EN

Designated Marksman Rifle

G28E Rifle

NATO 7.62 mm x 51 calibre

Operator's Manual

⚠ DANGER

Risk of death from gunshot wounds!

Accidental discharge of weapon may occur when loaded weapon is handled inappropriately.

› Do not use the weapon until you have read and understood this manual completely.

› Follow the safety instructions when handling the weapon.

› Carry out a safety check before working on the weapon.

Refer to the protection notice under ISO 16016!

Note the total of fired rounds in the Weapon firing log!

Functional elements - left side view

The illustrations on the front and back fold-out pages show the functional elements of the weapon from the left and right sides. The text refers frequently to these illustrations. Opening the fold-out pages while reading will make it easier to understand the text.

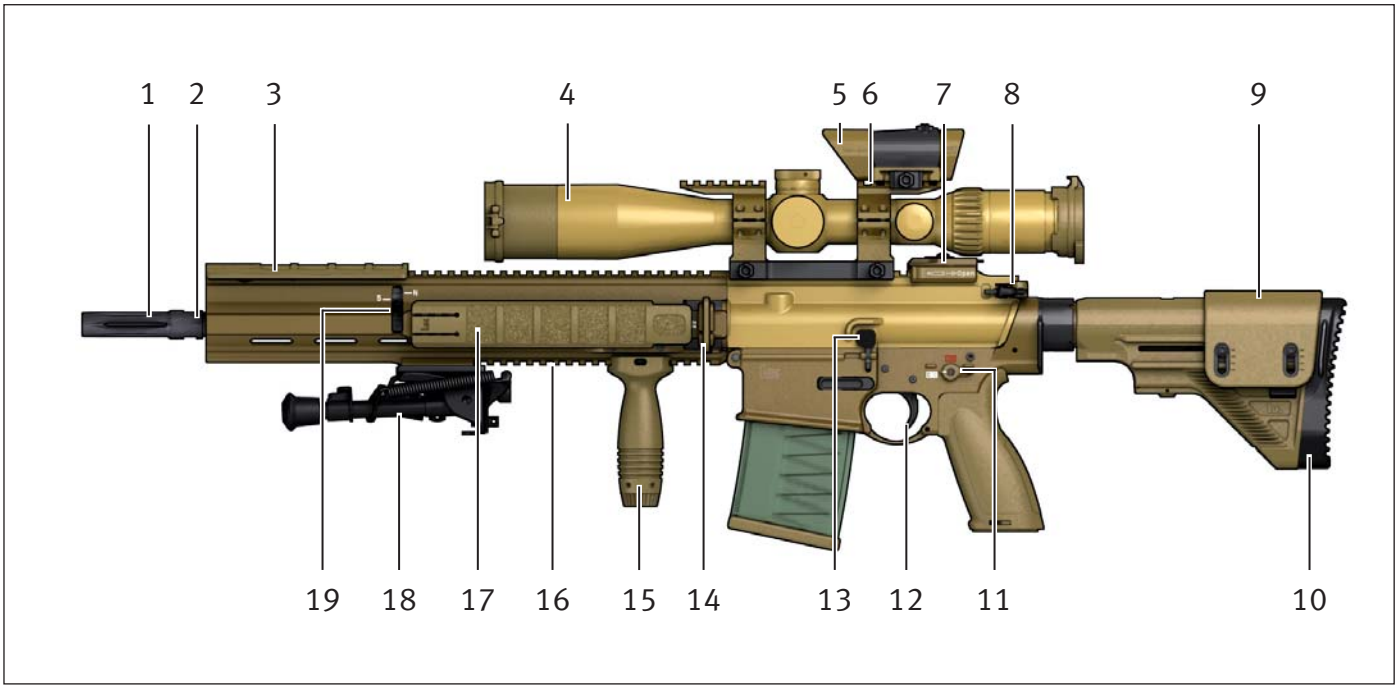


Fig. Ia: G28E, left side view

1 *Flash hider*
2 *Barrel*
3 *Picatinny-rail cover, short*
4 *3-20 x 50 telescopic sight*
5 *Red-dot sight Micro T1*
6 *Telescopic sight mount*
7 *Quick-release rear sight*
8 *Charging handle*
9 *Cheek rest, adjustable*
10 *Buttstock cap, concave*
11 *Safety lever, ambidextrous*
12 *Trigger*
13 *Bolt catch/release*
14 *Eye for carrying sling*
15 *Forward grip (with recess for LLM keypad)*
16 *Picatinny-rail*
17 *Picatinny-rail cover, long*
18 *Bipod*
19 *Gas nozzle, adjustable*

Functional elements - right side view

The illustrations on the front and back fold-out pages show the functional elements of the weapon from the left and right sides. The text refers frequently to these illustrations. Opening the fold-out pages while reading will make it easier to understand the text.

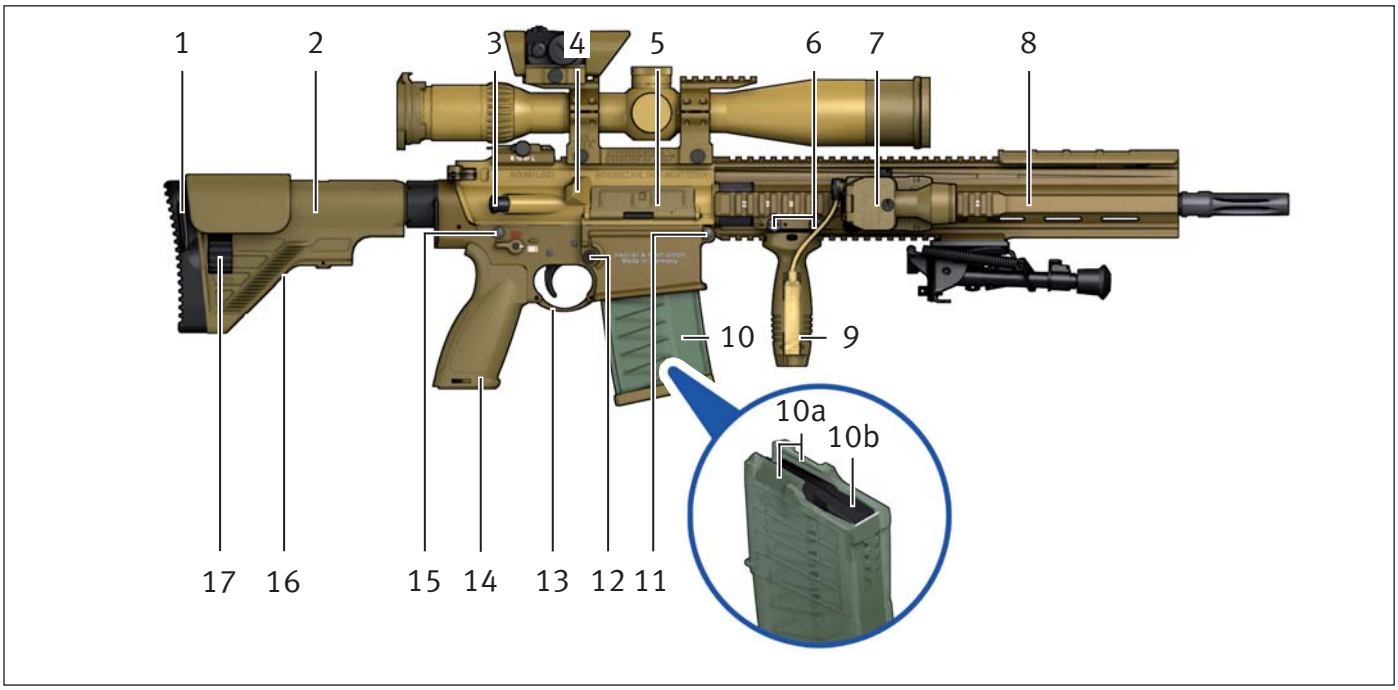


Fig. IIa: G28E, right side view

1	*Eye for carrying sling*
2	*Buttstock, adjustable*
3	*Forward assist*
4	*Cartridge case deflector*
5	*Ejection port cover*
6	*Locking screws for handguard*
7	*LLM (laser light module)*
8	*Handguard*
9	*LLM keypad*
10	*Magazine*
10a	*Magazine lips*
10b	*Follower*
11	*Locking pin, front*
12	*Magazine catch*
13	*Trigger guard*
14	*Pistol grip*
15	*Locking pin, rear*
16	*Release lever for buttstock*
17	*Extension wheel*

Table of contents

Part I Description

Part II Handling

Part I

Description

1 Using this manual/Scope

1.1 Purpose of this manual

The first part of this manual (“Description”) describes the design and functioning, the second part (“Handling”) the handling of the G28E weapon, and the third part (“3-20 x 50 telescopic sight and Micro-1 red-dot sight”) the description and handling of the 3- 20 x 50 telescopic sight and Micro T-1 red-dot sight.

1.2 Target audience for this manual

This manual is intended for soldiers, police, security forces, and other persons who are authorised to use this weapon. This manual does not assume extensive technical or weapons-specific knowledge.

1.3 Warnings, notes and information

To ensure the greatest possible safety during handling, important information and technical notes are specially highlighted.

1.3.1 Warnings and warning levels

Warnings are depicted as follows (example):

⚠ DANGER

Risk of death from gunshot wounds!

Accidental discharge of weapon may occur when loaded weapon is handled inappropriately.

› Do not use the weapon until you have read and understood this manual completely.

› Follow the safety instructions when handling the weapon.

› Carry out a safety check before working on the weapon.

The following colours and signal words are used in the warnings to indicate various danger levels:

Colour / signal word	Meaning
⚠ DANGER	Direct, imminent danger! Non-compliance will lead to death or extremely serious injury.
⚠ WARNING	Possible imminent danger! Non-compliance could lead to death or serious injury.
⚠ CAUTION	Dangerous situation! Non-compliance could lead to minor injuries.
NOTICE	Non-compliance could lead to material damage.

1.3.2 Symbols used

Symbol	Meaning
	Supplementary information on the weapon, on practical handling of the weapon or on using this manual.
1.	Call to perform an action in a sequence of actions: Here you have to do something!
›	Stand-alone step or call to perform an action in a warning: Here you have to do something!
››	The sequence of actions is not complete, and is continued on the next page: Please turn the page!
•	Bullet point

1.3.3 Conventions for illustrations

The detail of illustrations and drawings may vary from your particular weapon.

The information “right”, “left”, “front” and “rear” applies to the position of the weapon as seen in the direction of fire.

Illustrations and their constituent elements support the descriptions in this manual, and are identified as follows:

- The name of an illustration comprises the current page number and a consecutive lower-case letter starting again from “a” on each page, e.g. 6a.
- Calls to perform an action are indicated by upper-case letters enclosed in circles.
- Components relevant to the action are highlighted in blue. Where necessary the components are marked with numbers and identified in a legend.

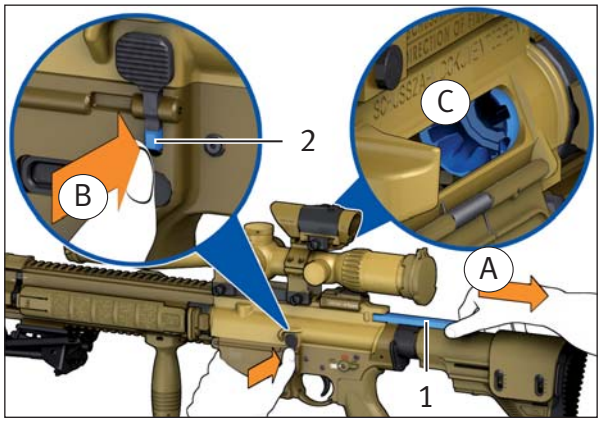


Fig. 6a: Example of an illustration

1 Charging handle
2 Bolt catch/release

- Motions are indicated by orange-coloured arrows.

1.3.4 Conventions for cross references

Cross references represent relationships between the text and an illustration or an specific section. Cross references are in *italics* and enclosed in (brackets).

- Example of a cross reference between text and illustration: (*6a-1*)

  The cross reference refers to numeral 1 in the illustration numbered 6a on page 6, the charging handle.

The text frequently refers to the front and back fold-out pages, which are identified by the Roman numerals I (front) and II (back).

- Example of a cross reference between sections: (*Section 1.3.3*)

  The cross reference refers to Section 1.3.3, conventions for illustrations.

2 Fundamental safety instructions

The weapon has been designed and manufactured according to recognised safety rules. Nevertheless, use of the weapon may result in injury or death of the user and third parties, or damage to the weapon and other material property.

› Follow all of the instructions in this operator's manual. Non-compliance may result in injury or death.

› Do not handle the weapon if you are tired, feel unwell, or have consumed alcohol, drugs or medicines.

› Follow the applicable regulations for the handling of weapons.

2.1 The operator's manual as an integral component of the safety concept

The operator's manual is an integral component of the weapon.

› Do not use the weapon until you have read and understood this operator's manual completely.

› Keep the operator's manual for the entire service life of the weapon.

› If you receive any supplements or amendments, be sure to add them to the operator's manual.

› Pass the operator's manual on to any subsequent operator or owner.

› Do not entrust the weapon to anyone who has not read and understood this operator's manual completely.

2.2 Safety instructions for handling the weapon

› Special care must be taken when handling firearms, because the position and direction of the weapon can be changed very easily.

› Use the weapon and ammunition only if they are in perfect technical condition.

- Treat the weapon as if there were a round in the chamber and the safety released until you have carried out a safety check.
- Make sure that the weapon is always unloaded when it is handled for purposes other than loading or firing.
- Use the weapon only for its intended purpose. Do not use the weapon as a club, hammer, pry bar, etc. Using the weapon for other than its intended purpose may result in accidental discharge of weapon or damage to the weapon.
- Do not play with the weapon.
- Never point the weapon at people when handling or practising with it.
- Do not touch the trigger when loading, unloading, aiming or handling the weapon in any other way. Always place your trigger finger on the outside of the trigger guard.
- Do not use excessive force when handling, disassembling, cleaning and assembling the weapon.
- Avoid dry firing of the hammer. Dry firing of the hammer can lead to premature wear.
- Store weapon and ammunition separately. Be sure to prevent access to the weapon and ammunition by unauthorised persons, especially children.
- Never give or take the weapon unless it is unloaded and the bolt group is in the open position.
- Do not entrust the weapon to anyone who is not entitled to possess the weapon. Observe applicable regulations.
- Immediately rectify any faults that compromise safety.
- Exposure to exceptional stresses such as when the weapon is banged or dropped can have a negative effect on safety. After excessive stresses, have the weapon inspected by the manufacturer or trained firearms personnel.
- Do not rely on safety features. Safety features are no substitute for careful, correct handling of the weapon.
- When using accessories and ammunition, follow the instructions provided by their respective manufacturers.
- When not in use, keep the weapon in the transport case to avoid damage to the weapon and telescopic sight/red-dot sight.
- Where the operational situation allows, protect the telescopic sight/red-dot sight with the telescopic sight protective case.

2.3 Safety instructions for firing

› Wear hearing protection when firing.

› Wear safety goggles when firing.

› Keep your hands out of the path of the bolt group when firing.

› Keep the muzzle area clear when firing.

› During training do not fire at doors, panes of glass, walls, concrete, stone, or smooth surfaces (including water) and, where the situation allows, avoid this also during operations. A bullet can penetrate these objects or be deflected in an unsafe direction.

› Pull the trigger only if the weapon is pointing at the target and the area behind the target is not endangered.

› Use only properly loaded, undamaged DM111 A1 cartridges (NATO interchangeability designation AB22) of the NATO 7.62 mm x 51 calibre.

› Wear protective gloves when touching the barrel, flash hider or silencer after firing. The barrel, flash hider and silencer heat up during firing.

2.4 Exclusion of liability and warranty

Heckler & Koch GmbH accepts no liability and provides no warranty for incidents arising from:

- non-compliance with this manual,
- incorrect handling of the weapon,
- negligence,
- improper use,
- modifications, attachments to or conversion of the weapon without the express written consent of Heckler & Koch GmbH, or
- use of accessories or spare parts from other manufacturers without the express written consent of Heckler & Koch GmbH.

3 Description of the weapon

The G28E rifle (NATO 7.62 mm x 51 calibre) is a gas-operated weapon with a rotating bolt head. The transparent polymer magazine (*IIa-10*) holds 10 or 20 cartridges.

3.1 Designation

Designated Marksman Rifle G28E

3.2 Approved ammunition

The ammunition approved for use is DM111 A1 full metal jacket soft core cartridges (NATO interchangeability designation: AB22) of NATO 7.62 mm x 51 calibre.

The use of tracer ammunition (DM21 A2, NATO interchangeability designation AB24) reduces the service life of the barrel and hence the weapon's accuracy considerably swifter than is the case with use of other ammunition types. The use of tracer ammunition - other than in combat - is therefore permissible only under specific orders and only for trajectory or wind observation during training. After use of tracer ammunition, the barrel is to be cleaned with particular care under the supervision of those in command.

3.3 Intended use

The G28E rifle is a small-arms weapon for use against chest-high targets with high first-round hit probability out to a range of 600 m, and for delivering precision suppressive fire against human targets out to 800 m.

3.4 Illustration

Fig. 12a: G28E Rifle

3.5 Scope of the system

The scope of system shows a custom variant. Please contact Heckler & Koch for more information on accessories.

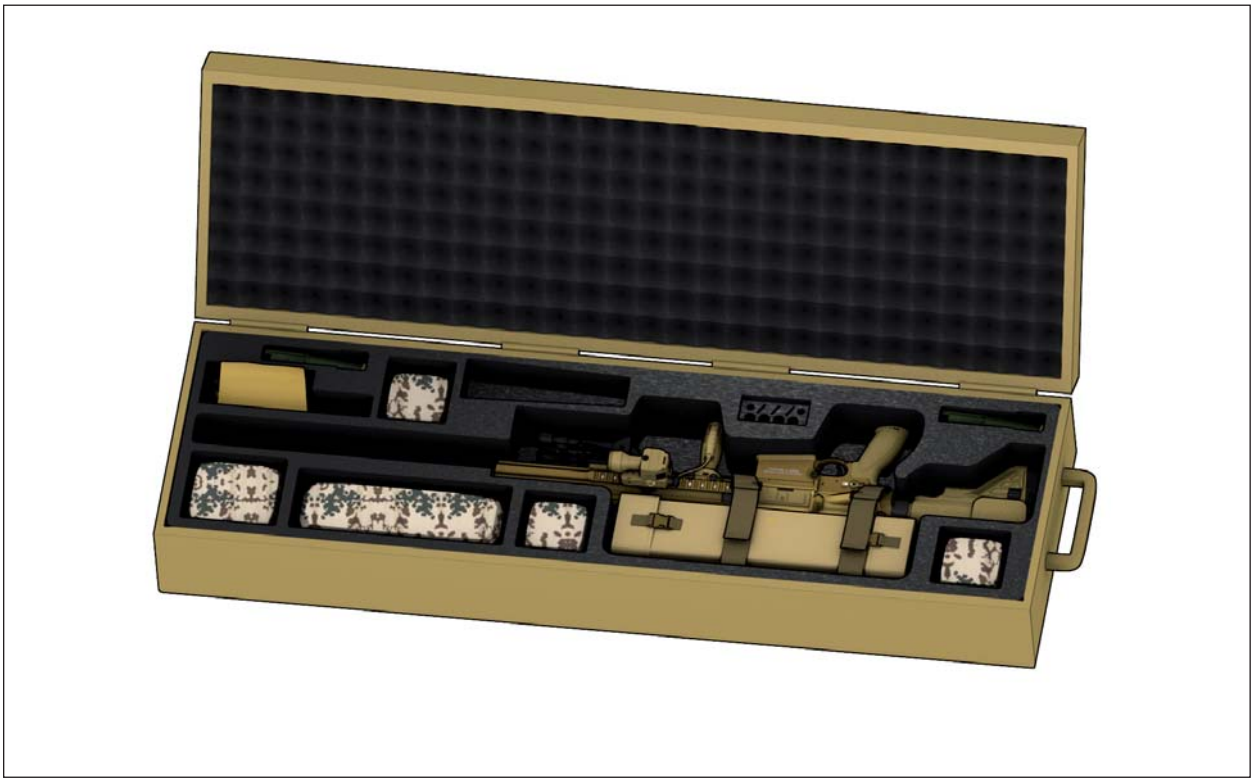


Fig. 12b: Weapon transport case

Item	Weapon transport case	Quantity
1	HLR15 laser rangefinder	1
2	12 cm trigger cable	1
3	60 cm trigger cable	1
4	Magazine case for 20-cartridge magazine	3
5	Magazine, 20 cartridges	8
6	G28E rifle, compl.	1
7	Bipod	1
8	Adapter for bipod	1
9	Quick-release sight (diopter)	1
10	Forward grip	1
11	Eye for carrying sling, front	1
12	G28E sights, compl., comprising: Telescopic sight, compl., comprising: 3-20 x 50 telescopic sight Mount for telescopic sight, compl. Red-dot sight Micro T1	1 1 1
13	LMT-225 sights, compl. (BWB-supplied LMT) comprising: LLM laser light module, compl. 17 cm trigger cable LLM mounting point, compl.	1 1 1 1
14	G28E telescopic sight protective case	1
15	G28E carrying sling, compl.	1
16	CR2032 battery	6
17	CR123A battery	2
18	List of contents for G28E weapon transport case	1
19	Personal case	1
20	7.62 x 51 mm cal. G28 cleaning kit	1
21	Set of Picatinny-rail covers, compl.	1
22	G28E muzzle cap	3
23	Torque wrench 2 - 25 Nm	1
24	SW11 insert for torque wrench	1
25	G28E operator's manual (EN)	1
26	G28E weapon firing log (EN)	1
27	G28E instruction charts (EN)	1
28	Magazine case for 10-cartridge magazine	2
29	Magazine, 10 cartridges	2
30	Charging handle with right-hand pawl	1
31	G28E tactical carrying sling	1
32	Cartridge case collector	1
33	G28E weapon transport case	1

