The Los Angeles Silhouette Club

Cast bullets in the .30-40 Krag

By: Glen E. Fryxell

This article is respectfully dedicated to "fatboy"

Back in the late 80s, I got bitten by the "handgun hunting bug". At about the same time, I started casting my own bullets in an effort to save money and stretch my shooting budget as far as possible. I was shooting a fair amount of bullseye competition at that time, so it's not surprising that most of my bullet-casting activities centered around handguns -- in particular loads for bullseye competition, and special loads for handgun hunting, as well as various loads for the inevitable plinking and recreational shooting. As a result, I got a lot of experience casting and loading wadcutters for bullseye, and semi-wadcutters and hollow-points for hunting. I also tinkered with a few cast loads for various rifles during this timeframe, but nothing overly serious.

A number of years ago, I got more interested in learning more about making cast bullets work well at rifle velocities. While the casting side of the equation is still pretty similar for these loads, setting up the load for optimum performance can be very different than for handguns. So, I asked some friends for their advice about building cast bullet loads for rifles. The best advice I got was from one of my Texan friends, Charles Graff. Charles emphasized the importance of sizing the bullet to fit the throat (not the groove diameter of the barrel), he emphasized the value of gas-checks at rifle velocities and the need to cast the bullet of suitable hardness for the intended velocity. Charles pays close attention to fitting the nose of a bore-riding bullet to fit the bore diameter of the rifle, he cautioned that fast-twist barrels can be hard on a cast bullet, and he told me that Marlin Micro-Groove barrels will shoot cast bullets just fine (just make sure they are large enough, hard enough and wearing a GC). In the years that have passed since, I have gained a fair amount of experience casting bullets for a wide variety of rifles -- from the 6.5x55 Swedish Mauser to the .450/400 Nitro Express, including such historically interesting and hunter-friendly rounds as the .35 Whelen, the 9.3x57 Mauser, the .405 Winchester, the .444 Marlin and the .45-70 (and given the prices that jacketed bullets cost in some of these calibers, shooting cast bullets makes a great deal of sense!). These projects have been educational and highly enjoyable experiences.

One of the other things that Charles told me was that as I learned more about casting bullets for rifle cartridges, I would eventually come to the conclusion that the .30-30 Winchester was almost perfect as a cast-bullet rifle cartridge, but that the .30-40 Krag was the closest thing to perfection that I would find as a cast-bullet rifle cartridge. Charles had a number of good reasons for holding this opinion:

- Case capacity is well-suited for cast bullet loads.

- Long case neck to cover up all the lube grooves in bullets with long bearing surface.
- Cartridge operates at moderate pressures, well suited to cast bullets.
- Moderate pressure loads allow the bullet to be introduced to the lands "gently" (important for good cast bullet accuracy).
- Full-throttle velocities are compatible with cast bullets.
- 1 in 10" twist is compatible with heavy cast bullets at full throttle.
- Wide assortment of excellent .30 caliber cast bullet designs available.

As you probably already know, the .30-40 Krag cartridge (aka ".30 US Army") was introduced in 1892 with the Krag-Jorgensen rifle and carbine. According to *Cartridges of the World*, the original military loading had a 220 grain FMJ round-nosed bullet over 40 grains of black powder. Almost immediately after the round was introduced, the powder charge was changed to smokeless. Velocity of the smokeless military load was 2200 fps. As a military cartridge, the .30-40 Krag had a fairly short service life, as it was replaced in 1903 by the .30-'03 (which would later morph into the .30-'06). However, in the 11 years that the .30-40 Krag was the official service cartridge, there were quite a few Krag-Jorgensen rifles and carbine made (all told over 700,000 Krag-Jorgensen's were built, over 500,000 of which were made at the Springfield Armory and chambered for the .30-40 Krag cartridge), and many of these guns are still in service, either sporterized, or in their original military configuration.

Starting in 1893, the .30-40 Krag was added to the chambering's of a variety of sporting rifles, including the Winchester High-wall, the Remington Rolling Block and the Winchester Model 1895 Levergun. More recently, Ruger made a run of their #3 Carbines in .30-40 Krag, and my friend Charles Sharps tells me that it also makes a dandy handgun hunting round for the Thompson-Center Contender as well. The 220 grain soft-point bullet was responsible for establishing the .30-40 Krag as an effective hunting round, but a variety of other bullet weights and designs were available at one time or another over the years. Nowadays, factory ammo for the Krag is usually found loaded with 180 grain soft-point round-nose bullets, generally somewhere around 2400 fps.

