



JUL 2008

DIGITAL ARCHIVE
EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

07

ARCHIVE ISSUE NUMBER

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DISASSEMBLY AND REASSEMBLY OF THE BROWNING CYNERGY SHOTGUN

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ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 055

DIGITAL ARCHIVE EDITION

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AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • JULY 2008

ISSUE RECORD

ORIGINAL DATE	July 2008
VOLUME	Archive volume not stated
ISSUE NUMBER	07
SOURCE ID	ag-ea92ee73052689f2dbbde786

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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SAFETY & COMPLIANCE

Bloomberg Loses Appeal in NYC Lawsuit

BY AMERICAN GUNSMITH EDITORS JULY 2008

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Just as this issue went to press, a Manhattan-based federal appeals court dismissed what should be the last of the frivolous lawsuits intended to bankrupt the major players in the firearms industry with the cost of their legal defense. Like the other suits previously dismissed, this one, filed by the City of New York, sought to hold manufacturers responsible for the criminal misuse of firearms.

The suit was originally filed by then-Mayor Rudolph Giuliani in June 2000, and was continued by the city's current Mayor, billionaire Michael Bloomberg. As you probably know, the Protection of Lawful Commerce in Arms Act, enacted by Congress in 2005, did away with the rash of similar lawsuits filed by anti-gun lawyers on behalf of many major cities and the State of New York. A federal-court judge in Brooklyn, New York, Jack B.

Weinstein, made the unilateral decision that the commerce act was unconstitutional, and allowed New York City's suit to pro-

ceed. It took another three years before Judge Robert J. Miner, writing for the U. S. Court of Appeals, held that the law is indeed constitutional, and that Judge Weinstein misinterpreted the law and erred by not dismissing the case.

Senator John McCain, incidentally, was one of the original supporters of the Protection of Lawful Commerce in Arms Act; Senators Clinton and Obama voted against passage of the act. Following the ruling by the court, Lawrence G. Keane, senior vice president and general counsel for the National Shooting Sports Foundation (NSSF) said: "Today's ruling is very gratifying to members of the firearms industry.

In passing the Protection of Lawful Commerce in Arms Act, Congress understood that frivolous lawsuits like New York City's defied common sense and represented a clear abuse of the judicial system that threatened to bankrupt a responsible and lawabiding industry. The ruling is clearly another major setback for gun-control

groups, principally the Brady Center to Prevent Gun Violence, which pursued and funded many of the municipal lawsuits against the firearms industry, including the New York City case.

Mayor Bloomberg, however, hasn't given up the idea that a big-city mayor with a personal agenda can dictate policy for the nation as a whole: He's also suing a number of out-of-state retailers, claiming that the firearms they sell legally are being used illegally by criminals in New York City. That trial will have started by the time you read this'before Mayor Bloomberg's old buddy, Judge Weinstein. Need Some Extra Cash?

If you would like to turn your gunsmithing ideas and expertise into cash (we pay pretty handsomely), I would like to discuss your article ideas with you. Contact me, Keith Lawrence, Editor, at: American Gunsmith, Merritt Island, FL 32954; email voice fax Editor Keith Lawrence Technical

PEOPLE & COMPANIES

Disassembly and Reassembly of the Browning Cynergy Shotgun

Here's what you need to know to service the shotgun Browning calls its "third generation over/ under."

BY CHICK BLOOD JULY 2008

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To paraphrase a line from the book John M. Browning, American Gunmaker, the story of erating systems based on the long recoil, short recoil, and blowback principles. And they covered guns using sliding locks, rotating locks, and vertical locks. Top of page: The Cynergy is as strong as the Superposed, but has a lower profile and a trigger system based on that of a bolt-action rifle. Reuniting the barrels to the receiver may require a bit of practice due to the unique design of the monoblock hinge.

Browning's genius is the story of the evolution of modern firearms. John M. Browning was issued 128 patents on at least 80 models in nearly every caliber from .22 Short up to the 37mm cannon shell. Those patents cov-

ered automatic, semi-automatic, lever, and pump actions. They covered gas op-Browning s crowning achievement't he Superposed'was designed shortly before the great inventor's death in 1926.

Built on a box-lock action, this now legendary over/under had double selective triggers when initially produced around 1930 by FN in Belgium for the European market. Val Browning, the son of John M., developed a single set trigger soon after the shotgun was introduced to these shores, which didn't happen immediately.

When Browning Arms realized the potential for sales of the Superposed on this side of the pond, a large number in numerous variations and grades were diverted to America, where

they became a nearly instant success. The purchase of an original FNmanufactured Superposed could max out a whole wallet full of credit cards. For example, a matching cased set with 12-gauge barrels sold at auction for over \$25,000 in 2004.

If that's a little more than you want to spend on an old shotgun, the Browning Custom Shop still produces new ones on special order. The waiting time is six to eight months, and the cost, depending on grade, runs from about \$4,500 to \$14,500. The Superposed remained top dog at Browning Arms until B. C. Miroku was selected to produce Browning's next generation of O/U shotguns' the Citori. The Citori, introduced in 1973, also featured a box-lock action,



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a single selective trigger, and automatic ejectors. In the opinion of many shooters, the Citori is an “economy version” of the Superposed. New developments in off-shoremade O/Us’ primarily a lower profile’ prompted Browning engineers to begin rethinking the Citori design about 10 years ago. The goal was to work up an over/under that was as strong as the Superposed and Citori, but with a lower profile and a trigger system closer to that of a bolt-action rifle for faster lock time.

A British designer made a stab at it, failed, and the Browning engineers took over. They came up with a monoblock hinge for a lower profile and better balance, anew recoil pad, a mechanical trigger system, an optional adjustable stock comb, back-bored barrels, and impact ejectors. This new design’ Browning’s third generation of O/U shotgun’ is known as the Cynergy. Like the Superposed and the Citori before it, I expect the Cynergy will develop a distinguished history all its own.

Field Stripping Field stripping an over/under hardly requires instruction, but here goes anyway. Open the action and check the chamber. Remove any shells. Swing out the forearm latch. Rotate the front end of the wood away from the lower barrel, and remove the forearm toward the muzzle. Grasp the barrels, pivot them down-

ward and detach them from the receiver. Inspect the monoblock hinge, ejector cam, and locking-pin surfaces. If dry or fouled, clean and lubricate.

Detailed Disassembly Relatively speaking, shotguns are somewhat more complex than other firearms. There’s more going on inside than with your average rifle, pistol, or revolver, and there are more parts interacting with others to make the weapon work. With its fair share of levers, screws, rods, springs, and pins, the Cynergy is well up near the top of the complexity scale. The detailed disassembly instructions I’m about to share with you came from one of the engineers who designed it. Ready?

Okay, you begin with the action closed. Place an 18- to 24-inch-long hardwood dowel down each barrel to prevent crushing, and secure the barrels at a 45-degree angle between padded vise jaws (just forward of where the forearm was). The stock is now tilting up and is at chest level. The recoil-pad screws (#47) on newer Cynergys have holes located immediately over them. Older Cynergys, like most long guns, have nearly invisible slits in their butt pads, so you’ll probably have to fish around to find the screws.

Do your fishing with a roundshank Phillips-head screwdriver that has had its business end coated with Vaseline. Even on newer models with screw holes in the recoil pad, the Vaseline is not a bad idea. Browning puts a “vapor deposit” on these pads for added slickness so there’s less chance of the pad hanging up on a hunter’s coat when it’s being brought to shoulder. This is a good idea, but I’ve found this vapor deposit to be somewhat brittle; it can develop cracks when violated with a non-lubricated screwdriver.

On a Cynergy without an adjustable comb, once the recoil pad is out of the way, you can go in after the stock bolt (#63). The bolt has a slotted head, metric threads, and a driver with a medium-length shank will be needed to reach it. This bolt is very soundly torqued in place. I’d recommend against using a plain-blade driver for fear it might slip off the bolt head slot and fracture the stock.

