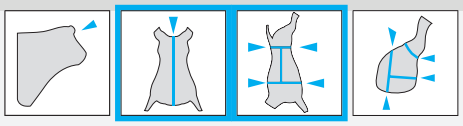
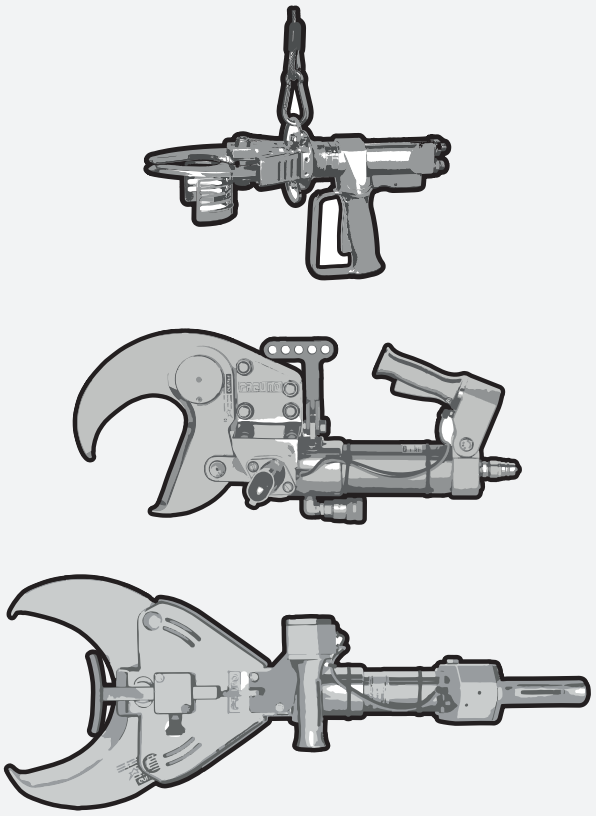
FREUND
GERMAN QUALITY SLAUGHTER-TOOLS

OPERATING MANUAL
SHEARS AND HYDRAULIC PUMPS

OPERATING MANUAL

Translation of original manual





SHEARS MODELS

- FS6
- FNS9
- HDS15
- HLS12
- LS15
- NS21
- NS26
- NS26-H1
- AS28
- HG12_evo2

HYDRAULIC PUMPS MODELS

- HPP12
- HPE9
- HPE20

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This operating manual was compiled with the greatest care. However if you notice incompleteness and/or mistakes, please inform us.

Contents

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1 About this Manual

The Shears and hydraulic pumps are also referred to as machine in this operating manual.

This operating manual was prepared to enable you to work quickly and safely with your machine.

The operating manual is a component of the machine and contains important recommendations, instructions and information.

- to enable safe and proper installation of the machine.
- to enable safe operation of the machine.
- to enable you to rectify simple faults yourself.
- for maintenance and cleaning.

Before you start operating the machine, read this entire operating manual thoroughly and carefully. It is imperative that you adhere to all written safety and warning information.

1.1 Target group

This operating manual is intended for operators of slaughtering facilities and the staff employed there, as well as for butchers and small businesses and their apprentices.

The operating manual is intended in particular for qualified personnel for assembly, installation, maintenance and servicing and for the cleaning staff.

The target group must have basic technical knowledge of how to handle the machine described herein.

1.2 Liability and warranty

All information and instructions regarding the operation and maintenance of the machine contained in this manual are provided to the best of our knowledge, taking into account our experience and know-how.

We will accept no liability for claims that extend beyond the scope of the warranty agreed in the main contract.

The original version of this operating manual was written in German. The translation was created with the best care and knowledge, but we assume no liability for translation errors. In case of doubt, the original German version always applies.

Exclusion of liability

We assume no liability and warranty:

- for wearing parts.
- for damage that occurs during slaughtering.

Furthermore, we expressly point out that we do not assume any liability for damages attributable to the following causes:

- not observing the information provided in this operating manual at all or to the necessary extent
- non-intended use
- unsuitable or improper handling
- spare parts or parts are used which have not been approved by FREUND Maschinenfabrik GmbH & Co. KG
- changing functions or materials on the machine without prior approval
- operating the machine incorrectly or operation by unqualified personnel
- safety devices being removed or manipulated
- cleaning the machine incorrectly or unprofessionally
- chemical or mechanical overloads
- maintenance and repair work not being carried out according to instructions or maintenance intervals not being adhered to

Modifications and/or adjustments to the machine are possible in certain cases. In such cases, prior written approval must be obtained from FREUND Maschinenfabrik GmbH & Co. KG – subsequently referred to as FREUND Maschinenfabrik.

1.3 Storing the operating manual

This operating manual is part of the machine and must be accessible at all times to the operating, maintenance and cleaning staff during the entire service life of the machine.

Therefore, always keep the operating manual near the machine’s place of use.

1.4 Installation manuals and technical information

Purchasing a FREUND product gives you access to our online customer portal, FREUND Assistance (FA). FA will show you which spare parts are available for your product. You can send an order request directly to our sales team via FA. The requisite installation manuals for ensuring safe installation of your FREUND spare parts are also provided on the FA portal. You will also find the CE declarations for series machines on the FA portal.

The appendix to this operating manual and the FA portal contain technical information (TIN). TINs provide descriptions of the most important maintenance and operating steps for your machine.

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1.5 Warnings

While you are using the machine, dangers may occur in certain situations or as a result of certain behaviours.

In this operating manual, warning information is given at the start of the respective chapter or life phase that involves danger of personal injury or property damage. They relate to all following actions of the chapter or life phase.

The precautions described must be observed to avoid the danger.

Structure of a warning

Signal word!

Type and source of the imminent danger.

Possible consequences of the danger if the warning is disregarded.

➢ Instructions for averting the danger.

Signal word	Meaning
DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
ATTENTION	Indicates a potentially hazardous situation which, if not avoided, could result in damage to the machine or the environment.

1.6 Symbols and layout elements

1.6.1 Layout elements

- Enumerations

➢ Individual, independent instruction step

Result arising from the instruction step

1. Step-by-step sequences in a specific order
2. The numbers indicate that the instruction steps follow each other
3. *Result arising from the instruction steps*

→ References to another chapter

Important additional information or special details regarding the use of the machine

Embedded warning note - shows type and source of the danger and the measure to avoid the danger

1.6.2 Safety signs

Warning signs

Warning of a danger point

Caution! At this point there is an increased danger to your safety.

Warning of sharp-edged machine parts

Danger to the fingers and hands from cutting and striking.

Danger to limbs from cutting or severing and injuries to the body.

Warning of dangerous electrical voltage

Danger to life from electric shocks to the body.

Warning of substances harmful to health and irritants

The information on the packaging and containers must be observed. Keep separate from food.

Prohibition signs

General prohibition signs

This sign is only used in connection with an additional sign or text, which describes the prohibition in greater detail.

High-pressure cleaners forbidden

Do not use high-pressure cleaners to clean the machine.

Parts of the machine could be damaged.

Mandatory signs

Wear protective gloves

protect the hands against friction, abrasions, and cuts.

Wear safety spectacles

protect the eyes against flying parts, fragments and squirting liquids

Wear a protective apron

protects the body against humidity, blood and other fluids.

Wear safety shoes or rubber boots

protect the feet against crushing, falling objects and guarantee secure support

Comply with the operating manual

Be sure to observe the information and notes in the operating manual.

Separate spare **parts list available**

There is a separate spare parts list for this spare part.

Assembly manual available There is an extra assembly manual for this spare part. In the assembly manual, work steps and required tools are shown.

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Available as a set

The symbol indicates an article in a set. In a set, multiple related spare parts are available together. A plate clarifies which parts are included.

Tool set available

To install this spare part, a special tool is required which can be ordered from us.

2 **The order of the work steps is marked with numbers in the grey field.**

Lubrication

Information about the amount and properties of the lubricant can be found in the operating manual.

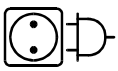
No lubrication

Glue

Parts must be glued; information about the type and properties of the glue can be found in the operating manual.

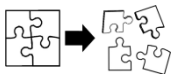
Cleaning

Instruction for an additional cleaning step.

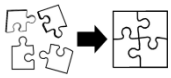


Power plug

symbolises the connection of the machine to the power network.



Disassembly of the machine or component



Assembly of the machine or component

symbolises the assembly of the machine after prior disassembly, carry out work steps in the reverse order.

2 For your Safety

This chapter describes the safety measures and safety devices. It serves for your orientation regarding safety questions about the use of the machine.

Safety instructions are intended to provide occupational safety and prevent accidents. Observe all the safety instructions provided here and at the beginning of each chapter.

Be sure to read the following chapter on safety and the safety instructions contained within carefully before commissioning and using the machine.

2.1 Obligations of the operator

In accordance with the rules and regulations of the employers' liability insurance association relating to the safety and health when working for a business in the meat industry (BGR 229), the site operator may only allow insured persons who are 18 years old and are familiar with the equipment and the handling of the equipment to operate slaughter equipment.

Young people over the age of 16 may be employed if this is required as part of their vocational training and if they have read and understood the safety regulations. Their safety must be ensured by a supervisor.

Risk assessment and protective measures

Before using work equipment, the operator must assess the risks that could occur (risk assessment) and derive necessary and suitable protective measures from this assessment. The presence of a CE marking on the work equipment does not release the operator from its obligation to carry out a risk assessment (German Regulation on Safety and Health - BetrSichV from 3 February 2015 Section 2 (3)(1)).

Operating instructions

Before employees use work equipment for the first time, the operator must provide them with written operating instructions for use of the work equipment in a form and language understandable to said employees and make them available in a suitable location (German Regulation on Safety and Health - BetrSichV 3 February 2015 Section 2 (12)(2)).

Operating staff

The site operator, as a higher level legal person, is responsible that the machine is used in accordance with its intended use and is responsible for training and for assigning authorized and qualified operating, maintenance and cleaning staff.

The site operator is obliged to ensure that each employee is properly trained in the operation of the machine.

Staff undergoing training may only work at the machine under the supervision of properly qualified staff.

Instruction of staff

The operator is obliged to instruct employees regularly and in light of certain events (e.g. if an accident has occurred) in safe work procedures and occupational safety and health. We recommend that the instruction and the content covered should be documented by the employee's signature.

Risk assessment	The site operator must inform operators of possible dangers, symptoms and preventative measures. Relevant occupational safety conditions have to be complied with.
Workplace	The workplace must comply with the national and regional hygiene and workplace regulations.
Escape routes	The operator must ensure that sufficient escape routes are available for the staff and that these are clearly marked. The operator must ensure that escape routes are not obstructed and that their function is not impaired (e.g. that doors open towards the escape route).
Cleaning	The operator must ensure that machine and working equipment can be cleaned easily and without any risk. The operator must provide suitable detergents and define suitable cleaning procedures.
Safety of the machine	The site operator must ensure that the machine is only operated and used in perfect and functional condition. The site operator must ensure that safety devices are regularly serviced and checked for proper function.

2.2 Employee responsibilities

Operating staff	The operating staff must be properly instructed and trained by the operator. Staff who have read and understood the safety information and have been properly familiarised themselves with the operation of the machine can be regarded as instructed. Operating staff must be familiar with the operating manual and the applicable OHS and accident prevention regulations.
Qualified personnel	A technical expert is a person who, due to technical training and experience, possesses sufficient skills and knowledge. The technical expert must be familiar with the operating manual and the applicable OHS and accident prevention regulations, as well as the applicable animal welfare laws.
Competent personnel	Competent personnel are such persons who, due to technical training and experience, possess sufficient skills and knowledge. The technical expert must be familiar with the operating manual and the applicable OHS and accident prevention regulations as well as with the latest regulations of the protection of animals.
Safety at the workplace	Maintain a stable upright position and keep your balance. Avoid awkward postures. Keep your workplace clean and tidy. Untidy workplaces can cause accidents. Always wear the personal protective equipment provided. Keep children, young persons and untrained staff away from the machine.
Emergency procedures	In the case of an accident, administer first aid and call a doctor and emergency medical services. Notify the operator or his authorised representative of every accident.

Machine safety

Before starting any work, carefully check the machine for proper function in accordance with the intended use.
Do not set the machine into operation if it does not work correctly.
Switch off the machine immediately if it no longer works correctly and have it checked.
Have defective safety devices, switches or other defective machine parts repaired.
Notify the operator or his authorised representative of any changes to the machine which may affect your safety.

2.3 Personal protective equipment

The staff must carry the customary personal protective equipment. The personal protective equipment is dependent on the respective field of work.

The personal protective equipment must be provided by the operator. For hygienic reasons, each employee gets his/her own personal protective equipment.

2.4 Residual risks

The Shears and hydraulic pumps was built according to the current state of the art before being placed on the market and complies with the basic safety and health requirements of the European Union.

The machine is operationally safe, assuming compliance with the operating manual, the company-specific instructions and the accident prevention regulations.

However, there are still dangers involved which cannot be eliminated by design measures. These include:

- danger of injury from compressed air/overpressure
- Cutting injuries from cutting tools
- danger of injury from flying pieces of meat and bone fragments
- Danger of injury from breakage or ejection of fragments of the cutting tool.
- danger of injury to fingers and hands.
- risk of injury from negligent handling of personal safety equipment while operating the stunning device, during maintenance and repair work and during cleaning and disinfection

It should also be noted that, despite all precautionary measures, residual risks may remain which are not evident.

You can minimise these residual risks by observing the safety instructions given at the beginning of the individual chapters and observing the instructions in the entire operating manual.

2.5 Intended use

All Freund hydraulic shears

- may only be operated by one operator at a time.
- may only be operated with intact safety devices.

The FNS9 is intended

- for use in severing the head joint between the head and neck on pigs and sows.
- for use in the removal of feet from halved pigs, sows, and sheep.

The HDS15 is intended

- for use in the general cutting up of pigs and sows
- for use in the severing of whole sheep and goat heads (with and without wool).

The HLS12 is intended

- for use in the removal of horns and legs from cattle on cattle slaughter lines.

The LS15 is intended

- for use in the removal of legs from cattle, calves, pigs, and sheep.
- for use in the removal of horns of any size.

The NS21 is intended

- for use in the removal of heads from pigs and sows in high throughput plants.

The NS26 is intended

- for use in the removal of heads from pigs and boars in high throughput plants.

The AS28 is intended

- for use in the quartering of cattle in high throughput plants.

The FREUND horn guillotine are

- intended for use in the removal of horns from cattle and bulls in high throughput plants.

Operating the machine within the limits of its intended use also involves:

- observing the safety instructions.
- proper execution of repair and maintenance work.
- regular cleaning of the machine.

Any other use is considered as contrary to the intended use and poses risks to the safety of operating staff.

Disclaimer of liability

FREUND Maschinenfabrik does not accept liability for any damage resulting from improper use of the machine.

2.6 Improper use

Every use other than those described as → chapter *Intended use* is deemed to be non-intended and is thus inadmissible.

The operator is solely responsible for risks in the case of improper use. Consult the manufacturer in case of doubt.

- Do not use the machine to cut other materials such as wood, plastic or stone.
- Do not use the compressed air jet of the hydraulic pump for cleaning of clothes or bodies.
- Do not extend the connecting cables to the machine.
- Do not use a machine if the safety devices are not functional.

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3 Technical Description

3.1 Rating plate

The rating plate is attached to the cylinder and provides information on the machine performance.

1.
2.
3.
4.

Abb. 3-1

Element	Erklärung
1	Company address
2	Machine type and designation
3	Working pressure Air pressure
4	Year of manufacture of the machine and production order no.

3.2 Machine overview - Shears

The machines described here are hydraulically or pneumatically operated shears for cutting up carcasses. All machines are hand-held tools and equipment that are connected to a hydraulic unit by means of hoses. All machines are equipped with one or two handles with triggers, which need to be actuated simultaneously in order to close the cutting tool.

Structure of the shears

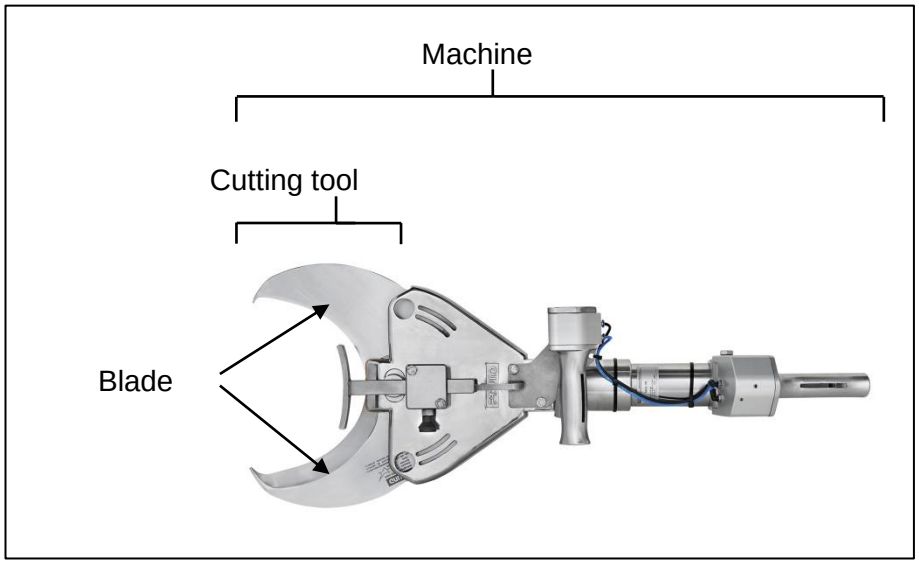


Fig. 3-2 Structure using shears NS21 as an example

All machines must be attached to a balancer system for work. In order to operate the machines, it is also necessary to connect said machines to a hydraulic unit using a hose kit. Details of suitable hydraulic units, balancer systems and hose kits can be found in the information about the individual shears available on the pages that follow.

