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INSIDE THE ARCHIVE

GLOCK MODS: AN M1911 MAN BRANCHES OUT

WATCHING THE FALLOUT FROM VIRGINIA TECH • DISASSEMBLY AND REASSEMBLY OF THE SPRINGFIELD EMP • SAFELY ...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 043

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IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from June 2007.

2 Watching the Fallout from Virginia Tech

THE NEW YORK TIMES • ORIGINAL PAGES 2

3 Disassembly and Reassembly Of the Springfield EMP

CHICK BLOOD • ORIGINAL PAGES 3-6

7 Safely Removing Barrel Obstructions

DENNIS A. WOOD • ORIGINAL PAGES 7-9

10 Using the Manson Precision Barrel-Crowning Tools

REID COFFIELD • ORIGINAL PAGES 10-13

14 Glock Mods: An M1911 Man Branches Out

ROBERT K. CAMPBELL • ORIGINAL PAGES 14-17

18 Working the Marlin Model 1891 .22 Lever-Action

DAVID R. CHICOINE • ORIGINAL PAGES 18-21

22 Reader Forum

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 22-24

FROM THE ARCHIVE

Watching the Fallout from Virginia Tech

BY THE NEW YORK TIMES JUNE 2007

ORIGINAL PP. 2

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Even though it will hopefully be old news by the time you read this, as we go to press in late April, I can't help but make a few observations on the recent tragedy on the Virginia Tech campus. As expected, the anti-gun lobby has seized on the situation to advance their agenda, which, as we all know, is to restrict the constitutional rights of ALL citizens in a misguided effort to protect us from the actions of the few.

Perhaps our friends at the National Shooting Sports Foundation said it best in a recently released statement: "All of us in the firearms industry were stunned and appalled by the horrific events at Virginia Tech University, perhaps even more so than most Americans since firearms have special meaning for us and are at the core of our hunting, shooting, and outdoor traditions.

The terrible actions of Cho Seung-Hui, a deeply troubled individual, should not be associated in any way with tens of millions

of Americans who responsibly use firearms nor the lawful commerce in firearms. Although no one was surprised that groups like the Brady Campaign and newspapers like The New York Times would shamelessly use the tragedy to advance their anti-gun campaigns, many Americans have decried this opportunism, and rightfully so.

None was more vehement in his disdain for such insensitivity than Virginia Governor Tim Kaine, who said: "People who want to take this...event and make it...their political hobbyhorse to ride, I've got nothing but loathing for them. This is not...something for a campaign or for a fund-raising mailing. The Governor's sentiments were reaffirmed by sensible writing about the incident in a number of publications, including the mainstream media.

For example, an editorial in The Wall Street Journal decried the "torrent of pop sociology and national psychoanalysis," saying, "There are evil and psychotic people in this

world willing to do great harm to others if they aren't stopped. The dilemma in a free society is how to stop them." The Journal's followup article puts into perspective how much the argument for gun control has shifted in America over the last 15 or so years, coinciding, not surprisingly, with the steep decline in violent-crime rates.

On the campaign trail, the candidates who have taken anti-gun stances in the past both Democratic and Republican (Giuliani) seemed to duck the issue. I was very pleased, however, when Senator and presidential candidate John McCain weighed in early with a "no gun-control" statement. In the end, we can only remain unsettled by the events in Blacksburg, Virginia, and at the same time remain watchful of those who try to achieve political and legislative gain from such a sad affair. Editor Keith Lawrence Technical

METALWORKING

Disassembly and Reassembly Of the Springfield EMP

This pocket-size 9mm will soon be chambered for the .40 S&W as well as the .45 GAP, packing a very large punch in a very small package.

BY CHICK BLOOD JUNE 2007

ORIGINAL PP. 3-6

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“**m**I one of those old geezers who still insists that the best personal defense ammunition ever made is .45 caliber. It pleases me, then, to note the current trend among pistol manufacturers to arrange marriages between this caliber and their respective products. With few exceptions, however, the pistols so adapted are on the large size for discreet concealment, and they can also be troublesome for those with smallish hands.

In any case, the available calibers are not the only things I like about the EMP from Springfield, Inc. It's no larger than a compact 9mm. It's a Series-70 M1911A1, so it's not cluttered internally with a collection of additional parts dreamed up to put a firing-pin block in a pistol that can't fire unless it is gripped firmly in the hand. As this is written, the EMP is being produced in 9mm using a hardcoat aluminum-alloy frame. When it comes out in .40 S&W and .45 GAP, the frame will be of steel.

Those initials behind the “.45” stand for Glock Automatic Pistol, around developed in cooperation between the Austrian pistol maker and Speer. The .45 GAP is slightly shorter than the 9mm Luger and contains an advanced propellant producing higher velocities without creating pressure problems. It's the same type of powder technology used in the very popular short magnum rifle rounds. Be assured, when pushing out 185 or 200 grain slugs, the GAP feels like a .40 S&W but hits like a .45 ACP.

I won't compare it to the impact of a 230-grain FMJ, but I'm guessing that a .45 GAP exiting a full-size accurized M1911A1 might just make one doozy of a bullseye round. (I must explore that possibility further one of these days.) Although the Springfield EMP differs in about 15 different ways from a pure Series-70, gunsmiths can rejoice: It's taken down and reassembled in ways very close or identical to the semi-auto most of us are familiar with.

When you take it apart, you'll find that all components of the EMP serve exactly the same function as those in a full-size M1911A1 although not all parts will interchange with those of the full-size pistol. In shrinking the EMP to the size it is, there had to be changes made. (I measured 6-1/2 inch- When chambered for the .40 S&W or .45 GAP, the frame will be the same small size but will be made of steel. es from muzzle to the extreme end of the beavertail grip safety.

The slide measures 5-1/2 inches, with a little over 3 inches of barrel and a grip width of 1-1/16 inches.) Due to their reduced width and depth, magazine bodies, of course, are not interchangeable. And even eyeballing the difference between a standard-size mag and the one used in the EMP would scream “not interchangeable.” Perhaps not so obvious (without taking comparative measurements) also on the “not

DISASSEMBLY AND REASSEMBLY OF THE SPRINGFIELD EMP CONTINUED

ORIGINAL PAGE 4

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interchangeable list are the EMP's plunger tube, slide-stop plunger, thumb safety/slide-stop spring, extractor, and safety plunger. On the other hand, the hammer, sear, searspring, and firing-pin stop you find in the EMP will fit any other M1911A1. And vice versa. Speaking of Field Stripping Field stripping the EMP is a bit different than what you're accustomed to with one of its larger brothers. The EMP arrives with a small cellophane bag in its box.

In the bag, among other things, is a short length of rigid plastic tubing. It gets snapped onto the end of the recoil-guide rod that is exposed when you lock the slide to the rear. The plastic retains the guide rod assembly. You unlock the slide and slowly allow it to move forward to align the stop with the dis-

assembly notch. Push the slide stop out from the right, and then move the slide forward and off the frame.

Invert the slide, then lift the recoil-spring assembly by its rear end, pull it from the slide, and push or pull out the barrel. There is no barrel bushing on an EMP. The reason is that the barrel is flared out at the muzzle. In the regular M1911A1, the barrel bushing serves as a pivot that encourages the barrel to return to the same position in the pistol after each shot. The EMP's flared 45 in a highly concealable package. barrel accomplishes the same thing.

Opinions vary as to whether this type of barrel alone is as effective in achieving mechanical repeatability as a wellfitted barrel/bushing combination. Since the EMP is intended to serve as a defensive handgun—not a surgi-

cally accurate target pistol—I'll leave all arguments on the flared barrel versus barrel and bushing to others. Detailed Disassembly After removing the grips, the slide can be further stripped down like any other M1911A1. All M1911A1 pistols, however, do not have ambidextrous thumb safeties.

The EMP does, and you remove the right-hand one first. In case you're working on the The two holes in the ILS lock are visible to the upper left of the grip and shown in the unlocked position. 9mm model, please remember it has an aluminum-alloy frame. If merely grasping the safety and pulling on it fails to separate it from its tongue-ingroove union with the left-hand thumb safety, be sure that further attempts to separate these parts don't damage the frame or the safeties themselves. The

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Springfield EMP Semi-Automatic Pistol (Specifications subject to change without notice) 1 Frame 1a Slide Stop 1br Thumb Safety (right) 1bl Thumb Safety (left) 1c Slide Stop Plunger 1d Thumb Safety/Slide Stop Spg. 1e Safety Plunger 1f Plunger Tube 1g Hammer Pin 1h Grip Screw Escutcheon 1i Mainspg. Housing Retainer Pin 1j Extended Ejector 1k Disconnecter union just mentioned can be quite tight depending on how much it has been squeezed together during factory assembly. I was on the lucky side.

