



OCT 2017

DIGITAL ARCHIVE  
EDITION

# PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

# 10

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

## SIERRA'S NEW MATCH KING

SWAB-ITS • IMPROVING THE WALTHER P22 • CHANGING AND REGULATING GLOCK SIGHTS • NEW GUNSMITH ITEMS

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 166

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# AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • OCTOBER 2017

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## HISTORY

# Swab-its

BY AMERICAN GUNSMITH EDITORS OCTOBER 2017

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**A**R-15s, progenitor of the longest serving service rifle in United States history as well as the so-called “Modern Sporting Rifle”, all share a common design feature. The barrel extension where the lugs of the bolt lock up, often called the “star chamber”, is a bit of a pain to get into for cleaning.

While legions of drill sergeants/instructors have wrongly and ignorantly forced generations of troops to clean small arms to the point of their premature demise, proper maintenance does necessitate keeping areas where moving parts mate (such as locking lugs) free from excess fouling and debris. Swab-its Super Brush, LLC ([SuperBrush.com](http://SuperBrush.com)) produces foam applicator solutions for industrial, medical, aerospace, printing, firearm, and other industries under the Swab-its brand.

Foam swabs are a replacement for fuzzy cotton swabs that have a tendency to leave lint and fiber remnants during use, which may be a problem in precision applications. This is useful when applying solvents, adhesives, sealants, paint, lubricants, and other materials. Swab-its offers Star Chamber Cleaning Foam Swabs specifically designed for AR-15/M16/M4 and similar Modern Sporting Rifles based on the design.

These swabs feature wings that penetrate locking lugs to quickly and easily clean the internal diameter of the barrel extension. Each lint-free and fiberfree tip can be used multiple times and should outlast a similar priced bag of patches, mops, and felt pads. Like all Swab-its foam swabs, each tip is washable and reusable with degreasing soap and water or mineral spirits. The handles double as Empty Chamber Indicators (ECI) and are a yellow color as seen with NRA and CMP chamber flags.

Swab-its Bore-Tips and Bore-Whips come in major calibers and are threaded for standard cleaning rods. They compress as they enter the barrel and then expand into the rifling as they travel through the bore with a 360 degree tight bore fit. Swab-its Gun-tips are foam swabs designed to clean other parts of firearms. They come in assorted lengths, head sizes, and thickness with their own handles made of flexible polypropylene.

The 3-in-1 Swab-its Bore-Sticks are caliber-specific replacements for a rod, jag, and patch that come with their own handle. In addition to the current offerings, Swab-its is working on new caliber options as well as a Multi-Cal Bore-Whip. Ordering can be done from the company directly ([Swab-its.com](http://Swab-its.com)), or on eBay or Amazon.

## PISTOLS

# Improving The Walther P22

*Walther released this rimfire pistol in 2002 and it's been in continuous production since. Here's how to work on and improve the P22.*

BY DAVID W. MANNEY OCTOBER 2017

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The Walther P22 has some issues straight out of the box, however, with a little TLC this pistol can be a very fine shooter. A customer brought one into my shop right after deer hunting season complaining that he had never shot the gun after buying it and it remained on his desk for along time. The first time he put in a magazine to shoot it, it completely failed to fire, and he gave up on it. It sat for another year before he finally brought it to me.

I thought it was odd that someone would wait that long to try to shoot a brand new pistol and then wait again to have it fixed, but I guess there are those who can wait. Once I had a chance to look at this gun, I found the firing pin was leaving very light marks on the rim. After solving the firing problem, I went out on a very cold December morning and tested it. My repair worked and I told the customer to come and pick it up. He picked it up and left happy to try it out.

I didn't think any more The arrows point to the three surfaces to smooth out due to contact with breech block and slide. Below center: Smoothed out and lightly polished firing pin. of it until he came back in February. Apparently, he had just tried to shoot it with his wife and now it would not cycle properly. Despite it still being below freezing temperatures outside, it was 30 degrees warmer than during my successful test. What follows is what I had to do to get this pistol to operate reliably.

For disassembly of the gun, check out Chick Blood's "Disassembly and Reassembly of The Walther P22 Pistol" in the June 2009 issue. Firing Failures Lights strikes had me looking at the firing pin being too short as there is very little movement once the hammer hits it. Once the breech block was disassembled, I looked at the firing pin. There were very jagged edges along the outside were it had been stamp out. This was causing the firing pin to drag on the inside of the breech block.

To correct this, lay the firing pin down on 220 grit sandpaper and sand until a finger nail doesn't catch on the edge. I turned it over and lightly did the other side as well, finishing with 400 grit and sanding in the direction of the firing pin's movement. While I was at it, I also touched up the top and bottom where it make contact in the slide and breech block. With the firing pin and spring in the breech block, push it back and forth to feel if there is any drag.

You might have to touch up the slot that the firing pin moves in. The objective here is to make everything smooth while removing as little material as possible. Since you will have the breech block out, fix the extraction issue too. Jamming I had problems with both round nose and hollow points jamming. The feed ramp was not very smooth and I pulled the barrel of the gun and looked at it closely. Using a

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Top 2. The other edge that needs some work. Bottom ceramic stone, I smoothed out the ramp and tested the smoothness by sliding around up the ramp by hand, just like the gun is loading it. During this testing, the round would occasionally catch just before going in the chamber. The extractor cut had left a burr on the inside of the chamber. A .22 chamber ironing tool swaged the material out the chamber so that around would drop in nicely.

I also knocked off the sharp corners on the side of the ramp to allow the rim of the round to slip on by. Extraction/Feeding

There were two problems going on at the same time. The first was that the chamber was rough and holding on to the fired round. The second problem was the way the slide was catching on the hammer during cycling. Polishing the chamber with 600 grit sand paper superglued on to a wooden swab stick, making it into a flap wheel, worked well. A This surface needs to be sanded and polished. 2.

Round over this edge. Note how the hammer is only riding on the right side. quick and light touch was all that was necessary to make the chamber smooth. The second prob-

lem proved more complex. Put the gun together without the magazine, recoil spring, and guide. Pull the trigger and gently let the hammer down. Slowly pull back on the slide. As the hammer is fully cocked, you will feel the hammer catch. The same thing happens as it goes forward, sometimes stopping the slide completely.

The hammer is catching on the safety block and/or the breech block as the slide passes

## IMPROVING THE WALTHER P22 CONTINUED

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No need to remove the casting marks as they are below the surface the hammer rides on. across it. The problem is mostly in the design of the hammer. There are two flat surfaces that meet with a sharp corner that then catches on the junction of the safety block and breech block. With the hammer removed, use a flat surface or a sharpening

stone to radius the sharp junction of the two flat surfaces of the hammer that make contact within the slide.

It's also useful to radius the sharp edge where the hammer transits into the thump ridges. Just put a radius on them because if you take too much off, the hammer will no longer cock when the slide cycles. Once there is a radius, smooth out with 320 and 400 grit

sandpaper. Finally, polish with a ceramic stone. Take out the breech block and look at it. You should see where the breech block is riding on the hammer, possibly only on one side.

