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INSIDE THE ARCHIVE

DISASSEMBLING FINE OLD GUNS: THE RIGHT WAY, PART 1

NSSF AWARDS HUNTER GRANTS • DISASSEMBLY/REASSEMBLY OF THE BROWNING A-BOLT II • EXPRESS RUST BLUING: ...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 001

DIGITAL ARCHIVE EDITION

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FROM THE ARCHIVE

NSSF Awards Hunter Grants

BY AMERICAN GUNSMITH EDITORS DECEMBER 2003

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The National Shooting Sports Foundation (NSSF) recently announced at the International Association of State Fish and Wildlife Agencies annual meeting that it has awarded over \$509,000 in grants through its Hunting Heritage Partnership. The grants went to state agencies to help provide expanded hunting opportunities to America's sportsmen.

The Hunting Heritage Partnership was established by the National Shooting Sports Foundation, the trade association for the firearm industry, to provide much needed direct funding to state wildlife agencies to help them with programs that provide opportunities for, and remove barriers to, hunter participation. "Officials in these grant recipient states have designed unique and dynamic recruitment tools and the Hunting Heritage Partnership grants recognize their successful efforts and help build on them.

These are exactly the kind of creative program development concepts that agencies in other states can look to as models to help preserve our hunting and conservation traditions," said Doug Painter, president of the

National Shooting Sports Foundation. Over 38 million Americans enjoy hunting and fishing and spent over \$70 billion in 2001 in pursuit of their pastime which supported 1.2 million jobs.

Efforts to expand hunting, such as those recognized by the Hunting Heritage Partnership, help boost the nation's economy. "When more hunters go afield, everyone benefits. The contributions hunters and anglers make in taxes paid and fees collected help to fund conservation efforts for all Americans to enjoy," said Steve Williams, director, U. S. Fish & Wildlife Service.

Applications from 36 states were submitted to the Hunting Heritage Partnership and grants were awarded to 18 states for programs focusing on issues from recruitment and retention of hunters to increasing access to hunting lands. The National Shooting Sports Foundation is working with the Congressional Sportsmen's Foundation and members of congress on behalf of America's 18 million hunters to provide states with additional funding opportunities through the Hunting Heritage Partnership.

PEOPLE & COMPANIES

Disassembly/Reassembly of the Browning A-Bolt II

Here's how to approach any of the of Browning A-Bolt II rifles your customers may bring in for servicing or repair.

BY CHICK BLOOD DECEMBER 2003

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The original A-Bolt Hunter and its BBR predecessor had several things in common. Both were manufactured by Miroku in Japan, had detachable magazines under their floorplates, and adjustable triggers. They were both delivered to the store without sights unless otherwise specified, and neither was designed by John M. Browning. The BBR was a big, heavy action. The A-Bolt arrived in 1985 to change all that with a threelug bolt and a short, 60-degree bolt throw.

This allowed rapid cycling of the action, ample scope clearance, and a bolt handle engineered to fit the human hand naturally. Further improvements to the Browning A-Bolt rifle, made around 1994, included an anti-bind bolt, a non-rotating bolt sleeve, and additional weight reduction without sacrificing the strength required for Magnum calibers.

In 1999, an opening up of the action for clearance with the increasingly popular WSM calibers gave birth to the A-Bolt II

and along list of models and chamberings including the newest super-short Magnum rounds. Fresh out of the box, an A-Bolt II barrel and receiver are coated with a factory-applied anti-rust compound. Before the gun is fired, this gunk should be cleaned up with snug-fitting bore patches, lint-free cloths, and a high-quality light gun oil.

Field Stripping The magazine is empty, the chamber is clear, and the safety is off. Raise the bolt handle, depress the bolt stop, and remove the bolt to the rear. It isn't necessary to operate the bolt stop for reinstallation, but the bottom bolt lug must be positioned as shown in the accompanying photo when inserting the bolt. Remove the barrel-mounting screw (#2), and withdraw the magazine floorplate (#40) with hinge (#34) and magazine (#33) attached.

Back out the front and rear trigger-guard screws, remove the guard, and separate the action from the stock. It may be necessary to hold onto the stock or forend and gently tap the barrel down on a padded work sur-

face to start the out. At this time, the trigger assembly can remain attached to the receiver. Move back to the bolt for a minute. When it's slid back into the receiver, the ejector pin (#20) has to be positioned midway in the bolt sleeve (#16) recess.

You might want to index the location with a felt-tip pen as I did for the aforementioned photo. It saves fumbling and possible surface scuffing. Detailed Disassembly Your recent experience with bolt removal will have familiarized you with the firing-pin sear (#25), also known as the cocking indicator. It protrudes from the bolt's rear when the gun is ready to fire. Secure that portion of the indicator between protected or smooth vise jaws.

Grasp the bolt handle (#5), pull toward the bolt head (#8) to compress the firing-pin spring (#27), and give the handle a Fortunately, all take down and go back together in the same manner.

DISASSEMBLY/REASSEMBLY OF THE BROWNING A-BOLT II CONTINUED

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turn counterclockwise. After the one turn, you won't need the leverage provided by the bolt handle to continue unscrewing the bolt sleeve (#16) and withdraw it from the firing-pin assembly, leaving the latter in the vise. Get a firm, finger grip on the bolt shroud (#15), pull toward the firing-pin tip, and lift the shroud off the assembly. Drift out the firing-pin sear pin (#26) in either direction with a 1/8-inch punch to free up the spring (#27), firing pin (#24), washer (#28), and sear/indicator.

Align the bolt-head key pin (#9) with its large bolt-sleeve opening. Drive the pin down and out with your 1/8-inch punch, back out the bolt-sleeve screw (#16A), and withdraw the bolt assembly (#4). The bolt head is caliber specific, and can be pulled out of the assembly. You'll see a "pigtail spring" (#23) sticking out the rear of part #8. That's the extractor spring, and the extractor is also caliber specific. When you pull out the spring, the extractor (#22) will fall out.

Hopefully, it will fall into your waiting hand. The ejector assembly (parts #19, 20, and 21) is retained by its pin. When installed, the opening in the key pin must be aligned with the chamber to allow passage of the firing pin. (#20). The pin drifts out right to left when the bolt head faces forward. So much

for taking down the bolt, but there are several reassembly tips to be covered later on. And leave your protected vise jaws standing by as your third set of hands. Now for the adjustable trigger assembly.

It's held to the receiver by a housing screw (#54), housing-screw washer (#55), and housing set pin (#56). The latter is a roll pin. Remove it first in either direction, followed by parts #54 and #55. By the way—and this is important—the bolt-handle lock (#6) hooks onto the safety (#57). When you remove the trigger assembly, don't lose either part #6 or #57. These are restricted parts, as are all other parts closely associated with the trigger assembly. For that reason, I'd advise you not to disassemble it further.

There's no real need to do so anyway. If it's dirty, soak it in kerosene or mineral spirits for a day or so, flush it out, and dry it with compressed air. If it needs adjustment, the necessary steps can be taken with the action still in the stock. The adjusting screw (#85) is turned clockwise to increase pull and counterclockwise to lighten it. The range is approximately 3 to 6 pounds.

The magazine can be removed from the floorplate by supporting the barrel at a downward angle, pressing the magazine latch (#3), and

swinging out the floorplate (#40). Grab the magazine at its upper end, tilt it away from the floorplate, and carefully lift or slide it from the groove at the bottom of the plate. I think this is a nice little feature. It makes it possible to carry spare, fully loaded magazines afield, and rapidly replace an empty one by reversing the removal process.

