



JUL 2016

DIGITAL ARCHIVE  
EDITION

# PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

# 07

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

# AR-15 DIAGNOSTICS

AMERICAN HUNTER • JIMENEZ HANDGUNS • MAUSER MAGAZINE MODIFICATION • M1 GARAND: .35 WHELEN CONVERSI...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 151

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](mailto:editor@gunsmithmag.com).



# AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • JULY 2016

## ISSUE RECORD

|               |                             |
|---------------|-----------------------------|
| ORIGINAL DATE | July 2016                   |
| VOLUME        | Archive volume not stated   |
| ISSUE NUMBER  | 07                          |
| SOURCE ID     | ag-f7f5702688edd32f5047389e |

## 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 July 2016.

---

**2** American Hunter  
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

---

**3** Jimenez Handguns  
DAVID W. MANNEY • ORIGINAL PAGES 3-6

---

**7** AR-15 Diagnostics  
JOE CARLOS • ORIGINAL PAGES 7-12

---

**13** Mauser Magazine Modification  
ROBERT COLES • ORIGINAL PAGES 13-15

---

**16** M1 Garand: .35 Whelen Conversion  
GLEN C. BUSSE • ORIGINAL PAGES 16-17

---

**18** Is Restoration Worth It?  
MARK R. HOLLENSEN • ORIGINAL PAGES 18-19

---

**20** Ithaca Model 49  
MARK R. HOLLENSEN • ORIGINAL PAGES 20-22

---

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

## FROM THE ARCHIVE

# American Hunter

*How Legendary Hunters Shaped America*

BY AMERICAN GUNSMITH EDITORS JULY 2016

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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1982-P02-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1982-P02-F01

Willie Robertson, famous for the Duck Dynasty television program and Duck Commander line of hunting products, and William Doyle, author of *American Gun*, joined to write a collection of true stories of hunting heritage. Robertson's first book, *Duck Commander Family*, was a New York Times bestselling success. *American Hunter* details how legendary hunters shaped America's history and compiles a chronological history of America's greatest hunters, covering their backgrounds and personalities.

Beginning with the Plains Indians, the book details legendary hunters such as Daniel Boone, Davy Crockett, Kit Carson, Buffalo Bill, Teddy Roosevelt, Ernest Hemingway, Lyndon Johnson, and more. Also included are the histories of American fox, rabbit, deer, squirrel, duck, goose, and big-game hunting, as well as action biographies of classic hunting weapons. Divided into

twelve chapters, the book opens with personal anecdotes from Robertson and continues to the hunting and species of early North America.

Hunting by our nation's founders, settlers, explorers, and expansionists follows, as well as detailing hunts by U. S. presidents. A section on women hunters and the state of hunting in America today follows. All of the history is interspersed with numerous hunting tales by Robertson. The book finishes with an extensive bibliography of source notes, making it a good start for further history and learning.

Teddy Roosevelt said, "The virility, clear-sighted common sense and resourcefulness of the American people is due to the fact that we have been a nation of hunters and frequenters of the forest, plains, and waters." This book honors American hunting history and is filled with incredible stories of skill, courage, and survival. *American Hunter* is a good synopsis of American history from the perspective of those who love hunting.

## PISTOLS

# Jimenez Handguns

BY DAVID W. MANNEY JULY 2016

ORIGINAL PP. 3-6

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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P03-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P03-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P03-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P03-F02

Purchases of inexpensive firearms will continue for as long as there are non-wealthy gun owners. Such guns will probably need service eventually if the owner wants to keep it running. I've had a variety of Jimenez handguns in my shop and this is an overview of what I learned. Jimenez JA Nine and LC380 We'll start with the Jimenez JA Nine and LC380, which are based on the Bryco Arms Model 380. While I haven't worked on the Bryco Arms predecessor, I do know the gun does not have a very good reputation.

This is not a review of these guns but they seem decent for the price. The finish of the dozen or so Jimenez pistols I've seen has been less than what I would expect of any well-known company. These actions need to be broken in to smooth them out and this can be aided by smoothing out the burrs. These guns have a cocked indicator in the rear, a cartridge indicator on top of the slide, and come with a well-designed trigger lock that cannot be manipulated to fire the gun.

Two keys are provided and they are Below center: Afield stripped JA Nine. a universal design that can be used on any Jimenez Arms lock. To field strip, don safety glasses

and clear the gun. The pistol has to be uncocked to remove the slide and has a magazine safety. Insert an empty magazine into the cleared pistol, pull the trigger with the muzzle pointed safely to decock, then remove the magazine. Grasp the frame of the pistol in your right hand. Using your left hand, push the slide rearward until it stops.

Holding the slide in this position, push in the disassembly button and pull the slide upward. Note, the recoil spring will still be under tension and can fly out if not controlled. The slide will lift up. Lift it up high enough to clear the frame to prevent the slide from hanging up, then push forward off the frame. An alternate way would be to push the top of the slide against a non-marring surface, such as a bench or table top, allowing the barrel to go under the bottom.

When the slide is completely removed from the pistol, the only loose parts will be the recoil spring and the spring guide. The barrel is pinned to the frame and is not normally removed. Start with the slide for detailed disassembly. The finish is very easily damaged on this gun so use caution when removing pins. I managed to mar the finish using a brass hammer. Start with pushing

out the retainer pin with a 1/16" punch to the right. There is some spring pressure on the retainer.

Remove the retainer, firing pin spring, and the firing pin assembly. This is really just a firing pin with an orange plastic end on it for the cocked gun indication. From the bottom, use a spring pin punch and drive out the roll pin enough to release the extractor and extractor spring. The cartridge indicator is staked into place and should not be removed unless it is damaged. The "optional" rear sight is held in by two screws. Remove the screw for the elevator and lift off the sight with the spring.

Unscrew the windage screw to push the base to the left. Once loose, there is a spring that the screw goes through in a slot. For the frame, remove the screws holding the right grip panel and remove the panel. Remove the trigger disconnect. Push down on the sear and release the cam. Remove the sear, sear spring, and the cam. Put the safety into the safe position. Remove the screws for the left panel and lift from the bottom to pull out from under the safety. Watch that the safety spring does not go flying

## JIMENEZ HANDGUNS CONTINUED

ORIGINAL PAGE 4

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P04-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P04-F01

*Original caption: Top: Right side of frame disassembled, when pulling up on the grip panel. Remove the safety and safety spring. The spacer, disassembly button, and disassembly button spring can now be removed. Push the magazine release to the rear and note where the magazine release spring is located. It has to go back into the same location to release the magazine correctly. The trigger is considered factory only. There is a pin above the trigger that is pushed out to the right.*

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P04-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P04-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P04-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P04-F03

To get the trigger out, rotate the disconnect counter clockwise 90 degrees and it will come out of the opening in the frame. Be careful of the small spring on the top of the trigger as it is easy to miss. To reassemble, reverse the order of disassembly. While putting the pin back in for the extractor, use a 1/16" punch to line it up before pushing in the extractor pin.

The sear has to be put in with the square 1 Slide 2 Trigger Sub-Assembly 3 Trigger Disconnect 4 Sear 5 Sear Spring 6 Recoil Spring 7 Ejector notch to the rear. When putting in the magazine release, make sure the spring is in the correct place and hold the frame near vertical with a slight down angle to keep it there. Install from the left side and hold to the back until it clears the frame, then move forward to lock into place.

When installing the left grip panel, insure the magazine release spring is in back of the safety. The magazine release has to be pushed in while slipping the grip under the safety. Jimenez JA-22 and JA-25 The JA-22 and JA-25 are very similar with a few interchangeable parts. The frames are different to accommodate the different calibers.

The serial number is on the right side above the trigger for the JA-25 and 15 Spacer 16 Disassembly Button 17 Disassembly Btn Spring 18 Grips Pair 19 Grip Screws 20 Firing Pin Assembly 21 Firing Pin Spring 8 Ejector Spring 9 Cam 10 Cam Pin 11 Magazine Release 12 Mag. Release Spring 13 Safety Lever 14 Safety Spring on the back of the frame grip on the JA-22. I will note any difference in take down in the instructions and will show the differences at the end. To field strip, don safety glasses and clear the gun.

