

PWS MK1, MOD1 RIFLE SERIES USER MANUAL

END USER MAINTENANCE MANUAL

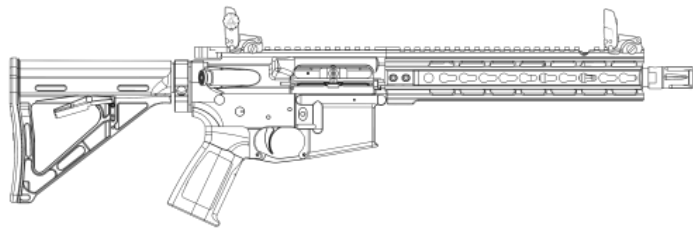
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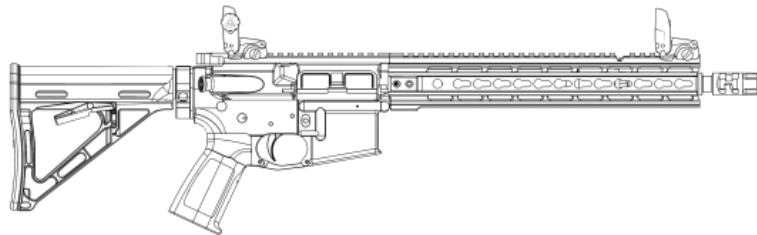
RIFLE, .223 WYLDE, MK107  
(M107RA1B)  
UPPER, 7.62x39, MK107  
(M107UF0B)



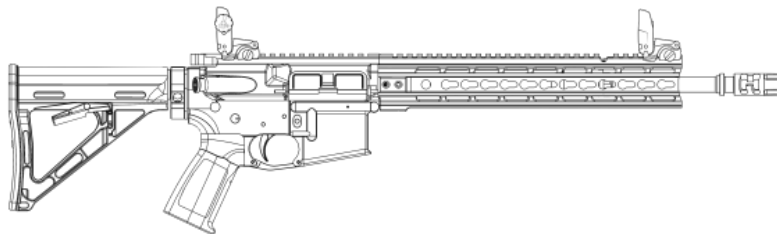
RIFLE, 300 BLK, MK109  
(M109RB1B)



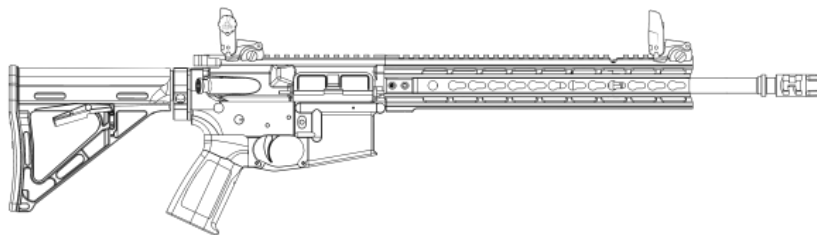
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(M110RA1B)



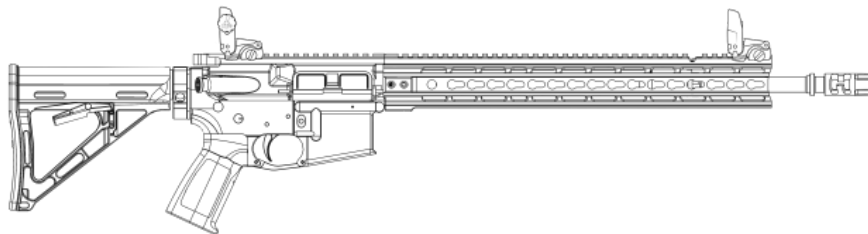
RIFLE, .223 WYLDE, MK112  
(M112RA1B)



RIFLE, .223 WYLDE, MK114  
(M114RA1B)



RIFLE, .223 WYLDE, MK116  
(M116RA1B)  
RIFLE, 300 BLK MK116  
(M116RB1B)  
UPPER, 7.62x39, MK116  
(M116UF0B)



RIFLE, .223 WYLDE, MK118  
(M118RA1B)

## **WARNING**

ALL WARNINGS in this user and maintenance manual pertain to all versions of PWS rifles, carbines and uppers unless otherwise specified.

Prior to beginning an inspection, ensure the rifle is UNLOADED. DO NOT pull the trigger until the rifle has been cleared. Remove the magazine and inspect the chamber to ensure that it is empty and that a round is not chambered.

Do not keep live ammunition near work area.

To avoid injury, use caution when removing and installing spring-loaded components.

The bolt cam pin must be installed or irreparable damage will occur to the weapon and injury or death of personnel may result.

Cleaning solvents are flammable and toxic and should be used only in a well-ventilated area. The use of rubber gloves is necessary to protect the skin when cleaning rifle parts.

Avoid skin contact when using carbon removing compounds. If carbon removing compound comes in contact with the skin, wash thoroughly with running water. Using gloves and protective equipment is required.

## **CLEARING PROCEDURE**

1. Orient the muzzle in a designated SAFE DIRECTION.
2. Attempt to place selector lever on SAFE (If weapon is not cocked, lever cannot be placed on SAFE).
3. Remove the magazine by depressing the magazine catch button and pulling the magazine away from the receiver.
4. Lock the bolt open by pull the charging handle rearward while pressing the bottom of bolt catch.
5. Ensuring the Bolt Carrier Group (BCG) is locked rearward, return the charging handle to full forward position.
6. If you have not done so before, place the selector lever on SAFE.
7. Visually (not physically) inspect the receiver and chamber to ensure these areas contain no ammunition.
8. Send the bolt forward on an empty chamber, by pressing the top of the bolt catch.
9. Close the ejection port cover.

Direct Support Maintenance Manual For	
RIFLE, .223 Wylde, MK107 (M107RA1B)	RIFLE, .223 Wylde, MK114 (M114RA1B)
UPPER, 7.62x39, MK107 (M107UF0B)	RIFLE, .223 Wylde, MK114 LE (M114RA1BLE)
RIFLE, .223 Wylde, MK109 (M109RB1B)	RIFLE, .223 Wylde, MK116 (M116RA1B)
RIFLE, .223 Wylde, MK110 (M110RA1B)	RIFLE, .300 BLK, MK116 (M116RB1B)
RIFLE, .223 Wylde, MK112 (M112RA1B)	UPPER, 7.62x39, MK116 (M116UF0B)
RIFLE, .300 BLK, MK112 (M112RB1B)	RIFLE, .223 Wylde, MK118 (M118RA1B)

Current as of January 2015

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## CONTACT INFORMATION

If any further information or assistance is needed, always contact the PWS customer service support team:

**E-mail:** customerservice@primaryweapons.com

**Phone:** (208) 780-6122

**Fax:** (208) 297-2675

## WARRANTY

PWS has a designated warranty department. If you are having any issues with any of our products, you believe your issue to be caused by damage during shipping, or that it was caused by fault on our part (eg. missing parts), please report the damage immediately by filling out a Warranty RMA Ticket online at [www.primaryweapons.com](http://www.primaryweapons.com).

## WARRANTY INFORMATION

All components manufactured by Primary Weapons Systems Inc. (PWS) are warranted by the manufacturer for 24 months from the date of delivery, to its customer against defects that may have occurred in the manufacturing process, during assembly, or during proofing of the product. The manufacturer also guarantees the product functions to factory specifications and meets the quality standards as set by Primary Weapons Systems Inc., and will warranty any product that fails to maintain those specifications.

This warranty shall include the replacement of any broken or worn parts that would render the carbines less than 100% safe and operable. The warranty shall extend to weapons with damage as a result of normal operational wear and tear. The warranty only covers defects as specified herein and does not include defects or damages related to use that exceeds the tolerances of the raw materials used in the product. Nor does it cover defects or damages attributable to the installation or use of after-market or non-factory installed accessories beyond conventional sighting systems such as: optics, lasers, and white lights to ensure long term reliability; misuse or normal surface wear; or defects or damages caused by neglect or by normal use within the scope of the intended role and application of these products. These are subject to the customer following both the maintenance schedule and maintenance procedures as outlined in both the User and Armorer's Manuals for these components and products. And that the customer follows the intended use guidelines as specified by the appropriate manual or instruction card. The warranty shall not extend to weapons damaged beyond repair through abuse caused by catastrophic conditions, such as fire, and routine abuse such as accidental dropping. THIS WARRANTY WILL BE VOID IF THE PRODUCT HAS BEEN ALTERED BY THE CUSTOMER OR THIRD PARTY; ABUSED OR MISUSED.

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## **SAFETY IS YOUR NUMBER ONE RESPONSIBILITY**

Regardless of where you are, the first concern of every firearm owner should be safety. Apply the following safety rules in every situation and with any kind of firearm. If you feel uncertain about any operational aspects of your firearm, please contact Primary Weapons Systems, Inc. (PWS) customer service at (208) 780-6122 before proceeding with its operation.

### **SAFETY WARNINGS**

**YOU MUST FOLLOW ALL SAFETY RULES TO ENSURE THE SAFE USE OF YOUR FIREARM. FAILURE TO FOLLOW THE INSTRUCTIONS AND WARNINGS IN THIS MANUAL COULD CAUSE SERIOUS PERSONAL INJURY OR DEATH TO YOU OR OTHERS AND DAMAGE TO PROPERTY.**

As a gun owner, you accept a demanding responsibility. How seriously you take this responsibility can be the difference between life and death. There is no excuse for careless or abusive handling of your firearm. Handle your firearm with extreme respect for its power and potential danger.

#### **ALWAYS KEEP YOUR FIREARM POINTED IN A SAFE DIRECTION**

Never point a firearm at anyone or anything you do not intend to destroy whether it is or is not loaded. This is particularly important when loading, unloading, or field stripping the firearm.

**ALWAYS** control the direction of the firearm.

**NEVER** stick any product made by Primary Weapons Systems in your anal cavity. Rectal insertion of any of our products can cause irreparable damage to both your rectum and your high quality firearm accessory.

**ALWAYS TREAT EVERY FIREARM AS IF IT IS LOADED AND WILL FIRE**

Do not take someone's word that the firearm is unloaded – always check it yourself. Never pass your firearm to another person until the cylinder or action is open and you visually check that it is unloaded. Keep your firearm unloaded and safely stored when not in use.

**NEVER PLACE YOUR FINGER INSIDE THE TRIGGER GUARD OR ON THE TRIGGER UNLESS YOU INTEND TO FIRE**

Ensure that other objects do not touch the trigger.

**ALWAYS BE SURE OF YOUR TARGET AND WHAT IS BEYOND IT**

Always be sure of where the bullet will strike and shoot only where there is a safe back stop free of obstructions, water or other surfaces that can cause ricochets. Be sure your bullet will stop behind your target. Bullets can ricochet and travel in unpredictable directions with considerable velocity. Do not fire randomly into the sky.

**ALWAYS WEAR EYE AND EAR PROTECTION THAT IS SPECIFIED FOR USE WITH FIREARMS**

Proper protective equipment should be worn every time you handle your firearm for purposes of discharging your firearm or for cleaning and maintenance. Ensure that others in the vicinity of where you are shooting also wear proper ear and eye protection.

**NEVER USE ALCOHOL OR DRUGS BEFORE OR WHILE SHOOTING**

Do not use your firearm if you are under the influence of a substance or medication that impairs your mental or physical abilities.

**ALWAYS HAVE ADEQUATE VENTILATION**

Discharging firearms in poorly ventilated areas, cleaning firearms, or handling ammunition may result in exposure to lead and other substances known to cause birth defects, reproductive harm, and other serious physical illness. Review the warnings and labels for all ammunition and cleaning products carefully. Wash hands thoroughly after exposure.

#### BEFORE HANDLING ANY FIREARM, UNDERSTAND ITS OPERATION

Not all firearms are the same. Familiarize yourself with the mechanical features of any firearm you intend to use. If you feel uncertain about any operational aspects of your PWS firearm, please contact PWS Customer Service at (208) 780-6122 before proceeding with its operation.

#### NEVER ALLOW A FIREARM TO BE USED BY INDIVIDUALS WHO DO NOT UNDERSTAND ITS SAFE OPERATION OR HAVE NOT READ THESE FIREARM SAFETY RULES

#### ALWAYS USE THE CORRECT AMMUNITION FOR YOUR PARTICULAR FIREARM

Never use non-standard, reloaded, or “hand loaded” ammunition that has not been subjected to internal ballistic pressure testing.

#### BEWARE OF BARREL OBSTRUCTIONS

Be sure the barrel is clear of obstructions before shooting. Mud, water, snow or other objects may inadvertently lodge in the barrel bore. A small obstruction can cause a dangerous increase in pressure and may damage your weapon and cause injury to yourself and others.

#### ENSURE ALL ACCESSORIES ARE COMPATIBLE

Ensure that all accessories such as grips, slings, scopes and other accessories are compatible with the firearm and that the accessories do not interfere with safe operation. It is your responsibility to understand and follow all of the instructions in this manual, as well as those that may be supplied with your ammunition and any accessory.

#### NEVER DISASSEMBLE YOUR FIREARM BEYOND THE FIELD STRIPPING PROCEDURE OUTLINED IN THIS MANUAL

Improper disassembly or reassembly of your firearm may be dangerous and can lead to serious injury or death.

NEVER MANIPULATE, ADJUST OR CHANGE ANY OF THE INTERNAL COMPONENTS OF YOUR FIREARM UNLESS SPECIFICALLY INSTRUCTED TO DO SO IN THIS MANUAL

Improper manipulation of any other internal component may affect the safety and reliability of your firearm and may cause serious injury or death.

NEVER ALLOW ANY ALTERATION OR REPLACEMENT OF PARTS IN YOUR PWS FIREARM UNLESS PERFORMED BY A QUALIFIED GUNSMITH

Repairs or replacements should only be done by a qualified gunsmith using genuine PWS parts. If you do otherwise, improper functioning of your firearm may occur and serious injury or death and damage to property may result.

### **FIREARM USE WARNING**

SAFE USE OF A FIREARM IS YOUR PERSONAL RESPONSIBILITY AND THE FAILURE TO FOLLOW ALL OF THESE BASIC SAFETY RULES MAY RESULT IN SEVERE PERSONAL INJURY OR DEATH TO YOU OR OTHERS AND DAMAGE TO PROPERTY. YOU ARE THE MOST IMPORTANT SAFETY DEVICE WHEN IT COMES TO THE USE OF YOUR FIREARM. PRIMARY WEAPONS SYSTEMS, INC WILL NOT BE RESPONSIBLE FOR ANY PERSONAL INJURY, DEATH OR PROPERTY DAMAGE THAT RESULTS FROM: (1) THE CRIMINAL OR NEGLIGENT USE OF THIS FIREARM; (2) A DISREGARD OF THESE SAFETY INSTRUCTIONS AND WARNINGS; (3) IMPROPER OR CARELESS HANDLING OF THIS FIREARM; (4) THE USE OF NON-STANDARD, DEFECTIVE, IMPROPER OR RELOADED AMMUNITION; OR (5) IMPROPER OR NEGLIGENT MODIFICATIONS OR REPAIRS TO THE FIREARM.

### **USED FIREARM DISCLAIMER**

BUYER AGREES TO HAVE ANY USED FIREARM CHECKED BY A CERTIFIED GUNSMITH PRIOR TO FIRING. BUYER ASSUMES ALL LEGALITY, LIABILITY AND RESPONSIBILITY FOR THE CONDITION, USE AND SECURITY/STORAGE OF THE PURCHASED FIREARM. BUYER UNDERSTANDS THAT ALL FIREARMS ARE POTENTIALLY DANGEROUS IF HANDLED IMPROPERLY. UPON PURCHASE, BUYER ASSUMES ALL LIABILITY AND RESPONSIBILITY INCLUDING BUT NOT LIMITED TO THE USAGE AND SAFE STORAGE OF THE PURCHASED FIREARM.

### **GENERAL INFORMATION**

Your firearm is a lightweight, gas piston-operated, air cooled, magazine-fed rifle produced for a high degree of accuracy, reliability, and durability. The firearm's construction features extensive use of aircraft-grade forgings, CNC-machined components and high-quality barrels. The unique design of this system has numerous benefits over the traditional direct-impingement system, as well as other gas piston-operated AR-15 based platforms.

### **BARREL LIFE**

Barrel life depends on how fast the rifle is fired and how accurate the shooter insists it must be. Firing the rifle as fast as the trigger can be pulled or sustained full-auto fire can ruin the barrel in just a few hundred rounds. Firing at controlled rates, both semi-auto and burst, will allow your barrel to last for 5,000 to 10,000 rounds with acceptable accuracy levels. As with any quality barrel, a proper barrel break-in will ensure your new PWS product is as accurate as possible and proper maintenance will help your product last much longer. PWS recommends you clean your rifle or upper at least every 1,000 rounds.



