

APR308 PRO

OPERATOR MANUAL



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Related documents:

Parts cataloguePC-APR308_PRO-00-EN

Abbreviations

MOA:	Minute of Angle (small angle, 1/60 of 1°)
POA:	Point of Aim
POI:	Point of Impact
MPI:	Mean Point of Impact
Left / right side:	Defined looking in firing direction.

1. General rules

READ MANUAL BEFORE USE.

1.1 Safety rules

1. Consider every weapon loaded until checked personally by the individual operator.
2. Always keep fingers off the trigger and outside the trigger guard until the sights are on target.
3. Always point the weapon in a safe direction.
4. Verify your target and the backstop.
5. Before firing always verify the serviceability and condition of both the weapon and ammunition.
6. Hearing and eye protection are mandatory.
7. Be sure to use NATO, SAAMI or CIP certified cartridges of correct caliber only.

SAFETY ADVICE!



Defects that can be traced back to the use of non NATO, SAAMI or CIP ammunition (especially reloaded cartridges) are not covered by the guarantee!

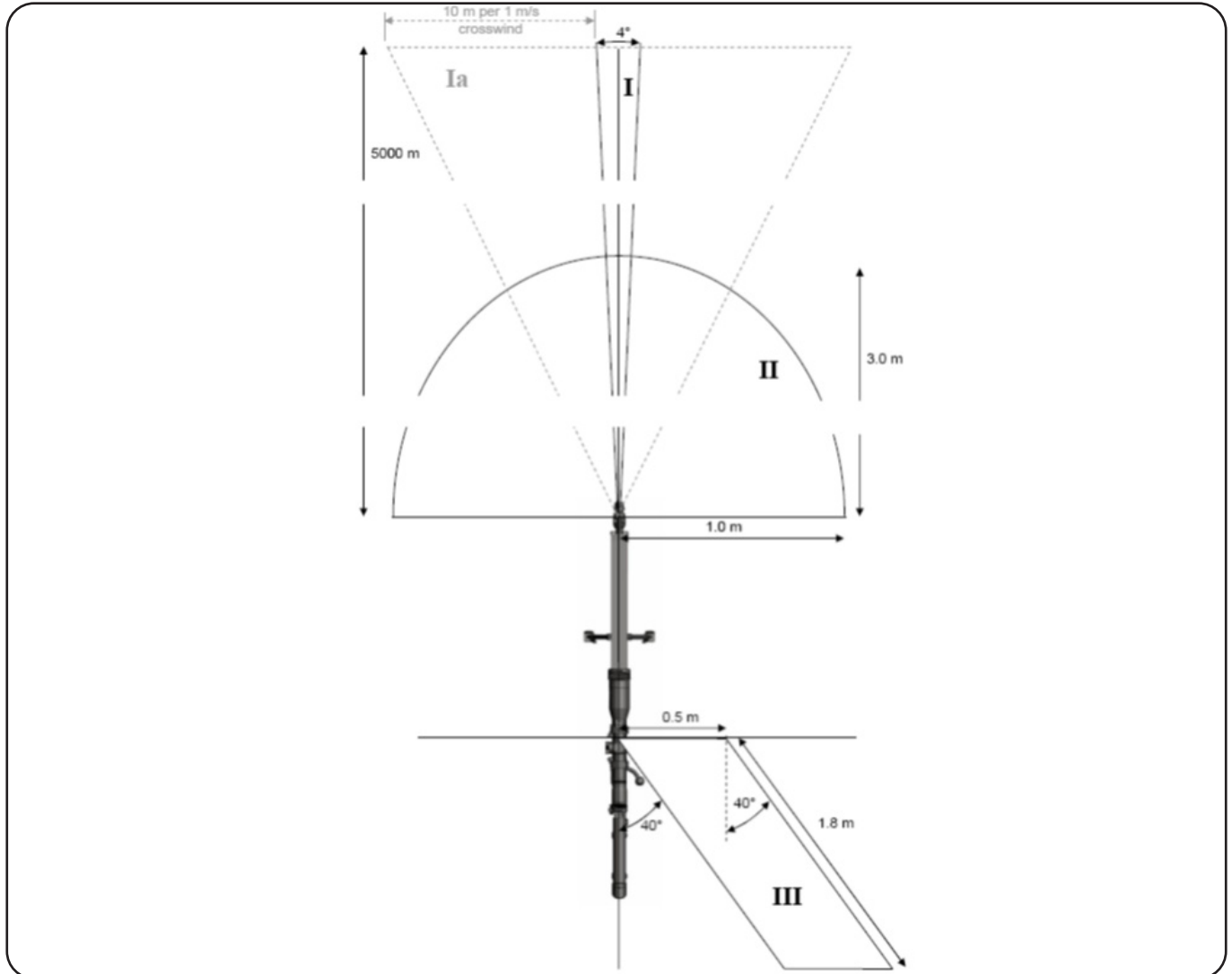
8. If a cartridge fails to ignite, keep the muzzle pointed in a safe direction and open the chamber only after a minimum of 30 seconds.
9. Live fire training should be carried out in open or well-ventilated areas to prevent excessive exposure to toxic gases.
10. Operate your weapon consciously and do not use excessive force.

1.2 Maintenance rules

1. The weapon is to be cleaned after each deployment or firing.
2. Any malfunctions are to be reported to the unit armorer or manufacturer.
3. The weapon is to be presented to the unit armorer for inspection after each mission or a minimum of once per year.

1.3 Weapon danger area

Safety template



Weapon danger areas are to understand as follows (proper use of weapon implied):

Area I: Area I is the zone of life danger by flying bullets - the zone of trajectories in absence of crosswind.

Area Ia: Considering crosswind, danger area Ia must be applied, basing on maximum permissible crosswind assumption.

Area II: Area II is the range of the hot gases expanding after muzzle departure. In this area, eyes might be hurt. This area can be virtually reduced to zero when using suppressor.

Area III: In this area, cases drop after ejection, according to the force the bolt is operated. The danger is to capture a hot case with the clothes, resulting in minor burn (mostly concerned are forearms, neck and chest).

2. Technical specifications

2.1 Overview rifle - APR308 PRO



2.2 General description

The weapon system is basically consisting of a bolt action rifle cal. .308 Win with suppressor, a riflescope and a specific cartridge. The system is intended to be soldiers primary weapon and serve them as anti-personnel rifle. The system is able to hit a head-sized target up to 400 m distance or a torso-sized target over 800 m and more with a first round hit probability of over 99%. Although being a precision-instrument, the system must resist the harsh military use and remain functional in typical operational environments.