Fig. 14a: Accessories transport case

Item	G28E accessories transport case	Quantity
1	G28E accessories transport case	1
2	JT LMT 225 return shipment set, incompl.	1
3	Merlin LR night sight adapter, compl.	1
4	CNDV-T3 Insight thermal imaging adapter, compl.	1
5	List of contents for G28E accessories transport case	1

3.6 Assembly groups and accessories

3.6.1 Assembly groups

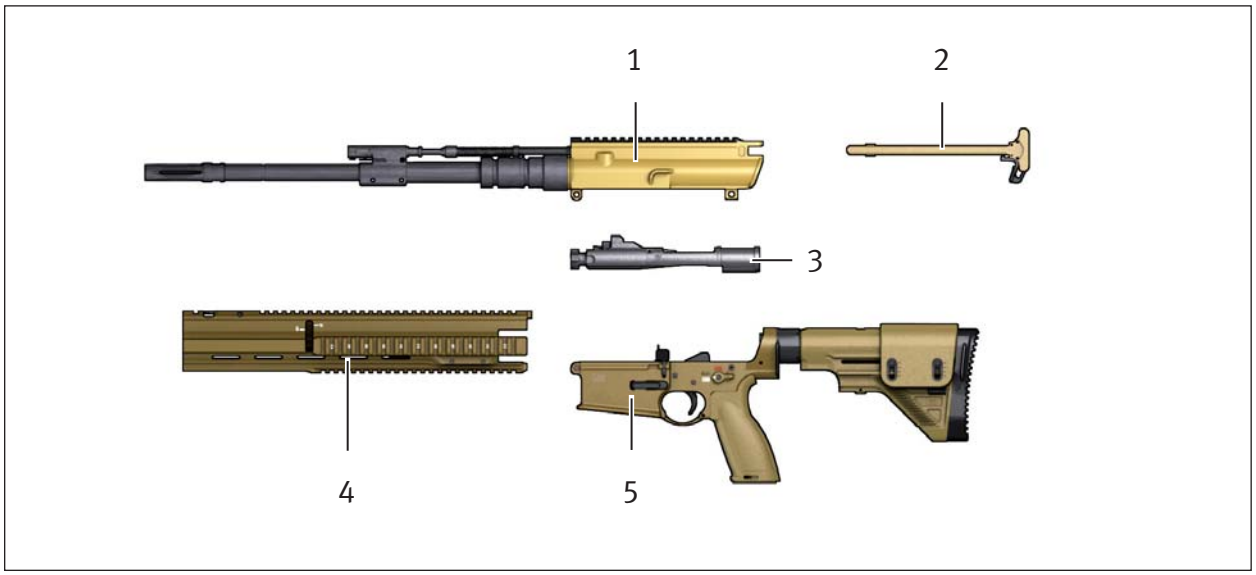


Fig. 15a: Assembly groups

1 *Upper receiver, compl.*
2 *Charging handle, compl.*
3 *Bolt group, compl.*
4 *Handguard, compl.*
5 *Lower receiver, compl.*

3.6.2 Accessories

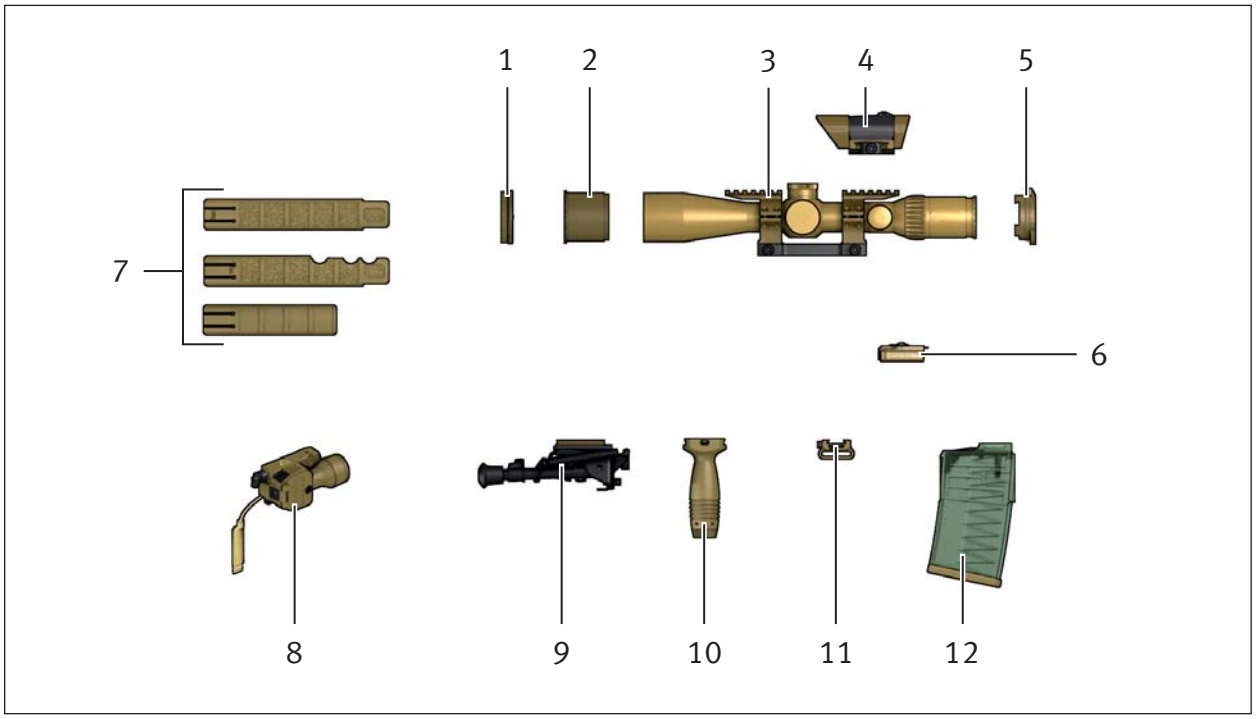


Fig. 16a: Accessories

1 *Objective lens port cover*
2 *Killflash filter*
3 *3-20 x 50 telescopic sight with telescopic sight mount*
4 *Micro T1 red-dot sight*
5 *Ocular port cover*
6 *Quick-release sight*
7 *Picatinny-rail covers*
8 *Laser light module (LLM 01)*
9 *Bipod*
10 *Forward grip (with recess for LLM key-pad)*
11 *Eye for carrying sling, front*
12 *Magazine*

4 Technical description

4.1 Safety features

4.1.1 Safety lever

The safety lever (*Ia-11*) prevents discharge of the weapon through accidental pulling of the trigger (*Ia-12*). In the “Safe” position the safety roller blocks the trigger. Only when the safety lever is clicked to the “Single fire” position will the safety roller release the trigger.

Fig. 17a: “Safe” position

4.1.2 Firing pin safety

The firing pin safety (*18a-7*) prevents accidental operation of the firing pin (*18a-8*), for example if the weapon is dropped. The firing pin safety blocks the firing pin and prevents the firing pin from striking the cartridge primer. Only when the trigger (*Ia-12*) is pulled does the hammer (*18a-11*) release the firing pin safety, just before the hammer strikes the firing pin.

Fig. 17b: “Single fire” position

4.2 Cutaway view

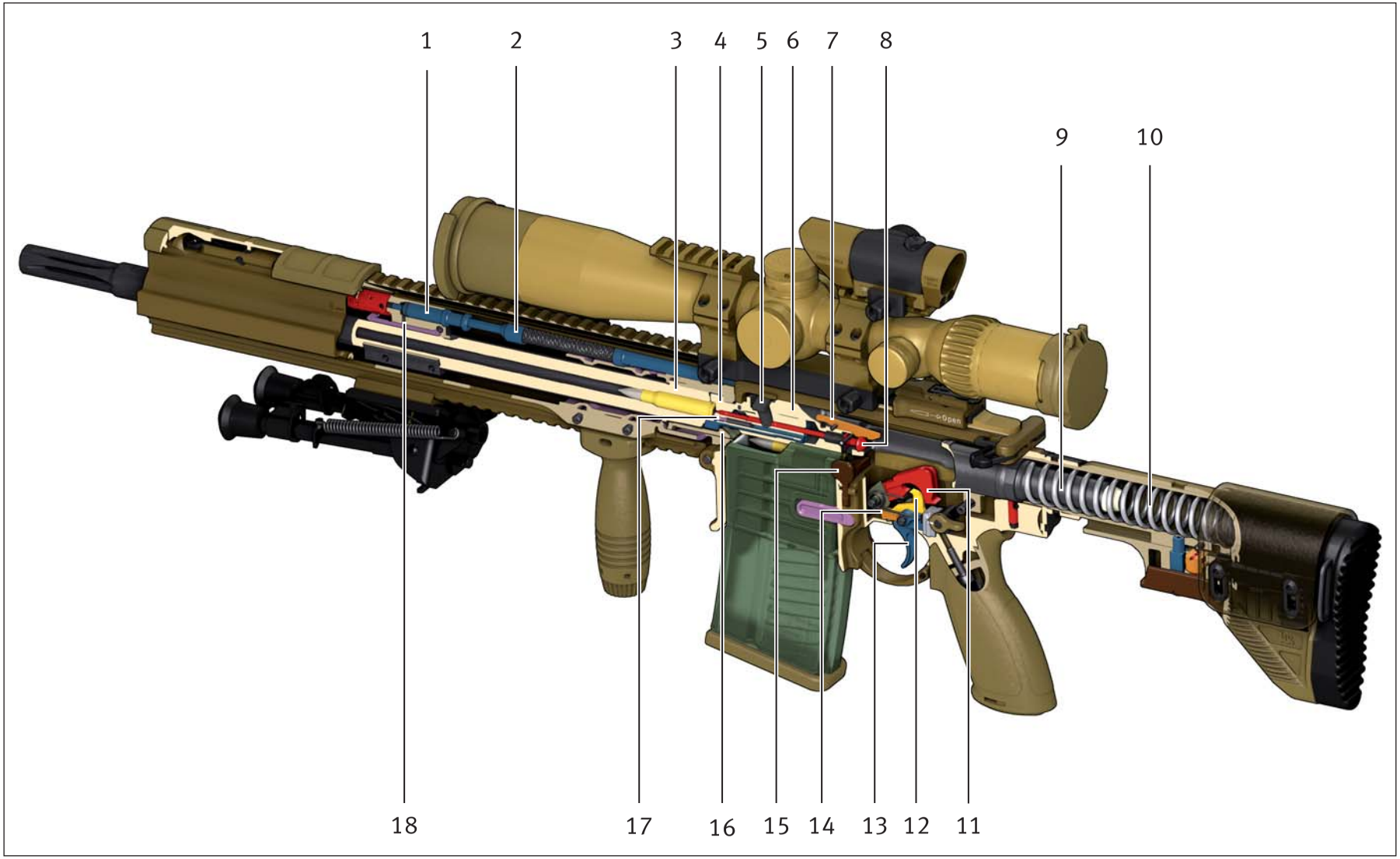


Fig. 18a: Cutaway view

1	*Gas piston*
2	*Rod*
3	*Chamber*
4	*Bolt head*
5	*Control bolt*
6	*Bolt group*
7	*Firing pin safety*
8	*Firing pin*
9	*Buffer*
10	*Recoil spring*
11	*Hammer*
12	*Disconnector*
13	*Trigger*
14	*Sear notch on sear release rocker*
15	*Bolt catch/release*
16	*Barrel extension*
17	*Ejector*
18	*Gas bore*

4.3 Functional elements

The safety lever (*Ia-11*) is used to make the weapon safe and to enable the single-fire function. The safety lever is ambidextrous.

The magazine catch (*IIa-12*) allows quick changing of magazines.

The handguard (*IIa-8*) is fastened to the barrel nut with two locking screws (*IIa-6*). The handguard is not attached to the barrel (*Ia-2*), this helps ensure the accuracy of the weapon. The handguard is equipped with Picatinny-rails at the 6, 9 and 12 o'clock positions. The Picatinny-rails not required are protected with removable covers (*Ia-3, Ia-17*).

The Picatinny-rails (*Ia-16*) can be used to attach various mechanical and optical sights, laser light modules, the bipod (*Ia-18*) and the forward grip (*Ia-15*).

The adjustable buttstock (*IIa-2*) can be locked in four positions over an adjustment travel of 67 mm.

The adjustable buttstock cap can be extended with the extension wheel (*IIa-17*) by a continuously variable amount up to 42 mm. The integrated cheek rest (*Ia-9*) can be adjusted over a continuous height adjustment travel of 15 mm.

The charging handle (*Ia-8*) is used to open the bolt group (*18a-6*) and to chamber a round or unload the weapon.

The forward assist (*IIa-3*) is used to chamber a round silently and to lock the bolt group manually in case of fouling.

The pistol grip (*IIa-14*) has a recess for storing the multi-purpose tool.

The ejection port cover (*IIa-5*) prevents foreign bodies from entering the chamber and the path of the bolt group. Movement of the bolt group automatically opens the ejection port cover to allow cartridge case ejection.

Where a silencer is used, the adjustable gas nozzle (*Ia-19*) must be turned to the "S" position.

4.4 Sequence of functions for firing

Initial state: The weapon has a magazine inserted (*Section 8.1*)

The bolt group (*18a-6*) is pulled all the way back manually by means of the charging handle (*Ia-8*). This causes the bolt group (*18a-6*) to cock the hammer (*18a-11*). The sear notch on the sear release rocker (*18a-14*) holds the hammer in the cocked position.

When the charging handle is released, the bolt group snaps forwards again, driven by the force of the recoil spring (*18a-10*). The bolt head (*18a-4*) pushes a cartridge from the magazine (*IIa-10*) into the chamber (*18a-3*). The extractor engages the cartridge on the cartridge rim. As the bolt group continues to move forwards, the control bolt (*18a-5*), driven by the control cam, rotates and locks the bolt head in the barrel extension (*18a-16*).

There is now a round in the chamber.

4.4.1 Sequence of functions in the “Single fire” position

Initial state: The weapon has a round in the chamber (*Section 8.2*)

Pulling the trigger (*Ia-12*) releases the cocked hammer (*18a-11*). Just before the hammer strikes the firing pin (*18a-8*), the hammer releases the firing pin safety (*18a-7*). The firing pin strikes the cartridge primer. The cartridge is fired. The bullet moves down the barrel (*Ia-2*).

After the bullet passes the gas bore (*18a-18*), the gas pressure from the barrel acts on the gas piston (*18a-1*). The gas piston acts on the rod (*18a-2*), which initiates the recoil of the bolt group (*18a-6*). As the bolt group recoils, the control bolt (*18a-5*), driven by the control cam, rotates and unlocks the bolt head (*18a-4*) from the barrel extension (*18a-16*). As the bolt group continues to recoil, the extractor extracts the cartridge case from the chamber (*18a-3*). As soon as the cartridge case reaches the ejection port, the two spring-loaded ejectors (*18a- 17*) eject the cartridge case to the right and the rear. The cartridge case strikes the cartridge case deflector (*IIa-4*) and is deflected to the right and away from the shooter.

4.4.2 Sequence of functions when the magazine is empty

The firing cycle can be repeated until the bolt group (*18a-6*) has fed the last cartridge from the magazine (*IIa-10*). When this happens the follower (*IIa-10b*) of the magazine pushes the bolt catch/release (*18a-15*) upwards. After the last round is fired, the bolt catch/release holds the bolt group in the open position as the bolt group moves forwards.

When the bolt catch/release is pushed, the bolt group snaps forwards, driven by the force of the recoil spring (*18a-10*). If a filled magazine was inserted prior to this action, the weapon now has a round in the chamber.

5 Cleaning kit and auxiliary materials

5.1 NATO 7.62 x 51 mm cal. G28 cleaning kit

The cleaning kit can be ordered from Heckler & Koch using the HK-Ident.-No. shown.

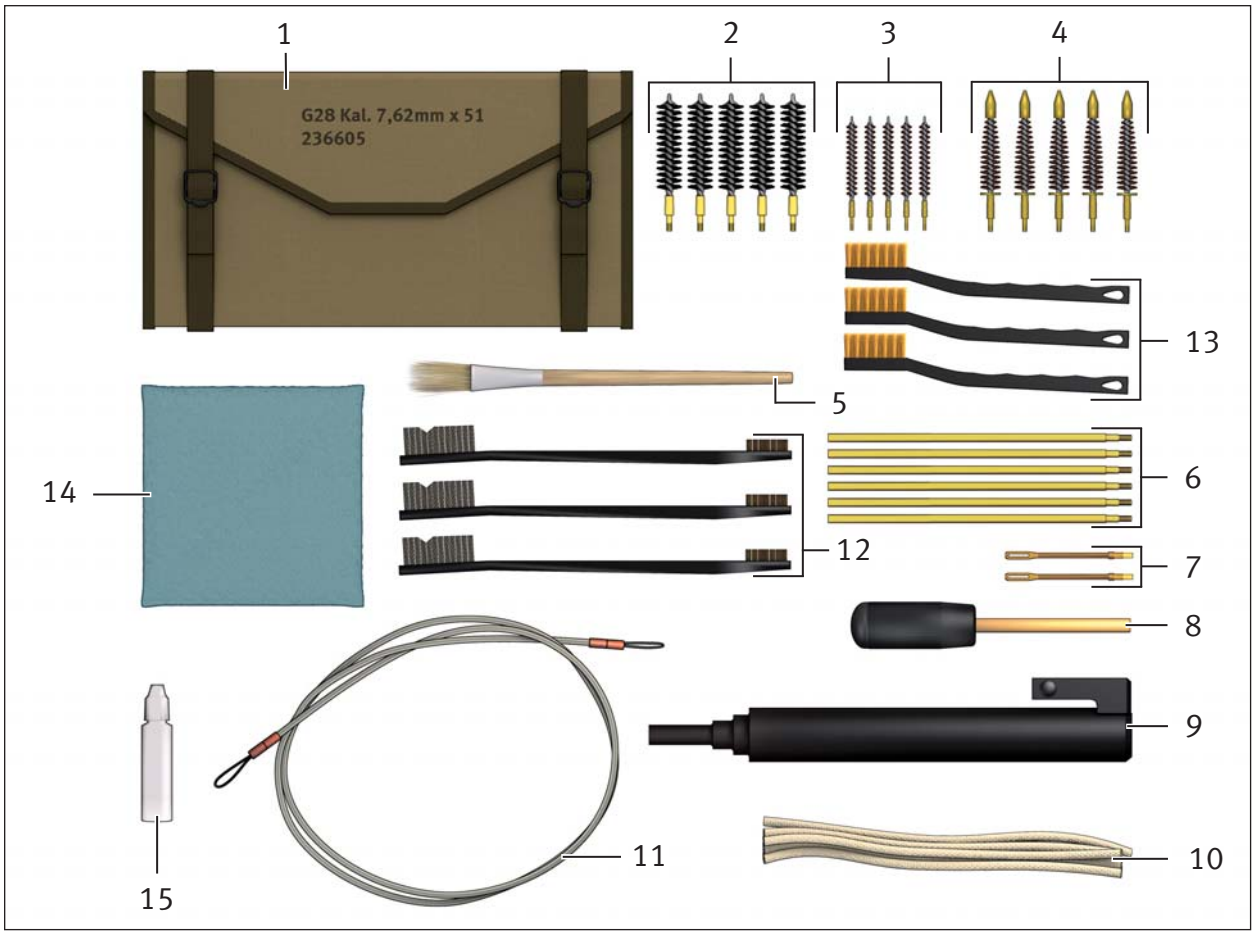


Fig. 23a: NATO 7.62 x 51 mm cal. G28 cleaning kit (HK-Ident.-No. 236 605)

1 *Case for cleaning kit*
2 *Oil brushes*
3 *Barrel cleaning brushes*
4 *Chamber cleaning brushes*
5 *Oil paintbrush*
6 *Cleaning rods*
7 *Pull-through holder*
8 *Cleaning rod with rotatable handle*
9 *Cleaning rod guide*
10 *Cleaning pull-throughs*
11 *Cleaning hose*
12 *Cleaning brush*
13 *Cleaning brush, brass*
14 *Cleaning cloth*
15 *Oil bottle*

5.2 Auxiliary materials

Auxiliary materials are obtainable via the supply chain.

