

How to Service the Springfield Armory M1A: Instruction Manual



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Introduction

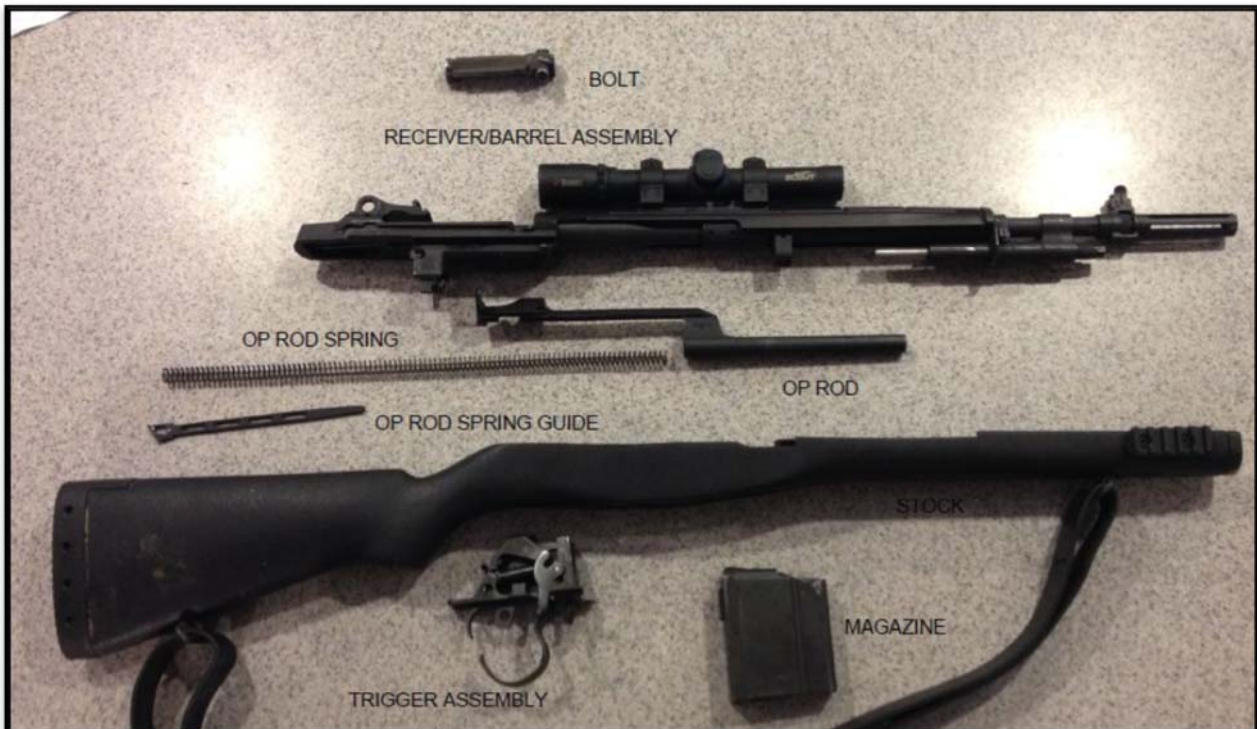
The Springfield Armory M1A took almost the exact same form of the military's M14 rifle to the civilian market. Springfield Armory produced the weapon to replace the older M1 platform that served the United States in World War II. The M1 succeeded so well in World War II that an update was built instead of designing a whole new weapon system to replace it. The United States began replacing the M1 with the M14 as the U.S.' standard service weapon from 1959 to 1970; the M16 replaced it in 1970. Though not used as the standard military weapon today, M14 and M1A variants still are used by squad designated marksmen, snipers, and special operations soldiers in every major U.S. conflict because of the 7.62x51mm cartridge's effectiveness and accuracy at long range.



Servicing the Rifle:

Parts Names, Tools, and Functions:

There are over 60 parts in the standard out-of-the-box model. The entire weapon can be disassembled for cleaning or other services but is unnecessary for routine maintenance; the parts listed below should be cleaned after every use of the rifle. For further details on cleaning, see the Cleaning section of this manual.



1. Bolt
2. Receiver/Barrel Assembly: referred to in this manual as RECEIVER, this is the main body of the mechanical rifle. The receiver houses the moving bolt, operating rod, barrel, rear iron sight.
3. Operating Rod: this rod connects the gas piston at the front of the rifle to the bolt so that the rifle functions semi-automatically (no mechanical manipulation or “cocking” of the rifle is required between trigger pulls). The operating rod moves backwards because of the force of the gas piston forcing it to the rear and moves forwards because of the force of the spring pushing it in the opposite direction.
4. Operating Rod Spring: this spring forces the operating rod to return to its forward (rest) position after the rifle has been fired. Referred to in this manual as OPERATING ROD SPRING or OP ROD SPRING.
5. Operating Rod Spring Guide: The Operating Rod Spring Guide is simply a small, thin piece of metal that fits inside the Operating Rod Spring to guide the Operating Rod while it is moving and to prevent the spring from buckling as it is under more force.