2.3 General technical data rifle

Designation	APR308 PRO
Manufacturer	B&T AG - Switzerland
Product ID	BT-350001
Operating system	Bolt action rifle, manually operated
Caliber	.308 Win (7.62x51 NATO)
Rifling	4 grooves, right hand twist 1:11"
Barrel length	610 mm
Effective range	800 m
Overall butt stock folded	935 mm
Overall butt stock open	1165 mm
Width butt stock folded	135 mm
Width butt stock open	95 mm
Rail incline	30 MOA
Weight (weapon only)	5.2 kg
Magazine capacity	10 rds, detachable
Trigger pull	1.5 kg - 2.5 kg (fully adjustable w/o disassembly)
Bolt configuration	3 locking lugs, 60° opening angle

2.4 Overview suppressor

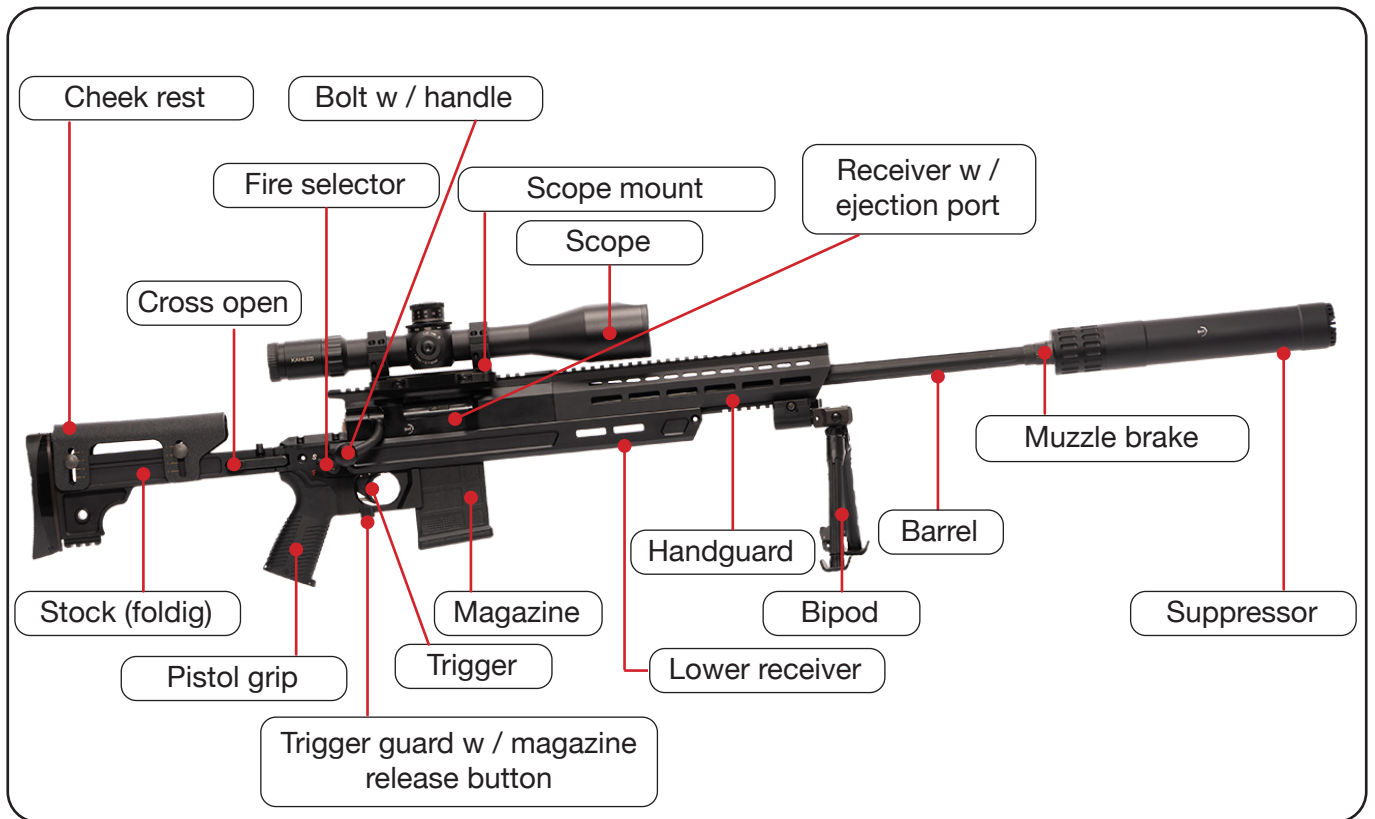


2.5 General technical data suppressor

Designation	B&T rifle suppressor Monoblock
Manufacturer	B&T AG - Switzerland
Product ID	SD-988320
Caliber	.308 Win (7.62x51 NATO)
Overall length	297 mm
Diameter	50 mm
Weight	660 g
Attachment	M27x1 LH
Suppression	30 dB A

3. Nomenclature

3.1 Rifle



3.2 Suppressor



4. Handling and operating procedures

4.1 Clearing weapon

a. Rotate the fire selector to «safe» position (see chapter „4.2 Operating fire selector“ on page 10).

b. Press the magazine retainer and pull the magazine downward out.



c. Close the folding stock.

d. Push the bolt handle to the top and pull it to the bolt stop.

e. Inspect the chamber visually to be clear.



4.2 Operating fire selector


4.2.1 Engage safety

- Operate the safety with thumb of shooting hand, use left or right side lever as most convenient.
- Push the safety lever upwards until it audibly clicks in „S“ position

WHITE „S“ = SAFE



- Weapon is in SAFE mode.

Note	
	Safety can only be engaged when firing pin is cocked.


4.2.2 Disengage safety

- Operate the safety with thumb of shooting hand, use left or right side lever as most convenient.
- Push safety lever downwards until audibly clicks in „F“ position.

RED „F“ = FIRE



- Weapon is in FIRE mode.

WARNING!	
	ENSURE THE WEAPON IS IN SAFE MODE BEFORE PERFORMING ANY TASKS E.G. LOADING & UNLOADING, STOCK ADJUSTMENTS AND DISASSEMBLY OF WEAPON.