Look for one of those socket-wrench drivers with its blade enclosed in a cylindrical sleeve, available from automotive tool suppliers. If the washers (#64 and 65) fail to come out with the bolt, they will tumble from the butt stock the first time it is pointed to the floor. Stock removal is a bit different on Cynergy models with adjustable combs.

Look at the sub-drawing at the top of the schematic on page 5.

DISASSEMBLY AND REASSEMBLY OF THE BROWNING CYNERGY SHOTGUN CONTINUED

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“A” A Adjustable Comb Base B Front Base Screw C Middle Base Screw D Rear Base Screw E Comb Mount F Comb Mount Screw G Adjustment Screw H Adjustment Screw Washer J Web K Web Set Screw 1 Barrel Lug Bushing 2 Left Cocking Lever 3 Right Cocking Lever 4 Cocking Link 5 Ejector Sear Link Spring Plunger 6 Left Ejector Cam Link 7 Right Ejector Cam Link 8 Ejector Retaining Pin 9 Ejector 10 Ejector Sear Link 11 Ejector Sear Link Spring 12 Ejector Sear Link Stud 13 Ejector Sear 14 Ejector Sear Stud 15 Ejector Spring Guide 16 Ejector Spring 17 Left Ejector Striker 18 Right Ejector Striker 19 Ejector Timing Adjustment Screw 20 Firing Pin Cross Pin 21 Firing Pin 22 Firing Pin Spring 23 Forearm 24 Forearm Bracket 25 Front Forearm Escutcheon 26 Rear Forearm Escutcheon 27 Left Forearm Insert 28 Forearm Insert Nut 29 Right Forearm Insert 30 Forearm Insert Screw 31 Forearm Lever Pivot Pin 32 Forearm Lever Spring 33 Forearm Locking Lever 35 Front Forearm Screw 36 Rear Forearm Screw 38 Inertia Mass 39 Inertia Mass Retaining Pin 40 Locking Cam 41 Locking Cam Screw 42 Locking Pin Bushing 43 Locking Pin Cross Member 44 Left Locking Pin 45 Right Locking Pin 46 Locking Pin Screw 47 Recoil Pad 47A Recoil Pad Screw (2) 48 Rocker 49 Rocker Pin 50 Rocker Pin Retainer 51 Safety Index Ball 52 Safety Retaining Pin 53 Safety Spring

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54 Sear Link 55 Sear Link Screw 56 Sear Spring 57
Selector 58 Selector Button 59 Selector Button Pin 60
Selector Pole 61 Center Bead Sight 62 Front Bead Sight
63 Stock Bolt 64 Stock Bolt Lock Washer 65 Stock Bolt
Washer 66 Stock 67 Left Striker 68 Striker Nut Lock Pin
69 Striker Nut Browning Cynergy Over/Under Shotgun
(Specifications subject to change without notice) 70
Right Striker 71 Striker Spring 72 Striker Stop 73
Striker Stop Pin 74 Striker Stop Spring 75 Tension Adj.
Retaining Screw 75A Tension Adj.

Screw 76 Top Lever 77 Top Lever Disconnect 78 Top
Lever Retainer 79 Top Lever Retaining Plunger 80 Top
Lever Retaining Spring 81 Top Lever Spring 81A Top
Lever Spring Pin 82 Top Lever Spring Stop 83 Top Lever
Spring Stop Screw 84 Trigger Link Disconnect 85
Trigger Link Disconnect Set Screw 86 Trigger 87 Trigger
Disconnect 88 Trigger Guard 89 Trigger Guard Screw
90 Trigger Link 91 Trigger Pin 92 Trigger Spring 93
Trigger Stop Pin

DISASSEMBLY AND REASSEMBLY OF THE BROWNING CYNERGY SHOTGUN

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identifies the base. It's bedded in with a proprietary compound before the screws are added. The base has a milled slot in its top that fits the dovetail in the web (J). When the web set screw (K) is loosened, the comb can be moved right or left to adjust cast. It is vertically adjusted for drop by backing off the adjustment screw (G) with a 4mm Allen wrench that's inserted through a hole in the comb (N/A).

The clever Browning engineers have replaced a slot or hex head with an Allen-head stock bolt and cut a channel in the bottom of the base. This allows the use of a T-handle wrench to reach the bolt, which need not and should not be completely backed out. Regardless of whether the shotgun has an adjustable comb or not, the action has to remain closed to keep the top lever in its middle position while you remove the stock. In most cases, it can be pulled straight back without great resistance.

A stubborn stock can be "encouraged" by using the heel of your hand to bump the pistol grip upward and wobbling it from side to side as you simultaneously tug on the back end. Why do you have to keep the top lever

centered? So it won't scrape up the stock, which it could do if the action were open. Open the action and you'll see what I mean. The top lever kicks to the side. While you have the gun open, run a fingertip over the upper breechface. Feel a little, hard lump? That's the top-lever disconnecter (#77).

It protrudes through the breech to contact the barrels when the action is closed, and gets pushed back into the lever by the barrels and releases the lever to center on the receiver. (More about the lever and its related parts later.) The trigger guard (#88) is retained by a screw (#89) located in the lower back end of the receiver. The guard's front end has a "hooked-in" arrangement with the receiver.

Retract the guard screw with several turns but not all the way out, then pull the guard to the rear and it drops free. The selector button (#58) and selector (#57) are the same for all gauges. The button is retained by two pins (#59). They slide out to release the button. Take a closer look at this area on the schematic. The safety-retaining pin (#52) has to be pulled out so the selector will slide to the rear.

DISASSEMBLY AND REASSEMBLY OF THE BROWNING CYNERGY SHOTGUN CONTINUED

ORIGINAL PAGE 6

Keep a finger over where the selector button used to be as you pull the pin; otherwise, the safety-index ball (#51) and safety spring (#53) will fly. Once controlled, they can be lifted out with a small magnet. As mentioned, the Cynergy has a mechanical trigger system. The gun doesn't use recoil to set up for the second shot. Instead, an inertial mass (#38) has been designed in to serve as a disconnect and prevent doubling. The mass has a roll pin (#39) attaching it to the trigger link (#90).

In turn, the link is held to the trigger by the pin (#91). This entire subassembly is freed by drifting out the trigger pin and should remain as a complete subassembly. Incidentally, pins #91 and 93 are identical. The striker stop (#74) is identified as a spring on the parts list. It's really a weight that prevents a striker from hitting a firing pin when the trigger is depressed. Older versions of the Cynergy carried two small points on the trigger itself to catch strikers.

The striker stop has had height added to it and assumed the responsibility. It's an added safety feature against an accidental discharge if the gun is dropped, so leave the stop and trigger as is. Both left and right rockers (#48) are interchangeable. However, they've been factory fitted to ensure the same trigger pull on both barrels. I

recommend you mark which is left and which is right, either before or after you remove them by pushing out the rocker pin (#49). The schematic is incorrect regarding this pin.

It is inserted from the left side of the receiver, not the right. Therefore, its head will be on the left and its clip (#50) on the right. After popping off the clip, drive the pin toward its headed end. I use the term "drive" because mere drifting may not move it. Part #49 is knurled under its head to prevent the pin from rotating. If it were free to turn, firing one side could put enough pressure on the other side to double the gun. If this was a rifle, the next item to be addressed would be the primary sear.

In the Cynergy, the sear links (#54) amount to the same thing. Each one is retained by a link screw (#55). A 3mm Allen wrench backs them out. The sear springs (#56) will remain in the links. They're deliberately made larger at their seating end to stay put. Now close the action. The left striker (#67) and right striker (#70) will move to the rear. What look like rods on the drawing are striker springs (#71). To take the strikers down further, remove the striker-nut lock pins (#68). These are cotter pins.

