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INSIDE THE ARCHIVE

BUILDING A CUSTOM MAUSER, PART TWO

SALES TO NEW GUN OWNERS • GETTING FAMILIAR WITH THE MOSIN-NAGANT RIFLE • REPLACING THE EXTRACTOR ON ...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 088

DIGITAL ARCHIVE EDITION

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FROM THE ARCHIVE

Sales To New Gun Owners

BY AMERICAN GUNSMITH EDITORS APRIL 2011

ORIGINAL PP. 2

When asked about the state of gun sales in the United States Scott Blackwell, Chief Sales Officer at the Freedom Group said, “It’s about the long-term effect on the shooting sports as a whole, as well as our industry, and how we collectively can do a better job at educating, informing and ultimately leveraging all customers. Think of all the new pistol and AR-15 purchases by people who didn’t own them before.

How do we as a group get them out shooting their new product more and enjoying the sport?” This growth in personal responsibility and activity is where the opportunity for the firearms industry lies: Taking those uncertain first-time gun buyers, in addition to inactive current owners, and turning them into enthusiastic participants in shooting, whatever their individual preference happens to be. Miles Hall is the owner and founder of H&H Gun Range and Shooting Sports Complex in Oklahoma City.

His facility was the first formally recognized with a Five Star rating by the National Association of Shooting Ranges.

In a presentation given shortly after this achievement he attributed hosting regular organized shooting events and competitions as the primary means of his success, noting that such activity was an “A-plus necessity.” When asked about the so-called gun sales “bubble”, he says that it has not burst but it has certainly shifted, with new customers appearing at his sales counters and continuing to return. “The clear majority of people who came in over the last two years were first time buyers.

They are still in — along with their friends. Sales numbers are just under last year by single to very low double digits. When comparing to 2008 sales, 2010 was up in the mid to high double digits. The issue is that this industry is not reconnecting to them.” Hall has backed that position with definitive actions. For six weeks, H&H hosted free lectures on the Second Amendment led by Don Powers, a professor at UCO and former judge.

The response? “It started off as a handful of people,” Hall told a local TV station, “and it has morphed into close to 100 people.

That is an awakening.” Hall also says the new shooters are definitely not the normal buyers of old and require a different mindset. “They watch the major networks, not outdoor channels and they identify with local dealers, not manufacturers, and – universally — they do not understand the shooting sports.” That, Hall believes, is the true opportunity the industry should be addressing, saying the consumers are making it known through their actions that they want to get involved. “We see classes booking months in advance and ranges are at capacity not just on the weekends but during the week and mid day,” he explains, “The worry for us here is in the ability to reconnect to these folks.

Advertising is the means that this group will respond to, but dealers are severely held back by low margins and little to no co-op money to buy air time.” “I worry, Hall says, “this group — and it is in the thousands just here in Oklahoma — will move on with their lives if not made to feel wanted and welcomed. We are doing all we can, but sure could use some help.”

RIFLES

Getting Familiar With The Mosin–Nagant Rifle

Technical advice applicable to the Mosin–Nagant Models 1891, 91/30, 27, 38, 39 and 44. Their actions are essentially the same.

BY CHICK BLOOD APRIL 2011

ORIGINAL PP. 3-5

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The Russian Mosin–Nagant 3-line rifle, Model 1891 was one of the earliest bolt action military rifles made for smokeless powder cartridges. The design and hyphenated name resulted from a collaboration between Imperial Russian Army Colonel Sergei Ivanovich Mosin and the Belgian arms maker Emile Nagant of Fabrique d'armes Émile et Léon Nagant.

Both rifle and carbine models, in military service for better than sixty years, have subsequently been manufactured in China, Finland, North Korea, Russia, Switzerland, France and the United States. Those still around from early production have octagonal receivers while those produced later have round ones. Despite the differences in receivers all Mosin–Nagants share a common characteristic. They have a massive, ungainly appearing action that could lead an observer to believe the firearm to be quite complex.

To the contrary, the design has proven to be so “soldier proof” it remains highly positioned amongst the simplest military bolt actions ever produced. Further, a receiver-mounted cartridge interrupter that interacts with the integral, five-round magazine enhances the gun’s reputation as the most positive feeding of any design using

rimmed ammunition. It was the ammunition itself that brought my initial research on the rifle to a screeching, though temporary, halt.

I’d been told of an old American Indian trick that made it possible for them to reload rimmed cases. They would scrounge up the spent rimmed cases remaining on the fields of their The rifle received for this article arrived with several accoutrements. One of which, its bayonet, is pictured here above the rifle. Note its length and multiple wound enhancing grooves. (Ouch!) black powder battles with the US Cavalry. The more inventive of the surviving warriors would later secure “strike anywhere” wooden matches.

The cut off match heads would be crushed into a powder and converted into a slurry. A measured amount of the slurry would be poured into an empty case, rotated rapidly between the palms of their hands and set it aside to dry. The centrifugal force of the rotation supposedly distributed the match head mixture evenly inside the case rim. After drying, the mixture remained sufficiently sensitive to react to the impact of a firing pin and ignite the black powder in the recharged, reloaded case.

I don’t know for sure whether or not the old Indian trick was successful and briefly considered trying it out to see if it really works before fully realizing I knew no living American Indians old enough to confirm that it did or didn’t. As it turned out soon after returning to my research, it would be a complete waste of time to experiment with match heads and the repriming of rimmed cases these days. But first, a few past and present details about the 7.62 x 54mm rimmed cartridge.

The 7.62 indicates the bore diameter in millimeters, which is .30 caliber. The 54 represents the length of the cartridge case in millimeters and the Rtells you the case has a rim. In production since 1891 it is the oldest round still seeing military combat service with several of the world’s armed forces. This despite the fact that most bottle neck rimmed cartridges were considered militarily obsolete after the First World War.

That particular notion is no longer a factor because the 7.62 x 54mm rimmed now boasts the addition of a boxer primer. Ballistic performance of the current cen-

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Complete removal of the magazine is optional when field stripping the rifle. The rifle cartridge is comparable to the .308 Winchester, though a bit outperformed by the .30-06 Springfield. If you type 7.62mmx54mm Rimmed Ammunition into your search engine and scroll down on the links you'll turn up access to about seven pages from Wikipedia available for study or print-out. With them on hand or in file you can bone up on the works, such as Background, Dimensions, Performance, Availability and Derivatives.

Additionally is a list of firearms presently using the round and still more references. Among the latter is a link revealing Russia's new sniper loading for the once-upon-a-time rimfire. Perhaps this might be worth packing along on the next hunt, eh? Right about now I figure you'd rather bone up on the gun itself. Field Stripping, Plus/Plus Open the bolt, check the chamber, the magazine and protect your eyes. Hold the trigger to the rear. Slide the bolt back and out of the receiver.

If any cartridges remain in the magazine, opening the floor plate lets them fall out except for the uppermost one. It's held in place by the previously mentioned interrupter that assures no problem feeding of the first round and every round to follow.

Any cartridge you encounter being retained by this interrupter can be popped out the bottom of an open magazine with downward finger pressure. Secure the complete bolt assembly between padded vise jaws and pull back on the cocking piece (1).

It is under pressure from the spring (3). Rotate the piece counter clockwise, keeping it under control as you allow it to move forward. Either remove the bolt assembly from the vise or shift it so you can grasp the bolt head (6) Mowbray and Joe Pulco contains full information on 48 rifles and carbines from all over the world. This book is available through manatarmsbooks.com. by its locking lugs. Pull the head forward until it comes to a stop, rotate it counter clockwise a little more than a quarter of a turn.