Required auxiliary materials are listed at the beginning of each section.

The following auxiliary materials are required in this manual:

- Grease
- Low-temperature oil (MIL-L-14107), e.g. O-157
- Oil (MIL-L-63460), e.g. S-761
- Oil paper
- Cleaning cloth
- Cleaning pull-throughs (NATO Stock Number 7920-12-131-7354)
- Telescopic sight lens cleaning cloth (NATO Stock Number 6640-12-124-6982)
- Telescopic sight cleaning paintbrush (NATO Stock Number 7920-12-120-0355)

Part II

Handling

6 Checks

6.1 Carrying out a safety check

Successful completion of a safety check verifies that there is no ammunition in the weapon. The safety check is especially important when accepting a weapon and when you are unsure whether or not a weapon is loaded.

1. Remove magazine (*Section 8.8*).
2. Pull charging handle all the way back and hold it (*27a-A*).
3. Push bolt catch/release and hold it (*27a-B*).

⚠ CAUTION

Risk of injury when the bolt group moves forwards quickly!

The bolt group snaps forwards when the bolt catch/release is pushed.

› Do not reach into the path of the bolt group.

4. Push charging handle (*Ia-8*) all the way forwards and lock it.
5. Look into the chamber. There must not be any cartridge in the chamber (*27 a- C*). If there is a cartridge in the chamber, then a fault is present (*Section 10*).
6. Push bolt catch/release. The bolt group (*18a-6*) snaps forwards.
7. Click safety lever (*Ia-11*) to the “Single fire” position.
8. Pull trigger (*Ia-12*). The hammer (*18a- 11*) is released.
9. Click safety lever to “Safe” position.

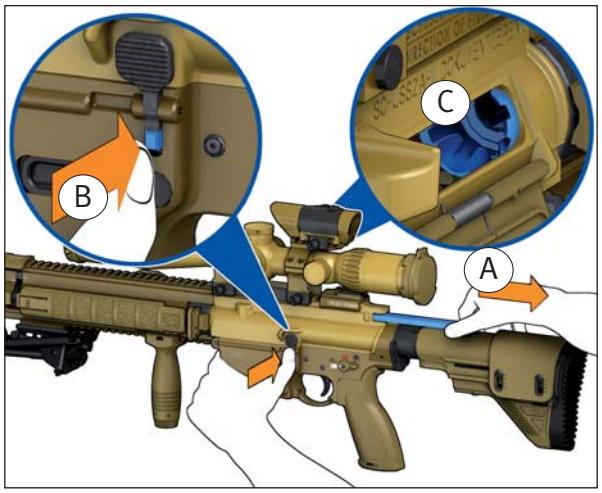


Fig. 27a: Carrying out a safety check

6.2 Carrying out a function check

Successful completion of a function check verifies that the weapon is functional. The function check is especially important after assembly of the weapon and after rectification of faults.

1. Carry out safety check (*Section 6.1*).
2. Remove magazine (*Section 8.8*).
3. Move charging handle (*Ia-8*) backwards and forwards all the way several times.
4. Let charging handle snap forwards.
5. Click safety lever (*Ia-11*) to “Safe” position.
6. Pull trigger (*Ia-12*). The hammer (*18a-11*) is not released.
7. Click safety lever to the “Single fire” position.
8. Pull trigger and hold it. The hammer is released.
9. Move charging handle backwards and forwards all the way several times.
10. Release trigger. The disconnector (*18a-12*) releases the hammer.
11. Pull trigger. The hammer is released.
12. Insert empty magazine (*IIa-10*) into the weapon until the magazine catch (*IIa-12*) engages.
13. Verify that the magazine is firmly seated.
14. Pull charging handle all the way back. The bolt group (*18a-6*) is held in the open position by the bolt catch/release (*Ia-13*).

⚠ CAUTION

Risk of injury when the bolt group moves forwards quickly!

The bolt group snaps forwards when the bolt catch/release is pushed.

› Do not reach into the path of the bolt group.

15. Push charging handle all the way forwards and lock it.
16. Push bolt catch/release. The bolt group snaps forwards.
17. Remove magazine.
18. Pull trigger. The hammer is released.
19. Click safety lever to “Safe” position.

7 Preparations

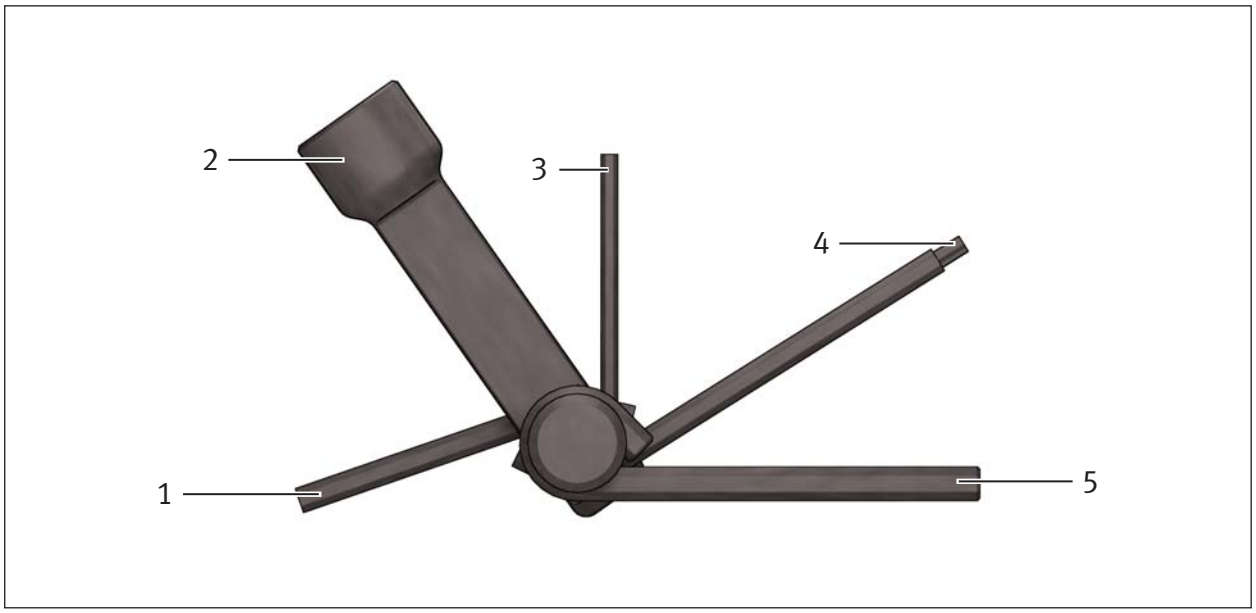


Fig. 29a: Multi-purpose tool

1	*3 mm Allen key*	*4*	*Torx key 10*
2	*Tool, jaw-size 11 mm*	*5*	*4 mm Allen key*
3	*Disassembly tool*		

7.1 Adjusting the buttstock

Required auxiliary materials:

- *Multi-purpose tool*

The buttstock can be locked in four positions.

1. Rotate cover of pistol grip 90° anti-clockwise.
2. Remove cover.
3. Remove multi-purpose tool (*29a*) from the pistol grip. ››

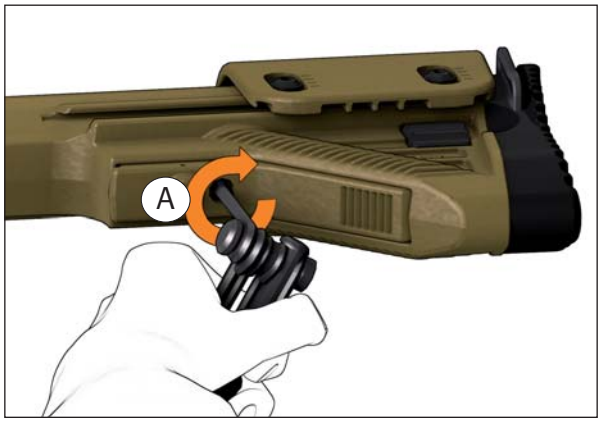


Fig. 29b: Inserting the Allen key in the threaded pin

4. Insert 4 mm Allen key (*29a-5*) in threaded pin.
5. Loosen threaded pin by turning anti-clockwise using 4 mm Allen key.
6. Press release lever for buttstock (*IIa-16*) and hold it.
7. Slide buttstock (*IIa-2*) to desired position.
8. Release the release lever for buttstock.
9. Slide buttstock until it locks in desired position.
10. Tighten threaded pin by turning clockwise (*29b-A*).

The buttstock is fixed and can no longer be moved.

11. Stow multi-purpose tool in pistol grip.
12. Insert cover into pistol grip.
13. Rotate cover 90° clockwise.

The extension wheel (*IIa-17*) is used to make fine adjustments of the buttstock cap (*Ia-10*).

14. Turn extension wheel clockwise to extend buttstock cap (*30a-A*).
15. Turn extension wheel anti-clockwise to reduce buttstock cap (*30a-A*).

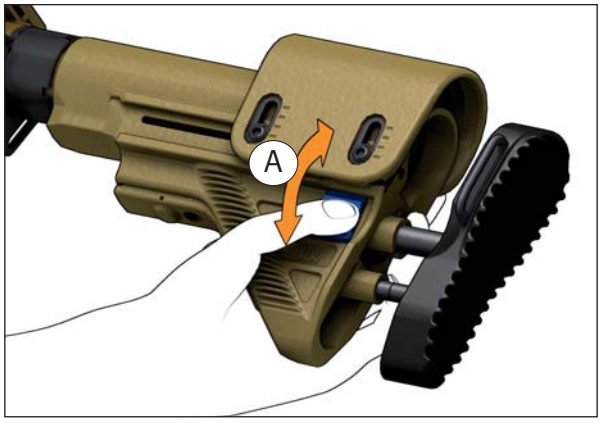


Fig. 30a: Turning the extension wheel

7.1.1 Adjusting the height of the cheek rest

Required auxiliary materials:

- *Multi-purpose tool*

1. Rotate cover of pistol grip 90° anti-clockwise.
2. Remove cover of pistol grip.
3. Take out multi-purpose tool (*29a*).
4. Insert 3 mm Allen key (*29a-1*) in screw.
5. Loosen both screws by turning anti-clockwise using 3 mm Allen key (*31a-A*).
6. Slide cheek rest to desired position (*31a-B*).
7. Tighten screws by turning clockwise using 3 mm Allen key.
8. Stow multi-purpose tool in pistol grip.
9. Insert cover into pistol grip.
10. Rotate cover 90° clockwise.

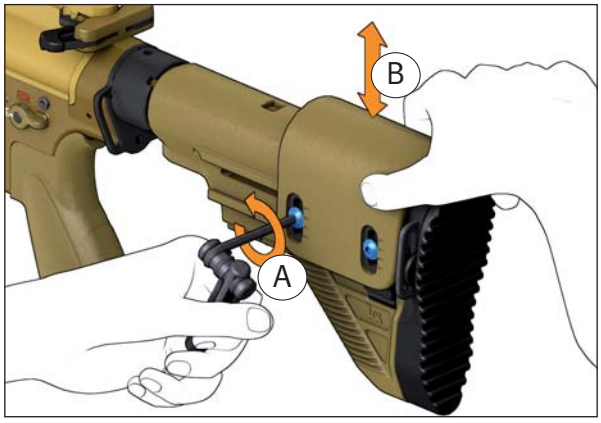


Fig. 31a: Sliding the cheek rest to the desired position

7.1.2 Removing the cheek rest

Required auxiliary materials:

- *Multi-purpose tool*

1. Rotate cover of pistol grip 90° anti-clockwise.
2. Remove cover of pistol grip.
3. Take out multi-purpose tool (*29a*).
4. Insert 3 mm Allen key (*29a-1*) in screw.
5. Loosen screws by turning anti-clockwise using 3 mm Allen key (*32a-A*).
6. Remove screws.
7. Remove cheek rest (*32a-B*).
8. Stow multi-purpose tool in pistol grip.
9. Insert cover into pistol grip.
10. Rotate cover 90° clockwise.

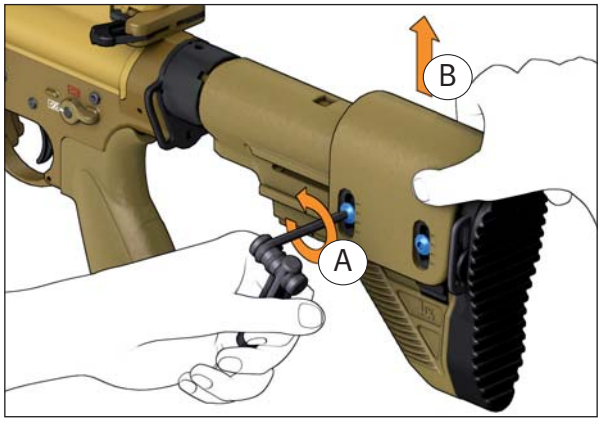


Fig. 32a: Removing the cheek rest

7.2 Using the carrying sling

7.2.1 Mounting the carrying sling on the weapon

The carrying sling can be attached to the plate or the buttstock.

1. Thread front loop of carrying sling (*33 a-1*) into front eye for carrying sling (*33a-2*).
2. Thread rear loop of carrying sling (*33 b- 2*) into rear eye for carrying sling (*33 b- 1*) or plate (*33 c-1*).

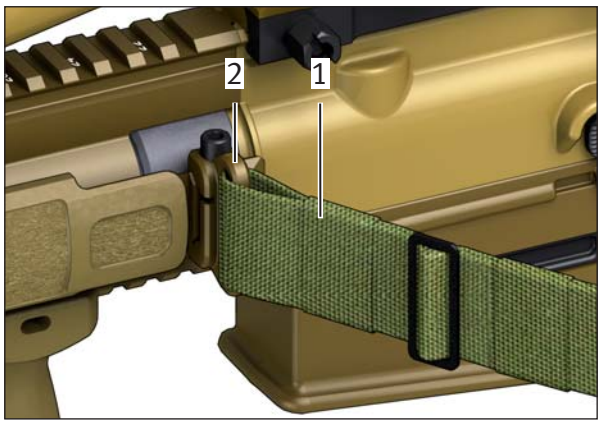


Fig. 33a: Attaching the carrying sling

1 Loop, front
2 Eye for carrying sling, front

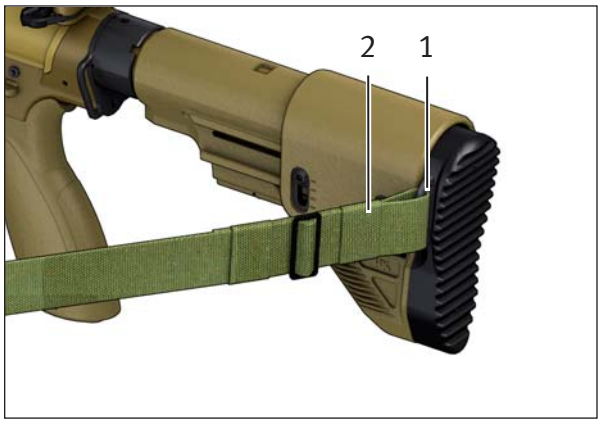


Fig. 33b: Attaching the carrying sling

1 Eye for carrying sling, rear
2 Loop, rear

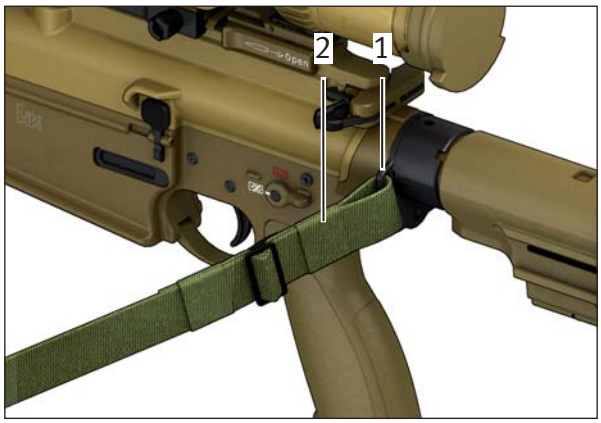


Fig. 33c: Attaching the carrying sling

1 Plate
2 Loop, rear

7.2.2 Carrying method

Right-handed shooters wear the carrying sling over the right shoulder. Left-handed shooters wear the carrying sling over the left shoulder.

1. Pull carrying sling over head and shoulder (*34a*).
2. Adjust length of carrying sling with front buckle (*34b-2*) and rear buckle (*34b-4*).

Fig. 34a: Pulling the carrying sling over head and shoulder

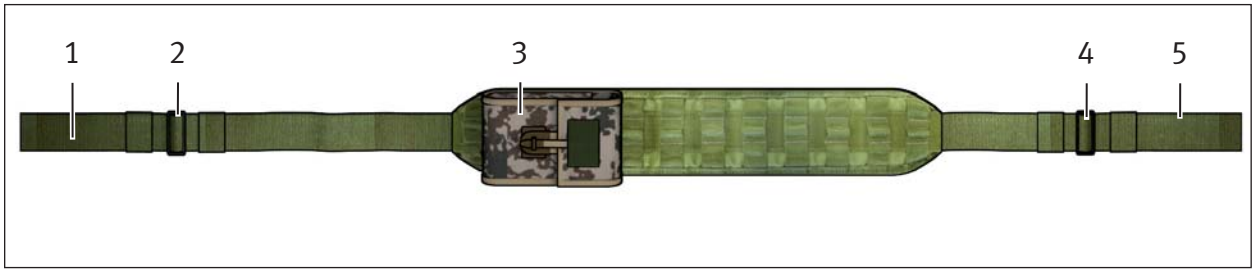


Fig. 34b: Carrying sling

1 Loop, front
2 Buckle, front
3 Magazine pouch for 20-cartridge magazine, detachable
4 Buckle, rear
5 Loop, rear

7.3 Fitting the telescopic sight protective case on the weapon

1. Place telescopic sight protective case (*35a-1*) over the 3-20 x 50 telescopic sight.
2. Thread rear retaining loop (*35a-3*) behind pistol grip (*IIa-14*).
3. Thread front retaining loop (*35a-2*) behind forward grip (*Ia-15*).

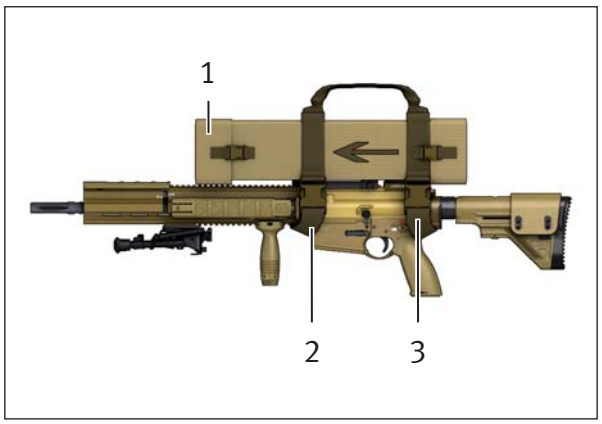


Fig. 35a: Fitting the telescopic sight protective case

1 Telescopic sight protective case
2 Retaining loop, front
3 Retaining loop, rear

Fig. 35b: Position of the telescopic sight protective case

7.4 Carrying the weapon with the telescopic sight protective case

› Fit the telescopic sight protective case on the weapon (*Section 7.3*).

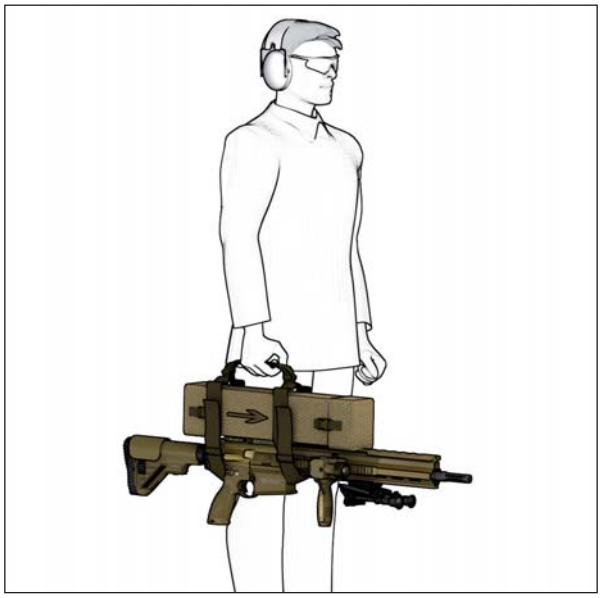


Fig. 36a: Carrying the weapon with the telescopic sight protective case

7.5 Using the weapon with a silencer

Firing with a silencer places greater stress on the weapon and thus contributes to faster wear and heavier fouling. If the weapon is used with a silencer, the weapon must be cleaned and lubricated more heavily at intervals of 500 rounds.

An incorrectly adjusted gas nozzle (*Ia-19*) can compromise the functional reliability of the weapon.

Replace the silencer with a new one after 2000 fired rounds.

