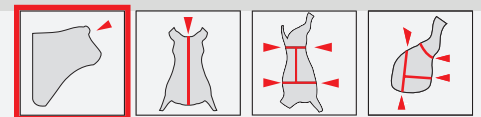


OPERATING MANUAL CAPTIVE BOLT STUNNER OF SERIES K

Translation of original manual

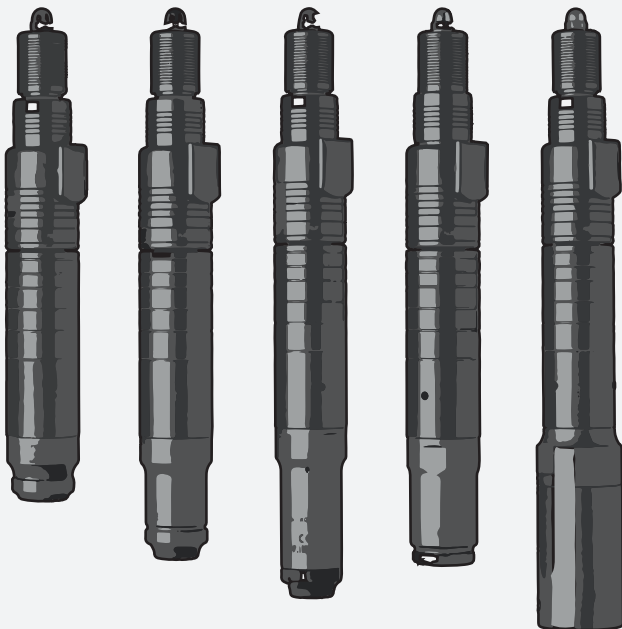


CAPTIVE BOLT STUNNER

- Typ KS bolt recoil system
- Typ KLS bolt recoil system
- Typ KR standard bolt
- Typ KL extended bolt
- Typ KK shortened bolt
- Typ KC blunt bullet stunning

OPTIONAL ACCESORIES

- stun test device
- stun test sleeve
- adapter sleeve
- cranial insertion rod
- optional tools



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Technical changes reserved

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

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1 About this Manual

The captive bolt stunners and the accessories of such stunners are also referred to as devices/machines in this operating manual.

This operating manual has been created in a way that allows you to work with the device quickly and safely.

The operating manual is a component of the device and contains important recommendations, instructions and information:

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

Before you start operating the devices, 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 for the staff employed there, for veterinarians and for persons carrying out emergency slaughtering as well as for butchers and small businesses and their trainees.

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:

- non-compliance or insufficient compliance with the information provided in this operating manual
- non-intended use
- unsuitable or improper handling
- Use of cartridges that do not conform to the original cartridges of Karl Schermer brand
- Use of spare parts or parts that are not approved by FREUND GmbH & Co.KG
- Unauthorised modifications to the functions or materials on the machine
- Incorrect operation or operation by unqualified personnel
- Removal or manipulation of the safety devices
- Incorrect or unprofessional cleaning
- Chemical or mechanical overloads
- Maintenance and repair work not being carried out according to instructions or maintenance intervals not being adhered to

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.

1.5 Symbols and layout elements

1.5.1 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

1.5.2 Safety signs

Warning signs



Warning of a danger point

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



Warning of hand injuries

Danger to the hands and fingers from crushing due to the falling or downward movements of machine parts.

Prohibition Signs



General prohibition sign

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



High-pressure cleaners prohibited

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 hearing protection

protect hearing during operation of the machine.



Wear safety spectacles

protect the eyes against flying parts, fragments and squirting liquids



Wear safety shoes or rubber boots

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



Wear a protective apron

protects the body against humidity, blood and other fluids.



Observe the assembly manual or spare parts lists

further information can be found in the assembly manuals and spare parts lists.

1.5.3 Symbols



Cattle (e.g. cows, bulls, oxen, buffaloes)



Goat (horned)



Pig (wedge-shaped head)



Horse



Pig (steep head shape)



Game



Sheep



Game (horned)



Sheep (horned)



Contact position



Goat



Location of the brain



Comply with the operating manual

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



Video playlist

Link to video playlist.



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.



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.



Part of a spare parts package

This spare part is part of a spare parts package, in which parts identified through experience as requiring replacement or being subject to wear are combined.



Tool set available

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

2

Numbers in the grey field indicate the sequence of the steps



Lubrication

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



Do not lubricate



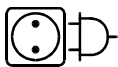
Glue

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



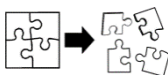
Cleaning

Instruction for an additional cleaning step

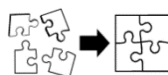


Power plug

Indicates connection of the machine to the power network.



Disassembly of the machine or assembly



Assembly of the machine or component

Indicates assembly of the machine following prior disassembly, Carry out steps in the reverse order

2 For your safety

This chapter describes the safety measures and safety devices. Before setting the machine into operation be sure you have read and understood the following safety information.

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.

Read the following chapter on safety and the safety instructions contained therein carefully before commissioning and using the machine.

2.1 Warnings

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

In this operating manual, warnings are 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.
NOTE	Indicates a potentially hazardous situation which, if not avoided, could result in damage to the machine or the environment.

2.2 Obligations of the operator

The operator is obliged to comply with the respective country-specific laws, guidelines, ordinances and regulations.

With regard to operators in the Federal Republic of Germany, this includes compliance with the following regulations:

- BetrSichV (Betriebssicherheitsverordnung / German Regulation on Safety and Health):
Regulation on safety and health protection when using work equipment
- Regulations of the employer's liability insurance association:
BGV A1 (DGUV Regulation 1), Principles of prevention
BGR 229 (DGUV Regulation 110-008), Working in the meat industry
- Regulation (EC) No 1099/2009
Regulation on the protection of animals at the time of killing
- German Animal Protection Slaughter Regulation (TierSchlV)
Regulation on the protection of animals at the time of slaughter or killing and on the implementation of Council Regulation (EC) No 1099/2009
- BGV D9 (DGUV Regulation 56): Working with ballistic apparatus.
- German Ordinance on the Proof Testing of Arms and Ammunition (BeschussV): General Ordinance on the German Weapons Act

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.

Competent personnel Only persons possessing the necessary knowledge and skills (expertise) may look after, restrain, stun, slaughter or kill animals.

The site operator ensures that the activities within the framework of slaughtering are only carried out by persons possessing a relevant certificate of expertise.

Back-up equipment The site operator shall ensure that during stunning operations appropriate back-up equipment is immediately available on the slaughtering point and is used in the case of failure of the stunning equipment initially used. The back-up method may differ from that first used.

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.

Workplace The workplace must comply with the national and regional hygiene and workplace regulations.

Hazard assessment	The site operator must inform users of possible dangers, symptoms, and preventative measures when handling the machine. Relevant occupational safety provisions have to be complied with in this regard. When working with the machine, it is compulsory to wear hearing protection and eye protection.
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.
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).

2.3 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.
Technical expert	A technical expert is someone who has expanded their existing specialist knowledge by attending an officially recognised specialist training course. Depending on the area of responsibility, acquisition of technical expertise may be contingent on passing an exam at the end of the course. Furthermore, a technical expert is someone who has a qualification recognised as equivalent by the competent authority or defined as equivalent in this Regulation.
Captive bolt stunner safety	Before starting any work, carefully check the captive bolt stunner for proper function in accordance with the intended use. Do not put the captive bolt stunner into operation if it does not work correctly. If a safety device is faulty, have it repaired. Notify the operator or his authorised representative of any changes to the captive bolt stunner which may put your safety at risk.

Safety at the workplace

Maintain a stable upright position and keep your balance.
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 captive bolt stunners.

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.

2.4 Personal protective equipment (PPE)

Personnel must wear the personal protective equipment that is customary in the industry. The personal protective equipment is dependent on the respective work area.

The personal protective equipment must be provided by the site operator. For reasons of hygiene, every employee is given their own personal protective equipment.

2.5 Tests in relation to the captive bolt stunner

2.5.1 Testing in accordance with the German Animal Protection Slaughter Regulation (TierSchlV)

Testing prior to first commissioning

For all captive bolt stunners of the Karl Schermer brand, all relevant stunning and work safety parameters are inspected prior to delivery of the stunners in accordance with the applicable German Animal Protection Slaughter Regulation (TierSchlV) and the EC Regulation 1099/2009, the operational safety regulation and the accident prevention regulation.

2.5.2 Tests as per the German Ordinance on the Proof Testing of Arms and Ammunition

Operators of captive bolt stunners in the Federal Republic of Germany must arrange for the following tests to be carried out:

- Repeat test
- Tests in the event of a significant functional defect

Repeat test

The following applies to operators of captive bolt stunners in the Federal Republic of Germany:

For all captive bolt stunners, the operator is obliged to present the captive bolt stunner to the manufacturer or its authorised representative for testing 2 years after purchase and every subsequent 2 years in accordance with the German Ordinance on the Proof Testing of Arms and Ammunition.

Tests in the event of a significant functional defect

The following applies to operators of captive bolt stunners in the Federal Republic of Germany:

With regard to a captive bolt stunner with a significant functional defect, the operator is obliged to present the captive bolt stunner to the manufacturer or his authorised representative for testing in accordance with the German Ordinance on the Proof Testing of Arms and Ammunition.

Test mark



After passing the repeat test, the machine is given a test mark or a test badge indicating the year and quarter of the test.*

The number in the square indicates the last two digits of the year. The numbers 1-4 in the triangles indicate the quarters.

The number in the triangle facing the muzzle indicates the quarter of the test.

The enclosed test certificate for the repeat test indicates the next test date as well as other information.**

*The captive bolt stunner is given a test mark or test badge after the first repeat test.

**The countdown until the next repeat test (every 2 years) begins on the date of invoicing.

Muzzle of the
captive bolt
stunner

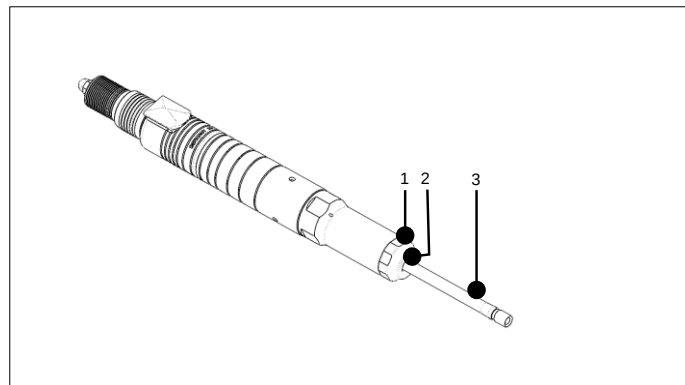


Fig. 2-1 Captive bolt stunner with bolt

Pos.	Designation
1	Bolt end guide
2	Muzzle (opening through which the bolt exits)
3	Bolt

2.6 Residual risks

The Captive Bolt Stunners K-Series 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 to fingers and hands.
- hearing damage from noise if noise emissions exceed 75 dB(A)

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.

2.7 Intended use

The captive bolt stunners of types KS, KR, KK, KLS, KL, KC may only be operated with the intended safety devices. Such devices must be fully functional.

Types: KS, KK The captive bolt stunners of types KS and KK are designed for stunning slaughter animals with a live weight of ≤ 650 kg (e.g. sheep, pigs, sows, boars, horses, cows, oxen, bulls).

Type KLS The captive bolt stunner of type KLS is designed for stunning slaughter animals with a live weight > 1000 kg (e.g. heavy bulls).

Type: KR The captive bolt stunner of type KR is designed for stunning slaughter animals with a live weight of ≤ 1000 kg (e.g. sheep, pigs, sows, boars, horses, cows, oxen, bulls).

Type: KL The captive bolt stunner of type KL is designed for stunning slaughter animals with a live weight > 1000 kg (e.g. heavy bulls, water buffaloes).

Type: KC The captive bolt stunner of type KC

- must **not** be used to stun slaughter animals if the slaughterhouse is located in a member state of the European Union.
- may be used to stun slaughter animals if the slaughterhouse is located in a state outside of the European Union. The use of the device type must be approved by the legal regulations of the respective country.

The captive bolt stunners of the Karl Schermer brand may

- only be operated by hand (one-handed guidance). The same safety and precautionary measures apply in relation to captive bolt stunners as apply to firearms.
- only be used with cartridges that conform to the specifications and qualities of the original cartridges of the Karl Schermer brand.
- only be loaded, unloaded and/or cocked in a secure state.
- not be released until the slaughter animal is in place for stunning.
- only be used in work areas that are well lit and well ventilated (air exchange rate: > 1.5/hour).

With regard to the captive bolt stunners, only spare, wearing and accessory parts may be used if such parts conform to the specifications and qualities of the original spare, wearing and accessory parts of the Karl Schermer brand.

"StunTest" test devices and test sleeve

Types KS, KR,
KK, KL, KLS

- are intended for the functional testing of captive bolt stunners of the Karl Schermer brand.
Within the area of application of the Federal Republic of Germany, the stunners meet the requirements of EC Regulation 1099/2009 and the German Animal Protection Slaughter Regulation (TierSchlV) with regard to functional testing prior to slaughter.

Type KLS

- An adapter sleeve is required for the proof test of the KLS captive bolt stunner with the StunTest test device or the test sleeve.

Cranial insertion rod

- is used after stunning with captive bolt stunners, if the slaughter of the animal is to take place without blood withdrawal.
Within the area of application of the Federal Republic of Germany, the stunners meet the requirements of the German Animal Protection Slaughter Regulation (TierSchlV).

Intended use also includes:

- compliance with the safety instructions and the safety requirements,
- proper execution of repairs and maintenance,
- regular cleaning.

Any other use is deemed non-intended use and poses risks to the safety of the operating personnel.

Exclusion of
liability

FREUND GmbH & Co.KG does not accept any liability for damage resulting from non-intended use.

2.8 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.

Non-intended use of the captive bolt stunners also includes:

- aligning and positioning captive bolt stunners on persons or parts of the body.
- handing cocked and/or loaded captive bolt stunners to other persons.
- releasing the bolt outdoors.
- modifying or manipulating the captive bolt stunners.
- using cartridges, spare, wearing and accessory parts that **do not** conform to the specifications or qualities of the original cartridges, original spare, wearing, and accessory parts of the Karl Schermer brand.
- using the captive bolt stunners in explosive or inflammable environments.
- using the captive bolt stunners to tranquillise animals prior to slaughter.
- using the captive bolt stunners without functional safety devices.

3 Technical Description

3.1 Captive bolt stunners

3.2 Functional description of the captive bolt stunners

The captive bolt stunners of the Karl Schermer brand comply with the specifications of EC regulation no. 1099/2009.

With regard to the use of types KS, KR, KL, KLS, KK and KC, the respective national regulations on the protection of animals apply at the time of slaughter or killing.

The captive bolt stunners are used for the stunning of slaughter animals such as sheep, pigs, sows, boars, horses, cows, oxen, bulls, and water buffaloes.



The stated muzzle velocity of 45-65 m/s for the Schermer captive bolt stunners of the K series is dependent on the strength of the cartridges used.

Colours are used to identify the strength of the cartridges, e.g. blue = strong, red = very strong.

Features Captive bolt stunning renders the animal immediately deeply unconscious for a prolonged period. It has been unanimously found to be a method of stunning in accordance with animal welfare provisions.

The thickness of the cartridge used must be aligned with the size, weight, age, breed, and hair coat of the animal to ensure that the full length of the bolt penetrates the animal's skull.

Types: KS, KR,
KL, KK, KLS

Irreversible stunning:

Following ignition of the cartridge, the propellant charge accelerates the bolt to such a strong extent that the bolt penetrates the skullcap at a speed of about 45 – 65 m/s and enters the brain of the animal.

Functionality can be tested using the test sleeve and the StunTest test device.

Type: KC

Irreversible stunning:

Following ignition of the cartridge, the propellant charge accelerates the bolt to such a strong extent that the impact plate strikes the skullcap of the animal at a speed of about 45 – 65 m/s.

Function with
recoil system,
Type: KS, KLS

The bolt is pulled back into the guide tube by the recoil system (damping elements) automatically after penetrating the animal's head.

Function without
recoil system,
Type: KR, KL, KK,
KC

After penetrating the animal's skull, the bolt needs to be manually pushed back into the guide tube or into the spacer sleeve (KC).

Test confirmations	Types KS, KR, KL, KLS, KK, KC meet C.I.P. specifications and bear the approval mark "CIP", "T" and "PTB 1087". The marking is located on the bolt guide of the device.
CIP	
T	
PTB 1087	Physikalisch-Technische Bundesanstalt Braunschweig NB 0102 Bundesallee 100 D-38116 Braunschweig

3.2.1 Functional and operating elements of type KR

Type KR

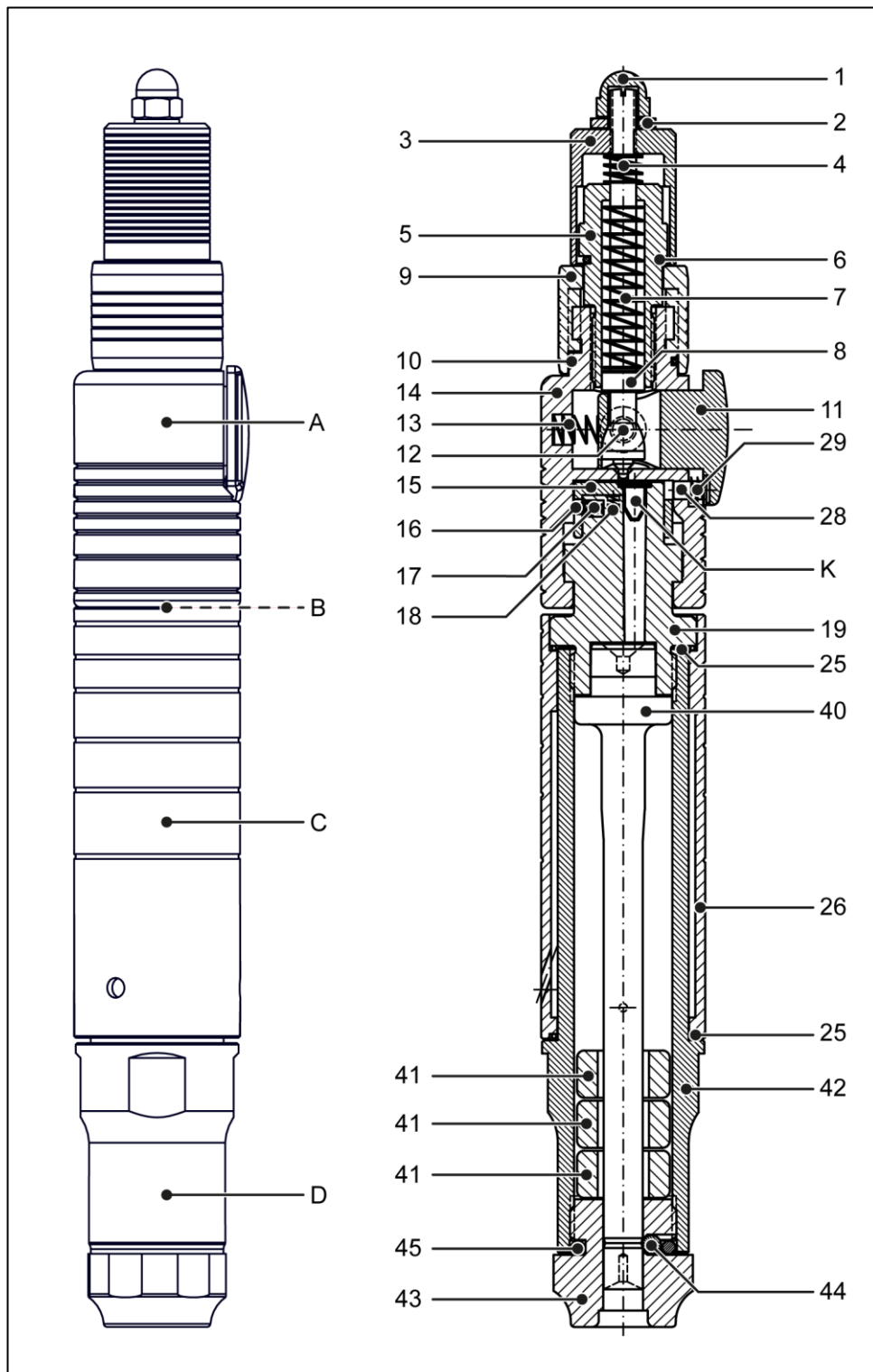


Fig. 3-1 Assemblies/components of type KR

Type KR

Pos.	Designation	Pos.	Designation
A	Bolt head		
1	Cap nut	9	Locking ring
2	Serrated washer	10	O-ring (locking ring)
3	Protective cap for firing pin	11	Trigger
4	Firing pin relief spring	12	Guide screw
5	Firing pin guide	13	Trigger spring
6	O-ring (red, x2)	14	Bolt head housing
7	Firing pin spring	28	Trigger lock pin
8	Firing pin	29	Trigger lock pin spring
Pos.	Designation	Pos.	Designation
B	Cartridge receiver		
K	Cartridge	17	Guide pin spring
15	Cartridge ejector	18	Ejector spring (x2)
16	Ejector guide pin	19	Cartridge repository
Pos.	Designation	Pos.	Designation
C	Bolt guide		
25	O-ring (protective sheath)	42	Guide tube
26	Protective sheath	43	Bolt end guide
40	Bolt	44	Clamping ball (x3)
41	Rubber buffer (black, red, black)	45	Fixing ring
Pos.	Marking		
D	Device type and serial number: e.g. KR10001 (old marking: e.g. KR1001)		

3.2.2 Functional and operating elements of type KL

Type KL

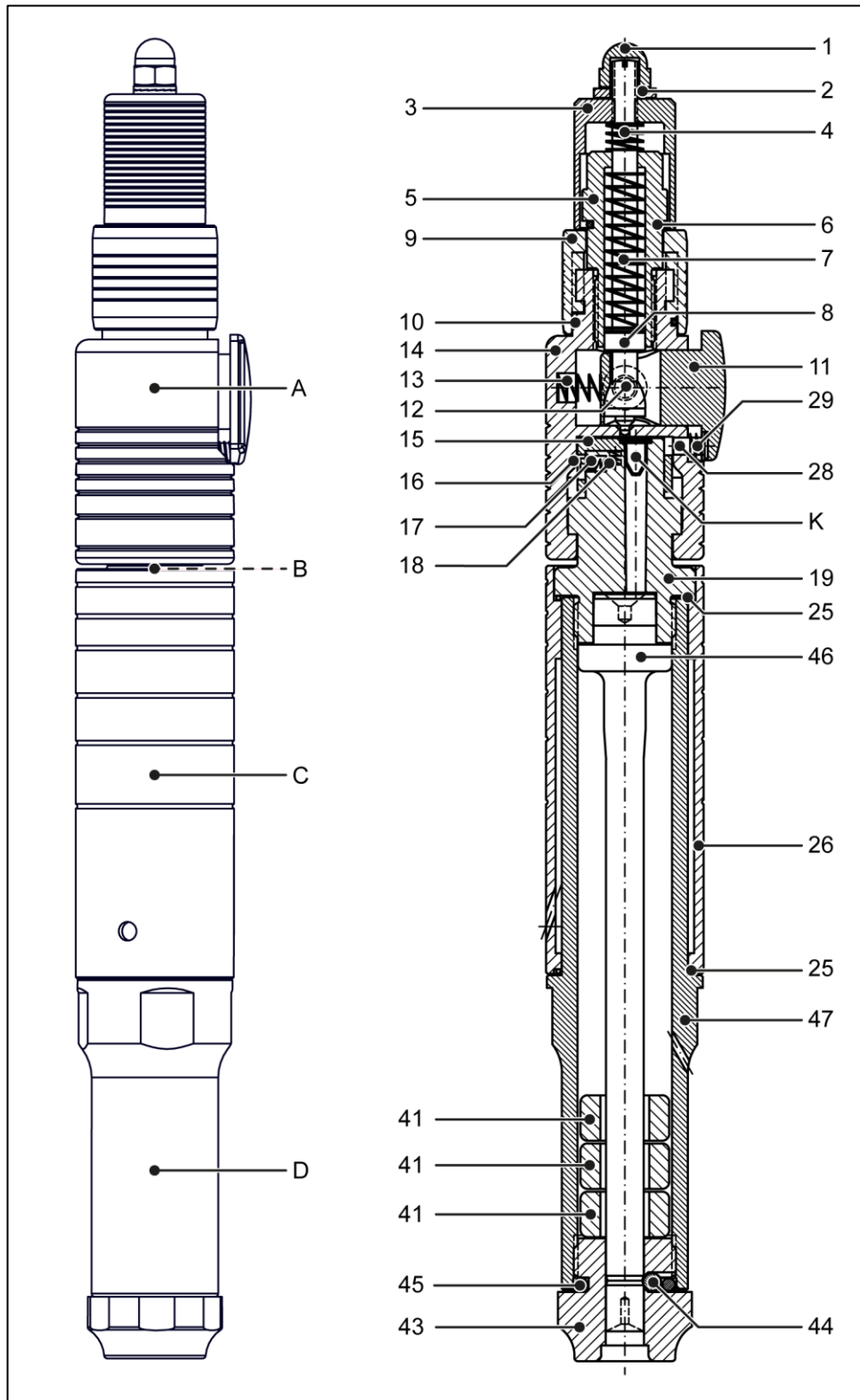


Fig. 3-2 Assemblies/components of type KL

Type KL

Pos.	Designation	Pos.	Designation
A	Bolt head		
1	Cap nut	9	Locking ring
2	Serrated washer	10	O-ring (locking ring)
3	Protective cap for firing pin	11	Trigger
4	Firing pin relief spring	12	Guide screw
5	Firing pin guide	13	Trigger spring
6	O-ring (red, x 2)	14	Bolt head housing
7	Firing pin spring	28	Trigger lock pin
8	Firing pin	29	Trigger lock pin spring
Pos.	Designation	Pos.	Designation
B	Cartridge receiver		
K	Cartridge	17	Guide pin spring
15	Cartridge ejector	18	Ejector spring (x2)
16	Ejector guide pin	19	Cartridge repository
Pos.	Designation	Pos.	Designation
C	Bolt guide		
25	O-ring (protective sheath)	44	Clamping ball (x3)
26	Protective sheath	45	Fixing ring
41	Rubber buffer	46	Bolt
	(black, red, black)	47	Guide tube
43	Bolt end guide		
Pos.	Marking		
D	Device type and serial number: e.g. KL10001 (old marking: e.g. KL1001)		