These models also have magazine safeties and recoil springs under tension that can fly out if not controlled. With an empty magazine inserted into the cleared pistol, press the trigger with the muzzle pointed in a safe direction. Remove the magazine. On the back of the slide is a take down button where the cocked gun indicator comes through. Push in on this about 1/8" with a punch or similar tool. While keeping this pushed in, lift up on the back of the slide.

Sometimes pulling the trigger will help release the slide easier. Slightly JA Nine (Specifications subject to change without notice) 22 Retainer 23 Retainer Pin 24 Magazine Assembly 25 Extractor 26 Extractor Spring 27 Spring Guide 28 Rear Sight Kit

## JIMENEZ HANDGUNS CONTINUED

ORIGINAL PAGE 5

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P05-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P05-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P05-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P05-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P05-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P05-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P05-F04. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P05-F04

Above center: Afield stripped JA-22. pull backwards and the slide will clear the frame, allowing it to be moved forward off the frame. Control the take down button as it has JA-22 (Speci ications subject to change without notice) 1 Slide 2 Extractor Spring 3 Extractor 4 Recoil Spring 5 Firing Pin 6 Firing Pin Spring a spring that will shoot the button across the room.

When the slide is completely removed from the pistol, pull the take down button, 19 Trigger Sub-Assembly 20 Trigger Cross Pin 21 Trigger Return Spring 22 Left Grip 23 Right Grip 24 Grip Screws 13 Safety 14 Catch pin 15 Magazine Catch 16 Magazine Catch Spring 17 Magazine 18 Safety Spring 7 Take down Button 8 Ejector 9 Sear 10 Sear Spring 11 Ejector Pin 12 Cam recoil spring, and fin-

ing pin out of the back of the slide. The barrel is pinned to the frame and is not normally removed.

Detailed disassembly starts with the slide. The finish on these models are also easily damaged, so be careful. The only thing to remove is the extractor on the slide. Using a roll pin punch from the inside of the frame, push the roll pin out far enough to release the extractor. Leave the roll pin in the frame as it is very difficult to put back in. There is a small spring behind it you'll need to watch for. For the frame, remove the screw holding the left grip panel and remove the panel.

Remove the safety and the safety spring. Take the right grip panel off and remove the cam. For the JA- 25, the sear and the sear spring

can be removed from the top of the frame when the cam comes out. The JA-22 will require the ejector to be removed before disassembly. Push down on the ejector and push the pin out with a 1/16" punch, which should be able to be pushed without a hammer. Release the ejector. The sear and sear spring will now come out. Using a punch, push out the pin holding the trigger assembly.

To get the trigger out, rotate the disconnecter counter clockwise 90 degrees and it will come out of the opening in the frame. There is a small spring on the top of the trigger that needs to be caught. The magazine catch is held in place by across pin. Push this out to release

## JIMENEZ HANDGUNS CONTINUED

ORIGINAL PAGE 6

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P06-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P06-F01

Original caption: Top: Take down buttons.

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P06-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P06-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P06-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P06-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1983-P06-F04. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1983-P06-F04

JA-25 (Specifications subject to change without notice) 7 Take down Button 8 Sear 9 Sear Spring 10 Cam 11 Safety 12 Catch pin 1 Slide 2 Extractor Spring 3 Extractor 4 Recoil Spring 5 Firing Pin 6 Firing Pin Spring the magazine catch, along with the spring. Reassembly is basically the reverse of disassembly. The sear has to go in with the angle to the front, otherwise the slide will stop on it and will not cock the gun or strip off a The JA-22 is on top.

The JA-22 on top is also half the thickness of the JA-25. 19 Trigger Return Spring 20 Left Grip 21 Right Grip 22 Grip Screws 13 Magazine Catch 14 Magazine Catch Spring

15 Magazine 16 Safety Spring 17 Trigger Sub-Assembly 18 Trigger Cross Pin round. For the JA-22 ejector, put the sear in place and hold down with a thumb when putting the pin in. Use a punch to keep the trigger in place while reinserting the trigger cross pin. The roll pin in the slide can be driven down too far and interfere

Notice the tab is longer on the JA-22 (right.) The taller one on the right is for the JA-22. with cycling. It should not be any higher than the step next to it. I like to assemble the slide without the recoil spring and then cycle the action to insure the slide will function properly. If it doesn't, doing it this way is easier to

get back apart to fix. The recoil spring likes to get in the way of the barrel when putting the slide on.

Pull the spring down and hold it compressed when slipping the slide over the barrel. Then, put in the firing pin, spring, and take down button in the slide once it is on the frame. Some notes on differences between the JA-22 and JA-25. The frame, barrel, and magazine are the most obvious differences. The sear, slide, firing pin, extractor, and take down button are the other ones. The rest of the parts I have found can be interchanged with no issues. AG

## MAINTENANCE &amp; REPAIR

# AR-15 Diagnostics

*Most semi-automatic firearms lock the bolt or slide to the rear on the last shot. Here we'll discuss what to do with an AR-15 that doesn't.*

BY JOE CARLOS JULY 2016

ORIGINAL PP. 7-12

There are good reasons why we want the bolt to lock to the rear when the magazine has been run dry. It is a quick indicator of being out of ammo and can make reloading a bit faster. While some have advocated counting rounds, the reality is most people won't in a fight. Military personnel sometimes use tracer rounds to indicate the magazine is almost empty but this isn't a viable solution in many situations. It's best to have the firearm work as intended.

So you're not wasting time, some Stoner platform firearms don't normally lock back on the final round. Pistol caliber and rim-fire conversions usually don't. However, it's possible for an AR-15 that's supposed to lock back on the last round function perfectly with a full magazine and fail to do so. Understanding the cycle of function is key to diagnosing such problems. One of the best resources about this is Army FM 23-9 M16A1, M16A2/3, M16A4 Rifle Marksmanship.

What we gunsmiths have to grasp is the difference in the bolt carrier travel necessary to reliably feed rounds from the magazine compared to the significantly longer travel required for the bolt catch to lock the bolt back on the last shot. This is because the flat surface of the bolt catch that traps the front of the bolt is located a fat 3/8" to the rear of the magazine. Anything that interferes with the carrier traveling that extra 3/8" can cause a failure to lock back.

I can think of five primary causes of failures to lock back and an additional seven occasional causes. First, get some information from your customer. Has lock back failure always been a problem with this rifle or is it something that surfaced recent-

ly? Has he replaced any parts (including magazines) or changed ammo when this started occurring? Were there any other problems noted? What may seem like two unrelated problems could be from the same cause.

I once had a customer whose fancy two stage trigger had an adjustment screw back out and allow a small captive coil spring to escape. She lost the second stage of her trigger pull and at the same time her hammer started failing to cock a significant amount of the time. The gun would also not lock back on the last round of a magazine. When I disassembled her lower I found the boogered spring trapped right under the hammer and adding so much drag there that it was difficult to cock.

That stiffness prevented the bolt carrier from its full rear travel. Once the spring was removed and replaced everything went back to normal. Consider maintenance and lubrication. In my article, "Do You Have Gas?" (January and February 2014) I established that most malfunctions are due to inadequate maintenance, bad ammo, or magazines. Failures to lock back are no exception. Obviously, if the bolt carrier, chamber, and upper receiver area housing moving parts is dirty the increased friction will inhibit function.

It never hurts to thumb cock the hammer and gently lower it a few times to check for undue resistance there. Inspect the chamber, preferably with a bore scope. If the chamber looks rough or has corrosion, polish it. See details in "AR-15 Chamber Selection" (July-September 2014.) Admonish your customers to use a chamber brush at the end of normal bore cleaning and use a corrosion inhibitor in the

bore, chamber, and muzzle crown any time the firearm is going to be stored for more than a handful of days.