## **APPEARANCE AND RECEIVER FIT**

Your new rifle is not a custom firearm. PWS requires a close fit between the receivers, but normal forging and machining variations may result in play or slight side to side receiver mismatch. This is not a manufacturing defect and has no adverse effect on accuracy or the weapon's function. All PWS rifles and uppers are test-fired before leaving our facility. New rifles will normally show evidence of this firing. If the receiver looks light or uneven in color, it is most likely dry and a light coat of oil on the metallic surfaces will improve its appearance. The upper and lower receivers are made from forgings because forgings provide superior strength over billet machining processes. By the very nature of a forging, small dents and dings on the outside of the receiver may be visible. No forging is free of them. This is not a defect.

## **MODIFICATION WARNING**

YOUR PWS FIREARM WAS DESIGNED TO FUNCTION PROPERLY WITH ITS ORIGINAL COMPONENTS FROM THE FACTORY. ALTERATIONS TO THE ORIGINAL COMPONENTS OR REPLACEMENT OF THEM WITH AFTERMARKET (NON-PWS MANUFACTURED) COMPONENTS CAN CAUSE MALFUNCTIONS OR EVEN MAKE THE FIREARM UNSAFE. DO NOT ALTER ANY PART OR ADD /SUBSTITUTE PARTS NOT MANUFACTURED BY PRIMARY WEAPONS SYSTEMS, INC. ATTEMPTED CUSTOMIZATION OF YOUR PWS PRODUCT MAY VOID YOUR WARRANTY.

## **HOW TO USE THIS MANUAL**

Please read this manual carefully before performing any maintenance. This manual must be referred to for all inspection, maintenance and repair procedures.

### **GENERAL**

There are several things you need to know to use this manual efficiently and effectively:

1. All references in the manual are to pages only. Reference to maintenance procedures is to the page where the respective initial setup appears.
2. Illustrations for the maintenance procedures show only those parts affected by the operation being performed.
3. When a procedure is common to MK1 series rifles, ONLY the MK112 configuration will be depicted. If a selected procedure is not common to all models of the MK1 series, separate procedures will be illustrated.
4. When the word rifle is referenced in text, it will reference the rifle and the carbines.

## **INDEXES**

This manual is organized to help you find the information you need quickly. There are several useful indexes.

1. Table of Contents – lists all chapters, sections, and appendices along with the referenced pages
2. Chapter Overviews – Summarizes material covered in the chapter at the beginning of each chapter
3. Symptom Index – lists, in alphabetical order, parts of the rifle with possible malfunctions. Located just before the troubleshooting table in each maintenance chapter

## **MAINTENANCE SECTIONS**

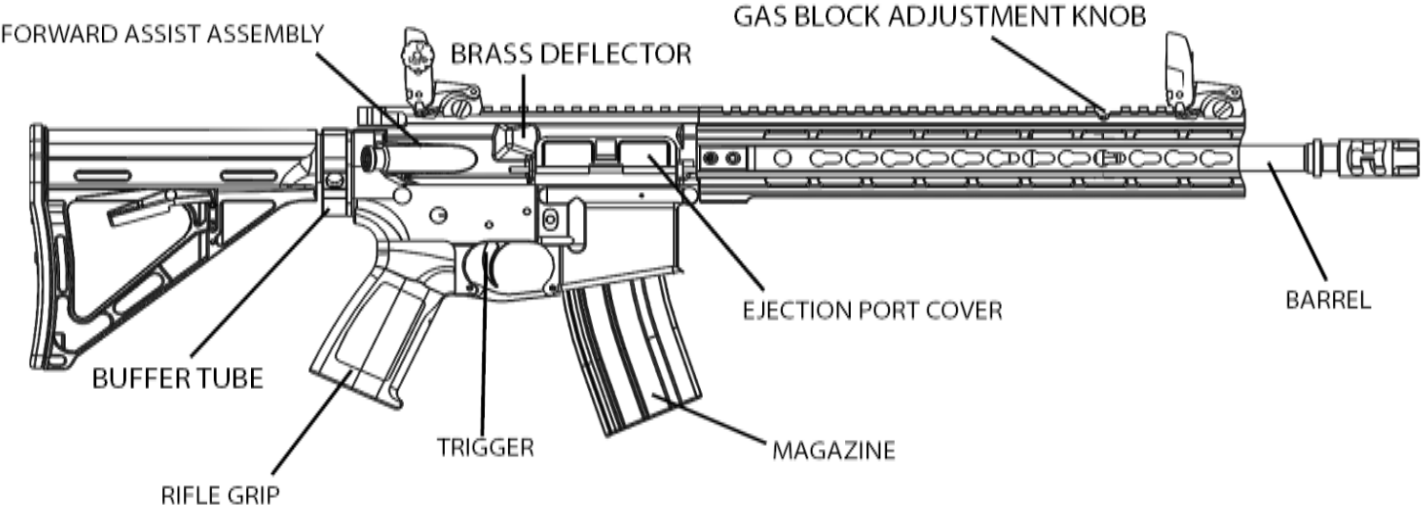
There are three maintenance sections: Section III - Preventive Maintenance Checks and Services (PMCS), Section IV - Troubleshooting, and Section V - Maintenance Procedures.

Each maintenance section provides a comprehensive list of instructions necessary to perform maintenance services on your firearm:

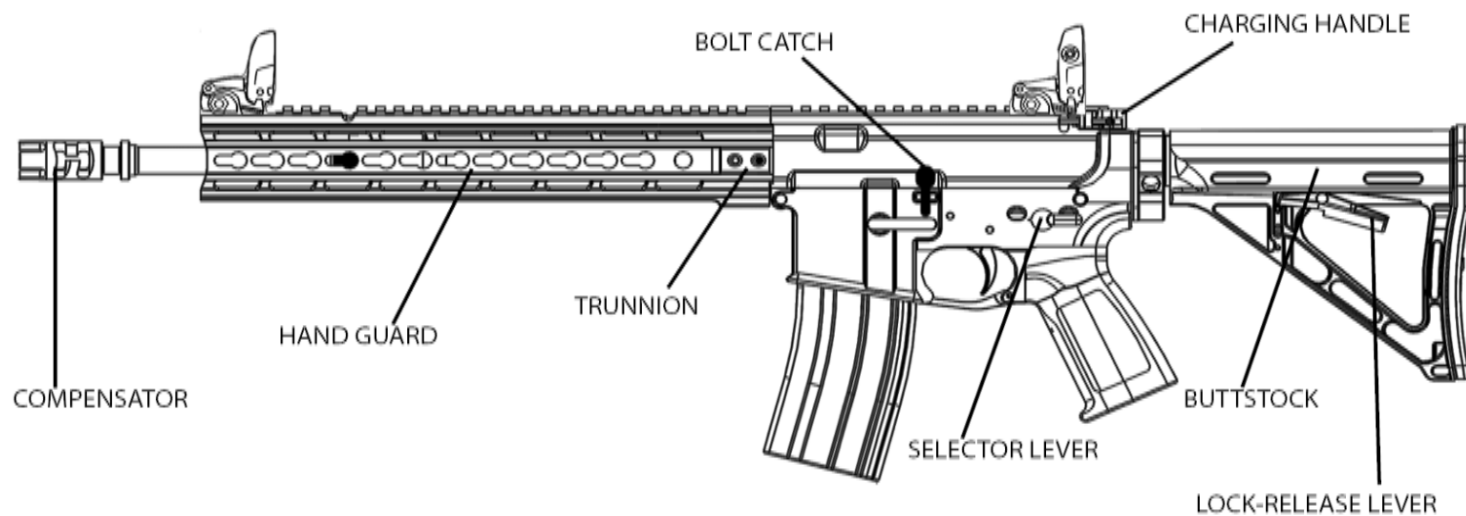
1. Section III: PMCS (page 37) – contains the procedures and instructions necessary to perform preventive maintenance checks and services.
2. Section IV: Troubleshooting – contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the MK1 Series rifle.
3. Section V: Maintenance Procedures – contains information necessary to properly assemble, disassemble, and care for your firearm.

EXTERNAL VIEW OF THE MK1 SERIES RIFLE

RIGHT SIDE



LEFT SIDE



## **CHAPTER 1**

### **INTRODUCTION**

#### **CHAPTER OVERVIEW**

This chapter contains general information, equipment description and data, and principles of operation for the MK1 MOD1 series rifle.

#### **Section I. GENERAL INFORMATION**

##### **1-1 SCOPE**

1. Type of Manual - End Use and Maintenance
2. Model Number and Equipment name - MK107, MK109, MK110, MK112, MK114, MK116 and MK118 rifles
3. Purpose of Equipment - Provides user an offensive/defensive capability with small arms fire

#### **Section II. EQUIPMENT DESCRIPTION AND DATA**

##### **1-2 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

###### **A. Characteristics**

- |    |                     |    |                              |
|----|---------------------|----|------------------------------|
| a. | Light weight        | d. | Magazine-fed                 |
| b. | Air-cooled          | e. | Semiautomatic or select-fire |
| c. | Gas-piston operated |    |                              |

## 1-2.1 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

### **B. Capabilities**

Provides user an offensive and/or defensive capability to engage targets with direct small-arms fire.

### **C. Features**

1. The MK1 series is a significant product improvement for M4/M16-type carbines and rifles. Utilizing a long-stroke piston system, the MK1 series greatly reduces fouling in the action of the weapon making it as reliable as the AK47 it was designed after.
2. Receivers are made of T7075 Forgings to ensure safety, durability, and function of the rifles while keeping weight and cost at a minimum.
3. The handguard system features the VLTOR KeyMod™ system which comes standard with two 2-inch 1913 Picatinny rail sections as well as a continuous 1913 Picatinny top rail.
4. The operating system utilizes an operating rod attached to the bolt carrier and a floating piston head attached to the operating rod. With only one moving assembly, the system is simple, rugged and versatile with less parts to wear and replace.
5. Chromoly steel, Arcor® salt-bath treated, button-rifled barrels\* deliver unmatched accuracy and performance.

### 1-3 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

(See Figure 1.1)

1. **MAGAZINE** 30 round capacity.
2. **BOLT CARRIER GROUP (BCG)** Carries bolt assembly to chamber and fires the weapon. Contains the bolt, firing pin, cartridge extractor, cartridge ejector, firing pin retaining pin, bolt return spring and bolt cam pin.
3. **CHARGING HANDLE ASSEMBLY** Provides a means of charging the weapon.
4. **UPPER RECEIVER AND BARREL ASSEMBLY** Upper receiver contains: ejection port, ejection port cover, housing for key, BCG and bolt assembly, and Picatinny rail. Rifle barrel assembly is air-cooled and contains the trunnion, gas block, piston tube, handguard, compensator or flash hider, and QD sling swivel points.
5. **LOWER RECEIVER AND BUTTSTOCK ASSEMBLY** Lower receiver contains the trigger assembly, sear (select-fire only), hammer assembly, selector lever, rifle grip, bolt catch, magazine catch, and buttstock assembly. The buttstock assembly houses the action spring, buffer assembly, and buffer tube (receiver extension).
6. **ADJUSTABLE GAS BLOCK** The 4-position adjustable gas block allows the user to adjust for standard ammo (position 1\*), high pressure ammo (position 2), suppressed with standard ammo (position 3) and suppressed with military ammo (position 4). The X-setting is for removal of the knob for annual maintenance. (See page 49)

\*For normal unsuppressed use, position 1 is the most recommended setting.



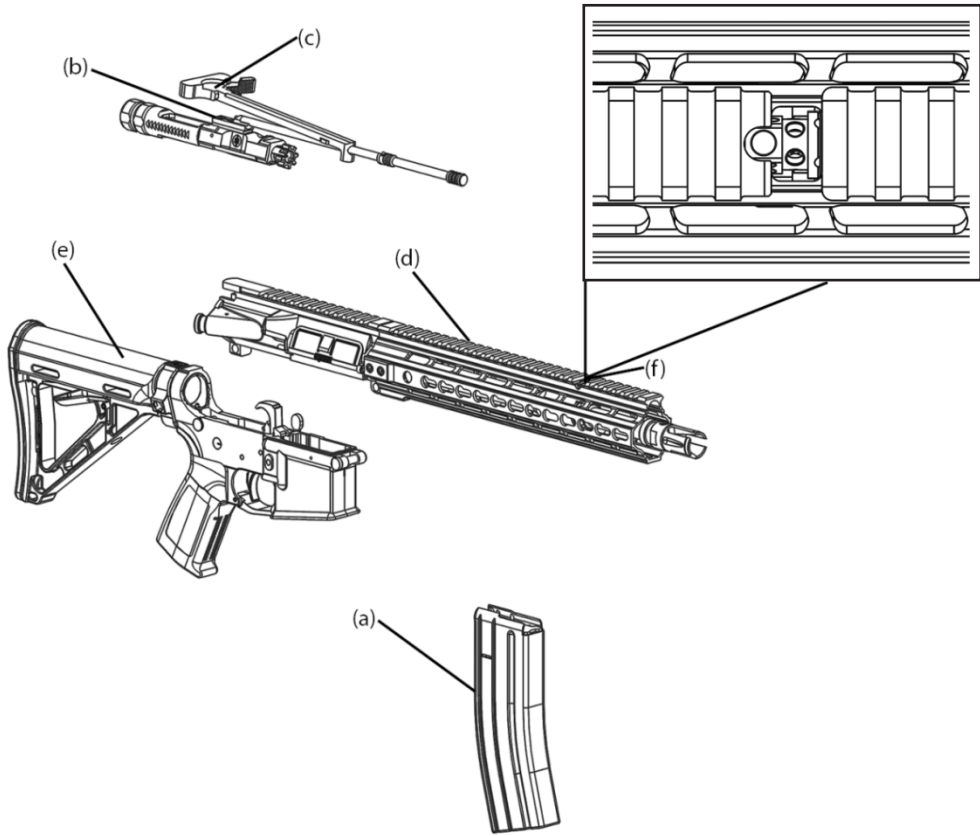


Figure 1.1

## 1-4 EQUIPMENT DATA

	US CUSTOMARY	METRIC
WEIGHT		
MK107, .223 Wylde & 7.62x39 without magazine	5 lbs, 13 oz	2.34 kg
MK109, .300 BLK without magazine	6 lbs, 1 oz	2.75 kg
MK110, .223 Wylde without magazine	6 lbs, 3 oz	2.79 kg
MK112, .223 Wylde without magazine	6 lbs, 6 oz	2.91 kg
MK114, .223 Wylde without magazine	6 lbs, 9 oz	2.96 kg
MK116, .223 Wylde & 7.62x39 without magazine	6 lbs, 13 oz	3.01 kg
MK116, .300 BLK without magazine	6 lbs, 10 oz	2.91 kg
MK118, .223 Wylde without magazine	7 lbs, 2 oz	3.15 kg
OVERALL LENGTH		
MK107 with compensator, buttstock closed, all calibers	24.5 in	62.2 cm
MK109 with compensator, buttstock closed	25.6 in	65.0 cm
MK110 with compensator, buttstock closed	27.5 in	69.9 cm
MK112 with compensator, buttstock closed	29.5 in	74.9 cm
MK114 with compensator, buttstock closed	31.4 in	79.7 cm
MK116 with compensator, buttstock closed, all calibers	33.0 in	83.8 cm
MK118 with compensator, buttstock closed	34.9 in	88.6 cm

## 1-4.1 EQUIPMENT DATA

	US CUSTOMARY	METRIC
BARREL LENGTH		
MK107 (all calibers)	7.75 in	19.7 cm
MK109	9.75 in	24.8 cm
MK110	10.75 in	27.3 cm
MK112	12.75 in	32.4 cm
MK114	14.5 in	36.8 cm
MK116 (all calibers)	16 in	40.6 cm
MK118	18 in	45.7 cm
MECHANICAL FEATURES		
Rifling	Right-hand twist, 6-groove, 1-turn-in-8 inches (20.32 cm)	
Method of Operation	Gas piston	
Type of Breaching Mechanism	Rotating bolt	
Method of Feeding	Magazine	
Cooling	Air-cooled	
Trigger pull	5.5 - 7.5 lbs	2.5 - 3.4 kg