6. **Stock:** the stock is the housing the holds the rifle mechanism. Technically, the weapon would work without the stock, but it is ergonomically designed so that the user can wield the weapon effectively. Stocks also protect the user from the heat of the metal rifle during firing. The standard M1A Scout rifle comes with a fiberglass stock.
7. **Trigger Assembly:** the trigger assembly is a collection of parts that fit together to function as the trigger mechanism. It consists of the trigger, trigger guard, safety, hammer, and magazine catch among others. The trigger assembly holds the entire weapon system together and allows it to function.
8. **Magazine:** the magazine holds the ammunition that the rifle uses. M1A magazines vary in size from 5 to 20 rounds. The magazine, when empty, allows the bolt to automatically lock to the rear when it becomes empty, allowing for faster and easier reloading.

Safety Check:

Safety check: Always check to make sure that your weapon is unloaded before servicing, cleaning, or doing any work on it. Always practice good firearm safety when working with firearms. To perform a weapons' safety check, follow these steps: (part names labeled in graphic will be capitalized for ease)

1. Check and make sure the weapon is on safe. Push the SAFETY from the front of the TRIGGER GUARD to the rear of the TRIGGER GUARD. The weapon is on safe when the SAFETY is inside the TRIGGER GUARD.
2. Remove MAGAZINE from the magazine well and place out of reach. Keep live ammo and magazines out of your work area.
3. Pull the OPERATING ROD to the rear of the weapon and lock the BOLT to the rear with the BOLT STOP. The BOLT STOP uses tension and friction to keep the BOLT locked to the rear, so any jarring of the weapon could release it and injure the user. Handle the weapon gently when the BOLT is locked to the rear.
4. Look into the CHAMBER and make sure there is no ammunition, spent shells, or obstructions inside.

Safety Check complete.

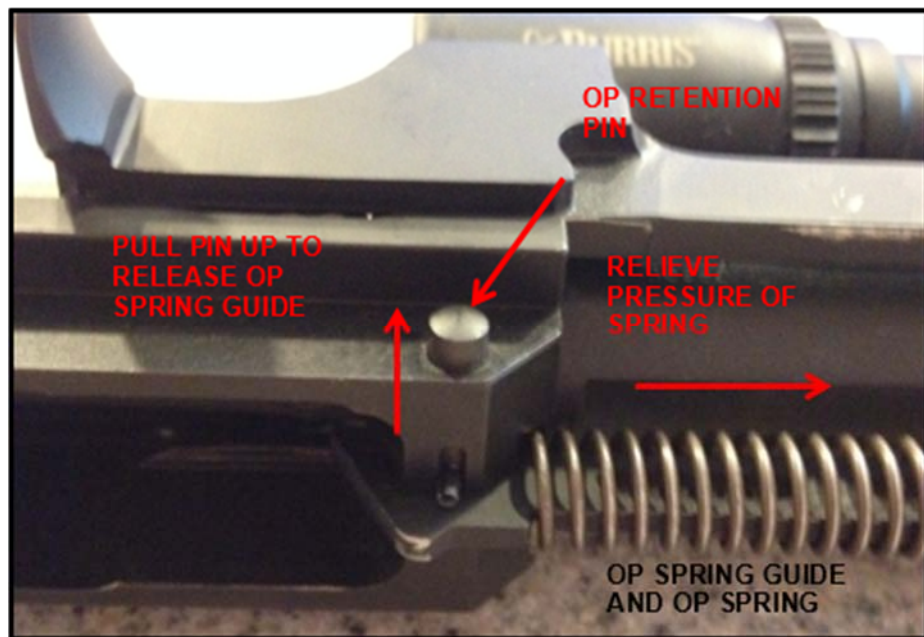
Disassembly:

To clean and service the M1A Rifle, the user must disassemble the weapon first. The steps to disassembly are as follows:



1. Removing the TRIGGER ASSEMBLY from the rifle: Hold the rear end of the stock between the legs while sitting and hold the front of the weapon by the front of the stock. Use the hand not occupied with the front of the weapon to pull of the TRIGGER ASSEMBLY. Loop your index finger into the TRIGGER GUARD and pull until it pops open. The TRIGGER GUARD rotates on a pivot, and once it rotates about 30 degrees forward it unlocks off of the slot that holds it onto the RECEIVER, allowing the TRIGGER ASSEMBLY to slide out. Place the TRIGGER ASSEMBLY on your work table.
2. Taking the main rifle assembly out of the STOCK: Grab the rifle by the GAS CYLINDER and BARREL and then pull it forward and up off of the STOCK. Place the STOCK out of the way on your work table.
3. Removing the OP ROD SPRING: lay the rifle across your lap with the barrel pointing to your left. Use