Lightly sand this with 400 grit and then polish, not trying to take all the marks out, just enough to make it smooth. Radius and polish the end that is in contact with the safe-

## IMPROVING THE WALTHER P22 CONTINUED

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ty block; just a small radius, so the hammer can pass by smoothly. Reassemble the gun and test the cycling of the slide against the hammer. It should be a lot smoother than it was before. Test by putting ten dummy rounds in the magazine and loading the gun. Pull the slide back and hold. Release and it should chamber the first round. Cycle all ten rounds through. More than likely it will not go completely forward until the magazine is almost empty. If so, the hammer still needs some work.

Glue some 400 grit sandpaper to a stick and use it like a finger nail file. Lightly sand the hammer in place on the gun and re-polish. Make sure the take down has not come back up, blocking the slide from going completely back. Test again. Repeat until all rounds will cycle. Other Items Since you will have the

gun torn down to work on, check these other items. The trigger bow has ears that engage in the slide.

Look at the bottom of the slide and check to see if there is any damage in the forward part of the recessed slope in the area of the breech block. This is where the ears on the trigger bow touch the slide. If the ears are sharp on the trigger bow there will be a dent on both sides where it has been hitting. Polish the ears so they are smooth and not sharp. I did this with 220 and 400 Second, on some guns the safety block is higher than the breech block.

This can interfere with the slide coming back and hanging up on the hammer. With the breech block in the slide, lay a straight edge on the breech block and push it towards the safety block. It should not touch the safety block when the safety is in the fire position.

If it does, grind down the safety block in the area where the hammer would hit it. Do this only in the fire position of the safety.

Reassembly Trick To make it easier to put the slide back on, compress the recoil spring on the guide rod and hold with your fingers. Insert the guide rod into the slide, holding the rod in place with your other hand, then let the spring go. Push the guide rod further in the slide and grip the guide rod on the outside of the slide. Then put the slide back on the frame. With the grit across both ears at the same time, and then followed with a stone.

Put a nice radius on them as this will help from doing any more damage to the slide. slide in position to drop down on the frame, hold the slide and frame with one hand. Push up on the guide rod and it will snap into place, allowing the slide to finish dropping down on the frame. AG

## HISTORY

# Sierra's New Match King

*Evaluating the second generation 90 grain .224 Match King bullet.*

BY JOE CARLOS OCTOBER 2017

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Sierra redesigned their 90 grain Match King boat tail bullet intended primarily for AR-15s used in Service, Match, and Palma rifle competition. This second generation corrects a decade-old design flaw. To understand how, let's look at Stoner's original design and how it evolved. Early AR-15s had a 1:14 twist designed for magazine-length 55 grain FMJs. Early reports from Viet Nam indicated the bullet turned sideways on impact, causing massive tissue damage.

Bear in mind that hot jungles were not the military's only concern given a possible threat of Russian invasion. One scenario involved an attack through Alaska 224 90 grain Match Boat Tails (left) had the word "THICK" boldly printed on the boxes to assure shooters that they were blow-up proof. The early 2005 failed Sierra design, the newer improved pointed Sierra, and the Berger Thick Jacket on the right. and Canada.

Bullets fired in subzero temperatures launch at lower velocity and some studies revealed stability reduction, so the twist rate was changed to 1:12. A forward bolt assist was added to address function issues caused by inappropriate gunpowder used in

early ammo manufacture. I carried an M14 during the first half of my Senior Trip to Viet Nam. We surrendered those old battle rifles and were issued M16s for the second half of my tour.

I had heard the reports of jams and felt uneasy about the substitution but kept my rifle reasonably clean and had no function issues. Knock on wood, or in the case of Viet Nam, bamboo! Later, the A2 was introduced. Designed to shoot a heavier and longer bullets, the twist rate was set at 1:7 with a NATO chamber which is sloppy and long to accommodate dirty battlefield conditions. Green tip ammo (NATO SS109/M855) is about the same overall length and fits standard magazines.

While lighter and shorter 55s will stabilize in either, the slower twists keyhole the heavier and longer bullets. Phase out of the older rifles was slow with reserve components with units holding onto A1s for years after active duty. Ammunition Supply Points had to inventory both bullets. As a Drill Sergeant, I was always relieved to draw the older M193 55s for qualifications. Even though 1:7 spun them twice as fast as necessary, the ammo proved more accurate than green tips.

Reserve components eventually switched and 55s slowly phased out. In addition to ammo, good shooting was also hampered by the A2's trigger design. The A1 had semi and full-auto and in Viet Nam this was frequently overused, mostly leading to misses beyond the confines of room distances and needlessly reloading too often. Replacing this with a three-round burst in the A2 added a cam to the trigger that looks more like a gear in a clock.

The result of this over-engineering is a trigger that feels and actually gauges different for each shot, making it difficult for even seasoned marksmen to adapt to. The A2 rear sight was redesigned to be more friendly to marksmanship. Smart guys, such as Army Marksmanship Unit gunsmiths and John Holliger from White Oak, further improved this. As a military firearms trainer I was concerned with the reasons for poor qualification stats.

Some suggested this was a societal problem with the new generation not growing up around firearms. Add a firearm/ammo combination with

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less-than-stellar accuracy in and the proficiency challenge increases. The military also shares the guilt and the Department of Defense places too much emphasis on testing and employing social theories instead of war fighting. I noticed this back when I was a Drill Sergeant and for the sake of our troops can only hope that things will change. The M16 replaced the M14 on the battlefield long before competitive shooters made the swap.

I remember vocal match shooters proclaiming the Mouse Gun would never outshoot the M14. Initially, I was one of them. Innovators at the Army Marksmanship Unit and civilians like Albert Turner and Frank White of Compass Lake Engineering found ways to improve the sights, take sling tension away from the barrel with float tubes, and install quality match barrels. Sierra and other makers did their part by offering more accurate bullets with higher ballistic coefficients to combat wind drift at longer distances.

The then-new 69 grain match bullets were normally seated to magazine length but could be seated longer to compensate for throat erosion in events allowing single feeding. Most folks wanted a match barrel with a decreased twist rate of 1:9 or 1:10 for shooting 69 grainers and similar match bullets of the era. While the 69 grain .224 bullets were an improvement, .30 caliber still held the wind advantage.

Once again, thank Sierra for coming up with their 77 grain Match King. Designed to be loaded to magazine length, it became

the standard for 200 and 300 yard rapid fire. Some magazine-length .308s are a little more wind efficient but come with higher recoil, which doesn't serve well in time constraints. Sierra's 80 grain Match King wasn't designed to fit a magazine and needs to be seated longer but this isn't an issue for slow fire.

Other manufacturers soon came up with bullets weighing between 73 and 82 grains attempting to duplicate Sierra's performance. These improved bullets brought the AR-15 up to equal accuracy performance against the heavier recoiling and more expensive .308 rounds. The longer, heavier AR bullets required twists of 1:7.7-1:8. With the possible exception of 1,000 yard shooting, 1:7 is too fast. Over-spun bullets exacerbate any imperfection and results in bigger groups with no improvements in any other aspect.