	US CUSTOMARY	METRIC
FIRING CHARACTERISTICS		
MK107, .223 Wylde muzzle velocity	2368 ft/sec	721.8 m/sec
MK107, 7.62x39 muzzle velocity	1960 ft/sec	597.0 m/sec
MK109, .300 BLK without magazine	2130 ft/sec	649.0 m/sec
MK110, .223 Wylde without magazine	2654 ft/sec	808.9 m/sec
MK112, .223 Wylde without magazine	2833 ft/sec	863.2 m/sec
MK114, .223 Wylde without magazine	2915 ft/sec	888.5 m/sec
MK116, .223 Wylde without magazine	2993 ft/sec	912.3 m/sec
MK116, .300 BLK without magazine	2444 ft/sec	744.9 m/sec
MK116, 7.62x39 muzzle velocity	2356 ft/sec	718.1 m/sec
MK118, .223 Wylde muzzle velocity	3049 ft/sec	929.3 m/sec
MAXIMUM RATE OF FIRE		
<b>MK107, .223 Wylde</b>		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	218 yds	200 m
Maximum Range, Area Target	328 yds	300 m

## 1-4.3 EQUIPMENT DATA

	US CUSTOMARY	METRIC
MAXIMUM RATE OF FIRE		
<b>MK107, 7.62x39</b>		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	200 yds	180 m
Maximum Range, Area Target	300 yds	270 m
<b>MK109, 300 BLK</b>		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	440 yds	400 m
Maximum Range, Area Target	540 yds	490 m
<b>MK110, .223 Wylde</b>		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	328 yds	300 m
Maximum Range, Area Target	437 yds	400 m

MAXIMUM RATE OF FIRE

**MK112, .223 Wylde**

Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	437 yds	400 m
Maximum Range, Area Target	547 yds	500 m

**MK114, .223 Wylde**

Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	547 yds	500 m
Maximum Range, Area Target	656 yds	600 m

**MK116, .223 Wylde**

Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	547 yds	500
Maximum Range, Area Target	656 yds	600

## MAXIMUM RATE OF FIRE

**MK116, 300 BLK**

Semiautomatic

45 rds/min

Burst

90 rds/min

Sustained Rate of Fire

12 - 15 rds/min

Maximum Range, Point Target

460 yds

420 m

Maximum Range, Area Target

550 yds

500 m

**MK116, 7.62x39**

Semiautomatic

45 rds/min

Burst

90 rds/min

Sustained Rate of Fire

12 - 15 rds/min

Maximum Range, Point Target

350 yds

320 m

Maximum Range, Area Target

450 yds

410 m

**MK118, .223 Wylde**

Semiautomatic

45 rds/min

Burst

90 rds/min

Sustained Rate of Fire

12 - 15 rds/min

Maximum Range, Point Target

656 yds

600 m

Maximum Range, Area Target

765 yds

700 m

### **Section III. PRINCIPLES OF OPERATION**

#### **1-5 GENERAL**

The MK1 and MK1S series:

1. Is gas-piston operated and fires in either the semiautomatic (MK1) or select-fire (MK1S) mode.
2. Has positive locking of the bolt. Firing pin is part of the bolt carrier assembly and cannot strike the primer until the bolt assembly is fully locked forward.

#### **1-6 PRINCIPLES OF OPERATION**

(See Figure 1.2)

1. MAGAZINE Holds loaded rounds ready for feeding as well as quick reload capabilities for sustained firing.
2. BOLT CARRIER GROUP Provides stripping, chambering, locking, firing, extraction, and ejection of cartridges using the propelling gases that exert pressure.
3. MK1 UPPER RECEIVER AND BARREL ASSEMBLY Provides support for the bolt carrier assembly. The barrel chambers the cartridge for firing and directs the projectile.
4. LOWER RECEIVER AND BUTTSTOCK ASSEMBLY Provides firing control for the rifle and carbine.
5. CHARGING HANDLE ASSEMBLY Provides initial charging of the weapon. The handle latch locks the charging handle assembly in the forward position during operation.



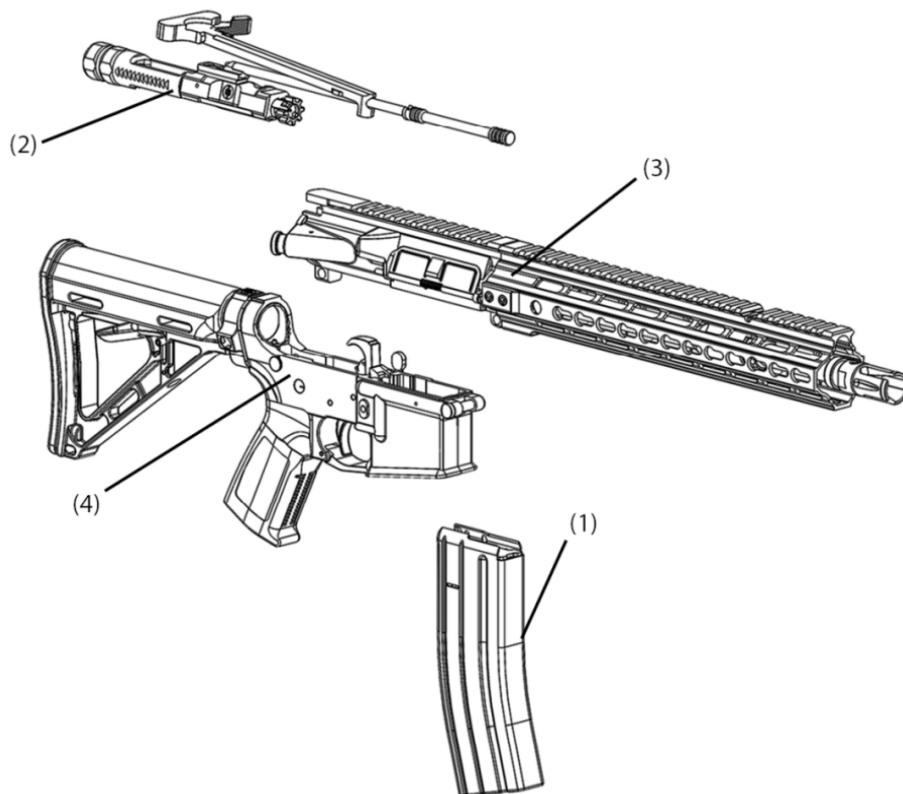


Figure 1.2

## **CHAPTER 2**

### **END USER MAINTENANCE INSTRUCTIONS**

#### **CHAPTER OVERVIEW**

This chapter provides information and instructions to help keep the rifle in good repair and contains the following sections:

- Section I. Repair Parts and Support Equipment
- Section II. Service Upon Receipt
- Section III. Preventive Maintenance Checks and Services (PMCS)
- Section IV. Troubleshooting
- Section V. Maintenance Procedures

#### **Section I. REPAIR PARTS AND SUPPORT EQUIPMENT**

##### **2-1 COMMON TOOLS AND EQUIPMENT**

All tools needed for end user maintenance will be supplied with purchase of rifle. If any further assistance is needed, always contact PWS customer service support team at [customerservice@primaryweapons.com](mailto:customerservice@primaryweapons.com) or call (208) 780-6122.

##### **2-2 SPECIAL TOOLS AND SUPPORT EQUIPMENT**

There are no special tools required for end user maintenance.

## **Section II. SERVICE UPON RECEIPT**

### **2-3 GENERAL**

1. Inspect the rifle for any damage incurred during shipment. If rifle has been damaged, report the damage immediately to PWS Customer Service. Email [customerservice@primaryweapons.com](mailto:customerservice@primaryweapons.com) or call (208) 780-6122. Or, proceed to [www.primaryweapons.com](http://www.primaryweapons.com) and fill out a Warranty RMA Ticket online.
2. Check the rifle and corresponding serial numbers against the packing slip to see if shipment is complete.

### **2-4 SERVICE UPON RECEIPT OF MATERIAL**

#### **WARNING**

Before starting an inspection, be sure to clear the rifle. Do not actuate the trigger before clearing the rifle. Inspect the chamber to make sure it is empty and free of obstructions. Check to see there are no obstructions in the barrel and no ammunition is in position to be chambered.

LOCATION	ITEM	ACTION	REMARKS
1. Container	a. MK1 MOD1 Rifle	a. Remove from containers b. Inspect the equipment for damage during shipment c. Check the equipment against the packing list to see if the shipment is complete	If damage is found, contact Customer Service immediately. If discrepancy found, contact Customer Service immediately.
	b. Basic Issue Items	Check for missing items	If discrepancy is found, contact Customer Service immediately.
2. MK1 MOD1 Series Rifle	a. Barrel Assembly	If volatile corrosion inhibitor (VCI) is in barrel, remove and discard	
	b. All Parts	a. Field-strip rifle and inspect for missing, damaged, rusted parts b. Clean and lubricate c. Reassemble d. Function check e. Check to see whether the equipment has been modified	
	c. Magazine	Check for positive retention and functioning of bolt catch	If discrepancy is found, contact Customer Service immediately.

**Section III. PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

**2-5 GENERAL**

This section contains the procedures and instructions necessary to perform preventive maintenance checks and services. These services are to be performed by the end user with the assistance of a qualified gunsmith using genuine PWS parts where practical; or by contacting PWS customer service directly at customerservice@primaryweapons.com or (208) 780-6122.

**2-6 PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

**WARNING**

Before starting an inspection, be sure to clear the rifle. Do not pull the trigger until the weapon has been cleared. Inspect the chamber to ensure that it is empty and no ammunition is in position to be chambered. Do not keep live ammunition near the work area.

The PMCS procedures are contained in the following table. They are arranged in logical sequence requiring a minimum amount of time on the part of the persons performing them:

- 1. Item No. Column** – Checks and services are numbered in disassembly sequence.
- 2. Interval Column** – This column gives the designated interval when each check should be performed.
- 3. Item To Be Checked Or Serviced Column** – This column lists the items to be checked or serviced.
- 4. Procedure Column** – This column contains a brief description of the procedure by which the check is to be performed. It contains all the information required to accomplish the checks and services. Information marked SH Indicates a specific equipment shortcoming and the procedure needed to correct the shortcoming.
- 5. Not Fully Mission Capable If: Column** - This column contains a brief statement of the condition (e.g., malfunction, shortage) that would cause the covered equipment to be less than fully ready to perform its assigned mission.

**NOTE**

An inactive weapon is a weapon which has been stored for a period of 90 days or more without use. Inactive weapons shall receive quarterly PMCS unless inspection reveals more frequent servicing is necessary.

Normal cleaning (PMCS) of an inactive weapon will be performed every 90 days. If the user finds corrosion on a weapon prior to the end of the 90-day period, the PMCS should be performed immediately.

ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1.	Quarterly	Charging Handle Assembly and Selector Lever	Pull charging handle (Fig. 2.1, 1) to rear. Ensure chamber is clear. Let bolt carrier assembly (2) close. Leave hammer in cocked position. Do not pull trigger.	Charging handle does not lock in place when in the forward position.

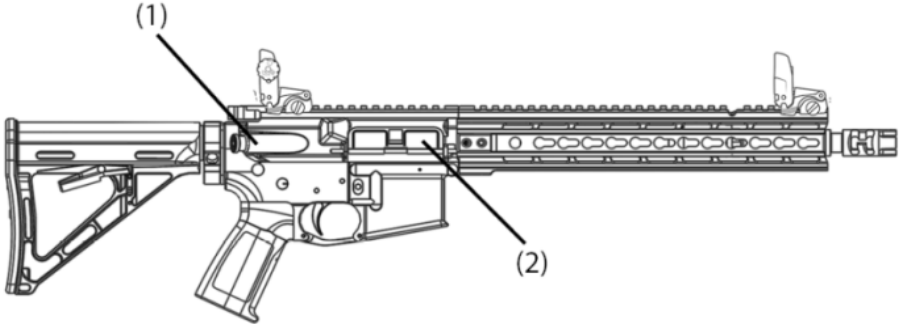


Figure 2.1

ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1.	Quarterly	Charging Handle Assembly and Selector Lever (cont.)	<p>Place selector lever (Fig. 2.2) in SAFE position. Pull trigger.</p> <p>Place selector lever in FIRE (semiautomatic) or SEMI (select-fire) position. Pull trigger.</p> <p>Hold trigger to the rear, charge weapon, and release the trigger with a slow, smooth motion, without hesitation or stopping, until the trigger is full forward (an audible click should be heard).</p> <p>Repeat the above FIRE (semiautomatic) or SEMI (select-fire) position test five times.</p>	<p>Hammer falls.</p> <p>Hammer does not fall.</p> <p>The weapon malfunctions during any of these five tests.</p>

The diagram illustrates the selector lever of the PWS MK1 MOD1. The main view shows the lever in the 'SAFE' position. Two inset views show the lever in the 'SEMI' and 'AUTO' positions. A callout labeled '(1)' points to the lever mechanism.

Figure 2.2

ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1.	Quarterly	Charging Handle Assembly and Selector Lever (cont.)	<p><b>MK1S (select-fire) Models Only</b></p> <p>Place selector lever (Fig. 2.2, 1) in AUTO position, charge the weapon and squeeze the trigger. Hammer should fall.</p> <p>Hold trigger to rear, charge the weapon and release the trigger. Squeeze the trigger. Hammer should not fall.</p> <p><b>NOTE</b></p> <p>Automatic sear should have released hammer while holding trigger in the squeezed position before releasing and re-squeezing the trigger.</p> <p><b>ALL WEAPONS</b></p> <p>With hammer in forward position, using moderate finger/thumb pressure, attempt to place the selector lever (Fig. 2.2, 1) in SAFE position.</p>	<p>Hammer does not fall.</p> <p>Hammer falls.</p> <p>Moderate finger/thumb pressure moves selector lever to SAFE position.</p>
2.	Quarterly	Upper Receiver and Barrel Assembly (Handguard Assemblies)	Inspect handguard assembly (Fig. 2.3, 1) for cracks and/or other damage. Dings and dents are acceptable in rails providing they do not prohibit attaching accessories to the Picatinny rails, or KeyMod™ slots.	Rails are missing or unserviceable.



ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
2.	Quarterly	Upper Receiver and Barrel Assembly (Handguard Assemblies cont.)	Release takedown pins to open and separate upper and lower receiver. Hand check the muzzle device (Fig. 2.3, 2) for looseness on the barrel. Hand check barrel (3) for looseness on the upper receiver (4).	Muzzle device ore barrel is loose.
3.	Quarterly	Upper Receiver and Barrel Assembly (Serviceability Check)	Check charging handle (Fig. 2.3, 5) and ejection port cover (6) for defects and proper function.  Inspect upper receiver (4) finish for scratches or worn shiny spots. If shiny or worn spots are visible, repair in accordance with unit SOP.	Charging handle (Fig. 2.3, 5) is defective.

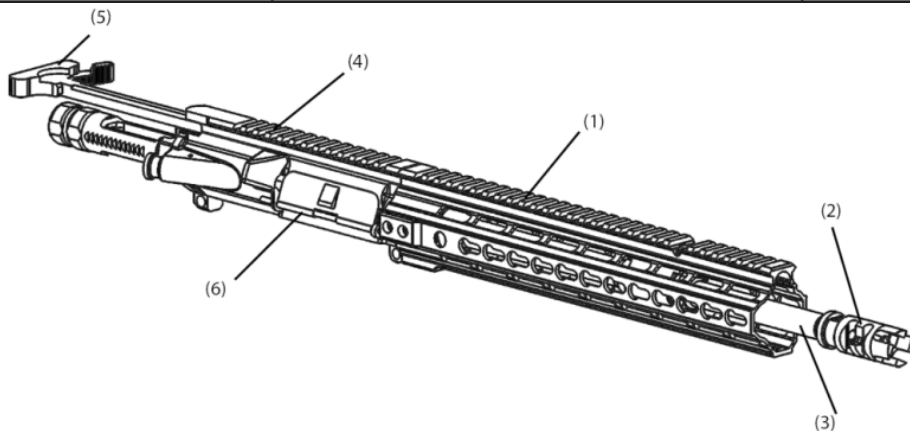


Figure 2.3

ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
3.	Quarterly	Upper Receiver and Barrel Assembly (Serviceability Check) (cont.)	<p>With one hand, position the complete upper (Fig. 2.3; 1, 4) so that the muzzle (2) is pointing down at approximately a 40-degree angle. Pull the charging handle (5) rearward. Holding the bolt carrier group (BCG) to the rear, push the charging handle (5) forward. Release the BCG.</p> <p>BCG should close and lock under its own weight. If it does not, remove the bolt assembly (Fig. 2.4, 2) from the bolt carrier (4) and slide the bolt carrier and charging handle (3) back into the receiver. If carrier (4) seems to drag in the receiver, clean and lube as necessary.</p>	Cleaning and lubrication does not correct malfunction.