The right side parted company with 1l Sear 1m Magazine Catch 1n Magazine Catch Spring 1o Magazine Catch Lock 1p Hammer 1q Hammer Strut Pin 1r Hammer Strut 1s Trigger 1t Sear Spring 1u Beavertail Grip Safety (1v on drawing) 1v Thin Line Grip (left) 1w Thin Line Grip (right) the left safety without any great

strain. Thinking that the safeties might balk at the separation, I devised a couple of harmless ways to “encourage” them.

The first was to sand one 1x Grip Screw 1y Sear Pin 1z Ejector Pin 2 Slide 2a Dovetail Front Sight 2b Fixed Combat Rear Sight 2c Extra Power Firing Pin Spring 2d Titanium Firing Pin 2e Extractor 2f Firing Pin Stop 2g NM Two-Piece Recoil Spring Guide 2h Outer Recoil Spring 2i Reverse Spring Plug 3 Stainless Barrel 3a Barrel Link Pin 3b Barrel Link 4 .45-Caliber 6-Round Magazine 5 ILS Mainspring Housing 5a ILS Locking Bolt 5b Mainspring Retainer 5c Mainspring (23 lb.) 5d ILS Mainspring Cap 5e ILS Plunger 5f ILS Plunger Spring end of a tongue depressor into a thin, wedge shape and force it under the right safety to get it started.

This could be followed with a hardwood dowel, similarly sanded but thicker, pushed

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in under the safety to move it further outward. (Even though I didn't need these wooden tools, I kept them anyway for possible use in the future.) If the wooden wedges had failed, I took the precaution of preparing a backup plan. You could add two narrow strips of duct tape to each grasping surface of a set of smooth-jaw pliers. Then secure the frame between padded vise jaws and grab onto the right-hand safety and pull it free.

Obviously, I've come to another one of the difference't he mainspring housing. Current production Springfield M1911A1 pistols, including this EMP, have an ILS (internal locking system). In addition to the plastic recoil-system retainer in the cellophane bag are two objects resembling keys as well as a small, angled length of bright steel. The key-like pieces have two small nubs at one end.

Those nubs fit the holes in the lock, located on the left in the textured area of the housing. When the holes are in a vertical position the pistol is unlocked. When horizontal, the pistol is locked. And I mean totally locked up; the hammer can't be cocked, the

trigger can't be pulled, and the slide can't move. Locking and unlocking is done by been faced with resistant safeties before.

After the separation, the left safety is drifted or pushed out like a single thumb safety, and then you can attack the hammer pin, sear pin, hammer, sear, and other internal parts just like a full-size 1911. And now we inserting a key and turning it clockwise or counter-clockwise. You'll want to remember that in case a customer walks in complaining that he "can't make this gun work." Check the position of the lock before you do anything else.

Just don't do it while the customer is present. (You can make a couple of bucks and impress your customer if you ask him to comeback in 15 minutes.) I usually don't get into the disassembly of a safety system. In this case, however, I will. Given enough abuse, or ignored over along enough period of time, a safety can break or become so terribly fouled it can't do its job anymore.

With the Springfield ILS, it's possible to repair or clean it and restore full function: Lower the hammer and turn the lock to its vertical position. Wrap a heavy rubber band around the grip safety until the safety is completely depressed. This keeps the sear

spring properly positioned in the gun. Cock the hammer and insert one end of the angled piece of bright steel (known as the "takedown pin") into the hole immediately under the beavertail on the right side of the grip frame.

This captures the mainspring cap (#5d) and maintains partial compression of the mainspring (#5c). Slowly lower the hammer to its fully forward position. With the correct diameter punch, drift out the retaining pin (#1i), remove the housing downward, and secure it between protective vise jaws. Select a punch that matches the diameter of the mainspring cap and press the cap downward. Continue pressing down as you remove the takedown pin. Ease off the pressure, and let the cap clear the top of the mainspring housing.

After lifting away the cap, you can pick out the mainspring and mainspring retainer (#5b). A few important points to remember: (1) The system can only be reassembled when the ILS is unlocked or vertical; (2) don't turn the lock when the ILS is disassembled; and (3) If there's no need to disassemble the complete locking system, don't pull out the takedown pin until the mainspring housing is reinstalled. I

FROM THE ARCHIVE

Safely Removing Barrel Obstructions

When faced with something stuck in a barrel, you need to assess the situation carefully, then employ one of a few processes for removing the obstacle safely.

BY DENNIS A. WOOD JUNE 2007

ORIGINAL PP. 7-9

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Someone once said that the best way to remove a barrel obstruction is to remove the possibility of an obstruction occurring in the first place. Well, sometimes that isn't always possible; obstructions can and do happen, and it can be downright amazing to see the stuff that finds its way into a firearm. Once the hunting season ends, my phone begins to ring with customers wanting to get their equipment cleaned and readied for the next season.

And now and then, I'll answer the phone and listen as a panic-stricken voice relates a woeful story about a plugged barrel. Diagnosing the cause and cure of a barrel obstruction over the phone is not always easy or smart to do. It's better to get all the information the customer is willing to relinquish about how the barrel got plugged up, and advise him to bring in the firearm and some of the ammo that was being used when the catastrophic event occurred.

Types of Obstructions The most common obstacle we can expect to find in a barrel is a bullet. This is not unreasonable, since a bullet is supposed to be in a barrel, but usually for only a very short time. If a handload is put together without powder, especially

when a Magnum rifle primer is used, a bullet can get stuck a short way past the chamber and throat area. These bullets can normally be knocked out of the chamber from the muzzle end, using a closefitting hardwood or nylon rod.

The bullet usually won't get upset much from the power of the primer alone, and therefore doesn't fully engage the grip of the rifling along its bearing surface. A "squib" load is defined as one which has some powder but insufficient power, and doesn't develop the pressures attributed to a normal cartridge of the same case/caliber. Squib loads may have enough power to get a bullet stuck anywhere from a couple of inches past the chamber to a couple of inches from the muzzle end.

Bullets stuck near the muzzle end are dangerous because they can bulge the barrel or cause it to burst if not removed before another round is fired. Most shooters know enough to stop shooting and investigate the situation if they hear an abnormal report when firing, but this isn't always the case. In addition to having an insufficient charge thrown when handloading, low-power cartridges can also be caused by deterioration of the ammo.

Ammunition that shows signs of corrosion or prolonged exposure to the weather or moisture should never be used. I tell customers: "When in doubt, throw it out!" A customer once brought in a Colt Police Positive revolver in .22 rimfire caliber that had two bullets stuck in the barrel, one behind the other. The ammo that the owner received along with the revolver was of the same vintage and stored in the same zipper case as the revolver, for who knows how long.

One stuck bullet would probably not have done much harm to the barrel and would have been much easier to remove, but the second round left an obvious ring (bulge) just behind the first stuck bullet. Once both bullets were removed, I had to install a liner to salvage the barrel. When a jacketed bullet powered by a lighter-than-normal load gets stuck somewhere along the bore, the approach to removal gets a bit more involved. The first thing we need to know is where the bullet is lodged.

Depending on the bore size and the type of action involved, we need to insert a cleaning rod of the appropriate size into the barrel (from the breech

SAFELY REMOVING BARREL OBSTRUCTIONS CONTINUED

ORIGINAL PAGE 8

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if possible), and then mark the cleaning rod where it stops at the muzzle and/or breech end. Lay the cleaning rod along the side of the barrel to see where the stuck bullet is internally. If at all possible, we want to work from the end of the barrel closer to the stuck bullet. Any rod of 1/8-inch diameter or smaller is going to have poor impact strength and will flex sideways and hit the rifling.

Therefore, I'm not much in favor of trying to drive out a jacketed small-caliber bullet that's stuck near the midpoint in the barrel. What has worked for me is drilling a hole through the center of the bullet to help relieve some of the pressure built up in the bullet from engaging the rifling. To do this, I use a couple of bushings that are made up to closely fit the bore. I'll discuss this process in detail in a moment. Soft obstructions can be anything from snow, twigs, mud, or patch material.

