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INSIDE THE ARCHIVE

FINICKY-FEEDING KRAG SPORTERS

MILITARY HARDWARE BOOKS • ADJUSTING FIXED REVOLVER SIGHTS • PRECISION BEDDING FOR WINCHESTER MODEL ...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 179

DIGITAL ARCHIVE EDITION

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HISTORY

Military Hardware Books

BY AMERICAN GUNSMITH EDITORS NOVEMBER 2018

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While it's unlikely you'll see serious military hardware in your shop, a study of their history showcases the development of small arms. Here are some recent titles from Osprey Publishing (OspreyPublishing.com, contact information omitted in this digital edition). FN MAG Since the 1950s, the 7.62mm FN MAG from Fabrique Nationale d'Herstal has been a dominant general-purpose machine gun.

Several nations have license-produced the weapon as their standard GPMG, including the British (L7 series), Americans (M240 series), along with more than 80 nations. It has been modified extensively for vehicular, naval, and aircraft platforms and used in the jungles of South East Asia, deserts of the Middle East, and icy battlefields of the Falklands, this book explores the origins, development, combat use, and legacy of the FN MAG machine gun and its more than half-century history.

Featuring specially commissioned artwork, firsthand accounts and photographs, The FN MAG Machine Gun: M240, L7, and Other Variants by Chris Mc Nab charts the technical evolution of this extraordinary weapon. The Anti-Tank Rifle The emergence of the tank in World War I led to the development of the first infantry weapons to defend against armored fighting vehicles, notably the German Tankgewehr.

Anti-tank rifles armed Polish, German, Finnish, British, and other troops fighting in the early campaigns of World War II, which saw the debut of the Boys Anti-tank Rifle—later also fielded by the US Marine Corps in the Pacific.

The 1940 battles made it clear that the day of the anti-tank rifle was ending due to the increasing thickness of tank armor, leading to the development of anti-tank rocket launchers utilizing shaped-charge ammunition, such as the man-portable recoilless anti-tank rocket launchers (called a “Bazooka” or “Stovepipe” by U. S. Troops) and the German Panzerfaust and Panzerschreck.

Nevertheless, anti-tank rifles—notably the PTRS and the PTRD—continued to equip Soviet forces on the Eastern Front through to 1945 and saw service in the Korean War and later. Fully illustrated and drawing upon a range of sources, this is the absorbing story of the anti-tank rifle, the infantryman's anti-armor weapon during the world wars.

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FROM THE ARCHIVE

Finicky-Feeding Krag Sporters

Someone else may have done all the hard work, but Krag-Jørgensen rifle modifications often require tweaking. Sporterized Krags remain ubiquitous and one is bound to land on your bench at some point.

BY BRIAN R. SMITH NOVEMBER 2018

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Top: Example of one of the many variants of the Norwegian Krag-Jørgensen rifle in as-issued form. Center: A sporterized U.S. Krag in the author's collection with shortened original barrel featuring an M1903 front sight band and a Lyman Cocking Piece rear peep sight. The higher comb and pistol grip were grafted on apparently using wood from the cut off forend. Above: Another example of a finely-executed example of a sporterized U.S. Krag. This one is stocked to the muzzle Mannlicher-style and has a Redfield receiver sight to compliment the soldered-on commercial ramp front sight. Bluing is deep, dark, and high-gloss.

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Professionally-executed Krag-Jørgensen sporters command surprisingly high prices at gun shows and at auction, especially those with some kind of famous gunsmith or owner provenance. I am a confessed quality Krag sporter “junkie.” I’ve seen some outstanding works of gunsmith art and consider myself fortunate to own several. Many use the original barrel, perhaps shortened. Others retain reworked government issue stocks, featuring high combs fashioned from the excised forend and skillfully mortised into the stock.

Some of these high-level Krags also exhibit pistol grips similarly crafted and mortised, with woodgrain painstakingly aligned with that of the rest of the stock. Krag rifles have been reworked skillfully into hunting rifles and target guns and fine examples of gunsmithing craftsmanship are coming onto the market in search of new “caretakers” as the estates of deceased original owners are sold.

It took a foreign design to bring the United States Army out of the single-shot era and into the age of the repeating military rifle. The U. S. was playing catch-up in any event; many other countries had already adopted repeaters. Germany and Spain had various versions of the Mauser, the Austro-Hungarian Empire employed the home-grown clip-fed Mannlicher, and France used the 8mm Lebel.

New to Russia was the M91 Mosin-Nagant and Great Britain had adopted the Lee-Enfield, the magazine and feed system of which were designed by an American, James Paris Lee.

The higher comb and pistol grip were grafted on apparently using wood from the cut off forend. S. Krag. This one is stocked to the muzzle Mannlicher-style and has a Redfield receiver sight to compliment the soldered-on commercial ramp front sight. Bluing is deep, dark, and high-gloss. The Americans entered the final decade of the 19th century armed

with the most recent iteration of the single-shot 1873 Springfield Trapdoor in .45-70. The United States didn’t always enjoy a leadership position in weapons technology.

The 1890s saw the U. S. Ordnance Department at cross purposes, torn between an interest in adopting a magazine-fed repeating rifle firing a flatter-shooting high-velocity cartridge at odds with old-school doctrine which held that repeaters wasted ammunition and that single-shot rifles were more cost effective.

Although Ordnance evaluated nearly all the contemporary arms available, for various reasons it kept coming back to the Krag-Jørgensen bolt-action rifle which appealed the more frugal of the American generals because it could be fired singly by hand-loading a cartridge either directly into the receiver, singly from a full magazine using the magazine cutoff, or if urgent matters

FINICKY-FEEDING KRAG SPORTERS CONTINUED

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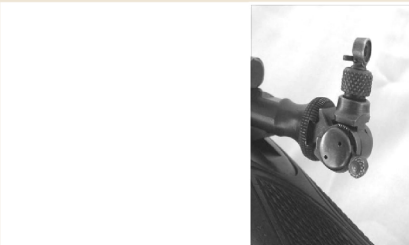
Top: This Krag sporter was done by the famous north central Pennsylvania gunsmithing firm of Taylor and Robbins and set up for target shooting with a Lyman 17A front sight and a complimentary receiver sight. A pistol grip was flawlessly mortised into the wrist of the military stock. Above: An example of a "faux" Philippine Constabulary Krag, which someone created by shortening the barrel and the stock forend, mounting an M1903 front sight, and refitting the front band.

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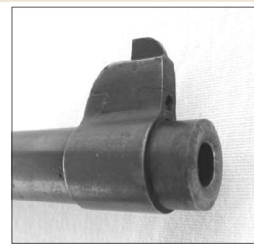
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Below left: The ubiquitous M1903 Springfield front sight assembly. If you find one of these on a Krag, it's a sure bet to be a sporter. The ID of the front sight band was just about perfect to solder on a Krag barrel at a length from 22" to 26". Below right: A Lyman #2 Cocking Piece bolt peep aperture sight dovetailed into a Krag cocking piece with the internal small aperture rotated down and visible to the front of the sight ring. This makes an iron sight setup that is very friendly to 50+ year old eyes, as the author can attest.

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A spring-loaded door (magazine gate) on the right side of the receiver was opened, automatically withdrawing a spring-loaded cartridge follower arm.

Loose cartridges were placed singly in the magazine and closing the magazine gate caused the follower arm to extend, pushing the cartridges to the left against a concave sideplate and upward against the closed bolt body if the cartridge cutoff was set to "off." If the cutoff was set "on" the cartridges were stopped a fraction of an inch away from the bolt so that the boltface rim could not engage the cartridge case.

The ease of loading single cartridges was both a blessing and a curse because the Krag had no provision for fast "packet" loading from a clip. Some ideas were tried, most notably the Parkhurst system which employed a

modified loading gate and modified rear magazine wall that accepted a Mauser-style clip from which five cartridges could be stripped into the magazine with the push of a thumb. The Krag-Jørgensen was adopted by the United States in the form of the rifle known as the U. S.