4.3 Loading & unloading the weapon

4.3.1 Loading the weapon

- a. Prepare one charged magazine.
- b. Open bolt by raising the bolt handle to its upmost position and pulling back to bolts rearmost position.
- c. Engage safety.
- d. Pull magazine retainer button rearwards with index finger of shooting hand.
- e. Insert magazine with one straight movement.
- f. Release magazine retainer button.
- g. Check magazine for proper seat trying to push it downwards.
- h. Close bolt sliding it forwards by the bolt handle.
- i. Lock bolt rotating bolt handle fully downwards.
- j. Weapon is now loaded with safety engaged.

4.3.2 Unloading and clearing of weapon

- a. Engage safety.
- b. Pull magazine retainer button rearwards with index finger of shooting hand.
- c. Fully remove magazine with one straight movement.
- d. Open bolt by raising the bolt handle to its upmost position and pulling back to bolts rearmost position.
- e. Allow weapon to eject chambered cartridge in your hand.
- f. Weapon is now unloaded with safety engaged.



CAUTION



If weapon fails to eject cartridge, inspect ejector and extractor.

WARNING!



Do not apply excessive force if bolt fails to open. Dirt or excessive form fit of cartridge case after overpressure shot may lock bolt in closed position. Try to open bolt carefully by slightly tapping bolt handle first upwards until bolt unlocked and then rearwards. Keep weapon pointing in safe direction.

4.4 Trigger adjustments

4.4.1 Adjusting 1st stage force

- Unload weapon.
- Turn screw in trigger housing with Allen key 2.5 mm to adjust 1st stage force.
- Turn clockwise to increase 1st stage force.

4.4.2 Adjusting 2nd stage force

- Unload weapon.
- Turn screw in trigger lever with Allen key 2.5 mm to modify 2nd stage force.
- Turn clockwise to increase 2nd stage force.



CAUTION



Use of excessive force will damage trigger parts.
Execute functional check after finishing procedures
(see chapter „5.3 Functional check“ on page 27).

Note



Basic adjustment of trigger pull: 2 kg

4.5 Operating folding stock

4.5.1 Closing folding stock

- a. Push on folding stock retainer open until stock released.

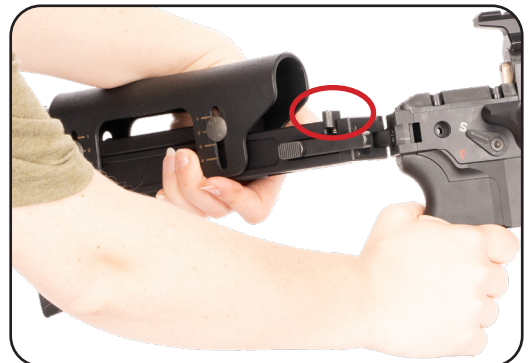


- b. Rotate stock to left weapon side until held by folding stock retainer folded.
- c. Check proper retention of folding stock in folded position.



4.5.2 Opening folding stock

- a. Push on folding stock retainer folded until stock released.
- b. Rotate stock into unfolded position until held by folding stock retainer open.



- c. Check proper retention of folding stock in unfolded position.

CAUTION



Rotate folding stock only if bolt is closed or just halfway open. If bolt is fully open, retainer open may interfere with firing pin retainer.


4.6 Stock adjustments

4.6.1 Adjusting stock length

- a. Open folding stock.
- b. Loosen two stock clamping screws underside the stock using Torx 25.




- c. Set stock to proper length.
- d. Tighten screws firmly but without excessive force.
- e. Push on butt plate to check firm seat of stock.

Note	
	If the extension does not slide, untight cheek rest clamping screws - if they are too tight, the cheek rest locks the extension.

4.6.2 Adjusting cheek rest


- a. Open folding stock.
- b. Loosen cheek rest clamping screws using Torx 25.
- c. Set height of cheek rest to proper height, placing the operator's eye aligned with aiming device.
- d. Tighten screws firmly but without excessive force.



Note	
	Overtightening clamping screws will accelerate wear out of cheek rest and lock the stock extension.

4.6.3 Adjusting butt plate

- a. Open folding stock.
- b. Loosen butt plate clamping screw using Allen key 4mm.
- c. Set height of butt plate for a most straight positioning of the operator's shoulder behind the weapon.
- d. Tighten screw firmly but without excessive force.


Note	
	Only a properly adjusted stock provides best accuracy and operator safety. Stock must be adjusted to operator's body and eye relief to riflescope.

4.7 Attaching & removing suppressor (Monoblock)

4.7.1 Attaching suppressor

- a. Before attaching the suppressor, shake it and listen to loosened parts.


- b. Screw suppressor on muzzle brake and tighten with firm grip.

WARNING	
	A misaligned suppressor will get damaged with one round fired and deflect the projectile into any direction. Carefully execute preparation for firing (see chapter „4.10 Preparation for firing and live firing“ on page 18).



4.7.2 Removing suppressor

Remove suppressor and store it.

WARNING	
	Allow suppressor to cool down before removing it with bare hands.

4.7.3 Maintenance suppressor

- Clean the suppressor with a soft metal wire brush. Grease the compensator and the bore diameter.

4.8 Attaching & removing riflescope with mount

4.8.1 Attaching riflescope with mount

- Place scope with mount on right side of Picatinny rail.
- Allow stopper to drop into a groove of the Picatinny rail.
- Tilt scope in upright position.
- Move mount forward in shooting direction
- Rotate clamping levers into closed position.
- Check proper seat of mounted scope.

