Alexander Arms

338 Lapua †Ulfberh†t Instruction Manual

WARNING

Please READ and Understand this manual before removing this firearm from its packaging and before use.

Part No SR1-MN-01

Dated 03/23/14

Warning

Before using this firearm, read and follow these instructions.
If there is anything that you do not understand, get help from someone qualified in the safe handling of firearms.

338 Lapua Ulfberht rifle

This instruction manual should always accompany the 338 rifle with which it is issued. If you lend, give or sell this firearm, this manual must go with it. Additional manuals for this rifle are available from Alexander Arms or through your local dealer.

PRECAUTIONS

READ AND UNDERSTAND THIS MANUAL BEFORE REMOVING THIS FIREARM FROM ITS PACKAGING

This product is classified by the Alcohol and Tobacco Tax and Trade Bureau, as a Firearm. It is therefore potentially lethal.

WARNING. If this firearm is carelessly or improperly handled, unintentional discharge could result and could cause injury, death, or damage to property

CAUTION. Always keep and carry the rifle unloaded, without the magazine in place. Only load the rifle when you intend to shoot. Use only clean, dry, original, high quality, commercially manufactured ammunition in good condition, which is marked as the caliber for this rifle.

CAUTION. Read this manual, which gives basic advice on the proper handling and function of this rifle prior to using or loading the rifle. Your safety and the safety of others depend on your mature compliance with this advice. If unfamiliar with firearms, seek advice from someone qualified in the safe handling of firearms.

WARNING. Always ensure that the two locking lugs are present in the rifle after reassembly or before firing. If both locking lugs are not installed, are incorrectly installed, or are in any way modified, the rifle may still fire and may explode causing injury, death or damage to property. Do not replace the locking lugs with any part other than locking lugs from the original manufacturer and, if replaced, head space must be checked by a person suitably trained and familiar with this procedure before the rifle is loaded. If you are unsure of the fitting or condition of the locking lugs, seek advice from someone who is qualified and familiar with this rifle.

WARNING. Do not exchange bolt assemblies from one rifle to another. Such action will accelerate wear and may cause a condition of excessive head space. Firing a rifle in such condition may result in injury, death, or damage to property.

LIST OF SECTIONS

Precautions

Design Objectives

The object of this rifle is to provide extreme range precision with minimum signature and fast follow up engagements in a portable platform. The DMR or semi automatic sniper system (SASS) platform is limited by the current 308 caliber used in the AR10 style weapon system. Evolving to a 338 Lapua caliber provides better range to target with acceptable wind drift, but also with adequate terminal energy to counter either protected targets or larger game animals. Weight is kept to limits to balance mobility with stability, while the timing of the reciprocating mass and the constant recoil design negates the need for a muzzle brake. This has a positive benefit on weapon signature in most environments as an effective bar type flash hider is employed. The ability to provide very soft recoil allows the user to track the projectile to the target and to identify fall of shot thus facilitating either corrections or quick follow up shots.

One of the principle challenges with the 338 Lapua lies in the extreme internal pressure and the loads that the cartridge transfers to the weapon. A substantial part of the design effort was to create a weapon capable of absorbing such loadings over a substantial service life without notable loss of accuracy or accumulation of damage to the weapon itself. Ammunition must be carefully handled during the feeding cycle as projectile damage will have negative effects at range, so the feed design must allow for a smooth and cushioned movement of the cartridge into the chamber. Equally, ejection cannot throw the brass violently in a direction such as to disclose the position of the weapon, but the force must be such that vegetation in close proximity will not impede the ejection of the spent casing.

Finally, the system must provide signature management. The barrel weight provides rigidity for accuracy, but also allows for substantial thermal mass, which is required if the semi automatic capability is to be used effectively. Low weapon movement during recoil helps maintain cover and the flash hider removes visible muzzle flash. Correct design of the gas system removes any flash from the gas system vents.

All parts used in the weapon are compatible with inclement environments with minimum maintenance.

Technical Features

- Caliber 338 Lapua Magnum will allow the shooter to engage targets reliably out to 2000 yards.
- Capable of using all current generation 338 Lapua ammunition up to 3.750” OAL including AP natures and high pressure loads.
- 1 in 9.3 twist Enfield pattern rifling for heavy jacket bullets and heavy weight projectiles.
- Tight minor diameter reduces bullet slip in throat and extends barrel life.
- Low chrome alloy barrel material, salt bath carbo nitride treated for wear resistance and corrosion resistance with thermal shock resistance.
- Dual ejectors for redundancy and reliability.
- Heavy duty plate extractor.
- Unique polymer feed ramp to negate projectile nose damage.
- Stainless steel, carbo nitrided, hard coated or chrome plated internals/externals for environmental compatibility and easy decontamination.
- Firing pin directly interrupted by the locking lugs. Rifle is unable to fire until fully engaged in battery and locked.
- Easy examination of headspace and tool free replacement of locking elements if ever needed.
- Low pressure gas system, fully corrosion resistant and adjustable for loads and conditions.
- Semi automatic action allows rapid engagement of multiple targets and reduces felt recoil.
- Capacity 10 rounds detachable double stack magazine.
- Weight 19.8 lbs.
- Barrel length 27 inches delivers optimum velocity and reduction of signature.
- Compound cylinder construction of barrel installation maximizes the radial support of the chamber and breach.
- Heavy barrel maximizes available thermal mass to remove heat from bore. Fluting retains stiffness while increasing surface area to effectively cool the barrel.
- Cooling time management allows for effective utilization of semi automatic capability.
- Flash hider reduces muzzle signature and disturbance of downrange material.
- Barrel has M18x1.5 standard metric threads for installation of muzzle brake or silencer, if desired.
- Barrel profile is compatible with current popular silencer QD attachments.
- Continuous top rail has 30 MOA built in.
- Rifle has only 48 individual parts for simple robust reliability.
- Rifle can be detail stripped with 1/8 hex wrench, 3/4 A/F wrench and soft face hammer only.
- Trigger pull is a crisp 4 lbs with 2 stage action.
- Target service life of over 5000 rounds.
- Folding stock for compact storage and transport.
- Hand guard and top cover are fully hard anodized
- Overall length 50”.
- Folded Length 41 1/4”.

History of the Name

Ulfberht is a sword that has its origin with the Vikings. Up until this date most edged weapons were either short with a thick section or were likely to break. The sword follows the pattern of a longer sword that was used by the Goths in the Southern German boundary of the Roman empire. While providing an advantage in combat, the problem with the steel persisted. Steels at this time were refined from a semi solid mass called sponge iron by repeated hammering and heating until most impurities were driven out. The Ulfberht ushered in the first use of true steel refined in small crucibles by fully melting the material to remove impurities and carbon. It is thought that the material originated in India, but references to a technique developed in Persia are also seen. Such steel shows that the Vikings were extensive traders, and for a period of 200 years, the steel was used to produce these exclusive swords. Such was the value that only royalty or chieftains could afford such a weapon and they can be found in grave goods. The weapon was the high point of development of weaponry in the time and could not be matched for nearly another 1000 years with the advent of the blast furnace. Aside from the true Ulfberht a number of forgeries with different spelling and inferior metallurgy were produced. The Ulfberht rifle follows the sword in being a pinnacle of weapon evolution.

