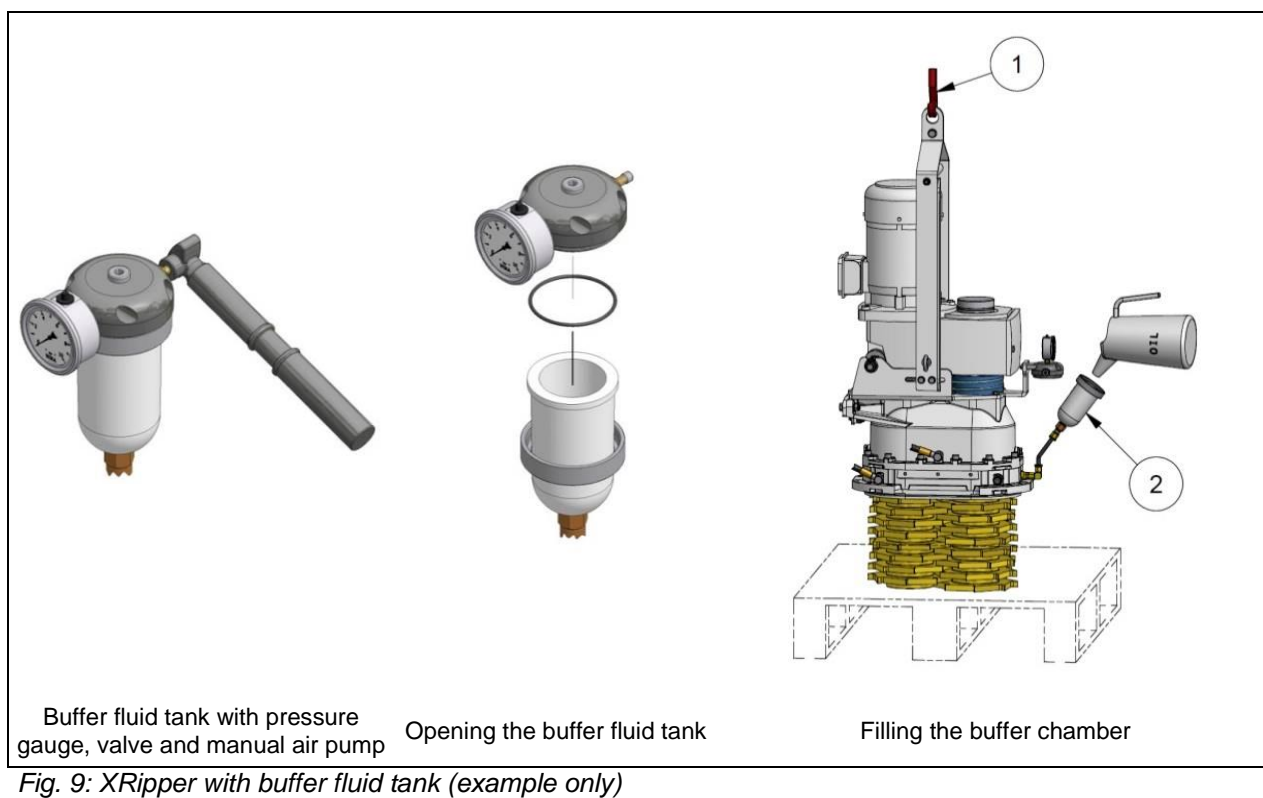
Possible indications of trouble in the sealing system after the running-in period:

- Severe contamination of the buffer fluid in the tank
- Buffer fluid escaping (tank is empty)
- Increase in buffer fluid level (tank is full)



#### Buffer fluid characteristics

- The hydrodynamic lubrication film of a mechanical seal can cause:
  - Slight contamination of the buffer fluid
  - A slight increase or reduction in the buffer fluid level
- A slight increase in the buffer fluid level is also possible due to thermal expansion during XRipper operation.





### 8.1.2 Depressurised quenching fluid tank

The quenching fluid is used for depressurised lubrication and cooling of the pump shaft seal. Any leakage of fluids (XRipper medium or gear oil) is absorbed by the quenching fluid.

The installation of the quenching fluid tank and the topping up of quenching fluid is as described in → **Chapter** "Pressurisable buffer fluid tank".

The instructions for pressurising the tank do not apply to this "depressurised quenching fluid tank" buffer chamber assembly.

Please also observe the "Trouble indication" and "Buffer fluid characteristics" in → **Chapter** "Pressurisable buffer fluid tank".

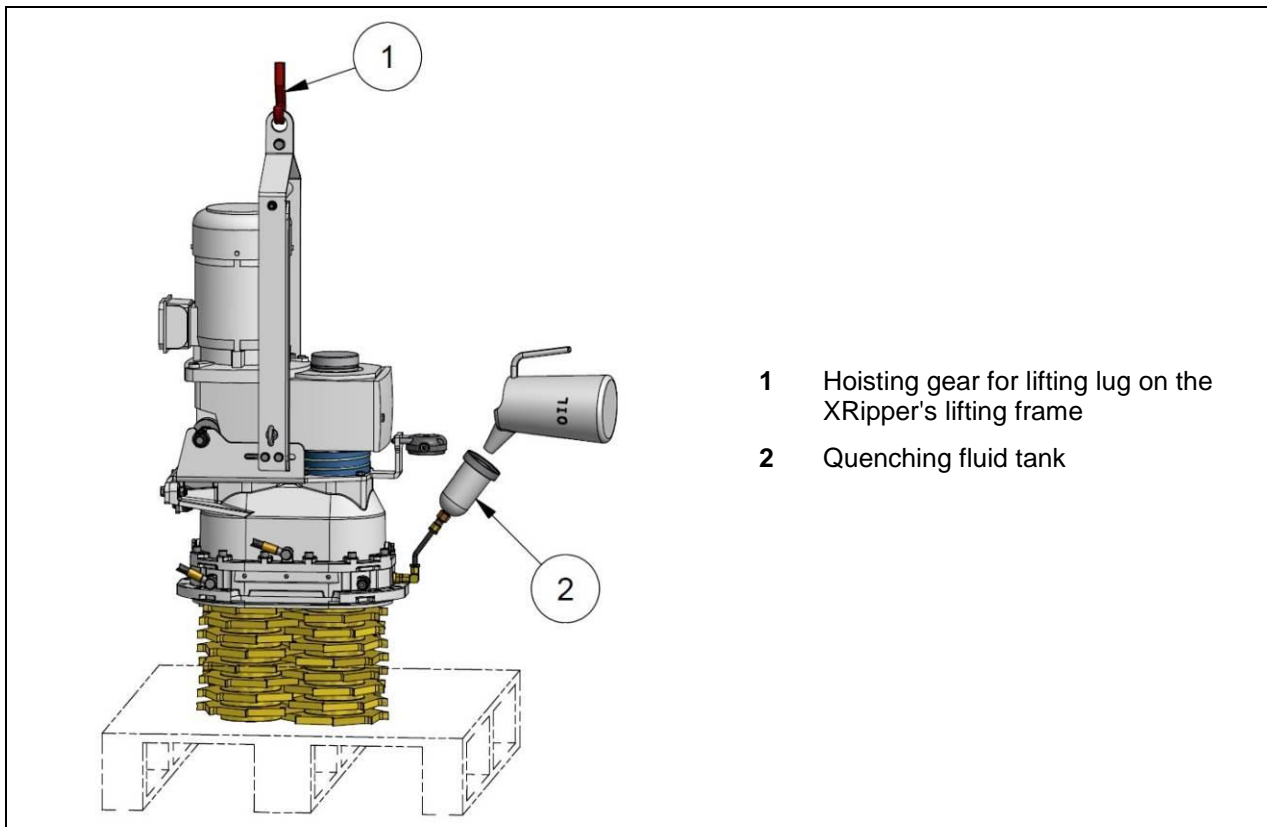


Fig. 10: XRipper with quenching fluid tank (example only)

### 8.1.3 Pressure valve

The pressure valve ensures a slight pressurisation of the buffer fluid. If the pressure rises too much ( $>1.5$  bar) or there is a leak on the pump shaft seal, the leaking fluid (XRipper medium or gear oil) can escape via the valve. A collecting tank can be connected if necessary.

Recommendation: To be able to monitor the buffer chamber pressure and the buffer fluid level, a buffer fluid tank should be installed instead of the pressure valve.

→ **Fig.** "XRipper with pressure valve"

Dismount the pressure valve for inspection of buffer fluid in the buffer chamber and for topping up buffer fluid.



#### Air buffer

When adding buffer fluid, leave an air buffer above it (about 1 cm distance between the oil level and the bearing seal housing) → **Fig.** "XRipper with pressure valve". The air buffer prevents the buffer chamber fluid from escaping through the pressure valve due to thermal expansion.