If necessary for parts replacement, the magazine-latch assembly can be taken from the trigger guard by drifting out the latch pin (#38). Yep, it's a roll pin. The magazine itself is best left alone beyond slight adjustment of the lips to correct any feeding problem. Why leave it alone? Part #44 that retains the magazine ramp (#45) is a rivet. If you've tried to buy Browning A-Bolt parts, you may have discovered that the butt plate is among the restricted parts. Why, of all things, should a butt plate be restricted?

Well, with the A-Bolt II, it's because the factory takes extreme care to match the butt plate to the surrounding material (be it wood or synthetic). I guess they don't believe a practicing gunsmith could do it as well. If you read Dennis Wood's article in this issue, however, I'm sure you'll have no problem with the task,



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1 Barrel Mounting Block 2 Barrel Mounting Screw 3 Barrel 4 Bolt Assembly 5 Bolt Handle 6 Bolt Handle Lock 7 Bolt Handle Pin 8 Bolt Head 9 Bolt Head Key Pin 10 Bolt Retainer (stop) 11 Bolt Retainer Guide Pin 12 Bolt Retainer Pin 13 Bolt Retainer Screw 14 Bolt Retainer Spring 15 Bolt Shroud 16 Bolt Sleeve 17 Butt Plate 18 Butt Plate Screws 19 Ejector 20 Ejector Pin 21 Ejector Spring 22 Extractor 23 Extractor Spring 24 Firing Pin 25 Firing Pin Sear 26 Firing Pin Sear Pin 27 Firing Pin Spring 28 Firing Pin Washer 29 Grip Cap 30 Grip Cap Screw (not shown) 31 Magazine Base 33 Magazine Body 34 Magazine Floorplate Hinge 35 Floorplate Hinge Pin 36 Floorplate Hinge Spring 37 Floorplate Latch Assembly 38 Floorplate Latch Pin 39 Floorplate Latch Spring 40 Floorplate 41 Magazine Follower Rivet 42 Magazine Follower 43 Magazine Follower Spring 44 Magazine Ramp Rivet 45 Magazine Ramp 46 Magazine Retainer Spring 47 Retainer Spring

Pin 48 Magazine Spring Pin 49 Inner Magazine Spring Strut 50 Outer Magazine Spring Strut 51 Magazine Strut Pin 52 Magazine Strut Spring 53 Trigger Housing 54 Housing Screw 55 Housing Washer 56 Housing Set Pin 57 Safety 58 Safety Blocking Pin 59 Safety Lever 60 Safety Lever Pin 61 Safety Lever Spring 62 Safety Link 63 Safety Link Roll Pin 64 Safety Pin 65 Safety Pin Snap Ring 66 Safety Selector 67 Safety Spring Browning A-Bolt II Bolt-Action Rifle (Specifications subject to change without notice) 68 Safety Stud 69 Sear 70 Sear Pin 71 Sear Screw 72 Sear Spring 73 Scope Mount Filler Screws 74 Front Sling Swivel Assembly 75 Rear Sight (not shown) 76 Front Sight (not shown) 77 Sight Ramp (not shown) 78 Rear Sling Swivel Assembly 79 Stock 80 Trigger Assembly 81 Trigger Engagement Screw 82 Trigger Guard 83 Trigger Guard Screw 84 Trigger Pin 85 Trigger Pull Adjustment Screw 86 Trigger Sear 87 Trigger Spring

DISASSEMBLY/REASSEMBLY OF THE BROWNING A-BOLT II CONTINUED

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Adjustment range is 3 to 6 pounds. but you'll probably have to install an aftermarket pad. With regard to ordering other Browning parts, you'll find that the key numbers on the schematic drawing on page 5 are not sufficient; you'll need to know the actual Browning part

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number. Since so many parts are caliber-specific, a list of all part numbers would cover much more space than we have in these pages. You can, however, get a parts list by calling Browning or

FINISHING

Express Rust Bluing: Tips and Techniques

One of the most durable metal finishes available, express rust bluing doesn't require a large investment in time or equipment to produce professional-looking results.

BY DENNIS A. WOOD DECEMBER 2003

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Before the advent of modern production methods, firearms manufacturers did things “the old-fashioned way.” Whether some of these older methods are actually better could be argued without either side changing their thoughts on the subject. In any case, bluing, as done in the good old days, was essentially a hand-applied process that took time to accomplish. The end result of the express rust-bluing process I’ll describe here looks and wears just as well or better than some of the methods used in days gone by.

In fact, it may even wear better than a few of the so-called “modern bluing methods” used on today’s production firearms. Surface Preparation Express or rust bluing is one of those tasks that, if begun properly, will almost always end up looking right. How the surface metal is prepared and handled during the application of the bluing formula is the real key to the end result. For the most part, mirror-bright finishes have gone away for a couple of reasons.

Light reflection off a mirror-polished firearm can spook game animals during hunting applications. A highly polished surface is also too slick to hold protective oil, because all the pores in the metal’s surface have been closed up. As a result, matte

finishes are often preferred these days, and this preparation is much easier to apply. The first step when dealing with metal previously blued is to remove what finish remains.

There are several rust and bluing removers available in liquid and gel form that work well enough for this phase of preparation. After the old bluing has been removed, a hot, soapy, water bath will remove what’s left of the remover solution. Look the metal surface over thoroughly for any pits or rough spots that will need to be removed. Small pits or nicks will require some amount of draw filing; just be cautious around screw holes and lettering like serial numbers and such.

Try your best to maintain flat areas, curves, and contours that contribute to cosmetic appearance. When you are completely satisfied that the file is no longer necessary, 220-grit emery paper is the next step to help remove the marks from draw filing. Strive to keep the sanding parallel with the bore line, and always back your emery paper with a flat block or wood dowel sized to match the contour you are dealing with.

I realize that sanding with the bore line is not always possible, but if you can do this in the larger areas there will be less blending to do later on. Work progressively from 220 grit to 320, and then to 400-grit paper. If you desire a finer finish, then move up to 600, then 800, and finish with 1200 grit. Brownells has all these emery papers available in their catalog.

If you prefer to go with a soft matte-type finish, consider the various grades of Scotch-brite blending pads they sell, and switch to those after the 400-grit emery-paper finish. If the metal is badly pitted, consider a medium grit sandblast to texture the surface. Sandblasting can help disguise some very ugly areas before the bluing is applied. Keep It Clean Once the metal surface has the desired texture or finish applied, it’s imperative that all oils and fingerprints are removed.

Clean the metal thoroughly with acetone or lacquer thinner. Wear rubber gloves and work in a well-ventilated area. Don’t touch the metal surface with your bare hands after this phase has been completed. Once the parts are clean, cotton jersey gloves will help to keep skin oils off the parts and still give enough dexterity that you can handle all the gun parts that need to be handled.

EXPRESS RUST BLUING: TIPS AND TECHNIQUES CONTINUED

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Because the bluing solution used here is acidic, it somewhat etches the metal surface. Therefore, we need to protect the bore to prevent any of that type of action happening in there. I use shellac or varnish to coat the inside of the barrel and protect the rifling from the rust bluing process. I usually apply two coats with a bore mop, with one coat applied from the chamber end and the other from the muzzle end.

Let the varnish dry thoroughly and then remove any that has dripped or run onto surfaces you intend to blue. Varnish can be removed with a soft cloth dabbed in a small amount of acetone. Once the bluing job has been completed, the varnish is easily removed from the bore with a brass bore brush and acetone. Prepare a Work Area The best way to start is to prepare your work area with all the tools you'll need to get this job finished without too many interruptions.