⚠ WARNING

Risk of injury from hot silencer!

The silencer heats up during firing.

› Let silencer cool off for at least 15 minutes after firing.

Required auxiliary materials:

- *Multi-purpose tool*

1. Rotate cover of pistol grip 90° anti-clockwise.
2. Remove cover of pistol grip.
3. Take out multi-purpose tool (*29a*).
4. Insert 4 mm Allen key (*29a-5*) into gas nozzle (*Ia-19*).
5. Click the adjustable gas nozzle to position “S” (silencer) with 4 mm Allen key (*38b*).
6. Stow multi-purpose tool in pistol grip.
7. Insert cover into pistol grip.
8. Rotate cover 90° clockwise. ››

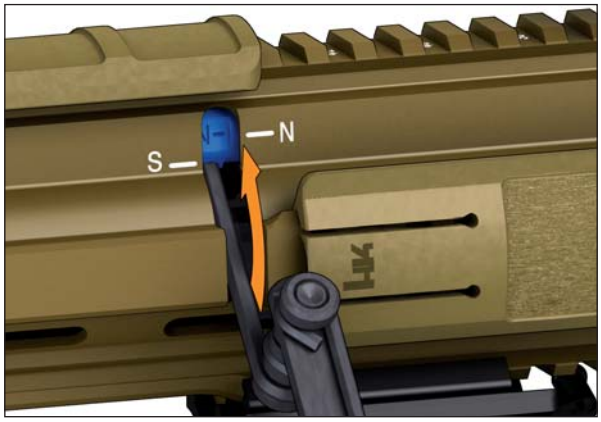


Fig. 37a: Rotating the adjustable gas nozzle

8. Fit silencer. See Operator's manual on silencers for further information.
9. After removal of silencer, return adjustable gas nozzle to position "N" (normal) with 4 mm Allen key (*38a*).

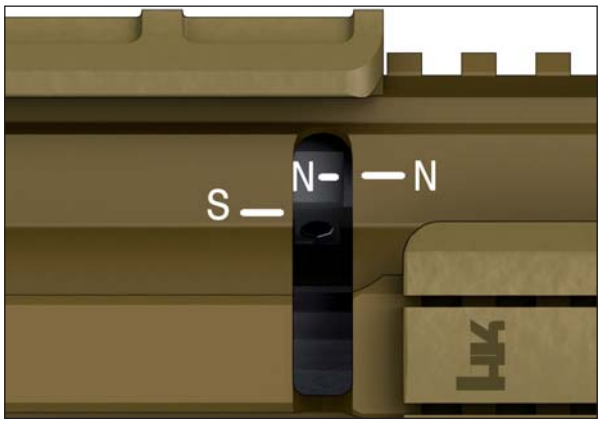


Fig. 38a: Gas nozzle at position "N"

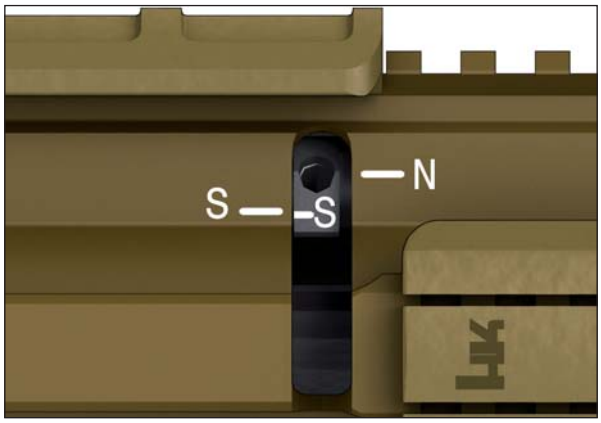


Fig. 38b: Gas nozzle at position "S"

7.6 Filling the magazine

NOTICE

Danger of material damage due to damaged or fouled cartridges!

Damaged or fouled cartridges can damage the weapon and cause malfunctions.

› Do not use damaged or fouled cartridges.

NOTICE

Danger of material damage from an overfilled magazine!

An overfilled magazine can lead to malfunctions.

› Do not fill the magazine with more than the number of cartridges indicated on the magazine.

NOTICE

Danger of material damage from keeping a magazine filled for long periods!

Keeping a magazine filled for long periods can result in damage to the magazine spring and cause malfunctions.

› Empty the magazine before you place the weapon in storage (*Section 8.11*).

1. Take hold of magazine (*IIa-10*).
2. Push cartridge under the magazine lips (*IIa-10a*) (*40a-A*). ››

NOTICE

Danger of material damage from tracer ammunition!

Firing of tracer ammunition (DM21 A2, NATO interchangeability designation: AB24) is permitted only in combat, since combustion residue from the tracer charge in the round damages the barrel and decreases accuracy.

› Use tracer ammunition (DM21 A2, NATO interchangeability designation: AB24) only in operational emergency situations.

3. Push cartridge to the rear as far as it will go (*40a-B*).
4. Repeat steps 2. - 3. until the magazine is full.

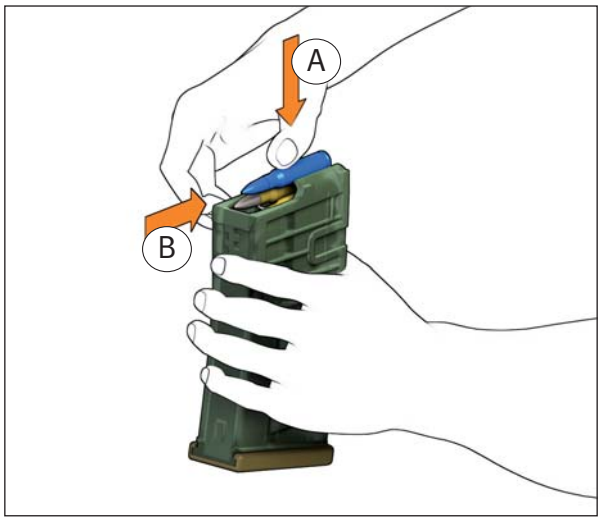


Fig. 40a: Filling the magazine

7.7 Preparing the weapon for firing

Required auxiliary materials:

- *Cleaning pull-throughs*

1. Disassemble the weapon (*Section 9.2*).
2. Screw together cleaning rod with rotatable handle (*23a-8*), two cleaning rods (*23a-6*) and pull-through holder (*23a-7*).
3. Place at least three clean cleaning pull-throughs (*23a-10*) in pull-through holder.

During cleaning do not rest the weapon on the red-dot sight or telescopic sight.

4. Push locking pin of cleaning rod guide (*62a-1*) in all the way to the left.
5. Insert cleaning rod guide (*23a-9*) from the rear all the way into the upper receiver (*62a- A*).
6. Push locking pin of cleaning rod guide in all the way to the right (*62a-B*).
7. Pull clean cleaning pull-throughs from the rear through the barrel (*Ia-2*) several times until the barrel is free of oil and foreign bodies.
8. Remove cleaning rod guide from upper receiver.
9. Visually check weapon for damage.
10. Assemble weapon (*Section 9.4*).
11. Carry out function check (*Section 6.2*).
12. Open ocular port cover (*16a-5*) and objective lens port cover (*16a-1*).
13. Click opened ocular and objective lens port covers into place on 3-20 x 50 telescopic sight.

7.8 Additional preparations in unusual climatic conditions

High air humidity and ambient temperatures between -35 °C and +40 °C do not require any special measures.

In cold conditions, freezing condensation can compromise the functional reliability of the weapon. To prevent the formation of condensation, do not bring the weapon from cold conditions into warm conditions and shortly thereafter again into cold conditions.

Required auxiliary materials:

- *Oil*
- *Low-temperature oil*

› When there are high concentrations of dust or temperatures above +40 °C, lubricate the lubrication points of the bolt group (*64a*) and the lubrication points of the functional elements (*64b*) more heavily.

› At temperatures below -35 °C, lubricate all moving parts of the weapon with low-temperature oil.

8 Operation

8.1 Inserting the magazine

1. Fill magazine (*Section 7.6*).
2. Click safety lever (*Ia-11*) to the “Safe” position.
3. Hold filled magazine (*IIa-10*) by the base and insert into weapon until magazine catch (*IIa-12*) clicks into place.

8.2 Chambering a round

⚠ WARNING

Risk of injury from accidental discharge of weapon!

A weapon with a round in the chamber is always a potential source of danger.

› Load the weapon only immediately before firing.

› Unload the weapon immediately after firing (*Section 8.10*).

1. Insert magazine into weapon (*Section 8.1*).
2. Pull charging handle (*Ia-8*) all the way back.
3. Let charging handle snap forwards. The weapon now has a round in the chamber and is set to “Safe”.

8.3 Chambering a round silently

⚠ WARNING

Risk of injury from accidental discharge of weapon!

A weapon with a round in the chamber is always a potential source of danger.

› Load the weapon only immediately before firing.

› Unload the weapon immediately after firing (*Section 8.10*).

1. Insert magazine into weapon (*Section 8.1*).
2. Pull charging handle (*Ia-8*) all the way back and hold it.
3. Move charging handle slowly forwards.
4. Press forward assist (*IIa-3*) with thumb or heel of hand and close bolt group (*18a-6*) fully until it snaps audibly and tangibly into place.

8.4 Chambering a round with one hand

If an arm or hand is wounded in combat, chambering a round with one hand is permissible.

⚠ WARNING

Risk of injury from accidental discharge of weapon!

A weapon with a round in the chamber is always a potential source of danger.

› Load the weapon only immediately before firing.

› Unload the weapon immediately after firing (*Section 8.10*).

Initial state: After the last round is fired the magazine is empty. The follower pushes the bolt catch/release upwards. Bolt group is held in rear position.

1. Insert magazine (*Section 8.1*).
2. Hold weapon by the handguard (*IIa-8*).

⚠ CAUTION

Risk of injury when the bolt group moves forwards quickly!

The bolt group snaps forwards when the bolt catch/release is pushed.

› Do not reach into the path of the bolt group.

⚠ DANGER

Risk of death from gunshot wounds!

Accidental discharge of weapon may occur when loaded weapon is handled inappropriately.

› Follow the safety instructions when handling the weapon.

› Do not point the muzzle under any circumstances at yourself or comrades.

3. Ram weapon buttstock (*IIa-2*) into the ground until bolt group (*18a-6*) closes and locks. The weapon now has a round in the chamber and is set to “Safe”.

8.5 Firing position and aiming

The supported shoulder firing position is the most stable and provides the best probability of hitting. Where possible, provide also rear support for the weapon, e.g. with a sandbag.

⚠ WARNING

Risk of injury from recoil!

The weapon's recoil can cause serious injury.

› When firing, pull the weapon firmly into your shoulder.

› When firing keep your eye at least 9 cm away (*45a-A*) from the 3-20 x 50 telescopic sight.

› Keep your hands out of the path of the bolt group when firing.

8.5.1 Firing position

› Rest weapon on the handguard (*IIa-8*) or bipod (*Ia-18*).

› Do not rest weapon on the barrel (*Ia-2*) or magazine (*IIa-10*).

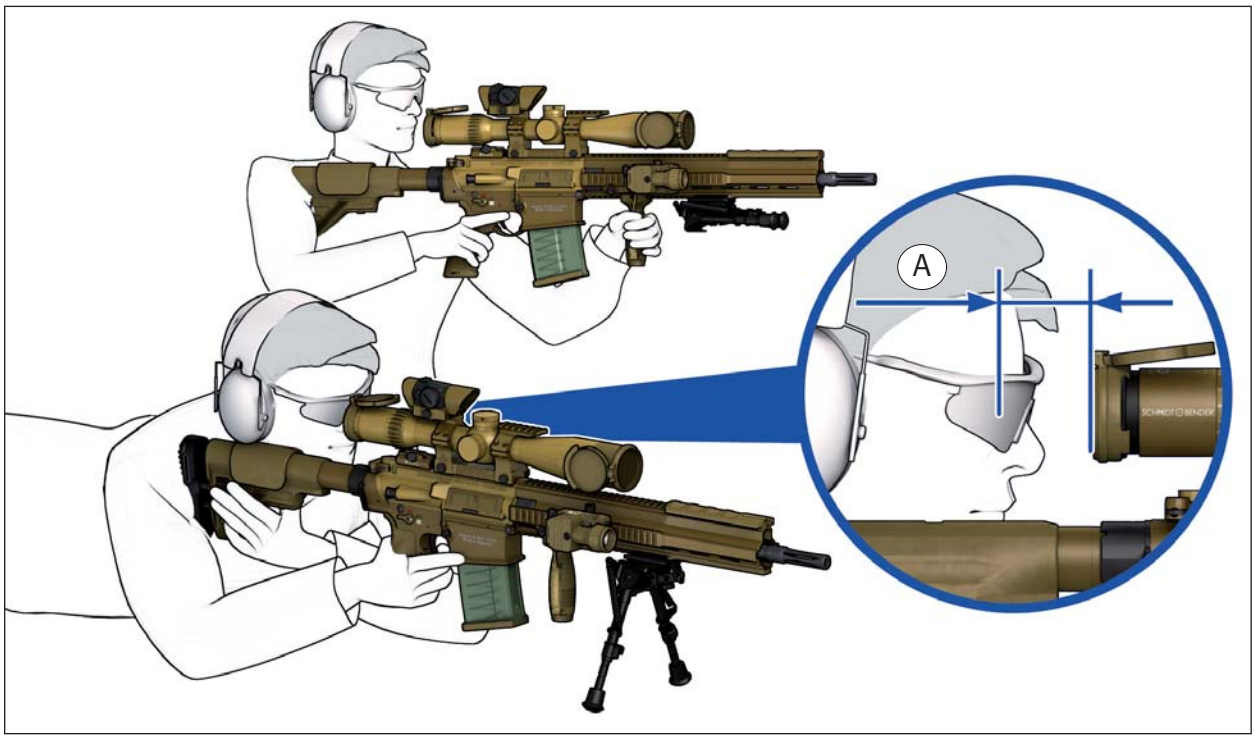


Fig. 45a: Firing position

8.5.2 Firing position with telescopic sight protective case

1. Open both front couplings (*46a-1*) of telescopic sight protective case.
2. Remove front cover for telescopic sight protective case (*46a-2*).
3. Open both rear couplings (*46a-3*) of telescopic sight protective case.
4. Remove rear cover for telescopic sight protective case (*46a-4*).

› Rest weapon on the handguard (*IIa-8*) or bipod (*Ia-18*).

› Do not rest weapon on the barrel (*Ia-2*) or magazine (*IIa-10*).

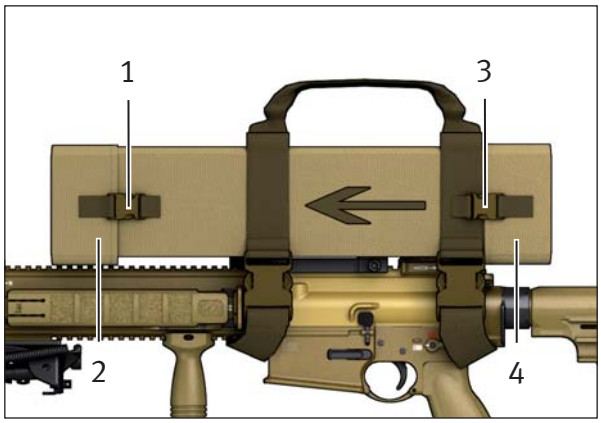
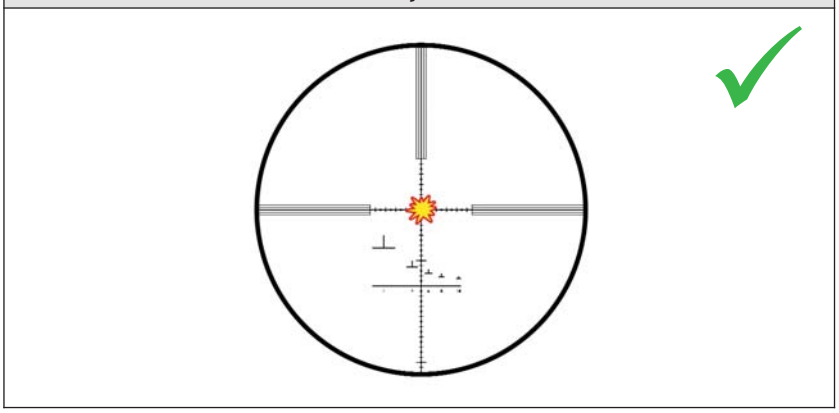


Fig. 46a: Telescopic sight protective case

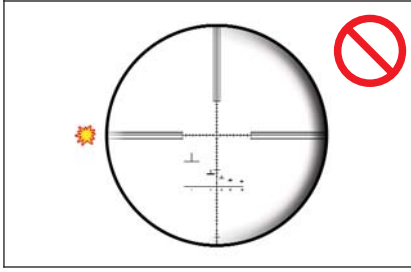
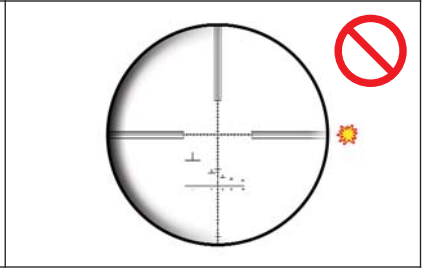
1 Coupling, front
2 Cover for telescopic sight protective case, front
3 Coupling, rear
4 Cover for telescopic sight protective case, rear

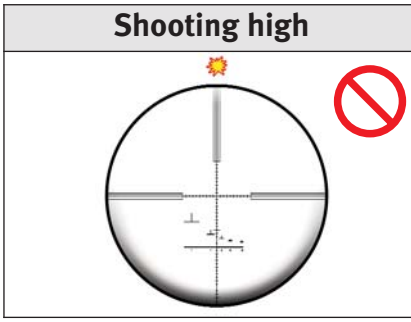
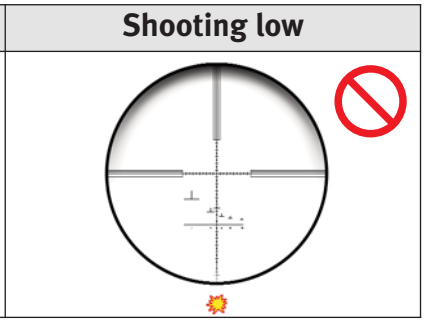
8.5.3 Aiming with 3-20 x 50 telescopic sight

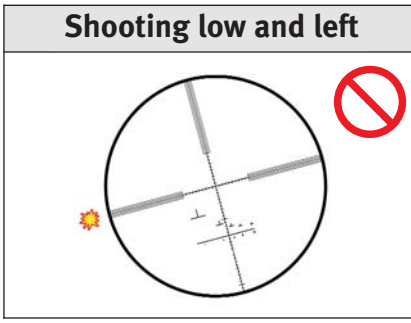
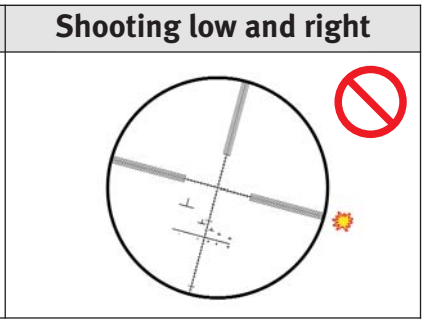
- Correct aiming

Point of impact centred


- Aiming errors

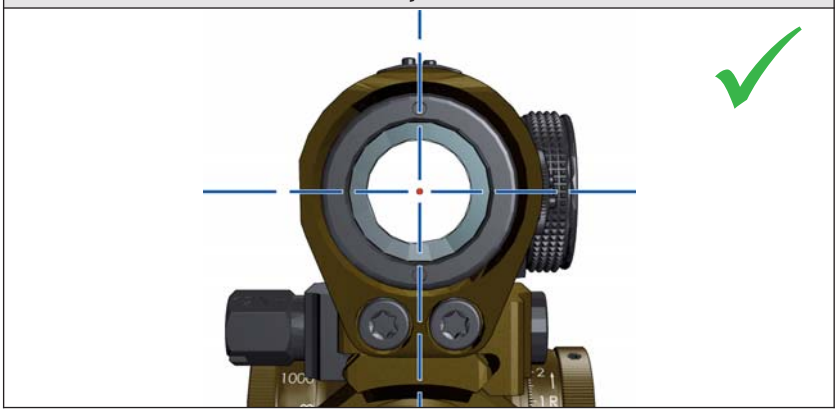
Shooting left	Shooting right
	

Shooting high	Shooting low
	

Shooting low and left	Shooting low and right
	

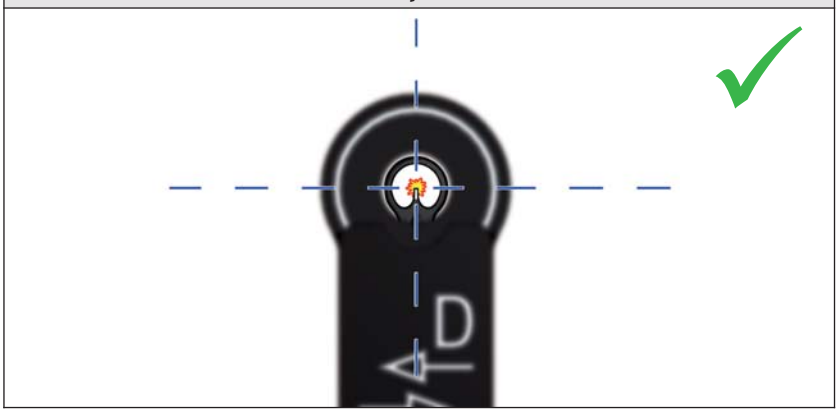
8.5.4 Aiming with Micro T1 red-dot sight

- Correct aiming

Point of impact centred


8.5.5 Aiming with mechanical dioptre sight

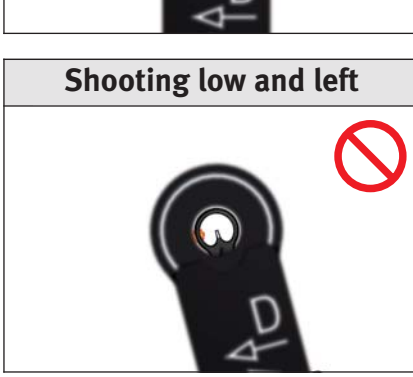
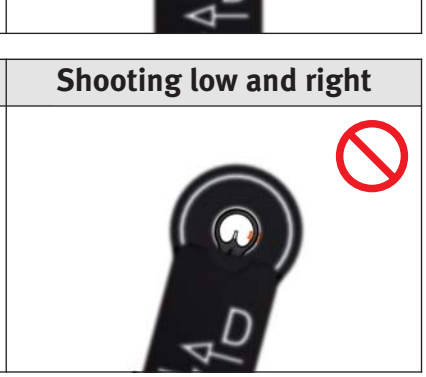
- Correct aiming

Point of impact centred


- Aiming errors

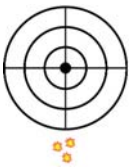
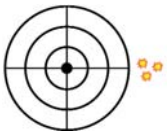
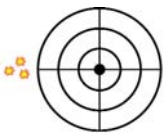
Shooting left	Shooting right
	

Shooting high	Shooting low
	

Shooting low and left	Shooting low and right
	

8.6 Adjusting the mechanical sights

The position of point of impact also depends on the ammunition. Use of different types of ammunition can change the elevation and windage of the position of point of impact. The sights can be adjusted to correct for the changed position of point of impact.