Rotate it clockwise 90 degrees and remove it from the bolt body (2). This frees up the bolt guide (5). Slide it forward and off the body. The guide has a slot at its rear end that is about to come in very handy. You see, the firing pin is threaded into the cocking piece. The slot on the guide slips over the flats on the firing pin and you can use the guide as a wrench to unscrew the pin. Careful now. Every turn on the pin is going to relax its spring.

Once the pin is completely undone from the cocking piece the spring will want to jump out the front of the bolt body and the cocking piece will drop free. It isn't absolutely necessary to remove the magazine floor plate (29) and follower (24) assemblies at this time but I opted to do so. Invert the barreled action. The floor plate release button is located in a recess just forward of the trigger. Push the button to the rear and swing open the plate. Squeeze it and the follower together.

This will open the end of the plate enough to clear its hinge pin (32). Withdraw the plate from the housing along with the follower. Two spring keepers mounted in the stock retain the two barrel bands (16). Individually depress the keepers and drift the bands toward the muzzle. You'll have to rotate each band to get it over the front sight (17). Withdrawing the cleaning rod beforehand significantly lowers the frustration factor of maneuvering the bands.

Two guard screws stand in your way of removing the barreled action from the stock. The rear guard screw (9) is located in the tang just aft of the receiver bolt way. The front screw (23) is seated in the forward end of the guard. You have to invert the rifle to get at it. Once both screws are backed

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out, the metal can be lifted from the wood (33) with magazine/trigger guard housing attached. Further Disassembly The trigger spring and bolt stop (20) are retained by a screw (21). The trigger (18) is mounted to the receiver by its hinge pin (19). This pin is fairly loose and requires no serious effort with a drift punch to remove it in either direction, at least it didn't on the rifle I received for this article, however, the same might not be true of the Mosin-Nagant that arrives in your shop.

If Mosin-Nagant (Specifications subject to change without notice) (Order parts using ZMN identification system.) your rifle is more stubborn than mine, support in the form of a nylon bench block, available from Brownells, is recommended as it would be for any pin resistant to removal. The feed interrupter and ejection spring (11) shun pins and are held to the receiver by a screw (10).

Regardless, once the screw is removed a pin punch can come be useful in cases where the ejector (12) must be nudged forward to dislodge it from its groove.

Additional disassembly of the magazine, normally required only for part replacements, should present no ob- 1 Cocking Piece (ZMN0001) 2 Bolt Body (ZMN0002) 3 Firing Pin Spring (ZMN0003) 4 Firing Pin (ZMN0004) 5 Bolt Connector/Guide Bar (ZMN0005) 6 Bolt Head (ZMN0006) 7 Extractor (ZMN0007) 8 Assembled Bolt (ZMN0008) 9 Rear Guard Screw (ZMN0009) 10 Ejector Spring Screw (ZMN0010) 11 Ejector Spring/Feed Interrupter (ZMN0011) 12 Ejector (ZMN0012) 13 Receiver (ZMN0013) 14 Barrel Assembly (ZMN0014) 15 Handguard (ZMN0015) stacles once you have become thoroughly familiar with the schematic.

With the Mosin-Nagant there are no tricks involved with disassembly or reassembly. All operations should follow the proven

practice of making certain the position of all components are exactly the same after reinstallation as they were prior to removal. This is particularly true when dealing with the bolt head of a Mosin-Nagant. If not properly reinstalled, firing the rifle will almost certainly result in property damage, personal injury, or both.

AG 16 Barrel Bands (ZMN0016) 17 Front Sight (ZMN0017) 18 Trigger (ZMN0018) 19 Trigger Hinge Pin (ZMN0019) 20 Trigger Spring/Bolt Stop (ZMN0020) 21 Bolt Stop Screw (ZMN0021) 22 Magazine & Trigger Guard (ZMN0022) 23 Front Guard Screw (ZMN0023) 24 Magazine Follower (ZMN0024) 25 Follower Spring Assembly (ZMN0025) 26 Follower Hinge Pin (ZMN0026) 27 Lower Follower Spring (ZMN0027) 28 Spring Retaining Screw (ZMN0028) 29 Floorplate (ZMN0029) 30 Floorplate Latch (ZMN0030) 31 Latch Screw (ZMN0031) 32 Follower Upper Hinge Pin (ZMN0032) 33 Stock (ZMN0033) 34 Buttplate (ZMN0034)

MAINTENANCE & REPAIR

Replacing The Extractor On A Ruger MKII Government Model

Ruger MKII Government Model are highly reliable, normally requiring few repairs and a little maintenance. Here's how working on one created a new customer for me.

BY WENDELL DEANER APRIL 2011

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Recently, a well-used Ruger MKII Government model pistol came into my shop for repair. The chief complaint was a broken extractor. For once I realized that the customer knew what he was talking about, since he had a piece of the extractor in his hand and the other piece was stuck in the bolt of the gun. Not too big of a job, but I looked at this as an opportunity. The man was a new customer. I'd never seen him before and one of his friends had recommended me to him.

As I had a couple of extractors on hand, I could have just popped one in and sent him on his way as this is a couple-dollar part available from Ruger and Brownells. Not to pick on mechanics, but I've always had a problem with technicians who only do exactly what they are told without taking into account the true needs of the customer. For example, let's say I changed your tires. Your car doesn't stop very well, eh? Doesn't surprise me. The brakes are shot. Why didn't I fix it? You didn't tell me to.

This customer's gun had been fired an estimated 5,000 rounds. Other than wiping it down with light oil after firing the only oth-

er maintenance had been occasionally pushing a patch soaked with Hoppe's #9 through the bore. As far as the customer knew the piece had never been stripped for field cleaning, a job he did not feel comfortable doing himself. The pistol was used but not abused. Normal maintenance requires field stripping and cleaning periodically. In my experience, every 5,000 rounds is about right.

The Ruger was obtained used, so it could have been fired many more times before he bought it. Due to the very nature of inexpensive .22s most of them are fired thousands of times, especially semi-autos. The nice thing is that the low pressures produced by this round are easy on the guns and they don't need to be cleaned after every firing. However, after five thousand rounds it's about time to clean up some of the gunk left behind.

Since I had to field strip the gun anyway, I recommended that not only should I replace the extractor but also give the gun a good cleaning. He readily agreed and I had another paying job. A job like this takes about an hour or so. I think a charge of

your minimum rate per hour, plus the cost of the extractor, plus a couple of bucks more if you find anything you don't like after you've broken down the gun for cleaning would make this job worth while.

I am talking about field stripping the pistol into its components of barrel, grip frame, and bolt, cleaning any obvious grime from the barrel channels and grip frame, cleaning the barrel, disassembling the bolt (which we have to do to replace the extractor anyway) and cleaning it, and using a degreaser on the parts pinned in the frame such as the hammer and trigger assembly.

It isn't awfully hard to take these parts out of the grip frame and reassemble them, but it will increase the time so as not to be worth it unless there is breakage or other problems. I've found that spraying with a good degreaser like Birchwood Casey's Gun Scrubber and cleaning what you can reach with toothbrushes and Q-Tips and the like will do a good job until there is really a reason to take this area down. After remov-

REPLACING THE EXTRACTOR ON A RUGER MKII GOVERNMENT MODEL CONTINUED

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These two pictures show the bottom of the barrel where it mates with the grip frame. Gun Scrubber and a brass or nylon brush will clean it up easily. ing the grip panels, I spray once and let the gun sit. With the grime softened, brush the parts and spray again before the fi nal cleaning. Finally, since the Gun Scrubber leaves all the metal it touches dry and unlubricated, I spray on some Break Free wiping off the excess after letting it dry.