The remnants of hardened mud can often be removed by flushing with hot water. I use one of those syringe-style marinade injectors used for barbecuing chicken. This is followed up with a cleaning rod and an oiled patch. To keep out the type of debris that could find its way into a barrel during a hunting trip, I tell

my customers to put a piece of masking tape over the muzzle or use one of those roll-up, rubber finger protectors.

If the quarry appears suddenly without permitting removal of the tape or finger protector, a bullet will pass through either without any harm to the barrel. Once in awhile a customer will call who has an over-size patch hopelessly jammed in either a shotgun or rifle barrel. What usually works when this situation pops up is to soak the stuck patch with a light oil (Kroil works great) from both ends of the barrel and then plug each end with a cork.

Let the oil saturate the patch overnight with the barrel lying flat on your bench, and then squirt more oil into the bore the next day. After this treatment, the over-size patch can usually be pushed out the chamber end with a cleaning rod. If the patch proves to be stubborn and refuses to cooperate with the Kroil treatment, a "patch worm" will usually do the trick. The one depicted here was made using a brass rod and brass wood screw.

Made up in the appropriate size, it can also be used to remove a lead .22-rimfire bullet that's stuck in a barrel. In this case, the head

of the screw was turned off in the lathe, but it could just as easily have been ground or filed off. One end of the brass rod was turned flat and square with the O. D. of the rod, center drilled, and then drilled with a twist drill slightly above the diameter of the brass screw shank. The wood screw is then soldered into the end of the brass rod.

In use, the brass screw is turned into the patch or bullet, and then locking-style pliers are clamped to the other end of the rod. Tapping on the jaws of the locking pliers with a small lead-faced hammer will get the bullet or patch moving. Drilling the Bullet Before any drilling begins, we first need to do some calculations to prevent damage to the bore and rifling when removing a stuck bullet. For the example depicted here, we're dealing with a .30 caliber (.308) barrel and bullet.

Rifling grooves are usually formed to a depth of .005 to .006 inch, so we multiply the groove depth by 2 and subtract that figure from the actual bore diameter of .308 inch, which gives us a diameter of .296 inch. After the location of the bullet has

SAFELY REMOVING BARREL OBSTRUCTIONS CONTINUED

ORIGINAL PAGE 9

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been determined, we need to make up a couple of bushings to guide the drill into the center of the bullet and away from the barrel's inside walls. I prefer brass as a material to make these bushing from, but there's no reason aluminum wouldn't work as well. Starting with a piece of 1/2-inch brass round stock 1 inch long, turn one end to a .295-inch diameter for a length of .750 inch, leaving a shoulder around 1/4 inch wide by 1/2-inch diameter that will stop against the muzzle end of the barrel.

A center hole is then drilled full length with a #11 (.191 inch) drill that will allow a 3/16-inch drill rod to easily slide through. Another bushing is then turned from 5/16-inch brass round stock to a diameter of .295 inch, 2-1/2 inches long, and again, drilled through the center with the #11 drill bit. Both inside diameters of this bushing can then be chamfered, with one end of one bushing chamfered within .060 inch from the outside diameter with a 30-degree, included-angle chamfer tool.

This end of the bushing will go into the barrel and come to rest on the end of a pointed bullet, keeping the drill bit centered on the bullet tip during the drilling process. A drill bit extension will be needed to reach through both bushings and get the drill bit centered on the bullet tip. For the

caliber involved here, 3/16-inch-diameter drill rod, 14 inches long, was used. A 3-foot length of 3/16-inch drill rod is cheap at about \$2 just make sure the one you buy is as straight as possible.

One end of this drill rod is chucked in the lathe and then faced square and the outside diameter edge is then chamfered and polished. The center of this end is then drilled with a center drill and then with a 1/8-inch-diameter drill bit to a depth of 3/4 inch. The shank of a 1/8-inch drill bit is then ground on each side of the shank, producing flats to help hold it in place after it is soldered into this hole.

If the bullet is stuck just a couple of inches past the chamber on a bolt action rifle, or if the action allows getting into the barrel from the rear, it may prove easier to drill a hole through the bullet's center from the action end. In this situation, a spent cartridge case, preferably one that was fired in the same gun, can be used as a bushing to guide the drill from this end. Chuck the fired case in the lathe and then drill out the primer pocket with the #11 drill bit and you have a guiding bushing.

From this end, you would first insert the bushing made to fit inside the bore, then the drilled out case, and then the drill extension. Flood the bore with light oil. We

want some of the oil to find its way along the sides of the bullet after the pressure is relieved along the bearing surface of the bullet once the drilling is started. The drill extension can be turned with a hand drill or with a variable-speed power drill, but go slowly and remove the lead chips often.

Let the drill do the cutting and don't push too forcefully. Once we have a 1/8-inch-diameter hole drilled through the center of the stuck bullet, most of the pressure between the bullet's bearing surface and the rifling becomes relieved. Letter "M" drill rod has an outside diameter of .295 inch and will fit very well into a .308 bore. Chuck up a 26 inch length of the drill rod in the lathe, and square up one end and then chamfer the outside edge.

Using a file, carefully radius this edge and polish it with 400-grit emery paper and then on a buffing wheel. We need to eliminate any sharp edges, as this will be our bullet-removal driving rod, and any sharp edges may ding the rifling. Insert this rod into the bore until it stops on the end of the now-hollow bullet. Squirt more Kroil into the bore and start with light hammer taps on the end of the driving rod until you feel movement of the stuck bullet.

Once the bullet gives and starts to move, it can then be easily driven out of the bore. I

TOOLS & FIXTURES

Using the Manson Precision Barrel-Crowning Tools

These well-thought-out tools make barrel crowning a breeze, producing a smooth chatter-free surface without the need for a lathe.

BY REID COFFIELD JUNE 2007

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The most valuable commodity in any gunsmith shop is something you can't buy, borrow, or steal. What is it? It's time. No matter how you try, you'll never get more than 24 hours in a day. Since most of us still like to take the time to eat, sleep, and spend a little time with the family, that leaves even fewer hours in our shop. Time Equals Money All of us who want to be successful have had to learn to use our time efficiently.

Whether it's finishing stocks, polishing metal, or installing a recoil pad, by necessity we've had to develop techniques and procedures to work faster and smarter. We've also learned that tools that save us time are often the best tools we can own. Sure, we all have limited budgets and sometimes the least expensive tool is all we can afford. But the initial price is not always the best indicator of the value of a tool. What will a tool do to broaden the range of services we can offer?

How much income can it produce? And how much time will it save? Those are perhaps the most important questions we should ask when considering a new tool. Dave Manson at Manson Precision Reamers probably understands the needs of gunsmiths as well as anyone. Dave started out working for Max Clymer at Clymer Reamers and basically ended up running the place. Eventually Max sold out and Dave decided it was time to open his own business—Manson Precision Reamers.

Over the years, Dave has established a well-deserved reputation for innovation. I don't know of any other reamer manufacturer that has developed as many new tools designed to make the gunsmith's life easier. These range from tool sets for truing the Remington 700 receiver (without a lathe), to a variety of tools for working on single-action revolvers (including line-reaming cylinders). Recently, I had the opportunity to give Dave Manson's Muzzle Crown Refacing Tool Kit an extensive workout.

This tooling allows the user to cut or recut a precision crown on any rifle or pistol barrel without having to use a lathe. Design Eliminates Chatter Sure, there are other hand crowning tools on the market; but, in my opinion, none offers the precision and reliability that you get with this set. One of the problems with other tooling is "chatter." With hand crowning, tool chatter is most often caused by the tool moving away or up from the face of the muzzle.

Hand pressure is just not enough to keep a cutter firmly and consistently engaged. Another contributing factor is the design of the fixed-blade cutters found on these hand tools. Generally, you'll have only four to six evenly spaced blades. When one moves "up," they all move up, and this leads to a rippled surface that's produced by chatter. The Manson tool uses a very different approach. Instead of blades,

USING THE MANSON PRECISION BARREL-CROWNING TOOLS CONTINUED

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Original caption: Left top: A pilot is shown positioned here in a .303 British rifle barrel prior to recrowning.