FROM THE ORIGINAL PAGE

The striker nuts (#69) resemble castle nuts. You'll have to machine a blade screwdriver or driver bit to clear the "castle" part, reach the nut, undo it, and relieve the spring pressure. At this point, you've taken out all striker components from the back of the receiver, and can move on to the

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locking pins (#44 and 45). Note that pin #44 is slotted to fit into the top lever. In reassembly, it must be put back where it came from. If I'm reading this drawing correctly, that means on the left side of the gun. The screws (#46) securing both locking pins are Allen heads, 3/32-inch English thread, and held in place with a mild thread-locking compound. The thread compound may fight you a little, but will "pop" audibly when you've torqued it enough to loosen up.

When both screws have been backed out, it's more than likely the locking-pin crossmember (#43) will fall free. Hopefully, you'll catch it. The trigger-link disconnect (#84) runs through and is retained in the cross member by another 3/32-inch set screw. The firing pins (#21) are spring loaded (#22) and are interchangeable from one barrel to the other. Their cross pin (#20) retains them. It's knurled at one end and has to be started right to left. Keep your thumb behind each firing pin as you push out the cross pin.

When observed from inside the receiver, the firing pin holes appear to be drilled for a side-by-side double gun. They're not. One angles up. One angles down. The top lever (#76) is centered. Another screw (#41) wearing

thread locker runs through it and threads into the locking cam (#40). The cam reaches down into the locking bolt. You can remove the screw, but the top-lever disconnect, retaining plunger, and spring (#77, 79, and 80) are still within the lever.

Remember them as you work the lever back and forth while lifting it out and cover the hole those parts are in until you have the lever held over a magnetic parts tray or inside a plastic bag. After you let loose, count the pieces that popped out. Parts #79 and 80 may be there. Part #77 may not. Where to look? In the receiver. Use a magnet or the indispensable paper clip. Leaving it where it is only guarantees it will fall out someday, somewhere never to be seen again.

From where you are now, concentrate on the top-lever spring (#81). All such springs are murderously heavy and this one does double duty. It applies pressure to the trigger-bar disconnect (#87) that does likewise to the rocker(s) to take pressure off the firing pins when the action is opened. This feature cuts way down on pins getting stuck in spent primers. The trigger-bar disconnect contains a tiny roll pin (#81A). It stays where it is.

You can back out the spring-stop screw (#83) if you have a 2.5mm Allen wrench handy. When you do, the toplever spring stop (#82) will probably stay in the receiver, with its spring (#81) providing plenty of pressure. Unfortunately, to remove the stop you first have to remove the spring, but there's no magic needed to do it. A small tool employed as a lever under the spring will start it up and on its way to out. Be aware that this spring is an independent cuss.

When you have it almost out, it can decide to complete the process and say "bye-bye." Controlling it is to your distinct advantage. Let's suppose that spring #81 has been showing signs of weariness or is broken. To replace it, you have to push the lever-spring stop forward with a screwdriver before you can move the disconnecter back through the receiver. And it ain't real easy working against that spring. The cocking levers (#2 and 3) along with their respective links (#4) stay with the receiver for the moment.

The levers will be inside their receiver slots, and the links still through their holes in the breechface. A post on the end of each link serves as a pivot for its associated lever. Push the links forward one at a time and you can lift off its lever. After that, withdraw the links. The trigger-guard screw remains in the receiver along with the selector pole (#60). The pole should stay put because it indexes the safety and it's pressed in.

Though not present in steel receivers, there are two hardened stainless-steel bushings pressed into the breech face of aluminum alloy receivers. They're not removable, but you'll know they're in there. All alloy Cynergy receivers are stamped "Feather." Now move along to the forearm bracket. Back out its front screw (#35) and rear screw (#36). The locking lever pin (#31) gets pushed out in either direction to let go of the lever (#33).

The lever spring (#32) is held in place by a standard thread screw (missing from the drawing). While the lower tension-adjustment screw (#75A) is a set screw assigned the job of tightening the bracket, once it's tight, the upper screw wearing the same number keeps it tight. Parts remaining in the bracket are related to the ejectors. All retaining screws involved with the ejectors have been staked in to prevent rotation, which would throw off the factory-set timing of the ejectors.



FROM THE ORIGINAL PAGE

As I did in the past with the Citori, I've decided to devote a separate article to timing Cynergy ejectors rather than include the information here. Fortunately, however, timing is much simpler with the Cynergy than with the Citori. Which brings me to the barrel as-

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DISASSEMBLY AND REASSEMBLY OF THE BROWNING CYNERGY SHOTGUN CONTINUED

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sembly and your need once again for the “castle-nut” driver you made earlier. This time it’s used to compress the spring (#16) of each spring guide (#15) individually. The ejector assemblies (parts #7, 8, 9, 17, and 18) are removed to the rear as units. Note: parts #8 are rivets, and replacements will be required if they’re taken out. The barrel bushing (#1) is another hardened insert that is press fitted and then soldered in place. All this security supposedly prevents recoil damage to the bushing.

Adjustable Stock Details The Cynergy model I used in preparing this article had a wood stock, but no adjustable comb. Regardless, I’ll discuss why an adjustable comb is advantageous and how to adjust the one that’s available on the Cynergy. The stock fit against a shooter’s face determines how consistently the dominant eye will align with the sight plane along the barrel rib when the gun is brought to shoulder. Cast and drop are critical factors in achieving this consistency.

With right-handed shooters, “cast off” is the distance the comb must be positioned to the right to gain an ideal sight picture with no bending of the neck. “Cast on” is the distance the comb is positioned to the left to gain the same ideal for lefthanders. “Drop” applies to the vertical distance between the top of the rib and the top of the comb, and the raising or lowering of the comb to provide the ideal sight picture.

What’s “ideal?” Each time the gun is shouldered, the front bead should be sitting on top of the middle bead with no rib visible between the beads. An old-time gunsmith who specialized in stock fitting once told me never to increase or decrease the length of pull after adjusting for cast and drop. “It changes the barrel-to-comb alignment,” he said. I’ve never forgotten his advice.

I’ll add another piece of advice to that of the old-timer: On Cynergy adjustables, merely loosen the combadjusting screw (G) by inserting an Allen wrench into the hole in the comb when moving the piece vertically. Don’t keep cranking the wrench. The insert (E) is mounted to the comb by twin screws (F). If you fail to let upon “G,” you’ll split the wood. Reassembly Tips I think it’s safe to assume that sooner or later you’ll be offered a plastic bag of parts that began life as a Cynergy shotgun.

And you’ll have a choice: Either follow the sequence below for its reassembly or hand the bag back to the person who brought their problem in the door. Reattach the Browning’s cocking levers to their rods and insert the rods into the receiver. Then slip the springs on the rods. Next, open the action to compress the springs. Reassemble the locking-pin assembly in the reverse order of the disassembly instructions.

When positioning the cross member (#43), its clearance cut must face upward and the hole in the face of the part must be to the rear. After the locks have been secured with the little cotter pins, the striker springs will be captured. Install parts #77, 79, and 80 in the top lever. Depress them and cover their hole in the lever until you can insert the lever far enough into the receiver to block the hole. Insert the trigger disconnecter (#87) under the top lever and rockers.

Take another look at the top-lever spring. One end is smaller than the other. The small end fits over the top-lever spring pin (#81A). The larger end engages the top-lever spring stop (#82). Though you can spot its recesses fairly easily in the upper tang, the stop is somewhat tricky to reinstall. My contact at Browning does it by removing the bit from a Mag Na Tip driver, using the bitreceptacle end of the driver to help locate the stop over its slot by

DISASSEMBLY AND REASSEMBLY OF THE BROWNING CYNERGY SHOTGUN CONTINUED

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This pin may have to be encouraged to complete the final 1/8 inch of its full seating. Snap on its retaining clip (#50) and then go to work on the safety. Install the safety spring, place the index ball over it, and depress both. Start in the retaining pin (#52) enough to capture the ball. The selector (#57) has to engage the trigger link (#90) with the “fork” in the link positioned over the selector.

