The Los Angeles Silhouette Club

The .40-50 Sharps Straight Contender

By: Glen E. Fryxell

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See Also: Hunting with the .40-50 Sharps Straight

Some of the old black powder cartridges of yesteryear can be quite well-suited for use in the Contender due to their straight cases, husky rims and modest operating pressures. I have been fascinated for some time with the concept of putting together a Contender in one of these old-timers, specifically one in caliber .40, able to use commercially available jacketed pistol bullets (that are all the rage these days), and some of those lovely .40 caliber black powder cartridge rifle cast bullet designs, like the Lyman 403169 and 403173 (that were all the rage in days gone by). Many concepts and candidates for this project have come and gone; some very nearly came to fruition and others were just fleeting fancy, but all carried the same basic attributes -- a straight case about 2” long, a big rim, and a nominal .40 caliber bullet.

Regardless of the final case design chosen, barrel stock was going to be needed for this project. T/C has established a website to sell off their “loss leaders” (www.foxridgeoutfitters.com/netcont.html) at very friendly prices. A blued 10” 10mm barrel was purchased as re-chambering fodder for this project. Interestingly, it was found when the 10mm barrel arrived that it slugged out at .404”, making it appropriate for one of the .403” bullet diameter .40 caliber black powder rifle cartridges, loaded with slightly over-sized cast bullets. Other 10mm T/C barrels undoubtedly will have a tighter groove diameter, probably somewhere around .401”.

10" T/C Contender re-chambered from 10mm to 40-50 Sharps Straight, loaded with the Lyman #403169.

The final decision to re-chamber to .40-50 Sharps Straight was made based on the suitability of the bore dimensions, the ability to make cases from .303 British (or .30-40 Krag) brass and the fact that dies are available from Huntington’s (for either .403” or .408” bullet diameters). While visiting with friend Cliff Labounty (of Labounty Precision Reboring), I mentioned that I was looking for a .40-50 Sharps Straight reamer, and did he by any chance know anybody that had one? He walked over to his tooling files, rummaged around for a minute, pulled out a nice, clean, shiny reamer and said, “What? You mean like this?”. After picking my jaw up off the floor, I had to ask what diameter bullet it was for, and why on earth did he have a .40-50 Sharps Straight reamer just lying around?

It was indeed for the desired .403" diameter bullet and was left over from a project he did for a customer about 10 years ago. This reamer had cut exactly one chamber. Cliff offered to rent it to me for a nominal fee. I was on Cloud 9 for the entire drive home.

First, I sat down and turned out a .40-50 Sharps Straight trim die from 7/8" round stock so as to simplify case forming operations. Next, I cut the new chamber, which was straightforward. Case forming was next on the agenda; to simplify this operation I took a 1/2" x 20 bolt, cut the head off and turned half of the shank down to .396" and then cut a 10 degree taper down to about .280" and polished it. This tapered expander plug threads into a standard RCBS pistol flaring die body.

Instead of going through all of the gory details of what didn't work, let me just report the final case-forming protocol that worked very well indeed (no cases were lost using this procedure). New .303 British cases were first run over a .338" expander, followed by a .358" and then finally over the .396" tapered expander plug. At this point, they were run into the trim die, trimmed to 1.87" and de-burred. From here out, cases were loaded normally. Fire-form loads were slightly "wasp-waisted" due to the difference in tapers between the .303 British and .40-50 Sharps Straight cases (.30-40 Krag brass more closely matches the taper of the .40-50 Sharps Straight and probably wouldn't display this minor wasp-waist). Also, there was a small "wrinkle" just aft of the case mouth on the fire-form loads, where the original .303 shoulder was. This wrinkle was "ironed out" by removing the de-capping stem from the sizer die and gently running the loaded round into the sizer die just far enough to iron the wrinkle flat (being very careful not to distort the bullet). An excellent fire-form load is composed of the Lyman 403169 bullet (about 245 grains) over 32.5 grains of H4895. This load is quite uniform shot-to-shot and approximately reproduces the original black powder rifle ballistics from a Contender length barrel (1380 fps). Brass seems to be quite long-lived; no cases have been lost to date.

