



FEB 2021

DIGITAL ARCHIVE
EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

022

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

THE “MANURHIN CANDIDATE”

REAMERS AND SLIDES • AR-15 FLIERS, PART 1 • LYMAN M77 GLOBE SIGHT • MC MILLAN MC3 STOCK

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 206

DIGITAL ARCHIVE EDITION

Preserved for the bench.

This edition presents the original American Gunsmith editorial work in a modern, searchable layout while preserving its issue, author, and source-page history.

ABOUT THIS EDITION

The article text comes from the original issue and has been reflowed for legibility. Obsolete subscription, ordering, association-service, and house-advertising pages are not reproduced.

Original article images appear only where permission has been confirmed. All other image positions remain visibly reserved so approved art can be restored without rebuilding the issue.

Report corrections or rights information to editor@gunsmithmag.com.



AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • FEBRUARY 2021

ISSUE RECORD

ORIGINAL DATE	February 2021
VOLUME	Archive volume not stated
ISSUE NUMBER	02
SOURCE ID	ag-a0bb76b4626514aa23f122a5

DIGITAL EDITION

PUBLICATION	American Gunsmith
EDITION	Digital Archive Edition
ARCHIVE STEWARD	Innovation Network LLC
CONTACT	editor@gunsmithmag.com

Editorial fidelity. Article titles, author attribution, issue relationships, source-page references, and article text remain bound to the archive corpus. Layout, covers, navigation, and conversion notes are newly produced for this edition. Historical statements remain part of the original editorial record.

IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from February 2021.

2 Reamers and Slides
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

3 The “Manurhin Candidate”
MARK R. HOLLENSSEN • ORIGINAL PAGES 3-8

9 AR-15 Fliers, Part 1
JOE CARLOS • ORIGINAL PAGES 9-12

13 Lyman M77 Globe Sight
JOHN BAXTER • ORIGINAL PAGES 13-16

17 Mc Millan Mc3 Stock
ROBERT K. CAMPBELL • ORIGINAL PAGES 17-19

20 S&W Barrel Swap
CHARLIE BRIGGS & MIKE DIEDRICH • ORIGINAL PAGES 20-22

23 Reader Forum
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 23-24

MEASUREMENT & INSPECTION

Reamers and Slides

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2021

ORIGINAL PP. 2

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2397-P02-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2397-P02-F01

Dave Manson Precision Reamers makes cutting tools and gauges for the firearms industry, from large manufacturers to one-man shops and hobbyists. Owner Dave Manson and his employees are all participants in the shooting sports and have skill and experience as shooters as well as tool makers. Dave Manson and company make a varied and large selection of standard chambering reamers and headspace gauges for all types of firearms. Virtually any caliber and/or wildcat can be made on special order.

They also offer a selection of tooling for other gunsmithing tasks, such as action truing, muzzle re-crowning, screw-in choke installation, forcing cones cutters, barrel wall thickness gauges, and others.

MansonReamers.com has a host of articles with instructions, useful information, answers to frequently asked

questions, and videos. In addition to their standard catalog of items, the site also lists specials and discounts, such as manufacturer overruns and writer's tools used by gunsmiths in published articles.

Lone Wolf Founded 1998, Lone Wolf Arms (LoneWolf-Dist.com, is a Glock accessory maker with in-house engineers that use Computer Aided Design and Computer Numerical Control machines for their custom parts. The company prides itself in their unique designs ideal for gunsmiths making custom builds. LWD's website provides inventory in real time and orders usually ship the same day. The Wolves Den is a promotions section that is updated regularly.

Parts can include one-offs, factory seconds, and complete uppers in various finishes and patterns for multiple generation Glock models.

MAINTENANCE & REPAIR

The “Manurhin Candidate”

BY MARK R. HOLLENSEN FEBRUARY 2021

ORIGINAL PP. 3-8

There were times when I would only occasionally see a Manurhin revolver come in for service or repairs, and even then, primarily for cleaning and inspection. Over the past few years I have seen them come in more regularly and they all came in for a different functioning issue. Having worked on these over the years, I am familiar with their design and capabilities and have always found them to work rather well.

They are smooth operating revolvers and feel much like a heavy Smith & Wesson revolver in your hand when operating them even though they are different. The earliest Manurhin revolvers were made in Mulhouse, France beginning in 1972 and were produced at that location until 1998. Then, that same year, a company by the name of Chapuis Armes purchased the old machinery and equipment and began producing new Manurhin revolver model configurations.

These revolvers are regarded as being of very high quality and durability, citing that they can outlast a comparable Smith & Wesson revolver firing the same 357 Magnum loads. This was partially based on a displayed MR73 revolver that reportedly survived over 96,000 full power 357 Magnum loads. They boast a frame that is larger than a K-Frame S&W but are dimensionally smaller than the L-Frame. The barrels are hammer forged with button rifling with the same (or similar) twist rate found in the S&W revolver barrels.

The high-polish bluing and smooth functioning actions are what draws people to them. Their style is high quality and they just feel “right” in the hand. The MR73 is available in many different calibers and ac-

cessory configurations, including 38 Special, 357 Magnum, 32 Smith & Wesson Long, 22 WMR and 22 LR. They can be purchased with a variety of available barrel lengths, sights, grips, finishes in bright blue or matte, and in Match configurations.

The earliest MR73 revolvers can be distinguished by a sideplate secured by three sideplate screws. Those are described as first generation guns, having been produced between 1972 and 1978. The second generation revolvers were made between 1978 and 1996 and third generation revolvers were made from 1996 to present. When they changed from the Gen 2 to the Gen 3 model, they adopted a two screw sideplate design, eliminating the top sideplate screw completely.

Therefore, to determine if you have a Gen 1 or Gen 2, remove the sideplate and identify which cylinder lever spring (159) it has. The Gen 1 has a wire spring that resembles a large safety pin that fits over and directly onto the hand itself, while the Gen 2 spring is a flat, clip-in-place type, with a flat protruding arm spring that presses against the back of the cylinder hand. This second type of lever spring is also present in the current Gen 3 models.

It should be noted here that the Gen 1 type is prone to breakage or binding and is no longer available to purchase for replacement. Any contemplated conversion of the Gen 1 to a Gen 2 and beyond type cylinder lever spring will require a new sideplate for it to work properly. At the time of this writing, I was unable to verify just how many different MR73 models and configurations are/were available on the market, so I am not listing all of them here.

Manurhin also made “Match” model revolvers in the MR73, in 38 Special, 32 S&W Special, and 22 Long Rifle calibers. These match revolvers had a variety of target sight configurations, grips, barrel lengths, finishes, calibers, sights, grips, and it can be had in several “Match” calibers and configurations. variety of target sight configurations, grips, barrel lengths, finishes, and other design upgrades, making them a sought after competition revolver.

In the hand, they work much like the Smith & Wesson revolvers with the cylinder moving in the same direction (counter clockwise) when operated. However, the fire control group is mechanically different and you will see those differences when the sideplate is removed. Serial number prefixes can help identify the MR model and that can be helpful when troubleshooting. For example, the following list of prefixes denotes certain aspects or equipment a MR73 revolver had on it when it left the factory.

MC is the MR73 Silhouette Model, 357 Magnum with 10 3/4" barrel and adjustable match sights. CK is the Silhouette Model in 22 LR with 10" barrel and adjustable match sights. MB has a 9" barrel and adjustable sport sights. MA is the MR73 with 8" and 5 3/4" 38 Special match barrels with adjustable match sights. XA is the 6" 22 LR match barrel model with adjustable match sights. The Ymodel is the 6" 32 S&W Long sport barrel with adjustable sport sights while the Nmodel is the same with adjustable match sights.

THE "MANURHIN CANDIDATE" CONTINUED

ORIGINAL PAGE 4

Someone with the wrong type of screwdriver attacked these screws! The one under the grip panel is just as bad. The revolver is in the fired or at-rest condition. Look closely at the cylinder lever (hand) and the cylinder lever spring. This was replaced by a more efficient and durable cylinder lever spring when the Gen 2 revolvers appeared around 1978. The following are all chambered in 357 Magnum. The Lmodel with 6" barrel and adjustable sport sights.

The Vwith 5 1/4" with adjustable sights and Dwith fixed sights; Kand Cis the same, respectively, but with a 4" barrel, Hand Bwith 3" barrels, and Gand A with 2 1/2" barrels. Finally, HA models are the MR73 revolvers made by Chapuis Armes. The revolvers denoted as "Match" also came as single action only. If you get one in the shop that has a double action lockup, someone more than likely replaced the hammer.

Conversely, if you get a standard revolver in with single action only lockup, it could have had a match hammer installed or the double action capability removed from that hammer. Just make sure you do some research before working on or function testing MR73 revolvers so you know what type you have in for repair or service. This will assist you while interpreting functioning and safety tests performed.

As mentioned previously, I have had a number of the MR73 revolvers in for repair, service, or inspection over the past

few years. A search of my American Gunsmith collection dating back to December 1992 revealed that no article has been written about them. My goal with this article is to familiarize gunsmiths with the MR73 revolver and design, and to point out a few fixes for some of the issues I have encountered in the past.