I lay out newspaper on my bench top with a juice glass filled about one-quarter full with bluing solution. Shake up the plastic bottle of solution real well before you pour some into your working container. Cotton balls and two-inch square pieces of old white T-shirts work well to swab on the solution. Paper towels are also handy to have at hand when doing this type of bluing. I use Bounty brand paper towels only because they really do absorb better than some of the stiffer paper types.

You'll need a metal tank large enough to hold the longest barreled action you anticipate bluing. Don't scrimp here, buy yourself a good sturdy tank. It pays to have an old kettle or pan handy to do handguns or small parts when not doing a complete rifle or shotgun. There's no sense firing up your

large tank for small jobs. I now use only distilled water in my tank for boiling parts during this process. I've tried rain water, melted snow, and captured water from a dehumidifier.

The best results are achieved when using distilled water. It seems there's always some foreign stuff in the free water I've tried that will leave a blotch or spot that can be very tough to remove. I fill the tank with enough water to completely submerge the parts I'm bluing and then add a bit more, but not so much that the water boils over and makes a mess. Three-quarters full has proven to be plenty. A source of heat to get the tank of water boiling mildly should also be close by your work area.

Out here in the boondocks, our heat is supplied by propane. It was a simple matter to have the delivery person hook up a supply valve and shut-off in my shop. Don't even think about using one of those portable propane tanks from your gas grill, it's way too dangerous unless you are willing to work outside. If you have natural gas supplied, get with someone who can safely hook you up to that source.

Or, if you have an understanding wife, ask her if you can use the stove and kitchen table. (Good luck with that endeavor.) Doing the Bluing I've been using Mark Lee's Express Blue, available through Brownells, for almost 15 years now, and I've found it to be the easiest to use of the rust blues I've tried. The first time I tried this bluing formula I had a successful result, and it's been that way ever since.

It works great on chrome-moly barrels, blackpowder barrels, and best of all on those older double-barreled shotguns that are

soft-soldered together at the joining rib. In use, the metal to be blued is heated to around 150 to 170 degrees before the application of the solution. I wouldn't recommend a propane torch as a heat source, because it's impossible to tell whether the metal surface is at 150 degrees or 350 degrees.

With a calibrated heat-gun that's equipped with an indicator, you can tell when the metal reaches very close to the required temperature. I use a heat-gun that has a variable range dial on it. I aim the heat output end at a thermometer stem and turn the variable dial until the thermometer dial steadies at 150 to 160 degrees. Now is the time to put on your cotton gloves, and don't touch the metal with bare fingers during any of the next steps.

Clamp one end of the barreled action in your padded vise so you have most of the metal hanging out in space. With the protruding metal heated as close as you can get it to the proper temperature, wipe the bluing solution onto the metal surface. You'll see the metal almost instantly turn a rusty, reddish-brown color. Rotate and then clamp the barreled action in a different spot, apply the heat-gun to the metal in the new area, and then wipe the solution on once again.

When you dunk the swab in the bluing solution, squeeze the swab so that it doesn't drip with solution. You just want the swab to be a bit more than damp. Yes, the solution will get all over the fingers of your gloves, but what the heck; the gloves can help apply the solution also. Keep rotating the barreled action in the vise and apply heat to the new area and

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wipe on the solution until the whole surface looks rusty brown. Let the solution work for 10 to 15 minutes and then apply another complete coat of solution in the same manner. The first two applications are best done one after the other. After the second application of solution it's time for the distilled water bath. Boiling and Carding While you're applying the bluing solution it's a good time to get your distilled water to the boiling point.

When the water is hot enough to cause some slight bubbling on the surface, it's ready to receive your solution-coated parts. I hang small parts from short lengths of coat-hanger wire into the hot-water bath. The coat-hangers span the top of the open tank with drop wires that in turn hold the small parts under the boiling water. This is much easier than trying to fish the small parts out of the hot water. I don't use wooden plugs in the chamber end, although I do use a wooden bore plug on rifle barrels.

This dowel is a handy attachment for the suspending wire. I don't plug the bore from both ends because I don't relish the thought of being scalded by hot water should pressure build up in the bore and blow a plug out. After about 10-15 minutes of boiling, the parts are removed. They'll be coated with a velvety, black-oxide finish. The water needs to be poured out of the tank. Dry the parts off with paper towels in the areas where the water didn't dissipate from the heat the metal is retaining.

Let the parts cool until they are cool enough to pick up, and make sure you still have your cotton gloves on. Carding is the process of removing the black-oxide surface finish. I use a hand carding brush specifically designed for this purpose. This is a fine wire brush with a wood handle that does quite a good job. At one time I thought this brush didn't work quite fast enough so I scrounged up an old washing machine motor and set it up with a belt-and-pulley system that rotates the driven pulley at 200 to 250 rpm.

If this kind of a setup interests you, here's how I set mine up: There's usually a tag somewhere on the motor indicating the speed at which the motor turns. We need to determine the size of the driven pulley to achieve a brush rotation speed of 200-250 rpm. If the motor turns at 1350 rpm, a one-inch pulley mounted on the motor shaft will also turn 1350 rpm. The diameter of the driven belt pulley that will drive the shaft that turns the brush will need to be determined.

Multiply the diameter of the driving pulley (1.00inch) by the speed of the rotating motor shaft (1350 rpm) and then divide this number by the rpm you want to obtain (200 rpm). In this case, we come up with a pulley diameter of 6-3/4 inches. A 6-inch-diameter pulley is more easily obtainable, and Top Bottom will give us 225 rpm for the brush. The brush rotates at a relatively slow speed, but you still need to be cautious while wearing those cotton gloves that you don't get tangled up in the brush.

During the carding process we are removing a fine black-oxide dust so wear a respirator of some sort. The dust will irritate your lungs something fierce. Once again, heat up the metal and apply another coating of solution on all the metal you want blued, and after the boiling process, card off the black oxide. You will begin to see the metal go from a gray color to a progressively blacker color. This can take from six to nine applications of heat and solution, the hot water bath, and then the carding process.

Conclusions Once the metal has reached the black est color you can achieve, you need to seal the bluing and arrest any further oxidation. After the final carding, I rub all the metal down with a flannel pad. This will remove any residual black dust left on the metal surface from the carding process. All of the blued surfaces are then coated with RIG. This is a thin brown grease that is brushed over the blued surface with a 3/4-inch wide acid brush and then left on to allow the bluing to cure for 48-hours.

After this curing period, the RIG is removed with an old cloth and the bore is cleaned with a copper/brass bore brush dipped in acetone to remove the varnish that was protecting the bore's lands and grooves. Yes, this process is somewhat involved and will take an uninterrupted afternoon to accomplish. But the results are worth the effort, and are equal to or better than many of the other bluing processes. ■

FROM THE ARCHIVE

Disassembling Fine Old Guns: The Right Way, Part 1

Antiques require some tools and techniques—and especially care—that might not be needed for disassembling newer firearms.

BY DAVID R. CHICOINE DECEMBER 2003

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As a working gunsmith neatness should always be your signature. You may not have ever given much thought to it, but the screws and pins on a firearm, as well as the areas surrounding them, and even the edges of the wood where it fits up to the metal, are the gunsmith's trademark. Many people, especially knowledgeable collectors and shooters, will unconsciously look to those areas first when they pick up a firearm as an indicator of whether the gun has been apart before.

When a person sees perfect-looking screw slots and pin heads on a firearm that has been recently disassembled, it conveys the idea that a true master craftsman performed the work. Moreover, the overall impression is that the work you can't see must be just as good as what you can see. The opposite is, of course, true.