Some believed 80 grainers were as far as the diminutive .223 Remington case could support but another smart guy proved that wrong. Jimmy L. Knox, who used a Very Low Drag design for several competition bullets, came up with a high ballistic coefficient 90 grain .224 bullet in his JLK line. All 90 grain bullets must be seated long and hand fed. Just as the AMU had been one of the innovators in developing the AR-15, they initially jumped on this new bullet around 2004.

It wasn't long before one of their Mouse Gun shooters used this bullet to break a 1,000 yard Service Rifle record that I had set with an M14 and 180 grain handloads a

decade prior. General shooter interest perked up by a bunch with that accomplishment! Berger added a VLD 90 to their inventory. VLD bullets require a high maintenance process called "chasing the throat" where constant throat measurement is needed to make adjustments to bullet seating depth.

Most shooters prefer to a boat tail bullet that can be seated to the same depth for an entire season rather than measure and likely make adjustments more often. As a military team armorer I found chasing the throat made VLDs a nightmare. Sierra came out with a 90 grain Match King in 2005 and many of us jumped on the green bandwagon. The bullet was hard to get initially and I finally had a supply and began load development in early 2006.

Using Sierra's recommended muzzle velocity of 2,650 fps for 1,000 yard reliability, I began working up to that target speed with across section of the only barrels then available in the recommended 1:6.5 twist. All of my barrels had Wylde chambers which allowed safely exceeding the scant loading data that was available for 90s at the time.

By the second range session I was safely approaching the 2,650 fps in virgin Lake City brass with factory crimped primers, but I began losing bullets at about 200 yards down range due to jacket separations causing them to blow up in a little puff of smoke. I contacted Sierra and they still credit me as the first reliable source of blow ups with the original 90. Soon after almost everyone

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Top Bottom trying the bullet suffered the same fate. Even worse, too many got the facts confused and wrongly thought all 90s were prone to blowing up. This misconception put the brakes on shooters wanting to try 90s and was compounded by Sierra leaving that original 2005 bullet design on the market for nearly a decade in its known-flawed condition. For the next couple of years after my initial failures, I experimented with every bore design I could.

I originally thought gain twist would cure this but couldn't find a source for barrels at the time. I tried 5R, polygonal, even and odd-numbered grooves, as well as cut and button rifling. No cure. Sierra told me later that most reported blow ups occurred with Krieger barrels. Having a taller 0.218" land, these likely constricted the bullet and raised pressure. Accuracy with other .22 caliber bullets is stellar with Krieger's design.

Early on, I sat down with Krieger's plant manager about these bullet blow ups but he was reluctant to change the land. Instead, he offered to deepen the groove from the industry standard of 0.2240 to 0.2245", assuring me this wouldn't sacrifice accuracy or longevity while being easier on the fragile Sierras. The modification cut blow ups in half with no accuracy degradation but even one blow up is the kiss of death in a match. The AMU was also aware of the 90 grain problems.

The JLK line that had been so successful for them sold to Swampworks and there was a temporary lapse in production while the

equipment was being moved and set back up. Instead of teaching their shooters to chase their throats, the AMU assigned their tech support to track of all the guns and keep up with the constantly-changing throat erosion. This had to be an enormous task and likely the reason they mostly confined 90s for 1,000 yards.

This high VLD maintenance proved burdensome and the AMU abandoned their 90 grain loads. This was around the time the general shooting public was being confused about which brands were really blowing up and why. Having the prestigious AMU drop 90s sent a message that was misinterpreted by many. Incidentally, I have never blown up a JLK or Berger 90 grain VLD. I approached Berger as they were already marketing a 90 grain VLD.

Like everyone, they had heard of Sierra's problems and they figured the market for a quality match 90 grain bullet was there. They sent our Team a pallet of them to test. Berger and I had agreed a thick jacket would be key and the first boxes of their new 90 had "THICK" clearly displayed. The first thing I did was torture test the new bullet in all the rifling designs that the Sierra had failed in. The deeper groove also cut pressures but this still didn't yield a Sierra-proof barrel.

Absolutely no blow ups and accuracy was great! The only issue I had with Berger's new bullet was it pressured more than the Sierra. Krieger already demonstrated groove depth helped with a taller land and both Krieger and Bartlein offered this op-

tion, one I use to this day. By this time Bartlein was also offering gain twist barrels. After much research I settled on a starting twist of 1:13 in front of a Wylde chamber progressively ending with 1:6.5 at the muzzle.

All of these contributed to lowered chamber pressures and great accuracy. The new 90 grain thick jackets were offered but sales were rather tepid because of the confusion about blow ups. Shooters with fresh 1:8 barrels were reluctant to switch to a 1:6.5 twist that 90s require, especially when the new Berger 90 wasn't yet vetted. The shooting community began to become reeducated to the benefits.

The Berger 90 boat tail with a ballistic coefficient 0.512 bucks wind with about 17% greater efficiency than the 80 grain SMK when loaded in a .223 Remington and arrives supersonic at 1,000 yards. Especially out of 20" Service Rifles, 80s are marginal there. Widespread 90 grain adoption was also hampered during the ammo buying frenzy a few years back, having Berger decide to furlough production of much of their line to focus only on back fill orders of their top sellers.

As a match-specific bullet, the 90s were temporarily halted. There was nothing wrong with these furloughed bullets and Berger still has the dies and equipment to tool back up for a run of their thick-jacket boat tails if sufficient demand warrants it. If you're a fan, let Berger know! Because of this, shooters lacked a reliable 90 grain bullet. Around the

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same time JLK was unable to obtain jackets for VLD and that bullet also went out of production. That left Berger's VLD 90 grain as the only option, along with its high maintenance throat chasing. Today's Situation I operate a Commercial Row store at Camp Perry during the CMP Service Rifle National Matches. During the 2016 event shooters mentioned they had heard Sierra finally fixed their 90 grain bullet, something I had urged them to do for years. I immediately reached out to Sierra, confirming the design change.

Having the new bullet in stock, I ordered a dealer drop shipment and was impressed. The bullet is factory pointed with a staggering 0.563 B. C., 24% more efficient than the 80, very high for a boat tail, and exceeding the Berger VLD. I've torture tested Sierra's second generation 90 and haven't yet had a single failure, including in the same barrels that routinely saw failures with the first generation design.

Accuracy is as good as the Berger 90 boat tail (I still have a supply.) Since then, I've performed load work ups with Berger and Sierra bullets for every gun I have built and provide a 20 round box of ammo with each bullet type when I ship completed uppers back to their owners. After performing their own tests, my customers are split on their preference. The Bartlein gain twist, Wylde chamber, 0.218x0.2245, 1:13-1:6.5 configuration that's perfect for Berger 90s works equally well with the new Sierra.

I am achieving muzzle velocities around 2,600 with both in 20" Service Rifle barrels, 2,700 fps in 26" Match Rifles, and 2,800 fps in 30"+ Palmas. All three barrel lengths keep the 90s supersonic to 1,000 yards and are about equal to .308s of similar barrel length, all for much less recoil and cost.

