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INSIDE THE ARCHIVE

GAIN TWIST BARRELS FOR PALMA

NAVY SEAL SHOOTING • SCCY HANDGUNS • MAKING 'SMITHING TOOLS • NEW MODEL 1911 TRIGGER JOBS

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 156

DIGITAL ARCHIVE EDITION

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FROM THE ARCHIVE

Navy SEAL Shooting

BY AMERICAN GUNSMITH EDITORS DECEMBER 2016

ORIGINAL PP. 2

Chris Sajnog is a retired Navy SEAL, completing active duty in 2009. In addition to his normal duties, Sajnog was a Navy SEAL Master Firearms Instructor and developed curriculum for the SEAL's sniper program. Since retiring, he has been training in the public sector, teaching civilians and law enforcement officers.

In Navy SEAL Shooting, Sajnog details his training ideas. "I've trained the world's deadliest snipers, and I can tell you this: Navy SEALs are just regular people with a unique set of talents," says Sajnog. "I had never even fired a gun until I joined the military." His approach is mastery of fundamentals. The skills of shooting—whether in combat, competition, hunting, or personal protection—are largely the same and all good marksmen learn them in the same fashion.

Up through page 110 the book covers useful preparatory information, such as mindset, fitness, goal setting, and the like. This is broken up into two sections, Training and Mindset. Section three runs pages 111-212 and is on marksmanship specifics. Section four, Operations, covers gun handling in a variety of environments. The book wraps up with two appendices on shot error diagnosis and ballistics information for zeroing.

Topics covered include improving accuracy with dry and live range drills, developing speed, shooting while moving, and clearing malfunctions. Dry practice and training principles are covered. "High speed" shooting is really essential marksmanship techniques developed by consistent, disciplined, organized practice. Shooting better is a matter of breaking down the mechanics behind shooting and maintaining the mindset to develop fundamentals. It's all very boring, actually. But that's good.

Like it or not, developing topflight skills in anything requires disciplined repetition and adherence to the basics. It's fairly simple, just not easy. Sajnog is wise in promoting this with his SEAL background as that seems to attract more gun owners than the competitions where the vast majority of this technique and training methodology was first developed. Navy SEAL Shooting is a very thorough break down of these principles and Sajnog does a good job covering a vast array of practical carbine and handgun skills.

Clearly illustrated with good photography and visuals, this is a solid manual for anyone wishing to be a better shooter—provided they actually bother to do the work. The book is listed on Amazon.com and available direct from the author at NavySEALshooting.com.

PISTOLS

SCCY Handguns

An overview of the SCCY CPX1 and CPX2.

BY DAVID W. MANNEY DECEMBER 2016

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The SCCY CPX1 and CPX2 are the same handgun except the CPX1 has a safety on it. Both are double action only. From all the reviews I have read on these guns and from working on them, they are very well made and well worth the price. I have tried out both versions and could not get them to jam on ammo, even while shooting some lousy stuff, just to get rid of it. These pistols also come with a custom trigger lock that fits this gun only. For field stripping, don safety glasses and check to make sure it is unloaded.

Put the safety on (Model CPX1), rack the slide back and lock it back. Drop out the magazine. Make sure there are no rounds left in the chamber. Using a flat-tipped screwdriver, gently pry out the disassembly pin located on the left in front of the slide lock. Pull back on the slide and the slide lock will drop, allowing the slide to come off the frame to the front. The recoil spring assembly is removed by pulling back on the section against the barrel. This releases the barrel.

This is all the disassembly needed for cleaning. We'll begin with the slide for detailed disassembly. Using a roll pin punch,

drive the roll pin down from the top until the extractor is released. The extractor and the spring can then be removed. Holding the slide with the extractor slot down, push in on the firing pin. You might have to shake the slide to get the firing pin retainer to drop out. With this out, the firing pin and firing pin spring will come out the back of the slide.

The front sight is staked in place and the rear sight is held in place with a 1/16" hex screw. Only if it's necessary to remove, mark the location first. I use a piece of tape in the dovetail on one side. Before taking the frame apart, I made a simple tool. Using a piece of 3/8" x 1/8" flat stock approximately 8" long, bend one end 1/2" back into a 90 degree angle and the cut a 1/16" wide slot lengthwise. This will allow removal of the end cap.

Using the tool, slip it into the magazine well and the hammer spring will what SCCY calls the receiver. Remove the magazine release spring by running a small flat tip screwdriver down the right side of the spring. Pry the spring sideways then towards the rear to release. Lift it up out of the frame. The magazine release button

then pushes out to the right. On to the SCCY receiver. On the CPX1, remove the screw on the left safety lever and gently pry the lever off.

There is a brass plunger and spring under the safety lever. Make sure to catch this. Push down on the trigger bar and remove the rest of the safety lever out to the right side. The hammer axis pin is hollow for the safety plunger and spring. Push the roll pin holding the hammer spring to the end cap out enough to release the hammer spring. Remove the end cap off the spring. Push down the trigger bar to gain access to the hammer axis pin and push out with a small punch. This is a slip fit pin.

The hammer and spring will now come out through the top of the receiver. Remove the slide hold lever by lifting off the trigger cam. go into the slot. Pull the cap up and off the frame, thus releasing the hammer spring tension. Drive the two frame pins out to the left. This will release the trigger group or

SCCY HANDGUNS CONTINUED

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The slide spring is removed by using a pair of needle nose pliers and squeezing the legs together and pulling it rearward. Lift the trigger bar out from the opposite end of the trigger, unhook from the trigger spring, and lift off of the trigger cam. Drive the trigger cam out to the right. The trigger spring is held in place by a very small pin that will fall out once the cam is removed. The ejector is held in place by another roll pin.

Unless you have to replace it, leave this alone. 1 Extractor Pin 2 Extractor 3 Extractor Spring 4 Firing Pin Retainer 5 Slide 6 Firing Pin and Spring 7 Hammer and Spring 8 Hammer Axis Pin 9/10Frame Pins 11 Frame Above center: Receiver disassembled.

For the magazine, push in on the button on the bottom and slide the 12 Barrel 13 Trigger Bar 14 Trigger Spring 15 Recoil Spring Sub

Assembly 16 Trigger Spring Pin 17 Trigger Cam 19 Slide Hold 20 Magazine 21 Slide Hold Spring SCCY CPX1 (Specifications subject to change without notice) 22 Trigger 23 End Cap and Pin 24 Disassembly Pin 25 Magazine Release Spring 26 Magazine Release CPX1 Safety Group 28 Left Safety Lever 29 Right Safety Lever 30 Safety Lever Plunger and Spring magazine pad off.

The spring and follower will come out the bottom. For reassembly, start with the slide. When replacing the firing pin, place the slide with the extractor slot up. Insert the firing pin with the cut out section up along with the spring. Drop the firing pin retainer in the hole. Push the firing pin into place and the retainer will drop down and hold it in place. On to the frame. When putting the magazine

release back in, make sure the tail of the long leg of the spring goes into the hole of the magazine release.

Use a screwdriver tip to push the short hook under the frame slot. For the SCCY receiver, hold the trigger cam with the leg at 2 o'clock, insert the trigger spring and let the leg hang down. Put in the pin, rotate the leg counter clockwise, and hook on the tab for the trigger bar. Assemble the trigger in the pulled position and insert the cam so it lines up with the front of the cut out. The cam is square so it will line itself up going in.

Make sure to drive the cam all down or it will hang on the inside of the frame. Put the receiver back into the frame and use the tool to hook the end cap in place before inserting the frame pins. AG

FROM THE ARCHIVE

Gain Twist Barrels For Palma

BY JOE CARLOS DECEMBER 2016

ORIGINAL PP. 5-11

The first Palma Trophy Match was held on September 13- 14, 1876 at Creedmoor Range, Long Island, New York with competing teams from Australia, Canada, Ireland, Scotland, and the United States. Since then, 27 official competitions have been held, along with three unofficial events, with the U. S Team winning 13, including that first one. Over the years, Teams from about two dozen countries have participated.

The PALMA Council is the international ruling body and consists of one representative from each qualifying country.