3.2.1 Foot shears FS6

Use

- Removal of feet from sheep
- >10,000 sheep per week
- High throughput plants

View

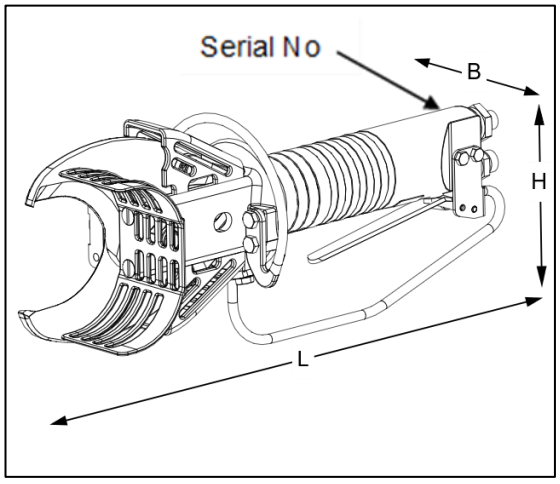


Fig. 3-2 Shears Model FS6

Dimensions

	FS6
Weight [kg]	3.0
Opening [mm]	68
Length L (mm)	400

Height H (mm)	129
Width B (mm)	163

Technical data

	FS6
Weight [kg]	3
Opening [mm]	68
Cutting speed [s/cut]	1-2
Working pressure [bar]	160
Connections [']	3/8

Optional accessories

	Part No.
Hydraulic pump HPP12	942-112-001
Balancer F4-2.5	920-414-001
Hose kit	142-103-101
Disinfection cabin DES-K01	913-501-502

3.2.2 Foot and neck shears FNS9

Use

- Removal of feet from halved pigs, sows and sheep
- For severing the head joint between the head and neck on pigs and sows
- >10,000 sheep or >5,000 pigs per week

View

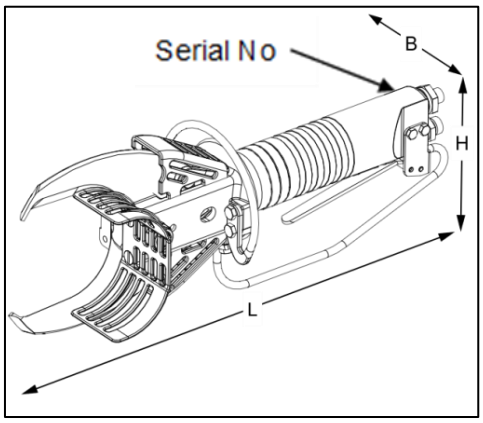


Fig. 3-3 Illustration example for FNS9 with champ and vertical knife

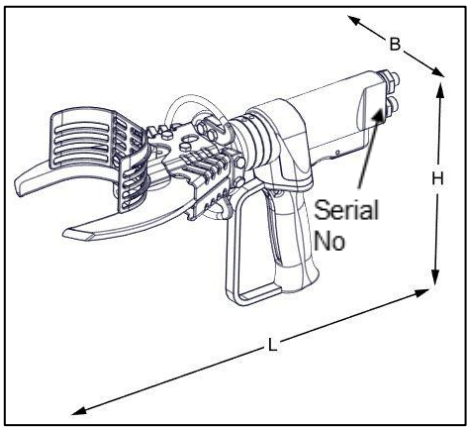


Fig. 3-4 Illustration example for FNS9 with pistol handle and horizontal knife

Dimension

	FNS9 (Fig. 3-4)	FNS9 (Fig. 3-5)
Length L (mm)	428	430
Height H (mm)	170	247
Width B (mm)	129	140

Technical data

	FNS9 (Fig. 3-4)
Weight [kg]	3.9
Opening [mm]	90
Cutting speed [s/cut]	1.0
Working pressure [bar]	160
Connections ["]	3/8

Possible variants

The possible variants can be found in the appendix under the heading **TIN-013462**.

Optional accessories

	Part No.
Hydraulic pump HPP12	942-112-001
Balancer F4-2.5	920-414-001
Hose kit	142-103-101
Disinfection cabin DES-K01	913-501-502

3.2.3 Head dropper and general cutting shears HDS15

Use

- Severing the head
- General cutting work
- >10,000 sheep or >5,000 pigs per week
- High throughput plants

View

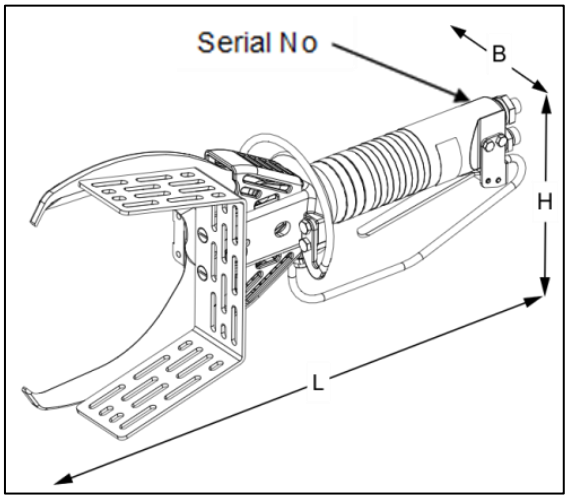


Fig. 3-5 Shears Model HDS15

Dimensions

	HDS15
Length L (mm)	486
Height H (mm)	210
Width B (mm)	129

Technical data

	HDS15
Weight [kg]	3.8
Opening [mm]	150
Cutting speed [s]	1
Working pressure [bar]	160
Connections ["]	3/8

Optional accessories

	Part No.
Hydraulic pump HPP12	942-112-001
Balancer F4-2.5	920-414-001
Hose kit	142-103-101
Disinfection cabin DES-K01	913-501-502

3.2.4 Horn and leg shears HLS12

Use

- Severing horns
- Severing legs
- >500 cattle
- High throughput plants

View

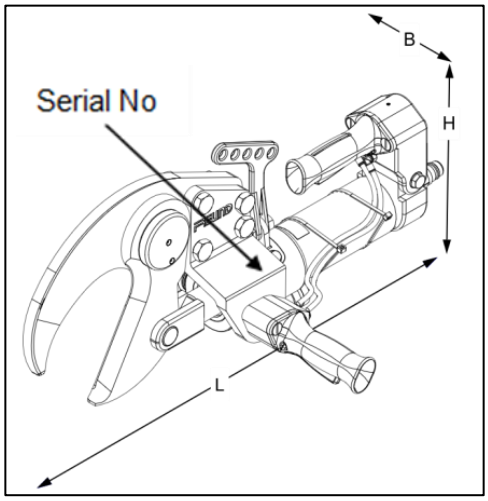


Fig. 3-6 Shears Model HLS12

Dimensions

	HLS12
Length L (mm)	670
Height H (mm)	288
Width B (mm)	305

Technical data

	HLS12
Weight [kg]	27
Opening [mm]	120
Cutting speed [s]	1.5
Working pressure [bar]	150-180
Air pressure control [bar]	3-8
Connections ["]	3/8

Optional accessories

	Part No.
Hydraulic pump HPE9-180-3-30 – 400V*	942-009-010
Hydraulic pump HPE20-150-5,5-44 – 400V*	942-020-006
Balancer F30-2 for shears	920-436-000
Balancer F3-1, 6N for hose	920-403-000
Hose kit 5 m	142-009-510
Hose kit 10 m	142-009-511
Disinfection cabin DES-K02	913-506-003

* Special voltages on request. Talk to our sales team.

3.2.5 Leg shears LS15

Use
- Severing legs
- >500 cattle or >5,000 pigs per week
- High throughput plants

View

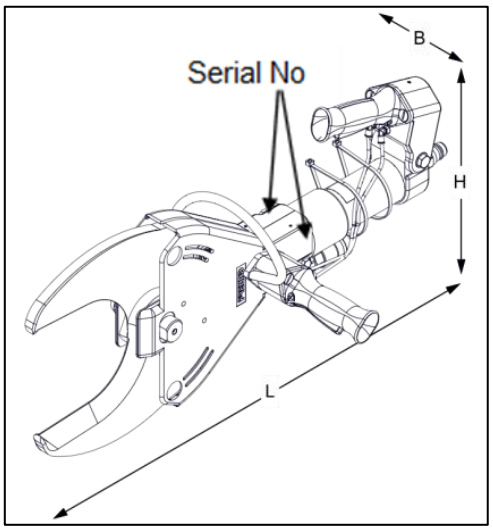


Fig. 3-7 Shears Model LS15

Dimensions

	LS15
Length L (mm)	680
Height H (mm)	312
Width B (mm)	310

Technical data

	LS15
Weight [kg]	21
Opening [mm]	150
Cutting speed [s]	0.7
Working pressure [bar]	100-150
Air pressure control [bar]	3-8
Connections [']	3/8

Optional accessories

	Part No.
Hydraulic pump HPE9-180-3-30 – 400V*	942-009-010
Hydraulic pump HPE20-150-5,5-44 – 400V*	942-020-006
Balancer F22-2 for shears	920-431-000
Balancer F3-1, 6N for hose	920-403-000
Hose kit 5 m	142-009-506

Hose kit 10 m	142-009-509
Disinfection cabin DES-K05	913-509-000

* Special voltages on request. Talk to our sales team.

3.2.6 Neck shears NS21, NS26, NS26-H1

Use

- Removal of the head from pigs
- Removal of the head from sows and boars
- >5,000 pigs per week
- High throughput plants

View

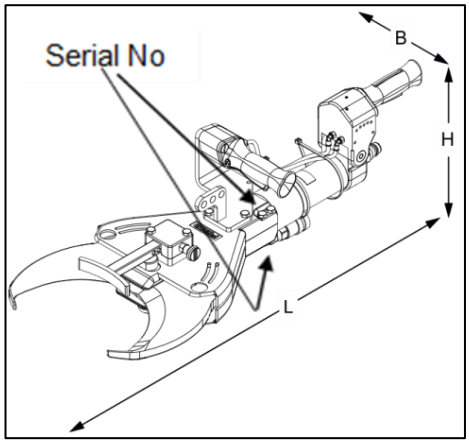


Fig. 3-8 Shears Model NS21

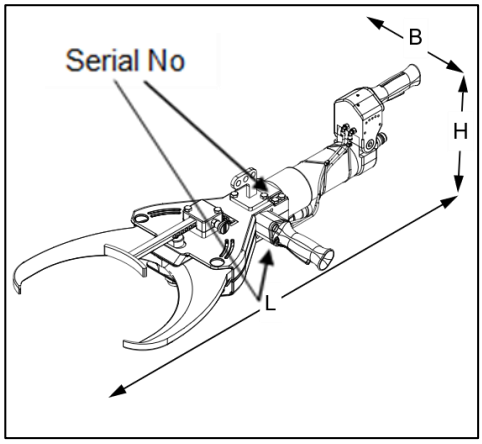


Fig. 3-9 Shears Model NS26

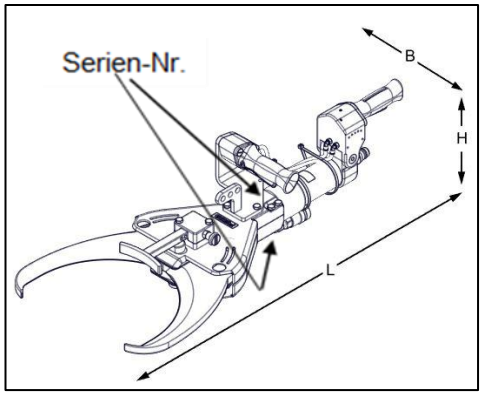


Fig. 3-10 Shears Model NS26-H1

Dimensions

	NS21	NS26	NS26-H1
Length L (mm)	803	959	893
Height H (mm)	210	210	210
Width B (mm)	330	396	396

Technical data

	NS21	NS26	NS26-H1
Weight [kg]	23	30	24

Opening [mm]	210	260	260
Cutting speed [s]	1	1.5	1
Working pressure [bar]	100	100	100
Air pressure control [bar]	3-8	3-8	3-8
Connections ["]	3/8	3/8	3/8

Optional accessories

	Part No.
Hydraulic pump HPE9-180-3-30 – 400V*	942-009-010
Hydraulic pump HPE20-150-5,5-44 – 400V	942-020-006
Balancer F25-2 for NS21 / NS26-H1	920-432-100
Balancer F30-2 for NS26	920-436-000
Balancer F3-1, 6N for hose	920-403-000
Hose kit 5 m for NS21 / NS26-H1	142-009-506
Hose kit 10 m for NS21 / NS26-H1	142-009-509
Hose kit 5 m for NS26	142-009-512
Hose kit 10 m for NS26	142-009-513
Disinfection cabin DES-K05	913-509-000

* Special voltages on request. Talk to our sales team.

3.2.7 Quartering shears AS28

Use
- Quartering of cattle
- >500 cattle per week
- High throughput plants

View

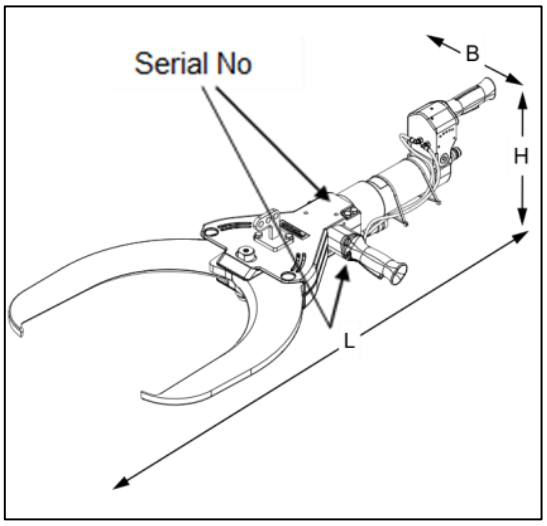


Fig. 3-11 Shears Model AS28

Dimensions

	AS28
Length L (mm)	1,103
Height H (mm)	210
Width B (mm)	510

Technical data

	AS28
Weight [kg]	32
Opening [mm]	280
Cutting speed [s]	0.7
Working pressure [bar]	110
Air pressure control [bar]	3-8
Connections [']	3/8

Optional accessories

	Part No.
Hydraulic pump HPE9-180-3-30 – 400V*	942-009-010
Hydraulic pump HPE20-150-5,5-44 – 400V*	942-020-006
Balancer F35-2 for shears	920-437-100
Balancer F3-1, 6N for hose	920-403-000
Hose kit 5 m	142-009-512
Hose kit 10 m	142-009-513
Disinfection cabin DES-K05	913-509-000

* Special voltages on request. Talk to our sales team.

3.2.8 Horn guillotine HG12 evo2

Use
- Removal of horns

View

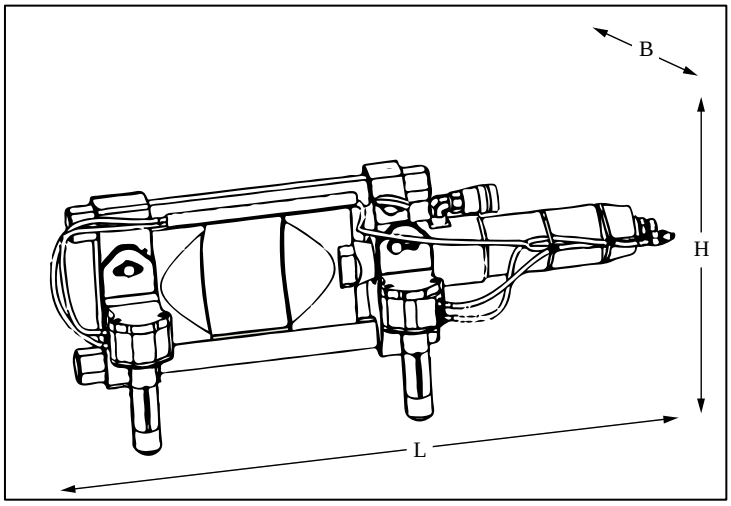


Fig. 3-12 Horn guillotine HG12 evo2

Dimensions

	HG12 evo2
Weight [kg]	35
Opening [mm]	120
Length L (mm)	820
Height H (mm)	250
Width B (mm)	190

Technical data

	HG12 evo2
Cutting speed [s/cut]	1.5
Working pressure [bar]	180
Connections [']	3/8

Optional accessory

	Part-No.
Hydraulic pump HPE9-180-3-30 – 400V	942-009-010
Hydraulic pump HPE20-150-5.5-44 – 400V	942-020-006
Balancer F45-3	920-473-000
Hose kit 5 m	142-009-514
Disinfection cabin DES-K08	913-511-000

3.3 Machine overview - Hydraulic pumps

The hydraulic pump is used in conjunction with hydraulic FREUND shears in industrial cutting plants and slaughterhouses.

The hydraulic pump is a complete hydraulic unit for generating different operating pressures. The pressure is generated by the pneumatically operated pump for the HPP12 and by an electrically operated pump for the HPE9 and HPE20.

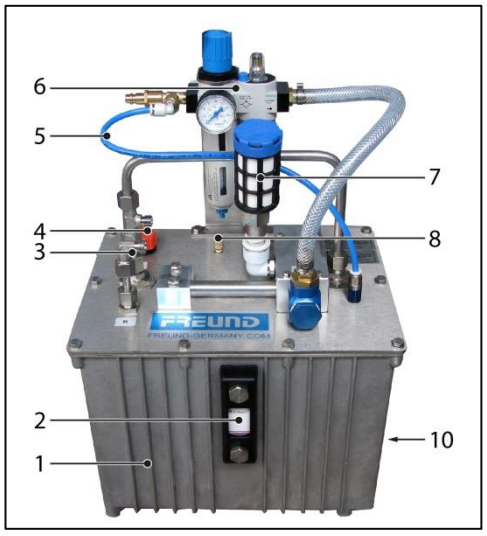


Fig. 3-13 View HPP12

Fig. 3-14 View HPE20

Element	Description	
	HPP12	HPE9/HPE20
1	Tank	Tank
2	Sight glass	Sight glass
3	Connection for shears	Connection for shears
4	Oil fill nozzle	Oil fill nozzle
5	Compressed air branch	Manometer
6	Service unit	Control box
7	Silencer	Motor
8	Air filter	Compressed air connection
9		Air fine filter
10	Oil drain plug	Oil drain plug

3.3.1 Technical data

	HPP12	HPE9	HPE20
Weight – empty [kg] Weight – filled [kg]	23 29	approx. 50 approx. 86	approx. 90 ca. 125
Fill volume hydraulic oil [l]	7-8	21	28
Max. operating temperature [°C]	60	80	
Dimensions (H x W x D) [mm]	→ *Dimensions*		
Drive type	Pneumatic	Electric	
Noise emission at 1 m distance: Noise pressure at workspace L_{pA} [db (A)] – when idling	79	75 ± 3.5	
Sound power level L_{WA} [db(A)] - operation	≤ 80	≤ 80	
Protection class	-	IP 55	

Input			
Driving air pressure [bar]	8-10		
Voltage (V)	---	230/400/690	
Power consumption [A]	---	11.3/6.5/3.7	
Motor rating [kW]	---	3.0	5.5
Control pressure [bar]	---	3 – 6	

Output		**at 50 Hz**	
Max. pressure [bar]	240	180	150
Pump output [l/min]	12	9	20