Once-fired .303 British brass can also be used to form .40-50 Sharps Straight cases, but a small percentage (about 5%) will be lost due to the necks tearing out during the neck expansion steps. In addition, most .303 British chambers are cut quite generously, so once-fired brass is usually rather grossly expanded just forward of the web. While this expansion can be sized back down to form .40-50 Sharps Straight cases, it creates an over-worked and weakened case in so doing -- and weakens it right where the strength is needed most. Factory new .303 British brass is cheap enough that it just makes sense to go that route to form these cases.

A little bit of history -- the .40-50 Sharps Straight was introduced in 1879, and was one of the last of the Sharps family of cartridges. The Sharps Rifle Co. went under in 1881. It is the smallest of the Sharps line, and was presumably designed as a moderate hunting and target cartridge, similar to its curvaceous cousin, the .40-50 Sharps Bottleneck. Original ballistics for the .40-50 Sharps Straight had a 265 grain lead bullet sailing forth at 1410 fps. Obviously, black powder was the original propellant, but contrary to the name, these cartridges were only charged with 40 to 45 grains of the smoky stuff. The Sharps Rifle Co. was not alone in reaming these chambers, Winchester and Remington also made single-shot rifles for this cartridge.

But the writing was indeed upon the wall -- repeating rifles, smokeless powder, higher velocity and flatter trajectories left the .40-50 Sharps Straight in the dust of the Old West and the history books, to die quietly with the last of the ravaged buffalo herds.

Several of the design features of the .40-50 Sharps Straight case make it very well suited for use in the Contender, however. It is a rimmed case, simplifying extraction. It is essentially a straight case with only a modest amount of back-thrust accentuating taper. The 1.88" case has an appropriate case capacity and powder column length to be efficiently exploited in Contender length barrels. And it's a cute little bugger -- it looks kinda like a .45-70 that got left out in the sun and shriveled up and shrunk just a little bit. It needed a good home, so I gave it the best one I can think of -- the Thompson-Center Contender.

Due to back-thrust considerations, the .40-50 Sharps Straight must be held to 40,000 psi peak pressure or less in the Contender. I have tried to keep things in the 30,000-35,000 psi range in my loading for this cartridge (I estimated these pressures by using the pressure data provided by the "Load From a Disc" calculations. I completely ignored the suggested powder charges. Using powders slightly slower than those identified as "ideal", I worked up to the velocity that correlated to the chosen pressure ceiling. Measuring case expansion at this point provides a tangible method for approximating this pressure with faster and slower powders. Remember, these are only estimated, not measured, pressures.). If you want to hot-rod your Contender, J.D. has any number of well thought-out wildcats that will make your heart go all a-flutter. The aim in resurrecting a 120 year old cartridge was not to "push the envelope" in terms of what could squeezed out of some helpless old geezer, but rather to explore a comfortable "fit" between the old and the new. Kept within these moderate pressure levels, the .40-50 Sharps Straight can still push a 245 grain cast FP (Lyman 403169) at 1600 fps from a 10" barrel, 300 grainer's at 1400+ fps, and the 200 grain Hornady XTP at 1800 fps. "Load From a Disc" calculations suggest that a 14" barrel picks up only 100 fps over these numbers. The .40-50 Sharps Straight is clearly very much at home in a 10" T/C.

Some of you might very well be asking at this point, "A 245 grain cast bullet at 1600 fps? A 200 grain XTP at 1800 fps? Why not just shoot a .44 Magnum Contender?", and you would be raising a very good point indeed. For a given bullet weight and shape, a .40 caliber bullet will have better sectional density and aerodynamics, so trajectories will be somewhat flatter and impact velocities will be a little bit higher. In addition, penetration should be deeper for .40 caliber cast bullets than for a similar weight and design .44 slug. Does this mean that the .40-50 Sharps Straight is a more powerful, harder-hitting cartridge than the .44 Magnum when both are fired from a Contender? Maybe, but I doubt it. I prefer to think of it as the .40-50 Sharps Straight being in darned fine company as a useful handgun hunting round. The .40-50 Sharps Straight has an old-world charm, flavor and charisma that a modern, mass-produced generic revolver round just can't muster. Coupling that antique-stained, 19th-century *panache* with solid hard-core hunting capability, and wrapping it up in a case design ideally suited for the Contender was sufficient reason to build one. Some will understand that, some won't. So be it.