Rifle, Springfield Model of 1892. Improve- If you find one of these on a Krag, it's a sure bet to be a sporter. The ID of the front sight band was just about perfect to solder on a Krag barrel at a length from 22" to 26". This makes an iron sight setup that is very friendly to 50+ year old eyes, as the author can attest. ments and simplifications were made in rifle and carbine forms in models of 1896, 1898, and 1899. The cartridge was designated the .30 U. S. or .30 Army, but popularly known as the .30-40 Krag.

The cartridge, very similar to the .303 British round, was noteworthy not only for being the first .30 caliber cartridge adopted by the U. S. Army, but also because it was the first U. S. military cartridge designed from the outset to employ smokeless powder. The Krag was truly a transitional arm in every sense of the word. In addition to ushering the U. S.

Army into the era of magazine-fed repeating shoulder arms and high-velocity smokeless cartridges, it was standard issue for only a decade; about the same short duration of official service as the M14 that followed 60 years later. Replaced by the M1903 Springfield, Krag rifles and carbines found their way to National Guard and other reserve units, with some Krag rifles remaining in service by VFW and American Legion burial details for rifle salutes during vet-

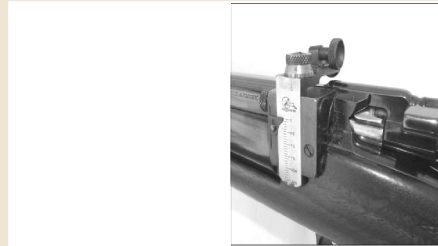
FINICKY-FEEDING KRAG SPORTERS CONTINUED

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Left: Redfield receiver sight fitted to a U.S. Krag sporter. Receiver sights were popular additions to sporterized military bolt actions because they were less expensive than a scope and lengthened the iron sight radius which helped a shooter improve shot placement. Above: Commercially-barreled Norwegian Krag sporter in 6.5x55 with its 2.5X Redfield Bear Cub scope attached with a Weaver side mount. The banded front ramp can be used in conjunction with an optional Williams WRGS rear sight for which the barrel is tapped.

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Below left: Right side bird's-eye close up of the Norwegian Krag sporter showing the beautifully executed jewelry on the bolt and bolt handle shaft, and the high polished blueing on the rest of the metal bits. Below right: Left side view of the action, Weaver mount and Redfield scope. The high gloss, ultra smooth hand rubbed stock finish is evident.

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S. Krag sporter. Receiver sights were popular additions to sporterized military bolt actions because they were less expensive than a scope and lengthened the iron sight radius which helped a shooter improve shot placement. 5x55 with its 2.5X Redfield Bear Cub scope attached with a Weaver side mount. The banded front ramp can be used in conjunction with an optional Williams WRGS rear sight for which the barrel is tapped. eran funeral services just 10 to 15 years ago.

Many Krag rifles were sold as surplus through the National Rifle Association and directly by the government ostensibly for the promotion of rifle practice via the National Board for the Promotion of Rifle Practice and Department of Civilian Marksmanship (since replaced by the Corporation for the Promotion of Rifle Practice and Firearms Safety, Inc. that governs the Civilian Marksmanship Program) for training, prac-

tice, and competition via Service Rifle matches but many The high gloss, ultra smooth hand rubbed stock finish is evident.

Krags so disposed were purchased for a dollar or two with intentions for hunting use and altered to remove excess weight. Gone were upper handguards and upper bands with their bayonet mounts. Saws were taken to stock forends and followed by wood rasps and sandpaper. Carbine stocks saw sling swivels installed because they were not so equipped as-issued.

Barrel shortening was made easy and inexpensive because the Krag rifle barrel diameter at roughly the 24" length was essentially the same ID dimension as the M1903 Springfield front sight base. If a sporterized Krag doesn't wear a screwedor soldered-on ramp style front sight base, it is likely wearing a "band-type" M1903 front sight base with a mere stub of a blade insert to allow for proper sighting with the trajectory of the .30-40 cartridge.

Shortening Krag barrels also did away with damaged crowns and worn muzzle rifling that resulted from cleaning from the muzzle with rods or pull-throughs. Lopping off six inches of rifle barrel yielded a 24" tube most often with relatively sharp rifling with which to crown a muzzle. Many sporters I have examined were left cut square at the new muzzle and not even crowned.

Professionally crowned or not, the result was that most shortened Krag rifles did exhibit improved accuracy after cutting as compared to that of their respective muzzle-worn, full-length configuration. Nearly two decades into the 21st century and more than 135 years since the adoption of the Krag rifle and carbine, sporterized Krag rifles can usually be found at just about any gun show and on the various online gun listings and auctions.

Some brick-and-mortar gun shops will accept Krag sporters on trade but many do not for fear of liability issues that

FINICKY-FEEDING KRAG SPORTERS CONTINUED

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Above left: Close up of Norwegian Krag sporter action and loading gate open, showing the follower just peeking out from behind the top of the magazine gate. Above center: Norwegian Krag sporter's cut-off lever marked "S" in the up position. Above right: Single bolt lug "in the white" is visible here just in front of the receiver scallop.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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Below left: The Norwegian's robust band-type front ramp evokes a bygone era in American gunsmithing and style. Below right: Bolt shown open and withdrawn to the rear.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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Above center: Norwegian Krag sporter's cut-off lever marked "S" in the up position. may arise from a combination of misuse, late 19th century metallurgy, and manufacturing process variation that was extant around 1900. Recall that Krag's were produced in the decade before the introduction of the M1903 Springfield, whose receiver heat treat issue and resolution followed years later. People shy away from sporterized Krag's because its single lug bolt has a known tendency to crack at the root.

The Krag bolt was manufactured at a time when metallurgy and heat treating were more art than science, instrumentation was primitive, and process control was often guesswork at best. While the Krag bolt was plenty strong enough for the original versions of the 6.5x55 and .30 U. S. Army, American hand-loaders being who they are tended to push the .30-40 cartridge to its limits.

While the Krag cartridge and even the barreled action may be able to withstand the increased pressures, the single lug could only put up with so many hotter rounds before cracking. Proven crack detection systems include dye penetration or magnetic particle inspection, however, barring those capabilities in your shop, examine the root area where the rear of the lug meets the bolt body using magnification. You can also try application of copious oil to the bolt and lug and wipe it off.

After propping up the bolt vertically with the head upward, periodically examine the bolt body for oil running down the bolt from the area of the rear of the lug. If a crack is present, oil that had wicked into the crack will run back out over the next day or two. Disassembly Regarding Krag disassembly, first open the bolt, withdrawing it completely to the rear, checking clear.

Holding the bolt handle in place with one hand, use the other to lift up the front of the extractor, the long thin metal strap on top of

the bolt that serves as a guide rib. One-eighth of an inch should be sufficient. Turn the bolt handle slightly counterclockwise as viewed from the rear. The extractor "cams" out of its slot in the receiver and the bolt locking lug can be aligned with the slot in the receiver and the bolt removed to the rear.

With the bolt in the hand, pull back on the cocking piece while turning the bolt sleeve assembly counterclockwise as viewed from the rear. Continue rotating counterclockwise until the front of the bolt sleeve clears the curved boss at the inner end of the bolt handle. Control the mainspring force by bracing a thumb against the back of the safety lever while turning the sleeve assembly.

Once the sleeve has cleared the rear of the bolt body, remove the bolt sleeve and firing pin/striker assembly from the rear of the bolt.

FINICKY-FEEDING KRAG SPORTERS CONTINUED

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Above left: The result of lifting the extractor about 1/8" to 1/4" and rotating the bolt handle more counterclockwise. The extractor bar readily "cams" out of the slot in the receiver, allowing the bolt lug to align with the receiver slot so that the bolt can be withdrawn from the receiver. Above right: Bolt shown fully rotated counterclockwise and ready to be pulled straight back and out of the receiver.