3.2.3 Functional and operating elements of type KK

Type KK

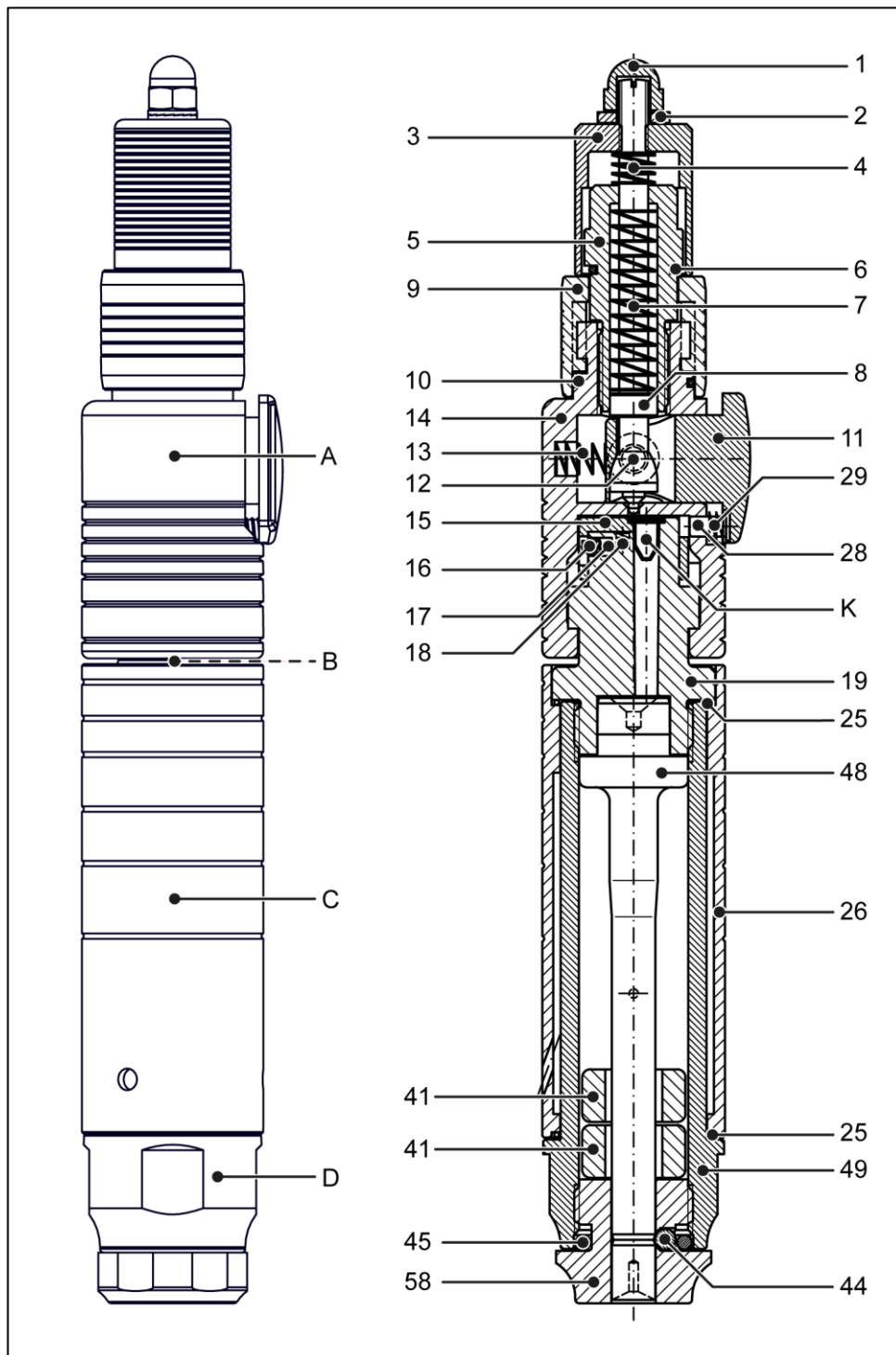


Fig. 3-3 Assemblies/components of type KK

Type KK

Pos.	Designation	Pos.	Designation
A	Bolt head		
1	Cap nut	9	Locking ring
2	Serrated washer	10	O-ring (locking ring)
3	Protective cap for firing pin	11	Trigger
4	Firing pin relief spring	12	Guide screw
5	Firing pin guide	13	Trigger spring
6	O-ring (red, x 2)	14	Bolt head housing
7	Firing pin spring	28	Trigger lock pin
8	Firing pin	29	Trigger lock pin spring
Pos.	Designation	Pos.	Designation
B	Cartridge receiver		
K	Cartridge	17	Guide pin spring
15	Cartridge ejector	18	Ejector spring (x2)
16	Ejector guide pin	19	Cartridge repository
Pos.	Designation	Pos.	Designation
C	Bolt guide		
25	O-ring (protective sheath)	45	Fixing ring
26	Protective sheath	48	Bolt
41	Rubber buffer	49	Guide tube
	(red, black)	58	Bolt end guide
44	Clamping ball (x3)		
Pos.	Marking		
D	Device type and serial number: e.g. KK10001 (old marking: e.g. KK1001)		

3.2.4 Functional and operating elements of type KS

Type KS

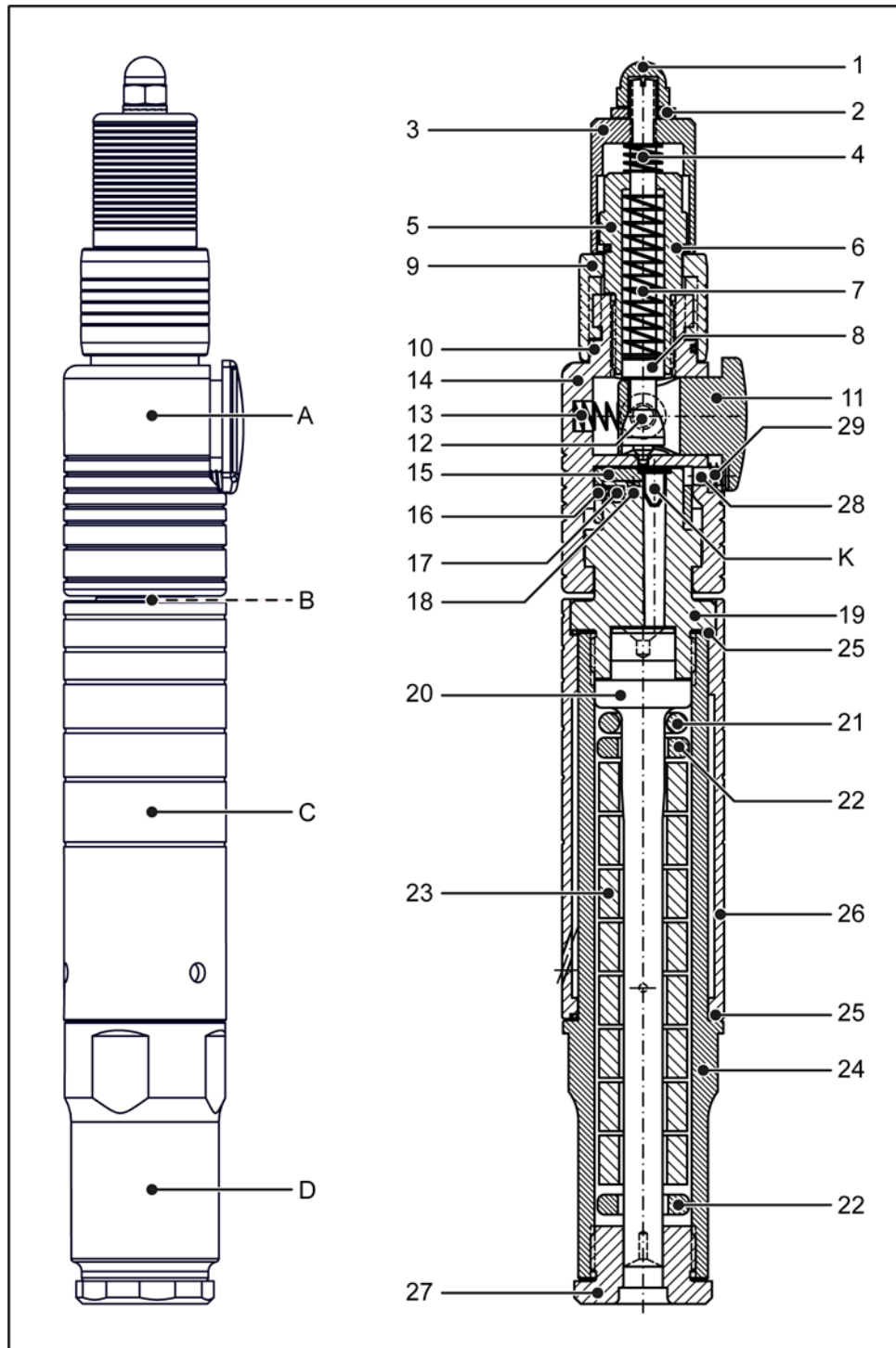


Fig. 3-4 Assemblies/components of type KS

Type KS

Pos.	Designation	Pos.	Designation
A	Bolt head		
1	Cap nut	9	Locking ring
2	Serrated washer	10	O-ring (locking ring)
3	Protective cap for firing pin	11	Trigger
4	Firing pin relief spring	12	Guide screw
5	Firing pin guide	13	Trigger spring
6	O-ring (red, x 2)	14	Bolt head housing
7	Firing pin spring	28	Trigger lock pin
8	Firing pin	29	Trigger lock pin spring
Pos.	Designation	Pos.	Designation
B	Cartridge receiver		
K	Cartridge	17	Guide pin spring
15	Cartridge ejector	18	Ejector spring (x2)
16	Ejector guide pin	19	Cartridge repository
Pos.	Designation	Pos.	Designation
C	Bolt guide		
21	O-ring	26	Protective sheath
20	Bolt	24	Guide tube
25	O-ring (protective sheath)	27	Bolt end guide
22	Rubber washer	23	Damping element (x8)
Pos.	Marking		
D	Device type and serial number: e.g. KS10001 (old marking: e.g. KS1001)		

3.2.5 Functional and operating elements of type KLS

Type KLS

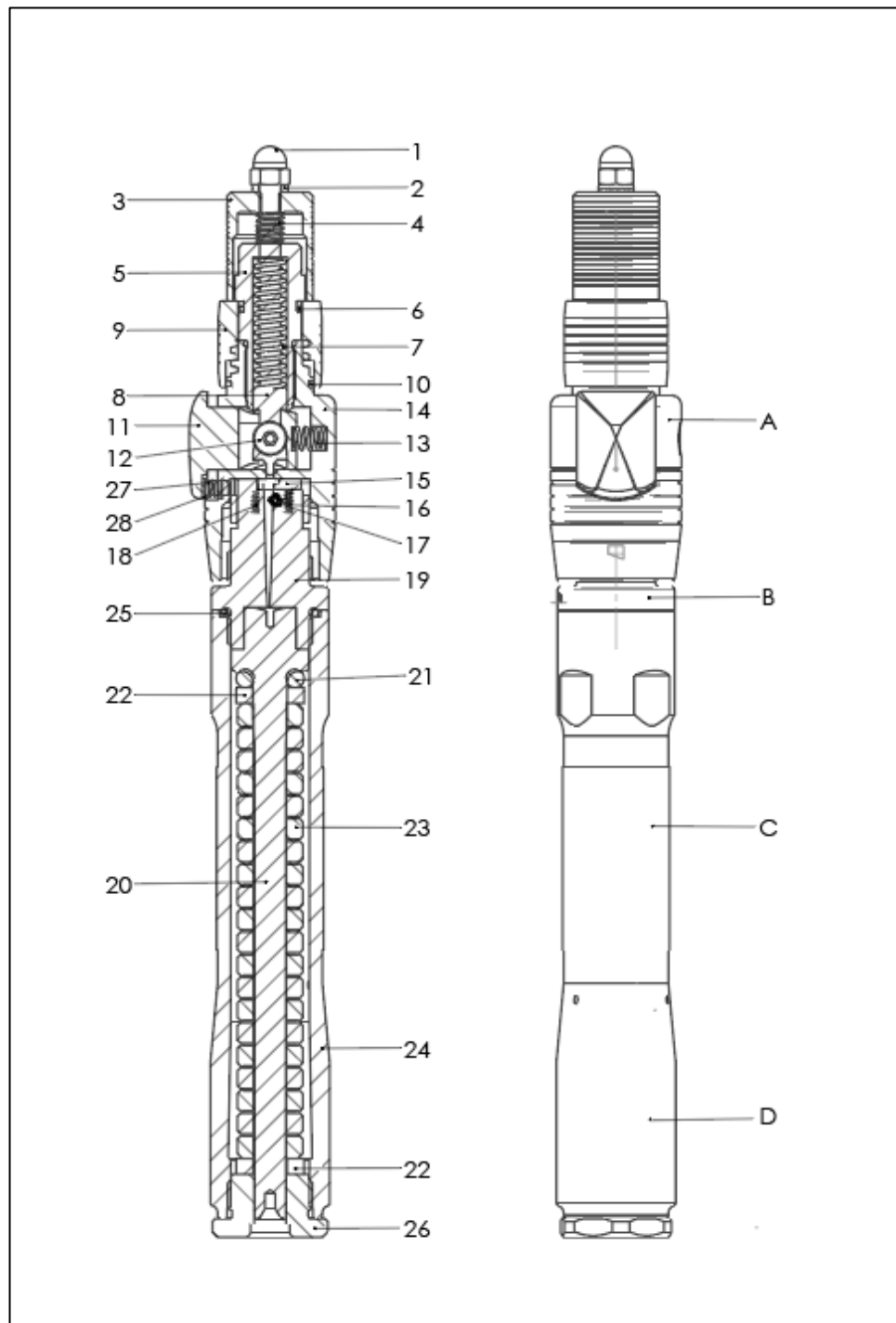


Fig. 3-5 Assemblies/components of type KLS

Type KLS

Pos.	Designation	Pos.	Designation
A	Bolt head		
1	Cap nut	9	Locking ring
2	Serrated washer	10	O-ring (locking ring)

Type KLS

Pos.	Designation	Pos.	Designation
3	Protective cap for firing pin	11	Trigger
4	Firing pin relief spring	12	Guide screw
5	Firing pin guide	13	Trigger spring
6	O-ring (red, x 2)	14	Bolt head housing
7	Firing pin spring	28	Trigger lock pin
8	Firing pin	29	Trigger lock pin spring
Pos.	Designation	Pos.	Designation
B	Cartridge receiver		
K	Cartridge	17	Guide pin spring
15	Cartridge ejector	18	Ejector spring (x 2)
16	Ejector guide pin	19	Cartridge repository
Pos.	Designation	Pos.	Designation
C	Bolt guide		
20	Bolt	24	Guide tube
21	O-ring	25	O-ring (guide tube)
22	Rubber washer (x 2)	26	Bolt end guide
23	Damping element (x 20)		
Pos.	Marking		
D	Device type and serial number: e.g. KLS10001 (old marking: e.g. KLS1001)		

3.2.6 Functional and operating elements of type KC

Type KC

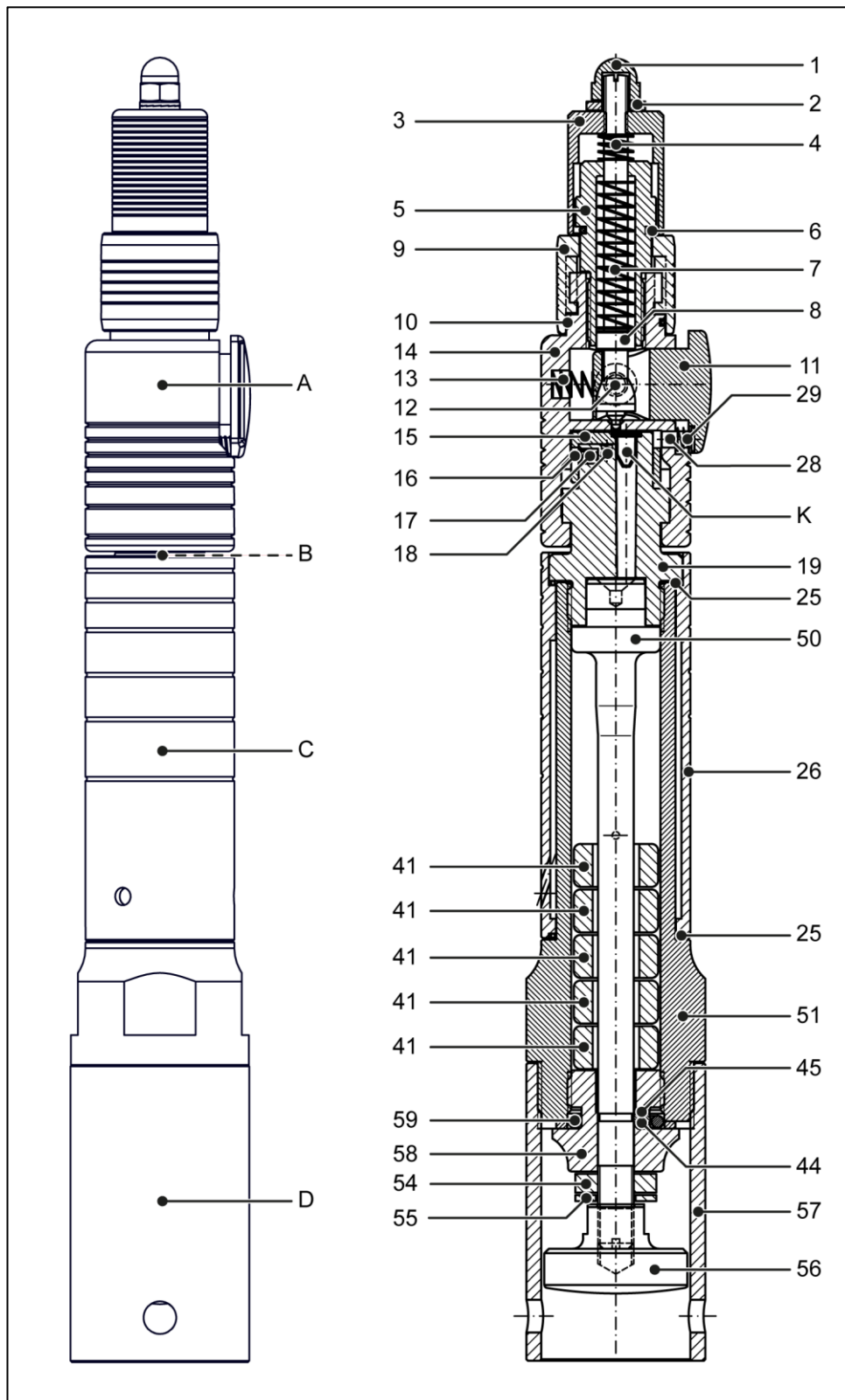


Fig. 3-6 Assemblies/components of type KC

Type KC

Pos.	Designation	Pos.	Designation
A	Bolt head		
1	Cap nut	9	Locking ring
2	Serrated washer	10	O-ring (locking ring)
3	Protective cap for firing pin	11	Trigger
4	Firing pin relief spring	12	Guide screw
5	Firing pin guide	13	Trigger spring
6	O-ring (red, x 2)	14	Bolt head housing
7	Firing pin spring	28	Trigger lock pin
8	Firing pin	29	Trigger lock pin spring
Pos.	Designation	Pos.	Designation
B	Cartridge receiver		
K	Cartridge	17	Guide pin spring
15	Cartridge ejector	18	Ejector spring (x2)
16	Ejector guide pin	19	Cartridge repository
Pos.	Designation	Pos.	Designation
C	Bolt guide		
25	O-ring (protective sheath)	51	Guide tube
26	Protective sheath	54	Lock nut
41	Rubber buffer (black, red)	55	Serrated washer
	black, red, black)	56	Impact plate
44	Clamping ball (x3)	57	Spacer sleeve
45	Fixing ring (rubber)	58	Bolt end guide
50	Bolt	59	Fixing ring (steel)
Pos.	Marking		
D	Device type and serial number: e.g. KC10001 (old marking: e.g. KC1001)		

EN

3.2.7 Information on the device



The following information is stamped on the bolt head and on the guide tube.

Information on the bolt head/cartridge repository

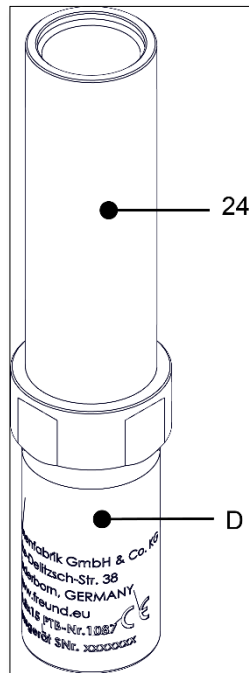
Type of information	Information
Country of production	GERMANY
Date of production	e.g. N35 (year, calendar week)

On the guide tube (bolt guide)

Type of information	Information
Manufacturer's address	Address of FREUND GmbH & Co. KG
Device type and serial number	e.g. KR10001 (old marking: e.g. KR1001)
Test mark*	CIP T PTB 1087 (882 old approval)
Cartridge type	Calibre 6.8/18**

*PTB: (Physikalisch-Technische Bundesanstalt in Braunschweig / *Germany's National Metrology Institute*)

**The approval for the 6.8/18 calibre also includes all shorter calibres, e.g. 6.8/15 or 6.8/11



C/24 Bolt guide/guide tube

D Information on the device:

- Manufacturer
- Address
- Internet
- CIP (PTB) approval number
- Calibre of cartridges
- Type designation (e.g. KS)
- Serial number
- CE marking

Fig. 3-7 Guide tube engraving (similar to that shown)

3.3 Cartridges

i When choosing a suitable cartridge strength, due consideration must be given to the age, weight, breed, hair coat, skin folds, sex of the animal and any head fixation.

Features The Karl Schermer brand captive bolt stunners are approved for cartridge calibre 6.8/18 in accordance with the PTB – test certificate. Cartridge calibres 6.8/15 and 6.8/11 may also be used for the Schermer captive bolt stunners.

The original cartridges are colour-coded and can be supplied in the following charge strengths:

Type	Marking	Application
Part number: 010-620004	Calibre 6.8/15	Blue
Part number: 010-620005	Calibre 6.8/15	Red
Part number 010-620001	Calibre 6.8/11	Test cartridges red
		StunTest device

Cartridge box/
cartridge

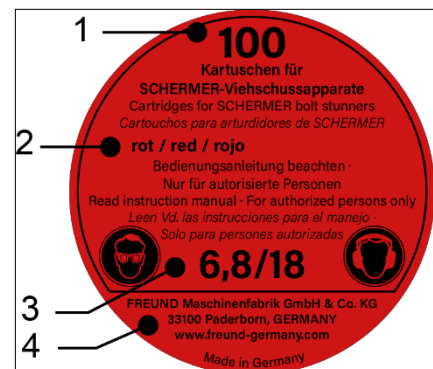
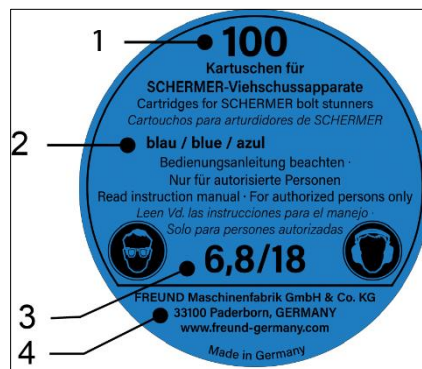


Fig. 3-8 Cartridge box/cartridge (example: Calibre 6.8/18)

Pos.	Designation	Pos.	Designation
1	Cartridge box/specification of the quantity	2	Colour code: Indicates the strength of cartridge.
3	Length of the cartridge in (mm) / Nominal calibre in (mm)	4	Company details FREUND Maschinenfabrik

3.4 StunTest test device

- Features
- The captive bolt stunners of types KR, KL, KLS, KK and KS are tested in the firing device of the StunTest test device for functionality of the bolt firing speed before slaughter begins.
 - The captive bolt stunner is loaded with a test cartridge of calibre 6.8/11 red for the functional test.
 - The test cartridge prevents any unnecessary wear on the captive bolt stunner.
 - The functional test for the captive bolt stunner tested is passed if a minimum value for the bolt speed → *Bolt speeds* is reached.

Objectives of the proof test	
Accurate speed measurement	The evaluation unit measures the speed of the bolt after the shot has been fired. <i>This measurement is carried out by means of light barriers, which enable precise and fast data acquisition.</i>
Checking the functionality	By determining the bolt firing speed, a check is performed to determine whether the captive bolt stunner is working properly. <i>Too low or irregular speed may indicate a defect or wear that needs to be corrected to ensure effective stunning.</i>
Ensuring effectiveness	A correct bolt firing speed is crucial for ensuring the immediate and humane stunning of the animal. The evaluation unit ensures that the speed is within the optimal range to quickly and painlessly stun the animal.
Reliability and maintenance	Regular checking of the bolt firing speed helps to ensure the reliability of the captive bolt stunner. It enables early detection and resolution of problems before they lead to serious malfunctions.
Regulatory compliance	In many countries, there are legal requirements applicable to the stunning of animals before slaughter. The evaluation unit helps to ensure that these requirements are met by providing documented evidence of bolt firing speed.

Adapter sleeve for KLS



In order to insert the KLS captive bolt stunner into the test sleeve, an adapter sleeve is required.

Bolt speed for*:

Type KS	Bolt speed: 38-40 [m/s].
Type KR, KK, KL, KLS	Bolt speed: 40-42 [m/s].

* The bolt speeds indicated refer to the use of the recommended test cartridges.

Article no:
010-129000

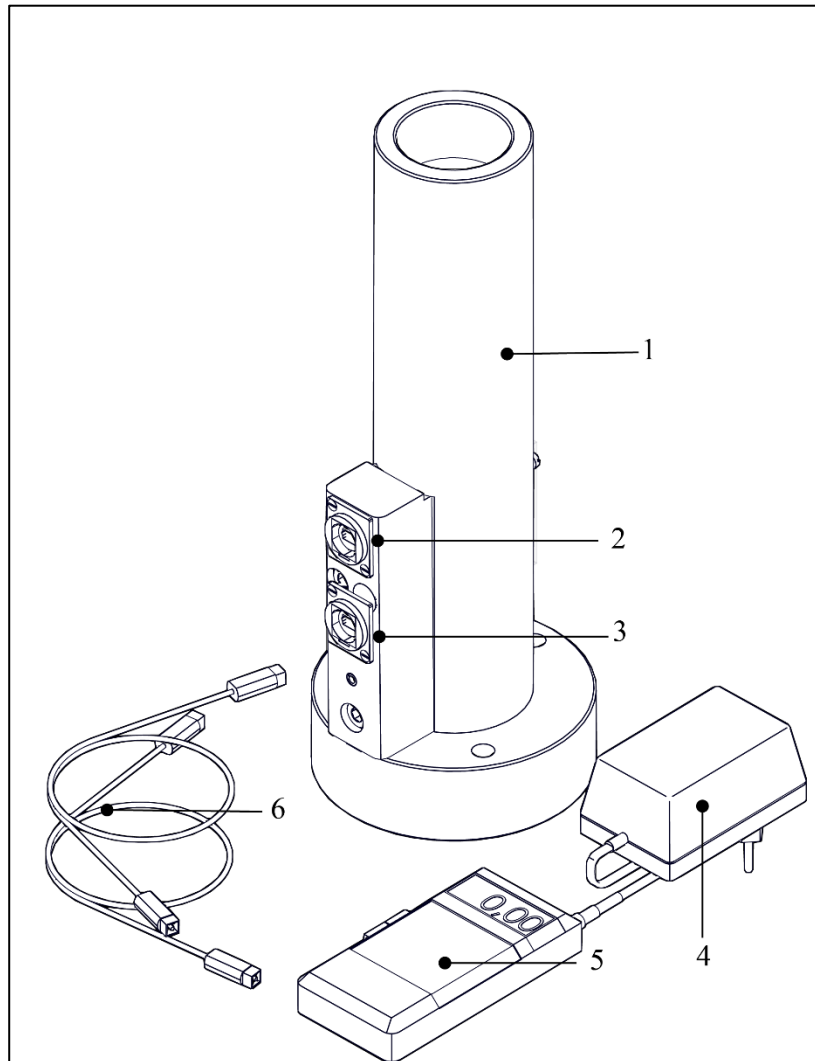


Fig. 3-9 StunTest test device (optional accessory)

Pos.	Designation
1	Base body (holder for the captive bolt stunner)
2	Connection: Port 1
3	Connection: Port 2
4	Power supply unit 9V DC
5	Evaluation unit
6	Measuring sensors with optical fibre cable
Not shown	Light source (not included in the scope of delivery)

Protective sheath The protective sheath is an important component of the KS, KR, KL, KK, KC captive bolt stunners.

- During the daily functional test, it is imperative to check whether the protective sheath is damaged or worn.
- It must be replaced if it exhibits signs of wear or damage.

