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ARCHIVE ISSUE NUMBER

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DO-IT-YOURSELF RECEIVER WRENCHES AND ADAPTERS

PROJECT CHILD SAFE ON THE MOVE • PROFILE OF THE KIMBER CUSTOM II, PART 2 • JEWELING GUN PARTS • WORKING...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 019

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SAFETY & COMPLIANCE

Project Child Safe on the Move

BY AMERICAN GUNSMITH EDITORS JUNE 2005

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As we go to press, it's been a busy few months for Project Child Safe's fleet of 15 mobile classrooms as the vehicles spread out across the country, visiting nearly a dozen states and bringing firearm-safety education to as many as 150 communities per day.

With program launches from the Carolinas to Arizona, Project Child Safe had distributed more than 7 million safety kits in more than 40 states by the end of March, according to Bill Brassard, managing director of communications, safety, and education for the National Shooting Sports Foundation (NSSF) and the Project Child Safe director. The vans visited more than 9,000 communities in those states, Brassard points out.

A firearms safety kit consists of a cable-style gun lock and a brochure that discusses safe gun handling and secure storage. "Governors, lieutenant governors, U.

S. attorneys, and law enforcement on all levels continue to receive the program with enthusiasm," Brassard said. "We have enjoyed a high level of cooperation." Demand for the safety kits continues to be strong, Brassard observed. "As the program has moved throughout the country, the demand from the public for the gun locks and safety kits has remained very high, and there's no sign that it's slowing down," he said. "The Project

Child Safe formula of visiting communities, partnering with government and community leaders as well as the media to provide important safety information has proven itself over and over." Recognizing NSSF's groundbreaking and highly successful efforts to promote safe firearms storage through its Project Home Safe program, the U.

S. Department of Justice (DOJ) last year selected the foundation to administer "Project Child Safe," anew and broader nationwide program under President Bush's "Project Safe Neighborhoods" banner. Under a \$50 million DOJ grant, NSSF coordinates publicity, logistics, inventory, and distribution with partnering government and law-enforcement agencies to get firearms safety kits into the hands of firearms owners in all 50 states and five U. S. territories.

The recent Southern tour resulted in one of the program's busiest weeks ever, when it launched in four states in one week last February. Project Child Safe's "Phase One" goal is the distribution of 19.2 million locks. "Clearly, Project Child Safe reaffirms the firearms industry's commitment to safe and responsible use of its products," said Brassard. Editor Keith Lawrence Technical

MAINTENANCE & REPAIR

Profile of the Kimber Custom II, Part 2

This M1911 clone raised a rifle company from the ashes, and went on to become one of the most popular and highly regarded pistols on the market today.

BY CHICK BLOOD JUNE 2005

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Last month, I covered disassembly and cleaning of the Kimber Custom Series II. In this issue, we'll make a complete inspection of the parts, and cover reassembly and troubleshooting. If you've worked with an M1911 to any degree, you should be pretty familiar with the function of its action. The Kimber Series II, like the one here, is an M1911 clone, but contains elements you probably won't know much about. One of them is the firing-pin lock.

It both secures the firing pin in the slide and prevents inertial movement. Among other things, this should defeat a possible discharge if the muzzle is impacted rearward while chambering a live round. The grip safety on the Series II performs the same as it does on other M1911s. When it's not depressed, it blocks the trigger. Ah, but on the Series II, it does more. The grip safety, when engaged, also moves the firing-pin lock plunger up through its cut in the frame next to the disconnect.

The firing-pin lock is thereby raised to allow the firing pin free movement when struck by the hammer. Moving On with the Inspection I prefer to start with the frame. The ejector should be straight, have no burrs, and be seated firmly against the frame so it doesn't wiggle. The top of the frame by the hammer well must show no sign of raised metal. As you know, this can happen when the hammer is allowed to fall full force on a frame unprotected by the slide.

Any raised metal can be stoned away, but you have to be careful not to lower that upper surface area in the process. Check the feed ramp and barrel bed, located just forward of the ramp, to make certain they haven't been altered or damaged. Find any indication of hanky-panky or peening? Too bad. The frame has to be replaced. Surface inspection of the hammer well, slide, and

frame rails is in order. Especially the rails. Look for dents, galling, bending, nicks, or serious wear.

Most minor damage can be stoned back to proper tolerances. How about that plunger tube? Does it have any dents or nicks? Check the grip-screw bushings. They have to be tight and must not extend into the magazine well. The butt of the grip frame, if bent or dented, can make installing the mainspring housing more than a simple matter. A disconnect tunnel that is round and free of burrs is good. One that is elongated or enlarged is bad. Very bad. Again, the frame will have to be replaced.

On Series II pistols, the firing-pin lock-plunger hole should be round, without burrs and free of fouling. Inspecting the Slide The sights must fit their dovetails tightly. Any roughness on the breechface should be stoned away. The

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Any and all lead deposits must be removed prior to the use of FMJ ammunition. firing-pin hole is to be round and free of burrs. Likewise the firing-pin stop recesses. Apply stones judiciously to remove imperfections. Do the same, if necessary, with the disconnector rail. The barrel is next on the list. No lead fouling, bulges, or rings in the bore are allowed. Neither is muzzle damage. The chamber must be free of scratches or roughness; they might make feeding or extracting less than optimal.

The ramp and throat are examined for proper angles and mating with the frame bed. To double check, secure the barrel in the frame with the slide stop and pivot it rearward. Desired result: The barrel comes to rest on the bed and displays a 1/32-inch clearance between the lower barrel ramp and the top of the frame feed ramp. Failure to meet the desired result could indicate burrs or flanging in the barrel-locking lugs and/or the link-pin hole.

Burrs or flanging can be removed by stoning them only to the original surface of the lugs. The link pin should fit its hole firmly. If very loose, replace the link and, if absolutely necessary, the barrel. If loose, but without play in the hole, stake the edges of the hole with a center punch. The perfect time to check the headspace is before the pistol leaves your shop.

Besides, if the gun is under warranty and hasn't been in the hands of strange people who fumbled with it in ways voiding the warranty, correcting a headspace problem is the factory's problem, not yours. Headspace is checked with "go" and "no-go" gauges, with barrel and bushing installed, stripped slide on the frame, and slide-lock pin

through the barrel link. With the go gauge inserted in the chamber, the barrel should move into its locked position without the use of force.

If there is no lockup, the chamber will need finish reaming or the barrel must be replaced. Remove the go gauge and chamber the no-go gauge. You should not be able to move the barrel into locked position. If the action closes on the no-go gauge, the gun is unsafe and the barrel must be replaced. Small Parts Inspection If the firing pin is anything other than straight, round, and smooth, replace it. But be aware of the fact that there's a difference between early Kimber firing pins and those used in the Series II.

They're not interchangeable. The firing-pin lock needs a onceover in search of rough spots and a worn or bent leg. The part should drop freely into its slide recess and move up and down easily. No drag, no binding. See if there's any damage to the firing-pin lock spring while you're in the area. While I'm on the subject, if the firing-pin spring shows a tapering down in diameter toward the front of the pin, it is unsafe and must be replaced.

The same is true for a cracked firing-pin stop plate and a slide-stop pin measuring less than .196 inch in diameter where the barrel link and lugs bear on it. The extractor calls for more than a little attention. To make sure it has proper tension, install it in the slide and secure it in place with the firing-pin stop. (The barrel is removed for this test.) Slide a dummy cartridge up the breechface. It should slip under the extractor with only mild resistance and apply pressure only to the case rim.

If the extractor is too tight (high resistance), decrease the bend between its hook and first lug. If too light (no resistance), increase the bend. Factory specification for proper tension is 3-1/2 to 4-1/2 pounds. When the extractor is mounted in the frame, there should be no rubbing between it and the ejector, and the latter should have no play whatsoever. Achieving that status sometimes requires installation of anew ejector. Okay, I reach for my Dremel tool and chuck in a 1/8-inch ball cutter.