The Canadians realized this earlier than us and have been using the two Berger 90s for Palma for some time, mostly in bolt guns with 30" barrels. "A Mouse On Steroids" by Robert Pitcairn (Canadian Marksman Summer/Autumn 2012, [goo.gl/RTgTjm](http://goo.gl/RTgTjm)) and "Gain Twist Barrels For Palma" (American Gunsmith December 2016) discusses this but these were written before Sierra released their second generation design. Be careful when purchasing the new Sierra 90 at gun shows or from low volume dealers.

Both sources may have stocks of the older bullet. You can tell the difference in bullets by looking at the tips. The old bullet has a conventional open hollow point meplat and the new bullet is factory pointed. The only criticism that I can offer to Sierra regarding the new design is lack of active promotion, however, good word of mouth seems to be working in favor of the upgraded bullet and I am ordering more to meet demand.

Loading 90 SMKs There is nothing difficult about loading 90 boat tails, provided you can load 77s or 80s. You'll need to know some specifics about your chamber. When only using one bullet seated magazine

length, chamber selection is easy, as was the situation when 69 grainers were the only option. When shooters began using different bullets, things got more esoteric as chambers got longer.

A consequence of longer chambers is shorter barrel life as the freebore gets longer to accommodate seating heavier bullets out further. This forces a compromise between what works best for magazine-length ammo and longer cartridges. This makes freebores excessive at magazine length, jumping the bullet, degrading accuracy, and shortening barrel life. Some military shooting teams can afford rebarreling every couple thousand rounds but my team couldn't and most civilian competitors can't either.

Wylde chambers area good option for 77s and 90s. Most of my customers using Bartlein barrels are getting 3,000- 4,000 round lifespans when following proper cleaning practices. The only time I would use a longer chamber is in a dedicated long range gun only firing 90s. Knowing you have a Wylde chamber isn't enough. Properly bro- VV N140 (right) is recommended in 20-26" barrels with Wylde chambers. Slower burning N150 (left) is preferred in 30-32" Palma barrels with Palma chambers.

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ken in, this measures about 2.502" overall with a Berger 90 grain boat tail and about 2.461" with a Sierra 90 Match King. To know exactly, measure with an overall length gauge. The long body of the gauge can be used with many different calibers. A dummy cartridge insert attaches to the front and the bullet is inserted. The unit is run up into the chamber until the case shoulder is stopped.

Holding that position, the little knurled brass thumb screw at the back is loosened and the plunger is pushed forward, pressing the bullet into the throat. The thumb screw is tightened to lock in the reading. Carefully insert a cleaning rod down from the muzzle to push the gauge back out of the receiver. A caliper reading from the cartridge base to the ogive using a caliber-specific comparator gives the distance.

Repeat with nine different bullets of the same make for an average to four decimal places, subtract 0.005" and that's the initial target seating length. This results in rounds coming out of the die 0.005" shorter than the chamber (just a little more than the thickness of a sheet of paper) before encountering the throat. Fire test groups at this setting, lengthening or shortening in 0.002" increments between test groups to find a sweet spot.

Each barrel will have its own specific sweet spot, normally with a bullet jump between 0.000-0.010". This can't be predicted with-

out test firing. I perform this service for every rifle I build or rebarrel and the customer receives a 20 round box of ammo set to this spot. Done properly, you should be able to cut your final groups by about 20% using this technique. 90 grain SMK bullets are available in 50 and 500 count boxes.

Experiments have found VV N140 for 20" Service Rifle and 26" Match Rifle barrels works best and longer 30-32" barrels with Palma chambers (a Wylde with just under 1/10" additional freebore and a tighter neck) prefer slower burning N150. These powders give me the best accuracy and consistent velocity. I prefer cases with a lot of volume to accommodate heavy powder charges and factory crimped primers, such as Lake City or Wolf.

Winchester also makes a good .223 Remington cases with straight and concentric necks, though they don't offer crimped primers. With thicker brass like WCC or Lapua, cut powder charges by a half grain avoid excess pressure. Likewise, brass without the primer crimp require cutting powder. In Bartlein gain twist barrels with Wylde chambers and L. C. or Wolf brass with factory crimped primers, I am achieving my 2,600 fps in 20" barrels and 2,700 fps. in 26" barrels with 2 4 .1 grains of the N140.

Any deviation from this will raise pressures. In dedicated Palma barrels with longer Palma chambers this will probably

top out around 2,800 fps with 24.5 grains of N150. Caution: Always start well below a suggested powder charge and work up gradually while watching for signs of pressure, group size, and chronograph readings. Again, start well below this and work up gradually just as with the shorter barrels. Insure your ammo is straight by using competition dies and measure runout with a gauge.

The stellar Hornady Cartridge Straightening Tool is a gauge and can fix runout if concentricity is off. No gun will shoot crooked ammo well, so manage it! 90 Grain Future I often wonder what would have happened had Sierra corrected their design failure back in 2006. There was genuine interest in a reliable 90 grain boat tail. They claimed sales didn't justify improving it, but if they had it might have sparked demand. Further, customers shouldn't have had to purchase the bullet in its original, weak design.

I still believe had they redesigned this then, 90s would be favored over 80s now. Given this second generation, I think they will eventually do so. Competition bullet design always favors performance. The 80 grain SMK is about 31% more wind resistant than the then-popular 69 grainer it replaced at 600 yards. Shooters eagerly made the swap when the 80 was introduced, even though it required

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308 and .223 bullets blow in a full value two mph cross wind coming from left to right. The new 90 grain SMK would hit about 1/2" inboard (left) of the Berger. a faster twist rate. The new, second generation 90 grain SMK is about 24% more wind efficient than 80s, though it requires a faster twist. Is there any reason to think that shooters will forever ignore the obvious advantages? The 90 grain SMK is the next logical step in the evolution of Service Rifle shooting.

**Reasonable Expectations** While the 90 is about 24% more wind efficient than an 80 in an AR-15, it's imperative to have reasonable expectations. Switching to a 90s is not license to ignore conditions and let the bullet "wind proof" you. There's still the need to dope conditions and make proactive sight adjustments.

Talking with shooters trying these out, almost all of them recount instances where they studied current conditions during a string of fire, rolled into position with an appropriate sight adjustment, but had the wind change slightly as the shot was fired. Where shooters using 80s sometimes end up with a 9 in such cases, those with the 90s could still catch a 10. Best estimates is using a 90 buys you 2-3 points in twenty-round 600 yard string.

I confess this is my subjective estimate and not a scientific study, and that such a point gain will vary at any given match depending on conditions, but the improvement in ballistic coefficient is there. Concerning accuracy potential, comparing hundreds of 1:8 barrels shooting 80s to my current Bartlein gain twists, the two current 90 boat tails

shot 7.7% tighter ten-shot machine rest groups with about half as many fliers and those fliers were about half as severe as those with the 80s.

Is the 90 grain SMK the final chapter in bullet design for the Mouse Gun? I initially was one of those vocal M14 shooters thinking the AR would never equal the old brown gun. I was also one of those that thought we had topped out with the 80 grain SMK. Having to eat crow twice, I am reluctant to make many predictions. Back when I was working with Berger on developing a reliable 90 grainer with a thick jacket the first run came out at 93 grains.