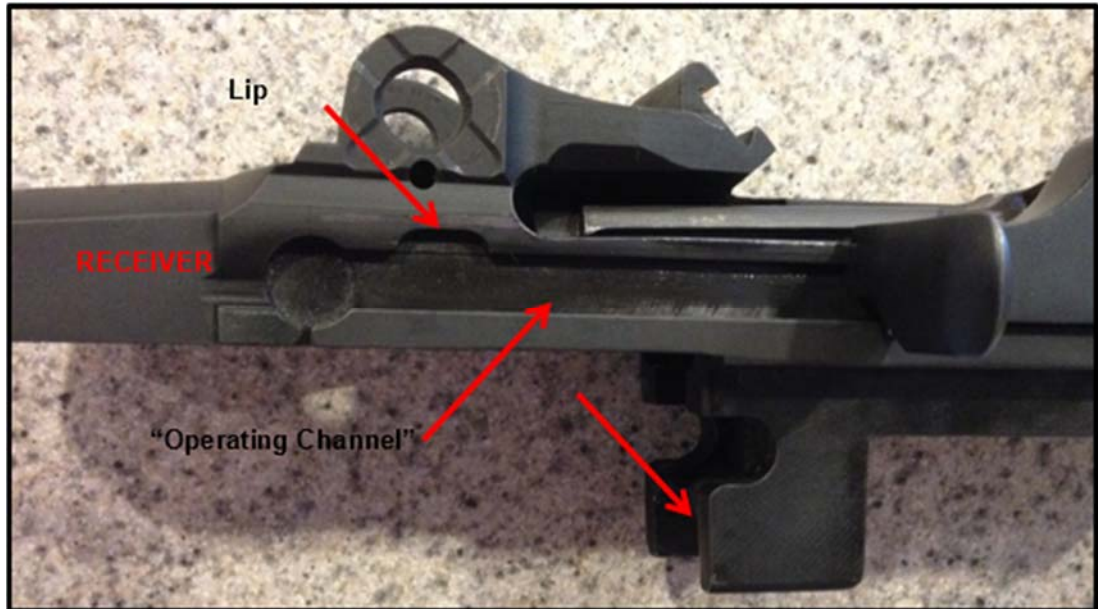
your left hand to pull the OP ROD SPRING to the left, releasing pressure of the OP RETENTION PIN that holds the OP SPRING GUIDE in place. Use your right hand to pull the OP RETENTION PEN towards you and release the OP SPRING. Pull the



entire OP SPRING and OP SPRING GUIDE out and lay them together on the work table. Without the OP SPRING in place, the OPERATING ROD should move freely forwards and backwards.

4. Removing the OPERATING ROD: Keep the rifle oriented from left to right across your lap with the barrel pointed to the left. Move the OPERATING ROD to the rear of the weapon (right). The rear of the OPERATING ROD slides through a channel called for instructional purposes the operating channel (a channel in the RECEIVER). At the rear of the operating channel there is a full circle milled into the RECEIVER. Directly in front of the half circle is a small lip in the operating channel. Move the OPERATING ROD so that the finger grip extending from the OPERATING ROD is directly above the lip in the operating channel. Pull directly up on the finger grip while rocking it side to side (forward/backward) until the OPERATING ROD pops free of the channel. Once free, move the OPERATING ROD completely to the rear and then pull it free of the rifle.

5. Removing the BOLT: Take hold of the BOLT by the GUIDE WHEEL and pull it free of the



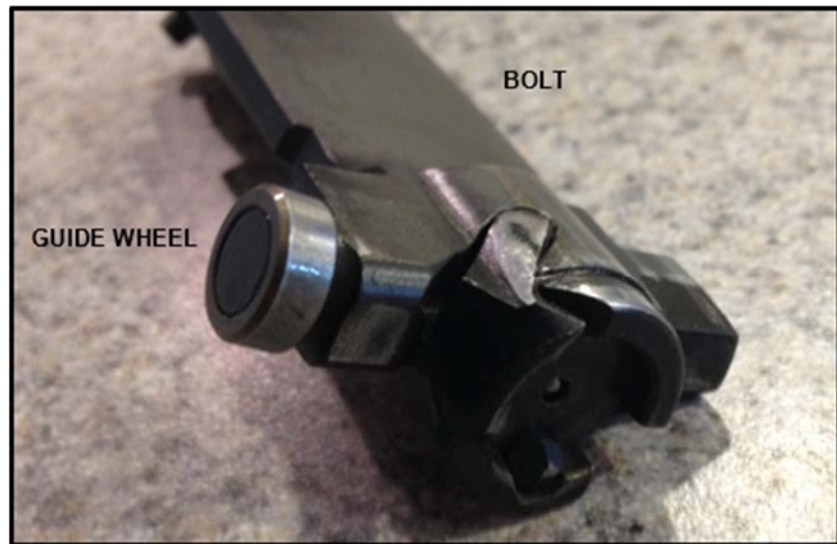
RECEIVER. The bolt might need to be rotated slightly to clear the RECEIVER. Set the BOLT out of the way on your work table.

