

# USER MANUAL



## **HECATE II** **12.7 x 99 (.50 BMG)**



**Wood and polymer versions**

Version 2.3



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## 1. FOREWORD

PGM PRECISION thanks you for having chosen the model HECATE II calibre 12.7x99.

Highest care was taken for the development parts which constitute this weapon like to its assemblies.

This weapon has been tested by the Official Proof House for Firearms and Ammunitions of Saint-Etienne, then controlled and tested by us according to strict procedures. We hope that it will bring whole satisfaction to you.

☞ **Please read attentively and completely this manual before using your PGM HECATE II. Do not hesitate to read it regularly.**

The information provided in this handbook, the photos and the images are not contractual. PGM PRECISION reserves itself the right to change specifications without notice.

To obtain further information, please contact your retailer or directly PGM PRECISION.

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## 2. GENERAL REMARKS

- ☞ Please respect the national laws which regulate the detention, the port, the transport and the use of firearms.
- ☞ A rifle, as any weapon can be dangerous. PGM PRECISION and its retailers decline any responsibility for the consequences resulting in whole or partly from :
  - a criminal intent or through negligence,
  - a careless handling,
  - the use of defective, incorrect, damaged, unsafe ammunitions,
  - an inadequate care of the rifle,
  - a resale in contradiction to legislation.
- ☞ Please keep this manual preciously. If you sell your weapon, please transmit this handbook to its purchaser.

### 3. SAFETY INFORMATION

- ☞ The weapon must be handled by complying with the safety requirements in force.
- ☞ Do not use this weapon under influence of alcohol or drug.
- ☞ Always check at first that the chamber is fully empty. Always handle the gun as if it was loaded. Keep the safety engaged until just before firing.
- ☞ Always check the barrel before firing to make sure it is free from obstruction.
- ☞ Never point any firearm at yourself or at any living being.
- ☞ Always shoot in direction from the target. Assure you that nobody is behind. If people are close to you, ensure you they stay behind.
- ☞ Never let handle your rifle by a person who is not informed about the details of safety and its handling.
- ☞ Never leave the weapon without supervision.
- ☞ Wear shooting glasses to protect your eyes from flying particles.
- ☞ Wear ear protectors to guard you against such damage. Unprotected, repeated exposure to gunfire can cause hearing damages. Assure you that other persons wear those protectors up to 20 m around you.
- ☞ Never fire without muzzle brake or silencer. Recoil would be too much important.
- ☞ When firing with muzzle brake, avoid that anybody stands on the blasting zone. When shutting in pairs, spotter has to lie down on left or on the right of the shooter. Shoulders come up to hips shooter.
- ☞ Never use “accelerator” ammunitions with muzzle brake or sound suppressor.
- ☞ If you detect off sound or light recoil when a round is fired, do not load another round into the chamber. Fully unload the rifle.
- ☞ If your weapon fails to fire, keep the muzzle pointed in a safe direction. Hold this position for a minimum of 30 seconds. Then remove the

magazine. Carefully open the bolt in order to eject the round. The round should be disposed of in a way that it can't cause harm.

- ☞ Only use manufactured ammunitions of quality. The caliber is engraved on the bolt receiver.
- ☞ The use of reloaded or not standard ammunitions causes the immediate end of the guarantee. That can cause significant damage with the weapon and wound the user or other people.
- ☞ Only use ammunitions manufactured according to CIP norms.
- ☞ You can reload yourself your cartridges. Ensure however that you employ the load and the adapted type of powder and follow the recommendations of the handbook of recharging provided by the powder manufacturer or of the warheads you use.

## 4. STORAGE AND TRANSPORT

### 4.1 Storage

- ☞ Remove the bolt and be sure that the chamber is empty.
- ☞ Put the weapon in its case or in a carrying bag. Stock it in a strong cupboard.
- ☞ Ensure that none of these elements can be accessible by children or unauthorized people.
- ☞ Apply the laws in force concerning the storage of firearms.

### 4.2 Transport

- ☞ Always transport the weapon unloaded. Put it in a carrying case or in a soft bag. Ammunitions and bolt have to be separated from the weapon.
- ☞ Apply the laws in force concerning the transport of firearms.

