



FEB 2004

DIGITAL ARCHIVE
EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

022

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

WORKING S&W'S .32-CALIBER NEW DEPARTURE/SAFETY HAMMERLESS

TAURUS ENTERS HIGH-TECH PARTNERSHIP • DISASSEMBLY/REASSEMBLY OF THE HENRY GOLDEN BOY RIFLE • GETTING ...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 003

DIGITAL ARCHIVE EDITION

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AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • FEBRUARY 2004

ISSUE RECORD

ORIGINAL DATE	February 2004
VOLUME	Archive volume not stated
ISSUE NUMBER	02
SOURCE ID	ag-3d5e0332c16165d03a49e43b

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.

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FROM THE ARCHIVE

Taurus Enters High-Tech Partnership

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2004

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Just as this issue went to press, Taurus International Manufacturing, Inc., announced that they have formed a trilateral partnership to fast-track the development of firearms that electronically recognize preauthorized individual users. The partnership was formed “to address the long-sought response to the quest for a firearm that will instantly and reliably recognize authorized operators of the equipment.

The new handgun will use the patented Dynamic Grip Recognition biometry-authorizing technology developed by the New Jersey Institute of Technology. This, combined with the Metal Storm, Ltd. will be developed into a total handgun that will incorporate the Metal Storm O'Dwyer VLe Technology in a platform to be built and integrated by Taurus with the NJIT biometry.

Recognizing the specific grip exerted by various individuals, the NJIT system will allow each firearm to be programmed so that pre-authorized users will be able to instant-

ly operate the firearm. The O'Dwyer VLe system is a new and unique approach to firing projectiles. Entirely electronic, the system utilizes precharged barrels holding multiple projectiles that are fired by electronic ignition.

Taurus will provide the platform that integrates the NJIT and Metal Storm technologies into a firearm that uses on-board electronics to recognize the operator and to fire the projectile while using a minimum of moving parts. “Having the opportunity to partner Taurus firearms advanced engineering with the New Jersey Institute of Technology and Metal Storm, Ltd, presents the firearms world with a combined wealth of science that will likely revolutionize ballistics, solid-state technology, and specific user identification,” said Robert G.

Morrison, Executive Vice President and Chief Operating Officer of Taurus International Manufacturing, Inc. Each partner has individually developed methodology that, combined, will provide an ex-

traordinary shooting system that will forever change the course of firearms technology both in scope and flexibility. Recognizing the growing trend in some states toward user-identifying handguns, Taurus is striving to make firearms that will be allowed for purchase in these areas.

Taurus, however, says it will continue to produce its regular line of mechanically operated and secured firearms for the foreseeable future. Taurus International Manufacturing, Inc. is a Florida corporation that imports and distributes firearms manufactured by Forjas Taurus, in Brazil, as well as manufacturing firearms in their Miami facility.

In the area of innovation, Taurus produces the forged Total Titanium handguns, along with the first integral locking device on production handguns known as the Taurus Security System introduced in 1996. Editor Keith Lawrence Technical

RIFLES

Disassembly/Reassembly of The Henry Golden Boy Rifle

Named rifle of the year in 2001, the second thing you'll probably be asked to do to this rifle is to give it a detailed cleaning.

BY CHICK BLOOD FEBRUARY 2004

ORIGINAL PP. 3-5

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What you'll notice immediately about this little .22 LR whether it's just out of the box or in the grasp of a customer is the octagonal 20-inch barrel and brass receiver. Well, the barrel does have the flats, but the receiver isn't really brass. What catches your eye is a receiver cover of brass-plated zinc, and you'll note that it's quite thin when you remove it. Too thin, actually, to be drilled and tapped for a scope mount. Mounting a scope is probably the first job you'll be asked to do.

Fortunately, the folks at Henry Repeating Arms Company in Brooklyn, New York, anticipated such requests, and offer a cantilever scope base/mount combo with the base extending well to the rear over the receiver. It retails for a little over 20 bucks. In our opinion, it's esthetically the best way to scope a Golden Boy, the alternative being long-eye-relief optics that would have to be planted somewhere on the barrel. With the Golden Boy's combination, the rear sight is removed to provide room for the mount.

After establishing dead center of the top barrel flat, temporarily glue or tape the mount on about 1/8 inch ahead of the receiver and mark the hole locations on the barrel. Drill and tap the barrel for #8-40 screws to a 5/32-inch tap-drill depth. Install the screws and secure them with threadlocker. The mount and scope base are pre-drilled for two #6-48 screws. Assemble the base to the mount, making sure they are centerbored and fit tightly together.

Make certain they remain that way with two more drops of thread locker. So much for the first job you'll be asked to do on a Golden Boy. The second one'd ue primarily to the use of cheap .22 ammo and its penchant for fouling will be a total cleaning. Stripping Down the Rifle Remove both tang screws. Number 55 is the one on top and #50 is under the stock aft of the lever (#14). The stock is taken off to the rear. Cock the hammer fully back and turn out the four cover screws (#42), two on each side of the receiver.

You may have to rock the cover (#2) side to side a bit as you slide it back off the receiver. The bolt (#35) could come along with it. If not, it slips out easily once the cover is off. Drift out the locking-bar pin (#18) in either direction to free the locking bar (#16) and its spring (#18). Before taking this disassembly step, notice how the locking bar fits under the lever. Restrain the hammer, pull the trigger, and ease the hammer completely forward past the rear of the receiver.

This will relieve the tension on the hammer spring (#24). Remove the spring and hammer-spring guide (#23). Drift out the hammer, trigger, and lever pins in either direction. They're identified in the accompanying photo, as are the carrier screws. Remove all parts related to the pins. The trigger spring (#20) will remain seated in the trigger if you're lucky. Remove the inner magazine tube 22 LR, .17 HMR, and .22 WMR. In .44 Magnum it is called the Big Boy's a totally different animal to be featured in a later issue.

DISASSEMBLY/REASSEMBLY OF THE HENRY GOLDEN BOY RIFLE CONTINUED

ORIGINAL PAGE 4

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None of the parts are listed as restricted on the schematic including the barrel, but we doubt the receiver would be available separately. Receivers are considered to be a firearm by BATF from the rifle to clear the follower from the carrier, and back out the carrier screws. The carrier will rise slightly above the upper edge of the receiver due to the feed-lever spring (#13) and tube (#12) housed in its bottom. Inside the receiver is a stud riveted to its right side. It stays where it is' Dforever.

What this stud does is anchor the carrier lever (#11); in other words, the entire carrier assembly. Grasp the carrier with one hand, pivot it above the receiver, and unhook the lever from the stud. As the assembly is lifted away, the lever spring and tube will fall out

the bottom of the carrier. Usually, they drop into the receiver, but be alert for other routes they may choose to take.

Before this removal process, take note of how the lever rests inside the carrier, and remember it when the The upper pins are tapered. The lower is a roll pin. A B Ctime arrives for reassembly. Disassembly of the receiver is complete, leaving the bolt yet to be undone. All the keys to its undoing are not shown in the schematic, so refer to the photo.

There are three pins: one for the ejector and one for the extractor (#38) and their common spring (#41), and one for the firing pin (#36) and its spring, also not shown in the schematic. The extractor and ejector pins are drifted downward. The firing-pin assembly pin moves in either direction. Aha! It seems

this Golden Boy's owner has been a slob. He not only chose to aim low on the price of ammo, but the bore and chamber of his year-old rifle are badly pitted.