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Below left: The bolt sleeve is rotated counterclockwise so that it clears the bolt handle root as shown. Sleeve and firing pin/striker assembly can be then withdrawn from the bolt to the rear. Below right: With the striker in the position as shown, control the mainspring with one hand and push the striker tip away from you so that the striker can then be slid off the end of the firing pin. Release the mainspring in a controlled manner to avoid a "launch."

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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The extractor bar readily "cams" out of the slot in the receiver, allowing the bolt lug to align with the receiver slot so that the bolt can be withdrawn from the receiver. Bracing the cocking piece on the bench, grip the mainspring firmly and pull back slightly to reduce force on the striker, then pivot the striker off the circular head of the firing pin assembly. The striker is removed toward the front while keeping the mainspring under control.

Release the restraining force from the mainspring once the striker is removed. Withdraw the firing pin assembly from the rear of the bolt sleeve. Select a properly-sized hollow-ground screwdriver to remove the screw in the front band, then slide the front band over the front sight and muzzle. Remove the screw from the rear band, push the pin out of the band, then slide the band forward off the stock and over the end. Sleeve and firing pin/striker assembly can be then withdrawn from the bolt to the rear.

Release the mainspring in a controlled manner to avoid a "launch" of the barrel. Remove the handguard by carefully prying

up; it is held in place by riveted spring clips that clasp the barrel. Depending on the model of rear sight, you may need to swing the rear sight leaf vertical. Rotate the handguard rear sight slide. Remove the front and rear trigger guard screws and the trigger guard. Separate the stock from the barrel.

The rear sight can be unscrewed from the barrel if desired; depending on the model of rear sight, the two screws may be different, so pay attention to which screw comes from which location in the rear sight. Remove the butt plate screws and set aside the butt plate. Close the magazine gate and use a screwdriver to lift the flat blade of the magazine hinge bar spring up until it's out of its seat. Hold the magazine gate closed and use your hand to gently tap the magazine hinge bar forward and out.

Separate the loading gate from the receiver and remove the springsteel magazine spring. Pivot the carrier and follower outward, then remove the carrier. Push the pin out of the carrier and separate it from the follower. Remove the side plate screw and the side plate itself. Note that Norwegian and Danish

Krag side plates are retained by the magazine cutoff spindle. Using a small slotted screwdriver, compress the cutoff plunger (or arm on Norwegian Krags) and wiggle the cutoff out of the receiver.

Push the trigger/sear assembly forward and down, then wiggle the sear, pushing from right to left until its round bearing clears the receiver. Control the trigger return spring to prevent its launch. Out the cartridge ejector pin, at which point the ejector can be removed from the receiver. Bores of individual examples that exhibit excessive wear or corrosion are another cause for concern.

Some Krag rifles I've closely examined will swallow a CMP Muzzle Wear gauge up to the shoulder, and the gauge itself fits the bore like a broomstick in a bathtub. Hard to hit the proverbial barn wall from the inside of the barn with what amounts to little more than a smoothbore. Other bores with rifling present but dark in appearance have been

FINICKY-FEEDING KRAG SPORTERS CONTINUED

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Above left: The Krag trigger/sear assembly is removed to the left by pulling down on the trigger so that the sear clears the receiver, then applying force to the sear with the index finger while wiggling the sear pivot out of its recess in the receiver. It is suggested to place a cloth over the receiver to trap the trigger return spring. Of course, you can use two hands if you don't need to hold a camera!

Above right: Trigger/sear/trigger return spring assembly shown removed from Norwegian Krag action.

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It is suggested to place a cloth over the receiver to trap the trigger return spring. Of course, you can use two hands if you don't need to hold a camera! found either to be decent shooters or they pattern like a scattergun. Although not a guarantee that the rifle to which is has been fitted will be accurate, there's nothing like a bright, shiny bore with sharp lands and an undamaged crown to begin with. All that said, there are Krag sporters and there are Krag sporters.

When collecting them, I generally ignore the crudely-modified barn workbench hack jobs and concentrate only on the sort of well-executed "custom" converted Krag sporter produced from the 1930s to the 1960s, many of which exhibit true American craftsmanship of a bygone time. It is not uncommon for many Krag sporters to use the original barrel, usually shortened to between 20 and 24 inches.

As mentioned previously, the barreled actions usually reside in either reworked GI stocks or high-quality commercial stocks from "back in the day." Some Krag sporters reuse the issue military rear sight, others may have a Redfield or Lyman receiver sight installed, and still others may see a "bolt peep" such as the Lyman #2 Cocking Piece rear peep sight dovetailed into the cocking piece head.

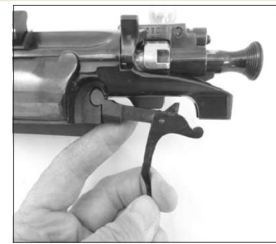
Of course, many Krag sporters were converted from military configuration during the widespread introduction of "shooting telescopes," and thus wear scope mounts and vintage glass optics such as an early

Weaver, Lyman Alaskan or All-American, Unertl Hawk, or Kollmorgen/Redfield Bear Cub models for example. One such custom Krag sporter found its way to my bench recently but it wasn't a common American .30-40.

No, this one was an Old World Model 1912 cousin manufactured in 1923 by Norway's royal Kongsberg arsenal, wearing a 24" commercial barrel chambered in 6.5x55 and carefully stamped with the gunsmith's name and the cartridge above the chamber. A beautiful example of American gunsmithing talent, it was fitted in a commercial walnut stock that had been finished to an ultra-smooth high gloss not unlike the Browning polyurethane, however, the Norwegian's timber wasn't finished with that abomination of a chemical.

The barrel was beautifully polished and blued, with two plug screws on centerline for an optional Williams WRGS rear sight, and wore a commercial hooded ramp front sight. A professionallyexecuted muzzle crown job was evident. The Norwegian 1912 wore aside-mounted Weaver scope base which provided the foundation for a vintage 2.5X Redfield scope with a picket post and crosshair, my personal favorite scope reticle. The entire ensemble, although a bit on the heavy side, made me a little green with envy at the owner.

The complaint was the Norwegian wouldn't feed from the magazine. The customer had seen the rifle at a gun show and was captivated by it, not only due to the



Above left: The Krag trigger/sear assembly is removed to the left by pulling down on the trigger so that the sear clears the receiver, then applying force to the sear with the index finger while wiggling the sear pivot out of its recess in the receiver. It is suggested to place a cloth over the receiver to trap the trigger return spring. Of course, you can use two hands if you don't need to hold a camera!

Above right: Trigger/sear/trigger return spring assembly shown removed from Norwegian Krag action.

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physical beauty of the rifle, but also because it was in his favorite chambering, 6.5x55.

It isn't recommended to fire current European CIP-standard 6.5x55SE ammunition in a Norwegian or Danish Krag, but handloads and SAMMI-rated commercial ammo can be used in 6.5 Krag rifles which have been thoroughly checked by a competent gunsmith. "It's a single-shot," the customer said, waving his arms in frustration in the direction of the subject rifle resting in the Midway rifle vise on my benchtop. "It won't feed from the magazine." Knowing that the Krag was equipped with a magazine cutoff lever, I showed the customer that feature and we tried cycling a magazine full of my 6.5x55 dummy rounds with the cutoff "on," that is, blocking the cartridges from being picked up by the bolt-face and chambered.

The rifle functioned as designed, the bolt slid fore and aft without touching the top round in the magazine. Confident, I flipped the lever to "off" and cycled the bolt. The cartridge would not feed. Say what? Opening and closing the magazine cover to reseal pressure on the dummy rounds in the magazine did no good. The customer was right—his new rifle was a bolt action singleshot. Reaching for that certain screwdriver I use for removal of Krag cutoff levers, I popped out the cutoff faster than it took to type this.