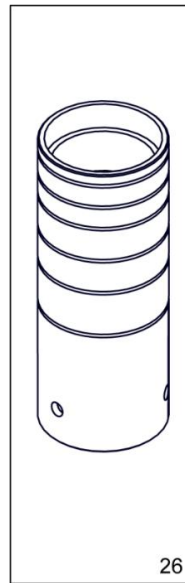


Fig. 3-10 Protective sheath

i The protective sheath is not part of the captive bolt stunner of type KLS.



German

[Playlist of German videos!](#)



English

[Playlist of the English maintenance videos!](#)



3.4.1 Evaluation unit/fibre optic cable

i The evaluation unit → *Evaluation unit* is used to determine the bolt firing speed.
This serves to ensure the functionality, effectiveness and reliability of the Schermer captive bolt stunners and thus to ensure a humane and legally compliant stunning of animals.

i The evaluation unit does not require any maintenance or calibration activities.

Before the proof test, the evaluation unit must be activated using the *Reset button*.

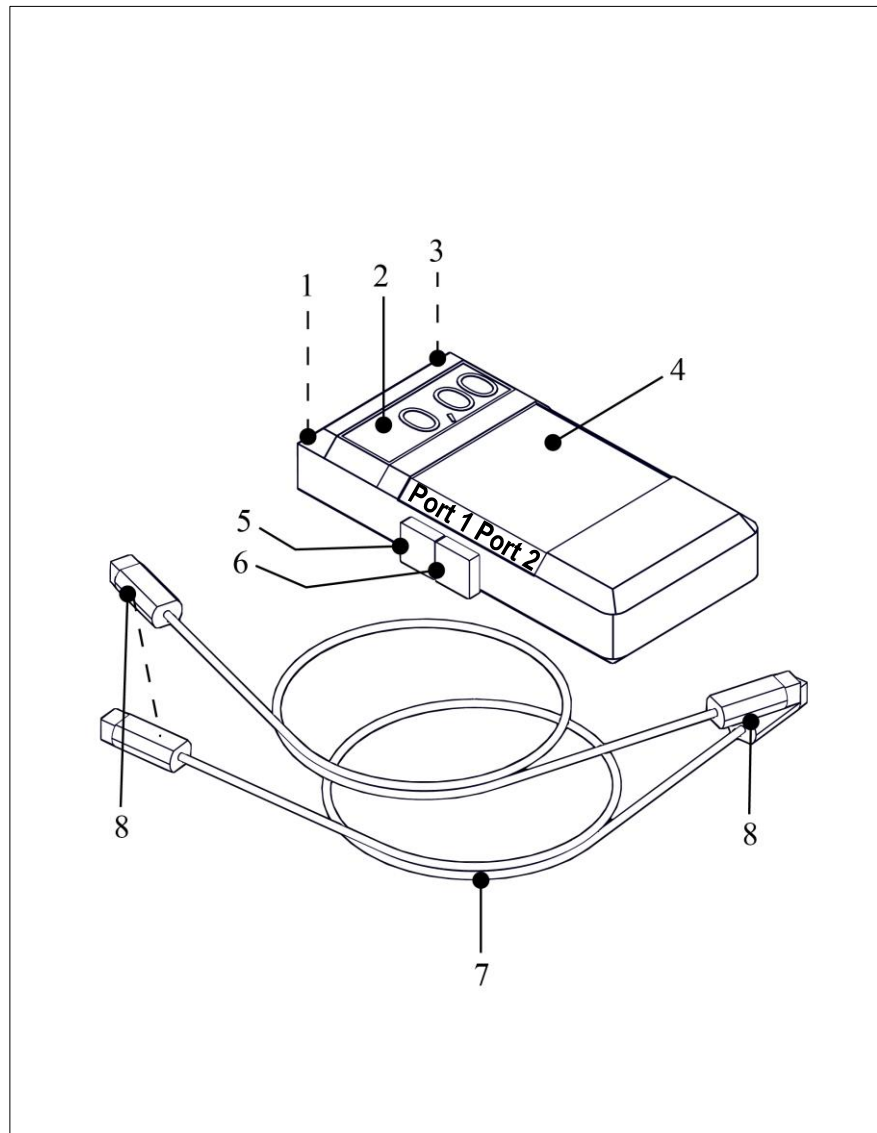


Fig. 3-11 Functional elements of the evaluation unit/fibre optic cable

Pos.	Designation
1	RESET button (sets the display to '0')
2	Display (indicates the status and the current muzzle velocity)
3	Connection socket for the power supply (9V DC)
4	Evaluation unit
5	Connection: Port 1 Sealing caps (protect the connection sockets against dirt and damage)
6	Connection: Port 2 Sealing caps (protect the connection sockets against dirt and damage)
7	Fibre optic cable (similar to that shown)

8	Connector for measuring sensors (connection to the evaluation unit)
8	Connector for measuring sensors (connection to the base body)

3.4.2 Base body

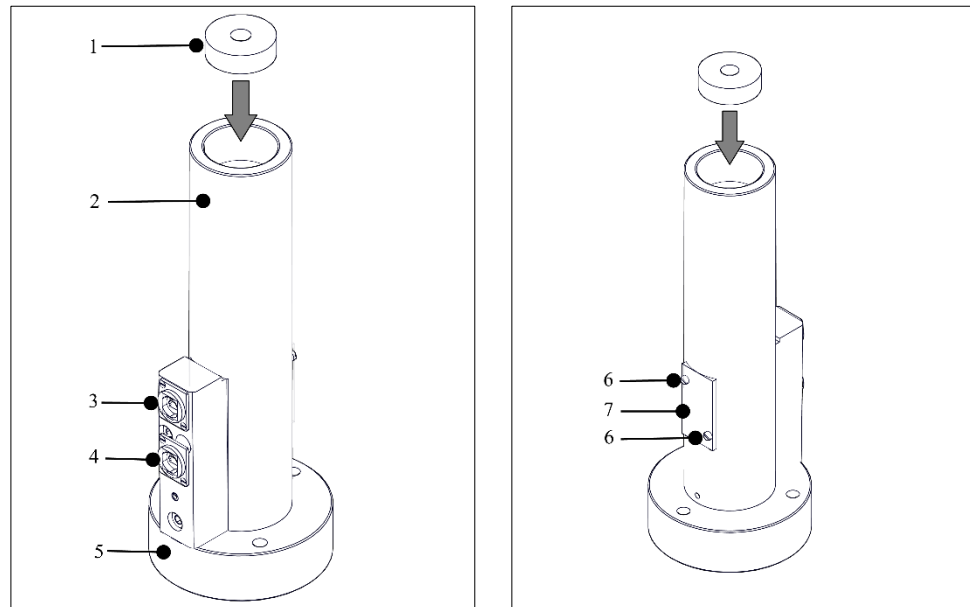


Fig. 3-12 Functional elements of the base body of the StunTest device

Pos.	Designation
1	Rubber washer
2	Base body
3	Connection: Port 1
4	Connection: Port 2
5	Base with mounting holes
6	Screws (M4x12)
7	Plexiglas cover
Not shown	O-rings, pos. 25 → <i>Functional and operating elements</i>

3.5 Test sleeve

Features The captive bolt stunners of types KR, KL, KLS, KK and KS are tested for penetration depth functionality in the test sleeve before slaughter begins. The captive bolt stunner is loaded with a test cartridge (calibre 6.8/11 red) for the functional test. The test cartridge prevents any unnecessary wear on the captive bolt stunner.

Constant test conditions are ensured by means of the captive bolt stunner inserted in the test sleeve. In this type of proof test, the shot is fired into square timber. The penetration depth of the bolt is the measured value to be checked.

A reference value is determined by firing a new or tested K-series captive bolt stunner before the proof test.

After the shot is fired during the proof test, the penetration depth of the bolt in the square timber is measured and compared with the penetration depth of the reference value.

The reference value and measured value are recorded in a test report.

Adapter sleeve
type KLS

In order to insert the KLS captive bolt stunner into the test sleeve, an adapter sleeve is required.

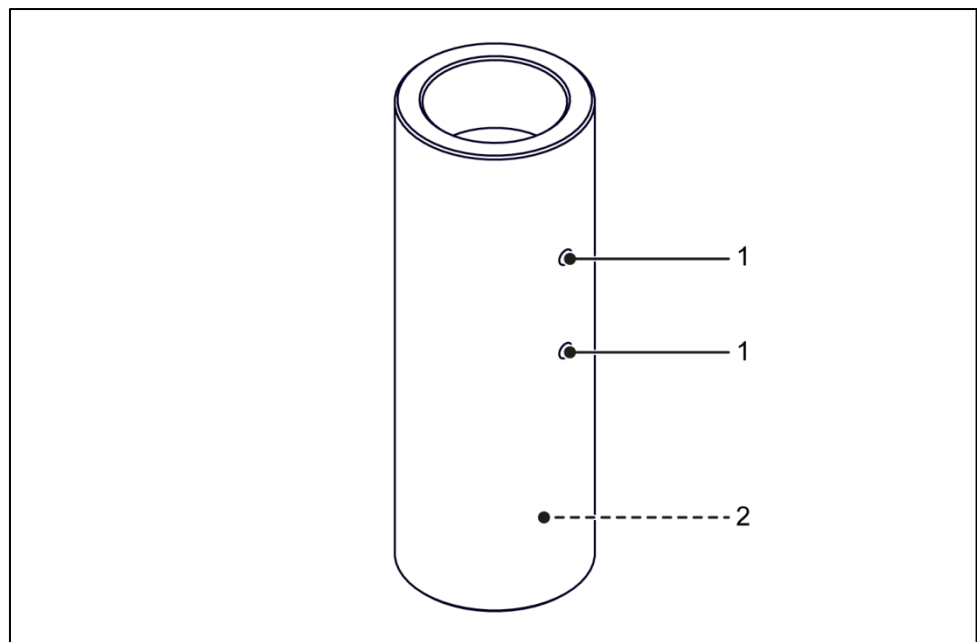


Fig. 3-13 Test sleeve (optional accessory)

Pos.	Description
1	Openings for pressure compensation
2	Stop surface inside the test sleeve
Not shown	Square timber (not included in the scope of delivery) Knot-free softwood, dimensions (L x W x D in cm): 10 x 10 x 100
Not shown	Measuring tool (not included in the scope of delivery)

3.6 Cranial insertion rod

Features The cranial insertion rod is used after stunning, if the slaughter of the slaughter animal is to take place without blood withdrawal. There are 2 versions of the cranial insertion rod available (→ chapter *Technical data*).

Article no.:
010-150400 (90)
010-150410 (35)



Fig. 3-14 Cranial insertion rod (optional accessory)

4 Transport and storage

The machines/devices of the Karl Schermer brand are intended for shipment by truck, train, aircraft or ship. Secure shipment is carried out in individual packaging or multi-packs.

Inspection by the
manufacturer

The machines/devices have been carefully inspected prior to shipment. The inspection ensures that the machines/devices exhibit the specified data and are working correctly.

Despite all due care, there is a possibility that the machines/devices may get damaged during transport. For this reason, check the machines/devices for potential transport damage when you unpack them.

4.1 Unpacking the machines/devices

After being unpacked, the machines/devices are ready for immediate use.

Reuse, recycling
and
disposal

FREUND GmbH & Co.KG recommends that the original packaging be used for transport (e.g. if the captive bolt stunner is shipped as part of the repeat test).

The original packaging consists of recyclable materials and can be disposed of according to the recyclables collection scheme in place.

Instructions for recycling and disposing of the packaging can be found in → chapter *Disposal and recycling*.

- Remove all packaging materials.
- Remove any accumulated condensate.
- Check the machines/devices for potential transport damage.
- Observe the machines/devices during the first hours of operation in order to identify any malfunctions.

4.2 Storing the machines/devices

It is imperative that you adhere to the following instructions regarding safe storage of the machines/devices:

- Only store the machines/devices in locations that are protected from moisture, frost and heat.
- Only store the machines/devices in a dry state if storing them for a longer period of time.
- Store the machines/devices in such a way that damage to the machines/devices is ruled out.
- Protect the machines/devices against corrosion.

It is imperative that you adhere to the following instructions regarding safe storage of the captive bolt stunner and the cartridges:

- Only store the captive bolt stunner if it is locked (→ chapter *Securing/releasing the captive bolt stunner*).
- When not in use, store the captive bolt stunner and the cartridges/cartridge boxes in separate locations.
- Store the captive bolt stunner and the cartridges/cartridge boxes in lockable cabinets/rooms that are only accessible to authorised persons.
- Only store the number of cartridges required for the daily requirements in the slaughtering area.
- Spare parts such as rubber buffers and damping elements must be stored in a dark place.

5 Operation and stunning

The country-specific regulations are to be observed in relation to the use of captive bolt stunners (→ chapter *Obligations of the operator*).
Veterinary, EU and animal protection regulations also apply.

5.1 Safety information



WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- The machine/device may only be operated by instructed and authorised service personnel.
- The machine/device may only be operated by personnel who have the requisite knowledge and skills (expertise) to anaesthetise animals properly and in accordance with animal welfare.



WARNING!

Danger if not in use

At the end of work and during periods when the captive bolt stunner is not in use, there is a danger that the bolt may be triggered unintentionally. This can cause life-threatening injuries.

- Secure the captive bolt stunner if it is not in use.
- Keep the captive bolt stunner under lock and key if it is not in use.
- Remove the cartridges from the cartridge repository if the captive bolt stunner is not in use.



WARNING!

Danger if parts of the captive bolt stunner are damaged or worn.

The use of a captive bolt stunner with damaged or worn parts can cause life-threatening injuries.

- Carry out a functional test and a proof test on a daily basis and before each use.
- Exchange damaged parts immediately.

**WARNING!****Danger if bolt is too short**

The use of a bolt that is too short due to re-sharpening can damage the captive bolt stunner and cause life-threatening injuries.

- Check the length of the bolt in the course of the daily functional check and exchange the bolt if it is too short.

Minimum bolt length:

Type KS, KR:	194 mm
Type KL:	230 mm
Type KLS:	235 mm
Type KK:	180 mm

5.2 Personal protective equipment



5.3 Animal protection

The harmonised laws of the EU and the German Animal Protection Slaughter Regulation (TierSchlV) require careful treatment that prevents pain, suffering or injury of the slaughter animals as the top priority.

- Avoid causing the slaughter animals any excitement, pain or suffering when driving, loading and stalling the animals.
- Avoid causing stress to the slaughter animals prior to stunning so that the level of agitation and injury is kept to an absolute minimum.
- Stun the animals so that they are quickly and painlessly rendered unconscious and insensitive right up to the point of death.
- Do not use any electric stunners to herd animals.
- Only use electric prods on healthy and unharmed cattle over one year old and pigs over four months old.

5.4 Selecting the captive bolt stunner

The appropriate captive bolt stunner must be selected according to the type of slaughter animal and the live weight.

The following table shows the intended uses of the captive bolt stunners according to the type of live weight, the weight of the slaughter animal, and the corresponding strength of the cartridges.

Weight of the
slaughter animal

The slaughter animal weight refers to the weight of an animal immediately before slaughter. It includes the total live weight of the animal, including all body parts and intestines.

Live weight The live weight (also called live mass) of a slaughter animal species refers to the weight of the animal in the living state before it is slaughtered. It covers the entire weight of the animal, including all body parts, intestines and fluids.

Application	KR	KS	KK	KL	KLS	KC	
 > 1000 kg				 Red	 Red	Observe country-specific legal regulations	
 650-1000 kg	 Red				 Red		
 300-650 kg	 Blue	 Red	 Red		 Blue		
 < 300 kg	 Blue	 Blue	 Blue		 Blue		
 				 Red	 Red		
 	 Blue	 Blue	 Blue		 Blue		
 >150 kg	 Red	 Red		 Red	 Red		
 30-150 kg	 Blue	 Red	 Blue		 Blue		
 < 30 kg	 Blue	 Blue	 Blue		 Blue		
 	 Blue	 Blue	 Blue		 Blue		
Strength of cartridge (colour code)	Blue		Strong		Heavy animals (e.g. bulls, cattle)		
	Red		Very strong		Heaviest animals		

5.5 Securing/releasing the captive bolt stunner



WARNING!

Risk of injury due to releasing the bolt

If the captive bolt stunner is unlocked, this can cause life-threatening injuries.

- Secure the captive bolt stunner prior to loading, unloading, cocking and prior to cleaning and maintenance work.
- Do not release the captive bolt stunner until the slaughter animal is in place for stunning.

Personal protective equipment



The captive bolt stunner is locked/unlocked at the bolt head of the captive bolt stunner.



Turning the locking ring can lock and unlock the bolt head of the captive bolt stunner.

Securing/releasing the bolt head

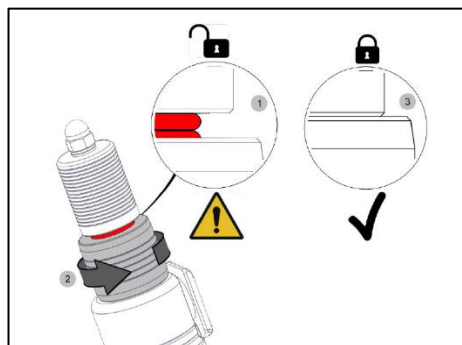


Fig. 5-1 Locking the bolt head

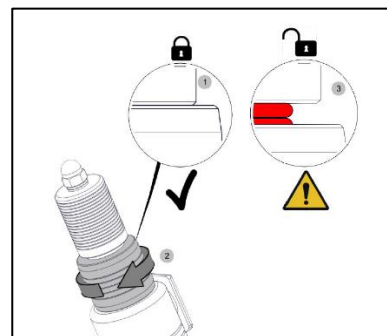


Fig. 5-2 Unlocking the bolt head

5.5.1 Locking the captive bolt stunner

The relevant manual can be found in the appendix under the heading **TIN-013584**.



- In locked state, the firing pin cannot strike the cartridge and trigger and ignition even if the trigger is pulled.
- If the trigger is no longer pushed outwards due to the spring being too weak, the spring must be exchanged immediately.
- The trigger lock pin prevents unintentional release of the captive bolt stunner when the bolt head is attached.
- If a trigger lock pin is worn or if the trigger lock pin spring is too weak, it/they must be exchanged immediately. Exchange the trigger spring, the trigger lock pin, and the trigger lock pin spring (→ chapter *Carrying out maintenance on the bolt head*).

5.5.2 Unlocking the captive bolt stunner

The relevant manual can be found in the appendix under the heading **TIN-013607**.

5.6 Removing and mounting the bolt head on the cartridge receiver



WARNING!

Risk of injury due to releasing the bolt

If the captive bolt stunner is unlocked, this can cause life-threatening injuries.

- Secure the captive bolt stunner prior to removing and mounting the bolt head.

Personal
protective
equipment



The bolt head must be removed from the cartridge receiver, in order to:

- carry out the daily functional test.
- load and unload the captive bolt stunner.
- clean and maintain the captive bolt stunner.

5.6.1 Removing the bolt head

Prerequisite The bolt head is secured and unlocked.

The relevant manual can be found in the appendix under the heading **TIN-013609**.

5.6.2 Mounting the bolt head

Prerequisite The bolt head is secured.

The relevant manual can be found in the appendix under the heading **TIN-013610**.

5.7 Loading and cocking the captive bolt stunner



WARNING!

Risk of injury due to releasing the bolt

A loaded captive bolt stunner can cause life-threatening injuries.

The captive bolt stunner is **not** secured if the red O-rings are visible on the bolt head.

- The captive bolt stunner must **not** be pointed at people.
- Do not unlock the captive bolt stunner until immediately prior to firing.
- Hold the captive bolt stunner tightly and securely in your hand when you cock it.
- Never allow a loaded and unlocked captive bolt stunner to leave your hand.
- Never leave a cocked or loaded or unlocked captive bolt stunner unattended.
- Never leave the stunning area or the area for the proof test with a loaded and unlocked captive bolt stunner.
- Never leave captive bolt stunners and cartridges unattended.

Personal
protective
equipment



The captive bolt stunner must be loaded and unlocked prior to the following activities:

- Stunning: just before each stunning procedure
- Testing: just before the daily proof test

5.7.1 Loading the captive bolt stunner

- Prerequisite
- The bolt head is secured.
 - The bolt head is removed from the cartridge receiver.

The relevant manual can be found in the appendix under the heading **TIN-013611**.

- Mount the bolt head on the cartridge receiver after you have loaded the captive bolt stunner.

5.7.2 Cocking the captive bolt stunner



WARNING!

Risk of injury due to releasing the bolt

If the captive bolt stunner is loaded and unlocked, this can cause life-threatening injuries.

The captive bolt stunner is **not** secured if the red O-rings are visible on the bolt head.

- The captive bolt stunner must **not** be pointed at people.
- Do not unlock the captive bolt stunner until immediately prior to firing.
- Hold the captive bolt stunner tightly and securely in your hand when you cock it.
- Never allow a loaded and unlocked captive bolt stunner to leave your hand.
- Never leave a loaded or unlocked captive bolt stunner unattended.
- Never leave the stunning area or the area for the proof test with a loaded and unlocked captive bolt stunner.
- Never leave captive bolt stunners and cartridges unattended.

- Prerequisites
- The captive bolt stunner is secured.
 - The captive bolt stunner is loaded.
 - The bolt head is mounted on the cartridge receiver.

The relevant manual can be found in the appendix under the heading **TIN-013614**.

5.8 Daily functional test



The following links will take you to the tutorial videos for cleaning, maintenance, and testing:



German

[Playlist of German videos!](#)



English

[Playlist of the English maintenance videos!](#)



Before starting work, check the captive bolt stunner carefully for flawless and intended function.

Only use flawless and functioning captive bolt stunners.

- Check the captive bolt stunner for external damage.

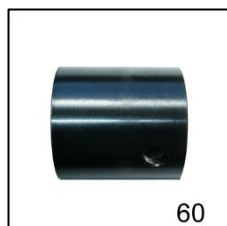
- Never use a captive bolt stunner with a faulty safety device.
- Arrange for faulty safety equipment to be repaired and inform your employer.
- Ensure that the bolt in the guide tube slides back and forth easily. The bolt must not get jammed.

Personal
protective
equipment



Assembly and cleaning tools

Assembly tool



60



61

Fig. 5-3 Assembly tool, cartridge receiver

Pos.	Designation	Article no.:
60	Assembly nut	010-223600
61	Assembly lever	010-223610

Cleaning brushes



62

73



74

Fig. 5-4 Cleaning brushes

Pos.	Designation	Article no.:
62	Use cleaning brush (short) with assembly lever (010-223610)	010-210231
73	Cleaning brush (long)	010-223730
74	Rod for cleaning brush (long version, similar to figure)	010-227740

Assembly tool for
spacer sleeve
(Type: KC)



Fig. 5-5 Assembly tool

Pos.	Designation	Article no.:
64	Assembly tool for spacer sleeve (type: KC)	010-227640

5.8.1 Checking type KR, KL, KK



The component numbering used in the following steps corresponds to the component numbering in chapter *Technical Description*.

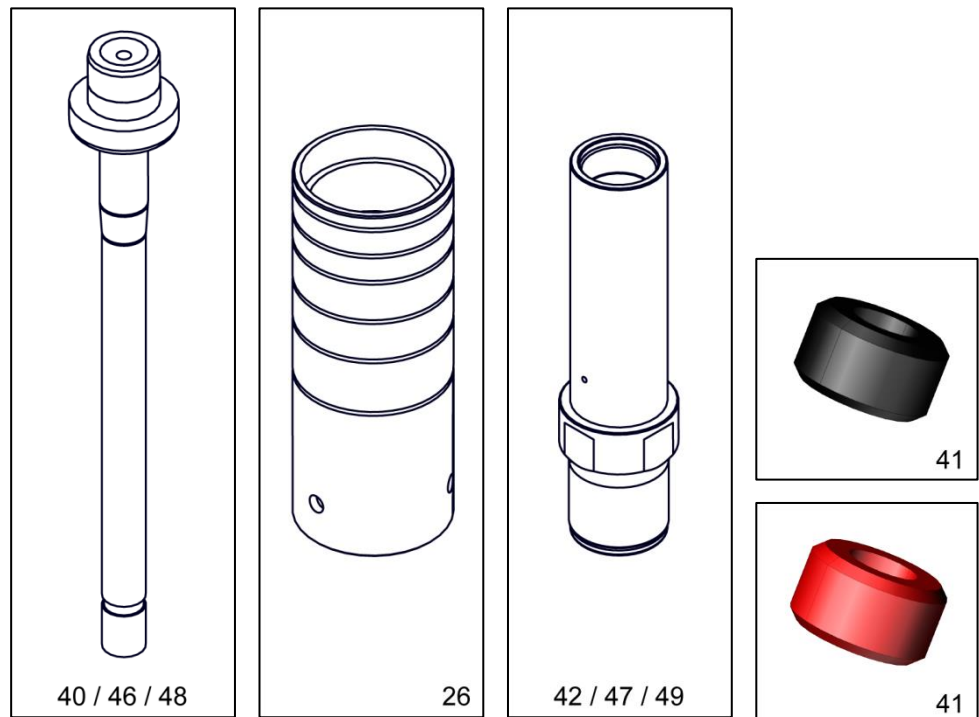


Fig. 5-6 Components of the bolt guide

Disassembly

- Secure the captive bolt stunner.
- Unlock the bolt head (A) and remove it from the cartridge receiver (B).
- Clamp the bolt guide (C) carefully into a vice and remove the cartridge receiver from the bolt guide. To this end, use the *cartridge receiver* assembly tool (60, 61).
- Remove the protective sheath (26) from the guide tube (42/47/49).
- Check • Check the guide tube and the cartridge receiver for damage (e.g. cracks on the thread).

- Pull the bolt (40/46/48) out of the guide tube.
- Remove the rubber buffers (41).
(Type KR, KL: 3 rubber buffers; type KK: 2 rubber buffers)
- Insert the bolt into the guide tube without the rubber buffers.
- The bolt must be easy to move in the guide tube.



If the bolt is difficult to move: Determine the cause and service the captive bolt stunner.

Possible cause	Remedy
• The guide tube is dirty.	• Clean the guide tube. • Clean the inner surface of the guide tube with the cleaning brush.
• Parts of worn rubber buffers are located between the bolt and the bolt end guide.	• Replace worn rubber buffers.
• The bolt is bent.	• Insert a new bolt.
• The captive bolt stunner was not screwed together with sufficient care following cleaning.	• Ensure that the cartridge repository is tightly screwed together with the bolt guide.
• The bolt is worn. • The bolt is too short as a result of frequent re-sharpening. Permissible minimum bolt length: • Type KR: 194 mm • Type KL: 230 mm • Type KK: 180 mm	• Insert a new bolt.