Position of point of impact	Corrective measures	Information
	1. Raise diopter (*50a-A*). 2. Turn diopter in direction “D” (Down) (*50 a-B*).	Turning the diopter by a half turn changes the position of point of impact by approx. 4 cm at a range of 100 m.
	1. Raise diopter (*50a-A*). 2. Turn diopter in direction “U” (Up) (*50 a- B*).	
	1. Press safety button for windage adjustment screw (*50b-A*). 2. Turn windage adjustment screw in direction “L” (Left) (*50b-B*).	Turning the windage adjustment screw by a quarter-turn changes the position of point of impact by approx. 3 cm at a range of 100 m.
	1. Press safety button for windage adjustment screw (*50b-A*). 2. Turn windage adjustment screw in direction “R” (Right) (*50b-B*).	

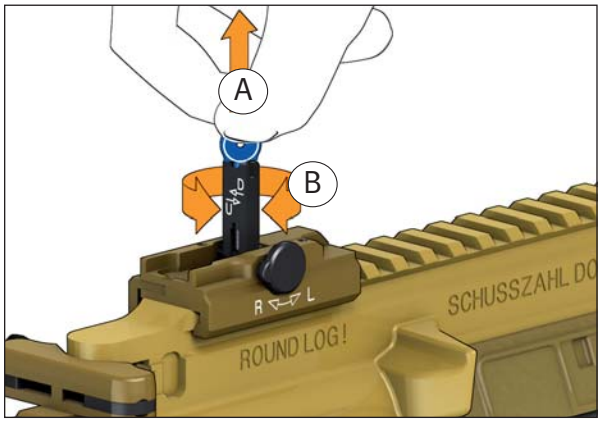


Fig. 50a: Turning the diopter

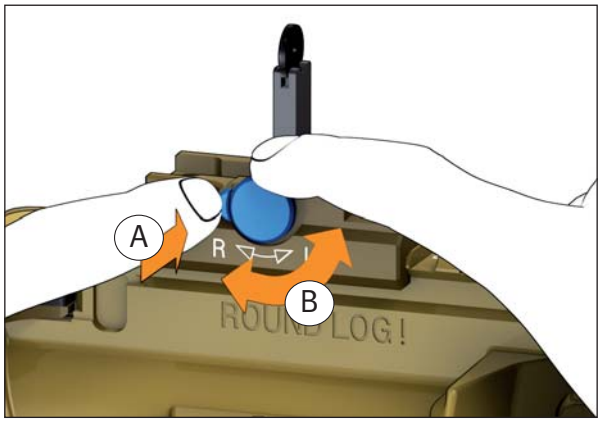


Fig. 50b: Turning the windage adjustment screw

8.7 Firing

Follow safety instructions for firing (*Section 2.3*).

1. Prepare weapon for firing (*Section 7.7*).
2. Chamber a round (*Section 8.2*).
3. Point weapon at target.
4. Click safety lever (*Ia-11*) to the “Single fire” position.

⚠ WARNING

Risk of injury from recoil!

The weapon’s recoil can cause serious injury.

› When firing, pull the weapon firmly into your shoulder.

› When firing keep your eye at least 9 cm away (*45a-A*) from the 3- 20 x 50 telescopic sight.

› Keep your hands out of the path of the bolt group when firing.

5. Take aim (*Section 8.5.3, Section 8.5.4 and Section 8.5.5*).
6. Pull trigger (*Ia-12*). A cartridge is fired.
7. After firing, or to reload, click safety lever to the “Safe” position.

Note the total of fired rounds in the Weapon firing log!

8.8 Removing the magazine

1. Click safety lever (*Ia-11*) to the “Safe” position.

NOTICE

Danger of material damage from dropping the magazine!

Dropping the magazine can damage the magazine lips (*IIa-10a*) and cause malfunctions.

› Remove the magazine by hand.

› Avoid impacts on the magazine lips.

In combat, for rapid change of magazine, the empty magazine may be allowed to fall to the ground.

2. Take hold of magazine (*IIa-10*).
3. Press magazine catch (*52a-A*).
4. Remove magazine (*52a-B*).

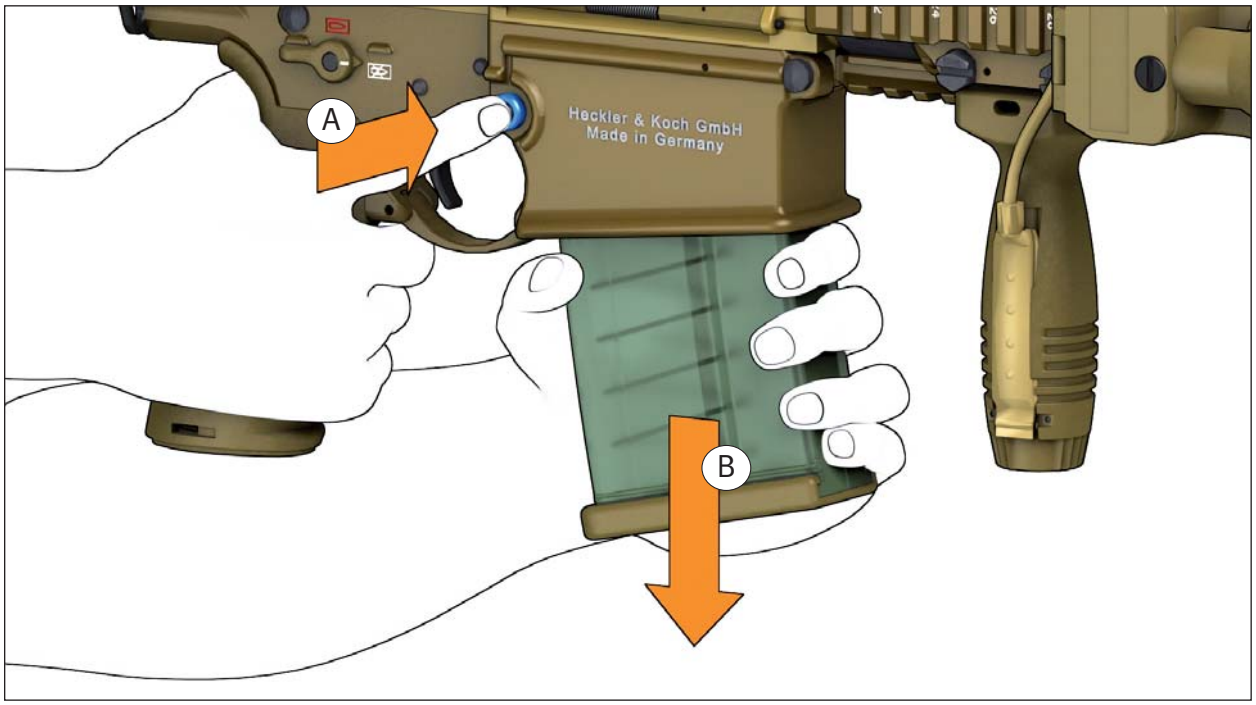


Fig. 52a: Removing the magazine

8.9 Reloading the weapon

⚠ WARNING

Risk of injury from accidental discharge of weapon!

A weapon with a round in the chamber is always a potential source of danger.

› Chamber a round only immediately before firing.

› Unload the weapon immediately after firing (*Section 8.10*).

After the last cartridge in the magazine is fired, the bolt catch/release locks the bolt group in the open position.

1. Remove magazine (*Section 8.8*).
2. Insert magazine into weapon (*Section 8.1*).
3. Push bolt catch/release (*Ia-13*). The bolt group (*18a-6*) snaps forwards.
4. Click safety lever to “Safe” position. The weapon now has a round in the chamber and is set to “Safe”.

8.10 Unloading the weapon

1. Remove magazine (*Section 8.8*).
2. Pull charging handle (*Ia-8*) all the way back and hold it. A cartridge is ejected.
3. Press bolt catch/release (*Ia-13*) and hold it. ››

4. Push charging handle all the way forwards and lock it.

⚠ CAUTION

Risk of injury when the bolt group moves forwards quickly!

The bolt group snaps forwards when the bolt catch/release is pushed.

› Do not reach into the path of the bolt group.

5. Look into the chamber (*18a-3*). There must not be any cartridge in the chamber. If there is a cartridge in the chamber, then a fault is present (*Section 10*).
6. Push bolt catch/release. The bolt group (*18a-6*) snaps forwards.
7. Click safety lever (*Ia-11*) to the “Single fire” position.
8. Pull trigger (*Ia-12*). The hammer (*18a-11*) is released.
9. Click safety lever to the “Safe” position.

8.11 Empty the magazine

⚠ WARNING

Risk of injury from igniting the cartridges!

Impacts to the primer can ignite the cartridge.

› Slide the cartridges into your hand as you empty the magazine.

› Prevent any impacts to the primer.

› Prevent cartridges from falling.

› Slide cartridges forwards out of the magazine (*IIa-10*).

9 Cleaning

9.1 General instructions for cleaning

Regular cleaning and care of the weapon and accessories

- maintain functional reliability and accuracy,
- increase service life,
- prevent accidents, and
- save repair costs and time.

› Clean weapon each time it is fired and at intervals of 1000 rounds.

› Clean weapon each time it is fired with a silencer and at intervals of 500 rounds.

NOTICE

Risk of material damage from the use of excessive force!

The use of excessive force during disassembly, cleaning and assembly can damage the weapon.

› Do not use excessive force when disassembling, cleaning and assembling the weapon.

9.2 Disassembling the weapon

⚠ WARNING

Risk of injury from improperly assembled weapon!

Improper assembly can compromise the safety and functioning of the weapon.

› Only disassemble the weapon to the extent described in this manual.

9.2.1 Disassembling the 3-20 x 50 telescopic sight

Required auxiliary materials:
- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

Except in the case of damage or heavy fouling, the 3-20 x 50 telescopic sight may not be disassembled. Specifically when the weapon and barrel are cleaned, the 3- 20 x 50 telescopic sight remains on the upper receiver.

If the 3-20 x 50 telescopic sight has to be disassembled, zeroing must be carried out after it is re-mounted, in order to check the point of impact.

Fig. 56a: Disassembling the 3-20 x 50 telescopic sight

1. Insert the insert for torque wrench into torque wrench.
2. Loosen locking screws of telescopic sight mount by turning anti-clockwise with torque wrench (*56a*).
3. Remove 3-20 x 50 telescopic sight (*Ia-4*) from upper receiver.

9.2.2 Disassembling the “Merlin LR” night sight adapter

Required auxiliary materials:
- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

1. Insert the insert for torque wrench into torque wrench.
2. Loosen locking screws of mount for “Merlin LR” night sight adapter by turning anti-clockwise with torque wrench.
3. Remove “Merlin LR” night sight adapter from handguard.

9.2.3 Disassembling the “CNDV-T3” thermal imaging adapter

Required auxiliary materials:
- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

1. Insert the insert for torque wrench into torque wrench.
2. Loosen locking screws of mount for “CNDV-T3” thermal imaging adapter by turning anti-clockwise with torque wrench.
3. Remove “CNDV-T3” thermal imaging adapter from handguard.

9.2.4 Disassembling the weapon into assembly groups

Required auxiliary materials:
- *Multi-purpose tool*
- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

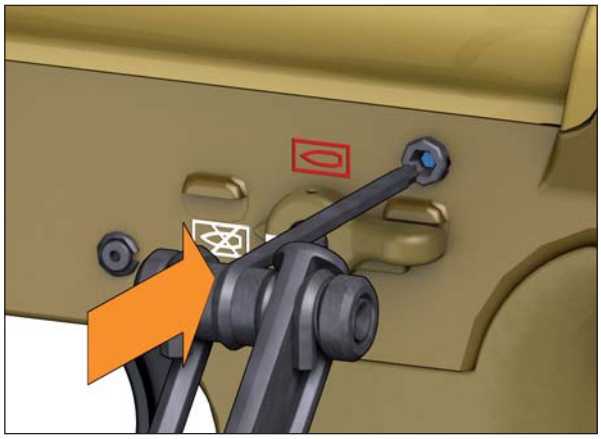


Fig. 57a: Pressing in the rear locking pin with disassembly tool

1. Carry out safety check (*Section 6.1*).
2. Rotate cover of pistol grip 90° anti-clockwise.
3. Remove cover of pistol grip.
4. Take out multi-purpose tool (*29a*).
5. Insert cover into pistol grip.
6. Rotate cover 90° clockwise.
7. Insert disassembly tool (*29a-3*) in the rear locking pin (*IIa-15*).
8. Using disassembly tool, press rear locking pin in (*57a*) and at the same time pull it out to the right as far as disassembly position.
9. Fold lower receiver downwards.
10. Press front locking pin (*IIa-11*) in to the right and pull it out as far as disassembly position.
11. Remove lower receiver.
12. Rotate cover of pistol grip 90° anti-clockwise. ››

13. Remove cover of pistol grip.
14. Stow multi-purpose tool in pistol grip.
15. Insert cover into pistol grip.
16. Rotate cover 90° clockwise.
17. Press buffer (*18a-9*) into extension and hold it.
18. Press in locking pin for recoil spring and hold it (*58a*).
19. Pull buffer and recoil spring (*18a-10*) forwards out of the buttstock.
20. Pull charging handle (*Ia-8*) back.
21. Remove bolt group (*18a-6*) from upper receiver.
22. Remove charging handle from upper receiver.
23. Insert the insert for torque wrench into torque wrench.
24. Loosen locking screws for handguard anti-clockwise with torque wrench (*58b*).
25. Pull locking screws for handguard (*IIa-6*) to the right as far as disassembly position.
26. Pull handguard (*IIa-8*) forwards off barrel (*Ia-2*).

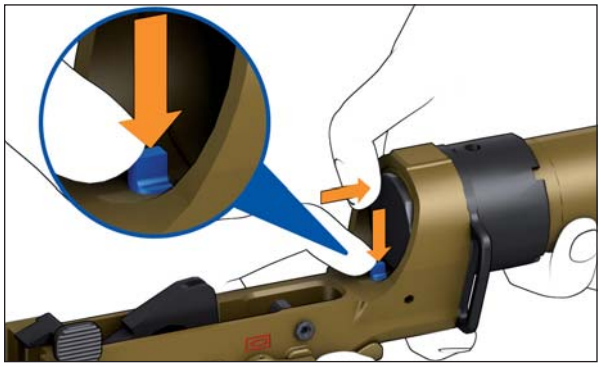


Fig. 58a: Pushing in locking pin for recoil spring

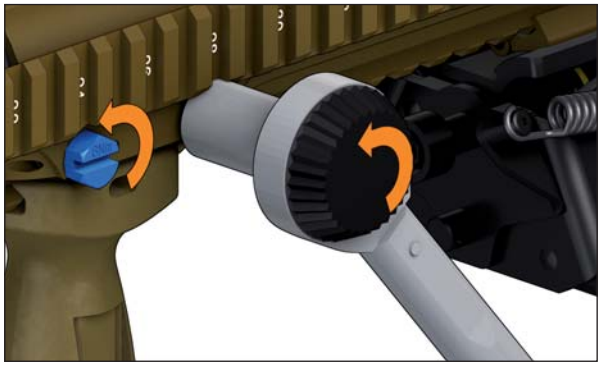


Fig. 58b: Loosening locking screws for handguard

9.2.5 Disassembling parts of the gas drive

1. Disassemble the weapon into assembly groups (*Section 9.2.4*).
2. Pull rod (*59a-3*) to rear and hold it.
3. Pull rod upwards and forwards out of upper receiver (*59a)*.
4. Remove gas piston (*59a-2*) from gas block (*59a-1*).

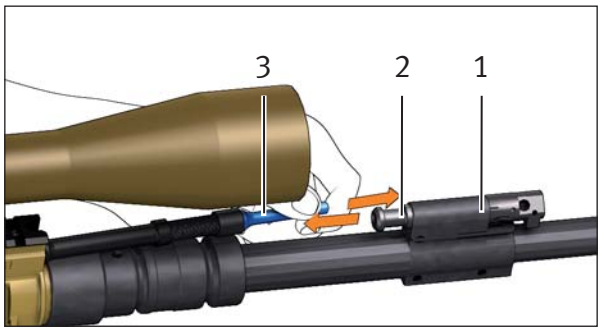


Fig. 59a: Removing the rod

1 Gas block
2 Gas piston
3 Rod

9.2.6 Disassembling parts of the gas drive

To make it easier to disassemble the gas nozzle when there is heavy fouling, oil must be applied to the gas nozzle.

1. Disassembling parts of the gas drive (*Section 9.2.5*).
2. Push leaf spring down and hold it (*59 b- A*).
3. Turn gas nozzle clockwise as far as it will go (*59b-B*).
4. Remove gas nozzle (*59b-C*).

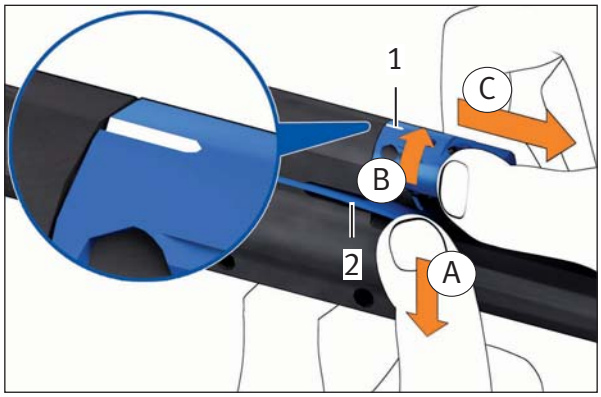


Fig. 59b: Push leaf spring down

1 Gas nozzle
2 Leaf spring

9.2.7 Disassembling the bolt group

1. Disassemble the weapon into assembly groups (*Section 9.2.4*).
2. Push locking pin (*60a-7*) into bolt head carrier (*60a-3*) from the right.
3. Pull locking pin out of the bolt head carrier to the left as far as will go.
4. Lift firing pin safety (*60a-4*).
5. Take firing pin (*60a-6*) and pressure spring for firing pin (*60a-5*) to the rear and out of the bolt head carrier.
6. Pull control bolt (*60a-2*) out of bolt head (*60a-1*).
7. Pull bolt head out of bolt head carrier.
8. Rotate cover of pistol grip anti-clockwise.
9. Remove cover.
10. Take multi-purpose tool (*29a*) out of pistol grip.