AS

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Krag-Jørgensen (Specifications subject to change without notice) 1 Bolt Body 2 Extractor 3 Bolt Sleeve 4 Extractor Rivet 5 Safety 6 Firing Pin Assembly 7 Mainspring 8 Striker 9 Ejector Pin the magazine was still loaded with the 6.5x55 dummies, I worked the bolt and was rewarded by the sound of a cartridge head being captured by the extractor hook and some increased drag on the bolt as the cartridge fed into the chamber.

One down and the next four dummy cartridges fed and extracted equally smoothly. "That's it?" the customer asked, eyes wide in surprise. As I examined the cutoff lever spindle I explained that the rifle was certainly and obviously operable without the cutoff lever. The forward end of the spindle exhibited a flat ground approximately 5/8" long, turning it into a semi-circular profile.

The round section is intended to hold the top cartridge case head just below the bolt raceway so that the bolt cannot 19 Magazine Spring 20 Carrier and Follower Assembly 21 Sear Spring 22 Sear 23 Trigger Pin 24 Trigger 25 Rear Guard Screw 26 Trigger Guard 27 Front

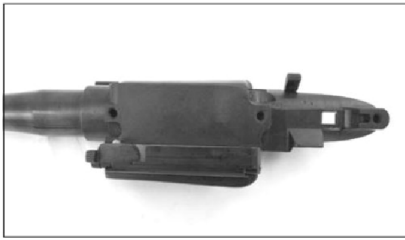
Guard Screw 28 Magazine Gate 10 Ejector 11 Bolt Assembly 12 Magazine Cutoff 13 Sideplate Screw 14 Sideplate 15 Receiver 16 Barrel 17 Front Sight 18 Hinge Bar "catch" the cartridge head and feed it.

The ground-away flat section allows the cartridge to present itself closer to the bolt so that the edge of the case head is in the bolt's path, permitting feed. But why wasn't it working as intended? As it happens, just like there are American Krag rifles and then there are American Krag rifles, the same is true with Norwegian models. The receiver and cutoff designs were changed at one point and the cutoff was modified to one with a shorter spindle.

The cutoff in my customer's rifle had along-spindled cutoff but required a short spindle to function properly. The portion of the spindle that was ground away to allow passage of the cartridges was at the forward-most section of the spindle and a good length of the round pro-

FINICKY-FEEDING KRAG SPORTERS CONTINUED

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Above left: On Norwegian Krag, withdraw the cut-off lever to release the magazine side plate. Cut-off shank resides in a slot in the top rear of the side plate, behind the semi-circular feature. The side plate may need to be pried free as many of them are a tight fit. Above right: Bulky asymmetry of the Krag receiver. Despite the offset mass of the magazine door and the channel to which it is attached, the rifle does not "feel" heavy towards the right when handled, even with an empty magazine.

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Above left: On Norwegian Krag, withdraw the cut-off lever to release the magazine side plate. Cut-off shank resides in a slot in the top rear of the side plate, behind the semi-circular feature. The side plate may need to be pried free as many of them are a tight fit. Above right: Bulky asymmetry of the Krag receiver. Despite the offset mass of the magazine door and the channel to which it is attached, the rifle does not "feel" heavy towards the right when handled, even with an empty magazine.

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Below left: Norwegian Krag barreled action shown removed from its stock to illustrate the receiver mass and magazine projecting downward beneath the bolt raceway. The Krag receiver was machined from a single billet of steel, requiring an enormous amount of metalworking, time, and skill in its manufacture, translating into tremendous cost that would make manufacture today prohibitive, even with CNC equipment. Below right: Example of a "long-spindled" Norwegian Krag cut-off lever. The

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Below left: Norwegian Krag barreled action shown removed from its stock to illustrate the receiver mass and magazine projecting downward beneath the bolt raceway. The Krag receiver was machined from a single billet of steel, requiring an enormous amount of metalworking, time, and skill in its manufacture, translating into tremendous cost that would make manufacture today prohibitive, even with CNC equipment. Below right: Example of a "long-spindled" Norwegian Krag cut-off lever. The

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Cut-off shank resides in a slot in the top rear of the side plate, behind the semi-circular feature. The side plate may need to be pried free as many of them are a tight fit. Despite the offset mass of the magazine door and the channel to which it is attached, the rifle does not "feel" heavy towards the right when handled, even with an empty magazine. file of the long spindle was blocking the top cartridge from being picked up by the bolt.

Now before anyone says, "It had to be an American Krag cutoff!" let me add that American Krag cutoff lever spindles are larger in diameter than those used in Norwegian Krag; they won't fit, period, without being turned down. My customer had some choices. First, live with the cutoff lever being removed from the rifle. Second, grind the rest of the spindle length to extend the flat which would allow the cartridges to feed. Third, purchase a proper replacement from a used gun parts source.

Finally, because the cutoff was sort of like a person's appendix and not really used, he could elect to cut the spindle off so that no part of it was projecting through the receiver to contact the cartridges. Although the cutoff

on a Norwegian Krag locks the sideplate in place, the commercial stock performed the same function on my customer's rifle so this last option was a viable one. As an aside, American Krag sideplates are held fast by a screw.

Since he is cursed with a bit of obsessive-compulsive disorder, my customer didn't want to leave that spindle hole in the receiver open and he didn't want to pay almost \$50 to acquire a proper cutoff, let alone pay me to polish and blue it.

He elected the low cost option, which was to cut off the cutoff, as it were, and reinstall the remaining The Krag receiver was machined from a single billet of steel, requiring an enormous amount of metalworking, time, and skill in its manufacture, translating into tremendous cost that would make manufacture today prohibitive, even with CNC equipment. The beveled portion of the spindle permits the top-most cartridge in the magazine to be presented in the path of the boltface, allowing the cartridge to feed.

When the cut-off is rotated downward, the shortened spindle and lever into the receiver to plug the offending hole. This still retains

the sideplate but isn't long enough to reach the case head of the top most cartridge in the magazine. So that's what I did that evening while the customer waited; after all, he's a good friend. With the cutoff lever reinstalled and twice a full magazine of dummies cycled through it without issue the customer left delighted with his no longer single-shot bolt action Krag rifle.

This story has an epilogue, as many do. The customer sighted in his new purchase and took a nice 6-point with it that season. But human nature being what it is, and humans being finicky themselves, he brought the rifle back early the following year, saying that it was too heavy to carry in the woods compared to his beloved Remington Model 7 in 7mm-08.

Since I was complimentary of the Krag's workmanship when I modified the cutoff, and since he knew I liked and collected old Krag sporters, would I be interested in owning this one? Silly question. AG full-diameter spindle section blocks the cartridge from being picked up by the bolt, turning the rifle into a hand-fed single-shot.

PISTOLS

Adjusting Fixed Revolver Sights

Have a classic single action that won't hit to you or your customer's point of aim? Here are several practical tips for fixing fixed revolver sights.

BY ED NUTTER NOVEMBER 2018

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Many modern revolvers include sights that are at least drift adjustable for windage but a number of older models have no provision for moving the sights. When it comes time to shoot them, it can seem hopeless to get the gun to hit at point of aim but all is not lost. There are a few things to try that can help. Before modifying anything, keep in mind that a differing bullet weight and velocity in different loads can change the point of impact.

As a rule of thumb, heavier bullet will tend to shoot higher and a lighter bullet will tend to hit lower. A variety of bullet weights can and should be tried to see which shoots best. Keep in mind that once you have the revolver sighted in for one bullet weight, velocity, and powder charge, the point of impact will probably change if these are changed. For a revolver already not hitting where you'd like, that can be a good thing. Warranty Yes, I typed that word.

