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It's an all to common occurrence. A fellow trying to get a newly acquired Mil-Surp rifle to print on the standard, black, 6 inch target bull @ 100 yards, but, after 5 rounds, a peak thru a spotter scope shows the paper is still clean. The bullets aren't even hitting the enlarged backer board!

A quick look at the tangent rear sight on most Mil-Surp rifles reveals the minimum setting is 300 meters. No wonder his shots aren't on paper, they are going *over* the target!

Often, getting a scope set up can be just as trying. Most "No Gunsmithing" or "No Drill & Tap" mounts for Mil-Surp rifles are required to fit rifles made by many arsenals in many countries. Tolerances tend to be generous on Mil-Surp rifles and the aftermarket mounts must fit them all. On top of that, unscrewing the caps from the scope's adjustment turrets reveals a series of tick marks, arrows, the words "*UP*" or "*DOWN*", ¼, ½ etc.

Additionally, the scope's turrets may or may not be "click" adjustable. The instruction card may not be of much help either. The same card may be packed with *all* 87 scopes in the company's inventory, from a very basic 4X ".22 scope", to an 8-32X target model that has all the bells & whistles. The scope's turrets may look very little like the one pictured in the

instructions. What to do?

In this article, we are going to is clear all the mystery away, and cover, in order, the simple steps to getting an open, aperture, and scope sighted rifle “on target & in the black”.

Before we get to sights & sight regulation, let’s take a moment to discuss rifle condition. The barreled action *must* fit securely in the stock. If the stock is cracked, ill fitting, or the barreled action shifting with every shot, accurate shooting *is impossible*. These faults *must* be corrected prior to attempting accurate sight or scope adjustment. See http://www.surplusrifle.com/shooting2005/idanddiag/index.asp for the full story.

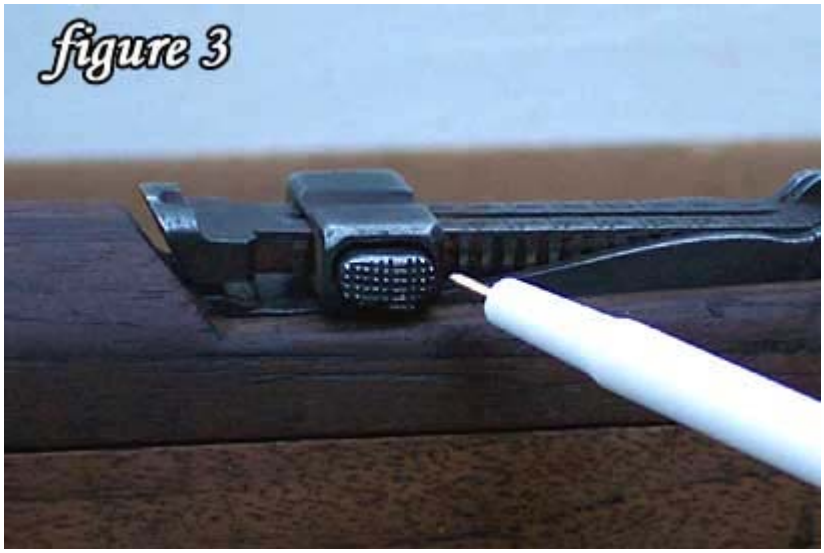
This stock is a very poor fit. Accuracy will be hard to achieve like this.

Barrel & muzzle crown condition are important to accurate shooting. If a barrel’s lands are badly rusted, corroded, or the crown damaged; no more then mediocre shooting will result. Often, a barrel will be in good condition, except for the last inch or two of lands near the muzzle, where it’s very worn. This is the result of improper cleaning technique. Such a barrel can be “back bored”. This often restores accuracy. Any rifle with all or *any* of these problems can’t be expected to be a great shooter

Almost no rifling at the muzzle; notice uneven carbon tracks, can’t expect much

accuracy here.

I've seen mechanical problems with both front & rear sights that have caused shooters fits. The pivot pin, the holes, or both in rear sights can become worn. This can cause the rear sight to shift right or left with every shot. This causes horizontal, or "X" axis shot stringing. The cure is to replace the undersize pin, or drill out the holes to a larger size, and install a new pin. New, standard size pins can be acquired from any home center or hardware store. Rear sight leaves that travel by squeezing one or both side locks must lock in tight to the ladder once the locks are released. I've seen the locks worn to a point that the leaves are skipping up & down the ladder with every shot! Replacement parts can be acquired from the **Numrich Gunparts Corp**.