I have found that the action is not a complicated design, so if you are proficient with Smith & Wesson revolvers, then you will feel pretty much at home working on these. They do have a different mechanism inside of them though. Disassembly I'll cover specific operating issues and repairs at the end of this article. Begin by releasing and opening the cylinder to make sure there are no live rounds.

With the cylinder still open, look down the barrel to make This gives you an idea as to how the cylinder lever hand and spring tighten up as the trigger is moved rearward, applying more tension on the back of the hand. Often, this type of "baby pin" spring fails—breaks, bends, or becomes lodged in the action. Check here first when the cylinder does not rotate during function testing of the Gen 1 models. sure no bullets or other obstructions are seen or encountered that have become lodged in the barrel.

With that done, begin by removing the grip panels (no associated part number in the accompanying schematic). Close the cylinder and slowly test the lock work in single and double action modes to make

sure the timing is correct—cylinder locks up each time the trigger is pulled or hammer is cocked manually. If it does not, mark that chamber with a piece of tape for reference for when you address that issue. Also, now is a good time to test for any "hammer push off".

This is done by cocking the hammer to the rear and pressing it firmly forward to see if it jumps off of the trigger sear engagement. With that testing done, continue disassembly of the revolver by removing the sideplate screws. Only the cylinder retaining screw, called the pivot stop screw (079), is shown in the schematic. There are two screws on the Gen 3 and newer guns and three on the Gen 1 and 2 guns. With the screws removed, open the cylinder (085) and remove it from the frame.

Loosen the trigger return spring set screw (120) located on the inner grip frame area just above the hammer spring adjusting screw (135). Count the number of revolutions it takes to free it from the trigger return spring (157), which is secured in the frame by the trigger return spring pin (119). Loosen the hammer spring adjusting screw (135), again counting the number of revolutions it takes to free it.

Typically, the hammer spring adjusting screw should take 3 1/2 to 4 one-half revolutions to free it from the spring and the trigger return spring set screw (120) should have about the same. If less, then some-

THE "MANURHIN CANDIDATE" CONTINUED

ORIGINAL PAGE 5

The hammer shown is a Match hammer and does not have the double-action sear attached to it or a place to attach it. A non-Match revolver will have the double-action sear. Also note the new and improved cylinder lever spring (one piece). Converting a Gen 1 to this type of spring can be done as long as you replace the sideplate. The tape was used to mark the cylinder that was found to be out of time during lock testing. This hammer has the double action sear attached.

Looking closely at the trigger return spring (top) you can clearly see how it interacts at the back of the recoil slide. It is easier to remove the recoil slide and trigger by inserting a brass pin punch in between the top of the trigger return spring and the frame, moving it away from the back of the recoil slide. one has moved them to help reduce felt trigger pull. With the springs relieved of all tension, remove the sideplate (107).

Tap on the frame grip area with a non-marring mallet or non-metallic screwdriver handle until the plate lifts up and comes free from the frame. Never pry the sideplate off. With the sideplate now removed, look inside at how the action is assembled and check for any wear or other issues that will need to be inspected and/or addressed. Begin by pulling the cylinder lever spring (159) off the hammer (125) and trigger recoil slide assembly (114).

On the Gen 1 models, the cylinder lever spring (same as 159) will have the wire-type spring attached to the hand and that spring looks much like a large baby safety pin. Remove it now. Back to the Gen 2 and newer models; remove the hand (137.01) by pulling the top of it rearward out of the slot in the frame and lift it off the trigger post. Remove the hammer spring (313) by unhooking it from the hammer stirrup (hammer spring rod, 133) and pulling it out of the slot it fits into on the grip frame.

Pull the cylinder release button head (031) rearward. While holding it back, pull the trigger (143) fully rearward and lift the hammer (125) clear from the frame pin it sits on. The connecting rod has U-shaped cuts on both ends, not centered on the ends. Since the cuts are closer to the top when removing this bar, I replace it in that same position, although it probably doesn't matter.

The connecting rod is placed between the two roller bearings on the recoil slide when The trigger will be connected by a small bar called the recoil slide connecting rod (112) that seats between the trigger (143) and the recoil slide (114). Lift the trigger, recoil slide connecting rod, and the recoil slide all out at the same time.

It helps to use a brass pin punch to wedge the trigger return spring (157) rearward to clear it off the back of the recoil slide so

that you can maneuver the assembly out from the frame. Note the recoil slide has roller bearings on the front and rear of it. The recoil slide connector rod has rounded or U-shaped cuts on both ends that fit in between the two bearings on the recoil slide, while the other end fits over a pin (slide connecting rod pin, 113) inside the trigger cutout.

I have noticed that the recoil slide connecting rod U-shaped cuts on both ends are not centered on the bars. In most cases when removed, the U-shaped slots that are cut closer to the top linear edge of the rod ends are found to be placed upward when installed in the recoil slide and trigger during reassembly. It more than likely doesn't matter but that is how I typically find the slide connecting rod when opening up a MR73 and so I install the rod in that same position.

The recoil slide assembly has a pin that protrudes through one side of it. This pin fits into a slot at the base of the internal safety (136) when installed. That means the protruding reinstalled. You must remove the cylinder latch assembly before you can remove the internal safety. The angled groove at the bottom of the internal safety is where the protruding pin from the recoil slide is placed when reassembled. Looks much like the transfer bar used in S&W revolvers and provides a similar function.

THE "MANURHIN CANDIDATE" CONTINUED

ORIGINAL PAGE 6

Far Also note the size of the frame pins used in the MR73. No wonder these revolvers surpass so many of the longevity tests conducted. This is nearly identical to the S&W cylinder assembly, to include the left-hand or reversed threaded ejector rod housing. pin on the recoil slide will go downward and into the slot for it located in the base of the internal safety bar. To remove the cylinder latch (140), pry it out with a small screwdriver tip being mindful of the cylinder latch spring (141) that operates it.

That spring has a 90-degree bend on one end and that bend goes in last when reinstalling it. The other leg is straight and simply goes in first and downward. The 90-degree bend on that spring leg will seat up against the front of the cylinder latch when installed properly. To remove the internal safety (136), begin by removing the cylinder release button head screw (034) and the cylinder release button head (031).

You can now retract the cylinder release button (032) rearwards and lift it upwards and out of the frame. Keep a finger on the cylinder release spring plunger (035) and cylinder release spring (036) so that you don't lose them. With these out, lift the internal safety out from the frame. To remove the firing pin (frame mounted), drift the small pin in the frame that retains it out from left to right. The firing pin has a return spring, so watch for it during removal.

Some models have the firing pin attached to the hammer nose, so that will require removal of the pin in the hammer—left to right—to remove it. Remove the trigger return spring (157) if needed by making sure

the set screw is free and by drifting the small trigger return spring pin (119) out of the frame from left to right. On some MR73 Match revolvers, the cylinder front latch assembly is dovetailed into the bottom of the barrel and retained in place by a single set screw.

This means you can adjust the cylinder front latch position if needed or you can remove it completely by drifting it off of the barrel after backing off the set screw (not shown in the schematic). To remove the standard type cylinder front latch, drift the front latch stopping pin (068) out from left to right, then pull the front latch (084) and front latch spring (067) out. The cylinder (085) disassembly is just like the S&W. Pull the cylinder pivot (075) or yoke out from the face of the cylinder.

Unscrew the ejector rod housing (not numbered in the schematic). It also has a left-hand or reverse thread. Once unscrewed, pull it and the ejector spring bearing washer (095) off the cylinder pin rod (091). Push the cylinder pin rod rearward to move the ejector ratchet (088.01) out, then pull the ejector spring (094) out from the face of the cylinder (085). Pull the ejector/ ratchet out the rear of the cylinder along with the cylinder pin rod and separate the two.

Also found on the cylinder pin rod is the small cylinder pin rod coil spring (093). Note which side of the lump on the cylinder pin rod to reinstall this spring onto. This completes disassembly of the MR73 type revolver. Reassembly is performed by following the above instructions in reverse order. No special techniques are needed other than already listed during the disassembly instructions.

Malfunctions Malfunctions can and do occur with these revolvers and each has different problems and causes; some from normal (or hard) use, others from excessive wear or incorrect reassembly. Knowledge of S&W lock work applies when working the MR73. There are some areas to inspect, along with corrective actions you can take if repairs/adjustments are warranted.

During initial function testing, if you find that the hammer will not lock when cocking it fully rearward during single action testing, check the "Sport & Match" trigger stop screw (144) if present. If it is screwed in too deep, it will prevent the trigger sear from fully engaging with the hammer ledge. This can also prevent the double action from working properly; as the trigger stop will hit the trigger guard frame before the hammer can be released from the trigger sear. Timing.

Often, dirt and debris around the back of the ejector/ratchet area can prevent the hand from making full contact with the ratchet. This can prevent the cylinder from fully turning and locking up with the cylinder latch. Check the cylinder locking notches around the cylinder as they can get gummed up with powder residue and debris as well. Sometimes, the hand deforms one or more of the ratchet notches. You can normally stone these to remove the burrs and get the timing back on track again.