Turning it at moderate speed for better control, I remove some of the crimp from the tube-assembly studs on the inner surface of the magazine well. I fill the well with a magazine insert (Brownells), and secure the grip frame between padded vise jaws. Grab the plunger tube with a pair of pliers and pull out the ejector like a sore tooth? No way. Run a length of .080-inch wire through the plunger tube, twist the wire ends together, then grab the ends and pull straight out.

To finish up the replacement, I go back in with the ball cutter and touch the inner frame-stud holes to lightly countersink them. After cleaning the holes up, I apply some blue Lok-Tite to each one and insert a 7/64-inch length of drill rod into the plunger tube for support. The extractor studs are then tapped carefully into their holes with the small-diameter end of the tube facing forward.

A plunger-staking tool (Brownells) will firmly seat the new studs into the countersinks, after which they are stoned down flush with the frame surface. As long as the extractor is solidly seated, a dented plunger tube is no

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cause to remove or replace it. Dents can be ironed out by inserting the length of 7/64th drill rod into the rear of the tube and tapping it very lightly forward until it stops against the slide-stop plunger-retaining shoulder at the front of the tube.

We mustn't forget the disconnecter, people. Factory length is 1.305 inches. If it's less than 1.295 inches, junk it and replace it. Other useful dimensions include .25-inch depth and 90-degree angle for the hammer full-cock notch; overall length of a relaxed recoil spring for full-size models of not less than 5.840 inches; and a .008- to .010-inch clearance between the recoil-spring plug and the entire length of the guide rod. Finally, you don't want to overlook any obviously broken, damaged, or out-of-round parts.

Reassembling the Pistol Normally, the frame would have the ejector, plunger tube, and grip-screw bushings already in place, unless you had to repair/replace them as a result of your small parts inspection. Insert the trigger (adjustment screw at the bottom) into its frame channel. Assemble the magazine catch. Place its spring into the hole in the right side. Insert the pin of the catch lock into the spring coils.

Press inward, aligning the locking tab with the slot running parallel to the spring. (A 1/6-inch hex wrench can be of help here.)

When the tab reaches the slot, turn the lock counterclockwise. Drop the assembly into the frame from the right. As you turn the lock clockwise with the hex wrench from the right side, push in on the catch button from the left side until the lock rotates about 90 degrees and engages its frame slot. Rest the frame on its right side. Push the trigger bow fully forward.

Install the firing-pin lock plunger (pushrod) into its frame recess with the looped end downward and its nose extending through the top. Eventually, the pushrod will be retained by the sear pin. Maneuver the pistol so you're looking into the action from the rear. Install the disconnecter into its frame recess next to the pushrod. The lower, flat end of the disconnecter should rest on the trigger bow.

Place the sear over the disconnecter with its upper engagement surface to the top of the frame and pointing toward you. Insert the sear pin from the left with the beveled head out. The usual jiggle-wiggle of the sear and disconnecter will follow and be only slightly complicated by the additional aligning of the pushrod loop prior to pushing the sear pin in flush with the frame. Aside from this minor annoyance, or as noted elsewhere, reassembly follows that of any M1911.

I should bring up a specific caution when working with the Kimber Series II, however. After cocking the hammer in preparation for joining the slide assembly and frame, the finger must be off the trigger and the grip safety must not be disengaged (pressed) during the reunion. If the hammer is allowed to fall, damage to the firing-pin lock plunger will result. Other Reassembly Tips Never attempt to drive the slide stop into place against any resistance from the slide-stop plunger.

Use a jeweler's screwdriver to press in the nose of the plunger as you apply upward and inward pressure to the slide stop. Make sure the open end of the recoil spring is under the recoil plug and the closed end of the spring is over the guide rod. A If and when replacements are required, use only Kimber factory parts for the specific model. Parts manufactured by others will not only void the warranty, but could cause malfunctions or unsafe conditions for which Kimber would no longer be liable.

With the company thereby removed from litigation, that leaves you. Troubleshooting There isn't a better time than now to bring up the too-often ignored problem of barrel leading. Kimber recommends the use of jacketed factory

PROFILE OF THE KIMBER CUSTOM II, PART 2 CONTINUED

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Cause Solution Failure to feed/chamber Adjust extractor tension; clear and clean barrel; change ammunition; dress back lower barrel edge; re-throat and polish barrel; polish and/or replace barrel link; replace damaged magazine; polish feed ramp (when damage is severe, frame must be replaced); dress breechface or replace slide if severe; reinstall magazine spring properly.

Problem Stovepipe jams Shooter education; adjust tension; replace extractor; use lighter spring; switch to full-power ammunition; replace ejector. Erratic ejection Adjust tension; replace spring; change ammunition or use heavier recoil spring; shorten ejector nose; refit or replace ejector. Failure to unlock Ammunition (live?) stuck in chamber; barrel/barrel Remove round; inspect for damage and replace lug/link pin or slide stop damaged. damaged parts as necessary.

Failure to lock Slide-stop pin not through link; debris in slide, Properly install slide stop; clean out debris; replace locking the lugs; broken/damaged barrel lugs; barrel, link, and pin; replace bushing. damaged or out-of-round bushing; bulged barrel; broken link/link pin or slide stop. Failure to extract Adjust tension; replace and adjust extractor hook; replace barrel or polish chamber; clean chamber; replace recoil spring; use factory ammo.

Slide binding/dragging (possibly also affecting feeding and ejection) Doubling/full-auto Or failures to cock

Cocking is stiff Possibly straighten or if not possible replace hammer strut; install new hammer-strut pin, stone burrs; stake pin in place; replace mainspring, polish mainspring tunnel in housing. ammunition in its pistols, and they do so for good reasons. Homemade stuff being much cheaper, you're bound to deal with barrels, Kimber and otherwise, that have been fed a fairly steady diet of lead bullets.

Depending on the alloy, these can Extractor tension too tight; fouled or damaged chamber; out-of-spec ammunition; less than 1/32-inch jump from ramp to barrel; tired magazine spring; non-factory magazine; damaged feed lips or follower; rough or damaged feed ramp; rough breech face on slide; barrel obstruction; magazine spring installed upside down. Limp wristing; extractor tension too light; extractor hook broken or damaged; recoil spring too heavy; weak ammunition; ejector broken or bent.

Improper extractor tension; weak/binding/deformed recoil spring; over-powered ammunition; loose ejector in frame. Extractor tension too light; extractor hook worn or broken; rough chamber; dirty chamber; recoil spring too light or worn; over-pressure ammunition.

Hammer strut bent or out of place; burrs/dents/fouling on rails; firing-pin stop isn't retained by firing pin; galled or bent recoil spring guide rod; deformed recoil spring; binding firing pin lock mecha-

nism; broken/peened/bent lower lugs, link pin, or slide stop; link too long or binding on frame; cracks in frame or slide.

Sear/hammer hooks damaged or providing insuffi Replace both sear and hammer; replace disconnecter; cient engagement; disconnecter is worn or broken; replace hammer; replace or reposition sear spring. half-cock hammer notch damaged or broken; sear spring weak, broken, or out of place. Hammer strut bent; hammer-strut pin dragging or loose; mainspring dragging in housing. leave heavy deposits behind in the rifling. Obviously, this causes a loss of accuracy.

Seldom mentioned in the same breath are the more sinister conditions of increased pressure and a resulting structural failure of the barrel. Even the hardest lead slugs Replace or reposition the strut; stone, true, and clean rails; replace stop and/or firing pin; replace guide rod; replace recoil spring; clean lock parts and recesses; stone or replace link parts; replace slide/frame. leave some fouling in their wake.

