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INSIDE THE ARCHIVE

SIG SAUER P320

THESE ARE MY GUNS • ITALIAN REPLICAS FIREARMS • SAVAGE 167 • AR-15 BARREL TREATMENTS FOR MAXIMUM PRECI...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 153

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IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from September 2016.

2**These Are My Guns**

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

3**SIG SAUER P320**

CHICK BLOOD • ORIGINAL PAGES 3-8

9**Italian Replica Firearms**

RYAN HOOVER • ORIGINAL PAGES 9-12

13**Savage 167**

GARY YEE • ORIGINAL PAGES 13-16

17**AR-15 Barrel Treatments For
Maximum Precision**

JOE CARLOS • ORIGINAL PAGES 17-20

21**Revolver Repair**

ROBERT K. CAMPBELL • ORIGINAL PAGES 21-22

23**Reader Forum**

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 23-24

FROM THE ARCHIVE

These Are My Guns

How The Anti-Gun Crusaders Have Invented A Public Health Crisis To Sell Their Misguided Agenda

BY AMERICAN GUNSMITH EDITORS SEPTEMBER 2016

ORIGINAL PP. 2

This book is an examination of Second Amendment rights in the United States and presents many facts and statistics that refute the anti-gun movement. Author Robert Jordan provides a definitive and in-depth examination of the anti-gun movement's claims and tactics, and the facts and statistics that completely refute them.

Jordan emphasizes he is not a politician, political operative, or media expert with a bully pulpit, just a regular American citizen with a desire for exhaustive research that is tired of seeing Constitutional rights under attack.

These Are My Guns begins with an overview of the issues and some of the root causes and continues with a historical breakdown of events and writings by people influential before, during, and after the Constitution was framed and written and goes up through modern court rulings on Constitutional law concerning the Second Amendment. This is followed by Cold Hard Numbers, a chapter detailing statistical analysis of data as published by various government agencies.

Following this overview, Jordan continues with Anti-Gun Tactics and News Media Complicity, giving examples of how policy and reporting differs with ASAAs (Anti-Second Amendment Activists) from collected data. The wraps up with a point-by-point rebuttal of an Institute Of Medicine report, the author's conclusion, a comprehensive set of tables concerning injury rates as reported by government agencies, and an extensive bibliography and reference section.

In a review from Publish Next, they said, "These Are My Guns is a wellwritten, data-driven treatise on the right of United States citizens to own guns. It looks at the country's founding documents and major Supreme Court cases, examines common arguments against gun ownership, and presents statistical data supporting ownership.

The manuscript is well-documented, containing many citations." Originally from Flint, Michigan, Jordan is an architect as well as chief photographer of Spectre Imaging, specializing in architectural and outdoor photography. This is his first book and he was driven to write it in defense of Second Amendment rights that he sees as eroding along with other basic rights that are supposed to form the backbone of the United States.

ORIGINAL SOURCE PAGE

2

PEOPLE & COMPANIES

SIG SAUER P320

terminate the dreaded “box-n-bag” disease.

BY CHICK BLOOD SEPTEMBER 2016

ORIGINAL PP. 3-8

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Ask a customer service manager for any manufacturer or importer to name the most consistently seen problem to arrive in their service departments. It's either a box or a plastic bag of loose parts from an owner who has disassembled their gun. Maybe they wanted to get a closer look at how it works or, worse, they wanted to make it work. Below center: You will require these slave pins during disassembly/reassembly. Make them in these dimensions. 1. Depress the magazine catch and remove the magazine.

Make sure it's empty. 2. Retract the slide and lock it back with the slide catch lever. Inspect the chamber. Make certain no ammo is present. 3. Rotate the take-down lever to a 7 o'clock position. 4. Control the slide. Depress the slide catch lever. Remove the slide assembly forward and off the frame. 5. Remove the recoil spring and guide by pressing both forward and lift out. On subcompact pistols the spring/guide assembly is never disassembled. 6.

Grasp the barrel by its lug and lift it out. "better." Quite often, the latter occurs before the gun has been fired. Whatever their reasoning, or lack thereof, they have discovered they cannot put the gun back together. (Duh?) Ask any working gunsmith the same question. Do likewise with any gunsmithing school instructor not planning a lecture or two on boxn-bagging. Gunsmiths early in their

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SIG SAUER P320 (Specifications subject to change without notice) careers are often challenged with a box or bag of parts taken from a firearm with which they are not familiar. Even with years spent pursuing the trade, established gunsmiths can still face this challenge.

Many years ago, after listening to my explanation of one of gunsmithing's largest problems, the publisher asked if I'd take on the task of applying my 20+ years of dealing with the public with a series of articles aimed 213 Housing, Sear 214 Spring, Safety Lever 215 Safety Lever 216 Sear 217 Spring, Sear 218 Pin, Sear at resolving these unfamiliarity aspects. Rather than pass along how I would go about this, I report exclusively how factory technicians go about it.

This has all been made possible by securing cooperation from manufacturers and importers who agree with my firm rule for giving out information on the servicing of any firearm.

Stated briefly, the more a gunsmith performing the work knows about doing it correctly the 101 Slide 102 Barrel 103 Spring, Recoil 104 Recoil Spring Guide 105 Front Sight 106 Rear Sight 107 Extractor 108 Extractor Pin 109 Extractor Spring 110 Pin, Extractor Spring 111 Cap, Slide Rear 112

Spring, Striker 113 Cup, Striker Spring 114 Housing, Striker 115 Spring, Striker, Reset 116 Safety Lock 117 Spring, Safety Lock 118 Pin, Striker 119 Recoil Spring Assembly 201 Frame 202 Lever, Take down Safety 203 Pin, Trigger Stop 204 Trigger 205 Trigger Bar 206 Spring, Trigger Bar 207 Slide Catch Lever, TDSL Lock 208 Post, Spring, Slide Catch 209 Spring, Slide Catch Lever 210 Slide Catch Lever Pin 211 Pin, Safety Lever 212 Pin, Coiled Spring, M2 5x18 219 Spring, TD Safety Lever 220 Pin, Coiled Spring, M2.5x18 221 Pin, Sear Pivot, Headed 222 O Ring, Take down Lever 223 Mag Catch, Long 224 Mag Catch Spring lower the risk of litigation.

A few companies, primarily based offshore, have disagreed, remain noncooperative, and, as a result, have yet to appear here. Until they alter their position they never will. Fortunately, SIG SAUER has been along-time provider of information for their products, most recently the P290 pistol, even going beyond some steadfastly domestic producers with their support. With the article you are now reading I believe they have outdone themselves by providing me their complete Armorer's School manual.

Before going further, a constructive criticism. The model P320 should have been called the "V"320 given its Versatility, a ca-

pability not apparent at first glance. The Full version can serve as a duty weapon, the Compact or Carry as a back up or primary for concealed carry, and Subcompact as a small carry or secondary backup.

Each of these versions have steel frames, a polymer grip shell, a removable fire control assembly, and can be easily converted with a change of slide, barrel, and magazine with no special tooling. Thanks to welcomed inputs SIG engineers received from LE and military ordnance experts, each size 320 has a crisp trigger pull combined with a quick return due to a pre-tensioned striker plus their exclusive internal safety system. There is no external safety on any 320 to get hung up or snagged when drawn.

All 320 are fully ambidextrous. Function Test You should be wearing safety glasses. Insert an empty magazine. Ensure it is locked in place by pulling downward on it. Pull the slide to the all the way to the rear. It should lock there as the follower pushes upward on the slide catch lever. Depress the magazine catch. The mag should fall freely from the grip frame, verifying a correct relationship between itself and the catch. Depress the slide catch lever. The slide should spring

SIG SAUER P320 CONTINUED

ORIGINAL PAGE 5

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forward. Prevent it from leaving the frame. Press and hold the trigger to the rear. The striker should release. Continue holding the trigger to the rear. Retract and release the slide. As you release the trigger, you'll feel the sear re-set. Slowly retract the slide until the barrel detaches from it.

When the trigger is pressed 1 Extractor Spring Pin 2 Rear Sight 3 Extractor Spring 4 Extractor Pin 9 Striker Assembly 10 Barrel 11 Recoil Guide Assy 12 Recoil Spring Assy 5 Extractor 6 Slide 7 Front Sight 8 Rear Slide Cap to the rear the striker shouldn't release. Use dummy rounds to fully load the magazine, then cycle the action until the mag is empty to check for extraction, ejection, and striker function.