When you come across a gun that has chewed-up screw slots, gouges or dents in the metal finish around screws or pin holes, scratches in the wood or slivers missing around tight-fitting areas, these are signs of poor craftsmanship, often indicating a lack of care by the person who worked on the gun last. The assumption is that the

weapon was disassembled by someone who exhibited very little talent or knowledge of firearms.

In the same vein, we assume any work that may have been done to the inside of the weapon, which we cannot see, is just a poor as the external appearance. Some people might consider this all pretty superficial and that I am making much ado about nothing. That may be, but these superficial areas are the very ones that you will be presenting to the customer first when you hand him back his repaired gun. You might ask yourself: Which of these titles would you like to sign your work with?

The neat and trustworthy master craftsman, or the gun-butcher, who, after being entrusted with the customer's prized weapon, ruined its appearance? As anyone who has worked on old firearms already knows, getting a screw or pin out of an old gun after it has been there for a century without damaging it or—even more important, without damaging the gun itself—is one of the more serious challenges we're faced with. Usually, the disassembly process itself is only a means to an end, albeit a very necessary one.

There are various reasons for removing these fasteners: We may have to repair some internal damage, or it may only be that we have to disassemble 44 American made in 1871. the gun in order to inspect and clean it properly. In either case, those screws and pins have to come out, and they will often be stuck fast by a coating of rust, along with old grease or oil that, over time, has hardened into a cement-like varnish.

We can also count on the screws being difficult to turn, because most gun screws were manufactured to very close tolerances, and the screw heads are often countersunk neatly into the side of the receiver. Those factors increase the surface area of the screw that is in contact with the firearm, offering a larger area that is subject to oxidation and, as a result, will offer even greater resistance to turning.

Something else to consider is that older factory-built guns were often manufactured by people who got paid by the amount of work they turned out in a day. Today, assemblers use a small airor electric-powered rotary driver set to a given torque to tighten the screws, but in the 19th century, the

DISASSEMBLING FINE OLD GUNS: THE RIGHT WAY, PART 1 CONTINUED

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bit and brace did the job the impact wrench does today. As you might imagine, it is easy to apply considerable torque to a screw using that U-shaped brace. The assembler's primary concerns were to get the screws in quickly, and tightly enough that they would not loosen as the result of normal use. In all likelihood, he turned them in plenty tight. Some, in fact, were turned in so tightly that a little smidgen of rust or hardened oil will set them in place so firmly that they're impossible to remove.

Forcing the issue will only result in tearing off the head of the screw, leaving you with the core of the screw still stuck in the gun. With old screws being such a problem, I'll address this issue here in this article. Next month, in Part 2, I'll cover dealing with stuck pins, separating wood from metal, and offer some hints on how to overcome the fact that each of us only has two hands. Safely Removing Old Screws Gun screws are turned by means of a slot that was machined into the screw's head.

On all older firearms, these slots were simple and conventional—a rectangular slot running across the screw head, meant to accept a “straight” screwdriver blade. To remove the screw, we simply insert a driver into the slot and turn the screw out. That's the theory, anyway. We'll assume that the screw in question is very tight, so what we really need is a screwdriver blade that fills that slot completely and snugly. This is so we will be able to apply the maximum amount of turning torque to the fastener.

The slots in most gun screws were machined, so they are truly rectangular in shape. Even though we run into some with concave bottoms, the sides of the slot are machined straight, at 90-degree angles to the bottom of the screw head. Have a close look at a gun screw that is not installed in a gun, and you will see what I'm getting at. Now take a moment to look closely at a conventional, store-bought screwdriver blade, you can see that the driver's blade is not straight-sided like a gun screw's slot.

Instead, it is tapered. These kinds of drivers were intended to fit many different sizes of screws for general-purpose use around the home or repair shop, although it should be obvious that they won't actually fit any screw slot perfectly. For gun work, we need a screwdriver with a blade that is known as “hollow ground.” Like conventional screwdrivers, hollow-ground drivers also have blades that are tapered, except at the tip; the part that fits into the screw slot is ground so that it has flat sides.

Nevertheless, it's not enough to simply obtain hollow-ground screwdrivers; we actually need to get drivers with blades of the correct size in both width and breadth, so they fit perfectly in the slot of the screw we want to turn. Since we will be exerting a good deal of torque on this blade, we don't want it twisting out of the slot because its too thin, gouging the surrounding metal because its too wide, or distorting part of the slot because its too narrow.

Look over the fit of the screwdriver blade to the slot Figure 1. shown in Figure 1. This is a perfect fit in every way—the kind of fit we

should have each and every time we turn a gun screw. Gun screws come in a variety of sizes, and many of the older ones are custom sizes, designed by the arms manufacturers to suit their own specialized needs. The fact that there are so many sizes has presented gunsmiths with challenges for years.

As a matter of course, whenever anew type of gun came in for repair, the smith would custom-grind the blade of a screwdriver (or drivers) to fit the screws in that weapon. Understandably, it didn't take long for the working gunsmith to accumulate a massive selection of different sized drivers. Today, there are several makes of good-quality hollow-ground screwdrivers available for the gunsmith. Among the most well known are the type with a conventional fixed blade and serrated wooden handle.

Since my work consists primarily of work on older guns, you can understand why I used to own hundreds of screwdrivers like this one. A very different approach to driving screws is the one offered by Brownells with their brand name Magna-Tip screwdriver sets. The Magna-Tip system uses one handle, with several styles and sizes of handles available.

This basic handle is made with a 1/4-inch hex drive to accept a huge array of different sizes and shapes of hollow-ground straight bits, as well as conventional Phillips, Allen, and Torx style bits. For the working gunsmith or the advanced

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Even the tightest screws can usually be removed with this tool. amateur, I believe the Brownells Magna-Tip drivers offer you the biggest bang for your buck, as well as the ability to fit the whole thing into a very small space on your workbench. I've been using these constantly since converting to this system over 15 years ago, and I'm convinced this is the single greatest set of tools ever invented for the gunsmith.

With a Magna-Tip screwdriver set like the one pictured on page 11, it becomes a fairly simple matter to select a bit that closely fits the screw slot for width, then you can run up the line of bits in that width and select the bit with the closest, tightest-fitting blade thickness. A good driver set like this will handle your needs for about 90 percent of the guns you will take in.

For the other 10 percent, standard-size Magna-Tip bits can be readily altered using a special grinding stone sold by Brownells for this purpose. So, you have the right screwdriver blade in the slot; it fits well from side to side; and the thickness is such that the driver has to be lightly tapped in. Good, that sounds like a perfect fit.

But before we start turning the screw, there is another thing you should look at closely, and that is the slot itself.

Over the years, slots, especially the narrow ones, tend to fill up with accumulations of old oil, dirt, and rust. Such deposits are not only unsightly, they may prevent your "perfect-fitting" bit from fully entering the slot, meaning you may only have half the purchase you think you do. Spray some penetrating oil or cleaner into the screw slots and go in there after it with small dental picks. Scrape and scrub the slot until it is absolutely cleaned, all the way down to the bottom.

With the slot cleaned, the screwdriver bit will fit down into the slot like it should—all the way to the bottom. Take the time to notice the shape of the bottom of the slot. Is it flat or is it concave? If you want to get the maximum amount of bite on that screw, then you should grind the face of that blade to match that bottom contour as closely as you can. In this way, the bit will fit even farther down into the screw.

DISASSEMBLING FINE OLD GUNS: THE RIGHT WAY, PART 1 CONTINUED

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In practice, now that we have a driver blade that fits perfectly in the slot, and have cleaned the slot so the blade fits all the way down into it, we are ready to move forward in the attempt to turn that screw. With very few exceptions, most gun screws have right-hand threads. This means they turn in to the right, or clockwise. To unscrew them, they will have to be turned in a counter-clockwise direction. (The hammer screw used on the Colt Double Action Army Model of 1878 is one commonly found exception.