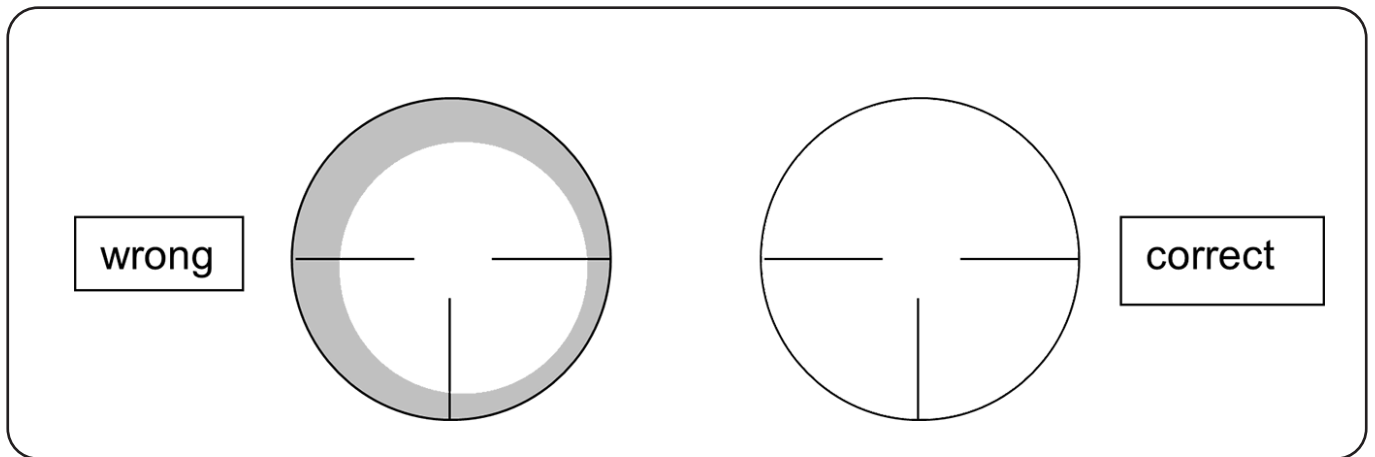


4.8.2 Removing riflescope with mount


- a. Rotate clamping levers into open position.
- b. Tilt scope off to right side and remove.

4.8.3 Placement of riflescope

- a. Take proper firing position, aiming in safe direction.
- b. Close eyes and search most comfortable position with rifle.
- c. Open eyes and check for correct image.



- d. Adjust scope mount position and stock adjustments until complied.

CAUTION	
	Improper placement of the riflescope obviates proper aiming and may hurt the operator's eye when firing the weapon.

4.9 Use of riflescope

See user manual for the corresponding riflescope.

4.10 Preparation for firing and live firing

4.10.1 Before loading

- a. Execute the following procedure in the last cover before reaching actual firing position.
- b. Inspect weapon to be in safe mode.
- c. Close folding stock halfway in a 90° position.
- d. Remove bolt (see chapter „5.1.1 Removing bolt“ on page 24).
- e. Inspect barrel visually to be clear and clean; otherwise use fix rod with copper brush to remove foreign particles and flex rod with cotton wicks to remove residuals of oil or water.
- f. If suppressor is mounted, inspect visually proper alignment (concentricity of bores); in case of misalignment, remove and reinstall suppressor and inspect again.
- g. Fully open folding stock.
- h. Inspect firm mount of scope.
- i. Inspect scope lenses to be clean; otherwise use LensPen to clean.
- j. Inspect stock to be properly adjusted and locked in open position.



ATTENTION



Firing a weapon with any obstruction or residuals of water or oil in the chamber or bore of the barrel will result in severe damage to the weapon and personal injury. A misaligned suppressor will get damaged with one round and deflect the projectile into any direction.

Note



The required first round performance is only accomplished if the barrel is dry when firing. Any residual of oil in the barrel will affect the trajectory.

4.10.2 Before firing

- Ensure bipod to stand stable on soft ground.
- Inspect scope adjustments according to actual firing distance, especially parallax adjustment and elevation.
- Inspect weapon danger area to be clear.
- Load weapon in safe mode.
- Disengage safety to put weapon into fire mode.

WARNING



Keep finger off the trigger until you are willing to fire. Hold weapon stable on target.

4.10.3 Firing

- Check weapon to be in fire mode (safety disengaged, levers point to „F“).
- Keep on aiming while putting finger on trigger.
- Slightly increase pull on trigger until shot breaks.



- Unlock and fully open bolt; observe the ejection of a cartridge case.
- Close bolt and lock.
- Weapon is now ready for second shot, loaded, armed and in fire mode.

WARNING



Weapon can be used by right hand shooters as well as by left hand shooters. While right hand shooters automatically remove finger from trigger to operate the bolt, left hand shooters must be conscious to take the finger off the trigger while reloading.

WARNING



If heavy black smoke appears after a shot released and no impact can be detected, probably the barrel was obstructed. Stop firing and return the weapon to an armorer for inspection.

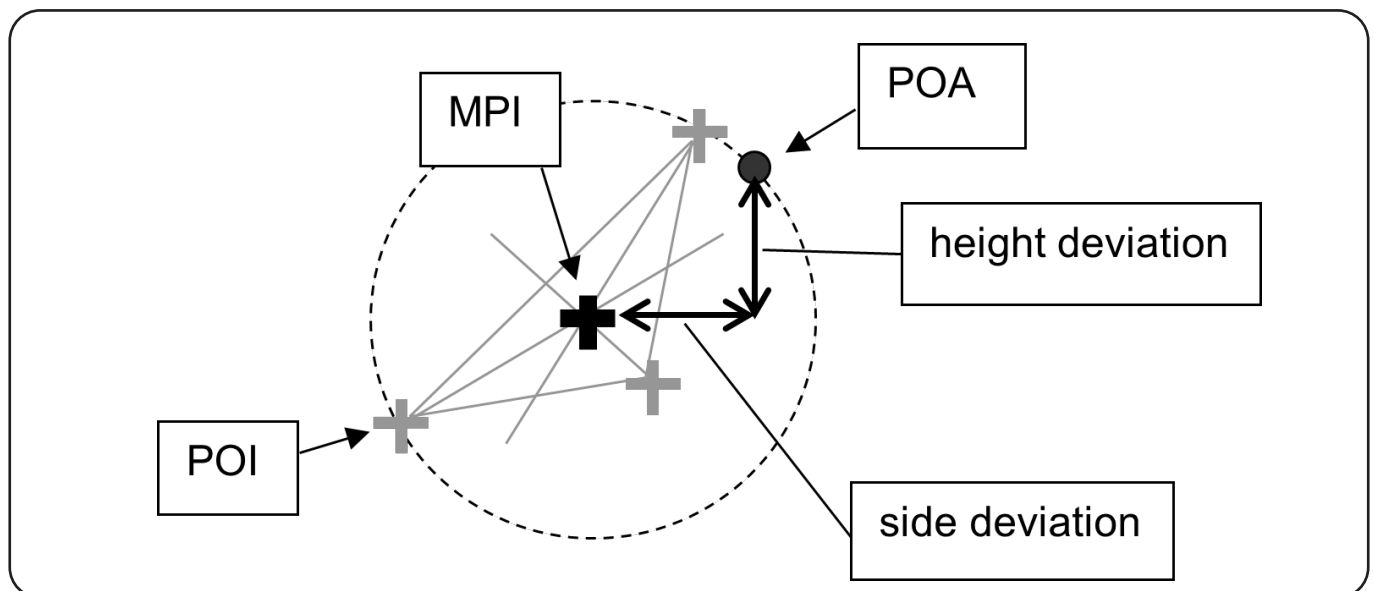
4.11 Zero riflescope

4.11.1 Firing reference groups

- Zeroing of the riflescope should be done at 100 m.
- Choose indoor range or outdoor range which is free of crosswind.
- Choose maximally stable firing position; best is firing from a bench in sitting position, second best is prone.
- Place fore end on sandbag or rifle rest; if not available, use bipod.
- Choose target that meets reticle pattern, e. g. black circle on white ground.
- Aim point blank to center of target.
- Fire three rounds.