Now you can push the retaining pin through the assembled parts, add the selector button with its longer end toward the muzzle, and then push the button pins (#59) through the receiver and assembly to hold them

together. With the action open, run a fingertip along the upper arc of the breechface to check for the presence of the top-lever disconnecter. You should press it in a few times to ensure its freedom of movement. Okay, now insert a dummy round and close the action. Did it sear up? Great.

Move the safety off and pull the trigger. Striker released? Great. Open the action, close it, and snap the safety “on.” Pull the trigger. No striker fall? Great again. Take it to a range and shoot it. And finally, hand the shotgun back to its owner along with a tidy bill for services rendered. I

MAINTENANCE & REPAIR

Beware of the \$2-an-Hour Job

There are any number of problems that can turn what should be a simple, profitable job into a losing proposition.

BY ARTHUR J. HUNT JULY 2008

ORIGINAL PP. 9

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Gunsmiths actually work for \$2 an hour? Sure, happens all the time. Sometimes it is because of inexperience; he doesn't understand the workings of a particular gun. Perhaps, in his eagerness to succeed, he undertook to repair a gun, only to find out later that there is no schematic and precious little information available. Or it could be something as simple as a frozen screw or a broken tap that turns what should be a simple half-hour job into an all-day nightmare.

Some of these problems can't avoided, but they can be minimized. The first instance cited above can be corrected easily. If you don't know anything about the gun, tell your customer so and approach it from that standpoint. No one can be expected to know everything about every gun. Tell him you need to take a few minutes to search your library for information before you can accept the job. I've often said that every gun manufacturer or importer should be required to provide technical bulletins for gunsmiths.

In the real world, however, this is never going to happen, so you have to do what you can to protect yourself. You can easily spend an hour or more before you even begin to realize what a particular job entails. And if a

gun is delivered to you in a plastic bag, it could take hours just to determine what, if any, parts are missing. Moreover, once you get that piece of iron apart, you still don't know what kind of trouble you'll run into getting it to function as it should.

This, of course, brings me back to my words of caution in previous articles about giving estimates. You can't estimate what a job will cost until after you know what it will involve. Let's assume you took the job, you got the gun apart, and you have the three hands you'll need to put it back together. If you told the customer you thought it would be a \$30 job, you're stuck with it because you started it, even if it takes you five or 10 hours to complete.

You owe it to yourself to tell the customer what it will cost to take the gun apart and diagnose the problem. Then stop at that point while it is still profitable. Call the customer then and tell him outright whether or not you think you can fix it. If you can (and be honest with yourself), you can give him an estimate at that point of the cost of parts and labor. Basically, you're feeling the customer out to find out how far he's willing to go to put the gun back in service.

While we're on this subject, don't ever be afraid to admit you can't do a particular job. Hell, I can't do brain surgery, and I'm not afraid to say so. You're always going to stay on the good side of your customers if you keep telling the truth. So watch yourself, be sure of yourself, know your limitations, and be very cautious when venturing beyond your past experience.

Even being cautious, you're going to have plenty of jobs that run over the time limit, leaving you in a position where you can't really charge for the extra time. But don't go looking for this kind of trouble. Sometimes you can (and should) chalk this extra time up to "education." I mean, how does a gunsmith gain experience and knowledge if he doesn't occasionally try something he's never done before? But before you take a job for the value of the experience, look carefully at the gun.

Is it a model that you're likely to be dealing with frequently, or is it an isolated case? If it is the later, you might not want to fool with it—especially if you're busy with guns you know about. If you're determined to learn something new, then go back to the shop at night and start in on it. Don't expect to make money on the job; instead consider the time spent as additional education and satisfy yourself. The best gunsmiths I know are self-taught.

They tread where others fear to tread, but they do so with reservation and caution. They have enough mechanical ability and know-how to take on a troublesome job, but quite often they learn that these jobs are not worth their time. So there's always something else to learn, but eventually you need to learn "to just say no." Gunsmiths can be divided into two types: The first is like the old "country doctor" who treats all illnesses and usually does a pretty good job.

Then there's the specialist, be it in custom rifles, gunstocks, pistolsmithing, or whatever. He's the man the country doctor will send you to if the job is out of the range of the "general practitioner." You can decide to be either of these, but you will obviously walk before you run. You'll probably have more competition as a specialist than as a G. P. If you don't mind that, go ahead and specialize. I prefer being a G. P. I like the variety. But I use the services of specialists all the time.

FROM THE ORIGINAL PAGE

This approach keeps more customers happy. Even if I don't do the specialized jobs myself, I provide a service to my customers by getting the job done. Because I'm a gunsmith myself, I can talk to the specialist in his own language and ensure that the job will be done in a manner that will satisfy my customer. Think about it.

THIS DIGITAL ARCHIVE PRESERVES THE RECOVERABLE SOURCE TEXT.

PEOPLE & COMPANIES

Timney Trigger Installation on the Winchester Model 70 Rifle

As a practical measure, installing an aftermarket trigger on the venerable Model 70 Winchester will greatly improve its performance.

BY NORMAN E. JOHNSON JULY 2008

ORIGINAL PP. 10-13

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Part of the accuracy workup on the Winchester Model 70 Stealth II short-action rifle shown here included installation of a new trigger. Timney makes an excellent trigger—I used their Model 401 and found it to be quite fine. Incidentally, at around \$115. The improved performance, as I’ll detail in a moment, made the cost seem even more reasonable. Installing the Trigger This trigger for the Model 70 was designed by Timney back in the 1960s to alleviate one of shooter’s biggest complaints with this rifle.

The rugged but lightweight Timney trigger is made of 6061 T-6 aluminum alloy, with hardened steel at all wear surfaces. It’s adjustable from under 2 pounds to nearly 4 pounds, without creep or overtravel. Complete instructions come with the trigger, written in easy-to-understand language. The rifle must be unloaded, of course, and the barreled action removed from its stock. This will give you access to the trigger sys-

tem. To begin the installation, place the barrel in a padded vise with the trigger assembly upward.

All parts will then be accessible and held steady. Remove the factory trigger by tapping out the pin. Remove the bolt stop, bolt-stop pivot pin, and its spring. (The boltstop pin releases the coil spring that activates the bolt stop.) This spring is under some pressure, so be careful not to lose these parts—they will be reused. After lifting out the old trigger from the action, place the new trigger into position with the pin holes aligned. Then work in the pin that holds the bolt stop and spring in position.

Some downward pressure will be needed against the coil of this spring to insert the pin. Then tighten the retaining screw located at the forward part of the trigger, and put moderate tension on the lock nut. As it would be on other Model 70s, installation of the Timney trigger on the Stealth II

shortaction was totally without complication. Using a Lyman digital scale for testing, I was able to adjust the trigger pull down to a safe 1 pound 4 ounces. The adjustments are easily performed but must be done carefully.

All you’ll need are an open-end, 1/4-inch wrench and a small Allen wrench. Positioning the action in the stock will retain the pins, so no adhesive is necessary on reinstallation. The lower front screw is the trigger-pull adjustment screw. It’s set at 3 pounds from the factory. Turning this screw counter-clockwise lightens the pull weight. Timney does not suggest going below 2 pounds on trigger-pull weight. The upper front screw is the trigger “backlash” or overtravel adjustment screw.