The bolt carrier assembly needs to be cleaned and lubed after each range session. Lube can be added to the rings during range fires to keep everything functioning properly. The final inspection is of the bolt catch. Make sure that it moves up and down freely with no drag. This is an area that is often neglected during cleaning and crud easily builds there. Aerosol gun scrubbing compound and a parts brush quickly cleans it.

I don't recommend that customers disassemble this, however, should you feel any drag remove the roll pin with the appropriate 3/32" punch and inspect for burrs or cracks. After a thorough cleaning and reinstallation, if there's still drag, replace the bolt catch, plunger, spring, and roll pin. This catch is typically damaged if the hammer falls forward with the upper receiver off. Next, consider ammunition. Weak ammo can fail to generate enough gas to fully function the rifle.

Try test firing some of the customer-supplied ammo in his gun with his magazines, then use a known-reliable load. If your ammo works and his doesn't find out what his load is and look it up in a reloading manual. Examine his casings for signs of pressure. If it appears that he is using enough powder but his reloads still aren't functioning ask if he is bumping his shoulders back the required 0.003" necessary for proper function.

If he gives you a blank stare or just says he sizes his brass but doesn't know how to adjust his sizing die for shoulder bump you

## AR-15 DIAGNOSTICS CONTINUED

ORIGINAL PAGE 8

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P08-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P08-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P08-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P08-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P08-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P08-F03

Far 45 ACP Olympic Arms unit, don't lock the bolt back on the last shot. 22 LR conversions, such as this M261, do not lock the bolt back on the final shot. may just have found the problem. Casings have to be trimmed from time to time. Failure to do so can result in them wanting to stick in the chamber upon extraction. Measure the full length of some of the customer's brass and compare to what the loading manuals call for with regard to maximum length.

Too-light ammo can fail to produce enough gas and too-hot ammo can also be a problem because the expanded casings may pose an extraction problem. Look at the condition of the customer's fired primers for signs of pressure and inquire about powder charges. Powder charges are relative to On right, the bolt carrier must travel about 3/8" further to the rear to achieve lock back. barrel characteristics and chamber dimensions and a Stoney Point reading may be needed to measure chamber length.

Generally speaking, chambers with longer free bore pressure up less than ones with shorter dimensions. Foreign military 5.56mm

ammo will probably fit AR-15 chambers and fire the first shot but the ability to feed and fire subsequent shots with some of this stuff is anybody's guess. Many foreign military weapons have gas ports located at varying distances from the chamber and this has a massive influence on gas port pressures and how weapons function with the ammo designed for them.

Not only is the location of the gas port often different, the size varies as well. Also, many foreign rifles use external piston systems that differ from the internal piston design typically found in Stoner guns. The ammo for these foreign guns was designed to function them optimally but the ammo characterizes are often at significant odds in our rifles function wise.

So, if you learn that your customer is having failures to lock back or other function issues with foreign military ammo be sure to try the gun and magazine using a known lot of U. S. manufactured ammo before going much further. On to magazines. In order to diagnose magazine-induced failures we need to understand how lock back is accomplished when

everything is operating properly. At the extreme rear of the magazine follower is a "shelf" a little over 1/4" wide and just shy of 1/8" deep.

When there is ammo in the magazine the follower is buried beneath it down inside the body of the mag. When the last shot has been fired the follower is free to move up and that shelf engages the extreme front surface of the bolt catch. At rest the bolt catch is normally held in the down position by its spring and plunger.

When the stronger magazine spring pushes upward on the follower the weaker bolt catch spring is overcome and the bolt catch pivots upward about 1/4" in front of the bolt, stopping and holding it to the rear. When the bolt is held to the rear and the operator depresses the pad of the bolt catch, the flat surface of the catch that holds the bolt is pivoted back down into its resting position and the bolt moves forward. Now that we understand how things work we can perform some quick diagnostics on magazines. With

## AR-15 DIAGNOSTICS CONTINUED

ORIGINAL PAGE 9

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P09-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P09-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P09-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P09-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P09-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P09-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P09-F04. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P09-F04

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P09-F05. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P09-F05

An ultrasonic cleaner is helpful in cleaning bolt carrier assemblies, Bob Sled magazines, and dirty chamber brushes. Above center: Use a rust inhibitor in the bore, chamber, muzzle crown, and magazine bodies. the rifle cleared and the bolt forward, "shotgun" the rifle by pushing the rear take down pin out and pivot the front pin with the muzzle down. Insert one of the customer's magazines and see it lift the bolt catch about 1/4" and pivot back when the magazine is removed.

Any magazine failing this needs to be set aside. Be particularly watchful of any magazines that the owner has identified as not inducing lock back. Those magazines may be pivoting the bolt catch but perhaps not as far up as they should. Reassemble the rifle and further test by letting the bolt forward and locking the magazine in place.

Pull the bolt to the rear with the charging handle to check that the Below center: Conventional 20 round magazine on the left,

AR-15 and AR-10 Bob Sled magazines, and a Compass Lake Engineering .22 LR Bob Sled on the right. A critical note. Any time magazines and/or magazine parts are changed there can be point of impact change.

I cover this in detail in "Magazine Checks" (December 2015.) As an example, I've experienced a 6 3/4" point of impact change at 300 yards out to the eight ring of the NRA SR-3 the target just by changing magazines. magazine locks the bolt back, setting aside those that don't. Repair any failed magazines by disassembling, thoroughly cleaning, and inspecting. Pay attention to the magazine interior and follower, noting any burs that tend to snag on your shop rag.

Look for corrosion or dents in the magazine body that may inhibit the free upward travel of the follower. George Harris wrote a particularly good article ("The Art And Science Of Magazine Maintenance") in the March 2014 issue. Apply a very light coating of corrosion preventative such as Boeshield before re-

assembly, then retest each magazine. Those that still fail need parts (or complete) replacement. Magazine cleaning can be done by shooters, especially after a tutorial by the gunsmith.

The frequency of cleaning can vary from annually to monthly depending upon environment, frequency, and duration of shooting. Any magazine subjected to extremely harsh circumstances like being dropped in the sand or mud should be set aside until it can be cleaned. Even magazines that have passed the quick shop tests that I described aren't certified as functional until they pass live fire. The shop tests are mostly diagnostics to identify magazines that either need cleaning or replacement.

Start by replacing the spring and follower as needed. Glen Zediker's The Competitive AR15 Builders Guide has an entire chapter on magazines.

## AR-15 DIAGNOSTICS CONTINUED

ORIGINAL PAGE 10

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P10-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P10-F01

*Original caption: Top: Another fix for failures to lock back is to remove the weights from inside the stock buffer. Far Undersized gas ports can also cause issues. Gas ports on issue rifles are 0.093". Many custom gunsmiths and barrel makers start with a drill slightly small and then ream the hole the rest of the way to avoid burrs in the bore.*

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P10-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P10-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P10-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P10-F03

With the bolt pulled fully forward, set the carrier assembly as shown. The carrier on the right has collapsed under its own weight, showing the need to replace the rings soon. Bob Sled magazines are designed for single fed slow fire and even the .22 LR version locks the bolt to the rear for each shot. These exert no pressures on the bolt carrier, promoting more consistency in the positioning of the carrier for each shot.

However, Bob Sleds tend to be a little finicky regarding lock back because most oft hem use a little spring loaded plunger at the rear instead of that comparatively large shelf of a standard mag, making it easy for dirt to get in and compromise movement. I clean my Bob Sleds frequently in an ultrasonic cleaner with the plunger down in the cleaning basket. If the rifle is losing gas pressure there may be insufficient force to compress the buffer spring and allow the bolt to travel that extra 3/8" to the rear.