While some buy for the warranty, others find it to be a hassle. If the revolver is brand new and right out of the box, try

contacting the manufacturer to see about sending it in under warranty. They will have the proper equipment and spare parts to alter guns they manufacture. Kentucky Windage Knowing the point of impact for a given load at varying distances allows the shooter to change their aim based on Many also do not have a hammer blocking safety either.

Unless your revolver uses the transfer bar system or hammer block safety (shown), you run the risk of accidental discharge if you carry with a fully loaded cylinder. that information. For instance, knowing the revolver hits, say, to the left and high a given number of inches (or feet...) at a given distance allows for a known adjustment to point of aim to hit a target. This is an imprecise method and can result in missing the target more than hitting it but is the easiest "fix" for this issue.

Needed Items If you choose to try to make the necessary adjustments to an otherwise non-adjustable set of sights, you will need a few things. I use target paper that is at least 11"x17" or larger with half-inch or one-inch gridlines to see precisely where the bullet is

hitting in relation to the point of aim. A piece of poster board with gridlines could be useful if target paper isn't large enough. A refrigerator box could be used if the revolver is really out of alignment.

As an absolute last resort, you could offer to pay for damages and use the broadside of a barn. Failure to hit that could justify replacing the revolver along with an optometrist appointment. At least for initial tests, a steady rest should be used. These can usually be purchased at your local gun shop or sporting goods dealer. A rest can be built from wood and/or metal you may have in your shop. A small file with a safe edge is needed. Powered hand tools can remove too much metal too quickly.

A high-speed air-powered die grinder should probably not be used. Other needed tools will be mentioned in the sections where applicable.

ADJUSTING FIXED REVOLVER SIGHTS CONTINUED

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Out Of Alignment If the barrel and cylinder don't line up squarely, the bullet could hit one side of the barrel first as it enters, possibly effecting accuracy. Brownells sells Revolver Range Rods that can be used to test alignment of the barrel and cylinder. A barrel out of alignment may need other work done. **Rear Sight** The rear sight should be moved in the direction the bullets need to go. On some models, the rear sight could be filed to one side using a small file.

Small amounts should be removed at a time, with frequent checking of point of impact. This becomes impractical on models where the sight is a groove in the top strap. **Front Sight** To raise the point of impact, the front sight can be filed down. To lower the point of impact, the front sight can be built up using a welder or some other means. This should be done in small increments with frequent testing. If you don't mind the revolver looking strange, the front sight can be bent to one side.

I would not advise that on an antique revolver. Care should be taken that the sight doesn't snap off while bending. Another modification would be to shave metal off one side of the front sight, though this will make it more fragile. **Barrel** The barrel can be screwed in or backed out to change the point of impact to the left or right. Older books say to use a hammer handle or hardwood handle as a wrench to separate the barrel from the frame.

I suggest using the proper vise insert for your revolver and the proper barrel wrench to reduce the risk of damage. As you turn the barrel, you may notice that you run out of room for adjustment. This may result in the barrel needing to be turned in a lathe or stoning the frame. I suggest modifying the cheaper and easier to replace part first. If the barrel is turned in a lathe, the forcing cone may need to be recut.

If the barrel is press-fit and pinned, the barrel notch can be filed in the direction the front sight needs to move and the opposite side filled in with epoxy. Pin alignment will

also need to be checked. This adjustment may be quite noticeable. A heavy hand and a die grinder will result in an expensive piece of scrap metal. Proceed gently using great caution and frequent testing. **Pressure** The last method and possibly the most dangerous is to straighten the barrel with a hydraulic press.

Removing and looking through the barrel may reveal a bend. Placing the barrel in a press so that pressure is applied to the opposite side may make the barrel straighter. It can also bend the barrel in the other direction or otherwise damage it. I would not try this on an original barrel, antique, or other valuable revolver, unless it had to be pressed into service for some reason. If it absolutely has to be pressed into service, the most value the revolver can have is being reliable and accurate.

So, if your revolver doesn't hit the bullseye, all is not lost. With some time and patience, you should make it into the 10 ring. AG

PEOPLE & COMPANIES

Precision Bedding For Winchester Model 70 Stealth II Rifles

Few rifles bear close resemblance when it comes down to bedding for best accuracy and there are no real mysteries involved.

BY NORMAN E. JOHNSON NOVEMBER 2018

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As I bed the action of a rifle, I liken it to going quietly to sleep—the less tossing and turning, the better. The metal-to-stock contact must be as uniform and solid as possible. An action that moves around and fails to settle down in its bed won't allow its groups to settle down very well either. I've termed these "restless groups." Here I will cover precision bedding a Winchester Model 70 short action; a bolt action Stealth II Varmint rifle into its factory-issue composite target stock.

In addition to the original .25 Winchester Super Short Magnum, I have chambered this rifle for the .243 WSSM and .300 Winchester Short Magnum, conforming to my own switch barrel rifle process. Not all rifle action types are suited to deliver top-notch accuracy without some help. This is particularly true of a high percentage of bolt actions with magazine cutout resulting in measurably weaker receiver side rails.

Included here I have placed the Winchester Model 70 receiver, which isn't exactly on top of the bench-rest accuracy short list. Some of these rifles shoot enviably well, but as a rule, considerable coaxing is in the cards. I have experience with scores of bolt action rifles, including several dozen Model 70 Winchesters, in a variety of barrel weights and calibers, both pre-1964 and later.

I made the statement that I believed I could get this short-action Model 70 Winchester rifle chambered for .300 WSM, to regularly deliver half-minute-of-angle or smaller groups with well thought-out handloads. As I removed the action and stripped it down, it paled in comparison to other actions I have become used to extracting extreme accuracy from. It felt so light in my hands.

I was surprised to learn the Model 70 Stealth II has a 28 thread-per-inch receiver thread pitch as compared to the more common 16 or 20 thread pitch, as used on most other rifle receivers, including other M70 Winchester, Remington 700/40X, et al. The faster 1:28 thread pitch can have bearing on barrel shoulder axial preload, if excessive torque is applied.

My other concern was in bedding the short action Model 70 with its open magazine to a sufficiently-rigid receiver that could withstand suspension of a 27-inch target-weight rifle barrel. Considerable attention would have to be devoted to the action bedding to accomplish this, as I will cover in some detail as I move along. Top, receiver with action screws (central screw added by author). Below, one piece trigger guard and floor plate assembly.

PRECISION BEDDING FOR WINCHESTER MODEL 70 STEALTH II RIFLES CONTINUED

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Center, top view of stock where selective precision bedding will take place at recoil lug—later central bedding—and rear tang area. Below, underside view of M70 Stealth II short action showing bedding contact surfaces.

The rifle came into my hands chambered for the .25 WSSM set into its factory-provided, target/varminttype, composite stock, which was made by Bell and Carlson (Belland-Carlson.com). These stocks have an aluminum bedding. The new action screw would later mate with the otherwise unused screw hole in receiver. Floor block cast into the stock with rails projecting out into the forend and back to the pistol grip area of the stock.

The original .25 WSSM cartridge, as received on this action, produced quite good accuracy for a production barrel, at well under plate latch is seen at right.

For the new chambering in .300 WSM I went with a Krieger 1:10 twist, number 8 contour, 416 stainless barrel finished at a 27" length (KriegerBarrels.com). I chose to use a removable pilot reamer from Dave Manson Precision Reamers with a 0.2995 bushing and a standard SAA- MI throat. (MansonReamers.com, Grand Blanc, MI 48439, I've come to trust the performance of these precision reamers. I replaced the factory Model 70 trigger with a Model 401 Timney trigger.

The flat forward support arm of this trigger served as part of the very solid, central bedding support as the pictures will show (Timney- Triggers.com). The Model 70 action is quite unlike the typical cylindrical style receivers, which hasn't really changed that much over the years since its minute-of-angle range with several bullets. birth in 1936.