4.11.2 Evaluating sight corrections

- Determine MPI of group and deviations according to figure below.





- Measure height and side deviation in millimeter and determine sight correction according to table in „6.2.2 Sight adjustment chart“.
- If deviation is smaller than 1 click ($0.1 \text{ mrad} = 10 \text{ mm}$ at 100 m), no correction is required.

4.11.3 Setting zero

See user manual for the corresponding riflescope.

4.12 Immediate action and stoppages

WARNING	
	Any failure to fire can be caused by a foul cartridge with retarded ignition. Opening the bolt before 30 seconds may cause case explosion with shrapnels.

WARNING	
	Always keep the finger off the trigger and the weapon pointing in a safe direction during immediate actions or investigation of stoppages.

4.12.1 Immediate action


Immediate action is the unhesitating application of a probable remedy to overcome a stoppage without investigating its cause.


- a. If weapon fails to fire when pulling the trigger, unlock and fully open bolt; observe the ejection of a cartridge or cartridge case.
- b. If ejection takes place, close bolt and lock; resume firing.
- c. If there is no ejection, a failure to extract or feed has occurred.
 - » Engage safety.
 - » Remove magazine, open bolt and inspect chamber to be empty.
 - » If chamber is empty, reload magazine and resume firing.
 - » If the chamber has a round, follow procedure below.

4.12.2 Cartridge jammed in chamber

To proceed if a cartridge or case is stuck in the chamber and the extractor fails to remove or is missing:

- a. Procedure to be executed in cover, weapon in safe mode, magazine removed; apply safety rules.
- b. If available, try to remove cartridge/case using the bolt of another rifle.
- c. Otherwise remove bolt and hit the rifle with its butt plate on the ground, in order to force the cartridge to drop out. Barrel must be maintained in a safe direction.
- d. If in worst case a live cartridge remains stuck in the chamber, remove bolt and keep it apart until service on weapon is possible. Remain responsible of weapon until handed out to technician.

WARNING	
	Do not remove a cartridge stuck in the chamber by using a fix rod from the muzzle end of the barrel.

WARNING	
	If due to a failure to extract or to eject a second cartridge was fed onto the chambered cartridge/case, do not reuse this cartridge. Bullet might slip into the case and will cause over-pressure when firing.


4.12.3 Stoppages

- a. A stoppage is any unintentional interruption in the cycle of function. If the weapon fails to fire, immediate action should be taken as the first step.
- b. Stoppages of the weapon normally fall into one of the following categories:
 - » Excessive fouling of weapon due to negligence, incorrect or poor maintenance.
 - » Failure of cartridge.
 - » Mechanical failure of the weapon.

4.12.4 Common stoppages & their causes


SN	Problem	Probable cause
1	Failure to extract	<ul style="list-style-type: none"> - Broken, stuck or lost extractor - Broken or weak extractor spring - Fouling of chamber - Torn cartridge's rim
2	Failure to eject	<ul style="list-style-type: none"> - Stuck ejector - Broken or weak ejector spring
3	Failure to ignite despite striking firing pin	<ul style="list-style-type: none"> - Non-conform primer - Broken or short firing pin - Weak firing pin spring - Large headspace
4	Failure to ignite despite pulling trigger (firing pin not striking)	<ul style="list-style-type: none"> - Safety engaged - Trigger group failed to cock firing pin (worn out firing pin retainer, disconnect or sear) - Trigger stuck in rear position (due to foreign particles or weak trigger springs)
5	Failure to feed	<ul style="list-style-type: none"> - Magazine improperly inserted (maybe in manual feed position) - Deformed magazine lips
6	Impossible to close and lock bolt	<ul style="list-style-type: none"> - Cartridge/case stuck in chamber (failure to extract) - Cartridge/case jammed in mechanism (failure to eject, improper feeding) - Foreign particles in chamber

4.13 Operating procedures in adverse conditions

Note	
	The following are additional procedures to take note when operating in adverse conditions. Normal maintenance and operating procedures are still applicable to ensure that the weapon will function properly.


4.13.1 Sand / Dust condition

- a. Clean the weapon as often as possible.
- b. Use less oil than normally.
- c. Inspect cartridges to be clean before loading.
- d. Operate bolt more carefully than usual.

WARNING	
	Besides stoppages, grains of sand may even provoke hazardous situations. Keep them off the weapon and do not operate the bolt with excessive force when sand is present.

4.13.2 Wet / Rainy condition

- a. Wipe of water drops from bullets before loading.
- b. When opening bolt, slightly incline ejection port to the ground, preventing rain to drop into open mechanic.

Note	
	A sniper rifle is a precision tool. Not only functionality has to be maintained in adverse conditions, but also first round hit capacity.

5. Field Assembly / Disassembly

ATTENTION



Unload and clear weapon before proceeding with disassembly.

5.1 Field stripping

5.1.1 Removing bolt

- a. Close folding stock halfway in a 90° position.
- b. Push down bolt stop and remove bolt rearwards.
- c. Open folding stock.



5.1.2 Removing firing pin

- a. Use bolt tool (operator's tool kit) to remove firing pin.
- b. Hold bolt in one hand and put bolt tool over firing pin housing.
- c. Rotate bolt tool (with firing pin housing) clockwise until firing pin comes loose.



5.1.3 Removing riflescope with mount

- a. This procedure is optional in order to protect the scope.
- b. Ensure lens covers to be closed.
- c. Remove riflescope.