And therein lies part of the charm of the .30-40 Krag -- its moderate velocities. At impact velocities of 1800-2400 fps, traditional lead core jacketed soft-point bullets do not tend to get overtaxed, and tend to expand smoothly and reliably. The .30-40 Krag is no flat-shooting long-range magnum, and it would be severely over-shadowed (in terms of effective range) shortly after its introduction by the .30-'06 and .270 Winchester (in fact, in terms of effective range, it was out-classed *at its birth* by the 7x57 Mauser, as testified to by none other than Theodore Roosevelt). However, the .30-40 Krag has always been regarded as a highly *reliable* hunting round. Sectional density, coupled with moderate impact velocity, results in reliable expansion, good weight retention and deep penetration. Effective hunting range is generally considered to be about 200 yards, and within its limitations, the .30-40 Krag is a highly capable killer of deer-sized game. It's not terribly flashy, it just flat works. Reliability is a good thing.

Not owning a Krag at that point when Charles told me that the .30-40 Krag was the perfect cast bullet rifle cartridge, I smiled to myself, but didn't say anything. I would learn soon enough.

A few years later, I was hunting feral hogs with my buddy Bob (aka "fatboy"), and he hinted to me that the sporterized Model 1896 Krag carbine (23" barrel) that he was hunting with might be available for trade, if I was so inclined. I was so inclined. We worked out a trade that left both of us very happy. The stock on this .30-40 Krag carbine has been sporterized and lightened up significantly, and the gun has an ivory bead front sight and the striker-mounted rear peep sight (think "ghost ring peep"), making a short, 7 1/4 lb, quick-handling package. All in all, an excellent "woods gun".

.30-40 Krag carbine.

Over the years, I've spent some very enjoyable sunny afternoons out at my range up in the mountains, "working" with this carbine, and learning to appreciate the fine qualities of the ancient Krag. One of the things I learned was this carbine does its best with cast bullets sized .310" or .311", and it definitely does NOT care for .312" (or larger) cast bullets. Also, I've found that good accurate cast bullet loads are easy to assemble, and that rifle powders with burn rates ranging from 4198 to H450 can be used to make good accurate ammunition (although I generally tend to gravitate towards the medium to medium-slow rifle powders, like 4895 to 4350 and H4831). The Krag-Jorgensen rifles and carbine have a reputation for being chambered rather "generously", so I have adopted neck-sized brass as standard operating procedure in an effort to make cases last as long as possible (and this has worked well). All in all, I've had a lot of fun and played with a lot of powder/bullet combinations. Instead of going through all the sordid details, I'll just touch on a few of the highlights.

I tend to agree with Elmer Keith in preferring heavier bullets for the .30-40 Krag, and so my cast bullet selections have generally been about 175 grains and up. There are many good, accurate cast bullet designs that are suitable for the .30-40 Krag, but there are none more accurate than the 175 grain Lyman/Ideal 311291. This is one of the first GC cast bullets ever designed (introduced in 1906), and it is a very accurate bullet in pretty much every .30 caliber rifle or handgun that I've shot it in. I have never shot any big game animals with this bullet, but when cast to a moderate hardness (so it can expand at 2000 fps), it has a long-standing reputation as a fine hunting bullet. When loaded on top of 30.0 grains of 3031, the 311291 is the most accurate load I've tested in the .30-40 Krag carbine to date (~2 MOA using iron sights). This load generates 1931 fps, and would make an excellent general purpose load.

Similarly loaded, the Lyman/Ideal 311291 HP is also quite accurate, and

311291 RN and RCBS 30-180 FP

expansion testing reveals violent expansion at 1900+ fps. This would make an excellent varmint load for coyotes/badger sized critters, but may be more destructive than some folks want for shooting deer. Personally, I don't think this would be a problem IF the shot was placed in the lungs. When hunting deer or hogs with cast HPs I generally try to wait for broadside ribcage shots, and avoid shoulder shots at all costs. Yes, a cast HP will generate some bloodshot meat, but there's not all that much meat in the ribs, and surprisingly little is lost.

Probably the best all-around cast bullet for the .30-40 Krag that moulds are currently produced commercially is the RCBS 30-180-FP-GC. This bullet drops from the blocks at about 190 grains when cast to a BHN of about 12. There are any number of good loads with this bullet (burning rates from 4895 to H450 seem to work well with this bullet), but my favorite is 35.0 grains of H380 for 1966 fps. This is a very accurate load, and excellent in every way as an all-round load -- flat-nosed hunting bullet, good sectional density, good velocity, excellent accuracy (~2.5 MOA with iron sights), etc. If I was forced to choose one load to use forever with the .30-40 Krag, this would be it. Cast to a BHN of about 12 (i.e. typical WW alloy), this load will do everything that can be reasonably asked of the .30-40 Krag.

.30-40 Krag loaded with the RCBS 180

The 215 grain Lyman/Ideal 311284 is another one of the original GC designs that came out in 1906. It was designed for the .30-40 Krag, and the (then) young upstart .30-03 (followed shortly thereafter by the .30-06). The best load I found for the 311284 in my Krag carbine was 30.0 grains of H4895 for 1821 fps. This result seems to fall into a trend -- in my experience, the 311284 tends to shoot well in .30 caliber rifles with a 1 in 10" twist rate up to around 1800 fps, then accuracy starts to drop off above that. Faster loads were acceptable, but clearly not as accurate as the 1800 fps loads. Rob Applegate was the first to point this tendency out to me, and my experiences with this bullet have fallen in line with his.

