

In Search of Accuracy by E. J. Kana

Many people have numerous ideas on what it takes to make a M.L. rifle shoot accurately. Most will say it revolves about three things – powder, patch and ball. Those are the big three but there are some other factors which have a bearing also. If you want to know what one old man thinks, please read on.

Many factors determine how well a rifle will shoot. Here is a listing of most in no special order: rifle barrel, ball size, patching material, patch thickness, patch lube, powder charge, powder granulation (2F or 3F), powder type (black vs. Pyrodex) cleaning patch, cleaning solution, loading rod, jag size, percussion caps, sights, and shooter. Other factors may include wind, clouds, sun position, gravity, other shooters, and range conditions but we will not discuss these factors at this time.

See, you thought this was going to be simple. Well it can be. There are many things a person can do to make a rifle shoot well. The most important however is to clean and take good care of your rifle from inside to outside. Failure to clean a barrel properly after shooting can cause a tack driver to become a pry bar.

The following covers the above components listed. Not every aspect concerning each item will be covered. Only the things this old man can remember as being important. Feel free to question any of the statements made. Remember there are exceptions to everything. And everyone has his or her own opinions.

The rifle barrel must be straight and true with groove depths varying from 8 to 10 thousandths for small calibers (.32, .36, and .40) – 10 to 12 thousandths deep for .45 calibers on up. There are exceptions to everything but if your rifle barrel is within these boundaries, good for you.

Barrel twist will determine the powder charge to a great extent. Small calibers have a faster twist than the larger calibers. One in 48 twist will work with the above small sizes while a .45 caliber will work with 1 in 56 or 60 and .50 and .54 with 1 in 66 or 72. Again exceptions will be found. Production rifles try to meet in the middle most of the time on these factors. So if you have a production rifle, what you have should work about average.

Black powder charges are next. I can't talk about Pyrodex because I have not used nor do I know of any top shooters that do. I cannot recall any advantages it may have over black powder. There are supposed to be some but I forget what they are. (Forget a lot now days.) Hunting loads and target loads are two separate loads for most rifles. Target loads are what we are interested in. A good target load will be between 30 and 70 grains of powder in most rifles. Ball size, patching material, patch lube, and powder charge are the big four for accuracy. Each will affect the other and all must be varied to achieve the utmost in accuracy.

One item that could be a standard is Teflon patching material. If you start with this material, then all you have to vary is the ball size and powder charge. If you try other patching materials and lubes, then a bunch of variables come in to play. Thickness varies from about .012 to .018 for most good patching materials made of cotton or denim. Most shooters use a good, tightly woven cotton material of the above thicknesses. Pillow ticking of the striped or flowered kind if tightly woven works the best. Do not use synthetic materials or loosely woven materials. They may work but will not give you good consistent accuracy. Look at your patching material after you have shot it. It must look as good as when you loaded it except for slight burning discoloration. If there are tears, burned holes, or nothing is left of your patch, then something needs to be corrected to eliminate this problem. The patch must be in good condition after firing.

Patch lube is the greatest variable at this time. There are many commercial lubes on the market today. Some have been on the market for years. Some are very new. Some are simple such as spit or water or complicated formulas. Natural ingredients are supposed to be better but Teflon seems to be working the best for the many shooters using it. Consistency of the lube on the patch is important from shot to shot. A properly lubricated

patch will allow the ball to be loaded easily and also keep the patch from tearing or burning when the rifle is fired. Patch lube has to be all this consistently from shot to shot. What works in one barrel with a certain ball, powder combination may not work in another. Experimentation is necessary with patch lubes to find the right combination of lube, patch thickness, and ball size.

Yes, everything has been general so far or stuff you have read or heard elsewhere but lets keep on and may be this will eventually come to an end.

Ball size will vary depending on the barrel's bore and groove size. A light patch and ball combination is needed for the best accuracy. Bench gun shooters use oversize balls and big charges of powder. But they shoot heavy guns off the bench. Offhand rifles need lighter charges to keep the flinching and punishment down. Again we want a target load that will give good accuracy with a low powder charge.

The patch material thickness and ball size is determined by the barrel size and smoothness. Load the largest ball you can down without having to beat it all the way to the bottom of the barrel. This is done with a loading rod made of steel or aluminum, not wood or synthetics. Remember this is for target shooting and not hunting what we are discussing here. A stout loading rod is needed for target shooting loading.

Again, use the largest ball size that will work down the barrel with a good patch and lube combination. A Teflon patch used with a .445 or .495 ball on most barrels needs only the right powder charge to shoot its best group. A good group for me at 50 yards off the bench is one large hole with 5 shots all touching under an inch and a quarter in diameter. If your rifle will shoot 5 shots consistently less than 1-1/2 inches than this is what you want. If a shot or two is out of the group, this means a problem is occurring at times. This happens to me more than I wish it would. Is this a rifle or a shooter problem?