You smile and inform him as pleasantly as your resentment over his lack of care will allow that the pits are too deep to be polished out and leave any semblance of effective rifling behind. You might also mention the polishing required would enlarge the chamber to a point where extraction would become at least balky. The good news is you can order and install anew barrel. (What you neglect to mention is the simplicity of the job.) Two tapered pins (#7) retain the barrel.

They're driven out right to left, and driven in left to right. Beneath the two tapered pins is a roll pin that

DISASSEMBLY/REASSEMBLY OF THE HENRY GOLDEN BOY RIFLE CONTINUED

ORIGINAL PAGE 5

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Henry Golden Boy Lever-Action Rifle (Specifications subject to change without notice) 1 Receiver Cover 2 Tang 3 Receiver 4 Barrel 6 Barrel extension 7 Taper Pin 8/9 Carrier 10 Carrier Screw (2) 11 Carrier Feed Lever 12 Carrier Feed Lever Tube 13 Carrier Feed Lever Spring retains the magazine outer tube and drifts right to left as well. Once all the pins are removed, secure the barrel between padded vise jaws, and tap the gutted receiver off to the rear. Use a wooden, plastic, or leather mallet for this.

The new barrel will go on as easily as the old one came off. Chances are this particularly neglectful owner has also mistreated the magazine-tube assembly. You can take care of that, too. Remove the barrelband screw (#30), drift out the front sight, and drive off the band toward the muzzle. Separate the forearm (#52) from the receiver. Drift the tube support (#56) from its dovetail in the barrel.

Now the outer tube (#48) and 14 Action Lever 15 Action Lever Pin 16 Locking Bar 17 Locking Bar Spring 18 Locking Bar Pin 19 Trigger 20 Trigger Spring 21 Hammer 22 Hammer Pin 23 Hammer Guide (Strut) 24 Hammer Spring inner tube (#44) can be withdrawn as a unit for cleaning, repair, or replacement. I didn't see a single part for the Golden Boy identified as being restricted, so I assume that none are (a welcome rarity these days).

Reassembly Tips To reassemble the carrier, remove the inner magazine tube from the rifle and rest the rifle on its finger lever. Attach the feed lever to its receiver stud. Hold the carrier in your left hand and insert the lever fully into the carrier body.

Swipe the bottom of the carrier with alcohol to degrease it, and have a small square of cellophane 25 Rear Sight 27 Rear Sight Elevator 29 Barrel Band 30 Barrel Band Screw 31 Front Sight 35 Bolt 36 Firing Pin 37 Firing Pin Spring 38 Extractor 41 Ext/Eject Spring 42 Cover Screws 44 Inner

Magazine Tube 45 Magazine Follower 46 Magazine Spring (not shown) 47 Magazine Button 48 Outer Magazine Tube 49 Magazine Tube Stud Pin 50 Stock Screw, Top 51 Butt Stock 52 Forearm 53 Butt Plate Screw (2) 54 Trigger Pin 55 Stock Screw, Bottom 56 Magazine Tube Support tape standing by.

Insert the feed-lever spring and tube into the carrier, compress the tube to be flush with the base of the carrier, and cover it with the tape to keep it captured. Check to see that the spring has not been crimped or trapped between the carrier feed lips and the feed lever. Pivot the assembled unit down into the receiver to align the carrier-screw holes. Reinstall the inner mag tube. When the follower enters the carrier, you'll know you're in good shape and can tighten down the screws.

To reinstall the hammer strut and spring, push the hammer forward beyond the rear of the receiver. This will provide ample room to position

PEOPLE & COMPANIES

Getting a Grip on Older Colt D-Frame Revolvers

Finding grips for Colt's older revolvers with the long grip frame can be difficult to downright frustrating. Some simple modifications will allow the use of grips made for the newer stubby frames.

BY RUSSELL CORBITT FEBRUARY 2004

ORIGINAL PP. 7-9

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Large numbers of Colt's old longgrip Detective Special and Police Positive Special revolvers are still in circulation, and the most frequent request I get when one comes in is for better grips. Pickings are pretty slim, however, when it comes to aftermarket grips, especially for the squarebutt models. Fortunately, it's not very difficult to modify the grip frame to accommodate the grips designed for the later-model D-frames.

Before you consider this modification, first do a bit of checking on the revolver to make sure it's not a priceless collectible. Seriously, it never hurts to do a quick search through the book so that you don't unknowingly chop up a rare Banker's Special that should be occupying a display case. Assuming you have a garden-variety revolver such as the Police Positive Specials used for this article, begin by opening the cylinder and ensuring that the revolver is not loaded.

Once you see six clear holes, remove the grips and use a suitable punch to remove the grip-locator pin. You can put the pin in your spare-parts collection, since grips for the newer Dframes use a different pin. Now look to

see which type of grip-frame opening the revolver has. If it's like the upper gun in the photo at the top of page 8, count your blessings and get out your saw. Proceed as per Type 1, below. If your frame is like the lower gun in the same photo, all is not lost; it just takes a bit more work.

In that case, get out your saw and epoxy bedding compound, and proceed as per Type 2. Type 1: Round Hole in Grip Frame This procedure is basically the same thing that Colt did in 1971 (or 1973, depending on whose information you use) when they shortened the grip on all D-frame revolvers and added the ejector-rod shroud. Start by scribing a line across the grip frame parallel with the bottom and just under the hole. Using a hacksaw or band saw, cut the bottom of the frame off, leaving the line.

Now you can use a file or a belt sander to finish the cut as close From top to bottom are the round-butt long grip, the square-butt long grip, and the new short square-butt grip.

GETTING A GRIP ON OLDER COLT D-FRAME REVOLVERS CONTINUED

ORIGINAL PAGE 8

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The revolver on top was made in 1955, and has the small-hole, square-butt frame. The bottom one was made in 1950 and is the large-hole-type frame. (This revolver has been round-butt; it was originally a square-butt gun.) Note that Colt's idea of a "round butt" is somewhat different from S&W's. to the hole as you can without actually breaking into the hole. Break the sharp corners on the outside of the grip frame slightly. Scribe another line across the rear section of the frame about 0.190 inch from the bottom.

Measuring from the rear point of the grip frame, cross this. This frame is also marked for the new grip-locator pin hole. 0.600-inch length, and insert through the hole until it protrudes equally from each side. Touch-up

blue the raw surfaces. To ensure that the grips fit snugly, you can fill the hole in the frame with bedding epoxy and use the grips as a template to mark the epoxy. Drill a line with a perpendicular line about 0.390 inch, and drill the spot for a 1/8-inch roll pin.

If you're really good and possibly a little lucky, you can eyeball this spot, using the new grips. Cut the 1/8-inch roll pin to a suitable hole through the epoxy once it has set up. Depending on the type and style of new grip panels, it may be necessary to relieve the grips where they fit up next to the trigger guard. You may also need to fill the new grips in the area behind the hammer, as subtle differences sometimes exist here as well.

Use black silicone rubber to fill this area on rubber grips, and epoxy dyed to match the grip (or dyed black to match the frame) for wooden grips. Type 2: Large Hole in Grip Frame This procedure is just a bit different from the round-hole guns, but accomplishes the same thing. First, use a rotary tool to cut dimples into and roughen up the upper inside area of the grip frame, just as if you were preparing a rifle stock for bedding.