If the revolver is well-worn, anew hand and fitment may be in order. I had one revolver that did not time correctly due to the trigger over-travel screw. Look for obvious issues first before ordering in replacement parts.

THE "MANURHIN CANDIDATE" CONTINUED

ORIGINAL PAGE 7

Hammer push off. This can occur from heavy use or hard thumbing of the hammer as sometimes seen in the movies. It can also happen if the revolver falls while the hammer is cocked and lands on the hammer. Normally, the hammer spur will be broken off or bent if this occurred. Test by cocking the hammer back fully until it locks. Then, without pulling the trigger, apply forward pressure to the back of the hammer spur.

If the hammer falls (without touching the trigger at all), the sear engagement is rough, rolled over, or damaged. I've found that correcting this condition is simplified through use of a Power Custom Series Stoning Jig. Trigger sear clean up was initially done incrementally until it worked in the offending revolver. Over time and by testing, I found that the best way to do it is to remove the trigger from the revolver and clamp it in the stoning jig as shown in the accompanying photo.

I use the S&W K, L, Nbushing, align the "0" with the top line on the jig, and tighten it up. Place the trigger upside down on the jig exactly as shown using the two protruding pins to align it; then clamp it into place. Once secure, raise the stoning angle to 21 clicks and lock it in place. To make sure that the angle is correct, mark the sear bearing edge on As you can see, the hammer was made for single action use only and was not a stripped down double-action capable hammer.

Good to know if you get a non-match revolver in that has this hammer installed (or vice versa). the trigger with a blue or black permanent marker and make a couple of passes with the stone over that area

to see if the shiny spot you created has the same bearing area as the sear itself. If not, readjust the angle (going up or down) until you basically wipe the marker off the sear completely with several light passes with the stone. The goal here is to clean up the sear and not take too much off.

Just get clean, sharp lines again. It won't take much—25 to 30 light passes seems to work much of the time for me. Check the hammer and make sure nothing is damaged there and if so, clean it up carefully! Parts for these revolvers are available but only at a cost most will be reluctant to pay. Anew hammer can be had for around \$300 with shipping and sales tax, so less is better when stoning or cleaning up a poorly performing revolver.

I once quoted anew hammer to a customer and he gave me the "all stop" on repairing that revolver. However, these revolvers have quite a bit of resale value, so a \$300 ham- You will have to clamp the trigger to the bushing positioned exactly as shown to get the proper and precise sear engagement angle. Adjust the fixtures angle height if needed (lower or higher) depending on the sear cut you have in front of you when stoning it true again.

So far, the "21 clicks up" adjustments have been repeatable on the MR73's I have had in the shop, and eliminated the push off. mer and labor to fit it isn't completely out of the question when looking at potential profit margins. Check the cylinder lever spring (159). I like to call this the hand spring. When installed in the revolver over the hammer and recoil slide assembly, the protruding flat spring "arm" should press up snugly against the back of the hand.

If the spring does not apply tension against the hand, reshape the arm so that it does. Sometimes anew spring will be needed. When in doubt, just replace it. Also, check the hand itself to ensure it is not deformed or damaged on the business end. Burrs and dings on the end that moves the ejector ratchet will cause timing issues. Replace it as well when needed, or weld up the end and re-fit it. A recent repair I had in the shop found an issue that I had not encountered before with a Manurhin.

It was a match revolver but I could not cock the hammer; it felt like it was hitting something inside of the action. The initial test found that when the cylinder was opened and the cylinder release button was pulled to the rear, the hammer would cock and function just fine. Disassembly of the cylinder found that the ejector rod center pin was bent and damaged just below the area of the ejector/ratchet.

The bent rod and damaged area prevented the end of the ejector rod center pin from protruding out the back of the ejector under the small coil spring tension. This would not allow the cylinder to fully lock into place in the frame, nor did it push the cylinder release button/bar rearward far enough, causing the hammer to run into the cylinder release bar inside the action. Once the ejector rod was stoned true and polished, the revolver worked just fine.

Specific Tips One MR73 had a cylinder that only turned when pointing downward, double or single action. Pointing it upward resulted in the cylinder not turning at all. Removal of the side-

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2398-P08-F01. Know the rights holder? Please ask them to contact us.
AG-AA23F122A5-A2398-P08-F01

Manurhin MR73 Revolver (Specifications subject to change without notice) 011 Frame 013 Recoil Plate 014 Cyl. rear stop 7135 Cyl. pivot stop 016 Hammer pin 017 Trig. pin 018 Cyl. latch pin 019 Cyl. latch spring pin 020 Grip panel dowel 021 Pin for lanyard 107 Side plate 7153 Side plate screw 031 Cyl. release button 032 Cyl. release button 034 Cyl.

RB screw 035 Cyl. release plunger 036 Cyl. release spring 051 2-1/2 Barrel 357 Mag. 052 3" Barrel 357 Mag. 053 4" Barrel 357 Mag. 054 6" Barrel 357 Mag 070 5 1/8" Barrel 357 Mag 073 8" Barrel 357 Mag 058 3" 4" front sight 061 Sport-sloped front sight 063 Barrel attaching pin 064 Front sight pin 084 Front latch 067 Front latch spring 068 Front latch stopping pin 071 Sport front sight 075 Cyl. pivot 079 Pivot stop screw 085 357 Mag/38SP Cyl. 037 Ejector locators 088 357/38 ejector 089 3-8" ejector rod 090 2 1/2 ejector rod 091 3-8" Cyl. pin rod 092 2 1/2 Cyl. pin rod 093 Cyl. pin rod spring 094 Ejector spring 095 Ejector spring washer 110 Def trig. assy 111 Trig.

112 Recoil slide connect rod 113 Slide connecting pin 114 Recoil slide 115 Recoil slide rollers 116 Trig. spring roller 117 Pin slide/safety roller 119 Trig. return spring pin 120 Trig. rtn. spring screw 121 Recoil slide assembly 125 Hammer assy* Sport 126 Spur hammer* Sport 127 Sear* 128 Sear/hammer rod pin* 129 Sear spring*

130 Oscillating firing pin 131 Firing pin axis 132 Hammer spring rod 133 Hammer spring pin 135 Hammer spring screw 136 Internal safety 137 Cyl. lever 139 Cyl. lever pin. 140 Cyl. latch 141 Cyl. latch spring 143 Trigger 144 Trig. stop screw 145 Trig. assy 146 Firing pin spring 157 Trig. return spring 159 Cyl. lever spring 160 Rear sight 166 Rear sight spring 167 Rear sight pin 173 Rear sight 179 Standard grip assy 184 Grip screw 313 Hammer spring 616 32 Match barrel 620 Match sight w/screw 617 Front latch stopping pin 626 Match hammer 630 Match 32 Cyl. 641 Match rear sight 406 Match 38 barrel 411 Match 38 Cyl.

420 Match w/ screw * Double action parts plate found the "old style" cylinder hand spring (baby pin type) still intact, but it had hung up inside of the action during the last reassembly of the revolver.

A little reshaping and cleaning up of that "pin type" spring made the revolver come back to life again. If you get one in that has a broken spring, you will have to make one unless you know of a source for parts. As mentioned earlier, you can convert a Gen 1 to accept the Gen 2 hand spring, but you will have to replace the side plate to do that changeover. Some parts are available (at a cost) for the Gen 1 revolvers and many more are available for Gen 2 and newer.

Again, at a substantial cost depending on which part you need. Hastings Distribution (HastingsDistribution.com, has many parts available along with detailed information. If you find there is end shake on the cylinder, S&W end shake shims can be used; they fit perfectly into the yoke. Other than the above, cleanliness and tight screws are always in order, along with frame pins staying in their proper positions.

These are very durable revolvers, however, a firearm is only as durable as the sum of their collective parts when all are working properly. One small bend in a pin can render the entire revolver useless until repaired. I was able to locate a couple of schematics contained within the pages of Manurhin original Owner's Manuals. The Gen 1 schematic didn't list each part individually with an accompanying part naming convention but the schematic for the Gen 2 shown here does.

I used the parts numbers from the Gen 2 schematic when identifying each part listed in this article as a reference point. The parts naming conventions were not the same as those found on S&W revolvers but they are similar in their individual functioning purpose. At least you now have a single source document that describes the Manurhin MR73 Gen 1, 2 and newer models made. AG

FROM THE ARCHIVE

AR-15 Fliers, Part 1

Stoner design flaws that contribute to fliers and how to address them.

BY JOE CARLOS FEBRUARY 2021

ORIGINAL PP. 9-12

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2399-P09-F01. Know the rights holder? Please ask them to contact us.
AG-AA23F122A5-A2399-P09-F01

Most of us probably have some idea what constitutes a flier. I'll give you my interpretation: "A flier is around that, without explanation, impacts outside the rest of the group." Closely related to fliers are fat groups and "walkers", two additional topics that we will give a little time to in this article. There are four causes of fliers that I am aware of. The first are marksmanship errors caused by the shooter. Second, sudden changes in range conditions that the shooter fails to notice.