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Original caption: Left bottom: The 90-degree cutter has been placed over the shank of the pilot and rests on the muzzle of the barrel.

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Manson's tool uses small carbide inserts approximately .150 inch wide by .500 inch long that are actually small files. Rather than tearing metal from the crown, this tool literally files the metal away. This makes for a much smoother, even finish. I would even go so far as to say it may be impossible for it to chatter. In the five or six months I've been using this tool, I've not had a bit of trouble with chatter. The second innovative feature is the use of expandable pilots to guide the cutter.

Unlike other tools that use solid pilots of a specific diameter, Manson's expandable pilots allow for a perfect, totally stable fit in barrels that may vary in bore diameter by several thousandths. By the way, the pilots are attached to a nylon brush that serves several functions. First, the brush helps to remove any foreign material as the pilot is inserted into the bore. It also prevents the pilot from falling down into the barrel as it is adjusted and positioned.

And finally, it brushes away any metal particles that might have fallen into the bore during the crowning process as the pilot is re-

moved. The crowning tool kit is offered in a variety of combinations ranging from a basic tool with just two adjustable pilots of your choice to a "master" kit. The master kit includes an 11-degree cutter, a 0- or 90-degree cutter, a 45-degree deburring cutter, a driver, assorted wrenches, as well as a setup gauge, cleaning brush, case, and instruction booklet.

Using the Tool Setup and use of the tool is quite simple. Begin by checking to make sure the gun is unloaded. While you could use this tool without securing the firearm in a vise, doing so will make the job easier. Next, select the appropriate pilot. In the instruction booklet, Manson has thoughtfully provided an extensive listing of calibers/bore sizes along with identification of the appropriate pilot. Place the pilot in the muzzle to a depth that corresponds to the length of the pilot wrench.

The wrench does double duty as both a means of expanding the pilot in the bore and ensuring that the shank of the pilot projects far enough above the bore to guide the cutter. After applying a drop or two of cutting fluid

to each of the three carbide inserts, the cutter is placed face down over the projecting shaft of the pilot. Next the driver is placed over the hex-drive nut on the cutter.

The driver incorporates a springloaded hand piece which you simply push down with your left hand while turning the handle of the driver with your right hand in a clockwise direction. This spring-loaded feature ensures that you have enough—but not too much—pressure on the cutter. You just turn the crank until you've cut as much or as little as needed. I generally make about 10 turns, then remove the driver and cutter to clean the chips and lubricate the inserts.

Actually, "chips" is probably not the most accurate term for the cuttings. As the crown is formed, the carbide inserts turn out strands of metal that are almost hair-like, leaving a smooth, even finish. After using the flat face cutter, I follow up with the 11-degree cutter. This recesses the bore slightly for

USING THE MANSON PRECISION BARREL-CROWNING TOOLS CONTINUED

ORIGINAL PAGE 12

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For size comparison, one of the carbide cutters has been removed from the cutter and placed on a penny. Further protection of the critical transition point between the bore and the face of the muzzle. After that, I use the 45-degree deburring or chamfering cutter to evenly break the outside edge of the muzzle face. More often than not, I can crown a rifle barrel in 15 to 20 minutes with this tooling.

Shotgun Barrel Facing Tool Not long after buying my first crowning tool, I called Dave to ask if he had a similar tool for shotguns. He did and I quickly ordered one. The basic cutter arrangement on the shotgun tool is the same and uses the same carbide inserts. However, the pilot arrangement is a bit different. The tool works on all gauges using standard 2-inch brass pilots which are also used with Manson's screw-in choke tooling.

These pilots are available in a variety of diameters and a blank pilot is also available for custom fitting. The driver is also different.

The shotgun tool incorporates a rubber-coated handle much like a screwdriver handle. It works well, although I couldn't help but remember a crowning tool I had years ago that turned more easily with a speed wrench. I decided to see if I could modify the Manson Shotgun Facing Tool to use a speed wrench.

Since the handle of this tool was The rubber handle allows for hand turning of the shotgun tool. just threaded on, I unscrewed it and discovered the shank had a 5/16-inch x 18 thread. It was a simple matter to install two ordinary nuts and then grab a 1/2-inch socket. I then searched through my tool chest and found a speed wrench, which I plugged into the socket. I could then turn the shotgun version of the tool more quickly and easily.

If you get one of these tools, I suggest you set it up for a speed wrench; you'll be glad you did. Conclusions These are high-quality tools and they're not cheap. The rifle and pistol tool sets run from \$295 on up to \$650.

The shotgun tool set sells for \$90 without the 2-inch pilot bushings. The bushings are \$10 each. Though the initial cost is substantial, when you start thinking about the time you save with these tools, you might see the cost in a very different light.

After using these tools, I think of all the time I spent cleaning up "chatter" after using other hand tools. I also think of the time I save by not having to pull the barrel from a revolver, for example, in order to crown it on my lathe. And then there's the setup time when using the lathe. Sure, these tools won't pay for themselves overnight, but they'll definitely save me enough time to cover the cost in a reasonably short period.

For me, these tools are just one more way to work more efficiently, faster, and may be even a little smarter. I

PEOPLE & COMPANIES

Glock Mods: An M1911 Man Branches Out

The Glock is no longer the mystery it once was. Today, the modifications necessary to optimize the Glock's performance are almost as "standardized" as those of the 1911.

BY ROBERT K. CAMPBELL JUNE 2007

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“Ve I worked with the 1911 for many years, and sometimes that experience has been helpful with other pistols, such as the Browning Hi-Power, for example. Sometimes the differences between pistols are hard to spot, and other times we find similarities between handguns that at first seem very different. Another example: If you can work on the Savage 1910, you can work on the Astra 400, and you won't be confused by the H&K P7M8. But the Glock? Ah, the Glock is an altogether different creature.

Sometimes my 1911-based reasoning produces positive results with the Glock, and other times it does not. With the Glock so popular with lawenforcement and now proving itself in competition'winning the first

topclass award at IPSC'we're going to see more and more Glocks turned infor improvement.

And at the very least, we should be familiar with the similarities and the differences between the Glock and "old Slabsides." When we first began to take a torch and file to the 1911, it was the sights and the trigger that received the most attention. Today, much the same is true of the Glock. Eventually 1911 pistols were introduced with considerable improvement supplied by the This sight is reminiscent of the old hunting-rifle Express sights.

Results at moderate range are very good. factory, and the Glock is getting its share of improvement with the Glock 35 and the long-

slide variants. The handwriting was on the wall when Wayne Novak started offering sights for the Glock. The Glock turned into a 50-yard rather than a 25-yard pistol. While the Glock can be improved while maintaining its good traits, I've seen some disastrous blunders in customization.

Oversize slide locks and extreme barrel and slide porting did nothing to improve the piece, and neither did poorly fitted barrels that robbed it of its reliability. Now that the Glock has matured, we seem to be arriving at a consensus on what is needed to improve this pistol. But before we start thinking of improvements, it's important to understand that there are several generations of Glock pistols. While there is

GLOCK MODS: AN M1911 MAN BRANCHES OUT CONTINUED

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about a 75-percent commonality of parts, the Glock frame differs in exact dimensions even among the same models, such as early Model 23s and late model Model 23s. The first generation did not have a frame rail, and there were other differences in checkering. Now, the Glock is checkered in all the right places and the most modern examples feature finger grooves. Large-frame Glocks are just that' large'and as a big pistol, they're challenging for average-size hands.

Most of the Glocks brought in for grip reduction will be the Model 21 in .45 ACP, or possibly 10 mm. The Sights Glock offers factory sight options that, in my opinion, range from terrible to barely acceptable. The plastic sights are poor and can be easily ripped off on the draw by a stiff holster welt. The plastic adjustable factory sight was reportedly used only to buy import points, but the things are occasionally seen in service and don't last long.

Glock self-luminous steel sights are reasonably good examples of the type, and should be specified on a personal-defense pistol. But for the serious Glock shooter, there are much better aftermarket sights available. There are some sights on the market that I'm hearing mixed reports on, and I'm taking a "wait-and-see" attitude, but at present I think the Ameriglo Operator offers a good option for Glock pistols.