Avoid excessive tightening of this screw or the firing-pin fall can be slowed or even stopped. I didn’t find it necessary to alter this adjustment. The rear screw is for the sear ad-

TIMNEY TRIGGER INSTALLATION ON THE WINCHESTER MODEL 70 RIFLE CONTINUED

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The supplied instructions clearly detail both the installation and the adjustments. Just-ment. Sear engagement is preset at the factory when the trigger is tested. Timney says it should not be decreased below the factory preset. The knowledgeable gunsmith, however, can perform a more sensitive sear adjustment in conjunction with trigger-pull weight. Depending on the individual rifle, it's possible some stock material may need to be removed where the trigger mechanism passes through the mortise.

A small chisel does the job here. Some attention at the sides of the trigger guard may also be required. If the trigger shoe is too long,

minor grinding to shorten it may be required. I did not find this necessary. Further Instructions If, after the trigger installation, the safety fails to function correctly, it may be necessary to make additional The Timney aftermarket trigger is held securely in place by the two original pins and the forward locking screw. adjustments within the bolt.

The instructions provided cover this in detail, if required. I've installed the Timney Model 401 trigger on many Model 70 Winchester rifles. All went without a hitch, and the original bolt-type safety worked fine. The Winchester's three-position bolt safety can be hard to move from one position to another

right out of the box. Most of these safeties will work more easily after working the thumb lever back and forth, as needed, and applying a good lubricant.

The firing-pin assembly can be screwed out of the bolt with the safety in the centermost position. Conclusion Installation of anew Timney trigger on the Winchester Model 70 will result in a very smooth and safe trigger. Moreover, the Timney aftermarket trigger is designed to outlast the rifle. If you don't feel comfortable doing the installation or if your customer is in a hurry, Timney will install the trigger for an extra \$40 plus \$8 for shipping and handling. I

PISTOLS

Slicking Up the Uberti Cowboy Revolvers

Although some are better than others in out-of-the-box condition, any of these popular price-point revolvers can be made smoother and easier to handle.

BY ROBERT K. CAMPBELL JULY 2008

ORIGINAL PP. 14-17

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Over the years, I've worked with a dozen or so Uberti singleaction revolvers, and have reached several definitive conclusions borne out by experience. First and foremost among these conclusions is the opinion that some Ubertis are better than others. Your customers would be well advised to look hard at the Navy Arms Deluxe or the Navy Arms Gunfighter, or the Beretta Stampede, which is a Uberti by another name.

At present, I believe these are the best examples of the breed and are far better fitted than anything Uberti produced in earlier years. The Beretta Stampede appears to be the "flagship" of the Uberti line and as such is well finished. The Gunfighter is fitted with premium W. C. Wolff springs from the factory, and the timing and action are good. Other Uberti specimens tend to be more "middle of the road" in quality, and made to sell for less.

Thus it seems Uberti is a bit like General Motors, in that its revolvers serve different tastes and budgets from Chevrolet up to Cadillac. Generally speaking, the more you pay for a Uberti revolver, the better product you're going to get—which is as it should be. In any case, the Uberti will cost a fraction of

the price of a new Colt Single Action Army. As you might suspect, there are some problems that are commonly encountered with Uberti revolvers.

Before we get into those, let's talk about how to test the Uberti for function. Some of these revolvers have grinding parts that are obvious as soon as the revolver is cocked. In other words, we have to look at adjustment before getting the revolver into specification before we look at improvements. I find that the two most common problem areas are the hammer cam and the bolt. If these two parts are out of whack, then adjustment must come before attempting to smooth the action.

A bolt that rises too early on the cocking stroke will leave a scratch around the cylinder of a single-action revolver. Sometimes this ring results from bad timing and sometimes from a form of bad handling. If the piece is brought to half cock and released without going to full cock, the hand rises and leaves a ring around the cylinder. So, when checked out, the bolt may allow a little penetrating oil to soak in before attempting to remove them. It's okay despite the appearance of a ring around the cylinder.

If the shooter cocks the revolver all the way to full cock each time, the ring is less likely to be imprinted on the cylinder. The hammer cam activates the bolt. The cam is timed to unlock the cylinder as well. If the hammer cam is bad, it may be reworked, although the simpler alternative is usually to replace it. If you're familiar with the Single Action Army, disassembling the Uberti revolver should produce no surprises.

When field stripping the Uberti, I often find loose grip frames, which can't be good for accuracy. I also believe this basic action, designed nearly 150 years ago, is not well suited to the pressures of heavy handloads in the .45 Colt versions, and not ideal for the Magnum cartridges in the .38- and .44-caliber versions. I tell my customers to stick with .38 Special or .44 Special loads, especially with the brass-framed revolvers.

That's not to say there's anything wrong with the use of brass to help keep manufacturing costs low. These are, after all, purely recreational pieces. When disassembling the grip frame, I carefully loosen the screws a

SLICKING UP THE UBERTI COWBOY REVOLVERS

CONTINUED

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little at a time. This seems to make for less binding, especially with well worn screws. And it's never a bad idea to spray penetrating oil into the screws and wait an hour or longer before you attempt to remove the screws. Once these screws are removed, you may find the backstrap is tight on the frame. Rock it gently to the rear and tilt the top of the backstrap off the frame. One-piece grips are easily plucked away. Those with a screw will have been removed at the beginning.

Next, remove the hammer-spring screw from the bottom of the triggerguard and rock the hammer spring out from under the hammer. Then place the frame upside down and remove the trigger guard screw and the trigger guard. Study these parts. The newer Ubertis have a hand similar to the Ruger, while the older models are more Colt-like. Repair and smoothing procedures are the same for ei-

ther, but there is a spring and plunger in the newer pistols that must be captured and preserved. It is near the back strap screw holes.

Next, remove the hammer by removing the hammer screw first and then lowering the hammer in the frame. Remember, the hand pivots on the hammer. With the frame upside down, take a good look at the trigger spring and then remove the triggerspring screw and the spring itself. At this point, one possibility for smoothing the action is to reduce the power of the springs. The hammer spring can be lightened by running the spring on a grinder. Thin the spring lengthwise, especially close to the retaining screw.

Any crosscuts will tend to weaken the spring and they will break. Also, be aware that the temper of the spring can be lost if it becomes too hot to hold, so take your time and do the work gradually. When working with the trigger spring, remember that the short leg of

the spring is the bolt leg. There's nothing to be gained from modifying that part. The longer or trigger leg can be bent to be a bit straighter, but only experience or trial and error can produce the proper bend by eye.

The trigger action should be lighter after you have bent and thinned the spring. Another alternative is to order reduced-power springs from W. C. Wolff company. This is probably the safest and simplest method, and will probably produce the most consistent results. While the hammer is out, you need to carefully polish the hammer cam. The Uberti is manufactured with a one-piece hammer, while the SAA has a removable hammer cam.

The angle of the cam absolutely must be preserved, but the function can be improved considerably by polishing rough spots and burrs from the hammer cam. At this point, you should reassemble the pistol and try it for function. It's rare to get it just right

SLICKING UP THE UBERTI COWBOY REVOLVERS CONTINUED

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the first time. An additional step that some feel is an aid in trigger action is to place a leather shim between the hammer spring and strap under the screw. The late Skeeter Skelton found that this not only improved the trigger action, it also caused the spring to flex less for virtually the same power. I always test ignition reliability with empty cases that have been primed with large rifle primers rather than the normal large pistol primers.

These primers are more resistant to ignition and pressure than even Magnum pistol primers, and are an excellent judge of ignition reliability. (Rifle primers should never be used in conventional revolver handloads.) If the rifle primers go bang, the revolver will work with any factory load or good handload.

Of course, I'm much more cautious with a handgun destined for personal defense, but single-action revolvers are used almost exclusively for recreational shooting and hunting these days. (For what it's worth, the only Uberti revolver I've seen that I would trust for personal defense is the Navy Arms Deluxe, but only after changing the base

pin.) These simple procedures above should help in smoothing any newproduction Uberti.