Clean the inside of the hole thoroughly with brake cleaner or chlorinated solvent to ensure good adhesion. Put a piece of duct tape on one side of the frame. Mix a suitable amount of epoxy (dye it black if desired) and fill the hole to just above level, ensuring

GETTING A GRIP ON OLDER COLT D-FRAME REVOLVERS CONTINUED

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No release agent is required, as any adhesive from the tape will clean off with solvents once the epoxy has cured. Overfill the hole a bit to ensure that both sides of the new grip frame can be sanded or filed flat. that it gets into the dimples and grooves. Allow the epoxy to cure until it is hard enough to stay put but soft enough to cut. This will be about four hours with Brownells Acra-Glas or Steel-Bed. Now remove the duct tape, and examine the epoxy plug.

Small voids or cavities are okay, but if any large holes are present, you'll need to fill them and wait for the patch to cure. When all

is well, use a wood rasp or coarse file to remove the excess epoxy from both sides, and remove any stray It's been finish-sanded and marked for cutting. The difference in the distance of the front strap to the trigger guard is clearly visible here. (continued on page 15) bits of epoxy that don't belong where they are.

After the epoxy is fully cured, file or sand the excess off until the epoxy is flush with the grip frame on both sides. Now scribe a line across the grip frame parallel with and 0.650

inch up from the bottom. Cut the grip frame off, leaving the line, and test-fit the new grips to the gun.

Depending on the type and style of new grip panels, it will probably be necessary to relieve the grips where they fit up next to the trigger guard on this grip frame design, as there is less room between the trigger guard and the front of the grip strap than on the later models. The difference is shown in the photos. These older-style frames

GETTING A GRIP ON OLDER COLT D-FRAME REVOLVERS CONTINUED

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may also require some filling of the new grips in the area behind the hammer. Use black silicone rubber to fill this area on rubber grips, and epoxy dyed to match the grip (or dyed black to match the frame) for wooden grips. Adjust the bottom of the grip frame by filing or sanding until it fits into the grips. Break the sharp corners on the outside of the grip frame slightly.

Use a detent ball larger than the locator hole in the new grips or make a short pointed punch from a piece of music wire, drill rod, or what-have-you. This should be large enough in diameter to be a close fit in the new grips' locator pin hole and 0.160-inch long. Place the pin in one of the holes and put the grip on the gun, adjusting for the best fit.

If you press hard on the pin area of the grip, when the grip panel is removed you will see the indent in the epoxy where you need to drill a 1/8-inch hole and insert a 0.600-inch-long 1/8-inch roll pin until it protrudes equally from both sides. Use one of the new grips as a marking template to locate the screw hole and drill to suit. A bit of touch-up blue is then applied to the raw surfaces. And Finally... If you've been careful, there should be no need to disassemble the revolver for cleaning.

You can ensure that no debris enters the lockwork by stuffing a couple of cotton balls or something similar into the action area, as seen in the photos. Probably the best stuff to use for the filler is Brownells Steel-Bed. It dyes black fairly well and is my first choice when I need a filler that will have to withstand some abuse. This is a relatively invisible modification, as almost all of the grips for the stubby Dframes cover the bottom of the grip frame.

A couple of final notes here: If you goof any part of this up, just fill in the area with epoxy and start over. If the new grips are loose and/or shift around on the grip frame, you can use epoxy or silicone rubber to fill spaces in the grips. Most release agents work for silicone rubber as well as epoxy. This procedure also works for the early short-butt guns. They have a slightly longer grip frame than the late models, and the locator pin is in a different place.

Depending on what grips your customer wants, modifying the grip frame may be easier than modifying the grips. I

MEASUREMENT & INSPECTION

Retaining Screw Blues

Sometimes, a loose screw can become a “loose cannon,” causing multiple problems.

BY KEN EDWARDSSEN FEBRUARY 2004

ORIGINAL PP. 10-12

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There are lots of Stevens Model 311, Fox Model B, and Springfield Model 511 double-barrel shotguns out there that have been passed down from father to son. Take, for example, the 16-gauge Stevens M311 shotgun brought into my shop recently. The owner spoke with a distressed pitch to his voice as he described the problems with the gun: “Sometimes it won’t open; the top lever is jammed. Sometimes it will open, but won’t shoot when I pull the triggers.

And sometimes it sounds like something is rattling around inside the action. Externally, the old gun showed that it had been well taken care of, but there were obviously some real issues going on internally. The rattling noise was the biggest concern to me. Without exception, every time I’ve worked on a Model 311-type shotgun with something loose inside it turned out to be a firing-pin retaining screw.

I won’t rehash the disassembly/ assembly procedures for the Model 311, as that was well covered in the July 1994 issue. But I will comment on my observations during disassembly, and provide you with a fix for the problems I found. Analysis of the Problem Making sure the gun was clear, I separated the forend and barrels from the action, and then the buttstock was removed. The buttstock had been removed

before, as evidenced by the repaired wood on the stock adjacent to the head of the stock bolt.

This is a fairly common goof the inexperienced and careless make. It occurs when the screwdriver slips out of the head of the bolt and wedges between the bolt and the wood. Continuing to turn the screwdriver will break out or crack the thin wood of the stock. It’s relatively simple to repair, but often means there are other problems caused by heavy-handedness and inexperience. With the buttstock removed, pretty much everything you need to know about the Model 311 action is revealed.

The rattling problem was immediately obvious. The left firing-pin retaining screw was out of its hole and wedged between the left sear and the receiver. Both hammers were forward. The left firing pin and firing-pin spring were still in place in the receiver, as were all the parts for the right firing pin.

It appeared the left retaining screw had been rolling around inside the action for some time, and had jammed in several different places as evidenced by the number of burrs, nicks, gouges, and bends I could see on the internal parts. This would also explain the intermittent jamming of the top lever. I checked the hammers, sears, and sear spring for proper assembly and everything was correct.

I moved both hammers to the full-cock position by raising the front of the cocking lever with a stout screwdriver, using the hinge pin as the fulcrum for the screwdriver. Neither of the hammers engaged their respective sears. Visual inspection of the ends of the sear and hammer pins revealed signs of the heavy-handedness mentioned before. The hammer pin was actually installed backwards. The swaged splines on the end of both pins should be in the right side of the receiver, with the pins drifted out left to right.

From the amount of deformation on the ends of the pins, I suspected that no slave pin was used when they were previously installed. I removed the sear pin, both sears, and the sear spring. It was immediately apparent that the sear pin was severely bent. The long rear leg of the right sear was also bent slightly, though the left sear and sear spring were serviceable. Next the hammer pin, both hammers, and the cocking lever were removed.

The hammer pin was almost as badly bent as the sear pin, but both hammers and the cocking lever were serviceable. It was now apparent that the hammers and sears could not make

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contact because of the bent pins. That would explain the failure to fire the customer described. The hammers could not stay cocked without sear engagement, and would ride forward when the action was closed. The left firing-pin spring and firing pin were removed. The right firing-pin retaining screw was loose. The right retaining screw, firing-pin spring, and firing pin were also removed at this point. The firing pins and springs were in good condition, while both retaining screws showed damage.

The retaining screws have oversize heads which not only retain the firing pins but also function as hammer stops. They take a beating every time the hammers fall, which is normal. Some of the screw threads, however, were damaged or missing, which is not normal. So far, it appeared as if all of the damage could be fixed with a few replacement parts. The last things I checked were the threaded holes in the receiver for the firing-pin retaining screws.

The left the receiver, deforming and then shearing off the threads in the receiver. It was obvious from the relatively good condi-

tion of the threads on the surviving retaining screws that the screws were much harder than the receiver material. The extra grip length of the new screws' along with thread-locking compound' will keep them tight. could be repaired. There were two possible ways to repair the threaded holes.