There was a revised version of the Model 70 in 1964 involving several stamped-out parts and a push-feed cartridge feed system replacing the old Mauserstyle claw extractor, along with a few other

PRECISION BEDDING FOR WINCHESTER MODEL 70 STEALTH II RIFLES CONTINUED

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Here the forward tang on the Timney trigger would replace the sear on the Model 70 trigger and serve as a solid action support. things at that time. The Stealth II has a short action with a one-piece aluminum trigger guard hinged floor plate assembly spanning 7 1/4 inches from the front recoil lug screw to the rear tang. Distance between screw holes in 6 3/8 inches. Two additional Steel Bed pillars are positioned at the sides of the central screw hole, forming a most solid triangular central pillar bed.

Note addition of brass pillars at rear tang and forward action screw hole. This top view shows precisely where pillars mate with critical action surfaces. The one piece scope base, along with a precision set of scope rings, also add measurable rigidity to a well-bedded action. Receiver Bed The Model 70 Winchester

rifle has a full square inch of contact surface behind the recoil lug with the front action screw at center. If well bedded, this contact surface alone provides very solid front support.

From there I directed my attention to the rear tang surfaces. Again I added a fulllength brass pillar at the meager surface in the rear tang area. This was surrounded by the integral aluminum bedding block, providing a full square centimeter of bedding surface here alone. I also added bedding surface covered with Steel Bed from Brownells behind the tang and at the laterally positioned surfaces just forward of the screw hole.

These rear tang surfaces provided a very solid support of more than three square centimeters. I then studied the bedding located above

and surrounding the central trigger guard screw, which has been a thorn in the side of many Winchester Model 70 riflemen.

Having worked with this action for more than 60 years, I learned early on that its center screw can cause all manner of consternation attributable to I still added a fulllength, centrally positioned, brass pillar downward from the flat surface surrounding the front guard screw to the bottom adjoining the front, lower end of the action screw. This is a 1/4-28 thread, capable of much draw-down torque. action movement and springing.

For some time I just let the central action screw float loosely, just sufficient to hold the trigger guard in place. But before attempting to make a solid bed beneath the central action screw, the bedding fore-and-aft at the recoil lug and rear tang must

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300 WSM Model 70 Winchester Stealth II precision-bedded action. A Krieger 1 in 10 twist barrel was used in this switch barrel rifle chambered with a reamer from Dave Manson Precision Reamers. The upper left groups were shot with 155 grain Sierra Palma bullets. The quarter-inch group at right center was shot with 168 grain Sierra bullets. Three lower groups were shot with 168 grain Berger bullets.

We couldn't even dream of performance such as this without a perfectly bedded action, a most vital link in the accuracy chain. be as solid and as well aligned as possible. A careful analysis shows there are two laterally opposing wings surrounding the central screw hole in the action. Immediately downward from this position in the aluminum bedding block there are surfaces for two added pillars.

Additionally there is room immediately to the rear of the central screw hole for still another bedding pillar of at least a square centimeter resting on the aluminum bedding block. As a sort of fortuitous finding, I used the solid, flat extended portion of the

Timney trigger as support to the underside of the action. The thin space between these two surfaces is carefully measured for thickness and a flat, metal surface plate is interfaced between these parts and bonded in. I used Steel Bed material to microscopically fill the gap between these metal surfaces.

At this stage a 1/4-28 countersunk socket head screw was fitted just forward of the hinged magazine cover latch on the floor plate trigger guard assembly, which also is supported by pillars. As a test for fit, torque is later applied to the center screw as the tang screw and recoil lug screw are snugly in place. This maneuver incidentally will reveal even the smallest amount of action-to-stock movement in a rifle. Further tests allude to action rigidity and springing, covered in a separate article.

No stones remained unturned on my journey for half-minute-or-under accuracy from a production rifle chambered for a cartridge as potent as the .300 WSM. As the groups were being observed, few rifles I have worked with in larger caliber have fared any

better. For example, one 100-yard, 10-shot group using 168 grain Sierra Match King bullets went into a very respectable 0.375-inch group. Eleven groups using both Sierra and Berger bullets averaged in the 0.3s.

There were three groups in the 0.2s and only one group just over a half inch at 0.504 inch. This doesn't even take into account the many fine bullets and components that later will be tested in this rifle. Adam Braverman at Nammo Talley (Nammo. com, sent me some worthy looking Lapua 155 and 167 grain bullets that fared very well in early tests. One other bullet I must mention is Berger's 135 grain, flat base, match bullet.

With 65 grains of Accurate 4350 and Nosler cases, it's showing me several groups around a quarter-inch. Converting a production rifle to custom rifle performance demands a good deal of well thought-out planning, limited only to our resources and creativity. AG

RIFLES

Savage Model 12 Extractor Retrofit

Sometimes a new or modified part becomes necessary to improve the dependable and safe function of a firearm. Here's a closer look on how I retrofitted a Savage Model 12 extractor.

BY NORMAN E. JOHNSON NOVEMBER 2018

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In the process of adding an additional cartridge to one of my Savage Model 12 switch-barrel rifles, a cartridge with a smaller diameter case rim would come into play. This cartridge was Federal's new .224 Valkyrie, which has gained considerable popularity, particularly in AR-type rifles. The existing barrels already fitted to the rifle were a .308 Winchester with a Broughton barrel, an E. R. Shaw 6.5x55mm Mauser barrel. This helps in squaring-up of the locking lugs against the bilateral races in the receiver.

Shown at upper left is the case ejector with the modified extractor at right. The extractor extends farther into the bolt face recess than the original part and has a greater slope on the claw of the extractor to accommodate extraction of smaller rim diameter size cartridges. I had a .22 PPC with Shilen 1:14 twist, and a .223 Remington with original Savage Varminter barrel and bolt. Before I move on to the .224 Valkyrie case extraction issue that I bumped into, I'll reveal my grand scheme of things for this rifle.

This rifle would include one of four chamberings to be slated in a series of special tests with four switch-barrel rifles chambered for the .224 Valkyrie in 1:7 and 1:14 twist and two chamberings in the .22 PPC in 1:7 and 1:14 twist. Some pretty serious testing would take place and I wanted to be fully prepared with the best equipment possible.

Extraction Problems Ensur Preliminary tests of the existing Savage Model 12 bolt face and extractor clearly revealed that the extractor claw would not extend far enough into the bolt face to reliably latch on to the smaller .224 Valkyrie case rim. SAAMI lists the case rim diameter for the Valkyrie at 0.422". Standard diameter for .30-06/.308size case rims are listed at 0.472". To further compound the problem, the Federal cases I had for the .224 Valkyrie measure across the rim at 0.415".

My .22 PPC Lapua cases based on the .220 Russian measured 0.440" and they would extract in my Model 12 rifle where I had already

SAVAGE MODEL 12 EXTRACTOR RETROIT CONTINUED

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performed minor alterations on the extractor for this case. These problems forced me back to the drawing board and the creation of a push feed extractor that would extract both a 0.472" case head and the smaller 0.415" .224 Valkyrie case rims I would be working with. I was faced with making a very small part to do a very big job, if it was possible. Ball bearing and thrust spring are functional in moving the extractor claw beneath the case rim during extraction.

The spherical cavity is somewhat larger in the modified extractor to increase its lateral travel. A, the ball and spring engaged fully as the case rim contacts extractor bevel. B, thrust of case rim against extractor bevel forces spring loaded ball downward as extractor moves to side. Case can now move fully

downward. C, as case rim is pushed fully against the bolt face and past extractor claw, the claw fully engages case extractor groove.

Spring-loaded ball holds extractor against case rim enabling cartridge to be extracted. Creating The Custom Extractor Experience already had alerted me to the fact such an extractor would be a tall order. This small piece of metal weighing but 9.5 grains, scarcely the size of your little finger nail, would be crafted from a piece of special steel found in the square shank of a Craftsman punch. The steel was machinable and du- Far 415" .224 Valkyrie and the 0.472" .308/.30-06 case heads.