Assembly

- Upon completion of the check, pull the bolt out of the guide tube.
- Slide the rubber buffers onto the bolt.
(Sequence for type KR, KL: black – red – black)
(Sequence for type KK: black – red)
- Insert the bolt in the guide tube.
- Slide the protective sheath onto the guide tube.
- Mount the cartridge receiver on the bolt guide.
To this end, use the *cartridge receiver* assembly tool.
- Place the bolt head on the cartridge receiver and lock it.
- Carry out the proof test → chapter *Daily proof test*

5.8.2 Checking type KS



The component numbering used in the following steps corresponds to the component numbering in chapter *Technical Description*

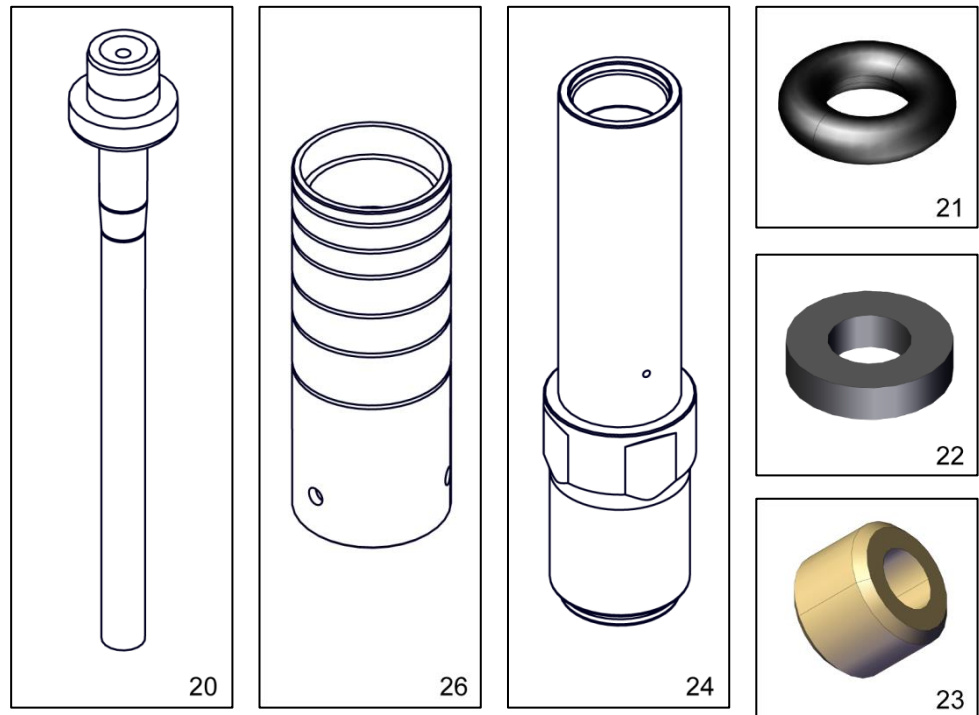


Fig. 5-7 Components of the bolt guide

Disassembly

- Secure the captive bolt stunner.
- Unlock the bolt head (A) and remove it from the cartridge receiver (B).
- Clamp the bolt guide (C) carefully into a vice and remove the cartridge receiver from the bolt guide. To this end, use the 'cartridge receiver' assembly tool (60, 61).
- Remove the protective sheath (26) from the guide tube (24).
- Check
 - Check the guide tube and the cartridge receiver for damage (e.g. cracks on the thread).
 - Pull the bolt (20) out of the guide tube.
 - Remove the O-ring (21), the 2 rubber washers (22) and the 8 damping elements (23) from the bolt.
 - Insert the bolt into the guide tube without the 8 damping elements and the 2 rubber washers.
 - The bolt must be easy to move in the guide tube.



If the bolt is difficult to move: Determine the cause and service the captive bolt stunner.

Possible cause	Remedy
The guide tube is dirty.	- Clean the guide tube. - Clean the inner surface of the guide tube with the cleaning brush.
Parts of the worn damping elements are located between the bolt and the bolt end guide.	Replace worn damping elements.
The bolt is bent.	Insert a new bolt.
The captive bolt stunner was not screwed together with sufficient care following cleaning.	Ensure that the cartridge receiver is tightly screwed together with the bolt guide.
- The bolt is worn - The bolt is too short as a result of frequent re-sharpening. Permissible minimum bolt length: - Type KS: 194 mm	Insert a new bolt.

Assembly

- After the check, pull the bolt out of the guide tube.
- Slide the 2 rubber washers, the 8 damping elements and the O-ring onto the bolt.
- Insert the bolt in the guide tube.
- Slide the protective sheath onto the guide tube.
- Mount the cartridge receiver on the bolt guide.
To this end, use the "cartridge receiver" assembly tool.
- Place the bolt head on the cartridge receiver and lock it.
- Perform the proof test (→ chapter *Daily proof test*).

5.8.3 Checking type KC



The component numbering used in the following steps corresponds to the component numbering in chapter *Technical Description*.

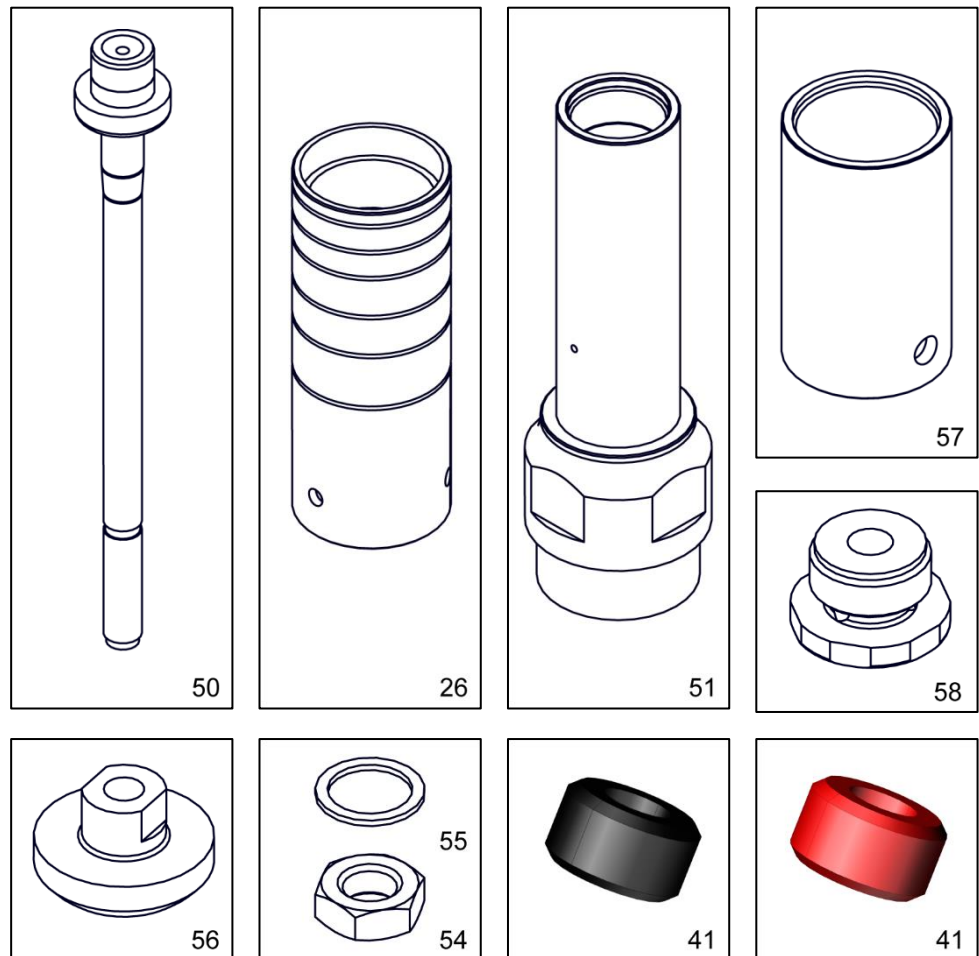


Fig. 5-8 Components of the bolt guide

Disassembly

- Secure the captive bolt stunner.
- Unlock the bolt head (A) and remove it from the cartridge receiver (B).
- Clamp the bolt guide (C) carefully into a vice and remove the cartridge receiver from the bolt guide. To this end, use the “cartridge receiver” assembly tool (60, 61).
- Remove the protective sheath (26) from the guide tube (51).
- Check the guide tube and the cartridge receiver for damage (e.g. cracks on the thread).
- Clamp the guide tube and release the spacer sleeve (57) from the guide tube. To this end, use the ‘spacer sleeve’ assembly tool (64).
- Leave the guide tube clamped.
- Release the bolt end guide (58) from the guide tube and remove the entire bolt system (bolt, bolt end guide, impact plate) from the guide tube.

- Clamp the bolt end guide and release the impact plate (56) from the bolt (50). The impact plate is secured by means of a lock nut (54).
- Remove the serrated washer (55) from the bolt (50).
- Remove the lock nut from the bolt.
- Screw the bolt end guide onto the guide tube.
- Remove the rubber buffers (41) from the bolt.
- Insert the bolt into the guide tube without the rubber buffers.
- The bolt must be easy to move in the guide tube.



If the bolt is difficult to move: Determine the cause and service the captive bolt stunner.

Possible cause	Remedy
• The guide tube is dirty.	• Clean the guide tube. • Clean the inner surface of the guide tube with the cleaning brush.
• Parts of worn rubber buffers are located between the bolt and the bolt end guide.	• Replace worn rubber buffers.
• The bolt is bent.	• Insert a new bolt.
• The captive bolt stunner was not screwed together with sufficient care following cleaning.	• Ensure that the cartridge receiver is tightly screwed together with the bolt guide.

Assembly

- After the check, pull the bolt out of the guide tube.
- Release the bolt end guide from the guide tube.
- Put the rubber buffers on the bolt (Sequence: black – red – black – red – black).
- Put the bolt end guide on the bolt.
- Screw the lock nut onto the bolt.
- Put the serrated washer on the bolt.
- Clamp the bolt end guide and screw the impact plate onto the bolt.
- Secure the impact plate on the bolt using the lock nut.
- Insert the entire bolt system (bolt, bolt end guide, impact plate) into the guide tube.
- Carefully clamp the guide tube into a vice and screw the bolt end guide onto the guide tube.
- Leave the guide tube clamped.

- Mount the spacer sleeve on the guide tube. To this end, use the 'spacer sleeve' assembly tool.
- Slide the protective sheath onto the guide tube.
- Mount the cartridge receiver on the bolt guide. To this end, use the 'cartridge receiver' assembly tool.
- Place the bolt head on the cartridge receiver and lock it.

5.8.4 Checking type KLS



The component numbering used in the following steps corresponds to the component numbering in chapter *Technical Description*.

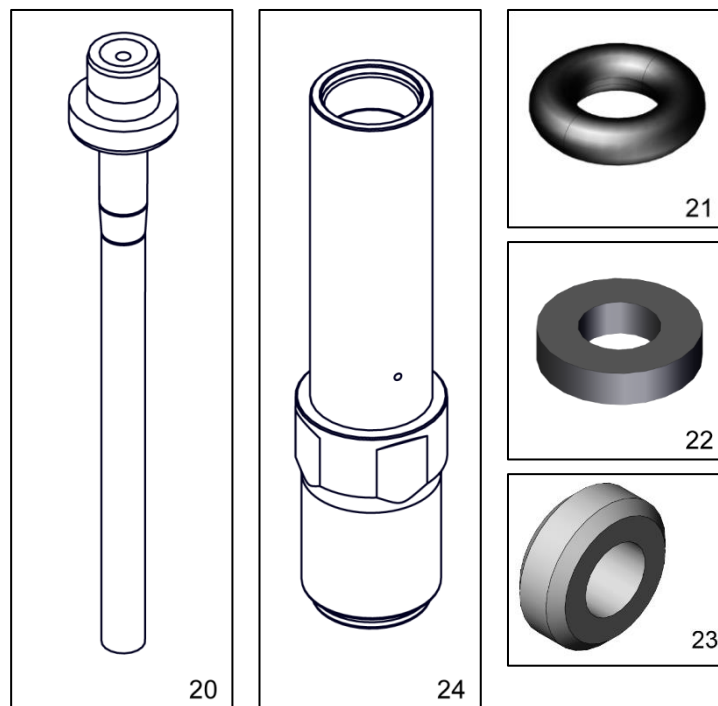


Fig. 5-9 Components of the bolt guide

Disassembly

- Secure the captive bolt stunner.
- Unlock the bolt head (A) and remove it from the cartridge receiver (B).
- Carefully clamp the bolt guide (C) into a vice and remove the cartridge receiver.
- To this end, use the "cartridge receiver" assembly tool (60, 61).
- Check the guide tube and the cartridge receiver for damage (e.g. cracks on the thread).
- Pull the bolt (20) out of the guide tube (24).
- Remove the O-ring (21), the 2 rubber washers (22) and the 20 damping elements (23) from the bolt.

- Insert the bolt (20) into the guide tube (24) without the damping elements and the 2 rubber washers.
- The bolt must be easy to move in the guide tube.

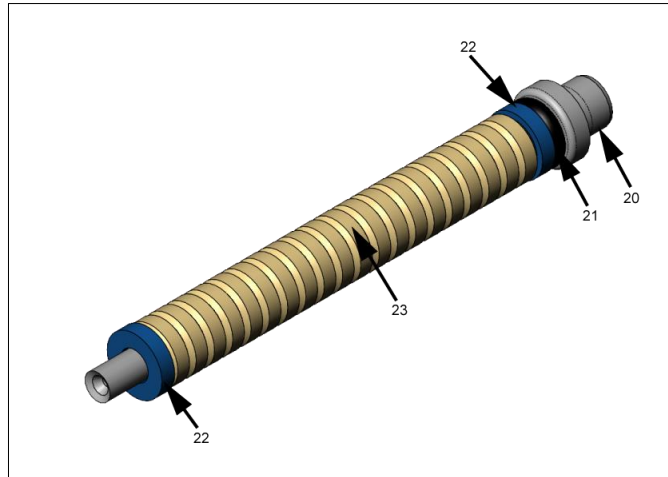


Fig. 5-10 Bolt with damping elements

- Insert the bolt (20) into the guide tube (24) without the damping elements and the 2 rubber washers.
- The bolt must be easy to move in the guide tube.



If the bolt is difficult to move: Determine the cause and service the captive bolt stunner.

Possible cause	Remedy
The guide tube is dirty.	Clean the guide tube. Clean the inner surface of the guide tube with the cleaning brush.
Parts of worn rubber buffers are located between the bolt and the bolt end guide.	Replace worn rubber buffers.
The bolt is bent.	Insert a new bolt. The bent bolt must be disposed of immediately!
The captive bolt stunner was not screwed together with sufficient care following cleaning.	Ensure that the cartridge repository is tightly screwed together with the bolt guide.
The bolt is worn: The bolt is too short as a result of frequent re-sharpening. Permissible minimum bolt length: Type KLS: 235 mm	Insert a new bolt.

Assembly

- Upon completion of the check, pull the bolt out of the guide tube.
- Slide the 2 rubber washers, the 20 damping elements and the O-ring onto the bolt.
- Insert the bolt in the guide tube.
- Mount the cartridge receiver on the guide tube.
To this end, use the "cartridge receiver" assembly tool.
- Place the bolt head on the cartridge receiver and then lock it. **(TIN-01361)**
- Carry out the proof test → chapter *Daily proof test*

5.9 Daily proof test



WARNING!

Risk of injury due to captive bolt stunner kickback!

When the shot is fired, there is kickback from the captive bolt stunner, creating a risk of serious injury.

- Wear your personal protective equipment during the proof test.
- Only use the recommended cartridges for the proof test.
- Hold the captive bolt stunner with both hands during the proof test, ensuring that there is space between it and your body.
- Never lean over the loaded and/or cocked captive bolt stunner.

Personal
protective
equipment



Carry out the proof test after you have completed the daily functional test of your captive bolt stunner.

Use the test sleeve or the StunTest device for the proof test.

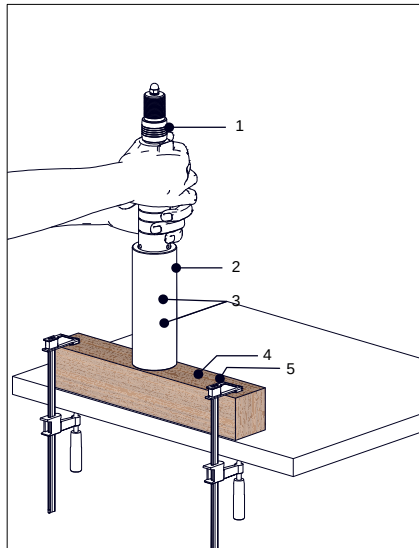
5.9.1 Structure of the proof test with test sleeve

Preparatory measures Fix a piece of square timber to a workbench using screw clamps. Check that it is secure.



When carrying out the proof test, ensure that the square timber does not have excessive damage. We recommend new square timber if there is excessive damage.

The square timber (softwood) should have a minimum thickness of 10x10 (cm).



Pos.	Designation
1	Captive bolt stunner
2	Test sleeve
3	Openings for pressure compensation
4	Square timber (edge length 10x10 (cm))
5	Screw clamps

Fig. 5-11 Test setup for proof test with test sleeve



To determine the reference value, use a new or a tested identical K-series captive bolt stunner (e.g. KS=KS).

5.9.2 Preparing the proof test with test sleeve

1. Enter the type and the serial number of the captive bolt stunner in the test report "Report -Daily Proof Test-" (→ template in the appendix).
2. Secure the square timber on a firm base with screw clamps.
3. Put the test sleeve on the secured square timber.
4. Insert the bolt guide (without bolt head) of the captive bolt stunner into the test sleeve.

KR, KS, KK, KL

KLS adapter sleeve

Before inserting the captive bolt stunner KLS into the test sleeve, the adapter sleeve must first be inserted into the test sleeve.

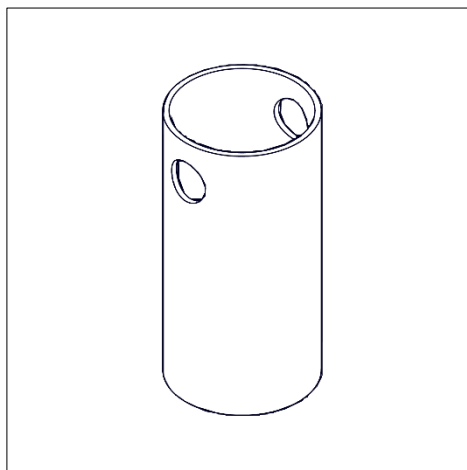


Fig.5-12 Adapter sleeve KLS

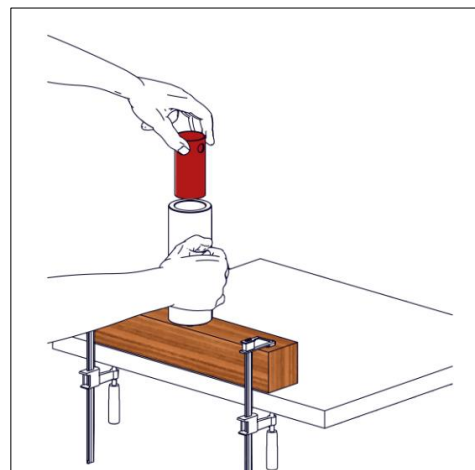


Fig.5-13 Inserting adapter sleeve in test sleeve

1. For the proof test with the test sleeve, load the captive bolt stunner with a cartridge (1) of calibre 6.8/15 red.
2. Insert the cartridge into the cartridge repository (2).

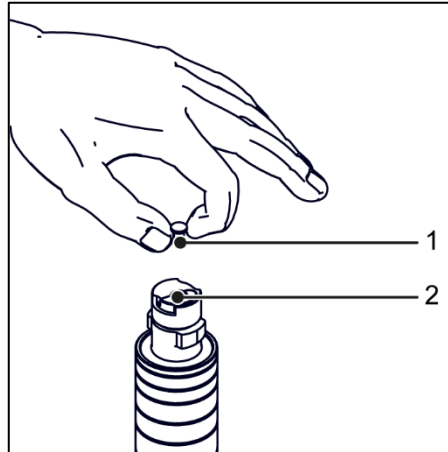
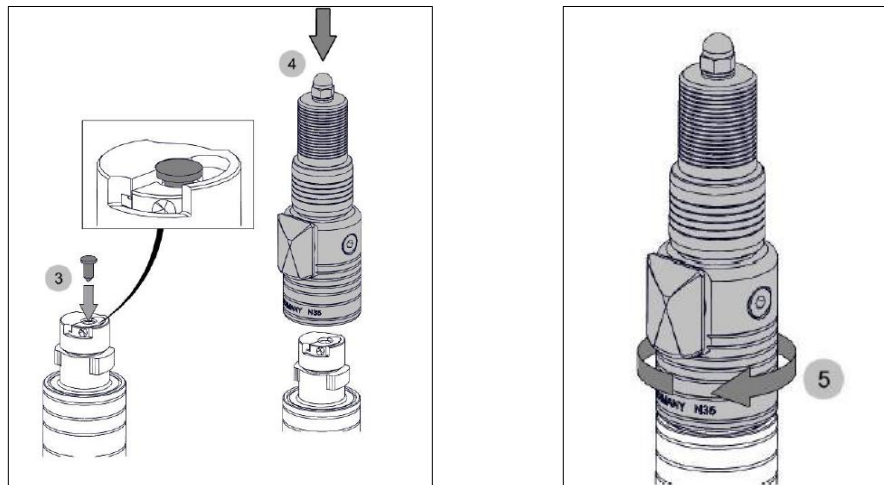


Fig. 5-14 Loading the captive bolt stunners

3. Place the bolt head (4) on the cartridge repository (3) and lock it (5).



i The relevant manuals can be found in the appendix under the following headings

TIN-013609 unlocking and removing the bolt head

TIN-013610 attaching and locking the bolt head

TIN-013584 securing the captive bolt stunner

TIN-013607 unlocking the captive bolt stunner

TIN-013611 (2/2) loading the captive bolt stunner

Carrying out the proof test

1. Release (2) and cock the captive bolt stunner.

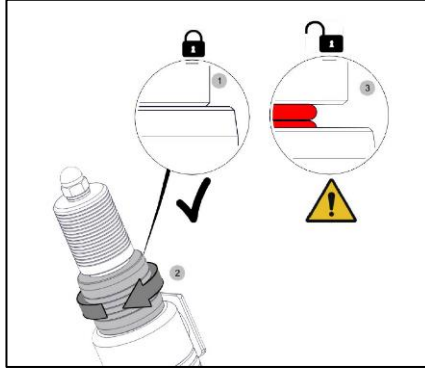


Fig. 5-15 Unlocking the bolt head

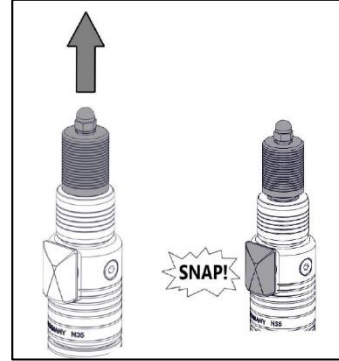


Fig. 5-16 Clamping the bolt head

2. Hold the captive bolt stunner with both hands, ensuring that there is space between it and your body.

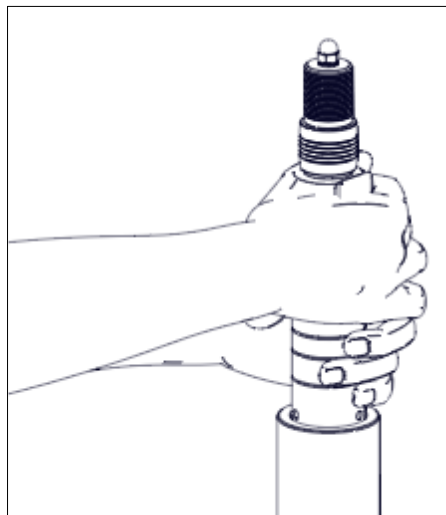


Fig. 5-17 Hand position for proof test

3. Press the captive bolt stunner firmly into the test sleeve.
4. Fire the shot into the square timber.
5. Measure the penetration depth with a suitable measuring tool (e.g. a depth gauge).

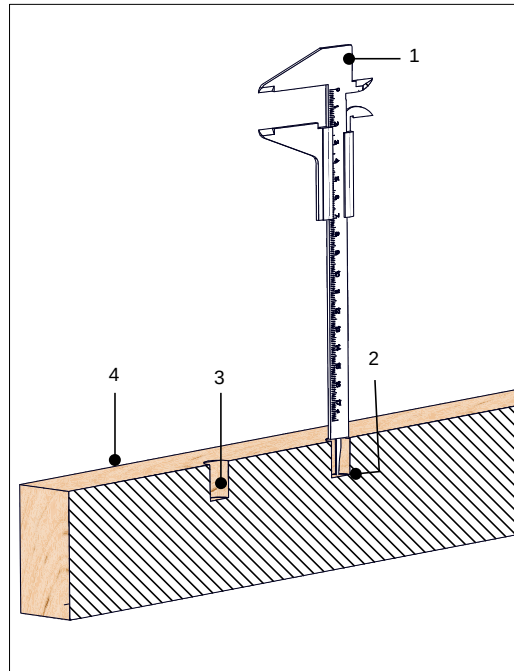


Fig. 5-18 Determining the reference value

Pos.	Designation
1	Calipers (vernier gauge)
2	Penetration depth (reference value) of the bolt of a new or tested captive bolt stunner of the K series.
3	Penetration depth (measured value) of the bolt of the captive bolt stunner of the K series to be tested.
4	Square timber

6. Enter the date, the measured value, the name of the tester and, if necessary, a comment in the table of the test report.

Evaluation of the measurement results

Compare the measured value with the reference value.

The measured value for the penetration depth must not deviate from the reference value by more than 5 mm.



- If the measured value deviates from the reference value by more than 5 mm, repeat the proof test with 2 further shots.
- The measured value for both shots must not deviate from the reference value by more than 5 mm.
- If the measured values still deviate from the reference value, the wearing parts of the captive bolt stunner need to be checked and exchanged.
- To this end, send the captive bolt stunner to FREUND GmbH & Co. KG.

5.9.3 Proof test with the StunTest test device



WARNING!

Risk of injury due to captive bolt stunner kickback!

When the shot is fired, there is kickback from the captive bolt stunner, creating a risk of serious injury.

- Wear your personal protective equipment during the proof test.
- Only use approved test cartridges for the proof test.
- Hold the captive bolt stunner with both hands, ensuring that there is space between it and your body.
- Never lean over the loaded and/or cocked captive bolt stunner.

Preparatory
measures

1. Screw the base body onto a worktop using 3 x M10 screws. Check that it is secure.
2. Insert the rubber washer into the base body.
3. Connect the two measuring sensor cables to the base body.
4. Have a suitable light source (e.g. a spotlight) to hand.



A spotlight, as a light source, is not included in the scope of delivery.

Connecting the fibre optic cable to the base body

Connect the two fibre optic cables (4) to port 1 (2) / port 2 (3) on the base body (1).

Measuring sensor 1 to port 1 (2)

Measuring sensor 2 to port 2 (3)

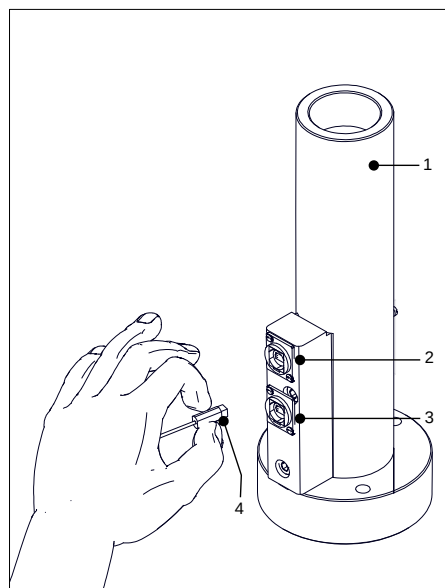


Fig.5-19 Connecting the fibre optic cables to the StunTest device

Pos.	Designation
1	Base body
2	Port 1
3	Port 2
4	Fibre optic cable connector

Connecting the fibre optic cables to the evaluation unit

1. Remove the sealing caps (3) from port 1 (1) and port 2 (2) on the evaluation unit.
2. Plug the connectors (4) of the fibre optic cables into the appropriate port (1/2) on the evaluation unit.
Fibre optic cable 1 to port 1 (1)
Fibre optic cable 2 to port 2 (2)

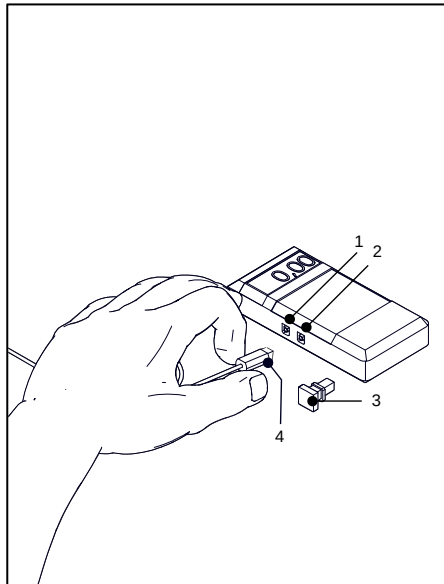


Fig.5-20 Connecting the fibre optic cables to the evaluation unit

Connecting the evaluation unit to the power supply

1. To do this, plug the secondary connector (1) of the power supply unit into the connection socket (2) on the evaluation unit.