## 5. GENERAL DESCRIPTION

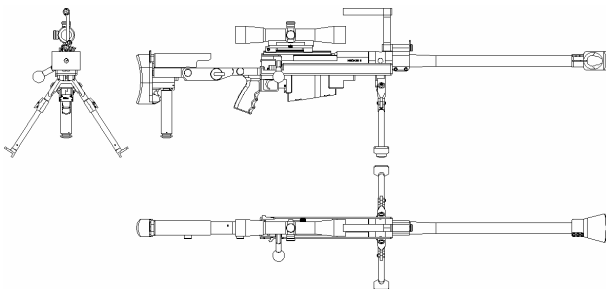
**HECATE II** calibre 12.7x99 is a high power sniper rifle system for the discriminating marksman. It's used for anti-material destruction, sniping and anti sniping.

This bolt action and manually operated weapon is composed of 4 principal elements :

- A rigid aircraft alloy framework with a bipod,
- A steel receiver with adjustable trigger assembly and the bolt,
- A match grade free floating barrel,
- A detachable buttstock.

The range HECATE II includes wood and polymer versions.

## 5.1 Technical information



HECATE II – polymer version equipped

- Heavy match grade free floating barrel screwed in the bolt receiver
- Muzzle brake
- 7 rounds magazine (dual row) - steel
- Rigid aircraft alloy chassis
- Steel bolt receiver
- Black finished
- Bolt with 3 forward located lugs
- Ultra fast travel firing pin
- Full adjustable double stage trigger
- Safety locks the trigger mechanism
- Folding bipod and retractable legs with adjustable banking brake
- Sling fixing points (polymer version)
- Adjustable cheek piece (polymer version)
- Ambidextrous handgrip
- Detachable buttstock
- Adjustable butt spike
- Folding butt spike (polymer version) – detachable butt spike
- Full interchangeability of pieces

	Wood	polymer
Caliber	12.7 x 99 (.50 BMG)	
Barrel length (mm)	700 mm	
Number of grooves (mm)	8	
Twist (")	15	
Range (m)	→ 1800	
Trigger pull weight (kg)	1.4 to 2.2	
Length (buttstock min) (mm)	1370	1386
Length (buttstock max) (mm)	x	1439
Length (removed buttstock) (mm)	1120	
Width + bolt (mm)	166	
Barrel axel / floor (mm)	285 / 375	
Magazine capacity	7	
Silencer length (mm)	470	
Silencer weight (kg)	3.880	
Weight (empty) (kg) <sup>(1)</sup>	15.3	
Barrel weight (kg)	4.380	
Magazine weight empty / full (kg)	0.590 / 1.440	
Pelican 1750 case dimensions (mm) <sup>(2)</sup>	1286 x 343 x 127	
Pelican 1750 case weight (kg)	≈ 11	
Explorer case dimensions (mm) <sup>(3)</sup>	1410 x 415 x 159	
Explorer case weight (kg)	≈ 10	

All specifications subject to changes without notice

<sup>(1)</sup> Complete weapon without scope – empty magazine

<sup>(2)</sup> for 700 mm barrel version

<sup>(3)</sup> for 900 mm barrel version

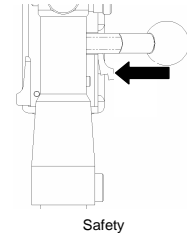
## 5.2 Accessories

- Maintenance kit :
  - Extractor replacement kit
  - Ejector replacement kit
  - Firing pin replacement kit
  - Cleaning kit
  - Standard tool kit
  - Emergency pull case
- 700 mm barrel with insert made of stellite
- 900 mm barrel
- Wood or polymer buttstock
- Silencer kit
- Sights
- Tactical sling
- Military bags
- Transport plastic case
- Picatinny rail (flat, 20 MOA, 30 MOA or 1°)
- 500 mm long Picatinny rail kit (20 MOA) + 1 lateral rail
- Scope mounts
- Headspace gauges, extractor gauge, firing pin gauge
- Scope rings (∅ 25.4 mm, ∅ 30 mm and ∅ 34 mm)
- Special scope rings for night vision sights (Simrad KN, Zeiss NSV80)
- ...

## 6. USING THE RIFLE

### 6.1 Safety mechanism

- **Safety position:**  
Safety is **ON**, when the safety lever is in its rearmost position.
- **Firing position:**  
Safety is **OFF**, when the safety lever is pushed in its foremost position.