		60 HZ	
Max. pressure [bar]	---	150	120
Pump output [l/min]	---	11	24

Dimensions

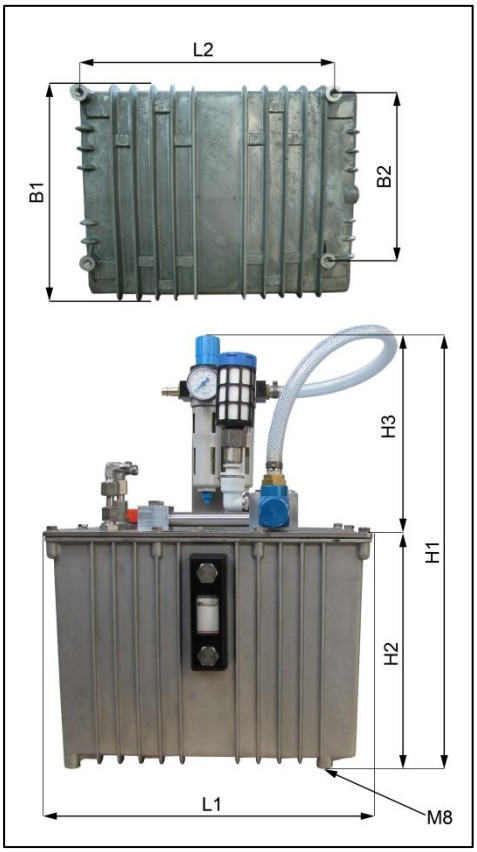


Fig. 3-15 Dimensions HPP12

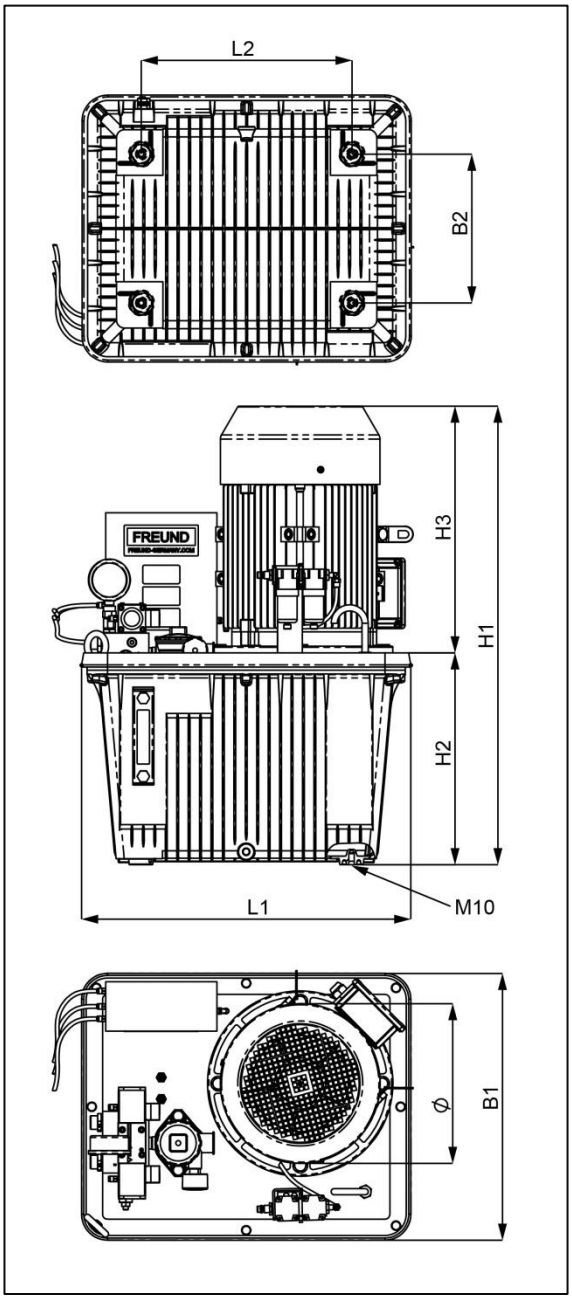


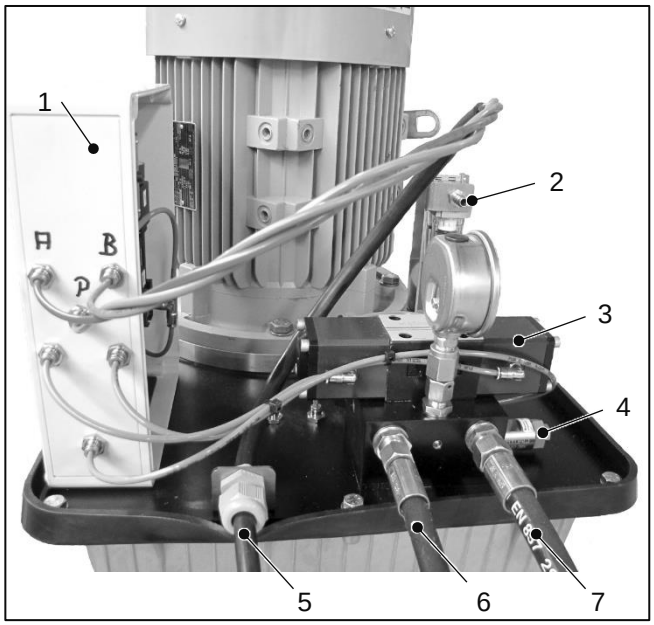
Fig. 3-16 Dimensions HPE9/HPE20

	HPP12	HPE9	HPE20
L1	310	510	540
L2	250	325	340
H1	440	660	735
H2	230	310	335
H3	210	355	390
B1	240	360	450
B2	240	175	170
Ø	---	220	258

[Specifications in mm]

3.3.2 Control elements HPE9/HPE20

Electrical control connections



	Designation
1	Control box
2	Compressed air connection
3	4/3 directional control valve
4	Pressure relief valve
5	Compressed air control line
6	Hydraulic oil return line
7	Hydraulic oil supply line

Fig. 3-17 Electrical control elements

Pneumatic control connections for the two-hand safety switch

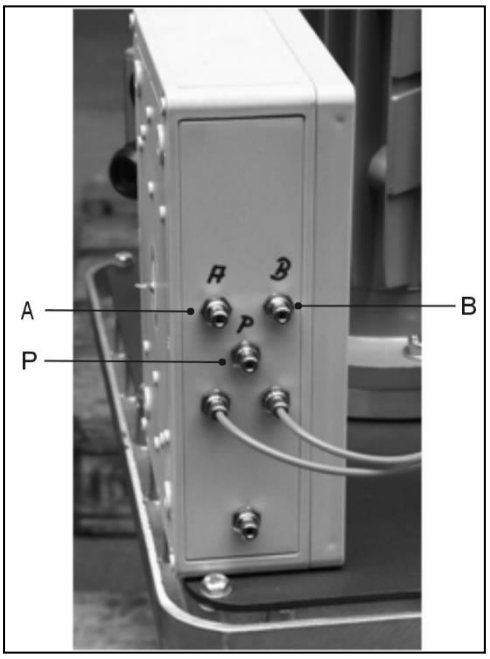


Fig. 3-18 Control box

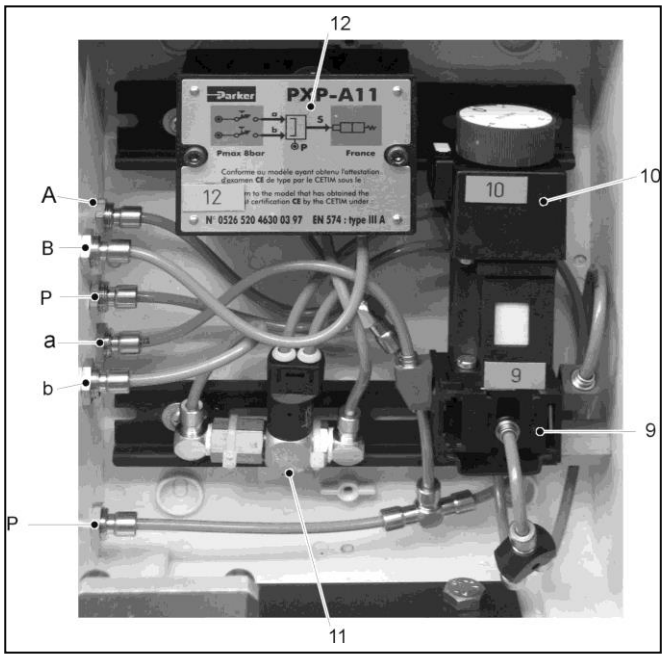


Fig. 3-19 Control box, inside

Connection	Colour
A	Red
B	Green
P	Blue

Element	Designation
9	Timer relay bottom plate
10	Timer relay
11	Differential pressure switch
12	Two-hand safety block

3.4 Service unit

To ensure an even air pressure quality, we have installed a service unit (Part-No. 100-035-082) in front of the machine.

The service unit consists of an oiler, a water separator and a pressure reducer (Fig. 3-1). It is pre-set at 6 bar air pressure.

The compressed air flows through a nozzle and is enriched with atomised oil drops. The service unit is delivered completely with hydraulic oil. The maximum capacity is approximately 0.45 litres.

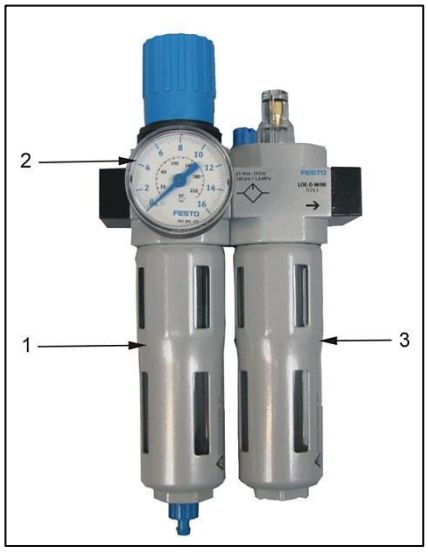


Fig. 3-1 Service unit

	Designation
1	Water separator
2	Pressure reducer
3	Oiler

3.5 Lubricants

The disturbance-free functioning and the efficiency of the machine depend significantly on the quality of the lubricants used.

Information and instructions relating to lubricants can be found in the appendix under the heading **TIN-100-013.**

The H1 designation has been established as an international standard for food grade lubricants.

FREUND Maschinenfabrik uses lubricants that comply with the FDA-H1 standard on all machines where accidental contact between the lubricants and the animal carcass is possible.

-

Safety data sheet

Please refer to the safety data sheets for further information. You can obtain the safety data sheets from our customer service team. The address and telephone number can be found in Imprintthe imprint.

Hydraulic oil

The hydraulic oil recommended by FREUND is a low-viscosity, highly refined medical white mineral oil. It is physiologically harmless and is certified as per FDA H1.

Grease

The grease supplied by FREUND is a high-performance transmission grease that is extremely resistant to high pressure loads and high temperatures. It is hygienically harmless and is characterised by good oxidation and ageing resistance.

It is physiologically harmless and is certified as per NSF-H1.

3.6 Compressed air

The machine is operated using clean dry compressed air. The air quality must meet the requirements of DIN ISO 8573-1, quality class 3.

Minimum requirements

- Solid contamination up to a particle size of max. 5 µm
- Maximum particle concentration up to 5 mg/m^3
- Maximum Water content up to 880 mg/m^3
- Maximum oil concentration up to 1 mg/m^3

EN

4 Transport and storage

FREUND machines are designed for shipment by truck, rail, air or ship. Secure shipment is carried out in individual packaging or multi-packs.

Test run ex works

The machine was tested prior to shipment. Such testing ensures that the machine corresponds to the specified data and is working properly.

Despite all due care, it is possible that the machine could be damaged during transport. When unpacking the machine, please therefore check it for possible transport damage and document any such damage. Notify the transport company and Freund's customer service team immediately.

4.1 Safety information

WARNING!

Danger due to falling or toppling load.

Death or very serious injuries are possible.

- ➢ Only use approved lifting gear and accessories appropriate for the total weight of the machine.
- ➢ Never stand under a suspended load.
- ➢ Secure the danger zone against unauthorized access.
- ➢ Wear a hard hat, protective footwear and gloves.

4.2 Personal protective equipment

4.3 Unpacking the machine

Recycling and disposal

The original packaging of the machine is made of recyclable material and can be given to the system for collecting recyclables.

For details about recycling and disposal of the package refer to the → chapter *Disposal and Recycling* on page 65.

- ➢ Remove all packing materials and dispose of it properly and in an environmentally sound manner.
- ➢ Remove any accumulated condensate.
- ➢ Check the machine for transport damage.
- ➢ Watch the machine during the first hours of operation to check whether any malfunctions occur.

4.4 Storing the machine

To store the machine safely, be sure to observe the following notes:

- Only store the machine in dry and frost-free rooms.
- When storing the machine for a longer period, make sure it is dry.
- Store the machine so that damage to the machine is excluded.
- Protect the machine against corrosion.

4.5 Transporting the machine

All FREUND-machines can be transported using a fork-lift truck or lift truck. The length of the fork must at least correspond to the depth of the machine.

- Only use lifting equipment and gear that has been approved for the weight of the machine. This includes transporting using a crane, fork-lift truck or lift truck. For the weight of the machine refer to → chapter *Machine overview - Shears*
- on page 17.
- Secure the machine during transport to prevent it from tilting and slipping.
- Only use ropes and lifting appliances which ensure sufficient safety and load bearing capacity.

Always drain the hydraulic oil from the hydraulic pumps before you transport the hydraulic pumps.

Always transport the hydraulic pumps in an upright position. The oil will escape if you fail to do so.

EN

5 Installation and Commissioning

The installation and connection of the machine is made by the operator.

For damages, which result from this, the manufacturer FREUND Maschinenfabrik, is not liable.

5.1 Safety information

DANGER!

Live machine parts.

Danger to life.

- Before starting any installation, maintenance and repair work, disconnect the machine from the power supply.
- Secure the machine against being inadvertently switched back on.

WARNING!

Risk of accident caused by insufficiently qualified personnel

Danger to Life and most severe injuries are possible.

- The machine may only be commissioned by instructed and authorized personnel.
- All works to live components may only be performed by approved electricians.

WARNING!

Sharp-edged machine parts.

Cutting hazard.

- Never put your hands near moving machine parts.
- Keep your hands away from the cutting tools.
- Always wear protective gloves for your own safety.

WARNING!

Compressed air.

Severe injuries.

- Before starting any installation, cleaning, maintenance and repair work, disconnect the complete unit from the compressed air supply.
- Never point the compressed air beam at persons.
- Never clean skin or clothing with compressed air.

5.2 Personal protective equipment

5.3 Connection diagram

HPP12 The relevant drawing can be found in the spare parts list under the heading **140-302-003**.

HPE9 The relevant drawing can be found in the spare parts list under the heading **140-302-001**.

HPE20 The relevant drawing can be found in the spare parts list under the heading **140-302-002**.

5.4 Commissioning the shears

We recommend using an additional motor circuit breaker to protect the drive unit from overload.

Pre-mounted delivery

At the factory, the machine is pre-mounted with hose kit and a hydraulic pump as the drive unit. This is its delivery state.

1. Set up the hydraulic pump.
2. Connect the shears to the hydraulic pump.
3. Add the hydraulic oil.
4. a. For HPP:

   Connect the hydraulic pump to the compressed air line. The compressed air pressure must be at least 4 bar.

   b. For HPE:

   Connect the hydraulic pump to the compressed air line and to the power supply. The compressed air pressure must be at least 8 bar.

Non-mounted delivery

1. Set up the hydraulic pump.
2. Connect the hoses of the hydraulic pump to the machine using the quick-lock couplings.

   ⚠ **Warning: Machine is pressurised! There is a danger of crushing.**

   The quick-lock couplings are self-locking, i.e. no oil escapes when they are coupled and decoupled.
3. Lubricate the hinge bolts of the machine with food-grade grease (→ Chapter *Lubricants* on page 33).

   ⚠ **Caution: There is a risk of injury due to sharp-edged machine parts!**

4. Screw the connection box of the hose kit onto the rear handle of the machine.
5. Add the hydraulic oil.
6. a. For HPP:
   Connect the hydraulic pump to the compressed air line. The compressed air pressure must be at least 4 bar.
   b. For HPE:
   Connect the hydraulic pump to the compressed air line and to the power supply. The compressed air pressure must be at least 8 bar.

5.5 Setting up the hydraulic pump

5.5.1 Requirements of the installation location

Temperature conditions

- Temperature range from +5 to +60 °C
- Relative humidity max. 60%
- Ambient pressure at least 1 bar below the drive pressure

Installation conditions

- Open and freely accessible, not in closed containers Ensure that the machine is sufficiently aerated and ventilated
- Operating elements must be freely accessible
- Exposed to as few environmental influences as possible (water, cleaning agents, vibrations etc.)
- Above the working position of the shears or cutter. A steel bearer construction, for example, is suitable for suspending the machine from the overhead track. The ceiling construction is also an option.
- Even, load-bearing surface
- Screwed securely to the surface or suspension (→ chapter *Dimensions* on page 30).

5.5.2 Routing the hydraulic hose

Route the hydraulic hose

- not near heat sources.
- friction-free, without kinks and not twisted.
- not compressed and/or exposed to tensile loads.
- secure against slipping.
- always with a slack in it, since the hydraulic hoses might shorten during operation. On hose packages ensure that there is enough free play for each hose to be able to change length within the hose package.
- the curved fittings first, if required. The minimum bending radius must not be undercut (DIN EN 853 - 857).

5.6 Connecting the shears to the hydraulic pump

HPP12 The relevant manual can be found in the appendix under the heading **TIN-011857**.

HPE9/ HPE20 The relevant manual can be found in the appendix under the heading **TIN-011866**.

5.7 Filling with hydraulic oil

5.7.1 Hydraulic pump

First fill The machine is filled for the first time using the hydraulic oil included in the delivery. The entire system of the machine (cylinders, piping, valves etc.) must be completely filled with hydraulic oil.

Viscosity HPP: 14 – 20 cSt

Viscosity HPE: 32 – 46 cSt

Fig. 5-1 Optimum oil fill level

- During the filling in and topping up of the hydraulic oil and during the assembly of the lines/hoses, ensure cleanliness. Dirt can lead to damage to the hydraulic system.
- Pour hydraulic oil into the oil fill nozzle until the sight glass is 2/3 full (Fig. 5-1).

5.7.2 Service unit HPP

The service unit ensures even oil mist in the compressed air and protects the pump against wear and corrosion.

The number of drops is preset at the factory. This presetting is 1 drop per 150 cuts.

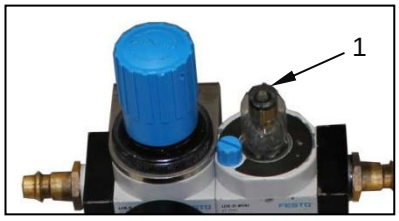


Fig. 5-2 Filling the service unit

- Fill the oiler using the hydraulic oil included in the delivery. The maximum fill volume is roughly 0.45 l.

5.8 Connecting the hydraulic pump HPE

- Connect the machine to your compressed air supply using the compressed-air hose.
- Connect the machine to your power supply using the compressed-air hose.

5.9 Connecting the hydraulic pump HPP

The machine is set to an operating pressure of 6.5 bar. The preset operating pressure of 6.5 bar is optimally aligned with the FREUND shears and cutters and secured by means of a seal.

The operating pressure may only be changed after consulting FREUND Maschinenfabrik. The safety-critical operating pressure of 10 bar must not be exceeded under any circumstances.

We recommend the installation of a ball valve in the compressed air hose. A ball valve can ease cutting off the compressed air after the work is completed.

Damage resulting from changing the pressure values are excluded from warranty.

The warranty for the machine is void if the seal is damaged in any way.

The compressed air connection must not be smaller than the connection thread.

Any reduction to a smaller connection thread can result in a loss of performance and pump malfunctions.

If the supply lines are too long, this could result in problems due to a drop in pressure in small lines.

- Connect a flexible compressed-air hose to the service unit.
- Connect the machine to your compressed air supply using the compressed-air hose.
- Do not extend any connecting lines, as this could otherwise lead to a performance reduction in the connected shears or cutter.

5.10 Setting the working pressure HPE

Every set of shears has a special working pressure that must be set before work begins.

The relevant manual can be found in the appendix under the heading **TIN-011888**.

5.10.1 Working pressures for FREUND shears

Shears	Application	HPE20-150	HPE9-180
		[Figures in bar]	
		10 or more animals per hour	up to 10 animals per hour
HLS12	Horns/legs	150 (120 at 60 Hz)	180 (150 at 60 Hz)
LS15	Legs	150 (120 at 60 Hz)	150
HG12	Horns	150 (120 at 60 Hz)	180 (150 at 60 Hz)
AS28	Quartering	150	150
		100 or more animals per hour	up to 100 animals per hour
NS21	Pigs' heads	100	100
NS26	Sows' heads	100	100
NS26-H1	Sows' heads	100	100
LS15	Hooves/legs	100	110
		100 or more animals per hour	up to 100 animals per hour
HZ10	Horns/legs	130	130
HZ7	Horns	130	130

5.11 Setting the run-on time HPE

The run-on time refers to how long the pump continues to run from the point at which the shears are fully open.

