.450 BONECRUSHER

by Lee Martin
(Arlington, Virginia)

In 1994 my dad and I designed the .458 Devastator, which is basically a .458 Winchester Mag cut to 1.40". It worked well in custom 5-shot Blackhawks, and at the time was a cheap alternative to the .454 (Casull brass was only offered through Freedom Arms back in '94). By design, our round uses 0.458" bullets that range in weight from 300 to 350 grains, with the latter maxing out at ~1,600 fps. If there's one downside to the Devastator though, it's the high operating pressure of 60,000 CUP. Not only is this hard on the gun, but it also pounds the living hell out of the shooter.

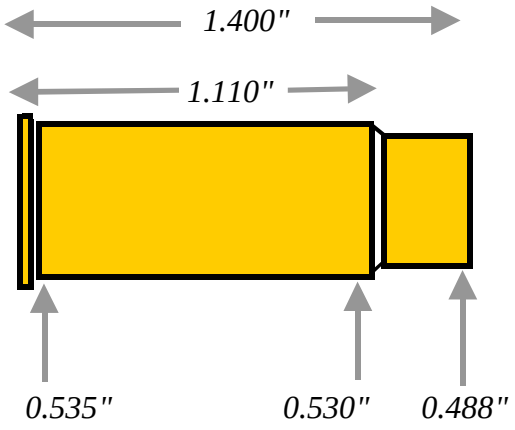
When Magnum Research announced their .450 Marlin revolver in early 2002, I acquired one within a month of its release. I was immediately drawn to the BFR's ability to shoot 350s at over 1,800 fps while limiting pressure to around 45,000 CUP. Secondly, the fit and accuracy of these guns is outstanding, and the MSRP is under a $1,000. In spite of these qualities, many find the sheer size and weight of the gun to be excessive for field carry. What you do get for the added dimension is increased case capacity, which ultimately provides the following: 1) More room for larger powder charges to burn and, 2) Lower operating pressure. Consider for a moment that a .45-70 BFR can duplicate .454 ballistics at 35,000 CUP; in other words, almost half the pressure of the Casull case. Granted, when the argument turns to overall efficiency and ease of carry, the tables are stacked against rifle cartridges in a handgun.

In the late 1970's, early 1980's a gentleman who's name escapes me built the "White Horse Magnum" single-action. It was gigantic, stainless steel, shot a cut down .460 Weatherby, and if I recall correctly performed like a .450/.45-70 BFR. Dick Casull has proven for years though that smaller cartridges/guns can equal the output of these massive 45s, but again the trade off is high pressure. All of this got me thinking about a .458" wildcat that would provide increased capacity in a standard sized Blackhawk. My intent was to simultaneously match (or better) .454 Casull performance, while lowering case pressure. Since our Devastator is a straight-walled cartridge, my only option was to use a bottleneck round to gain powder capacity.

Originally, I considered using .475 Linebaugh brass because the shoulder step to .458" would be less than that of the .500. Remember, there's always the potential for case setback with bottleneck rounds in revolvers. Unfortunately, the .475 wouldn't provide enough additional capacity to make the project worthwhile. Inspection of the

.500 Linebaugh however proved beneficial. Specifically, while the .454 Casull holds 28.0-30.0 grains of H110 or W296 under a 340 SSK grain bullet, the .500 Linebaugh could at a minimum take 37.0 - 38.0 (by comparison, the .458 Devastator holds 31.0 of H110 when using a 350 grain Hornady). In the end, I viewed a ~30% increase in capacity as a good reason to proceed, so in April of 2002 I designed the .450 Bonecrusher:

.450 BONECRUSHER



Lee Martin - April 2002

The dependent variable here is definitely velocity. In other words, will a ~30% increase in powder translate into noticeable gains in speed? Unquestionably, with pistol barrels there's the law of diminishing return. If a 350 could come close to 1,700 fps and do so at lower pressure than the Casull, then the Bonecrusher serves a purpose. If it clocks in around 1,600 we're duplicating the .454.

Bottleneck rounds in revolvers can be problematic, especially with regard to case setback. The .22 Jet in the Model 53 is the most widely known example of such, as were early attempts to build .256 Win Mag wheelguns. In my experience, the two most important variables to consider when working with bottlenecks are case design and chamber/brass cleanliness. Take the Jet for example…..the cartridge works at high pressure and the case has significant taper. Truthfully, the thing "looks" like it would want to back out of the cylinder upon firing; in reality though, the Jet functions if the cases are cleared of oil and lubricant. What some wildcatters did discover is that when the Jet's shoulder is improved, case setback is less common. In doing so, the walls are blown out, the taper is reduced, and the dimensions come closer to that of a straight case. I applied the same principles to the .450 Bonecrusher by using a short neck, 25 degree shoulder, and 0.005" total body taper. Though it's still a bottleneck, the majority

of the case is straight-walled in appearance. Another consideration is shoulder position. Theory has it that bottlenecks experience less cylinder lock-up if the shoulder is pushed back a few thousandths. By doing so, the brass has to blow forward to engage the neck step and by the time it does, the side walls have already expanded and gripped the chamber. Sounds good on paper, but I'm not convinced that it's necessary (as long as the cases are clean, our .30 Streaker works regardless of shoulder position). Lastly, there's certainly a limit to how much you can neck a case and have it still work in a revolver. Though I have no rule of thumb for this, I'd guess that a neck-to-body reduction of 20-25% is max (note: the Jet exceeds this and still works, so I could be wrong).