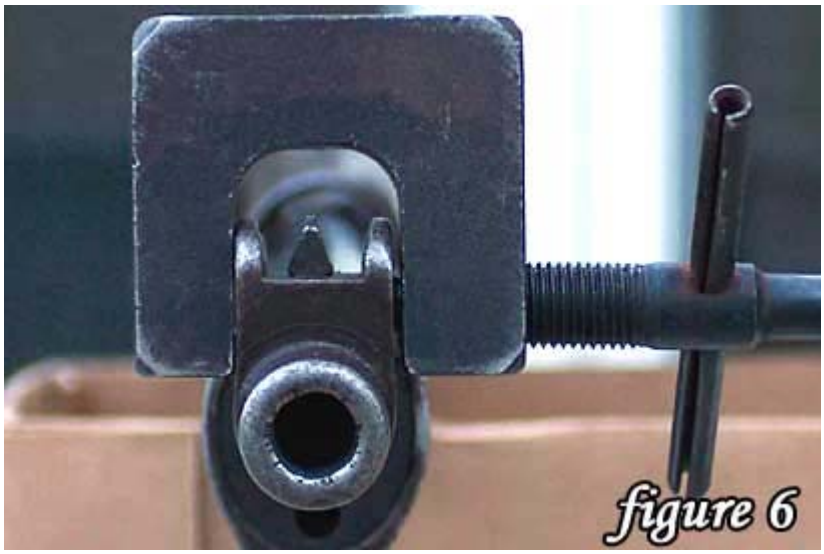


Make sure the locks grip the ladder tight.

Make sure the pin & holes aren't worn where the sight pivots.

Front sights can cause problems too. For the moment, we'll not discuss elevation issues (more on that later). What usually happens with front blades is they are rusted solidly in place! Rusted front sights need to be soaked in some type of penetrating oil. After the oil does its work, the front sight can be gently drifted with a small hammer & punch, or if you have one, a "Front Sight Pusher Tool."

A hammer & drift pin is OK, but be careful!



The Sight Pusher Tool is best.

Occasionally one sees front, drift adjustable sights that are loose & floating with every shot. Front blades that are loose & float are usually the result of a dealer finding a rifle in his stock that is missing its front blade. The dealer digs in a parts box and slides any old blade in. The cure is to either replace the blade with one that fits tight, or coat the bottom & sides of the dovetail slot with release agent (Note 1) and put epoxy on the blade bottom. Next, slide the blade in and let it dry. Alternately, the blade can be clamped in a vice, and the bottom of the blade can be center punched in several places. Center punching will raise a series of dimples on the metal. Once the sight is reassembled, the dimples may take up the slack.

Let's say the sights are nice & tight, but the rifle doesn't even make the paper while shooting from a bench, with both the front & rear of the rifle supported, on a standard, black, 6 inch target bull @ 100 yards. First, we will cut the margin of error; this will usually get the rifle printing on paper.

Start shooting @ 25 yards instead of @100. Unless there are major problems with the rifle, most will print @ 25 yards. True, it may print very high and to the left or right of center, but at least we have a baseline to start from. If possible, get a backer board, targets, or both that are larger then the normal match shooting targets. Only shots that print *somewhere* on target tell us anything. Missed shots that don't give us useable data, are wasted powder, primer & bullet.

Consider this; for a given load, in a given rifle, with a given set of weather conditions, at a given distance, the bullet will go where it wants to go. The guy behind the rifle doesn't make it go anywhere! When a shooter thinks of it in that context, it all makes sense!

Most Mil-Surp rifles aren't regulated for 100 yard zero. The lowest setting on many is 2 or 3 hundred meters! That's why we should start @ 25 yards. Even with the lowest setting on the ladder; it may still print a bit high, but should make the paper.

