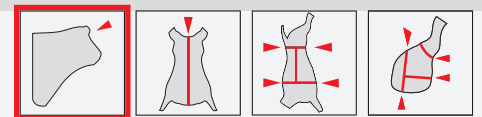




KARL SCHERMER Apparatebau

OPERATING MANUAL CAPTIVE BOLT STUNNERS K-SERIES

Translation of original manual



CAPTIVE BOLT STUNNERS

- Type KS bolt recoil system
- Type KR standard-bolt
- Type KL extended bolt
- Type KK short bolt
- Type KC blunt impact stunning

OPTIONAL ACCESSORY

- test device StunTest
- test 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 GmbH & Co.KG
- Use of spare parts or parts that are not approved by Karl Schermer 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 Symbols and layout elements

1.4.1 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

1.4.2 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 sinking or downward movements of machine parts.

Prohibition signs



General prohibition signs

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



High-pressure cleaners forbidden

Do not use high-pressure cleaners to clean the machine.
Parts of the machine could be damaged.

Mandatory signs



Wear protective gloves

protect the hands against friction, abrasions, and cuts:

- during the changing of sharp or cutting tools,
- during cleaning,
- while touching hot surfaces.



Wear hearing protection

protect hearing during operation of the machine.



Wear safety spectacles

protect the eyes against flying parts, fragments and squirting liquids:

- during operation,
- while the machine is cleaned.



Wear safety shoes or rubber boots

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

- during operation,
- while the machine is cleaned.



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.



1.4.3 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.



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**

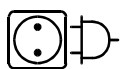
Information about the amount and properties of the lubricant can be found in the operating manual.

**Do not lubricate****Glue**

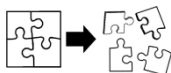
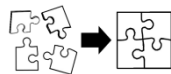
Parts must be glued; information about the type and properties of the glue can be found in the operating manual.

**Cleaning**

Instruction for an additional cleaning step

**Power plug**

Indicates connection of the machine to the power network.

**Disassembly of the machine or component****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. It serves for your orientation regarding safety questions about the use of the machine.

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

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

2.1 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	<p>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.</p> <p>The site operator is obliged to ensure that each employee is properly trained in the operation of the machine.</p> <p>Staff undergoing training may only work at the machine under the supervision of properly qualified staff.</p>
Competent personnel	<p>Only persons possessing the necessary knowledge and skills (expertise) may look after, restrain, stun, slaughter or kill animals.</p> <p>The site operator ensures that the activities within the framework of slaughtering are only carried out by persons possessing a relevant certificate of expertise.</p>
Back-up equipment	<p>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.</p>
Instruction of staff	<p>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.</p>
Workplace	<p>The workplace must comply with the national and regional hygiene and workplace regulations.</p>



- Risk assessment** The site operator must inform operators of possible dangers, symptoms and preventative measures. Relevant occupational safety conditions have to be complied with.
Ensure eye and ear protection is worn at all times when operating the machine.
- 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.
- Competent personnel** Competent personnel are such persons who, due to technical training and experience, possess sufficient skills and knowledge.
The technical expert must be familiar with the operating manual and the applicable OHS and accident prevention regulations as well as with the latest regulations of the protection of animals.
- 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	<p>Maintain a stable upright position and keep your balance.</p> <p>Keep your workplace clean and tidy. Untidy workplaces can cause accidents.</p> <p>Always wear the personal protective equipment provided.</p> <p>Keep children, young persons and untrained staff away from the captive bolt stunners.</p>
Emergency procedures	<p>In the case of an accident, administer first aid and call a doctor and emergency medical services.</p> <p>Notify the operator or his authorised representative of every accident.</p>

2.4 Personal protective equipment

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

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

2.5 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

With regard to all Schermer captive bolt stunners, 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 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:

With regard to all captive bolt stunners, the operator is obliged to present the captive bolt stunner to the manufacturer or his authorised representative for testing 2 years after initial commissioning 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 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 indicates the next test date as well as other information.

2.6 Residual risks

The machine has been built according to the scientific and technological state of the art and complies with the basic occupational health and safety 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)
- risk of injury from negligent handling of personal safety equipment while operating the machine, during maintenance and repair work and during cleaning and disinfection

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

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



2.7 Intended use

The captive bolt stunners of types KS, KR, KK, 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 slaughter weight of ≤ 650 kg (e.g. sheep, pigs, sows, boars, horses, cows, oxen, bulls).

Type: KR The captive bolt stunner of type KR is designed for stunning slaughter animals with a slaughter 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 slaughter weight > 1000 kg (e.g. heavy bulls, 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 Karl Schermer GmbH & Co. KG may

- only be used manually (i.e. hand-held). 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 Karl Schermer GmbH & Co. KG.
- 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: $> 1.5/\text{hour}$).

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 Karl Schermer GmbH & Co. KG.

“StunTest” test device, test sleeve

- is intended for functional testing of Schermer captive bolt stunners (types: KS, KR, KK, KL).
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.



- may only be operated with the approved test cartridges together with the captive bolt stunner.

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

Karl Schermer 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. Use a wooden beam or a solid board for driving tests.
- 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 Karl Schermer GmbH & Co.KG.
- 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 Functional description of the captive bolt stunners

The captive bolt stunners of Karl Schermer GmbH & Co. KG comply with the specifications of EC regulation no. 1099/2009.

Country-specific legal regulations

With regard to the use of types KS, KR, KL, 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 buffaloes.

Types: KS, KR,
KL, KK

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

Reversible 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

The bolt is pulled back into the guide pipe by the recoil system (damping elements) 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 pipe/spacer sleeve.

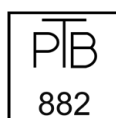
Features

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 of the animal to ensure that the full length of the bolt penetrates the animal's skull.

Test confirmations

Types KS, KR, KL, KK, KC meet C.I.P. specifications and bear the approval mark PTB No. 882.



Physikalisch-Technische Bundesanstalt Braunschweig
NB 0102
Bundesallee 100
D-38116 Braunschweig

3.2 Captive bolt stunners

3.2.1 Functional and operating elements of type KR

Type KR

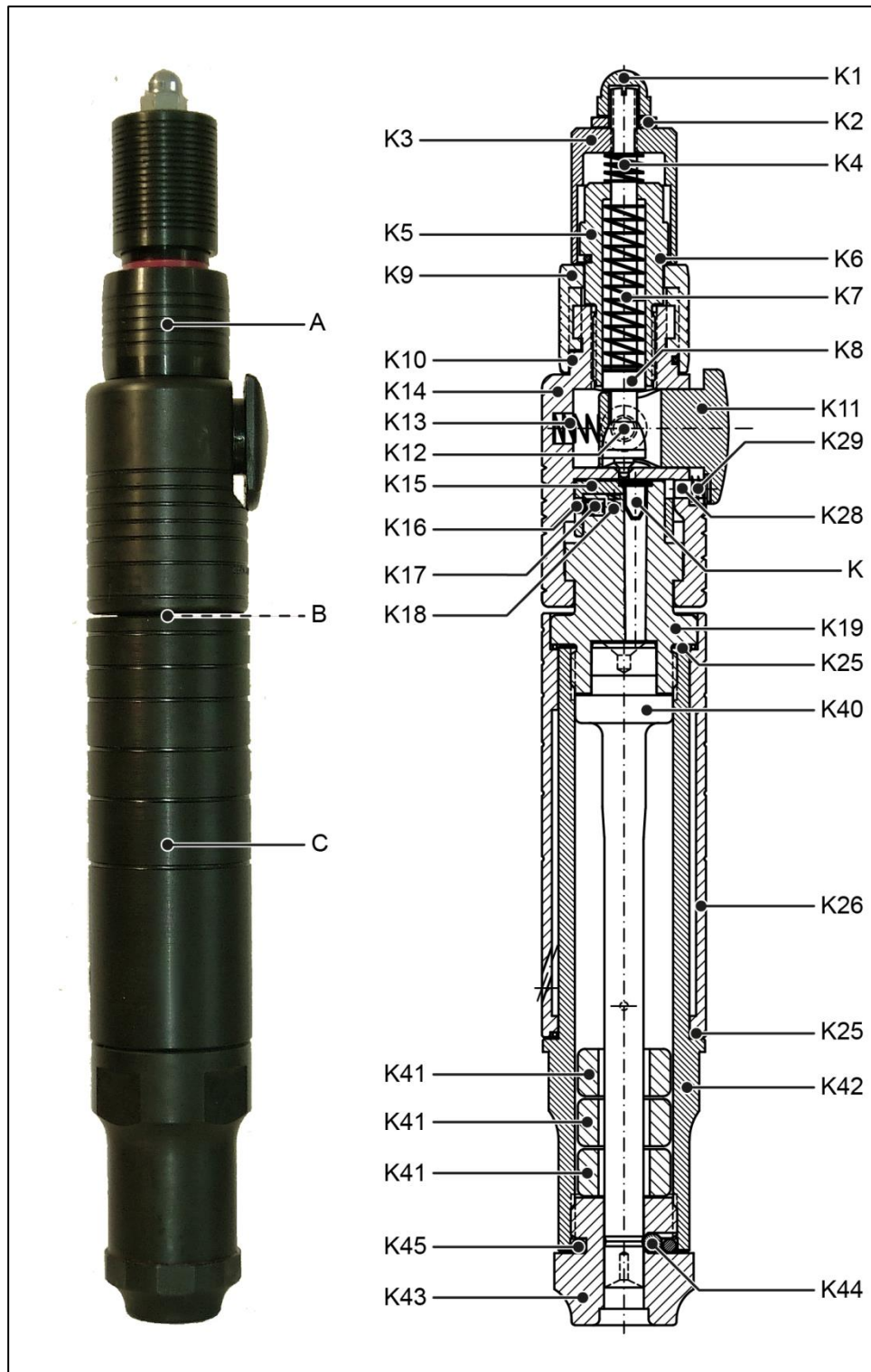


Fig. 3-1 Assemblies/components of type KR



Type KR

Item	Designation	Item	Designation
A	Bolt head		
K1	Cap nut	K9	Locking ring
K2	Serrated washer	K10	O-ring (locking ring)
K3	Protective cap for firing pin	K11	Trigger
K4	Firing pin relief spring	K12	Guide screw
K5	Firing pin guide	K13	Trigger spring
K6	O-ring (red, x 2)	K14	Bolt head housing
K7	Firing pin spring	K28	Trigger lock pin
K8	Firing pin	K29	Trigger lock pin spring
Item	Designation	Item	Designation
B	Cartridge holder		
K	Cartridge	K17	Guide pin spring
K15	Cartridge ejector	K18	Ejector spring (x2)
K16	Ejector guide pin	K19	Cartridge bearing
Item	Designation	Item	Designation
C	Bolt guide		
K25	O-ring (protective sheath)	K42	Guide pipe
K26	Protective sheath	K43	Bolt end guide
K40	Bolt	K44	Clamping ball (x3)
K41	Rubber ring (black, red, black)	K45	Fixing ring (rubber)