Gun Scrubber and Break Free are two of those products that stay on my bench in easy reach. The Gun Scrubber is usually sprayed on brass brushes to clean them and take off any copper solvent that could eat away the brass. It also does a good job just to remove the gunk and clean up items like old toothbrushes. With the little red tube in place it does a great job of cleaning those hard-to-reach areas like the parts in the grip frame of the Ruger without the hassle of disassembly.

If sliced bread hadn't come first I'd pick Break Free as the greatest invention. Break Free is a cleaner, lubricator, and rust inhibitor. I'm no chemist, but this stuff does what it says it will do. That's enough for me. The instructions recommend letting it dry for at least two hours, or even overnight. If I can, I let the parts sit overnight and wipe off the excess the next day.

This seems to let its best properties of lubrication work while not attracting all kinds of dust and other debris that can cause problems with regular gun oil or other lubricants. As you can see in the included photos the bolt and mating surfaces of the barrel and receiver were covered with grime associated with firing a lot of promotional (cheap) .22 ammunition. Hey, I don't knock the practice of using inexpensive .22s.

When I'm not hunting or target shooting, I use them exclusively at The moving parts here can be affected by gunk. The use of Break Free for the fi nal lubrication can help with the accumulation of dust and other debris. the range for plinking and keeping the muscle memory of my trigger finger in shape. For shooting five thousand rounds the build up in this gun was really not too bad. It came off easily with Gun Scrubber and a toothbrush.

The bolt had its share of gunk and the channel for the recoil spring assembly had accumulated an oily mess. The seven or eight little parts that make up the bolt as a mechanism were cleaned and lubed with Break Free. Unless you have a photographic memory or you work on any particular firearm all the time, I recommend a good schematic such as those available in the Official NRA Guide to Firearms Assembly: Pistols

REPLACING THE EXTRACTOR ON A RUGER MKII GOVERNMENT MODEL CONTINUED

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If cleanliness is next to Godliness, then the gunsmith and his toothbrush shall not be far apart. Although Ruger will sell you an extractor they want you to buy fi ve of them. Brownells will sell by the piece and the weight won't increase shipping on your regular order. and Revolvers. It's sometimes funny (or not so funny) how you can end up with a small part that seems to have no home when working on any firearm. The reassembly instructions can also be invaluable for little tips unique to each design.

The extractor can be a pill to remove, especially when it is broken and there is nothing sticking out to get a purchase on with fingers or pliers. The spring and extractor plunger are in a blind hole. The plunger must be pushed into the hole with a small screwdriver

blade held sideways as if you were paring an apple. Some recommend a dental pick for this job.

While I think separating the plunger from the extractor in order to get the screwdriver blade into this small opening is a good idea, most dental picks that I've used area bit too fragile to actually pull back the plunger under its spring tension without breaking or bending. As I said, the extractor was broken and hung up in the hole.

I had to keep tension back from the plunger while gently tapping the bolt on the edge of my workbench so the broken piece would come out enough to use my dental pick to pull it out the rest of the way. Here is where my Gun Scrubber came in handy. I sprayed some on the extractor and in the channel for

the spring. It had some gunk down there that didn't want to let go of these small parts until it was loosened with the spray.

Af- Properly cleaned and lubed this gun will give long service before any more attention is needed. Unless there is an obvious issue such as breakage or a safety concern there is no need to disassemble these parts. The grips would be removed during the actual cleaning process. ter that, the extractor, plunger, and spring came out easily with a few gentle taps on the bolt. I test fi red this gun, and it functioned slick as anew one.

After cleaning up the chamber area with a little Hoppe's and a Q-Tip it was good to go. As long as my customer keeps on shooting up the .22s as he has been, I can expect some return business about fi ve thousand rounds from now. AG

MAINTENANCE & REPAIR

A Hard Look At 1911 Magazines

look for in the 1911.

BY ROBERT K. CAMPBELL APRIL 2011

ORIGINAL PP. 9-12

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When a malfunction comes into the shop you must be able to track down and qualify it. Magazine problems are common with the 1911 pistol, but in order to isolate the problem and make an educated assessment of the function of the magazine we must know how the magazine works and where it stands in the 1911 feed cycle. Lets take a hard look at several issues involved in the 1911 and its feed cycle. Controlled Feeding Many who use the 1911 are able to name the good attributes of the pistol by rote.

A straight to the rear trigger compression, low bore axis and a comfortable grip are enumerated, however, few will mention the most important feature as regards total reliability. This is the controlled feed action of the pistol. From the time the magazine is seated until the slide locks to the rear on the last fired round the cartridge is always under control. The controlled feed of the Mauser 98 and pre-1964 Winchester Model 70 rifles are often lauded but the 1911 is no less of a wonder.

Browning's masterpiece may be fired at severe angles and even upside down and it will still function. A well maintained 1911 with 230-grain service ammunition and good magazines is the most reliable handgun combination I have ever examined. The

feed cycle is worth your study and you need to understand how the 1911 functions in order to isolate problems and find cures. 1911 Operation The magazine consists of a body, floor plate, spring, and follower.

Cartridges are loaded in the magazine against the While all seem to work well enough the jury is out on which is the best. Every magazine pictured was the designer's idea of good function but some were probably a product of a cost cutting program. It is your job to thread through the designs and choose the best or at least decide if the magazine is compatible with the particular pistol. cartridge carrier (follower), which is pressed upward by spring pressure. The magazine feed lips control the cartridge's release.

The magazine is loaded in the handle and the magazine catch locks into the locking slot in the body of the magazine. The slide is racked to load the pistol. The lower section of the slide known as the cocking block provides the power to catch the cartridge rim and move it forward onto the feed ramp. The magazine feed lips are tapered to control the exact point at which the cartridge leaves the magazine. As the cartridge moves forward the bullet nose meets the lower feed ramp.

The 1911 feed ramp is a two piece design located partly on the frame and partly on the barrel. The bullet nose meets the lower ramp and there is some resistance. This resistance comes at exactly the point at which the case rim rises and moves under the extractor. This small speed bump in the process moves the cartridge hard against the breechface and properly seats it under the extractor.

It is essential that the 1911 feed ramp have a gap of 1/32 inch between the two surfaces in order for the pistol to feed properly. I have checked any number of modern 1911 handguns and it seems that the maker understood this need for precision. After snugging under the extractor the bullet nose tips up slightly and is driven into the chamber. On firing, the extractor retains control of the extractor rim as the cartridge case is drawn from the chamber.

The cartridge case receives a bump from the ejector and is cleared of the controlled feed process. A vital part of this controlled feed mechanics is the box-type detachable magazine. The magazine must be well made of good material and properly designed and executed. Many modern magazines venture far from the original template, but they

A HARD LOOK AT 1911 MAGAZINES CONTINUED

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Occasionally these things come up and a little knowledge goes along way. This allows a flush fit and good handling. A gunsmith might suggest a custom bevel over a magazine guide in a carry gun. do so with good engineering and manage to work properly. Reliability Any firearm is subject to malfunction. A lack of lubrication and poor ammunition is a tie up waiting to happen. These issues should be addressed before we move further to examining the magazines or feed ramp.

Poorly made aftermarket magazines were once the rule. When Colt magazines were fifteen dollars I was able to purchase "gun show" magazines for about three dollars and fifty cents. They were poor economy. Today, quality aftermarket magazines are often tout-

ed as an improvement over the original and priced accordingly. While these magazines are well made and durable they are subject to wear. The follower or magazine spring may be replaced. I often use magazine springs from W. C.