Kimber insists, and I strongly second their insistence, that this fouling must be removed prior to using any jacketed ammunition to avoid the risk of a bulged or ruptured barrel. Most fouling problems can be

PROFILE OF THE KIMBER CUSTOM II, PART 2 CONTINUED

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Slide fails to lock open Bend follower dog-leg to engage stop or replace follower; replace magazine spring; restake or replace plunger tube; replace slide stop; replace slide. Premature slide lock Replace plunger and spring; reform plunger tube or replace plunger assembly; replace recoil spring; replace slide stop. Thumb safety binds Reform tube or replace assembly; replace thumb safety; replace grip or relieve binding area; stone burrs or replace safety; stone hammer pin's head or replace.

Hammer falls, thumb safety engaged Hammer falls, grip safety engaged Hammer fails to fall, safeties disengaged Trigger binds Clean frame slots; bend trigger bow to fit or replace; repair or replace trigger bow; stone to align trigger bow or replace. Trigger pull gritty Replace hammer and/or sear; stone extension of grip safety for clearance; replace sear and/or disconnecter.

Trigger pull too heavy Peened or rough sear/hammer engagement; sear- Replace sear, hammer, or both; re-bend or replace spring center leaf too heavy; sear spring out of line. sear spring; reposition sear spring. Trigger pull too light Worn or altered sear/hammer engagement sur Replace hammer, sear, or both; re-bend or replace faces; center leaf of sear spring too light; worn or sear spring, replace mainspring. altered mainspring.

Magazine fails to eject cleanly Magazine well severely fouled; binding on trigger bow; grip bushings intruding into magazine well; follower overriding slide stop; magazine catch fouled or damaged; magazine damaged. eliminated with a quality solvent, liberally applied, and allowed to "work" at least 10 minutes before the bore is scrubbed with a tight-fitting bronze brush.

That failing, ridding the rifling of its deposit will require more solvent, more "working," more Magazine follower overriding slide stop; magazine spring weak; plunger tube loose; slide stop broken or peened; slide-stop cut in slide worn. Slide stop plunger not applying enough force to slide stop; plunger tube bent or otherwise damaged; recoil spring weak; none of the above.

Plunger tube damaged; bent thumb safety; right grip panel binding on retaining extension of ambidextrous safety (if present); damage to sear engagement lugs of safety; dragging on hammer pin. Insufficient sear engagement with safety. Replace safety and/or sear. Damaged or too short grip-safety nose; notched or Replace grip safety; replace the trigger, re-bend damaged trigger bow; weak or broken right-hand or replace sear spring. leaf of sear spring.

Hammer strut bent or broken; insufficient trigger overtravel; insufficient clearance of grip safety to trigger bow; burred or other-

wise damaged disconnecter; hammer-strut pin binding on frame. Frame slots fouled; trigger bow too wide/narrow and binds on frame; burrs or damage to trigger bow; trigger shoe out of alignment with frame. Rough sear/hammer-engagement surfaces; trigger bow dragging on grip safety; disconnecter not fully engaging sear. scrubbing, and, in stubborn cases, a Lewis Lead Remover (Brownells).

The troubleshooting table above shows possible malfunctions along with their causes (in the order of probability) and their solutions. Except for the extra care demanded Replace hammer strut; adjust overtravel by turning the adjusting screw counterclockwise in 1/4-turn increments until no drag is felt when the hammer is manually lowered; stone for clearance or replace grip safety; stone or replace disconnecter; reset hammer-strut pin and stake in place.

Clean mag well with brush and solvent; bend trigger bow for clearance or replace trigger; stone grip bushing(s) flush; adjust follower or replace; clean, repair and/or replace catch assembly; polish/ reform magazine or replace. of you due to the precision construction of Kimber Series II pistols—and matters involving the firing-pin lock assembly, including the pushrod—these troubleshooting hints generally apply to all other M1911 clones. Sometimes we get lucky, folks. ■

TURNING

Jeweling Gun Parts

This simple process—accomplished with very basic equipment—not only adds to the appearance of working parts, it contributes significantly to mechanical function.

BY DENNIS A. WOOD JUNE 2005

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Original caption: Below top: A lustrous polish will enhance the effect of your jeweling efforts. Below bottom: The end result creates a nice appearance and has the advantage of holding rust-preventing lubricant better than a smooth surface.

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The term “jeweling” is also known as “engine turning” and “damascening.” It doesn’t matter which term you use, as long as the results are the same. Jeweling consists of tiny round swirls that are evenly spaced, the purpose of which is partly cosmetic—to dress up the appearance of the firearm—as well as to produce a surface that holds rust-preventing oil. Work Preparation As with any other gun project, preparation is everything.

If parts are to be blued, it’s always better to add these swirls after the bluing has been applied. Jeweling shows up best on polished steel, and the more lustrous the polish, the more dramatic the jeweling will appear. I prefer to mask off the bluing with electrician’s tape before polishing a targeted area, as the tape will protect the metal that I wish to remain blued. This works especially well on the

bolt bodies of bolt-action rifles, when the preparatory polishing is done on a power buffer.

The polishing wheel I use is charged with 555 Polish-O-Ray compound. I use a spiral-stitched muslin wheel, 8-inches in diameter with a face width of around 3/4 inch, turning at 3600 rpm. If a power buffer is not at your disposal, the area you plan to jewel should be polished with strips of 600-grit wet-or-dry paper. This should achieve an acceptable finish prior to jeweling, but if you’d like to take the polish to the next level, 1200-grit emery paper will give you a mirror finish.

On round parts such as bolt bodies, a “shoe-shine motion” done perpendicular to the centerline of the bolt body will get you there in short order. On flat parts, it’s best to put the paper on some sort of sanding block to maintain flatness. Jeweling Tools Once we have the parts polished and prepared for the en-

gine-turning process, we need to select the tools with which the work is to be done. I’ve heard of this process being done by several different methods.

A wooden dowel with silicon-carbide grit embedded in the end can be used. Cylindrical rubber rods, called “Cratex rods,” that have this same type of grit molded inside, are also used. These work pretty well as long as the part to be jeweled is relatively flat. However, when you try to work with cylindrical surfaces like those on a bolt body or a concave magazine follower, the flat faced rods leave much to be desired.

I prefer to use carbon-steel end brushes that are 3/16 inch in diameter with a 1/8 inch diameter shank. The wire end brushes conform to contours much easier than harder, flat-faced tools do, and on round bolt bodies that helps to blend the swirls into one another. Used as is, the 3/16-inch-

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diameter end-brushes will splay out to around 1/4 inch diameter once they come in contact with the part you are jewelizing. In some cases, this diameter will give a disproportionate look on your work. For example, if you plan to jewel the sides of a hammer, the 1/4-inch swirls appear too large for the surface involved. For smaller gun parts, I doctor-up the end-brush a bit to contain the splaying of the wires by sliding a small section of heat-shrink tubing on the outside diameter of the end-brush wires.

I use a heat gun to shrink the tubing, placed about 1/8 inch above the working end of the wires, thus constricting the wires into a tighter group. This keeps the wires of the end brush in a tight cluster that creates swirls of around 3/16 inch in diameter for those smaller parts. When I first began using the carbon-wire end brushes for jewelizing, I experimented with various grits of lapping compounds that are mixed with oil and used to lap parts together that need to fit very tightly.

My first attempts were with 120-grit, and I learned quickly that this is too coarse and aggressive for what we need to accomplish. The other extreme, 600 grit, is just too fine and doesn't produce the look I was after. The type I finally settled on is a 240-grit silicon carbide in a grease mixture, made by the Clover Manufacturing Company. The little end brushes hold this compound in the multitude of wires very nicely. The tiny wires don't actually do the cutting, the silicon grit does.

This grease/grit mixture stays in place, and will not run off curved surfaces like an oil-based mixture tends to do. Spacing the Swirls The jewelizing process must be done on either a drill press or a mill/drill setup. The brush needs to turn at around 2,000 rpm, and should contact the work piece as perpendicular as possible, or at top-dead-center on a bolt body.