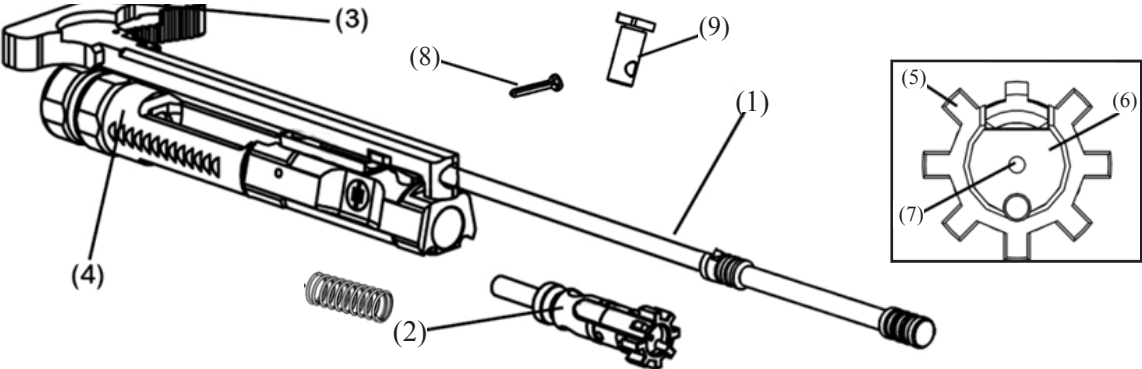


Figure 2.4

ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
4.	Quarterly	Key and Bolt Carrier Group (BCG) and Bolt Assembly (Serviceability Check)	<p>Remove BCG (Fig. 2.4, 4) and disassemble. Visually inspect bolt assembly (2) for cracks, especially in the area of the bolt cam pin hole. Check bolt face (6) for cracks on locking lugs (5), for a cluster of pits or chipped bolt face (6) and for an elongated firing pin hole (7). If cracked or broken, contact PWS Customer Service.</p> <p>Insert the bolt assembly (2) into the key and BCG (4) so the bolt assembly points down. The bolt assembly should move and slide freely in the BCG. Inspect bolt cam pin (9) for damage or excessive wear. Ensure firing pin retaining pin (8) is structurally sound.</p>	<p>Defects are found.</p> <p>Missing or broken firing pin retaining pin or bolt cam pin.</p>
5.	Quarterly	Bolt Assembly and BCG (Serviceability Check)	<p>Check extractor (Fig. 2.5, 1), extractor spring assembly (2), ejector (3), and ejector spring (4) for dirt and serviceability. If dirty, clean, lubricate and reassemble. If unserviceable, replace as necessary.</p> <p>Check BCG (5) and carrier key for excess wear, cracks or other damage. Ensure carrier key screws (8) are tight and staked. Check firing pin (9) for pits or breaks. If damaged, replace firing pin.</p>	<p>Parts are missing or unserviceable.</p> <p>Missing or broken firing pin retaining pin or bolt cam pin or firing pin is damaged.</p>

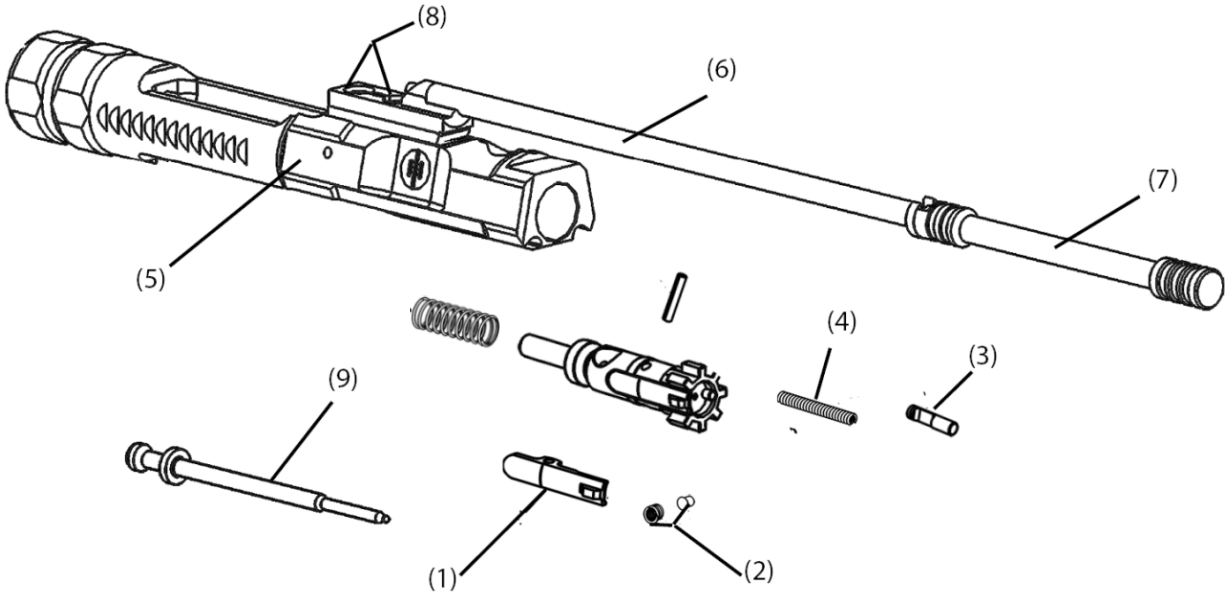


Figure 2.5

ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
6.	Quarterly	Lower Receiver and Buttstock Assembly (Serviceability Check)	<p>Remove buffer assembly (Fig. 2.6, 1) and action spring (2). Check buffer assembly for cracks.</p> <p>Check action spring (2) for kinks and free length. Free length should be 10 9/16 inches (26.83 cm) minimum to 11 inches (27.9 cm) maximum. Do not attempt to adjust spring length.</p> <p>Disengage takedown pin (14) and pull out. Push back in to re-engage takedown. An audible click should be heard.</p> <p>Lubricate helical compression spring and takedown pin detent (12) by placing one drop of lubricant in the channel at the rear of the takedown pin. Allow the lubricant to work its way around the pin detent and spring (12, 13).</p> <p>Check buffer tube (5) and buttstock assembly (6) for damage.</p>	<p>Buffer assembly is cracked.</p> <p>Spring is kinked or does not meet free length requirements.</p> <p>Components are defective or damaged.</p> <p>Components are damaged.</p> <p>The buffer tube or buttstock is cracked or otherwise defective.</p>

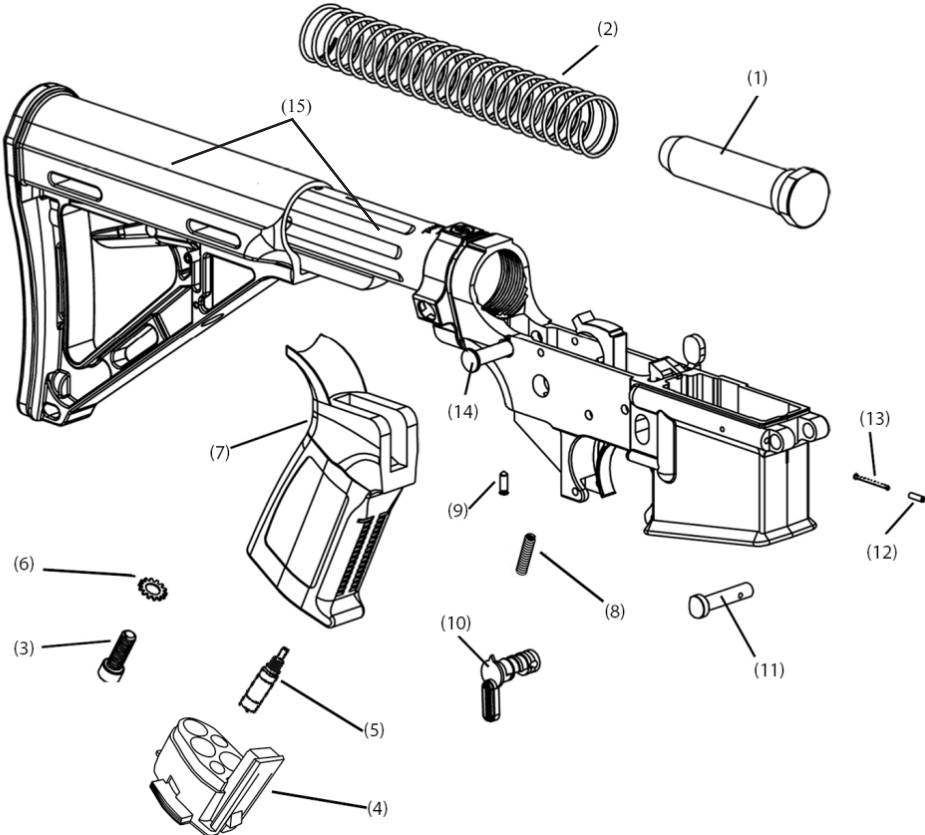


Figure 2.6

## **Section IV. TROUBLESHOOTING**

### **2-7 GENERAL**

1. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the MK1 MOD1 Series rifle. Each malfunction for the individual part or assembly is followed by a list of tests or inspections which will help you to determine the corrective actions in the order listed. If you have any further questions always contact PWS customer service.
2. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, see individual repair sections in the maintenance procedures on each major assembly.

### **2-8 TROUBLESHOOTING PROCEDURES**

Refer to troubleshooting table for malfunctions, tests, and corrective actions. The symptom index (page 48) is provided for a quick reference of the malfunctions covered in the table.

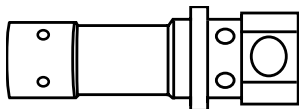
Two special instructions sections are included to provide instruction for the gas adjustment knob and gas adjustment settings (page 49), and PWS Enhanced Buffer Tube Installation Instructions (page 54).

<b>SYMPTOM INDEX</b>	
	Page
1. Failure of Magazine to Lock in Rifle	51
2. Failure to Feed	51
3. Failure to Chamber	52
4. Failure to Lock	52
5. Failure to Fire	57
6. Failure to Unlock	58
7. Failure to Extract	58
8. Failure to Eject	58
9. Failure to Cock	58
10. Short Recoil	60
11. Rifle Cannot be Zeroed	60
12. Fires Two Rounds with One Pull of Trigger	60
13. Fires with Selector Lever on SAFE or when Trigger is Released with Selector Lever on SEMI/FIRE (semiautomatic)	60
14. Bolt Assembly Fails to Lock to Rear after Firing Last Round	61
15. Failure to Cycle with Selector Lever set on AUTO (select-fire only)	61



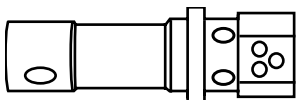
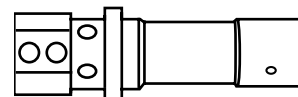
## GAS ADJUSTMENT SETTINGS

Before starting any troubleshooting, ensure that the gas adjustment knob is in the proper position. The 4-position adjustable gas block allows the user to adjust for standard ammo, military ammo, and two suppressed settings. The X-setting is for removal of the knob for annual maintenance only. Gas adjustment setting explanations are for .223/5.56 and .308/7.62x51 use. Users of .300blk or 7.62x39 caliber should leave the adjustment on Position 1 for all use unless in a rare instance carrier speed induced malfunctions occur and the advancement to Position 2 is required. Users of .300blk typically do not require ANY adjustment of the Gas Settings from Position 1, suppressed or unsuppressed.



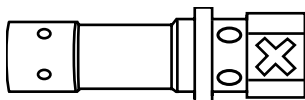
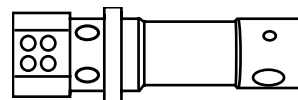
Position 1, marked by a single large circle, is for normal operation and can be used with standard ammunition, or in many cases, military ammunition.

Position 2, marked by two circles, is for use with higher pressure loads such as military ammunition.



Position 3, marked with three circles, is for suppressed use when running standard ammunition.

Position 4, marked by four circles, is for suppressed use when running higher pressure loads such as military ammunition.



The X-setting is used to remove the gas plug for annual maintenance ONLY.

**WARNING** FIRING YOUR WEAPON WHILE ON THE X-SETTING WILL CAUSE DAMAGE AND/OR LOSS TO YOUR GAS ADJUSTMENT KNOB.

## ADJUSTING YOUR GAS BLOCK

The gas adjustment knob can be changed with a tool located in the grip of your weapon. This tool is also able to change your sights. Use this tool to rotate the gas adjustment knob through its five settings (Fig. 2.7).

The gas adjustment plug contains a detent and spring to lock it in place. When you move it to the X-setting, the knob will move out toward the end of the barrel. Do not force it to the next setting. Doing so may result in damage to your gas adjustment knob or gas block.

Using the gas block adjustment tool located in the grip of your weapon, push the gas adjustment knob back toward the gas block and the knob will turn freely to the next setting.

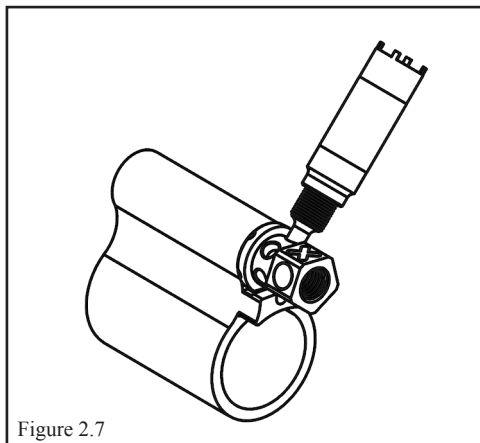


Figure 2.7

TROUBLESHOOTING PROCEDURES

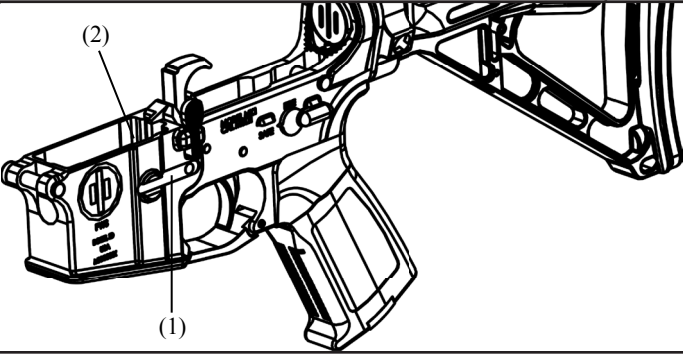
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. FAILURE OF MAGAZINE TO LOCK IN RIFLE	1. Dirty or corroded magazine catch (Fig. 2.8, 1)	Disassemble and clean
	2. Defective magazine catch spring (2)	Replace spring
2. FAILURE TO FEED	3. Worn or broken magazine catch (1)	Replace magazine catch
	4. Worn or defective magazine	Replace magazine
2. FAILURE TO FEED	1. Magazine catch spring weak or broken	Replace spring
	2. Magazine catch (Fig. 2.8, 1) defective	Replace magazine catch
	3. Magazine catch (1) out of adjustment (will not retain magazine)	Adjust magazine catch
	4. Short recoil	Refer to page 60
		

Figure 2.8

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<b>3. FAILURE TO CHAMBER</b>		
	1. Weak or broken action spring (Fig. 2.9, 1)	Replace spring
	2. Short recoil	Refer to page 60
	3. Dirty or obstructed chamber	Clean chamber with mil-spec chamber brush
<b>4. FAILURE TO LOCK</b>		
	1. Weak or broken action spring (Fig. 2.9, 1)	Replace spring
	2. Bolt cam pin (Fig. 2.10, 1) missing	Replace bolt cam pin
	3. Loose or damaged bolt carrier key (2)	Tighten and re-stake carrier key or replace as necessary