Wolff Company in special projects as a matter of course. The point is magazines are a renewable resource. There comes a time when they must be discarded. We see shooters spend well over one thousand dollars for a good 1911 handgun and balk at thirty dollars for a magazine! A firing test for reliability may be expensive. Worse, the firing test may be inconclusive. Wrap your mind around this.

The magazine may function as far as feed reliability is concerned yet not function properly and, in the long term, cause the pistol to

wear more quickly. My experience covers forty years with Plenty of room for the follower and the extra power magazine spring. Sometimes protrusion from the magazine well cannot be avoided. When it comes to an aluminum frame pistol this is a severe problem. the 1911, thousands of rounds and years of observation in training and tests and evaluation.

Lets look at the 1911 magazine and specific issues. I recently tested anew Springfield Tactical Response Pistol. This is a good example of the high end 1911, priced at about fifteen hundred dollars. There was lesson to be learned in marking magazines. The pistol failed to fully cycle with the last round of the magazine with the number two marked magazine. It turns out the magazine spring was

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The follower in the front has a nick in the body where it contacts the slide stop. This may spell trouble. The ACT-MAG worked just fine in every other pistol and other magazines did not work with the Firestorm slide stop. We replaced this magazine slide stop with a Wilson Combat slide stop of standard size. weak. This brought about an interesting discussion concerning eight round magazines in general.

Quite a few rounds of the ultra reliable Winchester USA ball loads were used in isolating this magazine, by the way, and the chore could easily have been done during the break in period. The eight round magazine supplied with the TRP is what we refer to as a modified Colt type. The Colt 1911 was designed to keep the magazine flush with the grip frame. There is sufficient space for the magazine spring and follower and seven rounds in this design.

Modified eight round magazines often use a modified follower and the standard seven round magazine spring in order to shoe-horn an extra round of .45 ACP into the magazine body. While common sense tells us that seven for certain is better than eight maybe, this was the trend for some time. International Defensive Pistol Association (IDPA) shooting stresses tactical loads and keeping the pistol topped off with ammunition.

It is one thing to lock a fully loaded eight round magazine in place with the slide locked back and then drop the slide, no problem, but when you perform a tactical load and slam an eight round magazine into a pistol with the slide down, you may have an issue. You really have to slam the magazine home! This type of pressure may result in a problem with the magazine lock and even the lock down slot in the magazine. I have encountered both of these problems.

Recently a Dan Wesson pistol lost its magazine catch and I suspect that the culprit was an overreach with an eight round magazine. There are proper eight round designs. The Wilson Combat magazine is a purpose designed eight round magazine with much to recommend. This magazine features a synthetic follower with a stainless steel body. The modern Elite Tactical Magazine from Wilson Combat features a true eight round follower and spring. Few magazines are truly fresh designs but the ETM is an exception.

Another exceptional magazine comes from Dave Lauck of D&L Sports, Inc., featuring a follower with two long legs that enhance feed reliability all of the way from full compression with the first round to almost no compression with the last round in the magazine. The original DLS magazine is a true hard use seven round magazine. The idea was to improve and perfect the 1911

feed device. The eight round version features an extended floor plate to accommodate a full strength eight round spring.

This magazine is tank tough and while expensive the magazine cannot be faulted on any count. Proof and Caution 1911 magazines are a diverse lot. That most 1911 handguns are reliable with most types of magazines speaks volumes about the design. The primary difference in 1911 magazines is follower design. While the angle of the feed lips is also important, this may be carefully adjusted. The follower is what we have to work with unless we change it. The follower may also be called the cartridge carrier.

The original magazine follower bumps the bullet into the feed ramp as we described earlier. These followers are either flat or concave. The flat follower features a leg that contacts the slide lock. Basically, all improvements in the 1911 magazine design have centered upon the follower. These improvements generally attempt to convince the bullet nose to enter the chamber more directly and to avoid bumping off of the feed ramp.

Ammunition should be designed to feed in the gun at hand but some ammunition makers decided that they would produce ammunition that required handgun modification to feed hollow point bullets. While the situation is better today many problems were traced to this ammunition philosophy.

A HARD LOOK AT 1911 MAGAZINES CONTINUED

ORIGINAL PAGE 12

The Wilson Combat magazine practically eliminates bullet nose contact with the frame ramp. The bullet nose seems to glide across the barrel ramp and slide into the chamber. There are those who feel that the Wilson Combat magazine does not maintain controlled feed, but extensive testing of the type and its issue with the proven Springfield Professional and FBI, Marine Corps and SWAT units proves the Wilson Combat magazine is very reliable.

The Metalform magazine with flat follower features the ideal controlled feed function of the 1911 in the view of many traditional shooters. Both types have given excellent service for many years. Modern magazines such as the Metalform Elite magazine skip the high danger part of the feed cycle when a hollow point bullet is likely to become jammed upon the feed ramp. The Slide and the Follower As you look into magazines more completely you must understand the function of the slide, slide lock and the follower.

As an example I recently examined a Philippine-produced 1911 that was well made of good material but lacked attention to detail. Unlike the Rock Island Armory pistols, this one fell short on execution. The oversize slide stop failed to activate with the ACT-MAG magazine supplied with the pistol. Even worse, when the pistol was loaded with a fully charged magazine the slide lock prematurely unlocked and the pistol loaded itself! The slide lock was off balance due to the extra weight of the oversized part.

In this case the slide lock was at fault but magazine follower problems are more prevalent. Some lack proper engagement, others engage the slide lock when they should not. A properly leg that is angled 90 degrees from the follower proper. This geometry is as important as the proper gap between the 1911 feed ramp for proper 1911 function — well, nearly so. If this geometry is not perfectly executed the

slide lock will end up locking not on the bottom edge of the follower ledge but on the vertical surface.

When this condition occurs both parts may wear prematurely. This improper mating may lead to failure to lock on the last round. In some cases, improper wear may result in a magazine becoming stuck in the frame. That is a severe problem not easily remedied. I encountered this problem once and simply managed to lock the slide open and beat the magazine out of the magazine well with a punch and mallet while simultaneously pressing the magazine lock. I had the help of a vise on that one.

If you have a follower in your hands that shows peening and wear on the leg that contacts the slide lock, something is amiss. The best magazine follower designs seem to be the Wilson Combat ETM, D&L Sports and the Metalform Elite. They seem very durable in competition with no complaints in my experience, only the occasional replacement needed. There is more. I have encountered a number of factory supplied magazines with a design that holds the follower higher than with other magazine designs.

The magazine spring also seems to be the maximum strength they could stuff into an eight round magazine. The follower rides so high and the spring is so strong you cannot release the slide with thumb pressure alone when the slide is locked to the rear on an empty magazine. And these are factory eight round magazines! When you find this situation you may simply think the gun is excessively tight but there is more to the situation that you may realize at first. The 1911 slide lock has been called a fail safe design.

If during recoil the slide lock bounces into the slide, the slide will normally bump it out of the without locking open. If the slide lock is an extended type with more inertia there may be a different outcome. Likewise the shooter's support hand thumb in the two hand grip will sometimes push the slide lock into the slide,

most often when using +P loads. A follower with too much contact with the slide will prevent this fail safe operation from its full utility.