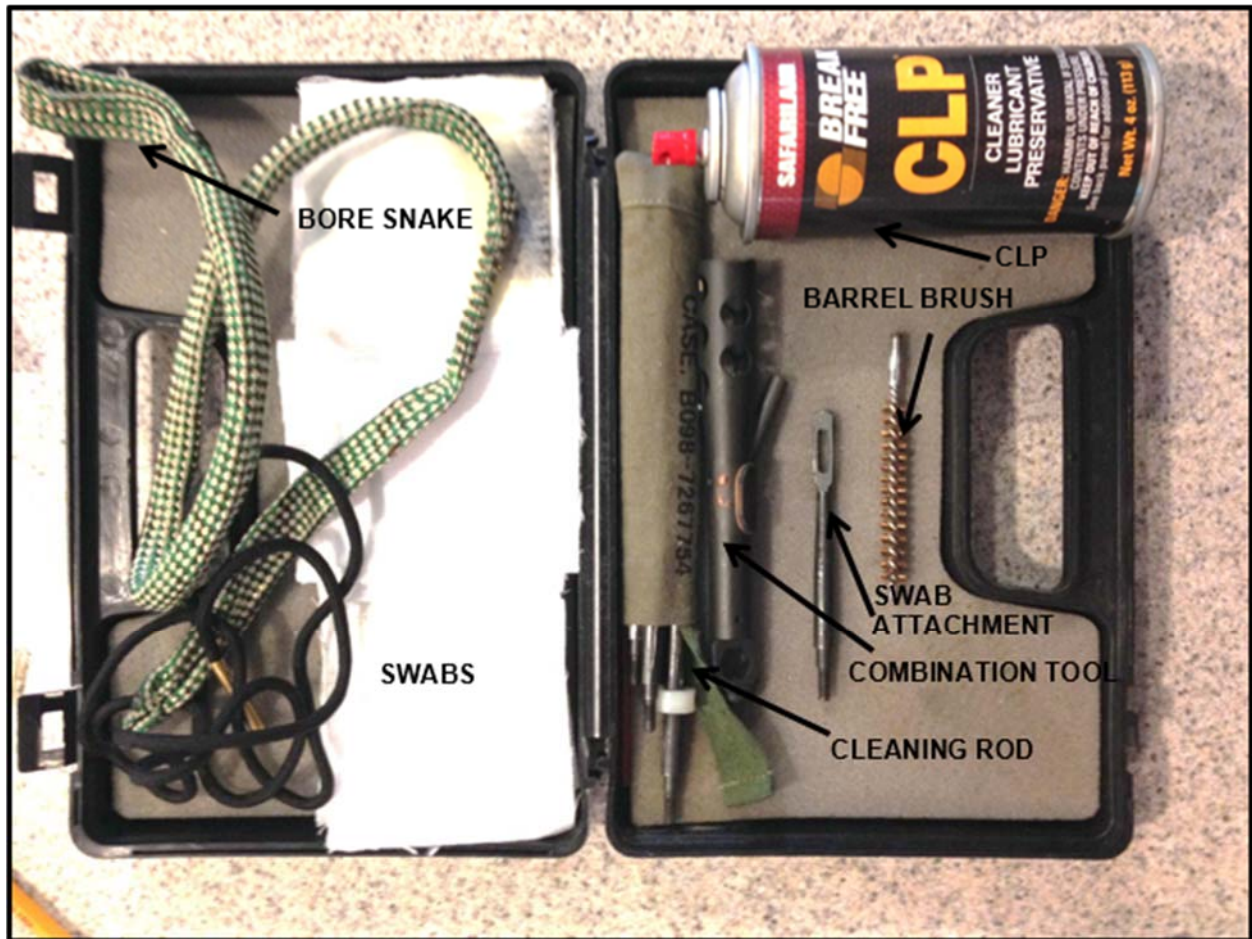
Disassembly is complete. The rifle can be disassembled further but is not required for routine maintenance and cleaning.

Cleaning

Tools:

Cleaning Tools allow for the weapon to be cleaned more effectively. Without tools, the hard to reach places on the weapon will become caked in grime and carbon residue, reducing the weapon's effectiveness and ultimately damaging the weapon.





1. **Cleaning Rod:** the cleaning rod is made up of 4 lengths of metal rod with a male screw thread at one end and a female thread at the opposite end. Screwed together, the cleaning rod is long enough to pass completely through the barrel. The cleaning rod attaches to the Combination Tool which serves as the handle.
2. **Bore Snake:** The Bore Snake serves a similar purpose to the Cleaning Rod: it passes through the barrel and scrubs powder residue out. The Bore Snake has a metal brush in the middle of it for scrubbing the barrel while the rest of it conforms to the curve of the barrel and drags the residue out that was loosened by the brush.
3. **Swabs:** the swabs scrub residue and oil from the receiver and other parts of the rifle. They do not shed pieces of cloth because they are very fine. If you use scraps of t-shirts or paper towels, tiny fragments will be left on the rifle.
4. **Swab Attachment:** the swab attachment screws into the cleaning rod. You insert a folded half of swab through the slot and then pass the cleaning rod through the barrel.
5. **Barrel Brush:** the barrel brush screws into the cleaning rod and breaks carbon residue from the inside of the barrel. Use the barrel brush four or five times per cleaning; any more could damage the barrel lining.
6. **Combination Tool:** The combination tool serves as a handle for the cleaning rod. The female screw thread on the cleaning handle rotates freely so that as the cleaning rod is pushed through the barrel the rod can rotate, allowing the helix of the brush to follow the helix rifling

of the barrel. The combination tool has several other tools and uses with the M1A Rifle, but none are required with routine maintenance.