This is a tritium night sight that features a thin front blade rather than the wide front post found on almost every Glock. On an accurate pistol such as the Glock 21, this is an excellent setup for both day and night. For shooters with poor eyesight, the XS sight is a good choice. This sight features a large front'a big glowing ball in the dark. It is very fast on target and has real utility for home defense. Finally, the Warren sight has proven itself in competition. Changing sights on the Glock is simple.

Bump the front sight out from under the slide. The new front post then fits into the hole once occupied by the factory sight. Tighten the setscrew and the front sight is mounted. Use Loc Tite once the shooter is convinced this is the sight for him. The rear sight is easily bumped out with a rubber mallet. Sometimes the little metal insert in the bottom of the sight separates; but since the rear sight will not be remounted, this is not a concern. I then drift the rear sight in with a brass mallet.

I carefully pad the sights to avoid damage. Many 1911 shooters have come to favor the Novak sight, which was the original high-visibility low-mount aftermarket sight. Then Wilson Combat introduced a design that found a home on many high-end 1911s. Either of these can be obtained in a version for the Glock, with no need for cut-

ting a dovetail for either the front or rear. The Trigger At first, many 1911 shooters were confounded by the Glock trigger.

But they found that it reset as quickly as all but the most finely tuned 1911. Glock trigger work is a science unto itself. When working with the 1911, we worked with the trigger mechanism; when working with the Glock, we tighten the slide. Glock barrel and slide fit is good for accuracy potential, but slide-to-frame fit is not very tight. When pressing the trigger, you might actually see the Glock slide move a bit. Slide tightening to improve trigger action is the proven route.

The firing mechanism of the Glock is partly in the frame and partly in the slide, while other handguns have the action in the frame, dropping a hammer. The Glock trigger presses the striker to the rear and releases it to fire. When tightening the Glock's slide, keep in mind that it has limited slideto-frame contact. Just enough tightening improves the trigger action, but too much will make you wish you'd never touched it.

Carefully place the slide in a padded vise and work the slide tighter by either vise pressure or the use of a mallet. You need not work the whole slide, as the Glock has

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relatively short bearing surfaces. Work in slow increments. Test the fit. Even if you have one of the more accurate Glocks such as the Model 21, you can produce a better action for rapid fire. The result is not a lighter trigger action but a tighter trigger action. As for reducing the pull weight, there are connectors that make changes in weight possible, but the trigger still moves only about a half-inch in travel from compression to firing.

We've come to agree the 1911 trigger needs to break at about 5 pounds in a personal-defense pistol, and the Glock breaks at about 5.5 pounds. The 3.5-pound connector may be a good weight for the competition shooter. For others, use your own judgment. In a double-action type, the trigger finger must lie on a shelf above the trigger and come down to contact the trigger and press it to the rear. The Glock connector would be the drawbar in a double-action design.

To my way of thinking, the Glock is a single-action pistol with a heavy trigger spring. A straight-through press works. The proper cadence with the press and reset makes for remarkably accurate shooting, as with the 1911. You can polish the Glock and produce a smoother though not necessarily lighter trigger. Although I like to use Wilson Combat and other high-quality aftermarket parts in the 1911, in my experience, the aftermarket trigger parts for the Glock are not always consistent.

I, therefore, prefer to modify the Glock factory parts. Many shooters do not realize it, but Glock triggers are available in both serrated and smooth-face types. The complete trigger bar assembly must be changed. The trigger bar has an extension that bears against the firing-pin safety. The rear of the bar rides the disconnecter. These surfaces can be polished to produce a smoother action.

The all-important connector is simply the piece the trigger bar bears against, performing much the same function as the drawbar does in, say, a SIG or Beretta. This standard type is not marked for identification in any way. There are parentheses marks on the 3.5-pound connector. There is a connector with a "+" sign in parentheses for the heavier law-enforcement trigger (8 pounds). Remember, the trigger still requires only a half-inch press with either the light or heavy connector.

A heavy trigger spring is sometimes used to simply make the trigger feel heavier. Go too heavy and you may experience reliability problems. I tried an experimental combination of the heavy trigger spring and heavy disconnecter and produced failures to fire. I normally disassemble the pistol and inspect it then move on to the next procedure. This is the procedure that improves the Glock trigger. After removing oil, grease, and powder ash, I coat the trigger bar and disconnecter with Tetra Lube.

GLOCK MODS: AN M1911 MAN BRANCHES OUT CONTINUED

ORIGINAL PAGE 16

Next, I reassemble the piece partially. I leave the slide lock out and reassemble with the trigger, trigger bar, and grip pin in place. The action can be smoothed by manually working the trigger to produce pressure on the vertical extension of the trigger bar. Essentially, what you're doing is working the action without spring pressure. Don't force any parts, but simply burnish them. After 20 strokes or so, the trigger will be noticeably smoother.

Stop and check for polishing-the parts will be shiny' and then give it about 20 more. After 50 strokes or so, excess wear can be produced. This exercise is not actually dryfiring the piece, but it is burnishing the moving parts without firing the pistol. Why not machine work? You can go too far too fast. This little hand polish works. The trigger bar and connector parts will appear shiny after this treatment and will be smooth if the procedure is done correctly. This is all that is required for a Glock trigger job.

Other Parts If you need a longer ejector on a 1911, you just mount one, but the Glock's ejector must be hand modified. (I'm not aware of along ejector available from any supplier for the Glock.) To make along ejector remove the piece and beat it until it is longer'carefully. Sure, a bit of finesse is good but the Glock sometimes demands rugged measures. The longer ejector is often demanded for pistols that are mounted with optical sights.

The extra bit of momentum zips the case out with authority, past the sight tube of a dot sight. Grip frames for the 1911 require only changing a flat or arched mainspring housing for better hand fit, coupled with a shorter or longer trigger. But the Glock is more difficult. However, a Glock magazine well is much easier to fit than a 1911. Recently I fitted a Dawson Precision magazine well to a Glock with good results.

The brass plug supplied with the kit is carefully fitted into the hollow recess in the Glock frame. There is a tapped hole in the plug that lines up with the hole in the bottom of the Glock grip frame. The holes did not quite line up with finger pressure, but a few taps with the brass mallet moved it into line. Next, I separated the magazineguide body using a thin blade and lined the screw hole in the upper magazine-guide body with the hole in the frame plug.

No one except tactical hypochondriacs worry about being caught in a high-volume running gunfight, but these magazine guides make range manipulation much easier and are mandatory in competition. The plug that is fitted into the hollow grip strap also makes for better balance. There are those who like the Glock grip and others who want every pistol to feel like the 1911. The process is more arduous than simply changing the mainspring housing of the 1911.

With the 1911, you have flat, arched, in between, and the Ed Brown Bobcat to choose from. The Glock, on the other, has a malleable grip frame. The process begins with filling the void in the Glock grip frame and allowing the compound to cure. Next, the frame is ground and reshaped. The internal mechanism is not affected, but the frame is changed dramatically. There are several types and styles of grip reduction and it is wise to study each before deciding upon the exact one you wish to perform.

As an example, Dane Burns and Robbie Barkmann each turn out subtly different designs.

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16

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There are others as well. It's important for the gunsmith and the owner to agree upon the desired outcome before the work is started. The process is not easy, and it's not easy to undo if the customer doesn't like the results. Naturally, a small-frame pistol can't be transformed as completely as a large-frame Glock.

Aftermarket Barrels A few years ago it was common to see monstrosities with four to eight ports in the barrel and slide, with the resultant ear splitting blast and particles of bullet jacket and powder that would be thrown into the face if the pistol were fired below eye level. The goal was to reduce +P (1140 fps) loads to standard levels (980 fps with the .45 ACP). Why standard pressure or reduced loads were not simply used in the first place is a question that boggles the mind.

We all know that a simple compensator works wonders with control and that the Magna Port works fine. There are a few good reasons for replacing a Glock barrel. A worn-out barrel is not one of them; personally, I've never seen a worn-out Glock barrel. The first reason is the need to fire lead bullets; the second is to increase accuracy; and the third is to change the caliber. The Glock barrel features polygonal rifling. This rifling is fine for general use.

The polygonal barrel will often prove quite accurate, and the barrel may produce more velocity than a conventionally rifled barrel of the same length. Polygonal rifling features shallow grooves that give the jacketed projectile adequate spin without deeply engraving the bullet. When using lead bullets there is nowhere for the lead to go. Without the traditional grooves, the lead fouls the barrel and increases pressure.