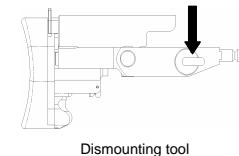
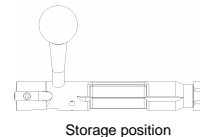
#### Caution :

- ☞ **The safety lever can not be set at the safe position as the firing pin is released.**
- ☞ **Remove your finger from the trigger while you're handling the safety.**
- ☞ **The safety lever must not stay between the 2 positions.**

### 6.2 Bolt

#### 6.2.1 Storage position

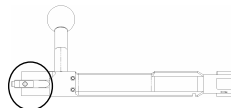
Using the bolt dismounting tool in the buttstock, place the bolt in position of storage for not wearing out the firing pin spring.



## 6.2.2 Introduction

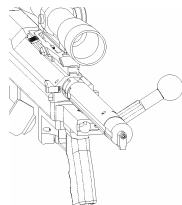
- ☞ Ensure that the rifle is completely empty.
- ☞ Wood version : remove the buttstock.
- ☞ Polymer version : remove the cheek piece.

- Remove the magazine.
- The firing pin extension must be in the insertion position. If the need arises, use the bolt dismounting tool.



Insertion position

- Introduce the bolt in the receiver.
- Close the bolt.
- Release the trigger.
- Open the bolt in rear position.

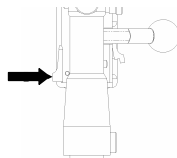


Bolt introduction

## 6.2.3 Removal of the bolt

- ☞ Wood version : remove the buttstock.
- ☞ Polymer version : remove the cheek piece.

- Push on the bolt catch and hold it in that position.
- Remove the bolt.



Bolt catch

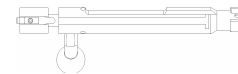
## 6.2.4 Assembling and disassembling the bolt

### - Disassembling :

- Put the rear part of the bolt into the bolt dismounting tool. Hold the front part of the bolt and then turn it in the clockwise direction.

### - Assembling :

- Align the firing pin extension key with the groove of the bolt.
- Push strongly the firing pin assembly using the bolt dismounting tool then turn ¼ in the anticlockwise direction.



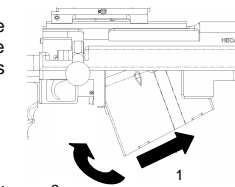
Assembly position

## 6.3 Magazine

### 6.3.1 Loading

- The magazine is loaded by pressing the cartridge head in front underneath of the holding lips and then pushing them into its rearmost position.
- Tilt the magazine (about 20°).
- Position it in the receiver.
- Swivel it round up to the "click".

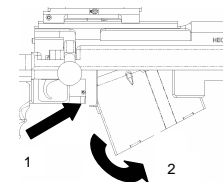
- ☞ The magazine must be gently removed before introducing the bolt.



Loading

### 6.3.2 Unloading

- Push the magazine catch and hold it in that position.
- Pull the magazine downwards.

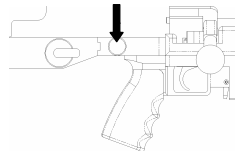


Unloading

## 6.4 Buttstock

### 6.4.1 Fixing the buttstock

- ☞ Knurled screw is braked by a plastic ball.
- Loosen the knurled screw.
- Introduce axle in the chassis until it stops.
- Tighten the knurled screw.



Fixing the buttstock

### 6.4.2 Wood buttstock settings

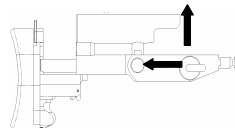
The only one part to be set is the butt spike. Cheek piece and buttstock suit all morphologies.

### 6.4.3 Polymer buttstock settings

Cheek piece, buttstock and butt spike are adjustable for maximum comfort and precision.

#### - Adjusting the height :

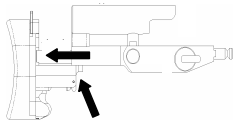
- ☞ Knurled screw is braked by a plastic ball.
- Loosen the knurled screw.
- Introduce axle in the chassis until it stops.
- Tighten the knurled screw.



Adjusting the height

#### - Adjusting the length :

- Using a 5 mm hexagonal spanner, loosen the screw.
- Adjust the length as desired.
- Tighten the screw.

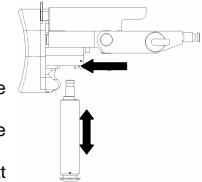


Adjusting the length

## 6.4.4 Butt spike

### - Detachable butt spike :

- ☞ Butt spike has a located pin.
- Position the flat forwards.
- Push the spike into the box up to the "click".
- Screw or unscrew it for adjusting the height as desired.
- Push the locking lever to remove the butt spike.