When dealing with flat parts such as hammers or trigger sides, some means to move the part accurately in both directions will

give a professional look to your work. Vises commonly referred to as "X & Y" vises can be purchased for a relatively low price, especially if one of the imported brands is chosen. These vises travel in both of the directions we need to space our swirls. The procedure is to create one row of swirls by moving the vise lengthwise half the distance of the swirl diameter.

Once a full row of swirls has been created, a bolt body will need to be precisely rotated to produce the next row of swirls. I made my own jewelizing index er with some very simple stuff. A 120-tooth spur gear, 4-1/2 inches in diameter, was used as the basis to control the index spacing. A base plate made of cold-rolled steel, measuring 10-inches long by 2-1/2-inches wide and 3/8-inch thick, holds two plates of 1/2-inch-thick steel 3-1/2-inches high by 2-1/2-inches wide.

These two plates were clamped face-to-face in a drill press vise, and a 1/2-inch-continued on page 22)

JEWELING GUN PARTS CONTINUED

ORIGINAL PAGE 22

diameter hole was drilled through both plates 3/4 inch from the top and left corner of each plate. This process will somewhat guarantee that the two holes will align once we assemble these plates to the bottom plate. A spud was then turned to slip fit through the spur gear and press fit into one of the plates. This spud has a spring roll pin that is intended to fit into the cocking notch on bolt bodies and acts as the driver when indexing the bolt body.

A simple spring-assisted lever with around piece of 1/8-inch steel stock was ground so that it meshes with the notches between the gear teeth, holding the gear in place after indexing. On the opposite end of this fixture, the other plate holds a finethread bolt that has one end turned to 60 degrees and acts as a center. The center fits into the firing-pin hole to keep the bolt body in alignment with the index gear. Most bolt bodies measure about .700-inch diameter, with a circumference of around 2.200 inches.

Using the 120-tooth gear for indexing, each space between the gear teeth will rotate the bolt body 3 degrees, or about .018 inch along the circumference. Half the swirl diameter of approximately .200 inch is .100 inch, so indexing five spaces in the gear tooth will get us pretty close to the spacing we're looking for.

The lead screw on the X & Y vise that I have has 9 turns per inch, so with one full revolution of the longitudinal-movement dial, the bolt will move about .111 inch, which matches the amount we index the bolt well

enough for our purposes. Occasionally, I'll run into parts with concave areas that complicate the process. One that comes to mind is the type of magazine follower with a radiused top that holds a cartridge during the chambering sequence.

I fashioned around aluminum bar with a center in one end and a hole to accept the driving pin in the opposite end. The indexing fixture is then clamped in the X & Y vise, and the follower is hot glued to the aluminum bar, striving to get it as square to the drill chuck as possible. These parts are a little tricky to jewel because you need to rotate the part and then move the part using the "Y-feed" dial, as the part will rotate away from the end brush a bit. It can be done, however, as seen in the accompanying photo.

After you have your part completely jeweled, clean it thoroughly in a solvent. Any residual compound left behind will not treat that part kindly during its working efforts. Conclusions Jeweling is not a difficult process to pull off. Power buffers are indeed handy to have around, but you can do just as nice a job of polishing with the emery paper. And if you're doing any serious work on firearms, you most likely already have a drill press.

With a little practice and a good eye, you can even eliminate the need for any indexing fixtures for jeweling small parts. One thing is for sure: If I can pull off a reputable jeweling job, so can you. ■

RIFLES

Do-It-Yourself Receiver Wrenches And Adapters

What happens when someone brings you a jewel that no one makes a wrench for? Here are some solutions for safely dealing with barrels, without marring someone's "pet" rifle.

BY RUSSELL CORBITT JUNE 2005

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A new customer called my shop awhile back and said he was in the process of building some personal hunting rifles and needed the barrels removed from two military Mauser actions. He also wanted one of the actions drilled and tapped. I gave him a price suited to large and small-ring Mauser rifles, without asking any more questions. Imagine my surprise when he showed up with two 1891 Argentine barreled actions! It was too late to back out. Besides, I considered it a challenge.

It got more challenging when I realized that my Brownells receiver-wrench base fit too far back on the receiver to allow the top half of the wrench to grip the receiver ring properly. The wrench assembly kept slipping back away from the receiver ring, and I was in danger of marring or even twisting the receiver. Those old barrels were really stuck. I put it all down (before I got really aggravated) and went to the next item in the queue, installing a new barrel in an FAL.

As I was torquing the barrel, I was struck by the fact that the Brownells receiver wrench set for the FAL is a two-piece affair that bolts to the base. Hmm...so is the

Remington 700 set, the Remington 788 set, the SMLE adapter, the Arisaka adapter, ad nauseam. Yup, looks like I'd been bitten by "Rule #1"—you have to be at least 5-percent smarter than what you're working on. Okay, now I knew how to get these Argentine barrels out.

I just had to make a handy base for the bottom of the Argentine receiver, and use whichever top half fit best (in this case, the Winchester M70 head and a thin lead shim). One whack with the 2-pound ball-peen hammer and they came right off. After having spent the time and effort to make a complete wrench base and handle, it occurred to me that I could simply have made an adapter from a piece of bar stock and used my existing wrench base. Another Rule #1 violation. (Sigh.) Live and learn.

Oh, well, I now have two wrench bases, which came in quite handy recently when I needed to straighten a 95 Mauser receiver that someone had twisted with one of those receiver wrenches that goes into the bolt-lug races. I've had occasion to remove and/or install barrels in quite a number of odd rifles for which there are no available

receiver wrenches. While some of the barrels can be removed by clamping the receiver in a vise (with a suitable filler), the problem then becomes one of holding and turning the barrel.

A pipe wrench works well if you're not going to reinstall that barrel, but a new barrel will probably look rather rough if you use a pipe wrench as an installation tool. That's why, outside of factories and arsenals, the most common method for barrel removal and installation is the use of receiver wrenches and barrel vises. In this article you'll find sketches of tooling I've fabricated to augment the basic Brownells receiver-wrench base.

The wrench heads and adapters can be very useful when one of these guns comes in, and nothing in your existing wrench collection will grip the receiver properly. I don't know if they will fit on other makes of wrench bases, but if your wrench base has a different bolt-to-bolt center distance than the Brownells wrench, just 1891 Mauser Adapter

DO-IT-YOURSELF RECEIVER WRENCHES AND ADAPTERS CONTINUED

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1895 Steyr Straight-Pull Adapter FN 1949 Wrench Head change the hole location to match your wrench base. Depending on your base's dimensions, this may necessitate changing location of the 1/4-inch hole for the Savage 99 flat-sided receiver adapter. The only material you need for most of these receiver-wrench adapters is a chunk of 1-1/4- x 1/2-inch bar stock. Some of them require modification of an existing wrench head. Because of the Krag receiver's odd shape, its adapter requires a bar at least 3/4 inch thick.

If you can't get 1-1/4-inch stock, you can use the more common 1-1/2-inch material and adjust the dimensions accordingly. The wrench heads for the MAS 36, the MAS 1949/MAS 49-56, and the Schmidt-Rubin K-31 are made from 1-1/4-inch-square cold-rolled steel (CRS) or leaded-steel bar stock. The alloy is relatively unimportant in most cases, but the better the metal, the better the

finished product. I have used CRS, hotrolled steel, Stressproof, "mystery steel," and even aluminum to make various heads or spacers.

Fit can be improved if necessary by coating the receiver with release agent and using Brownells Steel-Bed, Devcon, Liquid Steel, or something similar to fill in any gaps. Assemble the wrench with the epoxy filler in place, and tighten the cap screws just snug enough to keep the wrench assembly from moving. After 24 to 36 hours, the wrench can be tightened more and barrel removal attempted. The particulars on each of the illustrated adapters follow: 1891 Mauser.