Main features

General Layout

The Alexander Arms Ulfberht is a gas operated, semi automatic locked breach weapon designed specifically to chamber and work with the demanding requirements of the 338 Lapua cartridge. It is produced with the most advanced manufacturing methods, with modern materials. The mechanism is both robust and durable, permitting shots to be fired from all positions and inclinations.

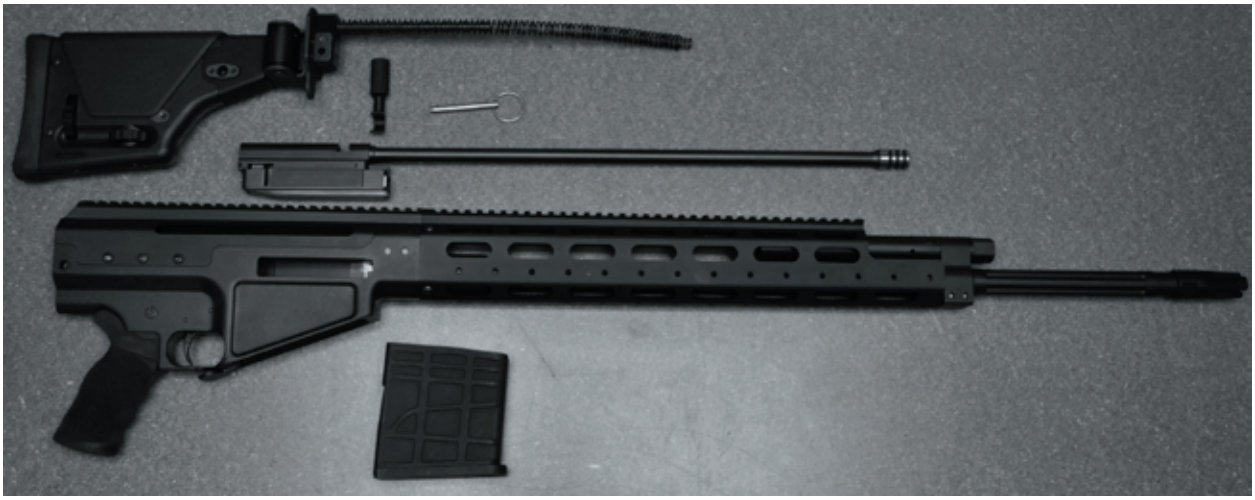
The rifle uses a non rotating bolt with large locking flaps that mate with recesses in the receiver to provide a very strong and durable mechanism which is resistant to dirt and fouling. Firing from a closed bolt with stationary barrel, the delayed gas operated action provides a high degree of accuracy

The rifle can be quickly and easily field stripped by the removal of a single pin for cleaning and inspection. All materials used in the construction are either corrosion resistant or coated to provide corrosion resistance in adverse conditions. The mechanism is simple with few parts to resist stoppages from fouling.

Ammunition is fed from a double stack polymer detachable magazine.

1. Caliber - 338 Lapua Magnum
2. Weight - 19.8 lbs empty
3. Length - 50” stock extended
4. Width - 1 3/4” less charging handle 3.15” total
5. Height - 8.5 inches from bottom of pistol grip to top of receiver
6. Fire control - Safe, Semi
7. Charging handle - Right hand side
8. Ejection - Right hand side.

Assemblies



Main Features

Receiver assembly

The receiver assembly includes the barrel, hand guard, top cover and gas assembly less the piston. The barrel is pressed into the receiver and is cross pinned for additional retention. The barrel is free floated without contact with the hand guard for accuracy. The receiver provides a guide for the bolt and carrier assembly, support for the barrel and locking lug recesses to lock the breach closed during firing. Additionally, the receiver houses the fire control group and location for the magazine. A pistol grip is provided and the stock assembly pins to the rear of the receiver to retain the internal mechanism and recoil springs.

Bolt and Carrier assembly

The bolt and carrier assembly is housed in the receiver and is removed through the back of the weapon when the butt stock is removed. The unit consists of the carrier with the piston attached, left and right locking lugs and the bolt, which houses the firing pin, extractor and ejectors. The two units are dovetailed together. The assembly allows for the insertion of the charging handle into the right hand side after the assembly is installed in the weapon. The handle provisions drawing the bolt to the rear during the initial loading cycle.

Butt stock

The butt stock assembly is comprised of the stock itself with the hinge mechanism, receiver end cap, buffer and recoil springs. It is pinned to the receiver by a single locating pin of the detent type.

Magazine

The magazine is a polymer construction double column box type to hold 10 rounds. It is employed to feed cartridges into the rifle. The assembly is comprised of five main parts and can be easily disassembled for maintenance.

Adjustable Gas regulator

The adjustable gas regulator function allows the user to match the function of the weapon to the ammunition and climatic conditions by means of restriction of the gas flow to the cylinder. Adjustment is made by loosening the cylinder cap and then rotating the cylinder to the numbered index point. The system has five settings labeled 0 to 4, which move sequentially from completely closed to fully open for extremely cold dirty conditions and subsonic ammunition. Setting 0 is fully closed and the rifle will not cycle when fired. Setting 1 is for use with suppressors and very high temperatures. Setting 2 is for general use at most climatic temperatures and full power ammunition, specifically 300 grain loadings. Setting 3 is for lower power ammunition such as some 250 grain ammunition and very cold conditions. Setting 4 is for subsonic loads, low pressure loadings and cold conditions. The gas setting should be selected as the minimum which will reliably cycle the rifle. For almost all use, the default is 2 or 3, depending upon bullet weight. Detailed instructions on how to correctly set the gas regulator are provided in section 6 of this manual.

Safety Instructions

General Handling and Use

As with all firearms, this rifle is potentially lethal if misused. You must read and fully understand this manual before using this rifle, if there is anything that you do not understand get help from someone who is qualified in the safe handling of firearms.

- Always handle the rifle as if it is loaded even if you have checked or have watched someone else check to be sure it is unloaded.
- Never point the rifle at anything you do not intend to shoot.
- Never take anyone's word that the rifle is unloaded. Always check for yourself and even then, handle the rifle as you would a loaded firearm.
- Always check the rifle is unloaded, that the bolt is racked open to check the chamber and that the magazine is removed before laying it down or handing it to another person.
- If possible, insert a chamber flag into the weapon chamber to visually identify the chamber is clear.
- Always keep and carry the rifle unloaded with the hammer released except when you intend to shoot.
- Be aware that dropping the rifle or any other severe impact may damage some part of the mechanism. Even if you cannot see the damage, it may cause the rifle to fire when you do not intend to and cause injury, death or damage to property. If you have dropped or suspect that the rifle may have been dropped or subject to impact have it examined by a competent gunsmith before using it.
- Never leave the rifle loaded and ready to fire.
- Never leave the rifle unattended, even if you believe that it is unloaded.
- Always instruct children regarding the dangers of all firearms. Even if you do not teach your children to shoot, ensure that they know about the safe handling of firearms. If you do teach your children to shoot, always ensure that they know how to treat and use a firearm properly and always supervise them closely.
- Always be sure that the backstop behind any target you are intending to shoot is adequate to stop and contain the bullets before you fire. Any rifle will penetrate a significant quantity of some materials such as wood or dirt.
- Do not shoot any target, even if you have a good backstop, if you cannot see the area behind the target clearly to ensure that it is safe.
- Always carry the rifle unloaded with the magazine removed until you are ready to shoot.
- Always ensure that the barrel bore, chamber and action are clean and free of obstructions and excess lubricant. After use, always clean the rifle immediately as this will assist in maintaining the correct function and safety.
- Never consume alcoholic beverages, take drugs or inhale any chemicals before or during shooting, as your coordination, judgment and vision could be impaired, making the use and handling of this rifle unsafe.
- Always seek a doctor's advice if you are taking medication or are subject to any medical condition, to ensure that you are capable of handling this rifle safely.
- Always wear ear protection when shooting. All others in the area of the rifle when it is being

fired should use ear protection.