Fixing the butt spike

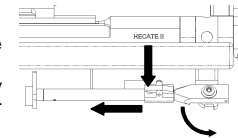
### - Folding butt spike :

- ☞ Only on polymer version.
- ☞ The butt spike has 3 positions (0°, 45° and 90°).
- Pull and rotate the butt spike.
- Drop it in the desired position.
- Screw or unscrew for adjusting the height as desired.

## 6.5 Bipod

### 6.5.1 Using and setting

- To unfold the bipod, pull its legs one by one and then pull them downwards.
- Length of the legs can be changed by pressing the catch and by pulling down or pressing the leg as far as needed.



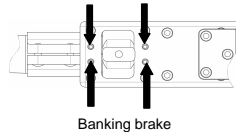
Using the bipod



### 6.5.2 Adjusting the banking brake

#### - Increasing the brake :

Using a 4 mm hexagonal spanner, tighten gently the 4 screws.



#### - Decreasing the brake :

Using a 4 mm hexagonal spanner, loosen gently the 4 screws.

### 6.6 Trigger

☞ The trigger is full adjustable by an armorer. Don't adjust trigger pull weight under 1.4 kg.

### 6.7 Barrel

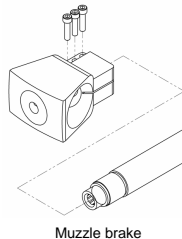
- ☞ Barrel can only be removed by an armorer or by PGM PRECISION.
- ☞ Using a 34 mm dynamometric spanner, tighten the barrel at torque of **11 daN.m +/-1**.

### 6.8 Muzzle brake and silencer

☞ **For your security, firing without muzzle brake or silencer is prohibited.**

#### 6.8.1 Installation of the muzzle brake

- Turn the muzzle brake clockwise by hand until it stops.
- Screw it (maximum 1 turn) and make it level.

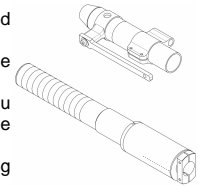


- Using a 5 mm hexagonal spanner, tighten the 3 screws.

☞ Glue the screw with low strength locking.

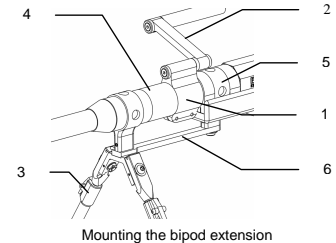
#### 6.8.2 Silencer kit

- ☞ Silencer kit contents a silencer and a bipod extension.
- ☞ The silencer moves the centre of gravity of the weapon because of its weight.
- ☞ The weapon is also unbalanced. We advise you to use the bipod extension to balance the weapon.
- ☞ When used, the bipod extension allows firing either with muzzle brake, either with silencer.



#### 6.8.3 Mounting the bipod extension

- Remove the magazine, the bolt, the buttstock and the scope.
- Using a 5 mm hexagonal spanner, loosen the 3 screws and remove the muzzle brake.
- Using a 5 mm hexagonal spanner, loosening the 2 screws, remove the carrying handle assembly (1+2).
- Using a 4 mm hexagonal spanner, remove the handle.
- Using a 5 mm hexagonal spanner, remove the bipod (3).
- Slip the extension bipod (4) until its stops against the pivot (5).
- Position the spacer (6) between the 2 pivots and tighten the screw of the rearmost.
- Position the bipod on the foremost pivot and tighten the screw.



- Mount the carrying handle.
- Mount the silencer or the muzzle brake and adjust it with a water level.

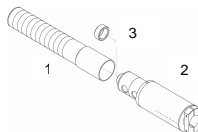
☞ All screws are glued with low strength locking, except the 2 which hold the spacer.

#### 6.8.4 Mounting the silencer

- Remove the muzzle brake.
- Screw the silencer on the barrel until it stops.
- Using a 5 mm hexagonal spanner, tighten the 2 screws.

#### 6.8.5 Using the silencer

- ☞ Silencer reduces sound by 25 dB in comparison with muzzle brake.
- ☞ Silencer part (1) can not be dismantled.
- ☞ Silencer assembly can be used without silencer part. Part (2) serves as a muzzle brake.



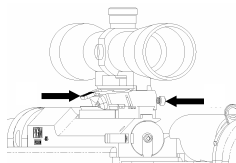
Silencer assembly

- Unscrew the silencer part (1) by handle.
- Tighten the knurled nut by handle to protect the thread.