This was just before Bartlein came out with gain twist barrels, so I declined the 93s and Berger thickened the jacket a little more. I think 600 and 1,000 yard events are well covered with 90s and I'd like to see manufacturers concentrate on a magazine-length bullet with a higher ballistic coefficient. There are at least two ways to approach this.

Factory pointing, such as what Sierra did successfully with their second generation This is different than using hand tools, such as the Reserve team tried as a failed experiment as the pointed bullets pressured up more, shot fatter groups, and didn't show any downrange improvements. I admit the team member doing the pointing was brand new to the process but so is everyone first trying it. The second approach is a polymer tip.

A number of bullet manufacturers offer these but my tests have found they aren't as accurate from machine rest as an hollow

point meplat. Sierra introduced an acetal resin-tipped 77 grain Match- King. While I haven't tested them, customers have told me they are not impressed with their accuracy. While shooter accounts to improved wind bucking, accuracy was lessened. Consider my two preferred 90 grain boat tails improved both ballistic coefficient and accuracy.

Also, these shooters admit their unstellar accuracy is possibly due to a load development issue as they simply used the same load up as with the open-tip 77s. Perhaps load adjustment will reveal a fix. If accuracy can be held, the tipped 77s have the same B. C. as the open tip 80 grain SMK, making it ideal for all rapid fire events. The CMP and NRA have since instituted rules allowing optics in Service Rifle and Match Rifle competition. Even before this ruling, competitors were using flat-top AR- 15s.

Given customers are modifying rifles to take advantage, upgrading barrels also makes sense. This would make switching to 90s ideal. I have been swamped with demand for flat tops and Bartlein gain twist barrels to shoot 90s. Bartlein reports on their website ([BartleinBarrels.com](http://BartleinBarrels.com)) a number of testimonials from top Service Rifle shooters using this combination to win at national and state level matches. Get your favorite gunsmith to build you one of these and add your picture to the list of winners!

**THERE HAS NEVER BEEN A BETTER TIME TO MAKE THE SWITCH. AG**

## MAINTENANCE &amp; REPAIR

# Changing And Regulating Glock Sights

*How to modify and set up sights for this popular service pistol.*

BY ROBERT K. CAMPBELL    OCTOBER 2017

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I have always shied away from making modifications to the action of service pistols, limiting work to necessary repairs, part replacement such as springs, and a little work with the grips. I stick with factory magazines for these guns. However, when it comes to Glock sights, I've been changing these since from my very first assignment to test and evaluate the Glock for a police department when the pistol was first introduced.

Perhaps the original sights were OK for a fast-and-dirty, close range sight picture but I wanted greater accuracy potential. After all, I wanted to see just what the pistol would do in testing. The first run of Glock .40 pistols did not exhibit what I felt was service-grade accuracy. Later developments and the addition of Novak sights resulted in a pistol that could be counted on for combat accuracy to 50 yards. To do so, replacing the sights is necessary.

Front sights on first generation Glocks weren't firmly attached and often drug off when drawing from hard shell holsters. Today, the front sight staking is much more secure but the screw and front post arrangement is superior. I have added Novak sights, the Warren Tactical—a great competition sight system—and others over the years and have enjoyed good results with each

when due consideration was given the purpose. Steel sights and self luminous sights are the best addition to the Glock and one of the easiest.

While I'm covering Glocks here, please note this also applies to the Springfield XD and Smith and Wesson Military and Police handguns, as well as some SIG pistols. It has given the author excellent utility. There are many types of sights and the end user must be certain of what he needs to accomplish. Some are interested in personal defense, others are primarily competition shooters. Each must make the decision based upon their own needs.

While sight installation is straightforward, dovetails do get damaged, sights are sometimes not quite the drop-in fit they should be, and tritium ampoules may broken by poor handling. The problem isn't usually the quality of the sights but the actions of amateurs that attempt to install the sights without proper tools. I have repaired and cleaned up more than a few such debacles during the past twenty years. Selecting the sights is easy enough. Brownells.com offers the popular versions.

## WHEN CHOOSING A NIGHT SIGHT AS

## CHANGING AND REGULATING GLOCK SIGHTS CONTINUED

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an example, the user may find that some, such as the Trijicon, require more effort to fit to the rear dovetail than others. Others, such as the XS Express Night Sight, slip easily into the dovetail and then tighten by means of a set screw. Either works properly if understood. Some have both a tight fit and a set screw. For a service pistol, tighter is better—within reason. Tools The tools are simple and not all of them are needed in every installation, but it's best to have them on hand.

A sight pusher is essential. I use the MGW Sight Mover from Brownells (584-045-017WB). This tool is a must have for plastic sights such as the Advantage Tactical and even the rugged, all-steel Battlehook sights with a Tritium insert. A hammer and punch just will not serve in this capacity! The slide

slips onto the stabilizing bar in the center of the tool and is then tightened by use of a thumbscrew. The tool works by concentration of force.

A tool for tightening the front set screw for Glock sights is usually supplied with the sights but not always. Good to keep such a tool on hand as these front sights are installed in the same manner, at least in all I have used. Other tools you must have on hand include a brass hammer for initial fitting, the front sight tool, a dowel with sandpaper wrapped around it in case the dovetail needs to be polished, and a cleaning and drying agent for use once the polish is done.

A set of pliers for the front sight in most cases and a punch in others may be required. There are several questions that must be asked of the shooter before the task begins. Some shooters purchase a Glock and replace the sights before the pistol is fired or proofed. That is OK if appropriate replacements are already identified but the pistol should be fired first to determine the zero and marked to give a good estimate of where to center the replacement sights. Note, this isn't a hard and fast rule.

As an example, the Battlehook sight (Battlehook.com), offer a much better sight picture than the Glock factory sight and you will be able to afford the user a much better zero. This may deviate zero from the factory sights and such a

## CHANGING AND REGULATING GLOCK SIGHTS CONTINUED

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A punch is needed to drive it out. mark should be used a starting place to adjust from as needed. Set the new sights on the frame atop the factory sights and mark the center of each. For removal, the original factory front sight is easy. This is among the few tasks that a simple pair of pliers proves useful. Grab the front post and pull. The sights will come out. Some later model Glock night sights are staked in but they're only slightly more difficult. Pad the slide and place it in a vise.

Use a punch and drive the front sight out by striking the sight from inside the slide. To remove the rear sight, use the MGW sight tool. With the slide field stripped, fit it into the guide on the Not difficult to correct but easier to go if done right in the first place. body of the MGW sight tool. The slide is centered

and the sight tool slowly cranked into position. Once certain the slide is centered in the jaws of the tool, tighten the slide clamp. Lubricate the main shaft of the sight tool before each use.

Twist the operating handle clockwise to turn right, counter clockwise for left, and remove the rear sight. Little pressure is demanded and the Glock rear sight is easily slipped away. The rear sight is usually usable again, in contrast to hammering with a brass punch which may damage the slide's finish as well. Prep the dovetail. This procedure takes but a few minutes but makes life easier. I make certain the dovetail cut is clean and free of corrosion before mounting the new sight.