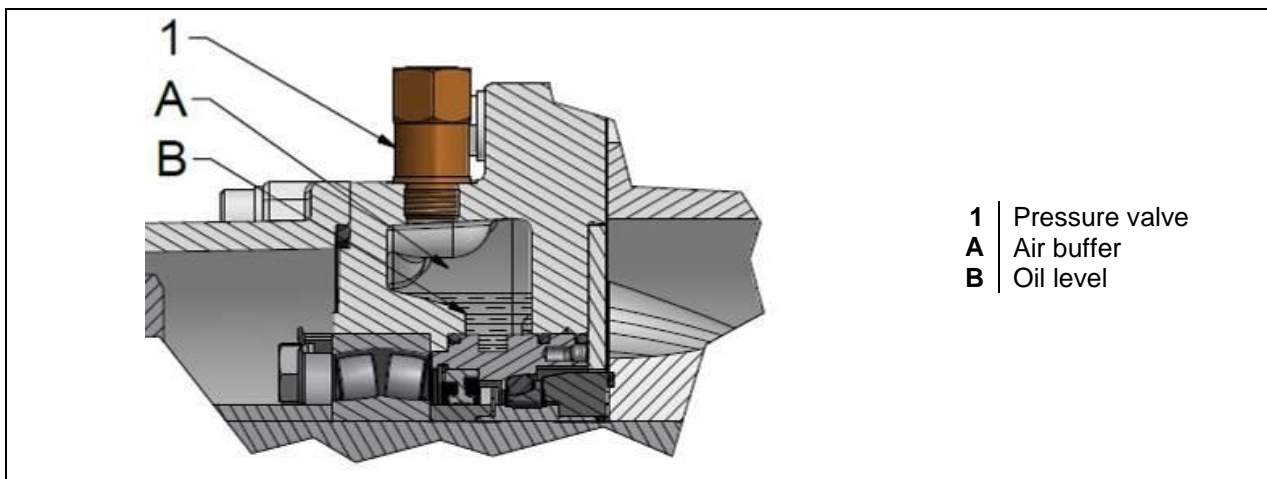


Fig. 11: XRipper with pressure valve

### 8.1.4 Buffer or quenching fluid - type

For optimum functioning of the mechanical seal, we recommend the oils listed in → Chap. "Oils and lubricants".

Please check your order confirmation to see whether the buffer chamber of your machine is filled with a buffer or quenching fluid differing from this chapter. In that case use only the oil specified on your order confirmation.



#### ATTENTION

To prevent premature wear of the seal, mineral oils or greases must not be used with EPDM O-rings. Use glycol as an alternative.

### 8.1.5 Buffer or quenching fluid - quantity

Series	XRP186	XRP186VVA*
Buffer or quenching fluid	<b>2.4** litres</b>	<b>2** litres</b>

\* VVA = All steel and cast parts of the machine coming in contact with the medium are made of stainless steel.

\*\* Guideline, depends on the buffer chamber assembly.

### 8.1.6 Buffer or quenching fluid - inspection and change

Buffer fluid or quenching fluid

- Check:
  - After the first 20 operating hours
  - Every 200 operating hours

Electronic buffer chamber monitoring is possible. Ask us ☎️✉️.
- replace:
  - Every 2000 operating hours
  - When there is severe contamination

When there is intense leakage, replace the cartridge mechanical seal → Chapter "Changing cartridge mechanical seal"

→ Chapter "Maintenance plan"



#### Buffer or quenching fluid characteristics

- The hydrodynamic lubrication film of a mechanical seal can cause:
  - Slight contamination of the buffer or quenching fluid
  - Slight increase or reduction in the buffer or quenching fluid level
- A slight increase in the buffer or quenching fluid level is also possible due to thermal expansion during XRipper operation.

### 8.1.7 Draining and cleaning the buffer chamber

If the cartridge mechanical seal is defective, drain and clean the buffer chamber.

Before changing a cartridge mechanical seal, drain the buffer chamber and clean it if it is contaminated severely → **Chapter** "Cartridge mechanical seal change"

→ **Chapter** "Maintenance plan"

#### Procedure:

1. In case of buffer chamber assemblies with a pressurisable buffer fluid tank or pressure valve, depressurise the buffer chamber before draining or cleaning.
2. Remove buffer chamber assemblies → **Chapter** "Buffer chamber assemblies".
3. Undo the screw plug (1) → **Fig.** "Draining the buffer chamber" and drain the buffer or quenching fluid from the buffer chamber using the hydraulic hose (2).
4. If there is severe contamination, clean the buffer chamber.
5. Screw the plug on the hydraulic hose and screw the upper screw plug back in (50 Nm) and install the various buffer chamber assemblies in reverse sequence.

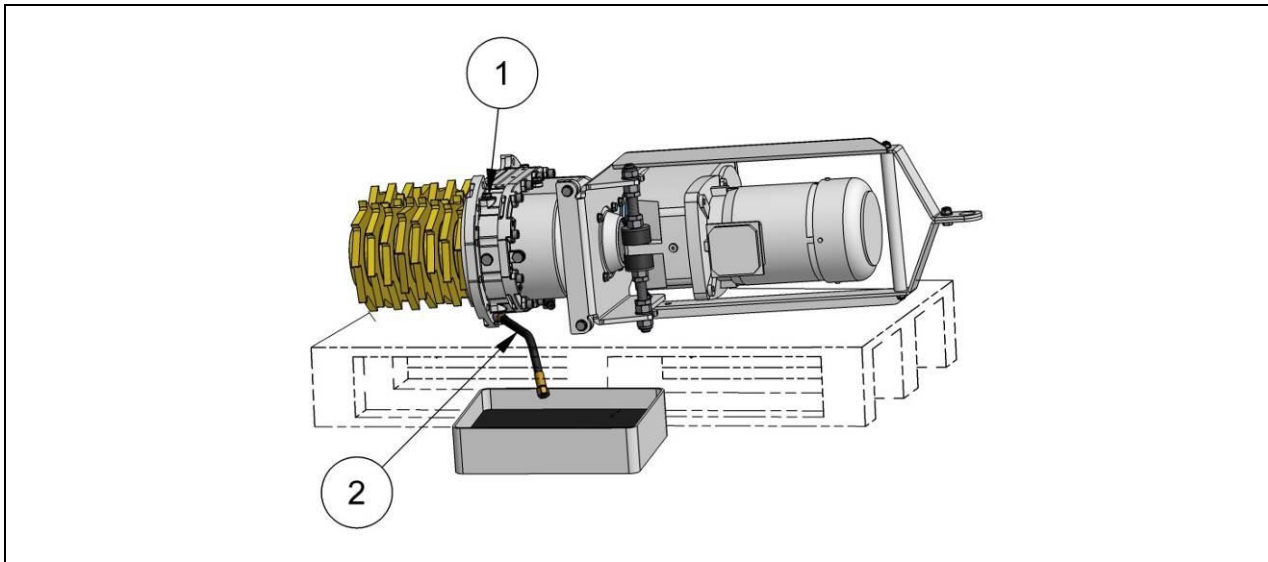


Fig. 12: Draining the buffer chamber (example only)



#### Environmentally friendly disposal

Treat buffer and quenching fluid like hazardous waste and dispose of properly.

## 8.2 Gearbox

### 8.2.1 Gear oil - grade

We recommend the oils listed in → Chap. "Oils and lubricants".

### 8.2.2 Gear oil - quantity

5.2 litre

### 8.2.3 Gear oil – inspection and change

→ Fig. "Gear oil change"

**Inspect the gear oil** and top up small quantities up to the seal indicator pipe (2) in Fig. "Filling" (only top up when the gearbox is at a standstill):

Every 500 operating hours, however at least every 3 months

#### Change gear oil:

- After the first 20 operating hours
- Every 2000 operating hours

The buffer or quenching fluid should be changed at the same time as the gear oil change → Chapter "Buffer chamber assembly".



#### Environmentally friendly disposal

Treat gearbox oils like hazardous wastes and dispose of properly.

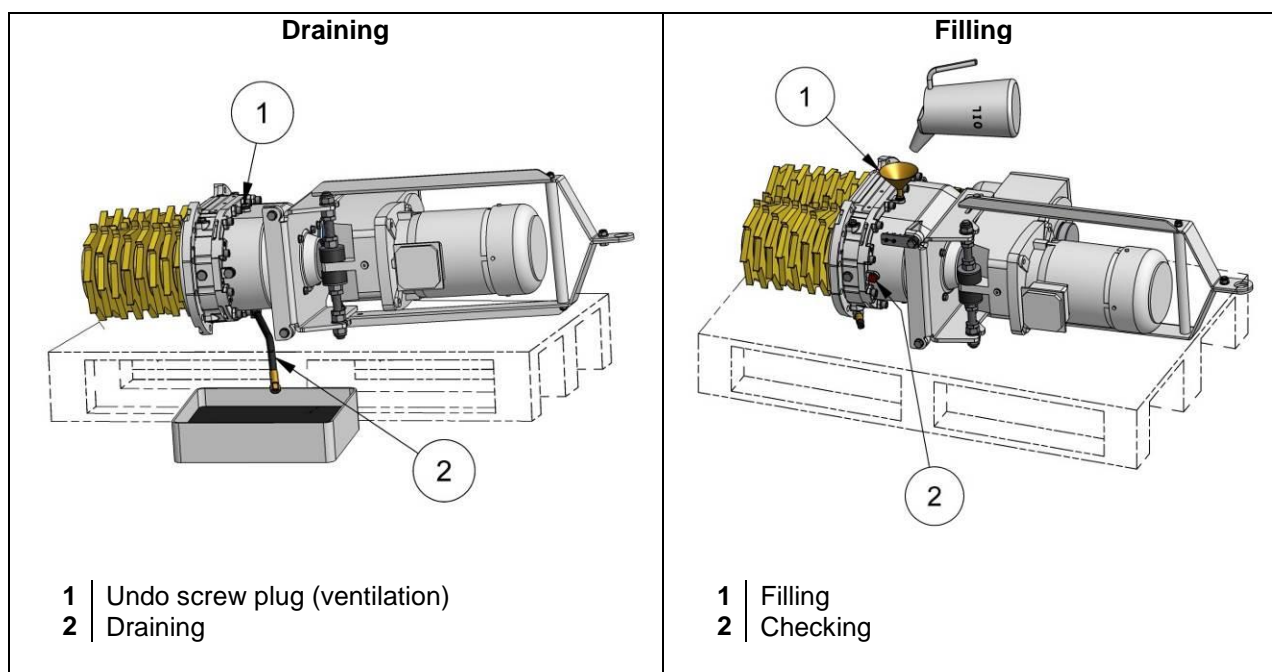


Fig. 13: Gear oil change (example only)