This is a left-hand thread and the screw must be turned clockwise in order to remove it.) So, assuming we know which direction to turn the screw, it's also very important to hold the driver straight down into the screw slot, so that all of the torque you are applying doesn't allow the blade to tilt sideways and slip up, out of the slot. Therefore, I like to think of this as a three-part operation.

The first one-third of the torque you are applying is for turning the screw; the second one-third is holding the driver straight and parallel with the screw; and the final one-third is pushing and holding the driver down hard into the slot. If the screw starts to turn—like it supposed to—we should be in good shape. But what if the

screw doesn't turn? Then we have to take some other steps. Simply pushing and turning harder on the screwdriver is not usually the answer.

Really stubborn screws can often be removed with greater safety by eliminating the reasons for the stubbornness before trying more force. As we already know, those reasons are usually rust and/or hardened lubricants. I like to start by trying some heat on the area around the screw and on the screw itself. Of course, this can only be attempted after removing any wood in the area of the screw.

I like to try heating the area up to about 250 to 300 degrees Fahrenheit, or just hot enough that a drop of water will "jump" back at you. This small amount of heat will not harm bluing or plating, but if the temperature is maintained for several minutes, it will begin to melt the old lubricants. You can try this in a home oven, but you should think about the possibility of contaminating it with the smell from the lubricants before you do.

Now, while the surface is still hot, apply some penetrating oil, followed again by a steady application of heat in order to try to maintain that 250- to 300-degree temperature. Be patient. After a bit, you should begin to notice tiny bubbles appearing around the seams at the screw head and threads. This is an indication of air and possibly old oils escaping from inside the hole.

If the area has been well covered with penetrating oil, the second you remove the heat source some of that hot penetrating oil will be pulled into the area between the screw and the gun. That hot oil will begin to dissolve the rust, and will mix with and dilute the old lubricants already there. Keep this up for five or 10 minutes, and then try to remove the screw once again while the whole thing is still hot.

Experience has shown that in most cases, the screw will begin to turn after this effort.
(continued on page 21)

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If it still refuses to turn, the next easy step is to try a tool called a “screwjack.” A screwjack is a type of clamp with a hollow screw at its center that holds a Magna-Tip driver bit. The tool is basically bolted onto an area of the gun so that its hollow screw is centered over the stuck screw. A tight-fitting driver bit is installed into the hollow screw, which is tightened into the gun. All this is designed to hold the bit straight down into the screw slot as tightly as possible.

A 1/4-inch wrench is then used on the flats of the bit to turn the screw. The screwjack offers you the ability to exert a huge amount of torque and downward pressure directly into the screw, and in most cases, it will begin to turn right away. As the screw turns, you do have to slowly back out that hollow screw in the jack along with it, until it gets to the point where it can be turned with a screwdriver handle. Then you can remove the jack.

If the screw refused to budge, try the jack along with the heating procedure. There will always be that obstinate screw that still won't budge. For these, there isn't much left to try other than to drill them out—a touchy procedure that I'll go into in a future article. Speaking

of tight parts that are screwed in, removing the nipples from the cylinder of a percussion revolver can be a real chore.

Nipples are turned by means of a tool called a “nipple wrench.” When the nipples are in so tight that you can't budge them, try the same trick we used on the screws above; that is, heat and penetrating oil. You can also remove the nipple the way I do in my shop. I tightly chuck the nipple wrench in my drill press, place the cylinder on the drill press table under the wrench, and hold the wrench down tightly onto the nipple with the press. In this way, the wrench can't slip up off the nipple while it's being turned.

To prevent damage to either the cylinder or the nipples, this method requires a nipple wrench that fits the nipple very closely. If you use it along with the heat and penetrating oil, you should be able to remove most stuck nipples. Of course, that assumes that the nipples are still in good enough condition to be turned.

If they are so battered and ruined that the nipple wrench cannot grasp them, you may have to resort to much more complicated methods for removal. ■

PEOPLE & COMPANIES

Customizing the Browning Buckmark Pistol for Competition

With some minor tuning and modification, this inexpensive handgun can produce impressive results at the range or in the field.

BY JIM RIDER DECEMBER 2003

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The Buckmark series of pistols have been offered by Browning in various styles for a good number of years. The Nomad, Med alist, and Challenger series of pistols predate the Buckmark, and except for minor differences, are mechanically similar. While the Buckmarks are relatively inexpensive, some models fall into the moderately expensive category when compared with other rimfire semi-automatics that demonstrate the same type of performance.

When choosing a pistol for modification, however, the least expensive models in the Buckmark line are every bit as good as the more expensive ones. If you're going to replace the barrel, it makes sense to find one with a standard barrel, as there's no need to pay for something you're not going to use. Aftermarket barrels are available for this pistol, if you have reason to replace the factory barrel. I ordered and installed a Volquartsen compensated barrel from Brownells for the gun used in this article.

This barrel changes the balance of the pistol, since it is not only heavier, but longer than the factory barrel. In my opinion, this improves the balance and feel for a one-handed sport such as Bullseye. For somebody just starting out in target competition, Bullseye or otherwise, it's a good idea to

begin with an inexpensive pistol. If you stick with the sport, you can select a higher-quality target pistol later, after learning the basics and deciding what you like and dislike.

In my view, if the gun is capable of groups tighter than the shooter's ability to hold, then it's a good one with which to start. There are a number of different manufacturers to choose from, and although many people prefer Rugers for a number of reasons, I like the feel and balance of the Buckmark. For anybody shooting below the Master level, I don't think any minor difference in mechanical accuracy would be noticeable between these pistols.

One of the big advantages of the Browning versus the Ruger is the restricted-parts issue. You can order barrels, hammers, sears, and just about any other part directly from the factory. Nevertheless, if you are modifying this firearm for a customer, remember to advise him in writing that the work involved will void any warranty from the manufacturer. A good reference for detail stripping the Buckmark pistol is The Gun Digest Book of Firearms Assembly/Disassembly, Part 1: Automatic Pistols, by J. B.

Wood of DBI Books. It can be purchased from the AGA at a significant discount. There can be some truly aggravating moments The one shown here has a charging handle installed at the rear of the slide while working on this pistol, but a copy of this book will make it a snap. The following are critical areas that will need some work to improve the function and consistency of the Buckmark, thus enhancing its overall mechanical accuracy. After these are covered, I'll go into some practical accuracy issues.

Grips Normally, grips wouldn't enter into a discussion on mechanical accuracy. On these pistols, however, the grips serve like sideplates on a revolver, and unless proper attention is paid to their function, the mechanics can suffer. If the gun owner prefers to keep the factory grips, take a look at the inside surface of both grips. If the pistol has seen much use, you may notice some wear on the top inch or so.

The trigger bar, its spring, and the magazine-catch spring are held in place by the right grip; while the slide stop, return spring, thumb safety, and safety detent plate are held in place by the left grip.

CUSTOMIZING THE BROWNING BUCKMARK PISTOL FOR COMPETITION CONTINUED

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Most of these rubber grips have metal backing plates on the underside. Check for this, and if there are metal plates present, I suggest you remove the paint to expose the metal on the underside of the grips. This coating should be very thin. Polish the top half-inch or so of the metal on the right grip to reduce friction on the trigger bar. On the left grip, put a good polish on the area surrounding the slide stop.