Note



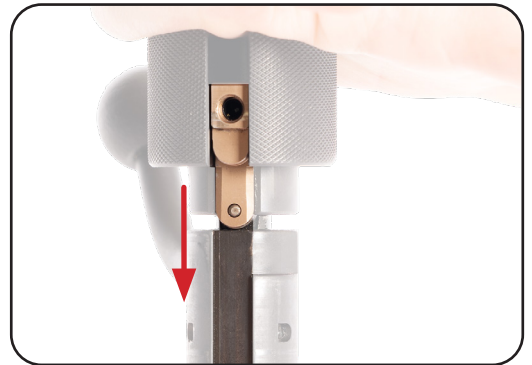
The rifle with bolt, magazine and scope with mount removed shall be called "main assembly".

5.2 Assembly


5.2.1 Installation of firing pin

CAUTION	
	Inspect firing pin and its bore in the bolt body visually to be clean before assembly. Firing pin stuck by obstructions may cause hazardous situations.

- a. Hold firing pin with bolt tool.
- b. Slip firing pin into bolt body, firing pin retainer aligned with face on bolt body.



- c. Push firing pin completely into bolt body against force of firing pin spring and rotate it counterclockwise until it snaps audibly into cocked position.

Note	
	Do not turn firing pin on uncocked position - bolt can not be inserted into rifle in this position.



5.2.2 Storage

- a. Push firing pin completely into bolt body against force of firing pin spring and rotate it counterclockwise until it snaps audibly into cocked position.



5.2.3 Installation of bolt

- a. Close folding stock halfway in a 90° position.
- b. Push on bolt stop.
- c. Slide bolt into receiver, with firing pin retainer running in bolt guide latch.



- d. Open folding stock (optional).

5.3 Functional check

5.3.1 Application

- a. Execute the functional check procedure always after stripping and reassembling the weapon system.
- b. Execute the functional check procedure always before leaving for mission.
- c. Execute one stage after the other in the order they appear below.

5.3.2 Checking trigger action and safeties

Step	Action to be carried out
a	Remove magazine and clear chamber to ensure that the rifle is not loaded. Safety on „S“.
b	Open bolt, close and lock bolt. -> Firing pin shall be armed, noticeable by firing pin retainer protruding firing pin housing.
c	Pull trigger. -> You should hear nothing as the firing pin should not strike.
d	Rotate safety lever to „F“. -> Safety shall run smooth and audibly lock into position.
e	Pull trigger. -> You should hear and observe the firing pin to strike.
f	Release trigger. -> Trigger shall return to foremost position.
g	Open bolt, close and lock bolt. Pull on trigger at its outer edge. -> Trigger safety shall lock trigger in foremost position, firing pin shall not strike.
h	Rotate safety lever to „S“. -> Safety shall run smooth and audibly lock into position.

5.3.3 Checking magazine

Step	Action to be carried out
a	Take empty magazine, pull follower down and release slowly. -> Follower shall rise smoothly into final position.
b	Open bolt and fully insert empty magazine. -> Magazine shall be held by magazine retainer.
c	Remove magazine and repeat procedure with every magazine included to the weapon system.

5.3.4 Checking folding stock

Step	Action to be carried out
a	Get rifle with stock open. -> Stock shall be locked without any clearance.
b	Close folding stock. -> Shall be held firmly in closed position.

5.3.5 Checking scope with mount

Step	Action to be carried out
a	Rotate elevation adjustment turret to over 30 MOA and back to 0. -> Shall click tangibly in every position. -> Yellow bar shall appear on top of the turret when set on 30 MOA (and higher).
b	Rotate windage adjustment turret in direction of arrow „R“, in counter-direction and back to 0. -> Shall click tangibly in every position.
c	Rotate parallax adjusting knob over its full range and back to 100 m. -> Shall run smoothly and stop accurately on extreme positions.
d	Rotate magnification adjustment over its full range. -> Shall run smoothly and stop accurately on extreme positions.
e	Rotate reticle illumination knob from 0 to 11. -> Shall run smoothly and stop accurately on extreme positions. -> Center cross of reticle shall shine in red color.
f	Open and close flip up covers. -> Shall flip up open at light push. -> Shall snap positively into closed position.

6. Ammunition

6.1 Specifications of cartridge

6.1.1 Technical data of cartridge (CIP standard)

Cartridge designation	.308 Win
Cartridge overall length	< 71.3 mm
Bullet weight (according to twist rate 1:11")	< 200 grs / 13.0 g
Average maximum pressure at breech end	≤ 4150 bar
Maximum pressure at breech end	≤ 4773 bar

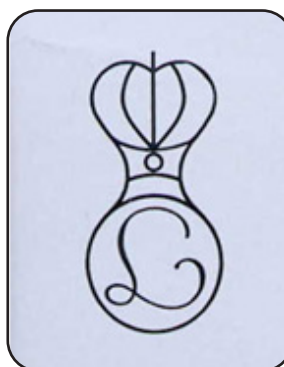
6.1.2 Compatible and non-compatible ammunitions

As the rifle was designed according to CIP-standards, every cartridge .308 Winchester and 7.62x51 (with exceptions as stated below) manufactured according to the same standards can be used with the rifle. CIP standard according cartridges normally carry a proof mark on the box.

CIP proof marks (small selection)



Finland (Lapua)



Sweden (Norma)



Italy (Focchi)

Best results have been achieved with:

- » RUAG Swiss P 168 grs (recommended for mid range applications up to 600 m);
- » Norma Diamond Line 190 grs (recommended for long range applications up to 1000 m);
- » Lapua D46 185 grs (suitable for military applications).

With respect to the muzzle brake and especially when using the rifle with mounted suppressor, the use of bullets which disintegrate at the muzzle departure is forbidden. The shrapnel is very likely to hurt people sideways to the weapon or can choke the suppressor.

This concerns namely sub-caliber bullets with sabot like e. g. Remington Accelerator™ bullets.

6.2 Ballistic data

6.2.1 Trajectory table

Weapon	B&T APR308 PRO cal. 7.62x51 610 mm twist 1:11"
Scope	Riflescope 68 mm over barrel
Ammo	Norma Diamond Line 190 grs Sierra MatchKing HPBT
Atmosphere	ICAO 500 m AMSL

Distance [m]	y* [m]	t ** [s]	Velocity [m/s]	Energy [J]	Wind 1m/s Drift in cm
0	-0.07	0	780	3742	
50	-0.01	0.07	755	3508	0.1
100	0.00	0.13	731	3286	0.4
150	-0.03	0.20	707	3075	1.0
200	-0.12	0.27	684	2874	1.8
250	-0.25	0.35	661	2685	2.8
300	-0.44	0.43	638	2505	4.1
350	-0.69	0.51	616	2335	5.6
400	-1.01	0.59	595	2174	7.5
450	-1.40	0.67	573	2022	9.7
500	-1.86	0.76	553	1878	12.1
550	-2.40	0.85	532	1741	14.9
600	-3.02	0.95	512	1612	18.1
650	-3.74	1.05	492	1489	21.7
700	-4.57	1.15	473	1374	25.6
750	-5.50	1.26	454	1268	30.0
800	-6.55	1.37	436	1170	34.8
850	-7.73	1.49	419	1082	40.1
900	-9.05	1.61	404	1002	45.9
950	-10.52	1.74	389	931	52.1
1000	-12.15	1.87	376	868	58.7

*y: MPI over POA in meters. Rifle zeroed at 100 m.