### 6.9 Scope mount

#### 6.9.1 French Army fast mounting

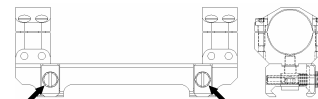
- Rotate the lever rearwards.
- Push locking knob and then the mount in the dovetail.
- Position the mount as desired and drop the locking knob in a groove.
- Rotate the lever forwards.



French Army fast mounting

#### 6.9.2 Scope Mount for picatinny rail

☞ Ensure the 2 jaws are free and right oriented (catch downwards).



- Put the mount at the desired position and push it against a sleeper.

- Using a 4 mm hexagonal spanner, tighten the 2 screws at torque of **6 N.m.**

Scope mount + rings

#### 6.9.3 Scope slings

- Tighten the 8 M4 screws at torque of **4 N.m.**

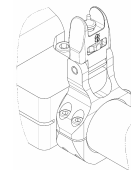
### 6.10 PGM emergency sight

☞ Rear sight and front sight can stay at the same time as the scope. They just have to be folded.

#### 6.10.1 Mounting

##### - Front sight :

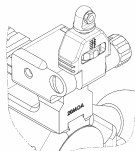
- Position it near the muzzle brake or the silencer.
- Using a water level, make it level.
- Using a 3 mm hexagonal spanner, tighten the 4 screws at torque of **4 N.m.**



Front sight

**Rear sight :**

- Position the rear sight in rearmost position on the picatinny rail.
- Using a 4 mm hexagonal spanner, tighten the screw at torque of **4 N.m.**



Rear sight

**6.10.2 Setting**

**Rear sight :**

- Horizontal adjustment value :  
0.1 mm per click (1 tour = 0.5 mm) : -2 → +2mm
- Vertical adjustment value :  
0.1 mm per click (1 tour = 0.5 mm) : 0 → + 4 mm

**Front sight :**

- Vertical adjustment value :  
0.1 mm per click (1 tour = 0.5 mm) 0 → + 4 mm

**Formulas :**

$$\text{factor} = \frac{\text{Target distance} \times 1000}{\text{Length of sight}} \times \text{click value}$$

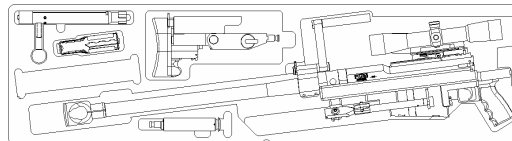
$$\text{Correction} = \text{factor} \times \text{click value}$$

**For 700 mm standard barrel :**

- Length of sight = 895 mm → factor = 112
- All knurling wheel : **1 click = 14 mm at 100 m**

**6.11 Transport case**

**6.11.1 Standard transport case**



Standard transport case interior (700 mm barrel)

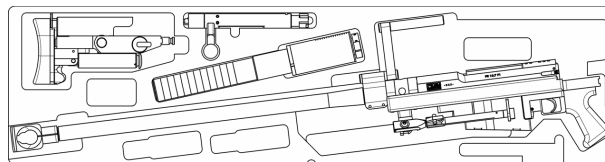
The transport case contains the following items :

- a rifle with a scope and a magazine
- a bolt
- a buttstock
- a butt spike
- a spare magazine
- a sight
- a collective unit



Pelican Case 1750

**6.11.2 900 mm barrel transport case**



900 mm barrel transport case interior

The transport case contains the following items :

- a rifle with a scope and a magazine
- a bolt
- a buttstock
- a butt spike
- 2 spare magazines
- a sight
- a collective unit



Valise Explorer 13513

## 7. MAINTENANCE

- ☞ Remove the bolt and ensure that the rifle is fully unloaded.

### 7.1 *Breaking in a new barrel*

- ☞ To obtain an optimal precision, we advise you to break in a new barrel. It's not absolutely required but highly recommended.

- Clean the barrel with a cleaning wick.
- Fire a first round and clean the barrel with a bronze bore brush and then with a cleaning wick.
- Repeat the previous step at least 10 times.
- Fire 10 series of 3 rounds and after each series, clean the barrel with a bronze brush and then with a cleaning wick.
- Finally, fire 10 series of 5 rounds and after each series, clean the barrel with a bronze brush and then with a cleaning wick.

- ☞ Let cool the barrel after each series

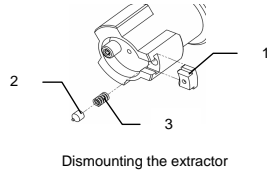
### 7.2 *Dismounting the weapon*

- ☞ The full dismounting of the weapon must only be realised by an armorer or by PGM PRECISION.