Slide components A function check confirms all mechanical properties of an unloaded firearm are working properly. Or not. If there are malfunctions during the check, negotiate corrective action. If there are no failures, it may be the shooting technique of the owner at

fault. I've found these suspicions can be rapidly squelched or affirmed by arranging alive fire test with the owner doing the trigger pulling.

I predict you will be quite surprised at how frequently a problem complained of vanishes after one of these little dramas. Any recoil operated pistol is subject to extraction and ejection problems, misfires due to short cycling, as well as poor accuracy due to a poor hold. So called "gas guns" can be more sensitive to limp wristing and their recoil must be met with resistance in order to function properly. The same can said of a gas operated rifle or shotgun not held tightly to the shoulder.

With long guns, the pain experienced by a recoiling butt stock slamming back into a shoulder due a poor hold provides instant notice to the gun bearer. This being stated, apply your best diplomatic talents when suggesting problems being blamed on a firearm are brought on by the shooter, particularly if the individual owning the gun resembles an NFL linebacker or is a woman with a short fuse and a black belt in a martial art. Slide disassembly

SIG SAUER P320 CONTINUED

ORIGINAL PAGE 6

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Striker Assembly 1 Striker Pin 2 Striker Reset Spring 3 Striker Housing 4 Striker Cup (2) Maintenance Shop items you'll need include a bench block, hammer, 1/16" 3/32", and 7/32" punches, a cup-tipped starter and finish punches, a 3/32" roll pin punch, bench mat, and slave pins you'll need to make to take down and reassemble the pistol.

With everything standing by, become familiar with the parts lists and diagrams. 1 Take down Lever 2 Take down Safety Lever 3 Slide Catch Lever Pin 4 Trigger Stop Pin 5 Trigger Stop Pin Frame 6 Slide Catch Lever spring 7 Spring, Slide Catch Lever 8 Slide Catch Lever 5 Safety Lock Spring 6 Safety Lock 7 Striker Spring Before we disassemble, let's discuss how the trigger system works. When the trigger is pulled it contacts the trigger bar, releasing the sear.

This releases the energized striker pin to detonate the cartridge primer. The resulting blow back drives the slide and barrel to the rear. The barrel lug cams down against the slide catch lever allowing the bar- Grip Frame Module 9 Trigger Bar 10 Safety Lever Pin 11 Trigger 12 Sear Housing Roll Pin 13 Sear Housing Assembly 14 Sear Pivot Pin

15 Trigger Bar Spring 1. Secure the assembly between padded vise jaws with its nose end upward. 2.

Insert a 7/32" punch from the bottom of the assembly to control the striker spring as you press down on the striker cups. 3. Relieve all tension on the striker spring and remove it from the pin. 4. Pull the pin to the rear and free of the striker housing. 5. Remove the striker reset spring from the left side of the housing. Tweezers help. 6.

Remove the safety lock and safety lock spring from the right side of the housing. rel to unlock from the slide which continues to the rear to extract/ eject the spent case and simultaneously compress the recoil spring. The spring reacts to push the slide forward, strip off and chamber around from the magazine, and the barrel lug cams against the slide catch lever to lock itself and the slide back into battery. With that understood, complete field stripping with your safety glasses on a positive-it's empty pistol.

With that done, take a gander at the slide components and prepare for slide disassembly. Use a 1/16" punch to push the ex-

tractor spring pin (1) inward. To remove the rear slide cap (8) push it off downward. With draw the striker assembly (9) to the rear and lift the extractor (5) from the right side of the ejection port. This allows you to remove the extractor spring pin and spring (3) rearward as a unit.

Any component or subassembly of the P320 needing service beyond the armorer level, such as part replacement, is destined to receive it at depot (factory) level. The striker assembly you removed is among them. The restriction of any subassembly housing the object that ignites a primer is a growing practice with major manufacturers and importers. It's beginning to ease a bit but no firearm exhibited at the SHOT or NRA Shows includes said subassembly.

I'm going to hope there are no breakages in the striker assembly on your bench, however, if it has become badly fouled it could neutralize its built-in mechanical safety features. Seven parts make up the striker assembly. Each should emerge from a detailed cleaning to-

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1. Move the trigger bar (9) out of and below the sear housing (13). Press down on the coil of the trigger bar spring (15) and unhook its looped end. 2. Lift the rear of the trigger bar clear of the sear housing, rotate it upward and forward to remove bar and trigger (11) from the module. 3. Drift out the slide catch lever pin (3) right to left and lift the slide catch lever (8) clear of the module. 4. Remove the slide catch lever spring (6) and post (7) from the lever. 5.

Use the 1/16" pin punch to drift out the trigger stop pin (4) right to left. 6. The take down safety lever (2) is removed by pulling its back end out of the sear housing and rotating the lever down and out of the module. 6 Safety Lever Pin 7 Sear Housing 8 Safety Lever Pivot Pin 9 Take down Lever Spring 1 Safety Lever 2 Sear 3 Sear Spring (2) 4 Safety Lever Spring 5 Sear Housing Roll Pin tally free of any crud capable of obstructing proper assembly function.

Quality solvent applied skillfully with an old toothbrush assures that will be the result. 1. Drive out the sear housing roll pin (5) with a 3/32" roll pin punch. 2. Use slave pin A to push out the safety lever pin (8) right to left. The slave stays in the housing. 3. Slave pin B pushes out the sear pivot pin (6) and remains in the

housing to keep A company. 4. The housing with both slave pins is removed as a unit. Details on the striker assembly.

As the slide is retracted, the lug at the rear of the striker pin (1) is captured by the sear. The safety lock (6) maintains the capture and the striker spring (7) is now energized. When the trigger is pulled the safety lever in the frame raises the safety lock and disengages the sear. The striker pin is released to impact and ignite the primer. Sound pretty important?

In combination with that safety lever in the frame, covered later, the striker assembly eliminates the need for or presence of any button or lever to protrude from the pistol. As soccer fans might say, hang ups are nil. Sear Housing Detailed disassembly of the striker assembly makes complete cleaning possible. Any damaged parts must be factory replaced. A complete replacement assembly or sear housing can be secured from SIG by calling On to the grip frame module.

Look straight down on the grip frame with its right side to your right. Remove the module from the grip frame by pressing inward on the right end of the take down lever with the finger of one hand and simultaneously turn the lever counter clockwise with your free fingers. Withdraw the lever from the

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Original caption: Left: Troubleshooting Chart

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When the take down safety lever (B) moves to the rear during the initial stages of a trigger pull, the trigger bar (A) moves forward. This causes the rear of the bar to contact the safety lever and move it upward. Simultaneously, raising the safety lever also raises the safety lock (C), disengaging it from blocking the sear. When the slide is retracted in the loading process the reaction is to raise the safety lock into firm contact, block the sear, and prevent the striker from getting anywhere near a primer.

To remove the sear housing, secure those two slave pins I suggested you make. Fearing you might have cast my suggestion aside (it wouldn't be the first time or, maybe, your pet mongoose ate it) please do so before continuing. If there is any evidence the housing is just short of oozing dirt you may be able to flush it clean. At least clean enough to function as a home decent enough for the sear system within to work. Cleaning rules to live by here.

No carburetor or brake cleaner and steer clear of any petroleum-based solvent unless SIG tells you the one you have in mind won't harm or degrade safe operation of the pistol. Use plain compressed grip frame. Push the module forward, lift it up and off the grip frame. The grip frame module diagrams show detailed disassembly sans sear housing, another depot-level assembly. air to blow dry all internals. A hair dryer would be OK but never a gun hot enough to strip paint.

An insider's guide to the P320's mechanical safeties. What I like most about these is they're designed truly "in" and don't need to be turned "on." All P320 pistols have three: The striker safety, the take down safety lever, and the take down lever. The best way to understand what each of these internal mechanical safeties do is take a walk through how they work together, as diagrammed here. Finally, keep involved with the owner. It's always a good idea and it's good for business.

To encourage your making a practice of it, blunt any owner's thought you're practicing any hustle talents, all the while convincing said owner you are the local wiz at keeping the pistol tip top. SIG's factory-approved maintenance schedule directs the operator to clean and lubricate annually when in storage, monthly when carried on duty, and after firing or exposure to water, dirt, etc. A function check is performed after every reassembly.