A M.L. rifle barrel needs to be smooth on the lands and in the grooves. Clean your barrel well and keep it lubricated and it should stay this way. Fouling left in the barrel overnight will start rust and pitting to occur. A rough barrel will not give the accuracy you want. A rough barrel will not allow the right combination of ball and patch to be used for the best accuracy possible.

A good, proper sized jag is needed to help you clean your barrel between shots and at the end of the shooting session. If the jag is under sized as some production ramrod tips are, cleaning of the rifling or grooves will not take place. Poor accuracy for shooting and poor cleaning will result if a good jag and cleaning patch combination is not used.

The cleaning/loading rod used for loading and cleaning at the range needs to be of stainless steel or aluminum with a solid handle of some type on the end. A muzzle protector of some type needs to be in place on the rod also. This will allow you to clean with a snug cleaning patch and to load a tight ball, patch combination. This is important if the right combination of components is being used. The loading rod should seat the patched ball down on the powder with the same amount of force/pressure each time. Do not beat the rod against the ball on the powder. Firm pressure is all that is needed to seat the ball. Be consistent with this to be accurate.

When hunting, I doubt if you will be carrying the metal rod in the field, but it should be used for a thorough cleaning of the barrel back at camp. Remember the snug cleaning patch is needed for a good barrel cleaning no matter what cleaning solution is used.

Cleaning solutions are used to do two things so they can and are usually different. Cleaning between shots removes fouling in the barrel, which can build up from shot to shot. This fouling removal needs to be consistent from shot to shot. A cotton cleaning patch such as flannel about one and half to two inches square works well for most rifles. The solution can be water, Windex, or any other material recommended for this activity. Run the dampened patch up and down the barrel a couple of times followed by a dry patch to remove any moisture

which may have been left from the dampened patch. Too much wetness could collect in the breech area of the barrel and result in misfires. Watch the amount of wetness on your cleaning patch to avoid this problem.

Cleaning the rifle at the end of the day or match involves another type of cleaning solution. There are many commercial products on the market for this. Probably the best is a homebrew of hot soapy water. If your barrel can be removed and the breech end placed in a can, bucket, or container of this solution with the nipple removed, the cleaning will be a snap. Work the solution up and down the barrel with a tight fitting patch on the cleaning rod. The hot or warm soapy water will dissolve the black powder residue quickly. Dry off the outside and run dry tight patches down the inside until no moisture remains. WD-40 or LPS-1 or something along these lines sprayed down the barrel and worked with a patch will displace any moisture left and oil the barrel at the same time. This has worked well for me and can be quick and easy if your barrel is removable.

If your barrel is not easily removable, then some extra steps will need to be involved. Ask for solutions on this or try some of the other commercial or homebrew solutions for cleaning barrels. Barrel cleaning is important. Do it correctly and promptly after shooting with a solution recommended for cleaning black powder residue. Your regular rifle cleaning solutions will not work on black powder fouling.

If your barrel is to maintain its accuracy, it must be cared for and cleaned properly after every outing or loading with powder. Yes this is extra work but it has to be done. If you have a fine shooting barrel, protect it and it should serve you well for a lifetime of shooting. Use a proper fitting jag, good cleaning/loading rod, muzzle protector, and plenty of a good cleaning solution and moisture displacing lubricant and you should be okay for years.

Percussion caps haven't been mentioned but are important also. They must ignite the powder charge consistently each time. A good reliable hot cap is important. RWS and CCI are the main two on the market. RWS may be a little hotter, but they cost more. CCIs are consistent and work well for me. They beat the cheap or foreign caps by leaps and bounds. The cap must also come off the nipple easily also to save you time. So a good hot flame and an easily removed cap are what you look for. A percussion cap, which is consistent from box to box, is important. If the cap does not go on the nipple easily, file and polish the nipple to get a good easy fit. This saves time and frustration.

Sights, both front and rear, are important if your shooting is to be consistent. A good, sharp sight picture is necessary for repeatability. If you don't see the sights and target well, your consistency will not be there from shot to shot. Look at and try sights on other rifles to find one that works for you and then get used to your sight pattern and stay with it from shot to shot.

Once the magic components are found that make your rifle shoot well, be consistent from shot to shot in every aspect of your loading, cleaning and firing. The shooter becomes the variable that makes the big difference. If some change occurs in the shooter's functioning, this will show up on the target as a blown shot or a shot out of the rifle's potential grouping ability. You must however know what your rifle's potential is and usually that must be determined by shooting off the bench the best you possibly can.

This could continue on and on for infinite boredom. If you have read this so far, congratulations. If you haven't figured out the key word in all of the above, then ask me sometime and I will share it with you. Questions or comments concerning the above are welcome. If you don't wish to see anything in the newsletter like this again, please let the President know. He controls the contents of the newsletter and he will know better next time then ask me for a short article. Questions are welcomed. See you at the range.