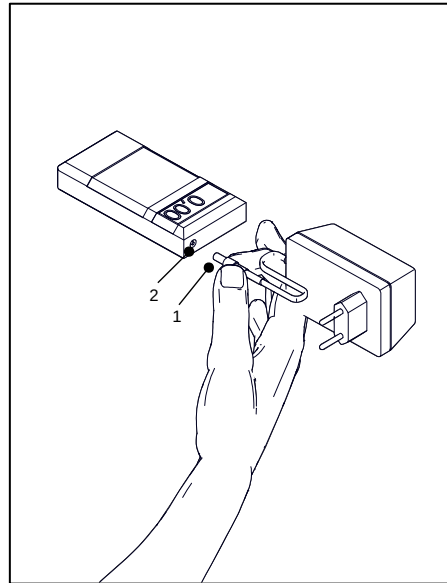


Fig.5-21 Connecting the power supply unit to the evaluation unit

2. Connect the power plug of the power supply unit to the power supply.
3. Ensure that the power supply unit of the power supply is set to 9 volts.



Fig.5-22 Adjusting the power supply

Connecting the light source (spotlight)



Use an LED lamp with a maximum of 330 lumen for the proof test with the StunTest device. A light source with higher light intensity could be reflected by the light well (area behind the Plexiglas cover of the base body) and thus falsify the measured values or not display any measured values.



Do not use any energy-saving or halogen lamps for the proof test with the StunTest device!

Positioning the
light source

1. Install a suitable light source in front of the base body of the test device. Connect the light source to the power supply.

2. Align the light beam (4) of the light source (1) with the Plexiglas cover (3) of the base body (2).

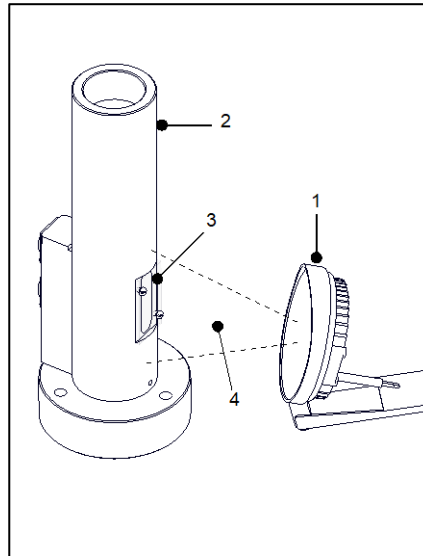


Fig.5-23 Aligning the light source

3. Check that the spotlight is in the correct position.
The value "0" must be shown on the display of the evaluation unit.
4. Correct the position of the light source if the following values are shown on the display of the evaluation unit:
"--", "-0", "0-"

Carrying out the proof test



If the protective sheath (26) of the captive bolt stunner shows significant signs of wear, it may not be possible to insert the captive bolt stunner into the base body.

If so, mount the protective sheath that comes with the test device.
After the proof test, mount the original protective sheath back on the captive bolt stunner.

Protective sheath
KLS

The captive bolt stunner of type KLS does not have a protective sheath.

KLS adapter
sleeve

Before inserting the KLS captive bolt stunner into the StunTest test device, the adapter sleeve must first be inserted into the test sleeve.

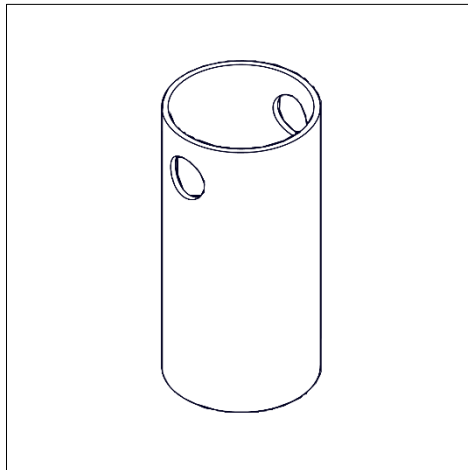


Fig.5-24 Adapter sleeve

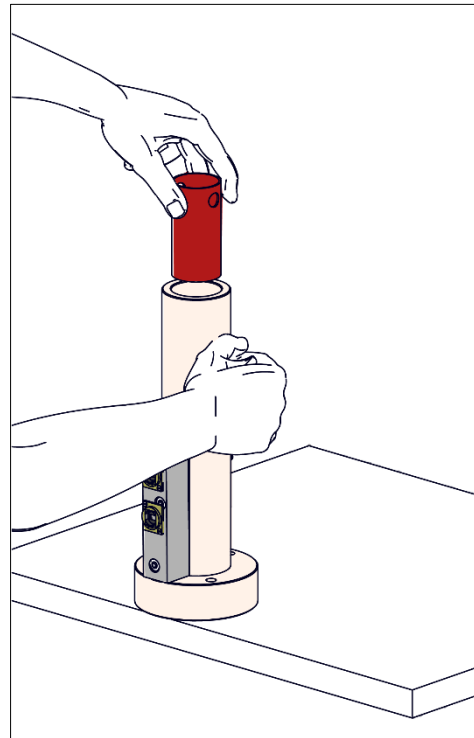


Fig.5-25 Inserting the adapter sleeve in base body (2) StunTest test device

Carrying out the
proof test

1. Press the *RESET* button on the evaluation unit.
The value "0" is shown on the display.
2. Ensure that the captive bolt stunner is secured.
3. Remove the bolt head from the cartridge receiver.
4. Insert the lower part of the captive bolt stunner (*bolt guide with cartridge receiver without bolt head*) into the base body.
The bolt end guide must be in contact with the rubber washer.
5. Load the captive bolt stunner.

Loading the
captive bolt
stunner

6. To this end, insert the test cartridge (calibre 6.8/11 red) (1) into the cartridge repository (2).

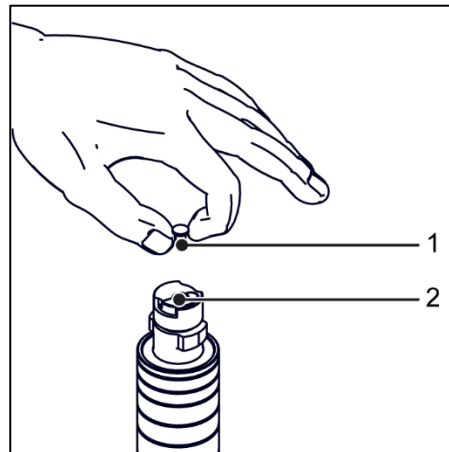


Fig.5-26 Inserting the test cartridge into the cartridge repository

7. Place the bolt head on the cartridge receiver and lock it.
8. Cock the secured bolt head.
9. Unlock the captive bolt stunner.



The relevant manuals can be found in the appendix under the headings:
TIN-013610 attaching and locking the bolt head,
TIN-013584 securing the captive bolt stunner,
TIN-013607 unlocking the captive bolt stunner.
TIN-013611 (2/2) loading the captive bolt stunner

10. Hold the captive bolt stunner with both hands, ensuring that there is space between it and your body.

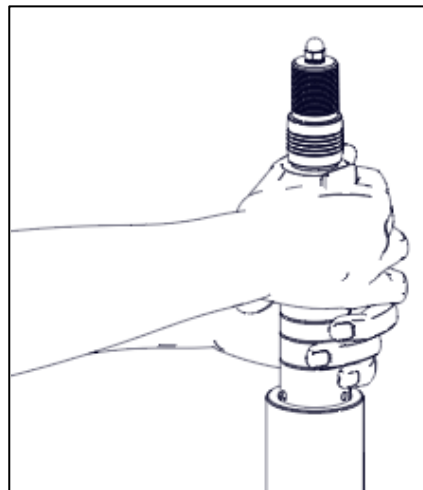


Fig.5-27 Holding the captive bolt stunner

11. Press the captive bolt stunner onto the rubber washer of the test device.



Caution! Danger of kickback!

Do not lean over the captive bolt stunner when firing the shot.

12. Fire the shot by pulling the trigger of the captive bolt stunner.

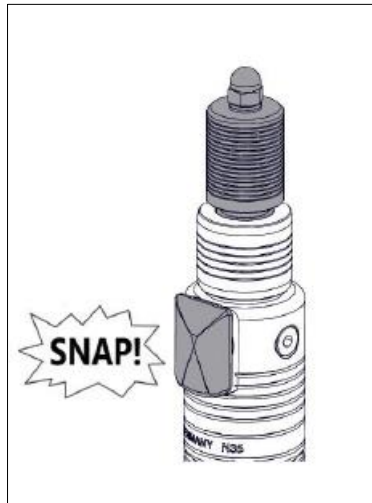


Fig.5-28 Pull the trigger and fire the shot

13. After firing the shot, secure the captive bolt stunner.
14. Pull the captive bolt stunner out of the base body (2).
15. Remove the bolt head from the cartridge receiver and remove the test cartridge from the cartridge repository.



The relevant manual can be found in the appendix under the heading **TIN-013611**.

Evaluation of the proof test

The muzzle velocity determined is shown on the display of the evaluation unit after a few seconds.



Fig.5-29 Display of the muzzle velocity



If the display shows the values "uu", "00" or "--", the firing of the shots was invalid and needs to be repeated.

16. Compare the muzzle velocity displayed with the minimum value that must be achieved for the captive bolt stunner (see table below).

Captive bolt stunner type	Muzzle velocity [m/s] (minimum value)
KS	38 - 40 [m/s]
KR, KK, KL, KLS	40 - 42 [m/s]
* The muzzle velocities indicated refer to the use of the recommended test cartridges.	

- i** If the muzzle velocity specified for the captive bolt stunner is not achieved, the proof test needs to be repeated with 2 further shots. The minimum value must be achieved for both shots.
- i** If the muzzle velocity is still not achieved after firing 2 further shots, the wearing parts of the captive bolt stunner must be checked and exchanged.
To this end, send the captive bolt stunner to FREUND Maschinenfabrik GmbH & Co. KG.

5.10 Stunning



WARNING

Risk of injury due to uncontrolled movements of the slaughter animal!

The slaughter animal may make uncontrolled movements before and during stunning, such as due to flight or missed shots.

- Ensure that operating personnel have sufficient escape options in the stunning area.
- Ensure that there are no unauthorised persons loitering in the stunning area.



WARNING

Risk of injury due to kickback

Improper handling of the captive bolt stunner can result in a kickback that injures the hand and face.

- Hold the captive bolt stunner with one hand (One-hand guidance), ensuring that there is space between it and your body.
- Do **not** lean over the captive bolt stunner when firing the shot.

NOTE**Possible damage to the captive bolt stunner due to triggering in an unloaded state**

If an unloaded captive bolt stunner is triggered, the firing pin strikes the cartridge repository and can damage it. This can cause cartridges to jam in the bearing.

➤ Never trigger an unloaded captive bolt stunner.

Personal
protective
equipment

**5.10.1 Selecting the captive bolt stunner/cartridge type**

The appropriate captive bolt stunner and the appropriate cartridge type (charge strength) need to be selected prior to stunning.

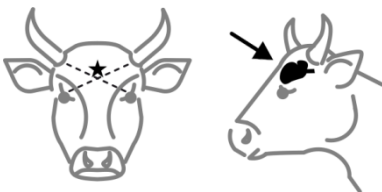
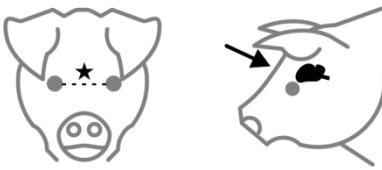
Captive bolt stunners:

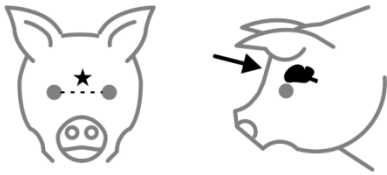
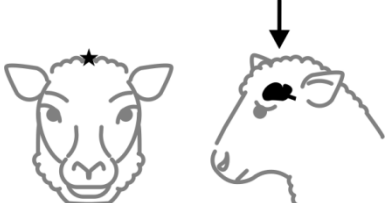
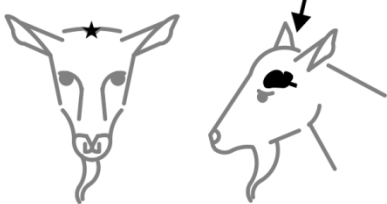
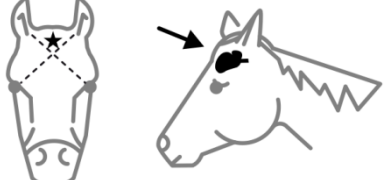
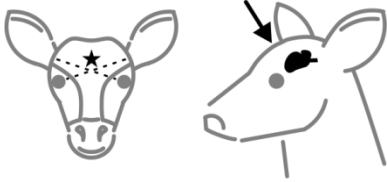
→ Chapter *Intended use* cartridge type.

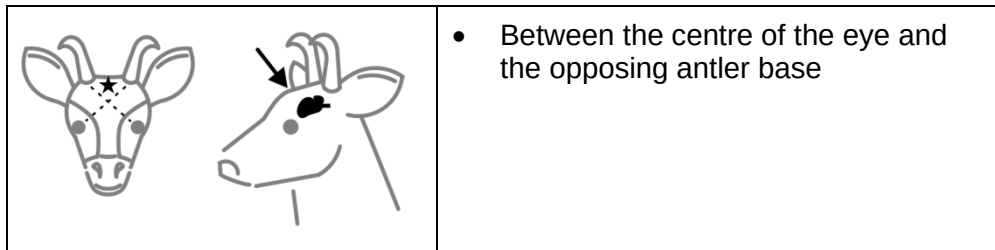
5.10.2 Contact position on the slaughter animal

Significantly different firing positions (contact position too high or too low, or firing at an angle) will result in insufficient stunning. If the base of the brain is not hit, the loss of consciousness or stunning caused by the impact or slight penetration of the bolt onto the top of the skull or into the brain is often of short duration.

The contact position of the captive bolt stunner is dependent on the type of slaughter animal. The following table displays the suitable contact positions.

Type of slaughter animal/contact position	Description
	- With the exception of heavy bulls and cows: Contact position is perpendicular to the forehead on the midline. - For heavy bulls and cows: Contact position is approx. 1 cm from the midline, just above the intersection of the diagonal connecting lines between the middle of the eye and the middle of the opposing horn base
	In the midline of the head, approx. 1 cm above the connecting line of the two eye centres, viewed from the side and towards the outer ear

	• In the midline of the head, 2-3 cm above the connecting line of the two eye centres perpendicular to the forehead
	• In the centre of the front connecting line between the ears with a shot down towards the throat
	• Behind the crest of the skull running between the horns on the midline directly behind the base of the horn with a shot towards the base of the tongue or, viewed from the side, towards the throat
	• In the centre of the front connecting line between the ears with a shot down towards the throat
	• Behind the crest of the skull running between the horns on the midline directly behind the base of the horn with a shot towards the base of the tongue or, viewed from the side, towards the throat
	• Perpendicular to the forehead on the midline, 2 cm above the intersection of the diagonal connecting lines between the centre of the eye and the centre of the opposing ear base
	• Next to the midline at the intersection of the diagonal connecting lines between the centre of the eye and the centre of the opposing ear base



5.10.3 Carrying out stunning



WARNING

Risk of injury

Cartridge did not ignite or the shot was not fired!

- Leave the captive bolt stunner secured and pointed in the direction of fire.
- Improper handling can lead to serious injuries
- Wait at least 30 seconds before you unload the device or insert a new cartridge



WARNING

Risk of injury due to kickback

- Hold the captive bolt stunner firmly and securely in your hand (one-handed guidance).
- An unexpected kickback can cause serious injury to the hand and face.
- Be sure to guide the captive bolt stunner correctly and stay in a safe area to minimise the risk of kickbacks.
- Do **not** lean over the captive bolt stunner when firing the shot.

Attaching the captive bolt stunner



When firing the shot, the captive bolt stunner must be perpendicular to the head of the animal to prevent the bolt from tilting and getting stuck in the head of the animal.

Correct contact
position

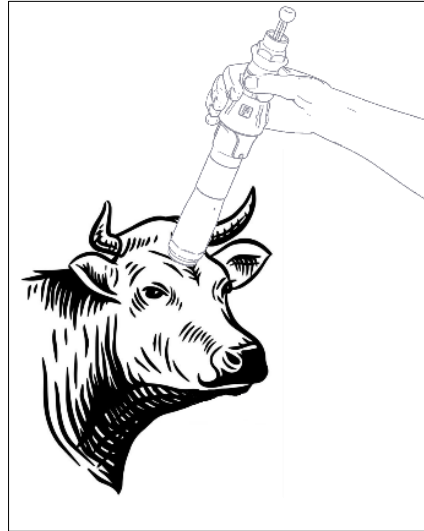


Fig. 5–30 Contact position of the captive bolt stunner

Prerequisites The following prerequisites must be met for the stunning procedure:

- Captive bolt stunner and the cartridge type are selected.
- Slaughter animal is in position for stunning.
- Captive bolt stunner is loaded, secured, and cocked
→ chapter *Loading and cocking the captive bolt stunner*.

Stunning with types KS, KR, KL, KLS, KK

- Clamp and unlock the captive bolt stunner.
- Place the unlocked captive bolt stunner in the appropriate contact position of the respective slaughter animal species.
- Pull the trigger and keep it pulled.

The bolt penetrates the skullcap, penetrates the brain and stuns the slaughter animal.

- After the shot is fired, secure the captive bolt stunner!

Type: KS, KLS **Captive bolt stunner with a recoil system:**

The bolt is pushed back into the guide tube automatically by the damping elements after the shot is fired.

Type: KR, KL, KK **Captive bolt stunner without a recoil system:**

The bolt needs to be pushed back into the guide tube manually.

Use the bolt head to push the bolt into the guide tube.

- Push the bolt back into the guide tube with the cap nut of the bolt head until the clamping balls engage with the bolt.

Disassembling the bolt head

Types: KS, KR,
KL, KLS; KK

- Remove the bolt head from the cartridge receiver.
The fired cartridge is released by automatically lifting the cartridge ejector in the cartridge repository.
- Remove the cartridge from the cartridge repository.
If the cartridge jams in the cartridge repository:
 - Insert a screwdriver between the cartridge ejector and the cams of the cartridge repository.
 - Pull the cartridge ejector upwards and remove the cartridge.

Stunning with type KC



When firing the shot, the captive bolt stunner must be perpendicular to the head of the animal. The lower edge of the spacer sleeve must sit flat on the contact position.

- Clamp and unlock the captive bolt stunner.
 - Place the unlocked captive bolt stunner on the contact position.
 - Pull the trigger and keep it pulled.
The impact plate strikes the skullcap and stuns the slaughter animal.
 - After the shot is fired, secure the captive bolt stunner!
 - Remove the bolt head from the cartridge receiver.
The fired cartridge is released by lifting the cartridge ejector in the cartridge repository.
 - Remove the cartridge from the cartridge repository.
If the cartridge jams in the cartridge repository:
 - Insert a screwdriver between the cartridge ejector and the cams of the cartridge repository.
 - Pull the cartridge ejector upwards and remove the cartridge.
- The impact plate needs to be pushed back into the guide tube manually.
- Push the impact plate back into the guide tube until the clamping balls engage with the bolt.

6 Cleaning and care



The captive bolt stunners must be checked for functionality on each working day prior to commencing work and, if necessary, the captive bolt stunners must be cleaned multiple times a day (Section 13(2) sentence 1 TierSchlV - German Animal Protection Slaughter Regulation). At the end of the working day, the captive bolt stunners must be disassembled and cleaned thoroughly to remove any residue adhering to the inside and outside of the captive bolt stunner after firing. Unmaintained, poorly cleaned or inadequately maintained captive bolt stunners can lead to stunning defects.



German [Playlist of German videos!](#)



English [Playlist of the English maintenance videos!](#)



6.1 Safety information



WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- The machine may only be cleaned by qualified personnel.

6.2 Personal protective equipment



6.3 Cleaning intervals

Interval	Cleaning and care products	Tool
After use / at the end of the working day	Machine cleaning agent with regreasing effect Weapon oil (e.g. Ballistol) Assembly paste	Cleaning brushes Dry, lint-free cloth

6.4 Daily Cleaning

NOTE

Damage to the captive bolt stunner due to cleaning with water and cleaning agents

Cleaning the captive bolt stunner with water and cleaning agents can lead to corrosion of the metallic components and decomposition of the rubber and plastic components.

- Never clean the components with water or cleaning agents.
 - For cleaning and care, use only the cleaning brush included in delivery, a machine cleaning agent with a regreasing effect, weapon oil and a lint-free, dry cloth.
-
- Clean and carry out care measures on the captive bolt stunner in the course of the daily functional test and after use.
 - Clean the StunTest test device and the test sleeve with a damp cleaning cloth and dry them with a lint-free cloth.
 - If using the cranial insertion rod: Clean and disinfect the cranial insertion rod.

7 Maintenance and servicing

To ensure the longest possible service life for the captive bolt stunner and reduce wear, it must be inspected and serviced regularly.

The work area around the workbench must be clean and free of foreign objects for maintenance and disassembly.

Repairs and maintenance may be performed only by qualified and authorised specialists.

Warranty If errors or defects occur in the captive bolt stunner within the statutory warranty period, please contact FREUND GmbH & Co. KG.
Only use spare and wearing parts that conform to the specifications and qualities of the original spare and wearing parts of FREUND GmbH & Co. KG.



German [Playlist of German maintenance videos!](#)



English [Playlist of English maintenance videos!](#)



7.1 Safety information



WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- The captive bolt stunner may only be maintained and serviced by instructed and authorised personnel.

7.2 Repeat test for captive bolt stunners

The operator is obliged to comply with the respective country-specific laws, guidelines, ordinances and regulations.

The following applies to site operators in the Federal Republic of Germany:

For all captive bolt stunners, the operator is obliged to present the captive bolt stunner to the manufacturer or its authorised representative for testing 2 years after purchase and every subsequent 2 years in accordance with the German Ordinance on the Proof Testing of Arms and Ammunition (→ chapter *Tests as per the German Ordinance on the Proof Testing of Arms and Ammunition*).

Before each test, all components must be exchanged for components from the relevant repair/spare parts kit.



The national laws and regulations of the country in which the captive bolt stunner is used apply.

Complete repair/spare parts kits

Captive bolt stunner type:	Order number
KR, KL, KK, KC	010-423022-R
KS	010-424022-R
KLS	010-422110-R

7.3 Maintenance intervals



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.

	Interval	Type	Tool
Daily	Daily	Check the captive bolt stunner for wear marks (cracks, ruptures) and exchange if damaged.	Assembly tool (type KS, KR, KL, KLS, KK, KC) Assembly hook
Interval A	After 300 shots	Check the wearing parts and exchange if damaged.	Assembly tool for spacer sleeve (type KC)
Interval B	After 1500 shots	Check the wearing parts and exchange if damaged.	Assembly paste, Ballistol oil
	If required	Sharpen the bolt.	Mounted point

7.3.1 Repair/spare parts kits for interval A

Captive bolt stunner type:	Order number	Designation
KR, KL, KK, KC	010-423023	Damping elements
KR, KL, KK, KC; KS	010-430022-E	Spring set
KS	010-424023	Damping elements
KLS	010-422100	Damping elements
KLS	010-430022-E	Spring set

7.3.2 Repair/spare parts kits for interval B (complete)



All repair/spare parts kits can be used for the "Interval B" maintenance interval (see also chapter *Repeat test for captive bolt stunners*):

Repair kits	Captive bolt stunner type:	Order number	Designation
	KR, KL, KK; KC	010-423022-R	Repair kit
	KS	010-424022-R	Repair kit
	KLS	010-422110-R	Repair kit

or use the following individual repair/spare parts kits:

7.3.3 Repair/spare parts kits for interval B (complete)

Captive bolt stunner type:	Order number	Designation
KR, KL, KK; KC	010-423022	Damping elements
	010-430022-E	Spring set
KS	010-424023	Damping elements
	010-430022-E	Spring set
KLS	010-422100	Damping elements
	010-430022-E	Spring set
KR, KL, KLS, KK, KC, KS	010-430021	Sealing kit (all captive bolt stunners)

7.4 Tools and care products

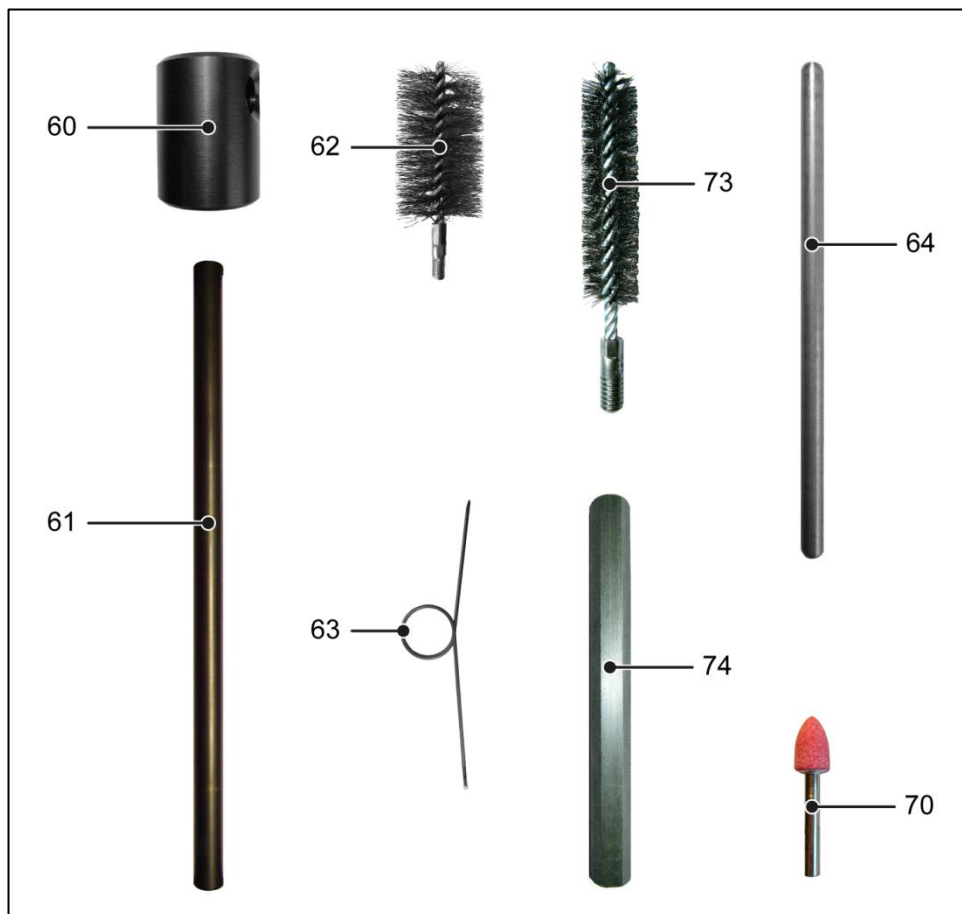


Fig. 7-1 Tools

Scope of delivery	Pos.	Designation
	60	Assembly nut (assembly tool for cartridge receiver)
	61	Assembly lever (assembly tool for cartridge receiver)
	62	Cleaning brush (short version)
	63	Assembly hook
	64	Assembly tool for spacer sleeve (type KC)
Optional	Pos.	Designation
	70	Mounted point (corundum-coated)
	73	Cleaning brush (long version)
	74	Rod for cleaning brush (73)
		Ballistol oil (not shown)
		Assembly paste (not shown)