3.2.2 Functional and operating elements of type KL

Type KL

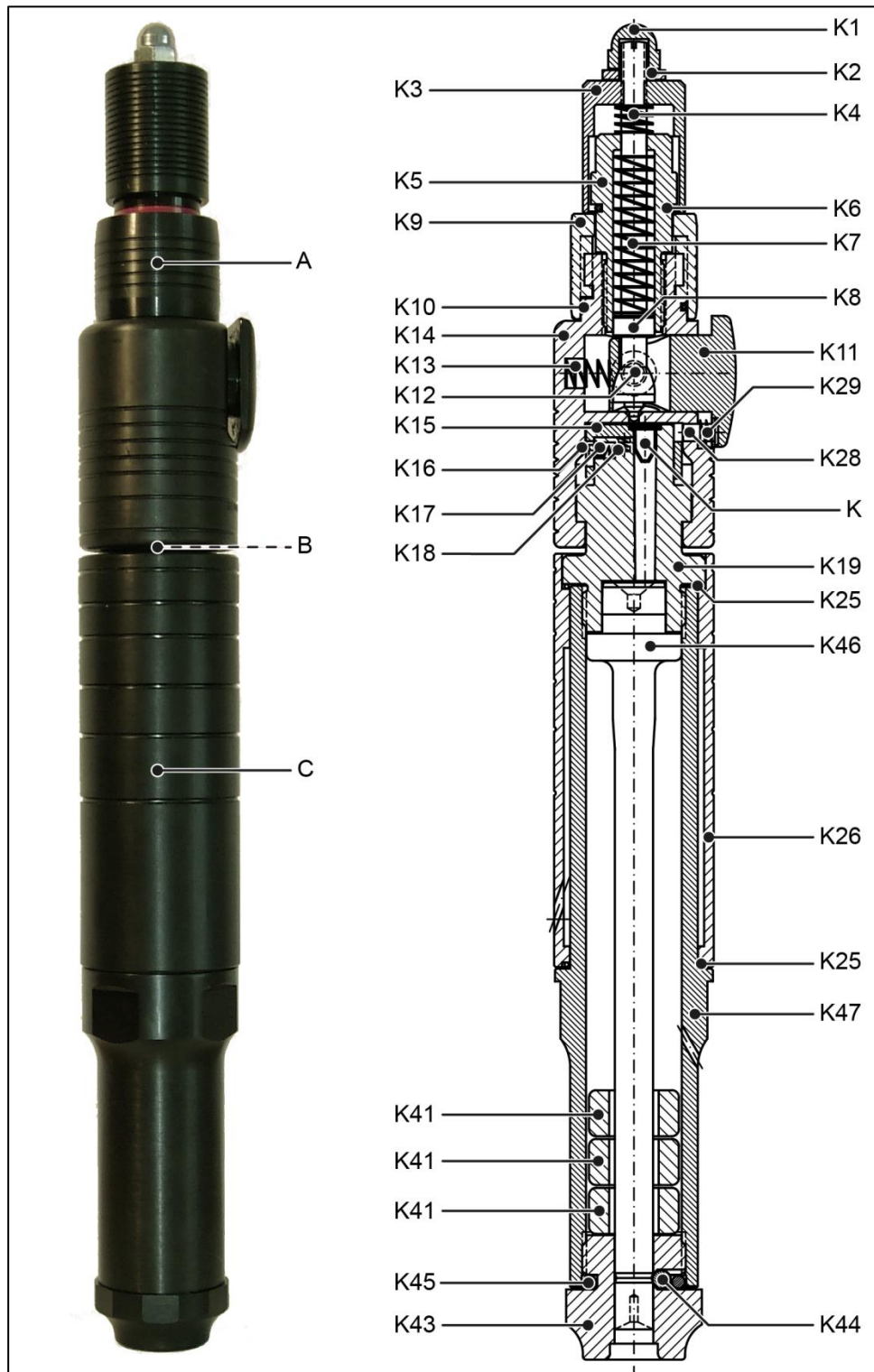


Fig. 3-2 Assemblies/components of type KL



Type KL

Item	Designation	Item	Designation
A	Bolt head		
K1	Cap nut	K9	Locking ring
K2	Serrated washer	K10	O-ring (locking ring)
K3	Protective cap for firing pin	K11	Trigger
K4	Firing pin relief spring	K12	Guide screw
K5	Firing pin guide	K13	Trigger spring
K6	O-ring (red, x 2)	K14	Bolt head housing
K7	Firing pin spring	K28	Trigger lock pin
K8	Firing pin	K29	Trigger lock pin spring
Item	Designation	Item	Designation
B	Cartridge holder		
K	Cartridge	K17	Guide pin spring
K15	Cartridge ejector	K18	Ejector spring (x2)
K16	Ejector guide pin	K19	Cartridge bearing
Item	Designation	Item	Designation
C	Bolt guide		
K25	O-ring (protective sheath)	K44	Clamping ball (x3)
K26	Protective sheath	K45	Fixing ring (rubber)
K41	Rubber ring (black, red, black)	K46	Bolt
		K47	Guide pipe
K43	Bolt end guide		

3.2.3 Functional and operating elements of type KK

Type KK

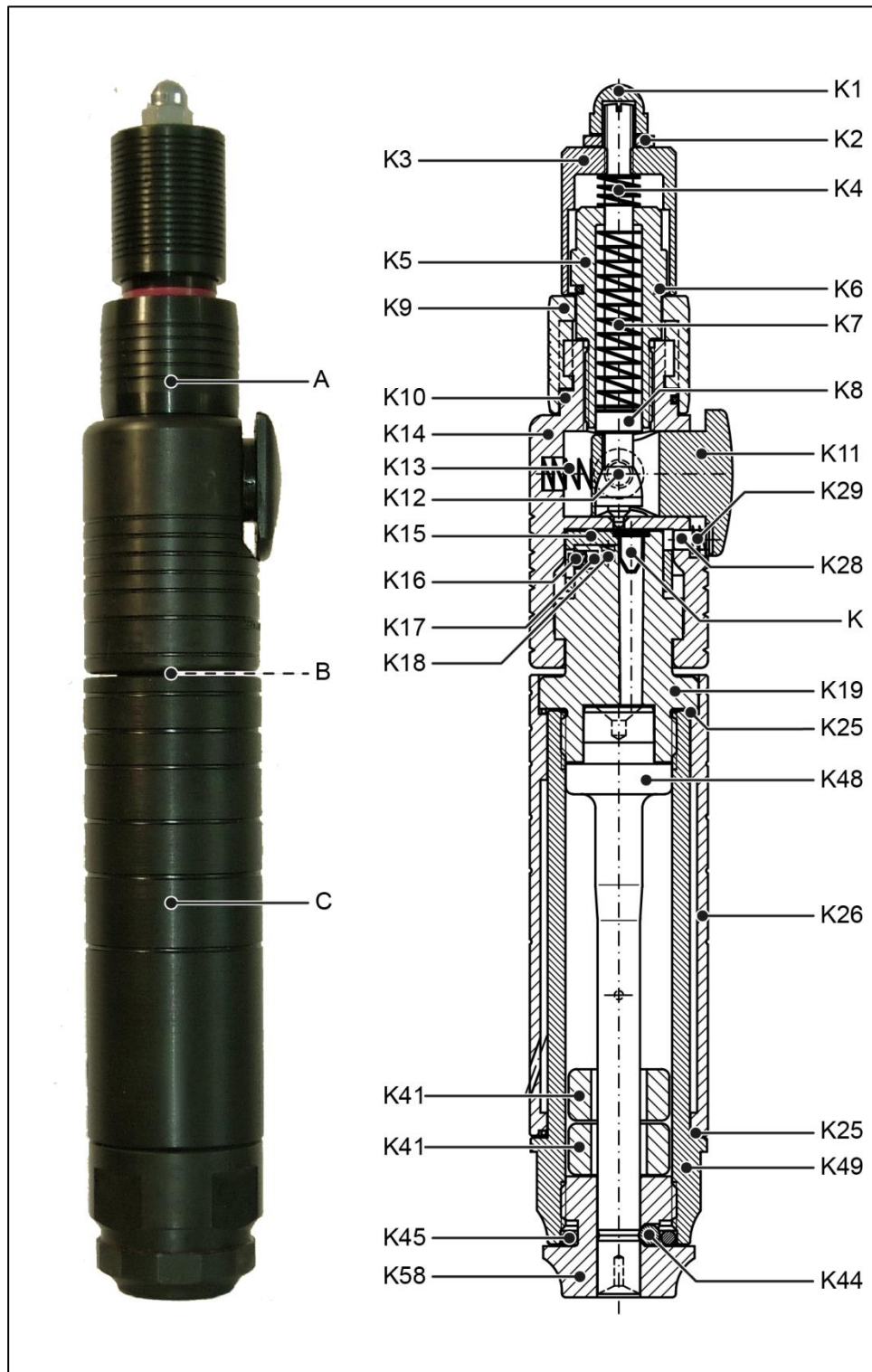


Fig. 3-3 Assemblies/components of type KK



Type KK

Item	Designation	Item	Designation
A	Bolt head		
K1	Cap nut	K9	Locking ring
K2	Serrated washer	K10	O-ring (locking ring)
K3	Protective cap for firing pin	K11	Trigger
K4	Firing pin relief spring	K12	Guide screw
K5	Firing pin guide	K13	Trigger spring
K6	O-ring (red, x 2)	K14	Bolt head housing
K7	Firing pin spring	K28	Trigger lock pin
K8	Firing pin	K29	Trigger lock pin spring
Item	Designation	Item	Designation
B	Cartridge holder		
K	Cartridge	K17	Guide pin spring
K15	Cartridge ejector	K18	Ejector spring (x2)
K16	Ejector guide pin	K19	Cartridge bearing
Item	Designation	Item	Designation
C	Bolt guide		
K25	O-ring (protective sheath)	K45	Fixing ring (rubber)
K26	Protective sheath	K48	Bolt
K41	Rubber ring (red, black)	K49	Guide pipe
		K58	Bolt end guide
K44	Clamping ball (x3)		

3.2.4 Functional and operating elements of type KS

Type KS

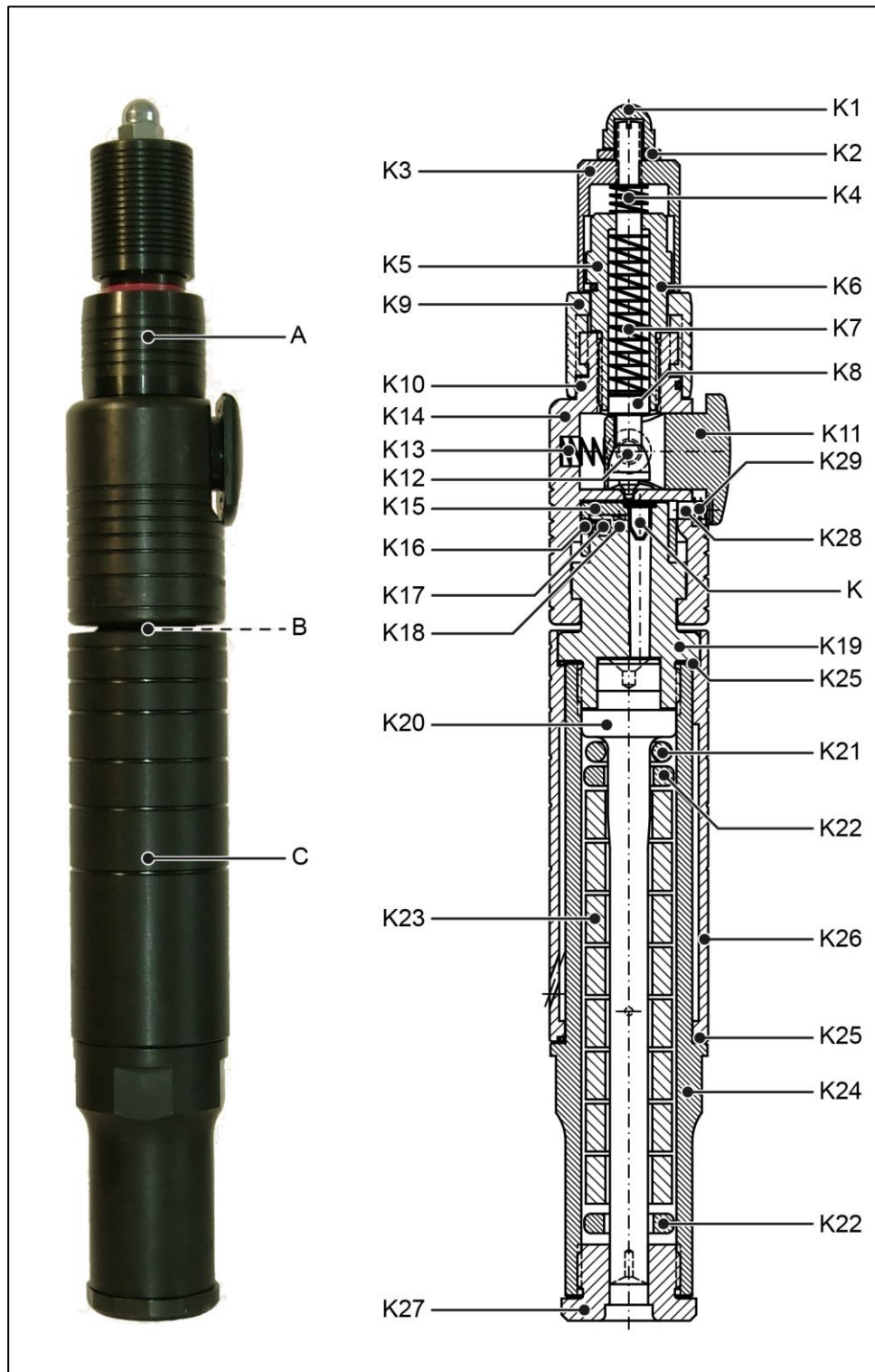


Fig. 3-4 Assemblies/components of type KS



Type KS

Item	Designation	Item	Designation
A	Bolt head		
K1	Cap nut	K9	Locking ring
K2	Serrated washer	K10	O-ring (locking ring)
K3	Protective cap for firing pin	K11	Trigger
K4	Firing pin relief spring	K12	Guide screw
K5	Firing pin guide	K13	Trigger spring
K6	O-ring (red, x 2)	K14	Bolt head housing
K7	Firing pin spring	K28	Trigger lock pin
K8	Firing pin	K29	Trigger lock pin spring
Item	Designation	Item	Designation
B	Cartridge holder		
K	Cartridge	K17	Guide pin spring
K15	Cartridge ejector	K18	Ejector spring (x2)
K16	Ejector guide pin	K19	Cartridge bearing
Item	Designation	Item	Designation
C	Bolt guide		
K21	O-ring	K26	Protective sheath
K20	Bolt	K24	Guide pipe
K25	O-ring (protective sheath)	K27	Bolt end guide
K22	Rubber washer	K23	Damping element (x8)