Check for a loose bolt carrier key. If the key becomes loose, gas will escape and the rifle will run sluggishly. I had this happen in a match in England one time. I had purchased a bolt carrier that came from the factory without the key screws staked and they backed out a little. Standard rings come in sets of three and are split, much like rings on auto cylinders. As with cars, those gaps need to be staggered about 120 degrees from each other. If the gaps line up, gas can escape.

Rings also wear out and need replacement occasionally. To lessen ring wear and enhance accuracy and function, add a few drops of oil to the rings during range firing.

I have encountered dozens of AR barrels with undersized gas ports that caused sluggish cycling. If the customer says he has had failures to lock back since the gun was new and with multiple mags there is a possibility that the gas port is under sized. Unfortunately, diagnosing this requires removing the front sight.

Depending on how the front sight is held in place the shooter may lose his zero. Fortunately, there are easier ways to get the gun functioning.

Similarly, the front sight assembly may not be lined up with the gas port. Again, this is not as uncommon as one might think but, like undersized gas ports, it can be compensated for quickly with the correct buffer spring. I use a simple pointer gauge to check if the sight is grossly out of alignment. We also need to consider the shooter as they certainly can induce malfunctions. With pistols, an infirm grip can induce problems as the slide needs a relatively stable platform on which to cycle.

A similar condition can happen with rifle shooters. In AR-15s the bolt carrier needs a stable platform and that platform includes the shooter and is position specific. If the customer tells

## AR-15 DIAGNOSTICS CONTINUED

ORIGINAL PAGE 11

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P11-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P11-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P11-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P11-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P11-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P11-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P11-F04. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P11-F04

you that lock backs are perfect from prone but experiences problems with the same ammo and magazines from standing, it's likely the shooter is the culprit. If the rifleman's position is correct the bulk of his or her weight is directly behind the gun, resulting in a solid platform. Contrast that to the standing position where the center of gravity is high and only the shoulder is directly behind the rifle. Compare muzzle climb in prone compared to standing to see the difference.

We would have identified this problem more easily were it not for the fact that a great number of our rifle shooters get their initial marksmanship training in the military were most of the qualification is done from the prone position while ignoring the others. Having served my share of time in combat I can tell you that terrain, tactics, time, and circumstances don't always allow us to get into that prone position and our military does a grave injustice by not training more frequently in other shooting positions.

Some additional points to check. The correct buffer spring can cure a bunch of function issues. For example, if your diagnostics find that the customer purchased or loaded ammo that is a little too weak to properly function his rifle it can be fixed by substituting a re-

duced-power buffer spring. Likewise, if you suspect the firearm isn't getting enough gas due to an undersized gas port or misplaced front sight housing, the reduced spring will compensate.

It will also usually work if you suspect the shooter's position is not solid enough for proper functioning of the rifle. For more severe cases, either lighten the stock buffer by removing the internal weights or by substitution of the low mass JP Enterprises buffer. Note, any of these quick fixes can cause shifts in zero. Far The A2 uses a spacer (top right) with a longer screw to attach the stock. Buttstock screws. From the A1 to A2 configuration, the buttstock was lengthened.

The buffer tube, however, was not and a spacer was provided to fit between the back of the tube and the stock. Obviously, a longer buttstock screw was needed. Depending on the source, one can sometimes end up with a screw that is too long and actually protrudes into the buffer tube. If it protrudes far enough the buffer will impact it and not travel far enough to the rear.

If your customer says there has always been a lock back problem with multiple magazines and your hand function check is failing to

achieve lock back, you may have a stock screw that is too long. Back the screw out a few turns and if hand function now works, replace with a proper length screw. Shooters with short arms still prefer the older A1 stocks but few factories offer these as standard. A rifle so fitted was likely installed by the owner.

If the aftermarket stock didn't provide a shorter screw, odds are the owner reused the too-long screw. Recoil reducers come and go from the market frequently. Many of them are similar to automobile shock absorbers and used to counter the secondary recoil pulse portion of total felt recoil caused when the rear of the buffer crashes to a stop at the back of the buffer tube. I have tested a number of these devices and find they work as my recovery times were shortened.

Unfortunately, they can contribute to failures to lock back. In some cases, compensate for this by getting the buffer spring just right. It can be a lot of trial and error. Bolt carrier weights are used to increase dwell time, or how long the bolt remains locked after cartridge ignition. This longer dwell time is thought to improve primer retention

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P12-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P12-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1984-P12-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1984-P12-F02

If so, the top of the Wedge can interfere with the bolt carrier.. Above center: Trim the top 1/8" off the Accu- Wedge if it's in the path of the carrier. This cheek piece was assembled backwards. Remove and rotate it 180 degrees with the Allen screws to the rear. when shooting very hot loads. In .223 Remington you can get an increase of about 0.3 grains of powder by using these. They also influence zero and can negatively impact functioning.

These weights fit into the back of the bolt carrier and add beyond the normal length of the carrier. The manufacturer includes instructions to dress the length of the very back of the buffer to compensate but many owners just skip that step and end up with function problems. Accu-Wedges work. I routinely see guys laying out 100 times the price of that little piece of bubble gum to end up with less accuracy gain! On rare occasions these can contribute to function issues.

Accu-Wedges come in one size and fit most AR-15 lowers but there are variances in lowers and sometimes the "shelf" where the Wedge sits below the take down pin is up higher than normal. This can end up positioning the top of the Wedge's "tail" section into the carrier's path. To avoid this, trim about 1/8" off of the top portion of the Accu-Wedge and enjoy the accuracy enhancements with no fear of malfunctions. A dented buffer tube is rare.

Unless the customer has abused the firearm such dents would likely have been in the tube when the gun was originally built. It is not impossible for the tube to have been damaged in shipment and for a careless builder to use it. Don't rule this out but it doesn't happen often. Something I have encountered happens with adjustable target stocks for match rifles that clamp directly onto the buffer tube. It is usually the adjustable cheek piece part that gives problems, especially if assembled backwards.

These are held in place by Allen screws that press in on the buffer tube. If a gorilla gun owner torques these set screws down too tightly it is remarkably easy to partly collapse the inside of the thin buffer tube just enough to catch the front end of the buffer itself. I have seen this cause complete stoppages with the bolt carrier prevented from moving far enough. Fortunately, when the gunsmith backs out the set screws the inside of the buffer tube springs back somewhat and function is restored.

Remember, it is the actual front of the buffer itself that becomes trapped, not the rear of the carrier. The carrier was designed so the tail end of it is skinnier than the front. This was done to aid function because the tail of the carrier actually enters the front section of the buffer tube during the cycle of function. The front of the buffer, however, is much fatter than the tail of the carrier.

There isn't much clearance between the buffer tube's interior walls and the front of the buffer so it doesn't take much constrict-

tion of the buffer tube walls to create a stoppage. Finally, look for a gross misalignment between the upper and lower. Full rifles purchased from reputable makers are nearly free from this concern. When dealing with "parts guns" or when swapping uppers from different manufacturers I have seen some pretty dramatic misalignments.

If it gets bad enough the bolt carrier can end up scraping the sides of the buffer tube, slowing the cycle of function. A loose buffer tube can also exacerbate the problem. To test for it, remove the bolt, cam pin, firing pin, and its retaining pin from the carrier. Remove the buffer spring from the stock and the hammer from the lower. With the stripped carrier in the upper, reassemble the gun. Hold the rifle in both hands and tilt it so the stock is lower than the muzzle.

The carrier and buffer should freely move to the rear of their own weight without catching or hanging up. Lower the muzzle so it is below the height of the stock and the carrier and buffer should move effortlessly back into battery. While there are a fair number of things that can cause failures to lock back I have found that the actual frequency of this problem is relatively low.

Stoner did a fantastic job of design but if you work on these rifles long enough you will likely encounter a failure to lock back eventually. AG

## RIFLES

# Mauser Magazine Modification

*How to feed your Mauser a "Swift" diet.*

BY ROBERT COLES JULY 2016

ORIGINAL PP. 13-15

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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P13-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-P13-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P13-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-P13-F02

Mauser rifles have a certain attraction to being rebuilt or sporterized into various chamberings. You can find examples lurking around gun shops, hiding at gun shows, even forgotten in a gun safe. Some cartridge modifications feed without issue while others drive the owner nuts with shorter or smaller diameter cartridges. This article will cover just such an issue. I was working on a M98 Mauser chambered in the iconic .220 Swift.