The hydraulic pump's run-on time is approximately 0.5 s and is preset at the factory. If this time is changed, there is a risk that the hydraulic pump will overheat.

If you change the shears, you may need to adjust the run-on time. Please contact our sales team before you make any changes to the settings. Please refer to the company information in the imprint for the address and telephone numbers.

5.12 Installing the balancer

The balancer is used for balancing and counterbalancing the weight of the machine attached to it.

1. Secure the balancer in accordance with the manufacturer's operating manual.

2. Attach the balancer to a sliding rail system to a beam above the workplace or at the ceiling.

   Install if necessary a carrier rail system (e.g. FREUND TS50) for going parallel to the rail system.

The distance between the centre of the overhead track or the carcass suspension point and the balancer suspension should be between 350 – 400 mm.

3. Attach the machine to the balancer
4. Readjust the balancer if necessary. Observe the operating manual for the balancer when doing so.

6 Operating

6.1 Safety information

WARNING!

Risk of accident caused by insufficiently qualified personnel

Danger to Life and most severe injuries are possible.

- The machine may only be commissioned by instructed and authorized personnel.
- All works to live components may only be performed by approved electricians.

WARNING!

Sharp-edged machine parts.

Cutting hazard.

- Never put your hands near moving machine parts.
- Keep your hands away from the cutting tools.
- Always wear protective gloves for your own safety.

WARNING!

Compressed air.

Severe injuries.

- Before starting any installation, cleaning, maintenance and repair work, disconnect the complete unit from the compressed air supply.
- Never point the compressed air beam at persons.
- Never clean skin or clothing with compressed air.

6.2 Personal protective equipment

6.3 Daily safety inspection

Before starting work, carefully check the machine to ensure it is operating faultlessly and as intended.

Only use technically sound and functioning machines.

Check

- the machine for signs of visible damage and loose machine parts.
- all hydraulic, electrical and/or pneumatic connections and connecting lines for external damage.
- the fit of moving parts.
  Ensure they do not block or show signs of damage.
- the balancer and the balancer settings.

6.4 Cutting with the machine

Workflow

1. Attach the cutting tool to the area to be cut.
   Cut only with the jaws of the blades. (see figures)
   ⚠ **Warning: There is a risk of injury when cutting due to sharp-edged machine parts.**

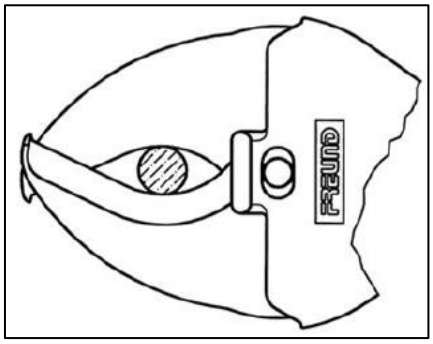


Fig. 6-1 Correct positioning

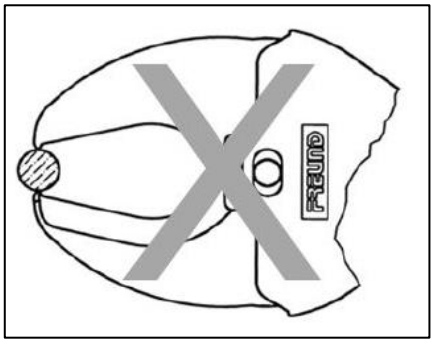


Fig. 6-2 Incorrect positioning

2. Press and hold the trigger. If your machine has two triggers, hold both triggers at the same time in the front and rear handle. Do not apply any additional force.

   The cutting tool closes.

3. Release all triggers.

   The cutting tool now opens independently.

Carry out the following steps after work.

After work

1. a. For HPE:

      Disconnect the hydraulic pump from the power supply and from the compressed air supply.

   b. For HPP:

      Disconnect the hydraulic pump from the compressed air supply.

2. ⚠ **Warning: Machine is pressurised! There is a danger of crushing.**

   Upon completion of work, remove the hydraulic hoses from the machine and ensure that there is no residual pressure in the machine.

- Check the blades daily for potential burrs upon completion of work. If necessary, re-sharpen the blades or replace the blades with new ones.

Hygiene

For hygienic reasons, the machine must be thoroughly cleaned at least once a day after each shift, and during the shift if there is heavy soiling.

- Every day upon completion of cleaning, use the grease gun to lubricate the hinge bushings via the grease fitting with the cutting tool closed slightly.
- Upon completion of cleaning, grease the blades lightly with food-grade grease. We recommend the original FREUND food-grade grease in this regard. (Part No. 100-013-007)

EN

7 Cleaning and Disinfection

Cleaning is carried out in order to remove dirt, meat and fat particles from the machine.

For hygienic reasons, the machine must be thoroughly cleaned at least daily after each shift, and in between in case of heavy soiling. All surfaces must be visually clean after cleaning.

Thorough cleaning is a prerequisite for the subsequent disinfection to be effective.

Always take note of the safety instructions in the product data sheets issued for the relevant detergents or disinfectants.

7.1 Safety information

DANGER!

Live machine parts.

Danger to life.

- Before starting any installation, maintenance and repair work, disconnect the machine from the power supply.
- Secure the machine against being inadvertently switched back on.

WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- The machine may only be maintained, serviced, operated, and cleaned by qualified personnel.
- Maintenance work on live components may only be performed by trained electricians.

WARNING!

Sharp-edged machine parts.

Cutting hazard.

- Never put your hands near moving machine parts.
- Keep your hands away from the cutting tools.
- Always wear protective gloves for your own safety.

WARNING!

Highly irritant or corrosive detergents and disinfectants.

Breathing difficulties and other health damage is possible.

- ➢ Always take note of the hazardous substance symbols and the safety data sheets issued for the relevant detergent or disinfectants.
- ➢ Wear the personal protective equipment specified by the manufacturer of the detergents and disinfectants.

7.2 Personal protective equipment

7.3 Carrying out cleaning and disinfection

- ➢ Only use detergents and disinfectants approved for the food industry.
- ➢ Always take note of the safety symbols and the safety and product data sheets issued for the relevant detergents or disinfectants.
- ➢ Store detergents and disinfectants separately or in a special room.

  Make absolute sure those detergents and disinfectants do not come in contact with food.

Notice!

Damage due to high water pressure.

High water pressures will cause damage to seals and machine parts.

- ➢ Do not use high-pressure cleaners.
- ➢ Only work at water pressures of less ≤ 6 bar.

- ➢ Wear the personal protective equipment specified by the manufacturer of the detergent.
- ➢ Only use cloths, brushes or other devices which are only used for cleaning.

Caution!

Corrosion on the saw blade.

Unsuitable detergents and cleaning equipment may result in corrosion on the saw blade.

- ➢ Only clean the saw blade with the specified detergents.
- ➢ Apply the detergents in the specified concentrations.
- ➢ Do not exceed the application times for the detergents.
- ➢ Only clean the saw blade with a soft cloth or a brush with soft bristles.

Work steps	Detergents and disinfectants	Auxiliary materials
		
Rough cleaning		
Removing product residue	Drinking water	Plastic scraper, brush
Removing small parts and assembly parts	Drinking water	Plastic scraper, brush; dishwasher if necessary
Intermediate rinsing		
	Drinking water, max. 60°C depending on fat melting temperature Low-pressure device, spray bottle	
Main cleaning		
Apply foam, allow to act for approx. 15 minutes	2 – 4% Somplex grease solvent 2 – 3% Ecolab P3-topax 19 2 – 3% Ecolab P3-topax 66 Ecolab P3-steril Powerfoam	Spray bottle, brush, tub, clean damp cleaning cloths
Rinse	Drinking water, max. 60°C	Low-pressure device, spray bottle
Check that machine is visibly clean		
Acid cleaning*[1] (instead of main cleaning)		
Apply foam, allow to act for approx. 15 minutes	3 – 6% P3-topax 56 3 P3-riskan, Somplex foam, acidic	Spray bottle, brush for removing limescale deposits
Rinse	Drinking water at 50 – 60°C	Low-pressure device, water hose
Check that machine is visibly clean		
Intermediate rinsing		
	Drinking water, max. 60°C Low-pressure device, spray bottle	

Work steps	Detergents and disinfectants	Auxiliary materials
Disinfection*2		
Spray, apply foam Allow to act as per product data sheet Solution temperature approx. 15°C	1 – 2% Ecolab P3-topax 99 0.5 – 2% Ecolab P3-topax 91 1% TEGOL 2000 1% TEGOL IMC 1% Somplex	Spray bottle, spray gun, clean damp cloth
Final rinsing		
	Drinking water, max. 60°C depending on fat melting temperature Low-pressure device, spray bottle	
Check		
that machine is visibly clean; repeat cleaning and/or disinfection if necessary		
Drying		
Rub dry or allow to dry in ambient air; allow disassembled parts to dry individually if possible		
Care		
Apply	Preservative oil, food grade oil	Spray bottle, clean cleaning cloth
Assembly		
Personnel must wash and disinfect hands		

* 1 For materials sensitive to acids such as POM, PMMA (acrylates) and cast materials, we recommend limiting acid cleaning to around 1x every 2 to 6 weeks.

* 2 The surfaces should, after cleaning and disinfection, simply be dried and protected from oxidation by a suitable preservative film.

EN

8 Maintenance and Repair Work

To ensure a long service life and low wear, the machine must be regularly checked and maintained.

The work area on the workbench must be clean and free from foreign material for all maintenance or dismantling work.

Repair and maintenance must only be carried out by skilled and authorized qualified personnel.

Warranty

If faults or defects are detected on the machine during the legal warranty period, contact our sales staff. Please refer to the company information at the imprint for address and telephone numbers.

Only use original spare parts or spare parts recommended by FREUND Maschinenfabrik.

8.1 Safety information

DANGER!

Live machine parts.

Danger to life.

- Before starting any installation, maintenance and repair work, disconnect the machine from the power supply.
- Secure the machine against being inadvertently switched back on.

WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- The machine may only be maintained, serviced, operated, and cleaned by qualified personnel.
- Maintenance work on live components may only be performed by trained electricians.

WARNING!

Sharp-edged machine parts.

Cutting hazard.

- Never put your hands near moving machine parts.
- Keep your hands away from the cutting tools.
- Always wear protective gloves for your own safety.

WARNING!

Machine is under pressure.

Risk of crushing from moving parts.

- Prior to all work disconnect the complete unit from the compressed air supply.
- Switch the complete system pressure-less.
- Do not perform welding work, heat treatments or mechanical modifications on pressure conducting components.

8.2 Personal protective equipment

8.3 Maintenance schedule

Some maintenance tasks must be performed at regular intervals.

The table below provides an overview of the maintenance tasks to be performed, together with the maintenance interval. If necessary, adapt the maintenance intervals to your operating conditions.

Further manuals for repair and assembly tasks are available from FREUND Assistance.

Interval	Maintenance job	→ Chapter
Daily	Lubricate shears	→ Chapter *Lubricating the shears* on page 54
	Visual inspection before starting work	→ Chapter *Daily safety inspection* on page 44
	Check water level and for soiling of the fine filter (HPE)	
	Check oil level	→ Chapter *Checking the* oil level on page 54
	Check machine for unusual noises, vibrations and changes	
	Check water level in the water separator of the service unit (HPP)	→ Chapter *Checking the service unit* on page 55
	Check water level in the oiler of the service unit (HPP)	→ Chapter *Checking the service unit* on page 55

Interval	Maintenance job	→ Chapter
Every 6 months	Electrical recurring inspection as per VDE 0701/0702/EN60204-1 (HPE)	→ Chapter *Periodic inspection of electrical equipment* on page 56
After 100 operating hours for the first time Annually or after 5 million strokes	Change hydraulic oil	→ Chapter *Changing the* hydraulic oil on page 56
After 100 operating hours for the first time Every 1,500 operating hours	Change oil filter (HPE)	→ Chapter *Replacing the* HPE oil filter on page 56
Every 2 years	Change seals (HPP)	
After 6 years at the latest	Change hydraulic hose	→ Chapter *Replacing hydraulic hose* on page 56
If required	Sharpening the blades	
	Change fine filter	

8.4 Recommended lubricants

Ensure compliance with the general occupational safety rules when handling lubricants.

We offer you the following lubricant containers for refilling the hydraulic pump:

	Retail container	Part No.
HPE	5L canister	171-500-004
	10L canister	171-500-005
	10L canister	171-500-006
HPP	5L canister	171-500-001
	10L canister	171-500-002
	10L canister	171-500-003

HPE The hydraulic oils used for the hydraulic pump HPE must have a viscosity of between 32 and 46 cSt (HLP46) as per DIN 51524-2 and DIN 15519 and ISO viscosity class VG46 as per DIN 51519.

HPP The hydraulic oils used for the hydraulic pump HPP must comply with a viscosity of between 14 and 20 cSt as per DIN 51524-2 and purity class 19/17/13 (biohydraulics) as per ISO 4406.

We offer you food-grade grease in the following containers for re-greasing the shears:

Retail container	Article number
1-kg can	100-013-007
Grease gun	151-001-067

8.5 Lubricating the shears

In order to prevent premature wear and damage to the machine, lubricate the machine prior to commencing work or after cleaning.

The relevant manual can be found in the appendix under the heading **TIN-011796**.

8.6 Checking the oil level

Attention!

Damages to the machine from mixing hydraulic oils of different viscosity.

- Never mix hydraulic oils that have different viscosity.
- Only use the original hydraulic oil of the FREUND Maschinenfabrik. Consult the manufacturer in case of doubt.

All hydraulic pumps are equipped with an oil level indicator. The oil level must be between the lower and upper marking of the oil level indicator (Fig. 8-1).

Only top up with fresh hydraulic oil with the indicated specifications, see → chapter *Lubricants* on page 33.

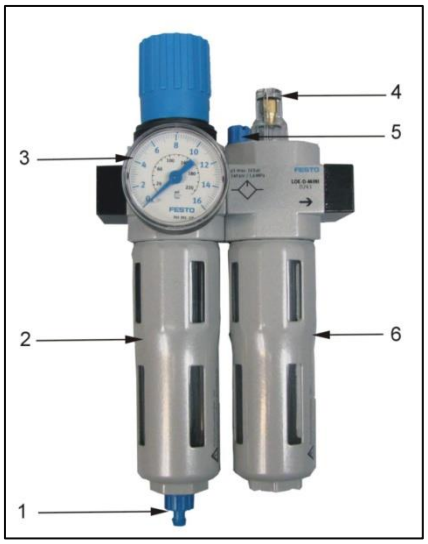
Fig. 8-1 Optimum oil level

- Check the oil level daily.
  Top up missing hydraulic oil if the oil level is below the lower marking of the oil level indicator.

1. Switch off the machine

2. Top up as much hydraulic oil as about 2/3 is filled of the oil level indicator (Fig. 8-1).
3. Switch the machine on and perform a test run.
4. Check the oil level after about 10 minutes.
   Top up hydraulic oil if required or drain excess oil.

8.7 Checking the service unit



1 Outlet screw water separator
2 Water separator
3 Manometer
4 Regulating screw for drip rate
5 Oil filling hole
6 Oiler

Fig. 8-2 Service unit

8.7.1 Water separator

1. Check the water separator (2) at least once per day.
   Empty the water separator when it is ½ full.
2. Unscrew the outlet screw (1) in an anti-clockwise direction.

8.7.2 Oil level

1. Check the oil level of the oiler (6) at least once per day.
   Top off the oil tank if the oil level drops below the lower mark.
2. Open the screw in the filling hole (5).
3. Add enough oil until the oil level is within the marks.

8.7.3 Drip quantity

1. Check the drip setting of 1 drip per 150 cuts.
2. Open the regulating screw (4).
3. Turn the regulating screw back until the desired amount of oil is set.
   Turn the regulating screw in anti-clockwise direction
   → the number of drips increases.
   Turn the regulating screw in a clockwise direction
   → the number of drips reduces.

8.8 Changing the hydraulic oil

HPP The relevant manual can be found in the appendix under the heading **TIN-011962**.

HPE The relevant manual can be found in the appendix under the heading **TIN-011939**.

8.9 Replacing the HPE oil filter

- Replace the oil filter initially after 100 operating hours.
- Replace the oil filter during each oil change.

You can find the corresponding instructions in the apendix under the heading **TIN-011939**.

8.10 Periodic inspection of electrical equipment

Periodic inspections of non-stationary electrical machinery and equipment that is used in slaughtering and cutting plants must be carried out at intervals of six months in accordance with EN 60204-1.

The electrical test must be carried out by an electrically skilled person in the sense of the accident prevention regulation “Electrical installations and equipment” or by an electrically instructed person.

Service package SDL-003-004

We at FREUND Maschinenfabrik would like to give you the option to arrange for the next periodic inspection of your machinery or equipment to be carried out at our factory. We offer the service package SDL-003-004 including a complete inspection of the electrical system with inspection report and test sticker.

If you are interested in arranging for a periodic inspection at our factory or by a service technician on-site, please contact our sales departement. Please refer to the company information in the imprint for address and telephone numbers.

8.11 Disconnecting shears from the hose

The relevant manual can be found in the appendix under the heading **TIN-011891**.

8.12 Replacing hydraulic hose

Only use the original FREUND-hydraulic hoses. These are ideally adjusted in length and specification to the hydraulic-pump and the corresponding shear.

Please observe the notes in → chapter *Routing the* hydraulic hose on page 39.

8.13 Sharpening the blades

The cutting result of the machine largely depends on the sharpness of the blade. Blunt blades put the user at risk and lead to poor work results.

Caution!

Improper resharpening can result in poor cuts, blade fracture or to machine damage.

- ➢ Arrange resharpening of the blades with FREUND Maschinenfabrik or a specialist company.

Select the correct sharpening manual on the basis of the machine designation:

AS28	The relevant manual can be found in the appendix under the heading **TIN-011833**.
LS15 / NS21 / NS26	The relevant manual can be found in the appendix under the heading **TIN-011831**.
HLS12	The relevant manual can be found in the appendix under the heading **TIN-011713**.
FS6 / FNS9 / HDS15	The relevant manual can be found in the appendix under the heading **TIN-011832**.

9 Troubleshooting

If malfunction or faults occur during the operation, you can look for possible causes and remedies in this chapter.

If you do not find the malfunction or fault of your machine in the following table, contact our sales staff. Please refer to the company information at the Imprint.

9.1 Safety information

DANGER!

Live machine parts.

Danger to life.

- Before starting any installation, maintenance and repair work, disconnect the machine from the power supply.
- Secure the machine against being inadvertently switched back on.

WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- The machine may only be maintained, serviced, operated, and cleaned by qualified personnel.
- Maintenance work on live components may only be performed by trained electricians.

WARNING!

Sharp-edged machine parts.

Cutting hazard.

- Never put your hands near moving machine parts.
- Keep your hands away from the cutting tools.
- Always wear protective gloves for your own safety.

WARNING!

Machine is under pressure.

Risk of crushing from moving parts.

- Prior to all work disconnect the complete unit from the compressed air supply.
- Switch the complete system pressure-less.
- Do not perform welding work, heat treatments or mechanical modifications on pressure conducting components.