I would also recommend doing the same along the middle of the plate, as the magazine thumb button may come into contact with this area. If the paint is worn through here, indicating friction between the magazine thumb button and the steel backing plate on the grip, use a file to remove just enough metal from the thumb button to provide adequate clearance. If you're using aftermarket target grips, it's a simple matter to attach backing plates to the underside.

There are grips out there that leave the wood exposed on the underside. Don't skimp on this, because even if you smooth the wooden surface to a mirror polish, oil, solvent, and debris will quickly migrate into the area and cause havoc. To make a quick pattern for the backing plates, trace around the existing grips on a manila folder, then come in 3/16 inch from all outside edges. Take care to make enough clearance for the thumb safety and slide stop on the left grip.

For material, 1/16-inch-thick mild steel would be a good choice. I wouldn't recommend aluminum because of galling concerns. Once the patterns are made to your satisfaction, using a suitable marker, trace around each pattern on the steel stock. You'll have to drill a few small holes in the plates to clear both the trigger-bar pin on

the right side, and the roll pin that protrudes on either side from the lower front portion of the grip frame.

The roll pin serves double duty for retaining the magazine ejector and spring, and also as a means of properly locating the grips on the frame. And, of course, drill the holes for the grip screws. Once you have the backing plates finished, use them as patterns on the inner sides of your grips. Now you need to relieve enough wood from the grips to inlay the backing plates so the undersides of the grips are level and form a continuous surface.

Using a rotary tool or die grinder, carefully rout around the pattern line to the right depth. You don't have to be too precise here, since you can use bedding material or epoxy to fill in any gaps. The backing plates can be clamped and epoxied in place on the grips and allowed to cure without using screws. Once the epoxy has set up, test fit them, relieving any wood, steel or bedding material that might interfere with moving parts.

Internal Parts When polishing, removing machining marks, or taking down burrs on any internal parts, remember not to remove too much material. If the defect is too deep to fix with light polishing, obtain anew part. Most of the parts in this gun are only a few dollars each or less. If you're building up a used pistol, chances are the mainspring plunger will have some ugly gouges that could cause lock time variations and contribute to a number of trigger-pull problems.

In order to remove the hammer and sear, you must first depress the mainspring plunger with a punch, then insert a pin or punch through the frame to keep it de-

pressed. This is how they get gouged up. They seem to be softer than one would expect. If it's not too bad, you can clean up the mainspring plunger with files and polish all surfaces. If it's too far gone, toss it into the bin of misfit parts and order anew one.

If you do order anew one, make sure to clean up any machining marks and polish the entire part to a mirror finish. Not only will this help the part function flawlessly, but remember that this is a steel part, riding under considerable mainspring pressure in an aluminum frame. Burrs or gouges could result in galling of the aluminum. Once you have a gouge-free and highly polished mainspring plunger, I recommend that you case-harden this part.

I can't go into the process here, but you can order Kasenit case-hardening compound from Brownells. It's easy to use and comes with instructions. Don't harden the entire part by heating and quenching, as it may become too brittle and break at an inopportune time. Take a look at the hammer link. Make sure there are no surface imperfections at the bottom where it rides in the cup of the mainspring plunger. I recommend that you smooth up and polish this area also.

Inspect the hammer-pin bosses on the hammer, and remove any slight imperfections. The same goes for the trigger bar, and the slot in the right side of the frame in which it rides. Put a good-quality polish on the trigger bar, but be careful not to change any of the edges where it interacts with the sear. Break, but don't round off, any sharp edges on the remainder of the trigger bar. In the Buckmark's trigger-bar slot, remove any paint in the slot and make

CUSTOMIZING THE BROWNING BUCKMARK PISTOL FOR COMPETITION CONTINUED

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Once installed, grind the screw flush with the inside surface. Mounting the charging-handle screw in this area does not affect any critical bearing surface, sure the area is smooth and level. As with any firearm, it's a good idea to inspect all pins relating to the hammer, sear, and trigger. Ensure that the pins are straight and free of burrs. If you find a problem, it's probably not worth your time to try and fix the pin. Chuck it into the bin of misfit parts and order anew one.

Make sure to carefully polish and fit all pins. Take it easy on the polishing, though; you obviously don't want to reduce the diameter of the pin to the point that it's a sloppy fit. Just a few shoeshine strokes with crocus cloth or strips of cloth-backed 300-grit sandpaper should do the trick. Sight Base The sight base serves an important function on this pistol, providing a means to hold the slide and recoil-spring guide in place.

If you have a standard pistol, you can purchase an aftermarket sight base designed for Weaver rail scope mounting from a number of suppliers. This is actually a good thing, as you can hang onto the original sight base, and switch between optics and iron sights at will. Some of these pistols are factory supplied with a means to mount a scope or red-dot sight. It's possible to remove some of the vertical play between the slide and the frame with a touch of judicious filing on one of these aftermarket sight bases.

Removal of a little material where the sight base mounts both forward and rear results in lowering the sight base, which in turn lowers the slide against the frame and removes slack. I've tried it with no vertical slide play whatever, and while the pistol seemed a bit more deliberate and precise in operation, there was no measurable increase in accuracy. I had to make adjustments to the magazine lips in order to lower the angle of the rounds so they wouldn't hang up on the slide as it cycled.

One thing that's important to note here is, when the vertical slack is taken out of the slide in this manner, you have to keep an eye on the breechface and make sure you're not lowering it to the point that it's misaligned with the chamber. This will obviously cause feeding problems and misfires. Since there was no observed increase in accuracy, and increased potential for malfunctions, I can't say I recommend the procedure.

I'm including my experience with it in this article as a warning, in case you or the customer are tempted to try it. The above problems could be resolved by lowering the barrel in the frame, but in order to do that properly, you'd have to remove material from the frame. You might also have to weld up and recut the barrel-retaining screw hole in the barrel lug. You could make it work, but the work involved would cost two to three times what the pistol is worth.

Practical Accuracy Improvements This pistol's trigger suffers from a good bit of over-travel, and Browning has wisely installed trigger stops on a number of Buckmark models. If the pistol you're working on doesn't have one, a small diameter set-screw installed for that purpose in the center of the trigger is a must. These triggers are composed of a soft material, so use care when clamping the trigger for drilling. It's very easy to leave visejaw imprints on the plated surface.

As with all set-screw trigger stops, use Loctite when assembling to keep the screw from backing out. Grip improvement is always a good idea on a target pistol, not just the grips themselves, but on the back and front straps of the frame. I personally don't care for checkering or stippling aluminum, and I've tried the adhesive-backed grip tape. I like the feel of the grit, but don't care for that solution either, as oils and solvents usually start peeling up pretty quickly.

One technique you can use works just as well if not better than stippling. It can be used on any firearm, on wood or metal, and is unaffected by solvents or oils. I use it on all of my target firearms. You'll need a good firearms-grade epoxy that is designed to withstand solvents, some

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silicon-carbide abrasive grit, epoxy dye, and an acid brush. All of the above are obtainable from Brownells. I use Acraglass and 600-grit dry silicon carbide. Mix it up properly, apply it with an acid brush, and you've got a great looking, non-peeling grip surface. If you ever need to remove it, it comes off easily with a wire wheel. The great thing about this method is you can create sharp edges, angles, and patterns using masking tape.

I've found that the best grip surface is produced by mixing in 1.25 parts of silicon carbide for every one part of epoxy. I mix in just enough black dye to make the mixture opaque. Apply the mixture with an acid brush, using a dabbing motion. This enhances the coarseness of the surface after it dries. While the epoxy is still wet, but has gotten tacky enough to stay put, I carefully peel the masking tape up, and then let it cure overnight.