- Always wear approved protective shooting glasses when shooting. Anyone in the area of the rifle during shooting should wear eye protection as firing the rifle may generate flying particles that could damage eyes.
- Always apply the safety when the rifle is loaded until you are ready to fire.
- It is important to keep clear and to keep others clear of the ejection port. The spent cartridges are ejected with sufficient force to cause injury and may also be hot. The ejection port should not be obstructed by your hand when clearing the rifle to ensure live rounds are safely ejected. Never place fingers in the ejection port.
- Never place your finger in the trigger guard or squeeze the trigger until you are aiming at the target and are sure you want to shoot.
- Always be sure of your target, what lies between you and your target and what lies beyond your target. Rifle ammunition can travel a significant distance after passing through even substantial targets, and may deviate substantially from the intended direction of your shot. Never shoot at any hard surfaces such as rock or a liquid surface such as water.
- The rifle generates a substantial noise and should not be fired in the vicinity of any animal unless it is trained to accept such noise.
- Never undertake any activity that may cause an accidental discharge of the rifle. Do not let your concentration wander during handling or firing any firearm as this may cause the weapon to fire unintentionally.
- Always be conscious of what is in front of the muzzle of the rifle even if the rifle has been checked to be unloaded. The rifle must never be pointed at anything you do not wish to destroy.
- Never walk, climb or cross any obstacle with the rifle loaded.
- Always ensure the rifle is unloaded before cleaning, storing, traveling, laying the rifle down or handing the rifle to another person.
- Always store the rifle and ammunition separately and out of sight and such that it cannot be accessed by children or untrained people.
- Never use the rifle for any purpose other than shooting.
- Do not dry fire the rifle without the appropriate adaptor.
- If for any reason the rifle fails to fire when you pull the trigger, keep the rifle pointing at the target or a safe direction and wait for at least 60 seconds. Remove the magazine if it contains any live rounds. If a hang fire has occurred, the rifle may fire at any time within the 60 seconds. If the round does not fire, eject it by allowing it to fall a short distance onto the ground. Do not eject the round into your hand. Allow the round to rest for a further 120 seconds and then examine the primer. If the firing pin indent is light, off center or no indent is present, do not continue firing and have the rifle examined by a competent gunsmith who is familiar with this design. If the firing pin indent on the primer is normal (in comparison with other previously fired rounds), the ammunition may be faulty. Separate the faulty round from other live rounds and empty cases, reload the rifle and continue firing in a safe manner. Place the failed round in a safe place away from your immediate vicinity and dispose of the round by returning it to a competent gunsmith.

- Never use the rifle if it fails to function correctly and do not force a jammed action as a round may explode causing serious injury, death or damage to property.
- Do not alter any of the components of the rifle or modify the weapon in any way as the level of safety may be reduced.

Safety Instructions

Safety Features

1. Trigger Guard

The trigger guard is formed by the back of the magazine housing, the front of the pistol grip and a steel strap which extends between these two items, to enclose the bottom of the trigger and protect it from damage and to help prevent accidental discharge.

2. Safety Catch

The rifle has a safety lever on the left hand side of the receiver which locks the trigger to prevent the hammer releasing from the trigger sear. The safety can only be applied when the hammer is cocked, but can also be employed when the bolt is manually held open prior to chambering a round. The recommended method is to move the action to the rear and allow it to close, then apply the safety prior to inserting a loaded magazine to charge the weapon

3. Firing Pin

The firing pin of the rifle is designed so that it will not impact the primer of a cartridge in the chamber of the rifle if the bolt is not fully forward. The locking lugs act to interrupt the firing pin movement. Further the firing pin has a return spring to mitigate movement from the momentum of the action.

IMPORTANT

These safety devices are designed and installed in this rifle to prevent accidental discharge. However, this rifle is primarily designed to efficiently discharge bullets and will do so when loaded if you pull the trigger. Always expect the rifle to fire if you pull the trigger.

Function

The Alexander Arms rifle functions by means of an adjustable gas operated long stroke piston. The design uses the principle of low gas pressure to operate the mechanism, which allows for a longer delay before the breach is unlocked. The breach is locked in place by means of two locking flaps which locate into recesses in the receiver. The lugs interrupt the firing pin when not fully in battery. When the rifle has a magazine of ammunition in place, the bolt can be pulled open by means of the charging handle and then released to feed a round of ammunition into the rifle‘s chamber. The final movement of the carrier moves the locking lugs into battery and allows the firing pin to contact the cartridge primer upon pulling the trigger.

If the rifle is now aimed at a target and the safety is released, pulling the trigger allows the hammer to impact the spring loaded firing pin, which, in turn ignites the cartridge primer. The flash of flame generated from the primer will now pass to the main cartridge charge which in turn burns with the release of a large volume of gas. This drives the bullet down the barrel and on towards the target. Rifling grooves in the barrel impart spin to the bullet during its passage down the barrel and this acts to stabilize the bullet once in flight so it will have a more accurate path.

The barrel is provided with a small gas vent in the side of the bore that is placed forwards of the receiver, towards the weapon's muzzle. When the projectile passes this port, a proportion of the propellant gasses are allowed to pass through and into the cylinder chamber above the barrel. Once sufficient pressure is present, the gas will drive the piston rearward together with the bolt carrier. This movement moves the locking lugs out of the recesses in the receiver and then moves the bolt backwards at the same time, extracting the spent cartridge case. Once free of the chamber, the case is thrown out of the ejection port by the spring force of two plunger ejectors opposed to the extractor.

The bolt will now continue rearwards until it is arrested by the recoil springs and ultimately will stop at the rear of the gun against the buffer, which is designed to prevent damage to the mechanism should the gas regulation be incorrectly set. At this time, the next cartridge in the magazine has risen so that the bolt moving forward will strip this cartridge from the magazine and chamber it.

The action of the bolt moving rearwards also resets the hammer. If the trigger is held, the disconnector catches the hammer and releasing the trigger sets the hammer sear back onto the trigger sear. If the trigger is released, the hammer resets directly onto the sear. The rifle is now loaded and pulling the trigger will fire the next round.

Loading the rifle

Caution To minimize the risk of unintentional discharge, load live ammunition into the rifle only when you intend to shoot

Caution Always use extreme care to ensure the muzzle is always pointing in a safe direction and is well clear of your body.