When installing a barrel in the 91 Mauser, you must be careful to avoid damaging or breaking the small steel stud inside the receiver. When torqued, the barrel shank must not touch this stud; it's not made for any kind of longitudinal stress. This stud acts as

a stop to prevent extractor breakage and retains the 91's extractor in the bolt when the extractor flexes out before snapping over the chambered cartridge's rim.

By the way, the 1891's extractor is very fragile, and should not be removed from the bolt unless necessary. 1895 Steyr-Mannlicher. I worked over an 1895 Steyr-Mannlicher FN 1949 Adapter Plate carbine recently. I was intrigued at the idea of removing the barrel, machining the shank of a #1 Mk. III SMLE barrel to fit, and reaming the new barrel's chamber to 7.62x54R.

This would give the owner (me) a very user-friendly carbine in a caliber much cheaper and more available than the 8x56R. (The Mannlicher clips work fine for the 7.62x54R. Before affordable brass was available, I used Boxer-primed 7.62x54R brass to make reloadable 8x56R cases).

DO-IT-YOURSELF RECEIVER WRENCHES AND ADAPTERS CONTINUED

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However, no combination of receiver wrench pieces I had on hand would remove the stubborn barrel. Therefore, to avoid unsightly damage to my receiver, I decided to make a wrench adapter specifically for the Steyr. Now that I have the adapter, I don't have time to fiddle with the rifle. I guess it's better that way; working on my own stuff K-31 Schmidt-Rubin Wrench Head Set doesn't pay very well. As you can tell by the diagram, there's not much to this adapter. FN 1949.

Should you get one of these for rebarreling, you'll need the wrench head and adapter plate shown in the drawings to hold the receiver without damaging it. A note about the adapter: It's a good idea to make absolutely sure you have all the flat areas on the receiver's bottom in contact with the wrench

adapter. You can use epoxy to help. Coat the receiver with release agent and "bed" the receiver into the wrench, tightening the cap screws just snug enough to prevent movement.

After the epoxy cures, tighten the cap screws tight and go ahead with barrel removal or installation. Schmidt-Rubin K-31. The dimensioned diagram shows the wrench parts I designed to augment the basic Brownells receiver wrench base to remove and reinstall K-31 Schmidt-Rubin rifle barrels. I don't know if they will fit on other makes of wrench bases. If your wrench base has a different bolt-to-bolt center distance than the Brownells wrench, just change the hole location to match your wrench base.

The 1-1/2-inch hole can be drilled, bored on the mill or the lathe, cut with a good-quality hole saw, or milled out using a rotary table. The method is unimportant; you just need the two 1-1/4-inch blocks with the hole cut in the right place. The spacer is discarded after the 1-1/2-inch hole is finished. Carcano. The Carcano's receiver ring is just about the same size as the Remington 700, so the Brownells 700 wrench-head set is modified a bit for the Carcano's recoil lug/front guard screw boss.

The fit can be improved if desired by coating the receiver bottom and front guard screw with release agent and using epoxy to fill the new lug pocket for a perfect fit on the odd Carcano lug.

DO-IT-YOURSELF RECEIVER WRENCHES AND ADAPTERS CONTINUED

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Carcano Wrench Head Place the front guard screw through the hole in the wrench head, and use a piece of duct tape to keep it in place temporarily. Fill the lug pocket about two-thirds full of epoxy and run the guard screw into its corresponding hole in the lug, taking care to keep your filler out of the guard screw hole and off the screw threads as much as possible. Assemble the rest of the wrench and tighten the cap screws just snug enough to keep the wrench assembly or receiver from moving.

After the epoxy cures, the wrench heads can be removed and any excess epoxy cleaned up. A note about the adapter: It's still 100-per-

cent usable on Remington 700 rifles. MAS 1936. The French MAS 1936 rifle has been imported in some numbers recently, some in the original 7.5x54 MAS and some converted to 7.62x51 NATO. I've had both come through my shop, and have observed several others that could use some chamber work or barrel requalification (set back one turn and chamber re-reamed).

However, the MAS 36's MAS 1936 Wrench Head receiver is oddly shaped, making it difficult to grab well enough to allow barrel removal without damage to the receiver.

The wrench head shown here will allow MAS 1936 receivers to be firmly clamped on the receiver ring, permitting marand scar-free barrel removal and installation. sioned diagram shown here will allow you to fabricate a wrench head that will allow proper slip-free gripping of the MAS's receiver ring, MAS 1949 & 49-56 Wrench Head The only material you need for this wrench head is a 5-inch chunk of 1-1/4-inch-square coldrolled steel or leaded-steel bar stock.

Saw off 1/2 inch to make the filler, and fashion the wrench head as described in the drawing. MAS 1949/49- 56. The dimen

DO-IT-YOURSELF RECEIVER WRENCHES AND ADAPTERS CONTINUED

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Mosin-Nagant Adapter placing the torque stress on an area more resistant to damage than trying to turn the receiver by its flat sides. The only material you need for this wrench is a 4-1/2-inch long chunk of 1-1/4-inch-square steel bar stock, and a piece of 1-inch round bar stock just over 1/4-inch thick. This head fits under the barrel, with the round part inserted into the round hole in the receiver. The wrench base is used against the flat top of the receiver, with the recoil-lug relief over the gas-spigot boss.

You may need to modify your wrench's recoil-lug relief to clear the boss enough to properly butt the wrench up to the receiver. Mosin-Nagant. The Model 1891 Mosin-Nagant rifle is one of the world's longest-serving military rifle designs—many were still in use as late as Viet Nam. It was developed into various carbines and evolved into the M91-30, but they all have essentially the same action.

I've even seen what appears to be M91-30 rifles and M39 carbines in the Afghanistan conflict's video footage, and M44 and M39

carbines in Iraq. Interestingly enough, its cartridge (the 7.62x54R) is also still in service in some parts of the world as a general-purpose machine-gun (GPMG) cartridge. This makes the 7.62x54R the world's oldest serving military cartridge. None of this is accidental; both the Mosin-Nagant rifles and the 7.62x54R cartridge are well-designed, well-engineered, well-made, and they work.

What's the old saw: If it ain't broke...? Barrels in these rifles range from hand-tight to torqued-by-Hercules. The drawing shows an adapter plate to use between the bottom of the receiver and the Brownells wrench base. Use a shimmed small-ring Mauser wrench head on top for round-receiver actions or a "universal" head with a V-notch on the hexagonal receivers. I don't know if it will fit on other makes of wrench bases.

The only material you need for this receiver-wrench adapter is a 4-1/2-inch piece of 1-1/4- x 1/2-inch bar stock. Savage 99 and Other Flat-Sided Receivers. There's not a lot to say about Savage Model 99 Adapter this one that's not in the drawing. It's useful on

pretty much any flat-sided receiver, including lever-actions, shotguns, etc. Be certain you use the bolt/bolt carrier or some other internal supports inside the receiver to prevent crushing. SKS.

The SKS has been imported into this country for a couple of decades now, and there are huge numbers in use and in closets. You may have one come in for a barrel change, as some of the imports didn't have chrome bores and/or the owners shot corro sively-primed ammo without proper cleaning. The barrels on the pressed-and-pinned models are difficult to change without special tooling to hold the receiver and press the barrel out, then hold the barrel and press the receiver back into place.

I don't recommend using the BFH (big...ah, um,...hammer) method instead of an arbor or hydraulic press. The models with screwed-in barrels are no more difficult than any other rifle, however, with the proper receiver wrench. The drawings are modifications to the Brownells small-ring Mauser

DO-IT-YOURSELF RECEIVER WRENCHES AND ADAPTERS CONTINUED

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SKS Receiver Wrench Heads wrench head to make a set of SKS wrench heads for the basic Brownells receiver wrench base. I don't know if they will fit on other makes of wrench bases. Note: The "top" wrench head is still suitable for use on small-ring Mausers. Break any sharp edges on the milled areas to prevent scratching the SRM receiver.. The SMLE is still a fairly common sight these days, and changing barrels is an occasional request that should be easily accomplished.