One, install bushings in the damaged holes, then drill and tap the bushings for replacement firing-pin retaining screws. Or two, drill and tap the existing The Repair The return of this gun to a serviceable condition now hinged on whether the two threaded holes in the receiver The threads were stripped in both holes. hole had no visible threads, and the threads in the right hole were barely visible. The damage most likely started when the firing-pin retaining screws loosened and backed out of their holes.

Then every time the hammers fell they would drive the loose retaining screws into holes for new oversize retaining screws. I chose the latter approach since it was the logical one to try first. It would be much easier to just tap the existing holes for larger screws, and if that was not successful I

would still have the option to install bushings. To measure the diameter of the stripped-out screw holes, I used the shanks of drill bits as plug gauges. I measured the left hole, which was the larger of the two holes.

A #30 drill was a snug fit, but a #29 (0.1360 inch) would not go. There is very little parent material between the firingpin holes and the retaining screw holes. Since a #29 drill is the tap-drill size for an 8-32 tap, this appeared to be the largest thread I could use without breaking completely into the firing-pin holes.

As you can see in the photo, the right retaining-screw hole had already partially broken into the firing-pin hole probably a result of the loose screw deforming the hole every time it was hit by the hammer. Fortunately, it broke into the firing-pin hole only at the top, and there was enough material in the rest of the hole to successfully tap it. I cleaned up the holes with the #29 drill, being careful to stay parallel to the old holes and to avoid making them deeper. The two retaining-screw holes are

RETAINING SCREW BLUES CONTINUED

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Figure 1. Tap Extension Details 1. Make from 0.312" diameter rod approximately 5" long. 2. Drill hole in end approximately 0.750" deep to accept the shank of your tap. 3. Locate set-screw hole so it will engage flat driving surface of tap (approx. 0.50" from end). 4. Drill and tap set-screw hole for 4-40 set screw. 5. Cut some flats on end of extension to fit your tap handle. recessed into the backside of the breech-face, and require extensions approximately 5 inches long.

I lengthened the drill by silver soldering an extension to the shank. I made the tap extension from a piece of 0.312-inch diameter steel rod (see Figure 1). Now I was ready to tap. I gave careful attention to the angle of the tap to stay parallel to the old holes, and finished with a bottom tap to get as many threads in the hole as possible. Both holes tapped perfectly without any problem. The original firing-pin retaining screws had a head diameter of 0.336 inch and thickness of 0.194.

The new screws would have the same head dimensions, and the threaded shank would be 8-32 by 0.337 inch long. Grip length was determined from the depth of the screw hole in the receiver (0.357 minus 0.020 inch for clearance. I wanted the longest grip length possible to help keep the screw tight and to better survive the pounding it would get as a hammer stop. Search as I might for an over-the-counter 8-32 screw with the necessary head dimensions, I couldn't find anything that was even close.

So, having no alternative, I made some new screws from 1/4-20 by 1/2-inch-long socket-head cap screws. Even after turning the head to the final outside dimension there was plenty of material left around the socket to work effectively as a hammer stop. If you prefer to have a slotted-head retaining screw, you can use a solid hex-head screw instead, and cut in a screwdriver slot. I turned the shanks of the new screws to 0.164 inch and threaded them with an 8-32 die.

As for the other damaged parts, I replaced the sear and hammer pins, straightened the right sear, and dressed Figure 2. Slave Pin Details 1. Make from 0.156" diameter rod approximately 3" long. 2. On one end put a 0.250" long taper and bring it to a point. The other end must be flat with no chamfer. 3. A high polish on the pin and some lube will make it easier to use. the other internal parts to remove burrs, nicks, and gouges.

Assembly Notes When I installed the new firing-pin retaining screws in the receiver, I used "permanent strength" Loctite. This material provides a very strong bond and ensures the same failure will not be repeated. Use it sparingly and make sure you don't get any Loctite on the firing pins or springs. If the retaining screws need to be removed in the future, the bond can be broken by applying heat to the head of the retaining screw using a torch with a small tip to localize the heat.

If you don't already have one, make a slave pin like the one shown in Figure 2. You'll need it to assemble the hammers, mainsprings, and mainspring plunger in the receiver. The slave pin is installed tapered-end first, right to left, and is drifted completely through and out the left side of the receiver when the hammer/cocking lever pin is installed.

Conclusions In the course of repairing this gun it became obvious that it had been disassembled by someone who was not a gunsmith; the damage to the buttstock and the incorrect assembly of parts were immediately apparent. Most likely, the firing pins had also been removed, and on reassembly the retaining screws were installed without thread-locking compound and were not tightened properly. Remember, the actions of all these guns are of the same basic design.

They all have a common firing-pin retention system, and share a common failure of that system. The stripped threads in the receiver could have meant the end for this old gun. Sometimes it takes making that special part to complete a repair. It may not seem worth the effort to salvage a relatively inexpensive gun like this, and sometimes the cost of the gunsmith's labor is more than the owner is willing to spend unless the gun has a sentimental value. This one obviously did, and you can't put a price tag on that. I

GRINDING

Basic Air-Gun Repair

In most cases, the cheaper guns are better replaced than repaired, but repair of the superior-quality models can be an additional source of revenue for the gunsmith.

BY ROBERT K. CAMPBELL FEBRUARY 2004

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The first handgun I owned was a Crosman air gun. It was also the first handgun I worked on, and the first I made a mess of. It was an inexpensive lesson, but one that has stuck with me. A .22-caliber pellet gun modeled after the Colt Single Action Army, this handgun was fertile ground for experimentation. I went about it contrary to instruction and soon learned that a steel rod does not mix with an aluminum barrel.

Over the intervening 30-some years, I've worked on, adjusted, and enjoyed quite a few air-powered arms. Some of the air guns we see today are not inexpensive, and all of them occasionally need adjustment. They are well suited to informal target shooting, training, and even hunting small game. I have used air guns inside the home on occasion; no smoke, odor, or noise combined with an effective backstop can make for a pleasant evening.

In this article, I'll look at some of the problems that come up with the better-quality air guns, along with the proper procedure for rectifying these problems. The skirted pellet is known for leaving lead deposits. Consequently, the most common problem with pellet guns is lead build-up in the barrel from these soft-lead pellets. Most barrels are aluminum, and care must be taken in cleaning them. A soft patch of .17- or .22-caliber, whichever is appropriate, should be used.

Avoid using a steel rod and whatever you do, don't use a brass brush in an aluminum barrel. A nylon brush works well, and when used with Birchwood Casey solvent will produce excellent results. Quality air guns are often supplied with some type of cleaning gear, but air-gun-specific cleaning gear is available, and should be used if possible. The majority of air guns are powered by a spring. In simple terms, a piston is compressed and holds a charge of compressed air.

When the sear or trigger is tripped, the air is released into a very small opening and this charge of air drives either a spherical BB or a flat pellet from the barrel. Occasionally, a spring may need to be replaced, but in my experience, the most common difficulty with these guns is the deterioration of the washers that seal the compressed-air piston. While instructions supplied with most air guns tell us to lightly oil certain parts of the gun, I have found that oil can destroy leather washers.

Fortunately, leather washers are seldom seen in the newer models. If required, replacement washers can easily be made from old leather belts or even old, worn holsters. Simply cut and trim the section to the appropriate size with a razor knife. Many air guns now use C0 car-2 tridges. Once considered less accurate than spring-type guns, the modern C0 types give excellent results, at least in plinking type activity. Seals occasionally need to be replaced, and both are produced to high standards.