Caution Read and understand this manual before you use this rifle.

Loading the magazine

- Use only good quality clean ammunition recommended for this rifle and marked with the appropriate caliber. Always examine each cartridge before it is loaded into the magazine and do not use it if it appears in any way damaged.
- With the open end of the magazine uppermost, grasp the magazine in one hand. Place a round onto the magazine follower with the base level with the rear of the magazine then press the round down until round is lodged under one side of magazine lips. Subsequent rounds will alternate from one side to the other. Place the next round on top of the previous round and repeat the procedure as before. Repeat until the magazine is loaded, but do not exceed its capacity.

Loading the rifle

- Always ensure the rifle is pointed in a safe direction before commencing loading.
- Without a magazine in position, pull back the charging handle to open the bolt and allow it to return fully forward. Check that the chamber and barrel are clear and **apply the safety**.
- Keeping fingers clear of the ejection port, insert a loaded magazine with the bullets pointing towards the muzzle into the magazine well by pulling back towards the back of the magazine well and then straight upwards without tilting. Then push it firmly home to ensure that the magazine latch is engaged. Do not strike the base of the magazine otherwise the magazine could be damaged or you could injure your hand.
- When you are ready to shoot, pull the charging handle to the rear and allow it to run freely forward ensuring that the charging handle is at the forward position. This will feed a round into the chamber. **The rifle is now loaded, cocked and ready to fire.**
- To fire the rifle, the safety must be moved to the fire position and the trigger pulled. Upon firing, **the rifle will reload for the next shot.** The safety should be reapplied if you do not intend to shoot immediately and the rifle should be unloaded as soon as you have finished.
- Always unload the rifle after use, before moving, and before any cleaning, maintenance and storage.

Unloading the rifle

- Always ensure that the rifle is pointed in a safe direction with the safety applied. Do not touch the trigger and always keep hand away from the ejection port and muzzle.
- Place a hand under the magazine to prevent it falling and press the magazine catch located below the trigger guard downwards to release the magazine. Pull the magazine downwards to remove it from the rifle. Place the magazine on a clean surface to avoid damaging it.
- Grasp the charging handle and pull it to the rear. Any cartridge in the chamber should be extracted by this action and will eject from the ejection port. **Always check to ensure that the chamber and barrel are clear keeping the rifle pointed in a safe direction.**
- Allow the bolt to return forward onto the empty chamber. Keeping the rifle pointed in a safe direction move the safety to the fire position and pull the trigger to allow the hammer to drop.
- Examine any previously chambered cartridges for dents or damage; if damaged, do not use again.

Firing

- Before firing, ensure that you are fully familiar with the operation of the rifle. Practice aiming and handling with your rifle while it is unloaded.
- Practice on a firing range before going hunting or using the rifle for any other type of shooting.
- Read and understand all the instructions and the safety instructions for this rifle. If you do not understand any instruction, seek help from someone qualified.
- Load the rifle as previously described.
- When you are ready to safely fire the rifle, aim carefully at the target and pull the trigger smoothly so that you do not disturb your aim. Be aware that the rifle will recoil upon firing

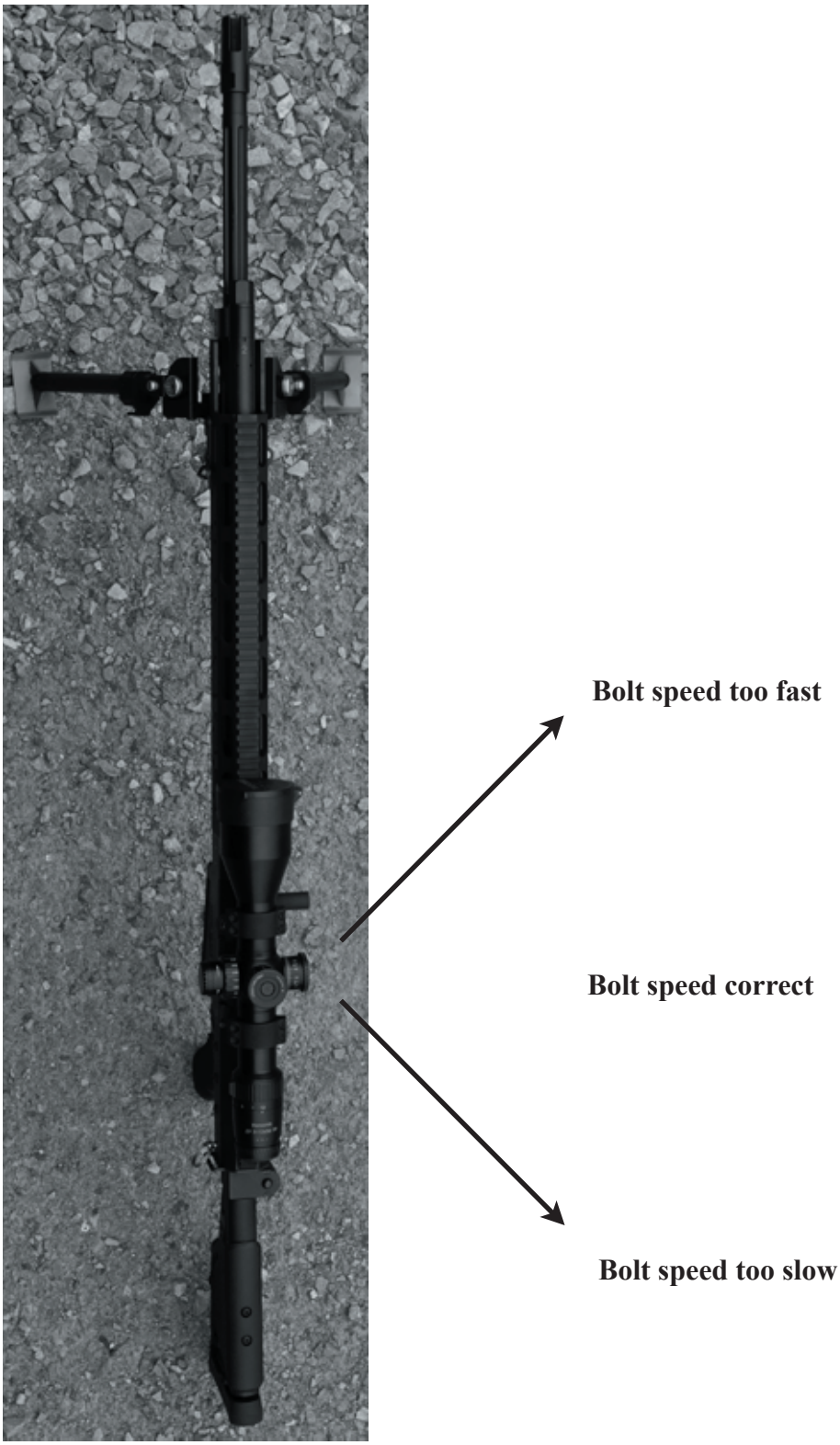
and you need to return it to aiming at the target before firing the next round.