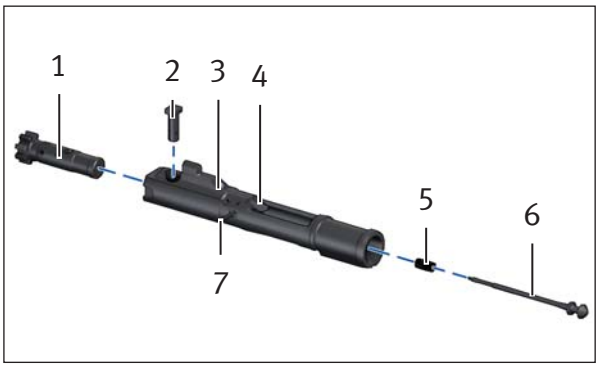


Fig. 60a: Components of the bolt group

1 Bolt head
2 Control bolt
3 Bolt head carrier
4 Firing pin safety
5 Pressure spring for firing pin
6 Firing pin
7 Locking pin

If the ejectors cannot be pushed into the bolt head, send weapon in for repair.

11. Using 4 mm Allen key (*29a-5*), check that ejector (*18a-17*) is functioning. For this, push ejector into bolt head (*18a-4*).
12. Stow multi-purpose tool in pistol grip.
13. Insert cover into pistol grip.
14. Rotate cover of pistol grip clockwise.

9.3 Cleaning the weapon

Required auxiliary materials:

- *Oil*
- *Cleaning pull-throughs*

Note the total of fired rounds in the Weapon firing log!

Clean the barrel from the chamber to the muzzle. The flash hider (*Ia-1*) must be screwed firmly onto the barrel to prevent damage to the muzzle. Always match the number of cleaning pull-throughs to the 7.62 mm calibre. Keep enough cleaning pull-throughs (minimum of three) ready before cleaning.

NOTICE

Risk of material damage from incorrect cleaning agents and care products!

Incorrect cleaning agents and care products can damage the weapon.

› When cleaning the weapon, use the specific cleaning agents.

› Do not use any metallic objects, plastics (nylon, etc.) or chemical cleaning agents (benzine, tetrachlorethylene, trichlor, etc.) and any fuel (kerosene, paraffin, diesel, etc.) to clean the weapon.

› Use of pull-through cleaning chains, steel rods or steel brushes for barrel cleaning is prohibited.

› Do not clean the weapon in an ultrasonic bath.

1. Disassemble the weapon (*Section 9.2*).
2. Visually check the weapon for damage.
3. Clean fouled parts and surfaces using cleaning cloth (*23a-14*).
4. Lubricate cleaned metal parts thinly.
5. Screw together cleaning rod with rotatable handle (*23a-8*), two cleaning rods (*23a-6*) and chamber cleaning brush (*23a-4*).
6. Clean chamber (*18a-3*) with chamber cleaning brush in and against the direction of fire.
7. Add three further cleaning rods to chamber cleaning brush.
8. Insert cleaning rod with rotatable handle from the rear into cleaning rod guide (*23a-9*). ››

9. Screw together barrel cleaning brush and cleaning rods.
10. Push locking pin of cleaning rod guide (*62a-1*) in all the way.
11. Insert cleaning rod guide (*23a-9*) with cleaning rod with rotatable handle and barrel cleaning brushes fully into upper receiver from the rear (*62a-A*).
12. Push locking pin of cleaning rod guide in all the way (*62a-B*).

NOTICE

Danger of material damage if the barrel cleaning brush is not pulled completely through the barrel!

Not pulling the barrel cleaning brush completely through the barrel can damage the inside of the barrel and decrease accuracy.

› Pull the barrel cleaning brush completely through the barrel from the chamber end. This allows the bristles of the barrel cleaning brush to straighten out again. Pull the barrel cleaning brush out of the chamber to the rear in line with the barrel bore axis.

NOTICE

Danger of material damage from incorrect cleaning direction!

It is forbidden to clean the barrel from the muzzle end of the weapon. This damages the barrel and decreases accuracy.

› Clean the barrel only from the chamber end and with the cleaning rod guide inserted.

During cleaning do not rest the weapon on the red-dot sight or telescopic sight.

13. Push lubricated barrel cleaning brush at least 20 times completely through barrel (*Ia-2*) from the rear.
14. Push in locking pin of the cleaning rod guide (*62a-1*) and pull it out as far as it will go.
15. Remove cleaning rod guide with cleaning rod with rotatable handle from upper receiver. ››

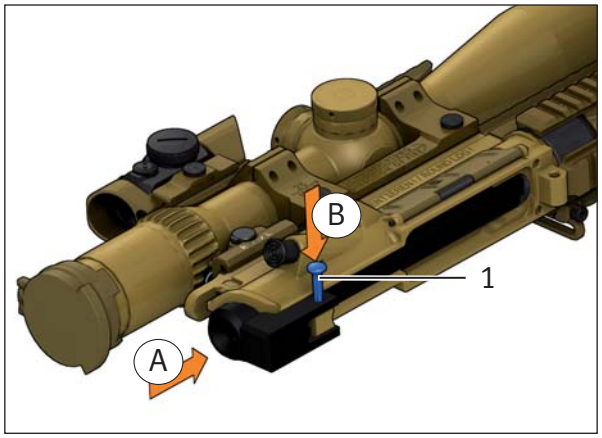


Fig. 62a: Pushing in locking pin of cleaning rod guide

1 Locking pin of cleaning rod guide

16. Replace barrel cleaning brush with pull-through holder (*23a-7*).
17. Insert clean cleaning pull-throughs in pull-through holder.
18. Insert cleaning rod guide with cleaning rod with rotatable handle and pull-through holder with clean cleaning pull-throughs fully into upper receiver from the rear.
19. Push locking pin of cleaning rod guide in all the way.

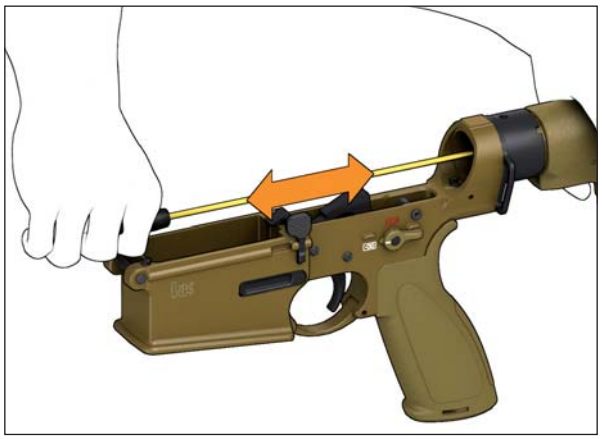


Fig. 63a: Cleaning inside extension

20. Pull clean cleaning pull-throughs through the barrel several times until the barrel is free of oil and foreign bodies.
21. Replace pull-through holder with oil brush (*23a-2*).
22. Pull lubricated oil brush through barrel.
23. Pull out locking pin of the cleaning rod guide as far as it will go.
24. Remove cleaning rod guide from upper receiver.
25. Clean magazine (*IIa-10*) and follower (*IIa-10b*) with cleaning cloth.
26. Screw together chamber cleaning brush with cleaning rod with rotatable handle and two cleaning rods.
27. Wrap chamber cleaning brush in lubricated cleaning cloth.
28. Clean inside extension with lubricated cleaning cloth (*63a*). ››

29. Clean bolt head (*64a-1*) with brass cleaning brush (*23a-13*).
30. Clean inside gas block (*59a-1*) with barrel cleaning brush.
31. Clean inside gas nozzle (*59b-1*) with barrel cleaning brush.
32. Lubricate the gas nozzle thinly.
33. Lubricate the lubrication points of bolt group (*64a*).
34. Lubricate the lubrication points of functional elements (*64b*).
35. Assemble weapon (*Section 9.4*).

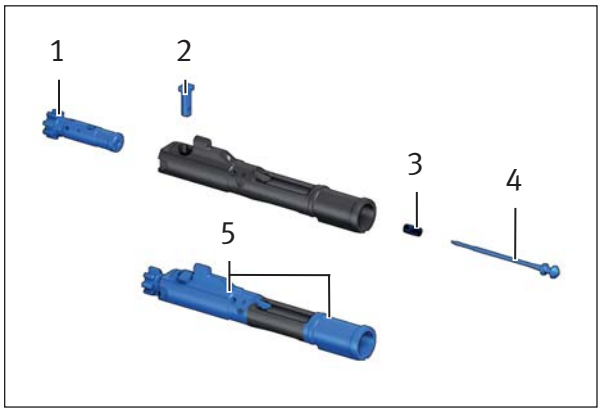


Fig. 64a: Lubrication points of the bolt group

1 Bolt head
2 Control bolt
3 Pressure spring for firing pin
4 Firing pin
5 Operating surfaces of the bolt group

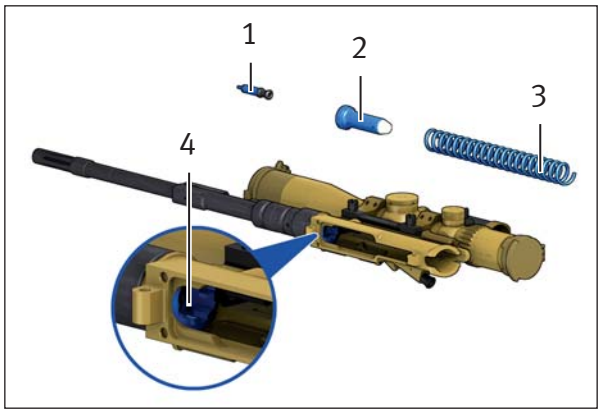


Fig. 64b: Lubrication points of the functional elements

1 Gas piston
2 Buffer
3 Recoil spring
4 Barrel extension

9.4 Assembling the weapon

9.4.1 Assembling the bolt group

1. Insert bolt head in bolt head carrier (*65 a*).
2. Insert control bolt (*65a-1*) into bolt head carrier (*65a-2*) with bore in the longitudinal direction.
3. Push pressure spring for firing pin (*60a- 5*) onto firing pin (*60a-6*).
4. Press firing pin and pressure spring for firing pin from the rear into bolt head carrier as far as they will go and hold them (*65b-A*).
5. Press locking pin completely into bolt head carrier (*65b-B*).

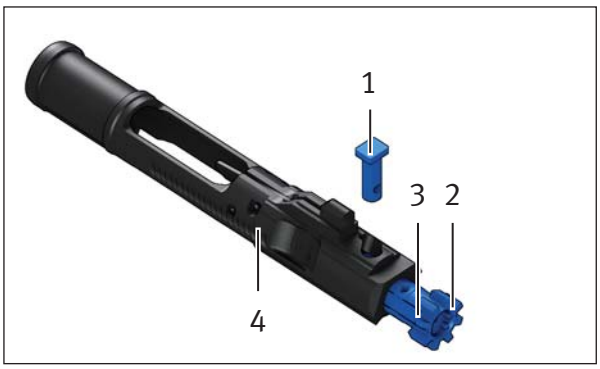


Fig. 65a: Inserting the control bolt

1 Control bolt
2 Bolt head
3 Extractor
4 Bolt head carrier

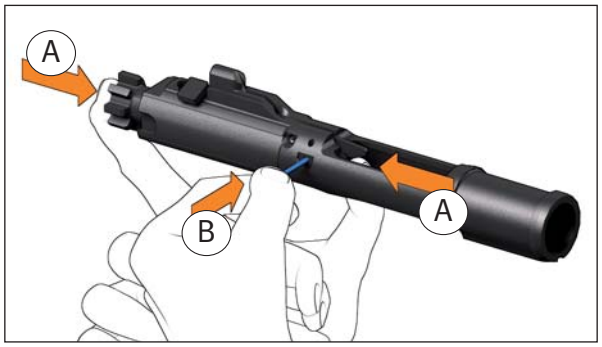


Fig. 65b: Pressing in the locking pin

9.4.2 Assembling the gas nozzle

1. Push leaf spring down and hold it (*66 a- A*).
2. Place gas nozzle against gas block (*66 a-B*).
3. Turn gas nozzle anti-clockwise as far as it will go (*66a-C*).
4. Release leaf spring (*66a-2*). Leaf spring snaps into gas nozzle.
5. Click gas nozzle to position “N” (*38a*), if weapon is being used without silencer.

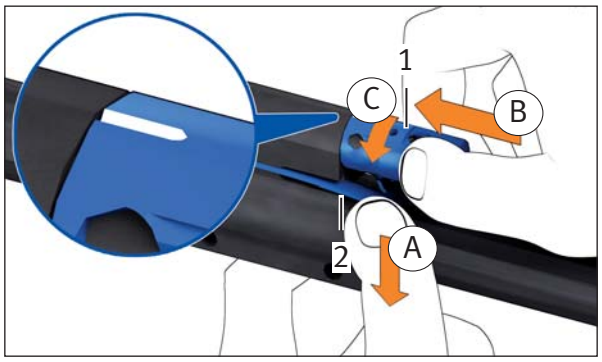


Fig. 66a: Inserting gas nozzle into the gas block

1 Gas nozzle
2 Leaf spring

6. Click gas nozzle to position “S” (*38b*), if weapon is being used with silencer.

9.4.3 Inserting the rod and gas piston

1. Insert gas piston (*66b-2*) into gas block (*66 b-1*).
2. Insert rod into upper receiver in assembly position (*66b*).
3. Press rod (*66b-3*) against spring force towards the rear and insert in gas piston.

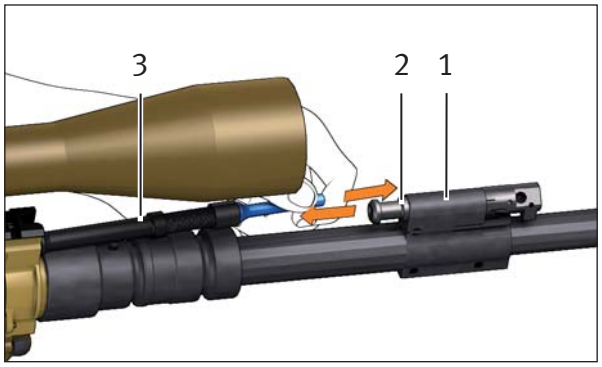


Fig. 66b: Inserting the rod

1 Gas block
2 Gas piston
3 Rod

9.4.4 Assembling the assembly groups

Required auxiliary materials:

- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

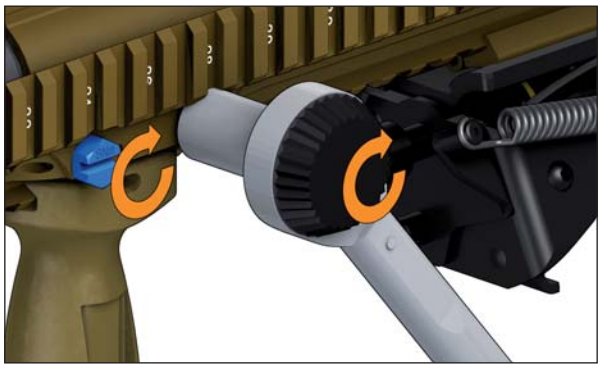


Fig. 67a: Tightening locking screws for handguard

1. Assemble bolt group (*Section 9.4.1*).
2. Assemble gas nozzle (*Section 9.4.2*).
3. Insert rod and gas piston (*Section 9.4.3*).
4. Push handguard (*IIa-8*) onto the barrel (*Ia-2*) from the front as far as it will go.
5. Insert the insert for torque wrench into torque wrench.
6. Set torque wrench to 8 Nm.
7. Press in locking screws for handguard and tighten them with the torque wrench until the torque is reached (*67a*).

The bolt group can only be inserted into the weapon if the bolt head is in the forward position. Otherwise the control bolt blocks the bolt group from being inserted into the upper receiver.

8. Insert charging handle (*Ia-8*) into opening in upper receiver and push it forwards about 5 cm.
9. Pull bolt head (*60a-1*) forwards out of the bolt head carrier (*60a-3*) as far as it will go. ››

10. Engage guide cam of bolt group in guide groove of charging handle (*68a*).
11. Push bolt group (*68a-2*) all the way forwards until charging handle locks.
12. Insert buffer (*18a-9*) into recoil spring (*18a- 10*).
13. Insert buffer with recoil spring into buttstock (*IIa-2*).
14. Push buffer behind locking pin for recoil spring.
15. Using front locking pin (*IIa-11*), insert lower receiver into front bore for locking pin of upper receiver at an angle of about 45°.
16. Push front locking pin in all the way to the left.
17. Swing upper receiver down onto lower receiver as far as it will go (*68b*).
18. Rotate cover of pistol grip 90° anticlockwise.
19. Remove cover of pistol grip.
20. Take out multi-purpose tool (*29a*).
21. Insert cover into pistol grip.
22. Rotate cover 90° clockwise. ››

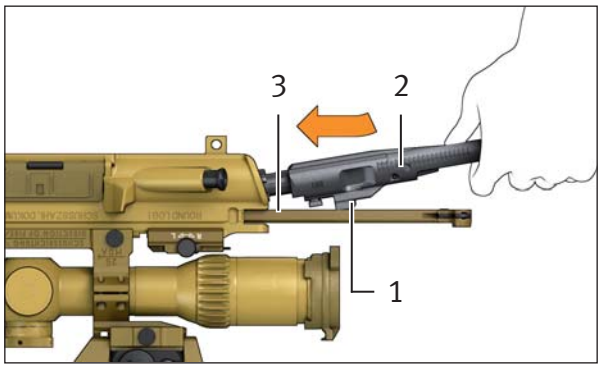


Fig. 68a: Inserting bolt group into charging handle

1 Guide cam of the bolt group
2 Bolt group
3 Guide groove of the charging handle

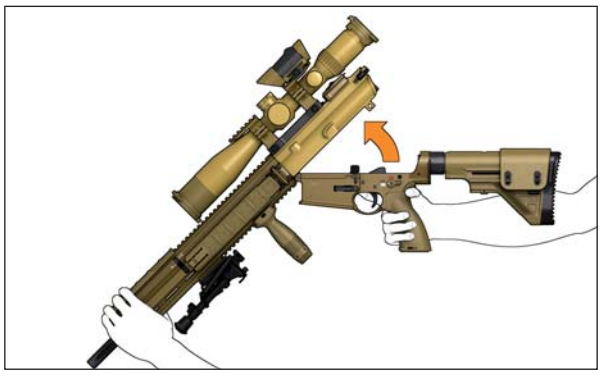


Fig. 68b: Assembling lower receiver and upper receiver

NOTICE

Risk of material damage from the use of excessive force!

Use of excessive force while fitting the locking pins can damage the weapon.

› Do not use excessive force when assembling the weapon.

› Use the multi-purpose tool when fitting the rear locking pin.

23. Insert disassembly tool (*29a-3*) in the rear locking pin (*IIa-15*) and hold it.
24. Push rear locking pin in all the way to the left.
25. Remove cover of pistol grip.
26. Stow multi-purpose tool in pistol grip.
27. Insert cover into pistol grip.
28. Rotate cover 90° clockwise.
29. Carry out function check (*Section 6.2*).

9.4.5 Disassembling the 3-20 x 50 telescopic sight

Required auxiliary materials:
- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

1. Insert the insert for torque wrench into torque wrench.
2. Set torque wrench to 8 Nm.
3. Place 3-20 x 50 telescopic sight on the upper receiver.
4. Tighten locking screws for telescopic sight mount with torque wrench until the torque is reached (*69a*).

Fig. 69a: Tightening the screws of the telescopic sight mount with torque wrench

9.4.6 Assembling the “CNDV-T3” thermal imaging adapter

Required auxiliary materials:
- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

1. Insert the insert for torque wrench into torque wrench.
2. Set torque to 12 ± 1 Nm.

3-20 x 50 telescopic sight and the optronics adapters may not be in contact with each other.

3. Place thermal imaging adapter on handguard.
4. Tighten locking screws for “CNDV-T3” thermal imaging adapter mount clockwise with torque wrench until torque is reached.
5. Pull rubber sleeve over 3-20 x 50 telescopic sight so that no light can emerge between 3- 20 x 50 telescopic sight and the optronics.

9.4.7 Assembling the “Merlin LR” night sight adapter

Required auxiliary materials:
- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

1. Insert the insert for torque wrench into torque wrench.
2. Set torque to 12 ± 1 Nm.

3-20 x 50 telescopic sight and the optronics adapters may not be in contact with each other.

3. Place night sight adapter on handguard.
4. Tighten locking screws for “Merlin LR” night sight adapter mount clockwise with torque wrench until torque is reached.
5. Pull rubber sleeve over 3-20 x 50 telescopic sight so that no light can emerge between 3-20 x 50 telescopic sight and the optronics.

10 Faults: Causes and remedies

Users are strictly prohibited from troubleshooting that goes beyond the scope of this manual! Only authorised specialists may troubleshoot such faults in the weapon.

⚠ WARNING

Safety risk from not knowing whether or not the weapon is loaded!

In the event of a fault, the weapon may be loaded, even if you expect it to be unloaded.

› In the event of a fault, treat the weapon as if a round is chambered and the safety is disengaged.

› In the event of a fault, verify whether the weapon is actually loaded.

› Follow the fundamental safety instructions (*Section 2*) for rectifying faults.

The following points do not constitute a complete list of all the possible faults. Faults/causes other than those named here are also possible.

NOTICE

Risk of material damage from feed or ejection faults!