My Lyman 403169 mould drops bullets that run .407" in diameter. Originally, I was sizing them .404" to match the groove diameter of this particular barrel, but accuracy, while acceptable, was less than what I had hoped for. Thinking that perhaps I was distorting the bullets by sizing them down that far, I bought a ".406" sizer die (which actually sizes bullets .4055") and accuracy immediately improved. This led to an interesting observation: when attempting to extract *unfired, loaded* rounds, a few of these cases would display sticky extraction. Due to the mechanical advantage of the closing Contender action, no resistance was felt upon closing, but things were definitely sticky upon opening. This is a clear sign of a tight chamber, and more specifically, very little neck clearance. Measurement of the loaded rounds revealed that some were running as much as .4255" at the neck, while a chamber cast revealed a chamber neck of only .426". I like tight chambers just as much as anybody, but when you're dealing with less than .0005" clearance, then all it takes is a little bit of powder fouling, bullet lube or a cartridge that is only ever-so-slightly out of round and you've got problems with both excessive pressures and difficult extraction. This problem could be solved by either thinning case necks (by reaming or neck-turning) or by relieving the chamber neck. Since the RCBS resizing die was actually doing very little actual sizing of the case (*i.e.* a very good fit between chamber and die), there was a concern that thinning the case necks might possibly lead to a situation where the sizing die would not reduce case mouth diameter sufficiently to provide adequate bullet pull. Therefore, it was decided to relieve the chamber neck to .429". This was accomplished with a .429" throating reamer. Please note that this modification would not be needed for anyone shooting .403" (or smaller) bullets, as the reamer dimensions are fine for that scenario. This modification was made necessary by my shooting over-sized .4055" cast bullets in a .404" barrel, which is incompatible with .403" diameter (or smaller) cast bullets.

403173 (left) and the 403169 (right) shown in both solid and HP form.

My 403173 mould drops bullets that are significantly out of round. I have hand-lapped the mould to try and "true it up" and that has helped, but it still isn't round (diameters range from .402" to .405" depending on where it's measured). In spite of this, these bullets actually shoot just fine.

In general, the best accuracy for both of these cast bullets seemed to come in the 1350-1450 fps ballpark. Whether this is due to the alloy used (wheel weights), the nature of this particular throat, or just part of the "personality" of the .40-50 Sharps Straight cartridge, I don't know, and frankly I don't care. As mentioned earlier, the motivation behind this project was to reproduce the original BP ballistics in a hunting handgun, not red-line the pressures in an effort to get every last shred of velocity possible before something came unglued.

Based on my experience with the .444 Marlin Contender, I tried using magnum primers to see how they would affect accuracy. In contrast to the larger .444, the .40-50 Sharps Straight didn't show any real preference for the hotter spark, and in fact some of the most accurate loads were assembled using regular primers. Perhaps

this is due to the smaller case capacity of the .40-50 Sharps Straight, or maybe it's the lower operating pressures, but either way regular primers seem to work just fine. I haven't tried pistol primers yet, but there may be some benefit from their use.

As far as powder selection goes, the faster powders (4227, 5744, etc.) were generally disappointing. 4198 did turn in a few good loads, but overall the best accuracy was consistently turned in by powders of more moderate burning rate. If I had to choose a single powder for use in the .40-50 Sharps Straight Contender, it would have to be IMR 3031 -- easy to light, moderate pressures and excellent accuracy. H4895 would be a close second choice, and for the very same reasons, and Acc. Arms 2520 was also quite good. Quite surprisingly, virtually all of the loads tested using Re 7 turned in horrid accuracy. Ken Waters noted similar behavior in his study of the .40-50 Sharps Bottleneck (published in *Handloader*, #163, May/June 1993). I expected Re 7 to be very well suited for a cartridge of this capacity and configuration, but for whatever reason, these two just don't play well together.