#### Tightening torque

Tightening torque for mounting the screw plugs → 60 Nm

### 8.3 Oils and lubricants

#### 1 Standard Vogelsang oil for XRipper gearbox and buffer chamber

Part number	<b>BSS.006</b>	
Description	EP (Extreme Pressure) gear oil	
Trade name (Fuchs)	Titan Gear MP 90	
<b>Characteristics</b>		<b>Test acc. to</b>
SAE class	90 (85W-90)	DIN 51512 or SAE J306c
Kinematic viscosity		DIN 51562
at 40 °C	198 mm <sup>2</sup> /s	
at 100 °C	17.3 mm <sup>2</sup> /s	
Flash point	215 °C	DIN ISO 2592
Pour point	-18 °C	DIN ISO 3016
Damage loading step	≥ 12	
Water hazard class	Slightly hazardous to waters	

#### 2 Alternative oils for XRipper gearbox and buffer chamber

Part number	<b>BSS0021*</b>	
Description	Fully synthetic industrial gear oil based on poly-alpha-olefins	
Trade name (Fuchs)	Renolin Unisyn CLP	
<b>Characteristics</b>		<b>Test acc. to</b>
ISO VG	220	DIN 51519
Kinematic viscosity		DIN EN ISO 3104
at 40°C	220 mm <sup>2</sup> /s	
at 100°C	26.7 mm <sup>2</sup> /s	
Flash point	260°C	DIN ISO 2592
Pour point	-42°C	DIN ISO 3016
Water hazard class	Slightly hazardous to waters	

\* *when using BSS0021 oil for the XRipper gearbox, the maintenance interval for inspection and gear oil change may be doubled → **Chapter** "Maintenance plan"*

Part number	<b>BSS.010**</b>	
Description	Medical white oil: water-white, non-fluorescent, tasteless and odourless mixture of hydrocarbons	
Trade name (Fuchs)	White oil W 530 (PH.EUR.)	
<b>Characteristics</b>		<b>Test acc. to</b>
Kinematic viscosity		DIN 51562
at 20 °C	238 mm <sup>2</sup> /s	
at 40 °C	68 mm <sup>2</sup> /s	
at 100 °C	8.4 mm <sup>2</sup> /s	
Flash point	230 °C	DIN ISO 2592
Pour point	-24 °C	DIN ISO 3016
Ambient temperature	-20°C to +40°C	
Water hazard class	Slightly hazardous to waters	

\*\* **BSS.010** oil is not permitted for high performance applications and continuous operation over a maximum of 50% of the permitted pressure → **Chapter** "Specifications".  
Please contact us.



#### Sealing system with mechanical seal ring made of Duronit

If a mechanical seal ring made of Duronit is used in the sealing system, the damage loading step for the buffer chamber oil must be ≥ 12 .

### 3 Alternative oils for the buffer chamber

Part number	<b>BSS.014</b>	
Description	Mineral oil based hydraulic and lubricating oil	
Trade name (Fuchs)	Renolin B 15	
<b>Characteristics</b>		<b>Test acc. to</b>
ISO VG	46	DIN 51519
Viscosity index	105	DIN ISO 2909
Kinematic viscosity		DIN EN ISO 3104
at 40 °C	46 mm <sup>2</sup> /s	
at 100 °C	6.9 mm <sup>2</sup> /s	
Flash point	210 °C	DIN ISO 2592
Pour point	-24 °C	DIN ISO 3016
Damage loading step	≥ 12	
Water hazard class	Slightly hazardous to waters	

Part number	<b>BSS.016</b>	
Description	Biodegradable, environmentally friendly, multigrade hydraulic oil based on rape seed oil (as per ISO 15308, type HETG)	
Trade name (Fuchs)	Hydraulic oil 40 N	
<b>Characteristics</b>		<b>Test acc. to</b>
ISO VG	46	DIN 51519
Viscosity index	220	DIN ISO 2909
Kinematic viscosity		DIN 51562-1
at 40 °C	42 mm <sup>2</sup> /s	
at 100 °C	9.6 mm <sup>2</sup> /s	
Flash point	300 °C	DIN ISO 2592
Pour point	-36 °C	DIN ISO 3016
Water hazard class	Slightly hazardous to waters	

#### 4 Oils for the buffer chamber with electronic buffer chamber monitoring

Part number	<b>BSS.021</b>	
Description	Fully synthetic EP industrial gear oil based on selected polyglycols (PAG)	
Trade name (Fuchs)	Renolin PG 100	
<b>Characteristics</b>		<b>Test acc. to</b>
ISO VG	100	DIN 51519
Kinematic viscosity		DIN EN ISO 3104
at 40 °C	100 mm <sup>2</sup> /s	
at 100 °C	19.6 mm <sup>2</sup> /s	
Flash point	260 °C	DIN ISO 2592
Pour point	-48 °C	DIN ISO 3016
Damage loading step	≥ 12	

Part number	<b>BSS.017</b>	
Description	Fully synthetic EP industrial gear oil based on selected polyglycols (PAG)	
Trade name (Fuchs)	Renolin PG 46	
<b>Characteristics</b>		<b>Test acc. to</b>
ISO VG	46	DIN 51519
Viscosity index	203	DIN ISO 2909
Kinematic viscosity		DIN 51562
at 40 °C	46 mm <sup>2</sup> /s	
Flash point	240 °C	DIN ISO 2592
Damage loading step	≥ 12	
Water hazard class	Slightly hazardous to waters	

#### 5 Lubricants for cartridge mechanical seals in the bearings and for the bearings

Part number	<b>BSS.002</b>	
Description	Lithium soap grease with a mineral oil base	
Trade name (Fuchs)	Renolit GP 2	
<b>Characteristics</b>		<b>Test acc. to</b>
Identification	K2K-30 ISO-L-X-CCEA 2	DIN 51502 ISO 6743-9
Intrinsic viscosity		DIN 51562-1
at 40 °C	110 mm <sup>2</sup> /s	
at 100 °C	9.5 mm <sup>2</sup> /s	
Dropping point	> 180 °C	IP 396
Service temperature	-30 to +120 °C	DIN 51825
Water hazard class	Slightly hazardous to waters	



## 9 Repair



### WARNING

**Risk of injury (cutting, amputation) due to sharp-edged, rotating XRipper rotors if the machine starts up unexpectedly!**

Before starting maintenance and repair work (opening covers, disassembling connectors) and before trouble-shooting, switch the machine off and secure it against being switched on again.



### WARNING

**Risk of injury from working materials escaping under high pressure!**

When the drain plugs on the gearbox and buffer chamber are loosened or the buffer fluid tank cover is opened, working materials can spray out under high pressure.



- Personnel must wear suitable protective clothing.
- Before carrying out maintenance and repair work, release the buffer chamber pressure.
- To protect against fluids spraying out, carefully and slowly open the buffer chamber, the bearing cover on the QD cover and the gearbox. Cover the valves or screws to be removed with a cloth or similar item where appropriate.



### ATTENTION

Before installing stainless steel bolts and stainless steel nuts:

Clean threads and contact surfaces. Apply anti-seize paste (part no. BKL.014/BAS.001) evenly and in sufficient quantity to the screw head face and bearing face and to the thread using a brush or filling knife etc. to avoid seizing of stainless steel.

### 9.1 Conversion and spare parts

Modifications or changes to the machine are only permissible after consultation with Vogelsang.

Only accessory parts approved by Vogelsang or genuine spare parts may be used. The use of other parts invalidates the guarantee for any resulting damage.

## 9.2 Disassembly of the functional unit

1. Depressurise the entire XRipper system.
2. Shut off the connected pipes if possible.
3. Depressurise buffer chamber (if the XRipper rotors are to be dismantled).
4. Loosen twelve hexagon nuts (2).
5. Pull out the functional unit using the lifting lug (1).