BASIC AIR-GUN REPAIR CONTINUED

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the ring that seals the piercing mechanism can become worn. One problem that commonly occurs with C0 guns is a pellet stuck in 2 the barrel. This occurs when the gas cylinder runs down. There is enough gas to press the pellet into the barrel but not out of the barrel. When the pellet becomes stuck, a magnificent jam can occur if the shooter does not notice and continues to fire the gun. Revolver-type air guns can suffer a jam between the cylinder and the barrel that is difficult to clear.

The only means of clearing this jam is to run a cleaning rod into the barrel and press the pellet back into the firing chamber. Care must be taken. Too abrupt a push and the pellet can ram against the air jet of Smith & Wesson type air guns, cocking it to one side. While it is usually easily realigned, the possi-

bility of permanent damage is great. Deformed pellets are also among the common causes of air-gun malfunctions. Some are easily cleared, but more finesse than elbow grease is usually needed.

The Smith & Wesson-type of airgun has both single and double-action firing capability, and features a hand and ratchet like a cartridge revolver. It is a precision instrument that is quite accurate and reliable. Standard timing procedures can be followed with these air guns. I would not attempt to lighten the action, however; the moving parts are of "pot metal" or aluminum. Only light, careful polishing is acceptable, although this can yield surprising results.

The single-action Crosman pistols take action polishing better, but again care must be taken to avoid cutting too deeply or destroying

light metal parts. There are proper tools for changing barrels and sights of airguns. When turning the crank that changes Smith & Wesson air gun barrels, move the barrel to a tight position but don't overtighten. The threads are easily stripped. These air guns are quite strong and capable, but will not take the pounding a true firearm will.

Quite a few air guns, including the Smith & Wesson, have adjustable sights and interchangeable sight blades. The rules that apply to cartridge firearms in sight alignment also apply to air guns, of course. When considering air gun triggers, keep in mind that the C0 types use 2 the trigger as a valve. They allow a little compressed air to escape from the seal to drive the projectile from



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the barrel. So, in proper terms, the trigger is a kind of hinge for the valve. If all of the hinged parts and valves do not properly work together, gas can escape at the wrong time or not at all. Remember that most of these pieces must not be oiled. This is a warning with oxygen equipment, torches, and other valved gear. No oil! In this case, the worst that could happen is probably a cold hand from gas release, but the gun will not function properly.

Parts not related directly to valving, such as the pivoting trigger action, on the other hand, can be lightly oiled. Conclusions There are many types of air guns, but the basics are the same. Of all the problems I've seen, a ruined bore is the most common in my experience. This comes from pellets jammed in the barrel and rough treatment in clearing them. Too many shooters try and get the last bit of gas from a cartridge.

This can result in a pellet not sufficiently propelled down the bore, or even two stuck in the bore. A properly gauged wooden dowel can be used to carefully tap

the pellets from the bore, but as previously mentioned a cleaning rod can serve. Be careful, as the pellets can come apart when this is done. You will also note that the barrels of some pellet guns and almost all BB guns tend to gather rust with age. The solution is to lightly clean these with repetitive solvent application, and to keep them oiled.

Yes, you can lightly oil the bore of air guns for longevity. The proper care of air guns is important, but once they find their way to the gunsmith something has happened. While air guns vary a great deal, most are lightly constructed. A careless fall can result in a severe dent that will ruin the mechanisms. A box of valves is not a very expensive investment for the gunsmith, but the most troublesome guns't he cheap ones'are often not worth the cost of repair.

Nevertheless, while not the most lucrative business, air gun repair is another aspect of your business that should not be ignored. I

PISTOLS

Working S&W's .32-Caliber New Departure/Safety Hammerless

These handsome revolvers' almost revolutionary in design when they were introduced' were produced in huge quantities, and many are still in service today.

BY DAVID R. CHICOINE FEBRUARY 2004

ORIGINAL PP. 16-20

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Beginning in 1888, Smith & Wesson manufactured a popular line of .32-caliber five-shot top-break revolvers that were known as the Safety Hammerless or New Departure revolvers. Even though this model was called a hammerless, the hammer was actually concealed inside the lock frame.

Over the years, many collectors have simply referred to them as the "lemon squeezers." This was because they came equipped with a safety lever mounted on the rear grip strap that had to be squeezed when the gun was gripped in order to fire the weapon. If the safety lever wasn't depressed, a safety bar interfered with the hammer and would not allow it to rotate rearward, hence effectively tying up the gun's action.

Like all S&W top-breaks, the Safety Hammerless featured simultaneous, automatic ejection of the fired cartridges as the barrel was opened. The .32 Safety Hammerless was chambered for one caliber

only't he .32 S&W'which is often referred to as .32 Short to distinguish it from the .32 S&W Long. Smith & Wesson manufactured .32 Safety Hammerless revolvers up until 1937, with a total of 242,981 revolvers produced in either blue or nickel finishes.

The .32 Hammerless pistols had a small, roundbutt grip shape, and most came equipped with checkered hard-rubber grips, although pearl and ivory were available as factory options. Collectors identify three different models of the S&W .32 Safety as outlined below. While all three have internal actions that operate in basically the same manner, between the First and Second models, there is a major difference in the way the barrels are opened and in the way the cylinders are retained during extraction.

As you will note from the parts illustration, the First Model barrel was opened by pushing down on a barrel-catch release button,

called a thumbpiece; but, on subsequent models, the barrels were opened by lifting up on anew T-shaped barrel catch.

This later one-piece barrel catch also acted as a cylinder catch, and in so doing several parts were done away with, simpli- 32 Safety Hammerless, Second Model, also known as the "bicycle gun." The original caption read: "Its lightweight and convenient size make it an ideal arm for the wheelman." fying the mechanism. Particulars of the three models are: .32 Safety Hammerless First Model. Manufactured from 1888 to 1902, with serial numbers from 1 to 91,417. The front sight is pinned into the barrel.

The First Model was available with a 2-inch (scarce), 3-inch, or 3-1/2-inch barrel. The barrel-catch button on top is pushed down to open the barrel. .32 Safety Hammerless Second Model. Manufactured from 1902 to 1909, with serial numbers from 91,418 to about 170,000. The front sight is

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pinned into the barrel. Available with 1-1/2-, 2- (scarce), 3-, 3-1/2-, and 6-inch (scarce) barrels. A T-shaped barrel catch is lifted up to open the barrel. .32 Safety Hammerless Third Model. Manufactured from 1909 to 1937; serial numbers from about 170,000 to 242,981. Front sights are forged as one piece and are made integral with the barrel rib. Available with 2- (scarce), 3-, and 3-1/2-inch barrels. Like the Second Model, a T-shaped barrel catch is lifted up to open the barrel.

From the model information above you can see these S&Ws were offered in a small variety of barrel lengths with 3 and 3-1/2 inches being the most common, and the 2- and 6-inch versions the most rare. The 2-inch barrel versions are scarcest, and were sometimes called "bicycle guns," in an effort to induce cyclists to purchase them as protection against vicious dogs.

Yes indeed, at the turn of the last century people had greater rights than dogs, and the little S&W .32 was intended to ensure the rider's rights. (Can you imagine the hue and cry that would rise up if such an advertising practice were tried today?) The engineering in these little hammerless revolvers was really quite advanced at the time of their introduction.

In addition to the concealed hammer and safety lever, all of them featured a rebounding hammer along with a separate, rebounding, framemounted floating firing pin. I can easily understand why they were so popular. Smaller than a modern Chief's Special, the New Departure' as S&W preferred to call

it was a truly compact revolver that could be easily and safely (due to their novel safety features) concealed in a pocket or purse.