An armorer or gunsmith should inspect annually for proper operator maintenance and perform a detailed disassembly and inspection every three years or 5,000 rounds. SIG's Troubleshooting Chart will help if any problems arise. Now, as your faithful and obedient Technical Editor sinks slowly in the Western sky, take my advice: If you have any doubts of parts availability to properly service a P320, call SIG before you run up a bunch of hours trying to out-Sherlock Mr. Holmes.

AND ABOUT THAT WESTERN SKY THING, REMEMBER CLASS, THE SUN ALSO RISES. AG

HISTORY

Italian Replica Firearms

Companies from Italy have produced numerous replicas of famous firearms from the 1800s. Here's how the Italians won the West.

BY RYAN HOOVER SEPTEMBER 2016

ORIGINAL PP. 9-12

Since the 1960s, modern replicas of historic 19th century firearms have been pouring into the hands of American gun owners. These owners range from collectors to reenactors and movie prop houses to competition cowboy action shooters and beyond. Having run a shop that is responsible for most of the warranty repairs, action work, and customization for one of the biggest importers of these weapons, I have become intimately familiar with the ins and outs of these firearms.

Here are some of the pros and cons of these interesting guns, some common problems encountered, and some easy solutions to bring these Italian guns up to our American standards. There are many similarities between these replicas and their original counterparts. Indeed, many of the replica guns available were made using specs taken from original guns. The one main difference that sets the originals apart from the replicas is their handwork.

In the mid to late 19th century, all firearms were hand fitted to some degree. Since then, labor costs have risen dramatically and mass-production techniques have advanced far. This is great for producing many things but not always replica firearms. When most of these guns were designed, hand fitting was the norm and the designers could create designs knowing that each part would receive at least some personal attention.

Today, that kind of hand fitting is impossible at a production level because it just isn't cost effective. The good news is these production techniques have made good guns available at a reasonable cost to American gun owners. Also, the lack of

hand fitting is usually the only problem encountered. The materials used in these guns are usually of a much higher quality than the originals and the fit and finish are usually acceptable to our American tastes, especially for the price.

If you know the right things to look out for and area knowledgeable gunsmith capable of giving these replicas a little TLC, these guns can be a joy to own and shoot. I am going to assume readers are familiar with the nomenclature of these guns. Some of the things I will try to describe are harder to put into words than they are to demonstrate. Where possible, I have included pictures but if questions remain contact me at I have only included guns manufactured in Italy and only the most common ones.

If I missed something, please let me know and I can start collecting topics for a future article. Revolvers Three major classes of revolvers in production from firms like Uberti, Pietta, and others are cartridge revolvers, conversion revolvers, and black powder revolvers. The Single Action Army is the most famous cartridge revolver but others like the 1875 and 1890 Remington, Schofield types, and Open Tops are also available. Black powder revolvers include the 1860 Army and 1851 Navy, among others.

Conversion revolvers are black powder revolvers that were converted to shoot cartridges. The most abundant are the Richards-Mason conversions and the 1858 Remington conversion. The most common problem of these guns (and most replicas) is springs that are too strong. In an effort to ensure the gun will go bang every time,

manufacturers sometimes use springs that area bit too heavy. This is doubly true of replicas and especially conversions and black powder guns.

The major problem is a too-strong spring pressure can cause galling. The parts are pressed so hard against each other under spring tension that accelerated wearing occurs. Replacing the sear/bolt spring and the hammer spring will increase the longevity of the gun and is an easy upgrade. One caution about changing springs in these revolvers is it can change the timing of the gun. Be sure that the new springs don't cause the bolt to rise too early or late. The spring at the legs of the bolt can also cause problems.

These legs are squeezed between the cam on the hammer and the frame every time the gun is cocked. If too heavy it can wear down the cam on the hammer quickly. Most Italians bevel the leg of the bolt that rides on the cam in exactly the wrong spot, leaving a sharp edge that cuts into the cam even further. Recontouring this leg is something that is standard when doing an action job to these revolvers. Single Action Army guns are worry free except for the odd fluke that is usually covered under warranty.

Some of the older imports do suffer from soft parts and heavy springs, so inspect any used guns for this. They can usually be turned into good shooters but you should know if you are going to have to put another \$100 into a used gun. Also, some of these older guns, especially Armi San Marco guns, can have parts that are difficult to obtain. Beware the base pin safety on replica Single Action Army revolvers! In

ITALIAN REPLICA FIREARMS CONTINUED

ORIGINAL PAGE 10

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The factory springs are much thicker and can cause galling. Bolt legs being too strong ruined these cams and too-strong sear and bolt springs caused the trigger to wear the hammer notches. order to incorporate some sort of safety on these guns, someone decided that the base pin should be altered to have two grooves instead of one like the original Colts had.

Should you push the base pin all the way in until it stops, it protrudes out the back of the frame, blocking the hammer from falling far enough to strike the primer. In practice, what happens is someone attempts to fire or dry fires the gun with the base pin in the safety position. They remain oblivious as to why the gun isn't going off, meanwhile the hammer continues to bash away at the base pin, driving it into the base pin latch or retaining screw.

This raises a burr on the base pin in between the two grooves and makes it impossible to remove without completely disassembling the gun. Either learn how to use the safety or grind the back of the pin down so you can push the pin all the way in. Also, check any gun you buy to see if the base pin can be removed and for burrs. Base pins can get stuck for other reasons. A good tool for any single

action owner to have is a base pin puller. These can be purchased from Brownells and are invaluable tools.

Don't use pliers on your base pins! Cowboy action shooting is a very popular gun game and some of these revolvers can be used to great effect in competition provided they are properly tuned. Single Action Army types are great and action work is apiece of cake. They are the first choice of most top competitors. One problem I've found is shooters preferring the old-time look of the conversions and Open Top (OT) revolvers wanting to use them to compete.

They take their gun to the range and see another shooter who is shooting his SAA by cocking it with his off hand thumb quickly and moving very fast. Our shooter then tries to shoot his conversion the same way, the gun starts over-rotating (throwing by) and the shooter ruins the cylinder. Because of the radiused bottom of the frame and the smaller diameter of the cylinder, there isn't as much depth in the bolt notches on the cylinder of conversions and OT revolvers as on the SAAs.

This means the bolt is really slamming into a very small notch when it is cocked fast and eventually the bolt skips over that notch, leaving This bolt has been galled to death! The top groove is the safety position. If you

push your base pin in to this point, be sure not to ever try to fire or dry fire the gun. a little divot. Do this enough times (like three or four) and the notch can be ruined. It's cheaper to buy and have a new cylinder installed than it is to repair cylinder notches.

By the way, any revolver that starts throwing by should be put aside immediately until it can be repaired. It's cheaper to adjust the timing than it is to buy anew cylinder. Another issue with conversion/ OT guns is how finicky they can be to time correctly. Because the barrel is separate from the frame and is held on by a wedge, the fit of the cylinder in the frame is variable depending on how far the wedge is inserted.

This means that the barrel/cylinder gap can change, the angle that the hand engages the ratchets on the cylinder can change, and how much end shake the cylinder has can change. All of these variables add up and can be frustrating. On the conversion, set the wedge so that it is bearing against the screw-in the barrel that prevents it from falling out. If you don't, the wedge will work its way out to this point while you shoot, possibly changing how the cylinder rotates or how large the barrel-to-cylinder gap is.

ON BLACK POWDER REVOLVERS, SET THE WEDGE

ITALIAN REPLICA FIREARMS CONTINUED

ORIGINAL PAGE 11

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This one was caught in time and fixed but it wouldn't have been long before this cylinder was ruined. Above center: The correct position to set the wedge if the gun is properly timed. The groove in the wedge is out as far as possible and the edge is bearing against the retaining screw. Stock springs can be re-contoured to function properly with less tension. so the hooked portion of the wedge spring is bearing against the barrel.

Lever Action Rifles Like the revolvers, the major problem that replica lever guns suffer is springs that are too strong. A too-strong spring on the hammer can cause the gun to be difficult to work and contributes to wear on the sear surfaces on the hammer and trigger. The same problem with the carrier lifter and lever springs can cause wear on the camming surfaces of those parts. I have seen levers and lifters that were severely worn where the spring rides.