3.2.5 Functional and operating elements of type KC

Type KC

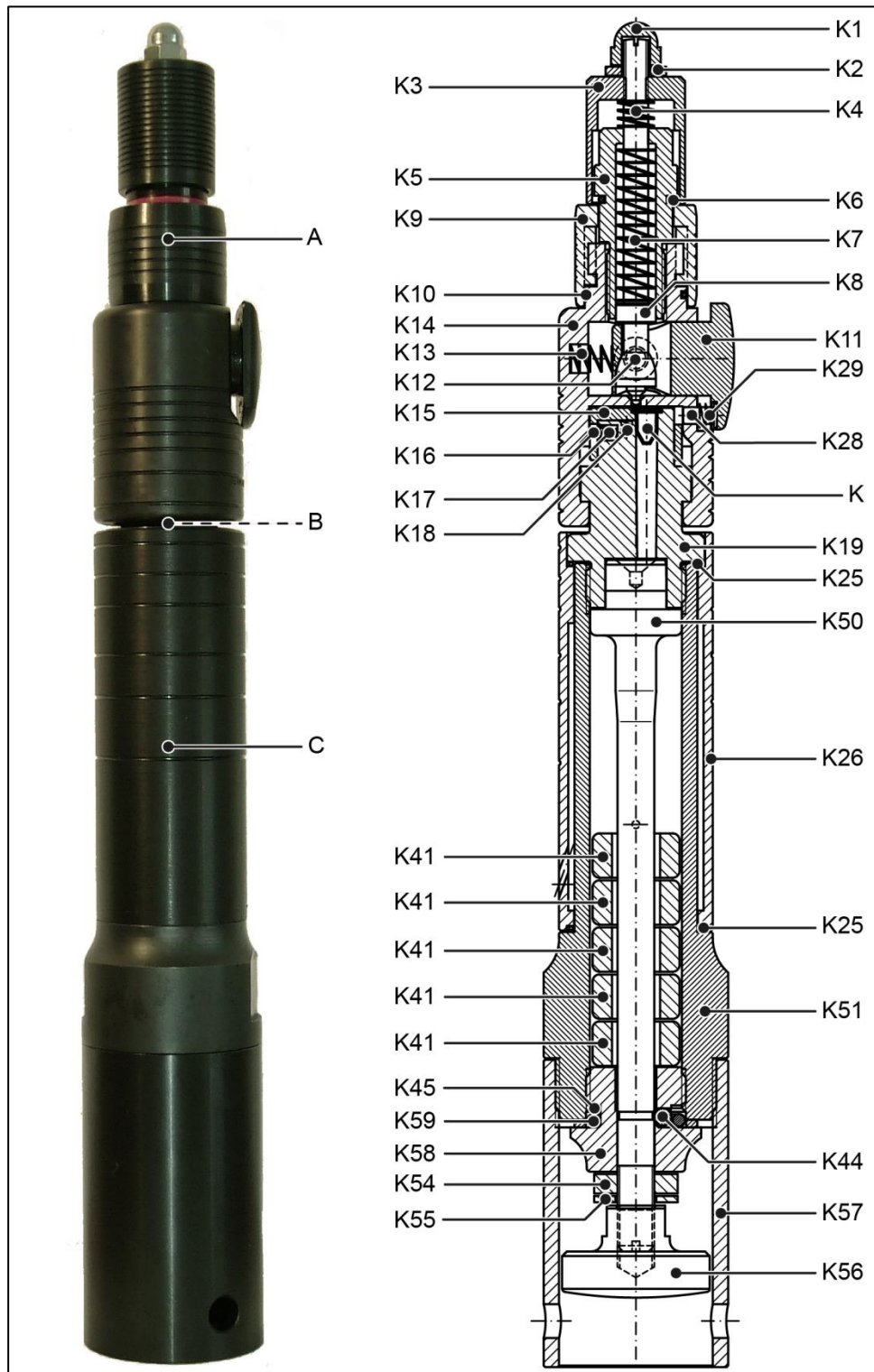


Fig. 3-5 Assemblies/components of type KC



Type KC

Item	Designation	Item	Designation
A	Bolt head		
K1	Cap nut	K9	Locking ring
K2	Serrated washer	K10	O-ring (locking ring)
K3	Protective cap for firing pin	K11	Trigger
K4	Firing pin relief spring	K12	Guide screw
K5	Firing pin guide	K13	Trigger spring
K6	O-ring (red, x 2)	K14	Bolt head housing
K7	Firing pin spring	K28	Trigger lock pin
K8	Firing pin	K29	Trigger lock pin spring
Item	Designation	Item	Designation
B	Cartridge holder		
K	Cartridge	K17	Guide pin spring
K15	Cartridge ejector	K18	Ejector spring (x2)
K16	Ejector guide pin	K19	Cartridge bearing
Item	Designation	Item	Designation
C	Bolt guide		
K25	O-ring (protective sheath)	K51	Guide pipe
K26	Protective sheath	K54	Lock nut
K41	Rubber ring (black, red, black, red, black)	K55	Serrated washer
		K56	Impact plate
K44	Clamping ball (x3)	K57	Spacer sleeve
K45	Fixing ring (rubber)	K58	Bolt end guide
K50	Bolt	K59	Fixing ring (steel)



3.2.6 Information on the device

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

On the bolt head housing

Type of information	Information
Country of production	GERMANY
Date of production	e.g. G10 (year, calendar week)

On the guide pipe

Type of information	Information
Manufacturer's address	Address of Karl Schermer GmbH & Co. KG
Device type and serial number	e.g. KR 2999
Test mark*	PTB 882
Cartridge type	Calibre 6.8/15
* PTB: (Physikalisch-Technische Bundesanstalt in Braunschweig / <i>Germany's National Metrology Institute</i>)	

3.3 Cartridges

Features The captive bolt stunners are used solely with the original cartridges (type: Calibre 6.8/15) of Karl Schermer GmbH & Co. KG.

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

Type	Marking	Application
Calibre 6.8/15 No. 3	Yellow	Sheep, pigs, horses, calves, young cattle, young bulls, sows, boars
Calibre 6.8/15 No. 4	Blue	Heifers, cows, oxen, bulls/steers
Calibre 6.8/15 No. 5	Red	Heavy bulls/steers

Cartridge box/
cartridge



Fig. 3-6 Cartridge box/cartridge (example: Calibre 6.8/15 No. 4)

Item	Designation	Item	Designation
1	Cartridge box	2	Cartridge

3.4 StunTest test device

Features The captive bolt stunners of types KR, KL, KK and KS are tested for functionality in the firing device of the test device before slaughter begins. The captive bolt stunner is loaded with a test cartridge for the functional test. The test cartridge prevents any unnecessary wear on the captive bolt stunner.

The bolt firing speed measured by 2 light barriers after triggering the shot is the measured variable for the calculated points total.

The functional test for the captive bolt stunner tested is passed if a minimum value for the points total is reached.



Fig. 3-7 StunTest test device (optional accessory)

Item	Designation
1 (BV7)	Connection/evaluation unit
2 (BV6)	Measuring sensors with optical fibre cable
3 (BV1)	Base body (holder for the captive bolt stunner)
Not shown (K26)	Protective sheath (as a temporary replacement for a worn sheath of the captive bolt stunner)
Not shown (BV8)	Power supply unit 9V DC

3.4.1 Evaluation unit/optical fibre cable

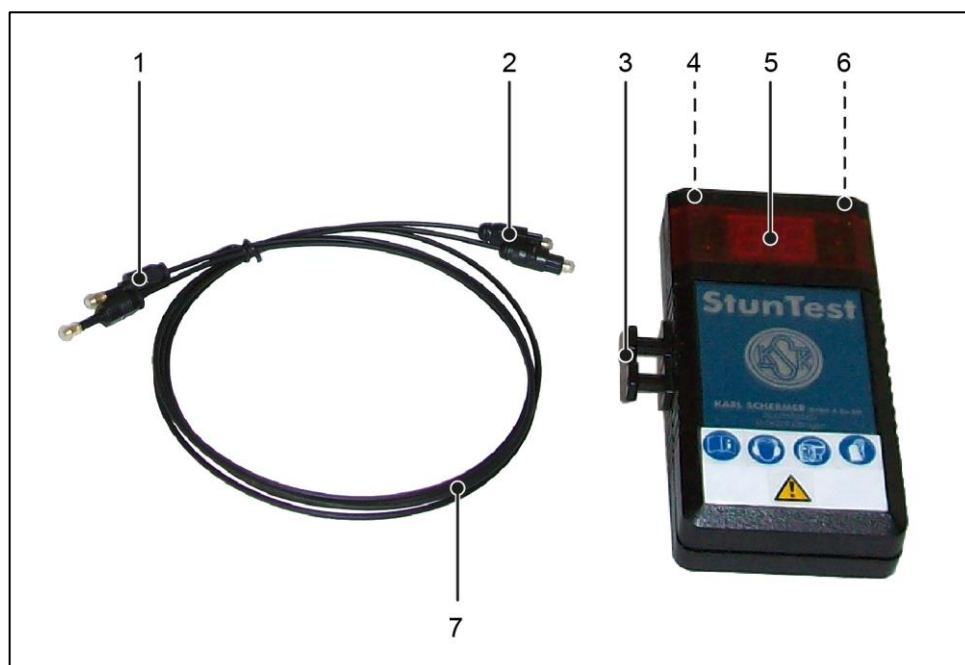


Fig. 3-8 Functional elements of the evaluation unit/optical fibre cable

Item	Designation
1	Connector for measuring sensors (connection to the base body)
2	Connector for measuring sensors (connection to the evaluation unit)
3	Sealing caps (protects the connection sockets against dirt and damage)
4	RESET button (sets the current points total to '0')
5	Display (indicates the status and the points total)
6	Connection socket for the power supply (9V DC)
7	Optical fibre cable

3.4.2 Base body

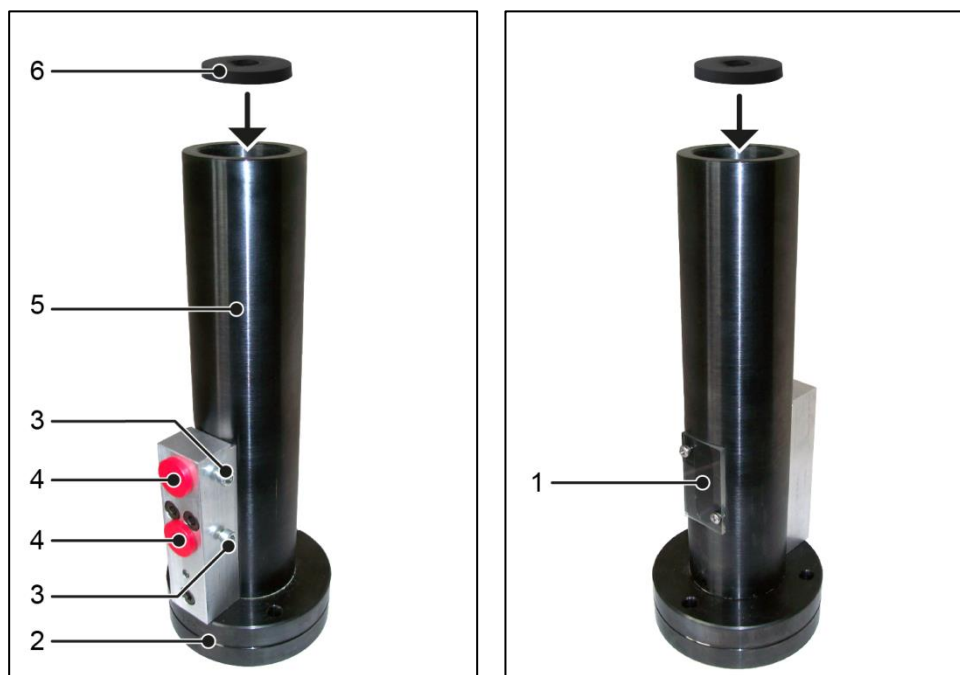


Fig. 3-9 Functional elements of the base body

Item	Designation
1 (BV2)	Plexiglas cover
2	Base
3 (BV4)	Clamping screw
4	Sensor holder
5	Holder for the captive bolt stunner
6 (BV5)	Rubber washer
Not shown (BV3)	Screws (M4x12)
Not shown (K25)	O-ring (protective sheath)

3.5 Test sleeve

- Features** The captive bolt stunners of types KR, KL, KL and KS are tested for functionality in the test sleeve before slaughter begins.
- The captive bolt stunner is loaded with a test cartridge 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 the measured value(s) are recorded in a test report.