Allow me to climb up on my soapbox for just a moment. Every long-distance shooter eventually gets caught by sudden changes in wind velocity or direction that occur on ranges. Masters and High Masters have cultivated skills that alert them to these changes but even these "walk on water" marksmen eventually get caught. So smart hombres use bullets with high ballistic coefficients at long distances to minimize the penalties of unexpected wind shifts. Third is gun and sight issues, Fourth is ammunition imperfections.

The first two causes are outside the purview of gunsmith fixes, though they're important topics that can only be earned

with plenty of quality live and dry practice. Eugene Stoner designed a fine rifle that has stood the test of time. The basic platform has been sold and copied in many foreign countries and has performed admirably in combat across the globe. Right from the factory, with no modifications, it shoots much better than it has any right to.

That being said, it was designed for reliability in combat, not super precise target shooting. There are certain features of its design that actually promote fliers. In the half century since its introduction, shooters, gunsmiths, and gun makers have recognized some of these shortfalls and compensated for them. Barrels and Tubes Let's take a moment to look at those Stoner design characteristics that contribute to fliers and how they've been addressed.

First is attaching the forward sling swivel to the barrel via the front sight housing. Shooters using a sling to steady wobble and combat recoil can literally bend the barrel. This design issue intersects with marksmanship fundamentals. Those shooters who accept a lighter amount of sling tension than they would use with other firearms will likely experience less sling-in-

duced fliers and their severity will probably be less. Regardless of the amount of sling tension applied, the consistency of tension is key.

This consistency not only applies from shot to shot but from one range session to the next. For example, if your last range session was in hot weather and your next trip was in cooler temperatures where you added a layer or two of clothing, that changes sling tension and your point of impact may well shift. A right-hand shooter applying a little more tension on one shot will probably experience a low left flier.

A float tube addresses this but can add a pound or more of weight so not everybody will want that solution. There are other options to lessen barrel flex from a supportive sling. Gun makers heard these early complaints about sling-induced fliers and zero shifts and reacted. Colt introduced the HBAR (Heavy Barrel). While using the same swivel, the fatter barrel lessens Center, handguards removed, exposing float tube. Bottom, this Geissele Automatics handguard also floats the barrel.

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2399-P10-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2399-P10-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2399-P10-F02. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2399-P10-F02

whip. When Service Rifle competitors began to seriously experiment with replacing the M14/M1A, demand for away to float AR barrels reached a fever pitch. Eventually, smart guys came up with float tubes. This is basically a pipe surrounding the barrel with a Delta assembly on one end and handguard endcap and sling swivel on the other. Thus, a tight sling can only bend the tube with no pressures applied to the barrel.

The float tube was sandwiched between the barrel and handguards, making it an internal modification and legal for Service Rifle. In the last few years both the National Rifle Association and Civilian Marksmanship Program have relaxed some of their rules for Service Rifle and Service Pistols. Rifles now permit AR handguards with rails on the outside, though there are some differences in NRA and CMP rulebooks.

Help your customer realize this and make them aware the onus is on them to comply with the rule(s) of the sports they participate. These various float tubes and modern handguards largely remove sling and other pressures from the barrel. This greatly reduces fliers but might induce other issues. One example, float tubes that throw the gas tube out of alignment with the Far key in the bolt carrier. Unfortunately, this is

more common than a lot of folks realize and we will cover the problem in an upcoming section.

Carriers Another issue with Stoner's design is the enormous amount of slop in the fit of the bolt carrier assembly inside the upper receiver. While that slop contributes to the incredible reliability of the AR, the downside is fat groups and fliers. Those precision issues are caused by the carrier not orienting itself so that the bolt face can be perpendicular to the center axis of the bore.

This, in turn, results in cartridges cocking at an angle inside the fat chambers found in most gas guns, especially those used by the military. A cartridge oriented at an angle in the chamber will send its bullet off center to the bore, deforming it and causing big groups and fliers. Function and precision in many gun designs are often at odds with one another.

As a gunsmith who custom builds ARs used at the highest levels of national competition and a former competitor myself with a half century of experience with this platform, it is my opinion that Stoner erred a little on the function side. That's okay if you are going Far Top, a Les Baer, no longer available. Center, JP Enterprises. Bottom, Young Manufacturing, Inc. into combat in a dirty environment.

On the other hand, this article is about eliminating fliers so let's see how we can do so by making accuracy improvements to carriers. Two companies have made part of this a little easier for us: JP Enterprises and Young Manufacturing, both of which offer National Match carriers with front ends that measure fatter than other carriers on the market. This results in more consistent positioning of the carrier.

When I was the match Armorer for the Army Reserve Shooting Team, I purchased 100 of these and tested the Team's National Match Service Rifle uppers, first with stock carriers and then with match carriers. 100 is a nice sample size so I feel very confident in my results. The match carriers resulted in an average reduction in group size of 8.8%.

In all of my testing and then the hundreds of thousands of subsequent rounds fired by Team members in the uppers with the match carriers, I am not aware of a single malfunction caused by any of the match carriers. For more information on match bolt carriers, refer to my article in the May 2014 issue. Having improved the front of the carrier, let's turn our attention to the back end. Shotgun an AR and note the gap at the back between the carrier inside the receiver. It is larger

AR-15 FLIERS, PART 1 CONTINUED

ORIGINAL PAGE 11

at top and much smaller at bottom. This indicates that the carrier is not level and indicates tilt, which has been recognized as a contributor to fat groups. As the back of the carrier sags down, the bolt face cocks at an angle, causing a cartridge attached to the bolt to move out of alignment with the bore. Again, bullets are deformed and fliers and fat groups are common. Contemporaries of Stoner tried to fix this problem but were not successful.

Gunsmiths, with few exceptions, pretty much buried their collective heads in the sand for decades. I looked at what had been done nearly 50 years ago and the mistakes made and designed my own version of anti-tilt pads to level the carrier while not adding a bunch of friction. I drill and tap the back of the carrier at 4:30 and 7:30 O. C. to accept 5-40 dome head cap screws.

The small surfaces of the cap head that actually make contact with the bottom and sides of the insides of the receiver are only about the size of pin heads and offer minimum friction but plenty of support. This is covered in depth in the May 2017 issue. Testing revealed that anti-tilt pads cut group size an average of 14%.

When applied to a match carrier the two accuracy gains combined (8.8% plus 14%) and resulted in nearly a I had to mill a flat on this example to allow for proper gas tube clearance. quarter average reduction in group size along with fewer fliers. Gas Tubes A few paragraphs back I hinted at how gas tube alignment issues that arise with certain float tubes and handguards can work against keeping carriers level and centered on the barrel.

If there are any errors with the alignment of the gas tube and the bolt carrier key, the carrier will be pulled out of alignment, compromising any positive contributions of match carriers and anti-tilt pads. As Stoner designed his platform a person has to work pretty hard to create a gas tube alignment issue. Stoner's design allowed the gas tube to float from the rear of the front sight all the way into the cloverleaf hole in the front of the receiver.

When smart guys invented float tubes, they inadvertently opened a can of worms. Float tubes take up considerable room under the handguards and sometimes that brings them into contact with the gas tube, pushing on it and forcing misalignment. Holding an upper with a float tube to light needs to show a line of white between both tubes. If it doesn't, the contact will cause problems. My March 2014 details how to fix this. Most of these problems occur when the float tube is 1 3/8" in diameter.

Compass Lake Engineering manufacturers a skinnier tube at 1 1/4" that they supply with a properly-bent gas tube and outer plastic handguards designed to give proper clearances. This CLE model is highly recommended. There has been a recent trend to replace regular A2 plastic handguards with rigid handguards that have rails outside. While these new units may float their barrels, some are ill designed.

What they are using to replace standard barrel nuts are often too fat and push up against the gas tube so that the tube enters the cloverleaf at an upward angle. When the bolt carrier key goes over such a cocked gas tube the whole carrier is forced

upward at an angle. My May 2018 article discusses this. When a customer hands me an upper complaining of fliers, I look at two things first: Ammunition issues and gas tube alignment. It's that important!

Chambers The 5.56mm NATO chamber is the correct choice for soldiers going into the dirty conditions of combat. For the rest of us, a number of its characteristics just contribute to fliers and fat groups. The NATO chamber has an overly-long freebore that bullets must pass through before reaching the back of the barrel. Complicating matters is the fatness of the freebore which exceeds that of other chambers, making it easier for bullets to begin to tip.

Barrels that begin life with long fat freebores will "wear out" sooner. If you gunsmiths take in a rifle with a NATO chamber from a customer who is complaining of fliers, be sure to ask if this has just started or if it has been a problem from the get go. If fliers have been common, even when the barrel was new, this may point to a rifle that needs anew barrel. If fliers began around round count 2,000 that barrel may have reached its wear out point.