Glock pistols don't usually corrode but I have noticed that some types of factory night sights do pick up corrosion. The dovetail is cleaned up, cleaned with alcohol, and allowed to dry before fitting the new rear sight. I have seen Loctite recommended but I do not use adhesive. In my experience the new sights are tightly fitted enough as issued, even the ones that slip in more loosely than others and are tightened with a set screw. After all, the sights may need adjustment for a different load at a later date.

Competition shooters may change the sights more often. The fit of most aftermarket sights is good and snug. A few tend to be tighter than others I've had to file and smooth the corner of a night sight for a proper fit on occasion. Note, I do not file

## CHANGING AND REGULATING GLOCK SIGHTS CONTINUED

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It tightens with set screws. the dovetail as that is a permanent modification. Filing the sight is an expedient. I take it slow and twist the tool easily, after all, it is easy to let some of the sights get out of track due to their design. Some require more effort than others. Be certain that the designs that require set screws are loosened before installation and tightened after the sights are in place. Also, be certain the Theoretically, the screw could work loose and be lost.

Sometimes, home-made tools in your own shop are best. end user is aware that they have to loosen set screws before the sights are adjusted. The front sight seems uncomplicated, however, there are cautions. In most cases the post or pinion holding the front

sight is a good solid fit but sometimes it isn't quite perfect. Each maker is a different story, or at least should be treated that way.

Once the old sight is knocked out or pulled out, check the slide window to be certain that there are no pieces of plastic left on the opening. I clean this area in the same manner as the rear sight. The new front sight is then carefully pressed into place. I have actually had front sights come into the shop that were cocked to one side or not fully seated. After changing a large number of sights—and if you work in a retail gun shop, night sights area steady item—you will note this as well.

The sight is pressed into place. The next step is to use a tool to tighten the tiny screw holding the front sight in place. If you area strong

guy and have fingers like bananas, this is tough! I am in between with average hands and the technique seems akin to neural surgery. I get good results by setting the screw in the tool and working from below. Most tools are just too deep or do not fit the screw well. A shop-made tool with a large nut for leverage is the best choice.

Changing Glock night sights is a common and profitable chore. My local shop tells me they haven't been able to order factory night sight Glocks for some time. This is temporary issue and the range of other Glock options should keep you busy. Even then, factory-installed night sights have a lifespan and will eventually need replacement. AG

## TOOLS &amp; FIXTURES

# New Gunsmith Items

BY PAUL MAZAN OCTOBER 2017

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After years of being the new products manager with the biggest supplier of gunsmithing tools in the world, looking for new products has become second nature to me. Now that I'm retired, I no longer call manufacturers looking for their new offerings or haunt SHOT Show booths or the armorer's trailers at Camp Perry looking for tools to put in the catalog. But old habits die hard and since I still shoot and work on guns, I remain on the lookout for tools that make my life easier.

I've recently come across three items I really like and think you will find useful. Wyoming Sight Drifter On a recent trip to Wyoming in search of an elusive Boone and Crockett record jackalope, a friend introduced me to a little ingenious tool called the Wyoming Sight Drifter.

This is one of those tools I looked at and thought, "Why didn't I think of that?" If you have ever been on the range sighting in an iron sighted rifle and needed to drift either the front or rear sight in its dovetail to adjust the point of impact, this little tool will transform your method of adjustment.

Previously, I took a brass punch and a light hammer to tap the sight—all while struggling to hold the barrel, position the punch,

and work the hammer, a process that re-Once I tried it I wondered why I hadn't thought of it myself. Easy to use, elegant, and effective. I no longer need to carry a hammer and brass punch to the range. quires four hands to do correctly. No more! With the Wyoming Sight Drifter there is no need for other tools.

The Drifter consists of two steel rods, one with a brass tip attached, connected by a moderately heavy spring. To move the sight, the brass tip is placed on the base of the sight and the rear steel rod is pulled back against spring pressure. Releasing the rear rod lets it fly forward, hitting the back of the front rod and transferring its energy through the rod and into the sight. The strength of the hit is controlled by how far you pull the rod back and can range from a light tap to a substantial blow.

I was sold on the tool the first time I used it. It is made in the USA and currently available directly from the manufacturer, Steve Anderson, who can be reached at He is a pleasure to talk to and is located at Cheyenne, WY 82007. The cost of the Wyoming Sight Drifter is \$32 plus \$5 ship-

ping. It is also currently listed on the Buffalo Arms Web Site, [BuffaloArms.com/wyoming-sight-drifter](http://BuffaloArms.com/wyoming-sight-drifter).

The Hy Skore Degreezer I received a pre-production sample of the new Hy Skore Degreezer from a fellow writer that has recently retired. This is a polypropylene copy of the traditional degreasing tanks you will find in auto repair shops and machine shops across the country with a couple of differences. First, the Degreezer is bench sized for the gunsmith or hobbyist. At approximately 11.25" long, 6.25" wide, and 4" high it is big enough for most gun parts and small enough to fit under your bench when not in use.

There is a small parts basket included and it has an angled surface to put the parts on to drain. Made of polypropylene, it is resistant to nearly every cleaner you might use, including acetone and mineral spirits. I normally use odorless mineral spirits to keep peace in the family because my shop is in the basement and my wife has a keen sense of smell. The top is pulled back against the spring and released. Anything from a light tap to a substantial whack can be delivered based on how far you stretch the spring.

## NEW GUNSMITH ITEMS CONTINUED

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Atop keeps debris out between uses, making this a handy item to have around your shop. Whether you just need to clean up a couple of greasy parts or need to soak years of old Cosmoline and dirt from a military relic of the 19th century, this little degreaser is a handy addition to your shop. It comes with the tank, parts basket, nylon brush, and cover that holds the brush and prevents solvent from picking up contaminants between uses.

At a suggested retail price of \$24.99 it is an affordable and handy Mini Bench Top Cut-Off Saw is a handy tool for reloaders that are forming brass for old guns from current brass. From left, a .30-06 case, a .30-06 case run through an 8x57mm Mauser die, and are-sized case cut to length on the saw with the extra piece from the neck. This saw works well with wood, plastic, or soft metals like brass. 30-06 case ready to be cut to length for use in the 8x57mm Mauser.

With similar fixtures made for the purpose, I can shorten plastic or paper shotgun cases for use in older shotguns with shorter chambers as well as brass shotgun shells to manufacture ammunition for the British Snider or

French Tabatiere. In addition to any shop. It should be available around the end of July 2017 from Hy Skore ([HySkore.com](http://HySkore.com)). Keep in mind that what I have is a pre-production sample and the final unit may differ slightly from my photos here. Drill Master Cut-Off Saw The Drill Master 2 in.

Mini Bench Top Cut-Off Saw, item #62136 and available at Harbor Freight ([Harbor-Freight.com](http://Harbor-Freight.com)), is not a new product to the market but a fellow shooter and gunsmith recommended it to me and I have found it extremely useful. If you have regular cutting chores around the shop or reloading bench, this little tool can cut not only your time but will also cut dowels, brass, and most any soft, small-size material. My primary interest with it is shortening brass cases to adapt them for old black powder rifles.