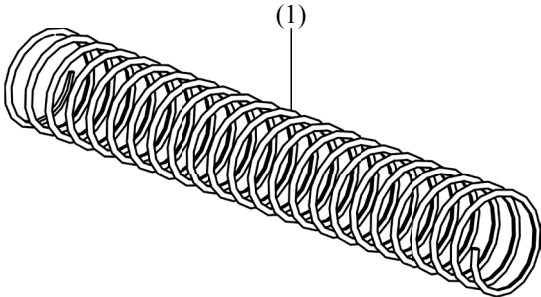


Figure 2.9

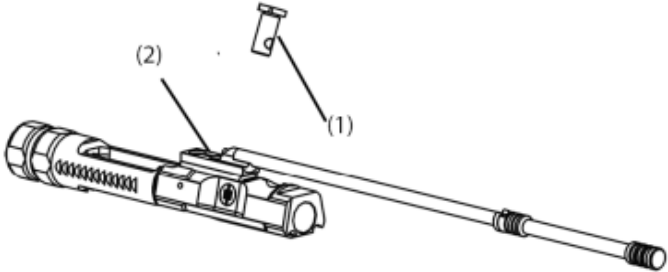


Figure 2.10

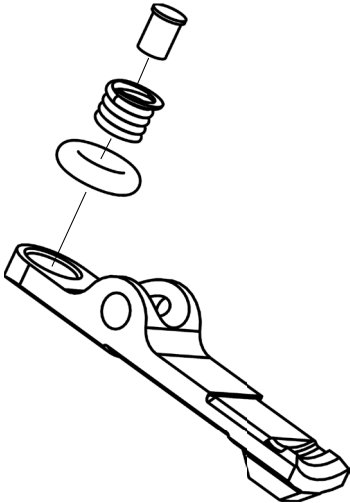
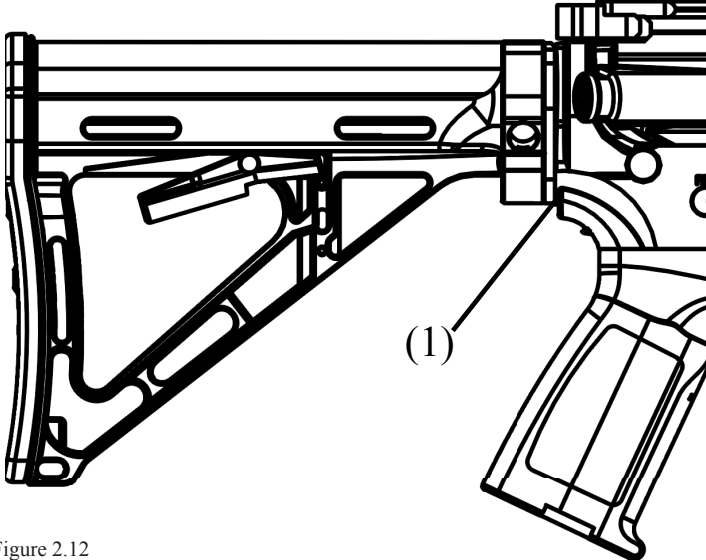
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<b>4. FAILURE TO LOCK (cont.)</b>		
	4. Improperly assembled extractor spring assembly (Fig. 2.11)	Relieve tension on the bottom screw and readjust buffer tube by unscrewing bottom screw and tightening the two top screws. Re-tighten the bottom screw (Fig. 2.12, 6)
	5. Buffer tube is out of alignment (applicable only to weapons using PWS EBT) Space between buffer tube and tension plate (Fig. 2.12, 1) should be parallel	
		

Figure 2.11

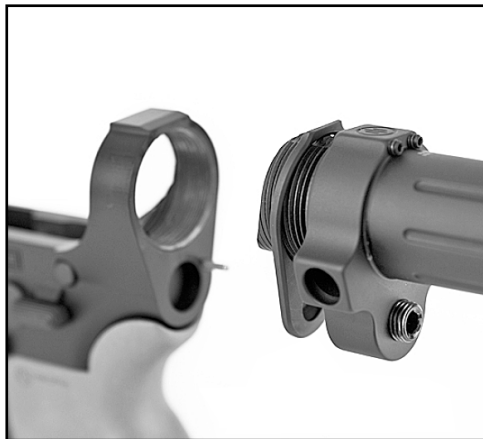
Figure 2.12

## PWS ENHANCED BUFFER TUBE INSTALLATION INSTRUCTIONS

### NOTE

The PWS Enhanced Buffer Tube should be installed by a professional. PWS will not refund or replace buffer tubes damaged by improper installation.

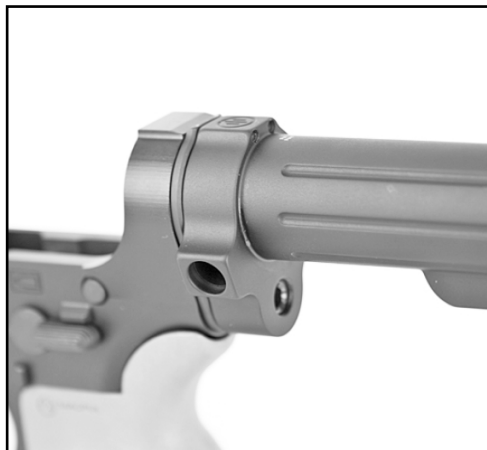
1. With the receiver in the state shown, ensure that the rear take-down pin, detent pin and spring are installed in your lower receiver.
2. With the buffer tube plate over the buffer tube threads and nub facing out (the male end of the plate facing the female end of the receiver) align the buffer tube with the back of the receiver.
3. With the fingers of one hand wrapped around the receiver holding the plate in place and ensuring the detent spring is depressed correctly (not bent over one direction or another) screw the buffer tube in clockwise from the rear.



4. When the lip of the buffer tube is near the buffer retainer hole, insert the buffer retaining spring and buffer retainer into the hole. Ensure that the buffer plate does not move out of the rear receiver hole and detent spring does not come out.
5. Push the buffer retainer into the hole far enough so that the buffer tube can be rotated over the outside edge of it. You may be able to get an additional revolution before the buffer tube is tight against the receiver. Ensure that the buffer retainer does not fly out of the receiver when you rotate the buffer around again.
6. Using a screwdriver or other wrench, push the buffer retainer down far enough to that the buffer tube can rotate over the top of it.



7. The buffer tube is properly installed when the extended portion of the buffer tube is on the bottom and the PWS symbol is on top. Some buffer/receiver combinations will result in a space being left between the buffer plate and the buffer. This is normal.
8. Tighten the top two screws first using the supplied wrench. The screws are tight when the wrench flexes as shown above. A small amount of blue Loctite® can be used, but is not required.
9. Tighten the bottom screw using the supplied wrench until snug. The bottom screw should be tightened approximately  $\frac{1}{4}$  turn after making positive contact with the plate.





MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<b>5. FAILURE TO FIRE</b>	<ol style="list-style-type: none"> <li>1. Broken or chipped firing pin (Fig. 2.13, 1)</li> <li>2. Fire control group (3) and/or lower receiver assembly improperly assembled or damaged</li> <li>3. Broken, defective, or missing firing pin retaining pin (1)</li> <li>4. Selector lever (4) frozen on safe position.</li> </ol>	<p>Replace firing pin</p> <p>Repair or replace</p> <p>Replace</p> <p>Disassemble, clean, reassemble or replace defective components</p>

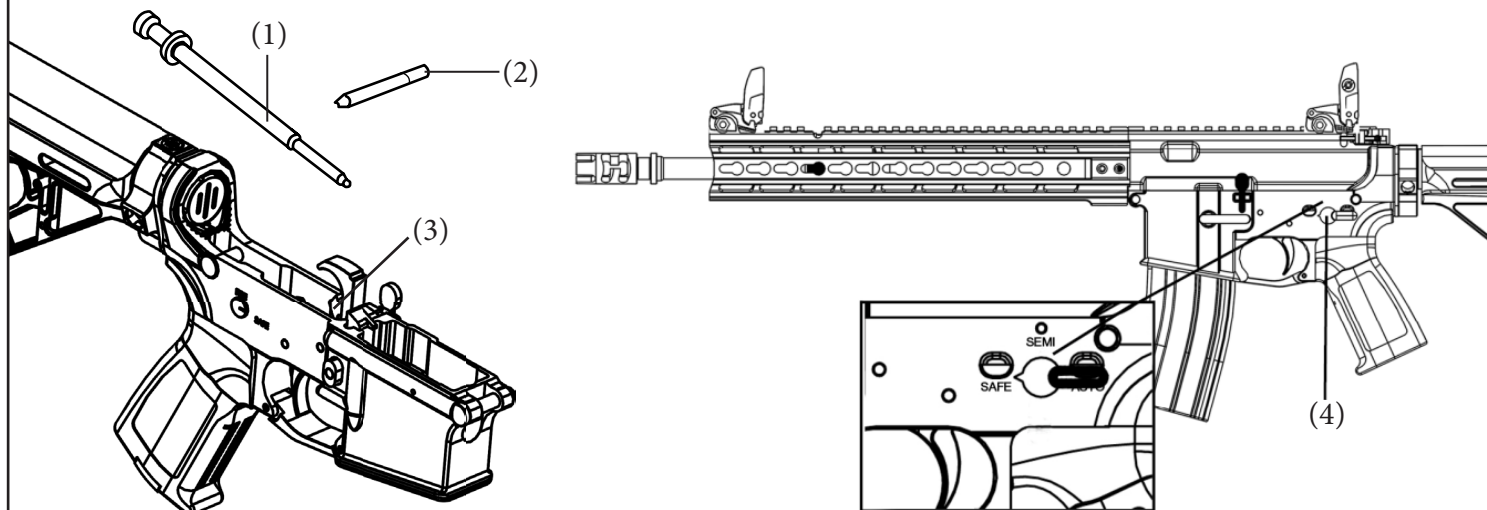


Figure 2.13

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<b>6. FAILURE TO UNLOCK</b>	1. Burred locking lugs (Fig. 2.14, 1)	Contact PWS Customer Service
	2. Burred lugs (2) on barrel extension	Contact PWS Customer Service
	3. Short recoil	Refer to page 60
	4. Debris or fouling in chamber	Clean chamber with copper cleaner or honing tool
<b>7. FAILURE TO EXTRACT</b>	1. Defective components in bolt assembly	Contact PWS Customer Service
	2. Short recoil	Refer to page 60
<b>8. FAILURE TO EJECT</b>	1. Defective components in bolt assembly	Contact PWS Customer Service
	2. Ejector (Fig. 2.14, 6) stuck in bolt body	Disassemble and Clean
	3. Short recoil	Refer to page 60
<b>9. FAILURE TO COCK</b>	1. Worn, broken or missing parts of fire control group	Contact PWS Customer Service
	2. Short recoil	Refer to page 60

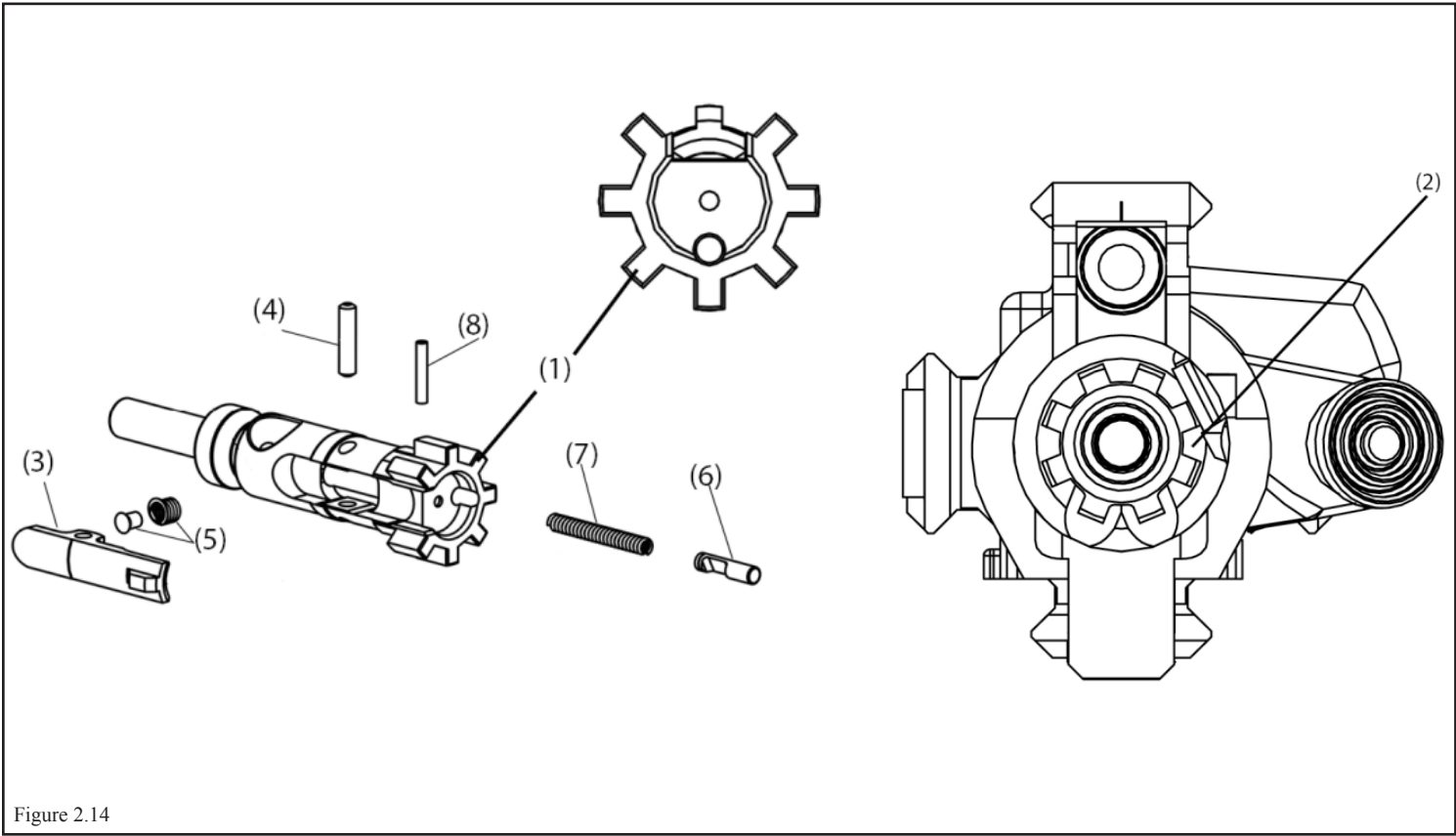


Figure 2.14

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<b>10. SHORT RECOIL/SHORT STROKING</b>	1. Broken or damaged action spring	Replace action spring
	2. Un-lubricated or dirty action spring and/or receiver extension (buffer tube)	Clean and lubricate
	3. Improper buffer weight (buffer is too heavy)	Replace buffer with standard carbine buffer
	4. Buffer tube is out of alignment (applicable only to weapons using the PWS EBT)	Relive tension and readjust buffer tube by unscrewing bottom screw (Fig. 2.15, 2)
	Space between buffer tube (Fig. 2.15, 1) and tension plate should be parallel	Refer to page 48 for installation instructions
	5. Excessive carbon build-up in piston tube	Clean piston tube using T-handle and .40 caliber brush
<b>11. RIFLE CANNOT BE ZEROED</b>	6. Out-of-spec ammunition	Replace ammunition
	1. Misalignment of handguard (Fig. 2.17, 3)	Contact PWS Customer Service or replace barrel
<b>12. FIRES TWO ROUNDS WITH ONE PULL OF THE TRIGGER WITH SELECTOR ON SEMI (DOUBLE FIRING)</b>		
	1. Perform function test (refer to page 81)	If any part of function test fails, replace fire control group
<b>13. FIRES WITH SELECTOR LEVER ON SAFE OR WHEN TRIGGER IS RELEASED WITH SELECTOR ON SEMI</b>		
	1. Worn, broken or missing parts of fire control group	Replace fire control group

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<b>14. BOLT ASSEMBLY FAILS TO LOCK TO REAR AFTER FIRING LAST ROUND</b>		
	<ol style="list-style-type: none"> <li>1. Magazine worn or broken</li> <li>2. Magazine catch spring weak or broken</li> <li>3. Broken bolt catch and/or spring</li> </ol>	<p>Replace magazine</p> <p>Replace magazine</p> <p>Replace bolt catch and/or spring</p>
<b>15. FAILURE TO CYCLE WITH SELECTOR LEVER ON AUTO (SELECT-FIRE ONLY)</b>		
	<ol style="list-style-type: none"> <li>1. Faulty selector lever</li> </ol>	<p>Replace selector lever</p>

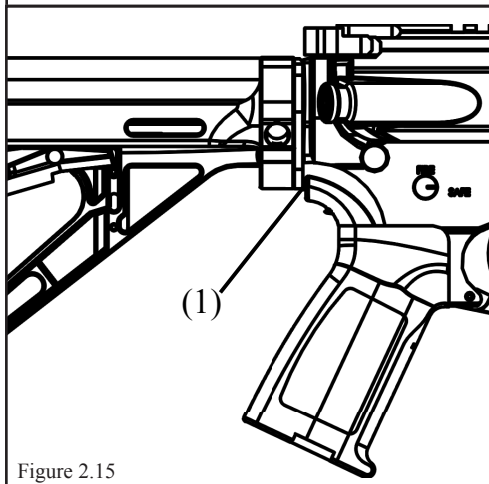


Figure 2.15

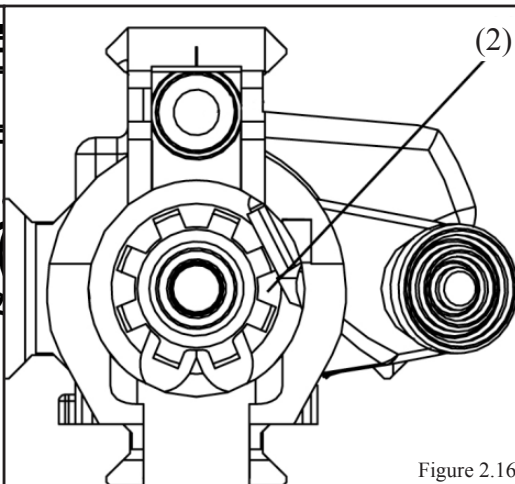


Figure 2.16

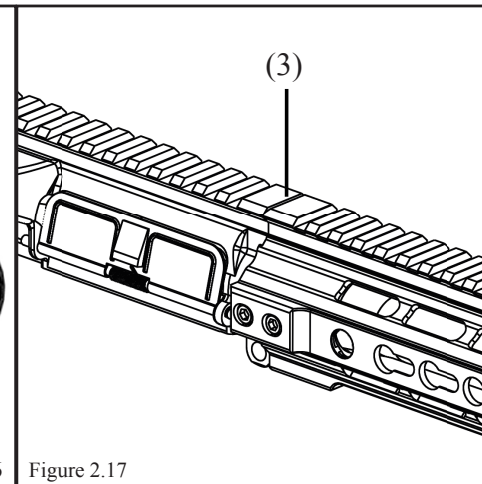


Figure 2.17

## **Section V. MAINTENANCE PROCEDURES**

### **2-9 INITIAL SETUP**

The following information will reduce the space required for the initial setup portion of the maintenance procedures.