However, I have not had tremendous success using the Brown-ells adapter with these, as the open slot tends to allow the wrench to tip or cant, risking marring or damage to the receiver. To solve this problem, I made a filler for the slot and turned it into a hole. Now the wrench can't tip and tight SMLE Adapter U. S. Krag Adapter barrels come out without worry of damage. The only material you need for this adapter is a 4-1/2-inch piece of 1-1/4- x 1/2-inch bar stock.

If you already have a Brownells SMLE adapter plate, just weld a plug across the slot as shown to eliminate that scary wrench wobble. US Krag-Jorgensen. Original military-configuration Krags now command in excess of \$1000 for a nice specimen. Looking around at a recent gun show here in Central Texas, I was stunned at the prices of Krags and (continued on page 22)

Springfields in far poorer shape than mine. (I hastened home and revised my 1896 rifle's estimated value!) Of course, values vary by location and older firearms in really good condition such as Krag and Springfields are more available and generally less expensive in the Northeast. They were generally cleaned up and hung on the wall as "grandpa's rifle" and left as such. On the other hand, guns in the Southwest were tools, used regularly (and sometimes abused regularly).

Generally, Krag tend to have poorer bores than even the older trap-door Springfields because of the nature of the early smokeless powders and the early non-mercuric priming. Should you get a Krag for rebarreling, you're going to have fun trying to turn that odd receiver. The drawing shows an adapter to augment the basic Brownells receiver wrench base. Because of the Krag receiver's odd shape, its adapter requires a minimum 3/4-inch-thick bar.

These barrels are not usually very tight, but if one has rusted some, it can be a real bear. My Krag adapter is aluminum, but you can make yours out of whatever you have on hand. Should you not have a milling machine or are otherwise unable to fabricate these adapters, I would be happy to make them for you at a reasonable cost. I will also assist with any questions you have concerning their fabrication and/or use. You can email me at ■

PEOPLE & COMPANIES

Working the Remington Model 1875/1890 Revolvers and Replicas

Remington's 1875, a development of the Remington-Beals revolver, was a close competitor of the Colt Single Action Army, with which it shares many features.

BY DAVID R. CHICOINE JUNE 2005

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The Model 1875 Single Action Army—also known as the Improved Army or Frontier Army—was Remington's first largeframe metallic-cartridge revolver and a contemporary of the Colt Single Action Army. The two revolvers were very similar in size and shape, but Remington, the old New York gunmaker, once again made use of some reliable features from the popular percussion-era Remington-Beals revolvers.

Those features enabled the use of fewer parts, and included a frame and grip straps that were made in one piece, as well as the use of one less action screw in the frame. Another very distinctive feature of the 1875 was its unusual tapered-rib ejector housing under the barrel, giving the revolver something of the appearance of Remington's Civil War-vintage percussion revolvers and the illusion of a greatly reinforced barrel.

This wedge-shaped ejector housing served as a guide, support, and as a container for the ejector spring. The ejector rod itself was for the most part, actually outside the housing. The 1875's unique base pin extended from just behind the cylinder all the way out to the end of the ejector housing. Remington used a rather delicate, spring-loaded catch at the end of the base pin to lock it in place.

Remington Model 1875 revolvers were offered in .45 Colt (these are scarce), .44-40, and .44 Remington centerfire calibers. Most of these were sold with 7-1/2-inch barrels, although a few were produced with 5-3/4-inch barrels. On the American frontier, the 1875 proved itself a reliable weapon and several of our more notable figures including Frank James, the brother of the infamous Jesse James, are known to have used them. Roughly 25,000 to 30,000 of the 1875 Models were produced between 1875 and 1889.

It is believed that a substantial number (some say 10,000) of the 1875 model were intended for sale to the government of Egypt; however, due to Egypt's default on another military contract with Remington, it is supposed that only a few were actually delivered. Another 683 of the Model 1875s were purchased in 1883 by the U. S. Interior Department for the Indian Police, and the Mexican government purchased about 1,000 revolvers during the 1880s.

By 1890, Remington had gone into receivership and was under the management of Hartley & Graham. In that year, the 1875 was replaced with the Model 1890. This revolver was almost identical to the earlier 1875, but in an effort to streamline the gun's appearance, the mass of the web which formed the ejector housing was greatly reduced. Remington Model 1890 is very rare, with only about 2,000 produced. They were offered in both 5-1/2- and 7-1/2-inch barrel Revolver courtesy of Stoeger Industries.

WORKING THE REMINGTON MODEL 1875/1890 REVOLVERS AND REPLICAS CONTINUED

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Above left and In the photo on the right, the gunsmith's finger is holding the safety in the "on" position. lengths and only in caliber .44-40. In all, comparatively few Remington 1875 and 1890 Model Single Action Army revolvers were manufactured. They were of excellent quality, however, and were respected in their day and they remain much copied and well thought of today. Internally, the Remington revolvers are simple and easy to understand.

They operate very much like the Colt Single Action Army, and repair procedures are virtually the same. Unfortunately, though, the parts are not interchangeable. Excellent, shootable-quality replica Remington revolvers are currently manufactured by A. Uberti in Italy, and sold in the U. S. under several brand names. Another very high quality and faithfully made Model 1875 replica is made in the U. S. and available from Hartford Armory. In a deviation from the original Remington, A.

Uberti has chosen to use the more reliable Colt smokeless-type, spring-loaded cross-bolt latch to hold the base pin in the gun. From the practical standpoint, this is an improvement on the original. Uberti has also fitted a sear-actuated, pivoting hammer-block safety, much like the ones used in their Cattle man revolvers. The Uberti

version is illustrated here. Disassembly Instructions Uberti 1875 parts nomenclature is used in the text that follows.

With minor variations, as covered in the text, these instructions are suitable for use with nearly all of Remington's large-frame, metallic-cartridge single-action revolvers, as well as replicas based on this design. 1) Start by making sure the weapon is unloaded. Hold the revolver firmly around the grip, being careful to keep your finger away from the trigger (#10), all the while keeping the muzzle pointed in a safe direction.

Check to make sure this weapon is unloaded by opening the loading gate (#142), then pull the hammer (#2) slowly toward the rear until you have heard two clicks. That should place the hammer about halfway back into the loading position, and from here the cylinder (#5) should spin freely in a clockwise direction.

To make certain that the cylinder chambers have no cartridges in them, slowly rotate the cylinder two full revolutions by hand, all the while looking into the cylinder chambers through the opening that has been presented at the rear of the frame (#1) by the open loading gate. If cartridges are present, this is a loaded gun; proceed cautiously. Leave the hammer in the loading position, and the loading gate still in the open position.

Maintain your secure grip on the weapon, keeping your fingers away from that trigger. Now tilt the revolver so that the muzzle is facing away from you and upwards in a direction determined to be safe, so that if the gun does accidentally fire no one will be harmed. Use your other hand to rotate the cylinder slowly, one chamber at a time, pausing as each chamber aligns with the open gate. Allow each cartridge to fall out of the chamber onto your workbench.

If any cartridge does not fall out of its own weight, you should manually operate the ejector by pushing the ejector rod head (#164) located under the front, right side of the barrel, to the rear until the ejector rod has forced that cartridge out of the chamber. When you've made certain that there are no more cartridges left in the cylinder chambers, the revolver can be safely disassembled.