Disassembly Instructions Numbers in the text that follows refer to the First Model illustration except as noted. 1. Push down on the barrel catch (#86) on First Models or lift up the barrel catch (#442) on Second and Third Models, and tilt the revolver barrel all the way down in order to open the action. Use caution here to be certain the cylinder is unloaded.

For cylinder (#69) removal on First Models only, notice the depressed area on the barrel topstrap; push down on the front of the cylinder hook (#82) at this depression. For Second or Third models, hold the barrel catch (#442) in the up position. Once this is done, with all models, pull the cylinder to the rear while turning it in a counter-clockwise direction.

The cylinder is held captive by the large interrupted thread on the base pin (#72), and these actions will cause it to withdraw toward the rear off the pin. 2. Remove the joint-pivot screw (#91a) from the left side of the hinge on the frame (#71), and use an appropriate straight pin punch to drive the joint pivot (#91) out of the frame toward the right side. Make a note of the witness mark on the head of the joint pivot that will match the corresponding mark on the frame for later reassembly.

The barrel (#68) is now loose and ready to be lifted up out of its joint with the frame. The extractor-cam assembly (#83) is located between the ears of the barrel hinge, and this can now be pulled down and out of the

barrel. Make a note of the extractor cam's position for reassembly. 3. Unscrew and remove the stock (grip) screw (#92) and remove both stocks (#99 and 100). Next remove the hammer-stud nut (#94) at the center of the sideplate (#76) along with the sideplate screw (#109) at the rear of the sideplate.

Turn the frame over on its side, holding it by the hinge area with the sideplate facing up over a padded 32 Safety Hammerless shows the checkered safety lever that must be depressed as the gun is gripped in order for the weapon to fire. These guns were also equipped with rebounding hammers and floating firing pins. work surface. Strike the grip frame a couple of sharp blows with a plastic or hardwood mallet to cause the sideplate to be shocked and jump up out of its seat in the frame.

Don't make the mistake of attempting to pry off the sideplate; you will cause permanent damage. (If the only requirement is to change the firing pin, refer directly to Step 7 below.) 4. These revolvers are equipped with rebounding hammers, and their rebound action is controlled by mainspring tension acting on the rebounding action stirrup. Taking careful note of the position of the hammer before any further disassembly is attempted. This will aid in understanding how the rebound system functions.

Use a pair of spreader-type pliers to compress the top of the mainspring (#78) forward, so the hammer stirrup (#88) can be rotated upward, out of its seat between the ears at the mainspring top. Use an appropriate screwdriver to loosen the strain screw (#93)

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Smith & Wesson .32 Safety Hammerless First Model
Parts 68 Barrel 69 Cylinder 70 Extractor 71 Frame 72
Base Pin 73 Hammer 74 Cylinder Stop 75 Trigger 76
Sideplate 77 Trigger Guard 78 Mainspring 79 Safety
Lever 80 Gas Ring at the bottom-front of the front grip
strap on the frame. You can now withdraw the main-
spring from the grip frame's side opening.

Making use of a straight pin punch, drift out the pin in
the front strap of the grip frame which holds the cylin-
81 Extractor Rod 82 Cylinder Hook 83 Extractor cam
84 Hand 85 Safety Catch 86 Barrel Catch 86b
Thumbpiece 87 Sear 88 Stirrup 89 Firing Pin Bushing
90 Front Sight 91 Joint Pivot 91a Joint Pivot Screw 92
Grip Screw der-stop spring (#107) in place, then re-
move the spring by gently prying it out to the rear.

Use a wooden hammer handle or a small plastic mallet
to strike the rear of the trigger guard (#77) a small
blow on its back side. (Hit towards the front.) This
should 93 Strain Screw 94 Hammer Stud Nut 95
Extractor Stud 96 Hammer Stud 97 Firing Pin 98
Extractor Spring 99 Grip (stock) g 103 Firing Pin
Return Spring 104 Handspring 105 Split Spring 106

Trigger Spring 107 Cylinder Stop Spring, Leaf #88) in
its rearmost position, the hammer can be gently worked
up off the hammer stud (#96) and out of the frame.

The trigger pin (not numbered) is the large pin that
passes through the frame from side to side under the
cylinder opening. It is now drifted out cause the rear of
the trigger guard (the guard itself is a compressed
spring) to unhook itself from the frame and to drop
down slightly. Depress the safety lever (#79) and pull
the trigger (#75) all the way back to the rear. The trig-
ger guard can now be removed by pulling it toward the
rear to unhook its front lip from the frame.

Next pivot it down at the front and push forward on the
bow. The V-shape trigger spring (#106) can now be re-
moved from the trigger guard opening in the frame. Pay
careful attention to the positioning of the trigger spring
for reassembly. 5. Push both the trigger and the ham-
mer back to their forward positions.

Use a cuptipped pin punch to drift out the cylinderstop
pin from the frame, and then push the entire cylinder
stop (#74) down so it is out of of the hampress the
safety lever and once again pull the trigger, causing the
hammer to rotate to the. amback

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of the frame using a cup-tipped pin punch. The assembly that consists of the trigger, hand (#84), and sear (#87) is pushed up and to the rear so that the entire hand is visible through the sideplate opening of the frame. Note carefully the positions of the three parts in this sub-assembly for later reassembly. The hand and its spring (#104) can be held with narrowjaw needle-nose pliers and pulled upward out of the seat with the trigger and sear.

The trigger can now be withdrawn out the bottom of the frame along with the cylinder-stop assembly, and the sear will be free to be lifted out through the sideplate opening. 6. The safety lever is removed by first drifting out its retaining pin from the lower-rear area of the rear grip strap. Now pivot the bottom of the safety lever to the rear and pull down. The safety catch or latch (#85) may be powered by a coil spring (First and later Third Models) or by a leaf spring.

The leaf spring will be located on the inside of the rear grip strap, and is held by across pin just like the cylinder-stop spring was. The coiltype spring will be located within the safety-catch recess in the frame, directly behind the top portion of the safety catch.

Smith & Wesson .32 Safety Hammerless Second/Third Model Parts 438 Barrel 439 Cylinder 440 Frame 441 Sideplate 442 Barrel Catch 443 Trigger Guard 444 Mainspring 445 Safety Lever 446 Base Pin 447 Extractor Spring 448 Trigger 449 Hammer 450 Cylinder Stop 7. The firing pin (#97) is retained in the frame by the firing-pin bushing (#89), which in turn is secured by across pin (not shown) located at the top of the frame.

To remove the firing pin, the cross pin that retains the 451 Extractor 452 Extractor Post 453 Extractor Cam Assembly 454 Cylinder Stop Spring 455 Trigger Spring 456 Front Sight, Second Model only 457 Barrel Catch Cam Spring 458 Firing Pin Spring 459 Latch Spring 460 Stirrup 461 Barrel Catch Cam 462 Hammer Stud Nut 463 Plate Screw 464 Stock Screw 465 Strain Screw 466 Hand 467 Joint Pivot 467a Joint Pivot Screw 468 Split Spring 469 Safety Latch 470 Barrel Catch Screw 471 Hammer Stud 472 Firing Pin 473 Firing Pin Bushing 474 Sear 475 Extractor Stud 476 Hand Spring 477 Right-Hand Stock 478 Left-Hand Stock firing-pin bushing is first drifted out of the frame using a cup-tipped pin punch.