Some of the older types, particularly those with brass frames, are much rougher and may call for individualized procedures appropriate to the particular handgun. For example, with some Ubertis, I've polished the high spots on the sides of the hammer to reduce friction and bring it to an acceptable fit. For this job, 800 grit seems to be about right. A needle file can be used to work the hand channel. The hand and the bolt sometimes have burrs that need to be addressed.

Another spot that's easy to work while the pistol is disassembled is the bushing and gas check. This is supposed to deflect unburned powder from the bolt, thus preventing binding from a buildup of powder ash. Depending on the powder used, fouling can be troublesome. If this bushing and the cylinder pin are polished, the cylinder will revolve much more smoothly, even with full-power springs. This is almost a "free lunch," producing smoother movement with no loss in spring power.

Don't overpolish, however; I've seen a single-action revolver that would spin the cylinder right past lockup and miss the next round. We discussed the hammer cam earlier. The cam contacts the cylinder-locking bolt and raises the contact end of the bolt. This lowers the opposite end of the bolt, releasing the cylinder, and allowing the cylinder to rotate. As the hammer is fully cocked, the cam releases the locking bolt and it tilts into place again, locking the cylinder.

To adjust the timing of a single-action revolver, the flat area of the cam can be adjusted by the removal of a small amount of metal. By removing a small amount of metal, the speed of lockup is improved, but if you remove too much, the hammer will have to be replaced. The sear sometimes needs attention. I've been able to determine the correct sear height for most Uberti revolvers.

Many have sears that are higher than need be, and by grinding and smoothing to .031-.032 inch, you should have good engagement with less creep. If the sear is too long, naturally, you get a bit of creep. Don't be surprised if you find the Navy Arms version to have a well-polished sear of the proper height. If you polish the

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sear, all the original angles must be preserved. Otherwise, the hammer could be cocked, hang for a moment, and then release. This happened to noted writer Skeeter Skelton, and he was lucky to lose only the toe of his expensive boot when it happened. Now let's take a look at the Uberti's cylinder. Sometimes the cylinder has rotation problems. When you remove the cylinder from the frame, check forend shake. End shake is an uneven movement that results in the front of the cylinder moving against the barrel.

This will produce rubbing on the front of the cylinder that is often visided visual inspection. A to check for end shake is toe barrel/cylinder gap. The gap should be consistent with each cylinder, so check all six. The alignment can be tight or loose, ranging from .004 to .008 inch in the case of the Uberti revolvers. A barrel/cylinder gap on

the tight side will give better accuracy but foul more quickly with unburned powder. (The U. S.

Firearms Rodeo revolver, for example, is a very well-made revolver with a barrel/cylinder gap of about .002 inch.) End shake can also produce poor timing. When the hand comes up to move the cylinder, a wobbling cylinder will require more force to rotate. The cure is usually to install anew base-pin bushing. Work the old one out and install the new bushing, being certain that the barrel/cylinder gap comes in between .004 and .008 inch at the most.

Once you begin working with the Uberti single-action revolver, you'll find that one of the fairly common problems is binding of the ejector-rod spring. This is just as common with the 7-1/2-inch-barrel revolver as any of the others. The problem is the spring binding at the end of its travel and not springing back as quickly as the shooter would like. This problem is a con-

cern in cowboy-action shooting. To solve this problem, I simply cut a few coils from the spring at a time and reinstall and test.

Most of the time, the first cut cures the problem. A final concern is the base pin. Some base pins area bit sloppy and tend to work out. I don't like the longer base pins delivered with some Uberti revolvers. Even the Navy Arms Deluxe, one of the best of the Uberti revolvers, uses this pin. If the base pin is pressed too far into the frame, the pin protrudes out the rear and the firing pin can't fully contact the cartridge primer.

I like the USFA and Colt pins much better, and routinely use them to replace the Uberti base pins. The Ubertis are not what I would call finely made revolvers, although the nickel-silver gripstrap and Wolff springs in the Navy Arms version area step in the right direction. Still, for the money, they're hard to beat, which means they'll always be popular with the cowboy-action crowd. I The softmetal screws are easy to mar.

RIFLES

Sporterizing the British Enfield

The slick-actioned Enfield can be turned into a fine hunting rifle with relatively simple techniques and inexpensive aftermarket parts.

BY BRIAN E. CAPPS JULY 2008

ORIGINAL PP. 18-21

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Recently, one of my favorite customers asked me to build a rifle for his son to use on an upcoming deer hunt. He and I share a fondness for surplus military rifles' Mousers, Mosin-Nagants, you name it. My task was to take a badly abused British SMLE (No. 4 Mark 1) and make it look good and shoot great. It would require extensive work; someone had already hacked several inches from the end of the muzzle and "customized" the original wood. At the next local gun show, I found a replacement stock and got to work.

It is said that the Germans build hunting rifles, Americans build target rifles, and the British build battle rifles (or something like that). If you've never had the opportunity to work the bolt action on a British Enfield, you're in for a treat; it's probably the slickest, quickest bolt gun on the planet. But all this comes at a cost.

The action has a reputation for being "springy," and along with a generally oversized chamber, is so rough on cartridges that most shooters get only one or two fullpower loads from their .303 cases before they split in half. This was never a problem for military use, of course, and for hunting, it just means using new brass. But it could be a consideration for target shoot-

ers. The Enfield has also been criticized by some hunters for not being as powerful as the .30-06.

Ballistically, it's closer in strength to the .308, but miles ahead of the .30-30. Then there's the matter of the 10-round magazine, illegal in most states because it holds too much ammo. Thus, there are lots of things that need to be addressed before the Enfield is ready to go after a trophy buck. The first step in a project like this is to field strip, give the rifle a thorough cleaning, and make a careful analysis of what you've got to work with.

If you don't already own a copy of *Bolt Action Rifles* by Frank de Haas, I'll stop here while you get one. Got it? Good. This book is an excellent source of information, with diagrams and drawings that make the disassembly process a snap and it covers almost every bolt-action rifle ever made. With the barreled action spotless, the first check is for headspace. For one reason or another, many of these rifles will be found to have too much headspace and a quick check with a set of headspace gauges will tell the tale.

No gauges? No problem. When these rifles were assembled at the factory, the range of acceptable headspace measurements was .064 to .074. Headspace on a rimmed cartridge (like the .303) can be measured by using an empty brass case. First, use a micrometer or digital caliper to find the thickness of the rim of that particular piece of brass and then insert it into the chamber. More than likely the bolt will close easily.

Next, obtain some shim stock (cut up a soda can) or find some various thicknesses of sheetmetal in your scrap bin. Cut a piece of metal the same diameter as the brass, measure the thickness of the two items together, and use a bit of grease to hold the shim in place. Now gently close the bolt on it. Continue adding shims until the bolt will no longer close easily. While this method is not tremendously precise, it will give you a fairly good approximation of your Lee Enfield's headspace.

If you suspect your measured headspace is in excess of .074, a set of .303 gauges will be a good investment (see Figure 1 for Brownells part numbers), and then you'll know for sure. When dealing with excess headspace, most other rifles require you to The other item here is a shorter bolt head minus the extractor.

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remove the barrel, cut a couple of new threads on the lathe, put the rifle back together, and recut the chamber. The crafty Enfield designers came up with a simpler, easier solution're placeable bolt heads. The bolt head (the piece that rests directly behind the cartridge case) merely unscrews from the front of the bolt assembly, allowing quick replacement and testing. These heads are available in a variety of lengths, each one .003 inch longer than the last.

The higher the number stamped on the bolt head (from 0 to 3), the longer it is. When you find the one that gives the proper headspace, you're ready to go to the next step. This particular rifle required a change to the next size bolt head to make things right. The next step in this project was major surgery: The barrel needed to be shortened. It's times like these I wish I had a lathe, because a hacksaw seems so crude.