- ☞ Before dismounting :
  - Unload the weapon.
  - Remove the magazine and the bolt.
  - Remove the scope.

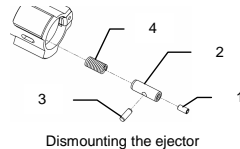
### 7.2.1 Replacement of the extractor

- Using a 1.5 mm drift punch through the central hole of the extractor (1), push the plunger (2) just enough inwards so that it no longer holds the extractor in position.
- Take the plunger and the spring (3) out of their housing in the bolt.
- To reassemble, follow the above steps in reverse order.
- Lubricate them before installation.
- Ensure that the plunger correct engages the central hole of the extractor,
- Operate the extractor and lubricate.
- Using the extractor gauge, check the extractor protrusion.

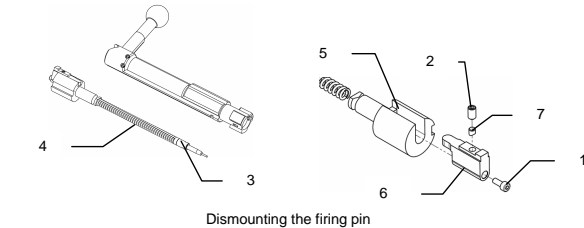


### 7.2.2 Replacement of the ejector

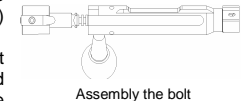
- Using a 1.5 mm hexagonal spanner, loosen the screw (1),
  - Push the ejector (2). Using a pair of pliers, withdraw the cylindrical pin (3) which secures the ejector.
  - Take the ejector and its spring (4) out of the bolt.
  - Clean and lubricate the hole.
  - To reassemble, follow the above steps in reverse order.
  - Lubricate and operate the ejector.
- ☞ Position the flat of the pin towards the screw.
- ☞ After its reinstallation, the cylindrical pin should slightly protrude from the ejector and not at all from the bolt.
- ☞ Glue the screw with low strength locking.



### 7.2.3 Replacement of the firing pin



- Remove the firing pin assembly from the bolt by turning the bolt dismounting tool about ¼ turn clockwise until it gets free of its locking cam.
- Using the 3 mm hexagonal spanner, loosen the screw (1) and then the screw (2).
- Remove the firing pin (3) and its spring (4).
- Put the new firing pin and the new spring into the bolt.
- Position the firing pin extension (5) in the bolt so that the firing pin extension key (6) is aligned with the groove of the bolt.
- Position the key so that there is full contact between the rounded part of the key and the bottom of the notch in the body of the bolt.
- Position part (7) and tighten the screw.
- Lubricate and operate.
- Using the firing pin gauge, check the firing pin protrusion.



- ☞ Glue the screw with low strength locking.

### 7.3 **Cleaning and lubrication**

- ☞ The respect of the indications hereafter will enhance the longevity and the performance of your rifle.
- ☞ Use the better oil which cleans, protect and lubricate your rifle.
- ☞ Please note that your weapon needs a regular maintenance and address you to a qualified armorer or directly to PGM PRECISION.

#### 7.3.1 **Cleaning and lubrication before firing**

- Clean the barrel with a cleaning wick.
- Ensure that the barrel is perfectly dry.
- Lubricate the bolt, the ejector and the extractor.

#### 7.3.2 **Cleaning and lubrication after firing**

- Start cleaning by complete strokes with the bronze bore brush soaked in oil.
- Wipe it with a cleaning wick until the last remains clean.
- Lubricate the barrel with a soaked cleaning wick.
- Clean the interior of the bolt.
- Lubricate the bolt.
- With a rag soaked in oil, wipe the exterior of the weapon and the moving parts.
- Lubricate the legs of the bipod.
- Dismantle the magazine and wipe it with a rag soaked in oil.
- Completely loosen the butt spike. Wipe and lubricate it.
- Store the weapon in a dry and temperate room.

#### - **Caution :**

- ☞ Always clean the barrel from the bore to the muzzle.
- ☞ Use a bore guide.
- ☞ Never use a steel brush or abrasive materials.
- ☞ Only use spare parts coming from PGM PRECISION.

#### - **At least once a year :**

Your weapon has to be controlled by a qualified armorer or directly by PGM PRECISION.

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