**t: Flight time at distance.

6.2.2 Sight adjustment chart

Weapon	B&T APR308 cal. 7.62x51 610 mm twist 1:11"
Scope	Riflescope 68 mm over barrel
Ammo	Norma Diamond Line 190 grs Sierra MatchKing HPBT
NVD	Simrad KN252 140 mm over barrel
Atmosphere	ICAO 500 m AMSL

Distance [m]	Elevation		Windage per 1 m/s wind	Movement by 1 click in mm	1 mrad in m
	Day	Night*			
50	2	16	0		
100	0	7	0	10	0.10
150	2	7	1	15	0.15
200	6	10	1	20	0.20
250	10	13	1	25	0.25
300	15	17	1	30	0.30
350	20	22	2	35	0.35
400	26	28	2	40	0.40
450	32	34	2	45	0.45
500	38	39	2	50	0.50
550	44	45	3	55	0.55
600	51	52	3	60	0.60
650	59	60	3	65	0.65
700	67	68	4	70	0.70
750	75	76	4	75	0.75
800	83	84	4	80	0.80
850	93	94	5	85	0.85
900	102	103	5	90	0.90
950	113	114	5	95	0.95
1000	124	125	6	100	1.00

*To apply when Simrad NVD mounted.

6.2.3 Table of hit probabilities

Weapon	B&T APR308 cal. 7.62x51 610 mm twist 1:11“
Scope	Riflescope 68 mm over barrel
Ammo	Norma Diamond Line 190 grs Sierra MatchKing HPBT
Atmosphere	ICAO 500 m AMSL

Distance [m]	σ [mm]	dia _{0.99} [mm]
100	6.6	40
150	10.1	61
200	13.7	83
250	17.4	106
300	21.3	129
350	25.3	153
400	29.4	178
450	33.7	204
500	38.1	231
550	42.7	259
600	47.5	288
650	52.5	319
700	57.7	350
750	63.1	383
800	68.7	417
850	74.6	453
900	80.6	489
950	87.0	528
1000	93.5	567

* σ : Standard deviation.

**dia_{0.99}: Diameter of a target with first round hit probability of 99%.

6.3 Care and handling of ammunition

The sniper weapon system can perform the required first round hit probability only with selected ammunition. Therefore never mix cartridges of

- Different brands;
- Different specifications in bullet type and weight;
- Different lot numbers.

Thus in operation as well as for training and storage, cartridges must be always properly identified.

Since ammunition and explosives are adversely affected by moisture and high temperature, due consideration should be given to the following:

- Do not open boxes until ammunition is required for firing.
- Protect ammunition from high temperature and direct sunlight.
- Do not attempt to disassemble cartridges.
- Never use lubricants or grease on cartridges.

7. Troubleshooting table


SN	Problem	Probable cause	Immediate action	Maintenance action
1	Failure to extract	<ul style="list-style-type: none"> -Non-conform ammunition -Case rupture -Fouling of chamber -Inoperative extractor 	<ul style="list-style-type: none"> -Remove blocked case -Clean chamber -Return removed case and rifle to armorer 	<ul style="list-style-type: none"> - Apply extractor and chamber inspection procedures -Clean chamber -Replace worn-out, lost or defective parts -If failure occurs with other rifles, check conformity of ammunition
2	Failure to eject	<ul style="list-style-type: none"> -Inoperative ejector 	<ul style="list-style-type: none"> -Remove case (if necessary by removing bolt and magazine) -Return rifle and case to armorer 	<ul style="list-style-type: none"> -Check proper assembly of ejector -Replace worn-out or defective parts
3	Misfire despite striking firing pin	<ul style="list-style-type: none"> Non-conform ammunition -Inoperative firing-pin -Improper headspace 	<ul style="list-style-type: none"> -Remove unfired cartridge -Check firing pin impact on primer -Remove and clean bolt -Load new cartridge -If failure repeats, return removed cartridge and rifle to armorer 	<ul style="list-style-type: none"> -Check firing pin impact on primer of cartridge -Apply firing pin protrusion and headspace inspection procedures -Replace defective or worn-out parts (namely firing pin and spring) -If failure occurs with other rifles, check conformity of ammunition
4	Misfire despite pulling trigger (firing pin not striking)	<ul style="list-style-type: none"> -Malfunction of trigger group -Firing pin retention loose 	<ul style="list-style-type: none"> -Unload -Check proper position of safety -Return rifle to armorer 	<ul style="list-style-type: none"> -Disassemble firing pin and check proper installation -Disassemble trigger group and check proper installation -Replace worn-out or defective parts
5	Failure to feed	<ul style="list-style-type: none"> -Incorrect position of magazine or cartridge -Deformed magazine body or lips -Worn-out magazine spring 	<ul style="list-style-type: none"> -Check magazine is properly held in rifle and try again -If failure repeats, change magazine 	NONE

SN	Problem	Probable cause	Immediate action	Maintenance action
6	Impossible to close bolt	<ul style="list-style-type: none"> -Failure to extract -Foreign particles in chamber 	<ul style="list-style-type: none"> -DO NOT APPLY FORCE TO CLOSE BOLT! -Remove cartridge -Check chamber visually and with little finger -Clean chamber 	NONE
7	Inconsistent firing results	<ul style="list-style-type: none"> -Loosened sight mounting -Defective sight -Barrel fouling -Barrel worn out -Loosened bedding screws 	<ul style="list-style-type: none"> -Check sight settings -Check sight mountings, tighten if loose -In case of detachable sights: Replace and return suspected to armorer -Return rifle/sight configuration to armorer 	<ul style="list-style-type: none"> -Apply sight inspection procedures and actions -Disassemble sight mount, check parts visually and replace defective parts -Apply barrel and headspace inspection procedures -In case of barrel fouling, apply chemical agent -Replace barrel if worn out -Inspect momentum of bedding screws (NT038, NT063); tighten and secure if loose
8	Low recoil, no impact detected	Underloaded cartridge	-Inspect barrel to be clear (bullet could be stuck!)	NONE
9	Heavy recoil, black smoke, no impact detected	-Obstructed barrel shot	STOP FIRING!	-Barrel replacement