- **THIS IS A SEMI-AUTOMATIC RIFLE AND IS IMMEDIATELY LOADED AND COCKED, READY TO FIRE AGAIN AFTER EACH SHOT UNTIL THE MAGAZINE IS EMPTY.**
- Always apply the safety if you do not intend to shoot immediately. Unload the rifle before moving and before any cleaning, maintenance and storage.

Adjustment of the Gas Regulator

The gas regulator is of a fixed type that requires a 3/4" AF flat wrench for adjustment. The system has five settings labeled 0 to 4 which move sequentially from completely closed to fully open for extremely cold dirty conditions and subsonic ammunition. Setting 0 is fully closed and the rifle will not cycle when fired. Setting 1 is for use with suppressors, very high temperatures and extremely high pressure ammunition. Setting 2 is for general use at most climatic temperatures and full power ammunition, specifically 300 grain loadings. Setting 3 is for lower power ammunition, such as some 250 grain ammunition and very cold conditions and setting 4 is for subsonic loads, low pressure loadings and cold conditions. The ejection pattern of the gun will provide a good guide as to which setting to use. Typically the selection should start with a setting that is going to provide a short stroke of the bolt, and then, once this is established, progress to the next setting to ensure reliable operation. Typically the weapon is not susceptible to temperature variations so, once a setting for a load is established, it will function across a very broad range of temperatures. A correct gas setting with good ejection will allow the cases from spent rounds to pivot around the extractor and out of the ejection port such that they will hit the side of the rifle behind the ejection port and then bounce directly to the side of the weapon. Such cases will bear a slight flat spot on the side of the case neck as witness.

Ejection angle from rifle



Typical Gas setting for commercial ammunition

Load	Gas Setting
250 Grain Lapua FMJ Core Locked	4
250 Grain Lapua Scenar	3
285 Grain Hornady®	3
300 Grain Lapua Scenar	2
300 Grain Black Hills®	1
265 Grain CorBon®	2
250 Grain Winchester®	2

To make an adjustment to the gas regulator, use the 3/4 inch wrench to loosen the cylinder nut that sits in front of the gas block. This has a conventional right handed thread and loosens in the normal direction. Once the nut is loose and the tension is removed from the wave spring that sits under the nut, pull the charging handle slightly back and then lightly tap the nut back to push the cylinder back and out of engagement with the index pin. Pushing the cylinder backwards against the wave spring, it is possible to rotate the cylinder to the desired setting. The charging handle may now be gently allowed to move forwards and the cylinder nut tightened gently, but firmly. If the wave spring has fallen out of the groove in the nut during this procedure it is simply a matter of rotating the nut back and forth a few half turns with light pressure on the spring and it will snap back into position. The cylinder nut should be lightly tightened only and a figure of 35 inch pounds (3.95 Nm) is used. If adjusting in the field, only light pressure should be applied to the wrench.

Adjustment of the Magazine Tension
This rifle is provisioned with adjustable magazine tension such that the user may vary the amount of tension applied axially to the magazine. A spring plunger assembly in the front of the magazine well allows the magazine retention force to be varied from a loose fit that can be easily dropped free to a fit requiring a positive pull to remove the magazine. Under most conditions a slight tension that requires a gentle pull to remove the magazine is the best setting as it will stabilize the magazine and permit more reliable feeding. If the rifle is to be used in situations where the loss of a magazine by inadvertent operation of the magazine latch is viewed as a problem the tension may be increased such that the magazine is retained.

Notes on Accuracy
As with any weapon, system the accuracy capability becomes dependent upon a number of

factors, most notably the shooter. This section seeks to address the typical mechanical concerns that relate to accuracy, in particular the details of the mechanism.

The first consideration is the scope and rings used to mount the scope. The semi automatic operation and near constant recoil mechanism essentially spread the recoil impulse over a much longer time period, thus it becomes easier to shoot with the perception of less recoil. In reality, the energy is still present and the optics must be able to endure this longer impulse together with the reversals of impulse applied by the gun. The same holds true for the rings used to mount the scope. In this, one should note that the scopes employed are typically higher magnification models with larger objectives suited to long range engagements, hence tend to be heavier. From test work, we have generally found that fixed rings either of steel or hard grade aluminum are required. The aluminum rings are generally preferred as they are wider for the same weight and spread the loads over a greater surface both on the scope and the rail. QD type rings, even good ones, will frequently shift with time and create problems with accuracy. There are many good scopes available for this weapon, but one should consider that even the best may suffer inadvertently. The user should seek an optic warranted for this caliber. It is advisable to use Loctite® between the scope body and the rings as movement is extremely difficult to prevent without excessive tightening, which may damage the scope.

The system will recoil backwards in the usual manner, but also has a downwards component. Because of this, a good shooting rest is important. If the bipod or rest deflects or settles, the first shot will act to settle the shooting position and will thus displace from the typical POI. We have found that the heavier bipods from companies such as Long Range Accuracy are well suited if provisioned with skid type feet. The normal rubber feet can dig in quickly and allow excessive bipod loading which will effectively spring load the legs and throw shots. Wide bags or shooting over a backpack offer good options. Rifle torque must be considered in settling the weapon.

A very extensive amount of test time has been expended to provide general guidelines for the behavior of the rifle in respect to first cold bore shots and response to cleaning procedures. One of the attributes of the mechanism is that the lock up of the bolt is consistent for all rounds whether fed manually or automatically from the magazine. This allows confidence that the first round that is hand fed or even single fed through the ejection port will shoot in the same way as subsequent rounds from the magazine. The barrel profile and weight have been developed to cope with the thermal loads imposed by both slow and rapid fire regiments with minimal effect.

Generally, the construction of the barrel and surface treatment does not necessitate unduly regular or severe cleaning. Barrels have been found to be consistent for several hundreds of rounds without cleaning except for a dry brush and patch through the bore. This minimal cleaning regimen does not cause a shift from POI for the first round as long as the bolt and carrier are not removed from the weapon. This is to some extent dependent upon the ammunition used so the user should be aware of the behavior and compensate appropriately. A pull through cleaner such as the Otis® system works exceedingly well. The bolt may be held easily back for cleaning using a spent shell casing. Equally, a cold bore shot fed from the magazine will not

deviate from subsequent shots. For more thorough cleaning, the Bore-Tech® products have worked exceedingly well and these avoid the ammonia that can cause etching of the barrel if not fully removed. The correct cleaning regime is covered in a later section of this manual but cleaning will necessitate the removal of the bolt and carrier so that these components may also be cleaned. Typically the first shot through the clean gun will throw down and slightly left. Depending upon ammunition the impacts will then return to POA. Any time the bolt and carrier are removed from the weapon, the first shot may show deviation from the POA and this should be noted for the weapon and ammunition. For this reason, it is not recommended that the bolt and carrier be removed except for maintenance or cleaning.

Ammunition has a significant influence on the acceptable duration between full cleaning. The build up of firing residue in the gas cylinder will, after several hundreds of rounds, be such that that the first hand fed shot will begin to diverge from the subsequent POI. At this point, the weapon should be fully cleaned to restore consistency. Generally, ammunition using an extruded propellant will allow between 300 and 500 rounds or more to be fired before the effects of fouling can be seen. Ball type propellants may exhibit the same symptoms in as few as 200 rounds. This is not a concern with a single shot bolt action but must be considered for a semi automatic weapon. Typically, the manufacturers of 338 Lapua ammunition do not consider the fouling residue during the selection of components.