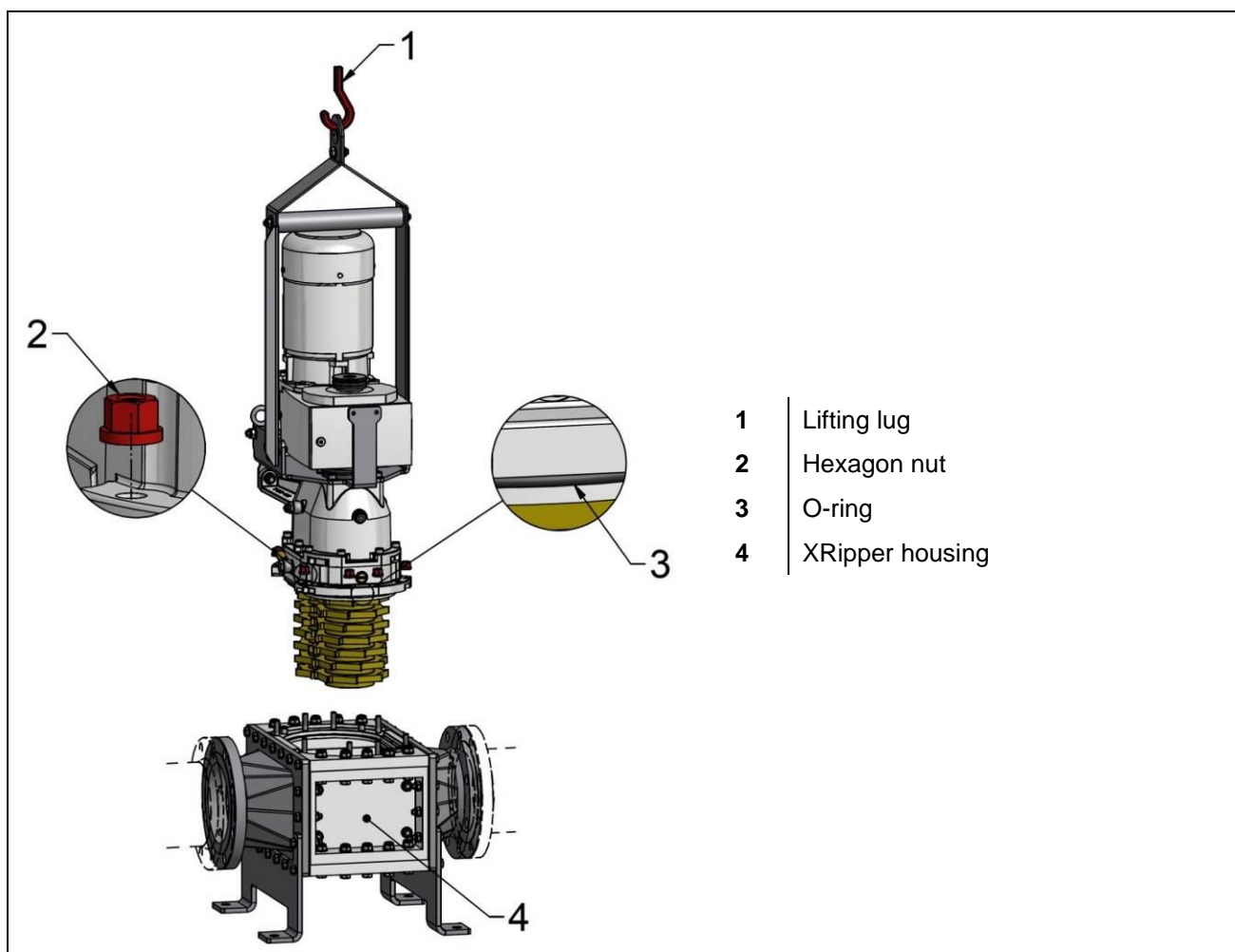


Fig. 14: Disassembling/assembling the functional unit

### 9.3 Replacing the ripper rotors

#### 9.3.1 Disassembly of the wear plates and cartridge mechanical seals with bearings

→ Fig. "Changing the XRipper rotors"

1. Place the dismounted functional unit on a slightly raised surface.
2. Undo nuts (1) and remove the radial support (2).
3. Dismount cover (4) and remove O-rings (5).
4. Undo the cylinder head bolts (6) in the bearings of the cartridge mechanical seals (9). Remove the pressure discs (7), spring washers (8).
5. Carefully pull off the cartridge mechanical seals with bearings (9) and prevent them from falling down.
6. Dismount the radial support (10), O-ring (11), and radial supports (12 and 13).
7. Dismount the wear plates (14 and 15) and bolts (16).

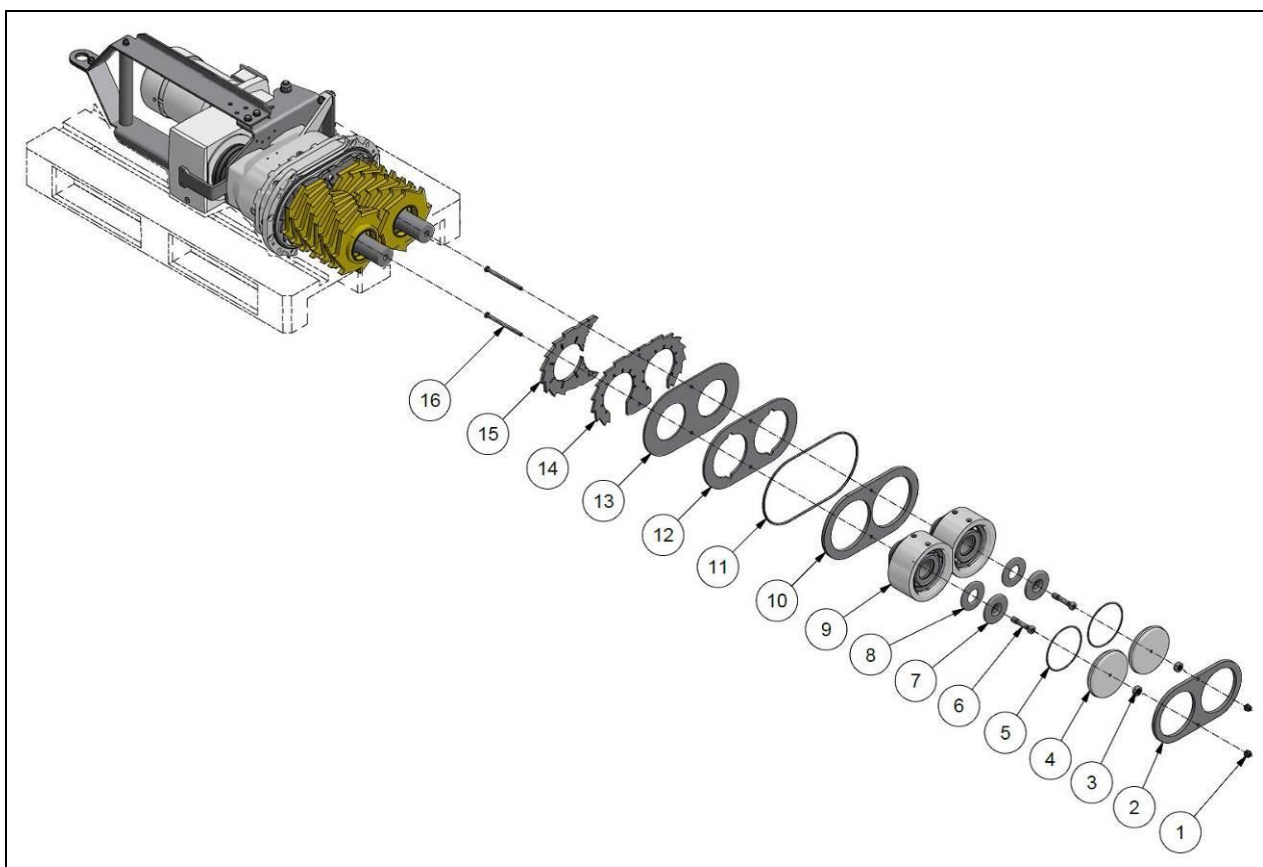


Fig. 15: Wear plates and cartridge mechanical seals with bearings



#### WARNING

##### Risk of injury due to sharp-edged XRipper rotors!

If the XRipper rotors are freely accessible or fall off, the sharp blades of the XRipper rotors can result in cuts.



- Personnel must wear suitable protective clothing.
- Note and comply with the transport instructions.

### 9.3.2 Disassembly of XRipper rotors

The XRipper rotors (17) must be detached from the upper and lower shaft in pairs using the puller.