I'm pretty certain that some of the spectacular Glock blow-ups were due to the continual use of lead bullets. To make use of economical lead bullets, a conventionally rifled barrel is demanded. The standard Glock barrel does not support the case head as well as some designs. This is a product of a design that is intended to feed every type of bullet every time. Lead bullets for automatics are practically unknown in Europe. Handloaders feel that the case should be supported more adequately.

I've used Bar Sto barrels in the Glock that produce excellent results. I've also used a .357 SIG-caliber Bar Sto in the Glock Model 22, originally a .40 caliber pistol, with excellent results. There are drop-in and fitted barrels. Glock barrels from Bar Sto are usually truly drop-in if specified that way. Nevertheless, a Glock barrel is not difficult to fit properly, although it's considerably different from the 1911. A fitted barrel coupled with good sights will convince you of the Glock's accuracy potential.

In no case should you allow anew barrel to affect the reliable functioning of the pistol. One of my customers uses the standard Glock barrel in his pistol for carry, but uses the Jarvis barrel with lead bullets for practice, and this works well for him. Another barrel that offers excellent results is relatively new. The Wilson Combat barrel is quickly achieving a reputation equal to the barrels they make for the 1911.

After going over the various problems I've seen with barrels, I have to make a comment about handloads. It's difficult to tell a shooter who has spent good money on a custom barrel that his handloads are not up to par. We must understand handloads well enough to make this judgment. For proofing and fitting a custom barrel, we must have a proven loading's benchmark to work to. The load must be light enough for control but heavy enough for good momentum.

I use Winchester's USA ball in the 124-grain weight in the 9mm (preferred over the 115 grain). I use the 155-grain .40, 230-grain .45, and the 124-grain .357 SIG. Good results have followed. Another drop-in barrel I tried gave me considerable trouble. Perhaps it was intended as a gunsmith-fit barrel and got slipped into the wrong batch. All Glock frames require the same procedure in fitting and I followed the rules on this one. The hood presented (continued on page 21)

GLOCK MODS: AN M1911 MAN BRANCHES OUT CONTINUED

ORIGINAL PAGE 21

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no problem. The usual two worn dimples are present on this and practically every other Glock barrel. I proceeded cautiously and found the rear lug struck the lock bar despite my best efforts at hood fitting. I went rather slowly with this one and in the end removed .016 inch from the rear lug to achieve a fit. The rear lug then cleared the lock bar with little clearance. But the pistol shoots quite well and my “drop-in” barrel took to fitting well. As for fitting a semi-drop-in barrel, the course is simple.

First, check the fit of the barrel in the slide. If the barrel sticks, determine where it’s sticking. To work the hood in, remove small amounts evenly. At some point, the barrel will fit with adequate clearance with a minimum of file work. When done, the underlug must now be centered between the rails. If canted, you will have to remove material from one side or the other of the hood. When fitting a barrel that locks on the hood instead of locking lugs, this is standard operating procedure.

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With this done, the top end is mounted to the frame. I have done this several times with Jarvis and Bar Sto semidrop-in barrels with good results. The Glock Consensus Anyone with experience with the 1911 will be able to approach the Glock with little difficulty. The differences are all in the details.

A generation ago, gunsmiths reached a consensus on the 1911 pistol and what was needed to make it a first-class handgun—a set of sights, a speed safety, a trigger job, and some added barrel throating to feed hollow-points. The Glock consensus is simpler, it seems to me, and includes good sights and a proper hand fit.

Unlike the 1911 grip which is always pretty much the same except for length, we have the option of different frame sizes with the Glock, with the Model 21, 23, and 37 all having different sizes in a real way. And in the final analysis, the Glock is not the great mystery we once thought it was. I

RIFLES

Working the Marlin Model 1891 .22 Lever-Action

Thanks in large part to the simplicity of its design and the quality of its manufacture, there are still thousands of these little lever guns in use after more than 100 years of service.

BY DAVID R. CHICOINE JUNE 2007

ORIGINAL PP. 18-21

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Marlin's Model 1891 leveraction repeater was manufactured from 1891 through about 1897, with nearly 19,000 rifles manufactured in all. This handy, small-framed model was offered in both .22 and the then-popular .32 rimfire calibers. The 1891 was a unique firearm in that it was the only Marlin rimfire lever-action that used a loading gate in the side of the receiver.

A few of the last 1891s made did use a tube-type loading system with inner and outer magazine tubes, like so many subsequent .22 rimfire rifles of various makes made to this day. An attractive rifle, it had the look of a scaled-down version of the largercaliber lever guns of the day. The design of the 1891 ac-

tion was ingeniously simple and this basic principal was carried over into the Model 1892, which was actually introduced in 1895.

Like the last few 1891s, the Model 1892 used a two-piece (inner/ outer) magazine tube that was loaded through the front end. Marlin made the Model 1892 until about 1916, with a total of something over 45,000 rifles manufactured. This popular model went through still more improvements and was later reintroduced as the Model 1897, a truly good looking, neat little take-down .22 repeater. This gun would later evolve into the well-respected rifle we know today as the Marlin Model 39.

The takedown instructions given here will work with the Model 1891. This is where you look to be sure the rifle is empty before you

start in with any work. Top of page: Marlin's Model 1891 was a unique and sturdy little .22 lever-action that was loaded through a gate in the sideplate just like the big guys. Author photos, as well as with the later Model 1892. The minor difference between the two rifles is the fact that the 1892 did not use a loading gate in the sideplate, as mentioned above.

The remainder of the basic workings and internal parts remained essentially the same between these two models. These little Marlin lever guns are just superb in every way. In fact, the Model 1891 and 92 were so perfectly simple and so well made that they rarely come in for repair, except, of

WORKING THE MARLIN MODEL 1891 .22 LEVER-ACTION CONTINUED

ORIGINAL PAGE 19

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Shown above the gate is the cartridge stop and the cartridge-stop spring, course, for what many owners seem to think of as the “mandatory” cleaning about once every 50 years. When trouble is experienced, it will usually be the result of looseness in the internal parts caused by wear at one or more of the gun’s three major action pivot points. These points are the lever, the carrier, and to a lesser degree, the hammer.

Two of these pivot points are threaded into the receiver and one, the carrier, is a pressed-in pin. All of these are parts that, if necessary, can be easily duplicated in a lathe from high-quality drill rod. In this case, the gun-

smith has the option of making the pivot area oversized to compensate for wear in the moving parts. Disassembly Instructions 1. First, let’s make sure the rifle is unloaded. Point the muzzle in a safe direction and hold it firmly around the forearm and barrel with your left hand.

Now open the action by pulling down the finger lever (#27) all the way with your right hand, keeping your fingers away from the trigger (#65). At this point, check to be sure there is no cartridge in the barrel’s chamber. Also look through the bolt opening down into the action to make And all this took barely a few seconds to accomplish. sure

there isn’t alive cartridge in the carrier (#7) inside the action. If there is a cartridge in the Marlin’s carrier, when you close the lever, you’ll be loading the rifle.

To safely unload a rifle with a loaded magazine, keep the muzzle pointed in a safe direction with your fingers well away from the trigger as you operate the lever to the full-open and then the full-closed positions. Do this several times to expel any cartridges that maybe in the magazine, repeating until no more cartridges are expelled from the action. 2. The next step calls for the removal of the sideplate, the lever, the breechbolt, the carrier, and the buttstock.

WORKING THE MARLIN MODEL 1891 .22 LEVER-ACTION CONTINUED

ORIGINAL PAGE 20

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1 Barrel 3 Breech Bolt 4 Buttstock* 5 Buttplate* 6 Buttplate Screws* 7 Carrier 8 Carrier Rocker 9 Carrier Rocker Spring 10 Carrier Rocker Spring Screw 14 Cartridge Stop 15 Cartridge Stop Screw 18 Ejector Assembly Pull the finger lever closed and unscrew the sideplate screw (#62). You can now lift the sideplate off from the left side, rear end first. Now thumb the hammer (#41) all the way back until it stays cocked, and open the finger lever until it is about halfway down.

Lift the breechbolt (#3) all the way to the rear and out of the receiver. Once the bolt is out, you can lift out the ejector (#18) from its recess in the frame. Reach into the action and lift out the cartridge-carrier assembly (#7).