As written by this council, these events are dedicated “to sustain in its finest tradition the superb competition in long range rifle marksmanship, which since 1876 has engendered mutual understanding and friendship, warm goodwill, and above all good sportsmanship among marksmen.” Established in 1874, the Palma is a historic course of fire and has a certain rhythm with increasing difficulty as the event progresses with limited chances to make up for a poor shot.

Where many Long Range competitions are held at a single distance, commonly 1,000 yards, a complete Palma match begins with unlimited sighters followed by 15 record rounds at 800 yards, then two sighters and 15 record rounds at 900, then again at 1,000 yards. Within the United States, most Palma and other Long Range matches are held under the auspices of the National Rifle Association.

American Palma shooters using NRA rules can effectively ignore the international Fullbore rules and shoot any .223

Remington/5.56 or .308 Winchester/7.62 iron-sighted rifles they choose with any bullet weight. International Target Rifle rules are more stringent, requiring a minimum trigger pull weight and .308/7.62mm cartridges using bullet weights of less than 156 grains or .223/5.56 with a maximum permitted bullet weight of less than 81 grains.

Palma shooting largely levels the playing field as everyone is forced to use less-than-optimum cartridges for the distances. This is an excellent way for people interested in precision long range shooting to develop wind reading skills. You will learn more about wind reading by shooting Palma matches, or a Palma rifle in long-range matches, than any other type of High Power or Fullbore match. In some circles, 90 grain bullets in .223 Remington have been gaining popularity for Palma shooting where allowed.

Hopefully this article will give you some ideas how to get more velocity and greater accuracy from your 90s, regardless if you choose boat tails or Very Low Drag profile. Gain twist barrels will work equally well when mounted on bolt guns or gas guns. I suggest reading Robert Pitcairn’s “A Mouse On Steroids” that appeared in the Summer/Autumn 2012 issue of Canadian Marksman, available free at DCRA.ca/marksman.php.

Pitcairn’s article approaches the use of 90s in bolt guns with uniform 1: 6.5" twists and contains valuable information on loads. My two-part article “Revisiting Gain Twist” in American Gunsmith November and December 2013 issues gets more into

the history of gain twist, its use in rifles, pistols, blackpowder, as well as military applications. Decreased barrel heating, throat erosion, bore fouling, and other advantages are also covered in a greater depth.

Though this goes into theories of why gain twist barrels seem to shoot so well, I did not cover gain twist for Palma. Gain twist is not new. It has been around for at least a century and a quarter. I’ve been using gain twist barrels since the late 1980s and have about a quarter century of experience with them. It was an incident that happened in Australia that prompted my first interest. As a member of the U. S.

Army Reserve Shooting Team, we were competing at Puckapunyal with other military shooting teams using our issue M16s. Our Australian hosts furnished their version of NATO SS109 62 grain 5.56mm ammo on that warm day, simply dumping a pallet of it on the ground uncovered. As the day grew hotter nearly all shooters, except the Ausies, started blowing primers. Contrary to intuition, our rifles were operating sluggishly, a U. S.

National Guard shooter blew an extractor, and one of the South Africans actually blew up a rifle. The Australians seemed to be about the only ones that were immune and claimed our chambers were too tight, despite issue barrels having anything but “tight” chambers. The Thales F88, the Steyr AUG licensed and made in Australia for the Australian Defence Force, is a bullpup that operates with a piston

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56mm military ammo blew primers on hot days. Gain twist barrels will help to lower chamber pressures, promoting primer retention. and has 1:9 twist barrels instead of 1:7 more common in other NATO issue rifles. As this was well before 9/11, I was able to procure a small quantity of their ammo for the trip home. I made contact with the Lake City Army Ammunition Plant and they were actually anxious to analyze it.

I shipped it to them and before long I had a report that said that the Australian ammo exceeded the chamber pressure recommended for the M16. The burn characteristics of whatever powder they used, however, caused the gas port pressures in our M16s to operate below specification, accounting for the sluggish operation of our rifles. Not wishing to experience such frustrations and safety dangers again, I analyzed my firearms options for future years.

I felt certain that the faster 1:7 twist of our M16 was a major contributor to our pressure issues. I considered 1:9 barrels and instead opted for two gain twist barrels. One began at a 1:11 twist in front of the NATO chamber and ended at 1:9 at the muzzle, and the other was a more aggressive 1:20 in front of the chamber to 1:10 at the muzzle. In other words, it effectively doubled twist rate in the span of a 14.5" M4 carbine barrel.

When the barrels were installed and I was ready to zero at distance, I used issue M855 62 grain, the closest I had to Australian issue, at 600 yards. U. S. green tip ammo has rightfully earned a reputation for being inaccurate. Despite this, my pit puller radioed back after my first group asking if I had substituted a match rifle with match ammo! The improved accuracy was an unexpected bonus, but how did the gain twist deal with the pressure of Australian issue ammo? I never got to find out.

Shortly after, the Reserve Shooting Team fell on hard financial times and hasn't been back to Australia since. I kept those two uppers in the gun safe for years hoping the team would get better funding. As it never happened, I sold one for a fraction of the amount I had in it. I still have the other one. Make me an offer I can't refuse... Gain twist, also known as progressive rifling, hints at how it works. We choose rifling twist rates based on what bullets we intend to shoot.

Long bullets have to be spun faster to stabilize than shorter bullets. When Stoner first designed the AR-15 he used a very practical twist rate of one bullet revolution in every 14 inches of barrel to stabilize the short 55 grain bullets of the Viet Nam era, written 1:14 and resulting in roughly 160,000 RPMs. Now we are shooting much longer 90 grain bullets requiring a much faster 1:6.5 twist with RPMs exceeding 300,000.

As far as the bullet stability in flight is concerned, the only twist rate that matters is that right at the muzzle. There is no need to start rotating a heavier, longer bullet at 300,000 RPM's way back near the chamber. In fact, there are very good reasons not to do that. Gain twist barrels start rotating the bullet slower at the chamber and pick up the twist rate uniformly as the bullet approaches the critical twist rate at the muzzle. I have already given examples of gain twist rates I've used in M4 barrels.

In 20" Service Rifle barrels I typically use 1:13 at the Wylde chamber and terminate at 1:6.5 at the muzzle. In 26" Match Rifle barrels I use 1:14 to 1:6.8. This allows about 2,600 fps of muzzle velocity with the 20" barrels and about 2,700 fps with the 26" barrels using Berger 90 grain Boat Tail Match bullets and easily hold a supersonic velocity to 1,000 yards. Both gain twist barrels also shoot magazine-length 77 grain bullets just fine as well.

It is one thing to acknowledge intellectually how the twist rate changes along the length of the barrel but I needed to physically see it. I had a 20" AR-15 Service Rifle length barrel split in half length wise to show my customers. Visit me at Camp Perry on Commercial Row, Building 910-Ain July during the Service Rifle National Matches. I have a big banner with the Bartlein Barrel logo outside. Unfortunately, I am only there during CMP week and I leave before the Long Range matches begin.

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I start my 32" Palma barrels at 1:23 in front of a dedicated Palma chamber which is about 1/10" longer than a standard Wylde dimension. For 30" barrels my beginning twist rate is 1:21". Both have a final twist of 1:6.8 at the muzzle. There are two good sources of gain twist barrel blanks for Palma. Bartlein Barrels Bartlein Barrels.com offers single point cut rifling in both 5R and 4 groove.

I prefer the 5R but it is a little more susceptible to cleaning rod damage and for those shooting gas guns, a land will always be cut or severed when the gas port is drilled. I don't know that cutting a land with the port necessarily causes any permanent accuracy harm to the barrel but it does make the break in process very difficult. Usually you'll see a heavy streak of copper fouling just forward of the port and about the same width, with the streak going from the port forward about two inches.

It is very difficult to get all that copper out between break-in shots but is absolutely critical that every bit of it be removed between shots in order to get a good break in. If you fail to do it right the barrel may copper there for the rest of its life and that can contribute to poor accuracy. I covered this in my October 2014 article, "Gas Gun Barrel Break In".

The groove width of the 4 groove Bartlein gain twist is wide enough to contain a gas port without cutting a land provided the gunsmith knows how to locate the port to center it in a groove. Drilling haphazardly unlikely will. Compass Lake Engineering CompassLake.com turns and chambers my

blanks for me. Having built a fixture for this, they are pretty good at centering gas ports. Bartlein barrels are available in both chrome-moly and stainless. I recommend the former.