I recommend using something like the Hornady Overall Length Gauge or the newer Dead Center Sports Length To Lands Gauge to take a measurement with the same bullet that the customer is shooting. As a general rule, when bullets are jumping 1/4" or more, fliers are becom-

AR-15 FLIERS, PART 1 CONTINUED

ORIGINAL PAGE 12

ing more common, more severe, and groups are opening up. Such barrels may need to be replaced. If you are replacing a barrel or performing anew build for a customer there are three chambers that I can recommend. The Compass Lake Engineering chamber is great for customers who want to shoot nothing but magazine-fed ammo, including issue ball ammo. For shooters using magazine-length ammo at short distance and then switching to longseated bullets for longer distances, this is a great chamber.

The Wylde chamber has a longer freebore than the CLE. Like the CLE chamber, it will perform well with any magazine-length rounds. For folks wanting to switch to long-seated bullets in heavier weights (90 grains for 5.56/223) this is my choice. As of this writing, the Wylde chamber is very popular. The final recommendation is a very limited specialty chamber, the 223 Remington Kiff ISSF chamber available from Pacific Tool & Gauge. This has a very long freebore, about 1/10" longer than a Wylde.

It was developed by Dave Kiff, the owner of PT&G, for shooting 90 and 95 grain bullets fed one at a time by hand into the chamber. Due to the extremely long freebore it should not be used with magazine-length ammo because bullets will be jumping too far. It is a good The proper way to square AR receivers is in a lathe. Using one of the so called "AR lapping tools" pictured here will normally make receiver run out worse, not better. chamber for long range matches like PALMA and F Class.

Receiver and Barrel The fourth design failure of most all Stoner firearms is the slop-fit between the barrel extension and the

inside surface of the upper receiver. When assembled, the barrel nut does an adequate job of preventing front to rear movement of the extension inside the receiver. Unfortunately, however, a lot of up and down and left to right movement is possible.

The Army Reserve Shooting Team discovered this issue over a quarter century ago while in Australia, which I detailed in the March and April 2013 issues. Gunsmiths need to tighten up the extension-to-receiver fit by using either shim stock and green Loctite or oversized BAT Machine match extensions. Properly done, you can expect about a 1/3 reduction in group size and a reduction in fliers. Heavy sling tension applied directly to barrels bends the barrel.

Those same sling pressures can also cause the extension to move inside the receiver. Keeping that extension centered in the receiver lessens the negative impacts of sling pressure. Eliminating movement of the barrel extension inside the upper receiver relates to the "registration point", the position of the muzzle from shot to shot. Failing to have a consistent registration point allows the barrel to go through its harmonic whip upon firing but the muzzle doesn't return to its previous point.

This is what happens when you have a lot of slop in the fit of the barrel extension as movements at the back of the barrel are translated to movements at the muzzle. This inconsistency is also influenced by the front surface of the receiver. Almost all of these receivers come from the factory with high spots on the fronts where the raised portion of the barrel extension

comes to rest when the firearm is assembled. Those high spots allow the barrel to pivot around during the harmonic whip.

The muzzle on such a firearm is guaranteed not to return to the same point between shots. The front ends of most all receivers will need to be properly squared. Make no mistake that so called, "Upper Receiver Lapping Tools" that sell for about \$35 from a number of sources is not the proper way to accomplish this task! These tools fit in a 3/8" hand drill. My tests show that runout actually increases from the use of these gizmos.

We want runout to decrease and the way to accomplish this is by proper machining on a lathe. When this is done properly average group size will decrease by a substantial 14%. Finishing up this section with the fifth and final design flaw in Stoner platform rifles is upper to lower receiver fit. As we all know AR lowers attach uppers by way of two captive push pins. While this is indisputably convenient it sure doesn't contribute to precision.

My April 2017 article on the Accu- Wedge details a 26% reduction in group sizes in one of my lowers by simply dropping in this piece. Some high points are that each upper/lower combination will exhibit its own specific group reduction, that every AR has two pins and tightening at both is key, and one of the best solutions is to start your build with a tightly matched receiver set such as available from Rock River. Next month we will get into fliers caused by ammunition characteristics.

Feel free to email me at to discuss this or any of the articles I've written. AG

FROM THE ARCHIVE

Lyman M77 Globe Sight

Restoring a Lyman M77 globe sight using old and new school techniques, including 3D printing.

BY JOHN BAXTER FEBRUARY 2021

ORIGINAL PP. 13-16

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2400-P13-F01. Know the rights holder? Please ask them to contact us.
AG-AA23F122A5-A2400-P13-F01

Most of us have an eclectic accumulation of stuff we have collected over the years based on our hobbies, professions, or even inheritance. In my case I have several genres of things, including obscure marine hardware, various wood-working novelties, motors, and, of course, gun parts. The gun parts represent several generations of meticulous acquisition and preservation, resulting in many items that are beautifully manufactured but sometimes missing critical parts or related assemblies.

Such was the case when I began a project to build a target plinker from a 1895 Mauser action I picked up at a gun show years back. The sight combination I selected for this project is comprised of a Lyman M77 front globe sight and Armstrong dual-range peep sight for the receiver. The rear sight is an early version of an Armstrong dual-range peep sight which is designed to mount on the right side of the receiver, a necessary requirement given the bolt-release lever on the left side of Mauser rifles.

The sight mounts to the receiver with a V-block base and two screws. The base is a snug fit between the bolt handle and rear of the ejector port, requiring precise measurements when drilling the holes in the receiver.

The Armstrong sight includes several ingenious features, including knurled adjustment knobs for elevation and windage adjustments. These knobs have 40 pitch threads and detents every 30 degrees resulting in a mere 0.002" of movement per click.

Vernier scales are mounted on both axes, with graduation markings every 15 clicks. The sight mounts to the base by means of a vertical dovetail with a quick release button to disengage the elevation screw from the base. This permits the intricate portion of the sight to be removed for safe transport. The aperture screws into a small plate that rides in vertical channels on across feed block positioned by the windage screw. The aperture plate has two small springs on the bottom that bias the aperture up.

The "dual-range" feature is enabled by across bar above the plate. The cross bar has a V-notch on one side. When the bar is pushed so that the V-notch section is above the aperture plate the sight will rise approximately 0.040". A quick ballistic calculation using a nominal 170 grain bullet load indicates this "dual-range" roughly corresponds to the bullet drop between a 25-yard sight-in range and a 200-yard target.

I admit to being skeptical about the value of this "dual-range" capability, but the mechanism and machining is clever. The adjustment knobs, peep sight plate, vertical dovetail, and cross slide have locking screws with hex heads. A vertical stop screw with the same hex head size can be adjusted to prevent the sight from being lowered onto the top of the receiver. A small hex wrench accompanies the sight in a snug fitting hole at the top rear of the sight mount.

My Lyman M77 front globe sight has a female dovetail from front to rear, locked in place by a shoulder on a knurled screw mounted on the right side. More modern configurations like the Lyman Model 17 globe sight use a standard female dovetail cut across the top of the barrel and come with a variety of offsets.

Like the more modern M17 sight, the M77 includes a set of inserts, four sizes of apertures in a post-mounted ring (sometimes referred to as a "lollipop sight"), several colored solid inserts with a small aperture, and a poststyle insert. The inserts are placed

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2400-P14-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2400-P14-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2400-P14-F02. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2400-P14-F02

into the sight from the rear and held in place by a threaded cylindrical tube which serves as the rear cover for the sight. The sight body has milled slots on either side from the rear to middle of the sight that guides horizontal tabs protruding from the outside of the inserts. The inserts are made from a dull black metal sheet approximately 0.025" in thickness, except for the solid semi-translucent colored inserts, which are either yellow or red.

My M77 only had one insert remaining (an aperture with a 0.085 internal diameter) and no male dovetail to mount to the barrel. The inserts for this model can still be found, although in many cases the sets are not complete and exhibit some surface damage. While Lyman

M17 inserts are compatible with the older M77 sight, other inserts, including those of the Lyman Series 20 and 93 globe sights, will not fit. This struck me as an opportunity to use a 3D printer to produce the inserts.

The first step was to model the sight in On Shape (On-Shape.com), a free online Computer Aided Design (CAD) package. I made a parametric model for the inserts, which allows key variables such as the aperture size and sight style to be easily changed so that all the different sights can be generated. Additionally, custom configurations can be easily created by adjusting the variables. A complete set of inserts was modeled and exported to STL files, a file format native to the stereolithography CAD

LYMAN M77 GLOBE SIGHT CONTINUED

ORIGINAL PAGE 15

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2400-P15-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2400-P15-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2400-P15-F02. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2400-P15-F02

software. The STL file format is a three-dimensional representation of the part's surface geometry and can be used to view the part using a 3D viewing program and to create the physical object with a 3D printer. A set of six inserts was printed on a Dremel 3D45 printer using black PLA material—Polylactic Acid, a thermoplastic made from renewable resources. This material produces a flat black finish which is ideal for this application. Additional solid aperture sights were printed in red and yellow.