For the following example; we will assume the sights, stock & rifle are mechanically sound & tight. Let's say the bullet strike is 5 inches ***high*** and 3 inches to the ***right*** of dead center while using a "6 o'clock hold" with the rear sight at its l*owest* setting. This tells us to correct the windage; we need to move the front sight to the *right.* (Note2) This is known as "chasing the bullet." What we want to do is make the sights coincide with the bullet strike. Since the bullet strike was 5 inches high; we need either a taller front sight, or a deeper notch on the rear sight. The front sight is the easiest fix. See the following articles for ways (both permanent & non-permanent) to raise the front sight blade height.

http://www.surplusrifle.com/sights/frontsight/index.asp

http://www.surplusrifle.com/shooting2005/FR8FSRework/index.asp

http://www.surplusrifle.com/shooting/frontsightfix/index.asp

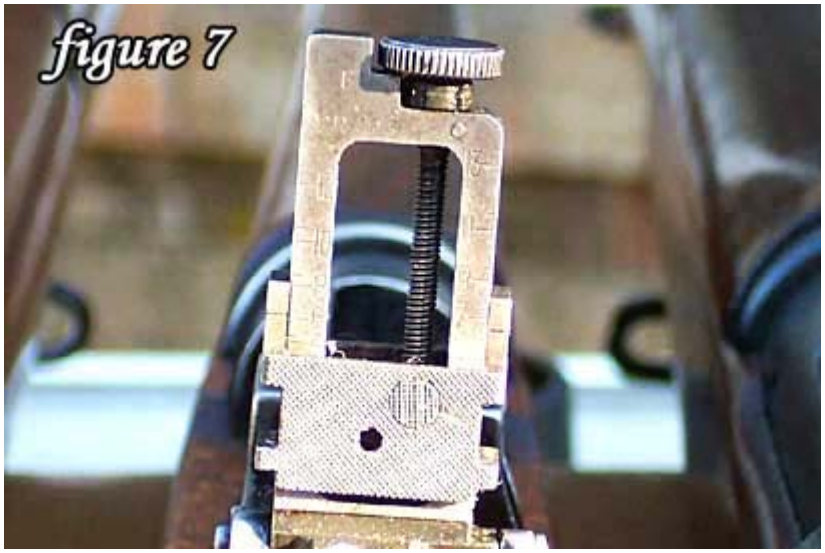
http://www.surplusrifle.com/shooting/mosinfrontsight/index.asp

Where to hold, 6 o'clock hold or center hold?
A 6 o'clock hold is when the black circle of a paper target seems to just sit on top of the front sight blade. This is also known as *"floating the bull"*. A center hold is when the top of the front sight is placed dead center in the small round white area of a paper target. Which is better? It depends. Target distance, load, and even weather conditions can determine which one is best. Eyesight may be the biggest determining factor in metallic sight placement. Those with sharp eyes can see a 1 inch white dot @ 100 yards, and often use a center hold. Those (like me) with glasses that are as thick as the bottoms of old fashion soft drink bottles may do better with a 6 o'clock hold.

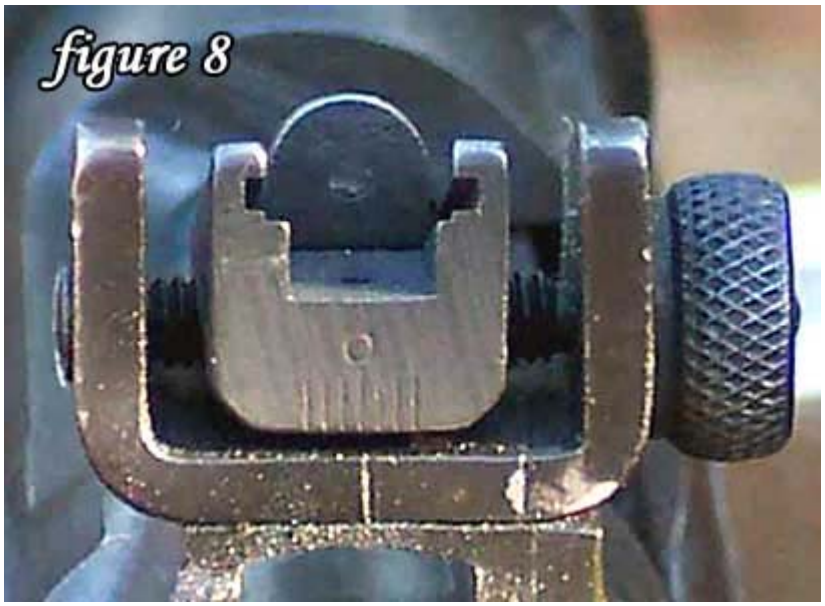
For those wishing to simply swap different height blades, www.sportsmanguide.com The Sportsman's Guide, 411 Farwell Ave, So. St. Paul, MN 55075-9876 1-800-888-3006 has a set of 4 **Mauser 98 blades**, each of a different height for $19.97, part # HX5A-92972. They also have a set of **3 Mauser 96 blades**, each of a different height for $19.97, part # HX5A-92971.