I like to make it a habit in such situations to move any live ammunition to a location apart from where I am working on weapons. 2) To remove the cylinder: With the hammer placed in the loading position so that the cylinder will spin freely, open the loading gate. The Uberti replicas use a push-button base-pin retainer system that is very much like the one used in the Colt Single Action Army. It's really an improvement over the original system, which was

WORKING THE REMINGTON MODEL 1875/1890 REVOLVERS AND REPLICAS CONTINUED

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The strain screw at the bottom-front of the butt should be loosened before removing the spring, more fragile. Push in on the base-pin screw (#140) located on the left-front of the frame, just under the barrel. Withdraw the base pin (#21) to the front far enough so that the cylinder is free and can be rolled out to the right side of the frame.

On Remington originals, depress the base-pin catch located at the front end of the base pin, and withdraw the base pin out the front far enough so the cylinder becomes free and can be rolled out to the right side of the frame. 3) To remove the grips, mainspring and trigger guard, unscrew and remove the grip screw (#54) from the center of the left-hand grip, and then lift off the two grips (#45 & #46).

Loosen the mainspring screw (#53), and the bottom of the mainspring (#20) can be tapped sideways out of its slot in the grip frame (in either direction) using a small hammer and straight brass punch. Then lift the spring out of the frame. Unscrew and remove the triggerguard screw (#31) from the front of the guard bow. The triggerguard (#26) is now tilted down from the front and pulled forward and down off the frame.

Note: to reinstall the mainspring, hold its top up against the bottom of the hammer roller (#25) at the lower-rear side of the hammer, grasp the spring by its bottom side with a strong pair of pliers, and push upwards, causing the spring to bend just far enough for you to reseat it within its slot in the frame. Once you have the mainspring started into the slot, you can release your grip with the pliers and then use a small punch and hammer to reseat the spring fully into the frame slot.

Notice the gate screw, spring, and plunger at the bottom of the photo. 4) To disassemble the action, unscrew and remove the trigger-bolt spring screw (#35). This is the only screw inside the action part of the frame that faces straight up. When the screw is removed from the underside of the frame, the trigger-bolt spring (#19) will fall out the bottom of the frame. Remove the forward-most of the two screws on the left side of the frame.

This is also the smaller of the two screws and is called the trigger screw (#38); however, it holds the bolt (#12) and the trigger (#10) in place. The trigger and the bolt can now be removed through the bottom of the frame. The hammer screw (#37) can now be unscrewed and removed from the frame. Once that's done, the

WORKING THE REMINGTON MODEL 1875/1890 REVOLVERS AND REPLICAS CONTINUED

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hammer assembly (#2) should be pushed down into the frame far enough so that the hand screw (#52) becomes fully exposed through the triggerguard opening at the frame bottom. Remove the hand screw and the hand assembly (#7 and #18) can now be pulled out from the bottom of the frame.

To remove the hammer, push the hammer back up through the frame, and remove it through the hammer opening at the top of the frame. 5) Finally, the support ejector is removed by first removing the support-ejector screw (#166) from the bottom-front of the barrel, and pulling the support ejector down slightly along with the ejector and base pin assemblies. Then pull forward and remove them out the front of the frame.

Once the support ejector is out of the frame, the base pin (#21) can be fully withdrawn from the front, and the ejector assembly (#219) along with the ejector spring (#135) can be withdrawn out the rear of the support ejector. To remove the gate (#142), unscrew and remove the gate-catch screw (#145) from the underside of the frame. The gate-catch spring (#136) and gate catch (#134) will fall out through this same screw hole.

The revolver's gate is now free and can be pulled forward out 1 Frame 2 Hammer Assembly 3 Barrel 5 Cylinder 7 Hand Assembly 10 Trigger 12 Bolt 15 Front Sight 18 Hand Spring 19 Sear and Bolt Spring 20 Main

Spring 21 Base Pin 25 Hammer Roller 26 Triggerguard 30 Hammer Roll Pin 31 Triggerguard Screw 35 Bolt Spring Screw 37 Hammer Screw 38 Trigger Screw 43 Right Grip Nut 44 Left Grip Nut into the cylinder opening of the frame.

Note: On the Uberti replica, the hammer-safety components should be disassembled only by factory-trained personnel.

As always, you reassemble the re Remington/Uberti 1875/1890 Single-Action Revolver (Specifications subject to change without notice) 45 Right Grip 46 Left Grip 51 Grip Pin 52 Hand Screw 53 Main Spring Screw 54 Grip Screw 91 Hammer Safety Bar 95 Firing Pin Spring 98 Firing Pin 134 Gate Catch 135 Ejector Spring 136 Gate Spring 137 Base Pin Spring 139 Base Pin Nut 140 Base Pin Screw 142 Gate 145 Gate Catch Screw 147 Hammer Safety Spring 149 Hammer Safety Pin 150 Hammer Safety Plunger 151 Hammer Safety Plunger Pin 152 Hammer Safety Stop Screw 161 Support Ejector Pin 163 Support Ejector 164 Ejector Nut 165 Firing Pin Sphere 166 Support Ejector Screw 219 Ejector volver in the reverse order.

Should you require parts for Remington replicas and other replica firearms, you might want to try VTI Replica Gun Parts Lakeville, CT 06039; www.vtigunparts.com). ■

TOOLS & FIXTURES

Making and Using a Locking-Lug/ Bolt-Face Comparator

The exact length between the bolt face and its locking-lug camming surface is an important measurement. This precision tool takes the complication out of making that measurement.

BY NORMAN E. JOHNSON JUNE 2005

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Many times, someone has come into my shop, seen my locking-lug/bolt-face comparator, and asked: "What in the world is that thing?" No one who's ventured a guess has ever come close. Necessity being the mother of invention, some 30 years ago I invented a tool to determine the precise length between a bolt face and its locking-lug camming surfaces. Initially, I used this compared measurement in my handloading. It told me if I could interchange brass cases from one rifle to another of the same model.

It also provided me with information when truing locking lugs. Still another use where it proves invaluable is when using the same barrel in different rifle actions. I work with a number of switch-barrel rifles, and commonly use the same barrel in more than one action. This is particularly likely to occur with my Remington Model 700 and

Model 40X actions, where I may have five or more barrels fitted to one or more actions.

A recent situation where the comparator came in handy was fitting and headspacing a Douglas barrel in 6.5-06 caliber to both a 40X and 700 Remington action for this cartridge. Before undertaking the chambering and headspacing, the comparator told me which of the rifles I had in mind were compatible. After chambering was completed and load testing got underway, I discovered I could actually interchange fired cases from one action to the other. The resultant accuracy was excellent.

Making the Comparator As the photos show, this little arbor-press-looking gadget is quite uncomplicated. From a 1-3/4- x 1-3/4- x 5/8-inch block of aluminum or steel, cut a 1- x 3/4-inch rectangular window just below center. The 1-inch width of the opening will accommodate the maximum outer

width of most bolt locking lugs. With the window cut out and perfectly squared, cut an opening at the bottom 11/16 inch in width. The bolt body fits this opening.

With the block shaped and finished to the described dimensions, drill and tap a 1/4-28 hole centered through the top of the unit. Be sure this hole is absolutely square with the block and locking-lug jaws. Next take a fully threaded 1/4-28 x 2-5/8-inch bolt and square the head to a 5/16-inch width. Leave a remaining base about 1/16-inch thick as a contact surface to fit the rifle's bolt face. Attach a double nut at the top of the bolt used as a lock knob to turn the threaded ram.

Attach a pointer to the bottom nut which will later be used to indicate its position on the scale. As a scale, I stamped numbers and dots in 1/1000-inch increments. The two bolts are from a Remington Model 700 short-action and a Remington Model 40X.

MAKING AND USING A LOCKING-LUG/ BOLT-FACE COMPARATOR CONTINUED

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The dial is calibrated in 1/1000-inch increments. around a flat washer with a 1/4-inch hole in the center. This rotary scale is held in the desired position with a socket-head screw tapped into the top of the gauge. The scale is calibrated in increments of 1/1000 inch, which is 35.7 (36 is fine) equidistant markings around the periphery of the scale.