1. Materials/Parts required are not listed unless they apply to the procedure
2. The normal standard equipment condition references the manner in which the assembly remains from the previous step in the assembly or disassembly process. Equipment condition is not listed unless some other condition is required. Maintenance procedures follow a logical process in disassembly, inspection, and reassembly.

### **2-10 LUBRICATION GENERAL**

1. PWS uses and recommends the Gun-Ease line of cleaning products. PWS has assembled a cleaning rod set specifically for the MK1 rifles and uppers. See appendix A in this manual.
2. Whenever the term cleaner, lubricant, preservative (CLP) or the words Gun-Ease, lubricant, lube, LSA or LAW are cited in this manual, they can be interpreted as any commercially available product that falls within the required parameters of the particular application. Substitutions can be utilized as applicable as long as they adhered to the following:
3. Do not use water based lubricants when the temperature is at or below freezing (32°F). Under all but cold weather conditions, CLP or other such lubricants can be used as long as they are designed to operate in the conditions in which they are being deployed.
4. Use the lubricant LAW during cold arctic conditions, +10°F (-12°C) and below.
5. Any lubricants may be used from 10°F to + 100°F (-12°C to 38°C).
6. Rifle Bore Cleaner (RBC) may be used to remove carbon buildup in the bore and other portions of the rifle.

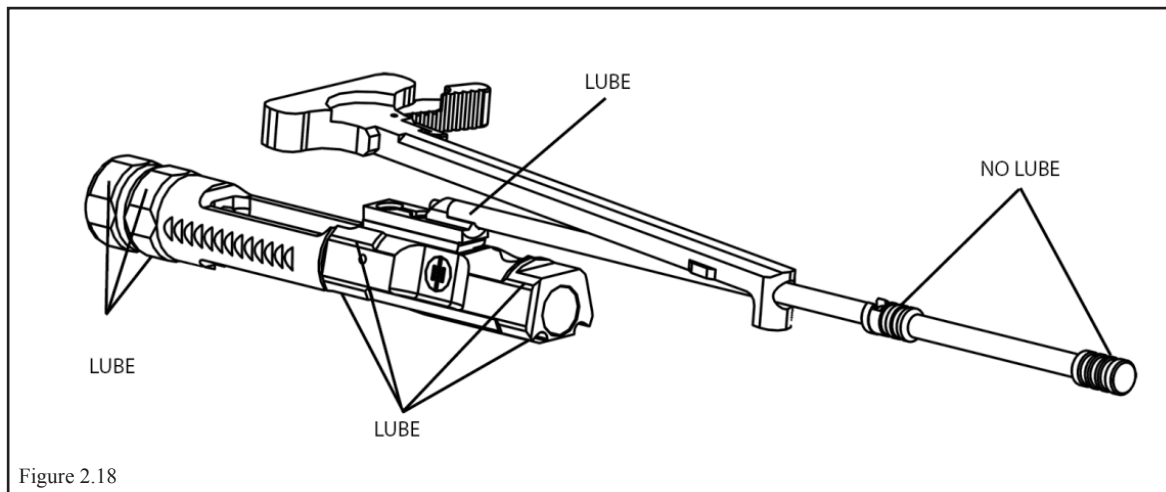
**NOTE**

Do NOT lubricate the piston head.

The illustration below (Fig. 2.18) shows the only points on the weapon that should be lubricated. Additional or excess lubrication is unnecessary and can cause malfunctions by attracting dirt and debris.

**Cleaning/Lubrication Application Interval**

Regular cleaning and lubrication intervals should occur every 1000 rounds under normal operating conditions. Under adverse environmental or operational conditions, the interval may be increased to ensure proper operation. Reapply lubricant to the operating parts as necessary.



## **2-11 MAJOR COMPONENTS OF MK1 MOD1 RIFLES (DISASSEMBLY)**

**This task covers disassembly.**

### **INITIAL SETUP:**

Equipment conditions

MK1 MOD1 rifle assembled

General Safety Instructions

Before starting an inspection, clear the weapon. Do not keep live ammunition near your work area.

To avoid injury to eyes safety glasses should be worn at all times.

Below armorer level maintenance, do not interchange bolt assemblies from one weapon to another.

### **A. DISASSEMBLY**

Remove Magazine (Fig. 2.19, 1), bolt carrier/charging handle assembly (2), and upper receiver and barrel assembly (3) from lower receiver and buttstock assembly (4).

B.



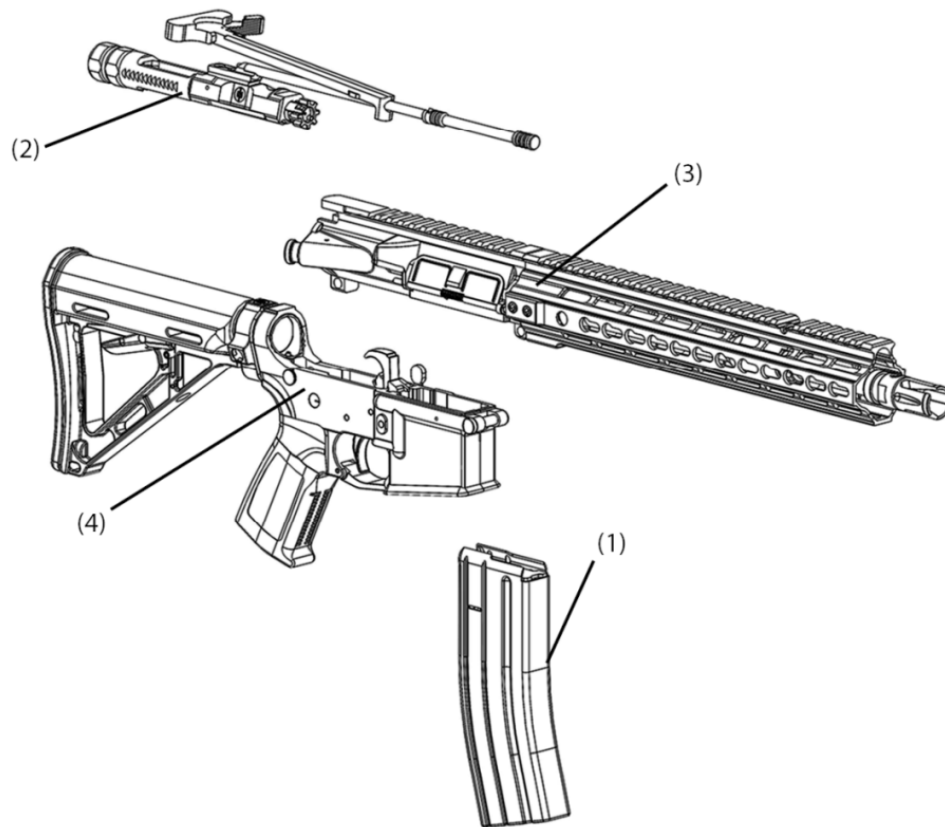


Figure 2.19

## **2-12 BOLT CARRIER GROUP (BCG)**

### **This task covers:**

**A. Disassembly**

**B. Cleaning**

**C. Inspection/Repair**

**D. Lubrication**

**E. Reassembly**

### **INITIAL SETUP:**

#### Tools

No tools necessary

#### Equipment Conditions

BCG removed

#### General Safety Instructions

Bolt cam pin must be installed prior to firing to prevent injury or death to personnel.

Do not interchange bolt assemblies from one weapon to another.

If changing out the bolt assembly, checking proper headspace with approved gauges is required.

### **A. DISASSEMBLY**

1. Remove firing pin retaining pin (Fig. 2.20, 1). Tilt BCG (2) and catch firing pin (3) as it drops out.

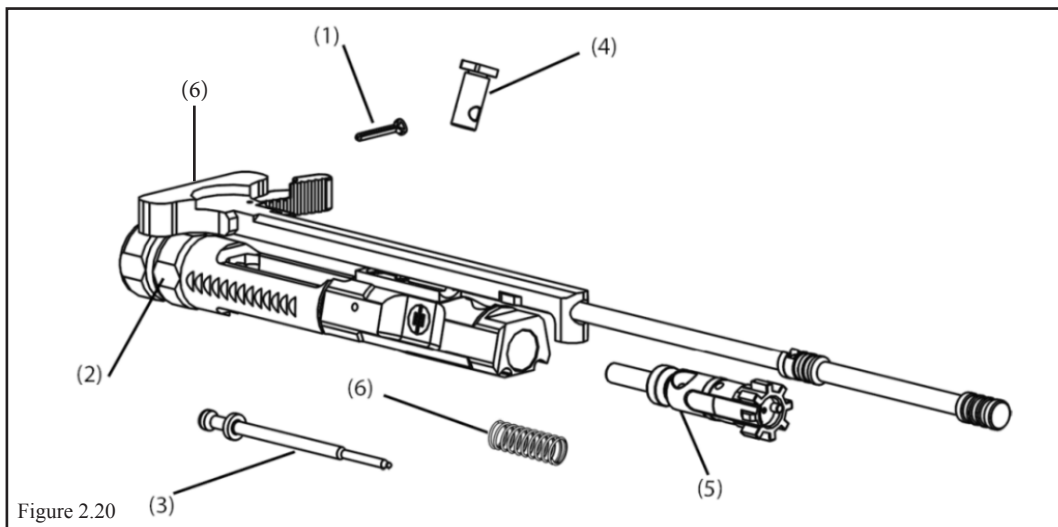
**CAUTION**

Do not spread or close legs of firing pin retaining pin (1)

2. Push bolt (Fig. 2.20, 5) to rear and lift bolt cam pin (4) straight up to remove.
3. Remove bolt (5) from BCG (2). Remove spring (6) from bolt.
4. Slide charging handle (6) forward and off of the operating rod to clean or replace.

**NOTE**

For disassembly of bolt assembly (Fig. 2.20, 5), see page 71.



## **B. CLEANING**

Clean the bolt and BCG of carbon deposits.

## **C. INSPECTION/REPAIR**

Inspect BCG (Fig. 2.21, 5) as follows:

1. Insert bolt (5) into BCG (2). Bolt should rotate freely.
2. Inspect carrier key (6) for dents, cracks, or looseness. If cracked or loose, repair or replace as necessary.
3. Inspect firing pin retaining pin (1) and bolt cam pin (4) for cracks, damage, or excessive wear. Replace if unserviceable.
4. Inspect firing pin (3) for damage. If tip is chipped, replace as necessary.
5. Inspect BCG (2) for damage or wear. If unserviceable, repair or replace as necessary.
6. Inspect charging handle (7) for cracks or damage. Wear marks in on the charging handle is normal as long as it does not diminish the structural integrity.
7. Inspect piston head (8) for cracks or damage. Pay close attention to the area at the rear of the piston where it is held onto the operating rod.

## **D. LUBRICATION**

A small amount of lubrication is recommended on the enlarged contact points (9) of the BCG (Fig. 2.21, 2) as well as on bearing surfaces of the bolt (5) and the cam pin (4). Under no circumstances should you lubricate the piston head (8). Doing so can cause excessive buildup on the piston heads and in turn will cause weapon malfunctions.

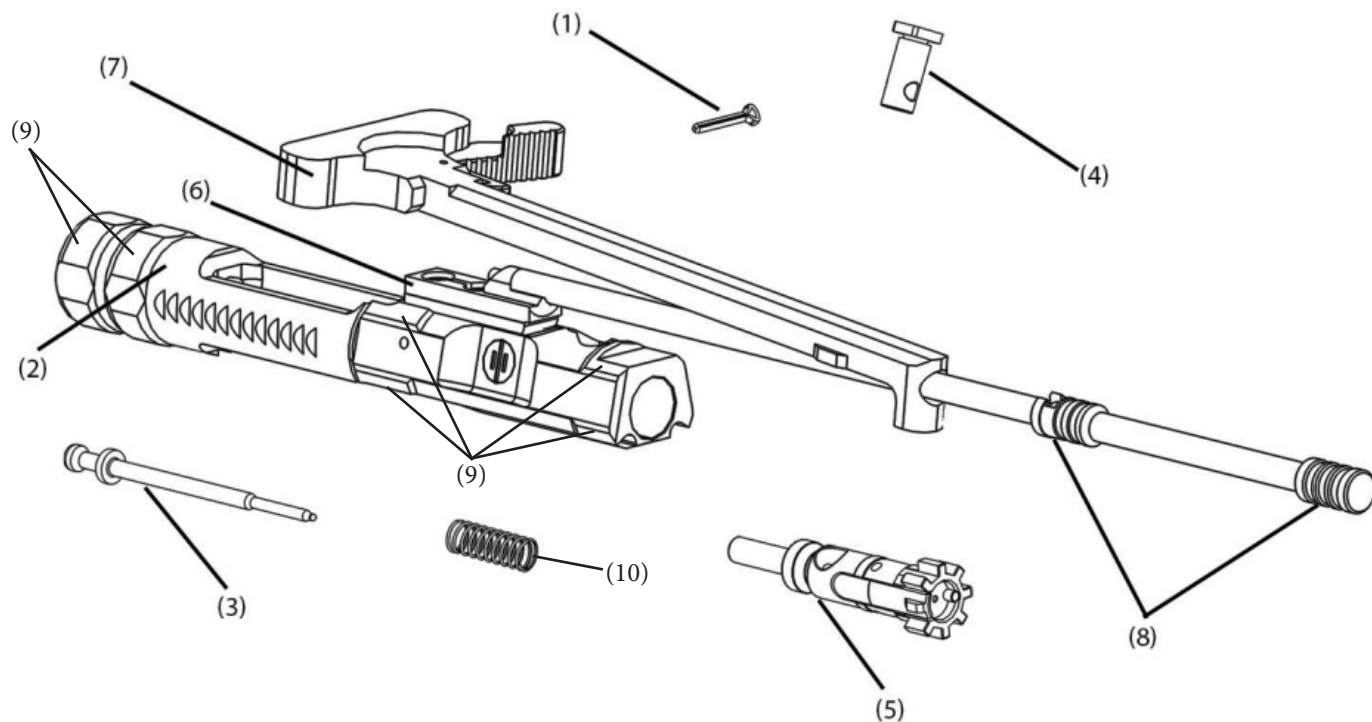


Figure 2.21

## **E. REASSEMBLY**

### **WARNING**

Do not interchange bolt assemblies without checking proper headspace with approved gauges.

Bolt cam pin must be installed or a catastrophic failure will occur while firing the first round. If the bolt cam pin is not installed, injury to, or death of, personnel may result.

1. Reinstall spring (10) on rear tail portion of the bolt (Fig. 2.21, 5). Insert bolt back into the front of the carrier (2).
2. Install bolt cam pin (4) and rotate one quarter turn.
3. Hold BCG (2) with bolt assembly (5) down and drop firing pin (3) in through the rear of the carrier (2).
4. Install firing pin retaining pin (1) from left side only. To ensure proper installation, check by holding BCG (2) with bolt assembly (5) up and attempt to shake out firing pin.
5. To replace piston head (8), install charging handle by sliding operating rod through the hole located at the front of the charging handle (7).
6. Install piston head (8) by sliding it onto operating rod.

## 2-13 BOLT ASSEMBLY

### This task covers:

- A. Disassembly
- B. Cleaning
- C. Inspection/Repair

- D. Lubrication
- E. Reassembly

### INITIAL SETUP:

#### Tools

No tools necessary

#### Equipment Conditions

Bolt assembly removed from BCG

#### General Safety Instructions

Do not interchange bolt assemblies without checking proper headspace with approved gauges.  
To avoid injury to your eyes, use care when removing and installing spring-loaded parts.