Cleaning: Method:

Cleaning method and order is partially user-preference. Find the method that works best for you. My method for cleaning my M1A Rifle is as follows:

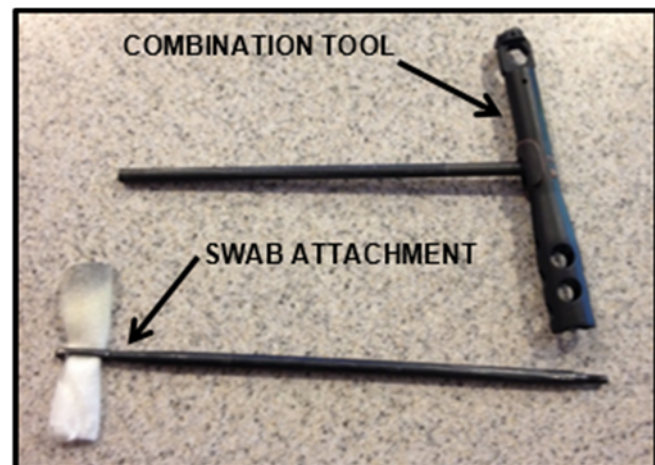
1. Take CLP (Cleaning, Lubricating, Protecting) fluid and attach thin spray straw to the spray cap. Insert straw into the end of the barrel and spray a 3 second burst of CLP into the barrel. Hold the rifle vertically so that the CLP coats the inside of the barrel. This step is to dissolve the powder residue from the barrel. Do not allow the CLP to sit on the barrel for more than 10 minutes.
2. Assemble Cleaning Rod and attach to the Combination Tool. Insert and screw in the .30

Caliber metal Barrel Brush into the Cleaning Rod. Insert the Cleaning Rod into the end of the barrel (the end with the Flash Hider) and push it all the way through the barrel until the brush comes out of the chamber on the other side. Pull the Cleaning Rod back through.



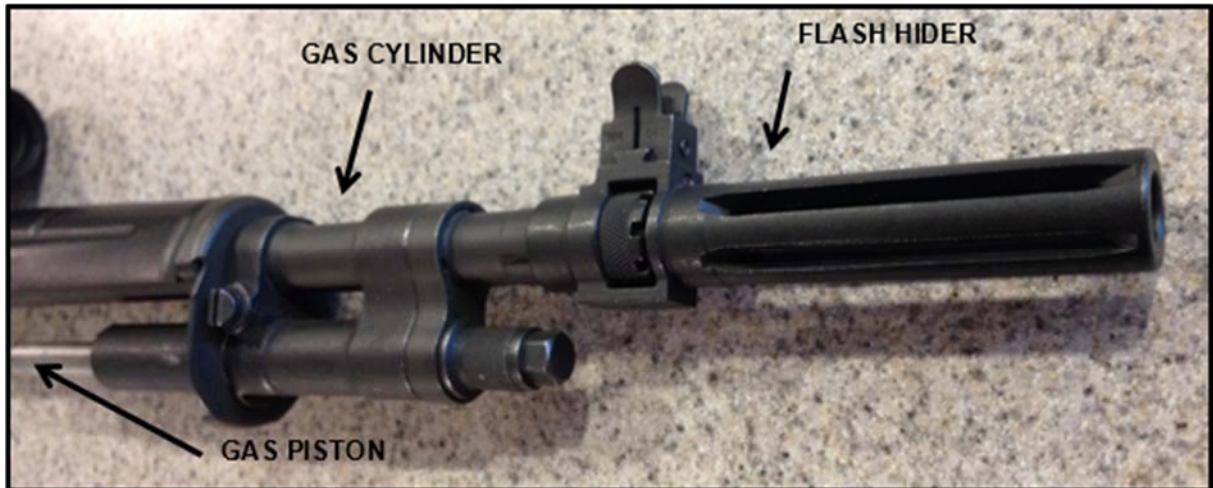
Make sure that your fingers are not gripping or keeping the Cleaning Rod from rotating as it passes through the barrel. The Cleaning Rod should be able to rotate so that the Metal Barrel Brush follows the curves in the BARREL's rifling and does not make scratches in the barrel. Repeat the action around 5 times.

3. Remove the Metal Brush from the Cleaning Rod and insert the Swab Attachment. Rip a Barrel Swab in half; fold the half-piece in half. Slide the folded piece through the Swab Attachment so that the same amount is hanging out of each side. Insert this into the barrel from the end with the FLASH HIDER and push all the way through. You will not be able to reverse the motion of the rod because the swab will bunch up in the barrel, so you must push it all the way through. The CLP in the barrel will soil the first swab



very quickly. After 2 repetitions, change the swab for the other half of the swab. Run the Cleaning Rod through the barrel an additional four times.

4. Use another swab and thoroughly wipe down the BOLT and RECEIVER so that when you touch it no black residue gets on your fingers. You can also use a piece of scrap cloth for this so that you don't run out of barrel swabs as fast.
5. Hold the rifle so that the FLASH HIDER is pointed up. The GAS PISTON will come out of the GAS CYLINDER. The GAS PISTON is shiny metal and any powder residue can easily be seen and wiped off. Wipe off all residue.



6. Insert the small end of the Bore Snake into the chamber side of the barrel and allow the metal tip to pass completely through the BARREL. Grab the metal end and pull the Bore Snake through the barrel. This cleans all other powder and CLP residue from the barrel.
7. Use a swab and the metal brush to scrub the face of the BOLT and remove any residue or grit.