You should include a test for this condition when testing magazines. Lock the slide to the rear and be certain you are able to press the slide lock against the follower and release the slide. If the slide lock does not release with only thumb pressure the follower may be too tall or the magazine spring too strong. Eventually slide peening may occur in the shallow slide cut out. If you spot peening in the slide cut, the follower is the culprit.

When looking at magazines and their function you need to see the whole picture. The 1911 pistol is a controlled feed system that demands good quality magazines. By being aware of the different types and their mission you will be well armed to equip the customer and make proper recommendations. Magazine Chute Compatibility When you are commissioned to install the new Smith and Alexander Magazine guide, the standard by which we judge all magazine guides, you told the customer he will have to purchase new magazines.

What? You did not? Well, maybe he will and maybe he won't have to purchase new magazines. There are a number of bumper pad styles that are not compatible with these chutes. I recently tried a Chip McCormick ten round magazine and with the protective cover that prevents over insertion. As expected, it did not to work in the Springfield TRP with Smith and Alexander magazine chute. What I did not expect was the same problem with Novak magazines as well. Neither did factory Taurus PT1911 magazines.

Sure, to each his own magazine but most have a box of assorted magazines. Be certain to brief them on the situation. They do not need to learn that a proven magazine does not work in their pistol during competition or worse, a critical incident. AG

FINISHING

Building a Custom Mauser, Part Two

Surplus Mausers are still great for customization. In this second issue of the series we'll take care of the bolt handle, bolt lugs and drill and tap for scope mounting.

BY WENDELL DEANER APRIL 2011

ORIGINAL PP. 14-18

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Original caption: bottom: Standard military, Numrich Arms, Forged, TIG Welded. tact and heat it with an oxyacetylene torch to bend it in place. Brownells also sells a fixture for this purpose as well as the needed heat sinks and heat shielding paste too.

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Last time, we separated our Mauser action from its old military barrel and finished polishing it to our satisfaction. If we are using Weaver-type scope mounts the rear receiver ring has been ground down and shaped to accept them. Let's proceed to the next steps on my list. First, we'll shape the bolt handle to accept a scope. The bolt handle on a Mauser goes straight up over the receiver when worked.

That's not a problem since these rifles were made for open sights, however, this must be corrected for a scoped hunting rifle. There are several ways this can be accomplished. If you are going to use anew bolt handle cut the old one off using a cutter attached to an air compressor, if you have one. If you don't a Dremel tool can serve, but it will take longer and burn up a few cutting wheels. The bolt and new handle are then held in a nifty little bolt-welding jig from Brownells to join them.

Use of heat shielding paste and a heat sink made specifically for this purpose is mandatory to make sure the original heat treatment of the bolt is not compromised. TIG (tungsten inert gas) welding is supposed to be a

little cooler than other types and irritating pits in the weld can also be lessened according to the skill of the operator. Much has been made about matching the filler rod to the bolt, but I've found that any rod you would use for most modern steels will work perfectly.

TIG is one kind of welding best left to professionals and decisions about what to use should be theirs. After welding, the bolt is shaped and polished to fit under a scope. Another method of shaping the bolt is to leave the military one in- From top to

The last approach I'll discuss is replacing the issue bolt with anew bolt body from Numrich Arms that has the handle already shaped. When purchasing this unit I also ordered anew magazine box and bottom metal that has a push-button release latch to drop the floor plate. These worked well except for having to tweak the release latch so the floor plate wouldn't drop open under recoil. Also, I had to mill out the rear action hole on the trigger guard just a smidgen to fit my particular action.

Sometimes it seems that no matter what part you buy for a gun that is supposed to be a "drop-in" fit you

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.35 Whelen rounds are shown for comparison. still have to grind a little here or file a little there. I guess that's why we are called gunsmiths and not parts assemblers. Lapping Bolt Lugs With the bolt handle taken care of, it's time to lap the bolt lugs. This means that the inside of the lugs must mate perfectly with the lug recess in the receiver. Since we are probably working with an action that has mismatched numbers on the bolt, chances of being able to skip this step are slim.

Twenty-five percent contact on each lug might have been considered good enough for whichever government's work that originally built the rifle. Mark each lug surface with machinist's dye and push the bolt into the action. While putting pressure on the bolt to

the rear against the recess, work the handle up and down a few times and check your results. The places where the dye is rubbed off are making contact. Like I said, don't expect to see 100 percent.

Even rifles with matching numbers will probably have no more than 25 percent on one side and maybe 50 percent on the other, if that. Many commercial bolt-action rifles I've checked have no better than this, so it would be foolish to expect better specs from rifles produced by the millions during the hurry-up of wartime. Once lug contact has been assessed we will improve it as needed. Coat the inside bolt lugs with abrasive grit and push them into the lug. This takes the place of thumb pressure.

The astute reader will note that a Mauser 96 action is shown, however, the principle is the same. raceway so it stays on the bolt. Work the bolt while maintaining steady pressure on it. Brownells has a great spring-loaded tool that makes this job a lot easier than holding the bolt steady with your thumb. It can be ordered with threaded sleeves to accommodate different actions including Enfields, Springfield, Remington 700, and model 70s as well as small and large-ring Mausers.

This tool works by holding the bolt against the inside of the raceway while the bolt is rapidly moved up and down to mate the two surfaces. A short throw only is needed for this process. Mov-

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All must be degreased and be in excellent working order. The military two-stage trigger should not be overlooked as an option for custom rifles. A little tweaking here and there can give an excellent trigger that some clients will appreciate. ing the bolt back and forth as far as it will go defeats the purpose by throwing off the grit. After about 50 throws add some more grit, then do 50 more. Check your progress by using machinist's dye to coat the lugs and see how much is wiped off when the bolt is sent home.

We are looking for almost 100 percent contact. There is a third lug on the Model 98 bolt at the rear. This is a safety feature to stop the bolt from flying out in case of a catastrophic failure. Trying to lap this bolt in is a futile project in most cases because you would grind the front lugs to a nubbin before getting good contact with the rear. If you do find you are getting contact it is just icing on the cake. In any case it's not necessary to worry about it.

I have seen 320 grit abrasive paste recommended by some to do this job. When you're getting towards the end I suppose it will give

a nice finish, but for the initial process I use valve-grinding compound commonly and cheaply found at any auto store. You're hand is going to Minor fitting is required to install this safety. Minor fitting is required to use this safety. get tired after the hundreds of bolt throws it takes to do this job right and it doesn't hurt to use a coarser grit to start.

Finish up with 320 if you want to. Also, if you don't have any machinist's dye just use a black felt-tip marking pen to check your progress. Works for me.

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A mirror finish is not necessary for smooth bolt operation. 220 grit paper is all that's needed. A mirror finish is not necessary for smooth bolt operation. Now we'll drill and tap for scope mounts: A jig made specifically for this purpose is mandatory. No "eyeballing" here unless you want your scope to be cocked off-center. Forster makes the Cadillac of these tools and it can be used for open sight installation as well.

An inexpensive jig from B-Square is available from Brownells and works very well for installing the two-piece Weaver and one-piece Leupold and Redfield mounts that most of us use. After setup it's a simple manner to drill the holes in the action that are needed. The jig comes with a drill guide that ensures

proper positioning. A #31 drill bit is used for the 6x48 mount screws that are supplied with the Weaver bases.

I use a Tru Tapper, also from B-Square, to absolutely line up the tap with the holes utilizing the rigidity of the drill press or mill. This is best accomplished by leaving the action in the jig and vise, chucking the Tru-Tapper, and lining up on a milling table. A tap guide is also supplied. B-Square's directions include holding the action by hand on a solid table while drilling. I guess you could do this if you had three hands, but I clamp the jig in a sturdy vise on a milling table and go from there.