A small straight-pin punch can now be used to drive the firing pin and its bushing out of the frame from rear to front. "

WORKING S&W'S .32-CALIBER NEW DEPARTURE/SAFETY HAMMERLESS CONTINUED

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32 Safety First Model top-strap shows the cylinder hook or catch and the depression into which it must be pushed in order to remove the cylinder. Once the rear of the guard bow has been shocked forward, it comes unlatched from its seat in the frame. Notice the "lip" at the extreme rear left of the guard. This is what locks into the rear of the frame. There is a small coil spring (#103) at the front of the firing-pin shoulder that acts to retract the firing pin after firing.

Note the positions of these components for reassembly. These revolvers are equipped with rebounding hammers, and their action is controlled by mainspring tension on the stirrup, which you will note has a flat on its top-front to act on the hammer in rebound. 8. For cylinder disassembly, insert five fired cartridge casings or dummy cartridges into the cylinder chambers for support.

Grab the extractor rod (#81) tightly within the jaws of a drill or lathe chuck, and rotate the cylinder in a counter-clockwise direction. This action will unscrew the extractor rod from the extractor (#70), and the extractor spring (#98) will come out with the rod. Note the witness mark dot on one of the rear-facing legs of the extractor.

This dot should be aligned to the This assembly is from a .38, but other than a slightly larger size, the parts look almost identical. serial numbers on the rear face of the cylinder for reassembly. The extractor spring is quite a snug fit on the extractor shaft. To avoid damaging the extractor spring during reassembly, start the extractor rod into the threads on the extractor by just onehalf to one full turn.

Hold the front 1/4-inch of the extractor rod securely in a drill chuck or padded vise, and push the cylinder forward to compress the extractor spring while you tighten the extractor rod by turning the cylinder in a clockwise direction. By doing this, you will prevent one or more coils of the spring from binding on the extractor shank and crushing the spring. 9. To disassemble the barrel on First Models, remove the small screw at the bottom-rear of the thumbpiece (#86b).

The thumbpiece can now be removed by lifting it straight up. Use a small cup-tipped pin punch to drift out the rear of the two pins in the barrel top strap. This will release the barrel catch (#86) and its coil spring (#101) to be removed from the bottom of the top strap. Drift out the forward of the two pins in the

barrel top strap with the same punch and you will free the cylinder hook (#82) and its coil spring (#102) for removal out the top. Note the positions of these parts for reassembly.

On Second and Third Models, the barrel is disassembled by removing the barrel-catch screw (#470) from the left side of the barrel top strap, allowing the barrel catch (#442) to be withdrawn out to the rear. Hold the barrel (#438) in a muzzle-up position, and tap the rear of the barrel top strap on the wooden bench top. This will cause the barrel-catch cam (#461) and barrel-catch cam spring (un-numbered) to fall out of the recess in the top strap. Make a note of the positions of these parts for reassembly. 10.

On all models except the Third, you can remove the front sight by using a tiny cup-tipped pin punch to drift out the front-sight pin. The sight is pulled straight up out of its slot in the barrel rib. Mark the sight in some way to ensure that it faces the same direction when you reinstall it later. And, as always, you reassemble the revolver in exactly the reverse order from that detailed above. I

READER FORUM

Reader Forum

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2004

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FAL Trigger Job I have a FAL metric with a terrible trigger (8-1/2 pounds pull). I know that there are adjustable triggers for ARs and such. But I can't find one for the FAL. Do you have any sources or are there modifications that can be made to the factory trigger to smooth and lighten the pull? Any help would be appreciated. We don't know of any aftermarket trigger sources for your FN FAL. Takedown instructions appear in Gun Digest's Assembly/Disassembly for Rifles.

Remove the trigger spring and send it to Wolff Springs Newtown Square, PA 19073) along with a request for a similar, lighter spring. Don't forget to remind them to return the original spring with your order. While waiting for the new spring, hand polish the sides of the trigger with 300- and 800-grit compound. Do the same all around to the hammer-spring guide. Don't use power tools for the polishing, and thoroughly clean all compound residue off when you're finished.

When you reassemble the rifle using the new spring and test fire it, the pull should be both smoother and lighter with no adverse affect on function. If it still is too heavy, remove one coil from the new spring and test fire again. However, the pull must not be less than 6-

1/2 pounds, which is the weight DSL Inc. sets when they perform trigger jobs on the FAL. If after reading this, you decide to let DSL handle the job, call Imported Problems I need help today on two firearms.

The first is a German-made derringer in .38 Special. The name on it is as follows: ROHM GMRH SONTHEIM/ BR RG 17 CAL 38 SPECIAL. I reblued the barrels and powder-coated the aluminum frame. My customer brought it back saying that the gun fired when he was loading it. I asked if he had the hammer in the safety position to load it. He stated that he has never had to do this in the past. I had made a drawing of the selector spur and how it was positioned before tearing it down.

I have gone over and over the gun and cannot see away it could be loaded with the hammer down in the fired position. Can any derringer be loaded with the hammer down? The second firearm is a Churchill Multi XII semi-auto 12 gauge imported by Kassnar from Japan. The gun has problems operating with high-brass loads. It works great with sevens and eights. Some low-brass sixes work, but not all the time. I can't find any info on this gun or if there is any gas adjustment on this action.

I thoroughly cleaned the firearm, gas ports, and gas-operation system. No luck. Can you help? The derringer hasn't been imported since 1968. It employs a firing pin and spring according to our records. Therefore, the hammer strikes the pin when the trigger is pulled, drives it into the primer, and the spring retracts the pin. We are not aware of a safety or half-cock notch on the hammer of these guns, which were not well made and are of little current value.

Many derringers were unsafe. (See the article on the Bond Arms Defender in the October 2001 issue; it is an exception.) It sounds to us like, somehow, the firing pin is protruding from the breech and coming into hard contact with the round just chambered when the action is closed. Most Churchill semi-autos had 2- 3/4- or 3-inch chambers with the 3inch (only) capable of firing and ejecting 2-3/4-inch Magnum shells. Did you use the proper size drill when clearing the gas port holes?

If you enlarged them, the gun will never be able to operate correctly. Also, in these guns, the piston overrides the barrel extension. Sometimes it can seize to the extension or become attached to it due to corrosion, thereby slowing down the action. Since you were not specific regarding the problems being experienced, we are only assuming they involved extraction/ejection. If you need further assistance, and possibly that includes a copy of an owner's manual, send an e-mail to Jim Heverling with your request.

He has been with KBI for many years, and is quite familiar with the Churchill. Winchester Bolt I have a friend's Winchester 67. All I had for a bolt was a bolt sleeve and firing pin. I was able to get all but the striker-spring plunger. I got one as close as I could, and have looked through a few books on it. I cannot get the firing pin to go back when working the bolt. If the striker knob is pulled back with the bolt in place, it will work. Any idea what is wrong? I would appreciate any help you could give me.

We don't think anything is wrong. The Model 67 did not cock upon closing the bolt. The rifle had to be manually cocked by pulling the striker knob (cocking piece) after the bolt is closed on a chambered round. Davis Shotgun? A customer brought me a shotgun in pieces to put back together. The only mark on it is "Daniel Boone," engraved on the frame and the serial #D6335. I think I've identified it as an N. R.

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Davis, by matching the parts to that gun in the Gun Parts Corp. catalog, but I don't know exactly how to reassemble it. I can generally figure it out if there is a schematic, but the parts are just laid out in no specific order. Would you know of anywhere I could find the info I need? Davis made cartridge shotguns from 1853 to 1919. These included improvements shown in N. R. Davis patents of 1879, 1884, and 1886. If you have the barrel from the gun, it's usually the place where a patent number

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is shown. Send a check for \$3 to the U. S. Patent Office, Washington, DC along with the number and a request to secure a copy of the patent, which will contain detailed drawings of the gun's interior. If there is no patent number shown, you can still contact the patent office and request they conduct a search based on the dates and name provided here. A search will cost more than 3 dollars, however. A copy of the patent is important because there are no schematics of Davis shotguns.