I have two good friends who own lathes and mills I can use when necessary, but in this case I settled for hand power. While the initial cut looks (and generally is) kind of rough, another hand-powered tool can be used to dress up the muzzle rather nicely. Over the years, I've purchased several facing cutters and they do a fine job of ensuring the muzzle is square with the bore. While a fairly good finish can be obtained with a file, I've never been able to match the perfect 90-degree angle a cutter makes.

For the final cut, a 45degree muzzle cutter will cleanup the lands and grooves. The final finish is made with a brass screw from the hardware. The 45-degree cutter uses the same handle and pilot to crown the barrel. On the right side of the photo are rimmed-cartridge headspace gauges next to some .303 rounds. store, mounted in a hand drill. The screw is spun at slow speed to allow an abrasive (valve-grinding compound will do the job) to remove the tiny burrs left by the 45-degree cutter.

When doing this deburring, go slow and move your drill in a figure-eight pattern to make sure no spot is polished more than another. The great thing about a project like this is that you can use your imagination and do as much or as little as you like. I wanted to do away with the original sights and mount a scope, so out came the hacksaw once again. The rear peep sight was removed, as was the base it was attached to.

After a few minutes work with a saw and a file, the receiver was no longer cluttered up with excess material. The SMLE action makes mounting Figure 1. Brownells Part Numbers for To .303 Headspace Gauges - #184-100-302 & 184-100-303 .303 Cal.

Action-Proving Dummies - #669-303-005
Acra-Glas Kit - #081-003-002 Book: Bolt Action Rifles - #251-903-601 Scope Mount Rings - #962-070-104 Spray-On Lacquer -

#083-046-806 Williams Scope Mount - #962-070-071 a scope in the traditional fashion (on top of the receiver like a Mauser) somewhat problematic, but the Williams Company provides a handy solution to the problem. This scope mount is attached to the left side of the receiver with three screws and uses offset rings to center the scope over the action.

The top portion of the scope mount (where the rings are attached) must be parallel with the top of the receiver'which can get a little tricky. When setting up to bore the three holes, the barreled action needs to be mounted in a vise very securely, and the vice should be firmly mounted to the table of your drill press. Many vises have an aggressive pattern on the jaws which can mar a rifle, but placing a few copper pennies at strategic places will allow you to achieve a tight fit without damaging the action.

Of course, other metals and other materials can be used to pad vice jaws, but pennies always seem to be convenient for me. Plus'and this is a big advantage'a few pennies only cost a few pennies! The rear of the scope mount will be approximately .040 in front of the ejector. (The ejector is basically a screw that is positioned forward of the safety). The receiver also has a ridge running parallel with the top of the ac-

SPORTERIZING THE BRITISH ENFIELD CONTINUED

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tion, and the mount should slide down the side of the receiver and come to rest on that ridge. Lock the mount in place using C-clamps so that the location of the holes can be marked. When the holes are drilled and tapped and it's time to mount the scope, use a thread-locking compound on the threads. Even though the .303 doesn't kick very hard, enough shooting will eventually loosen the screws.

Many states mandate a maximum five-cartridge capacity for deer rifles, so the next step was to modify the trigger guard/magazine holder to legal capacity. The following is a procedure that works well for me: Remove The electrical tape was added to show how it would be attached to prevent the stock and action from being glued together. The threaded object in the middle is the stock-attaching bolt. the spring and follower from the magazine and the magazine-catch mechanism from the trigger guard.

Use the now-empty magazine-holder portion of the trigger guard with a piece of heavy paper or thin cardboard and trace the outer dimensions. That tracing can then be used to

fashion a magazine bottom plate. Once you've cut out the tracing, place it on a piece of thick sheet metal and transfer the pattern to the metal. When the basic bottom plate is formed, make sure it fits the trigger guard and remove any rough edges with a file or sandpaper.

At this point, you will need to make a decision on the finishing process you want to use: bluing, sprayon coating, etc. The floorplate will need to be attached to the trigger guard by brazing or silversoldering, and bluing will not stick to either. If you plan to blue, great care must be taken to ensure no gaps can be seen and that any joining materials are removed from visible surfaces. I avoided this problem by using bake-on lacquer spray finish. It's easy to apply, and perfect for a field gun.

My choice of color was "Parkerizing Gray," which is non-reflective and just looks "right" to me on this rifle. Before the brazing process begins, take the magazine (minus the spring and follower), and push it up into its normal spot in the assembled receiver.

While holding the magazine in place, take a scratch awl or scribe and scratch a line even with the bottom of the trigger guard. (For size reference, note the photo of the modified trigger guard, magazine spring, and the shortened magazine.) Cut the magazine a little distance below the line and assemble the pieces when the new plate has been brazed to the bottom of the trigger guard.

You may need to file off a bit more metal from the bottom edge of the magazine, as the first cut may leave the modified magazine too long to fit on top of the new floorplate on the trigger guard. Obviously, proper magazine fit is necessary to ensure the rounds will feed properly into the chamber. I dealt with basic stock work in my article in the May 08 issue, but a two-piece stock is a different animal altogether.

The forward portion of the stock is fairly simple (just copy the original wood), but the buttstock needs special treatment as recoil can eventually crack or chip it. Look at the socket where the rear stock "plugs into" the receiver. It needs some help. Use whatever tools are at hand to

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roughen up the interior area of the socket and finish with brake cleaner or lacquer thinner; this area needs to be surgically clean. Support the action so that the threaded stock-bolt hole is parallel with the ground. We'll be filling part of that cavity with Acra-Glas epoxy. Mix a batch according to instructions and pour enough to almost cover the protruding metal in the upper left portion of the socket (see photo).

Let the mixture cure overnight and it's time for "Phase Two." To ensure the butt-stock is as strong as possible, cut off some of the forward stepped edge of the wood enough so it will not touch the dried Acra-Glas filler when plugged into the receiver. Drill a series of small holes or make some nicks in the wood which will allow the epoxy mixture to attach firmly to the stock and spray that area with brake cleaner.

Liberal apply the release agent (a quantity comes with the epoxy kit) to all the inner and outer surfaces at the rear of the receiver, the dried Acra-Glas at the base of the

socket, and the threads on the stock bolt. (We want to strengthen the stock, not permanently glue it to the action.) Now find your roll of electrical tape, which is needed for the next step. Place a piece of the tape on the outer lip of the stock, shiny side toward the end of the receiver (see photo).

Once the process is finished, this tape will leave just enough of a gap between the metal and wood to allow for stock swelling when the weather gets humid. Whip up another quantity of Acra-Glas, and pour enough into the cavity at the rear of the action to fill the space created by the shortened stock. (By "enough," I mean that a small quantity of epoxy will ooze out around the electrical tape.) Let it cure for three to five hours, then remove the stock and allow the mixture to finish hardening overnight.

This whole stock-strengthening process could be considered overkill, but to my way of thinking, it means the rifle can withstand hard use and the wood will remain in

good enough shape to be handed down to the next generation. Before the finish is applied to the metal, assemble the complete rifle's scope and all. Get your hands on some dummy .303 rounds (no live ammunition should ever be in the shop) and make sure the action feeds and cycles the dummy cartridges through the magazine. Check the trigger pull.

In my opinion, it should be at least 4 pounds. Look the entire rifle over one more time before you put the finishing touches on the metal and wood. You certainly don't want to do a great refinishing job on the wood and metal and then find out that something doesn't work just right. So there you have it. In this project, an old beat-up war club was turned into a fine hunting rifle.