The RCBS die set does not provide adequate bullet pull to load 10mm (.400") jacketed pistol bullets in the .40-50 Sharps Straight, nor was it intended to. Since this was originally a 10mm barrel, I wanted to at least see if the 200 XTP could be shot with any kind of accuracy (in spite of the fact that they were .004" undersized). Therefore, to load these bullets, I resorted to "neck-sizing" the cases with a 10mm carbide sizing die, flaring with the 10mm flaring die and then seating the bullet normally. This overworks the case neck somewhat, but worked sufficiently well for assembling a few test loads. A load of 38.0 grains of Acc. Arms 2015 BR, sparked with a Fed 215 primer gave right at 1600 fps with the Hornady 200 XTP. Accuracy was good, although point of impact (not surprisingly) was considerably lower than with the heavier cast bullets. This is a mild load and it should be possible to push this bullet another 200 fps faster (or so) and still stay within the back-thrust limitations of the Contender. Nonetheless, a .40 caliber 200 grain XTP at 1600 fps should be deadly on deer as it is.

One of my favorite ways to fire-form brass is to use fire-form loads during my summer varmint hunting. There's more than enough shooting to be done and it gives me some preliminary familiarity with the new gun. Varminting with the .40-50 Sharps Straight was an eye-opening experience. Trajectories were much flatter than anticipated, especially for a long-forgotten old-timer. Even at a leisurely 1100 fps, the 403169 was surprisingly destructive to rodent flesh, and higher velocities only added more spectacle. The .40-50 Sharps Straight would be just about perfect for hogs, or that late season doe-hunt, or...

Just for the record, the .40-50 Sharps Straight should make a fantastic lever-gun round; a truly definitive north-woods black bear carbine. I would expect the conversion to be quite straight-forward. If anybody does this, I'd be very interested in hearing about your results.

The .40-50 Sharps Straight didn't get much of a chance back in the 19th century to show its stuff. The Sharps Rifle Company went under shortly after its debut and the field of small arms cartridge design was evolving rapidly towards

higher pressures, smaller bores and a fashion statement involving belts. Now that we're waltzing our way into the new millennium, perhaps the .40-50 Sharps Straight can prove its mettle in a different kind of single-shot, the Thompson-Center Contender.

- Glen E. Fryxell

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40-50 Sharps Straight Contender Load Data

- re-chambered from 10mm with a .404" groove diameter -
Cases formed from Frontier .303 British brass.
WLR primers unless otherwise noted.

Lyman 403169 (sized .4055" @ 245 Gr.)

Powder	*Charge*	*Velocity*	*Comments*
IMR 4227	25.0	1272	Sticky cases, vertical stringing
AA 5744	25.0	1358	Mediocre, warm
IMR 4198	27.0	1327	OK
IMR 4198	30.0**	1531	Poor
Re 7	28.0	1199	Poor, large velocity variations
Re 7	31.0**	1384	Poor
AA 2015	30.0	1317	OK
AA 2015	33.0**	1424	Bad
IMR 3031	33.0	1452	Very accurate
H322	31.0*	1308	
H322	34.0**	1447	Good
AA 2230	31.0*	1246	
AA 2230	33.0**	1420	Good
H4895	32.5	1383	Very accurate, mild pressure, very consistent velocities (+/- 2 fps)
AA 2520	34.0*	1468	
Varget	36.0**	1306	Decent

* = CCI Large Rifle Magnum primer
** = Fed 215 primer

Lyman 403173 - 298 grain when cast with WW
- All of these loads used Federal #215 Primers -

Powder	*Charge*	*Velocity*	*Comments*
IMR 4227	25.0	1425	Poor
AA 5744	25.0	1300	Very bad accuracy
IMR 4198	29.0	1425	OK
Re 7	30.0	1382	OK
AA 2015	33.0	1470	Very accurate, best load
H322	33.0	1449	OK
AA 2520	34.0	about 1400	
Varget	35.0	1320	Very accurate
H4895	37.0	1339	Accurate

See Also: Hunting with the
.40-50 Sharps Straight Contender

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