Developing an extractor system to handle both cartridges can be a tall order. 224 Valkyrie and larger case rim sizes like the

.308 Winchester, .30-06, and similarly-sized cases. These materials are described in text. rable enough to do the job. I made a jig to help in machining the punch stock to precise outer dimensions of the existing part.

During operation the extractor slides through the race milled into the right hand bolt locking lug, where it enters the recess occupied by the cartridge case head and extraction rim flush with the bolt face. During the case chambering process the bolt push-feed action slides a loose cartridge into the chamber. As force is applied by the bolt through the bevel of the spring-loaded extractor, the extractor pops over the case rim and locks on, allowing for cartridge extraction.

An accompanying drawing illustrates this.

SAVAGE MODEL 12 EXTRACTOR RETROIT CONTINUED

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Model 12 Savage Case Extractor Dimensions (may vary) Part Dimensions Extractor weight 9.5 grains Width at bottom of flange 0.270" Width at top of extractor 0.183" Overall thickness 0.100" Extractor claw length 0.040" Ball diameter 0.150" Ball drive compression spring length 0.400" Old extractor length 0.265" New extractor length 0.280" Old extractor claw bevel outer surface length 0.065" New extractor claw bevel outer surface length 0.090" Far 30-06 case head solidly engaged in Savage M12 bolt. 224 Valkyrie case head is locked into the Savage Model 12 bolt face with author's modified extractor fully engaged in the case rim.

Note how extractor has moved more inward into the locking lug race on this picture. Function of the new extractor produces positive result. This would be ideal where cartridge case heads are all the same workable diameter, however, in this situation they were not. I solved this problem by machining an extractor with the beveled claw approximately 0.035" longer to make up for just over half the diameter differences between the .224 Valkyrie and .308-size case rims.

The socket for the spring-loaded ball bearing, beneath the extractor, was also elongated to accommodate for the required difference in extractor side movement. Some very careful thinking and experimentation was in order but things came together very well. The di-

mensions below should provide basic information on most of the things that were considered in the Model 12 Savage extractor revision to make possible extraction of different diameter cartridge cases.

As an after-thought, wouldn't it be nice if such special parts would be available to obviate such a unique problem as I have outlined here? In some cases there are such magic parts... until such time we either do without them or make our own. AG 224 Valkyrie cartridge in the Savage Model 12 rifle made it possible to shoot fine groups such as these. An E. R. Shaw barrel with a 1-7 rifling twist and 52 grain Berger bullets were used. An extractor to fit different cartridge rims helped make it all possible.

HISTORY

Kimber K6s Revolver

While looking very much like a S&W J-Frame, the Kimber K6s shows some improvements.

BY ROBERT K. CAMPBELL NOVEMBER 2018

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Recently, I was looking over the UnblinkingEye.com, a website with good information concerning history, photography, and some firearms. Ed Buffalo is a featured photographer there. He is also a holster maker. Consider, where are you going to find a holster for the Colt 1903 for concealed carry? My example is getting well worn but works just fine for this classic firearm. What might be a more modern revolver that could be used instead? Ed made a shooting review of the Kimber K6s revolver.

While we engage primarily in gunsmithing projects and fixes instead of shooting reviews in this publication, Ed and I came to the same shooting conclusions: The revolver is more accurate than I can hold and kicks a lot, especially with Magnum ammunition. I decided to take a hard look at the Kimber revolver and do a pre-emptive study of it before a K6s comes into the job. The K6s is well made of good material.

It a small frame Magnum that may be fired often for mastery of personal defense shooting, so it's likely to shoot loose at some point. At least, unless it is very different from its predecessors. I was a bit shy at first about taking the piece down for inspection. After all, the big Allen head nuts holding the side plate looks pretty darned intimidating. It turns out the Kimber K6s is well made of good material but it isn't revolutionary.

To fire and use the revolver as issued you might have thought the internals contained roller bearings. The Kimber isn't anything an experienced gunsmith need fear addressing. While I consider each handgun on its own merits, there are some makes that would surprise you with a truly bad firearm. Kimber has earned a good reputation with 1911 clone guns. This revolver was to be somewhat more of the same.

The Kimber K6s is based on proven operating procedure but isn't a clone of Smith & Wesson revolvers as the Taurus and Rossi revolvers are. But then, Taurus has since invented handguns that Smith & Wesson has not. Kimber upgraded the revolver concept and how they managed to do so is interesting. I took a hard look at the K6s based on engineering and gunsmithing and found a workman-like revolver with good features.

I also found a revolver that anyone familiar with the Smith & Wesson J-Frame revolver will find easy enough to address and even modify if desired. The design goal of the K6s was to offer a six shot .357 Magnum revolver little larger than five shot revolvers and to produce a reliable, smooth action. Good sights, a snag-free frame, good

KIMBER K6S REVOLVER CONTINUED

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grips, and combat-oriented controls are also important. My evaluation indicates the Kimber K6s will be more robust and long lived than other small-frame .357 Magnum revolvers. I have previously covered some of the problems with these handguns. It is asking a lot for a frame originally intended for the .32 S&W Long cartridge to accept .357 Magnum momentum. The guns do not blow up but the small parts take a beating.

By the same token, physics being what they are, I am certain those valiant enough to fire the K6s to high round counts with Magnum ammunition will experience some type of wear on the small parts. Let's look at the revolver closely so we will know what to expect. The K6s features a six-shot cylinder. It appears to have flutes but does not. These are simply polished flats on the cylinder extending almost to the rear of the cylinder, stopping short of the locking bolt cuts.

The cylinder is the same width at its narrowest point—between the flats—as most five-shot .38 Special revolvers and keeps weight to the advertised 23 ounces. There are lighter revolvers but none you would care to fire with .357 Magnums. For the most part, the K6s is an adaptation of the

Smith & Wesson double-action revolver. The cylinder release is Ruger-like and powered by a plunger set in a modest recoil shield. The release is less likely to injure the thumb on firing than most small revolver designs.

There are no sharp edges. The rubber grips do a fair job of separating the hand from metal. Any larger and concealment would be affected. The sights are the best revolver sights on the market, with high visibility. My test gun sports night sights and self-luminous irons are good to have. The rear sight features a set screw allowing windage adjustment when loosened. The hammer is concealed in the frame making it a classic humpback frame. Look at the cylinder geometry.

On the J-Frame, with its five-shot cylinder, the bolt stop slot seems to be above the frame center. Six-shot revolvers have a bolt stop on each side of the median of the frame. This meant Kimber had to move the bolt stop further to the right in the frame to modify the J-Frame size to accommodate a six-shot cylinder. There are more differences internally, making for the reason the Kimber K6s is smoother than the Smith & Wesson revolvers it is based on.

I initially commented when first cycling the action that if it were a different make I would guess the revolver wouldn't fire as it felt like too common butchered actions brought in for repair. Not the ones with hitches in the action, mind you, but the ones that someone has cut the springs too short, making the action impossibly light. Not so with the Kimber. It consistently breaks all primers, even the hardest Magnums. To inspect the action, disassemble the K6s with an Allen wrench to remove the grips.

The single screw is removed and a thin screwdriver slipped under the grips to remove them. They are a tight press fit. On the right side of the revolver are three Allen screws. They were quite difficult to break and appeared to be sealed with red Loctite. Once the screws were removed it wasn't difficult to tap the side plate out of its slot in the receiver. I was hoping there were no blind holes or tiny springs to spring loose as I ran into this with an early Taurus and it took three hands to place it back.

LITERALLY THREE HANDS, OR MAYBE FOUR AS MY SON

KIMBER K6S REVOLVER CONTINUED

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helped me. There were none of these evident with the Kimber. With the side plate removed, the K6s appears like a J-Frame variant. The hammer spring is set at a different angle. While difficult to measure with a protractor, it was angled about five degrees different. The hammer of the Kimber gets a press from the push rod at a closer point on its pivot than the Smith & Wesson does. The action is shorter and that is part of the reason why the K6s feels light.