My dad built the reamers and reloading dies for the Bonecrusher in early 2003. It wasn't until the fall of that year that we got serious about doing the conversion however. As usual, the project started with a new stainless Super Blackhawk that was stripped down to the frame and backstrap combination. An oversized cylinder was machined and fit to the gun, pawl modification was done, and the throats were line bored to the frame. Next, an 8.5" piece of Pac Nor barrel was mated and the cylinder gap was set to our standard 0.002" (11 degree forcing cone). Unlike most of our conversions though, I decided to use barrel porting by drilling 4 holes on each side of the front sight. These were followed by two additional ports at 3:00, with no expansion chamber. As with all .500 Linebaugh based conversions, the frame's loading gate area needed to be enlarged for the 0.610" rim.

Initial testing was done using 32.0 grains of W296 under a 350 grain bullet. Ironically, this charge didn't even come close to filling the case which made me a little nervous. With slow ball powder, you typically want to work at near 100% load density. In spite of the excess volume, the 32.0 grains shot well and turned out to be pretty accurate. Just out of curiosity, I examined how much W296 it would take before the charge became compressed with a 350. To my surprise, it wasn't the 37-38 grains as anticipated, but instead topped out at 44.0. Would I ever try this load in a Ruger conversion? Definitely not, the pressure would be well in excess of what safe for the .500 Linebaugh sized chamber. As with any .500 based conversion, thin cylinder walls limit how hard you can push the round. Though it's preferable to stay between 30,000 and 35,000 CUP, I find 40,000 to be safe in an oversized cylinder (I realize I'm leaving myself open to debate on this one).

Early on, we tested the gun using large rifle primers under 32.0 grains of W296. In hindsight, this was totally unnecessary because we never planned on exceeding 40,000 CUP. Needless to say, a problem developed….a problem that always occurred after firing four rounds. In other words, the gun functioned perfectly for the first four shots and would only fail when cycling to the fifth chamber. After some investigation, we determined the cause to be: 1) Even though Starline brass will handle a rifle primer, they're still 0.006" taller than a large pistol, and 2) Operating pressure was enough to back the primer out of the case, but not enough to flatten it. As a result, the primer would stick out by a few thousandths and wedge against the frame's pinch plate (after the first empty case rotated 288 degrees). This was immediately solved by

switching to large magnum pistol primers for all tested loads. Short of this one workaround, the Bonecrusher exhibits no case setback and extraction is effortless.

32.0 grains of W296 with a 350 jacketed bullet definitely gets your attention. Remember, this is a full 2-3 grains higher than the max 340 SSK load in a .454, and one grain higher than that of the Devastator. At this level, a 350 grain bullet is going around 1,495 fps which puts it in line with the .454 Casull. Working up in 1 grain increments of W296 gives noticeable gains in velocity:

Bullet	Powder	Charge (grs)	Velocity	ME	TKO
350 JFP	W296	32.0	1,495	1,737	34.2
350 JFP	W296	34.0	1,572	1,921	36.0
350 JFP	W296	35.5	1,620	2,040	37.1
350 JFP	W296	37.0	1,668	2,163	38.2
350 JFP	W296	38.0	1,705	2,260	39.0

38.0 grains of W296 with a 350 is maximum for two reasons: 1) 40,000 CUP should not be exceeded, and 2) 38.0 – 40.0 grs of ball powder is about all you burn in an 8.5" barrel.

Overall, I'm very pleased with the performance that this gun returns. None of these loads exceed 40,000 CUP, which is attributable to the large case capacity. Initially, I was worried that W296 wouldn't shoot well with a charge density below 90% (remember, the case will take up to 44.0 grains; at 38.0, the powder is loosely filling the shell). Even when tested in 40 degree weather though, no misfires occurred and the accuracy was outstanding. Secondly, 1,700 fps with a 350 grain bullet churns-up 2,200 fpe and provides a TKO of close to 40.0 Granted, the .500 S&W will easily outperform these figures, but does so out of a 72 ounce gun (my .450 weighs ~30% less).

Does the lower operating pressure translate into lighter recoil? Maybe, maybe not. With barrel porting it's hard to gauge it against an un-braked gun like our .454 Casulls and .458 Devastators. There's definitely less muzzle flip and left-to-right torque with the Bonecrusher (there is muzzle climb, but it isn't as fast as a .454). As such, the ports may be doing their job. Like the .500 S&W however, most of the Bonecrusher's recoil is straight back into your hand. In other words, your wrist absorbs the majority of the punishment.

To date, I've worked only with 350 grain bullets in this wildcat. I do plan on developing loads for a 405 grain soft-point and hope that the gun can give 1,500 – 1,550 fps with this weight. 300 grain bullets are also an option, but may turn out to be less efficient. Though a 300 will allow you to go higher than 38.0 grains of W296, you're again limited by barrel length……..in the end, an 8.5" tube can only burn so much powder. Once the testing is extended to other bullet weights and types, I'll post my findings.

If you have any questions or comments, I can be reached at sc429@yahoo.com

NOTE: These loads work in my gun and have not proved unsafe. I am however not responsible for these loadings in any other firearm. As always, maximum loads should be approached with care.

PICTURES:

L to R: .454 Casull, .458 Devastator, .450 Bonecrusher

.450 Bonecrusher Conversion

Me before……..

Me after…..recoil is stiff but manageable