Unscrew and remove the tang screw (#64) from the 25 Extractor 27 Finger Lever 28 Finger Lever Spring 29 Finger Lever Spring Screw 30 Finger Lever Screw 31 Firing Pin 34 Forearm 35 Forearm Cap 36 Forearm Tenon 37 Forearm Tenon Screws 38 Front Sight* 41 Hammer upper receiver tang, and pull the buttstock (#4) straight back and off to the rear. 3. Next we'll remove the finger lever, the hammer, the trigger, and the safety. Start by unscrewing and removing the mainspring screw (#58) and lifting out the mainspring (#57).

Next, unscrew the finger-lever spring screw (#29) and lift out the screw and the finger-lever spring (#28) from the bottom of the receiver. The finger lever (#27) can now be lifted straight up and off its pivot screw (#30).

If neces- Marlin Model 1891 Lever-Action Rimfire Rifle 42 Hammer Screw 43 Magazine Tube 52 Magazine Cap 53 Magazine Spring 54 Magazine Follower 55 Magazine Tube Stud* 56 Magazine Cap Screw 57 Mainspring 58 Mainspring Screw 59 Receiver 60 Rear Sight 61 Sideplate 62 Sideplate Screw 63 Sideplate Screw Collar* 64 Tang Screw 65 Trigger 65a Sear 65b Safety Lever 65c Safety Lever Pin 66 Trigger Pin 67 Trigger/Safety Spring 68 Trigger/Safety Spring Screw * Not illustrated sary, the pivot screw can also be removed.

Unscrew and remove the hammer screw (#42) and lift the hammer out through the hammer opening in the top of the receiver. Next, unscrew and remove the trigger-spring screw (#68) and lift off the trigger/safety spring (#67.) Using a cup-tipped pin punch and hammer, drift out the trigger pin (#66). This frees the trigger (#65) and sear (#65a), allowing them to be pulled out through the bottom of the receiver. Take note their correct positions for later reassembly. Next, use a small

WORKING THE MARLIN MODEL 1891 .22 LEVER-ACTION CONTINUED

ORIGINAL PAGE 21

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pin punch and hammer to drive out the safety-lever pin (#65c). You can now lift the safety lever (#65b) out from the lower tang. 4. The final step involves the removal of the forearm, the magazine assembly, and the buttplate. Unscrew and remove the two forearm tenon screws (#37) and slide the forearm cap (#35) forward slightly just far enough so it clears the forearm tenon (#36). Next, unscrew and remove the magazine cap screw (#56) and pull the magazine tube (#43) down slightly.

The magazine cap is now free and can be pulled out toward the front of the rifle. The magazine spring (#53) is also free to come out at this point. Note that the spring is under tension, and be careful to keep these parts cap-

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tive as you remove them. The magazine tube is also now loose and can be pulled out of the forearm along with the forearm tip (#35). Once the magazine tube is out, tilt it forward to allow the magazine follower (#54) to fallout, taking careful note of its position for correct reassembly later.

At this point, the forearm itself can also be pulled down and off the barrel. The buttplate (#5) is removed from the stock simply by unscrewing the two buttplate screws (#6). Further disassembly of the Marlin Model 1891 is not required for normal maintenance. As always, you'll reverse the above procedures to reassemble the firearm. I

MEASUREMENT & INSPECTION

Reader Forum

BY AMERICAN GUNSMITH EDITORS JUNE 2007

ORIGINAL PP. 22-24

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Removing Revolver Endshake I recently acquired a Smith & Wesson Model 28 with recessed chambers. The cylinder appeared to have quite a bit of fore-and-aft play, so I measured the headspace and barrel/cylinder gap with feeler gauges. With a deprimed .357 Magnum case in the chamber, I measured headspace of .013 inch and a barrel/cylinder gap of .007 inch. Question 1: What should these measurements be? Does the gun need to have its endshake adjusted?

Question 2: There appear to be two ways to accomplish endshake adjustment. Method one swages the cylinder arbor with a tool that resembles a tubing cutter followed by truing/trimming to length with a piloted cutter. Method two first trues the end of the arbor with a piloted cutter and then adds shims to bring the endshake within tolerance. Is one method to be preferred over the other? If so, which?

Assuming no barrel/cylinder-alignment problem is present, if there is leading build-up at the rear of the barrel, the gauge may have to be increased and/or the ammunition changed. The rear gauge (headspace) is factory set according to caliber. Calibers .38, .357, .41 and .44 are specified at .060 to .068 inch; .22 Magnum

at .004 to .008 inch; .45 ACP at .090 to .094 inch; .45 Long Colt at .060 to .068 inch; and .38 or .357 with cylinder counter bore at .012 to .018 inch.

Some of America's top revolversmiths are in agreement that tolerances should be based on how the gun is used. For example, a PPC revolver should be gapped at .005 to .006 with headspace of endshake of .0005 to .0010 inch. In the same order, the consensus for a duty or personal-defense gun is .005 to .006, .004 to .005, and .001 to .0015 inch; for a silhouette gun, the measurements are .0015 to .0025, .003 to .004, and .000 to .0010 inch; for sporting use, .0015 to .0025, .003 to .004, and .0005 to .0010 inch.

For IPSC competition, the numbers are .0025 to .0035, .001" to .002, and .0005 to .0010 inch. Stretching the yoke after its barrel has been supported with a metal rod or hardwood dowel can be done with a tubing cutter, but not one directly off the shelf. It must be modified by removing the cutter wheel and grinding the wheel to approximately 3/32-inch wide, then stoning it to remove any burrs. Smooth and free spinning is the word.

READER FORUM CONTINUED

ORIGINAL PAGE 22

The yoke is given more room to turn in the tool by filing down the cutter frame on the left side by 1/32 inch and the rollers, if grooved, should be reversed to provide more bearing surface on the end of the yoke barrel. A second method of stretching a supported yoke barrel is by peening. The yoke is removed from the cylinder. Work on a hard, true surface. Use your hammer to peen all around about 1/32 inch from the barrel end of the yoke. Peen too much and you will cause cylinder bind.

If you do, you can reduce the peened area a bit by rolling the yoke on a fine file. Follow this by doing the same to it on a perfectly square Arkansas stone. By far the simplest method, often preferred when time is a critical factor, is the use of endshake bearings. These are available from Brownells in several thicknesses and are revolver specific. Whitney Wolverine Takedown At a recent gun show, I purchased one of the new Whitney Wolverines.

It had been fired some so, once I got it home, the first order of business was to field strip and thoroughly clean it. However, even following the instructions the barrel jammed about halfway. With the hammer at full, it presses against the underside of the barrel, wedging it in place. Because of a small piece which indexes to the top of the barrel and which came loose while I was fiddling with the gun, I haven't been able to reassemble it, either.

I probably could get that piece back in place with some needle-nose pliers, but I haven't had much time to work on the gun (which, fortunately, also means I haven't had time to cause any damage). However, I'd like to get it back together and do some shooting. I would appreciate any advice you might have before resuming my attempts. Perhaps the previous owner messed things up with an ill-informed stab at a takedown job.

We suspect the loose part you mention is the ejector, but are puzzled since it's pressed into the barrel and doesn't come out easily. We did a full article on the new Whitney in the March 06 issue. With the exception of mistakenly referring to University of Washington footballers as "Wolverines" instead of "Huskies," the article is an accurate and complete guide to proper disassembly and reassembly. It should serve to resolve your problems.

HK Questions Do you or anyone you know have information on working the HK USP and Compact, especially trigger jobs, et cetera? Thank you for your help. John Starling Farmville, North Carolina The USP, especially the Compact, is more of a duty weapon than anything else. Its purpose is close-in self-defense. Takedown and reassembly for the pistol appear in Gun Digest's book of disassembly/reassembly dedicated to pistols.

We don't know what you mean by "et cetera," but if you're thinking of a target trigger job, the USP would not be a good candidate. In cases where USP owners, including law enforcement, find the gun's trigger pull intolerable, the offending pistols are normally returned to the factory or handed over to a crackerjack gunsmith. In those hands, the gun is torn completely down and given a detailed polishing to reduce or eliminate internal friction.