Because the lever and carrier lifter springs are so heavy, the screws that secure them in the gun can be extremely difficult to remove. To remedy this, after taking off the side plates of the gun, use a screwdriver to pry the springs off the lever and carrier lifter. This relieves much of the pressure on the spring and unscrewing them becomes much easier. If you

still have a hard time, take the lever and lifter out, push the spring into the middle of the receiver to further release some pressure, and try again.

This procedure is easier done on an 1873 or 1876 than an 1866 or 1860 Henry. On the '66 and the Henry, the lever/lifter screw also holds the side plates on. On the '66 you can unscrew the lever screw and the right side plate will come off so you can reach in and pry the springs off. On the Henry, you have to tap the screw out in order to slide the side plates off.

When you reassemble the '66 or the Henry, turn the screws into the springs just enough to hold them in the gun while reassembling the side plates. Tighten the screws from the bottom of the receiver after the gun is assembled. You almost certainly will not have to tighten them down as tight as they can go. In fact, a good and simple way to make Winchester lever guns run better is to loosen the tension on the carrier lifter, lever, and hammer springs. Better yet, replace them with aftermarket springs.

The spring that moves the lever safety on the 1873 and 1876 is also too strong. Wire spring replacements are available and are easily made. Many people remove the safety entire-

ly. The 1866 and the Henry lack these safeties so I don't see anything wrong with this, though be aware of any potential liability issue. The great thing about the Winchester toggle-action lever guns is their ability to be short stroked.

Short stroking is when different links and a lifter are installed to shorten the travel required by the lever to operate the gun. Coupled with an action job, this is standard for cowboy competition shooters. It makes the gun feel great and work fast and I also like it on ranch guns. Unfortunately, there is currently no commercially-available short stroke kit for the 1876. The only 1892 I know of coming from Italy is manufactured by Chiappa, formerly known as Armi Sport.

These guns are not bad in terms of grade of materials and external cosmetics but they do need treatment. For a '92 to feel good it needs to be given the hand work it would have received 100 years ago. The parts should be properly fit and polished and the springs adjusted to work smoothly without being overly strong. I have also seen a few of the 1886/71 Pedersoli guns coming out of Italy and, though I don't have much experience with them, I'm really looking forward to getting my hands on a Model 71 in .348 Win-

ITALIAN REPLICA FIREARMS CONTINUED

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Above center: Example of a poorly fit extractor. This .22 Magnum is too short for the cut out in the barrel as well as not being properly contoured to the chamber. A new extractor will be needed. This one wasn't caused by recoil but by poor packaging for shipment. This is the most likely place for a crack to develop, regardless of the cause. Also notice the filler screw toward the front of the top tang. If this screw is in too deep it can cause problems with the sear spring. chester to refurbish like an original.

I'll report more on that later. Single Shot Rifles The two most common types of single shot rifles I see are Sharps and Winchester 1885 High/Low Wall replicas. These guns are a lot of fun, especially since they lend themselves to caliber conversions so easily. There are a few minor problems that plague them. First, let's talk about extraction. All of the falling block guns are designed to extract, not eject. When you drop the block to unload, don't expect the empty case or unfired round to come shooting out.

Some of these rifle extract so forcefully it seems like they do eject and others will only extract enough for you to pull the case out

with your fingernail. I know that people who shoot these guns in odd or old calibers prefer the guns that don't throw brass on the ground to catch cases for reloading. One of the main problems these guns suffer from is improper extractor fit. Inspect if it isn't extracting or the case is getting stuck under the extractor.

Another problem I see, especially with Winchester 1885s with set triggers, is a failure to fire. This is almost never a headspace or firing pin issue but is usually due to our old friend, the too-strong spring. If the sear spring is too strong, it holds the sear against the hammer so hard that the trigger spring can not overcome it and the sear hits the safety notch on the hammer when the gun is fired, robbing the hammer of most of its energy before it gets to the firing pin.

This can be solved by lightening the sear spring, contouring the rear trigger spring to put more pressure on the trigger, or both. Also, the safety notch on the hammer usually needs to be recontoured. There is usually a screw in the front of the upper tang that fills the hole that the front screw of a tang sight

would go in. Either this filler screw or the front tang sight screw can be screwed too deep and will put pressure on the sear spring.

This can take so much pressure off the spring that the gun will no longer cock. The last thing to look out for on the larger caliber single shots is stock cracking. The wrist of the stock is particularly vulnerable because so much wood must be removed to fit it to the stock. If there are gaps in the stock, one spot may be taking up most of the recoil and that is just asking to crack under recoil. If your stock has gaps, consider having it restocked or at least bedded to close those gaps.

So, now all you would-be cowboys have a brief overview of some of the major issues with these replica guns. What I've included in this article is based on the most common problem I see in my shop which services hundreds of cowboy guns each year. If you take one thing away from this let it be that modern cowboy replica guns need a little TLC to bring them up to our American standards but they can be great guns. AG

METALWORKING

Savage 167

Gunsmithing the Savage 167 pump action shotgun.

BY GARY YEE SEPTEMBER 2016

ORIGINAL PP. 13-16

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The Savage 167, also marketed as the West Point Model 167, was typically sold by True Value Hardware. While I couldn't find a parts diagram for the Savage Model 167, the parts and schematic for the Savage Model 30, Stevens Model 77, and Springfield Model 67 pump action shotguns from which the Savage 167 evolved can be substituted in its place.

Where available, I used the equivalent factory part name and its corresponding number for this article but there are a few parts unique to the Model 167 for which the official factory name is unknown. How the action works. The following assumes that the action is closed with a spent shotshell in the chamber, the hammer down on the firing pin, and the slide lock lowered from the path of the slide assembly. Pumping the operating handle/forearm causes the Operating Handle Bar (63) to move rearward.

The Slide Assembly (6) has a stub that protrudes downward, interlocking it with the operating handle bar. Unlike other shotguns that have a milled recess as its lock up

point, lock up in the Savage 167 is attained between the breech Breech-Bolt (9), slide assembly, and the Slide Lock (30).

Movement of the operating handle bar forces the slide assembly to move rearward, the beveled portion of the slide assembly to engage the matching bevel on the underside of the Breech Bolt (9), causing it to unlock by forcing it back and down onto the slide assembly where the two move together toward the rear. The breech bolt's two Extractors (15 and 16) pull the shot-shell from the chamber. As the slide assembly moves to the rear, the rear of the slide assembly disassembles into major components.

Note the breech bolt, slide assembly, and trigger guard group have not been disassembled in detail. The stock-bolt has been assembled to the trigger group. bly strikes the tail of the Cartridge Stop (47), causing it to begin a seesaw action with its tail pivoting down and the front of the cartridge stop moving up to prevent a fresh cartridge from exiting the Magazine Tube (52).

Concurrently, the slide assembly engages the Hammer (45), forcing it back and depressing the Mainspring Plunger (42) and

compressing the Mainspring (43) until the hammer hook is arrested by the Sear (40). At about this point, the Ejector Plunger (24) strikes the base of the shotshell, forcing it out through the ejection port.

When the operating handle assembly is pushed forward, the slide assembly goes forward with it, allowing the Lifter Assembly (59) to rise and introduce the fresh shotshell into the path of the breech bolt. As it goes forward, the shotshell is pushed with it. When the breech bolt is about two-thirds of the way closed, the Lifter Pawl (58) clears the slide assembly and pops up from pressure of the Lifter Spring (71). This in turns moves the lifter assembly down.

Almost concurrently, the front of the slide assembly engages the front camming surface of the cartridge stop, causing the cartridge stop to rotate down and out of the way of the magazine tube. The Magazine Follower (61), under pressure from the Magazine Spring (50), forces a fresh shot-shell out of the magazine tube and onto the lowered lifter assembly where the shot-shell's movement is arrested by the lifter and the slide

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Above center: Barrel rotated halfway counter-clockwise in anticipation of removal. assembly's bottom protrusion. Unlike other shotguns with two shell stops, it is normal for a shotshell in the Savage 167 to rest halfway out of the magazine tube and on the lifter assembly. Continual forward movement of the breech bolt chambers the shotshell.

Pressing the Trigger (37) causes the Sear Trip (35) to move forward, compressing the trigger spring which in turn pushes the sear forward, thereby disengaging itself from the hammer. Freed from the sear, pressure from the mainspring plunger pushes the hammer forward. Below center: Breech bolt, slide assembly, and operating handle bar as seen from inside the receiver.