7.5 Carrying out maintenance on the bolt head



German

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English

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Type:
KS, KR, KL, KLS
KK
KC

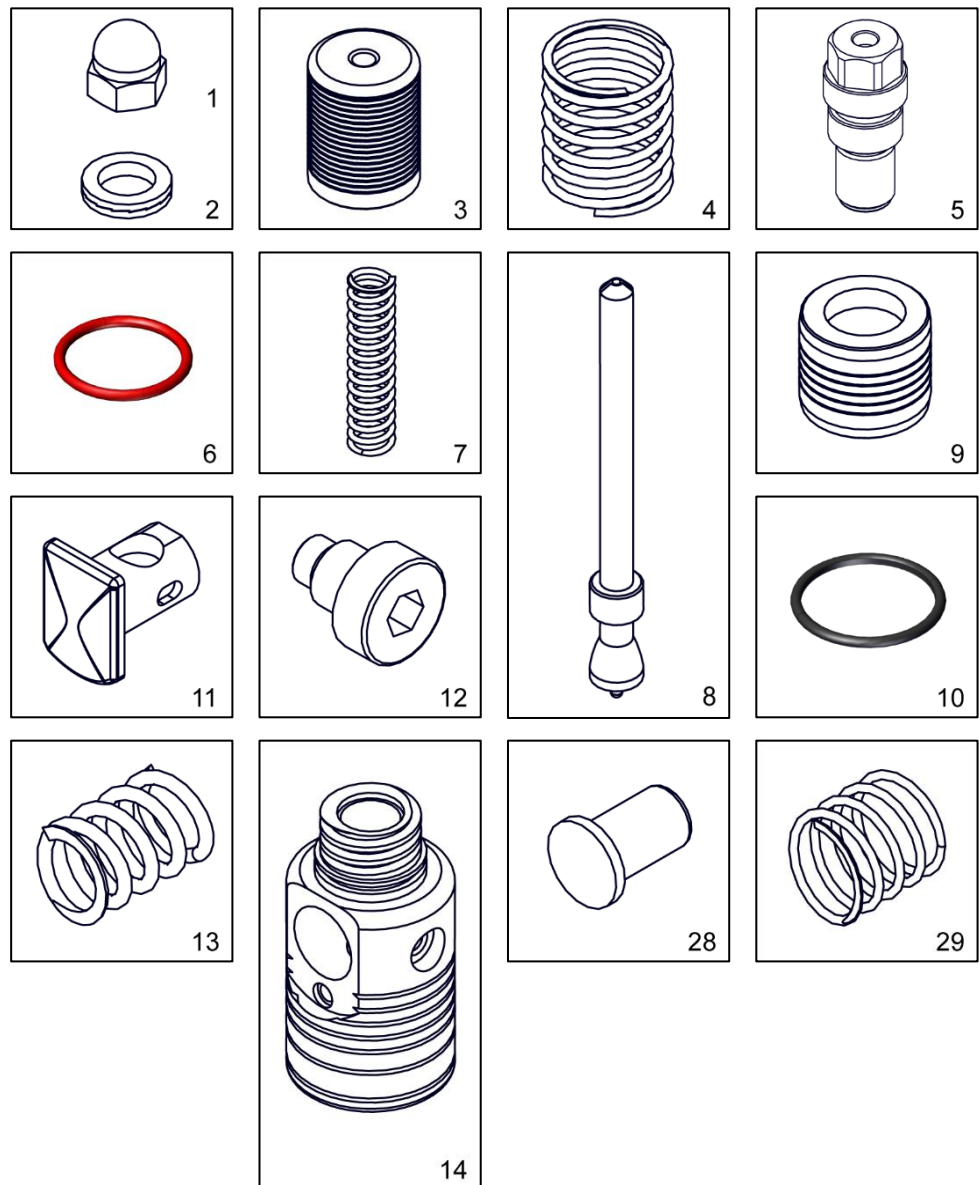


Fig. 7-2 Components of the bolt head

Wearing parts The following components of the bolt head are wearing parts and must be checked at regular intervals and exchanged if damaged:

		Component	Pos. No.
Type: KS, KR, KL, KK, KC		Cap nut	1
		Serrated washer	2
		Protective cap for firing pin	3
		Firing pin relief spring	4
		Firing pin guide	5
		O-ring (red, 2 x)	6
		Firing pin spring	7
		O-ring (locking ring)	10
		Trigger	11
		Firing pin guide screw	12
		Trigger spring	13
		Trigger lock pin	28
		Trigger lock pin spring	29
		Bolt head housing	14
Type KLS		Bolt head housing not shown	Similar to Fig. 14

Greasing The following components of the bolt head must be greased at regular intervals:

Component	Pos. No.
Firing pin	8
Locking ring	9
O-ring (locking ring)	10
All threads	

Disassembling the bolt head

- Unlock the bolt head (A) and remove it from the cartridge receiver (B).
- Loosen the cap nut (1) and remove the serrated washer (2). Check the serrated washer for wear.
- Unscrew the protective cap for the firing pin (3).
- Remove the firing pin relief spring (4) and check it for wear.
- Unscrew the firing pin guide (5).
- Check the O-rings (6) for wear.
- Unscrew the locking ring (9).
- Check the O-ring (10) for wear.
- Pull the trigger (11) and pull out the firing pin (8).
- Remove the firing pin spring (7) and check it for wear.
- Loosen the firing pin guide screw (12) and pull the trigger (11) out slowly.
- Remove the trigger spring (13), the trigger lock pin (28), and the trigger lock pin spring (29). Check the trigger spring for wear.
- Exchange worn components.

Cleaning/greasing

- Clean the remaining components of the bolt head.
- Grease all threads, the firing pin (8), the locking ring (9), and the O-ring (10).

Installing the bolt head

- Insert the trigger spring (13) and the trigger lock pin (28) with the trigger lock pin spring (29) into the bolt head housing (A).
- Insert the trigger (11) into the bolt head housing (A).
- Pull the trigger (11) and screw the guide screw (12) into the bolt head housing (A).
- Grease the O-ring and attach it to the bolt head housing.
- Tighten the locking ring (9).
- Pull the trigger (11) and insert the firing pin (8).
- Insert the firing pin spring (7).
- Tighten the firing pin guide screw (12).
- Insert the firing pin relief spring (4).
- Tighten the protective cap for the firing pin (3).

Functional test of the bolt head/adjusting the firing pin

- Bolt head is secured (red O-rings are not visible) see Fig. 7-7.
- The tip of the firing pin must be below the flat surface of the bolt head when the trigger is pulled.
- Bolt head is **not** secured (red O-rings are visible):
- The tip of the firing pin must be below the flat surface of the bolt head when the trigger (11) is **not** pulled.
- The tip of the firing pin should be approx. 1.5 mm above the flat surface of the bolt head when the trigger (11) is pulled.



After cleaning and performing maintenance on the firing pin, the firing pin needs to be readjusted. When the trigger is not pulled, the dimension for adjustment purposes is: 1.5 – 1.7 mm

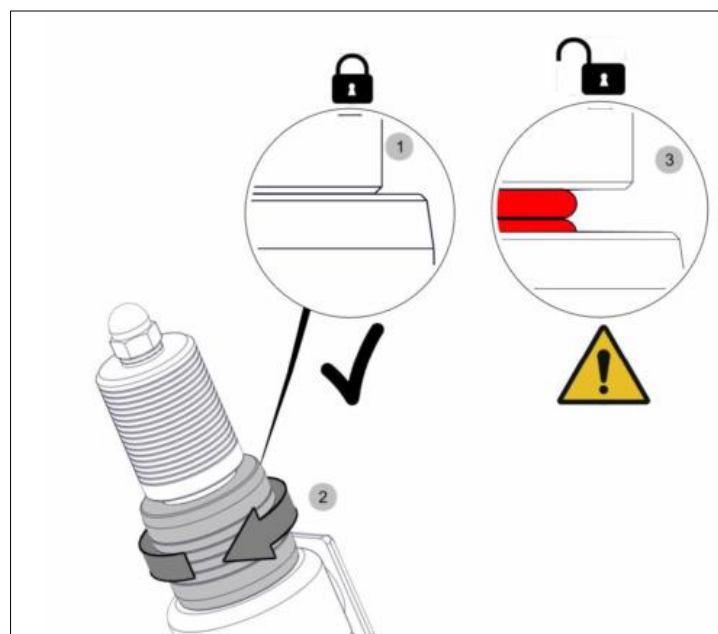


Fig. 7-3 Bolt head locked/unlocked

- If necessary, adjust the position of the firing pin tip by turning back the protective cap for the firing pin (3).
- Insert the serrated washer (2).
- Tighten the cap nut (1).

7.6 Carrying out maintenance on the cartridge receiver



German

[Playlist of German videos!](#)
[Maintenance of the cartridge receiver](#)



English

[Playlist of the English maintenance videos!](#)
[Bolt Stunner – Cartridge receiver](#)



Type:
KS
KR, KL, KLS, KK
KC

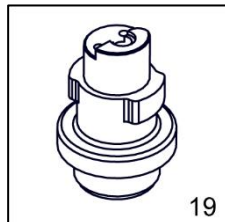
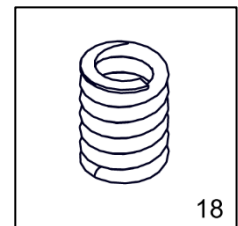
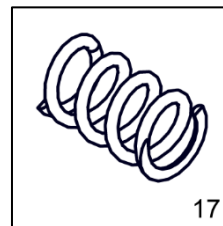
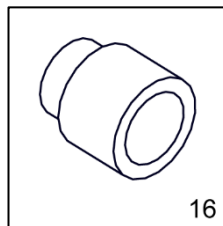
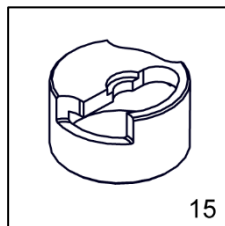


Fig. 7-4 Components of the cartridge receiver

Wearing parts The following components of the cartridge receiver are wearing parts and must be checked at regular intervals and exchanged if damaged:

Component	Pos. No.
Guide pin spring	17
Ejector spring (x 2)	18

Greasing The following components of the cartridge receiver must be greased at regular intervals:

Component	Pos. No.
Cartridge ejector	15
Ejector guide pin	16
Guide pin spring	17
Ejector spring (x 2)	18



It is not necessary to unscrew the cartridge receiver from the bolt guide for disassembly of the cartridge ejector, the ejector guide pin and the ejector springs.

The ejector guide pin is held under tension by the guide pin spring and can spring out of the cartridge repository in an uncontrolled manner during disassembly.

Disassembling the cartridge ejector

- Use the assembly hook (63) to press in the ejector guide pin (16) to the stop.
- Slowly remove the cartridge ejector (15) from the cartridge repository (19).
- Pull out the ejector guide pin (16) with the guide pin spring (17) and check it for wear.
- Remove the two ejector springs (18) from the cartridge repository and check them for wear.
- Exchange worn components.

Cleaning/greasing

- Clean the components of the cartridge receiver and grease the old and new components.

Assembling the cartridge ejector

- Insert the ejector springs (18) into the cartridge repository (19).
- Insert the ejector spring pin (16) with the guide pin spring (17) into the cartridge repository.
- Attach the cartridge ejector (15) to the cartridge repository (19).

The cartridge ejector is mounted if the guide pin has locked into place.

7.7 Carrying out maintenance on the bolt guide

German [Playlist of German videos!](#)



English [Playlist of the English maintenance videos!](#)



7.7.1 Type KR / KL / KK

Type:
KR, KL, KK

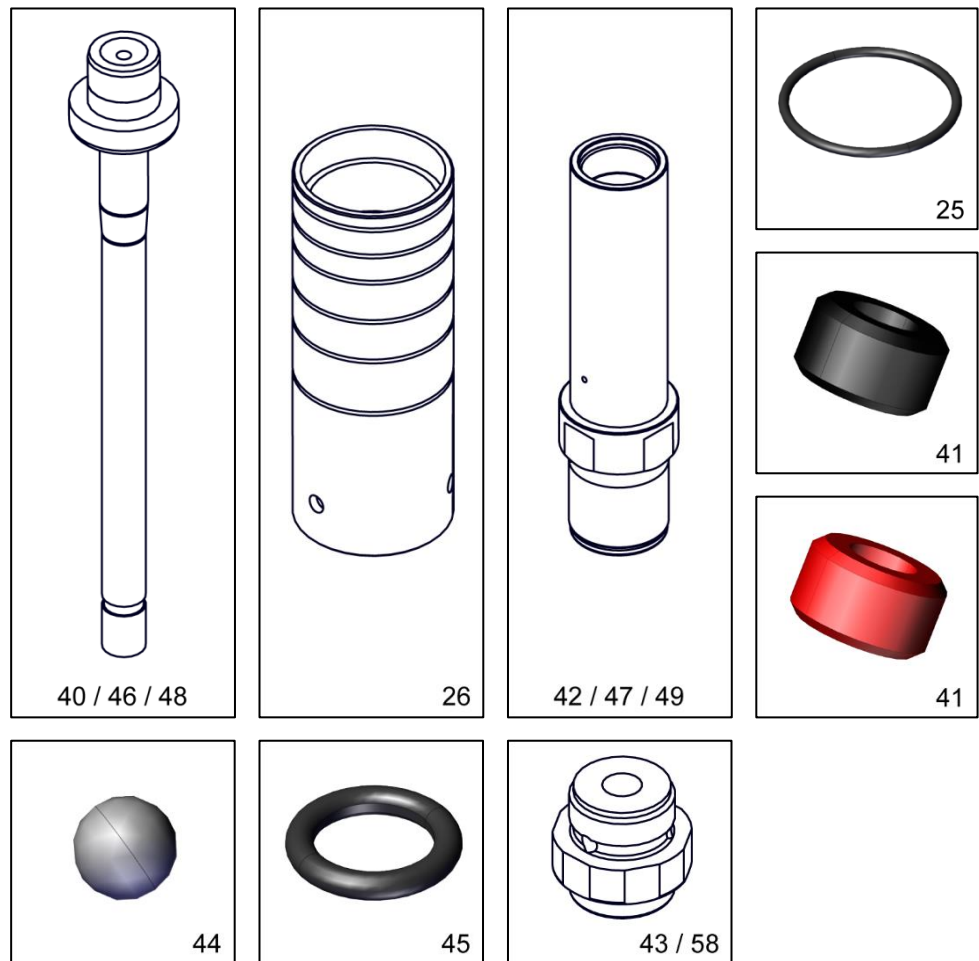


Fig. 7-5 Components of the bolt guide



The following components of the bolt guide are wearing parts and must be checked at regular intervals and exchanged if damaged:

Component	Pos. No.
O-ring protective sheath (x 2)	25
Rubber buffer (black, red)	41
Clamping ball (x 3)	44
Fixing ring	45
Guide tube	42/47/49

Greasing

The following components of the bolt head must be greased at regular intervals:

Component	Pos. No.
Protective sheath	26
Bolt	40/46/48
Bolt end guide	43/58
Clamping ball (x 3)	44
All threads	

Disassembling the bolt guide (type KL/KR/KK)

- **Secure the captive bolt stunner.**
 - Unlock the bolt head (A) and remove it from the cartridge receiver (B).
 - Clamp the bolt guide (C) and remove the cartridge receiver from the bolt guide. To this end, use the assembly nut (60) 'assembly lever' (61).
 - Remove the protective sheath (26) and the O-rings (25) from the guide tube (42/47/49) and check the O-rings for wear.
 - Pull the bolt (40/46/48) out of the guide tube and check the rubber buffers (41) for wear.
(Type KR, KL: 3 rubber buffers; type KK: 2 rubber buffers)
 - Clamp the guide tube and release the bolt end guide (43/58) from the guide tube.
 - Remove the fixing ring (45) from the bolt end guide and check it for wear.
 - Check the clamping balls (44) for wear.
Replace worn clamping balls.
- Cleaning/greasing
- Clean the components of the bolt guide.
 - Grease all threads, the O-rings (25), the bolt (40/46/48), and the bolt end guide (43/58).

Assembling the bolt guide (type KL/KR/KK)

- Assembly
- Insert new clamping balls (44): Grease the new clamping balls and press them into the designated holes.
 - Fix the clamping balls in place with the fixing ring (45).
 - Screw the bolt end guide (43/58) to the guide tube (42/47/49).
 - Insert the bolt (40/46/48) with the rubber buffers into the guide tube.
 - Slide the protective sheath (26) and the two O-rings (45) onto the guide tube (42/47/49).
 - Mount the cartridge receiver (B) on the bolt guide.
To this end, use the assembly nut (60) and the assembly lever (61).
 - Place the bolt head on the cartridge receiver and lock it.
 - Carry out the proof test
(→ chapter *Daily proof test*).

7.7.2 Type KS

Type: KS

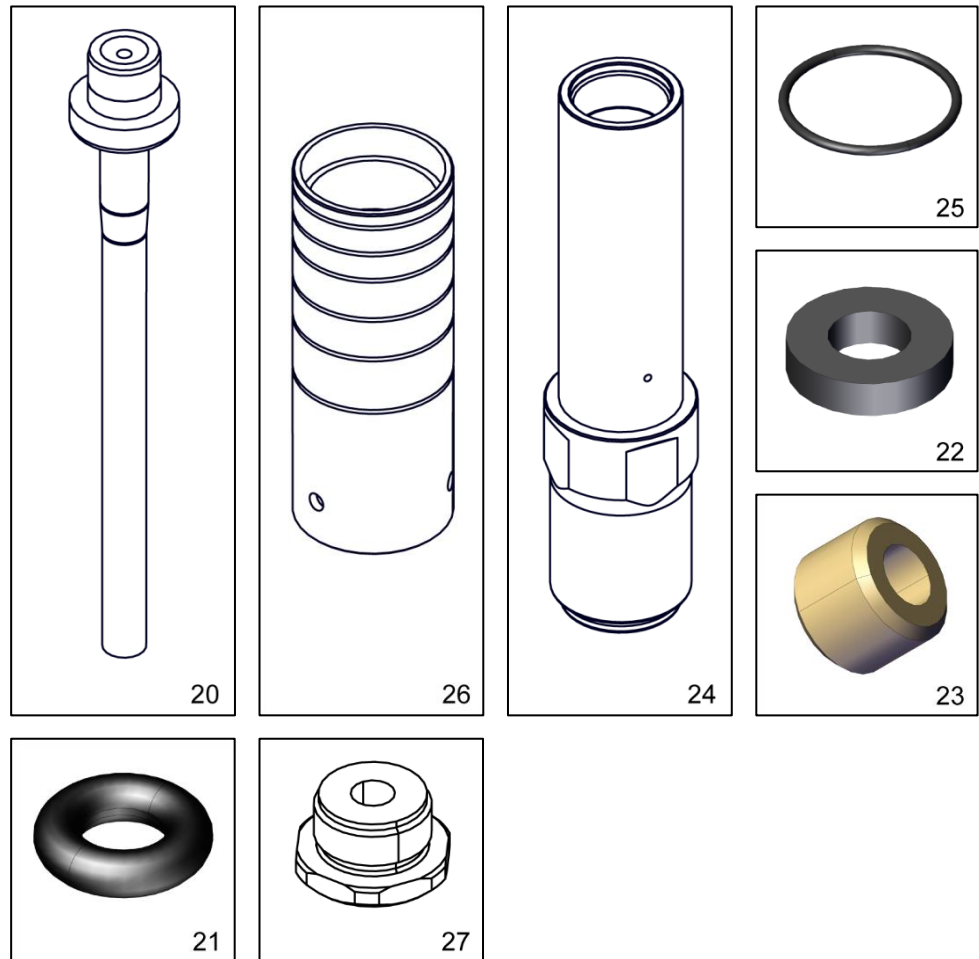


Fig. 7-6 Components of the bolt guide

Wearing parts The following components of the bolt guide are wearing parts and must be checked at regular intervals and exchanged if damaged:

Component	Pos. No.
O-ring	21
Rubber washer (x2)	22
Damping element (x8)	23
O-ring protective sheath (x 2)	25
Protective sheath	26
Guide tube	24
Protective sheath	26

Greasing The following components of the bolt head must be greased at regular intervals:

Component	Pos. No.
Bolt	20
O-ring protective sheath (x 2)	25
Bolt end guide	27
All threads	

Disassembling the bolt guide (type KS)



Exchange worn components immediately.

- Secure the captive bolt stunner.
- Unlock the bolt head (A) and remove it from the cartridge receiver (B).
- Clamp the bolt guide (C) and remove the cartridge receiver from the bolt guide. To this end, use the assembly nut (60) and the assembly lever (61).
- Remove the protective sheath (26) and the O-rings (25) from the guide tube (24) and check the O-rings for wear.
- Pull the bolt (20), the O-ring (21), and the two rubber washers (22) out of the guide tube and check the damping elements (23) for wear.
- Clamp the guide tube and release the bolt end guide (27) from the guide tube.

Cleaning/greasing

- Clean the components of the bolt guide.
- Grease all threads, the O-rings (25), the bolt (20), and the bolt end guide (27).

Assembling the bolt guide (type KS)

- Screw the bolt end guide (27) to the guide tube (24).
- Insert the bolt (20) with the O-ring (21), the rubber washers (22) and the damping elements (23) into the guide tube (24).
- Slide the protective sheath (26) and the two O-rings (25) onto the guide tube (24).
- Mount the cartridge receiver (B) on the bolt guide (C). To this end, use the assembly nut (60) and the assembly lever (61).
- Place the bolt head (A) on the cartridge receiver (B) and lock it.
- Carry out the proof test
(→ chapter *Daily proof test*).

7.7.3 Type KC

Type: KC

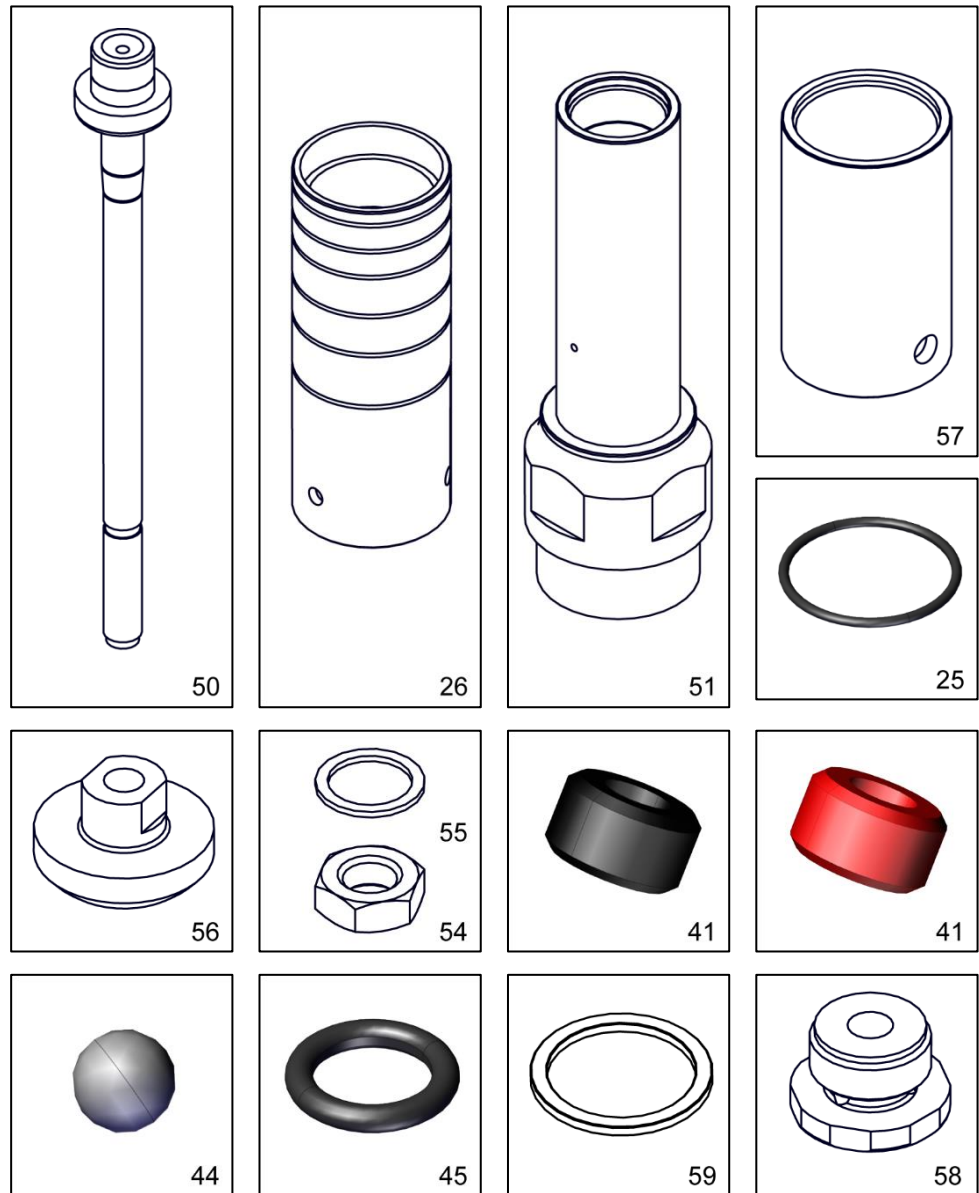


Fig. 7-7 Components of the bolt guide

Wearing parts The following components of the bolt guide are wearing parts and must be checked at regular intervals and exchanged if damaged:

Component	Pos. No.
O-ring protective sheath (x 2)	25
Damping elements (black, red)	41
Clamping ball (x 3)	44

Fixing ring (rubber)	45
Fixing ring (steel)	59
Serrated washer	55

Greasing The following components of the bolt head must be greased at regular intervals:

Component	Pos. No.
O-ring protective sheath (x 2)	25
Bolt	50
Bolt end guide	58
Clamping ball (x 3)	44
All threads	

Disassembling the bolt guide (type KC)



Exchange worn components immediately.

- Secure the captive bolt stunner.
- Unlock the bolt head (A) and remove it from the cartridge receiver (B).
- Clamp the bolt guide (C) and remove the cartridge receiver from the bolt guide. To this end, use the 'cartridge receiver' assembly tool (60, 61).
- Remove the protective sheath (26) and the O-rings (25) from the guide tube (51) and check the O-rings for wear.
- Clamp the guide tube and release the spacer sleeve (57) from the guide tube. To this end, use the 'spacer sleeve' assembly tool (64).
- Leave the guide tube clamped.
- Release the bolt end guide (58) from the guide tube and remove the entire bolt system (bolt, bolt end guide, impact plate) from the guide tube.
- Clamp the bolt end guide and release the impact plate (56) from the bolt (50). The impact plate is secured by means of a lock nut (54).
- Remove the serrated washer (55) from the bolt and check it for wear.
- Remove the lock nut (54) from the bolt.
- Remove the rubber buffers (41) from the bolt and check them for wear.
- Remove the fixing rings (45, 59) from the bolt end guide (58) and check them for wear.
- Check the clamping balls (44) for wear.
- Exchange worn components.

- Cleaning/greasing
- Clean the components of the bolt guide.
 - Grease all threads, the O-rings (25), the bolt (50), and the bolt end guide (58).