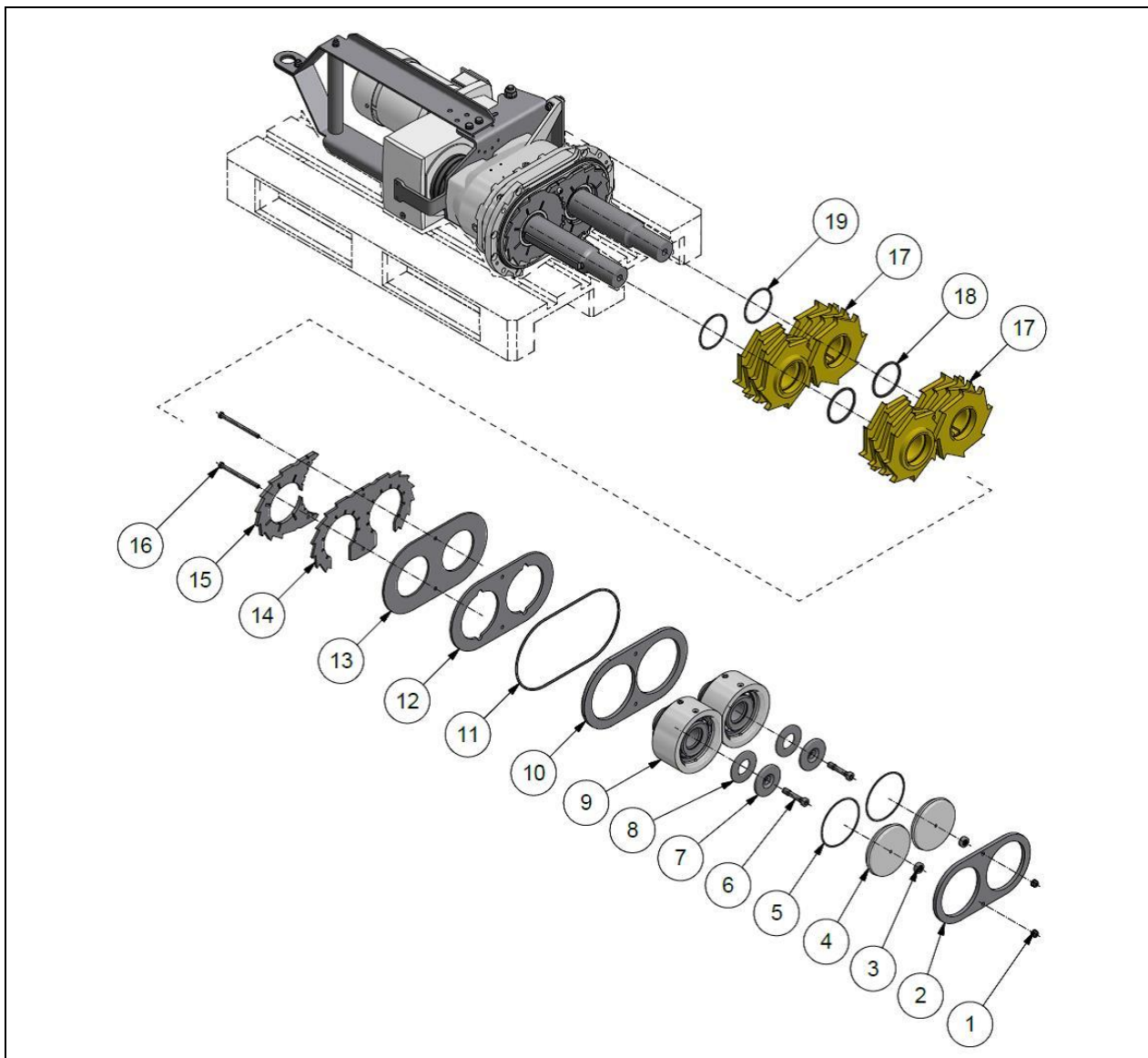


Fig. 16: Changing the XRipper rotors

### 9.3.3 Assembly of XRipper rotors

1. Before mounting the new XRipper rotors, thoroughly clean the contact surfaces of the XRipper rotors and seal components and oil the shafts lightly.
2. Fit an O-ring (19) to each XRipper rotor (at gearbox side). Also mount an O-ring (18) between each pair of XRipper rotors.
3. Slide the XRipper rotors in pairs onto the upper and lower shaft.

### 9.3.4 Assembly of the wear plates and cartridge mechanical seals with bearings

1. → **Fig.** "Wear plates and cartridge mechanical seals with bearings"  
Push wear plates (14 and 15), radial supports (12 and 13), O-ring (11) and radial support (10) onto the two bolts (16) (observe correct sequence) and push all components onto the shafts. Observe the assembly instructions for the wear plates → **Chap.** "Wear plate change".
2. Grease both cartridge mechanical seals in the bearings → **Fig.** "Greasing the cartridge mechanical seals in the bearings":  
Apply the grease using a grease gun (C) at the two grease nipples (A) until the grease comes back out of gap (B). Finish greasing.  
We recommend the lubricating grease listed in → **Chap.** "Oils and lubricants".

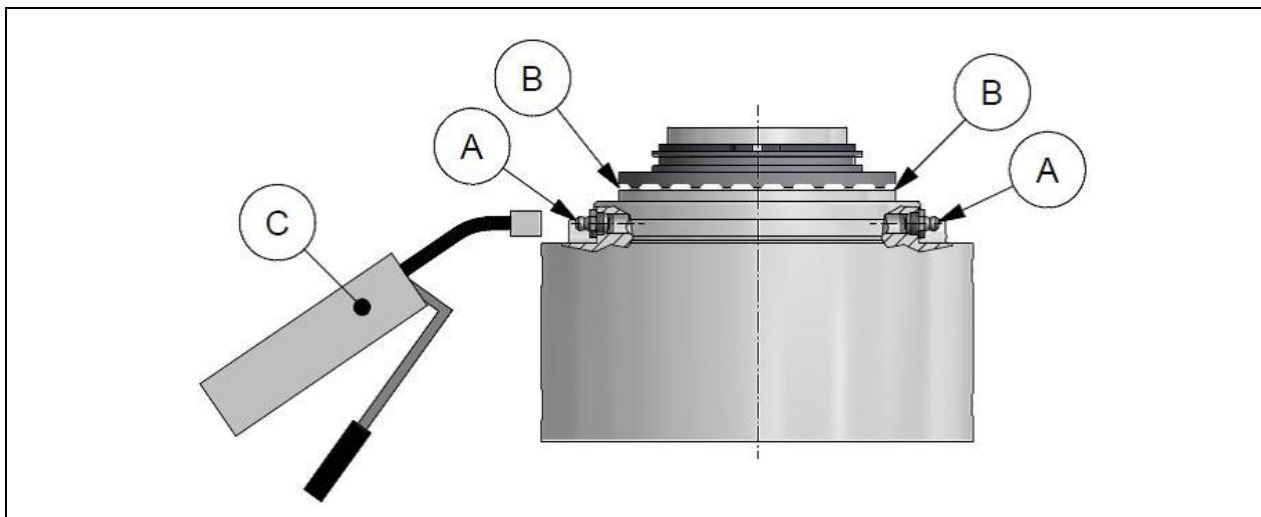


Fig. 17: Greasing the cartridge mechanical seals in the bearings

3. Push the bearings of the cartridge mechanical seals (9) onto the shafts one at a time.

4. Insert the pressure discs (7) and spring washers (8) and make sure that the spring washers are positioned correctly in the pressure discs → **Fig.** "Position of pressure disc (B) and spring washer (A)".
5. Carefully press the pressure discs and spring washers into the bearing. Spring washers must not fall into the extracting groove.

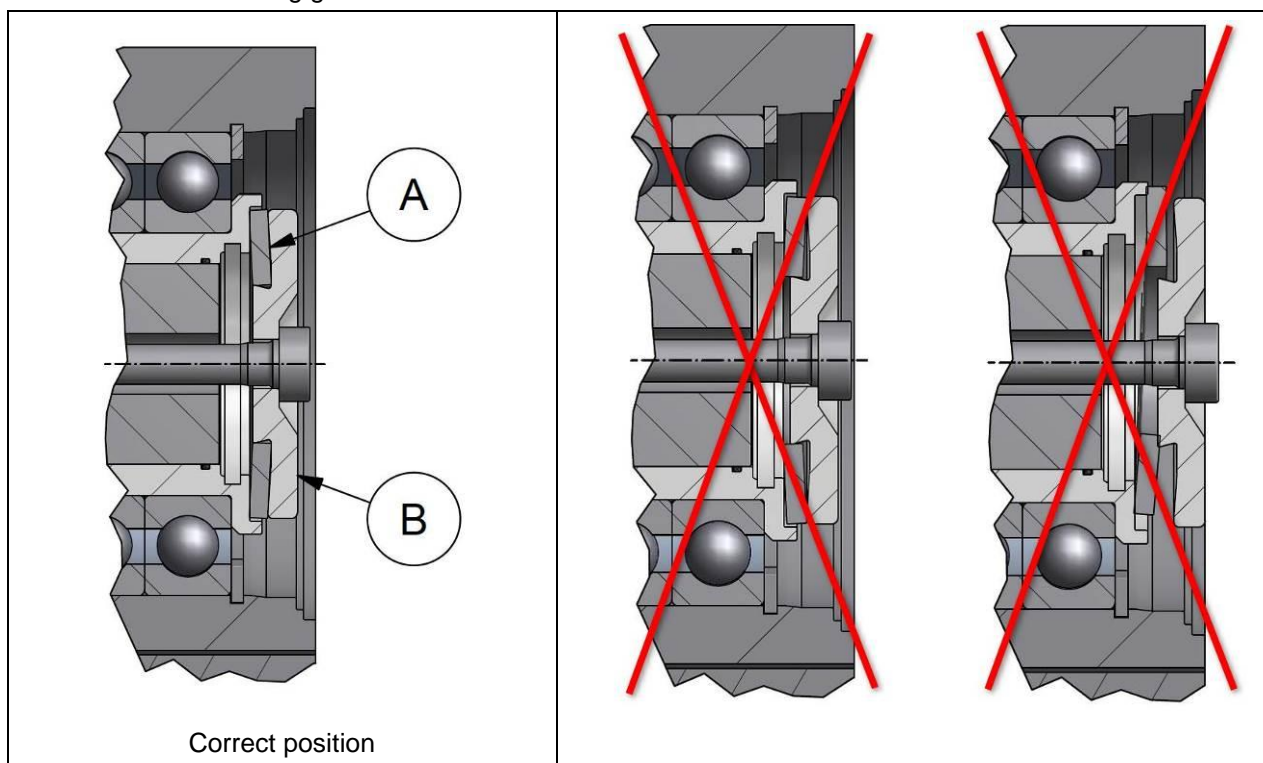


Fig. 18: Position of pressure disc (B) and spring washer (A)

6. Tighten the spring washers and pressure discs with the cylinder head bolt.



#### Tightening torque for strain bolts

- Tighten the M 16 strain bolt (10.9, steel) with **200 Nm**, then loosen it and tighten again with **140 Nm**.
  - Tighten the M 16 strain bolt (A4, stainless steel) with **160 Nm**, then loosen it and tighten again with **140 Nm**.
7. Place O-rings (5) in the bearings and put the covers (4) in place with screw plugs (3).
  8. Push radial support (2) onto the thread ends (14) and the covers (4) and tighten using the nuts (1).

9. Grease both bearings (9) → **Fig. "Greasing the bearings"**:  
To do this, dismount the screw plug (B). Apply the grease using a grease gun (C) at the grease nipple (A) until the grease comes back out of the open hole (B). Finish greasing. Screw the screw plug back in and tighten it.  
We recommend the lubricating grease listed in → **Chap. "Oils and lubricants"**.