Fig. 3-10 Test sleeve (optional accessory)

Item	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 animal is to take place without blood withdrawal. There are 2 versions of the cranial insertion rod available (→ chapter *Technical data* on page 89).



Fig. 3-11 Cranial insertion rod (optional accessory)



4 Transport and storage

The machines/devices of Karl Schermer GmbH & Co. KG 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

Karl Schermer 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* on page 87.

- Remove all packing materials and dispose of it properly and in an environmentally sound manner.
- 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 in secured state
(→ chapter *Securing/releasing the captive bolt stunner* on page 41).
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.

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* on page 12). 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 supervise, sedate, anaesthetise, slaughter and kill animals.



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.



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 the 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.

Minimum bolt length:

Type KS, KR: 194 mm

Type KL: 230 mm

Type KK: 180 mm

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

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 agitation, pain or suffering when driving, loading and stalling the animals.
Do not use any electric stunners to herd 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.
- Only use electric prods on healthy and unharmed cattle over one year old and pigs over four months old.
- Stun the animals so that they are quickly and painlessly rendered unconscious and insensitive right up to the point of death.

5.4 Selecting the captive bolt stunner

The appropriate captive bolt stunner must be selected according to the type of slaughter animal and the weight of the slaughter animal. The following table shows the intended uses of the captive bolt stunners according to the weight of the slaughter animal.

Captive bolt stunner type	Weight of the slaughter animal
KS, KK	≤ 650 kg
KR	≤ 1000 kg
KL	> 1000 kg

Captive bolt stunner type	Weight of the slaughter animal
KC	As per the respective country-specific laws, guidelines, ordinances and regulations.

5.5 Securing/releasing the captive bolt stunner



WARNING!

Risk of injury due to triggering the bolt

If the captive bolt stunner is not secured, this can cause life-threatening injuries.

- Secure the captive bolt stunner prior to loading, unloading, cocking and prior to all 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 secured/released at the bolt head of the captive bolt stunner.



The bolt head can be secured and released if the bolt head is mounted on, or removed from, the cartridge holder.

The bolt head is removed from the cartridge holder in the following figure.

Bolt head



Fig. 5-1 Bolt head of types: KS, KR, KL, KK, KC



5.5.1 Securing the captive bolt stunner

WARNING

Risk of injury due to unintentional triggering of the bolt!

The captive bolt stunner is not secured. The red O-rings (1) are visible.

- Turn the locking ring (1) in the direction of the arrow to the stop.



*The red O-rings are not visible.
The captive bolt stunner is secured.*



In secured 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 trigger spring being too weak, the trigger 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 *Maintenance and servicing* on page 68).

5.5.2 Releasing the captive bolt stunner

The captive bolt stunner is secured. The red O-rings (1) are not visible.

- Turn the locking ring (1) in the direction of the arrow to the stop.



⚠ WARNING

Risk of injury due to unintentional triggering of the bolt!

The captive bolt stunner is not secured. The red O-rings (1) are visible.



5.6 Removing and mounting the bolt head on the cartridge holder



WARNING!

Risk of injury due to triggering the bolt

If the captive bolt stunner is not secured, 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 holder, in order to:

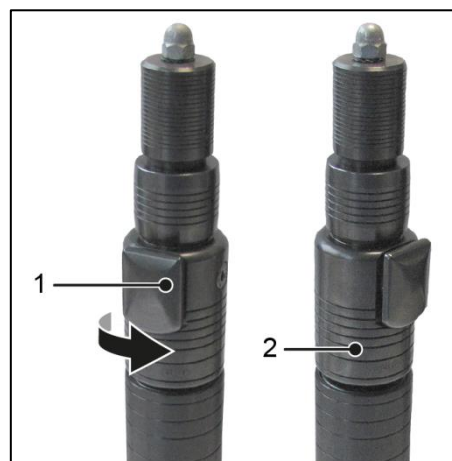
- carry out the daily functional test.
- load and unload the captive bolt stunner.
- clean and maintain the captive bolt stunner.

5.6.1 Removing the bolt head

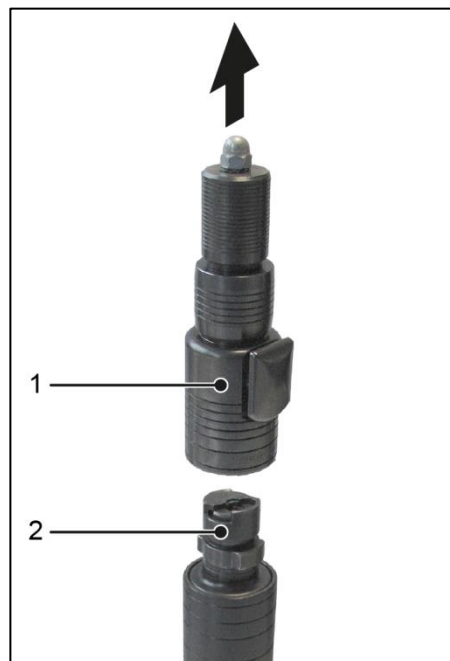
Prerequisite

The captive bolt stunner is secured.

- Turn the bolt head (1) in the direction of the arrow.
The bolt head (2) is released.



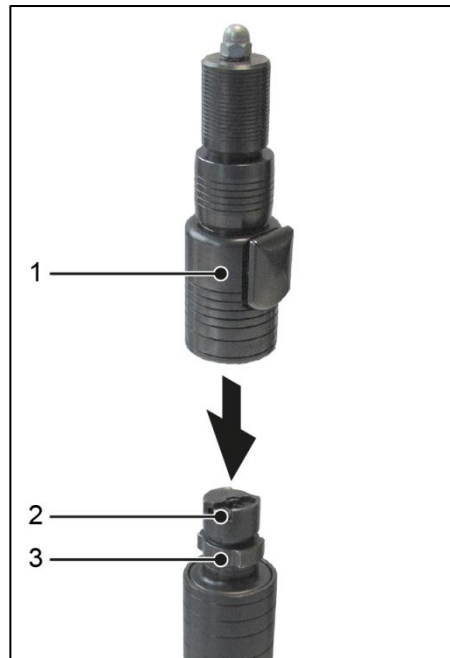
- Remove the bolt head (1) in the direction of the arrow.
The bolt head is removed from the cartridge holder and the cartridge bearing (2) is freely accessible.



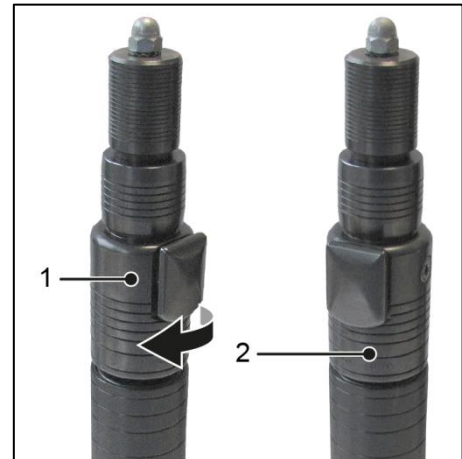
5.6.2 Mounting the bolt head

Prerequisite The captive bolt stunner is secured.

- Put the bolt head (1) on the bayonet lock (3) of the cartridge holder (2).



- Turn the bolt head (1) in the direction of the arrow.
The bolt head (2) is locked and mounted on the cartridge holder.



5.7 Loading and cocking the captive bolt stunner



WARNING!

Risk of injury due to triggering the bolt

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

- Secure the captive bolt stunner prior to loading the cartridge bearing.
- Do not press the bolt into a loaded and/or cocked captive bolt stunner.
- Stunning: Do not load the cartridge bearing until the slaughter animal is in place for stunning.
- Proof test: Do not load the cartridge bearing until just before the proof test.

Personal
protective
equipment



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

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

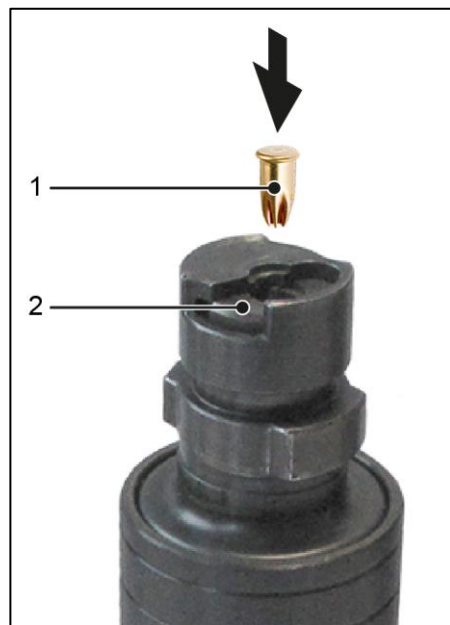
5.7.1 Loading the captive bolt stunner

Prerequisite

The captive bolt stunner is secured.

The bolt head is removed from the cartridge holder.

- Insert the cartridge (1) into the cartridge bearing (2).



The cartridge is correctly inserted in the cartridge bearing, if the upper edge of the cartridge and the cartridge ejector (1) are flush.



- Mounting the bolt head on the cartridge holder.

5.7.2 Cocking the captive bolt stunner



WARNING!

Risk of injury due to triggering the bolt

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

- Hold the captive bolt stunner tightly and securely in your hand when you cock it.
- Never allow a cocked captive bolt stunner to leave your hand.
- Never leave the stunning area or the area for the proof test with a cocked captive bolt stunner.

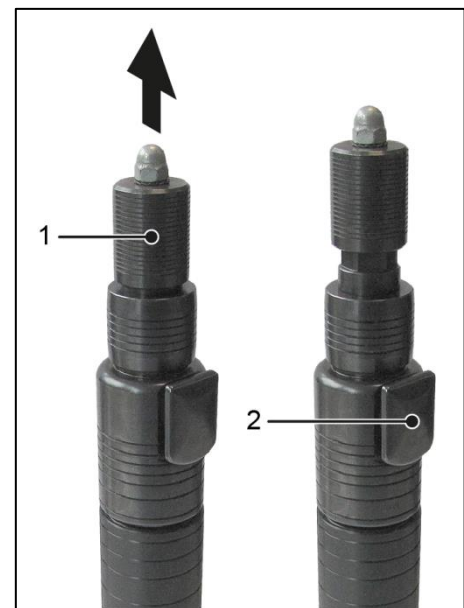
Prerequisites

The captive bolt stunner is secured.

The captive bolt stunner is loaded.

The bolt head is mounted on the cartridge holder.

- Pull the protective cap for the firing pin (1) in the direction of the arrow until the trigger (2) audibly locks into place.
The captive bolt stunner is cocked.



5.8 Daily functional test

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 pipe slides back and forth easily. The bolt must not get jammed.