Putting the Comparator to Use To use the locking-lug/bolt-face comparator, slip the jaws of the tool against the locking lugs with the bolt-face surface centered on the face of the ram. Hold the instrument tightly against the locking lugs as the threaded ram is turned to make contact with the bolt face. If

held at true center, the flat surface of the ram will push a Remington ejector pin inward against its spring tension. At this point, turn and lock the scale at zero with the pointer.

It may be ad From the visable to make a few measurements to be sure of repeatability. Measurements can be taken of other bolts for comparison. The locking lugs of the bolt will self-align as the flat surface of the threaded ram makes firm contact with the bolt face. The comparator can be depended on to repeat readings with an accuracy of 1/1000-inch or less if all parts are held in alignment.

To make a reading of the space between the locking lug surfaces and the bolt face, remove the bolt from the unit, reset, and measure the span between the two jaws of the comparator and the flat surface of the ram. Be sure the ram is returned exactly to the recorded scale position before taking the reading. **Conclusion** Determining the length between a bolt face and its opposing locking-lug surfaces can be a useful measurement for the gunsmith or anyone who needs an exact comparison between two bolts.

Making such a comparator is an uncomplicated machine-shop process, and cost is minimal. ■

READER FORUM

Reader Forum

BY AMERICAN GUNSMITH EDITORS JUNE 2005

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Jammin' Daewoo I have a Daewoo DP51 that I bought new at a gunshow. It looks nice and feels pretty good, except the thing keeps jamming by feeding the next cartridge up before the expended shell case is extracted completely from the chamber. The chamber is not too tight, and the gun is not being limp wristed. Off hand, I wouldn't think that the action spring is too heavy, but perhaps the magazine springs are. Have you heard of this problem on this particular gun before?

I would like to hear what you have to say, then I guess I will try to write the company to see if they can fix the problem. Although I like the way it looks, if the problem is common with this particular pistol, I think I'd rather get rid of it. I don't want to have to try 15 different kinds of ammo or 15 different springs to try to get it to shoot reliably. Thanks for your time. Charles May We spoke with the present importer of the Daewoo.

Though they have sold many hundreds of these pistols, your problem was new to them. It does sound like the pistol may be short stroking. These guns arrive from the

factory pretty dry. Try lubrication on the slide and frame rails. That failing, the Daewoo's extractor might be too tight and could be holding onto the spent shell rather than releasing it. Take off the slide and the barrel, insert an empty case into the extractor, and see if it comes out cleanly and without difficulty.

If it doesn't, use a fine file with one safe edge (a screw-head file would be perfect), and carefully widen the extractor between its-case contacting surface and its claw. One or two passes should suffice. Double Trouble I have two problems.

I have a Rossi 38 revolver with a broken hammer pin. How do I get the old one out, and how do I fit in another? I also have a 742 that pulls brass off the rim of the cartridge when fired. I think the chamber is bad. How can it be cleaned, or should I have it reamed with a finish reamer? Thanks. RDS The hammer pin on Rossi M68, 69, 70, and 31 revolvers is a stud. As with an S&W, of which Rossi is a clone of sorts, these studs are installed prior to the revolver being polished for bluing.

They are made absolutely flush with the outside of the frame. Replacing studs at S&W requires a proprietary factory tool which swages the stud back in the frame hole. Whether the revolver is then repolished and reblued is up to the owner. We understand the Rossi stud can be driven from the frame, but we can find no listing for replacement studs. S&W never offered them; perhaps the same is true of Rossi.

If so, you could try substituting drill rod cut to length, machined to diameter, polished, and then hardened with Kase Nit (Brownells). In lieu of the previously mentioned factory tooling, chilling the rod and slightly warming the frame before installation could result in a tight, "pseudo-press fit" between the two. Touchup blue will mask the bright end of the new stud that's sure to show on the outer frame, but won't make it disappear.

With your M742, cleaning and polishing should precede the use of a finishing reamer. To clean, use

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(continued from previous page) an oversize bronze bore brush and solvent. To polish, use a cleaning mop charged with 800-grit polishing compound. Turn both by hand, unless you have a lathe large enough to hold the action. Even then, the rpms should be low. You should also closely check out the extractor itself. Maybe it's shot. Replacing it can be a pain with the Model 742, because the extractor is riveted in and has to be adjusted for tension. In addition, locating one may be difficult.

Beretta Buttstock Removal I'm having difficulty finding the proper tool to fit the Beretta Onyx 686 stock bolt. Can you provide some assistance? Thanks. Lawrence Werner Minden, Nevada According to the schematic, the stock bolt in the 686 wears a slotted head. Use a flashlight after you remove the butt plate or pad to see if that's true with your gun. All you need then is along-shank straight-blade screwdriver to back out the bolt. If the bolt is a hex head, things can get more complicated.

Then you need a socket, socket wrench, and shaft extension. The problem is that the OD of the socket is often too large for the hole in the stock, in which case, you run the risk of splitting the wood by forcing in the socket. When you run into that problem, the outside of the socket has to be ground or turned down symmetrically to allow insertion with room to spare all around the bolt head. Lighten Angle Eject Trigger?

I recently purchased a Winchester 94 Angle Eject in .45 Colt caliber, and find it has a very hard trigger pull. Not wanting to mess

with the sear, I've asked several gunsmiths if they could help me, and every one of them has told me that this model cannot be worked on. I don't know if there is a liability question or what their reasons are. It's not much fun to shoot a weapon with an 8- or 9-pound trigger pull, and I'm considering tackling the job myself. Incidentally, I'm retired from the U. S.

Air Force, and was an aircraft armorer for many years, but that type of work does not compare with the work of a qualified gunsmith. In fact, today, aircraft armorers are called "gun plumbers." Chuck Baisden, MSGT USAF (retired) You can rest assured there is a liability problem with any firearm. A few years back, every handgun sold had \$65 added to its cost before it left the factory. This was just to cover liability insurance—per gun!

Unfortunately, this cost has only risen due to frivolous lawsuits and jury awards. As costs rose, so did trigger pulls along with factory efforts to discourage any attempt to lighten them. If Wolffe made springs for the Angle Eject, your task would be simple. They do not, which means you are faced with friction reduction. It makes the pull feel lighter because it reduces any drag that may exist between components of the trigger system and the receiver.

Engagement surfaces between trigger/sear/striker and/or hammer should remain untouched. The sides of the trigger, the firing-pin tunnel in the bolt, the sides of the hammer, any pins retaining the trigger and/or hammer and firing pin or striker,

can be polished using fine stones and Cratex wheels (from Brownells), ultra-fine emery cloth, and mild metal polish. All work must be done cautiously, with many reassemblies for checking your progress.

This can be very tedious, which might help to explain the attitudes of your local gunsmiths. **Out-of-Production Shotgun Info** Regarding the letter in the March 2005 from Zeke Corder about the Montgomery Ward "Texas Ranger" shotgun: This gun is a Stevens Model 95, which sold in 1929 for \$10. It was made in 12 and 16 gauge (see *The Official Price Guide to Antique and Modern Firearms*, page 570). For the shotgun's mainspring, try the Wolff #13 shotgun hammer spring.

Regarding the letter from Rich Huggins about the Winchester Model 59 shotgun, see Brownells' *The Encyclopedia of Modern Firearms Parts & Assembly*, Vol. 1, pages 934 to 948 for service and repair of the Winchester M50 shotgun. This should also work for the M59. Hope this helps. Everett Boyle Windsor Locks, Connecticut Thanks, Everett; your references on out-of-production guns are better than ours. Since our files are not set up to identify old firearms, we usually refer this type of question to the NRA Museum.

We do, however, welcome correspondence such as yours, and are happy to pass the information on.

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