### A. DISASSEMBLY

#### NOTE

Do not separate extractor and extractor spring assembly unless replacement of either or both is required.  
Do not remove the rubber insert from the extractor spring assembly.

1. Push out extractor pin (Fig. 2.22, 5) and remove extractor (3) and extractor spring assembly (4) as a unit.
2. If required, twist extractor spring assembly (4) counterclockwise to remove from extractor (3).

### CAUTION

Be sure to use vise jaw protective caps.

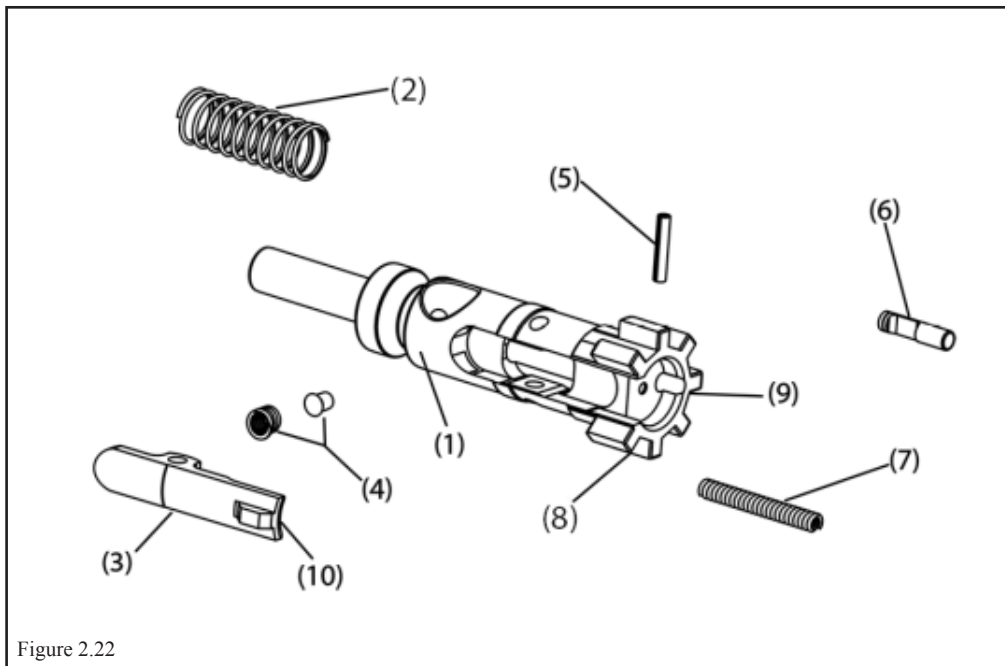


Figure 2.22



**B. CLEANING****CAUTION**

Do not distort extractor spring assembly during cleaning.

Clean major contact points and lugs (Fig. 2.22: 8, 9) of carbon deposits. Extractor (3) and spring assembly (4) do not need to be removed for routine cleaning and maintenance. Refer to Section III, 2-7 for preventative maintenance checks and services interval instructions.

**C. INSPECTION/REPAIR**

1. Inspect for cracks or damage, especially around locking lugs (Fig. 2.22:8, 9). Replace any components that are damaged, cracked or have excessive wear.
2. Inspect the extractor (3), extractor spring assembly (4), and extractor pin (5) for cracks, breaks, chips, and other damage. Pay close attention to cartridge extractor lip (10). If damaged, replace.

**D. LUBRICATION**

A small amount of lubrication is recommended on the bearing surfaces (both rear of the bolt and band that contacts the carrier) of the bolt (Fig. 2.22, 1). Over-lubrication is not recommended.

**E. REASSEMBLY****WARNING**

To avoid injury to your eyes, use care when removing and installing spring loaded parts.

**CAUTION**

Be sure to use vise jaw protective caps.

1. If removed, insert large end of extractor spring assembly (Fig. 2.22, 4) into extractor (3) and seat by pushing and turning clockwise.
2. Position extractor (3) and extractor spring assembly (4) on bolt body (1).
3. Compress extractor spring assembly (4) and extractor (3) to align holes.
4. Install extractor pin (5) by hand.
5. Reinstall spring (2) on rear tail portion of the bolt (1).

## 2-14 UPPER RECEIVER AND BARREL ASSEMBLY

### This task covers:

- |                       |                       |
|-----------------------|-----------------------|
| <b>A. Disassembly</b> | <b>D. Repair</b>      |
| <b>B. Cleaning</b>    | <b>E. Lubrication</b> |
| <b>C. Inspection</b>  |                       |

### INITIAL SETUP

#### Tools

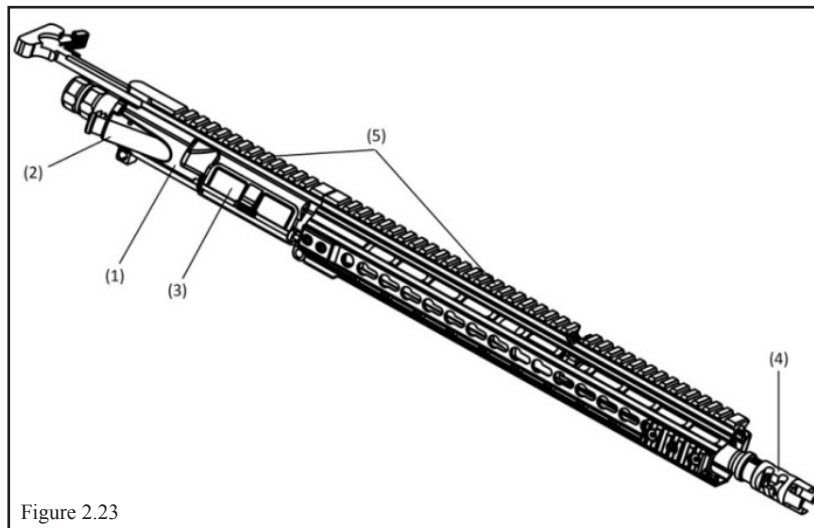
Upper Receiver Action Block

#### Materials/Parts

Lubricants

#### Equipment Conditions

Upper receiver and barrel assembly removed from lower receiver



## 2-14.1 UPPER RECEIVER AND BARREL ASSEMBLY

### General Safety Instructions

To avoid injury to your eyes, use care when removing and installing spring loaded parts.

### A. DISASSEMBLY

#### NOTE

The KeyMod rail should not be removed as a part of routine maintenance. You should only remove the KeyMod rail to repair or to replace the rail or related components.

If not replacing any components, clean in accordance with the user manual in Appendix A.

### B. CLEANING

Clean all items as part of routine maintenance. Lubricate the bore brush with oil and insert in into the barrel via the chamber. Wipe powder residues and oil from the barrel bore and chamber with cleaning patches. Clean all surfaces with a brush coated in oil to remove dirt and debris.

### C. INSPECTION

1. Inspect upper receiver (Fig. 2.23, 1) for breaks, cracks, or damage to the top rail (5) that would prevent the attachment of accessories onto the Picatinny rail. Replace as necessary.
2. Inspect forward assist assembly (2). Ensure that the forward assist fully depresses and returns without binding. Replace defective components.
3. Inspect ejection port cover (3). Ensure the ejection port cover closes and latches as well as springs open when pushed open by either your fingers from the inside of the receiver or from the movement of the BCG. Replace defective components.

4. Check muzzle device (Fig. 2.23, 4) for looseness on barrel. A shim set or crush washer is used to properly align the muzzle device. Typically, if a logo is present, proper orientation is achieved when the logo is straight up at Top Dead Center (TDC). If loose or out of alignment repair or replace as needed.
5. Inspect top Picatinny rail of the handguard (5) for damage that would prevent the attachment of accessories onto the Picatinny rail. Replace as necessary.
6. Inspect the outside of the rail for damage to that would prevent the attachment of the key mod rail sections, replace as necessary.

#### **D. REPAIR**

Repair or replace all unserviceable parts.

#### **E. LUBRICATION**

Lightly oil surfaces and remove any excess lubricant. Do not over lubricate, this can cause the action to become sticky, allowing dust and debris to collect.

## 2-15 LOWER RECEIVER AND BUTTSTOCK ASSEMBLY

### This task covers:

- |                       |                       |
|-----------------------|-----------------------|
| <b>A. Disassembly</b> | <b>D. Repair</b>      |
| <b>B. Cleaning</b>    | <b>E. Lubrication</b> |
| <b>C. Inspection</b>  | <b>F. Reassembly</b>  |

### INITIAL SETUP

#### Tools

No special tools necessary

#### Materials/Parts

Lubricants

#### Equipment Conditions

Lower receiver and buttstock assembly removed

### **A. DISASSEMBLY**

1. Extend buttstock assembly (Fig. 2.24: 1, 2).
2. Pull down sharply on lock release lever (3), depress buttstock lever (2), and pull stock rearward and off of the buffer tube (4).
3. Push the buffer retaining pin (5) down to allow the buffer (6) and buffer spring (7) to move forward. Remove buffer and buffer spring.

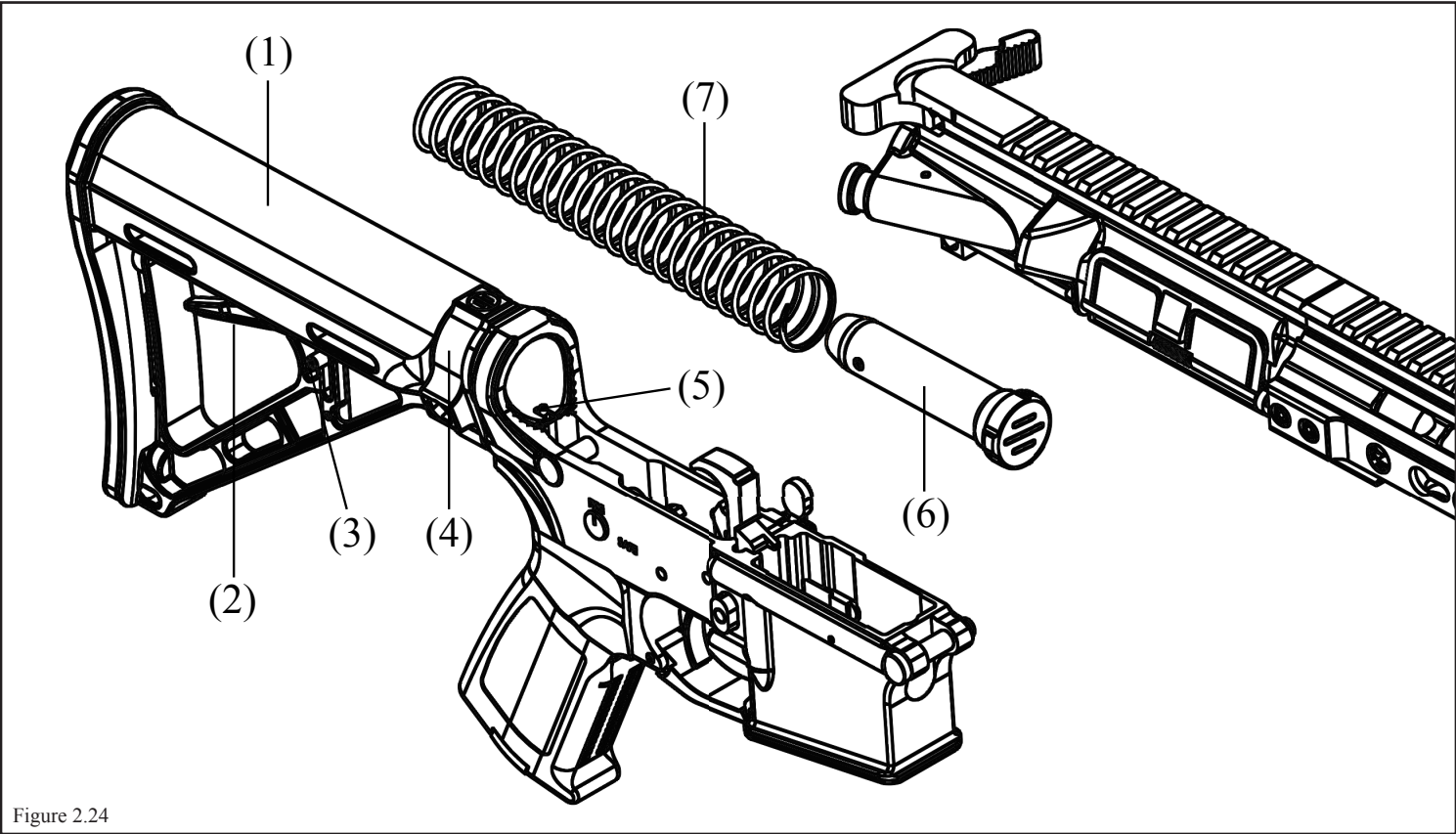


Figure 2.24

## 2-15.2 LOWER RECEIVER AND BUTTSTOCK ASSEMBLY

### **B. CLEANING**

Clean all items. Remove all carbon deposits.

### **C. INSPECTION**

1. Inspect buffer assembly (Fig. 2.24, 6). If cracked, replace.
2. Check free length of buffer spring (7). Free length should be 10 9/16 inches (26.83 cm) minimum to 11 inches (27.9 cm) maximum. If not, replace. Do not attempt to adjust the length by stretching the buffer spring.
3. Inspect lower receiver without further disassembly.
4. Inspect for missing or damaged parts. Inspect finish of lower receiver for shiny spots.

### **D. REPAIR**

Upon completion of inspection, repair or replace items as needed.

### **E. LUBRICATION**

Lightly lubricate all metal components. Wipe off the excess and let it air-dry to a film barely visible or wet to the touch.

### **F. REASSEMBLY**

1. Press buffer spring (Fig. 2.24, 7) and buffer assembly (6) into the buffer tube until buffer retaining pin engages.
2. Slide buttstock (1) over buffer tube (4). Pull down on lock release lever (3) and slide stock all the way forward.

## **2-16 MAJOR COMPONENTS OF THE MK1 MOD1 RIFLES (REASSEMBLY)**

**This task covers:**

- A. Reassembly**
- B. Inspection/Function Checks**
- C. Stowage**

### **INITIAL SETUP**

Equipment Conditions

Rifle disassembled into major components

#### **A. REASSEMBLY**

1. (Fig. 2.25, 2) Slide the charging handle to the rear of the operating rod until it stops against the carrier key portion of the BCG and operating rod.
2. Slide the BCG (2) into the upper receiver (3) and guide the lug portion of the charging handle into the receiver groove. Push BCG (2) forward into the receiver.
3. Place the upper (3) and lower receiver (4) together.
4. Push the take-down pins in place. It is easiest to do the front pin first and the rear pin second.

#### **B. INSPECTION & FUNCTION CHECKS**

Perform the following function checks on assembled weapon:



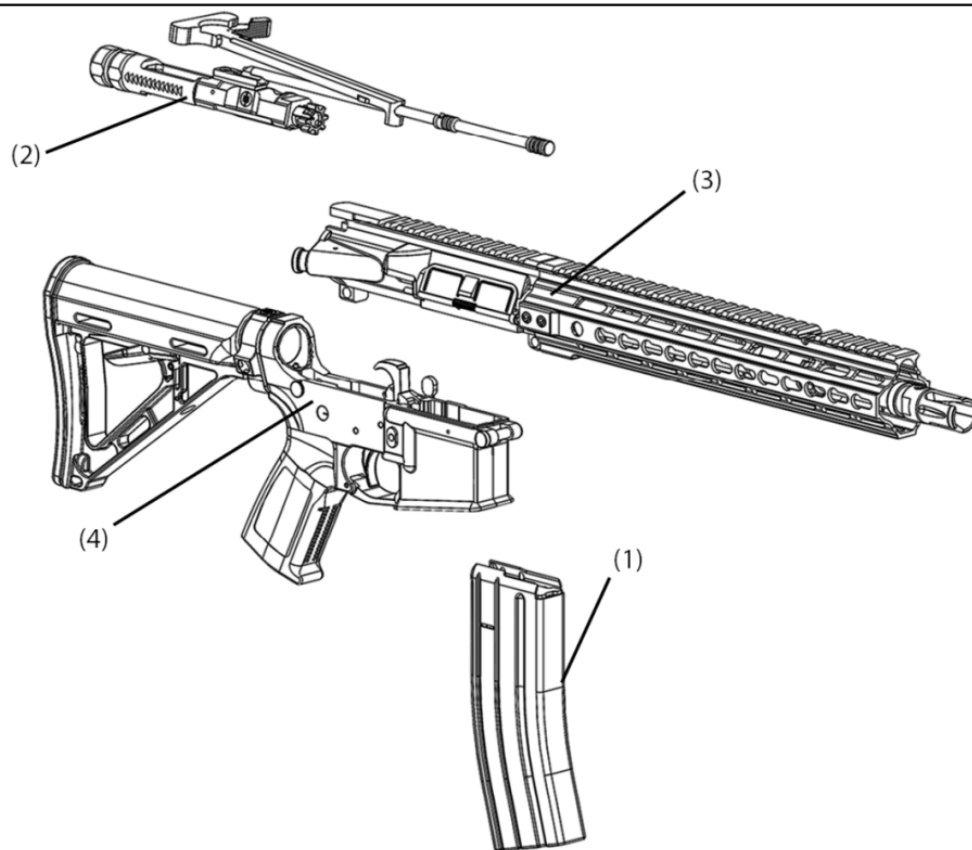


Figure 2.25

## **B. INSPECTION & FUNCTION CHECKS**

Perform the following function checks on assembled weapon:

1. Remove magazine if installed. Pull charging handle assembly to rear. Check that chamber is clear. Release the charging handle to send the BCG forward so it is in the forward locked position. Do not pull trigger. Leave hammer in cocked position.