Personal
protective
equipment



Assembly and cleaning tools

Assembly tool for
the cartridge
holder

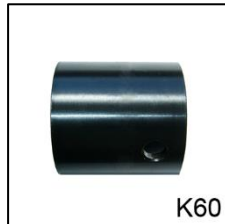


Fig. 5-2 Assembly tool 'cartridge holder'

Item	Designation	Item	Designation
K60	Assembly nut	K61	Assembly lever

Cleaning brushes

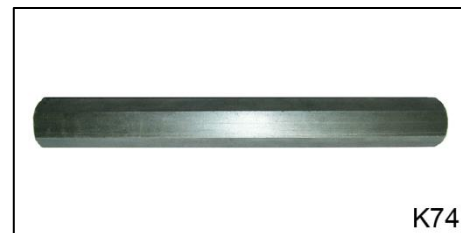


Fig. 5-3 Cleaning brushes

Item	Designation
K62	Cleaning brush (short)
K73	Cleaning brush (long)
K74	Rod for cleaning brush (long version)

Assembly tool for
spacer sleeve
(Type: KC)



Fig. 5-4 Assembly tool

Item	Designation
K64	Assembly tool for spacer sleeve (Type: KC)

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. 5-5 Components of the bolt guide

- Secure the captive bolt stunner.
- Disassembly ➤ Unlock the bolt head (A) and remove it from the cartridge holder (B).
- Clamp the bolt guide (C) and remove the cartridge holder from the bolt guide. To this end, use the 'cartridge holder' assembly tool (K60, K61).
- Remove the protective sheath (K26) from the guide pipe (K42/K47/K49).
- Check ➤ Check the guide pipe and the cartridge holder for damage (e.g. cracks on the thread).
- Pull the bolt (K40/K46/K48) out of the guide pipe.
- Remove the rubber rings (K41).
(Type KR, KL: 3 rubber rings; type KK: 2 rubber rings)
- Insert the bolt into the guide pipe without the rubber rings.
The bolt must be easy to move in the guide pipe.
- If the bolt is difficult to move: Determine the cause and service the captive bolt stunner.



Possible cause	Remedy
The guide pipe is dirty.	Clean the guide pipe. Clean the inner surface of the guide pipe with the cleaning brush.
Parts of the worn rubber rings are located between the bolt and the bolt end guide.	Replace worn rubber rings.
The bolt is bent.	Insert a new bolt and have the bent bolt repaired by Karl Schermer GmbH & Co. KG.
The captive bolt stunner was not screwed together with sufficient care following cleaning.	Ensure that the cartridge bearing 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 pipe.
- Slide the rubber rings onto the bolt.
(Sequence for type KR, KL: black – red – black)
(Sequence for type KK: black – red)
- Insert the bolt in the guide pipe.
- Slide the protective sheath onto the guide pipe.
- Mount the cartridge holder on the bolt guide.
To this end, use the 'cartridge holder' assembly tool.
- Place the bolt head on the cartridge holder and lock it.
- Carry out the proof test (→ chapter *Daily proof test* on page 55).

5.8.2 Checking type KS



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

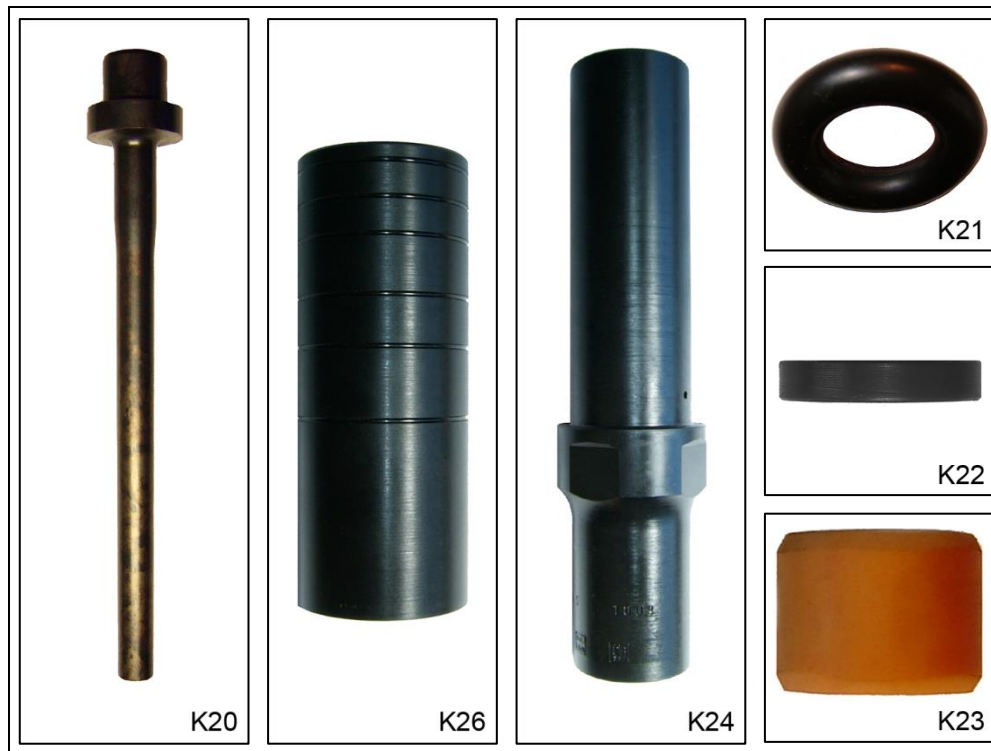


Fig. 5-6 Components of the bolt guide

- Secure the captive bolt stunner.
- Disassembly
 - Unlock the bolt head (A) and remove it from the cartridge holder (B).
 - Clamp the bolt guide (C) and remove the cartridge holder from the bolt guide. To this end, use the 'cartridge holder' assembly tool (K60, K61).
 - Remove the protective sheath (K26) from the guide pipe (K24).
- Check
 - Check the guide pipe and the cartridge holder for damage (e.g. cracks on the thread).
 - Pull the bolt (K20) out of the guide pipe.
 - Remove the O-ring (K21), the 2 rubber washers (K22) and the 8 damping elements (K23) from the bolt.
 - Insert the bolt into the guide pipe without the 8 damping elements and the 2 rubber washers.
 - The bolt must be easy to move in the guide pipe.
 - If the bolt is difficult to move: Determine the cause and service the captive bolt stunner.

Possible cause	Remedy
The guide pipe is dirty.	Clean the guide pipe. Clean the inner surface of the guide pipe 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 and have the bent bolt repaired by Karl Schermer GmbH & Co. KG.
The captive bolt stunner was not screwed together with sufficient care following cleaning.	Ensure that the cartridge holder 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 pipe.
- Slide the 2 rubber washers, the 8 damping elements and the O-ring onto the bolt.
- Insert the bolt in the guide pipe.
- Slide the protective sheath onto the guide pipe.
- Mount the cartridge holder on the bolt guide.
To this end, use the 'cartridge holder' assembly tool.
- Place the bolt head on the cartridge holder and lock it.
- Carry out the proof test (→ chapter *Daily proof test* on page 55).

5.8.3 Checking type KC



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



Fig. 5-7 Components of the bolt guide

- Secure the captive bolt stunner.
- Disassembly
 - Unlock the bolt head (A) and remove it from the cartridge holder (B).
 - Clamp the bolt guide (C) and remove the cartridge holder from the bolt guide. To this end, use the 'cartridge holder' assembly tool (K60, K61).
 - Remove the protective sheath (K26) from the guide pipe (K51).
- Check
 - Check the guide pipe and the cartridge holder for damage (e.g. cracks on the thread).
 - Clamp the guide pipe and release the spacer sleeve (K57) from the guide pipe. To this end, use the 'spacer sleeve' assembly tool (K64). Leave the guide pipe clamped.



- Release the bolt end guide (K58) from the guide pipe and remove the entire bolt system (bolt, bolt end guide, impact plate) from the guide pipe.
- Clamp the bolt end guide and release the impact plate (K56) from the bolt (K50). The impact plate is secured by means of a lock nut (K54).
- Remove the serrated washer (K55) from the bolt (K50).
- Remove the lock nut from the bolt.
- Screw the bolt end guide onto the guide pipe.
- Remove the rubber rings (K41) from the bolt.
- Insert the bolt into the guide pipe without the rubber rings.
The bolt must be easy to move in the guide pipe.
- If the bolt is difficult to move: Determine the cause and service the captive bolt stunner.

Possible cause	Remedy
The guide pipe is dirty.	Clean the guide pipe. Clean the inner surface of the guide pipe with the cleaning brush.
Parts of the worn rubber rings are located between the bolt and the bolt end guide.	Replace worn rubber rings.
The bolt is bent.	Insert a new bolt and have the bent bolt repaired by Karl Schermer GmbH & Co. KG.
The captive bolt stunner was not screwed together with sufficient care following cleaning.	Ensure that the cartridge holder is tightly screwed together with the bolt guide.

- Assembly
- After the check, pull the bolt out of the guide pipe.
 - Release the bolt end guide from the guide pipe.
 - Put the rubber rings 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 pipe.

- Clamp the guide pipe and screw the bolt end guide onto the guide pipe.
Leave the guide pipe clamped.
- Mount the spacer sleeve on the guide pipe. To this end, use the 'spacer sleeve' assembly tool.
- Slide the protective sheath onto the guide pipe.
- Mount the cartridge holder on the bolt guide.
To this end, use the 'cartridge holder' assembly tool.
- Place the bolt head on the cartridge holder and lock it.

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 and there is a risk of serious injury.

- Wear your personal protective equipment during the proof test.
- Only use approved test cartridges for the proof test.
- Never lean over the loaded and/or cocked captive bolt stunner.

Personal
protective
equipment




The proof test can be carried out for types KS, KR, KK and KL.
Carry out the proof test after you have completed the daily functional test.
Use either the test sleeve or the StunTest test device for the proof test.

5.9.1 Proof test with test sleeve


- Preparatory measures
- Fix the square timber to a workbench using screw clamps.
 - Enter the type and the serial number of the captive bolt stunner in the test report "Report -Daily Proof Test-" (→ template in the appendix).
 - Determine the reference value for the penetration depth:
 - To determine the reference value, use a new or a tested K-series captive bolt stunner.
 - Put the test sleeve on the square timber.
 - Load the captive bolt stunner with a test cartridge.



- Cock the captive bolt stunner.
-  **WARNING** Risk of injury due to kickback!
Hold the captive bolt stunner with outstretched arms and push it firmly into the test sleeve.
Fire the shot into the square timber.
- Measure the penetration depth (reference value) with a suitable measuring tool.
- Enter the reference value and the date in the test report.



Fire the shot to determine the reference value with new square timber if the square timber can no longer be used due to frequent firing. In such cases, note the new reference value and the date in a new test report.

- Proof test
- Load the captive bolt stunner to be tested with a test cartridge.
 - Cock the captive bolt stunner.
 -  **WARNING** Risk of injury due to kickback!
Hold the captive bolt stunner with outstretched arms and push it firmly into the test sleeve.
Fire the shot into the square timber.
 - Measure the penetration depth with a suitable measuring tool.
 - Enter the date, the measured value, the name of the tester and, if necessary, a comment in the table of the test report.

- Evaluation
- 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 exchanged. To this end, send the captive bolt stunner to Karl Schermer GmbH & Co. KG.

5.9.2 Proof test with the StunTest test device

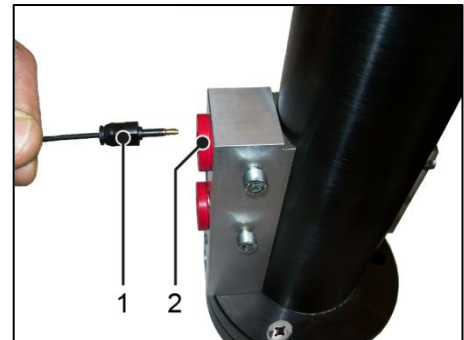
Preparatory measures ➤ Screw the base body (BV1) onto a worktop using 3 M10 screws.

➤ Insert the rubber washer (BV5) into the base body.

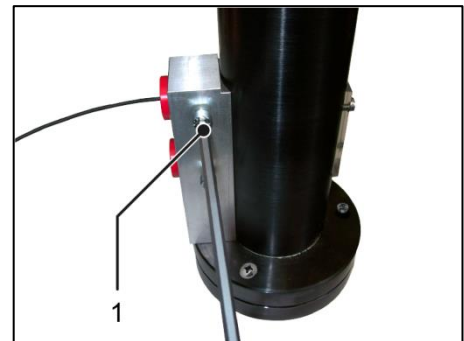
➤ Mount the two measuring sensors (BV6) on the base body.