The large rectangular notch near the center of the image is part of the slide assembly that interlocks with the operating handle bar.

ward, striking the Firing Pin (7) forward into the primer. When the trigger is released, the pressure from the trigger spring pushes the sear trip and the trigger back to its position of rest.

Even if the trigger isn't released, the sear trip spring automatically pushes the sear trip forward, causing the sear to reengage the hammer and preventing the hammer from following the bolt forward if the action is worked. Unlike some older shotguns like the Winchester 97 or earlier Ithaca Model 37s, the Savage 167 is incapable of slam firing. Unlike its predecessors where the Safety (33) is integral to the Trigger Guard (66), the Model 167 has a tang-mounted safety that is convenient for either hand.

A leaf spring provides the tension for the safety and a linkage pin goes into the safety bar itself. When the safety is moved to the

rear, the linkage forces the safety bar rearward where it prevents the sear from moving. Moving the safety forward to the fire position moves the safety linkage forward, compelling the safety bar forward where it disengages the sear and allows the sear to move. Operation of the slide lock and slide lock spring assembly.

The slide lock is controlled by a stud located on the left side of the hammer. When the hammer is cocked, the stud is rotated to its rearward position which pushes the Slide Lock Spring (28) and the slide lock up and against the slide assembly, preventing the slide and breech bolt's rearward travel. When the hammer is forward, the stud on the hammer is rotated 1/4" away, disengaging it from the slide lock spring and detensioning the slide lock. The slide lock drops clear of the slide assembly and the unfet-

SAVAGE 167 CONTINUED

ORIGINAL PAGE 15

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Above center: The breech bolt, slide assembly, and operating handle bar while inside the receiver. tered action is freed for opening. While the breech is locked, pushing the slide lock button up causes the engagement surface of the slide lock to pivot down, disengaging it from the slide assembly and allowing the action to be unlocked. Spring tension from the Slide Lock Release Spring (41) provides the energy to return the slide lock to its position of rest.

For disassembly, as with any other firearm, keep the muzzle pointed in a safe direction, finger off the trigger, and make sure it is unloaded. Close the empty action. The Savage 167 is unique among pump Below center: The safety (vertical bar beneath the wire slide lock release spring) in the disengaged position, freeing the sear to move. For clarity, the slide lock has been removed. action shotguns

in that the trigger guard group is attached to the Stock (75) and the two are removed as a unit.

Remove the Trigger Guard Screw (1) from the receiver that is above the trigger guard and then use a punch 1.25" long to drive out the Trigger Guard Pin (48). This allows you to separate the receiver from the trigger group and stock. To remove the trigger group from the stock, unscrew the Buttplate Screws (73) securing the Buttplate (74). Use a large flat screwdriver to remove the Stock Bolt (76) and its washers (77 and 78). The trigger group may now be separated from the stock.

To disassemble the trigger guard group, de-tension the hammer by releasing it, taking care to catch it on your thumb to ease it forward. After driving out the Hammer Bushing (70), lift out the hammer, mainspring

plunger and mainspring. Unlike its predecessors, the Savage 167 does not have Lifter Screws (72) and the pivot pins for the lifter are cast integral to the trigger guard. Since the lifter is pressed on and its removal could warp the lifter, removal is not recommended. Remove the trigger spring.

This removes pressure from the sear and makes removal easier. Drive out the Sear Pin (69) to remove the sear. Remove the Trigger Pin (68) to remove the trigger and sear trip assembly. The safety is secured in place by a circlip and its removal allows the safety and the safety leaf spring to be taken out. The safety bar that blocked the sear may now be lifted from the trigger guard group. This completes disassembly of the trigger group. Rack the forearm back. Insert a small screwdriver beneath the rear

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1 Trigger Guard Screw 2 Ejector Screw 3 Firing Pin Retractor Plunger Pin 4 Firing Pin Retractor Plunger Spring 5 Firing Pin Retractor Plunger 6 Slide Assembly 7 Firing Pin 8 Breech Bolt 9 Firing Pin Stop Pin 10 Extractor Spring (Left) 11 Extractor Spring (Right) 12 Extractor Spring (Left) 13 Extractor Spring (Right) 14 Extractor Plunger (2) 15 Extractor (Left) 16 Extractor (Right) 17 Shell Stop Spring 18 Shell Stop 19 Top Rib Support Screw 20 Top Rib Sleeve 21 Rear Sight 22 Front Sight 23 Extractor Pin 24 Extractor Plunger 25 Ejector Spring 26 Extractor Assembly of the operating handle bar assembly tail and pry it slightly up.

This disconnects the operating handle bar assembly from the slide assembly and allows moving the slide 27 Slide Lock Release 28 Slide Lock Spring 29 Slide Lock and Spring Stud 30 Slide Lock and Spring Assembly 31 Safety Spring 32 Safety Spring Plunger 33 Safety 34 Sear Adjusting Screw 35 Sear Trip 36 Sear Trip Spring 37 Trigger 38 Trigger Spring 39 Sear Trip Pin 40 Sear 41 Slide Lock Release Spring 42 Mainspring Plunger 43 Mainspring 44 Cartridge Stop Pivot Screw Nut 45 Hammer 46 Cartridge Stop Pivot Screw 47 Cartridge Stop 48 Trigger Guard Pin 49 Receiver 50 Magazine Spring 51 Barrel 52 Magazine Tube 53 Filling Block Savage 167 (Specifications subject to change without notice) 54 Magazine Tube Yoke Screw 55 Magazine

Tube Yoke 56 Magazine Plug 57 Lifter Pawl Pin 58 Lifter Pawl 59 Lifter Assembly 60 Magazine Tube Adapter 61 Magazine Follower 62 Operating Handle Bar Collar (Rear) 63 Operating Handle Bar Assembly 64 Operating Handle Wood 65 Operating Handle Bar Collar (Front) 66 Trigger Guard 67 Trigger Adjusting Screw 68 Trigger Pin 69 Sear Pin 70 Hammer Bushing 71 Lifter Spring 72 Lifter Screws (2) 73 Buttplate Screws (2) 74 Buttplate 75 Stock 76 Stock Bolt 77 Stock Bolt Lock Washer 78 Stock Bolt Washer assembly and breech bolt back and out of the receiver.

The breech bolt is pretty conventional in that it has two extractors (15 and 16). To remove either extractor, depress the Extractor Plunger (14) and lift up the extractor. Allow the plunger to go forward and tip it out of the bolt. You can reach in with a dental pick to pull out the Extractor Spring (12 and 13). The firing pin is held by the Firing Pin Stop Pin (10) that is in the back of the bolt.

Driving the firing pin stop pin out allows the firing pin retainer, firing pin spring, and firing pin to be removed from the breech bolt. This completes the breech bolt disassembly. The Ejector Assembly (26) in the Model 167 is secured by the Ejector Screw (2) found on the left side of the Receiver's (49) exterior. Removing the ejector screw

allows the ejector assembly to be removed. Afterward, use a punch to drive out the ejector pin from the ejector assembly.

This allows the ejector plunger and the Ejector Spring (25) to be removed for cleaning and inspection. The final item that may be removed from the receiver is the cartridge stop. Unlike most other shotguns, the Model 167 has only one cartridge stop and the lifter assembly when lowered prevents more than one shell from exiting the magazine. You may have to make a special screwdriver to secure the Cartridge Stop Pivot Screw Nut (44) in place while loosening the cartridge stop pivot screw.

Removal of the latter allows the former to drop out of the receiver and the cartridge stop to be removed from the receiver. This completes the receiver disassembly. To remove the Barrel (51), unscrew the Magazine Cap on the end of the magazine. With the Operating Handle Wood/forearm (64) moved slightly back, rotate the barrel 90 degrees clockwise and pull it away from the receiver. Unscrew the Magazine Plug (56) screw and afterward lift the magazine plug out.

This gives access to the magazine spring and the magazine follower, which may now be removed. The operating handle bar assembly and operating handle wood may now be pulled straight out of the receiver. AG

RIFLES

AR-15 Barrel Treatments For Maximum Precision

Barrel treatments can improve accuracy but are not a guaranteed cure. Here's the chilling truth about cryogenic barrel treatment and fluting.