You may wonder why someone would re-barrel a M98 Mauser action to a shorter, smaller diameter cartridge only to have feeding and chamber jamming issues while stripping a fresh round from the magazine. This rifle in particular was a large ring military action with a fresh .220 Swift barrel. When the magazine was filled the bolt would push the rounds back and forth while being cycled.

An overly- .220 Swift on left and .30-06 on right. Large magazine space for the smaller cartridges caused them to become jammed in the magazine as some cartridges would be pushed forward while others would be pulled rearward with the top cartridge occasionally popping out of the feed rails. This is a common issue when the magazine is sized for a cartridge the size of a .30-06. Why not use a short cartridge follower conversion kit?

While that is an option, I wanted this rifle to feed and chamber .220 Swifts smoothly every time. With various countries manufacturing Mauser actions and with minor fluctuation in tolerances between them there would be no way to be certain a conversion kit would be an easy fix. On the bench I loaded dummy cartridges in the magazine and observed how they fed when stripped from the follower. As the cartridge was pushed forward there was not enough upward angle to position it for a smooth entry into the chamber.

What I needed was to angle the follower to help point the cartridge into the chamber. With the follower removed, I filed a taper angle to the left side top rail of the follower top that contacts the receiver left feed rail. The follower measured 0.368" on the back edge and 0.300" on the front edge. I removed 0.168" of metal from the front edge while tapering an edge to the rear of the follower. This was enough to start the cartridge in at a good angle for chambering while pushing the bolt forward.

This fix worked for single round feeding but I wanted reliable and smooth function from a full magazine. I needed to determine what length to cut the follower to. This .220 Swift barrel had a 1:12 twist and 55 grain bullets would be the heaviest used. I measured factory cartridges with 50 and 55 grain bullets and settled on an average cartridge overall length of 2.600" and allowing some extra space to prevent jammed cartridges in the magazine. This measurement would determine that I needed to

## MAUSER MAGAZINE MODIFICATION CONTINUED

ORIGINAL PAGE 14

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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P14-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P14-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-P14-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P14-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-P14-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P14-F04. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-P14-F04

cut 10mm off the follower to make a full length cartridge bed for the modified follower. The cut was made slightly ahead of the back edge of the follower because I would weld the back piece back on. Once welded back together, some filing, shaping, and polishing of the shortened follower fit the desired cartridge length perfectly. The magazine well needed a block to fill the gap created by

modifying the shortened follower. I used a piece of black nylon measuring about 45mm x 17mm x 21mm.

Because all Mausers have slight differences in bottom metal, this block must be hand fitted to the individual metal. With a belt sander, small amounts of material are taken off while test fitting the block. It's OK to make the block fit the sides of the magazine snug, however, the block should allow the follower

to move freely through full travel without any binding. A final smooth polish to the follower cartridge face side of the block will ensure cartridges slide freely against it.

The block must be cut to correct length to allow a snug fit from the receiver inner feed rail stop to the removable bottom metal. Work slow and test fit often for a perfect fit. The next step of block fitting is opening up space for the bolt to

## MAUSER MAGAZINE MODIFICATION 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P15-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P15-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-P15-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P15-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-P15-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1985-P15-F04. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1985-P15-F04

pass over while still keeping the cartridge held forward while on the follower. A Dremel tool with a drum sander makes quick work of this task. Again, use plenty of trial fittings and remove small amounts of material at a time. Once fit, the bolt should not bind anywhere as it passes over the magazine block while also having the cartridge head stop against it. 220 Swift cartridge loaded into magazine ready to feed. With the block and follower made, a correct size magazine spring will need to be selected.

I have quite a pile of left over magazine springs to dig through when searching for a favorable donor, one good reason to keep old gun parts. A magazine spring is selected by

measuring the space from the front side of the new block to the front inner side of the magazine well. With the spring far compressed, the center leaf length needs to fit in the magazine space with plenty of free movement.

The leaf that fits into the follower spring clip will need to be shortened and have the narrow side section filed back to allow full engagement into the follower groove while allowing the rear portion to be held against the follower stop. Test fit the spring by pushing the assembled spring and follower down into the magazine. When binding is noticed, shorten the leaf spring that fits into the floorplate.

When this spring section is shortened it allows the magazine spring to pivot the follower forward, allowing free travel through the magazine. This should result in smooth feeding cartridges when fully loaded into the magazine along with a good-feeling push feed when stripping a fresh round. Modifying the follower and associated parts to accommodate a smaller cartridge will improve the overall function to strip and feed rounds smoothly.

Attention to small details like this will make customers return for other work and the compliments spread by word of mouth are the best public relations you'll ever receive!

AG

## MACHINING

# M1 Garand: .35 Whelen Conversion

*Converting John Garand's self-loading rifle to a potent medium bore cartridge. Here's how to sporterize a World War II battlefield classic.*

BY GLEN C. BUSSE JULY 2016

ORIGINAL PP. 16-17

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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1986-P16-F01. Know the rights holder? Please ask them to contact us.  
AG-2F5047389E-A1986-P16-F01

This article is a written overview of performing a caliber conversion on the M1 Garand for those with machine shop knowledge and an understanding of M1 operation and assembly. I disassembled an as-issued M1 and replaced the military barrel with an Adams & Bennett short-chambered .35 Whelen barrel threaded for a Mauser action. The first step was machining the threads off the barrel and rethreading to fit the Garand action. Next, I installed the barrel and placed assembly marks.

Before chambering the barrel, I fit the bolt to insure both lugs were making full contact. Using a chambering reamer, I finished the chambering to a 0.005" headspace. The barrel was then removed and I placed the right and left bullet guiding grooves using dimensions taken from the old barrel. The area inside the receiver just ahead of the cartridge guide needed to be made bigger side-to-side (0.860) for the larger .35 Whelen with optic. diameter bullet.

I installed the barrel for the final time using the assembly marks as a guide. Gas Chamber In order to maintain strength, I made the gas chamber from one piece of steel round stock 1" in diameter and 7" long. On my lathe with a fourjaw indepen-

dent chuck, I located a point 3/16" off center and drilled a center hole. I used alive center in the tail stock to support the piece. I then turned the piece to a diameter of 21/32" in the center of the piece 4 1/2" long.

This left me with enough material on each end to cut mounting tabs. I used my shaper to cut the tabs 3/4" long, 3/8" wide, and 3/16" thick. I drilled two holes for mounting 8x40 screws in each tab. To drill the bore, I used my lathe with a three-jaw chuck and drilled a bottomed 33/64" hole 5 1/8" deep to the edge of the drilled hole. The hole was reamed to 0.525" and polished to fit the operating rod piston.

I drilled two holes into the bottomed end of the gas chamber, with one hole drilled and tapped to 10x32 for the gas tube and the other hole drilled and tapped part of the way through the hole for a 4x40 screw to be used as a gas bleed. The holes were drilled to enter the gas chamber at the edge of the inside of the bore to be able to access the mounting screws without removing the gas tube.

I drilled two 4x40 screws longitudinally, one with #59 drill for a 0.041" hole (brass colored) and the other one with a #56 drill

for a 0.046" hole (silver colored.) You may need other sizes. Bottomed holes were drilled in the barrel to match holes in the mounting tabs and located so that the gas chamber hole is 6 5/8" from the face of the receiver. The original operating rod is cut or shortened and may have to be heated and bent to fit the gas chamber without dragging on the bore.

I made a button to fit into the end of the operating rod and the inside of the gas chamber. The cylindrical portion of the operating rod is 5" from the shoulder to the end. Installing the operating rod may be just a little tricky. Turn the operating rod so that the catch portion of the rod is between the receiver legs and then can be inserted into the gas chamber. This allows the rest of the receiver parts and operating rod springs to be installed normally.