Assembling the bolt guide (type KC)

- Insert new clamping balls: Grease the new clamping balls (44) and press them into the designated holes.
- Fix the clamping balls in place with the fixing rings (45).
- Put the damping elements (41) on the bolt (50) (Sequence: black – red – black – red – black).
- Put the bolt end guide (58) on the bolt (50).
- Screw the lock nut (54) onto the bolt (50).
- Put the serrated washer (55) on the bolt (50).
- Clamp the bolt end guide (58) and screw the impact plate (56) onto the bolt (50).
- Secure the impact plate (56) on the bolt (50) using the lock nut (54).
- Insert the entire bolt system (bolt, bolt end guide, impact plate) into the guide tube (51).
- Clamp the guide tube and screw the bolt end guide onto the guide tube.

Leave the guide tube clamped.

- Mount the spacer sleeve (57) on the guide tube (51). To this end, use the 'spacer sleeve' assembly tool (64).
- Slide the protective sheath (26) and the two O-rings (45) onto the guide tube.
- Mount the cartridge receiver (B) on the bolt guide (C). To this end, use the assembly nut (60) and the assembly lever (61).
- Place the bolt head (A) on the cartridge receiver (B) and lock it.
- Carry out the proof test
(→ chapter *Daily proof test*).

7.7.4 Type KLS

Type: KLS

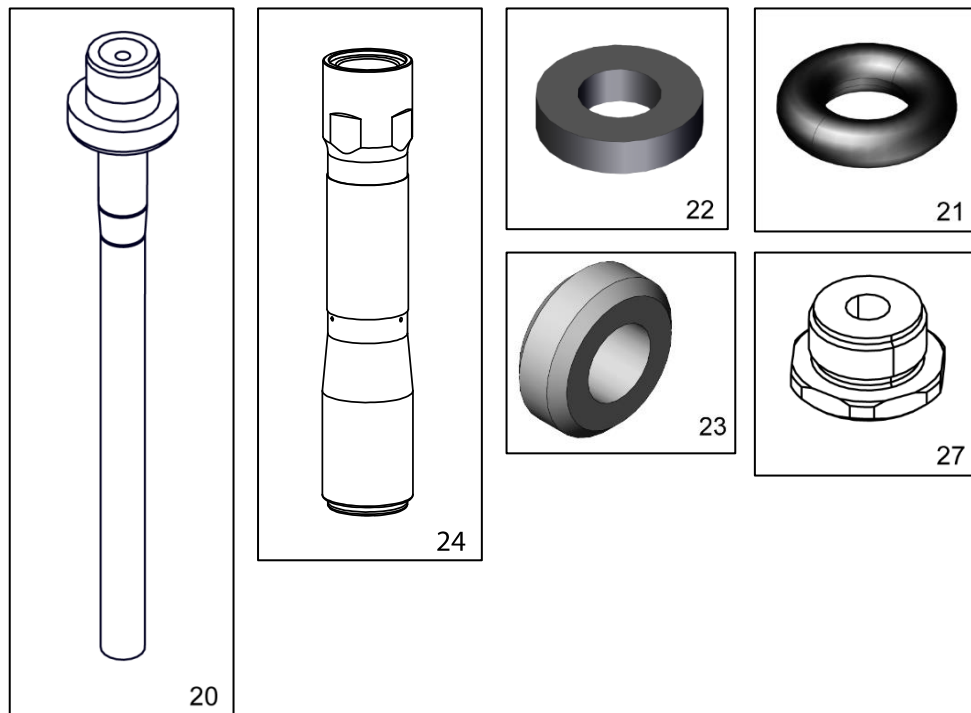


Fig. 7-8 Components of the bolt guide

Wearing parts The following components of the bolt guide are wearing parts and must be checked at regular intervals and exchanged if damaged:

Component	Pos. No.
O-ring	21
Rubber washer (x2)	22
Damping elements (x20)	23

Greasing The following components of the bolt head must be greased at regular intervals:

Component	Pos. No.
Bolt	20
Bolt end guide	27
All threads	

Disassembling the bolt guide (type KLS)



Exchange worn components immediately.

Disassembly

- Secure the captive bolt stunner.
- Unlock the bolt head (A) and remove it from the cartridge receiver (B).
- Clamp the bolt guide (C) and remove the cartridge receiver from the bolt guide. To this end, use the 'cartridge receiver' assembly tool (60, 61).
- Pull the bolt (20) out of the guide tube and check the damping elements (23) for wear.
- Clamp the guide tube and release the bolt end guide (27) from the guide tube.

Cleaning/greasing

- Clean the components of the bolt guide.
- Grease all threads, the bolt (20), and the bolt end guide (27).

Assembling the bolt guide (KLS)

Assembly

- Screw the bolt end guide to the guide tube.
- Insert the bolt with the rubber buffers into the guide tube.
- Mount the cartridge receiver on the bolt guide. To this end, use the 'cartridge receiver' assembly tool.
- Place the bolt head on the cartridge receiver and lock it.
- Carry out the proof test (→ chapter *Daily proof test*).

7.8 Sharpening the bolt



WARNING!

Danger to life if using a bolt that is too short

Danger to life and risk of very serious injuries.

- Do not grind down the bolt to below the minimum permissible bolt length.
- Interrupt the grinding process several times to check the length of the bolt.

The bolts of the captive bolt stunners KR, KL, KLS, KK and KS can be re-sharpened with an appropriate mounted point (70). The bolt is re-sharpened by grinding the inner surface of the bolt tip. Grinding on the outer surface of the bolt tip is **not** permitted and can lead to functional faults. (See figure below).

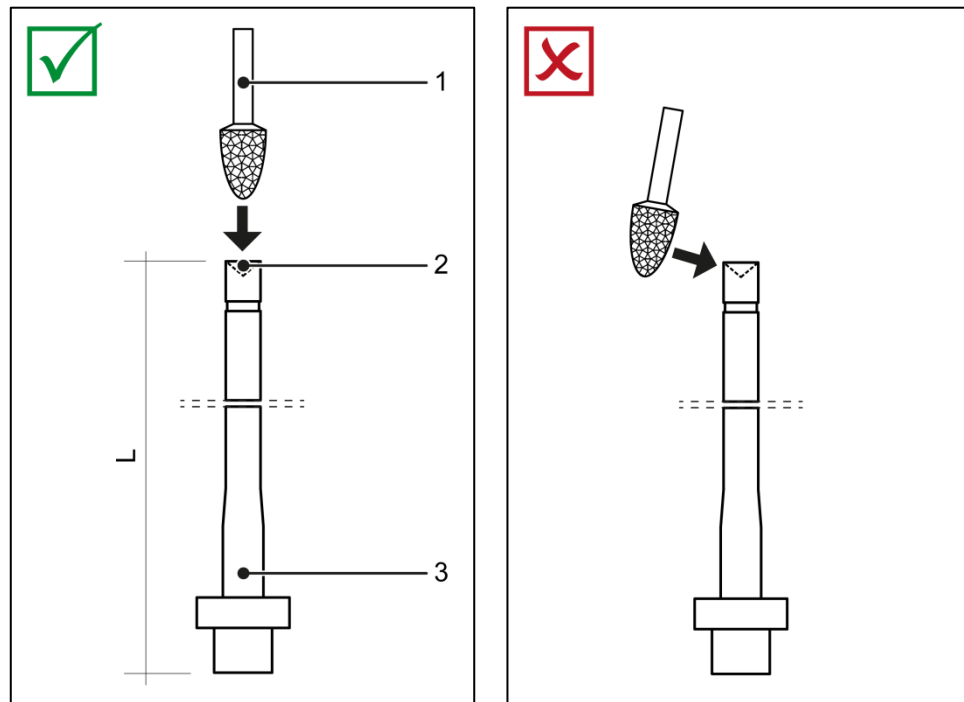


Fig. 7-9 Attachment position of the mounted point

Pos.	Designation	Pos.	Designation
✓	Correct contact position	L	Minimum permissible bolt length: Type KS, KR: 194 mm Type KL: 230 mm Type KLS: 235 mm Type KK: 180 mm
✗	Incorrect contact position		
1	Mounted point (corundum-coated)		
2	Bolt tip		
3	Bolt		

Prerequisite The bolt (20, 40, 46 or 48) has been removed from the bolt guide (→ chapter *Carrying out maintenance on the bolt guide*).

- Clamp the bolt in a vice.
- Clamp the mounted point (70), for example, in the drill chuck of a hand drill/standing drill.

Sharpening ➤ Align the mounted point so that it is parallel to the longitudinal axis of the bolt.



Only grind the bolt tip to the extent necessary to make it sharp again. Observe the minimum permissible bolt length.

Assembly and proof test

- Install the sharpened bolt in the bolt guide. (→ chapter *Carrying out maintenance on the bolt guide*).
- Carry out the proof test. (→ chapter *Daily proof test*).

8 Troubleshooting and fault rectification

If errors or faults occur during operation, this chapter provides information to help you find and remedy the cause.

If you cannot find the error or fault in the following table, please contact FREUND GmbH & Co. KG. Please refer to the company information in the imprint for the address and telephone numbers.

8.1 Safety information



WARNING!

Risk of accident caused by insufficiently qualified personnel.

Danger to life and risk of very serious injuries.

- Fault rectification work may only be carried out by instructed and authorised personnel.
- Secure the captive bolt stunner if the cartridge did not ignite or the shot was not fired.
- Never point the captive bolt stunner at other persons or at body parts.
- Wait 30 seconds before you commence fault rectification work.

8.2 Personal protective equipment

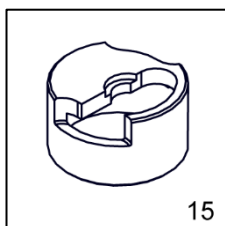


8.3 Overview of possible faults

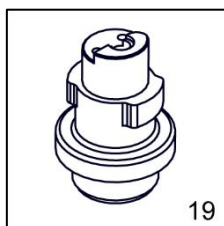


Carry out the daily proof test after you have rectified the cause(s) of the fault(s)
(→ chapter *Daily proof test*).

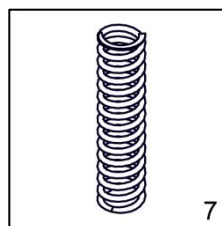
Components of
cartridge ejector



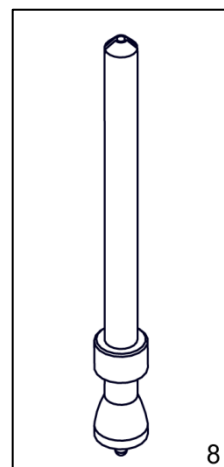
15



19



7



8

Fault	Possible cause	Remedy
The cartridge keeps jamming.	The cartridge ejector (15) is damaged (e.g. by the device being triggered when there is no cartridge in the cartridge repository).	Replace the cartridge ejector (15).
	The cartridge repository seat (19) is damaged (e.g. by the device being triggered when there is no cartridge in the cartridge repository).	Replace the cartridge repository seat (19).
	The cartridge repository seat is contaminated with various residues.	Clean the cartridge repository seat with the detergent included in the scope of delivery. <i>Never use water for cleaning purposes.</i>
The cartridge does not ignite.	The spring tension of the firing pin spring is too low.	Insert a new firing pin spring (7).
	The firing pin is bent.	Insert a new firing pin (8).
	The firing pin is set incorrectly.	Adjust the position of the tip of the firing pin.
	The captive bolt stunner was not fully unlocked when the shot was fired.	Fully unlock the captive bolt stunner right before firing the shot.
	The protective cover was not able to spring back unimpeded when the shot was fired.	Hold the captive bolt stunner in such a way that the protective cover can spring back unimpeded.
	The cartridges are moist.	Ensure that the cartridges are stored in a dry place.

Components of
type KS, KLS

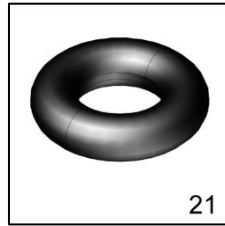


Fig.8-1 O-ring

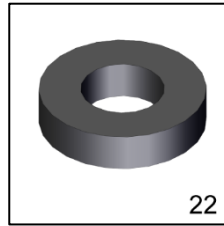


Fig.8-2 Rubber
discs

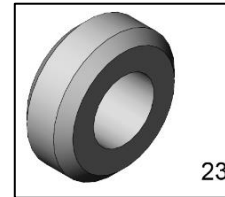


Fig.8-3 Damping
element KLS

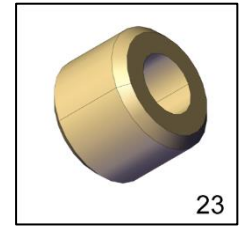


Fig.8-4 Damping
element KS

Components of
type KR, KL, KK,
KC

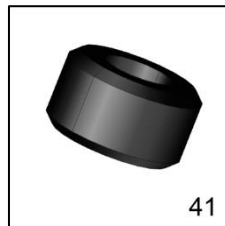


Fig.8-5 Damping
element KR, KL,
KK, KC

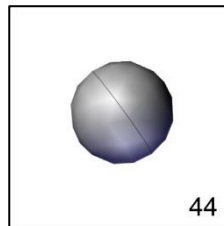


Fig.8-6 Clamping
balls KR, KL, KK,
KC



Fig.8-7 Fixing rings
KR, KL, KK, KC

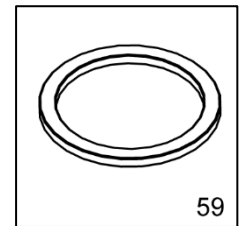


Fig.8-8 Fixing rings
KR, KL, KK, KC

Fault	Possible cause	Remedy
Slaughter animals do not always fall after the shot is fired.	Type KS, KLS: The bolt is not fully returned to the starting position after the shot is fired.	Exchange the following wearing parts: • Damping elements (23), • O-ring (21) • Rubber washers (22).
	Type KR, KL, KK, KC: The bolt cannot be fully returned to the starting position after the shot is fired.	Exchange the following wearing parts: • Damping elements (41) • Clamping balls (44) • Fixing rings (45, 59)
	Components of the bolt guide are dirty.	Clean the dirty components of the bolt guide.
	The bolt is damaged (e.g. bent):	Exchange the bolt guide (→ chapter <i>Carrying out maintenance on the bolt guide</i>).
	The strength of the cartridge is too weak for the slaughter animal.	Use a stronger cartridge.

Fault	Possible cause	Remedy
The bolt gets stuck in the head of the animal after the shot has been fired.	The captive bolt stunner is not properly placed on the head of the animal.	Place the captive bolt stunner in the appropriate contact position on the animal's head. When attaching the captive bolt stunner, ensure that the captive bolt stunner is at the correct angle (→ chapter <i>Contact position on the slaughter animal</i>).
	Rubber pieces between the bolt and the guide tube jam the bolt.	Remove the rubber pieces and exchange the wearing parts (e.g. O-rings, rubber washer, damping elements, and rubber buffers).
	The bolt jams or slides sluggishly in the guide tube (e.g. due to a bent bolt).	Exchange the wearing parts and/or the bolt (→ chapter <i>Maintenance and servicing</i>).
	The bolt was not sharpened correctly.	Sharpen the bolt (→ chapter <i>Sharpening the bolt</i>).
The tip of the bolt does not emerge from the guide tube.	The cartridge receiver and the bolt end guide are not firmly screwed onto the guide tube.	Ensure that the cartridge receiver and the bolt end guide are firmly screwed onto the guide tube.
	The bolt is too short (e.g. as a result of being sharpened too often).	Ensure that the bolt is at least the length of the minimum permissible bolt length: Type KS, KR: 194 mm Type KL: 230 mm Type KLS: 235 mm Type KK: 180 mm If a bolt is too short, exchange it immediately.

9 Disposal and recycling

The captive bolt stunners, the tools and the accessories must be disposed of in accordance with the legal provisions in force in the respective countries.

9.1 Disassembling and disposing of the captive bolt stunner



All captive bolt stunners, tools and accessories contain materials (metals, plastics) that can be returned for recycling. It is imperative that the regional and local environmental regulations be adhered to in the course of disposal.

9.1.1 Disposing of materials

- Dispose of the cartridges in accordance with the respective country-specific laws, guidelines, ordinances and regulations.
- Disassemble the captive bolt stunner completely.
- Separate all recyclable materials by type.
- Dispose of waste oil and components and materials soiled with oil in accordance with the applicable environmental regulations.
- Sort the individual recyclable materials and send them for recycling and disposal.
- Send hazardous waste to a local hazardous waste site.

9.2 Disposing of packaging materials



All packaging materials used by FREUND GmbH & Co.KG are environmentally friendly and can be reused.

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

10 Technical data

10.1 Captive bolt stunners

Type KR	Technical data	Type KR
	Type of application	Irreversible stunning
	Dimensions [(length / diameter) mm]	385 / 56
	Weight (kg)	3.1
	Penetration of the animal's skull	Yes
	Bolt recoil system	Manual
	Bolt diameter (mm)	12
	Bolt exit dimension (mm) <i>The exit dimension depends on the type of slaughter animal and the strength of the cartridge.</i>	Max. 85
	Number of rubber buffers	3
	Calibre of cartridges	6.8/18 red, blue
	Calibre of test cartridges	6.8/11 red
	Sound power level [dB(A)]	120.7
	Sound pressure at the workplace [dB(A)]	90.8
	Measurement uncertainty [dB(A)]	2.5
	Vibration weighted acceleration (m/s ²)	14.1
	Vibration limit value (shots/day)	1180
	Certification	PTB/CE
	CIP (PTB approval)	CIP T PTB 1087 <i>(Old approval: 882)</i>
	CE type examination number	DE-11-MARLIV18-PTB09
Type KL	Technical data	Type KL
	Type of application	Irreversible stunning
	Dimensions [(length / diameter) mm]	425 / 56
	Weight (kg)	3.3
	Penetration of the animal's skull	Yes
	Bolt recoil system	Manual
	Bolt diameter (mm)	12

Type KL	Technical data	Type KL
	Bolt exit dimension (mm) <i>The exit dimension depends on the type of slaughter animal and the strength of the cartridge.</i>	Max. 125
	Number of rubber buffers	3
	Calibre of cartridges	6.8/18 red
	Calibre of test cartridges	6.8/11 red
	Sound power level [dB(A)]	111.9
	Sound pressure at the workplace [dB(A)]	80.1
	Measurement uncertainty [dB(A)]	2.5
	Vibration weighted acceleration (m/s ²)	18.9
	Vibration limit value (shots/day)	668
	Certification	PTB/CE
	CIP (PTB approval)	CIP T PTB 1087 (Old approval: 882)
	CE type examination number	DE-11-MARLIV18-PTB09
Type KLS	Technical data	Type KLS
	Type of application	Irreversible stunning
	Dimensions [(length / diameter) mm]	416.5 / 56
	Weight (kg)	3.3
	Penetration of the animal's skull	Yes
	Bolt recoil system	Automatic
	Bolt diameter (mm)	12
	Bolt exit dimension (mm) <i>The exit dimension depends on the type of slaughter animal and the strength of the cartridge.</i>	Max. 125
	Number of damping elements	20
	Cartridge type	6.8/18 red, blue
	Sound power level [dB(A)]	111.9
	Sound pressure at the workplace [dB(A)]	80.1
	Measurement uncertainty [dB(A)]	2.5
	Vibration weighted acceleration (m/s ²)	18.9
	Vibration limit value (shots/day)	668

Type KLS	Technical data	Type KLS
	Certification	PTB/CE
	PTB (CIP) approval	1087 (Old approval: 882)
	CE type examination number	DE-11-MARLIV18-PTB09
Type KK	Technical data	Type KK
	Type of application	Irreversible stunning
	Dimensions [(length / diameter) mm]	345 / 56
	Weight (kg)	2.9
	Penetration of the animal's skull	Yes
	Bolt recoil system	Manual
	Bolt diameter (mm)	12
	Bolt exit dimension (mm) <i>The exit dimension depends on the type of slaughter animal and the strength of the cartridge.</i>	Max. 75
	Number of rubber buffers	2
	Calibre of cartridges	6.8/18 red, blue
	Calibre of test cartridges	6.8/11 red
	Sound power level [dB(A)]	120.7
	Sound pressure at the workplace [dB(A)]	90.8
	Measurement uncertainty [dB(A)]	2.5
	Vibration weighted acceleration (m/s ²)	14.1
	Vibration limit value (shots/day)	1180
	Certification	PTB/CE
	CIP (PTB approval)	CIP T PTB 1087 <i>(Old approval: 882)</i>
	CE type examination number	DE-11-MARLIV18-PTB09
Type KS	Technical data	Type KS
	Type of application	Irreversible stunning
	Dimensions [(length / diameter) mm]	385 / 56
	Weight (kg)	3.3
	Penetration of the animal's skull	Yes
	Bolt recoil system	Automatic

Type KS	Technical data	Type KS
	Bolt diameter (mm)	12
	Bolt exit dimension (mm) <i>The exit dimension depends on the type of slaughter animal and the strength of the cartridge.</i>	80-85
	Number of damping elements	8
	Calibre of cartridges	6.8/18 red, blue
	Calibre of test cartridges	6.8/11 red
	Sound power level [dB(A)]	110.9
	Sound pressure at the workplace [dB(A)]	79.5
	Measurement uncertainty [dB(A)]	2.5
	Vibration weighted acceleration (m/s ²)	19.2
	Vibration limit value (shots/day)	650
	Certification	PTB/CE
	CIP (PTB approval)	CIP T PTB 1087 <i>(Old approval: 882)</i>
	CE type examination number	DE-11-MARLIV18-PTB09
Type KC	Technical data	Type KC
	Type of application	Irreversible stunning
	Dimensions [(length / diameter) mm]	445 / 60
	Weight (kg)	4.4
	Penetration of the animal's skull	No
	Bolt recoil system	Manual
	Bolt diameter (mm)	12
	Bolt exit dimension (mm)	

Type KC	Technical data	Type KC
	Number of rubber buffers	5
	Calibre of cartridges	6.8/18 red, blue
	Calibre of test cartridges	6.8/11 red
	Certification	PTB
	CIP (PTB approval)	CIP T PTB 1087 <i>(Old approval: 882)</i>
	CE type examination number	

10.2 Bolt speeds

Captive bolt stunner type	Muzzle velocity [m/s] (minimum value)
KS	38 - 40 [m/s]*
KR, KK, KL, KLS	40 - 42 [m/s]*
* The bolt speeds indicated refer to use of the recommended test cartridges. (6.8/11 red)	



The stated muzzle velocity of 45-65 m/s for the Schermer captive bolt stunners of the K series is dependent on the strength of the cartridges used.

10.3 StunTest test device - Evaluation unit

	Technical data	StunTest test device (evaluation unit)
Power supply unit	Primary voltage (V/AC)	230 (±10%)
	Secondary voltage (V/DC)	9
Sensor cable	Length (cm)	150
Evaluation unit	Display	LED display, 2-digit
Base body	Dimensions [(length / diameter) mm]	329 / 125

10.4 Test sleeve

Technical data	Dimensions
Dimensions [(length / diameter) mm]	198 x 66

10.5 Adapter sleeve

Technical data	Dimensions
Length (mm)	78.34
Outer diameter (mm)	50.11
Inner diameter (mm)	45.88

10.6 Cranial insertion rod

Long version	Technical data	Cranial insertion rod
	Dimensions H x W x D (mm)	1010 x 100 x 35
	Dagger length (mm)	975
	Dagger diameter (mm)	9
Short version	Technical data	Cranial insertion rod
	Dimensions H x W x D (mm)	385 x 100 x 35
	Dagger length (mm)	350
	Dagger diameter (mm)	9

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
DE-33100 Paderborn.

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

Hereby we declare that the machine,

Type **Captive Bolt Stunner**

Serial number

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

The machine has been type-tested by the Physikalisch-Technische Bundesanstalt PTB (NB0102).

Certificate no.: DE-11-MaRLIV18-PTB09 4th addendum

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

DIN EN ISO 11201:2010-10	DIN EN 13732-1:2008
DIN EN 12100:2011-03	DIN EN 15895:2018-08
DIN EN 13861:2012-01	DIN EN ISO 5349-2:2015-12

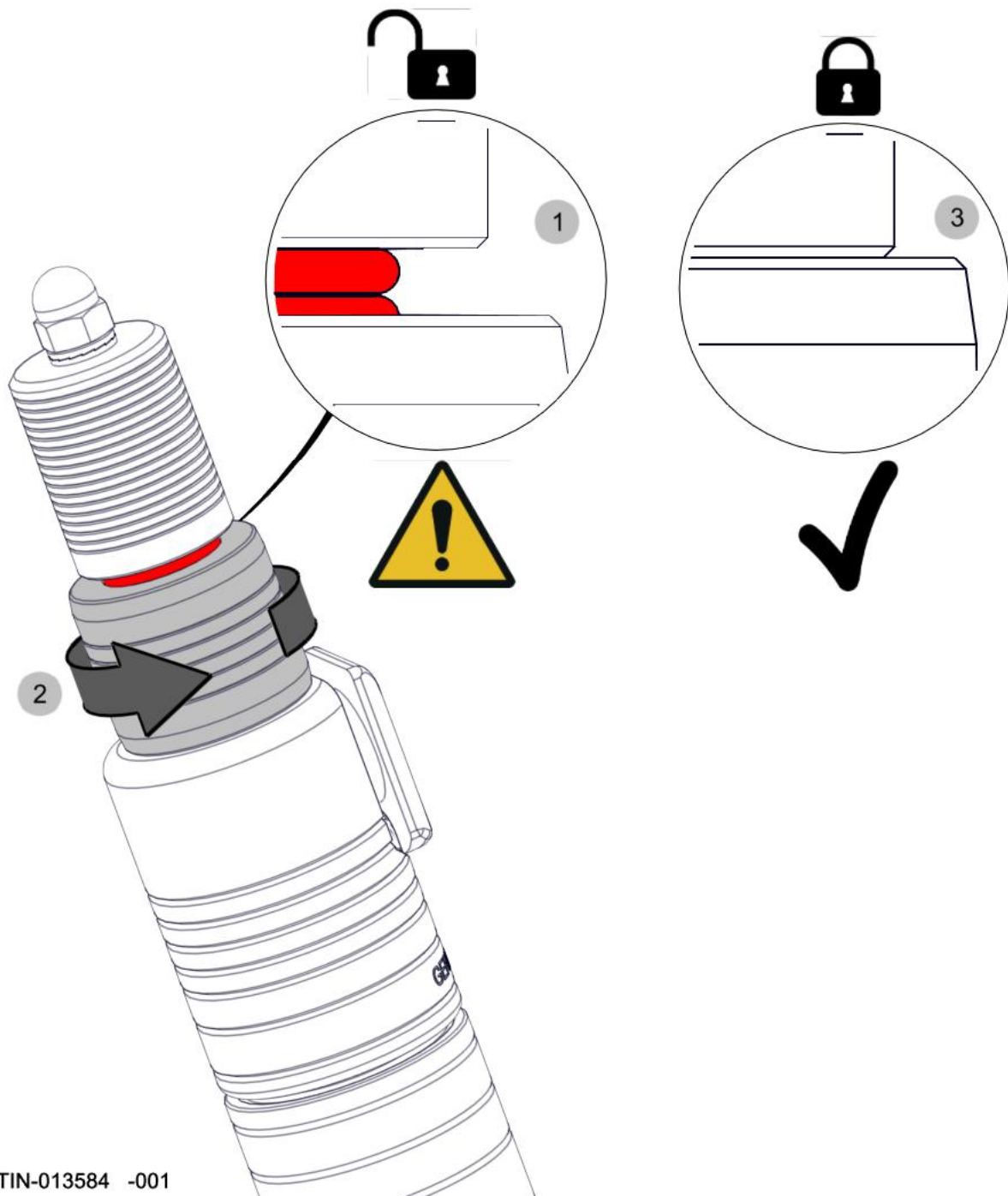


TIN-013584



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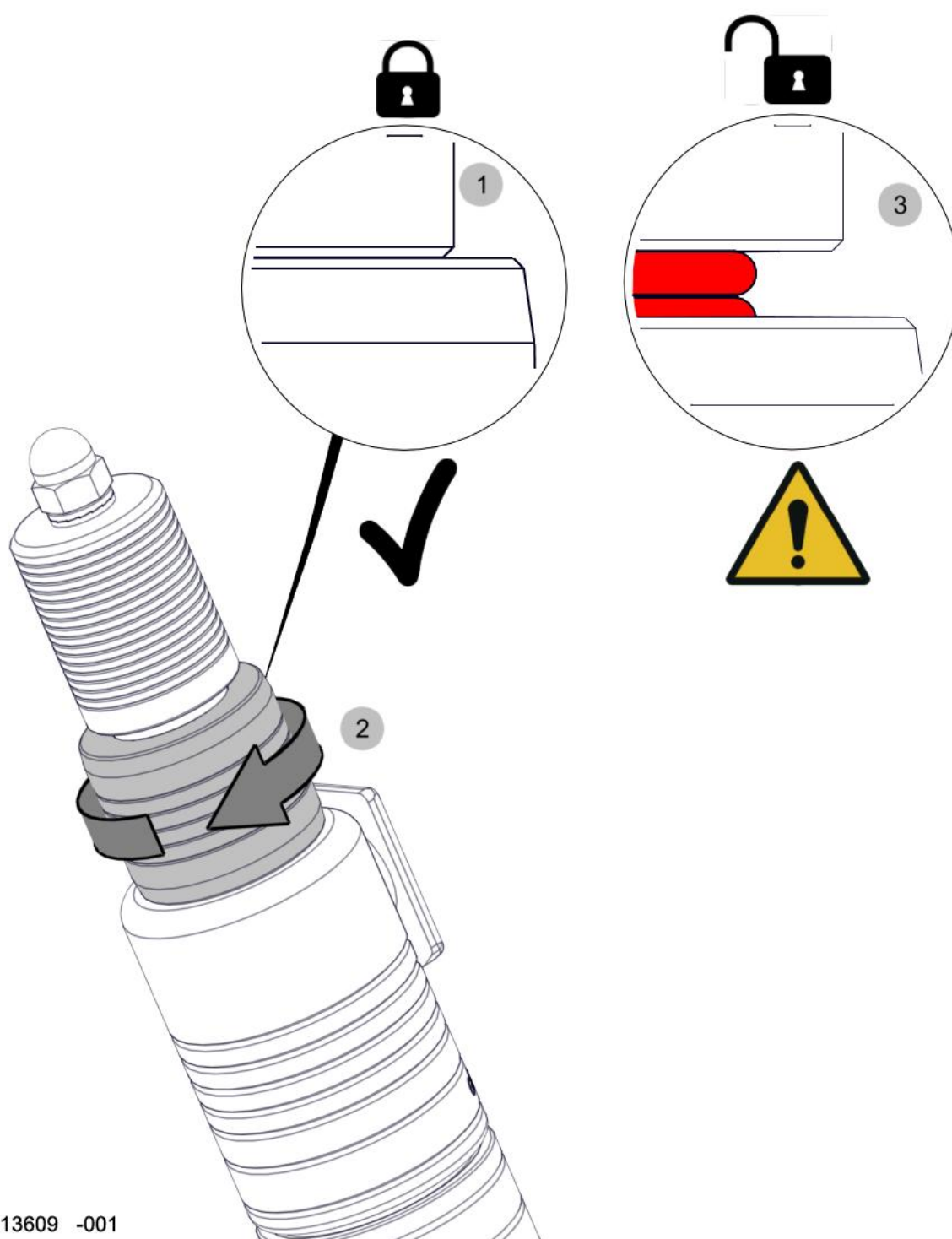