### **WARNING**

If rifle fails any of the following tests, continued use of the rifle could result in injury to, or death of user.

2. Place selector lever in SAFE position and pull trigger. Hammer should not fall.
3. Place selector lever in SEMI/FIRE position. Pull trigger. Hammer should fall.

### **MK1S (SELECT-FIRE MODELS) ONLY**

4. Place selector lever in AUTO position. Charge weapon and pull trigger. Hammer should fall.
5. Hold trigger to the rear, charge weapon and release trigger. Pull trigger. Hammer should not fall. AUTO sear should have released hammer while holding trigger in the squeezed position before releasing and resqueezing the trigger.
6. With hammer in forward position, attempt to place the selector lever in the SAFE position. If selector lever can be placed on SAFE, replace fire control group components as necessary.

## **C. STOWAGE**

Prior to stowing weapons in arms rooms, perform the following functions:

1. Clear. (refer to page 5, 85)
2. Place selector lever in SEMI/FIRE position.
3. Pull trigger. Hammer should fall.
4. Close ejection port (dust) cover.
5. Place weapon in rack.

## APPENDIX A

### CLEANING

The below items are what PWS recommends you use when cleaning your PWS firearm. This list includes all the necessary items that you need to properly maintain your rifle. PWS recommends using the Gun-Ease line of CLP for all routine cleaning, lubrication, and maintenance. Whenever the word Gun-Ease is used, it can be interpreted as any commercially available product that falls within the required parameters of the particular application as outlined on page 62. Items 1-4, 9, & 10 can be purchased online at [www.primaryweapons.com](http://www.primaryweapons.com).

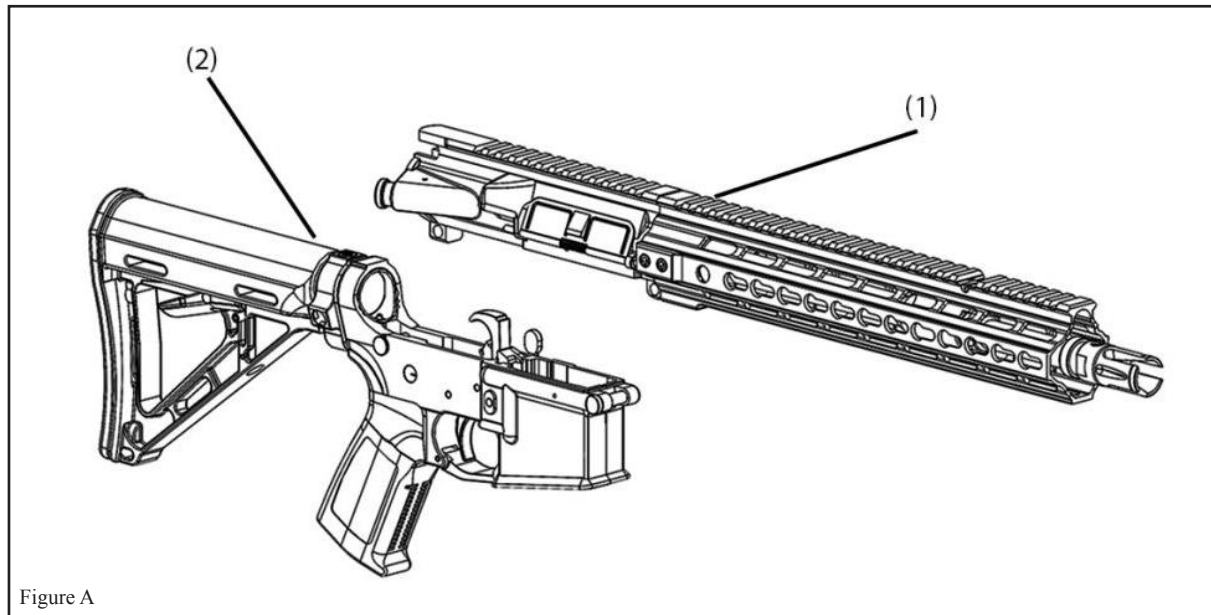
ITEM	ITEM NAME	DESCRIPTION	PART #
1	ROD, CLEANING, SET	PWS CLEANING ROD SET, 3 PCS	1M80690
2	WIPES, CLEANING, SET	PWS GUN-EASE, WIPES	5GEWPEA1
3	PEN, APPLICATOR, LUBE	PWS GUN-EASE, APPLICATOR PEN	5GEPNEA1
4	TUB, LUBRICATION	PWS GUN-EASE, TUB	5GETBEA1
5	BRUSH, CHAMBER	OTIS .223 CHAMBER BRUSH	
6	BRUSH, BORE	OTIS 40 CAL BORE BRUSH	
7	BRUSH, NYLON, A/P	OTIS BLUE NYLON A/P BRUSH	
8	BORESNAKE, VIPER	.223 VIPER BORESNAKE	
9	ATTACHMENT, ROD DRILL	PWS CLEANING ROD ASSEMBLY DRILL	1M80692
10	ATTACHMENT, T-HANDLE	PWS CLEANING ROD ASSEMBLY T-HANDLE	1M80694

## **CLEARING PROCEDURE**

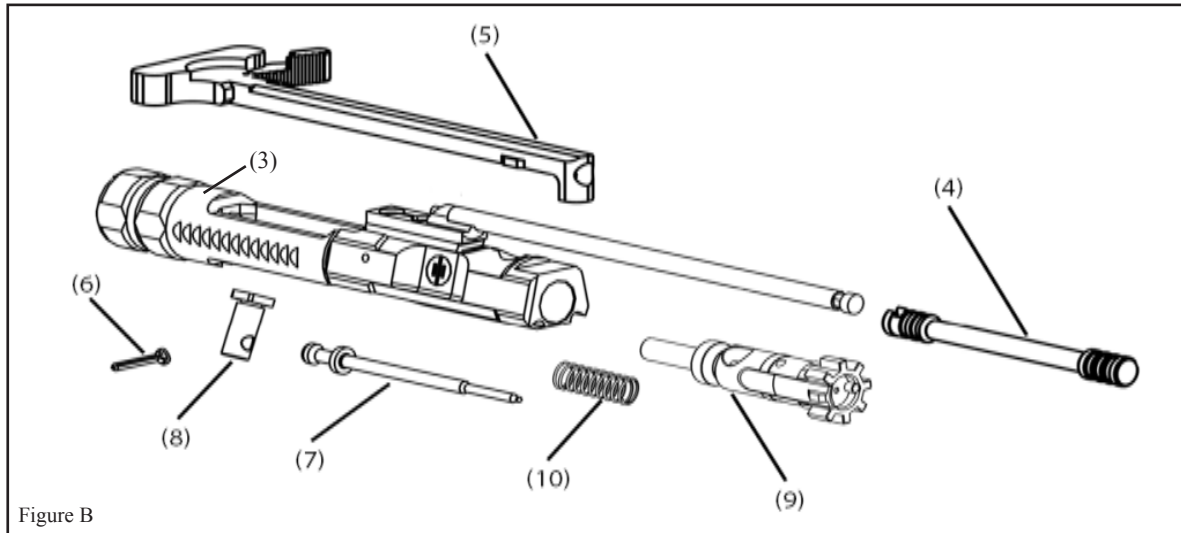
1. Orient the muzzle in a designated SAFE DIRECTION.
2. Attempt to place selector lever on SAFE (If weapon is not cocked, lever cannot be placed on SAFE).
3. Remove the magazine by depressing the magazine catch button and pulling the magazine away from the receiver.
4. Lock the bolt open by pull the charging handle rearward while pressing the bottom of bolt catch.
5. Ensuring the Bolt Carrier Group (BCG) is locked rearward, return the charging handle to full forward position.
6. If you have not done so before, place the selector lever on SAFE.
7. Visually (not physically) inspect the receiver and chamber to ensure these areas contain no ammunition.
8. Send the bolt forward on an empty chamber, by pressing the top of the bolt catch.
9. Close the ejection port cover.

## CLEANING

1. Separate upper (Fig. A, 1) and lower (2) receivers.
2. Use clean rag and Gun-Ease or Gun-Ease wipes to wipe down exterior of rifle and clean BCG and interior components.
3. Also wipe down complete lower with clean rag and Gun-Ease or Gun-Ease wipes and brush. Include the buffer tube and trigger mechanism.
4. Lightly lubricate all metal components. Wipe off the excess and let it air-dry to a film barely visible or wet to the touch.



5. Remove BCG from upper.
6. Disassembled bolt carrier group (Fig. B):
  - a. Remove charging handle (5).
  - b. Remove firing pin retaining pin (6).
  - c. Remove firing pin (7).
  - d. Remove cam pin (8).
  - e. Remove bolt (9) and spring.
6. Wipe down BCG and minor components with a clean rag and Gun-Ease.
7. Lubrication is recommended on the enlarged contact points of the BCG (3) as well as on bearing surfaces (both rear of the bolt and band that contacts the carrier) of the bolt (9) and cam pin (8).



10. Use cleaning rod, with chamber brush to apply a light amount of oil and clean the chamber. Lubricate the bore brush with oil and insert into the barrel via the chamber. Wipe powder residues and oil from the barrel bore and chamber with cleaning patches. Clean all surfaces with a brush coated in oil to remove dirt and debris.
11. Use BoreSnake to clean barrel, pulling from chamber to muzzle.
12. Reassemble bolt carrier group (Fig. B):
  - a. Reassemble bolt spring (10) and bolt (9) into carrier (3)
  - b. Reassemble cam pin (8)
  - c. Reassemble firing pin (7)
  - d. Reassemble firing pin retaining pin (6)
  - e. Reassemble charging handle (5)
13. Reassemble BCG (Fig. C, 3) into upper (1).
14. Reassemble upper (1) and lower (2) receivers.
15. Function check rifle, according to manual (see page 82).

#### **NOTE**

The KeyMod™ handguard should not be removed as a part of routine maintenance. You should only remove the KeyMod™ handguard to repair or to replace the rail or related components.



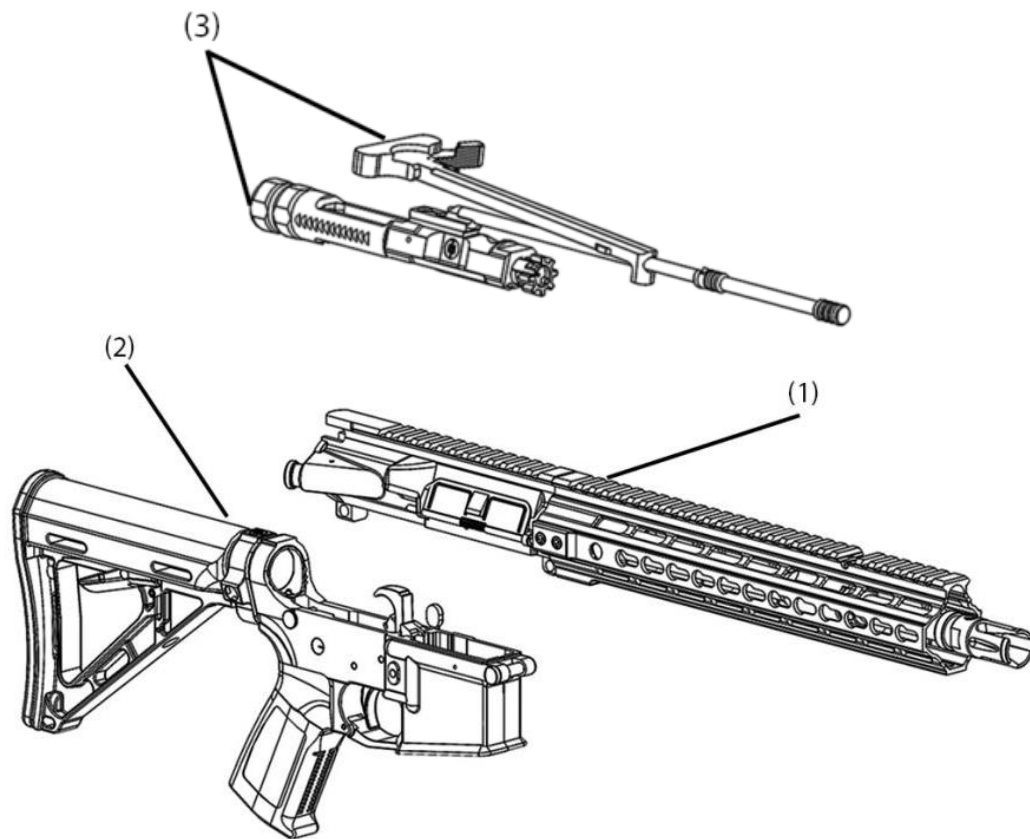


Figure C

16. To service the Gas Adjustment Knob (GAK):

- a. Turn GAK to the X-setting (Fig. D) using the provided GAK tool, located in the grip of your firearm.
- b. Take two sections of the cleaning rod set and thread it onto the GAK tool. Then thread the tool onto the end of the GAK. This will help you remove the knob from the gas block with the rail installed.
- c. DO NOT remove the spring (Fig. E, 4) and detent (3) from GAK.
- d. Use the gas block adjustment tool (Fig. D, 1) to move the knob forward for easier removal. Then thread the tool on to the end of the gas block adjustment knob (6) and pull.
- e. Wipe down gas block adjustment knob with Gun-Ease wipes. Also use the tooth brush and wipes to clean out piston tube and the knob its self.
- f. Reinstall GAK into piston tube. Make sure that it is seated fully against the gas block (Fig. E, 2).

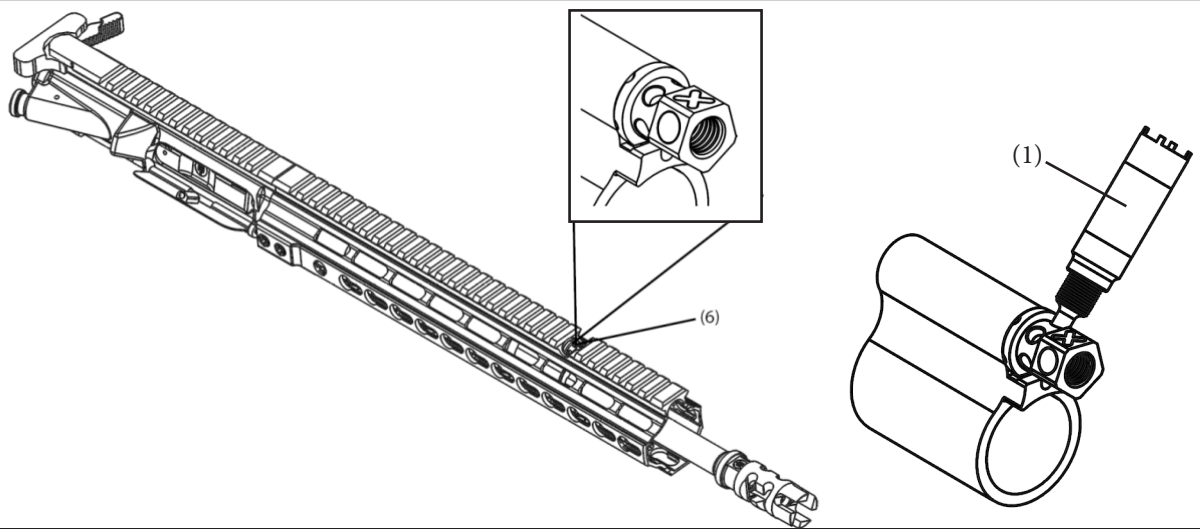


Figure D