Cleaning Complete

Assembly

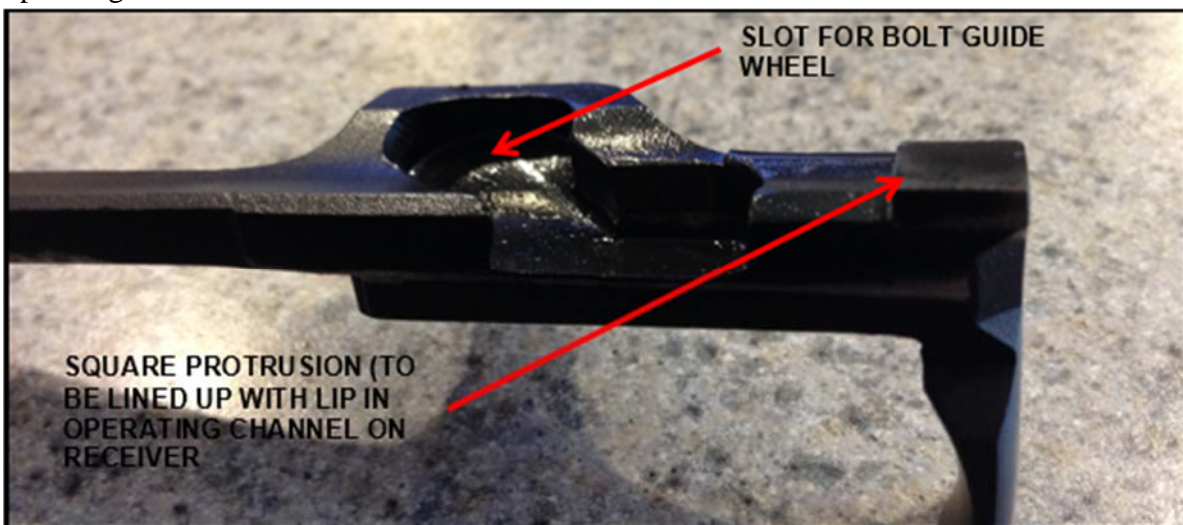
After cleaning, the rifle must be reassembled to become functional again.

1. Orient the rifle from right to left with the barrel pointed left. Rotate the rifle so that it is standing up on its own. Take hold of the front of the BOLT on the GUIDE WHEEL and the side opposite. Slide the BOLT into the RECEIVER. Make sure the tooth of the firing pin that comes out of the back of the BOLT passes over the hole on the far side of the RECEIVER.

2. Insert the OPERATING ROD into the OP ROD GUIDE on the BARREL.



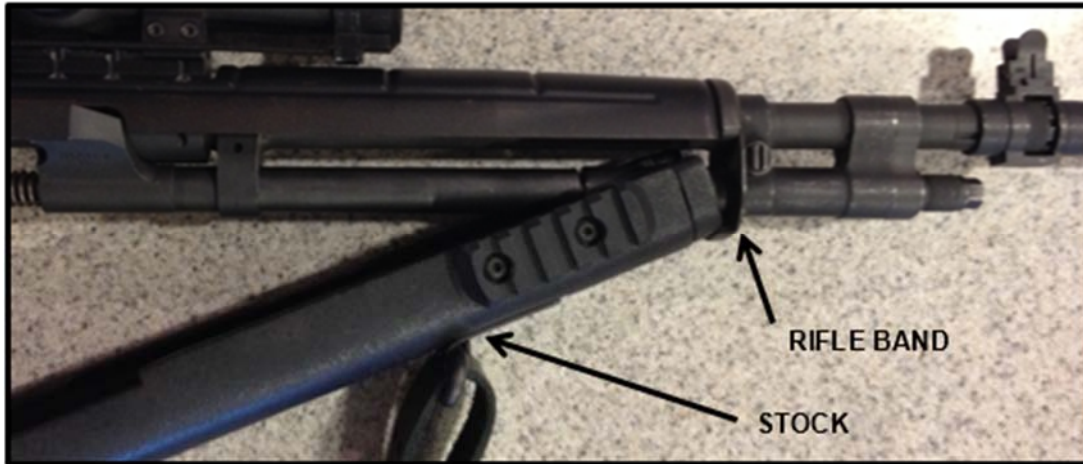
3. Don't allow the OPERATING ROD to click fully into position by the lip in the operating channel. Move the square protrusion on the OPERATING ROD into position by the lip in the operating channel.



Move the BOLT back so that the GUIDE WHEEL is directly aligned with the GUIDE WHEEL slot in the OPERATING HANDLE. When they are aligned, push the OPERATING ROD into place in the operating channel. If done correctly, moving the OPERATING ROD backwards and forwards will be smooth, and the BOLT will move freely with it.

4. Push the BOLT and OPERATING ROD all the way forward. Tilt the rifle on its side so that the top of the barrel is towards you. Insert the OPERATING ROD SPRING and OPERATING SPRING GUIDE into the hollow center of the OPERATING ROD; this is a 2-handed operation. Use the left hand to push all of the tension in the spring to the left while using the right hand to align the OPERATING SPRING GUIDE and the OP RETENTION PIN. Push the OP RETENTION PIN down so that the OPERATING SPRING GUIDE cannot move.

5. Take hold of the Rifle assembly with the left hand and the stock with the right hand. Position the front of the Rifle assembly onto the Stock so that the RIFLE BAND locks around the front of the stock. Slide the RECEIVER into the rear of the stock.