This small difference in design makes for a short stroke and smooth action. Another reason is the action is very well polished. It looks as if someone that knew what they were doing performed a first class action job, polishing the parts but not interfering with original angles. The work is very good and part of the reason for the Kimber's price. The example illustrated cost \$840 at Dewey's Pawn Shop, Greenville, South Carolina.

In addition to the obviously smooth machine and polish work, there is also a coating on the parts that inhibit friction. Disassembly is the same as with Smith & Wesson revolvers. It will be a long time before normal wear begins to work on these parts but the at-home gun butcher may attempt to make an already excellent action "better" so don't hesitate to take a repair job in on the Kimber if the opportunity is presented.

It is the same basic action with a few modifications that Smith & Wesson introduced some 120-odd years ago. Smith & Wesson parts do not fit, of course, but they look the same. As for the springs, I did not have a bolt stop spring on hand to compare but a standard weight Smith & Wesson J-Frame hammer spring looks a great. Although the Kimber looks similar to a J-Frame, it isn't. Grips designed for the J-Frame will not fit, however, wooden grips may be modified.

The crescent where the grips fit into the frame must be filed down to fit the Kimber as the K6s opening is much smaller. A J-Frame grip must also have a new hole drilled to fit the stabilizing slot in the bottom where it butts into the frame. Makers are not yet up to speed on the Kimber but they should be soon. If you have a set of custom J-Frame grips around that you wish to fit to the Kimber, it can be done. The Kimber K6s is a viable revolver with many advantages over older technology.

However, nothing is perfect and we will see these in the shop sooner or later depending upon what type of treatment they are given. AG Far deal the same, with the same apparent diameter and about 5mm longer. This spring could easily be adapted to the Kimber if need be.

PEOPLE & COMPANIES

Reader Forum

BY AMERICAN GUNSMITH EDITORS NOVEMBER 2018

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Savage 25 Magazines Who can I contact to find aftermarket metal magazines for a Savage Model 25 bolt action chambered in .223 Remington? Spare magazines are available for purchase through the Savage service department or online at Store.SavageArms.com. Or contact Savage Customer Service at [Contact them at or 30, Mount Gilead, OH 43338. New Subscriber's Franchi I'm anew American Gunsmith subscriber and just received my first issue in August 2018. I was delighted by Paul Mazan's "Winchester 1912 Restoration" as that article is right up my alley. In my experience with cold blue such as Super Blue Liquid Gun Blue, over polishing the surface will always cause a splotchy finish. I remove file marks and scratches with coarse cloth no finer than 120 grit.](mailto:For metal magazines, Snyder Magazines (SnyderMags.com, a division of Snyder Fabrication, LLC, makes a variety of aftermarket magazines for Savage rifles that have removable box magazines.</p>
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I find 120 seems to permit Super Blue to penetrate well. A light buffing with 0000 steel wool between applications works fine. Following the instructions on the bottle is

very important for good results. I also received my copy of Learn Gunsmithing. In the chapter on semiauto shotguns there are comments about Franchi models. A friend of mine entrusted me with his Franchi 20 gauge which had functioning issues for years despite having taking it in to a gunsmith previously with no success.

That made me think I might be over my head but I took a look. Disassembly revealed the gun was clean and had no missing or broken parts. After a thorough inspection, I reassembled and conducted a test fire. It appeared the carrier was not able to lift to the point where the bolt was able to push the shotshell into battery fully, as if the hull was too fat and stopped the carrier. The ammunition used had a hull with a plastic unibody.

I happened to have some paper-hulled ammunition and the gun functioned perfectly shooting them. should be under the barrels for this fastener to attach to is missing. Do Gary Weaver Klamath, CA I decided to take a drastic measure. Using a bastard mill file in the draw filing method, I reduced the thickness of the carrier on the side that contacts the hull. With this modification the carrier

was then able to lift to the point where the bolt was able to push the shotshell into the chamber.

I test fired again with the previous ammunition that had be causing malfunctions and the shotgun now ran perfectly. Measuring the diameter of the older paper-hulled shotshells and the newer plastic hulls found the plastic to be wider. While the plastic unibodies fired just fine, the unmodified carrier wouldn't function properly with them. Given this Franchi was manufactured when paper hulls were the norm, I'll bet the trouble only began when plastic became the only normally-available option. Richard A.

Johnson Worchester, MA Thanks for the kind words. We're glad our material is helping you. Given that Franchi began manufacturing firearms in Brescia, Italy in 1868, their guns certainly predated plastic shotshells by nearly a decade when Remington introduced shotshells with plastic cases in 1960. Good work on your successful diagnosis and effective fix! Stevens and Crescent Shotguns I have an old Stevens double shotgun that has a forearm with a Deeley & Edge fastener. The piece that

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you know where I can purchase this piece? I'm also still trying to figure out the model number and I can not locate a reference for it. I am also looking for a buttstock for a Crescent Firearms Co. No.60 Empire-Hammerless double barrel 12 gauge. Fred Ludwikowski From Paul Mazan. As near as I can see it appears you have a Stevens 1890 shotgun. These were produced from 1890-1915.

Unfortunately if the barrel does not have anything attached to the bottom center I do not know of anyone that offers this part in any style. You will have no choice other than to find a set of barrels you can salvage it from or make on from scratch. It is difficult to give a more definitive answer without more information, however, I will give you some leads. I am personally unaware of any Stevens shotguns that used a Deeley & Edge forend latch. That doesn't mean that they didn't, I just have never seen one.

Are you sure that forend originally went with the gun? The forend attachment appears to be the same style as was used on the Stevens 311 and if the underside of your barrels has the same style you might try a Stevens 311 forend and see if it will work. Crescent did use a Deeley & Edge-

style fastener. Is it possible you might be trying to use the Crescent forend on the Stevens? If the forend is original to the Stevens and you have the model number your best bet for old parts is Numrich Gun Parts.

They will often have a schematic that shows the parts as well as a listing of parts for the gun along with prices. They also list a number of Deeley & Edge forend assemblies and parts for a number of shotguns. The same source also has stocks for some of the Crescent shotguns but they are listed by the type of mainspring rather than by the model. More about Crescent.

The company made good quality inexpensive single and double barrel shotguns at its Norwich works beginning about or by mail a Big Sandy, TX 75755. 1892. They offered in 12, 16, 20, and 28 gauge guns with Damascus twist or steel barrels. Many considered them among the best American shotguns for the money at the time. The Empire No.60 is in the Standard Catalog of Firearms listed along with a couple dozen other Crescent sub-models.

Huge quantities of these "hardware guns" were produced in the profusion of private brands as well as in Folsom's house brand

American Gun Co. of NY and can be found on many thousands of doubles. Crescent was bought by J. Stevens Arms as a division of Savage Arms around 1930. Prices likely range from \$300 for Fair to \$500 for Excellent. Outers Foul Out I was reading through my back issues and found an article by Paul Mazan on cleaning with the Outers Foul Out.

I have a Foul Out II which works like a champ for lead and copper. Regrettably, I ran out of solution and can't find a resupply. Any hints where to look? Sandy Eisele, The Foul Out appears to have been discontinued as I cannot find it anywhere, including the Outers Laboratories website. Unfortunately, it appears the chemicals are no longer available from Outers. I received this confirmation directly from the company: "Thank you for your inquiry.

I'm sorry but the Foul Out System was discontinued about seven years ago and Outers no longer has parts or chemical solutions in stock." Jim Rex Outers Technical Services Anoka, MN All is not lost. There are Do It Yourself electrolysis bore cleaner options (FrFrogsPad.com/copclean.pdf) and homemade solution (bit.ly/2mZDVDQ) AG

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