BY JOE CARLOS SEPTEMBER 2016

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Ve I mentioned many times how disappointed I was in the accuracy of the National Match Service Rifle uppers I inherited when I came on as the Armorer for the Army Reserve Service Rifle Team. Only 39 of 135 uppers would shoot MOA. My purchase budget was very limited so I had to use plenty of elbow grease and ingenuity in finding ways to shrink group sizes. And I wanted to get the guns shooting better with a minimum of delay. While this was a challenge, cryogenic barrel treatment made its contribution.

None of the barrel extensions were properly stabilized inside the upper receivers so the backs of the barrels moved around from one shot to the next. This was common in guns of the era.

In order to fix the problem the guns had to be stripped down and rebuilt from scratch, pro-Badger cut-rifled barrel with less invasively machined flutes shot fine without treatment.cedures I covered in "The

Relationship Of Barrel Extension Diameter To Accuracy In The AR-15" (March and April 2013.) There were other problems like gas tube to float tube contact as well as handguard end caps rubbing against the backs of the front sight housings.

These issues were going to require detailed disassembly and adjustments and I knew many of the barrels were coming off their receivers. None of the barrels in question had been fluted. My budget allowed eight barrels cryo treated for the purchase price of one new premium barrel. Very few of the barrels were shot out and I hoped that cryo would be an affordable repair option.

I matched and labeled the barrels to their receivers as I took them off, making sure the guns were put back together with their original parts and retested with the same ammo lots to confirm what the cryo treatment accomplished. When the gun powder settled, I found that some barrels did not respond at all. I did not cull those barrels

out of the final analysis and my total sample of cryo treated barrels improved by an average of 9.4%.

I left the non-responding barrels in the final average because there is no way of predicting if a barrel will improve by cryo. If it does, your money was well spent but it's a roll of the dice. Testing the original barrels found a few "walkers" that fired the first shot from a cold barrel into one place with subsequent shots forming a ragged "straight" line of impacts until the barrel warms up. Such a warm up can require quite a varying number of shots in different barrels.

It is not unusual for these shots to "walk" in a diagonal or other direction. In most cases, even when walkers finally do settle down and place bullets into one general area, they are seldom really tight groupers. Walkers seemed to be more common in stainless steel and also most frequent in barrels

AR-15 BARREL TREATMENTS FOR MAXIMUM PRECISION CONTINUED

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Upper lead weight on the right has a channel cut to (hopefully) clear the gas tube. Use a carbide smoker (top) to coat the gas tube in black soot to test for clearance. that had been button rifled. Every time you take a barrel with walker tendencies to the range you have to begin the warm up process all over. Cryo seemed to usually help these barrels. The “registration point” is the position that the gun muzzle returns to after firing a shot.

A good, repeatable registration point is key to tight grouping and a consistent zero. An AR barrel by itself may have a repeatable registration point but if that barrel is simply clapped into the upper receiver in the old 1960s method with a barrel nut, the barrel extension will float around inside the receiver

and the hastily assembled firearm can often give the appearance of a barrel with a registration point problem.

Cryo treatment will not help until the back of the barrel is properly stabilized in the upper receiver. Walkers are likely barrels with a specific registration point problem. They may be barrels that left their factories with some residual stress that hadn’t been completely removed. Some barrel makers and gunsmiths have also posited that improper break in of the barrel can contribute to walkers and other registration point problems.

The theory goes that barrels heated up by firing too many rounds in rapid succession early in life can result in registration point is-

sues. I discuss this further in, “Gas Gun Barrel Break-In” (October of 2014.) USAR Test Since I had experienced some initial success in fixing sick AR barrels, I was motivated to experiment further. I know of shooters and a few gunsmiths who immediately send barrels off for cryogenic treatment in the hopes of harvesting some additional accuracy. I decided to try that.

I began with a fairly large sample of dozens of premium barrels that I had just received from several well-regarded custom barrel makers. The sample included chrome moly and stainless barrels with cut and button rifling. All of the barrels had Wylde chambers and I broke them in noninvasively. I sent half of the barrels from each

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category out for cryo and built temporary uppers with the non-treated barrels. Those were machine rest tested using several known lots of factory match ammo and the results were recorded. The barrels were then cleaned, ranked according to accuracy, and put into storage for later use. When the cryo-treated barrels came back they were also built into temporary uppers using the same receivers, match bolt carriers, float tubes, etc., then machine rest tested with the identical lots of ammo.

Testing revealed no difference! The conclusion I drew is cyro has some value as a “repair” option but not an across-the-board improvement. I see in some catalogs where certain gun makers tout up that their barrels are cryo treated. Often this is accompanied with grandiose “sub minute” accuracy claims that I have never seen delivered. Don’t be surprised if other promises like “triple lapped” accompany their write ups.

I am reminded of the 239th Ferengi Rule of Acquisition, “Never be afraid to mislabel a product.” Perhaps cryo is an informed decision on their part. Maybe they are buying barrels from low-bid makers not doing a proper stress relief at the factory. Such barrels may benefit from being cryogenically treated. Or perhaps such companies have just failed to perform the due diligence that I did. The cost of having low-bid barrels treated with cryo is being passed on to their customers.

Since not everyone is informed on the true values of cryo they may expect to get superior performance just because of it. That was certainly not my experience given an average 9.4% group reduction. For me, cryo merely brought marginal barrels up to shooting average. If you are looking for barrels with true matchgrade accuracy I recommend buying a genuine premium barrel from reputable companies like Krieger and Bartlein and not gamble on cryo, fire lapping, or other work arounds.

Fluting There’s a tie in with fluting and barrel cryogenics. Fluting looks cool (not a valid reason to get it) and cuts barrel weight while maintaining rigidity. While most Service Rifle competitors usually want to add weight, tactical shooters or hunters may find the weight reduction attractive. My interest had to do with claims of improved heat dissipation much like a car radiator with added surface area.

National Match competitions are fired on round bullseye targets at distances of 200, 300, and 600 yards with long range at 1,000 yards. The National Trophy Infantry Team Match (“Rattle Battle”) is fired on human silhouette targets and starts at 600 yards. Staring from sling-supported prone, shooters have 50 seconds to fire as many rounds as they can. Better shooters will expend an entire 30 round magazine. From there, the team advances to the 500 yard line and does it again.

Should the team have remaining ammunition they’ll repeat at 300 yards. Obviously, these barrels get really hot and it’s not unusual for hot barrels to shift point of impact and shoot fatter groups. Heat mirage from hot barrels can also trick a shooter’s eyes. I wondered if fluting might help with barrel heating. As with other experiments, I started with a large sample of new button-rifled barrels from reputable custom manufacturers and sent half out to be fluted while building the others into temporary uppers.

I tested from machine rest using known lots of factory match 77 grain ammunition by firing 30 rounds as fast as I could push the machine rest back into battery. Then the target was rapidly swapped out and a second magazine with a different ammo lot was fired, rather like a “rattle battle” match. When the fluted barrels came back I removed the unfluted control barrels and retested. Groups were terrible with the fluted barrels.

The folks that did the fluting for me cut a fairly aggressive flute, with half of the barrels done in a straight pattern and the other half in a spiral. The flutes were cut fairly wide and deep, which should have produced the desired increased surface area for cooling. Why did the fluted barrels shoot so bad? There are two possibilities.

AR-15 BARREL TREATMENTS FOR MAXIMUM PRECISION CONTINUED

ORIGINAL PAGE 20

First, changing the exterior of a barrel that has been rifled using the button process. Button rifling is a swaging process. The groove is not actually cut out, rather, a button is pulled through the barrel and the groove is displaced into the barrel. The theory is that when the exterior of such a barrel is changed, dimensional changes to the inside of the barrel occur and alter what the barrel maker intended to be final.

Some barrel makers recommend that if a customer desires fluting that he allow the manufacturer to do it under their controlled conditions so they can perform a final lap after the fluting to help eliminate internal dimensional changes. This sounds good but not all custom barrel makers lap their barrels. Those that do don't always offer factory fluting. The second possibility for poor performance has to do with inducing stress.

It is possible that the folks that performed the fluting rushed the operation and heated things back up, inducing stress. I am inclined to favor the second possibility. The end result of my fluting experiment was a bunch of sick barrels. I sent them out for cryogenic treatment, then reassembled them back into the same uppers for a second round of testing. Every one of them did better, however, the cryotreated fluted barrels still didn't outperform the non-fluted control barrels.