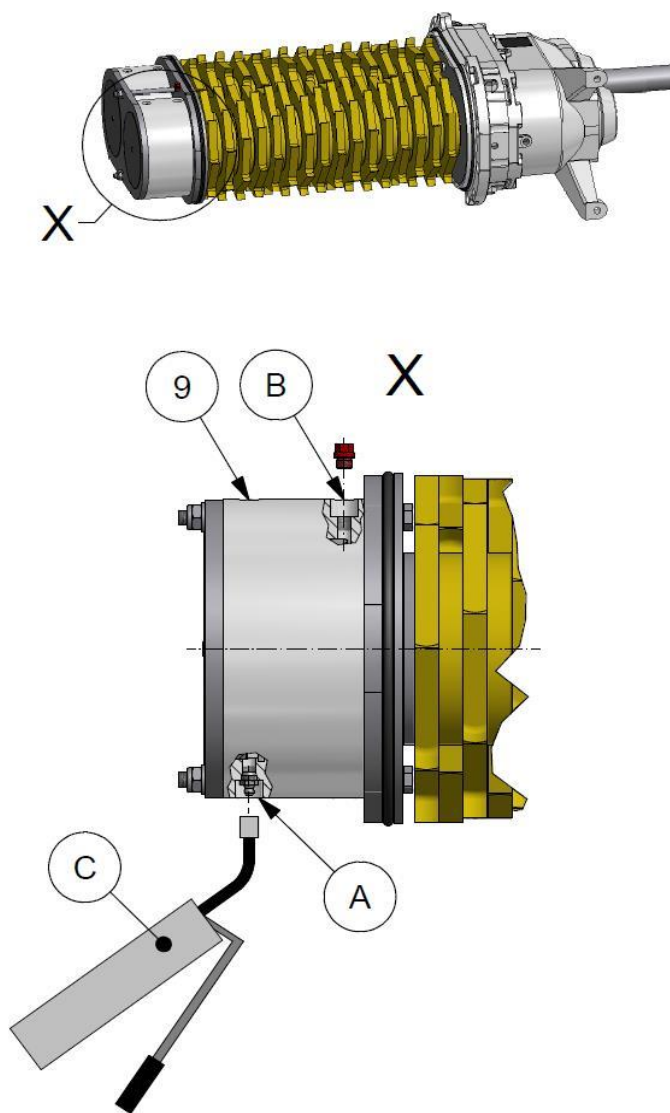


Fig. 19: Greasing the bearings



## 9.4 Change of wear plates

### 9.4.1 Disassembly of the wear plates (cover side)

→ Chap. "Disassembly of the wear plates and cartridge mechanical seals with bearings"

### 9.4.2 Disassembly of the wear plates (gearbox side)

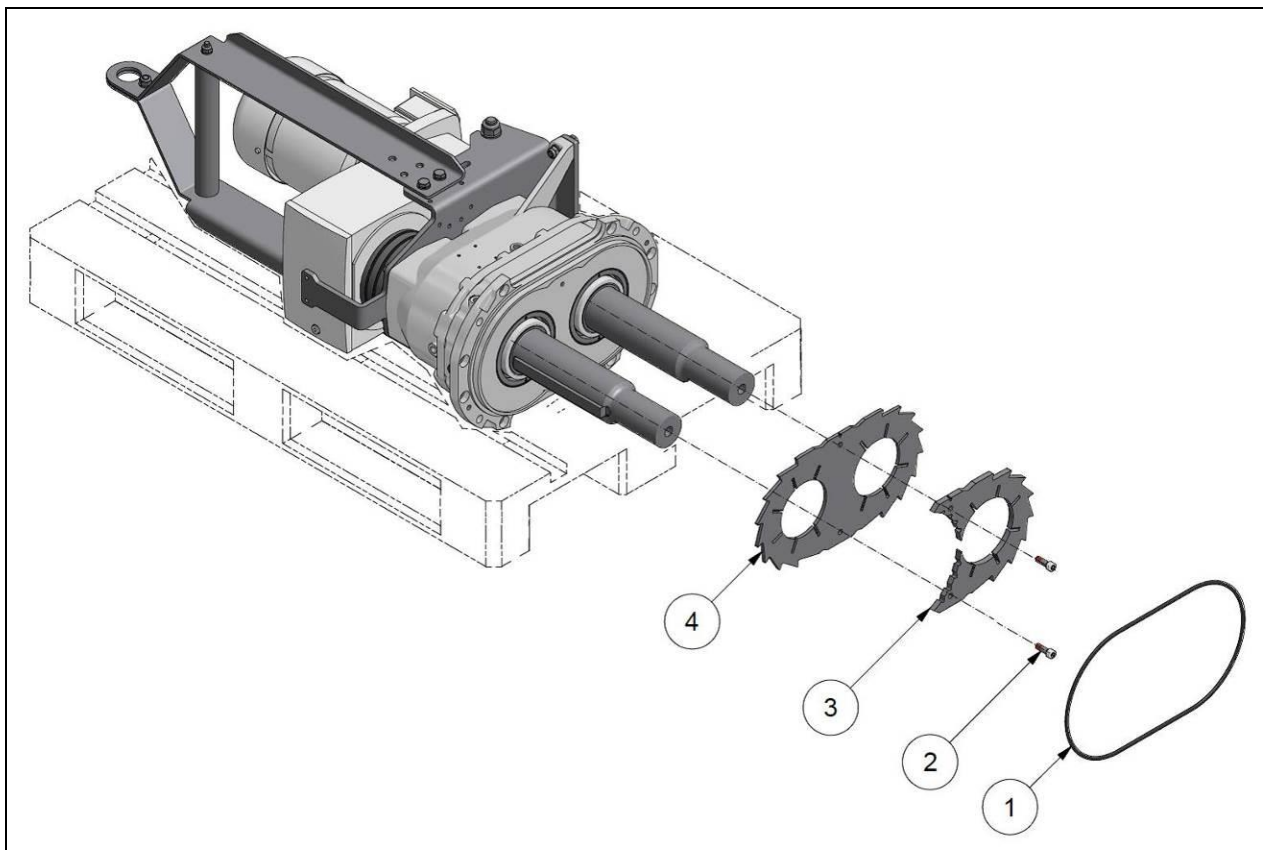


Fig. 20: Wear plate change at gearbox side

1. Perform the steps in → Chap. "Changing the XRipper rotors".
2. Remove O-ring (1) and undo screws with microencapsulation (2).
3. Remove the wear plates (3) and (4).



### 9.4.3 Assembly of the wear plates

The wear plates are assembled in the reverse order of disassembly. Make sure the orientation of the wear plates is correct, on both the cover side and the gearbox side:



#### ATTENTION

The cutting direction (1) of the wear plates must always be the opposite of the cutting direction of the XRipper rotor blades (2). → Fig. "Orientation of the wear plates".