The following section describes how to assemble a measuring sensor.

➤ Insert the measuring sensor (1) into the holder (2) on the base body to the stop.



➤ Fix the measuring sensor in place by hand-tightening the clamping screw (1).



➤ Remove the sealing cap (1) from the connection socket of the evaluation unit.

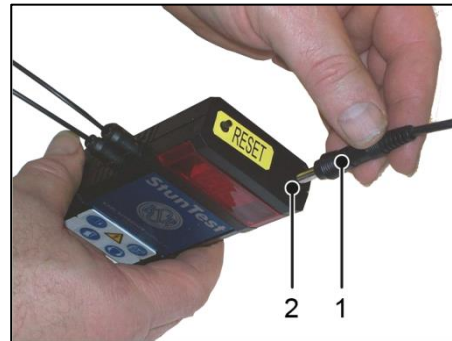
➤ Insert the sensor cable's connector (2) into the connection socket of the evaluation unit.



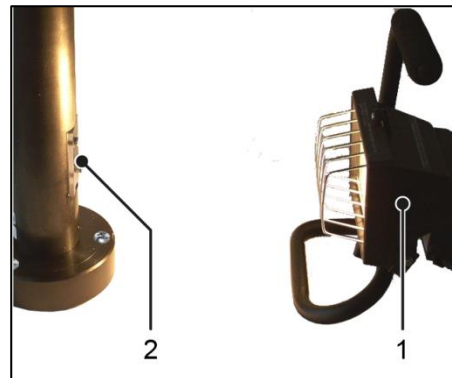
➤ Mount the second measuring sensor in the manner described in the previous steps.

➤ Connect the evaluation unit (BV7) to the power supply.

- To this end, insert the power supply's connector (1) into the connection socket (2) of the evaluation unit.



- Connect the power supply unit (BV8) to the power supply at the installation site.
- Place a suitable spotlight in front of the base body and connect it to the power supply at the installation site.
- Align the light cone of the spotlight with the Plexiglas cover (BV2) of the base body.



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



If the protective sheath (K26) of the captive bolt stunner exhibits significant signs of wear, it may not be possible to insert the captive bolt stunner into the base body.

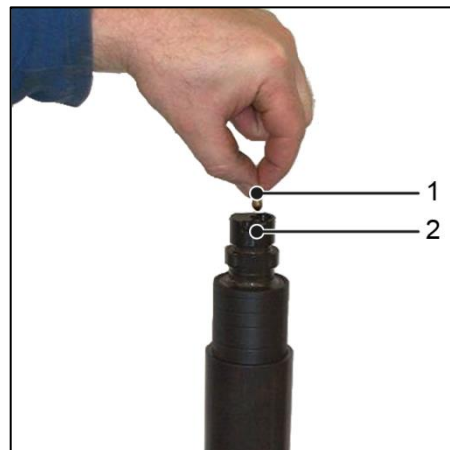
In such cases, mount the protective sheath that accompanies the test device.

After the proof test, mount the original protective sheath back on the captive bolt stunner.

Carrying out the proof test

- Press the RESET button on the evaluation unit (BV7).
The value "0" is shown on the display.
- Ensure that the captive bolt stunner is secured.
- Remove the bolt head from the cartridge holder.

- Insert the lower part of the captive bolt stunner (bolt guide with cartridge holder) into the base body (BV1).
The bolt end guide must be in contact with the rubber washer (BV5).
- Load the captive bolt stunner.
- To this end, insert the test cartridge (1) into the cartridge bearing (2).



- Cock the secured bolt head.
- **⚠ WARNING** Risk of injury due to kickback!
Do not lean over the captive bolt stunner when mounting the bolt head.
Place the bolt head on the cartridge holder and lock it.
- Release the captive bolt stunner.
⚠ WARNING Risk of injury due to kickback!
Do not lean over the captive bolt stunner when firing the shot.
- Hold the captive bolt stunner with outstretched arms.
- Press the captive bolt stunner onto the rubber washer (BV5).
- Fire the shot by pulling the trigger (K11).



- Secure the captive bolt stunner and pull it out of the base body.
- Remove the bolt head from the cartridge holder and remove the test cartridge from the cartridge bearing.

Evaluation of the proof test

The evaluation begins after the firing of the shots. The points total determined is shown on the display of the evaluation unit after a few seconds.



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



- Compare the points total displayed with the minimum points total that must be achieved for the captive bolt stunner (see table below).

Captive bolt stunner type	Points total (minimum value)
KS	38
KR, KK, KL	40



If the points total is not achieved, the proof test needs to be repeated with 2 further shots. The minimum value must be achieved for both shots.

If the points total is still not achieved after releasing 2 further shots, the wearing parts of the captive bolt stunner need to be exchanged. To this end, send the captive bolt stunner to Karl Schermer GmbH & Co. KG.

5.10 Stunning



WARNING

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

Before and during stunning, the slaughter animal may make uncontrolled movements (e.g. due to flight reflexes and missed shots).

- Ensure that there are sufficient escape options available to operating staff in the stunning area.
- Ensure that there are no unauthorised persons loitering in the stunning area.

**NOTE****Damage to the captive bolt stunner due to triggering an unloaded captive bolt stunner**

If an unloaded captive bolt stunner is triggered, the firing pin strikes the cartridge bearing. This can damage the cartridge bearing. As a result, the cartridges may get jammed in the cartridge 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:

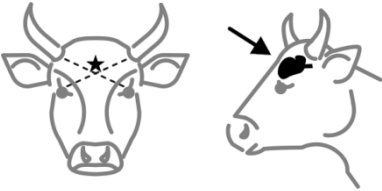
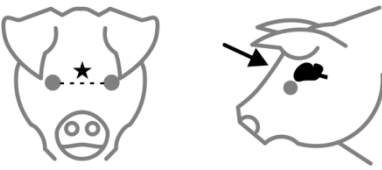
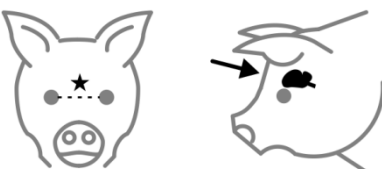
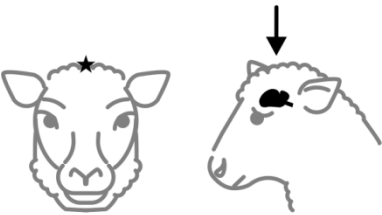

→ Chapter *Intended use* on page 17

Cartridge type:

→ Chapter *Cartridges* on page 31

5.10.2 Contact position on the slaughter animal

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
	<p>With the exception of heavy bulls and cows: perpendicular to the forehead on the midline</p> <p>For heavy bulls and cows: 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</p>
	<p>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</p>
	<p>In the midline of the head, 2-3 cm above the connecting line of the two eye centres perpendicular to the forehead</p>
	<p>In the centre of the front connecting line between the ears with a shot down towards the throat</p>
	<p>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</p>

Type of slaughter animal/contact position	Description
	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
	Between the centre of the eye and the opposing antler base



5.10.3 Carrying out stunning

- Prerequisites The following prerequisites must be met for the stunning procedure:
- The captive bolt stunner and the cartridge type are selected.
 - The slaughter animal is in position for stunning.
 - The captive bolt stunner is loaded, secured, and cocked.
(→ Chapter *Loading and cocking the captive bolt stunner* on page 45).

Stunning with types KS, KR, KL, KK




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. The surface of the bolt end guide must sit flat on the contact position.


- Release the captive bolt stunner.
- Place the unsecured captive bolt stunner on the contact position.
- Pull the trigger and keep it pulled.

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

Type: KS Captive bolt stunner with a recoil system:
The bolt is pushed back into the guide pipe by the damping elements after the shot is fired.

-  **WARNING** Risk of injury if the cartridge did not ignite or the shot was not fired!
Secure the captive bolt stunner before you remove the bolt head from the cartridge holder.
- Remove the bolt head from the cartridge holder.
The fired cartridge is released by automatically lifting the cartridge ejector in the cartridge bearing.
- Remove the cartridge from the cartridge bearing.
- If the cartridge jams in the cartridge bearing:
 - Insert a screwdriver between the cartridge ejector and the cams of the cartridge bearing.
 - Push the cartridge ejector upwards and remove the cartridge.

Type: KR, KL, KK Captive bolt stunner without a recoil system:
The bolt needs to be pushed back into the guide pipe manually.

-  **WARNING** Risk of injury if the cartridge did not ignite or the shot was not fired!
Secure the captive bolt stunner before you remove the bolt head from the cartridge holder.



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

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

- Push the bolt back into the guide pipe with the cap nut until the clamping balls engage with the bolt.

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.

- Release the captive bolt stunner.
- **WARNING** Risk of injury due to kickback!
Hold the captive bolt stunner with outstretched arms and do **not** lean over the captive bolt stunner when firing the shot.
- Place the unsecured 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.
- **WARNING** Risk of injury if the cartridge did not ignite or the shot was not fired!
Secure the captive bolt stunner before you remove the bolt head from the cartridge holder.
- Remove the bolt head from the cartridge holder.
The fired cartridge is released by automatically lifting the cartridge ejector in the cartridge bearing.
- Remove the cartridge from the cartridge bearing.
- If the cartridge jams in the cartridge bearing:
 - Insert a screwdriver between the cartridge ejector and the cams of the cartridge bearing.
 - Push the cartridge ejector upwards and remove the cartridge.

The impact plate needs to be pushed back into the guide pipe manually.

- Push the impact plate back into the guide pipe until the clamping balls engage with the bolt.



6 Cleaning and care

The purpose of cleaning and care is to remove residues from the captive bolt stunner which adhere to the inner and outer surfaces of the captive bolt stunner after the shots have been fired.

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	Machine cleaning agent with regreasing effect Weapon oil (e.g. Ballistol)	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 authorized specialists.

Warranty If errors or defects occur in the captive bolt stunner within the statutory warranty period, please contact Karl Schermer GmbH & Co. KG. Please refer to the company information in the imprint for the address and telephone numbers.

Only use spare and wearing parts that conform to the specifications and qualities of the original spare and wearing parts of Karl Schermer GmbH & Co.KG.

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:

With regard to all captive bolt stunners, the site operator is obliged to present the captive bolt stunner to the manufacturer or his authorised representative for testing 2 years after initial commissioning 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* on page 15).