I found that the original operating rod spring could not be modified for use in this application. Gardner Spring supplied me with a spring 0.380" in diameter, 12" long,, with a wire diameter of 0.0475, and a coil-to-coil distance of 1/8" or more to give enough room to compress the spring without collapsing on itself.



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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1986-P17-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1986-P17-F01

35 Whelen, shown disassembled. The gas tube is 3/16" stainless steel tubing threaded 10x32 on each end. The length of the tube will be determined by where you locate the gas port hole. To locate the gas port hole in the barrel, I slugged the barrel, removed the slug, marked it at the groove diameter, and pushed the slug back into the barrel until it rotated the mark to the bottom.

By measuring down the barrel to the slug and transferring this measurement to the outside bottom of the barrel, the distance from the muzzle to drill the gas port hole is accurately located with the port between lands. Drill the hole no less than into the bore. Using a #21 drill (tap drill), drill the hole just deep enough to thread the hole but not all the way through. The hole is tapped at 10x32.

Elbow Connector Block In order to connect the gas tube to the barrel and keep it as compact as possible, I made a right angle connector block from 3/8" keystone. I shaped one end of the block to match the barrel radius and then drilled through the block from the center of the radius side with a 13/64" drill. On the side opposite the radius, countersink the hole to accept the screw head.

In the center of the block at a right angle to the screw hole, drill a second hole (#21) into the first, but not through the block. Then, tap to 10x31. Connector Block Screw Drill a longitudinal hole 3/8" deep into a 10"x32"x11" screw 1/16" in diameter. Drill a 1/16" hole at a point 3/16" below the head of the screw. To produce a clearer path for the gas, reduce the diameter of the screw at the cross hole on the lathe.

The diameter of these holes may have to be increased in order to produce enough pressure to operate the action. This will depend upon the strength of the operating rod spring and the ammunition being fired. The amount of pressure to operate the action can be decreased by using different bleed screws in the gas chamber. For sights, I added a Burris Scout scope 2x7 with an eye relief of 18 to 21 inches. This sight works well for me. The success of this project depended upon my son, Scott.

My shooting shoulder has been surgically replaced, so he volunteered to test the completed rifle. AG

## MAINTENANCE &amp; REPAIR

# Is Restoration Worth It?

*A badly-repaired shotgun tests whether restoration or replacement might be the best approach.*

BY MARK R. HOLLENSEN JULY 2016

ORIGINAL PP. 18-19

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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1987-P18-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1987-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1987-P18-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1987-P18-F02

We gunsmiths sometimes come across guns with previously-attempted repairs that make us scratch our heads and wonder why. I recently had a case like that. I met with a customer bringing in a shotgun in need of further repairs after a questionable attempt by another gunsmith. I won't name the particular make and model but it was not an inexpensive shotgun. After listening to my customer's concerns about being "afraid to shoot it" since the attempted repair, I took a look.

The gun was an over/under 12 gauge with a vent rib from a quality manufacturer. My eyes were immediately drawn to a large bulge in the top barrel about six inches down from the face of the chamber. I then saw two weld spots on the rib where the bridges of the rib met the top barrel just ahead of that nasty bulge. As I looked more closely at the gun, the only damage I found was the bulge in the barrel itself and the rib areas that apparently had separated from the barrel when the bulge formed in the barrel.

My suspicions were that a squib load had been fired, leaving a wad in the bore just before the next round was fired into it. The shooter was very lucky that the gun did not come apart and cause injury. I inspected the forend and found it was not damaged and that the action was still tight. Given what had happened to the gun because of this mishap made me wonder if a restoration was worth it and if the gun could be put back into a safe, usable condition.

There was already one attempt at repairing the damage, apparently at the lowest possible cost. This is where we gunsmiths really need to think beyond, "I bet I can fix it." I am not sure who did the previous work or why and I am in no position to claim someone else's work inadequate. My goal here is to examine what had occurred and articulate why I feel the repairs were better approached by taking a more informed course of action. Despite our best efforts and knowledge, some repairs are, unfortunately, costly.

I fully support and applaud all gunsmiths because of their "can do" attitude with a constructive thought process that allows making creative, permanent repairs or ser-

vices. There is no better feeling than successfully repairing a broken gun using alternative techniques or methodologies that result in a fine looking, fine working, permanent repair on a gun that otherwise would no longer be serviceable.

However, in some cases, including this one, I wonder if the work performed is worth the trouble, let alone the associated costs and liability. The "Repair" This shotgun had two 20 gauge chamber sleeve tubes installed in the barrels. The sleeves were measured to be 5 1/4" long and appeared to have been professionally installed with the extractors operating correctly. Neither sleeve tube moved when I tried to remove them.

It seemed that the top barrel appeared to have heavy dirt or powder residue in the bore but I was surprised to find it wasn't dirt. Looking at the rib area where the bridges of the rib seat on top of the top barrel, I found two welds had been made on two of the rib bridges. I suspect these were the two spots that the rib had separated from the barrel when the incident occurred. It was apparent the rib had

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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1987-P19-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1987-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1987-P19-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1987-P19-F02

been welded back on the barrel with either a MIG or TIG welder and that both of the welds had gone so deep they burned through the top barrel. What I first identified as dirt was actually two weld beads/drips inside of the top barrel. Turns out the “repair” was installing two 20 gauge 5 1/4” chamber sleeves in the bore and some welding of the rib. Of course, the gun is just as useless as it had been when damaged. Now I understood why he was scared to shoot it. What do you do in this type of situation?

I called the customer and reported my findings. Since the forend and receiver seemed to be in great condition and the fact that the gun was a quality, somewhat-expensive make and otherwise fairly new, I suggested that we either find a used 12 gauge barrel set to install on the gun or, preferably, install a brand new barrel set on the receiver. He immediately agreed with me and asked that I order anew barrel set for the gun.

I felt the need to write about this particular situation not to criticize a repair gone sour (I’ve certainly made mistakes in attempted fixes) but to illustrate that it’s sometimes best rule out a restoration or repair based on the set of circumstances at hand.

Turning a gun like this back over to the customer after questionable “repairs” would have given me nightmares about anyone trying to shoot it.

It may be hard to admit you can’t make a great fix, just tell a customer that the barrels were damaged beyond repair, and suggest a replacement barrel set be fitted to the action. Cost is a factor, but what is the total cost if the gun is fired and the repair fails? And if cost is the main issue, why not just clean the gun up and use it as a wall hanger or put it away until the proper fix can be paid for?

Considering the installation of the 20 gauge chamber sleeves, I am still not convinced that sleeving alone Problem is, the 5 1/4” long sleeves stopped in the middle of the bulge area formed in the barrel and the rib welding finalized the death of this barrel set. would have done the trick. In this case, the chamber sleeves were only long enough to meet the area of the bulge and not go past it. Even so, they were found to be fairly thin.

Given the large size of the bulge, I suspect there would be a dangerous weak spot just ahead of the chamber sleeve where it aligned with the bulge in the bore.

Regardless of whether the welds to the rib had been done properly, I would not have installed chamber sleeves in the barrels at all. Better to replace rather than restore. Perhaps this particular situation isn’t common but it’s important to fully consider taking on and making certain types of gun repairs.

We all want to save our customers some money on repairs but we also have to think about what might happen with that repaired gun. To me, it is not sufficient to make a repair that only I would be “sorta OK” with shooting for my customer. I am not one to condemn others and admit to mistakes but I seek to minimize those mistakes and fully consider coming to terms with what really needs to be done rather than what might work.