TIN-013607



5.5.2

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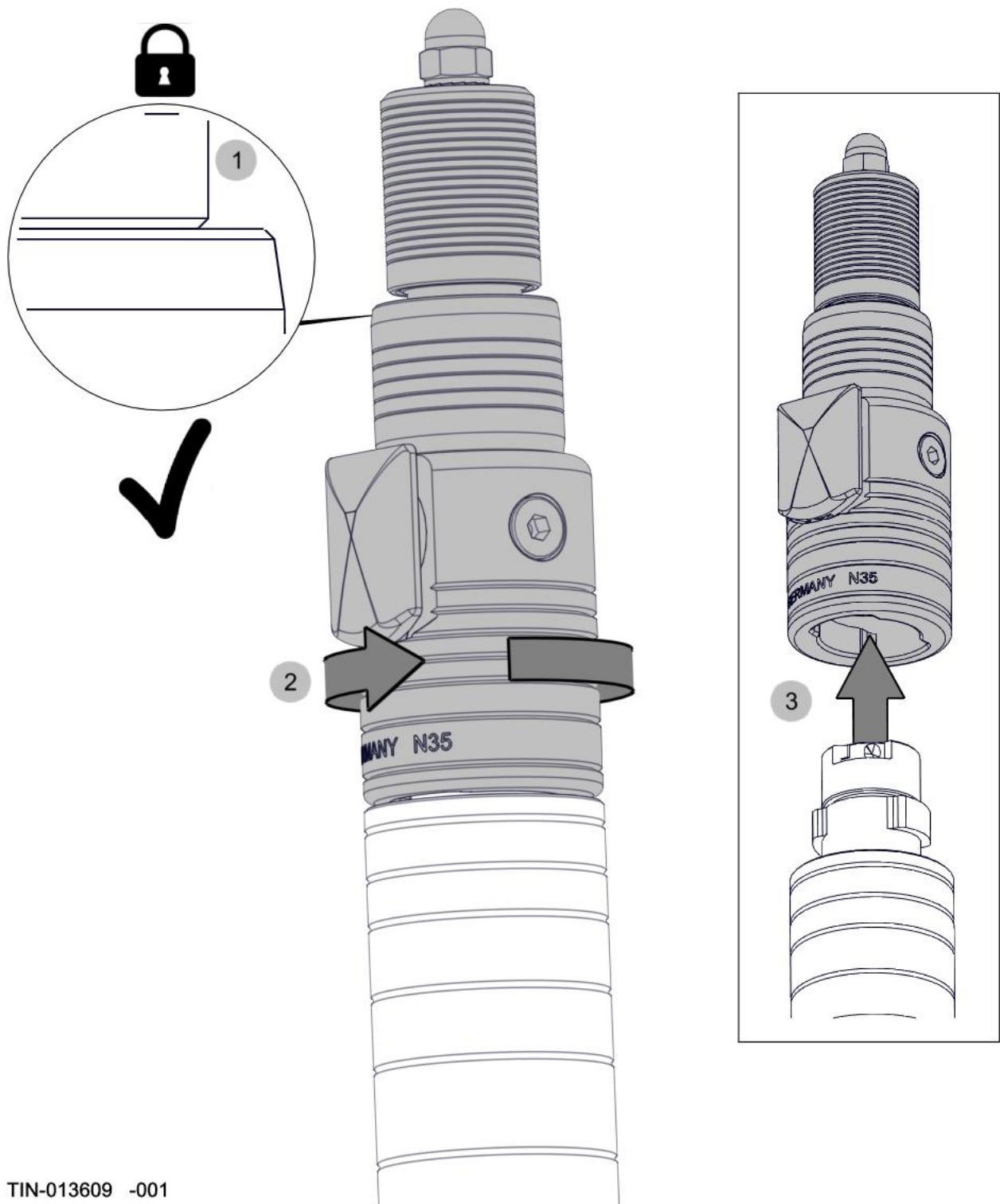


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5.6.1

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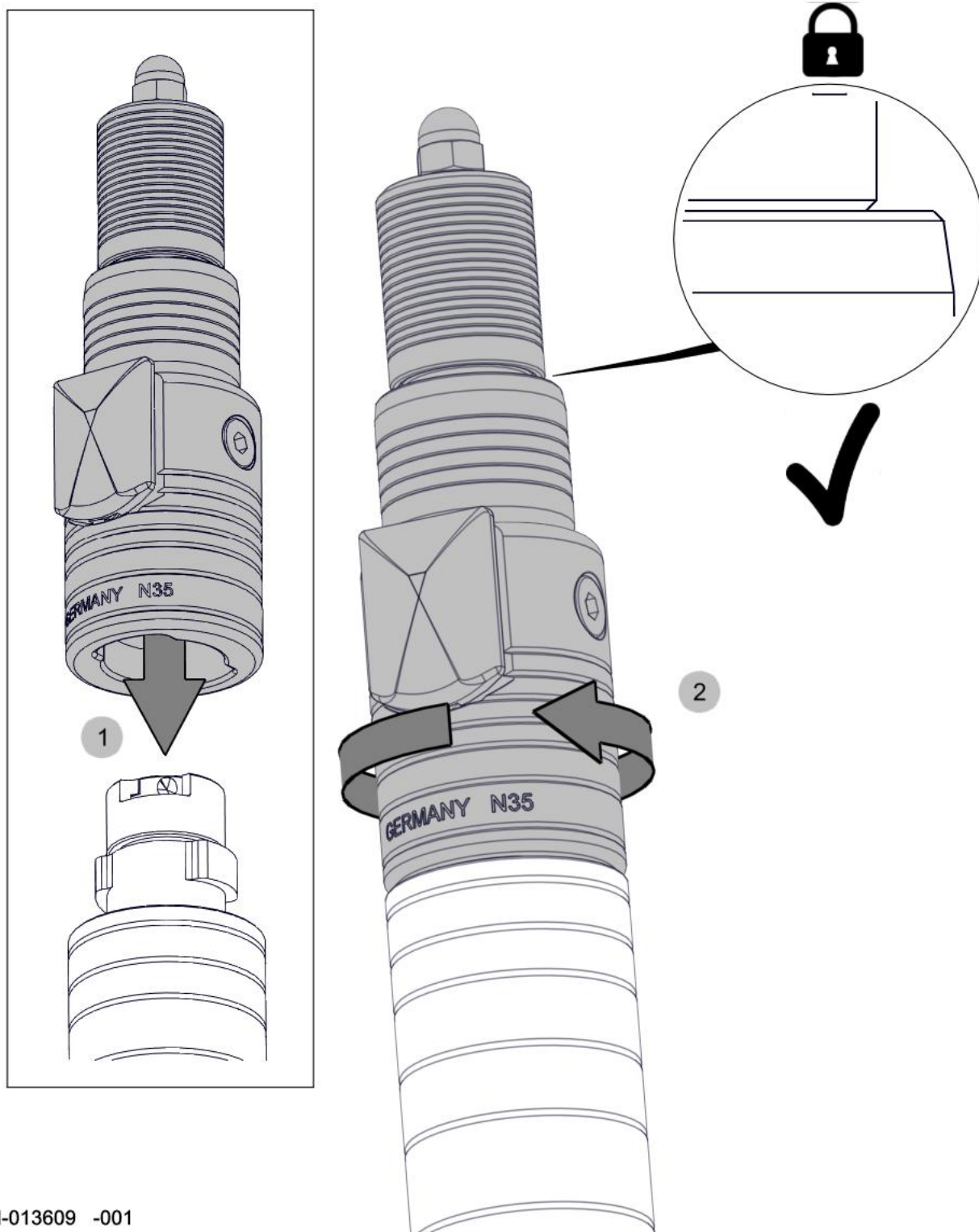


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5.6.2

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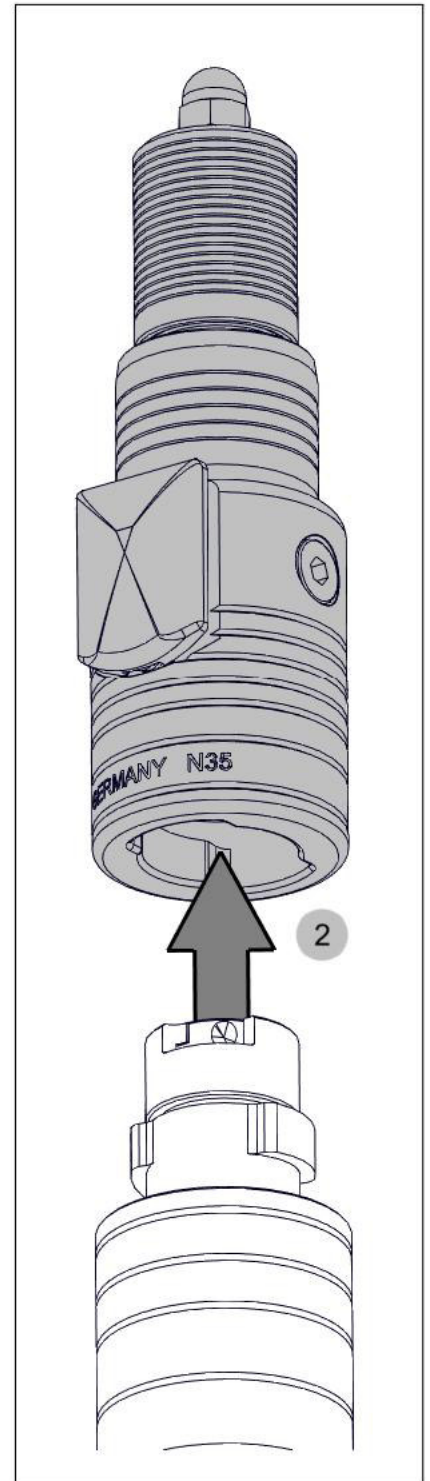
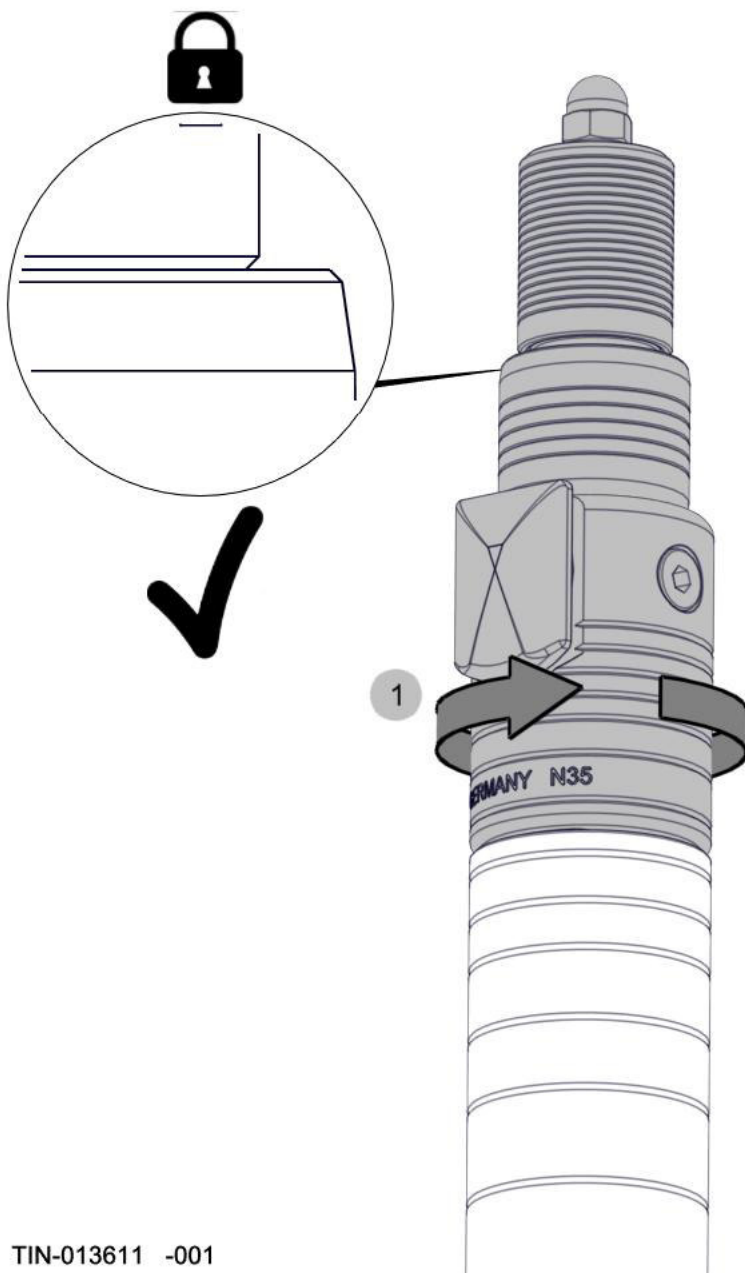


TIN-013611



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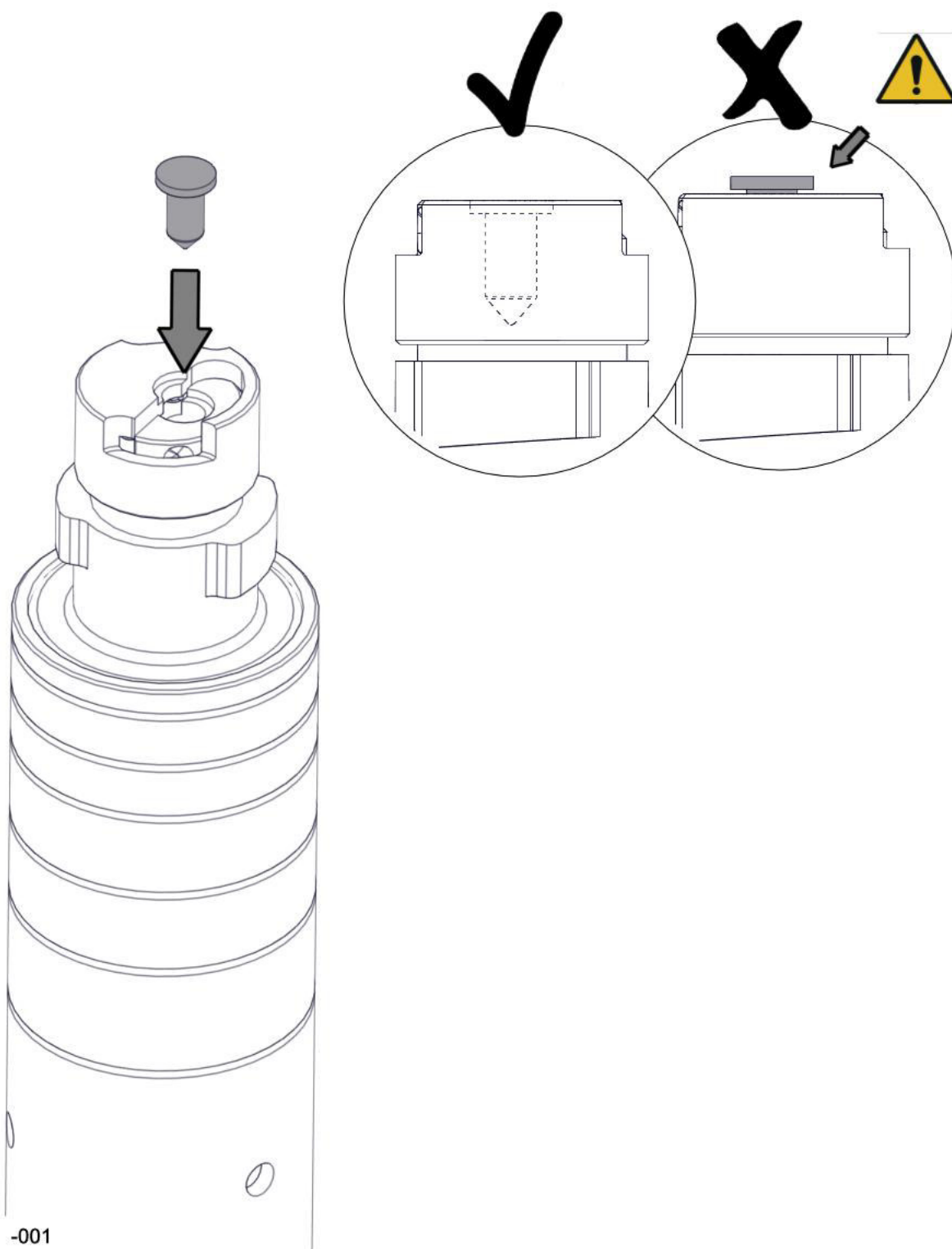


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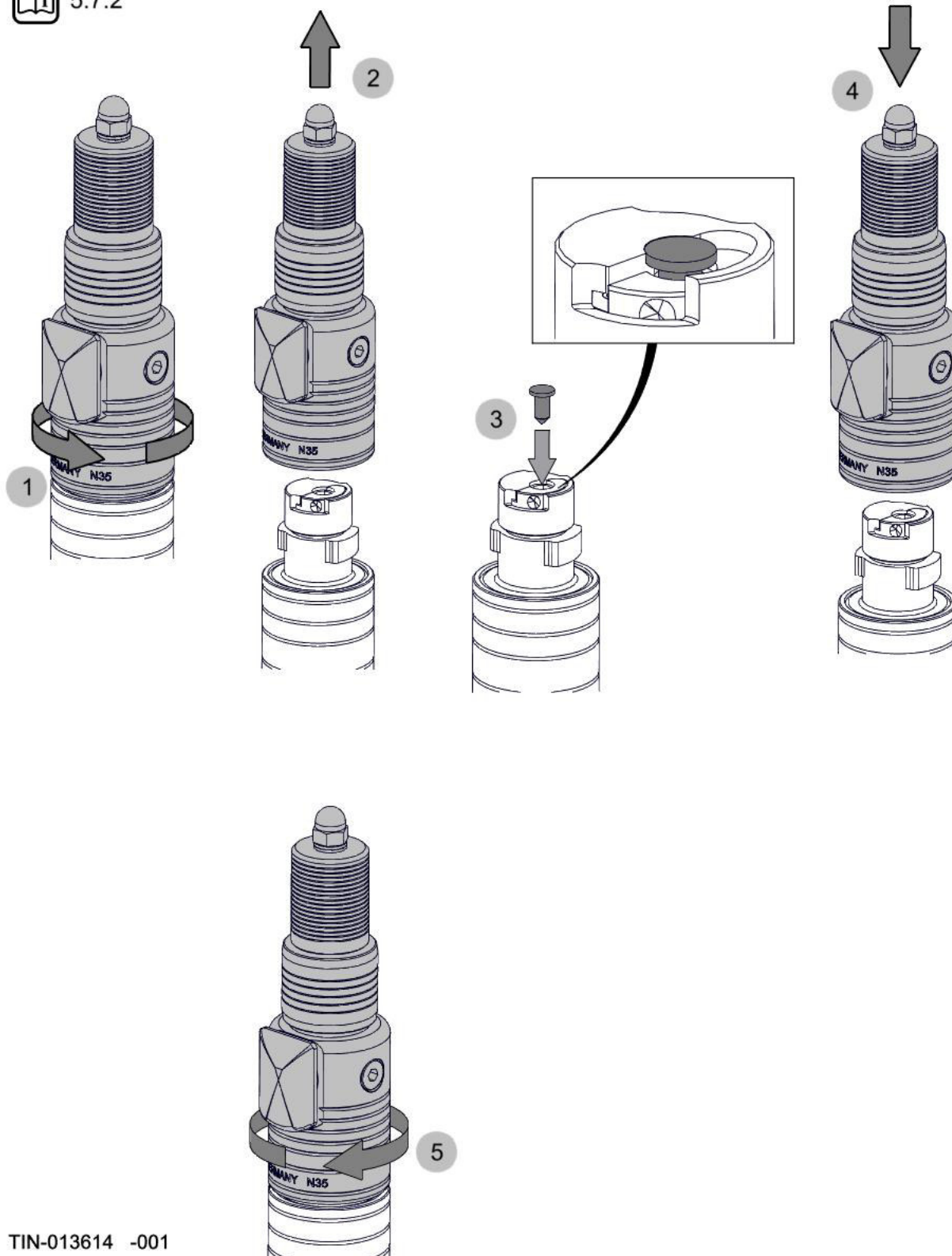


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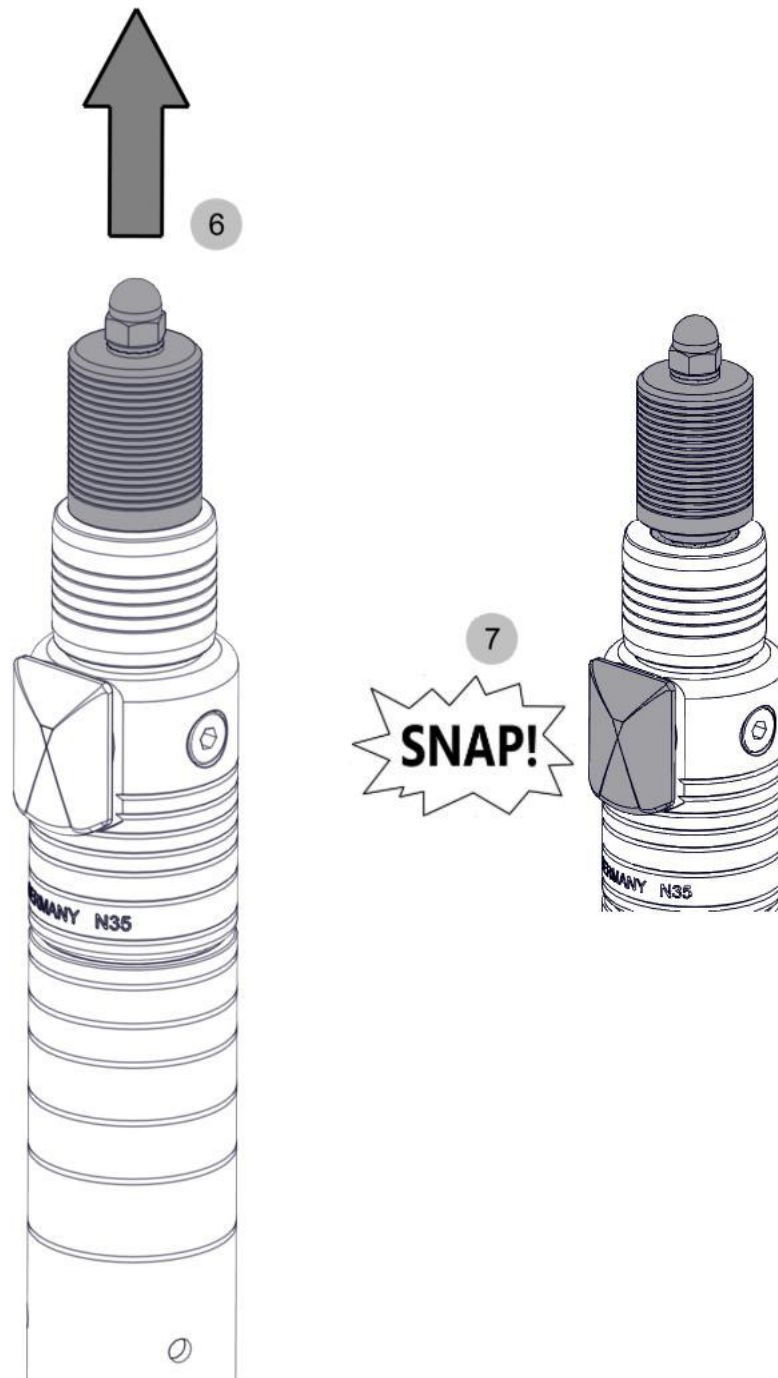


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5.7.2

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TIN-013614 -001

11 Appendix

11.1 Templates for test reports

→ following pages

EN

113/114

REPORT Daily proof test with StunTest device**Serial number of StunTest device:** _____**Test munition** Cartridges of very low calibre 27 6.8/11
red
_____**Captive bolt stunner type:** _____**Serial number of captive bolt stunner:** _____**Reference minimum values (muzzle velocity):** Type KS: 38 [m/s]
_____Type KR/KL/KK/KLS: 40 [m/s]
_____**Date:** _____

Date	Muzzle velocity [m/s]	Comment	Name of the tester