Once the rifle is printing center @ 25 yards, it should be in somewhere the black @ 100 yards. Minor adjustments can easily be made @ 100 yards; once the rifle is on paper at that distance.

Aperture sighted rifles are a blessing to those of us with aging eyes. One doesn't look *at* the aperture one simply looks *thru* it. Now the eye only has two points to consider, instead of 3. The human eye will automatically seek center in the aperture without a conscious effort of the shooter. This is because center is where the light is brightest. Mil-Surp rifles always have large aperture holes compared to a match rifle. The smaller the hole; the finer one can shoot. That's all well & good for the target range & match shooting. For military purposes, a large aperture makes sense. When weather conditions get adverse or it gets dark, the large aperture insures a soldier can acquire & engage an enemy.



Enfield No 4 Mk II aperture sight.

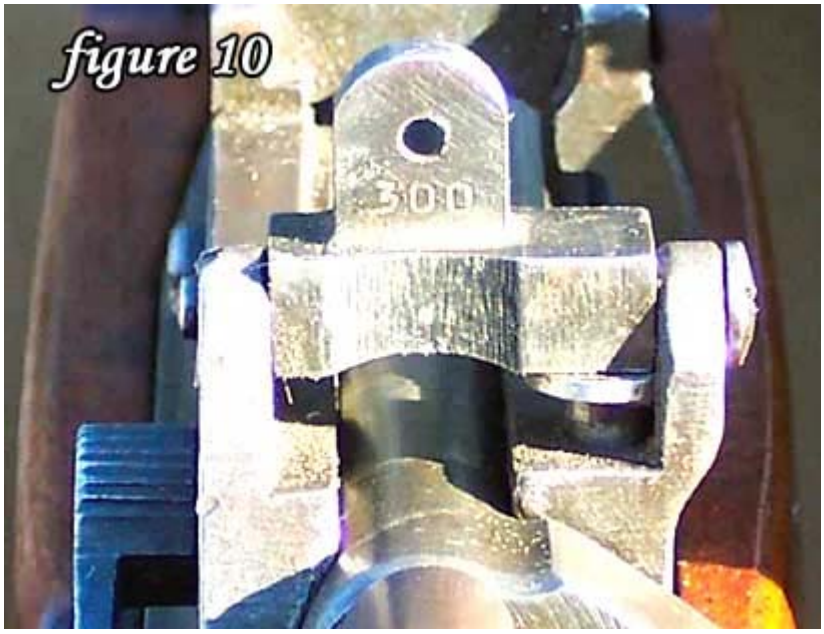


03/A3 aperture sight.

The 03/A3 Springfield aperture sight is adjustable for both windage and elevation. If, as in the previous example the bullet strike is 5 inches ***high*** and 3 inches to the ***right*** of dead

center while using a “6 o’clock hold”, by pushing the aperture *down* & turning the windage knob *left* will get the rifle printing center. Again, starting @ 25 yards will make the job easier. (Note 3)

Spanish FR8 aperture sight.



Enfield No 4 Mk I* flip type aperture sight.

The Enfield No 4 Mk I* is usually fitted with an “L” shaped flip aperture sight. The overwhelming majority of these sights are graduated for 300 & 600 yards. (Note 3) With service velocity ammunition, the only option is to adjust the height of the front sight blade to get elevation set for 100 yard shooting.