7.3 Maintenance intervals

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

7.4 Tools and care products

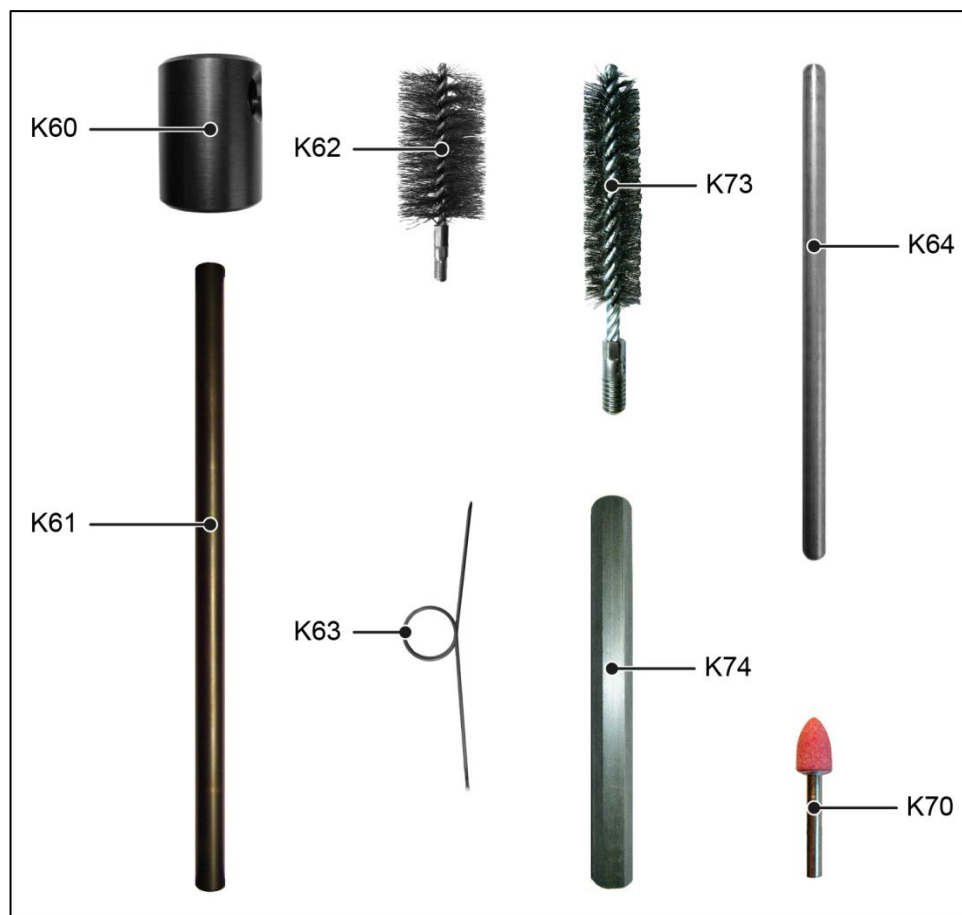


Fig. 7-1 Tools



Scope of delivery	Item	Designation
	K60	Assembly nut
	K61	Assembly lever
	K62	Cleaning brush (short version)
	K63	Assembly hook
	K64	Assembly tool for spacer sleeve (type KC)
Optional	Item	Designation
	K70	Mounted point
	K71	Ballistol oil (not shown)
	K72	Assembly paste (not shown)
	K73	Cleaning brush (long version)
	K74	Rod for cleaning brush (K73)

7.5 Carrying out maintenance on the bolt head

Type:
KS
KR, KL, 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	Component number
Serrated washer	K2
Firing pin relief spring	K4
O-ring (red, 2 x)	K6
Firing pin spring	K7
O-ring (locking ring)	K10
Trigger spring	K13

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

Component	Component number
Firing pin	K8
Locking ring	K9
O-ring (locking ring)	K10
All threads	

- Disassembly**
- Unlock the bolt head (A) and remove it from the cartridge holder (B).
 - Release the cap nut (K1) and remove the serrated washer (K2). Check the serrated washer for wear.
 - Unscrew the protective cap for the firing pin (K3).
 - Remove the firing pin relief spring (K4) and check it for wear.
 - Unscrew the firing pin guide (K5).
 - Check the O-rings (K6) for wear.
 - Unscrew the locking ring (K9).
 - Check the O-ring (K10) for wear.
 - Pull the trigger (K11) and pull out the firing pin (K8).
 - Remove the firing pin spring (K7) and check it for wear.
 - Loosen the guide screw (K12) and pull the trigger (K11) out slowly.
 - Remove the trigger spring (K13), the trigger lock pin (K28) and the trigger lock pin spring (K29). Check the trigger spring for wear.
 - Exchange the worn components.
- Cleaning/greasing**
- Clean the remaining components of the bolt head.
 - Grease all threads, the firing pin (K8), the locking ring (K9) and the O-ring (K10).
- Assembly**
- Insert the trigger spring and the trigger lock pin with the trigger lock pin spring into the bolt head housing.

- Insert the trigger into the bolt head housing.
- Pull the trigger and screw the guide screw into the bolt head housing.
- Grease the O-ring and attach it to the bolt head housing.
- Tighten the locking ring.
- Pull the trigger and insert the firing pin.
- Insert the firing pin spring.
- Tighten the firing pin guide.
- Insert the firing pin relief spring.
- Tighten the protective cap for the firing pin.
- Carry out the following functional test.

Bolt head secured (red O-rings are not visible):

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 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 is pulled.

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

7.6 Carrying out maintenance on the cartridge holder

Type:
KS
KR, KL, KK
KC

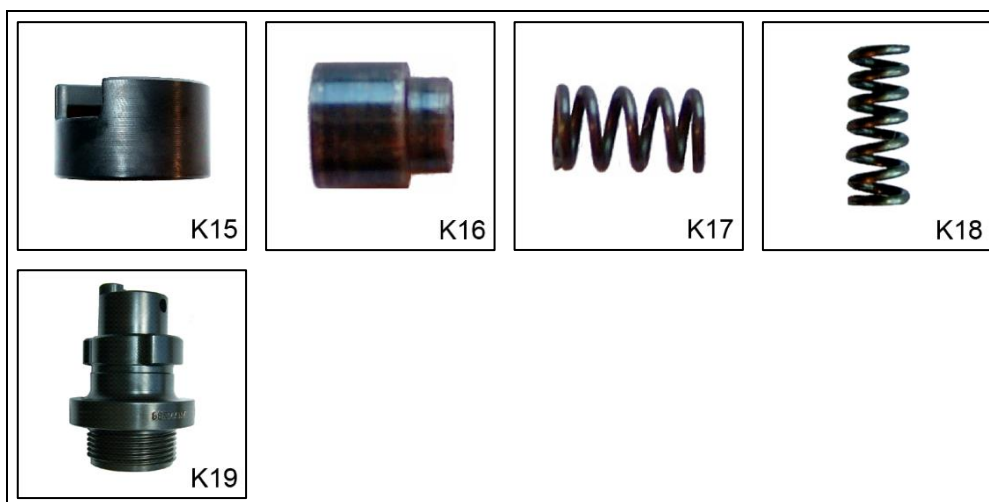


Fig. 7-3 Components of the cartridge holder



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

Component	Component number
Guide pin spring	K17
Ejector spring (x 2)	K18

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

Component	Component number
Cartridge ejector	K15
Ejector guide pin	K16
Guide pin spring	K17
Ejector spring (x 2)	K18



It is not necessary to unscrew the cartridge holder 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 bearing in an uncontrolled manner during disassembly.

- Disassembly**
- Use the assembly hook (K63) to press in the ejector guide pin (K16) to the stop.
 - Slowly remove the cartridge ejector (K15) from the cartridge bearing (K19).
 - Pull out the ejector guide pin (K16) with the guide pin spring (K17) and check them for wear.
 - Remove the two ejector springs (K18) from the cartridge bearing and check them for wear.
 - Exchange the worn components.

- Cleaning/greasing**
- Clean the components of the cartridge holder and grease the old and new components.

- Assembly**
- Insert the ejector springs into the cartridge bearing.
 - Insert the ejector spring pin with the guide pin spring into the cartridge bearing.
 - Attach the cartridge ejector to the cartridge bearing.

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

7.7 Carrying out maintenance on the bolt guide

7.7.1 Type KR / KL / KK

Type:
KR, KL, KK



Fig. 7-4 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	Component number
O-ring (protective sheath)	K25
Rubber ring (black, red)	K41
Clamping ball (x 3)	K44
Fixing ring	K45



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

Component	Component number
O-ring (protective sheath)	K25
Bolt	K40, K46, K48
Bolt end guide	K43, K58
Clamping ball (x 3)	K44
All threads	

- Secure the captive bolt stunner.
- Disassembly
 - Unlock the bolt head (A) and remove it from the cartridge holder (B).
 - Clamp the bolt guide (C) and remove the cartridge holder from the bolt guide. To this end, use the 'cartridge holder' assembly tool (K60, K61).
 - Remove the protective sheath (K26) and the O-rings (K25) from the guide pipe (K42/K47/K49) and check the O-rings for wear.
 - Pull the bolt (K40/K46/K48) out of the guide pipe and check the rubber rings (K41) for wear.
(Type KR, KL: 3 rubber rings; type KK: 2 rubber rings)
 - Clamp the guide pipe and release the bolt end guide (K43, K58) from the guide pipe.
 - Remove the fixing ring (K45) from the bolt end guide and check it for wear.
 - Check the clamping balls (K44) for wear.
 - Exchange the worn components.
- Cleaning/greasing
 - Clean the components of the bolt guide.
 - Grease all threads, the O-rings (K25), the bolt (K40, K46, K48) and the bolt end guide (K43, K58).
- Assembly
 - If the clamping balls are worn: Grease the new clamping balls and press them into the holes.
 - Fix the clamping balls in place with the fixing ring.
 - Screw the bolt end guide to the guide pipe.
 - Insert the bolt with the rubber rings into the guide pipe.
 - Slide the protective sheath and the two O-rings onto the guide pipe.
 - Mount the cartridge holder on the bolt guide.
To this end, use the 'cartridge holder' assembly tool.
 - Place the bolt head on the cartridge holder and lock it.
 - Carry out the proof test
(→ chapter *Daily proof test* on page 55).

7.7.2 Type KS

Type: KS



Fig. 7-5 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	Component number
O-ring	K21
Rubber washer (x 2)	K22
Damping element (x 8)	K23
O-ring (protective sheath)	K25



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

Component	Component number
Bolt	K20
O-ring (protective sheath)	K25
Bolt end guide	K27
All threads	

➤ Secure the captive bolt stunner.

Disassembly ➤ Unlock the bolt head (A) and remove it from the cartridge holder (B).

➤ Clamp the bolt guide (C) and remove the cartridge holder from the bolt guide. To this end, use the 'cartridge holder' assembly tool (K60, K61).

➤ Remove the protective sheath (K26) and the O-rings (K25) from the guide pipe (K24) and check the O-rings for wear.

➤ Pull the bolt (K20), the O-ring (K21) and the two rubber washers (K22) out of the guide pipe and check the damping elements (K23) for wear.

➤ Clamp the guide pipe and release the bolt end guide (K27) from the guide pipe.

➤ Exchange the worn components.

Cleaning/greasing ➤ Clean the components of the bolt guide.

➤ Grease all threads, the O-rings (K25), the bolt (K20) and the bolt end guide (K27).

Assembly ➤ Screw the bolt end guide to the guide pipe.

➤ Insert the bolt with the O-ring, the rubber washers and the damping elements into the guide pipe.

➤ Slide the protective sheath and the two O-rings onto the guide pipe.

➤ Mount the cartridge holder on the bolt guide.

To this end, use the 'cartridge holder' assembly tool.

➤ Place the bolt head on the cartridge holder and lock it.

➤ Carry out the proof test
(→ chapter *Daily proof test* on page 55).

7.7.3 Type KC

Type: KC



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	Component number
O-ring (protective sheath)	K25
Rubber ring (black, red)	K41
Clamping ball (x 3)	K44
Fixing ring (rubber)	K45
Fixing ring (steel)	K59
Serrated washer	K55

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

Component	Component number
O-ring (protective sheath)	K25
Bolt	K50
Bolt end guide	K58
Clamping ball (x 3)	K44
All threads	

- Secure the captive bolt stunner.
- Disassembly**
 - Unlock the bolt head (A) and remove it from the cartridge holder (B).
 - Clamp the bolt guide (C) and remove the cartridge holder from the bolt guide. To this end, use the 'cartridge holder' assembly tool (K60, K61).
 - Remove the protective sheath (K26) and the O-rings (K25) from the guide pipe (K51) and check the O-rings for wear.
 - Clamp the guide pipe and release the spacer sleeve (K57) from the guide pipe. To this end, use the 'spacer sleeve' assembly tool (K64). Leave the guide pipe clamped.
 - Release the bolt end guide (K58) from the guide pipe and remove the entire bolt system (bolt, bolt end guide, impact plate) from the guide pipe.
 - Clamp the bolt end guide and release the impact plate (K56) from the bolt (K50). The impact plate is secured by means of a lock nut (K54).
 - Remove the serrated washer (K55) from the bolt and check it for wear.
 - Remove the lock nut (K54) from the bolt.
 - Remove the rubber rings (K41) from the bolt and check them for wear.



- | | |
|-------------------|---|
| | <ul style="list-style-type: none">➤ Remove the fixing rings (K45, K59) from the bolt end guide (K58) and check them for wear.➤ Check the clamping balls (K44) for wear.➤ Exchange the worn components. |
| Cleaning/greasing | <ul style="list-style-type: none">➤ Clean the components of the bolt guide.➤ Grease all threads, the O-rings (K25), the bolt (K50) and the bolt end guide (K58). |
| Assembly | <ul style="list-style-type: none">➤ If the clamping balls are worn: Grease the new clamping balls and press them into the holes.➤ Fix the clamping balls in place with the fixing rings.➤ Put the rubber rings 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 pipe.➤ Clamp the guide pipe and screw the bolt end guide onto the guide pipe.➤ Leave the guide pipe clamped.➤ Mount the spacer sleeve on the guide pipe. To this end, use the 'spacer sleeve' assembly tool.➤ Slide the protective sheath and the two O-rings onto the guide pipe.➤ Mount the cartridge holder on the bolt guide. To this end, use the 'cartridge holder' assembly tool.➤ Place the bolt head on the cartridge holder and lock it.➤ Carry out the proof test
(→ chapter <i>Daily proof test</i> on page 55). |

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.