Feed or ejection faults cam damage the weapon.

› In the event of feed or ejection faults, verify whether the barrel is free (visual check), particularly that there is no round in the barrel.

Fault	Cause	Remedy
Bullet is stuck in the barrel.	Improperly loaded an assembled ammunition.	Send weapon in for repair.
Cartridge has not fired.	Defective ammunition	Wait at least one minute. Unload weapon (*Section 8.10*). Do not re-use cartridges that have failed to fire.
	Firing pin sluggish, damaged or broken.	Send weapon in for repair.
	Hammer defective.	Send weapon in for repair.

Fault	Cause	Remedy
Bolt group does not open after firing.	Defective ammunition	Unload weapon (*Section 8.10*). Clean weapon if necessary (*Section 9.3*). Send weapon in for repair if necessary.
	Gas drive fouled or defective.	Clean gas nozzle. Send weapon in for repair if necessary.
Cartridge or cartridge case is not ejected.	Case rim ripped off.	Unload weapon (*Section 8.10*). Send weapon in for repair if ecessary.
	Chamber is fouled.	Clean chamber.
	Rearward movement of bolt group too short.	Unload weapon (*Section 8.10*). Carry out function check (*Section 6.2*). Check setting of gas nozzle. Clean weapon if necessary (*Section 9.3*). Send weapon in for repair if necessary.
	Defective ammunition	Use different ammunition.
	Extractor, pressure spring for extractor, ejector or pressure spring for ejector damaged.	Send weapon in for repair.
Cartridge is not loaded into the chamber.	Chamber is fouled.	Unload weapon (*Section 8.10*). Clean weapon (*Section 9.3*).
	Cartridge deformed.	Use different cartridge.
	Recoil spring defective.	Send weapon in for repair.

Fault	Cause	Remedy
Cartridge does not feed.	Magazine not correctly inserted.	Insert magazine correctly.
	Magazine spring defective.	Send magazine in for repair.
	Magazine or magazine lips damaged.	Use different magazine.
	Rearward movement of bolt group too short.	Unload weapon (*Section 8.10*). Carry out function check (*Section 6.2*). Check setting of gas nozzle. Clean weapon if necessary (*Section 9.3*). Send weapon in for repair if necessary.
	Rearward movement of bolt group too long.	Check setting of gas nozzle.
Bolt group does not stay in open position after last round.	Magazine spring defective.	Send magazine in for repair.
	Rearward movement of bolt group too short.	Unload weapon (*Section 8.10*). Carry out function check (*Section 6.2*). Check setting of gas nozzle. Clean weapon if necessary (*Section 9.3*). Send weapon in for repair if necessary.
	Rearward movement of bolt group too long.	Check setting of gas nozzle.
	Bolt catch/release damaged.	Send weapon in for repair.
	Defective ammunition	Use different ammunition.

Fault	Cause	Remedy
Magazine sticks in magazine well.	Magazine damaged.	Exchange magazine. Send damaged magazine in for repair.
	Magazine catch defective.	Send weapon in for repair.
Weapon fires with a significantly higher rate of fire.	Gas piston defective.	Send weapon in for repair.
Windage or elevation of point of impact changed.	Sights misaligned.	Adjust sights (*Section 8.6, Section 15.1 and Section 17.1*).
	Other type of ammunition.	Use another type of ammunition or adjust sights (*Section 8.6, Section 15.1 and Section 17.1*).
	Sights damaged.	Send weapon in for repair.

11 Protection, packaging and storage

Protection guards the weapon against external influences and maintains its functional reliability even if it is not used for long periods. If the weapon is expected to be stored for more than 6 months, the weapon must be protected.

If the weapon is expected to be stored for not more than 6 months, then it is sufficient to clean the weapon (*Section 9.3*).

11.1 Protecting the weapon

Required auxiliary materials:

- *Grease*
- *Oil*
- *Oil paper*

1. Clean weapon (*Section 9.3*).
2. Seal both ends of the barrel (*Ia-2*) with grease.
3. Wrap weapon in oil paper.

11.2 Packaging the weapon

With the exception of operational scenarios, the weapon is to be stored and transported in the air-tight and water-tight transport case. The transport case has a pressure valve which must be open for transport by air, to balance the pressure inside the transport case.

1. Unload weapon (*Section 8.10*).
2. Empty the magazine (*Section 8.11*).
3. Package weapon without ammunition in transport case.
4. For transport by air, open pressure valve.

11.3 Storing the weapon

Store the weapon and ammunition separately.

1. Follow applicable regulations for the storage of weapons and ammunition.
2. If the weapon is expected to be stored for more than 6 months, protect the weapon (*Section 11.1*).
3. If the weapon is expected to be stored for not more than 6 months, clean the weapon (*Section 9.3*).
4. Package the weapon (*Section 11.2*).
5. Store the weapon in an enclosed, weather resistant room.

⚠ WARNING

Risk of accidents caused by unauthorised persons!

Unauthorised persons who have no experience with weapons can cause accidents.

› Be sure to prevent access to the weapon and ammunition by unauthorised persons, especially children.

6. Protect rooms where weapons are stored against break-in and fire.

Whenever the weapon is stored for more than 1 year:

7. Check the grease seal on the barrel and the oil film on the metal parts annually.

12 Transport and shipping

12.1 Preparing the weapon for transport

1. Package the weapon (*Section 11.2*).
2. Secure the weapon in vehicle.

NOTICE

Risk of material damage from vibrations!

Vibrations during transport can damage the weapon.

› During transport, secure the transport case against slipping and damage from outside influences.

› Avoid impacts and vibration of the weapon.

12.2 Transporting the weapon

Transport weapon and ammunition separately. Where possible, transport the weapon in a transport case, weapon carrying case, or at least with the telescopic sight protective case in place.

› Follow applicable regulations for the transport of weapons and ammunition.

12.3 Shipping the weapon

Ship weapon and ammunition separately. Ship the weapon only in the transport case.

› Follow applicable regulations for the shipping of weapons and ammunition.

13 Destruction and disposal

13.1 Destroying the weapon

› Follow applicable regulations for the destruction of weapons and ammunition.

13.2 Disposing of the weapon

› Follow applicable regulations for the disposal of weapons and ammunition.

Part III

3-20 x 50 telescopic sight and Micro T-1 red-dot sight

14 Description of 3-20 x 50 telescopic sight

The information in this Section is extracted from the telescopic sight operator's manual of the manufacturer Schmidt & Bender, adapted in this case to the G28E weapon system. The content may therefore vary from the Schmidt & Bender operator's manual. Refer additionally to the Schmidt & Bender operator's manual.

General information

The telescopic sight is a precision optical instrument. It should be handled with appropriate care, the greatest possible avoidance of damage and no excessive force. The telescopic sight must be protected against excessive impact and vibration.

During transport or storage of the weapon without the transport case, the telescopic sight protective case is to be firmly mounted on the weapon wherever the operational situation allows.

14.1 Safety instructions for handling the telescopic sight

- Do not attempt to carry out work on the telescopic sight. Repairs may be carried out solely by the manufacturer Schmidt & Bender or authorised specialist firms.
- To avoid eye injuries, never look without protection through the telescopic sight at the sun or laser light sources.
- Protect the telescopic sight from any impact other than that experienced in normal use.
- Avoid exposing the telescopic sight for an unnecessarily lengthy period to direct sunlight. Intense lengthy sunlight causes high temperatures inside the scope which can damage the telescopic sight.
- When firing with the weapon, keep your eye at least 9 cm away from the ocular of the telescopic sight.

14.2 Technical data

14.2.1 General data

- Field of view - 13 - 2.1 m/100 m
- Exit pupil - 11.4 - 2.5 mm
- Optimum eye relief - 90 mm
- Laser protection class - L4 (DIN/EN 207)
- Twilight factor - 10,1 - 31,6
- Transmission - 90 %
- Ocular adjustment range - +2 to -3 dptr
- Parallax compensation - 25 m - ∞
- Weight - 920 g

14.2.2 Dimensions of the 3-20 x 50 telescopic sight

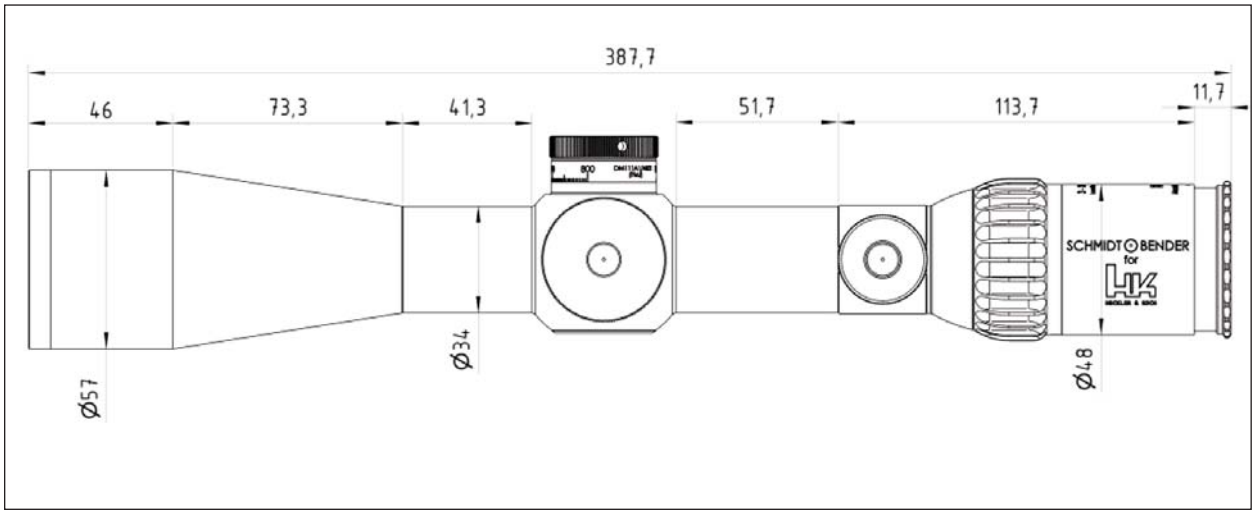


Fig. 83a: Dimensions in mm

14.3 Accessories / Scope of delivery

The accessories form part of the scope of delivery of the G28E.

1 3-20 x 50 telescopic sight with telescopic sight mount and accessories (comprising Items 1 - 4)

2 Killflash filter

3 Objective lens port cover

4 Ocular port cover

14.4 Functional elements of the 3-20 x 50 telescopic sight

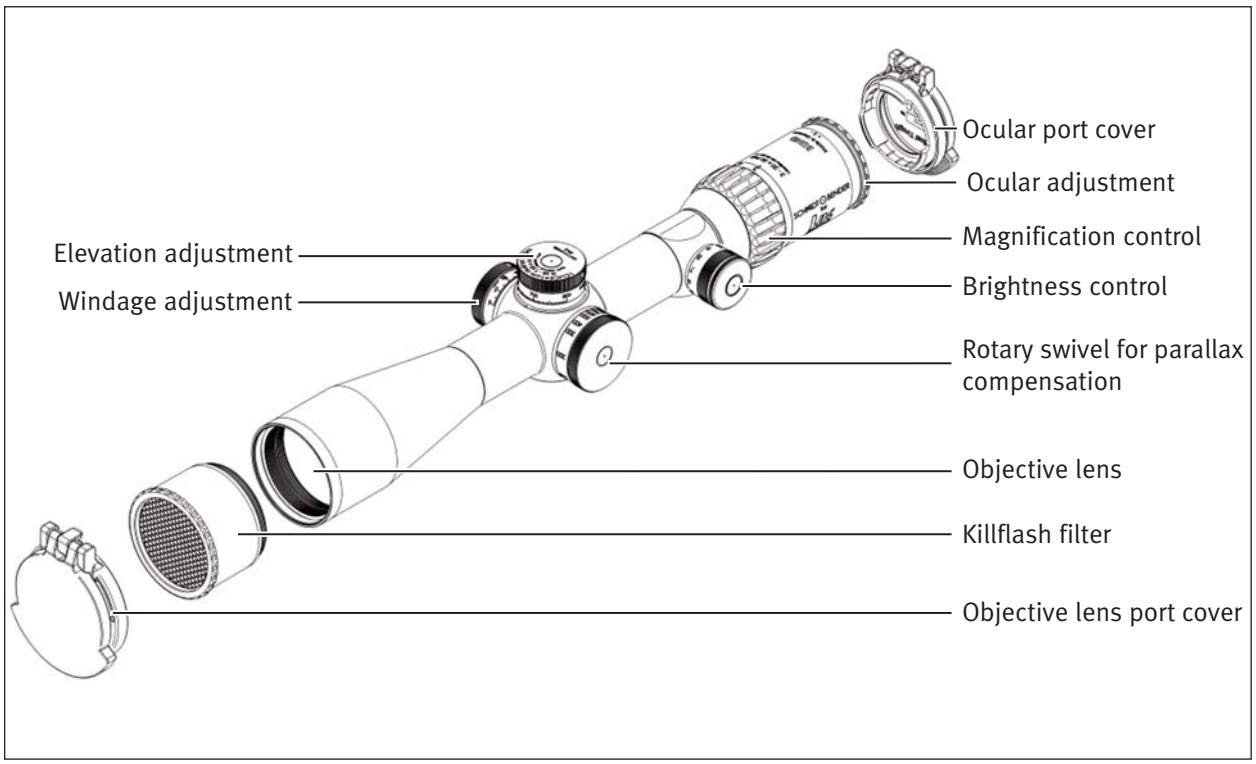


Fig. 84a: Functional elements of the 3-20 x 50 telescopic sight

15 Handling the 3-20 x 50 telescopic sight

15.1 Adjusting the telescopic sight

15.1.1 Diopter compensation

Eyesight deficiencies can be counterbalanced to some extent with diopter compensation.

Set the telescopic sight to maximum magnification. Rotate the ocular to the left until it stops and now rotate it to the right until you can see the reticle with optimum sharpness of image (*85a*).

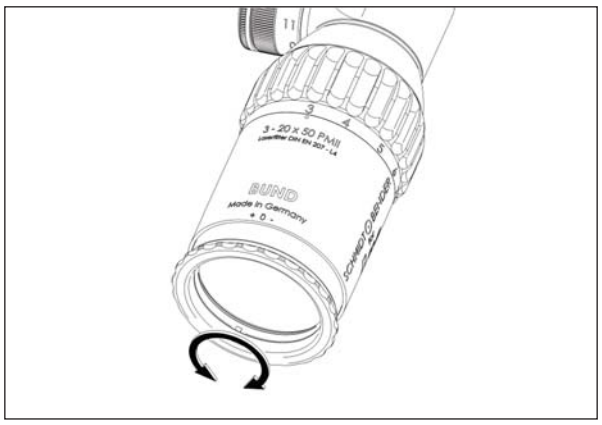


Fig. 85a: Adjusting the ocular

As eyesight can vary widely over the longer term, regular adjustment of the ocular setting is to be recommended.

15.1.2 Parallax compensation

Using the adjustment swivel for parallax compensation, the parallax of the telescopic sight can be adjusted individually without the shooter having to interrupt target acquisition.

The adjustment swivel for parallax compensation is marked with target ranges. Where the range to target is known (acquisition by laser rangefinding), turn the adjustment swivel for parallax compensation until the desired range to target aligns with the index arrow mark. If the range to target is not known, set the maximum magnification. Turn the adjustment swivel for parallax compensation towards the estimated range to target until you see an image of the target with maximum sharpness.

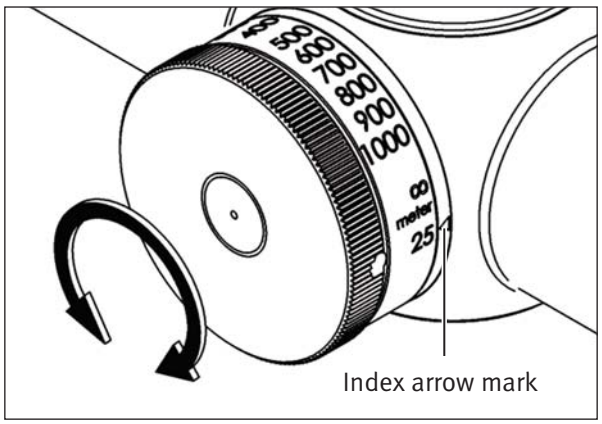


Fig. 85b: Rotary swivel for parallax compensation

The parallax is now correctly adjusted. The approximate range to target can be read on the adjustment swivel for parallax compensation.

15.1.3 Elevation adjustment

The 3-20 x 50 telescopic sight has an elevation adjustment knob with engraved ballistic compensation, aligned with the trajectory of the DM111 A1 full metal jacket soft core cartridge. This enables the shooter to adjust the weapon system rapidly to the relevant range to target between 100 m and 800 m. In tandem with this, use of a laser rangefinder is recommended.

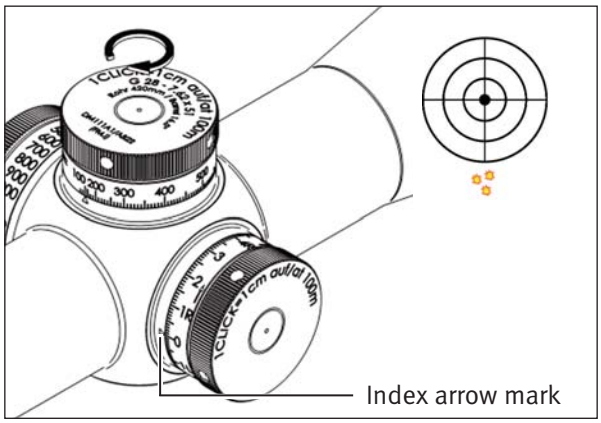


Fig. 86a: Elevation adjustment

To adjust elevation, turn the elevation adjustment knob until the engraved range to target aligns with the index arrow mark.

Shooting low is corrected by turning the elevation adjustment knob clockwise (*86a*).

Shooting high is corrected by turning the elevation adjustment knob anti-clockwise.

Each click of the elevation adjustment knob changes the reticle in elevation by 0.1⁻ (1.0 cm/100 m).

15.1.4 Windage adjustment

Shooting left is corrected by turning the windage adjustment knob clockwise (*86b*).

Shooting right is corrected by turning the windage adjustment knob anti-clockwise.

Each click of the windage adjustment knob changes the reticle in windage by 0.1⁻ (1.0 cm/100 m).

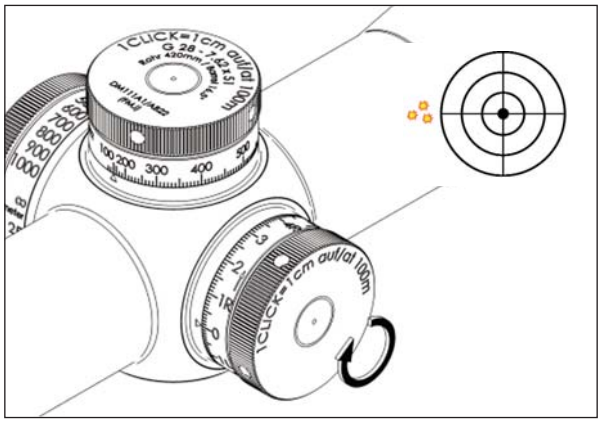


Fig. 86b: Windage adjustment

15.1.5 Using the reticle illumination

The reticle, lit entirely in red, gives support to the shooter in poor lighting conditions by showing the reticle clearly against the dark target.

First, adjust the reticle brightness to the prevailing lighting conditions. For this, turn the reticle brightness knob from 0 towards 11 until the step is reached where the reticle is clearly illuminated without dazzling the pupil of your eye.

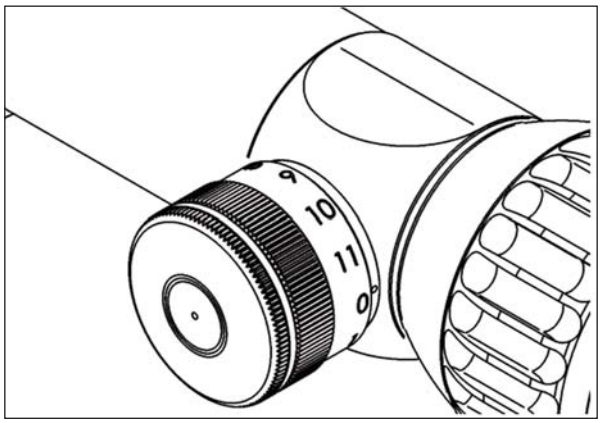


Fig. 87a: Reticle brightness knob

You can switch off the reticle illumination by turning the knob from a step it has clicked into, to a position between two steps (*87a*). Power supply is interrupted in such an intermediate position (standby mode). Just before firing, click the knob into the pre-selected step and the reticle illumination is switched on with the selected brightness.

Switch off the reticle illumination after using the telescopic sight!

A microchip switches the illumination off automatically after six hours.