PLA is non-toxic; in fact, it is used in medical implants and food packaging. It has a glass transition temperature of 145°F and a high resistance to UV degradation, making it suitable for most shooting conditions. The inserts are printed slightly oversized and individually sized to fit using needle files. The STL files for the inserts can be found on

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2400-P16-F01. Know the rights holder? Please ask them to contact us.
AG-AA23F122A5-A2400-P16-F01

the American Gunsmith website, AmericanGunsmith.info/lymanm77-down-load. The M77 sight mounts to a male dovetail attached to the barrel. To determine the correct height the distance from the centerline of the action to the center of the rear sight aperture with the rear sight set to the lowest position was determined.

The distance from the center of the M77 front sight to the top of the dovetail was subtracted from the rear sight measurement; the resulting dimension is the required distance of the sight base from the muzzle centerline. The sight base was also designed in On-Shape. The dovetail is a standard 60° with a 0.46" wide flat and the outer barrel diameter at the location for the sight is 9/16" diameter.

Once these features were modeled, it was a simple task to set the final base dimensions to place the top of dovetail at the proper place based on the previous measurements. The base was manufactured from an aluminum rectangular bar measuring 1/2 x 1". The base was milled to the required overall height and length before being cut from the bar.

To create the concave radius required to mate to the barrel, a 9/16" mill was aligned to edge of the base with a machine square and the mill table moved to position the cutter above the centerline of the base. The depth of cut determined the height from the barrel (0.250") and was easily checked with calipers during the machining process.

The base was cut from the bar after the barrel radius was milled into the part to the required depth. A #6 mounting hole and counterbore was drilled into the base.

In preparation for milling the dovetail into the base, an adapter was made from a 9/16" brass rod. The adapter was milled to the width of the sight base and the two parts connected with a 6-48 screw. The adapter was clamped into the vise on the mill and positioned to take several light vertical "climbing" cuts with the dovetail cutter; top to bottom on the right and bottom to top on the left. The base was deburred, degreased, and treated with Aluminum Black metal finish.

It is important to thoroughly clean the part after machining as any residual oil will result in an inconsistent finish. Once degreased, the base was sanded with 400 grit paper, wiped down with isopropyl alcohol, and coated with Aluminum Black several times with light sanding between coats. Once complete, the part was washed in hot water and lightly oiled. The base was mounted to the barrel with a single 6-48 screw.

The radiused interface of the base to barrel provides stability, enabling a single screw for mounting. This configuration enables future "switch-barrel" options; a new base can be manufactured with this method and fitted to barrels of any diameter.

Furthermore, customized front sight inserts can be designed and manufactured using CAD and 3D printing for any situation.

I made a travel box for the sights with some help from the 3D printer to keep the inserts organized and securely hold the front and rear sights. 3D printed parts for the rear sight cradle (after removal from the receiver base), a short dovetail for the front sight, and a tray for the inserts fit inside a small wooden box with a foam insert to hold the parts securely in place. These classic sights add a touch of class to a ground-up rifle project that started with an unbarreled small receiver Mauser action.

Fortunately, individual gunsmiths now have the tools to design with advanced computer models and create the custom hardware using both traditional machining techniques as well as additive manufacturing tools, including 3D printing. The availability of computerized modeling software and publicly-available 3D printers enables today's gunsmith to go beyond their traditional machine shop fabrication capabilities to include specialized components as apart of their offering.

On Shape users can find the entire model, named "Lyman M77", in the On Shape public folder. Individual "part studios" are included for the inserts, base, housing, clamp screw, and eyepiece. There are dimensioned drawings of the insert and base as well as assembly drawings for the complete sight. AG

RIFLES

Mc Millan Mc3 Stock

Building accurate rifles using Mc Millan's precision stock.

BY ROBERT K. CAMPBELL FEBRUARY 2021

ORIGINAL PP. 17-19

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P17-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P17-F01

Original caption: Top: The Remington 700 Mc Millan Mc3 stock and Bushnell scope combination proved an ergonomic and useful combination. It is most friendly when firing. While wood stocks are often less consistent, not every synthetic stock is better than wood.

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P17-F02. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P17-F02

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P17-F03. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P17-F03

I have installed quite a few rifle triggers and barrels. I've also modified some stocks and fitted new ones. While each part of the rifle is important, the stock probably doesn't get enough attention. Bedding and fit is important and some makers such as Mc Millan take a lot of the work out of fitting a rifle stock. Some stocks are expensive but they serve a real purpose. The most accurate combinations are the subject of constant study.

In the end, no matter how good the action, barrel, and optics are, the foundation—the rifle stock—must be solid. Stocks shift or move during recoil. The barrel and action also shift in most types of stocks. This has an effect on the relationship between the point of aim and the point of impact. While the rifle must

be free floating and not touch the stock more than necessary for best accuracy, the action must be firmly bedded.

Very seldom do you see a truly accurate rifle with a factory stock, although many are reasonably accurate. The best shooters use some type of aftermarket rifle stock as they stop shifting and compression.

Most factory plastic stocks are hollow; this is cheap and it isn't ideal. The grain structure of wood stocks cannot be as consistent as high end polymer stocks. This results in inconsistent harmonics and less accuracy than is optimum. The plastic stocks are surprisingly thin in many cases, though some are better than others. As an example, the Savage Apex Storm is considerably superior to the Savage Axis, a less expensive rifle, but all have relative shortcomings compared to a stock like those from Mc Millan.

Fiberglass is more rigid than plastic and a robust Mc Millan offers greater weight and solid density. The heavier the caliber, I believe, the greater the advantage a Mc Millan stock offers. A problem for many shooters is the expense, which can be as much as \$1,000. Mc Millan has experimented with injection molding to the point they felt that they were able to offer a quality stock in this material.

The original fiberglass stocks are more costly, while the newer stocks are less expensive and much better than an inferior hollow body stock. For the most part, wood stocks and plastic stocks in particular cannot offer the stiffness needed for a solid, dense stock. There are limits to the thickness of which plastic ma-

MC MILLAN MC3 STOCK CONTINUED

ORIGINAL PAGE 18

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P18-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P18-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P18-F02. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P18-F02

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P18-F03. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P18-F03

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P18-F04. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P18-F04

Top While it isn't well suited to adult shooters, it was a good job of creating a youth stock. terial may be molded. Tolerances and shrinkage due to the elements are problems with many plastic stocks. Some of the plastic stocks are excellent choices for rimfire rifles as there are different standards at play. When you move to heavier calibers the problem of rigidity becomes more apparent. And this problem becomes more important the heavier the caliber. The new Mc Millan Mc3 stock addresses many issues.

First, the Mc3 is crafted from a material called Xenolite; shrinkage isn't a problem according to Mc Millan. Differences in the material allow greater flexibility in molding the final outline of the stock. The stock is similar to the legendary A5 stock Below and The work was flawless and only minor fitting was

needed. and it features aluminum pillars. This pillar bedding is intended to offer rigidity at the trigger guard and action screw in particular.

The Legend Standard is available for less than \$300, providing a price that gives shooters looking for an excellent stock a good break. For specifications, the Mc3 has an average weight of 61 ounces, 30.75" length, 1.75" forend width, and a length of pull of 13.5". The stocks are 100% Xenolite composite material for improved rigidity and stiffness with aluminum pillars bedded in during molding. A one-inch Pachmayr Decelerator recoil pad, two front sling studs, and rear QD Cup and Loop is included and installed.

A cheek riser or spacer system is available but not included on the Legend Standard. The Mc3 is molded to fit Varmint and

Sendero barrel contours and is designed to fit all Remington 700 footprint actions including Defiance, Bighorn, Seekins Precision, Kelbly, Stiller, Lone Peak, Tuebor Precision, and similar, though some may require minor modification. The stocks are available in OD green and tan as well as the full spectrum of Mc Millan paint shop options.

It's worth emphasizing that "some may require minor modification" warning in the specification as it proved true for my project. There is some discussion as to whether to rely on factory pillar bedding or to also bed the stock. I think that bedding the stock will be a good choice for those seeking the "Nth degree" of accuracy—and that is almost all of us. My personal rifle has turned out very well but it is a precision hunter, not a Ben-

MC MILLAN MC3 STOCK CONTINUED

ORIGINAL PAGE 19

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P19-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P19-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P19-F02. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P19-F02

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P19-F03. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P19-F03

chrest competition rifle. It is important to take the shooter's needs into account. A few words are in order on the origin of the Remington 700 30-06 Springfield illustrated. I found the rifle on the used rack at a pawn shop. This Remington 700 was in excellent shape with a clean bore. While a snug fit, the trigger guard area did not require hand fitting, and smooth action.

The scope isn't expensive but turned out to be a very nice rifle optic; the Bushnell Varmint has given such good service it isn't slated for replacement. The wood stock was the problem as it had been cut into a youth stock leaving it far too short for my average build, even though the job. The trigger group and receiver were a good tight fit.