So I spent a bunch of taxpayer dollars to have barrels fluted and then fixed with cryo to achieve no accuracy gain. While I am sorry to have wasted your money there is always some cost to learning. I would caution to not draw the wrong conclusion from my specific fluting test. Fluting did not work (heat wise) for my NMC uppers where the barrels are surrounded by a close-fitting metal float tube. These tubes remove sling pressure from the barrel and the first models were much better ventilated on the top and bottom.

I suspect that the makers were considering barrel heating in their designs. Over the years, a lot of the vent holes and slots have been dropped. This was likely just an economic consideration on the part of their manufacturers as it takes extra time and machining to drill and cut these vents. Also, shooters have added more lead weights between the tubes and handguards which also holds barrel heat in and not let it dissipate.

Hunters and tactical shooters probably have firearms that better lend themselves to ventilation and fluting might work better for them, especially if they also want to reduce weight. Match Rifle, F-Class, and some long range handguards are also better vented than those for Service Rifle. I don't know if fluting helps in these cases as I have only tested with Service Rifles. A caveat on the lead weights for Service Rifles.

In addition to the bottom handguard weight, some shooters also put an upper lead weight in place. Be very careful with this as these upper handguard weights have a channel cut in the lead to avoid contact with the gas tube. In reality, often there will be contact, bending the tube slightly out of alignment with the bolt carrier key and causing fliers and fat groups!

If you are contemplating using an upper weight, smoke the top of the gas tube with a carbide light, place the weight on top, and check for any black carbide soot rubbed off. If that happens, I'd abandon the weight. While the extra weight helps with recoil control, the degradation in accuracy isn't worth the price. I did have a cut-rifled Badger barrel fluted.

Unfortunately, Badger is no longer in business but Northern Competition (Northern Competition. com, did the fluting for me and the owners used to work for Badger. They also had concerns about inducing stress by rapid and hot machining of the flutes and use a very noninvasive method. They make light cuts and rotate to a differ-

ent flute constantly to avoid overheating. The 6.5 twist 90 grain barrel done by them shot great without cryo or other work.

I can't say if it was their noninvasive fluting method or the cut rifling but fluting did not impact accuracy in this barrel. If you are looking for someone to flute a barrel for you they might be worth contacting. I see no reason to flute National Match barrels. If you are going to have fluting performed, the best way is to have the actual barrel maker do it at the factory so they can perform a final lap. If you are performing the actual fluting yourself, do so without heating up the barrel.

If you have a fluted barrel that is not performing well you may want to consider shipping it off for cryogenic treatment. Used judiciously, cryo may help with problems like walkers and stress-induced accuracy issues. Companies offering the cryogenic service used to make other claims for it like easier cleaning or longer barrel life. I tested cryo for accuracy, not for ease of cleaning, which isn't easily quantified.

Alleged longer barrel life is a real can of worms and after examining hundreds of barrels I am convinced that "wear out" is as much a function of how the owner cleans the bore as the actual round count. Because of that extra cleaning variable thrown into the mix it is very difficult for any researcher to set up a study of how cryo influences wear out. If barrels did last longer from cryogenic treatment I didn't notice it.

I prefer to go with true premium barrel makers such as Krieger and Bartlein that don't induce stress or do a good job of stress relief at the factory and I avoid any machining or questionable break in procedures that might reintroduce stress. Cryo isn't all things to all people but it may be of value to you as long as you have reasonable expectations of it and apply it to those situations where it can really make a difference. AG

MAINTENANCE & REPAIR

Revolver Repair

Important and common things to check when working on revolvers.

BY ROBERT K. CAMPBELL SEPTEMBER 2016

ORIGINAL PP. 21-22

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Revolvers enjoy a deserved reputation for reliable function with minimal maintenance. Perhaps this reputation leads to a complete lack of maintenance among some shooters. When a revolver comes into the shop there are usually two problems that precipitated the visit. The revolver is either at the high end of a high round count or has been subjected to shooter error, even abuse. There are also many second-quality revolvers that weren't particularly good even when new.

With sloppy tolerances there is nowhere to go but down when practice sessions are attempted with these handguns. The problems covered in this report have been observed in various revolvers over several decades. While operating a training company, practically every problem cropped up within less than a year, usually with second quality revolvers. We'll start with failures to close and rotate. On two occasions revolvers used during a class failed to operate due to ammunition related problems.

One bullet stuck in the forcing cone due to a failure to fully ignite the powder. Another fired but the cartridge case split and part of the case stuck in the forcing cone. A common

failure to rotate is caused by a high primer or improperly resized cartridge case. When a revolver fails to rotate, I clean it and examine for accumulated powder ash, grime, and lead deposits. Check under the ejector star.

I recently found a .38 caliber revolver with enough powder residue to raise the extractor and cause rotation problems. Thorough cleaning fixed this. Light loads without a good crimp also cause dirty shooting. The chamber may bleed powder into the extractor star but probably the cartridge cases leak powder when the revolver isn't properly unloaded muzzle up. A loose ejector rod can cause a failure to close and simply screwing the ejector rod back in place is one cure.

A warped crane isn't common but should be looked for. The extra effort needed to operate a dirty gun can bend the ejector rod. I've observed the firing of quality +P loads in a two hundred dollar .38 revolver. With the high pressure the shooter ended up beating the ejector rod against the barricade to eject the stuck cases. This happens with cheap revolvers shooting .32 H&R Magnums. Top end, high pressure This is an IMBEL, from the same company that manufactures Springfield frames.

Below center: This .32 caliber revolver shows adequate headspace and a tight fit, despite the fact that it isn't well finished and is about 30 years old. ammunition should not be fired in second rate revolvers. The center pin and extractor can become beat up from recoil and have seen this problem in ultra-light .357 Magnum revolvers. Since few shooters are able to withstand the recoil of these revolvers for very long, I can surmise the damage occurred with a modest round count.

A scandiumframe revolver suffered an ejector rod underlug lockup so battered I had to polish out burrs to restore the revolver to operation. I was certain the problem would repeat if the firearm were fired with Magnum loads. These handguns are truly designed to be carried much and fired little. Elongated forcing cones are sometimes encountered. I have seen this in early revolvers that apparently did not have the heat treating we enjoy today.

A quick fix is to file and polish the elongated portion of the forcing cone. The proper fix is another barrel. This year, I worked with a .22 revolver that gave trouble even after a good cleaning. The cylinder seemed clean and free of excess powder build

REVOLVER REPAIR CONTINUED

ORIGINAL PAGE 22

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Above center: The crane-to-frame fit is still OK but this revolver has seen hard use. up and the owner told me he thought the revolver chambers had been cleaned well. The revolver would fire perhaps twenty rounds and then extraction became very difficult. A rubber mallet was used to bump the ejector rod on occasion. The ejector rod was not bent and the crane, ejector rod, and extractor seemed fine. The revolver was cleaned, revealing signs of honest wear but not abuse.

After cleaning, the revolver worked fine but within twenty rounds the hard extraction began again. I have had previously experienced this problem with Russian cartridges in several .22 revolves but this revolver exhibited hard extraction with a variety of loads from top makers. I examined the chambers for powder residue, powder ash, and lead deposits. The chambers appeared normal but

the problem had to be there. Since the revolver had once operated normally it wasn't a factory defect.

I discounted the possibility of a short chamber based on past performance. I took a .223/5.56mm cleaning brush (slightly longer than .22 Long Rifle brushes) to thoroughly clean the chambers and it proved effective. It turned out there was a type of ring that was removed by this cleaning. The owner admitted to firing perhaps one thousand .22 Short cartridges the previous summer and the shorter cartridge had left a powder and lead residue in the chamber that Below center: The ejector rod sometimes becomes loose.

It is simple to disassemble the cylinder's ejector rod components. Clean them and check the ejector spring. The extra effort will pay off. was finally dislodged. The owner's ef-

forts had reduced but not eliminated the ring. This problem was solved with a longer brush, though I think a chamber reamer might be needed if the combination was both lead and corrosion. Another concern is the center pin of the cylinder and the end of the ejector star as it locks into the recoil shield.