The second source of rifle gain twist blanks is RKS Enterprises (Box 635, Wimborne, Alberta, TOM2GO (Canada), Like Bartlein, they use a single point cut rifling process and their barrels shoot every bit as accurately. RKS barrels are all 6 groove, so gas ports will cut a land. Ron Smith, the owner, says a finished length of 30" is as long as he can go. Both steel types are available but their stainless seems to shoot better. The price difference between the two companies is nearly break even.

RKS can give you the same twist rate gains that I have recommended. When you purchase a blank from either company, specify what twist you want in front of the chamber and the final twist at the muzzle. Bartlein normally makes their blanks about an inch over the desired finished length, with a half inch taken off either end during machining.

Most .223 Remington match chambers occupy about two inches before the rifling begins, so it's important to call the manufacturer and discuss your project with a technical representative so you end up getting the twists you want where you need them. You also need to have a conversation with the machinist that will be turning and chambering your blank.

Most will want to make a final shallow lathe cut to true the outside dimension of the blank, so the blank must be slightly fatter

than the final diameter and you need to convey that to them. Regardless of which source you choose to purchase your barrel blank from, there are two internal dimensions you need to specify. The first has to do with the land height. The standard .22 caliber centerfire land height is 0.219" with a taller 0.218" available from both barrel makers.

Every bullet I've ever shot out of an AR-15 performed better with the 0.218" land and the 90 grain is no exception. Though this causes additional constriction resulting in increased pressure, the slow gain twist at the front of the chamber compensates. The accuracy improvement is key to getting the tightest groups possible. Groove depth is the other critical dimension to specify. The standard groove depth for a .22 centerfire is 0.2240".

Through years of extensive research I have found that a slightly deeper groove depth of 0.2245" improves accuracy and reduces fliers when using 90 grain bullets. Cutting the groove that half-thousandth deeper has the added benefit of lowering pressures. With taller lands and a deeper grooves, pressure ends up being almost identical to standard 0.219" x 0.2240" dimensions but there is no comparison with regard to accuracy!

Concerning reduced pressures, when powder begins to burn and build up gas pressure to eventually force the bullet forward, the inertia of the resting bullet also has to be overcome and rotated several hundred thousand revolutions per min-

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ute. Because we don't have to do that immediately, starting with a slow twist just in front of the chamber can get that bullet to begin rotation easier and with less pressure. I am able to load about 0.3-0.5 grains more powder, yielding 30-50 fps more muzzle velocity. Cartridges with more powder capacity than the wimpy .223 can benefit even more. I have been told that the .338 Lapua can get up to three grains more powder with gain twist.

As with all load recommendations, work up gradually while watching for signs of pressure. Receivers for Palma AR-15s Most Palma shooters use barrel lengths around 30". AR match barrels of that length normally have diameters of an inch for the majority of their length. Original AR-15s had a 20" barrel (1/3 less than a Palma tube) and the 1960s barrels were skinny. A Palma gun today has to support a far greater weight than the skinny receiver was designed to accommodate.

A2 barrels weigh about 2.5 pounds whereas a 30" Palma AR barrel will tip the scales at nearly 5.75, more than double the weight. What can be done? The threaded portion of the front of the receiver has to remain as Stoner designed it. Otherwise, the barrel nut would never fit. Fortunately, nearly 2/3 of the barrel extension lives aft of the threaded section. It is possible to thicken that area. Two companies make thick-walled flat tops.

DPMS (DPMSinc.com, makes the Lo-Pro, thought it lacks a forward assist and ejection port cover, and Sun Devil Manufacturing (Sun-Devilmfg.com, offers heavy-wall lowers and uppers, with either or both the assist and cover. Compared to conventional flat top receivers, the thicker receivers are roughly double. In order to harvest the potential accuracy of any AR barrel/receiver combo, the gunsmith needs to properly stabilize the barrel extension fit to the receiver.

Oversize BAT Machine match barrel extensions will help. To learn how to do this right, read my two part article "The Relationship Between Barrel Extension Diameter And Accuracy In The AR-15" in the March and April 2013 issues. If built right, an AR-15 Palma rifle can be built with all the expensive match sights, adjustable stocks, etc. as a bolt rifle and rival them in accuracy. 90 Grain Bullets At one time there were as many as four different 90 grain bullet choices. The JLK was the first.

It was a VLD, which required chasing the throat, and seemed to like the 5R rifling pattern in barrels with deeper 0.2245" groove. While the JLK line is still manufactured by Swampworks (SwampWorks.com), their web site currently lists the 90 grain .224 bullet as out of production due to problems getting the jackets. If you are addicted to this bullet,

send me an email and I'll supply contact information for a stocking dealer where you can still purchase them. Next came the Berger VLD, which is still available.

It has a high ballistic coefficient (0.551) and, like all VLDs, requires chasing the throat. I could get a wider variety of 1:6.5 twist barrels to shoot accurately with the Berger VLD as compared to the JLK. Not all shooters want to go to the extra work of chasing the throat and constantly lengthening their ammo to keep up with throat erosion. A maintenance-free boat tail 90 grain bullet arrived from Sierra in 2005. I was still Armorer for the Army Reserve Team at the time and started doing load work ups.

Sierra recommended a muzzle velocity of 2,650 fps for 1,000 yard shooting, however, the second day on the range I started experiencing midair bullet blow ups. I called Sierra and they still cite me as being the first creditable source of the problem. As more shooters tried the bullet word soon got around. It appears that the jacket is just too thin. Sierra felt that rough obturation to the back of the bullet was a contributing factor. This led me to gain twist as a potential solution.

I checked first with the two companies I had purchased gain twist blanks from back in the late 1980s, but one had gone out of business and the other had dropped the gain twist option. I checked all over and couldn't locate a single source

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The Hornady Lock- N-Load Ammunition Concentricity Gage on the right can gently push bullets into better alignment with the casing, of gain twist barrels. This was before Bartlein was offering them. I continued to work with Sierra and their 90 for about two more years, trying every barrel option I could think of, including 5R, polygonal rifling, even and odd numbers of lands and grooves, different heights of lands and depths of grooves, varying land-to-groove ratios, cut rifling, and button rifling.

I never was able to come up with any configuration that was “Sierra proof”, though I have used other Sierra bullets with great success. The 90 Sierra Match Kings were accurate but shooters just couldn’t rely on them holding together to make it to the target. I threw in the towel and approached Berger. Obviously, like most everybody by then, they had heard the talk in the pits about Sierra’s jacket failures but could see a potential demand for a reliable and accurate .224 90 grain boat tail.

I also suspect knowing a major military shooting team would be trying the bullet may have also encouraged them. In talking to Berger we easily agreed upon the need for a thick jacket. It wasn’t long until the first pallet of Berger 90s arrived. The bullet boxes even had the word “THICK” boldly printed on them. The first thing I did was torture test them. I couldn’t get those bullets to blow up no matter what and they were as accurate as any Berger product. Just as Mr.

Pitcairn mentioned in his article, I found the Berger BT to pressure more, especially compared to VLDs, as boat tails have a bit more bearing surface. The Berger bullet had a

slightly higher B. C. (0.512) than the Sierra and Berger recommended a muzzle velocity of 2,600 fps for reliable 1,000 yard shooting. I had more pressure issues trying to get the Bergers to 2,600 out of 20” AR-15 Service Rifle barrels than I had getting Sierra bullets to shoot 2,650, likely due to the thicker jacket.

By this time, Bartlein was in the gain twist barrel business. I worked with them on rates of gain and the various internal dimensions and after some trial and error I arrived at the specs mentioned previously. Not only did the gain twist barrels solve the pressure problems, the accuracy was stellar!

Comparing the performance of hundreds of barrels, the new combination of the Berger 90s fired from gain twist barrels to more common 80 grain loads, the 90s tightened groups by 7.7% while shooting about half as many fliers. Fliers with the 90s were out 50% less and the 90s fight wind drift about 17% more efficiently than the 80. So life with the Berger 90 was good, but the new offering had its work cut out for it in perception as there remains much confusion among shooters regarding 90 grain bullet blow ups.