The barrel used for this weapon has been finish lapped prior to dispatch, but for best accuracy, some degree of seasoning is required. The extremely hard surface treatment applied during manufacture will slow the typical break in process. During the initial shots it will be found that the POI will move slightly. This will decrease with shooting and eventually settle. It is not advisable to use abrasive compounds. Fire lapping will damage the barrel.

Maintenance
This rifle is a precision mechanism and will function better, last longer, and remain safer when it is properly maintained and lubricated. The advice in this section will help keep your rifle in good condition.

WARNING

- **Ensure that the rifle is unloaded before disassembly and cleaning.**
- Wear safety glasses. Some components in the rifle are spring loaded and may fly free if you lose control of them.
- Never dry fire the rifle with the bolt removed from the gun.
- Do not alter any parts as the level of safety will be reduced.
- Do not force any parts during the assembly, disassembly and cleaning of the rifle.

Lubricants
Always minimize skin contact with lubricants
•The preferred lubrication for this rifle in most conditions is BreakFree® CLP.
•For all normal conditions, the rifle should be operated in a very lightly lubricated or semi dry condition after cleaning using CLP. This lubricant will function in all but the coldest conditions and can be used down to -35 Fahrenheit, although application below 0 F requires

the lubricant to be warmed. When applying CLP, always shake the bottle before use and clean and apply using a clean rag or cloth.
- The bolt, firing pin, firing pin retainer, ejector, locking lugs and extractor assembly should be inspected for any damage before cleaning and lubrication.
- When applying lubricant, a very light film implies that the surface is only just visibly oily, then wiped dry using a clean cloth
- CLP lubricant can be obtained from all good gunsmiths.

Firearm Disassembly

- **Always ensure the rifle is unloaded and apply safety.**
- **Remove the magazine.**
- If possible, work on a clean flat surface with ample lighting. This will make subsequent assembly quicker and easier.
- With the butt stock unfolded, pull out the end plate retaining pin from the left hand side of the rifle. This pin has a spring detent and is also under pressure from the action spring, so it will not move very easily. A slight twisting action will help.

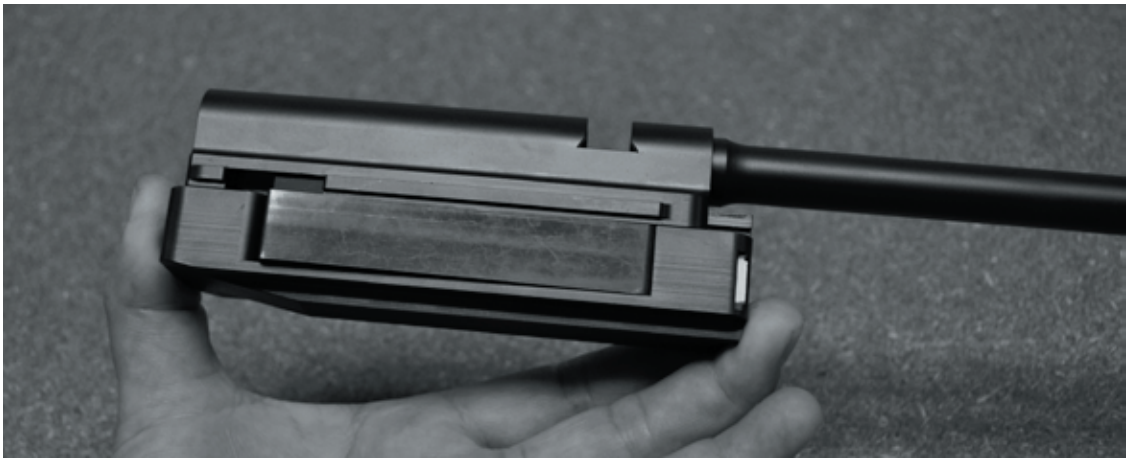
- Carefully pull out the butt stock with the receiver end plate assembly from the back of the rifle. This will also remove the action springs. Exercise caution as this part is under spring pressure.

- Pull the charging handle gently to the rear and, before reaching the back of the charging handle slot, slide the handle out of the dovetail in the bolt carrier, removing it from the weapon. The charging handle is retained in position by the action springs.

- Insert the charging handle in front of the carrier to slide the bolt and carrier assembly to the rear so that it extends beyond the back of the receiver and and can be grasped for removal.

- Slide the bolt carrier assembly out of the rear of the receiver. The operating rod and piston will slide out with this assembly.

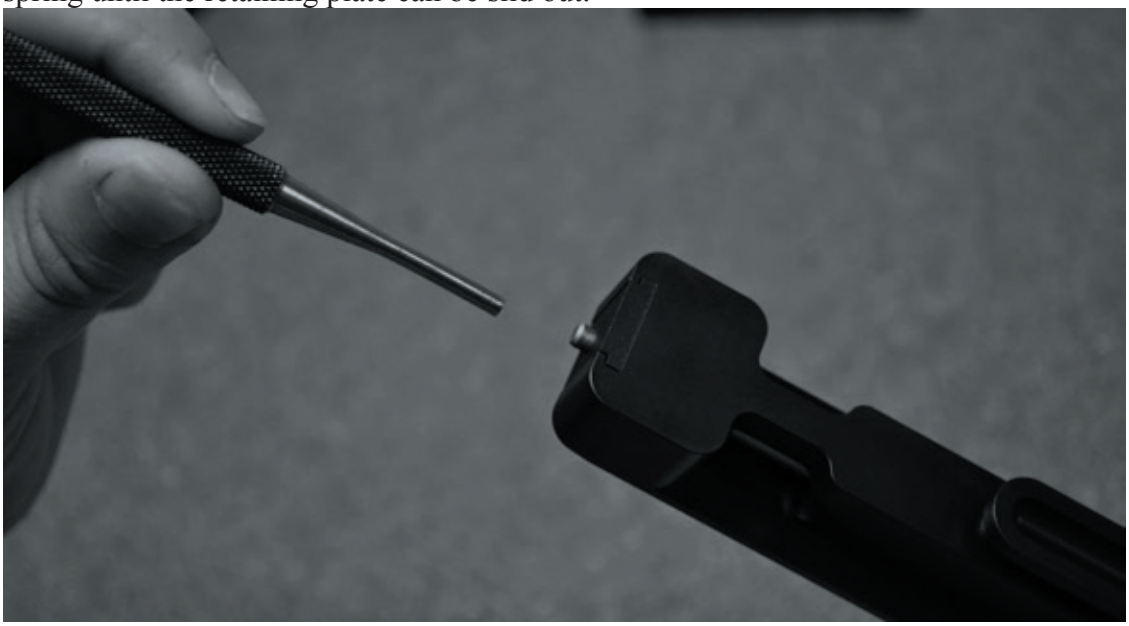
- With the bolt and carrier assembly removed, push the bolt backwards on the carrier to cam out the lugs. Note the lugs are not retained in place, so be careful to retain these to prevent them falling from the bolt.