You can use a spent cartridge case to check headspace by loading the chambers and then checking rotation. The allowable distance is about 0.008 between the cartridge case and recoil shield with 0.010 at typical maximum. If the gap is greater than 0.012 misfires are almost guaranteed. When the cylinder is opened the yoke should be straight and the motion free of binding. Press the ejector rod and be certain that the rod is tight. The cylinder should freely rotate whether the barrel is vertical or horizontal. AG

RESTORATION

Reader Forum

BY AMERICAN GUNSMITH EDITORS SEPTEMBER 2016

ORIGINAL PP. 23-24

Working .22 Rifles I read RK Campbell's "Working .22 Rifles" in the June 2016 issue with keen interest as I am an avid restorer of .22 rifles. I have been coaching youth Hunter Skills teams under a program similar to the NRA Hunter Education Challenge but scaled down somewhat. The Upper Savannah Shooters Association is the only shooting club in South Carolina that sponsors this type of learning experience for youth on an extended basis.

It starts with Hunter Education Classes and continues for five months from November to March. Students meet every Sunday to practice wildlife ID, orienteering, rifle, shotgun, and archery skills to carry youth beyond Hunter Education class to become true sportsman and shooters. The program includes .22 rifle marksmanship as part of the program. A student of mine brought a Stevens 53D rifle to my class to shoot. It would chamber and fire around but would not eject.

After a thorough cleaning and using a .22 chamber iron to smooth the burr on the chamber, everything worked as it should. After that the rifled could hold its own in terms of accuracy with the CZ trainers and scouts we use. I did not disassemble the bolt because I had no disassembly instruction or diagrams and didn't want to experiment on a proud child's rifle owned by his grandfather that replacement parts may not be available for. Unfortunately, the rust and crud in the bolt keeps interfering with the firing pin.

I plan to put the assembled bolt in a sonic cleaner to see if it can be further cleaned but have not done so yet. Do you have any suggestions? Should I disassemble the bolt? If so, where would I find instructions or an exploded diagram to help in disassembly? Is there a similar Stevens model that in-

structions may be available for? Author RK Campbell responds. I would hope the ultra sonic cleaner will solve the problem.

To dig further, Numrich Gun Parts Corporation (gunpartscorp.com) has a parts diagram available at: goo.gl/31tCwS. Also try Bob's Gun Parts and Jack First. While I have not disassembled this bolt, it should be similar to anything else of the same time period. I would thoroughly soak the bolt assembly first. Carefully turn the cocking piece until it comes off. The internal parts will then be released. As you have heard so often before, assemble in the reverse order.

Note, some old rifles have a small pin that must be pressed out, some do not. Sorry to sound like I am going from the seat of my pants, however, The Gun Digest Book of Exploded Gun Drawings, including the online archive, does not cover this rifle. Colt Huntsman I would like to shoot CCI Quiet-22 .22LR ammunition in my .22 Colt Huntsman. What springs will I have to reduce in length in order for the pistol to continue to function as a semi-automatic?. We're not familiar with the CCI Quiet-22.

CCI lists the muzzle velocity at 710 feet per second. CCI standard velocity is listed at 1,070 and high velocity at 1,200-1,300. Further, HV ammo is seldom used in bullseye matches and standard velocity rules the firing line. Given the power reduction, you may have to reduce spring tension, however, don't start chopping off coils as there's a risk you'll wind up battering the receiver of the gun. It's better to replace them with lighter springs of the same weight.

Belknap Model B967-R I have a Belknap Model B967-R .22 semi-auto rifle in for repair with no known history on it. The cus-

tomers claims it was jamming. I took it apart and cleaned, removing about twenty David Castle Greenwood, SC years of grime. The firearm now shoots the first round and chambers the second round but will not cock to fire. The rifle reloads and cocks properly every time by hand. I have already cleaned and polished everything in the action I can think of.

Frankie Joyner Joyner Sales The rifle was named in honor of Augustus Belknap who helped about two dozen San Antonioians form their own military company after being refused admission to the San Antonio Rifles. The group, Belknap Rifles, won more competitive drills than any other militia company in the United States at the turn of the nineteenth century.

Any hope of securing technical information on the rifle itself would require the assistance of the Texas State Historical Association at the University of Texas in Austin (tshaonline.org, Winchester Model 190 I am looking for a schematic and disassembly instructions for a Winchester Model 190. It is the same as the 290 except for a plain stock. I've couldn't find it in the NRA's rifle book and have had no luck tracking it down. Jack Roche Sam Calloway The rifle is so simple you don't really need a schematic.

There are ample take down instructions appearing in the second edition of Gun Digest Book of Rimfire Rifles Assembly/Disassembly. If you want audio/visual input, direct your browser to search for "Winchester Model 190 Rifle" and you'll find videos on You Tube and elsewhere showing disassembly of the 190. Monte Carlo Stock I am looking for a Monte Carlo for a Lee-Enfield No. 1 Mk. IV 303 British rifle. I have seen them at gun shows but nobody seems to know where they came from. The ones I've seen

READER FORUM CONTINUED

ORIGINAL PAGE 24

to date were made of walnut and were beautiful. Two suggestions: Boyds Gunstock Industries (boydsgunstocks.com, and Wenig Custom Gunstocks (wenig.com, Be certain to discuss your wood and finish requirements with both. Mauser HSc Super I'm having an issue with a Mauser HSc Super, serial number 025XX. It's marked ".380 ACP" on the left side of the frame and "9mm Kuntz" with a 38 under the 9mm on the barrel. I picked this handgun up at a sheriff's auction and the price was worth the chance.

I cleaned it then took it to the range to fire it as a function test. It fired a few rounds but seemed to have some issues with the hammer cocking. Upon further inspection I noticed a broken clip on what I'm assuming is the hammer pivot pin. I can't find any schematics showing the left side upper. The one schematic I have found seems to show a longer hammer pin.

I suspect this one might be broken as the picture Submit a question or letter to the Reader Forum column by addressing an email to or posting a letter to American Gunsmith, Alexandria, VA 22310. Send subscription questions to shows the little clip with the screw holding it in. Do you know where I might get a proper schematic, and clip and pivot pin if needed?

George Potvin We may be experiencing a terminology misunderstanding but have found no "hammer clip" or screw retaining it on the parts list shown in the Gun Parts catalog. We have noted a center-grooved pin that secures the hammer through matching holes on both sides of the receiver. The schematic we are referring to is of the HSc Super. You will find more information on its disassembly in the Gun Digest Book of Automatic Pistols Assembly/ Disassembly.

We are adding a tip for shooting self-loading pistols: Failure to maintain a firm wrist when firing can cause failures to cock. Winchester Blowing Open My friend and I have nearly-identical Model 1300 Winchester 12

gauge shotguns. When shooting either gun the action "blows open" though there appears to be no wear on the action bar or bolt and the lock up is good. Is this an inherent problem with these guns? I see nothing worn or broken. One gun is a Defender and the other is a Ranger.

Jack Owen This is a common attribute of the "Fast Action" Model 1300. Even with target loads, the forend must be held forward upon firing. Failing to make this a habit with light loads will enable a F. A. 1300 to extract and eject a heavy load. Shotgun Rib Soldering I recently had a Mossberg 500 come into the shop with a loose rib, appearing to be soldered only at the point directly in front of the receiver and not on the factory posts.

I resoldered the rib in the same manner using Brownells Hi-Force 44 Solder with the recommended Comet Flux. The rib continues to break loose when shooting the shotgun after soldering. While I'm positive the solder is not hot enough to properly bond together, I am using a propane torch and am afraid of overheating the barrel despite using some heat stop jammed all around the locking recess to attempt preventing ruining the recess directly.

Robert Driscoll How hot can I get the barrel before I ruin the heat treatment? I would like to get the shotgun back to my customer correctly fixed. Am I wrong to be skeptical? Is there another way to bond the rib? Ryan M. Davis Cross Saber Custom Gunsmithing Brownells used to offer an industrial adhesive they branded as "Black Magic" that provided the same tenacious properties of the product employed by a major provider of ribs for attachment, or reattachment, to shotgun barrels.

The equivalent still available today is Loctite 380 Black Max, a fast-curing cyanoacrylate toughened with elastomers. It's designed for gluing on shotgun sights, sight ramps, and repairs to vent ribs and beads, or installing rifle-type sights on plain barreled shotguns. AG

SEARCHABLE ISSUE RECORD

Archive index

These Are My Guns American Gunsmith Editors	2	AR-15 Barrel Treatments For Maximum Precision Joe Carlos	17-20
SIG SAUER P320 Chick Blood	3-8	Revolver Repair Robert K. Campbell	21-22
Italian Replica Firearms Ryan Hoover	9-12	Reader Forum American Gunsmith Editors	23-24
Savage 167 Gary Yee	13-16		

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