In the tens of thousands of rounds I’ve fired, I have never blown up any 90 grain bullet other than Sierras. Unfortunately, not all shooters got the word and some think all 90s are prone to blow up. Berger tried to counter this, including that “THICK” label on the boxes. As word of the heavy jacket and stellar accuracy of the new Berger 90 got around, more shooters made the transition. Most of them I have talked to are happy.

I believe that had the bullet been given a couple more years to prove itself in the face of High Power competition it would be more commonly used. However, as events and politics caused a demand for guns, ammo, and components to skyrocket, Berger was running a year behind in production. Something had to give and Berger decided to furlough production of a number of their bullets for the most popular. Sadly, the 90 grain boat tail was among those.

Berger still has the dies and production equipment to resume production. If you are a fan of these, make your wants known to the factory. For now, email me if you are having difficulty finding a source or check on Gun Broker. No Pointing I discourage “pointing” Berger’s thick jacketed 90 grain bullets. This practice was one of those “flavors of the week” about the time the 90 grain boat tails were coming out. One of the members of our team purchased a pointing kits and used it on the new 90s.

They looked fine and I understand the lure of the improved ballistic coefficient that the manufacturer of the pointer claims. We loaded some of the pointed bullets and sent them out for field testing. Reports were not good. A number of folks noticed decreased accuracy and there were reports of pressure issues on hot days when regular non-pointed bullets were doing fine. I saw the same two problems on my machine rest tests.

I asked one of the shooters whose gun was blowing primers with the pointed bullets to measure the diameters of ten of

GAIN TWIST BARRELS FOR PALMA CONTINUED

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them and average the readings, then to repeat with non-pointed bullets. Although I had already performed this same test I didn't hint what my findings were. Working independently, we both arrived at an increase in bullet diameter of 0.0003" for the pointed bullets. My theory was that because the pointing is basically a swaging operation, the thick jacket is resisting the process and resulting in bullets bulging ever so slightly in the bearing surface.

I also admit that perhaps our swaging tool operator wasn't sufficiently polished in its operation at that early stage. Whatever the cause of the problem, nobody ever asked for any more pointed 90 grain Berger boat tails. Which 90 grain bullet is best for you? Service Rifle shooters going out to only 600 yards mostly choose the Berger boat tail because it is so easy to get shooting accurately and equally easy to keep shooting well. Folks with a casual interest in Palma might also want to try the boat tail.

Palma shooters knowing how to chase the throat should at least try the Berger VLD because of its superior ballistic coefficient. I would also do a load work up for the boat tail and pick the one that shoots the tighter groups. In a two mph full value wind pick up at 600 yards, the VLD will drift about a half-inch less than the boat tail. At 1,000 yards that difference in wind drift will be about 1.5". As a shooter you will have to evaluate for yourself how important such differences are.

As mentioned, my first idea for fixing the Sierra 90 grain blow ups was to go with again twist barrel that wasn't available at the time. With these available, I've since conducted torture testing with one or two Sierra 90s in each gain twist barrel I test fire. So far, I have not been able to blow one up!

It may be that the more gentle obturation caused by slower burning powders used in 30 and 32 inch Palma barrels coupled with gain twist and seating the bullet out fur-

ther in the neck will conspire to keep 90 grain SMK jackets in place. If you choose to try the Sierras remember the old saying, "Let the buyer beware!" Palma Chambers I use Wylde chambers in all my Service Rifle and Match Rifle guns.

Both of those disciplines use magazine-length 77 grain bullets at the 200 and 300 yard lines and then 90s at 600, and for occasional Long Range event for shooters that are interested. There are things I like about the Wylde chamber, especially the gradual one degree 15 minute lead angle. For sure, if you are even remotely considering ever trying the 90 grain SMK bullet that gradual lead angle is going to be a must!

Although I am using the Palma reamer for what are technically gas operated AR-15s, since they are never fed from a magazine they are essentially single shot rifles and I'm able to tighten certain dimensions to a similar degree as a bolt gun. The neck dimensions in gas guns are typically quite fat for reliability of feeding. I was able to tighten that up considerably. That in itself helps to better align the bullet to the center axis of the bore.

I recommend a neck of 0.2526" for heavy wall casings like Lapua and 0.251" for thinner walled casings like Lake City. If you outside neck turn your brass, those recommended dimensions can be tightened up. Consult your reamer maker. Free bore was the next consideration. I had tried Vihtavuori N150 powder before in my match rifles. Accuracy was stellar and velocities were very consistent.

With my Wylde chambers, however, I just couldn't pack enough of the very coarse powder into the casing to get the kinds of velocities I wanted for 1,000 yards. I wanted to be able to get 25 grains in my Palma loads with the entire neck to have contact with the bearing surface of the bullet, that is, the area above the junction with the top of the boat tail. I simply loaded up some

dummy rounds until I was able to get 25 grains with the VLD bullet and 24.5 grains with the boat tail of N150 to fit.

A 90 grain Berger boat tail loaded in a conventional Wylde chamber will give an overall cartridge length of about 2.50". My Palma chamber increases that length to about 2.60" with the Berger or about 1/10" longer than the Wylde. To get that, specify a free bore of about 0.1640". That places the top shoulder of the boat tail just slightly below the casing neck/shoulder junction.

This provides good support for the bullet and allows the shooter to straighten any rounds that are not seated concentric with the casing without loosening the grip of the neck on the bullet. This chamber also has enough room to lengthen the bullet seating length to compensate for erosion for those shooting VLD bullets. Bullet Seating Depth Equally important as the actual chamber dimensions is tailoring the bullet seating depth to that chamber to arrive at the gun's accuracy sweet spot.

With boat tails, I start with the bullet seated about 0.004" deeper than where it would contact the throat, jumping them. I fire a ten round machine rest group at these initial settings, then seat the next batch 0.002" longer. The micrometer dial on quality competition seating dies, such as from Redding or Bonanza, helps. If my second groups are better I'm going in the right direction and I continue to lengthen my cartridge overall lengths until my group size increases, indicating I've gone too far.

If that second group with the longer seating depth shoots worse, I go in the opposite direction by seating bullets deeper. Normally my boat tails end up with between 0.000 and 0.010" of initial jump. With VLDs, I start with the cartridge loaded length about 0.006" longer than contacting the throat, jamming the bullet into the throat,

GAIN TWIST BARRELS FOR PALMA CONTINUED

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and adjust from there. My VLD's usually end up jamming between .000 and .010". Each gun will demand its own individual jump or jam and nobody can tell you in advance what that specific amount will be. With boat tails, once you have established the right amount of initial jump you can load up a full case and shoot at that setting for the entire season. With VLD bullets, however, you have to take nightly chamber readings and constantly increase the seating length to compensate for throat erosion.

In other words, whatever amount of jam your initial test results arrive at must be maintained through the entire shooting season. This process is called "chasing the throat." It is not difficult but does require attention to detail and takes a little bit of time on the seating step. With a good rifle machine rest it takes me about a half day to accomplish what I have described. It can be done on a bench rest with sand bag support but I would suspect it would take longer.

No matter how long it ends up taking, it is time well spent performance wise. Concentricity According to the Gun Tec Dictionary, bullet run out is, "The measurement (usually in thousandths of an inch) that a bullet and/or case are misaligned in relation to the centerline or axis of the entire case." Cartridge concentricity is a matter of protracted discussion that we don't have time to cover in this article.

What we can say is that no barrel, whether of conventional uniform rifling or gain twist, can accurately shoot "crooked" ammo. I strongly recommend using a cartridge straightening tool. My article, "Better Ammunition" in the April 2016 issue has more information. .30 Caliber Gain Twist Ballistically, a 90 grain Berger boat tail bullet fired out of a .223 at 2,800 fps

will equal any boat tail bullet fired in a .308. Likewise, a 90 grain VLD from a .223 at 2,850 fps will equal any VLD fired in a .308.