They predate by many years the use of such drawings. You should also be aware that Davis made blackpowder percussion shotguns which would not be suitable, or safe, for modern loads. S&W Specs I have some questions concerning three Smith & Wesson revolvers and their headspace and barrel-to-cylinder gap: the Model 14-K-frame, .38 caliber; Model 19-3 K-frame, .357 Magnum; and Model 586-3 L-frame, .357 Magnum. What is the headspace and barrel-to-cylinder gap for each model? Any information would be greatly appreciated.

Distance between the rear of the cylinder and the frame equals shell rim thickness plus .006 inch. Barrel-to-cylinder clearance in S&W revolvers gauges between .003 and .006 inch when they leave the factory. Maximum allowable is .008 inch, and the ideal is .005 to .006. Model 1894? I have an old Rem 12-gauge double barrel that is giving me fits. When it fires, the firing pins stay forward and will not allow the barrels to break over.

I have tried making shorter pins, putting springs in front of them so they retract, and at times the gun fails to fire. I cannot find this gun in any of my books, and have never seen one before. It is hammerless

and the pins are in a screw-in sleeve on each side. It came in with a bad safety, doublefiring with one trigger only (while it has two), a broken stock, and a triggerreturn spring that did not function. All is repaired except the pin problem.

The gun has no model number, but the patent date is stamped Oct 30 94. Under this date are the numbers 4 821, and on the other side of the inside of the action is stamped what appears to be a serial #371047. It has a case-colored frame, and looks to be the thin cyanide-type coloring. Any help would be greatly appreciated. Jerry Martin Shawnee, Oklahoma We believe you have a Remington Model 1894, which went out of production in 1910.

It was the company's first hammerless and was available with or without auto ejectors. Judging by the condition of the gun when it was brought in, you have already performed yeoman service for a careless owner. As for the remaining problem, a possible cause is the firing pin(s) binding in the breechface. Fabricating and installing bushings could resolve this problem, but if you choose to take on the task, don't fail to countersink the new bushings at their rear.

This will make transit of the firing pin easier, and can also ensure center hits on the primers. Smith & Wesson? I have a .38 S&W Double Action Third Model that I am working on and I have no assembly/disassembly schematic to work from. I have tried Numrich without success and none of my NRA manuals have it either. I was hoping that I could get some help from you.

The thing that makes this difficult is that there is no sideplate on this model. Everything assembles through the trigger guard area. Any help would be greatly appreciated. Sorry, Rick. It's not a Smith and Wesson.

Caliber on the barrel is probably marked ".38 S&W" but no S&W double-action ever made was disassembled through the trigger guard and none was ever sold without "Smith & Wesson, Springfield, Mass." stamped on the barrel. What you have might be an H&R, an Iver Johnson or in the worse-case scenario one of those clones made by who knows who or when. If you can find out where it came from, we might be able to help you with takedown or parts info. Savage Receiver Sight I have an earlier Savage Model 99 in .303 Savage.

My customer wants to have a receiver sight installed. I have a Williams 99S receiver sight for a Savage, which is drilled for 6-48. The receiver of the Savage had at one time been drilled and tapped for 8-40, but the hole spacing exceeds that of the Williams sight. Therefore, either the Williams sight must be opened up to accommodate 8-40, or the receiver drilled and tapped for 6-48. If I alter the Williams sight, I'll still have to drill and tap one 8-40 hole.

My problem is: How do I drill a hole on the curved receiver that is "normal" (dead perpendicular) to the receiver? I called Savage Arms, Canada, and they know the problem, but they didn't have a factory jig here to do the work, nor did they offer a suggestion. I have a Forster jig, but it won't work on this type of problem. I also have a bench mill, but I'm not dan email to Chick Blood, Technical Editor, at

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(continued from previous page) sure if I can use it to do the work. I don't want bad holes; I've seen what can happen. I appreciate any advice you can give. Thanks. Mike Grinnell Haliburton, Ontario Your problem begins with a Williams sight that hasn't been made in about 20 years. One reason for ceasing production is that owners of Savage 99s had no desire to have holes drilled in the receivers. The sight you need is a Williams FP99, but that's also out of production.

Maybe you could turn one up on the internet or by shopping around in the old parts market. Try Gun Parts Corp. Antique Gun Parts or get a free copy of Brownells "Parts Source List" and let your fingers do the walking. While you have Brownells on the phone, you might as well order a Palmgren Drill Press Vise, which can be used for rounded stock and will hold it steady during drilling.

If you want to try installing the 99S, hopefully, one of the 6-48 holes in it will match up with one of the 8-40 receiver holes to align the sight with the bore. Drill that hole out to accept an 8-40 screw, and fasten the sight to the receiver after you drill out the second sight hole to 8-40. Secure the receiver in the Palmgren, use the enlarged sight hole as a drill guide to open up another hole in the receiver. Make no change in the vise angle, and use a Tru-Tapper (from B-Square) in your quill to tap the hole.

But don't charge ahead just yet. If it appears the process outlined above will not result in a proper centerbore fit for the sight, please suggest to the rifle's owner that he forget about more holes in the receiver, and join you in the search for an FP99 sight. It's either that or paying you for your time' plus phone charges'in trying to find one for him. Auto-5 Extractor I have a question regarding a Browning 20-gauge Auto-5 of Japanese manufacture.

I bought this new, and after about 1,000 rounds, the left extractor broke. I replaced it and ran another 1,000 rounds or so through the gun before the left extractor broke again. Is there something I should be doing or looking for to prevent these from breaking? I don't see that any fitting is necessary to replace these. Another question: On apart like this, isn't only the surface hardened by the heat-treating process used in manufacturing it?

If this is true, wouldn't any required fitting require that the part be heat-treated again? Any help would be appreciated. Unfortunately, Browning is no longer showing the Auto-5 in its line. Sad...very sad. Gas guns rule these days it seems. Your notion about the lack of fitting is incorrect, however. When the extractors are reinstalled, capture a dummy round between them. Force the right-hand extractor to its outer limit by sliding the shell against the bolt face.

Tilt the shell so it clears and shows a space between the shell rim and the left extractor. The gap should be between 1/32 inch and 1/64 inch in width. Any wider than 1/32 and the shell will occasionally drop off the extractors and/or extraction will be sluggish. Sluggish extraction places extra stress on the extractor and will weaken it. The gap is corrected by tapping the hook of the left extractor inward.

Check the adjustment by reinserting the dummy round, and tilt it without applying pressure to the right side. The shell rim should be retained by the left extractor until only moderate tilting pressure is applied. If the shell doesn't release, the left extractor hook is too sharp or too long. Both can be corrected with a fine file.

Additionally, if the left hook doesn't move outward from the boltface when pressure is applied, the extractor is misshapen or the last coil of the extractor spring has lodged between the extractor and the breechblock. To correct this, "turn in" the last coil of the spring or replace the warped extractor. To answer your other question, the amount of fitting we're talking about here should not call for more heat treatment.

If these measures result in yet another broken extractor, you should return the gun to Browning in Morgan, Utah. Auto-5 extractors are not supposed to break after only 1,000 rounds, and Browning engineers would probably be interested in examining your shotgun.

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