The bolt handle, however, was too tight in the stock. done was excellent and the stock was very attractive but it severely eroded the rifle's resale value and made it useless for an adult shooter. Plus, 30-06 Springfield isn't an ideal youth starter rifle, at least in my opinion, but then perhaps the previous owner handloaded ammunition to 30-30 Winchester levels. Regardless, the rifle was in excellent condition and the stock, while not for me, was very well turned out.

Due to the short, nonstandard stock, that Remington was setting on the shelf at a bargain basement price and has become my favorite 30-06 bolt action rifle of all time, largely due to the Mc-Millan stock I added. I don't say that lightly as the rifle's Huber aftermarket trigger (Huber Concepts. com, is

also a desirable component, but that is a story for another time. In total, action, optic, excellent trigger, and Mc Millan stock combination make for an excellent rifle. Back to bedding.

I suspect few Mc Millan Mc3 stocks will be bedded as most will be installed and used as issued. But some of us will want to get the maximum benefit from the rifle. With these stocks the recoil lug is molded in. With original wooden stocks the recoil lug is machined in place. I originally began the project planning to test the rifle for accuracy with the wooden stock but decided against it.

I could not get into any type of firing position with the cut down stock that would have provided valid results and decided against (Continued on page 22)



ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2401-P22-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2401-P22-F01

testing accuracy until after final fitting. Inletting with the Mc Millan is far superior to factory rifles. You may actually get very close to the maximum accuracy potential without bedding, although repeatability may be better with bedding. There has been a great deal of experimentation in bedding but in the end aluminum pillar bedding and the Mc Millan system is at the top of the strata for most of us. Pillars stop compression according to Mc Millan and that is the design intent. That is a great improvement.

The end user must decide if accuracy potential is met with the stock and if bedding is needed. When fitting the Mc Millan stock I experienced some difficulty in a perfect fit. The rifle went in and tightened but the area around the bolt did not allow the bolt to rise as it was locked down tight. I carefully moved the rifle back and forth and determined that the stock needed a little work both fore and aft. A small area about six inches back from the forend was carefully sanded.

More material was removed around the bolt handle. In the end I had a very tight, solid fit. This is for the best as we want some fitting in order to achieve maximum fit and accuracy potential. After tightening the action

down and dry firing the rifle, I was ready for the range. I fired a few of my own handloads using 168 grain Nosler bullets and Hodgson IMR 4895 powder. It took a few shots to properly sight the rifle at 100 yards having first bore sighted the rifle in the shop.

Using factory Nosler 165 grain Partition loads I carefully fired two three-shot groups getting an average group of 0.9 inches. This is good enough for the hunting and recreational shooting I am doing with the rifle and it is plenty accurate to 300 yards. While there are more accurate rifles, I've found this rifle maintains its accuracy in extended firing. Another great advantage in the Mc Millan stock is comfort. While accuracy potential is there the stock design is among the most comfortable I have fired and used.

The wrist doesn't get tired and the shoulder isn't beat up. This is worth the upgrade alone. I find the Mc Millan Mc3 an excellent, all-around stock and well worth its price. Be prepared to do minor fitting. If you want the final degree of accuracy, bed the stock. The Mc3 is an affordable option for shooters well worth the asking price. AG

FROM THE ARCHIVE

S&W Barrel Swap

A couple stumbles, then success! Here's how we swapped barrels on a Smith & Wesson 500 Magnum.

BY CHARLIE BRIGGS & MIKE DIEDRICH FEBRUARY 2021

ORIGINAL PP. 20-22

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2402-P20-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2402-P20-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2402-P20-F02. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2402-P20-F02

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2402-P20-F03. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2402-P20-F03

As many of you know, several of my recent articles were built around a partnership with a good buddy and fellow gunsmith, Mike Diedrich. Some recent health problems (hopefully short term) have lessened the time I can spend in my shop. However, I can still type and Mike always turns out magnificent work, so the articles can still be produced. For this article Mike had to think through every aspect of the project, one piece at a time. There was one small failure but a major success was finally achieved.

Mike's total machine time at the mill and the lathe alone was nine hours and his copious notes made this article happen. A customer brought in a Smith & Wesson Model 500 Magnum X-Frame revolver with a four-inch barrel that he wanted changed a 8.375-inch barrel to reduce the awesome effects of recoil and lengthen the sight radius. The problem with this particular S&W model is that it uses a two-piece "barrel" which is actually a barrel sleeve covered by a barrel shroud.

I believe at the factory these barrels are installed with a special expanding mandrel and likely why they say barrel swaps like this area factory only job!

Many of us would have told the customer, "thanks, but no thanks" but Mike, ever the "determined German," combined his creativity and machining skills to accomplish the job. "On my first effort to attempt to remove the four-inch barrel, I decided to make my own expanding mandrel out of aluminum to protect the inside of the barrel which I could expand inside the barrel, effectively locking it into the barrel, so I could unscrew it." Mike notes. "The inside bore diameter of the lands is 0.478", so I 125" x .125" notches milled into it.

Looking closely at the left end shows the four slits and the 10-32 screw used to expand it.

S&W BARREL SWAP CONTINUED

ORIGINAL PAGE 21

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2402-P21-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2402-P21-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2402-P21-F02. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2402-P21-F02

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2402-P21-F03. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2402-P21-F03

Looking closely, you can see the 0.750" keys welded in. I started the mandrel on the lathe using an aluminum rod that was 0.50" diameter and 12" long. Naturally, I turned it down to 0.478 x 4. Then, I drilled a 1.75" hole into the "chamber" end of the mandrel and tapped it for a 10-32 SS screw, 1.5" long pan head. I counter-sunk an 84-degree bevel into the opening of the hole to a depth of 0.375" to accommodate the pan head.

Using a band saw I cut four 0.75" long slots through the threaded area, 90° apart in the end of the rod. The plan was to make it so that as you tighten the screw it would expand the mandrel, locking it into the barrel. I put the mandrel into the barrel from the muzzle end and tightened the screw at the forcing cone using an Allen wrench from the inside of the frame to tighten the screw and expand the end of the rod to create a snug fit, allowing me to unscrew the barrel.

Then, I used a Vise Grip pliers on the muzzle end of the mandrel to try and turn the barrel out." "As a result, the aluminum mandrel

tried to grab but it simply slipped! Maybe I should have cut six slots instead of the four. Maybe I should have tapped the mandrel for 12-32 or drilled it deeper.

Regardless, I had to come up with another idea." Dan Wesson uses a two-piece barrel as well but they have a barrel nut that uses a spanner wrench to snug down the barrel and the barrel shroud to the correct gap between the forcing cone and the face of the cylinder. The problem here, is that the Smith & Wesson 500 Magnum does not use a barrel nut.

It appears that at the factory the barrel and shroud are probably installed with a special mandrel of some type. "So, I decided that the next— and possibly only—option was to make a spanner wrench," Mike continues. "I made this out of a piece of 0.750" diameter A2 tool steel with a length of six inches. At one end I turned down the diameter to 0.478" for approximately 0.750" in length.

Then, I milled two 0.125 x 0.125 grooves in the 0.750 end 180 degrees apart to accommodate two 0.125 x 0.125, 0.750" long keys made separately. The keys would be welded into the grooves, effectively making a spanner wrench with the keys extending 0.0625 forward, 180 degrees apart. "The gun with the four-inch barrel was laid horizontally in the milling vise. I milled 0.125 x 0.125 slots at 180 degrees into the crown, taking care not to interfere with the lands and grooves.

Of course, the milling cutter was round so I used a 0.120" file to flatten the bottom of the radius left by the milling cutter when done. "Now I was ready to take the 4" barrel off—or so I thought. I removed the cylinder and placed the frame in a padded vise, snugged up gently just enough to prevent it from wiggling, and installed my spanner wrench into the crown of the barrel with white lithium grease, and attempted to turn the barrel out. However, the short 0.065" keys just rolled over the

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact editor@gunsmithmag.com and reference AG-AA23F122A5-A2402-P22-F01. Know the rights holder? Please ask them to contact us.

AG-AA23F122A5-A2402-P22-F01

edge of the crown! Obviously, I was not there yet. So then I came up with the idea of drilling into the end of the 0.478" diameter to a depth of approximately 0.75" deep, then tapped the hole 5/16 x 18. I purchased some threaded rod 5/16 x 18 and proceeded to make two lengths, one 4.75" long for the 4" barrel and the other one made 8.5" long for the 8 3/8" barrel. "Next, I threaded the short rod into the spanner wrench and then put the spanner wrench back into the muzzle of the 4" barrel.

At the forcing cone end of the frame I took two aluminum washers and placed them on the threaded rod to protect the forcing cone. I then put a nut on the rod. As I then tightened the nut, I could see the wrench getting pulled into the notches milled into the crown of

the barrel. I tightened it very snug against the forcing cone, which prevented the spanner from sliding off the notches. I then inserted the Tee handle into the wrench. "Turning the wrench, I could remove the barrel.

I then installed the 8 3/8" barrel using the longer threaded rod and tightened the barrel and shroud to 30 foot-pounds. The shroud was VERY snug, and it left me with a longer forcing cone. The forcing cone had to be fit to the revolver so the cylinder could close. The cylinder gap can run from 0.004" to 0.006".