9.2 Personal protective equipment

9.3 Overview of possible faults

9.3.1 Potential faults with shears

Fault	Possible cause	Remedy
Cutting tool does not close	Quick connector is not tight or is blocked	Connect hose correctly
		Replace hose
		Clean hose
	Multi hose defective	Replace multi hose
	Valves defective	Replace valves/control blocks
	Spring in handle defective	Replace spring in handle
	Unit defective	Repair unit
		Replace unit
	Bolt defective	Replace bolt
Cutting performance drops	Blade blunt	Sharpen blade
		Replace blade
	Bolt is too tight	Loosen nut
	Bolt is too loose	Tighten nut
	Insufficient oil	Replace oil
	Insufficient grease	Replace grease
	Defective pump body	Replace pump body
	Unit defective	Repair unit
		Replace unit
Cutting tool no longer fully closes	Mechanical system worn	Check connecting rod and replace if necessary
		Check bolt and replace if necessary
		Check blade socket and replace if necessary
	Flange bolt is too tight	Loosen nut, replace guide washer if necessary

Machine gets hot	Insufficient lubrication	Relubricate
	Bolt tightened too tightly at blade	Loosen bolt
	Worn guide plates	Replace guide plates
	Oil pump defective	Repair oil pump
		Replace oil pump
	Unit defective	Repair unit
		Replace unit
	Poor air quality for hydraulics	Repair unit
		Replace unit
	Poor oil quality	Replace oil
Oil escapes	Lines leaky	Send machine for repair
Compressed air escapes	Lines leaky	Send machine for repair
Trigger not working	Spring broken	Replace spring

9.3.2 Potential faults with HPE

Fault	Possible cause	Remedy
Machine does not start	Fuse has switched off.	Check the fuse and the motor connection.
	No power.	Check power supply and the connecting lines.
	Motor circuit breaker has tripped.	Check the power supply. Allow the motor to cool down.
	Electrical motor defective, bearing damaged or short-circuit in coil.	Send the machine back to the manufacturer to be checked.
	Direction of rotation of the motor not correct.	Change the electrical connections.

Fault	Possible cause	Remedy
Loud and unusual noises.	Direction of rotation of the motor not correct.	Change the electrical connections.
	Oil level in the tank is too low.	Check that the container is leaktight.
		Top up hydraulic oil.
	Air filter is soiled.	Clean or replace the air filter.
	Pump is defective.	Replace the pump.
	Motor only operating on two phases.	Check the electrical connection.
	Noises of flow and vibration.	Check the setting values.
Motor running hot.	Ambient temperature too high.	Ensure lower room temperatures.
	Fan cannot draw in air freely.	Ensure free air intake at the fan.
	Incorrect hydraulic oil viscosity.	Use hydraulic oil with correct viscosity, → chapter *Lubricants* on page 33.
Hydraulic oil dirty.	Dirt ingress due to dirty components, e.g. piping.	Rectify the cause. Replace the hydraulic oil completely.
Hydraulic oil dirty.	Dirt ingress during filling.	Rectify the cause. Replace the hydraulic oil completely.
	Dirt ingress due to improper maintenance or cleaning.	
	Dirt ingress from the environment, e.g. the ventilation filter.	
	Wear debris from components.	

Fault	Possible cause	Remedy
Oil temperature too high.	Inadequate heat dissipation due to lack of hydraulic oil in the tank.	Check the oil level in the tank. Top up hydraulic oil if necessary. Set up forced air circulation if required.
	Insufficient heat dissipation due to enclosure or inadequate venting.	
	Run-on time set too high	Adjust the run-on time at the *timer relay* control element.
	Cutting cycle too quick	
	Pressure valves not set correctly; setting usually too low. Part of the volume delivered by the pump returns to the tank via the pressure relief valves.	Check the settings in accordance with the data given in the wiring diagram. Correct the settings if necessary.
Shears do not open or close. Shears fail.	Valves in handle defective.	Change the valves.
	Inadequate compressed air supply	Check the compressed air connection and the connection hoses.
	Compressed air controller defective	Check the controller. Change the pneumatic elements if necessary.
	Working pressure is too low.	Check the working pressure setting. Check the compressed air line for kinks or other interruptions.
	Direction of rotation of the motor not correct.	Change the electrical connections.
	Unclean compressed air.	Adhere to the requisite compressed air quality, → chapter *Compressed air* on page 34.

9.3.3 Potential faults with HPP

Fault	Possible cause	Remedy
Loud and unusual noises.	Oil level is too low.	1. Check the oil level. 2. Top up hydraulic oil.
	Pump is defective.	Contact FREUND Maschinenfabrik.
	Noises of flow and vibration.	Check the setting values.
Pump not working/air escapes via small hole on the control slide housing.	Control slide sags.	Clean control slide and the sleeve.
		Check and replace the O-rings and sleeves.
		Lubricate the control slide.
Pump not working/no pressure.	Valves are closed.	Check the position of the valves.
	No pressure in compressed air supply line.	Open the supply line.
	Pressure regulator is closed.	Check the position of the pressure regulator.
	No hydraulic oil or hydraulic oil too low.	Top up hydraulic oil.
No volume flow	Valves are closed.	Check the position of the valves.
	Suction filters are clogged	Replace the suction filters.
Pump works without conveying or works irregularly.	Air is in the hydraulic system.	Vent the hydraulic system.
		Check the suction lines and screw connections for leaks.
		Check the seal set between air system and hydraulic system.

Fault	Possible cause	Remedy
Hydraulic oil dirty.	Dirt ingress due to dirty components, e.g. piping.	1. Rectify the primary cause. 2. Replace the hydraulic oil completely.
	Dirt ingress during filling.	
	Dirt ingress due to improper maintenance or cleaning.	
	Dirt ingress from the environment, e.g. the ventilation filter.	
	Wear debris from components.	
Hydraulic oil leaks out.	Seals are not leaktight.	Replace the seals.
Hydraulic system responds slowly.	Connecting lines are too long.	Only use original connecting lines.
Shears do not close or open.	Pressure spring in the control slide is defective.	Replace the defective parts.
	Control slide is defective.	
	Inadequate compressed air supply	Check the compressed air connection and the connection hoses.
	Compressed air controller defective	Check the controller. If required, replace the pneumatic elements.
	Pressure is too low.	Check the compressed air settings. Check the compressed air line for kinks or other interruptions.

EN

10 Disposal and Recycling

The machine must be disposed of in accordance with the pertinent national regulations.

More Information

For more information about our materials and their disposal please contact our sales staff.

Please refer to the company information in the imprint for the address and telephone numbers.

10.1 Disassembling and disposing of the machine

Old machines contain recoverable materials which you can return for recycling.

When disposing of the machine, make sure to observe local environmental regulations.

1. Disconnect all connections and supply lines from the machine.
2. Completely disassemble the machine.
3. Segregate all materials.
4. Dispose of waste oil and components and materials soiled with oil in accordance with the applicable environmental regulations.
5. Send the individual materials to the appropriate recycling or disposal facilities.
6. Send hazardous waste to a local hazardous waste site.

10.2 Disposing of packaging material

All packaging materials used by FREUND Maschinenfabrik are environmentally friendly and can be recycled.

You can safely dispose of the packaging materials through your local waste collection system or return them for recycling.

Declaration of Conformity

in the sense of the EC Machinery Directive 2006/42/EC, Annex II, No.1 A

Manufacturer	**FREUND Maschinenfabrik GmbH & Co. KG** **Schulze-Delitzsch-Str. 38** **33100 Paderborn, GERMANY**
Documentation Authorised Representative	**FREUND Maschinenfabrik GmbH & Co. KG** **Schulze-Delitzsch-Str. 38** **33100 Paderborn, GERMANY**

Hereby we declare that the machine

Type **HPE9 /HPE20**

Serial number

complies with all relevant provisions of the EC Machinery Directive 2006/42/EC.

The machine also complies with all relevant provisions of the following EC Directives

(EC)1935/2004	**Food safety**

The following harmonised standards (or parts of these standards) have been applied:

BS EN 60529:1991 + A1:2000 + A2:2013	**BS EN ISO 12100:2010**
BS EN 60204:2018	**BS EN ISO 13732-1:2008**

EU-Declaration of Conformity

in the sense of the EC Machinery Directive 2006/42/EC, Annex II, No.1 A

Manufacturer	**FREUND Maschinenfabrik GmbH & Co. KG** **Schulze-Delitzsch-Str. 38** **33100 Paderborn, GERMANY**
Documentation Authorised Representative	**FREUND Maschinenfabrik GmbH & Co. KG** **Schulze-Delitzsch-Str. 38** **33100 Paderborn, GERMANY**

Hereby we declare that the machine

Type **FS6 /FNS9 /HDS15 /HLS12 /LS15 /NS21 /NS26 /NS26-H1 /AS28 /HG12_evo2**

Serial number

complies with all relevant provisions of the EC Machinery Directive 2006/42/EC.

The machine also complies with all relevant provisions of the following EC Directives

(EC)1935/2004	**Food safety**

The following harmonised standards (or parts of these standards) have been applied:

DIN EN 12984:2005+A1:2010	**DIN EN ISO 12100:2010**
DIN EN 1672-2:2020	**DIN EN ISO 13861:2012-01**
DIN EN 11148-11:2011	

EU-Declaration of Conformity

in the sense of the EC Machinery Directive 2006/42/EC, Annex II, No.1 A

Manufacturer	**FREUND Maschinenfabrik GmbH & Co. KG** **Schulze-Delitzsch-Str. 38** **33100 Paderborn, GERMANY**
Documentation Authorised Representative	**FREUND Maschinenfabrik GmbH & Co. KG** **Schulze-Delitzsch-Str. 38** **33100 Paderborn, GERMANY**

Hereby we declare that the machine

Type **HPP12**

Serial number

complies with all relevant provisions of the EC Machinery Directive 2006/42/EC.

The machine also complies with all relevant provisions of the following EC Directives

The following harmonised standards (or parts of these standards) have been applied:

DIN EN 1672-2:2020	**DIN EN 60204-1:2018**
DIN EN 13850:2015	**DIN EN 11148-2:20111**

Conformity

The company FREUND Maschinenfabrik GmbH & Co. KG hereby confirms, for articles and their materials that, when used as intended, come into contact with food comply with the following general requirements.

- Regulation (EC) No. 1935/2004 of 27 October 2004 for articles and materials that are intended to come into contact with food.
- Regulation (EC) No. 10/2011 of 14.01.2011 for plastic articles and materials that are intended to come into contact with food.
- Regulation (EC) No. 2023/2006 of 22 December 2006 for good manufacturing practices for articles and materials that are intended to come into contact with food.
- LFGB - Food, Articles of Daily Use and Feeding Stuff Law, as of 01.09.2005.

This applies to all the following machine types and their spare parts:

FREUND-Shears

Machine parts that come into contact with food	Material designation	Groups of materials and articles	Notes
Shear blade	X46Cr13 (1.4034)	Stainless steel	
Cylinder	X5CrNi18-10 (1.4301)	Stainless steel	
Bolts	X46Cr13 (1.4034)	Stainless steel	
Handles	X5CrNi18-10 (1.4301)	Stainless steel	
Control block / casing	3.1645 eloxiert	Aluminium	
Brackets	X5CrNi18-10 (1.4301)	Stainless steel	
Fastening elements	X5CrNi18-10 (1.4301)	Stainless steel	

Paderborn, 21.02.2020

Head of Development

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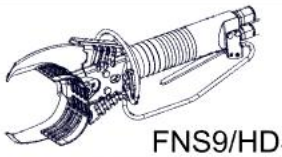
Freund Maschinenfabrik Beteiligungs-GmbH
Amtsgericht Paderborn HRB 2048
Geschäftsführer: Robert Freund

VerbundVolksbank OWL eG
BIC: DGPBDE3MXXX
IBAN: DE 96 4726 0121 8600 0895 00
Sparkasse PB-DT, BIC: WELADE3LXXX
IBAN: DE 38 4765 0130 0001 0450 20

TIN-000-017



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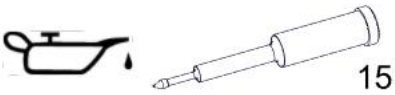

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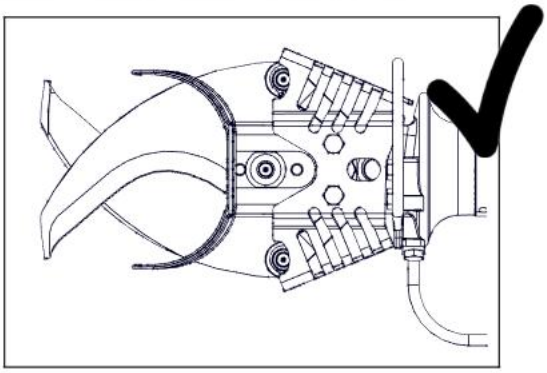

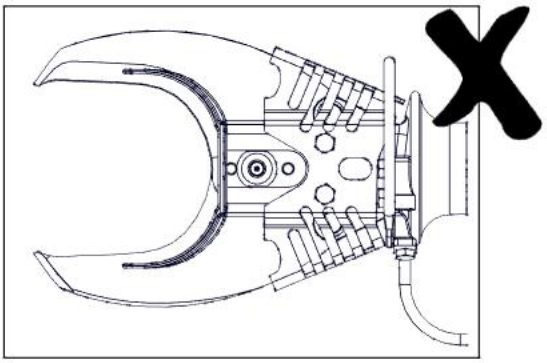

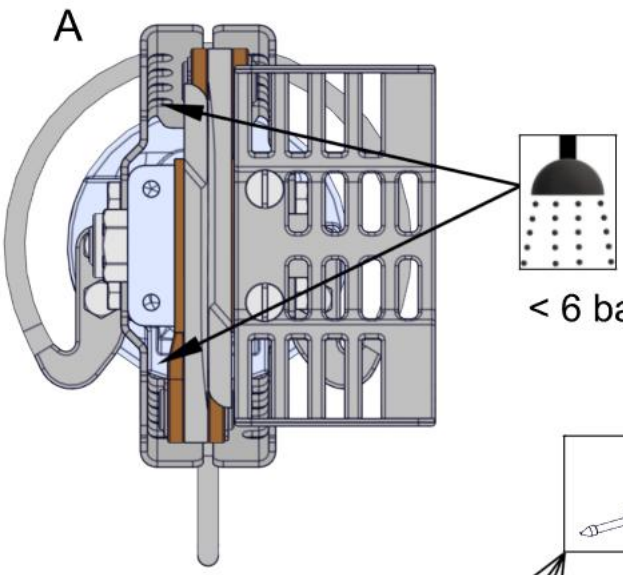

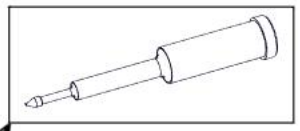

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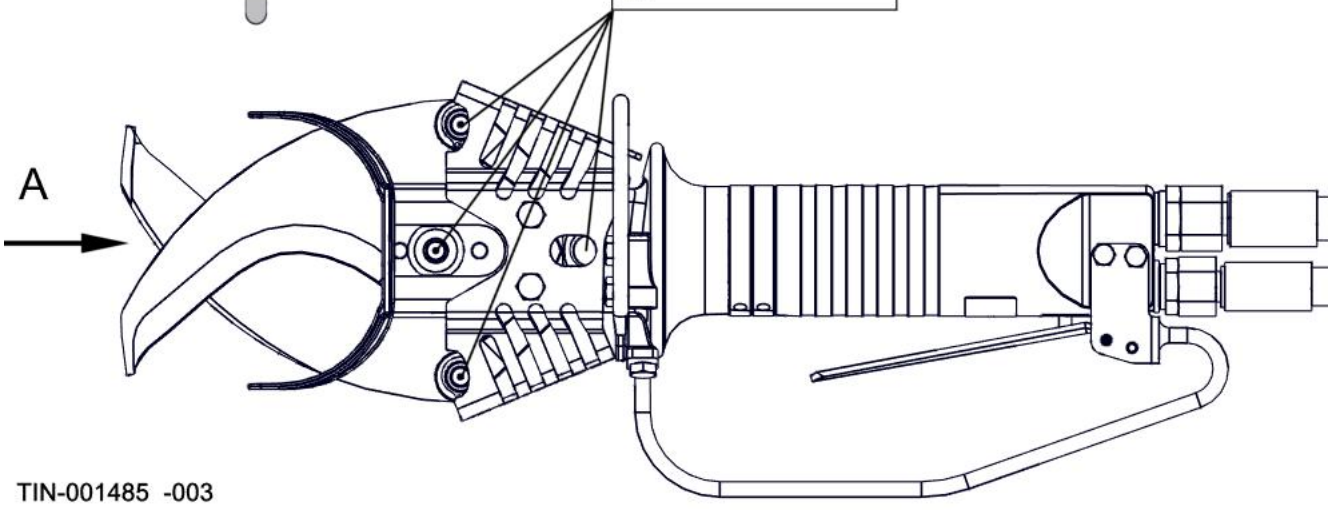

TIN-001485 -003

Erklärung der Symbole siehe Betriebsanleitung Kap.1 / *Explanations of symbols see operating manual chp. 1*

Demontage
Disassembly

Montage
Assembly

Betriebsanleitung beachten
Pay attention to operating manual

Montageanleitung
Assembly instructions

Werkzeugsatz
Toolkit

100-013-029 Hydrauliköl / Hydraulic oil (Esso Macrol 82)

VK Gebinde / Disposal dimensions	Teile Nr. / Item No
5L Kanister / Canister	171-500-001
10L Kanister / Canister	171-500-002
20L Kanister / Canister	171-500-003

Verwendung / Ability for	Füllmenge / Filling capacity
HPP12	7 L

100-013-026 Hydrauliköl / Hydraulic oil (Newastane AW46)

VK Gebinde / Disposal dimensions	Teile Nr. / Item No
1L Flasche / Bottle	047-004-004
5L Kanister / Canister	171-500-004
10L Kanister / Canister	171-500-005
20L Kanister / Canister	171-500-006

Verwendung / Ability for	Füllmenge / Filling capacity
Anschlusseinheit / Connecting kit K16-P4 , PNM , SD11	0,1 L
HPE 9	21 L
HPE 20	28L

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100-013-001 Getriebefett / Gearbox grease (Kajo EP371 GLP OF)

VK Gebinde / Disposal dimensions	Teile Nr. / Item No
1 kg Dose / Box	171-500-010

Verwendung / Ability for	Füllmenge / Filling capacity
Getriebe / Gear K16	0,1 kg
Getriebe / Gear K18	0,1 kg
Getriebe / Gear K23, K28	0,1 kg
Getriebe / Gear K33	0,1 kg

100-013-048 Getriebeöl / Gearbox oil (MOBIL Glygoyle 30)

VK Gebinde / Disposal dimensions	Teile Nr. / Item No
1L Flasche / Bottle	159-016-035

Verwendung / Ability for	Füllmenge / Filling capacity
Getriebe ZKM60, ZKM75	0,5 L

100-013-032 Vakuumpumpenöl / Vacuum pump oil (MOBIL Rarus 427)

VK Gebinde / Disposal dimensions	Teile Nr. / Item No
1L Flasche / Bottle	171-500-015
5L Kanister / Canister	171-500-016
10L Kanister / Canister	171-500-017

Verwendung / Ability for	Füllmenge / Filling capacity
VP 020	0,5 L
VP 200	7 L
VP 300	7 L

100-013-036 Lebensmittelfett / Lubricating grease (Rivolta F.L.G. 4-2)

VK Gebinde / Disposal dimensions	Teile Nr. / Item No
0,14 kg Fettpresse / Grease gun	151-001-067
1 kg Dose / Box	100-013-007