Use the directions given and go slow. Don't force your taps or they will break. This is not a total disaster as some would have you be-

lieve, provided you have a broken tap remover on hand, but it is best not to. This is a small modification but one your customer will appreciate. Break it in the first place. Back off as needed and let the chips out. I allowed my fifteen-year-old grandson to do this job with my supervision for his education, so don't be intimidated.

Different drills and taps are needed for the 8x48 holes sometimes recommended for the big kickers, but for the .30-06 class of cartridges I have not had a bit of trouble using the smaller screws. I use carbide-tipped drills for these old actions. If the actions are hardened it is only on the surface and can usually be cut easily with the

BUILDING A CUSTOM MAUSER, PART TWO CONTINUED

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carbide drill. If you have something stubborn a carbide end mill can be used to “break” the surface and allow the drill to proceed. Some have recommended annealing the spots for the holes to soften them, however, since we are not going to re-heat treat this action I don’t think it is a good idea. By using heat paste and sinks and not grinding or otherwise overheating this action I don’t believe it is necessary to re-heat treat it as long as we are careful. Others may have different opinions.

If you want to get your action heat treated go to it. Bolt Release Lever This is a very important part of our rifle since the ejector is also housed here. I am assuming the lever snaps back into place when pulled open and there is no problem with the fixed ejector. Function of this part is critical and must be 100 percent. No shortcuts here. If it doesn’t work properly, that is the province of another article.

The serrations on top can be worn and rounded and need a little file work with a small triangular file to sharpen them slightly for better purchase. There are several ways to mount this lever on the action. I have even seen it modified to put the serrations on the bottom for cosmetic reasons. I personally like it on top, but each of you must do your own thing with your rifle. That’s what makes it yours and that is what this article is about.

I also like to take this little gem that sits prominently on the left side of the action for everyone to see and polish it with 320 grit before rebluing. Jewelling is another popular treatment for this part as well as on the bolt itself. Sometimes I think this may be a little fancy for the plain hunting rifles that I usually put together, but if you and your customer like it, fine. Triggers The trigger is one of the most important parts of any rifle.

For the gunsmith working the 98 Mauser there are a lot of options. Removing and installing anew trigger on this type of ac-

tion is easy. Drive out one pin and you’re there. No sense in wasting time talking about it. Triggers for this application are generally of two types Those that come with an integral safety that only blocks trigger movement and those that use a separate safety that mimics the original, locking the firing pin from falling as well as allowing clearance for the scope. Timney makes both kinds.

I will go as far as to recommend their triggers since they are easily adjustable for pull weight, creep and overtravel, plus they are probably the least expensive of the lot. There are others, such as Rifle Basics, Jewell and Fajan on the market and all will work well. It’s up to you to pick, but, for the money, Timney will not let you down. When buying a trigger without a safety, such as the Timney Sportsman, I use a Buehler-style two-position wing safety that is easy to install and does a credible job.

A small notch must be cut into the cocking piece to fit this safety. It works similarly to the original but fits well under a scope while still allowing complete access in the field. Other safeties such as the popular three-position side safety of Model 70 fame are available but must be fitted with special tools and a milling machine. This is not really a big deal for most gunsmiths, but this series of articles lean toward hand tools that even hobby gunsmiths have in their shop.

Whatever kind of trigger and safety you choose, after adjustment, the procedure of rapping the rifle on its recoil pad to see if the trigger breaks with the safety on and off and then pulling once on the trigger and releasing the safety to make sure the rifle won’t fire is mandatory. These triggers all have a recommended range of pull weights from the manufacturer and complete instructions on how they are to be adjusted. Trying to beat them with a lighter weight of pull is a fool’s game.

One option usually not mentioned is tuning the original trigger to suit. You probably won’t get a pull weight of less than five pounds or so, but you could be surprised as to what a good marksman can do with a crisp trigger in that range, especially since these rifles will not be lightweights. I personally like a twostage military trigger and think anyone can get used to the take-up easily. It may be safer in the field than a two pound break-like-glass number.

How to tune the military trigger is the subject of another article and I recommend considering it as I use them on some of my personal rifles. It’s all up to the ‘smith. Last Items The two last items on my list for working the action before barreling are polishing the bolt races and opening up the channel at the tang end to allow for more positive and smoother bolt operation. A heavy, well-made tool for race polishing is available from Brownells.

Although it’s nice to have, one could just as easily make a polishing block. The idea is not to shine the races to a mirror finish but to just smooth any irregularities or bumps in the raceway, which is all that’s needed. I usually use 220grit abrasive paper to knock off any rough spots. Shaping a small “Y” where the bolt cocking piece comes into the tang area is also one of those “a little bit will do ya”-type of operations.

A channel as big as the mouth of the Mississippi where it flows into the Gulf is not necessary. All we want is a little extra clearance. Follow the original lines and use a cutting wheel on an end mill or Dremel tool to clean it up. This could help a great deal if a fast extra shot is needed and is a nice professional touch your customer will appreciate. Next time we will rebarrel our rifle and set it in anew stock. AG

HISTORY

Gunsmithing Books

Gunsmithing and The Encyclopedia of Modern Firearms.

BY STEVEN R. KERN APRIL 2011

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The classic texts for the gunsmith were written in an age when today's plethora of aftermarket options didn't exist and still serve as a foundation to gun work today. Modern Gunsmithing Introduction To Modern Gunsmithing, written by Harold E. Mac Farland, came along much later than other classics, which were all published around World War Two. The original copyright was 1964 but by 1971 the book was already in its fourth printing.

I'm guessing by the time this book came out most of the earlier classics were hard to find and likely out of print, although Roy Dunlop's book had developed a life of its own. Since some of the earlier books were most likely not available, Introduction To Modern Gunsmithing recovers some old ground to include initial chapters on methods and tools as well as fabrication of tools and gun parts. There are also nearly twenty pages on the selection and working with different steels.

All of this material had already been covered in the books of others. Military actions were so common and cheap at the time of publication, even in the dollars of day, there are three chapters on reworking surplus guns including topics such as action selection, with over twenty different choices from Mausers to Rolling Blocks, methods of improving actions and fabricating new stocks.

Gunsmiths working on commercial firearms will find chapters on Diagnosing and Elimination of Malfunctions, Shotgun

Work, Trigger Work, and Handgun Work of very special interest as these issues are dealt with both by firearm type and specific model. Along the way on all of the above subjects, the author discusses such popular firearms as the Remington Model 740, the Winchester Model 94, Colt Model 1911, Savage Model 99, Winchester Model 100 and Winchester Model 70.

Gunsmiths will find information on these guns worth the cost of this book. There are also solid tips on achieving more accuracy with many of the more popular arms. The real lifesaver for many will be basic disassembly instruction for over 100 different firearms! Puzzled on how to deal with obsolete European semi-automatics?

Chapter 14 has info on three different Astro models, four different Bayard models, Browning Pocket Pistols Models 1910 and 1922, three different Czech handguns and seven different Walter models, including the PP, PPK, and P-38. There is also information on most of the High Standard semi-autos, including pre-WWII models. The chapter concludes with details on all of the Winchester lever action rifles produced to the time of publication.

Introduction To Modern Gunsmithing concludes with typical reference information in a final chapter found in many books of this type. What will interest anyone comparing bullet performance is a formula for producing your own gelatin blocks. This is the same formula used by the ammunition factories to compare bullet expansion and penetration. Encyclopedia of Firearms F.