And the .223 can do so at a fraction of the cost and recoil. Gain twist works in pistols, muzzleloaders, and modern rifles. If you choose to shoot Palma with a .308, gain twist should work just fine for either bolt guns or gas guns. Everybody worries about how much gain to use. From what I have seen there is no magic formula. Smith & Wesson uses again twist barrel in one of their heavy hunting revolvers. Their rate of twist doubles from 1:20 at the back of the barrel to 1:10 at the muzzle.

Colerain Barrels (ColerainBarrel.com, specializes in gain twist for muzzle loaders. Their 42" barrels begin at a twist rate of 1:96 and speed up to a final twist of 1:48. Doubling the twist rate has worked very well for me in 20" Service Rifle and 26" Match Rifle lengths. While not cast in stone, doubling is a good start.

If the shooter determines he needs a final twist rate of 1:12 to stabilize a .30 caliber bullet, a good start twist in front of the chamber is likely 1:24, though a start twist of 1:23 or 1:25 would probably shoot as accurately. A few years ago when gain twist started to become popular again, some bench rest and long range shooters tried using very modest gains, such as starting at 1:12.25 and finishing at 1:12; only a quarter inch gain in twist in barrels as long as 26 or 30 inches.

While such barrels shot as well as conventional, uniform twist barrels, I don't think the accuracy improvements and reduced pressures of the more aggressive gain twists were ever realized and I don't hear much about anyone using such modest gain twists these days. Readers with experience about all these topics are encouraged to write to me at and share their experiences. AG

METALWORKING

Making 'Smithing Tools

Make tools that are easily made and save your money for those things you can't make.

BY DICK MAHEU DECEMBER 2016

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One of the many pleasures I have enjoyed over the five decades I have been working guns is the opportunity to be inventive in making or modifying parts and tools needed to complete the work at hand. Starting in 1967, I have always collected scrap tool steel and similar odds and ends that I thought would come in handy in the future. I also learned early on that many commercial tools can be modified to provide exactly what's needed for the job at hand.

One of my favorite pastimes browsing Brownells catalogs for the latest tools. While sometimes being just what the doctor "ordered", my pockets are just not deep enough to procure most of them. I'm sure many of you can identify with that scenario. However, I have garnered many good ideas from those catalogs in making my own tools; sometimes similar, other times very different but usable for the intended tasks.

Over the years, I have made dozens of special tools and jigs for my work, often right in the middle of a job I needed them for. Having materials on hand for this is indispensable. All of these tools were made many years ago and have seen much use on my bench. Remington Firing Pin Tool This tool takes the trauma and surprises out of

disassembling the Remington 700, 7, 78, and similar Remington bolt action firing pin assemblies.

I started out with a piece of tool steel 6 1/2" in length, 1 1/2" in height, and 1" in width. I didn't have a milling machine back when I made this tool so had to hog out the middle by drilling a series of holes, hacksawing it out, and finish grinding the surface to get my tool blank. This was a time consuming process but proved effective. With a milling machine this will go much quicker and effectively.

It's ironic that we can afford luxuries such as lathes and milling machines well after the years we did most of our gun work! I took 4 7/8" of metal out of the length of the blank and 3/4" in height from the top, smoothing out the bottom of the cut with a grinder and files. Both ends were center drilled 7/16" from the top on both ends and tapped for 7/16 x 14 threads. This is the threaded dimension of the Remington firing pin assembly that screws into the bolt body.

For the screw-in portion of the tool, I used a 5 1/2" piece of 7/16 x 14 threaded rod. You can get by with a much shorter piece, say three inches. I used the longer piece of rod because I use this tool for other pur-

poses. I drilled a 1/4" hole in one end of the rod approximately 1 1/2" deep to accept the firing pin tip with enough clearance to not damage the tip. I then chamfered the external end of the hole.

You can use brass rod if you so choose for this although I have found that the firing pin is much harder than the threaded rod and there will be no damage to the firing pin at all. I flattened the sides of the other end of the threaded rod for about 3/8", drilled a hole through it with a #13 drill, and drove in a piece of 3/16" drill rod for a handle.

To utilize the tool, secure the sear notch of the firing pin head in protected vise jaws, pull the bolt body forward, insert a coin (a penny works fine) in the notch of the firing pin head, and unscrew the firing pin assembly from the bolt body. Screw the firing pin assembly into the end of the tool until it stops and then screw the threaded rod into the firing pin tip until the firing pin cross pin is fully exposed.

Install the tool in a bench vise if desired to drive out this pin but I have found it just as easy to set the tool on the bench for this procedure. Unscrew the threaded rod to disassemble the firing pin assembly completely.

MAKING 'SMITHING TOOLS CONTINUED

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Above center: Boxlock tool. The mainspring is a very powerful spring and this tool takes the danger out of this procedure. Granted, you may never have to take many of these assemblies fully apart, but if you do, this tool is the "cat's meow"! I also made a tool just like this for disassembling the Ruger Model 77 firing pin assembly. The only difference between them is due to the Ruger assembly being threaded for 7/16 x 20 threads. It is utilized in the same way.

Remington Barrel Nut Wrench This is another very handy tool to have in your tool box and is easily made from an existing open end wrench. I show three of these tools as I have encountered different size Below center: Firing pin tool with firing pin assembly installed. nuts between the various models. It is utilized in removing the barrel nut from the Remington Models 740, 742, 4, 74, and 7400.

The action bars prevent using a regular open end wrench and require utilizing a wrench with the sides ground down for proper clearance. These barrel nuts are often on very tight so start with a wrench that is hardened properly and has good tensile strength. The two widths for these wrenches to fit the different nuts are 5/8" and 13/16". It will be a grind-and-try endeavor to get the right fit on the nuts.

Procure this wrench from Brownells if desired, however, it is easily made from an existing spare wrench you may have on hand. I've been using my homemade wrenches for well over 40 years. Boxlock Hammer Tool If you ever need to reassemble the hammers in a double barrel boxlock shotgun I can't stress enough how much you'll need this tool. It's an understatement to say the mainsprings in these guns are extremely stout and you will bust a few knuckles and shatter a few nerves without this tool.

Examples of guns of this type are the Fox Model Band its many derivatives, the Savage/Stevens 311, and others very similar to these including several Spanish, English, and Russian guns. Taking these hammers out is straightforward according to the NRA and J. B. Wood manuals. Putting them back together is where this tool earns its keep. There was a time when Brownells sold a similar tool made from 3/16" tool steel but I haven't seen it listed for some time. It is easily made from apiece of tool steel.

I made mine over four decades ago out of apiece of 6" x 1 1/8" x 1/4" tool steel and covered it with a rubberized dip for better grip. The handle portion is approximately 2 1/2" long and 1 1/8" wide. The head of it (the user portion) is 1 1/4" long and 1" wide. The notch is approximately 3/4" deep with one

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side ground down from 1/4" to 3/16" at the tip. The other side is ground down to approximately 1/2" with a radius curve. This is a grind/file endeavor and must fit the back of a hammer contour very precisely to provide good purchase on the hammers. You must have a hammer available for reference to get it right! Use a heavy leather glove on the tool hand when using it as these very heavy mainsprings require much force to compress them.

The springs will try to bend the hammer pin out of alignment so carefully do one at a time while keeping the hammers straight forward. I would classify this as an impossible task without this tool! I drilled a 1/4" hole in the handle to hang this tool up when not in use.

Winchester Firing Pin Tool This tool is simple to make and is useful in reassembling firing pins on to compress the spring and washer while inserting the firing pin spring retainer that locks in the spring to the striker and can be used for both disassembly and reassembly. Mine is 7" long and 5/8" wide simply because that's the material I had on hand when I made it. The thickness is 3/16" which is critical for it to work properly. The slot is 5/8" long by 5/16" wide, milled completely through the piece.

This can also be done with drills and files. The end of the slot is milled out with a 3/8" end mill to a depth of 1/16" to retain the spring washer. Although I didn't own a milling machine at the time I made this tool four decades ago, I was able to use the

end mill in a drill press to make this washer slot. This works provided there is no side movement with the end mill! It is simply a down movement just as with a drill to accomplish this task.

Never do any milling on a drill press where side movement of the end mill is necessary. A drill press is not built for this movement and the possibility is high that the chuck and arbor will fly out of the drill press, causing great harm to the operator and damaging the machine. Mauser C96 Tool This is a tool you will probably never be called upon to use. I have only used mine once, however, this tool is ideal if this job ever comes your I originally got the idea for this tool from J. B.