The bolts of the captive bolt stunners KR, KL, KK and KS can be re-sharpened with the mounted point (K70). 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).

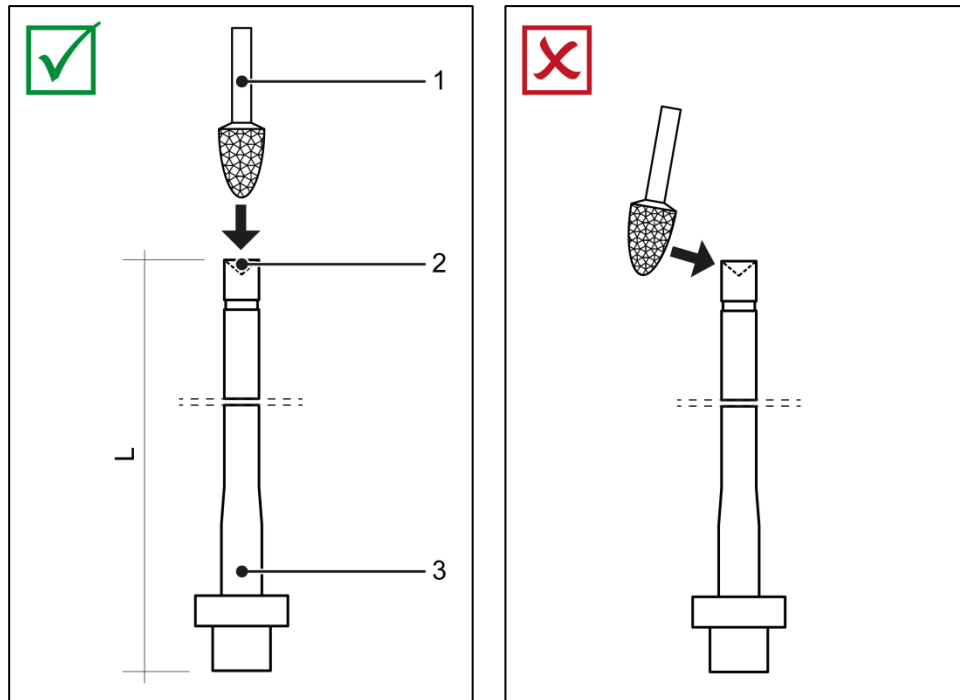


Fig. 7-7 Contact position of the mounted point

Item	Designation	Item	Designation
✓	Correct contact position	L	Minimum permissible bolt length: Type KS, KR: 194 mm Type KL: 230 mm Type KK: 180 mm
✗	Incorrect contact position		
1	Mounted point		
2	Bolt tip		
3	Bolt		

Prerequisite The bolt (K20, K40, K46 or K48) is removed from the bolt guide (→ chapter *Carrying out maintenance on the bolt guide* on page 75).

- Clamp the bolt.
- Clamp the mounted point (K70) in the drill chuck of the grinding machine.

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.



- **⚠ DANGER** Danger to life if using a bolt that is too short!
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.
- Assembly and proof test ➤ Install the sharpened bolt in the bolt guide.
(→ chapter *Carrying out maintenance on the bolt guide* on page 75).
- Carry out the proof test
(→ chapter *Daily proof test* on page 55).



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 Karl Schermer 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* on page 55).

Fault	Possible cause	Remedy
The cartridge does not ignite.	The spring tension of the firing pin spring is too low.	Insert a new firing pin spring (K7).
	The firing pin is bent.	Insert a new firing pin (K8).
	The firing pin is set incorrectly.	Adjust the position of the tip of the firing pin.
	The captive bolt stunner was not fully released when the shot was fired.	Fully release the captive bolt stunner right before firing the shot.
	The protective cap was not able to spring back unimpeded when the shot was fired.	Hold the captive bolt stunner in such a way that the protective cap can spring back unimpeded.
	The cartridges are moist.	Ensure that the cartridges are stored in a dry place.
Slaughter animals do not always fall after the shot is fired.	Type KS: The bolt is not fully returned to the starting position after the shot is fired.	Exchange the following wearing parts: <ul style="list-style-type: none"> • Damping elements (K23), • O-ring (K21) and • rubber washers (K22).
	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: <ul style="list-style-type: none"> • Rubber ring (K41) • Clamping balls (K44) • Fixing rings (K45, K59)
	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 (→ chapter <i>Carrying out maintenance on the bolt guide</i> on page 75).
	The charge strength of the cartridge is too weak for the slaughter animal.	Use a cartridge with a stronger charge strength.

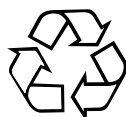
Fault	Possible cause	Remedy
The bolt gets stuck in the head of the animal after the shot has been fired.	The captive bolt stunner is not properly placed on the head of the animal.	Place the captive bolt stunner in the contact position and at the correct angle on the head of the animal (→ chapter <i>Contact position on the slaughter animal</i> on page 62).
	Rubber pieces between the bolt and the guide pipe jam the bolt.	Remove the rubber pieces and exchange the wearing parts (e.g. O-rings, rubber washer, damping elements and rubber rings).
	The bolt jams or slides sluggishly in the guide pipe (e.g. due to a bent bolt).	Exchange the wearing parts and/or the bolt (→ chapter <i>Maintenance and servicing</i> on page 68).
	The bolt was not sharpened correctly.	Sharpen the bolt (→ chapter <i>Sharpening the bolt</i> on page 81).
The tip of the bolt does not emerge from the guide pipe.	The cartridge holder and the bolt end guide are not firmly screwed onto the guide pipe.	Ensure that the cartridge holder and the bolt end guide are firmly screwed onto the guide pipe.
	The bolt is too short (e.g. as a result of being sharpened too often).	<p>⚠ DANGER Danger to life if using a bolt that is too short!</p> <p>Ensure that the bolt is at least the length of the minimum permissible bolt length:</p> <p>Type KS, KR: 194 mm Type KL: 230 mm Type KK: 180 mm</p> <p>If a bolt is too short, exchange it immediately.</p>



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 Recyclable metals

No.	Component	No.	Component
K1	Cap nut	K42	Guide pipe
K2	Serrated washer	K43	Bolt end guide
K3	Protective cap for firing pin	K44	Clamping balls
K4	Firing pin relief spring	K46	Bolt
K5	Firing pin guide	K47	Guide pipe
K7	Firing pin spring	K48	Bolt
K8	Firing pin	K49	Guide pipe
K9	Locking ring	K50	Bolt
K11	Trigger	K51	Guide pipe
K12	Guide screw	K54	Lock nut
K13	Trigger spring	K55	Serrated washer
K14	Bolt head housing	K56	Impact plate
K15	Cartridge ejector	K57	Spacer sleeve
K16	Ejector guide pin	K58	Bolt end guide
K17	Guide pin spring	K59	Fixing ring (steel)
K18	Ejector spring	K60	Assembly nut
K19	Cartridge bearing	K61	Assembly lever
K20	Bolt	K62	Cleaning brush
K24	Guide pipe	K63	Assembly hook
K27	Bolt end guide	K64	Assembly tool, spacer sleeve
K28	Trigger lock pin	K73	Cleaning brush
K29	Trigger lock pin spring	K74	Rod for cleaning brush
K40	Bolt		

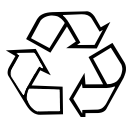
9.1.2 Recyclable plastics

No.	Component	No.	Component
K6	O-ring	K25	O-ring
K10	O-ring	K26	Protective sheath
K21	O-ring	K41	Rubber rings
K22	Rubber washer	K45	Fixing ring (rubber)
K23	Damping element		

9.1.3 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 Karl Schermer 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)	85
	Number of rubber buffers	3
	Cartridge type	6.8/15 red, blue, yellow
	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
	PTB (CIP) approval	882
	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
	Bolt exit dimension (mm)	125
	Number of rubber buffers	3
	Cartridge type	6.8/15 red
	Sound power level [dB(A)]	111.9



Technical data

Type KL	Technical data	Type KL
	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
	PTB (CIP) 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)	75
	Number of rubber buffers	2
	Cartridge type	6.8/15 red, blue, yellow
	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
	PTB (CIP) approval	882
	CE type examination number	DE-11-MARLIV18-PTB09

Type KS	Technical data	Type KS
	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	Automatic
	Bolt diameter (mm)	12



Type KS	Technical data	Type KS
	Bolt exit dimension (mm)	80-85
	Number of damping elements	8
	Cartridge type	6.8/15 red, blue, yellow
	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
	PTB (CIP) approval	882
	CE type examination number	DE-11-MARLIV18-PTB09

Type KC	Technical data	Type KC
	Type of application	Reversible 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)	-
	Number of rubber buffers	5
	Cartridge type	6.8/15 red, blue
	Certification	PTB
	PTB (CIP) approval	882
	CE type examination number	-

10.2 StunTest test device

	Technical data	StunTest test device
Power supply unit	Primary voltage (V/AC)	230 (±10%)
	Secondary voltage (V/DC)	9
Sensor cable	Length (cm)	100
Evaluation unit	Display	LED display, 2-digit
Base body	Dimensions [(length / diameter) mm]	329 / 125



10.3 Test sleeve

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


10.4 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)	8
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)	8



11 Appendix

11.1 Declaration of Conformity



**EG-Konformitätserklärung • EC-Declaration of Conformity •
Declaración CE de conformidad • Déclaration CE conformité**

im Sinne der EG-Richtlinie Maschinen 2006/42/EG, Anhang II, Nr. 1 A
content according to 2006/42/EC, Annex II, No. 1 A
contendido según 2006/42/CE, anexo II, núm. 1 A
contenu conforme à la directive 2006/42/CE, annexe II, N° 1

Hersteller • <i>Manufacturer • Constructor • Constructeur</i>	Karl Schermer GmbH&Co.KG Einsteinstrasse 51 D-76275 Ettlingen
Dokumentationsbevollmächtigter <i>Documentation manager</i> Responsable de la documentation <i>Mandataire de la documentation</i>	Sabine Knebel

Hiermit erklären wir, dass das Viehschussgerät • *We hereby declare that the captive bolt stunner* • Por la presente declaramos que la pistola grapadora • *Nous déclarons par les presentes que le pistolet d'abattage*

Typ • *Model* • Modelo • *Type*

Serien-Nummer • *Serial-Number* •
Número de série • *N° de série*

mit allen einschlägigen Bestimmungen der EG-Maschinenrichtlinie 2006/42/EG übereinstimmt.
fulfills all relevant provisions of Directive 2006/42/EC.
concuendo con todas las disposiciones de la Directiva 2006/42/CE relativa a las máquinas.
satisfait à la ensemble des dispositions pertinentes de la directive 2006/42/CE relative aux machine.

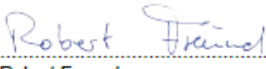
Die Maschine wurde bauartgeprüft durch • *The machinery has been model tested by* • Tipo aprobado •
Organisme d'évaluation de la conformité

Physikalisch-Technische Prüfanstalt PTB
(NB 0102)

Bescheinigung • *Attestation-No.* • DE-11-MaRLIV18-PTB09
Certificado • *Attestation d'examen n°*

Folgende harmonisierte Normen (oder Teile dieser Normen) und Richtlinien wurden angewendet:
The following harmonised standards (or parts thereof) and following EC-directives were applied:
Se aplicaron las siguientes normas armonizadas (o partes de estas normas) y directivas de la CE:
Les norms harmonisées suivantes (ou parties de ces normes) ont été utilisées et des directives CE:

DIN EN ISO 12100

Name und Unterschrift <i>Name and Signature</i> Nombre y firma <i>Nom et signature</i>	 Robert Freund	Ettlingen,
	Geschäftsführer • <i>Managing Director</i> • Director gerente • <i>Directeur</i>	

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11.2 Test report template

→ next page



Report -Daily Proof Test-

Captive bolt stunner type:

Serial no.: _____

Reference penetration depth (mm):

Date: _____

[illegible]