This customer did the right thing by asking more questions and following his gut feelings after the “repairs” had been made. Thank goodness for that! We should set aside the notion of how much we can make from a repair or how much we can save a customer on a repair compared to the overall best solution. Especially when the potential costs of the outcome could be irreversible injury or even death. AG

## MAINTENANCE &amp; REPAIR

# Ithaca Model 49

*Working a classic lever action rimfire rifle.*

BY MARK R. HOLLENSEN JULY 2016

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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P20-F01. Know the rights holder? Please ask them to contact us.  
AG-2F5047389E-A1988-P20-F01

I recently had a customer asking to have an old Ithaca Model 49 .22 lever-action single-shot rifle refurbished. It was in fair shape, very dirty with a few dings and dents, but all of the parts were accounted for. Although I had to order replacements for two parts beyond repair, the gun was a shooter. Research on this gun was hindered due to a lack of a serial number but seems to have been manufactured between 1961 and 1969, prior to the Gun Control Act of 1968.

While thumbing through my collection of gun manuals and exploded views, I never ran across a disassembly and reassembly instructions for this particular rifle. Completely refurbishing this old favorite meant everything had to come off of the gun. The barrel and other visible parts were sent out for bluing and the action and other aluminum parts received anew coat of finish. The wood needed to be stripped and finished as per the customer's wishes.

I decided to share my disassembly/re-assembly information as I had to start from scratch and this will save you time should a Model 49 find your bench. I began by removing the buttplate, then removed the buttstock using along, flat-head screwdriver to reach the through-the-stock screw. The wood came off without issue. The forend is removed by first using an Allen head wrench to loosen and completely remove the set screw located under the front sight/faux tube band.

After the set screw is removed, work the sight/faux tube band off the end of the barrel. Pull the forend assembly off the rifle. The barrel band and faux magazine tube comes off in one assembly. The faux magazine 22 lever-action single-shot rifle worthy of refurbishing. tube is just that, a fake tube of steel that is inserted into a blind hole drilled into the forend about two inches deep. Just pull it out. The barrel band can be removed by unscrewing the Phillips head screw and removing it from the forend.

With the wood is off the gun, it can be methodically disassembled. I inspected inside the action, noting the trigger seemed to be the best starting point. I was not sure which direction the frame pins were supposed to be removed, so I started slowly with the old "left to right" stand-by method. After a few gentle taps, I observed two cuts in the trigger frame pin on the right side of the action. This told me I was moving it in the correct direction.

The pin came out without problems and I found that the trigger lever spring and trigger lever plunger that I had seen while the trigger was still in the gun did not come out when the trigger was removed. Pulling the lever down, I found the trigger lever spring/plunger lever assembly was easily removed by pulling them out of the retaining hole. When reinstalling, use of a slave pin is advisable to align the detent relief cut with the hole in the frame and lever.

I then moved to the lever, removing the frame pin for it from the left to the right. All of the pins in the frame have two cuts on one end (right side) of each pin and each are to be removed from left to right. After removal of the lever pin, the lever pulls down off of the bolt block. Make a mental note of where the two claw-type hooks go on the bottom of the bolt block when reassembling. Be careful! There is a coil spring and detent pin inside the bottom of the bolt block that will fall out.

If it doesn't, remove it now. Don't forget to replace these items when reassembling. Remove the bolt block via drifting out the large frame pin that holds the bolt block in place. There is another small detent pin inside the same hole as the spring and detent just removed. Get this little 1/4" round pin out or dislodged down about 1/2" before hammering at the bolt frame pin. Spray some oil in the hole and tap the frame pin back and forth lightly a few times so the pin drops. A magnet will help here.

Once the small detent pin is out or clear of the frame pin, use a brass punch to tap out the bolt frame pin from left to right. Don't worry about the firing pin as it has nothing to do with the frame pin retention. With the frame pin removed, note where the detent pin fits and its job. Don't forget to reinstall this when reassembling. The bolt assembly is removed by pulling it out from the top of the

## ITHACA MODEL 49 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P21-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P21-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P21-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-P21-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P21-F04. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-P21-F04

## 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P21-F05. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-P21-F05

This hole also contains one more small detent that serves to hold the bolt assembly frame pin in the gun. Make sure you get that “other” small detent pin out before removing the bolt assembly frame pin. The bolt contains the firing pin, firing pin return coil spring, and a pin that keeps the firing pin in place along with the firing pin coil spring. The bolt can be easily taken down from here as all parts are visible and no tricks needed to remove or reinstall them. Just note how they go into place.

The next part to remove is the hammer. Begin by unscrewing the stock stud tube located at the rear of the action. While unscrewing it from the frame, keep an eye at the base of the receiver as a very small (fine) lock washer will drop out. Once the stock stud is removed, Left and find the coil mainspring inside the stock stud. Pull this spring out. Looking inside the action, you locate the hammer rebound cam, which looks like an H&R hammer rebound cam. Remove the rebound cam and note how it was in place.

The long edge on the front of the cam lug goes upwards when reinstalling into the back of the hammer and the small end needs to be fed into the center hold of the stock stud tube when screwing it back onto the receiver. Drift the hammer frame pin out left to right. Note the two cuts on the hammer frame pin will not feed through the pin hole of the hammer. Reinstall the frame pin from right to left, smooth end first into the frame.

## ITHACA MODEL 49 CONTINUED

ORIGINAL 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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P22-F01. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-P22-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P22-F02. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-P22-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P22-F03. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-P22-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](mailto:editor@gunsmithmag.com) and reference AG-2F5047389E-A1988-P22-F04. Know the rights holder? Please ask them to contact us.

AG-2F5047389E-A1988-P22-F04

With receiver stripped, remove the ejector trip lever. Start by using an Allen screw to remove the small set screw located on the bottom of the receiver near the front. The screw comes out followed by a coil spring. Deep inside is an ejector lever trip detent pin that might not come out. If it doesn't, remove the ejector trip lever frame pin instead. This is the smallest frame pin on the action and is also removed from left to right. Once out, the ejector trip lever can be pulled out of its slot.

After removal, use the end of the same pin punch used to remove the frame pin to slide into the ejector trip lever frame slot and push the detent pin out of the ejector trip lever set screw hole. The next step is to remove the barrel. This is only necessary if the barrel is

to be reblued and the receiver refinished. Begin by tapping the barrel/extractor retention frame pin left to right until it comes out of the frame. You may need to push the extractor forward a little bit while drifting the pin out.

Once the frame pin is out, pull the extractor and extractor coil return spring out of the back of the barrel. To remove the barrel itself, clamp the barrel tightly in a vise with aluminum or padded jaws, grasp the action with both hands, and begin twisting it back and forth while pulling the action back away from the barrel. It will loosen and then come off. Note, the barrel has a pin cutout in the bottom of the barrel where the frame pin fits.

During reassembly make sure the barrel is set back into the receiver enough so the frame pin will fit (clear) the hole cut out. This ensures the barrel is in the correct location and that the sights will be straight up and down in alignment with the receiver. The rear sight is removed by drifting it out of its dovetail from right to left with a brass punch. Reassembly is reverse of the above order. This old favorite is one that I personally like and really enjoyed refurbishing into a virtually new gun.

I am sure the customer's son was astounded when he saw it after completion because the gun was really rough looking before. This refurbished Model 49 will see many more years of shooting now. AG

## PISTOLS

## Reader Forum

BY AMERICAN GUNSMITH EDITORS JULY 2016

ORIGINAL PP. 23-24

**A**rticle Error I believe there is an error in the article, "Correct Handgun Sight Adjustment" in the May 2016 issue. On page 18 in the Adjusting Sights section, the author mentions filing the front sight in order to move the point of impact down. Would this not cause the point of impact to be higher? Author RK Campbell responds. Thanks for reading and you are correct. If you wish to move the bullet impact down, a taller front sight is needed and that means sight replacement.

Filing the front sight down moves the point of impact up, not down. Stevens 124c Shotgun I need to know how to take apart a Stevens Model 124c shotgun to put anew firing pin in it. You have one of them "Grandpa's oldies" there. It looks like an autoloader but it ain't. Made from the mid 1940s to the late 1950s, it's a three shot with one in the chamber and across bolt action that has a flimsy, plastic stock.