R. "Bob" Brownell, founder of Brownells, was the editor of The Encyclopedia of Modern Firearms, which contained the current military and firearm manufacturer manuals of the day. All of the large domestic firearm manufacturers are listed here with detailed information typically far beyond anything shared with the public. In the development of this book, Brownell was assisted by Walter J. Howe, Editor of American Rifleman, as well as Rifleman staffers Julian Hatcher, E. H. Harrison, and M. D. Waite.

Both domestic manufacturers and foreign companies are included, as well as military manuals at the ordinance depot level with completely detailed stripping and disassembly instructions, not merely the simple field stripping instruction given to the soldier in the field. Also included are what the military called "special tools" with illustrations and instruction for items such as front sight staking tools for the Colt Model 1911.

The information Brownell assembled is some of the best information available from the factory on the guns of the day. Since 1959 when The Encyclopedia of Modern Firearms was first printed, times have changed and many of the factories have stopped passing this information along to commercial gunsmiths. As a result, this book is forever in a time warp and isn't updated. My hard copy version notes the Seventeenth printing took place Octo-



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ber 1975. Fortunately, the firearms therein are still around and many of the models were produced in such huge amounts, such as Winchester's Model 12 and Model 94, it is guaranteed they will be around. The military technical manuals included in this tome include the following separate areas: Shotguns, Springfield Rifle, and Colt Semi-Automatic Pistol.

At the time of the first printing as well as several of the additional printings, the M1 Garand was still the current service rifle and not available as surplus, so it did not receive coverage. The included Shotgun manual was published by the military as TM 9-285 and dated September 21, 1942. It covered the following shotguns: Winchester Model 97 and Model 12; Stevens Model 620A, M620, and M-520; Ithaca Model 37; Remington Model M10, M31, M11 and Sportsman; and the Savage M720.

In the case of all of the proceeding, the shotguns discussed were 12 gage, even though most of them were at least commercially available in smaller gages. The illustrations as well as the descriptions are particularly outstanding and likely cost the government far more than might be commercially justifiably for the factories to

produce in service manuals. One estimate of the taxpayer cost was \$250,000! The next military manual included is TM- 9-2170, Ordinance Maintenance, U. S.

Rifles, Cal. .30, M1903, M1903A1, M1903A3, and M1903A4. In other words, what everyone in the 20th Century called the Springfield Rifle, which was used as the base for the first commercial modification projects, or sporterization. This practice was popular for many decades but has since faded, especially for the Springfield. Instead, special nostalgic matches have become popular at Camp Perry championships as well as at local club contests.

The Colt .45 Automatic Pistol is covered by TM 9-1295, Ordinance Maintenance, M1911 and M1911A1, dated 8 September, 1947. As an interesting historical note, the two previous TM's were both signed by Chief of Staff George C. Marshall. The TM dated 1947 was signed by Chief of Staff Dwight D. Eisenhower. Although some of the techniques used in TM-1295 would not be the most popular techniques today, the information provides accurate information into how the pistol was worked on in the World War Two era.

The final military manual covered here is numbered TM-9-2117, dated 15 July, 1957 covering Winchester and Stevens Riot-Type shotguns. For those interested in military surplus firearms, there is information in this TM on five different arsenal rebuild locations, one ordinance rebuild depot and an armory used for rebuilding work. All weapons rebuilt in the United States were to be stamped with either a two letter or a three letter code for the establishment location.

However, rebuilds by overseas maintenance shops were not to be stamped. Also, if the firearm was rebuilt at another location, the new rebuild identification was to be placed below the previous identification. If the firearm had been previously been rebuilt at the same location, it was not necessary to add a duplicate mark.

Some of the information on commercial firearms can be found in other publications, such as the parts lists and diagrams in the Numrich Gun Parts Corporation catalog published annually, as well as a few instances of factory information as made available from the original manuals before manufacturers stopped providing such information. The best examples of earlier manufacturer-supplied information are the Winchester and Remington factory manuals. They both provide a lot of information but use very separate methods.

The last Remington manual was in a very large three-ring binder with information separated by tabs for the various model numbers. The Winchester information was printed from sketches and drawings by Winchester employee A. A. Arnold. Separate soft cover manuals were provided for the following models: Model 12 Shotgun, Model 50 Shotgun, Model 70 Rifle, Model 77 Rifle, Model 88 Rifle, Model 94 and others.

Those who are not quite satisfied with the information supplied by Brownells may find copies of the original Winchester material very useful as the Encyclopedia edited and reduced the original factory material. However, I would suggest either inspection or return privileges as some of the copied material has faded and is not as clear as the factory original material. Other Winchester firearms not included in the special manuals is covered with factory schematics and catalog information.

In addition to providing part, assembly/disassembly, and repair information, the data in The Encyclopedia on specifications for pins, screws and helical springs on the listed firearms will likely justify adding this volume to any gunsmith's library. Brownells still provides this book today and it can be ordered from the book section of their catalog. Prospective purchasers have a choice of a hardbound copy or loose leaf to be enclosed in a three-ring binder, which is my choice.

As an added bonus, specific information can be copied and even enlarged for use at the bench, preserving the condition of the original material. AG

ORIGINAL SOURCE PAGE

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MAINTENANCE & REPAIR

Squad Designated Marksman Rifles

How the Army Marksmanship Unit builds DMR rifles.

BY JOHN M. BUOL JR. APRIL 2011

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The AMU's Designated Marksman Rifle is yet another example of competition shooting's positive influence. The Custom Firearm Shop Service Rifle gunsmiths have built and continue to service over 375 Squad Designated Marksman rifles based on their experience of building and maintaining over 200 M16 uppers and lowers for competition use. Service Rifle Teams firing M16A2/A4 rifles with free float tubes have dominated National and Interservice championships and broke all records held by the M14/M1A.

What started as an experiment to create AR-15s capable of winning at Camp Perry has found its way into the hands of designated marksmen in Iraq and Afghanistan. The AMU uses these rifles to train Designated Marksmen at Fort Benning and abroad. The 101st and 82nd has fielded them in combat with exemplary results. Here's how they are put together.

The DMR is a standard M16A4 fitted with a stainless steel matchquality barrel, clamp-on front sight A-Frame, free-floating M1913-railed hand guard, bipod with quick release adapter and two-stage trigger. All

the modifications can be applied or reversed in about 30 minutes by direct support 45Bs with proper training. The total current cost for these modifications is \$1,200. Issue M16A4 barrels are turned to a small diameter under the hand guards to reduce weight and for M203 mounting.

This small diameter allows the barrel to whip during rapid-fire engagements causing shot dispersion. Additionally the front sling The modifications are made to standard M16A4 rifles and can be applied in thirty minutes by trained direct support personnel (MOS 45B trained by the AMU CFS.) The total cost for these additions is \$1,200. swivel is attached to the barrel via the front sight base and any tension on the sling during firing causes changes of impact.

The match replacement barrels are 0.840" diameter profile, twenty-inch long stainless steel barrels. The portion of the barrel that is visible is dimensionally the same as an issue barrel. The muzzle is threaded 0.5"/28-TPI to accept standard attachments. The replacement barrel is assem-

bled with a clamp-on front sight A-Frame and proof fired using a M197 Proof Cartridge as prescribed for all M16 barrels.

Further, all DMR upper receivers are function fired for reliability and accuracy using A059 Ball and AA53 ammunition. The issue hand guards are replaced with a float tube, removing all external pressures from the barrel. The replacement hand guard manufactured by Daniel Defense is made of aircraft grade SAE 6061T6 aluminum and has external M1913 rails on all four sides, like issue RAS hand guards, but will not begin to rotate or twist after field use.