Wood's excellent Gunsmithing: The Tricks Of The Trade. It's listed on Amazon.com and elsewhere. I highly recommend it as this book is worth its weight in gold! An occasional problem occurring with Mauser C96 "Broomhandle" pistols happens due to improper reassembly. It is possible to put the rocker coupling in backwards, which is located at the lower front of the sub-frame.

Its upper beak supplies tension to the locking block and the sub-frame can be An old way of dealing with this problem was to drill a hole just forward of the trigger inside the guard and insert a punch to force the coupling upward to clear the trigger and spring. A blocked receiver and sub-frame does have a little movement to the rear. This tool can be entered from the top to de-

press the hammer spring plunger to the rear. The tool is put in from the top just behind the rear wall of the magazine.

The tool is then maneuvered toward the front with its lower tip depressing the hammer spring plunger toward the rear. This relieves tension on the coupling and allows it to rotate, clearing the trigger and trigger spring, and freeing the sub-frame to move to the rear. The first tool I made did not seem to work properly so I devised a second tool which does work. It's made from a common screwdriver with a 3 1/2" blade. The shaft is 3/16" with the tip at 1/4" wide.

The bend radius is 1/2" with the tip 1/4" long with a tapered slit in it. It is definitely a cut and try endeavor to make this tool if you ever get this job in your shop. According to J. B. Wood, there are some differences between the older and newer model Broomhandles, the likely reason I had to make two models of this tool. Well, there you have it folks. Five mighty, handy, self-made tools to build just when you may need them.

I have plenty of other designs I plan to include in upcoming articles that are just as handy and useful. I hope to hear your comments, good or otherwise, on your attempts at building these shop aids. AG put in the gun this way. When this is done, the gun will not function properly and will defy all attempts to at disassembly. One projection of the rocker coupling will protrude below the sub-frame and lock behind the trigger and trigger spring inside.

PEOPLE & COMPANIES

New Model 1911 Trigger Jobs

Colt's new Model Series 70 and the Series 80 feature a firing pin block/ drop safety. Here's how to perform a trigger job on them.

BY ROBERT K. CAMPBELL DECEMBER 2016

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It is difficult to address any report on Colt pistols without beginning biblically: In the beginning, there was the 1911... Likewise, 1911 trigger jobs have been discussed at length. In this article we'll look at an area that doesn't receive frequent treatment, namely, the firing pin block or drop safety on Colt's new model Series 70 and Series 80 pistols. I've found that some arti-

cles about Colt's firing pin block are in error. Many shooters feel this is how a 1911 should be built.

The original 1911 features a simple inertial firing pin with the pin held to the rear of the firing pin channel by the firing pin spring. When the hammer strikes the firing pin it is driven forward against spring pressure, strikes the primer, then drawn back by spring pressure. The firing pin is shorter than the

channel. Some designs, such as Spanish copies of the 1911, don't feature an inertia firing pin.

The proper check for a correctly operating inertia firing pin is to lock the slide to the rear and insert a pencil into the firing pin channel against the firing pin. Press the firing pin forward. It should spring back when the pencil is released.

NEW MODEL 1911 TRIGGER JOBS CONTINUED

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This does not work with pistols with a firing pin block. When at rest, the tip of the firing pin should not protrude past the firing pin channel. The inertial firing pin was deemed safe for use. Whether the pistol was carried hammer down on a loaded chamber or properly carried cocked and locked, the inertia firing pin doesn't touch the cartridge primer. Tests that arguably go beyond likely, real-world concerns demonstrated the 1911 could fire as a result The dovetail is GI type.

Colt had to make a change to ensure institutional sales. of the firing pin taking a run forward. I have personally drop tested an issue 1911 at a height of 15 feet with a primed cartridge case in the chamber. While there was a slight dimple in the primer on some drops, the primer never fired. There was no difference if the pistol was cocked and locked or

hammer down. Incidentally, if the hammer is lowered on a pistol with a firing pin block the block isn't functional as the trigger is being pressed.

Despite the general safety of the inertia firing pin, when SIG introduced their P-series pistols their positive firing pin block was toutover the 1911, Smith & Wesson Model 39, Browning Hi-Power, and virtually every other service pistol. Any company that wished to continue institutional sales was forced to incorporate a firing pin block. Smith & Wesson played catch up with their 459. Colt introduced the Series 80 with firing pin block which the company adapted to all their 1911s.

Colt did a good job of integrating their block and the change was deemed good by both police and military. While many 1911 fans ac-

cepted the change some opponents were highly vocal, claiming the firing pin block prevented a good trigger action. While this isn't true, the parts involved required a learning curve and proved more difficult than the previous models. Colt's firing pin block gave rise to defining two types of trigger action that isn't entirely correct. The more modern design was referred to as Series 80.

This included any make using a Colt-type block, including those from Para Ordnance. Any 1911-type pistol without the safety block was called the Series 70. It would be more correct to call the non-blocked design the GI trigger action, but Series 70 is what we're ed as an advantage stuck with. As a result of market pressure, Colt introduced anew Series 7 0 which we will address at length. This pistol is similar in appearance to the original Se-

NEW MODEL 1911 TRIGGER JOBS CONTINUED

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This may lead to confusion for those unaware. This is a high quality parts kit well suited to the Colt pistol. ries 70 but is a different pistol and overall superior to first Series 70 pistols in my opinion. The original Series 70 Colt was a response to those calling for a tighter, more accurate Colt. The pistol used a collet-type barrel bushing with fingers that gripped the barrel and increased potential accuracy while being less expensive than hand fitting a National Match bushing. The sights remained GI.

The Series 80 included addition of Colt's firing pin block. Series 80 Trigger Job Series 80 trigger actions have a procedure similar to the GI trigger action but is more involved. For example, an aftermarket trigger with overtravel adjustment isn't recommended for the Series 80 because trigger travel is shortened and the hammer falls sooner. The firing pin then beats against the spring-loaded plunger that hasn't completely lifted. If the firing pin block plunger is beaten it eventually sticks, preventing discharge.

The only correct means of achieving a lighter trigger action with this action is installation of a complete set of matched parts designed specifically for Series 80 pistols such as the Brownells Trigger Pull Reduction Set. The hammer lever lets the firing pin plunger out earlier in the trigger movement. When the hammer falls the

plunger has cleared by lifting out of the path of the firing pin as it should. Removing the firing pin block assembly may be done but I would never do so.

It is a severe liability problem to remove a safety device from any firearm. How would you know if the firearm you modified for exclusive competition use will not find its way into a holster and concealed carry? New Series 70 The new Series 70 was a response to demand from shooters for anew version. This handgun does not incorporate the firing pin block in the action. I have considerable experience with the original Series 70 and the new version is similar primarily in appearance.

The fit, finish, and overall performance are considerably superior to the original 1970s version and is among the best fitted and finished Colt 1911 handguns I have seen in some time. This handgun is more similar to the 1950s and 1960s commercial guns than the later Series 70. The new pistol also features high profile sights and cocobolo double-diamond pattern grip panels. The new Series 70 does not feature a collet type barrel bushing, which is all to the good, and instead uses a well-fitted bushing.

There is no full length guide rod as traditional shooters may prefer, and the barrel bushing, while snug, may be field stripped with the hand. To achieve a high level of drop safety, the new Series 70 uses a heavy

duty firing pin spring and the same firing pin as the Series 80. There is interchangeability with the Series 80 although there is no firing pin block.

This makes sense as the firing pin has the notch for a safety bar despite there being no safety bar in the pistol and there is no mortise in the frame for the plunger. The new Colt feed ramp features anew "dimple" that feeds all modern hollow points well. While the pistol reads Series 70 in billboard writing on the slide, the new handgun is different pistol from the original. Safety Checks Once you have performed an action job on the Series 80 with the proper parts it is essential to safety check the action.

Remove the slide and barrel assembly from the receiver. With the slide removed, press the trigger but do not let the hammer fall. The hammer lever should rise from 0.040 to 0.050 above the frame at this point. Work the firing pin plunger. I mark the firing pin plunger to check contact points. Assemble the pistol and dry fire several times. Disassemble the pistol and be certain that there are no signs of contact between the firing pin and the plunger.