Charging Handle One of the most common gripes with the Buckmark is the difficulty encountered when working the slide. Not only is it hard to overcome Figure 1, main-spring pressure, the design is just not ergonomic. This can be painful, as the slide edges bite into the thumb and index finger,

and feels even worse if it slips out of your grip. If you have a red-dot sight installed, the problem is aggravated.

The newer models have small protrusions on the rear of the slide to compensate, but even this change is inadequate. Motivated by the ease of charging the AR-15, I designed a charging handle that is similar in function. In use, the shooter grips the pistol with one hand, with the muzzle pointed downrange, and uses the other hand to work the slide, with the index and middle fingers used to pull at the same time on either side of the charging handle.

This small addition has made this pistol the most convenient and easy-to-work firearm I have ever used on the line. This part can be easily made from aluminum or a hard composite plastic (see Figure 1), keeping in mind you're trying to keep the weight down. Required tools are only a hacksaw, files, drill-press with a 1-inch sanding drum, and a buffing wheel. I think it would take longer to make it with a milling machine due to the setup time. If you have a spindle sander, it would be helpful on the concave areas.

I used a small diameter Allen-head screw to mount the handle on the rear of the slide. The slide is thick enough above the frame rail recess to get good thread engagement when drilled and tapped. The exact size and thread pitch of the screw isn't important, but keep the diameter as small as you can to keep from weakening the slide and charging handle, while providing enough thread surface to get good engagement. Grind the screw flush on the inside of the slide.

The slide doesn't come into contact with the frame in this area, so just get the burrs off and make sure nothing is binding. I used Acraglass between the charging handle, slide, and on the screw threads. I did this for two reasons: I didn't want the thing flying off during a match, and my file work wasn't quite accurate enough to provide an exact mating surface between the rear of the slide and the inside surface of the handle.

Keep in mind that it's easy to separate epoxied parts with the careful application of a propane torch. The modifications in this article, whether done in whole or part, can produce excellent results at the range or for small-game hunting. Not only will accuracy be improved, better function and increased reliability will result as well. ■

MAINTENANCE & REPAIR

Tuning the Extractor

Extractors are simple parts and usually have a long life. Care on the part of the shooter, along with some simple gunsmithing tools and techniques, can ensure they live even longer.

BY ROBERT K. CAMPBELL DECEMBER 2003

ORIGINAL PP. 18-22

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When working up a 1911, it's easy to drop in an Ed Brown hard-core extractor and trash the old part. The Ed Brown parts are of higher quality than the usual factory parts, and the problem is solved if an extractor problem existed in the first place. This simple replacement was not an option with a balky Charles Daly 1911 I worked on recently. The extractor had lost tension and the claw was no longer sharp. Someone had probably slammed the slide home on a loaded chamber repeatedly, damaging the extractor.

The extractor would not work reliably with every type of brass case. I pulled the extractor and found that it didn't match anything I had in the parts box. Both the length and configuration differed. A call to KBI resulted in an offer to repair the gun at no cost, reflecting a commitment to the model. But they didn't have an extractor on hand to send me.

In the interest of time and education, I decided I would repair the 1911 myself. Over the years, many writers have told us that the extractor controls feeding, chambering, and extraction. This is true, but the extractor does not control headspace. The gun

might feed without an extractor, but it would tie up when fired. Some folks fire the .40 S&W cartridge in the 10mm pistol, or fire the 9mm Luger cartridge in the 9mm Largo pistol. In this case, the cartridge does headspace on the extractor.

This, of course, is a dangerous practice to be avoided. The .45 ACP and the .38 ACP both use a .900-inch-long cartridge case, a product of their shared development. For absolute precision, I sometimes trim my favorite brass (Starline) to a length of .898 inch, using a Forster trimmer. Some chambers are tighter or more uniform than others, which is the reason why barrels such as the Nowlins I've been using lately are more accurate.

When the cartridge is stripped from the magazine, it may not always chamber and headspace perfectly if the extractor is out of specs. Let's look at what the extractor does. When the pistol recoils, the slide and barrel travel together with the case held by the extractor. When the barrel halts its rearward movement, the slide continues, and the extractor pulls the case from the chamber.

High pressure, a dirty chamber, and steel-cased ammunition can all increase wear on the extractor.

Considering that the extractors are simply small springsteel parts, they are quite rugged and long lived. But I have replaced more extractors than any other part of the 1911—except for springs and magazines. A common situation resulting in extractor damage is the fitting of heavier-than-normal springs for use with heavy loads. Changes in normal operation tend to batter the extractor.

Sometimes a dirty or rough chamber is at fault in malfunctions, and sometimes the wrong spring is the culprit, but the extractor can also be at fault. I've used Jack Weigand's extractor tuning tool with great success. This is a simple tool, but a great aid in the shop. The tool comes with two wedges, one for the .45 ACP and one for the .38 ACP and 9mm caliber 1911 pistols, one of which is snapped into the extractor. A trigger-pull gauge such as the RCBS is hooked into the gauge to measure spring tension.

THE EXTRACTOR WILL RELEASE THE WEDGE AT A

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certain weight. Some extractors show 20 to 25 ounces and work fine, but many will show much less. To adjust the extractor, the part is carefully removed from the gun. I always drop the firing-pin stop, the firing pin, and the spring, and carefully bring the extractor out with finger pressure only. Most of the time, this works. Occasionally an extractor may have to be bumped off the breechface a little.

This is common when unburned powder ash or gum from certain types of ammunition has conspired to varnish the breechface. If you pry the breechface end of the extractor, you are certain to spring it or ruin the hook. This, obviously, is to be avoided. Once the extractor is out, you wedge it into the Weigand tool by turning a dial until the extractor is held securely. Then, pressure is placed on the extractor until it is bent or sprung properly. Reinstall and check the pressure for a proper fit.

This is all that's required in many cases to restore or "tune" the extractor. I like to set mine between 22 and 25 ounces. Another

consideration is that the extractor hook be sharp. Some will have become blunted over time, and others were made of soft steel in the first place. A soft sub-standard part should be trashed. A quality part that has become blunted can be filed sharply and brought back to proper fit and sharpness. Sometimes you'll want to tune an extractor that's not malfunctioning.

For example, when fitting a 9mm Luger barrel to the .38 Super for economy reasons, you might find that the extractor does not reach the 9mm rim (.405- versus .386-inch breeches in the respective calibers are the difference.) Sometimes the extractor will work 45/10mm and .38/9mm extractors. fine, and sometimes it won't. You can use the Weigand tool to bend the tip of the extractor and ensure proper function with either caliber.

The new class of extractor seen on the Wilson Combat KZ-45 and a few other pistols is a different matter. These pistols use a fixed extractor. While they may be more rugged than the original extractor, they

have more parts, including the extractor, spring, plunger, and a roll pin in some versions. The replacement of these extractors would require the removal of the roll pin and removal of the unit, then replacement in the same manner. The roll pin is driven out with a punch.

I would recommend a solid pin rather than the hollow pin seen in some versions. The jury is out on these extractors, but they just might be a considerable improvement. It's standard operating procedure to include a sheet of "dos and don't s" when delivering a custom pistol.