With the shortened barrel, anew, correctly dimensioned stock, and a scope for more accurate shot placement, it will be a joy to carry in the woods. I think I'm going to build another one just like it for myself. I

PEOPLE & COMPANIES

Reader Forum

BY AMERICAN GUNSMITH EDITORS JULY 2008

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Marlin Screw Search I'm in need of a magazine-tube stud screw for a Marlin M36, 2nd variation. The Brownells Encyclopedia (13th printing) lists this as part number 36-53 and also lists the thread pitch as a .137 x 42. I was going to make anew screw, but this pitch is new to me and I can find no reference to it anywhere. Could this be a mistake? Any input from you guys would be greatly appreciated. George M.

Burkhart Lancaster, Pennsylvania The book you refer to is usually reliable, but typographical errors do occur even in the most carefully edited manuscripts. You're advised to call Marlin Firearms at and either request engineering or historical assistance (or both). We are more than reasonably certain the factory records can resolve this problem for you. Rough-Bored Walther I have a Walther P-38 with a bore that's pitted and rough. What's the best way to clean it up? Thanks.

First, give the barrel a thorough cleanout. If the pitting is deep and the roughness excessive, you'll probably have to search for anew barrel. If not, lap the bore repeatedly with JB or a similar cleaning/polishing compound. Butchered MAS Barrels About a year ago, I took

in a MAS 49 as part of a trade, figuring to add it to the parts pile because I had been told that it didn't function properly. Then six months ago, along-time customer bought a MAS 49/56 on-line.

When it came in, I inspected it and advised him not to fire it. When the importers' who shall remain nameless' converted the rifle from 7.5mm to 7.62, they butchered the breech. It looks like it was done by a one-eyed blacksmith with a dull cold chisel. Then I pulled out the one I had taken in trade and saw the same gouge marks. Yep! Same importer!

As of today, I have three of these little darlin's laying on my bench, all from the same importer and all showing the same butchery in the breech' and all blowing the casing out of shape because of crude rework. There should be a law against selling firearms that have been hacked up like this. I've tried unsuccessfully to find replacement barrels for MAS 49s from every source I can think of. Do you know of a source for barrels for this rifle? Will the barrel from a MAS 36 assemble in the MAS 49 receiver?

READER FORUM CONTINUED

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And are they available? I was thinking a 36 barrel could be reworked to accommodate the gas tube. My last thought on creating operational firearms from this pile of scrape is a bit more involved, and I'd like your opinion on the matter. I was thinking that I could bore the breech and then press fit an insert to give me new material to work with. I could then chamber the rifles back to the original 7.5 or to 7.62 like the hamhanded idiots at the importer attempted to do.

I seem to recall you discussing this type of process and having reservations about overall strength and safety of the final product, but I could not find it. I am sure there are other MAS 49s around the country that were re-chambered in the same fine craftsman-like manner, with the same problem of the casing blowing up so badly that they will not extract. Hoping to hear from you soon with salvation. Thank you.

The only parts source for the MAS 49 we know of is Century Arms, with technical operations based in Vermont. Though we have done many articles on firearms they've supplied, we have never seen one with anything approaching the type of damage you describe. Nevertheless, while we've never published an article addressing the specific problem you're saddled with, we

would suggest you take a look at John Hinnant's book, *Complete Illustrated Guide to Precision Rifle Barrel Fitting*, Third Edition (2003).

The book is available from the author. We discussed your case with Mr. Hinnant, and we agreed that a switch to the Model 36 barrel would be problematic because of the gas system. We also agreed that, for strength, any barrel insert you intend to install should be threaded in rather than simply pressed in.

Winchester and Browning Questions I have two requests. First, I need information about adjusting the trigger on a Winchester Model 70. I want to retain its crisp let-off, but reduce the pull to about 3 pounds.

My other problem involves a Browning Model 81 BLR (lever-action .243 Win.) A customer dropped off the barreled receiver with forend, buttstock, and a bag full of additional parts. Apparently, he took it apart after dropping it in a mud puddle. All I have to help me visualize the end result of this project is the parts schematic from Browning. The only help I got from the folks in Arnold, Missouri, was the advice that setting the timing on the gear assembly is largely a trial-and-error proposition.

What I need is the step-by-step assembly procedure like you typically include in American Gunsmith articles. Can you help me with these requests? The Model 70 trigger doesn't have to be removed from the action to adjust it, but with a hunting rifle, we advise against taking the pull down to less than 3-1/2 pounds. Working from a schematic of the rifle, you'll notice there are three stop nuts on the trigger screw.

Loosen the screw and turn the two upper nuts counter-clockwise simultaneously to lessen tension on the trigger spring and reduce the pull. The same nuts are turned clockwise to increase weight of pull. The lower

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(continued from previous page) nut is left alone during these adjustments. Note: If the rifle fires on closing the bolt, the pull must be increased. To adjust trigger travel, loosen the lower nut and turning the trigger screw clockwise until the firing pin fails to release when the trigger is pulled. Maintaining rearward pressure on the trigger, slowly back out the screw until the sear releases the firing pin. Add a quarter turn of back out to the screw and tighten the lower nut.

Of course, if you really want a crisp adjustable trigger, you can replace it with the Timney aftermarket trigger. (See Norman Johnson's article beginning on page 10 of this issue.) For disassembly and reassembly procedure for the Browning Model 81, pick up a copy of Gun Digest's book disassembly/reassembly of centerfire rifles. The book also includes details on reinstallation of the gear assembly. Learning Precision Machining I would like to find some good books on gun machine work.

I've completed a thorough machine-shop course that was offered at my local tech school. I learned to operate a mill, lathe, surface grinder, etc. I read the synopsis of the course offered by the American Gunsmithing Institute, and it sounds like a repeat of what I have already covered. I have a book by Steve Acker and it is very good, but it covers only a portion of the

gun machine work I need to learn. I would appreciate any suggestions on some good books on this type of work.

There's a two-volume set published back in 1988 by Industrial Press that you might find on-line. While no machining books we know of are "gunspecific," you can acquire the machining skills and then apply them to guns as needed. For example, you don't have to be told how to mill a flat on a gun barrel if you've already mastered the process on a bar of coldrolled steel.

Extend that concept to anything machine tools are used for in the manufacture of firearms, get your tolerances down to a very few thousandths, and you'll be drilling scope-base holes and cutting dovetails with precision. And when you get really, really good at working to an accuracy of a few tens-thousandths of an inch, you might be sharp enough to join the American Pistolsmiths Guild or the American Custom Gunmakers Guild as a full-fledged member.

There are no shortcuts, however, unless you're lucky enough to be equipped with computer-guided machine tools from the get-go. CNC equipment might make achieving accuracy happen a little sooner, but we doubt it would enhance your learning curve any more than a pocket calculator helps in learning basic arithmetic.

Winchester and Ruger Parts I am looking for a forearm shoe for a Winchester Model 37 (.410 gauge) and a magazine throat for a Winchester Model 1400 (20 gauge). I've already checked with Jack First and Numrich. Do you have any other ideas on where I might find these parts? Also, I've been asked to replace the barrel on a Ruger Mini-14. Having never done this before, I'm wondering if it's an easy job I should take or a difficult task I should pass up.

Any insight on tools and procedures including headspace problems would be greatly appreciated. For the Winchester parts, call Buckinghams or Nu Line Guns Regarding the Ruger barrel, check the prefix on the rifle (180, 181, 184) There were some engineering changes made after the 180, and we're not certain if these changes included barrel/receiver threads. If anew barrel fails to conform to the right specs, you won't be able to mount it without rethreading.

To replace the barrel, you'll need a good barrel vise, headspace gauges, and a receiver wrench. The wrench may have to be turned with a cheater bar to extend its handle, since Ruger turns in its barrels very firmly. The best source of information on the rebarreling project is a book by John Hinnant, *The Complete Illustrated Guide to Precision Rifle Barrel Fitting*. It can be ordered directly from the author

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