I have tried several methods of shortening currently-available cases to make brass for old guns with disappointing results. Cutting 24 gauge brass shotgun shells to 2" to make .577 Snider rounds, cutting 2 3/4" plastic shotgun shells for use in short 2 9/16" chambers found in old shotguns, or shortening

.30-06 cases to make into 8x57mm Mauser cases previously proved problematic. This little saw cuts them clean without crushing the case neck.

I build simple wooden jigs for each application and can produce case after case to exactly the right length that need nothing more than a quick deburring to be ready to load. Cutting dowels to fill in old screw holes or pieces of walnut to replace pieces that have broken off an old stock is fast, easy, and most importantly, square. It comes with an attached vise that is adjustable to make angle cuts. The blade is made of high-speed steel and is limited to softer materials like brass, plastic, and wood.

I found this little beauty on sale at Harbor Freight for \$34.99. As far as I'm concerned, it paid for itself the first day. As you might guess, being in the Harbor Freight store it is made in China if that is a consideration for you. I am always looking for new tools and ideas that will make gun work go faster and easier. When I find them I will share them with you. Have fun and be safe! AG

## PEOPLE &amp; COMPANIES

# Remington 141 Facelift

*Renovating Remington's classic pump-action rifle.*

BY PAUL MAZAN OCTOBER 2017

ORIGINAL PP. 19-20

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I love to work on guns that haven't crossed my path before. Recently, a customer brought a tired old Remington 141 into my shop that just begged to be worked on. I've never been a big fan of the pump action in any type of firearm but this one had the twin attraction of being a gun I had never worked on and chambered in .35 Remington, a caliber I have never used. Topped off by along-discontinued Balfour scope and Pachmayr mount, it was a combination I couldn't pass up.

Everything worked as it should but the old girl had definitely seen some time in the field and was pretty tired. There was light, scattered pitting on the receiver and barrel, bluing wear on the high spots, and the stock finish had seen better days. All in all, it was the perfect specimen for a bit of customizing and refinishing. The Model 141 followed on the heels of the Model 41 and is a sleeker, reli-

able, and handy rifle. It was manufactured from 1935- 1950 with the exception of the war years.

About 76,881 were made. One of the attractions of the gun is the pre-war craftsmanship. The action is smooth and reliable, and the fit of wood to metal is excellent. It is all steel and walnut, so it is attractive and parts rarely break or wear out. The pump action was produced to compete with lever action guns from Winchester and Marlin in an action type that many American hunters are well acquainted with.

What could be more natural for a hunter that grew up with a pump shotgun than to take to the deer woods with a rifle with the same type of action? Unlike the Winchester Model 94, a scope can be mounted on top of the action and its spiral magazine tube keeps the points of the bullets off the primers, allowing it to safely handle spitzer bullets with their higher retained velocity; something neither

the Winchester or Marlin lever guns can do safely. Customizing old guns is always a controversial subject.

Collectors want old guns left in the same configuration as they were when they left the factory and insist that any change decreases the value. Yet, at the same time well used and worn old guns are devalued because they are not in like-new condition. It sometimes seems that unless you keep the gun in its original box and unused it is devalued in the collector's eyes. To the average gun owner who rarely changes anything about his factory gun beyond adding a scope, all he really wants is a dead deer.

Worn bluing and dents in the wood are badges of honor that show the gun has been used. If he leaves it to his family after his hunting days are over, the person receiving it may want that old gun refinished to make it look new again in honor of his relative. Some will refinish the gun themselves but many look at the bluing and the dents and bring

## REMINGTON 141 FACELIFT CONTINUED

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*Original caption: Bottom: After checkering and refinishing the wood and rebluing the metal, the 141 took on a classic, custom look, is the kind of add-on sale that makes me a bit more money and gives the customer a sense of pride in a custom rifle unlike any of the thousands of the same model out there. In this case, the gun showed a lot of minor pitting on the action and barrel. The finish was worn in many places.*

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A cabinet rasp is used to the remove wood around the grip cap and make it stand proud of the bottom line of the stock. There should be no high or low spots. them in to have the job done. I keep pictures of previous jobs around to show new customers what can be done to customize the gun at a reasonable price, making it better looking as well as more functional while still honoring their loved one's memory.

## IT

I discussed some changes we could make to the stock and forend and the owner really liked the idea of having a "custom" gun with-

out the multi-thousand dollar price tag. I used the factory stock, added a pistol grip and grip cap, and checkered it before refinishing. The forend on this rifle is rather fat and round and has what I think is ugly grooving to keep the hand from slipping when wet or wearing snow-covered gloves.

I rasped the grooves off, then contoured the wood and checkered it in the same pattern as the butt stock. Before attempting any metal work the gun must be completely disassembled and detail cleaned. In most cases you'll find the gun hasn't be truly clean since it left the factory. Dirt and debris that is 50 to 75

years old will be found just where they were deposited all those hunting seasons ago. This is also the time to inspect the parts and deburr, repair, or replace any that are broken or show excessive wear.

The pitting was carefully buffed out of the barrel and receiver. Doing good metal work without wallowing out the screw holes, or rounding the edges, the barrel, and receiver is a learned skill and never easy. When first attempting to polish metal for rebluing, I strongly suggest using (Continued on page 23)

## REMINGTON 141 FACELIFT CONTINUED

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Always remember that nobody ever sees how long or how hard you worked on a project. All they see is the finished product. Be sure your finished product is one you can be proud of. Careful refinishing provided a cost-effective “custom” job for my customer’s Remington 141. AG emery cloth backed by a flat sanding block. The barrel can be done

with the emery cloth used in a shoeshine motion but flat surfaces and sharp edges cannot be maintained without a good, flat sanding block.

It is slow and tedious work requiring patience. Keep at it and you’ll get there. draw file to remove most of the metal that has to

go, then finish up with abrasive cloth. Either way, this is a time consuming task. The kiss of death for the beginning gunsmith is the buffing wheel. I’d bet you a cold adult beverage more guns have been ruined by electric sanders and buffers than rust. Patience is a virtue that I have very little of and I normally work flat surfaces with a

## HISTORY

# Restoring A Forearm

*Restoring a Snider with some judicious woodwork brought an old military rifle back to life.*

BY PAUL MAZAN OCTOBER 2017

ORIGINAL PP. 21-23

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One of the common problems with collecting and shooting old military rifles is undoing the work that has been done to them over the years. I found a wonderful old Snider on Gunbroker.com. Like so many of them, the barrel and forearm had been cut at some point in its history to make it handier and more suitable for some settler to use around his farm.

For those of you unfamiliar with the Snider, it is a conversion of the 1853 English Enfield from a muzzleloader to a single-shot black powder cartridge gun along the same lines as the Trapdoor Springfield. However, rather than putting in a trap door that opens forward, the Snider opens to the right side. The

cartridge is .577 Snider and it can be loaded with the same .58 caliber Minié ball that was used in the gun when it was a muzzle loader.