Scopes are another breed of cat altogether. http://www.surplusrifle.com/shooting2005/goodoptics/index.asp & http://www.surplusrifle.com/shooting/frontsightfix/index.asp have the full story on optical

sights. However, the short version is; simply ignore all the numbers, tick marks, graduations, up & down, left & right, curved arrows, 1/8, ¼, ½ or whatever else is painted on the turrets etc. Don't worry if it "clicks" or not.

The adjustment turret of a Bausch & Lomb 24X target scope.

The adjustment turret of a Tasco (Japan) 4X sporting scope.

With a scope sighted bolt gun, the easiest way to achieve zero is to **"Bore Sight"** the rifle. Kits are available to do this job. Some have a piece that gets inserted into the muzzle, and the scope is adjusted against a standing grid. Others have a laser light that is mounted in a holder shaped like a cartridge case. It is inserted in the chamber and the laser light shines on the target and the scope is adjusted to coincide with the light dot. I've personally never used these items, although I hear they work well. This is *mechanical zero*. Mechanical zero *doesn't* take into account things like wind drift etc, but, it will get you on the paper @ 25 yards.

I've always bore sighted in the traditional manner. Simply post a target with a large, bright orange dot in the center at 20 or 25 yards; put the rifle on a sold rest, (Note 4) now remove the bolt. Next, while looking thru the bore, move the entire rifle up or down, left or right until the orange dot is centered in the bore. Now, **without moving the rifle,** adjust

the scope's windage & elevation turrets until the reticle is centered on the dot. Double check to make sure the dot is still centered in the bore; and the reticle is still centered on the dot. Once again, this is *mechanical zero.*

Fire a 3 shot group and place the rifle back to where the scopes reticle is centered on the dot. Now, **without moving the rifle,** adjust the turrets until the reticle is sitting square in the group you just shot. You may want to have the elevation 1 inch high @ 25 yards. Then move the target back to 100 yards, fire another 3 shot group. The rifle should print in the black. Make any minor adjustments for wind drift.

Metallic sights & scopes aren't hard to deal with at all once you think about it. With just a bit of consideration and careful preparation, it's no big deal to get a rifle shooting in the black!

Note 1

Any time epoxy is used in a situation where two parts **must not** be permanently bonded together, some form of release agent must be applied to **one** of the parts. Kits like Brownells™ "Agraglas Gell"® come with a bottle of release agent. Brownells™ "Agraglas Gell"® kit is the *best* kit for rifle bedding I've *ever* used. It even includes mixing bowls and packets of brown & black die so the epoxy can be matched to the color of wood or steel! There is enough material in one kit to do quite a few complete rifles. The kit cost about $17.00, and *is worth every penny*. I keep a kit handy at all times, even if I'm not bedding a rifle. It doesn't go bad on the shelf. This stuff is just that good! However, what if you only have a few small jobs to do?

Cheap Guys Solution

Plain, two-part epoxy kits (usually two small tubes, epoxy & hardener) that come from a department store are fine for small jobs. However, you *will* have to supply your own release agent. No problem! Just walk over to the shoe department & get a small can of wax-type shoe polish. Rub the polish on any metal surface you *don't* want the epoxy to stick to. I've used wax-type shoe polish before, and it's worked perfect.

I've even heard of fellows using spray furniture polish, and even "non-stick" cooking spray like PAM™ as release agent! I've not tried these items, but the users claim it works.

Note 2

Moving a sight 0.001 = bullet strike movement of approximately 1 inch @ 100 yards!

So, moving a front sight blade with a hammer & drift pin must be done carefully. A "Front Sight Pusher" tool with a screw or turn-bolt system that will gently push the front sight blade is *much* better.

Note 3

The 03/A3 Springfield aperture can be found with several different diameter holes.

The Enfield No 4 Mk I "L" shaped flip aperture sight is *almost* always found stamped "300 & 600". However, examples have been reported with 200 & 400 stamped on them.

The point is; if someone says: "*This is the **only** way such & such a rifle was **ever** made",* chances are, there is an unmodified rifle out there to prove them dead wrong!

Example: Many sub-contractors, in small factories, made all of the bands, sights, sight protectors, sling swivels etc for Enfields in WWII. The parts were diverted to whichever *rifle* factory had an immediate need.

Note 4
A front pedestal & rear rabbit or bunny rear bag, or a solid one-piece rest is best for this job, but simple sandbags work too.

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