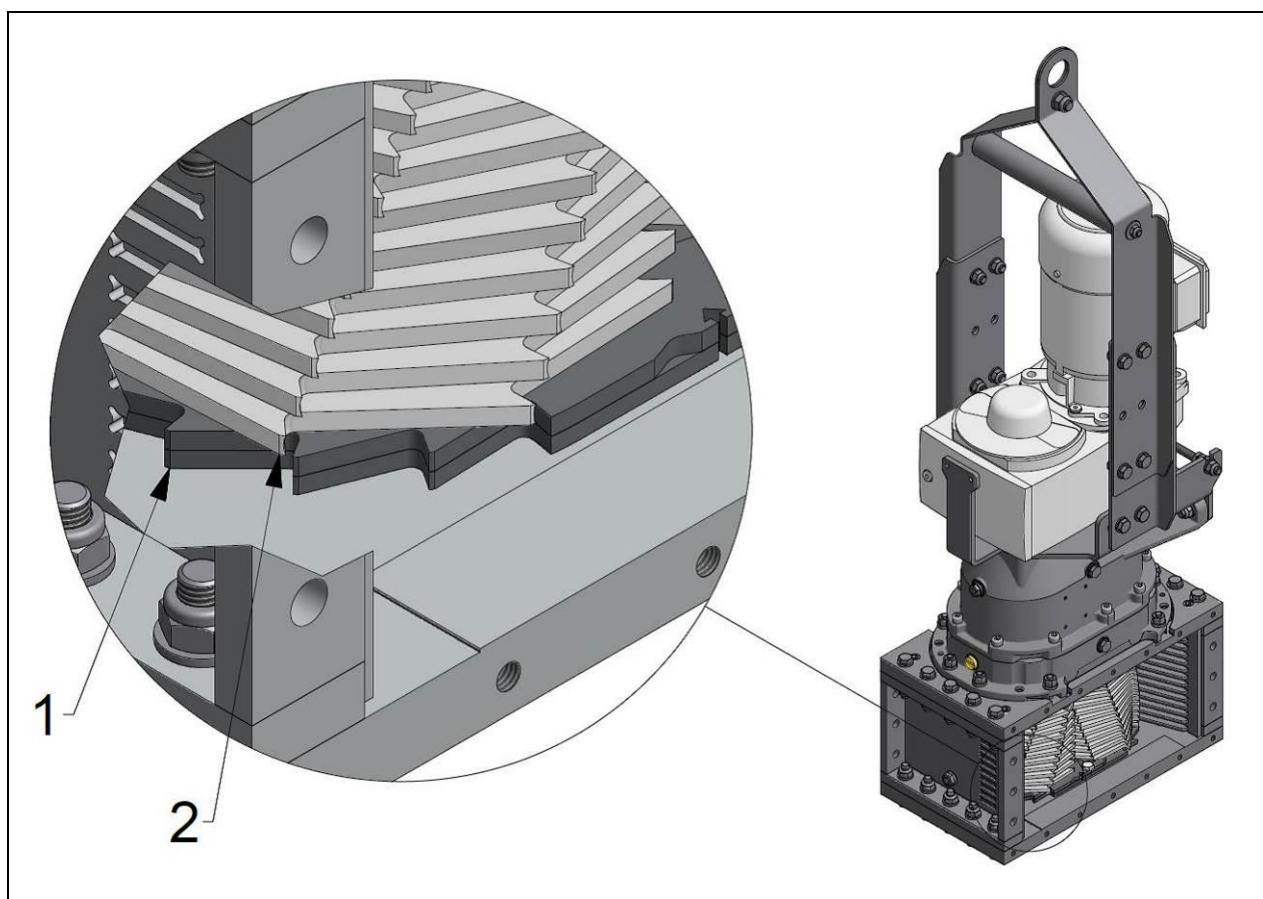


Fig. 21: Orientation of the wear plates



#### Tightening torques

Wear plate screws: **40 Nm**

## 9.5 Change of cartridge mechanical seal



Cartridge mechanical seal – installation/disassembly tool

Size 186Q: Part no. WKZ0457

1. Depressurise the buffer chamber if necessary.
2. Dismount the functional unit → **Chap.** “Disassembly of the functional unit”.
3. Drain the buffer chamber and clean it if necessary → **Chap.** “Draining and cleaning the buffer chamber”.
4. Drain the gear oil → **Fig.** “Gear oil change”.
5. Perform the steps in → **Chap.** “Changing the XRipper rotors” and “Wear plate change”.
6. Remove the set screws (1) of the cartridge mechanical seal.
7. Put on installation/disassembly tool (A) and screw the cylinder head bolts (2) into the extracting boreholes of the cartridge mechanical seal.
8. Evenly pull out the cartridge mechanical seal using the three hexagon head bolts (3).
9. Change O-ring (4) in the bearing seal housing.
10. Before installing the new cartridge mechanical seal, carefully remove the burrs on the keyways and clean the cartridge mechanical seal seat in the housing.
11. Push new cartridge mechanical seal onto the shaft. Carefully oil the outer O-rings (4) on the seal carrier before installation. Attention! Do not use mineral oil or grease for O-rings made of EPDM. Use glycol as an alternative.
12. To install the new cartridge mechanical seal, place the installation/disassembly tool on the cartridge mechanical seal without bolts.

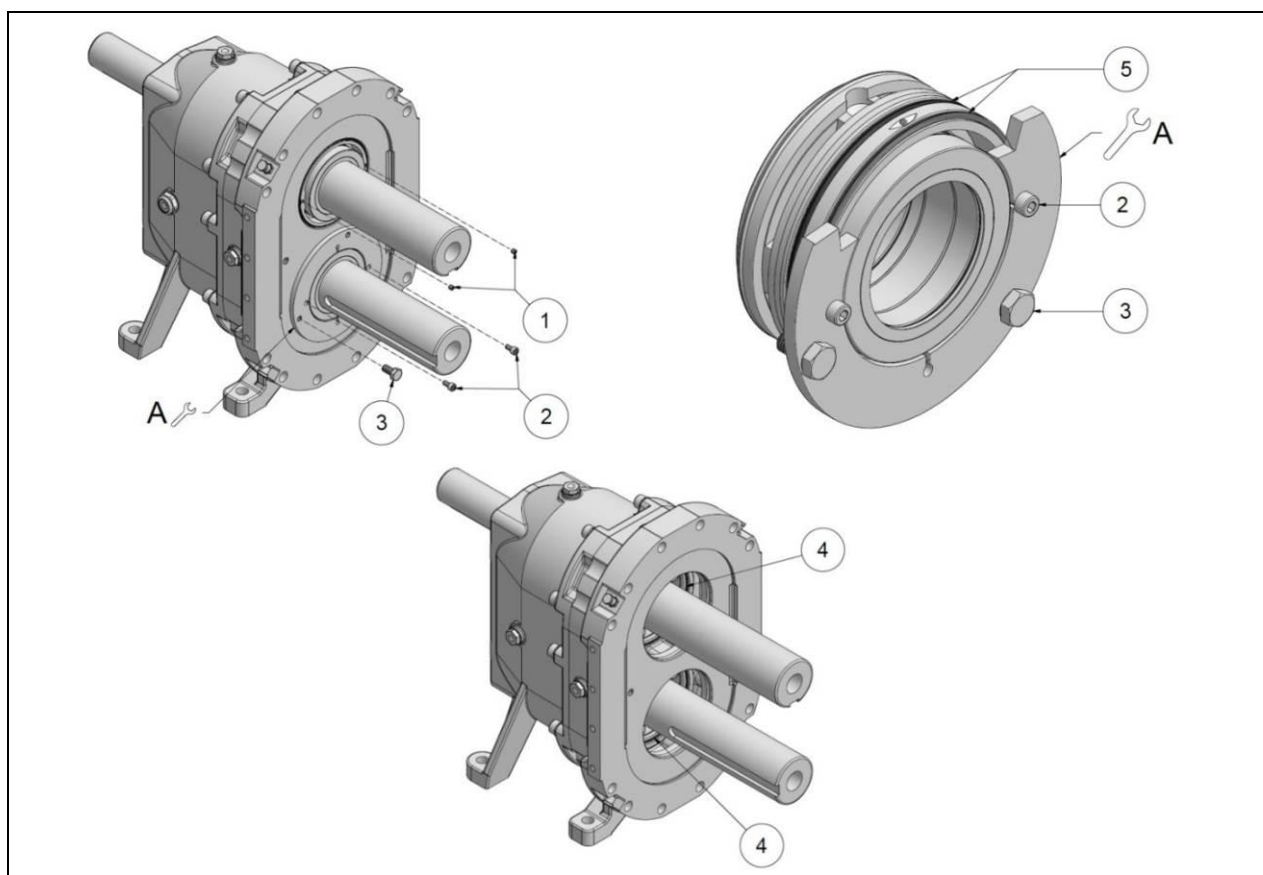
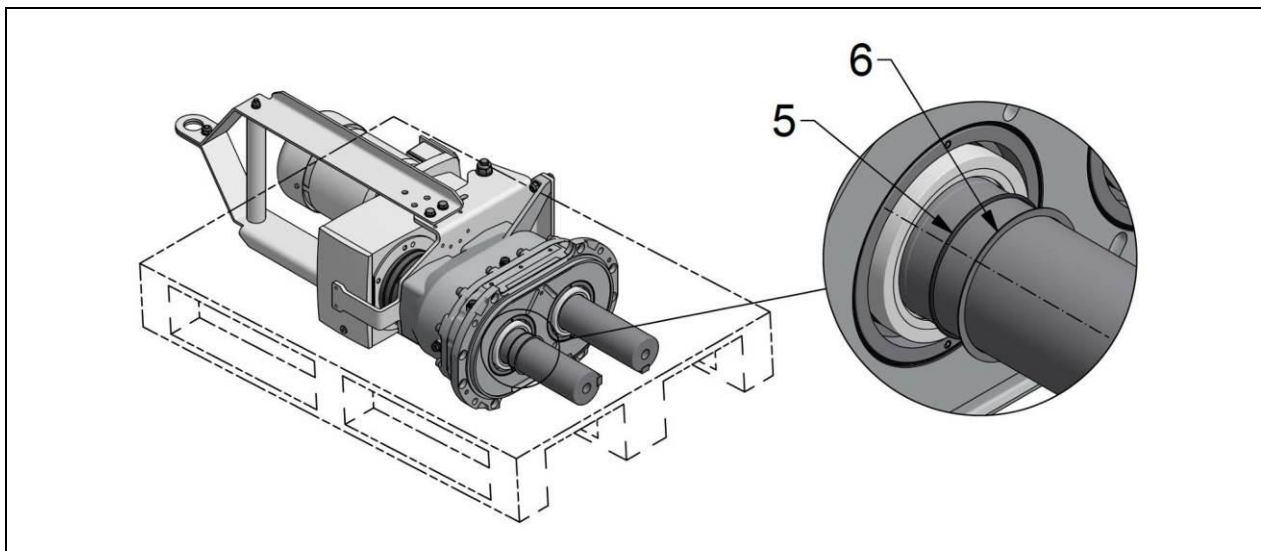


Fig. 22: Disassembly/installation of the cartridge mechanical seal  
(pos. A, 2 and 3 are included in assembly/disassembly tool; for part no. see above)

13. Push the XRipper rotor without fitting key onto the shaft and press it against the cartridge mechanical seal until the seal is sitting flush. If the pressing force is not sufficient, install spring washer, pressure disc and strain bolt as well → **Fig.** “Changing the XRipper rotors”. Tighten the XRipper rotor with strain bolt until the cartridge mechanical seal is sitting flush.
14. Remove the strain bolt, pressure disc, spring washer and XRipper rotors again.
15. Push O-ring (5) and support ring (6) onto the shaft → **Fig.** “O-ring and support ring disassembly/assembly”.



*Fig. 23: O-ring and support ring disassembly/assembly*

16. Before installing the XRipper rotors, thoroughly clean the contact surfaces of the XRipper rotors and cartridge mechanical seal!
17. Re-install the wear plates and XRipper rotors.
18. Top up the buffer chamber and readjust the pressure in the buffer chamber if necessary.
19. Top up the gear oil.
20. Continue with → **Chap.** “Assembly of the functional unit”.

## 9.6 Assembly of the functional unit

→ Fig. "Disassembly/assembly of the functional unit"

1. Clean the contact surfaces thoroughly.
2. Grease the O-ring (3) and press it onto the contact surface. Make sure that the O-ring adheres.