Verwendung / Ability for	Füllmenge / Filling capacity
Scheren / Shear	0,01 kg
Getriebe / gear SH/BBH	0,1 kg

100-013-057 Lebensmittelfett / Lubricating grease (Rivolta F.L.G. GT-2)

VK Gebinde / Disposal dimensions	Teile Nr. / Item No
0,18 kg Fettpresse / Grease gun	028-100-006

Verwendung / Ability for	Füllmenge / Filling capacity
Trimmer Kopf / Trimmer Head	
Getriebe HSK-P3	

100-013-038 Schmierfett / Grease (OKS 475)

VK Gebinde / Disposal dimensions	Teile Nr. / Item No
0,4 kg Kartusche / Cartridge	100-013-037
0,14 kg Fettpresse 7 / Grease gun (ST)	151-002-039
0,14 kg Fettpresse/ Grease gun (EDF, SD11)	047-004-002

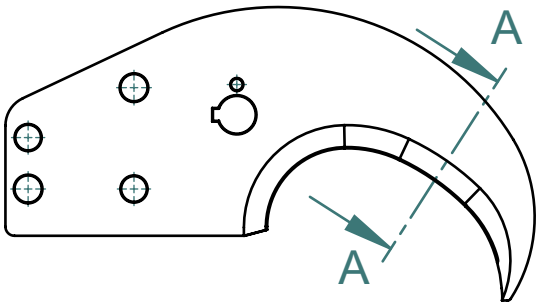
Verwendung / Ability for	Füllmenge / Filling capacity
Getriebe / gear ST, SST, BBST	0,07 kg
EDF , SD11	0,03 kg

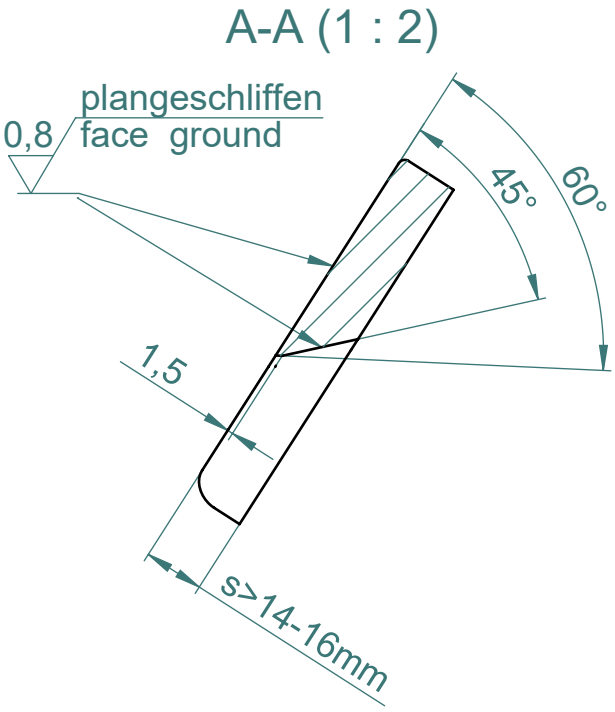
100-013-039 Schmierfett / Grease (OKS 479)

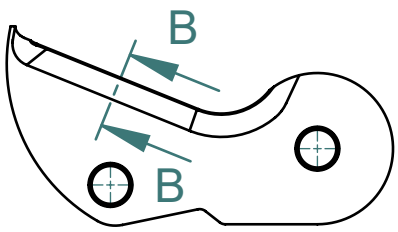
VK Gebinde / Disposal dimensions	Teile Nr. / Item No
1 kg Dose / Box	100-013-039

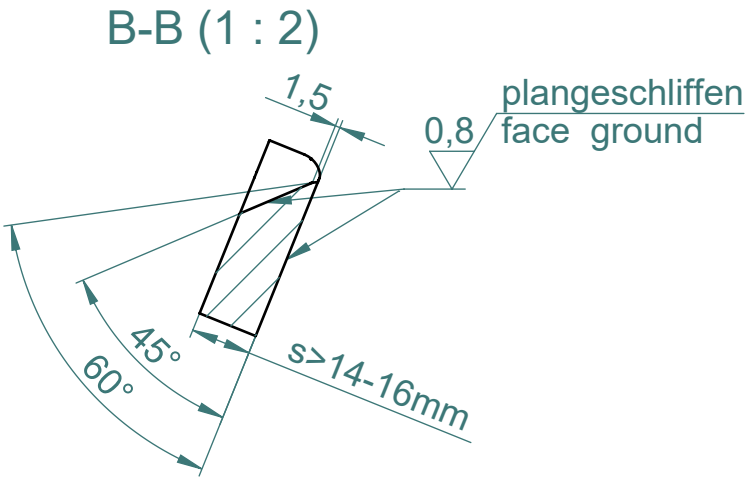
Verwendung / Ability for	Füllmenge / Filling capacity
Getriebe / Gear GM	0,1 kg
Getriebe / Gear ZKM25	0,1 kg
Getriebe / gear FK40	0,1 kg

HLS12 TIN-011713









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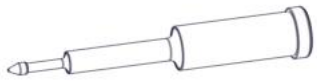
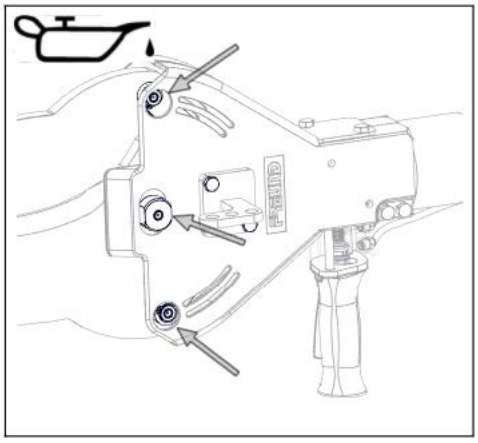
TIN-011796

8.4

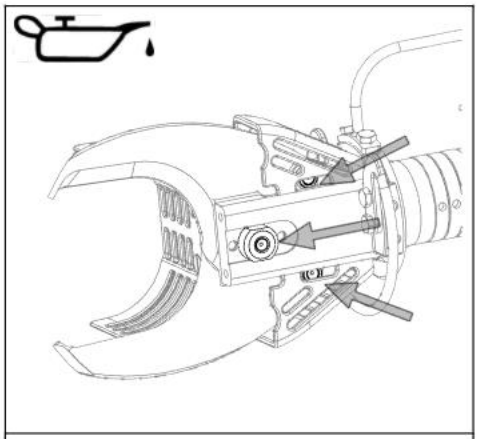


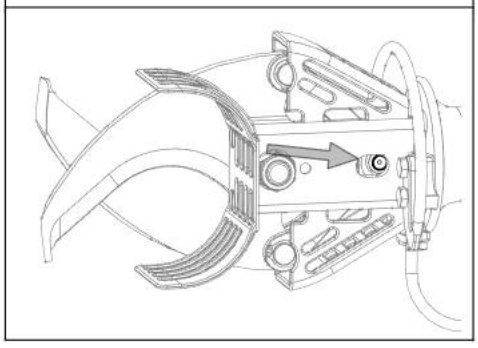
151-001-067

AS28, NS26

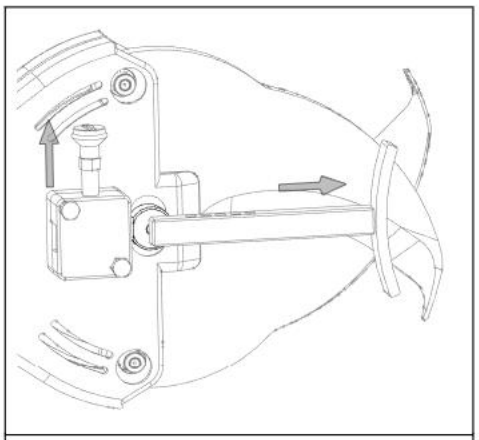


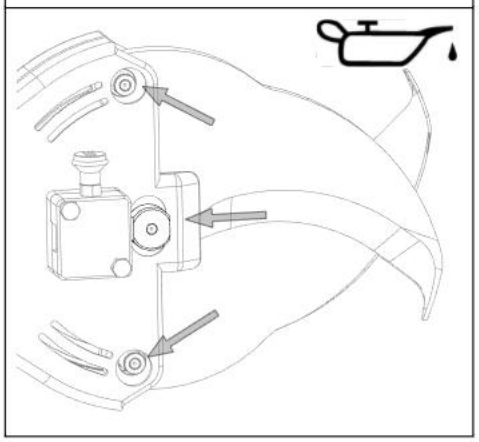
FS6, FNS9, FNS9P, HDS15



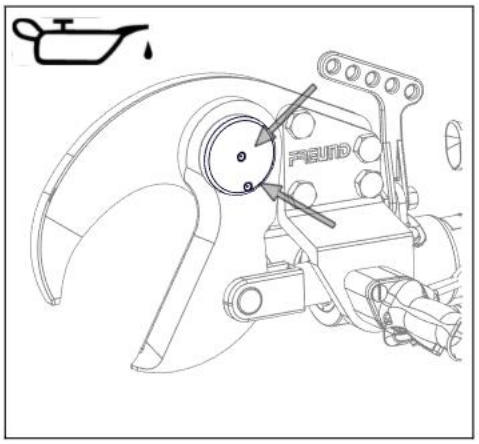


NS21, LS15





HLS12



TIN-011796 -000

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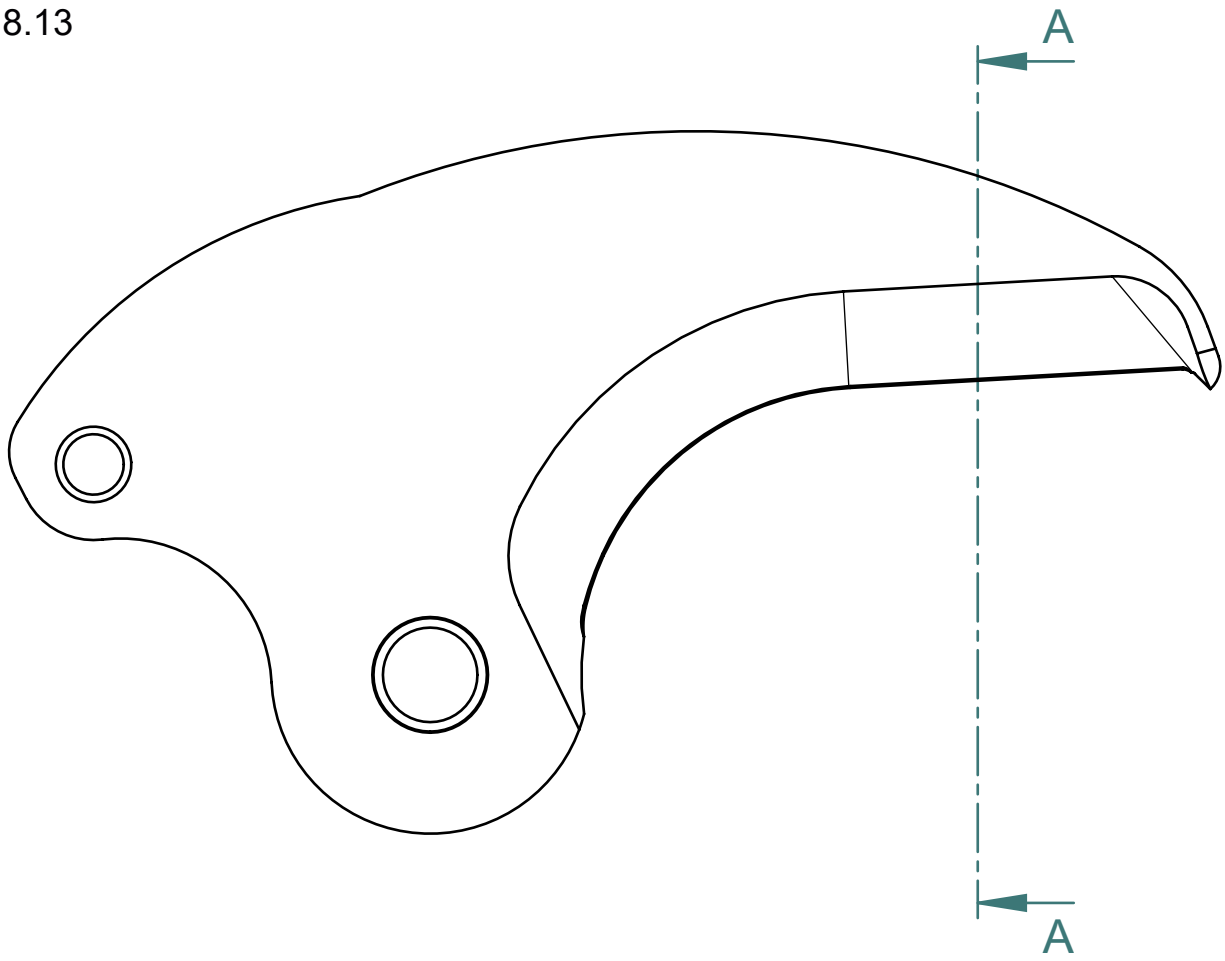
LS15, NS21, NS26 **TIN-011831**

8.13



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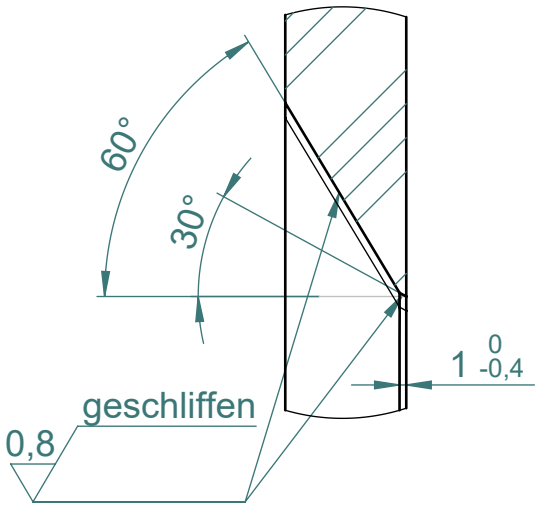
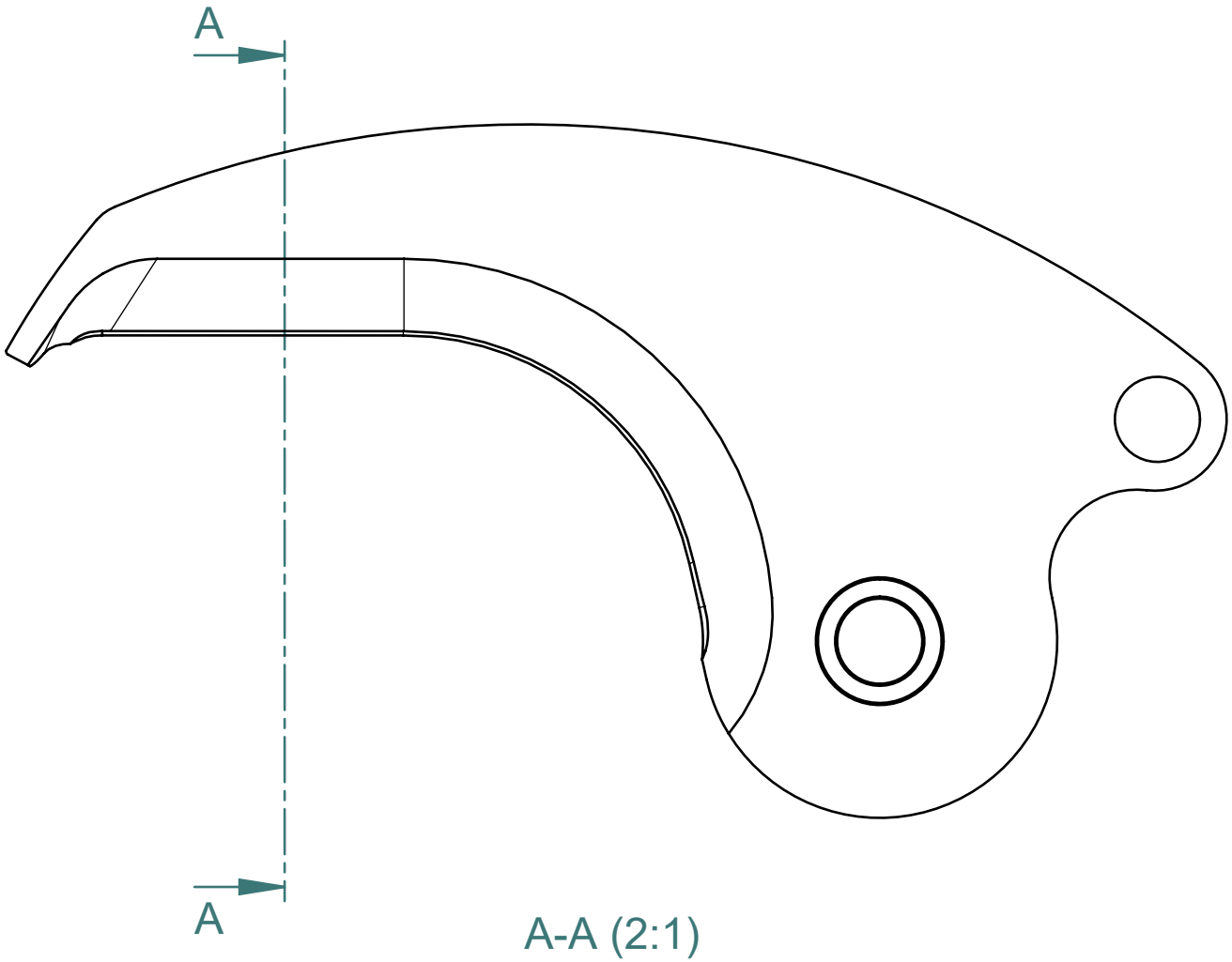


TIN-011831 001

FS6, HDS15, FNS9 **TIN-011832**

8.5.4



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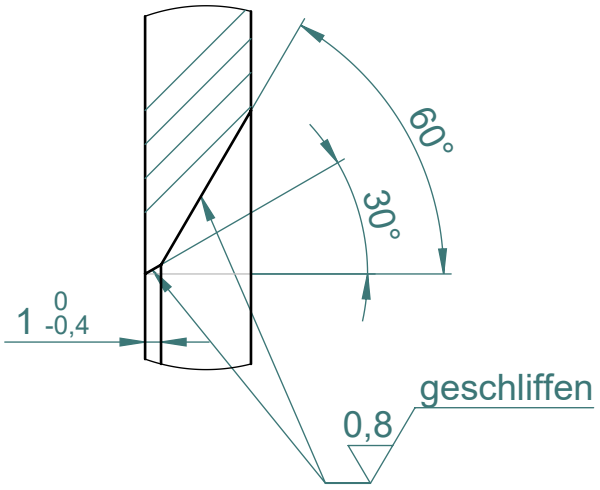
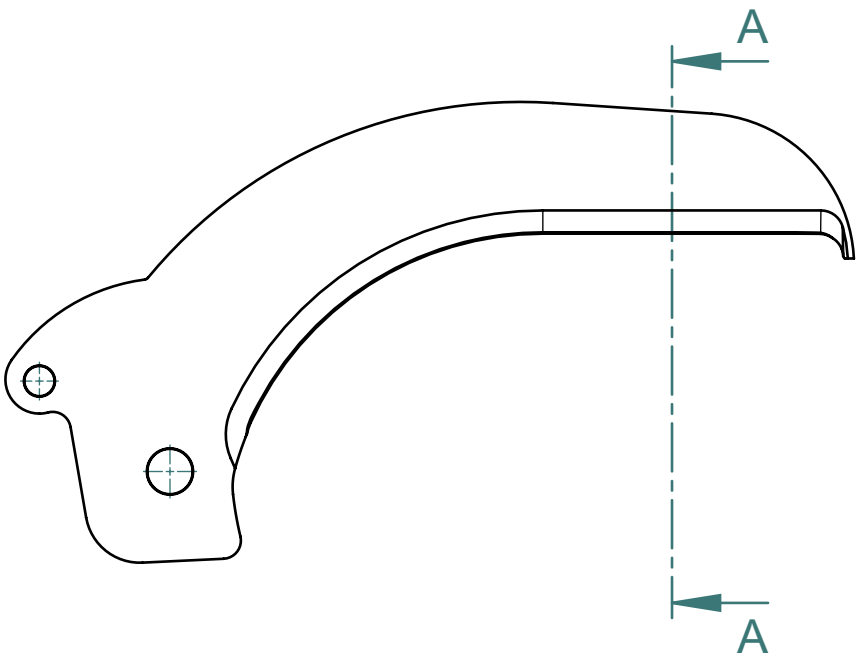