You can see how to disassemble and reassemble the gun as follows: Search "Stevens Model 124" on You-Tube.com and you'll find a good disassembly/reassembly video lasting about ten minutes. Colt Model 1908 .380 My next project is going to be my favorite CCW pistol, a Colt Model 1908 Pocket Hammerless in .380 ACP. I am looking for a gunsmith that can make the only improvement I think it needs: Removal of the European-style magazine release.

A 1911-style release from a Colt Mustang should be able to be fitted into the frame with proper placement machining. After the installation, it will require the notching of the magazines as well. It would be great to be able shoot and change mags with the press of a button. From my re-

search and measurements, the release would mount high up on the frame, in line with serial number and about a 1/4" diagonally back and up from the upper rear radius of the trigger housing.

By placing it in this area there is solid metal all the way through and is above the trigger and far enough down on the mag to catch and retain it without modification to the grips. Mike Cusano Brownells used to offer the next best thing to a set of manufacturing blueprints on the M1911. All major and minor component measurements of the seemingly everlasting pistol are included. Those for the M1908 are not.

We believe with some certainty that modifications will have to be made to the frame to accommodate the conversion you seek. Lowell Rush With equal certainty, we believe modifications will have to be performed on the Mustang components to be installed after being proportionally scaled down from the M1911 .45 ACP measurements. If the safety button and assembly is too large for the frame you may have to fabricate one that will fit from scratch.

From what you have thus far appeared to accomplish, these tasks should not lie beyond your abilities. Iver Johnson Trailsman A customer brought in an old Iver Johnson Trailsman missing the assembly lock plunger and assembly lock. Both of these part are similar to the Colt Woodsman, which is the closest schematic I have. We were able to purchase the assembly lock and are trying to fabricate a plunger but the tongue that holds the two pieces together does not align correctly.

Where can I find a machine print for these parts? Tony Carbone T&C Gunsmithing, Inc. The Trailsman was a revolver (Model

66) produced from 1958-1975. It puzzles us how this can have parts similar to a semi-auto Colt Woodsman? Jack First shows parts but no schematic for the revolver in their gun parts reference book. Parts may also be available from Firearms International in Houston, Texas and among the aftermarket providers listed in Brownells Gun Parts Source List.

Other than the original manufacturer, we have no source for blueprints. Firearms International is your best bet there. Eric Kruger Marlin Model 27 I have been given a Model 27 .32-20 slide action and am looking for information on this gun. Bruce Try Marlin Firearms: A History of the Guns and the Company That Made Them by Lt. Col. William S. Brophy. Included are the patent numbers and disassembly/reassembly of the action parts. Read the entire section on the Model 27.

It was made to digest blackpowder and smokeless powder loads but has been out of production since the early 1900s. Chiappa M4-22 I've been having issues with my Chiappa M4-22 .22 AR-15 upper receiver. Upon pulling the trigger, a small dent would appear on the cartridge rim, nothing like the deep indentation of typical .22 firearms. There was plenty of potential firing pin travel but the issued firing pin return spring was heavy, so much so that I couldn't press it in with mere finger pressure.

I had to use some sort of piece of metal to avoid hurting the tip of my finger. Finally, only a hint of the head of the firing pin protruded from the rear of the bolt. I'm a bit of a shade tree gunsmith. Usually I limit my work to the 1911, M1, and M14 but this Chiappa business drove me crazy with the firm

## READER FORUM CONTINUED

ORIGINAL PAGE 24

claiming my Colt AR-15 was the problem. Here's my letter to Daniel Schreier, Production and Logistics Manager at Chiappa Group, LLC. The purpose of this letter is to advise you of a failure and remedy related to my Chiappa M4-22. I received a Chiappa M4-22 upper as a gift. The problem was only one round in every 5-10 would fire. I tried about half dozen different brands of ammunition with no change. I discovered the problem was due to insufficient firing pin impact.

Following your company's instructions, I sent an email statement of the problem but received no response. After a third email I finally received a response to call your customer service and they told me my Colt lower was the problem and that I could send in my Chiappa upper and Colt lower for verification but because I was not the original purchaser it was ineligible for warranty service. I didn't feel that was a satisfactory response.

Since the failure to fire problem was pretty obvious, the remedies were as well: Using a lighter firing pin return spring and more firing pin head exposure. It's noteworthy that when I mentioned a too-heavy firing pin return spring to the representative, she said such spring force Submit a question or letter to the Reader Forum column by addressing an email to or posting a letter to American Gunsmith, 14439 NW Military Hwy, STE#108 PMB#410, San Antonio, TX 78231. Send subscription questions to was necessary.

As suspected, that proved quite incorrect. It took me about 1.5 hours to disassemble the bolt, replace the issued spring with a lighter one (it's from a ball point pen!), and file and dress 0.03" off the back face of the bolt for more firing pin head exposure. Since this fix I have fired some 400 rounds from the modified Chiappa/Colt rifle, new and old cartridges from a variety of manufacturers, and had no failure to feed problems and no failure to fire malfunctions.

Given that safety is a crucial issue, on normal bolt closure, with this much lighter return spring, there is no noticeable firing pin impact on the case head. If effected during original manufacture, there would be no cost to Chiappa to fix this. In truth, the lighter spring would probably cost less to acquire. And elimination of this failure to fire problem would help the company's reputation. You've done just fine but we can't dispute the Chiappa policy of limiting warranty service to original purchasers.

It is not uncommon with gun manufacturers. As for the corrective measures taken for a DIY fix, we'd only add peening the front section of OEM firing pin to lengthen it. But, then, why argue with success? Hi Standard R-101 I have a customer with a Hi Standard Sentinel R-101 double action revolver that was having problems firing and rotating the cylinder. The trigger guard was broken. I replaced it and now the cylinder rotates.

The revolver fires in single action but sometimes misfires in double action until it comes around again. Also, does this revolver require a return spring for the ejector? All the diagrams I've seen does not show a spring. Can a spring be installed for a return or does it need it? Mark Wiggins Refer to the second edition The of Gun Digest Book of Revolvers Assembly/Disassembly. It contains all you need to know about the Sentinel. Included is the fact the revolver has no double action return spring.

It employs a double action lever activated by its spring and has a spring located inside the body of the ejector ratchet. CVA Apollo We had an Apollo rifle turned in for repair, a black powder firearm made by CVA. Someone jammed in a breech loader and we had to drill it out. Once we got that out (it was less than three inches long) we found the breech loaders for the Apollo were longer for it and can't find a schematic. Also, any ideas where to get parts for the receiver as CVA is out of business. John C.

Tate Pat If CVA is no longer in business it is being falsely promoted on the web as otherwise. Visit CVA.com or call As for securing a receiver, we strongly suspect it will be attached to a complete rifle. Contact the company for an owner's manual containing a schematic. AG

## SEARCHABLE ISSUE RECORD

# Archive index

|                                              |       |                                                   |       |
|----------------------------------------------|-------|---------------------------------------------------|-------|
| American Hunter<br>American Gunsmith Editors | 2     | M1 Garand: .35 Whelen Conversion<br>Glen C. Busse | 16-17 |
| Jimenez Handguns<br>David W. Manney          | 3-6   | Is Restoration Worth It?<br>Mark R. Hollensen     | 18-19 |
| AR-15 Diagnostics<br>Joe Carlos              | 7-12  | Ithaca Model 49<br>Mark R. Hollensen              | 20-22 |
| Mauser Magazine Modification<br>Robert Coles | 13-15 | Reader Forum<br>American Gunsmith Editors         | 23-24 |

**Rights and corrections.** Images without confirmed permission remain reserved in place. Authors, photographers, and rights holders may contact [editor@gunsmithmag.com](mailto: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](http://GUNSMITHMAG.COM) • [EDITOR@GUNSMITHMAG.COM](mailto:EDITOR@GUNSMITHMAG.COM)**