The Series 80 is a great pistol but there are more parts than the GI gun and this means more complications. The Series 70 solves every problem for those wishing to own a pistol without a firing pin block. AG

MAINTENANCE & REPAIR

Winchester Model 67 Sight Renovation

Making a rear sight elevator and front sight bead for a Winchester Model 67 turned out to be a good reason to go over the whole rifle.

BY NORMAN E. JOHNSON DECEMBER 2016

ORIGINAL PP. 18-19

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A middle-aged man came to my shop with a much used and rusted Model 67 Winchester .22 rimfire single-shot rifle. He wanted the rear sight elevation step replaced and a bead installed on the front sight. The old gun wore the ravages of down-right abuse and neglect. The man said he couldn't hit anything with it and asked if these measures would correct the problem. At first glance, I could see the rear sight elevation step was gone and had been replaced with a piece of wood the thickness of a common, flat toothpick.

As he gave me his information for my FFL records, his name seemed familiar. Turns out he is the grandson of a farmer whom I had worked for as a teenager back in the late 1940s. My duties then were many and varied, including assisting in butchering an occasional young steer to feed the family. That old Model 67 was the same 22 rifle began by buffing away the major rust and making a rear sight elevator.

Below center: The Model 67 rear sight elevator, as finished, is placed on a Buffalo nickel dating back to about the time the rifle was first made. One I used to humanely dispatch the critter, as well as shoot small game and occasional pests around the farm. The gun was never cleaned and was set in the corner of the milk house when not in use. I hadn't seen the gun in more than 60 years, told the story to the grandson, and that I'd go over the gun and sight it in.

He was very pleased to learn about the old gun's history and that it would receive my personal attention. The Model 67 Winchester was offered from 1934 to 1963 and bore no serial number. The rifle had a 27-inch barrel. Cocking is accomplished by pulling rearward around, knurled knob. It features a swing-up safety that blocks passage to the sight line when activated. This is a simple and dependable design. Repairing The Sights First, I worked on the rear sight elevator.

There is a linear slot extending along the back base portion of the rear sight passing beneath the sight leaf. A common wedge-like

rear sight elevator serves to hold the rear sight upward at the required elevation. The slot for the rear sight elevator is 0.060" wide and finding a piece of metal of that thickness simplified the job. A common finetoothed hacksaw was used to roughcut the piece, which was finished with a fine file and wire wheel. After successfully trying for fit, the piece was blued.

Unfortunately, live-fire testing found the rifle shot four inches high at 25 yards even with the rear sight elevator as low as it would go. I planned to add a bead to the front sight. The front dovetail sight came to a rather sharp bevel at the top and was quite low, causing the rifle to hit high at the desired 25 yards. I made and attached a linear bead out of brass for easy viewing.

The added height of a bead atop the blade-style front sight was expected to reduce elevation, so I went about making and installing this added part. I used a 3/8" length of 3/32" round brass stock to form the bead.

WINCHESTER MODEL 67 SIGHT RENOVATION CONTINUED

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Above center: The brass rod core used to build up the front sight. This was soldered to the top of the front blade sight and file finished to uniformity. This resulted in lowering the barrel enough to bring bullet impact on at 25 yards and be within This lowered the front sight enough to sight the gun in at 25 yards. Top Many deep nicks and blemishes were removed in the process. Bottom The group on the right was shot before any sight work was performed.

The smaller group at left was the result of being able to see better with the properly adjusted sights. the amount of adjustment in

the rear sight elevator. Though the exact sight picture may vary among shooters, with open sights the most common is where the top of the front sight is even with the top of the rear sight. This is the picture I saw as I sighted-in the Model 67. As the years slip by, one's visual acuity tends to diminish.

Using open sights requires the eye to focus on three places at once: The rear sight, the front sight, and the target. Anyway, I sighted-in the customer's rifle and did very well. Using Winchester standard velocity, solid point bullets I was delighted to find the rifle

could be adjusted right on target at 25 yards with the new rear sight elevator set at mid-adjustment.

Consider ing all the work I did on the old gun—which also included stock refinishing, replacement of both trigger guard screws, and buffing and cold bluing the metal—there was an element of sentimental attachment that helped reduce the charges I made. The gun's new owner was delighted to see his grandfather's old gun look and shoot so well after decades of neglect. Guess I was just as happy as he was. AG

PISTOLS

New 1911 Grip Screws

A new and much needed improvement of grip screw bushings for 1911s.

BY ROBERT K. CAMPBELL DECEMBER 2016

ORIGINAL PP. 20-21

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There is a short list when looking for ways to improve 1911 handgun performance. I sometimes add good sights to GI 1911A1 pistols. Even the very best 1911 handguns from major makers will benefit from a properly-fit Bar-Sto barrel. There is one basic problem everyone working these pistols regularly finds—and cusses—but we don't usually attempt along term fix. I am talking about grip screw bushings. The rub is there are few 1911 shooters happy with factory grips.

Various makers offer so many excellent custom grip options (I'm a fan of and use custom grips on all my 1911s) and this leads to grips being changed out often. With this many change outs, the grip screws and grip screw bushings can give us trouble. I was excited to finally find a fix. When I first examined the bushings from Challis Grips (Challis- Grips.com, the hex head design alone was worth serious study.

However, it was the addition of an Oring that made me contact the manufacturer to learn about his intent and purpose more closely. First, the Hex Drive. This design solves several problems. The most careful gunsmith will admit that slotted screws tend to get nicked up. Truthfully, that isn't a fair analogy. It isn't gunsmiths that change grips most often, it is the home hobbyist and they are likely to be the ones that damage screws and strip bushings.

I think that keeping these bushing and screw sets on hand and offering to change out from the old style will result in a small but steady profit for the gunsmith. To change to the hex head bushing, a 7/32 nut driver is all that is need. The socket holds the bushing in proper alignment and it is easier to accurately engage the frame threads. Starting the bushing by hand and then using the driver isn't necessary with these bushings.

The Challis design is much more stable A few simple tools go along way in solving the problem. than previous designs. Apply sufficient torque to seat the bushing tightly and strongly. This will minimize damage to the threads under recoil momentum. I have fired handguns fitted with Challis grip screw bushings with a good many +P loads to confirm these claims. As many of us have discovered, G10 and other heavier materials sometimes are the hardest on grip screw bushings.

However, once you have converted a 1911 to the Challis system, the grip screws are easily removed with the same 7/32 nut driver that drove them in place. The bushings are not fragile. Even if the grip screw bushings need to be removed, such as to refinish the pistol, these bushings may be reused and that isn't always true with the older design. While I understood this, I was not certain why Orings were added to the design. I asked the source and after considerable testing came to several conclusions. These grip

NEW 1911 GRIP SCREWS CONTINUED

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Above center: The Challis hex head bushings are well made of good material. The bushings are offered for both standard size grip panels and popular slim grips. screw bushings do not have to be used with Challis grips and can be used with grips from any maker. They can be used without the O rings. While the Orings are not demanded with these bushings, the improvement is worthwhile and they will maximize results. The Oring is slipped around the Challis grip screw bushing and retained by the grooves in the bushing.

The ring is forced down into a conical seat as the grip screws are tightened. This seat is outward against the counterbore. When the handgun grip panels are seated properly, the compressed Oring isolates the grip panel

from the grip screw bushing with a rubber cushion that prevents contact between the bushing and the grip panels as the gun is fired. By cushioning recoil shock to the bushing it is less likely to work itself loose. This will prevent loosening of both the grip screws and the grip screw bushing.

The company reports that this is especially beneficial when used with the more fragile grip materials such as mammoth ivory. The newest grip screws and bushings from Challis are rather inexpensive compared to ivory or even stag grips and will help preserve their longevity. There are also grip materials such as G10 and aluminum that are used for greater adhesion. While useful in tactical environments, grips made of these materials abrade or scuff the frame.

The grip screw Oring acts as a buffer to curtail this type of scuffing. Challis also makes a bushing extractor. If you work the 1911, then you will run across stuck bushings. The Challis stuck grip screw bushing extractor is well made, well polished and finished, and offers plenty of leverage. This little tool will come in handy more than once and is well worth its cost. To use, place the bushing extractor over the grip screw bushing and rotate to Top Bottom engage.