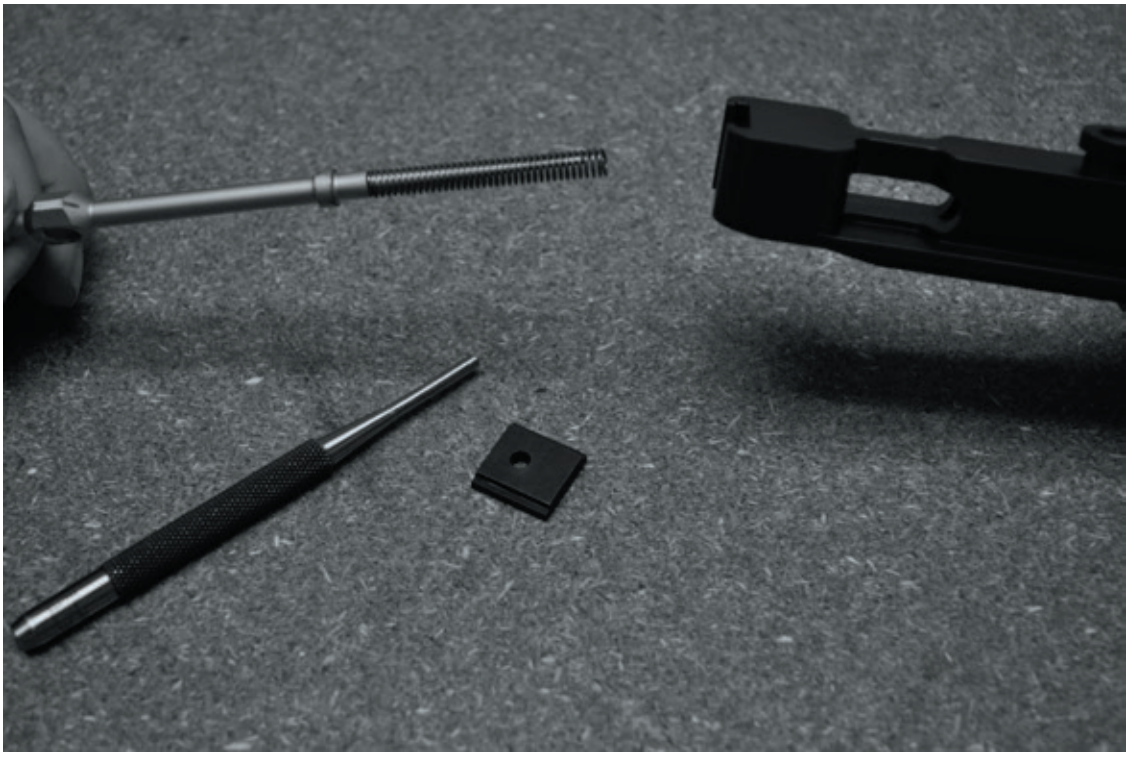
- Tilt the bolt to remove the left and right hand lugs.

- The bolt can now be slid forward to fully remove it from the carrier.

- Using a small punch or a 1/8 hex wrench, push the firing pin forwards against the spring until the retaining plate can be slid out.



- Carefully allow the firing pin spring to relax, then tilt the bolt to remove the firing pin and the return spring.



The weapon is now basically stripped fully for cleaning and maintenance. It is very rare that any further disassembly is required, but the following instructions allow for further disassembly.

Disassembly of the magazine.

- It is possible to take apart the magazine for cleaning and maintenance.
- Start with the magazine unloaded.
- Depress the button on the base of the magazine using a pen or small punch until it is possible to slide the base plate forward.
- The magazine contains a spring and is under spring tension. Carefully restrain the base plate and the interior parts as the base is slid from position.
- With the base removed, it is now possible to release the spring and remove the retaining plate, spring and follower from the magazine body.
- Note that the retaining plate is orientated to the magazine and will only fit in one direction.

Removal of gas cylinder

- It is possible to remove the gas cylinder completely from the rifle for cleaning.
- Loosen the cylinder nut as described in the section concerning gas regulator adjustment.

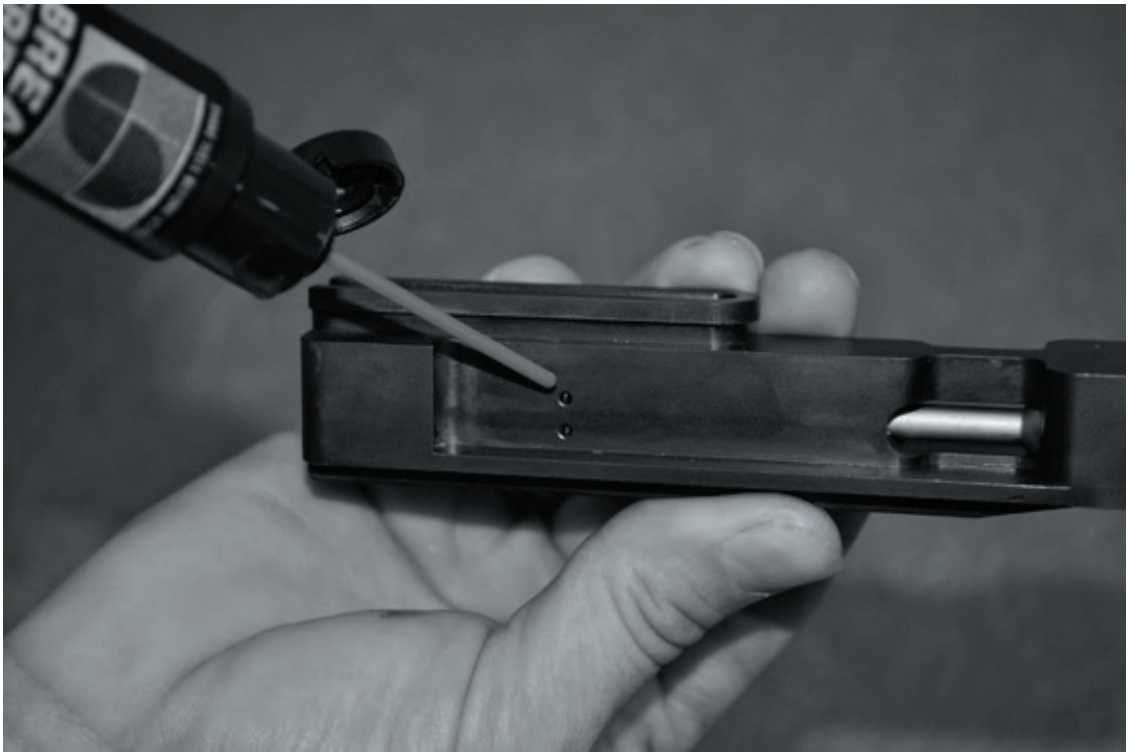
- Fully unscrew the nut, carefully retaining the wave spring which is a loose item.
- Use a 1/8 hex drive to slightly loosen the two screws at the bottom of the gas block.
- Now remove the screws fully one at a time.
- Pull the gas block forward on the barrel and remove the gas cylinder from the gas block.