When doing a trigger job, one of the "don't s" you'll want to warn the shooter about is slamming the slide on an empty chamber. This is ruinous to the trigger action. But we seldom warn the prospective buyer not to slam the slide on a loaded chamber. The proper technique is to load the pistol from the magazine by racking the slide, place the gun on safe, and secure it. Then, if desired, the magazine can



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be topped off with another round and reseated. To drop around in the chamber and drop the slide on it seems logical to some, but this can't be done often without damaging the extractor. The extractor performs in a far different manner in normal operation. When the slide

drops and the extractor is forced to snap over the case rim in this manner, it is stretched past its design parameters. Loading the weapon the proper way is just simple consideration for a good friend. ■

FINISHING

Reader Forum

BY AMERICAN GUNSMITH EDITORS DECEMBER 2003

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Project Guns Several years ago, I purchased two Remington frames for the purpose of rebuilding as decorators. In the same buy, I got a Whitney Navy frame and cylinder which had been converted to .38 rimfire. Now that I am retired, I want to finish the project, and have acquired some parts from Dixie Gun Works. The article on the 1858 Remington in the April 2003 issue was very helpful. Parts for the Whitney are the biggest problem. I need a hammer and cylinder pin, but Dixie doesn't have them.

Do you have any ideas about other sources? Now for the important question: I subsequently purchased a Whitney .36 Navy in kit form which I would like to finish as a shootable cartridge conversion. I found some good information in R. Bruce McDowell's A Study of Colt Conversions and Other Percussion Revolvers, and have made a template for fabricating the backing plate/spacer.

Unfortunately, I am not a machinist, and need some help in fabricating a cylinder, either by turning down the nipple end of the cylinder and fitting a spacer in the original manner, or by machining a complete new cylinder. Do you have any suggestions or recommendations on a gunsmith who could provide such services? Sidney Contact R&D Gun Shop: They are experts in Colt conversions and can probably help you out locating a hammer and cylinder pin for the Whitney.

Type 99 Arisaka Front Sight I'm hoping you can provide some suggestions that will keep me out of trouble with a project. I have a WWII-issue Type 99 Arisaka in beautiful condition that requires front sight work.

The front sight base is slightly tilted and must be made level in order for the gun to shoot straight. Barrel adjustment does not appear to be the solution, as the headspacing is good and the rear sight is level. I believe the solution is to remove and properly refit the front sight base.

How should I go about this without messing up a very nice piece of history? Mike Without examining it, we can't be certain whether Nippon chose to sweat or press fit their Model 99 sight bases to the barrel. We've heard of both options being encountered. If press fit, some heat and a slide hammer could be used to remove the base. If sweated on, higher heat and a brass drift could dislodge it.

In either case, there are likely to be some surface marks left behind that will have to be cleared up after the sight base has been reinstalled. Mounting Unertl Scope I have a customer that wants to put a Unertl scope on a Ruger M77. He has the Unertl rings, but does not have the mounts. Can you tell me what mounts could be used (and who makes them), or where I can go to get more information?

David Rogers Grand Mesa Gunsmithing The Unertl scope will mount on Weaver bases, but is it variable or fixed power, and does it have external adjustments? You should discuss the customer's needs with Unertl Frozen Ruger I had a Ruger Vacquero come in with a frozen-up loading gate. I took the gun apart and found that someone had worked over the loading-gate spring. I replaced the spring thinking that would solve the problem. It didn't.

The first time I opened the gate it was a little tight. After opening and closing it four or five times, it froze closed tight again. Any ideas? I thought maybe the transfer bar was interfering, but could see no signs of binding. I'm stumped. It's not the transfer bar.

It's a wrong angle on the loading-gate spring. When wrong, the spring digs into the gate every time the gate is opened. The more the gate is opened and shut, the worse the scoring gets. Result: the gate won't open. The solution is to put a medium-size bevel on the spring where it contacts the gate. The bevel will face toward the inside of the frame. It's a trial-and-error situation the factory often encounters, but the bevel will allow the gate to move freely.

The problem seems to pop up more easily if the revolver is made of stainless steel. You didn't say whether yours was stainless or not. If it is, replace and bevel the spring with one intended for a blued-finish Vacquero. Mauser Scope Mount What's the proper mount for a Leupold 4.5 x 14-40 mm scope on a Mauser Model 66 bolt-action 7x57 sporting rifle? The firearm is new and unfired except for the factory proof target.

I have tried, but have not been able to find any information as to what such a scope mount looks like, let alone where to find one. Additionally, I would very much like to have a schematic and whatever information is available regarding disassembly of this rather unique action. Although no longer manufactured, this is a very fine rifle valued at around \$2,000 to \$2,500, and I

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(continued from previous page) certainly don't want to damage it because of inadequate knowledge. Any information you could pass along would be greatly appreciated. Neil D. The Model 66 was developed by Walter Gehmann. Manufacturing rights for this short-action were acquired by Mauser in 1963. It was introduced in 1965, and sold in the U. S. as the Model 660. Distribution was terminated in 1974.

A schematic for the 660 appears in the Gun Parts Corporation Catalog and Ludwig Olson devotes several pages to it in his Mauser Bolt Actions, which is considered the bible on Mauser rifles. HRemington Model 14/141 I've got a Remington Model 14/141 that's driving me nuts! The trigger, sear, etc., work fine, until the ejector and ejector plunger are installed into the bolt. Then, the trigger can't trip the sear (nor can I trip it with a screwdriver). Everything else seems perfect. Your thoughts are appreciated.

Charles Reading the article on the Model 141 in the August 2002 issue should help you solve your problem. H&R .22 Project I picked up an old .22 rifle at a gun show, as I needed a .22 barrel for a project I had in mind. When I got it cleaned up, I decided to keep it, so I wrote to Numrich Gun Parts. They had no idea where to find the parts I needed. The rifle is a Harrington &

Richardson Model 365, serial #7856 and has the word "RASCAL" stamped into the barrel.

The parts I need are the bolt-handle assembly, and aside-mounted (peep?) sight. (The left side of the receiver has two threaded holes.) The bolt was equipped with a 1/4-20 machine screw as a bolt, and the weapon fires just fine. The barrel is very heavy for a kid's gun. I'd appreciate anything you can tell me about this gun and where I can get parts. I really enjoy my American Gunsmith magazine.

I've almost talked myself into a double rifle in .470, as I have a friend who wants to go hunt a Kodiak, and has asked me to come "back him up." I've seen a Kodiak, and my .300 Weatherby ain't what I would pick as a back-up weapon so.... William Farrant Naples, Michigan According to its serial number and a near equal number of phone calls we made checking it out, the gun show rifle you couldn't resist was made in 1930. H&R 1871 (a.k.a.

New England Firearms) won't admit to having any knowledge of a gun made by a predecessor. Walker Arms, Bob's Gun Shop, and others we contacted have no parts for the gun and we are not surprised. We did note, however, that Brownells newest catalog shows a generic caliber .22 bolt handle

that might be adapted to replace the machine/stove bolt now serving that purpose on your bolt body. While you're looking through the catalog, check out peep sights from Williams and others.

It may be possible to relocate the holes in them to match those on your rifle. As a final thought, the 2003 edition of Gun Digest lists the Harrington & Richardson Collectors Association (c/o G. L. Cardet, Suite 603, Miami, FL 33135). Dropping a line to the Association might prove helpful. How about a .416 Rigby as a backup for the Kodiak hunt? It would certainly be more economical and readily available than the double rifle now tempting you.

Rebarreling the Model 760 I'm considering rebarreling a 30-06 Remington Model 760, with a factory .308 barrel. With the different lengths of cartridge involved, I'm wondering if the receiver is the same for both calibers. That is, is the magazine-well length the same, with the .308 simply using a filler block of sorts in a magazine that is actually 30-06 length, front-to-back? Any info or advice is greatly appreciated. R Yes, the receiver is the same for both calibers. Yes, the magazine well is the same.

And yes, you can use a filler block at the rim end of the magazine to accommodate the .308.

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