I set the gap at 0.005" and test fired the finished gun, which proved my modifications were successful." For further information about this job, feel free to contact Charlie Briggs or Mike Diedrich (gunsmith_25@verizon.net). AG

FINISHING

Reader Forum

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2021

ORIGINAL PP. 23-24

NEF Handi-Rifle I recently finished a job that has been languishing in my shop and the October 2020 Reader Forum letter on the NEF Handi-Rifle from Rueben Cole caught my attention. This job consisted of a Harrington & Richardson Handi-Rifle and the complaint was the same, with the action popping open upon firing. The gun was in mint condition and chambered in 500 S&W Magnum. I soon diagnosed a case of too-little engagement at the locking block to the barrel underlug. And, brother, I mean barely engaged!

It malfunctioned from the factory. How do I know? The serial number on the barrel matched the receiver. I checked a number of things first. The solution proved to be draw filing the rear surface of the barrel to allow a deeper seating of the barrel/ underlug further into the recess of the receiver breech area. If you find something similar on your bench, check the breech end of the barrel for burrs, milling traces, dings, etc. It does not take much.

Pull the barrel off and chuck it up with the breech end up in your bench vise. Place a wide, flat file on top of the barrel. With both thumbs and forefingers, move the file back and forth sideways briskly with short strokes, keeping the file pressed flat against the breech face. While doing this, walk in "peep" steps around the barrel at least half way to monitor your progress, ensuring you're keeping the surface true and flat.

When you're satisfied with the job, wrap fine sandpaper or, preferably, emery paper for a good polish. Test it in the gun before finishing too fine because more draw filing may be required. I fitted a Savage The 219 has been made available as a combo and this was obviously an add-on barrel as the fit was terrible. Draw filing was the answer. This will shorten the distance be-

tween the breech end of the barrel and hinge recess. Just be careful as it won't take much.

Final warning, don't ever do what I say as this was for entertainment purposes only. Smiles! 7mm Mauser vs. 7x57 Mauser The December 2020 Reader Forum letter "Remington Rolling Block No. 1" references that the 7mm Mauser and 7x57 Mauser are different cartridges. For over forty years I have understood them to be different names for the same cartridge, as do several references I have now checked. Please explain. Don Roberts Shoot The Works Gunsmithing From Mark Hollensen.

The early 7x57mm was slightly different than the 7mm Mauser cartridge created later. My understanding is that today's 7mm Mauser and the 7x57 are virtually the same. Based on the dimensions provided in the article, it appeared the chamber was more closely related to the old original 7x57 cartridge, but that was more of a possibility than a conclusion based on the information at hand. RK Campbell is right. The dimensions could be outside the specification for either the 7mm Mauser or the elder 7x57.

If a 7mm Mauser doesn't fit and the original 7x57 cartridge (not the modern one) doesn't fit, then the search will need to continue based on the actual casting measurements. I believe today's 7mm Mauser cartridge cases and the 7x57 cases are made to the same specification though. My copy of Cartridges of the World, 3rd edition has data shown here. My assumption is they are very close but not exactly the same dimensionally.

They list the 7mm Mauser as: OAL 2.235"; base to start of shoulder 1.7277", base to base of neck 1.8957", neck diameter 0.3207"; neck diameter at top of shoulder 0.324"; rim diameter 0.473"; case diameter at base 0.4711"; shoulder angle 20 degrees,

45 minutes; diameter of case at base of shoulder 0.4294". The 7x57mm is listed as neck diameter 0.320"; shoulder diameter 0.420"; base diameter 0.470"; rim diameter 0.474"; case length 2.23"; cartridge OAL 3.06"; bullet dia. 0.284".

Chris Stauffer Hillsboro, OH Remington 1100 Hammer Spring Service Customer has two 1100s. One works fine while the other frequently will not fire when the trigger is pulled. Strength of the hammer spring is suspected to be weaker than other as unfired shotshells will discharge in the other. Has there been an article on Remington triggers or hammer springs?

Jim Thompson JT'S Sporting Supplies Look up March 1993 ("Working the Remington 1100 Shotgun"), January 2007 ("Servicing the Remington 11-87 Premier Trap Shotgun") or April 2007 ("Troubleshooting Ejection Failures On the Remington 1100".) The January article is most helpful for your situation and we'll send you a copy. From Mark Hollensen.

It could be a weaker hammer spring, a malformed rear end of the firing pin (dented down, shortening the overall length), or the forend is not seated firmly (sometimes wood is soft) to the front of the action and the bolt is a little more forward than it should be, causing an angle to form where the hammer cannot strike the rear of the firing pin squarely. You will see this last condition more so on the Auto 5s or Remington 11-48s but I have seen it on an 1100 or two.

To quickly check for this condition, put both guns together and see where the barrel aligns with the front of the receiver on the one that works as compared to the one that does not. Also, look at the position of the closed bolt on both and compare to see they are in the same exact forward position. I assume there are light firing pin strikes. The firing pin

READER FORUM CONTINUED

ORIGINAL PAGE 24

might be broken but still in the bolt. An 1100 could also have a chewed up bolt locking lug area on the barrel which can create a headspace issue. That alone can prevent the firing pin from optimally reaching, causing light primer strikes. Finally, is the barrel original to the gun? If not, that could be the culprit. If the gun was made during the 1970s through the 90s, current factory barrels may not work.

I have seen quite a few older Remingtons in the past few years where the customer added a newer barrel and it would not function properly. This may cause the firing pin issue as well. This modern day of plug-and-play guns was not at the forefront of manufacturing to check for a mismatched receiver/barrel is to contact Remington customer service with the gun's serial number and barrel information. From Paul Mazan. I suspect the trouble will be found in the trigger unit or the bolt itself.

It appears the gun is functioning as far as extracting, ejecting, and releasing the next round from the magazine, feeding it up to where the bolt can pick it up to chamber, so we can eliminate those systems and parts. I would start by assuring myself that the gun is unloaded, then remove the trigger unit and bolt. A visual inspection of the hammer spring is fast and easy. If the spring is broken or bent, that may be the culprit. If the hammer spring appears good, check the bolt.

Check the firing pin for free movement within the bolt as well as for breakage. A bound up firing pin can be burred, broken, or corroded in place. If you find it broken or heavily rusted, replace it and be sure the new one moves freely. The next place to check is the trigger unit. Is the safety disengaging? When pulling the trigger, does the hammer fall freely or does it hesitate and bind?

Often the problem won't be anything more than the build up of corrosion or crud in the unit because it has not been cleaned or lubricated since the day it left the

factory. Although it is not beyond the realm of possibility for the hammer spring to be broken, I rarely encounter that. Today's springs are very good but replacing it could not hurt. When you are satisfied that the components are clean and operate with a minimum of friction, reassemble the gun and test shoot it.

I'll bet you will find your problem solved. From Sergey Lyalko. The most widespread problem of this type in 1100 is a broken firing pin spring. Since the firing pin on this gun is inertial, it must be moved back all the way for every shot. The hammer spring on this gun very seldom requires replacement. Unibath Bluing Salts I have a small gunsmith shop and have used Unibath bluing salts for several years. None of the contact info I have is working. Mich Aldrich Try Box 813, Joplin, MO 64802.

Stoeger P350 I picked up a Stoeger P350 pump shotgun. While unfired, it's older than the one year warranty so sending it in for repair isn't being considered. The issue is, with the slide racked back, it will lock and not move forward unless the trigger group is removed from the receiver. After reassembly and carefully loading a shotshell into the magazine, the action will work until the shell is ejected at which time the action will lock to the rear.

All parts appear to be there and in the right position, nothing worn, bent, or broken. I did note that the carrier latch will engage more with a shell in the magazine than when the magazine is empty and the magazine spring cap is against the carrier latch. Instead of the cap being flat like the base of a shell, it's contoured in such away that the carrier latch's movement is limited. Steve Olin Stoeger Industries offers a five-year warranty on their shotguns. If it's a never-fired gun it should be a factory fix.

Stoeger option 2) for a Return Authorization and Repair Request or Stoeger Industries. com/repair-request. AG

SEARCHABLE ISSUE RECORD

Archive index

Reamers and Slides American Gunsmith Editors	2	Mc Millan Mc3 Stock Robert K. Campbell	17-19
The “Manurhin Candidate” Mark R. Hollensen	3-8	S&W Barrel Swap Charlie Briggs & Mike Diedrich	20-22
AR-15 Fliers, Part 1 Joe Carlos	9-12	Reader Forum American Gunsmith Editors	23-24
Lyman M77 Globe Sight John Baxter	13-16		

Rights and corrections. Images without confirmed permission remain reserved in place. Authors, photographers, and rights holders may contact editor@gunsmithmag.com. Corrections to searchable text are tracked against the source-page record.



American Gunsmith

The complete searchable archive of a technical journal devoted to craft, repair,
maintenance, machining, and restoration.

GUNSMITHMAG.COM • EDITOR@GUNSMITHMAG.COM