Removal of extractor

- Removal of the extractor is simple and is not normally required for general cleaning. It may be required for replacement of a damaged unit or for inspection.
- Remove the bolt from the rifle as detailed above and working on a smooth flat surface place the bolt with the extractor side down.
- Using a large diameter punch in the bolt face push the extractor outwards from the bolt. This compresses the ball detent that holds this part in place and moves it during operation.
- Carefully slide the extractor out of the bolt taking care to use the punch to retain the small ball detent and spring that sits under the extractor.
- Take the bolt and shake it lightly to remove the spring and also the second detent ball.
- This assembly has a ball at the bottom of the bore, the spring, and then the working detent ball. The two balls are interchangeable. This allows for expedient field repair if wear is found.

Firearm Lubrication and Cleaning

- With the firearm at the basic disassembly level, it is recommended that the unit is cleaned prior to reassembly.
- With the exception of the barrel bore, all the internal working parts should be cleaned of obvious carbon fouling and then a very thin film of CLP applied.
- The fire control group should be blown out with compressed air, if available.
- The cylinder may be cleaned in place by the use of the barrel cleaning rod. This is best performed using cotton patches and CLP to remove the carbon residue. After removing the firing residue, the cylinder should be patched dry.
- If the cylinder is heavily fouled, it will be necessary to remove it for cleaning. This may be achieved by following the instructions given in the previous section. Once clean, the cylinder should have a very thin film of CLP applied and then reassembled in the reverse order of disassembly.
- The bolt face should be brushed clean. A very small drop of CLP may be applied to the extractor if the conditions are not excessively dusty.
- The ejectors should be brushed clean and manually depressed to check operation.
- If the firearm has been immersed in water or subject to wet or corrosive conditions CLP should be applied carefully to all the springs using a soft patch. The extractor should be removed to clean and lubricate the spring. The ejectors should be lubricated and several drops of CLP applied to the vent holes to force out any water. All lubricant should be wiped away prior to reassembly.



- In excessively dusty conditions, do not apply CLP unless it can be wiped off well. Dust accumulation and carbon fouling should be wiped off.
- The piston requires cleaning to remove firing residue. This is best achieved using a patch and the barrel cleaning solvent. The piston is coated to resist the carbon becoming fixed to the surface as far as is possible.
- The barrel bore may be cleaned with any good barrel cleaning solvent. CLP or similar should be avoided. For light cleaning, Hoppes Elite Bore Gel is a good choice as it will not disrupt subsequent groups. The preferred cleaning solvent is Bore Tech as it avoids ammonia compounds that will degrade the interior surface if not used correctly and fully removed.
- The magazine should be disassembled and wiped to remove any dirt or dust.

Firearm Assembly

Due to the simple construction of this weapon and the relatively few parts, the assembly procedure is the reverse of the disassembly outlined above. Where fasteners have been removed, such as the detailed removal of the gas cylinder, they should be reinstalled with a torque value of 35 inch pounds (3.95 Nm) with a light coating of CLP to aid future disassembly.

Unusual Operating Environments

Extreme Cold/Arctic

•This rifle is designed to operate at temperatures down to -40 Fahrenheit with standard lubrication/cleaning. Excess lubricant will cause sluggish action. When operating at low

temperatures the weapon must be cleaned and lubricated while warm. If this is not possible, the weapon should be cleaned only.

- When using the rifle, it must be kept dry to prevent the mechanism from freezing and the mechanism should be functioned by hand every 30 minutes if it is in the presence of moisture from vehicles or personnel. If possible, try to avoid moving the rifle from cold to warm areas as this will cause condensation to form on the parts. Always wipe all areas of the rifle dry both externally and internally if condensation does occur.
- The ammunition must be kept dry. Ammunition should not be lubricated.
- CLP may provide sluggish action at low temperatures and approved Arctic grade lubricant may be substituted. It should be removed and the weapon cleaned and lubricated with CLP if returned to temperate operating conditions.

Hot, Dry and Dusty

If the rifle is to operate in a hot environment, then standard lubrication with CLP is adequate and the normal quantities should be used. If the environment is also dusty, then the rifle must be cleaned more frequently and careful attention should be paid to remove any abrasive deposits. The surface finishes on the rifle allow it to be used without lubrication as long as it is cleaned frequently. Desert conditions may also produce large temperature swings between the day and night and consequently condensation can occur. Again, the frequency of cleaning should be increased and efforts should be made to prevent dust contamination. If possible, the rifle should not be laid on the ground. The chamber will require to be wiped out more frequently. Where possible, the rifle should remain loaded and the muzzle capped to prevent abrasive material entering the bore as easily. The barrel bore should be pulled through, at frequent intervals, with a dry patch to remove abrasives and preserve the bore life.

Tropical and Temperate Rainforest

The materials used in the rifle and the surface coatings are, for the most part, impervious to corrosion resulting from wet conditions. Regardless, wet conditions drastically increase the rate of corrosion in an incorrectly protected weapon. If the rifle is employed in wet conditions, it should be adequately prepared before deployment. Use CLP to clean and lubricate as shown, but increase the frequency of cleaning to a minimum of daily and pay particular attention to hidden internal parts in the rifle. The barrel should be cleaned more frequently. The locking lugs should be wiped with CLP specifically as should all the springs. The ejector springs should be lubricated with CLP through the vent ports as detailed. The external parts of the stock hinge will require the application of CLP to prevent corrosion.

Constant precipitation will wash the lubricant from the rifle and deposit dirt from run off from vegetation or structures. The rifle will function well when wet, but the dirt should be removed by frequent cleaning. It is unavoidable that the ammunition will become wet and the weapon should be calibrated for shooting wet ammunition, both POI and also first shot dispersion.

Over Surf/Maritime
The aggressive nature of sea water and beach sand will accelerate both corrosion and wear.

Weapons should be correctly prepared before deployment with application of silicon type oils to the stock hinge and locking lugs and then wiped dry. Sand should be removed from the weapon and not allowed to accumulate. The weapon should be cleaned and lubricated at frequent intervals to remove contamination. The use of CLP will displace sea water from the weapon. The normal amount should be used, but the frequency of application increased.

Service and Repair
Should this rifle require repair or service, make sure it is not loaded and then take it to a gunsmith who is familiar with this type of weapon. Replacement parts should only be used from Alexander Arms as the quality of some parts may not meet the requirements of the design and injury, death or damage to property may result from such use. Alexander Arms does not accept responsibility for the function of this weapon if replacement parts are used from any other supplier or the rifle is in any way modified.

The barrel assembly is fitted at the factory and no attempt to remove or replace the barrel should be made. The fixtures to remove and replace barrels as well as replacement barrels are available from Alexander Arms.

Warranty Statement
Based on the Magnuson-Moss Warranty act, Alexander Arms offers no express warranty on any of its products. However in recognition of the obligations of implied warranty Alexander Arms will stand behind all its products and will provide all reasonable support for the products it supplies.

Any component that fails within the first year of service subject to reasonable wear and tear will be replaced free of charge for that part. Alexander Arms reserves the right to determine if a part is subject to abuse.

This warranty statement is subject to further terms of contract for all military or agency purchases.

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