### WARNING

**Risk of crushing from rapid dropping of sharp-edged XRipper rotors into the XRipper housing!**

3. **Slowly** lower the XRipper and **carefully** guide the XRipper rotors into the XRipper housing (4).
4. Install and tighten (85 Nm) the hexagon nuts (2) again.  
**Attention! Do not tilt the XRipper housing while doing this, but press it evenly by hand (no tools)! Make sure the O-ring is seated correctly.**

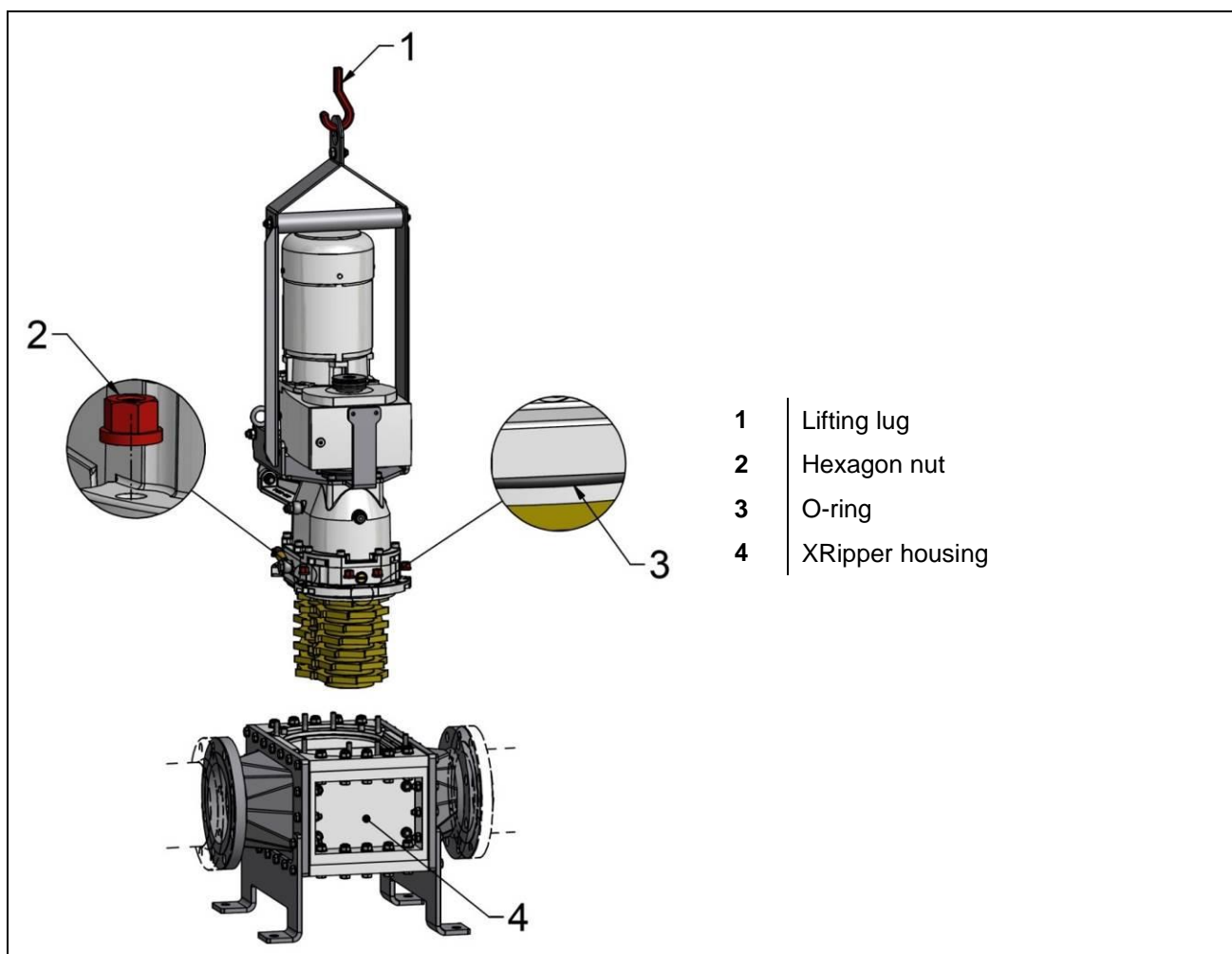


Fig. 24: Disassembling/assembling the functional unit

## 10 Troubleshooting

### 10.1 Application problems

#### Application problem


• XRipper stops after starting, will not start	A, B
• XRipper stops during operation	A, B
• XRipper rotates, but does not cut	K, M
• Leakage on XRipper	L
• Power consumption too high during operation	G, H, L
• Pressure and level variations in the buffer chamber	D, F
• Leakage at the mechanical seal	E, F
• Extreme pressure and level fluctuations in the buffer chamber	E
• XRipper too hot	C
• Motor too hot	B, I, L
• Noises & vibrations	B, C, H, L

#### Help

→ Chap. "Help"

### 10.2 Help

	Possible cause	Possible remedy	Observe notices and safety notes → Chap.
<b>A</b>	Hard foreign matter in the XRipper chamber	Retrofit the system control, which attempts to get rid of the blockage by reversing several times. If the XRipper remains stationary then remove the foreign matter from the XRipper chamber.	"System control"
<b>B</b>	Faulty electrical connection	Have an electrician check the electrical equipment.	"Drive"
<b>C</b>	Oil level in the XRipper gearbox is not OK	→ Chap. "Gearbox"	"Maintenance"
<b>D</b>	Operational fluctuations in buffer chamber	→ Chap. "Buffer chamber"	"Maintenance"
<b>E</b>	Cartridge mechanical seal damage	Change the cartridge mechanical seal, → Chap. "Cartridge mechanical seal change"	"Repair"
	Faulty repair of the cartridge mechanical seal		
	Buffer fluid tank leaking	Check buffer fluid tank for leaks.	"Maintenance"
<b>F</b>	Cartridge mechanical seal elements not in ideal position	Pressurise the buffer chamber once with the max. permissible buffer chamber pressure (tank pressure) (single mechanical seal: 5 bar, double mechanical seal: 10 bar). Then restore the design pressure.	"Buffer chamber" "Pressurisable buffer fluid tank"
		Put the buffer chamber into operation in its non-pressurised state (buffer fluid tank closed) and observe the buffer chamber fluid level and pressure.	
		Adjust the tank pressure (buffer chamber pressure) to higher than its design pressure. Observe max. permissible buffer chamber pressure (tank pressure): Single mechanical seal: 5 bar, double mechanical seal: 10 bar	

	Possible cause	Possible remedy	Observe notices and safety notes → Chap.
<b>G</b>	Foreign matter jammed in between the XRipper discs	Clean the XRipper chamber and XRipper rotors (XRipper discs)	"Opening the functional unit"
<b>H</b>	Damaged XRipper discs	Check the XRipper rotors for coarse burrs, grind them off if necessary or replace the XRipper rotors	"Changing the XRipper rotors"
<b>I</b>	Oil level in the geared motor is not OK	 "Geared motor operating instructions"	
<b>K</b>	Incorrect direction of rotation	Change the direction of rotation of the XRipper	"Flow direction"
<b>L</b>	XRipper placed under stress by the pipe	Check the orientation of the pipe to the XRipper. If necessary, provide a compensator or secure the pipe	"Installation"
<b>M</b>	Clogging on the inlet side of the XRipper	Check free orifice diameter of the pipe system on the inlet side	

### 11 Putting out of operation and disposal

1. Disconnect XRipper from the power supply. Observe notices and safety notes → **Chap.** "Installation" → **Chap.** "Drive".
2. Disconnect XRipper from the pipe. Observe notices and safety notes → **Chap.** "Installation" → **Chap.** "Installation in pipes".



#### **WARNING**

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#### **Risk of injury by crushing or impact!**

Pipes under flexural strain can spring back under spring energy.



- Personnel must wear suitable protective clothing.
  - Take care when undoing bolts and screws.
3. Drain working materials.
    - Drain the gear oil from the XRipper gearbox. Observe notices and safety notes → **Chap.** "Gear oil – inspection and change".
    - Drain buffer fluid from the buffer chamber. Observe notices and safety notes → **Chap.** "Draining the buffer chamber".
  4. Drain the XRipper and remove residual medium. Observe notices and safety notes before disassembly of the functional unit → **Chap.** "Disassembly of the functional unit".



#### **Environmentally friendly disposal**

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Working materials such as oils, hydraulic fluids and dangerous media should be treated as hazardous waste and disposed of properly.

5. Hand over XRipper for scrap: Observe notices and safety notes → **Chap.** "Transport, storage".

## 12 Maintenance plan



### ATTENTION!

Carefully follow the following maintenance instructions and, if applicable, document them in the service plan → **Chap.** "Service plan".

**Safety devices** must be checked on a regular basis for proper function, especially after maintenance and repair work and before start-up.

Observe and comply with the **maintenance instructions in the relevant documents** → **Chap.** "Relevant documents".

**Before and after long periods of shutdown**, rinse the XRipper with water

Change the buffer or quenching fluid if it is **severely contaminated**.

If the machine's **running noise changes** → **Chap.** "Trouble-shooting".

### 12.1 Maintenance intervals



### ATTENTION!

Carefully observe the following maintenance intervals and document them in the service plan → **Chap.** "Service plan".

#### After the first 20 operating hours:

- Tighten the bolts and screws for machine attachment and on XRipper connectors
- Check the buffer or quenching fluid
- Change gear oil

#### Every 200 operating hours:

Check the buffer or quenching fluid

#### Every 500 operating hours, at least once every three months:

Check gear oil

#### Every 2000 operating hours, at least once a year:

- Tighten the bolts and screws for machine attachment and on XRipper connectors
- Change the buffer or quenching fluid
- Change gear oil



13 Service plan

The guarantee is valid only if maintenance and service work is performed and documented acc. to → Chap. "Maintenance plan".

Serial number: \_\_\_\_\_

Activity as per maintenance plan	Operating hour meter/ throughput rate	Date	Signature

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