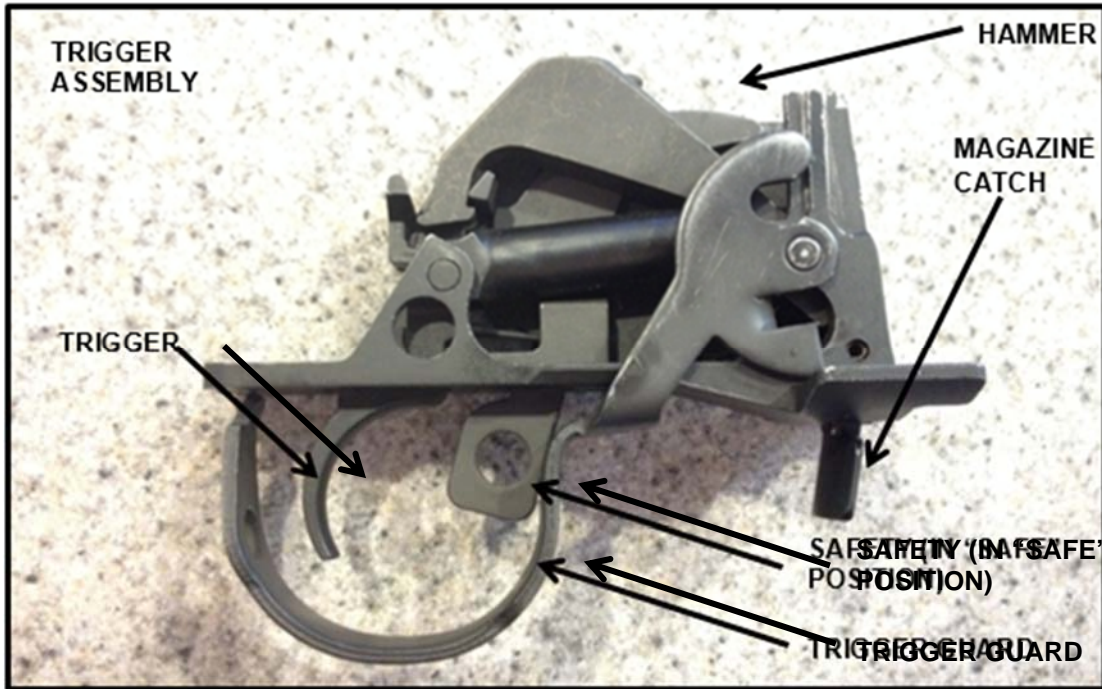


6. Orient the rifle left to right so that the barrel is pointed to the right. Insert the TRIGGER ASSEMBLY into the stock so that the trigger base fits into the cuts on the stock.



If the TRIGGER GUARD is in the closed position, the TRIGGER ASSEMBLY will not go fit into the stock and RECEIVER. During this step, make sure that you are not moving the rifle. The rifle will come off of the stock when the trigger is not attached and can cause damage if dropped.

7. Push the TRIGGER GUARD into the closed position. This locks the TRIGGER GUARD, STOCK, and RECEIVER all together

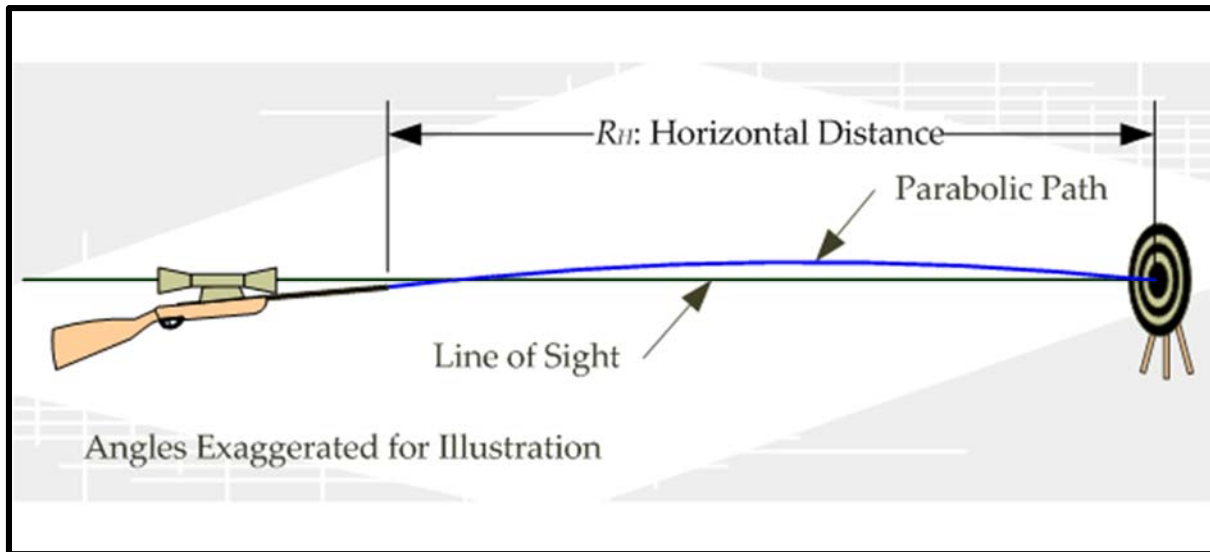




Chapter 2: Using the M1A

Fundamentals of Shooting

Rifles and all weapons that shoot bullets fire their projectiles in a parabolic arc. To be able to hit targets at any range, the shooter must “zero” their sights (sights are what a shooter uses to aim the weapon) so that the line of sight is the same as the bullet path at a certain range.