15.1.6 Changing the battery

To change the battery, unscrew the cover of the light unit. Remove the dead battery. Dispose of the battery in an environmentally friendly way! When inserting the new battery, ensure that the plus sign on the battery is showing upwards (*87b*). Battery changing must be performed in the dry. The battery is a commercial off-the-shelf CR 2032 / 3 V button cell. Operating continuously at the highest light intensity, the battery supplies approx. 100 hours of power.

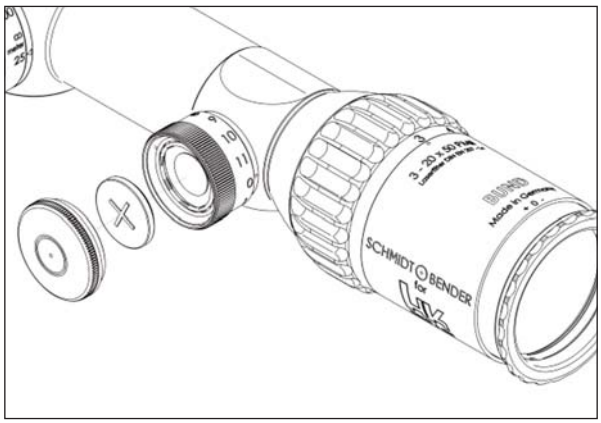


Fig. 87b: Changing the battery

15.1.7 Description of the reticle

The specially developed G28E telescopic sight reticle offers the shooter numerous ways to estimate ranges with the aid of coverage measurements. In combination with parallax adjustment (focusing) and ballistic compensation, this enables the shooter even at longer range to deliver precision fire, especially where a laser rangefinder is used.

The reticle system is in the first focal plane. The coverage measurements therefore remain in the same ratio even if the 3-20 magnification is altered.

The coverage measurements can be seen in Figs. *89a*, *89b* and *89c*. The values are in mils (¯) and correspond to 0.1 m/100 m or 1 m/1000 m.

The telescopic sight reticle consists of the centering bars, the mil dots and the lead bars for range estimation (*89a*).

The distance between the centering bars equates to 10¯ (1 m/100 m or 10 m/1000 m).

The distance between the mil dots and lead bars for elevation and windage is in each case 1¯ equating to 0.1 m/100 m or 1 m/1000 m. The distance between mil dot and lead bar is accordingly 0.5¯ = 0.05 m/100 m or 0.5 m at 1000 m.

The lead circles have an external diameter of 0,2¯ (2.0 cm/100 m).
The internal diameter is 0.1¯ (1.0 cm/100 m).

The stadia pattern allow rapid rangefinding for persons, in steps of 200, 400, 600, 800 and 1000 m. Coverage measurements for head, shoulder and torso dimensions enable rangefinding without use of a laser rangefinder.

In practice, the reticle can be used to calculate the range to target, whereby the shooter measures with the reticle [the range of] a target whose size he knows or reckons.

The ranges calculated in this way can then be used to adjust the parallax and target ballistics.

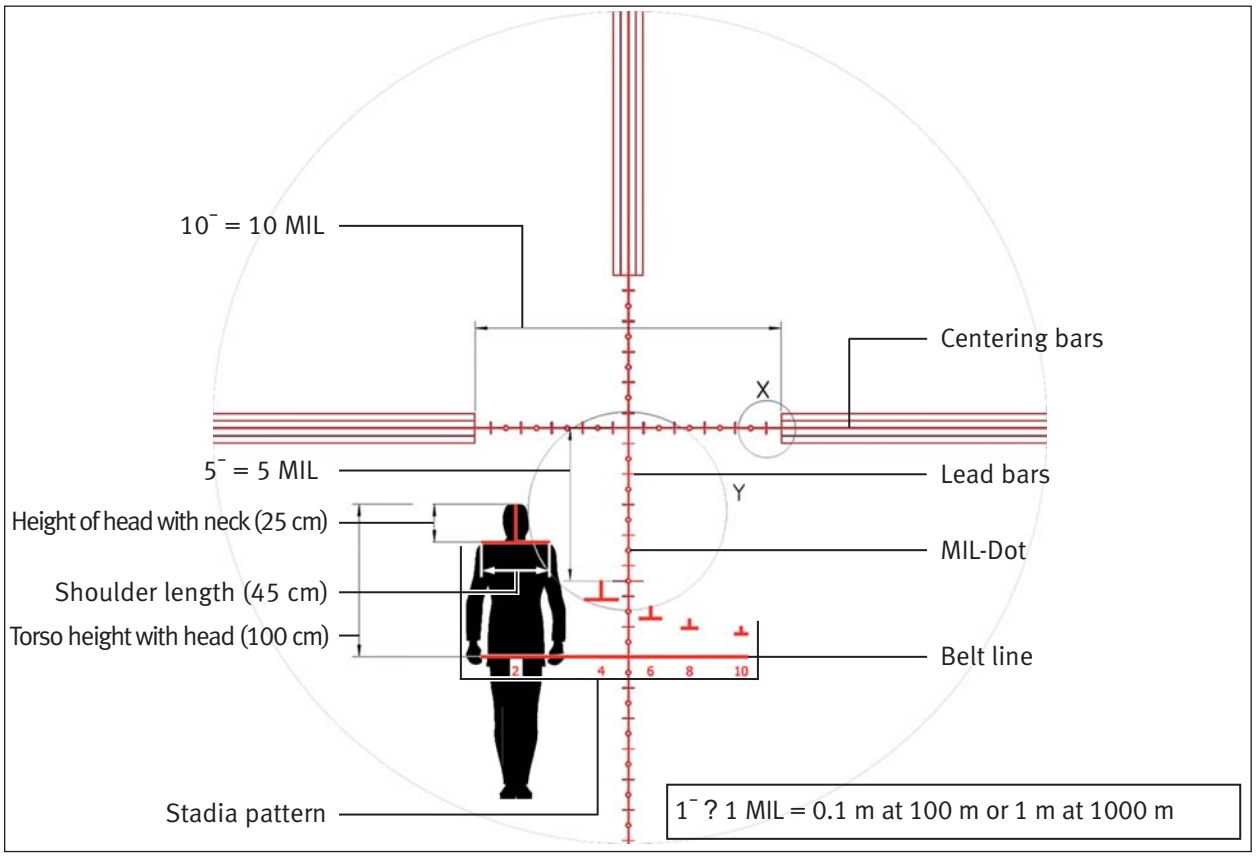


Fig. 89a: Reticle coverage measurements

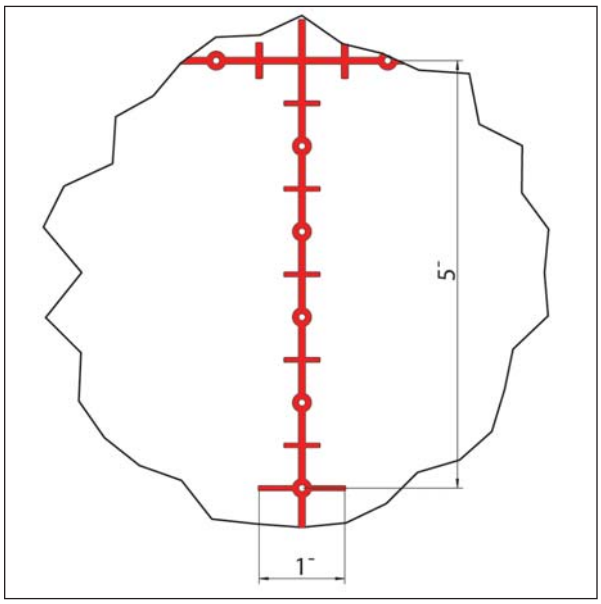


Fig. 89b: Coverage measurements, Detail y

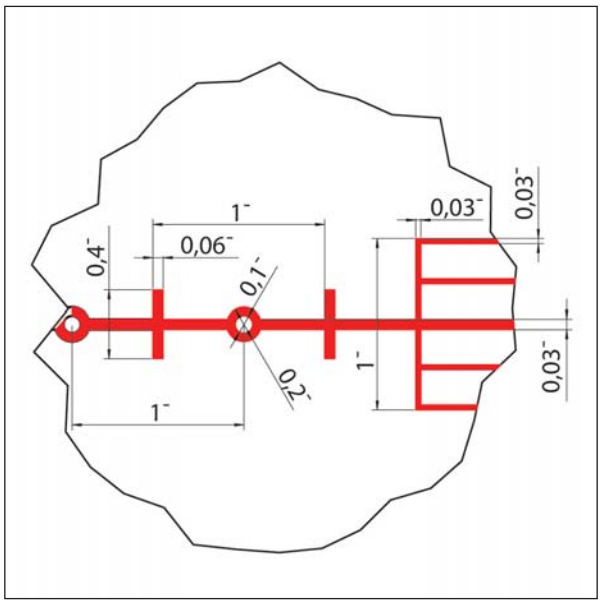


Fig. 89c: Coverage measurements, Detail x

15.1.8 Calibrating the adjustment knobs

If point of impact displacement is detected, the knob for elevation and/or windage must be re-calibrated.

For this, the mean point of impact of a shot group must be established.

The difference between the target point (aiming point) and the mean point of impact of the shot group must be corrected by turning the windage adjustment knob and/or the elevation adjustment knob (*Section 15.1.3 and Section 15.1.4*).

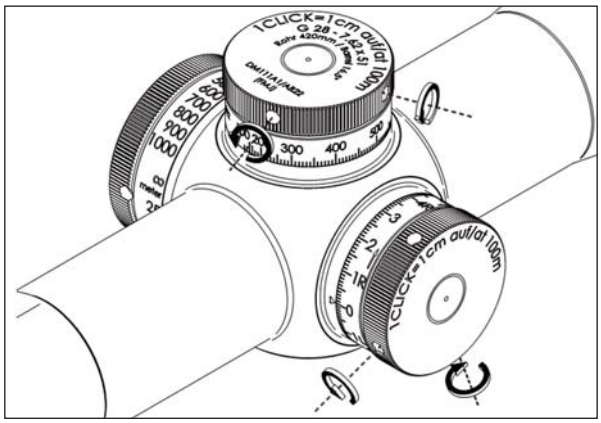


Fig. 90a: Calibrating the adjustment knobs

If the mean point of impact coincides with the target point (aiming point), the windage and elevation adjustment knobs must be set to this range to target.

For this, the two Allen screws in each of the elevation and windage adjustment knobs must be loosened with a 2 mm Allen key (*90a*).

Turn the windage and/or elevation adjustment knob so that the engraved range figure showing the actual range to target is at the index arrow. Re-tighten both Allen screws.

15.1.9 Using the killflash filter

The killflash filter prevents light sources from being reflected in the objective lens and disclosing the shooter's position. The killflash filter prevents the shooter from being dazzled by sunlight from an oblique angle.

Note that use of the killflash filter lowers the illumination of the telescopic sight, with potentially negative impact at twilight.

15.1.10 Using the port covers

To guard against external influences and weather conditions such as sand, dirt, rain, snow, etc, the ocular and objective lens port covers should be closed after each use of the telescopic sight. Before each firing, care should be taken to open the port covers and click them into place. This prevents them from swinging to and fro in an uncontrolled way during firing.

15.2 Maintenance and care of the telescopic sight

For cleaning the metal parts, use a clean and slightly moistened cleaning cloth.

To clean the lenses, use the accompanying telescopic sight cleaning set. Before being wiped clean, any heavy dust coating and dirt particles should first be removed with the paintbrush.

Slight fouling can then be removed with the lens cleaning cloth. To help the cleaning process with the lens cleaning cloth, breathe slightly on the lenses before cleaning.

Heavy fouling can be removed either with the cleaning fluid in the telescopic sight cleaning set or with lukewarm water in which a small amount of surfactant is dissolved.

Beware! Whatever the circumstances, avoid dry rubbing of the external surfaces of the lenses. This can destroy the lens coatings.

15.3 Temperatures

The 3-20 x 50 telescopic sight can be used in temperatures from -25° to +55° C.

The temperature range for storage of the telescopic sight is between -55° and +70° C.

16 Description of the Micro-T1 red-dot sight

The information in this Section is extracted from the operator's manual of the manufacturer Aimpoint, adapted in this case to the G28E weapon system. The content may therefore vary from the Aimpoint operator's manual.

General information

The Micro T-1 red-dot sight is a passive reflex collimator illuminated-dot sight. When storing the Micro T-1 red-dot sight, always remove the battery and close the anti-dust port covers. Close port covers only if the lens surface is dry.

16.1 Safety instructions for handling the Micro T-1 red-dot sight

- Do not attempt to carry out work on the Micro T-1 red-dot sight. Repairs may be carried out solely by the manufacturer Aimpoint or authorised specialist firms.
- Protect the Micro T-1 red-dot sight from any impact other than that experienced in normal use.
- Avoid exposing the Micro T-1 red-dot sight for an unnecessarily lengthy period to the direct effects of cold temperatures. The effects of exposure to lengthy cold temperatures can influence battery life negatively. Also, the rotary switch can ice up, preventing it from turning normally.

16.2 Technical data

16.2.1 General data

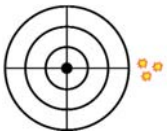
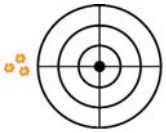
• Weight	-	105 g
• Open shutter	-	20 mm
• Optical magnification	-	1 x, eye relief unlimited
• Dot size	-	4 MOA (1.2 mrad)≙ 11.6 cm at 100 m
• Optical coating	-	Anti-reflex and bandpass coatings, T-1 is NVD compatible
• Dot brightness	-	Dot brightness manually adjustable

17 Handling the Micro-T1 red-dot sight

17.1 Adjusting the Aimpoint Micro T-1 red-dot sight

Beware! Do not continue adjusting windage and elevation if you feel a resistance. The elevation adjustment screw is mounted on the top of the red-dot sight. The windage adjustment screw is mounted on the right-hand side of the red-dot sight.

Position of point of impact	Corrective measures	Information
	1. Turn cover of elevation adjustment screw anti-clockwise. 2. Remove cover of elevation adjustment screw. 3. Insert cover of elevation adjustment screw into elevation adjustment screw. 4. Turn elevation adjustment screw clockwise.	Turning the elevation adjustment screw by one click changes the position of point of impact by approx. 1.3 cm at a target range of 100 m.
	1. Turn cover of elevation adjustment screw anti-clockwise. 2. Remove cover of elevation adjustment screw. 3. Insert cover of elevation adjustment screw into elevation adjustment screw. 4. Turn elevation adjustment screw anti-clockwise.	

Position of point of impact	Corrective measures	Information
	1. Turn cover of windage adjustment screw anti-clockwise. 2. Remove cover of windage adjustment screw. 3. Insert cover of windage adjustment screw into windage adjustment screw. 4. Turn windage adjustment screw clockwise.	Turning the windage adjustment screw by one click changes the position of point of impact by approx. 1.3 cm at a target range of 100 m.
	1. Turn cover of windage adjustment screw anti-clockwise. 2. Remove cover of windage adjustment screw. 3. Insert cover of windage adjustment screw into windage adjustment screw. 4. Turn windage adjustment screw anti-clockwise.	

After correction of the Micro-T1 red-dot sight, zeroing must be carried out to verify the position of point of impact.

Check whether the Micro-T1 red-dot sight is seated firmly on the Picatinny-rail.

Turn rotary switch to “0” (anti-clockwise).

Close the anti-dust port covers.

17.1.1 Changing the battery

To change the battery, unscrew the threaded cover anti-clockwise with the tool. Remove the dead battery. Dispose of the battery in an environmentally friendly way! When positioning the battery cover, ensure that the O-ring is present on the battery cover and not damaged. When inserting the new battery, ensure that the plus sign on the battery is showing upwards. Battery changing must be performed in the dry. Screw in the battery cover fully clockwise with the tool. The battery is a commercial off-the-shelf CR 2032 / 3 V button cell. Check that the illuminated red dot appears when the rotary switch is turned clockwise.

17.1.2 Using the anti-dust port covers

To guard against external influences and weather conditions such as sand, dirt, rain, snow, etc, the anti-dust port covers should be closed after each use of the Micro T-1 red-dot sight. To prevent the port covers from loss when being removed, they should be removed in a downward direction. The bungee is then stretched around the Micro T-1 red-dot sight and the rail. This prevents the port covers from swinging to and fro in an uncontrolled way during firing.

17.2 Maintenance and care of the Micro T-1 red-dot sight

For cleaning the metal parts, use a clean and slightly moistened cleaning cloth.

Beware! Do not clean the lenses with your fingers under any circumstances. Wipe off the lenses with a special lens paper/cloth or remove the dirt by blowing. Alternatively the lens can be breathed on and the dirt wiped off with a clean piece of clothing. Do not use your fingers to clean the lenses. Before being wiped clean, any heavy dust coating and dirt particles should first be removed with the paintbrush.

Slight fouling can then be removed with the lens cleaning cloth.

17.3 Temperatures

No specific measures are required in extreme heat, salty air and high altitudes.

17.4 Fitting the Micro T1 red-dot sight

Required auxiliary materials:

- *Torque wrench 2 - 25 Nm*
- *Insert for torque wrench*

The red-dot sight can be fitted on the front or rear Picatinny-rail of the telescopic sight mount, according to choice.

When the red-dot sight is fitted on the rear Picatinny-rail, the view of the elevation adjustment knob of the telescopic sight is partly obscured.

Fig. 98a: Tightening the screw of the rail mount with torque wrench

1. Set torque wrench to 8 Nm.
2. Insert the insert for torque wrench into torque wrench.
3. Place Aimpoint Micro T-1 red-dot sight at desired position on Picatinny-rail.
4. Tighten screw for rail with torque wrench until the torque is reached (*98a*).
5. When using the anti-dust port covers, ensure they are correctly fitted and can be easily opened.
6. Check whether Micro-T1 red-dot sight is seated firmly on Picatinny-rail.
7. Adjust Aimpoint Micro T-1 red-dot sight (*Section 17.1*).

17.5 Changing the position of the lens hood of the Micro T-1 red-dot sight

Required auxiliary materials:

- *Multi-purpose tool*

1. Rotate cover of pistol grip 90° anti-clockwise.
2. Remove cover of pistol grip.
3. Take out multi-purpose tool (*29a*).
4. Loosen screw of lens hood by turning anti-clockwise using torx key 10 (*29a- 4*).
5. Remove lens hood forwards.
6. Loosen screw of lens hood by turning anti-clockwise using torx key 10.
7. Remove lens hood to the rear.
8. Insert lens hood from the rear into the Micro T1 red-dot sight.
9. Tighten lens hood screw clockwise with torx key 10.
10. Insert lens hood from the front into the Micro T1 red-dot sight.
11. Tighten lens hood screw clockwise with torx key 10.
12. Stow multi-purpose tool in pistol grip.
13. Insert cover into pistol grip.
14. Rotate cover 90° clockwise.

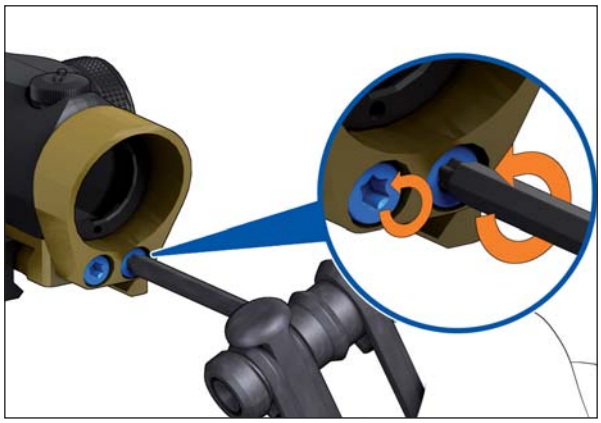


Fig. 99a: Changing the position of lens hood

Rifle	**G28E**
Calibre	NATO 7.62 mm x 51
Approved ammunition	DM111 A1 full metal jacket soft core (AB22), exceptionally DM21 A2 tracer (AB24)
Operating principle	gas-operated
Bolt system	locked rotating bolt head
Magazine capacity	10 or 20 cartridges
Mode of fire	single fire
Dimensions	
Length, max.	1082 mm
Length, min.	965 mm
Width	78 mm
Height$_1$	340 mm
Barrel length$_2$	421 mm
Sight radius	494 mm
Weight	
Weapon without magazine$_1$	approx. 7.49 kg
Magazine, 10 / 20 cartridges (full)$_3$	approx. 0.34 kg / approx. 0.68 kg
Magazine, 10 / 20 cartridges (empty)	approx. 0.11 kg / approx. 0.15 kg
Other data	
Trigger pull	approx. 27 N
Muzzle velocity -v_0-$_3$	approx. 785 m/s - 790 m/s
Muzzle energy -E_0-$_3$	approx. 2950 J
Barrel profile / twist	Groove/land profile, 4 grooves / right-hand twist - 305 mm

$_1$ with 3-20 x 50 telescopic sight and Micro T-1 red-dot sight, bipod and forward grip
$_2$ without flash hider
$_3$ DM111 A1 full metal jacket soft core ammunition (AB22)

Technical data

No Compromise

Quality . Innovation . Service . Safety

TECHNISCHE DOKUMENTATION

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