The Snider was originally Holes are drilled oversized so the alignment of the extension can be adjusted. available in three primary barrel lengths. The three-band Enfield or long rifle has a 36.5" barrel. The twoband or short rifle has a 30.5" barrel, and the Cavalry Carbine has a single barrel band with a 19.5" barrel. Brass for the .577 Snider is available from Track of the Wolf (Track-OfTheWolf.com, or Buffalo Arms (Buffalo-Arms.com, at about \$4.10 per case.

As an alternative, Gunbroker. com lists 24 gauge shotgun hulls for about \$16.00 for 25. You will have to shorten the plastic shotgun hulls and they are generally not reloadable

but they do provide a less expensive way to load for a Snider. These instructions will, of course, apply to any military rifle that's had its forend cut off. I'm simply using this Snider as an example.

In my case, there was still enough barrel left to shorten it to the correct length for a two-band short rifle but I had to do something about the forend. There are a couple of methods of adding wood to the front of the stock and the method used is dictated by your ability to find matching wood and fit it so the splice is as invisible as possible.

I am not very good at finding walnut that matches the color and grain pattern of European walnut stocks so the method I chose was to do what is known as a "barracks bag cut".

## RESTORING A FOREARM CONTINUED

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For those of you sheltered youngsters who never heard of a barracks bag cut, let me explain. Back in the bad old days when soldiers were returning home from foreign shores, they would allegedly hide souvenir firearms in their barracks bag with their clothing stuffed around the gun so it was undetectable. With a handgun or two, this wasn't a problem but along gun was generally longer than the bag. To solve this, ingenious GIs would reportedly remove the barreled action from the stock and then cut the stock in two.

Repeat this step over and over until the barrel is fully inletted. Repeat with the ramrod/cleaning rod. The forearm extension is reduced again at the forward barrel band to the size of the forearm tip. To keep the cut

from being seen after the gun was reassembled at home, he would place the cut under the rear barrel band so it was covered when the gun was assembled. Now we all know no American GI would ever smuggle in an unauthorized firearm so let's just say this is a legend rather than a fact.

If you buy that, please write me as I have a toll bridge for sale I'm certain you'd be interested in. With the tip of the stock cut off under the rear band, I bought a piece of 2x2 poplar and attached it to the forend in the same way I have shown how to repair broken stocks in previous articles. I have found that poplar takes walnut stain well and if I refinish the stock and stain the two together, I can come much closer to matching the color.

I drilled oversized holes in both the stock and the piece of poplar, placing pins in the two smaller holes and a piece of all thread rod in the larger hole. The holes were then filled with Brownells Acraglas Gel and clamped together for 24 hours to properly set. Up to this point the job has been easy. Now the work begins. The new extended forend has to be inlet for the barrel and the ramrod groove, then contoured to match the forend stub glued it to.

A great gauge for contouring the profile of the forend is the barrel band. It has to slide all the way down the forend. Using it as a test gauge shows where to remove wood. Inletting of the barrel and ramrod groove is time consuming and I

## RESTORING A FOREARM CONTINUED

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start by drawing a centerline down the top of the stock and cutting a groove down it. Then by blackening the barrel either with soot or inletting black and pushing the band down into the channel marks where wood needs to be removed. You can hog out a lot of wood at first but go slowly and carefully as you get closer to the final stages. That barrel will be

in and out of the stock literally hundreds of times. If you Top After finishing, it should be undetectable. Bottom are like me, the temptation is to get it done.

Resist the urge and go slow. Scrape small amounts of wood out until the barrel sits in the forend perfectly. Parts such as the forearm tip, upper band, and sights that might be

needed to complete the project are available from S&S Firearms (SS- Firearms.com, With the hard work done all that is left is to sand, stain, and finish the stock for reassembly. Now comes the fun part! You get to take your rifle out to the range and see if you have done a good enough job that everyone thinks it is all original. AG

## METALWORKING

## Reader Forum

BY AMERICAN GUNSMITH EDITORS OCTOBER 2017

ORIGINAL PP. 24

**W**inchester 70 Safety Lock I have a Post-'64 push-feed Winchester Model 70 chambered in .264 Winchester Magnum with a safety lock that will not stay in the breech bolt when under pressure from the striker spring when assembled. This particular rifle has the breech bolt with a firing pin sleeve to retain the striker and a breech bolt sleeve cap to hold the assembly together. There is no firing pin lock screw on this rifle's breech bolt assembly and the faulty safety has three detents.

So far, I haven't been able to locate a safe and functional replacement. I have come up with "factory" replacement safeties from Midwest Gun Works, Inc (MidWest-GunWorks.com, that have two detents but they do not fit the bolt correctly and would appear to warrant modification and fitting. I have replaced the plunger/spring and safety lock pins filling to the original safety lock for correct function only to have the safety pop out of the bolt recess when moving from position to position.

Can I use a factory-correct Winchester two-detent safety lock and fit it to the breech bolt and have it function safely? With my research efforts of available schematics, do I possibly have a fabricated/incorrect bolt that was made to function in this rifle? John Paton Crawford Country Gunsmithing Your rifle, we fear, was made during a period when off-shore interests were in a fierce race to acquire US-based companies, milk them dry, and then abruptly cut them loose. Winchester was among them.

Almost without exception, product quality of the acquired companies lessened. We know of several veteran Pre-'64 Winchesterwise gunsmiths who were deeply shocked and angered at what was presented to them as "a Winchester" for repair. This respondent recalls an incident involving a Model 94 with a bright purple—not blue—receiver. The gunsmith expected the color could be removed in the refinishing. It was, but the receiver could not (or refused) to accept rebluing, including hot bluing.

The fault, it turned out, lay in the composition of the metal and not the bluing salts or bluing practitioner. Thank goodness that the corporate ghost of the man for whom the American company named itself—Browning—eventually brought Winchester home and "The Rifleman's Rifle" soared back to regain its Pre-'64 reputation.

In your case, your problem may be rooted in the past milking process or because it was disassembled and improperly reassembled by an earlier owner, who may have lost a couple of parts in the doing. Since the safety appears to be questionable, keep the serial number at hand and call the Browning/Winchester customer service department at Hopefully, what damage has been done can be reasonably undone.

Remington 514 For those working on this rifle, the 1980 version of Firearms Assembly 3: The NRA Guide to Rifles and Shotguns has a page and two-thirds on it. Numrich Gun Parts Corporation had the extractor, plunger, and spring in stock at reasonable prices when I dealt with a 514 that wouldn't extract. Turns out replacing those parts didn't solve the problem. I got significant improvement by cleaning the chamber down to "eating clean" and then adding a dab of sewing machine oil.

Check the chamber under magnification for any peening from dry firing. Brownells lists the Tom Menck .22 Chamber Ironing Tool that swages out burrs in rimfire chambers caused by dry firing. Best of luck. Mike Roca Thanks for the info! Marlin 1894M Rebuild I have most of the parts for a Marlin 1894M that I would like to make complete. Searches at the usual parts sellers have come up empty and the parts I need seem unavailable. Where can I have parts made? Lowell Fitch "Make them?" Not without factory blueprints.

But the complimentary Gun Parts Source List from Brownells goes beyond "usual" sources. AG

## SEARCHABLE ISSUE RECORD

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