The shooter looks through the scope or sights and has a direct, linear line of sight to the target or object that they are shooting at. The barrel slants at a slight angle. Depending on the height of the sights above the barrel axis, the bullet should cross the line of sight at 2 points (shown). As shown in the picture, the bullet path crosses the line of sight path very close to the muzzle (end of the barrel) and right at the center of the target. The shooter must decide where they want the line of sight to cross the bullet path. This is called the Zero. The crosshairs of the scope can be adjusted so that the line of sight crosses the bullet path at different points. The shooter must determine the range that they will most likely be shooting and zero for that range. After zeroing, shooters must shoot at greater and lesser ranges and find where the bullet hits the target relative to the line of sight. For example, in this graphic, if the shooter fired at a target located at $R_n/2$, the bullet would hit above the bull's-eye, because the line of sight of the scope is below the trajectory of the bullet.

There is a method to zeroing a scope. A novice shooter cannot hope to zero a riflescope without some shooting practice first. Being able to effectively zero a rifle is dependent on the fact that there will be little to zero user error in firing the actual weapon. For example, zeroing a rifle at 200 yards in theory is a very simple task; you simply shoot at the target, note where the bullet hits and adjust the scope accordingly. But this assumes that the bullet went exactly where the actual bore axis was pointing, which is not necessarily true.

The shooter must group a number of shots before the scope can be adjusted. To get a good group of shots, one must practice the four fundamentals of shooting:

1. Body Position: the shooter wants to be in a good body position for shooting. For Zeroing a rifle, a shooter should be in the prone or benchrest position because they allow for the greatest accuracy.
 - a. Prone: in the prone position, the shooter lays down with the rifle pointed directly ahead of them. For most accurate results, use a sandbag or something soft to set the front of your rifle on so that there is less barrel movement (see picture) make



sure that your legs are splayed out behind you. Some shooters prefer to spread their legs in a slightly different method. If shooting right handed, the right leg can be extended straight back in line with the back and the rifle and the left leg splayed out more to the left. This provides a more stable platform for shooting but is not useful in restricted space.

- b. Benchrest: benchrest shooting allows for great accuracy much like the prone position does. In the benchrest position, the user sets the front of the rifle on a front prop (ideally) like a sandbag or bag for stability. The shooter sits in a chair to fire from the sitting position. Make sure that you are sitting low enough that you can place your elbows on the shooting table for more stability.



2. **Breathing:** Breathing can cause great difficulties when shooting. When holding the rifle in the correct shooting position, the rifle stock is held against the shoulder, so any movements of the lungs and diaphragm causes some movement of the rifle. A shooter should pull the trigger when their breath reaches the top or the bottom of their lungs' capacity. When the breath has been fully sucked in or pushed out, a moment exists where there is no movement of the body. This is the prime time to shoot. Be careful to shoot at the top or bottom of the breath but do not hold your breath. After a few held breaths, the body gets low on oxygen and will start breathing harder, making it more difficult to shoot.
3. **Sight Picture:** sight picture is what the shooter sees of the target when the sights are properly aligned. For a scope, the sight picture should be the bulls-eye of the target being aligned with the crosshairs of the scope. As a shooter, make sure that the sight picture is the same every time when you are shooting.
4. **Trigger Squeeze:** When shooting a rifle, the trigger squeeze is the last step before the bullet flies downrange. The trigger squeeze can cause severe inaccuracy if performed incorrectly; think about performing the action: you are pulling on a lever that is attached to the rifle that affects where the muzzle points. The shooter needs to pull the trigger softly so that the entire weapon is not pulled off target by an excessively hard yank on the trigger. The trigger squeeze is hard for novice shooters because they expect the bang and recoil of the rifle firing, so they pull the trigger hard and fast in anticipation. This is a bad practice. Most precision rifles or military rifles have a trigger that has 2 stages. The first stage is around 1-2 mm long and is extremely easy to pull; when pressure is applied, the trigger moves backwards freely until it hits the second stage. The second stage pull actually fires the weapon. The second stage requires about 5 pounds of pressure. Squeeze the trigger slowly and directly to the rear; do not anticipate the blast. This takes practice.

Zeroing:

Practice the four fundamentals of shooting, and your shots should begin to group. When at the rifle range, shoot three to four shots at the bull's-eye of your target starting at a close range (25-50 yards). Shooting a good group at close range should be relatively easy. A good group depends on the range; the M1A should be able to get a 4 shot group into a 1 inch diameter circle. If your group is not on the bull's-eye of your target, that is fine; the sight can adjust to fix that after you get good grouping.



Once you get a good group like the one pictured above at a range of about 50 yards, then you can start to adjust your scope to Zero it. There are adjustment knobs on the top and side of your scope that adjust the angle of the optics inside the scope. Most scopes have the same adjustment intervals – 0.25MOA per click. MOA means Minute of Angle. A minute of angle means one minute of one degree, $1/60^{\text{th}}$ of a degree, which translates to about 1 inch at 100 yards.



If your bullets hit 2 inches above the bull's-eye at 100 yards, turn the elevation knob (up/down) 8 clicks in the down direction, a 2 MOA adjustment. If your bullet hits 1 inch to the right of the bull's-eye, adjust windage (left/right) left 4 clicks. After adjusting, fire another group and recalibrate the scope from there. Zeroing can feel tedious, but make sure you practice good shooting fundamentals or you will just be wasting time and bullets.

Illustration of a Rifle Showing the Line of Sight and Bore Angle. Wikipedia, 6/26/2014.
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