TIN-011832 000

AS28 **TIN-011833**

8.13



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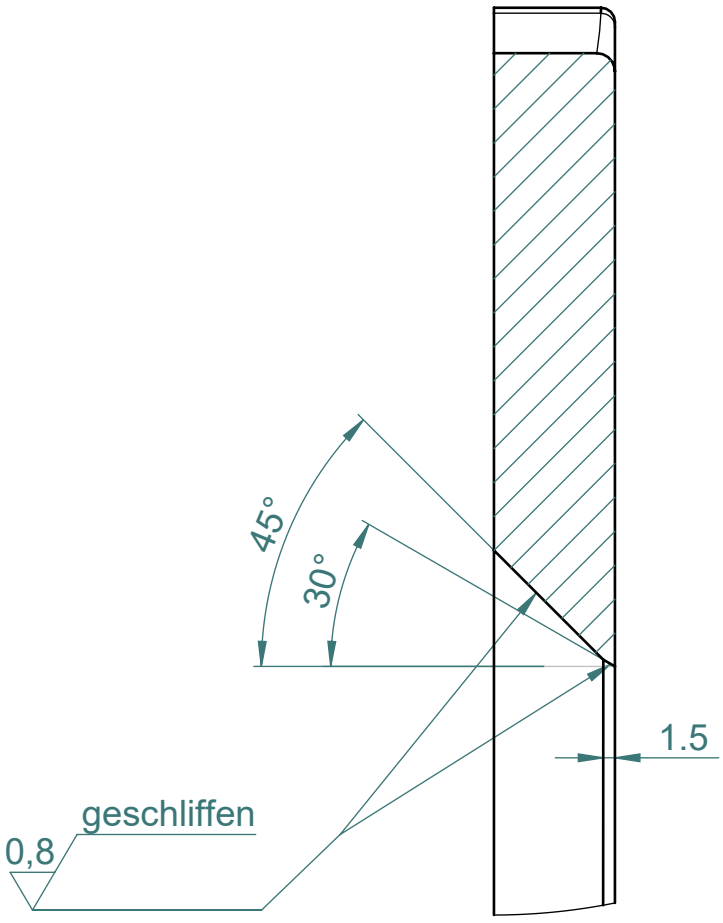


TIN-011833 001

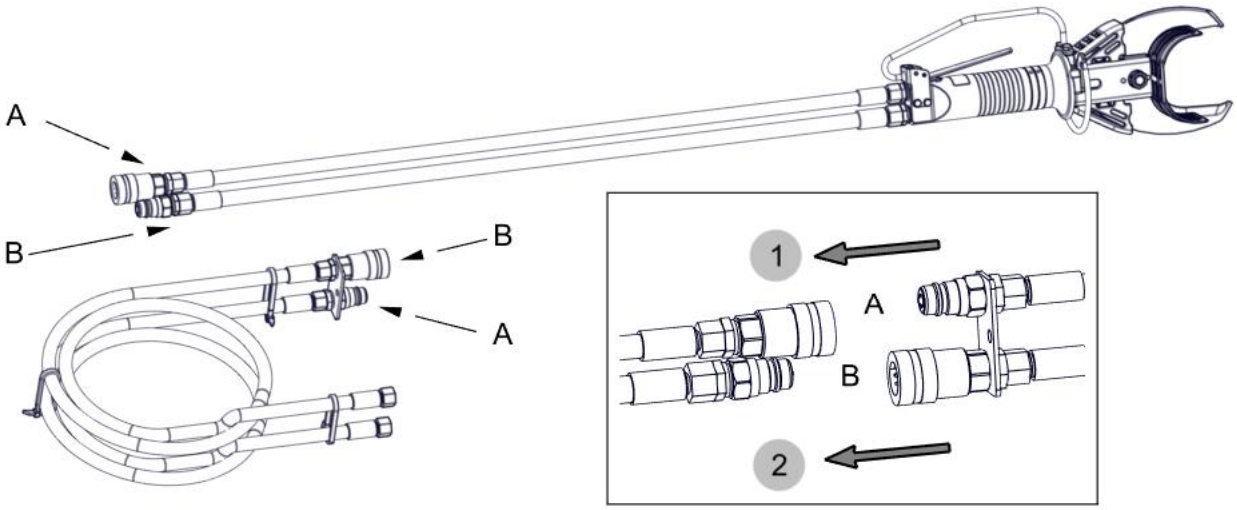
TIN-011857

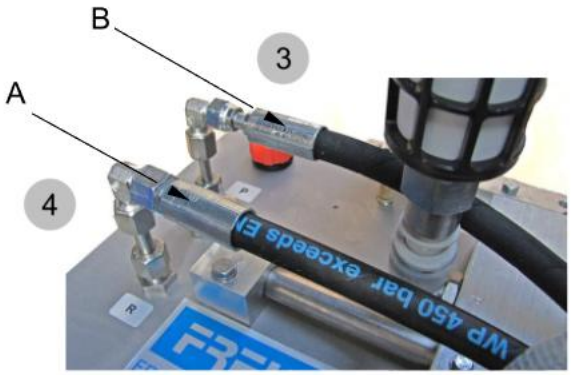
1 - 4

142-103-101

FS6, FNS9, FNS9P, HDS15 — 142-103-101 — HPP12

5.6





TIN-011857 -001

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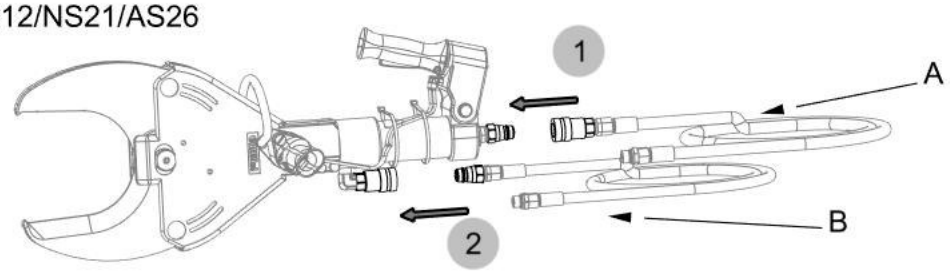
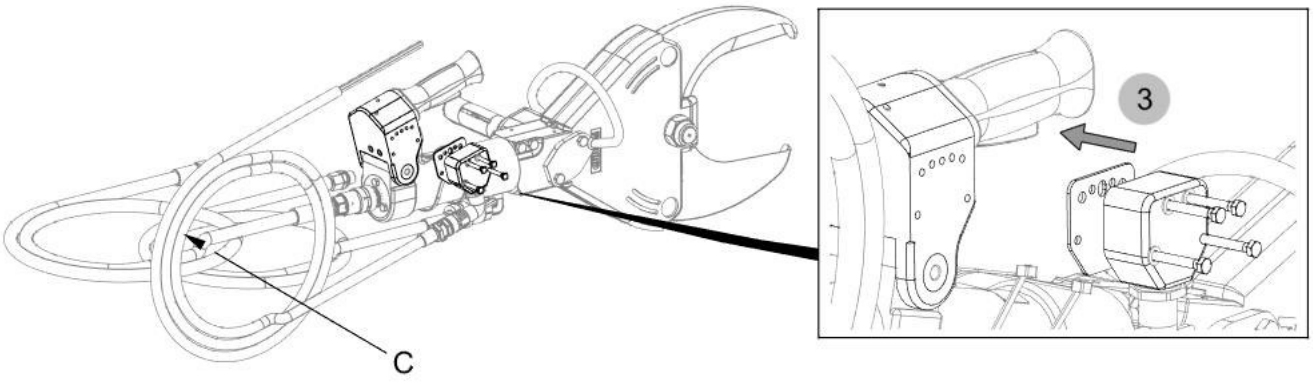
TIN-011866

1 - 8

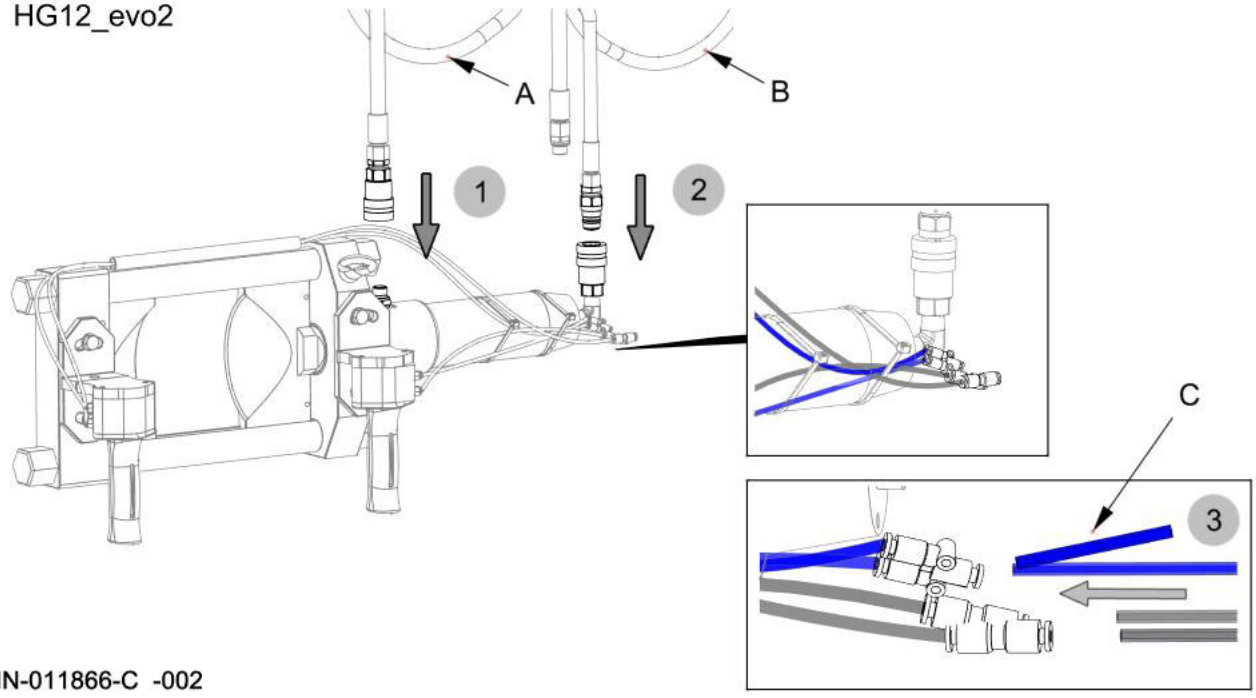
	5m	10m	
LS15	142-009-506	142-009-509	HPE9 / HPE20
HLS12	142-009-510	142-009-511	
NS21/AS26	142-009-512	142-009-513	
HG12	142-009-514		

LS15/HLS12/NS21/AS26





HG12_evo2



TIN-011866-C -002

Erklärung der Symbole siehe Betriebsanleitung Kap.1 / *Explanations of symbols see operating manual chp. 1*

Demontage *Disassembly*

Montage *Assembly*

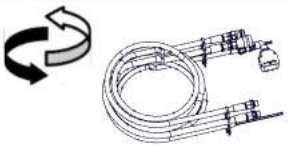
Betriebsanleitung beachten *Pay attention to operating manual*

Montageanleitung *Assembly instructions*

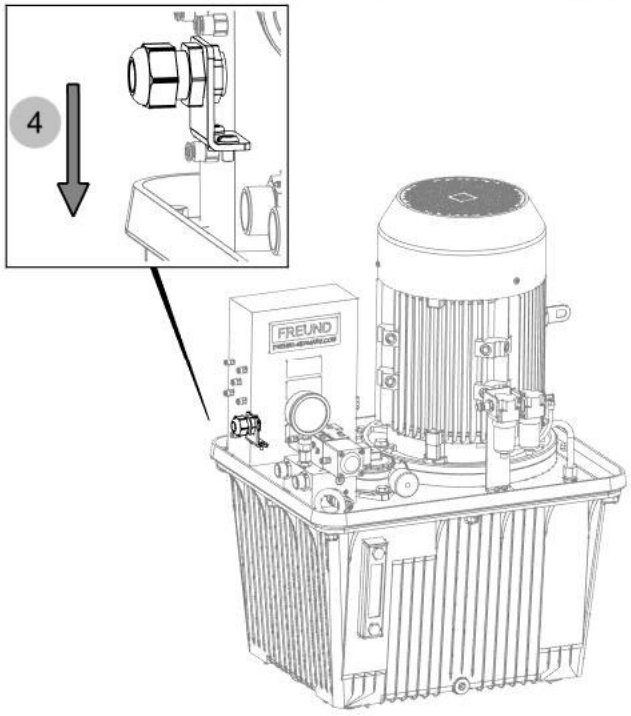
Werkzeugsatz *Toolkit*

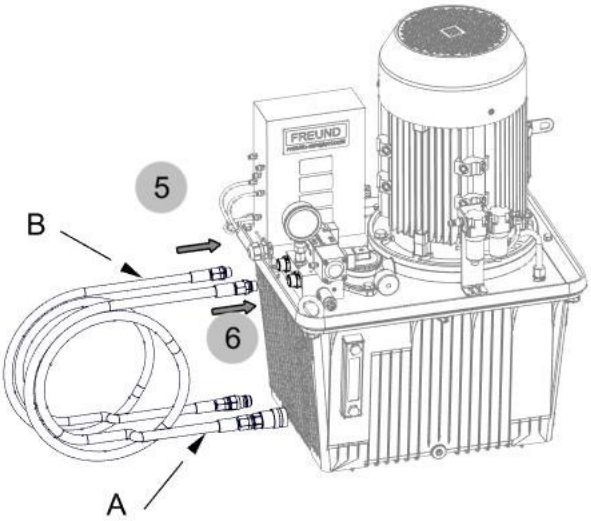
TIN-011866

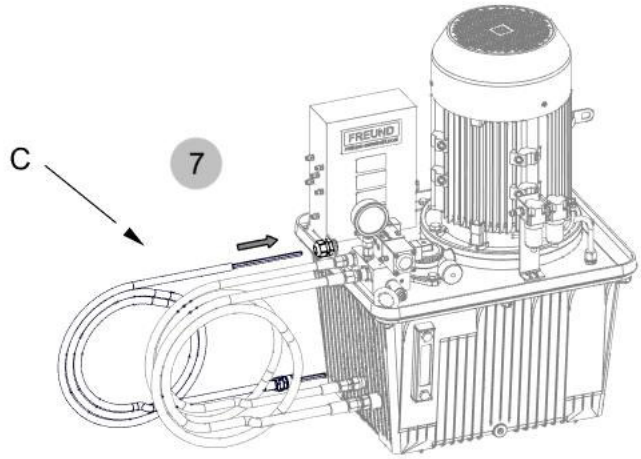
1 - 8

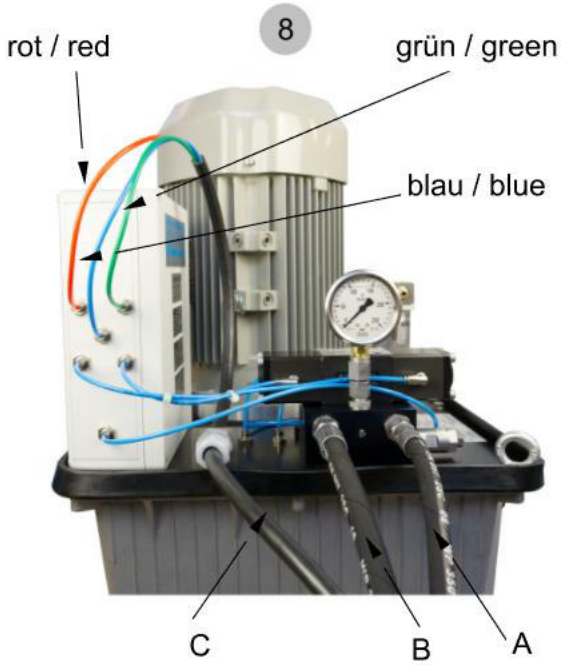


	5m	10m	
LS15	142-009-506	142-009-509	HPE9 / HPE20
HLS12	142-009-510	142-009-511	
NS21/AS26	142-009-512	142-009-513	
HG12	142-009-514		









TIN-011866 -002

Erklärung der Symbole siehe Betriebsanleitung Kap.1 / *Explanations of symbols see operating manual chp. 1*