Attach firmly with the supplied standard full size grip screw. Insert the rod and rotate clockwise to remove the bushing. If the bushing has been secured with Loctite, you may need to heat the bushing slightly for removal.

AG

MEASUREMENT & INSPECTION

Reader Forum

BY AMERICAN GUNSMITH EDITORS DECEMBER 2016

ORIGINAL PP. 23-24

Springfield 67H I have a Model 67H Springfield 12 gauge pump shotgun and need an instruction manual and parts for it. Any advice where I can go? Also, in the October 2016 Reader Forum about "Accuracy problems" and the Browning A-Bolt chambered in .300 Winchester Magnum, I feel your given advice is good but the problem may also be indicative of a worn barrel. Using a borescope to see what's inside may also be prudent.

For your shotgun, contact Numrich Gun Parts Corporation (gunpartscorp.com), as they list a schematic, manual, and gun parts for the 67H. A Google search for "Springfield 67H" reveals a number of instruction manuals available for free download. Your advice to consider a worn barrel and inspection via borescope is good, especially given the Magnum chambering. Stevens Visible Loader I'm looking for info on the Stevens Visible Loader. I found a few references online but I suspect you'll have more details.

Can you point me in the right direction? I am working on two of these that were passed down to my son-in-law when his father passed. One has been refitted with a Winchester M67 barrel and is about seven inches longer than the other. We have distant memories of super senior 'smiths speaking of the Visible as the "mizzable loader" due to its feed system.

It turned out to be a design than provided great visibility of a cartridge on its way to being chambered while proving a highly unreliable system for getting it there. It was also considered a "grizz" when it came to repair. Regardless, if you browse up "Stevens Visible Loader" you'll be rewarded with links to parts, disassembly, and re-assembly. You'll also find a number of comments that make interesting reading. J. C.

Higgins .22 I had a customer bring me a .22 singleshot rifle that had been in his father's basement for about 30 years. He asked me to clean it and check it out to be sure it was safe to shoot. The stampings on the rifle are, "J. C. Higgins, Model 101.24, Sears, Roebuck & Co., 22 Short, Long or Long Rifle." S. Shearman The problem is the bolt won't open and will only move about 1/32 of an inch.

This is about as simple as a rifle gets and I am at a total loss as to what could possibly be keeping to bolt from opening. Artesia, NM William Reinhart You'll have to find out who made the rifle for Sears as they didn't make the guns they sold. There is across reference section living on some back pages of the Numrich Gun Parts Corporation catalog. After you have determined the identity of the manufacturer, contact us and we may be able to help you.

At the moment, we have only a hunch that the bolt could be seriously fouled, or even rusted, shut. Remington Trigger Reuse Any advice on what to do with all the stock recalled Remington triggers I have swapped out? John Diehl Have you swapped out the OEM triggers for aftermarket substitutes or replaced them with properly functioning OEM trigger assemblies? Either way, you now have a surplus of recalled Remington trigger assemblies on hand.

Under normal circumstances, a recall on any firearm or a key element to its proper/safe function includes instructions to return the affected gun and/or component to the factory for corrective action. Following a more strict OEM practice, replacement of an OEM trigger voids any warranty on the firearm immediately. We don't know which best describes your situation. Our suggestion is to make no mention of aftermarket triggers when you call Remington.

Ask if they offer free corrective servicing of the recalled triggers and return to you after those measures have been taken. It's along shot they will, but if they do you can make a nice profit on the stash of properly-behaving "Remtriggers" you'll have on hand. Charles Daly Shotgun I have a Charles Daly Field 20 gauge pump gun made in Turkey (Model KBI-HBG) I bought as new. I took the gun out of the box it came in and wanted to try it out before giving it to my grandson.

The gun wouldn't chamber a shotshell and wants to stick on top of the chamber. Wiggling it around will allow the shotshell to chamber but attempting to eject it allows it to come out about 1/2" or less without ejecting. Sometimes brass is pulled off the rim. I tried to get in touch with the company but they went out of business in 2010. Can you help identify what's causing this problem? A gunsmith at Gander Mountain says it's not worth fixing. Bill's Gunsmith Louie Danielson Correct.

KBI, former importer of Charles Daly, is no longer in business. We recall they switched their offshore provider from Turkey to Japan previous to the demise, though it might have been the other way around. The chap who used to be our top tech contact for Charles Daly at KBI would know for certain. His name is Jim Heverling and is running his own operation now. You should contact him with any questions and feel free to mention that Chick Blood provided you with his email address at jimhev@verizon.net.

James Williams AR-15 Magazine Issues I have various AR-15 magazines you can hit with a hammer and may not

READER FORUM CONTINUED

ORIGINAL PAGE 24

seat. Do you have some tips (aside from the trash can) on trimming modifications on either the lips or attaching points that will make these easy to load? The problem isn't being fully loaded where the top round is hitting the bolt, it's that there is difficulty seating even with an empty magazine. All the magazines insert and latch easily if there are no rounds in the magazines or if the bolt is locked back. All the magazines require a firm push to latch if even three or four rounds are in them.

The really bad magazine is from Okay Industries but I have another one from the same company that latches with little effort. In addition to them, I have Parsons Precision Products, Adventure Line Mfg. Co., and B. F. I. alloy magazines, and new Magpul plastic magazines. Maybe I'm spoiled as I'm used to M14s which latch with a slight tug to the rear, but these AR-15 magazines just don't seat without really being slammed. Joe Carlos responds.

So far your diagnostic process is similar to what I would do myself and your conclusions make sense. Submit a question or letter to the Reader Forum column by addressing an email to or posting a letter to American Gunsmith, Alexandria, VA 22310. Send subscription questions to First, determine if the guns that are having problems with the magazines in question have worked well with other magazines. That's an easy indicator of problems.

For fixing the problem magazines, you mention the feed lips and that is a possibility. Usually, when feed lips are opened up far enough to impede seating of the magazine with the bolt in the forward position they often cause other malfunctions, such as allowing the bullet end of the round to tip upwards causing failures to chamber. I would investigate this first. To see if the feed lips are stretched too far up, try inserting an empty magazine with the bolt locked back.

If the empty magazine seats properly with the bolt back but fails to do so with the bolt forward, the feed lips are likely out of specification. Of course, it always helps to start with quality. I seldom find bad G. I. magazines. Check the baseplate to see if they're issue and not a copy. You say the magazines lock into place but require a firm push if there are three or more rounds.

It will always be more difficult to lock a magazine when the bolt is forward given additional spring pressure but it shouldn't require excessive forcing John Tate of things. Regarding M14s, I would employ a similar rocking forward and back to help lock AR-15s, especially when the bolt is forward and there are rounds charged, and because you're already used to it. Adventure Line and Magpul are normally reliable and it's not likely all these are acting abnormally. Try them in a different rifle and see if they work.

If they do lock normally, you likely have a gun problem. Volunteer Commando Mk 45 We have a Manchester Arms/Volunteer Arms Commando Mark 45 in the shop that does not fire every time, leaving only a light strike on the primers. Where we can find anew firing pin and spring? Failing that, how best can these be removed for inspection and identification? We checked Numrich and they weren't stocking most parts for the Commandos.

Steven Murfin Since nothing turned up in the Standard Catalog of Firearms we entered "Manchester Arms Commando" into a search engine and found information about Commando Arms/Volunteer Enterprises and their firearms at VolunteerCommando.webs.com/manuals. These guns are "Chicago Typewriter" (Thompson .45 submachine gun) look alikes with a straight magazine instead of the 50-round drum. These are not clones of the original Thompson and are not fully automatic.

If it were, this response to your inquiry would end here. Since that is not the case, these are semi-automatics with a fierce trigger pull. They were initially produced by Commando, previously named Volunteer Arms, as the Mark III. In production from 1969 to 1976, the model was changed to Mark 45 after the Volunteer Arms name ceased to exist. You will very likely have to reach beyond Numrich for replacements. Your best bet is a copy of the Brownells Gun Parts Source List for out-of-production firearms. AG

SEARCHABLE ISSUE RECORD

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