The issue barrel is removed and anew barrel is inserted into the upper receiver with the barrel nut and hand guard nut behind it next to the receiver, tightened 30 foot-pounds using a combination tool and torque wrench and re-torqued a total of three times. On the final tightening, alignment of the gas tube hole is checked in the barrel nut with gas tube hole in the upper receiver. If it is aligned no further tightening is required.

If the gas tube hole in the barrel nut is not aligned with the hole in the upper receiver

SQUAD DESIGNATED MARKSMAN RIFLES CONTINUED

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Notable examples for just the M16 developed by the CFS include improved A2 rear sights, free float hand guards/rails, and magazine-length 77 grain projectiles (Mk 262). the barrel nut is tightened to align the holes, not to exceed 80 foot-pounds. Two aligning pins are inserted into the holes in the barrel nut at 3 o'clock and 9 o'clock as viewed from the muzzle. The hand guard threaded end is slid over the barrel and onto the alignment pins.

The hand guard nut is slowly engaged onto the hand guard while gently wiggling the front up and down to facilitate tightening the nut. Once the hand guard nut is hand tight, it is clamped in a padded vise and snugged up with a spanner wrench. The gas tube is in-

stalled into the clamp-on front sight base using anew spring pin. The front sight base and assembled gas tube is slid onto the barrel, rotating the assembly to align the gas tube with the hole in the barrel nut.

There should be a 0.025-0.030inch gap between the front sight base and the shoulder on the barrel when it is properly fitted. Once in the proper position the hex screws are tightened to 30 inch-pounds while rotating the base to align the front sight as near horizontal as possible to eliminate large windage adjustments when zeroing the rifle. The compensator with the concave compression washer is installed with the small diameter towards the barrel.

The center slot of the compensator should come up to 10 o'clock when tightened by hand and then tightened to 12 o'clock with a combination tool and torque wrench. Installing the compensator from further away from 12 o'clock will result in bore constriction which is detrimental to accuracy. The M16A2/A4 trigger system is replaced with a two-stage Geissele Automatics match trigger. The issue safety/ selector is retained and functions as issued, but the burst capability has been eliminated.

A HARRIS HBLMS BIPOD IS FITTED WITH A LA RUE THROW LEVER MOUNT. AG

FINISHING

Reader Forum

BY AMERICAN GUNSMITH EDITORS APRIL 2011

ORIGINAL PP. 23-24

Gun Values I need some information on a Sauer & Sohn Model 38 pistol chambered in .32 ACP. The hammer is enclosed and has a decocker. The frame is stamped CHL 7.65 along with a small Nazi eagle over a number 37. On the other side of the frame is stamped with a small Nazi eagle over the letter N. The gun has good 100% blueing, and is in excellent shape. Could you give me approximate gun value? Marietta, GA Sorry, we don't provide gun values.

Best you check The Blue Book of Gun Values or write to the NRA National Firearms Museum, Fairfax, VA 22030, nramuseum.org. If they can't provide an answer ask them to direct you to a professional estimator. The latter will be able to offer a complete analysis but normally charge for their services. Hi-Standard Wood Grips Where can I get Hi-Standard Sport King checkered wood grips? Here's the catch. I'm looking for a set that does not have a thumb rest.

Frank Borgeson Scottsdale, AZ For your Hi-Standard grip panels, prepare to enter the aftermarket. Try G. W. Elliott, Inc. in East Hartford, CT at or Tom Forrest in Lakeside, CA at If that effort strikes out you may be obliged to reach out to a custom grip-making source. A-5 Ejector Replacement I need to change out the ejectors on two Browning Auto-5 shotguns. I ordered the AGI course on the Auto- 5 but it had no information on this procedure. Do I need to drill out the old ejectors or punch them out?

Also, will i need some kind of fixture to keep from damaging the new ejectors while peening the new rivets? Dave Ed Cockrell Ed's Gun Before beginning any change or change-out on an Auto-5 you would be very wise to have replacement parts on hand. Good luck there! Ejectors have historically been among the parts on the Auto-5 unavailable to anyone other than factory service personnel or their counterparts at authorized Service Centers.

Translation: Though Browning still services the Auto-5 shotgun at its Arnold, MO, facility you couldn't purchase an ejector. As for the actual work required, you may be as mildly surprised as us to find out the one repair/replacement item unmentioned in an Auto-5 Jerry

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READER FORUM CONTINUED

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Field Service Manual is ejectors. This could partially be due to the existence of more than a single type of ejector and more than a single means of attaching it to the Auto-5 barrel extension. We, therefore, feel safe in assuming any how to knowledge was/is acquired hands-on by newcomers to the Browning service department or service center under in-person supervision provided by veteran personnel. Nor do we doubt the use of a unique, factory fixtures to avoid the damage you rightfully fear.

Remington Model 512 This time last year a friend of mine decided to hand over a Remington Model 512 .22 as he stated he has no use for it. I looked it over and found it to be in good shape. I used the rifle on my ranch, shooting about 1500 rounds without incident and then put it in storage having cleaned only the barrel. After a few months I decided to strip it down for a cleaning job. To my surprise I found the sear attached to the trigger was totally worn as was the rest of the action.

The carrier was in very bad shape as the sear appeared to have rubbed against it. I was amazed that I was able to shoot a single round let alone over 1500! I tried to locate new parts or a replacement trigger assembly without success. Is it possible that there is another assembly that would fit in this rifle? If so, what make and in what catalog? All parts in this rifle are worn too much to bother with restoration nor do I wish to take the time.

Wally You may not want to repair the worn parts but replacement of them on a rifle shooting as well as your 512X sounds to us like the thing to do. We've found out that the Remington part number (27) for the 511 rifle is the same as for the 512. That may be of some help in rounding up replacements from the usual suspects in the aftermarket (Numrich Gun Parts Corporation, Jack First Gunshop, etc.) On Remington's website they publish a list of gunsmiths who still support the servicing of these obsolete guns.

We believe Nu Line Guns to be among them. Savage Model 1917 I am looking for a sear for a Savage Model 1917 chambered in .32 caliber. I have check with Numric, Jack First, and in some of my old America Gunsmith issues. I found a phone number for Savage parts but it has been disconnected. Do you have any other sources that might have a sear for this gun? Gary As we very recently were informed, Steve Simon, owner of The Small Arms Shop you called, no longer sells parts for obsolete Savage guns.

He still services them, however. Phone him at after 5:30PM. If Steve can't help, call Savage to see if they can provide another resource. If that action does not resolve your need, call Brownells and ask for a free copy of their Parts Source List for out-of-production firearms. Then exercise your fingers as they will likely be required to do a lot of walking. Stoeger Shotguns I am researching Stoeger Double Shotguns.

What is available in the way of diagrams for the Condor and Condor Outback Over/Under models and the Outback Side/Side Coach Gun? I'm specifically interested in the Details of the Inertia system for cocking the second trigger for the top barrel to fire and the safety to prevent the top from firing when the bottom barrel is fired first. Has American Gunsmith published any articles on these shotguns?

Ronald Unfortunately, Stoeger has fallen beneath the protective wing of Beretta and the Manager of Beretta has determined not to work with us. So much for the details you request. His decision was made despite past articles on Beretta firearms that have appeared here after the technical information they contained had been reviewed and approved by the factory. The curtain came down after Stoeger was acquired and absorbed so no Stoeger articles were possible. None have appeared nor were written to appear here. AG

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