This includes the sides of all trigger-system components, their related pins, and any points of contact

ORIGINAL SOURCE PAGE

22

READER FORUM CONTINUED

ORIGINAL PAGE 23

where rubbing has occurred between those components and the frame or slide. There may be a reduced-power spring kit that would still allow the gun to function as designed. We haven't scouted the aftermarket to find one, but Wolff Springs would be a good place to start. Add to that a scan of the Brownells catalog. We strongly recommend that no cutting of OEM springs be done in search of a lighter pull.

Do-It-Yourself Light Mount I live in a rural area of Mississippi about 100 miles north of the Gulf Coast and after Hurricane Katrina in 2005 we were without power for 13 days. (We were among the lucky ones; we still had a home.) As stories of looting and violence were circulating and law enforcement and emergency services were stretched thin, people were on edge and neighbors came together to watch out for each other. (Call it the ultimate neighborhoodwatch program.) My gun-repair shop is attached to my home, which made it easier for me to keep an eye on both my home and my business at the same time.

My closest neighbor and I started taking turns staying up at night and keeping watch over both of our properties. We taped flashlights to our long guns to make them more efficient during our nightly vigils. Fortunately no one decided to bother us during this time, so we didn't have to test how well our hastily devised night weapons worked with their taped-on lights.

After all of this was over and our power was restored, I took a closer look at my AR-15 and the light I had taped to it, and decided that I needed to improve upon it. Since my shop was by necessity closed for two weeks and the cost of gas and supplies had skyrocketed, buying one of the quality lights on the market was a no-go for me.

So I started looking for a less expensive alternative. I went through my shop to see what I had to accomplish the job.

The collection of parts I assembled included a Weaver #45 scope-mount base, an off-brand Weaver-style scope ring, a Brinkman Maxfire flashlight with a momentary on/off switch on the tailcap (it uses lithium batteries and the beam is blinding), and a couple of screws and nuts from the junk bin. The first step was to mount the light in the scope ring and then secure the ring to the scope base.

Using masking tape to hold the contraption in indifferent places, I next decided on where to position the light on the rifle's forearm. Obviously, the best position for the light will vary from shooter to shooter. The best position for me was on the upper forearm on the left side. With the lights tailcap switch placed 7 inches or so from the front of the rifle's carry handle, I only had to raise my left thumb from my normal shooting position to activate the light switch.

Using masking tape, I then marked the forearm around the scope base to keep from losing my place and then removed the mount and light. After separating the ring from the base, I drilled and countersunk the screw holes on the scope base for the machine screws I had selected to fit. Then I removed the upper forearm, and using a Dremel tool and a small stone, I cut a groove on the underside of the scope base to fit over the rib on the forearm to allow the base to fit flush.

From that point, it was a simple matter of marking and drilling screw holes through the forearm and heat shield and attaching the base with the screws and nuts. (If you try this, be careful that the placement of the mount doesn't allow the screws to contact the fragile gas tube.) The ring with

light can now be attached or removed in seconds as needed thanks to the handy thumbscrew on the ring.

While this setup is not as fancy as the some of the aftermarket mounts, it certainly gets the job done. In addition to being inexpensive, another advantage of this type of mount over some of the commercial ones is there are no wires and pressure switches that must be taped or glued to the gun.

Daniel Robbins Mt. Olive, Mississippi AMT Backup Info I recently purchased a used AMT Backup in .45 ACP, and was wondering if there is any technical data available. It's double-action-only, all stainless, and in very good shape. Have there been any articles in American Gunsmith on this particular handgun? If so, could you give me the issue number and date of printing. I'm especially interested in an exploded view and field stripping instructions.

No articles, but you can go to and click on "Pistols." A drop-down menu will ask you for "Manufacturer," under which you'll select "AMT." Three guns will be shown, and the Backup is among them. A PDF version of the owner's manual will cost you \$1.49, charged on-line to your credit card. **Chamber/Forcing Cone Data** I'm looking for chamber and forcingcone dimensions for 12-, 16-, 20-, 28-, and .410-gauge shotguns. I am considering lengthening the forcing cone on a 16-gauge Citori.

I was wondering if I need to take a forcing cone to the same size as the chamber, or if I can leave it .010 to .020 small if it is for one shell length only (like a 16 or 28 gauge). I can understand the need to have it at the chamber diameter if it is a 3- or 3-1/2-inch chamber, since most are designed to take a

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(continued from previous page) shorter shell. In the case of a 16 gauge, there is one length, so I think if it's a little small the opening of the hull would prevent the wad from hitting a .010 shoulder. Is this correct? Where can I get these dimensions and other information on this topic? Where can I get the reamers for this besides Brownells? I would like to get one with an interchangeable pilot to match the bores and keep it in alignment if possible.

I know the Browning Citori does not have chrome-lined bores, but I may do another shotgun that does. Should I get a carbide reamer for both? Brownells states that the carbide reamers are not recommended except for chrome-lined bores, but I have used carbide reamers, drills, and endmills for other machining. Would performing this operation on a gas-operated gun such as the 1100 or 11/87 affect the cycling, since it would theoretically lessen recoil? Any information would be helpful.

Let's start with the definition of a forcing cone: The front part or "throat" of the chamber where chamber diameter is brought down to bore diameter. It is believed this aids the passage of shot into the barrel. Whether along or short forcing cone is better is a matter of some disagreement, but it seems everyone who makes barrels has his own set of rules on that length. For this discussion, a rule of thumb for throats is 7/16 to 11/16 inch. Forcing cones can be of a shallow or steep angle.

Steeper angles tend to deform pellets more than shallower angles do, and deformed pellets fly more erratically and thus shot patterns tend to spread. We have read of skeet shooters from days past who favored very soft lead or even squareshot loads to improve their "kill" rates. (Square shot is no longer permitted in competition.) Take note: The crimp of the shotshell unrolls as the gun is fired.

The chamber must have sufficient length to accommodate this "blow-out" condition, and some 2-3/4-inch shells do not reach 2-3/4 inches. This raises pressures, deforms shot, and affects patterns. Therefore, the forcing cone must never constrict the full opening of the hull. Chamber specifications are available from S. A. A. M. I. Newtown, CT 06470) and Clymer Manufacturing is a good source for reamers, although we think the kind Brownells sells are made by Clymer.

Broken Drill Removal I have broken a #31 drill bit in a Mauser receiver. Before drilling, the locations of the 6-48 screws were marked. (The top of the receiver was ground a few thousands until it was easily marked with a center punch.) The hole was started with a center drill, then deepened with the #31 drill bit. This hole is in the rear of the receiver, and I intended to drill through. I suspect that when the drill bit encountered the case-hardened interior of the receiver, it snubbed up and broke off.

The drill bit is part of the Brownells tap & drill kit #2, which list the drill-bit composition as HSS. Please advise what you think is the best approach for getting me out of this embarrassing dilemma. I do not have access to EDM. Thank you. A 1/8-inch bottom-cutting carbide endmill set up dead rigid in a milling machine (Bridgeport or equal) will ream out the drill stub. The result will be .005 inch over for a 6-48-diameter screw.

There are oversized 6-48s available, or you could move up to 8-40, then redrill and tap the hole using generous amounts of cutting oil. Too bad there's no machine shop nearby with EDM capability. Such a shop could make your problem easier to solve. Parts Sources I have two weapons that I can't locate parts sources for. The first is a Benelli B76, 9mm semi-auto handgun. The second is a Norinco .22 ATV (a lookalike of the Browning .22 Auto). The Norinco has a broken extractor. Can a Browning extractor be substituted?

I would appreciate any help you can provide. Our former source for Benelli pistol parts is apparently out of business, but try Gun Parts Corp. and Bob's Gun Shop. Regarding the rifle, it all depends on how close Norinco came to swiping the Browning design. If they came close, a Browning extractor could probably be used with minor fitting. It's worth a try anyway, since the part isn't expensive. If you run across an importer for the Norinco (possibly in the owner's manual), let us know.

SEARCHABLE ISSUE RECORD

Archive index

Watching the Fallout from Virginia Tech
The New York Times

2

Disassembly and Reassembly Of the Springfield EMP
Chick Blood

3-6

Safely Removing Barrel Obstructions
Dennis A. Wood

7-9

Using the Manson Precision Barrel-Crowning Tools
Reid Coffield

10-13

Glock Mods: An M1911 Man Branches Out
Robert K. Campbell

14-17

Working the Marlin Model 1891 .22 Lever-Action
David R. Chicoine

18-21

Reader Forum
American Gunsmith Editors

22-24

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