SN	Problem	Probable cause	Immediate action	Maintenance action
10	Trigger fails to return after release	-Lack of lubrication -Damaged trigger spring	-In combat situation, continue firing by pushing trigger manually forward while operating bolt -Return rifle to armorer	- Disassemble trigger group -Replace trigger springs -Lubricate and reinstall trigger group
11	Folding stock retention fails when open	-Accumulation of dirt -Damaged retention	-Wipe off dirt -If failure repeats, return rifle to armorer	-Visual inspection -Replace worn-out, lost or defective parts
12	Failure of non-essential features	-Improper installation -Dirt -Damaged or lost parts	-Visual inspection -Wipe off dirt -If failure repeats, return rifle to armorer	-Visual inspection -Replace worn-out, lost or defective parts

8. Accessories


8.1 Suppressors

Picture	Art.-No.	Type	Description
	SD-988320	APR308 PRO	B&T Monoblock rifle suppressor - cal. 7.62 mm / .308

8.2 Riflescopes

Picture	Art.-No.	Type	Description
		APR308 PRO	B&T provides suitable rifle scopes on request.

8.3 Case

Picture	Art.-No.	Type	Description
		APR308 PRO	B&T provides suitable hard or soft cases on request.

9. Warranty statement

Warranty claims on behalf of the Client are to be explicitly declared as such. During the legal warranty period, B&T provides warranty cover solely for defects that arise as a result of faulty materials, construction errors or poor workmanship. If a warranty claim is justified, B&T will, at its own discretion, either repair or replace the defective good. Costs incurred in transporting the defective good to B&T are borne by the Client. Spare parts fitted and replaced become the property of B&T.

Inasmuch as is legally permitted, any other liability of B&T is excluded, in particular liability for damages arising either directly or indirectly from the delivered good itself, from its use or from its defects.

Merchandise is covered by the warranty provisions of the manufacturer. Parts that are naturally subject to wear and tear, damage arising from insufficient maintenance work, noncompliance with operating regulations and cases of force majeure are all excluded from warranty cover. Warranty claims lapse if the Client itself or third parties alter or repair the delivered good without the prior written consent of B&T. All product specifications are subject to change without prior notice. Published data are mean values and therefore not suitable acceptance criteria.

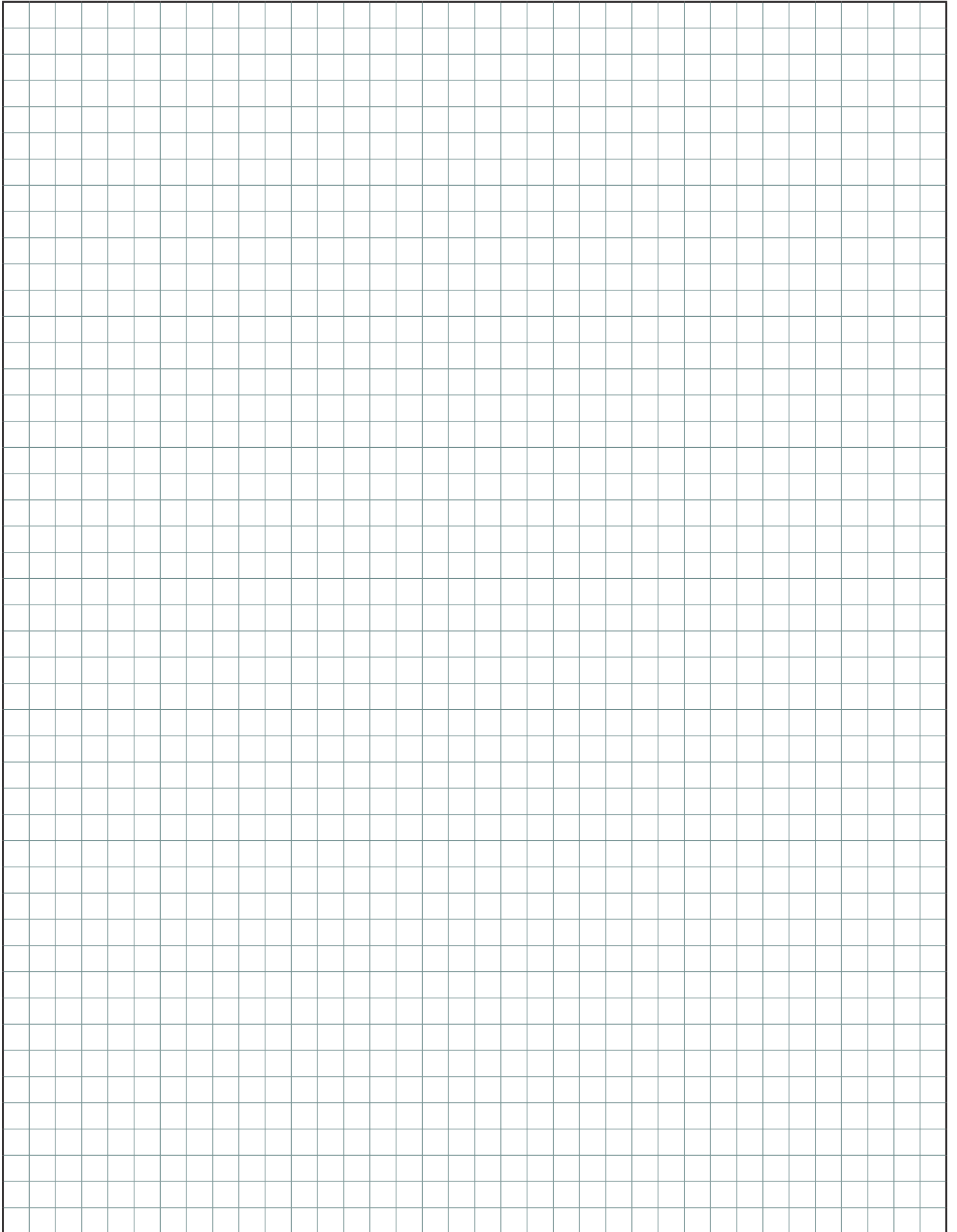
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