The hollow-point version of the 311284 weighs about 203 grains when cast to a BHN of about 12. The same 30.0 grains of H4895 generated 1891 fps with the HP and delivered decent accuracy (~3 MOA with iron sights), although it generally seemed to lag slightly behind the standard 311284. I suspect the reason for this is because my 311284 mould drops bullets with a .301" diameter nose, and the HP mould drops bullets with a .299" diameter nose (making it slightly undersized relative to a .300" bore diameter). I suspect that this accuracy difference is why Charles Graff is so keen on a full diameter bore-riding nose when he's fitting cast bullets to his rifles. As for limiting velocity to ~1800 fps, in this case it is no handicap whatsoever as 1800 fps is a deadly velocity for a cast HP, and the

311284 HP will deliver devastating expansion at this velocity. In the 203 grain 311284 HP, the HP cavity runs roughly 40% of the length of the bullet, so ~60% of the bullet shank is left over after the nose is gone to punch on out the other side, so complete penetration of deer and black bear-sized game should not be a problem.


311284 HP and loaded round.

The 197 grain Lyman/Ideal 311299 HP has a narrower HP cavity, making it well-suited for a more controlled expansion type of load. For this type of load, I generally target velocities around 1600 fps, so I started off using 4198, since previous experience had shown me that a good accurate load should be easy to get with this powder in this velocity range. 22.0 grains of 4198 gave me just what I was looking for -- 1685 fps, and very good accuracy (~2.5 MOA with iron sights). This mould drops bullets with a .304" diameter nose. Informal expansion testing revealed more controlled expansion than with the 1800+ fps 311284 HP load discussed above, offering a complementary and very useful level of performance.

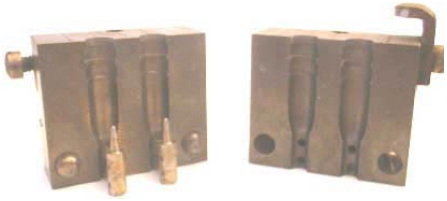

311299 HP and loaded round.

But the bottom-line is that I specifically wanted a ~200 grain cast HP that could be pushed at 1900-2000 fps, expand quickly, and still retain as much weight as possible after the nose sheared off, so that penetration would be maximized. I stumbled across a 2-cavity Cramer mould for a .30 caliber HP (#41B) that a previous owner had ground the HP pins down to where they made a flat-point bullet (a very good-looking flat-point bullet, I might add). I sent this mould off to my friend Erik Ohlen at Hollow Point Bullet Mold Service, (541)738-2479) modify@hollowpointmold.com, with the instructions that I wanted 2 sets of pins made up: 1) to make a HP cavity .100" across at the mouth, and .250" deep (with a tapered pin with a rounded tip), and 2) a new set of pins to make the flat-point bullet (the existing set of pins had been pretty beat up from abusive handling). As usual, Erik's work was superbly done, and he turned the job around in a timely manner. Firing up the lead-pot, the mould starting casting beautiful keepers almost immediately, and the bullets fell free from the HP pins easily. And boy does this mould cast quickly and smoothly! When cast to a BHN of about 11-12, these Cramer HP's weighed 197 grains, and miked .312" across the driving bands and .300" across the nose. Just exactly what I was looking for! Since this bullet was designed with full-throttle loads in mind, the first load I tested was 35.0 grains of H380 with both the solid form of this bullet and the HP. Decent accuracy was obtained and a muzzle velocity of about 1955 fps. I was sufficiently encouraged that I decided to play around a little more and see just how much I could tweak things to get this bullet to really sing.


311299 HP and loaded round.

Other test loads were assembled using H4831, H450 and H414, all with similar results (velocities in the 1950-2000 fps range, with groups running ~2" at 50 yards with iron sights), but the real winner was found with 40.0 grains of 4350 -- 5 shots went into an inch and a half at 50 yards, with a muzzle velocity of 2065 fps (with very consistent velocities). This is now my preferred load for this Krag carbine.

By simply switching out the pins I can also make the corresponding flat-pointed solid, which should weigh in at a little over 200 grains, and should be a deep penetrator of meat and bone. Sounds like a good project for this summer...



Repaired Cramer #41B mould.

The .30-40 Krag, loaded with cast bullets weighing 190 to 200 grains, both in solid form and HP, leaving the muzzle at 1900 to over 2000 fps, with good accuracy and no leading -- now that is field performance to gladden the heart of any woods hunter! Charles, you know, you just may be right, the .30-40 Krag just might be the perfect cast bullet rifle cartridge. "Well, at least for anything under .35 caliber..."

The Cramer HP and Cramer solid.

- Glen E. Fryxell

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