Demontage *Disassembly*

Montage *Assembly*

Betriebsanleitung beachten *Pay attention to operating manual*

Montageanleitung *Assembly instructions*

Werkzeugsatz *Toolkit*

TIN-011888

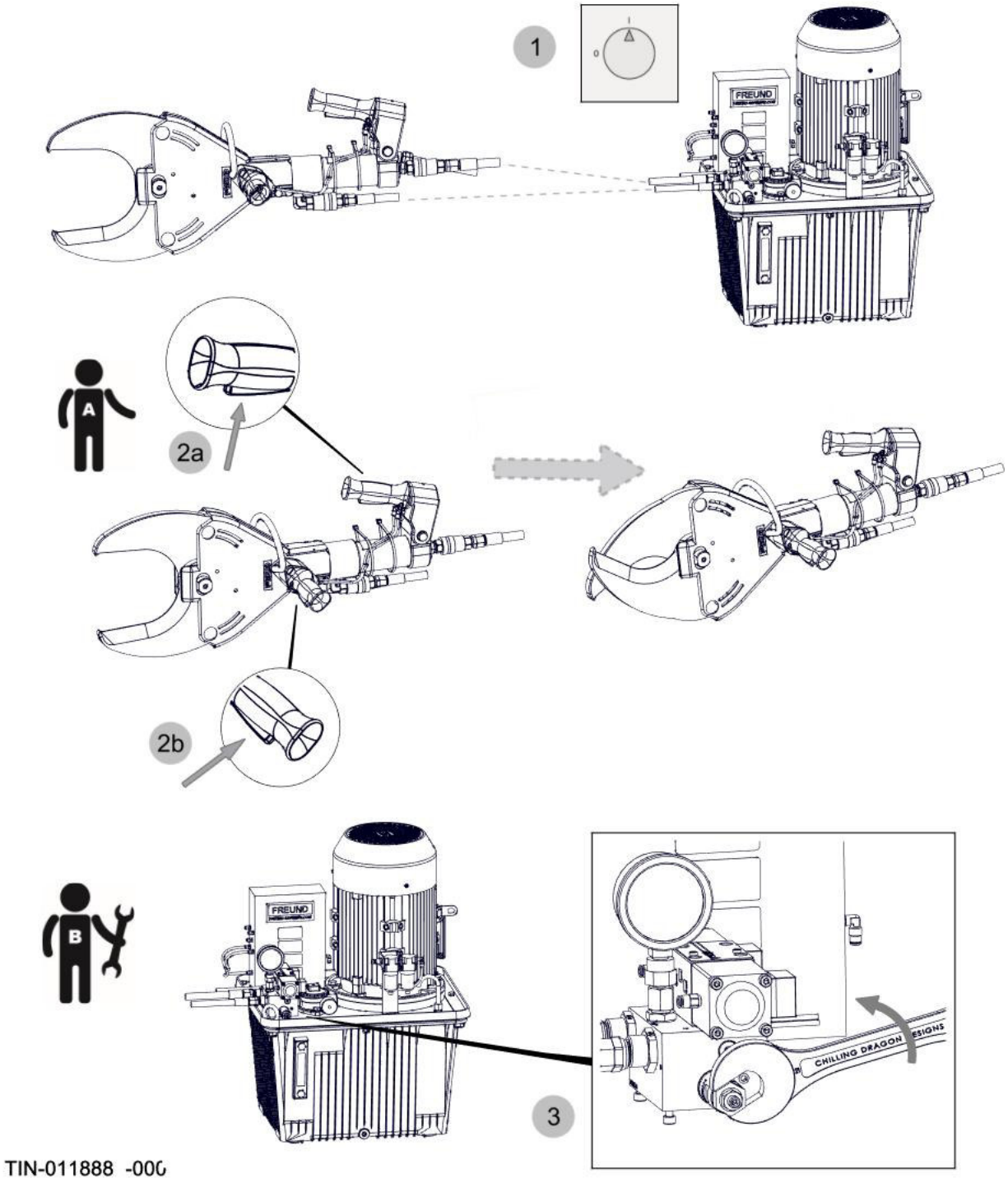
5.10

bar

SW21

SW4

1 / 2



TIN-011888 -000

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TIN-011888

5.10

SW21

SW4

6.1.1

4

5

6a

6b

TIN-011888 -000

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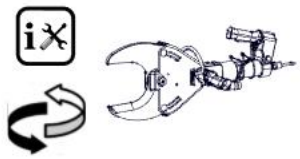
1-5

TIN-011891-C



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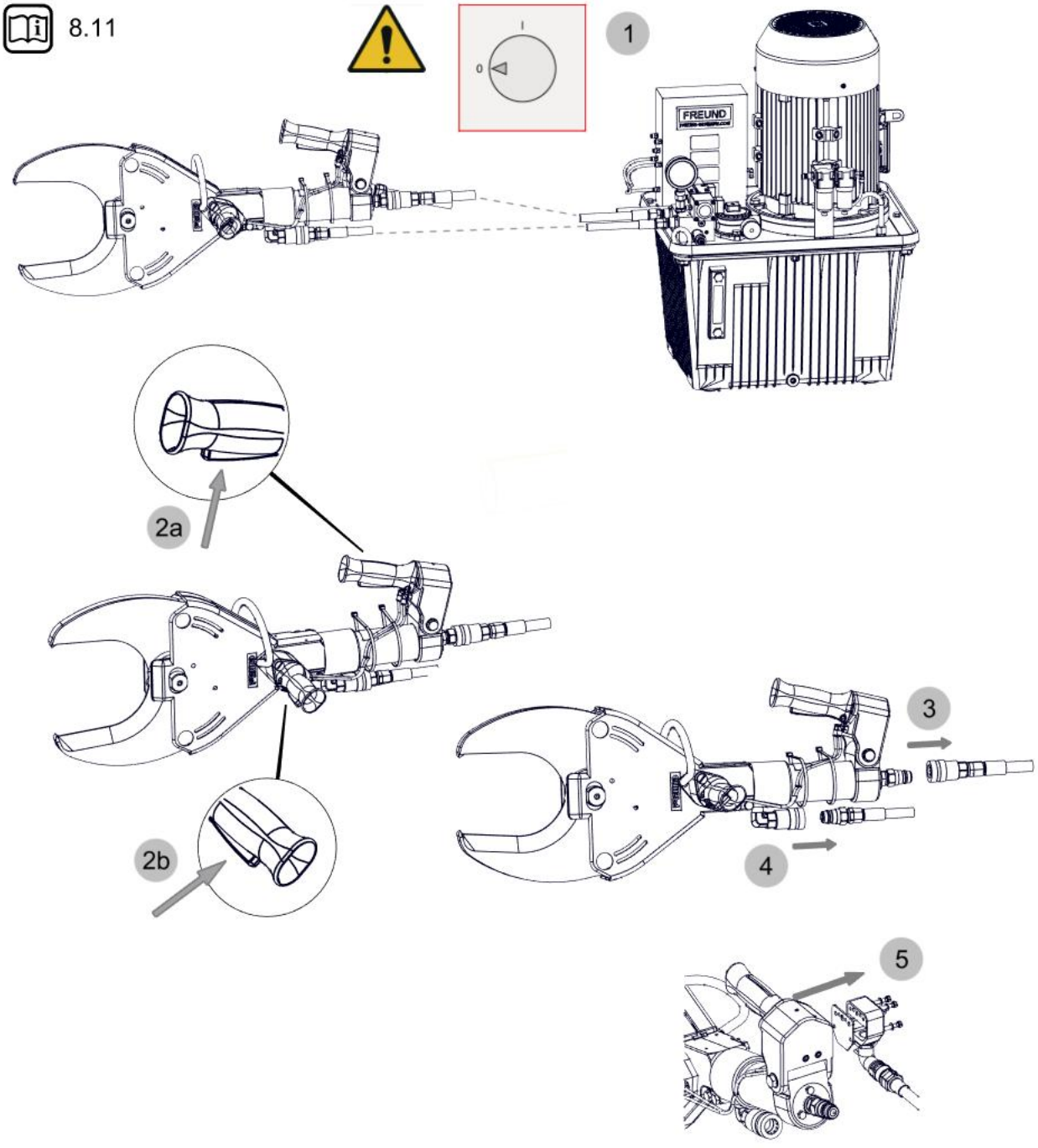

TIN-011891-C -000

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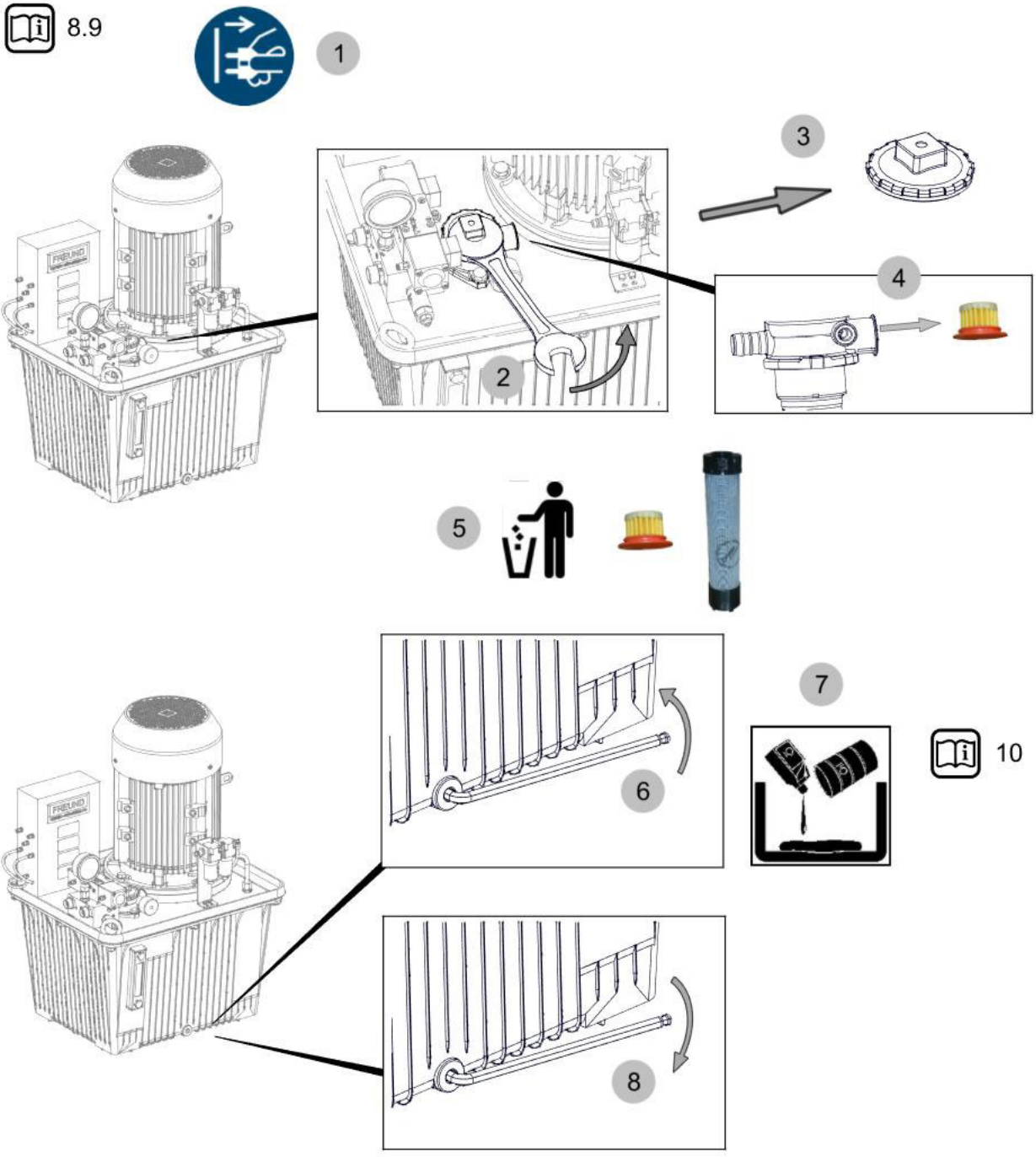
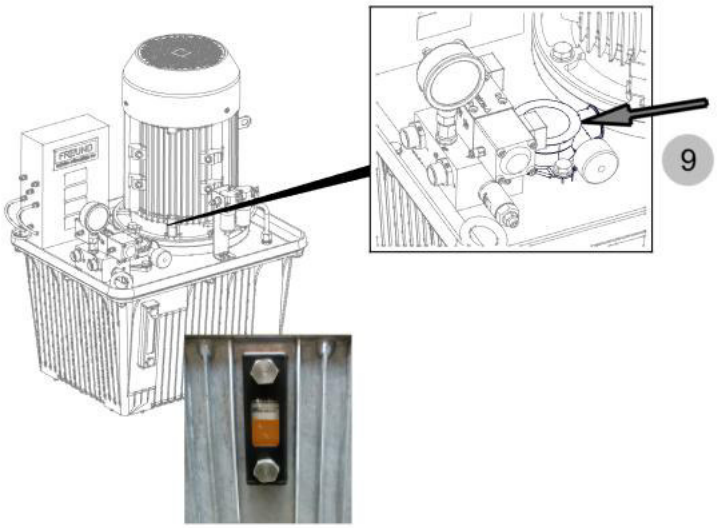
TIN-011939



TIN-011939 -000

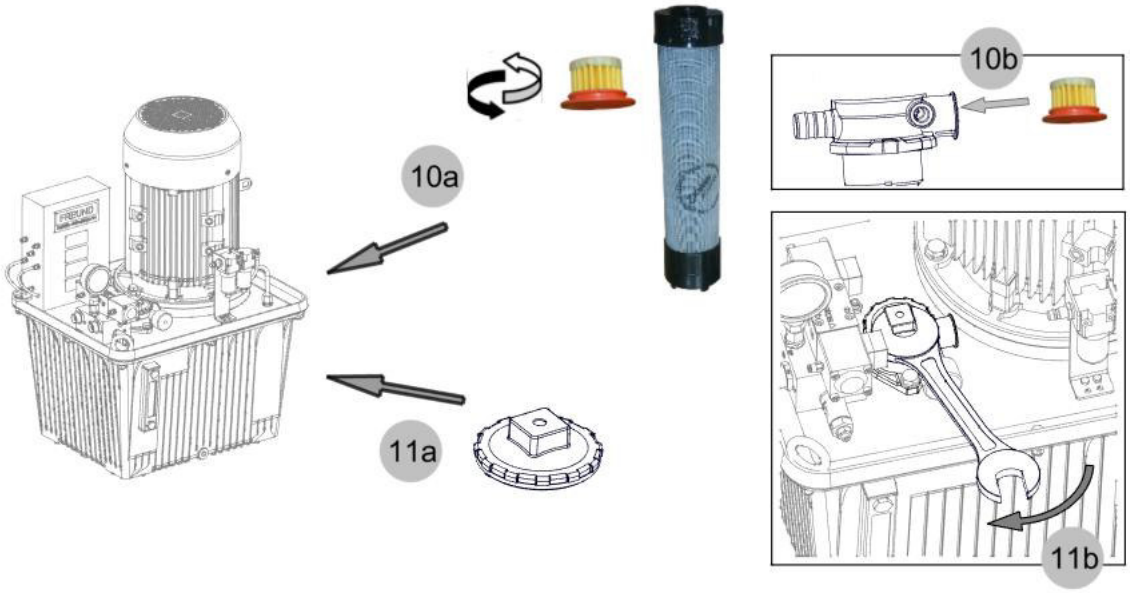
TIN-011939

8.9



HPE20 - 28 l
HPE9 - 21 l

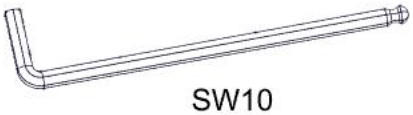
078-000-010E



TIN-011939 -000

TIN-011962

1 / 1

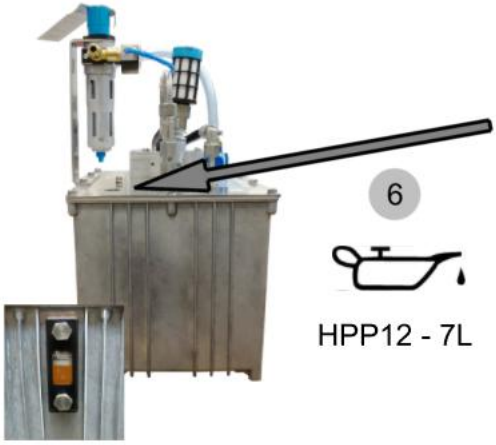


8.8

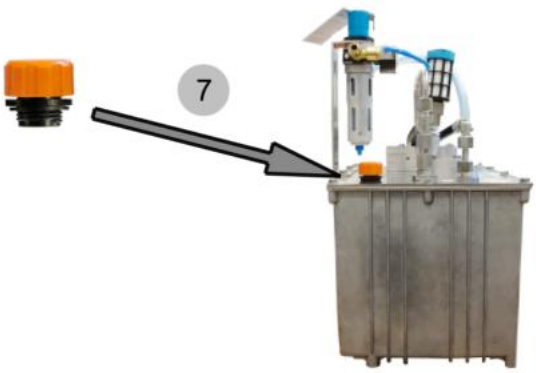
3 10

2

4



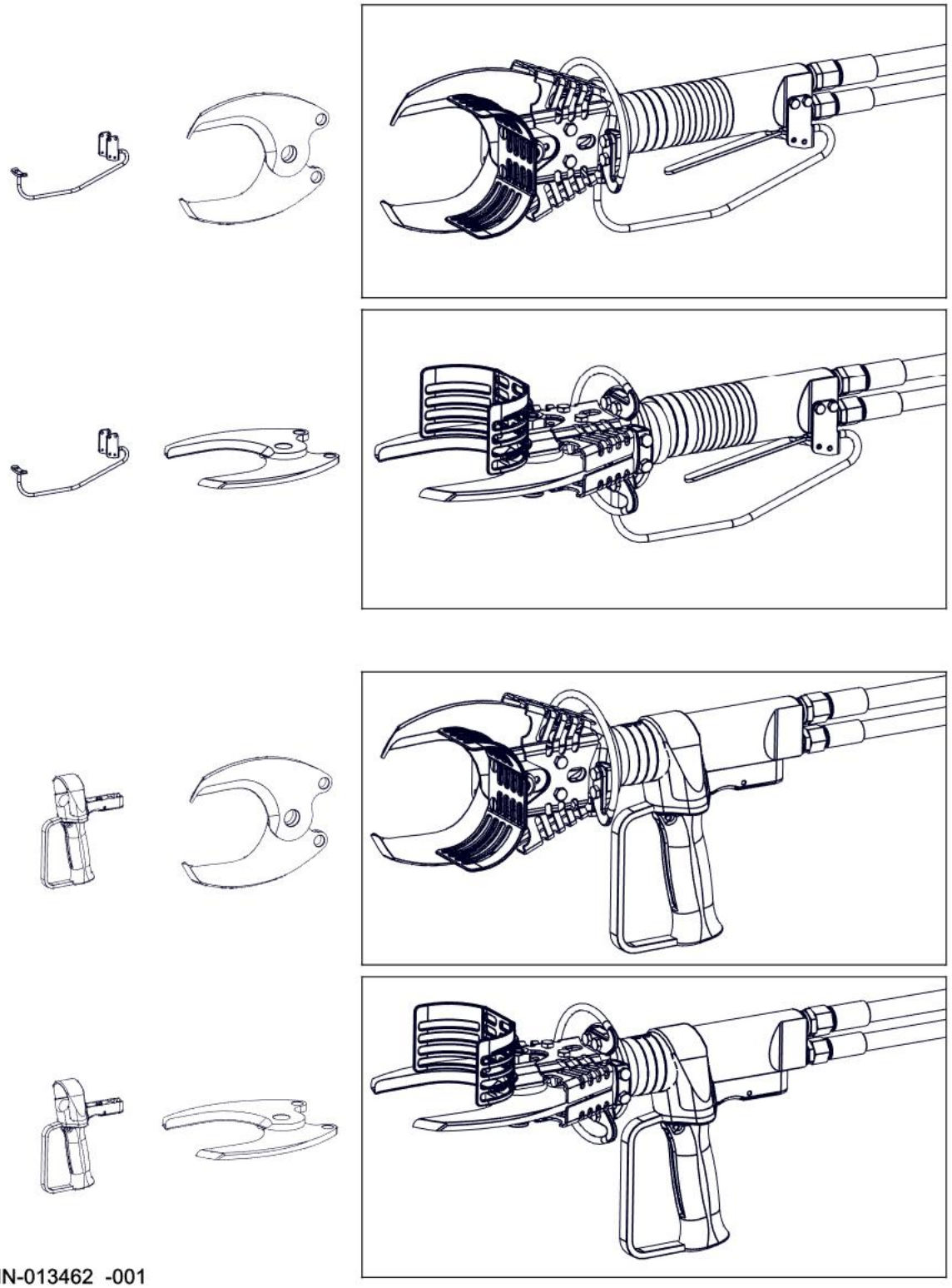
HPP12 - 7L



TIN-011962 -000

TIN-013462

FNS9



TIN-013462 -001

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