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Technical Newsletter From Your Ballistic Technicians
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The X-Ring

Putting A Chronograph To Work

by Paul Box

With the availability of more affordable chronographs coming on the shooting scene over the past twenty years, many shooters are adding this valuable tool to their equipment list. Most of us use one to tell us the velocity of our loads, but we're going to look at another aspect of load development using a chronograph. Our shooter (Bob), just bought a new 25-06 and wants to work up some varmint loads with the 87 gr. bullet. Bob starts working with IMR-4350 and loads three shells at the starting load and fires them checking both for accuracy and velocity. Pressures look fine so he bumps his load up a grain and checks again. Bob notices that each grain of increase is giving an average of 80 fps. Bob continues increasing his load and notices the primers are starting to flatten, but no other pressure signs are showing. Now the velocity increase has dropped to 30 fps. Bob becomes a little more cautious and increases the load by .5 of a grain and checks again. To his surprise the load drops in velocity by 15 fps. Even though no other pressure signs have occurred, the top has been reached. Every cartridge will have an efficiency range with a given combination of components. Once that range is passed, pressures will increase sharply and velocity will increase minimally. Changing to a different burning rate of powder will change this pressure curve and might give better velocity along with better accuracy. Bob now has the tool to find out.

Lana Brown from Africa took this Impala with Sierra's 7mm 140 gr. SPT ProHunter in her 7mm-08

2001 Bianchi Cup!!

by Carroll Pilant

Well, the last mover- moved and the last plate fell and the 2001 Bianchi Cup winner was declared from the 155 contestants from all over the world. Doug Koenig has won it for the 5th time with a score of 1920-184 Xs. Doug has had a very impressive string of shooting at the Cup, being the first person to ever shoot a score of 1920 points with 157 Xs out of a possible 1920-192 Xs in 1990. Doug also won it again in 1992 with 1920-170 Xs, 1998 with 1920-180 Xs, 2000 with 1920-185 Xs. Second place winner was Bruce Piatt with 1920-180 Xs. Bruce is no stranger to the winners circle either, having won it in 1993 with 1920-170 Xs, 1997 with 1920-163 Xs and in 1999 with 1920-181 Xs. Carl Bernosky took 4th place with 1918-174 Xs. These three shooters were all using Sierra bullets for their bullet choice. The Bianchi Cup is held the week previous to Memorial Day each year at the Green Valley Rifle and Pistol Club (formerly the Chapman Academy) in Hallsville, Missouri.

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Smoothing Things Out

by Carroll Pilant

I have a .308 Winchester that had a rough/slightly dark bore that shot well enough to use as a spare hunting rifle. After about 20 shots I had severe copper fouling in it. I had a chance to use one of David Tubb's Final Finish Systems and thought that this rifle would be a good trial for it. This kit consists of 75 Sierra bullets split into 5 groups impregnated with different polishing compounds. Group one has 10 bullets of the most coarse compound, group 2 has 10 bullets of a less coarse compound, group 3 has 15 bullets of fine compound, and groups 4 and 5 have 20 bullets each of finer compound, respectively. Tubb recommends using a fast powder with a light load and he uses bullets with the most bearing surface to take advantage of more area for polishing compound. This means that in some calibers, your rifle may not stabilize the bullet. Don't worry about this, since you aren't shooting for accuracy and it will not hurt the rifle just because it isn't stabilizing it. The procedure is to shoot the 10 #1 compounds, clean, 10 #2, clean, 10 #3, clean, 10 #4, clean, 10 #5 clean, and you are done. The last 25 bullets are for when you feel the accuracy is falling off and your throat is starting to get a little rough- you can touch it up. Tubb says that it removes less than three ten-thousandths of metal from the bore. The .308 I used had a long throat to start with and after measuring it before and after, I couldn't tell a difference. Cleaning was a different story. The bore is bright and shiny and the patches go through it SOOOO SMOOOOOTH now that it doesn't seem like the same rifle. I've had several skeptics' say, "yeah- it ate all the rifling out, etc!" Let them talk all they want. The rifle shoots better and cleans easier, and that is enough for me. I just finished treating an 8x57 that was about the same shape as the .308 and had the same results with it. The barrel on it is now smooth, cleans much easier, and the accuracy has improved. Next I will do my new .260 Remington, although I will modify the process by only using the #3, #4, and #5 steps to break in the barrel. For more information on the Final Finish System, call 806-323-9488 or go to www.zediker.com and you can see what a difference there is from actual photos of a bore, before and after.

Q: I was just reading an article on the .50 BMG and noticed a statement that the bullet doesn't stabilize until about 200 yards out. I don't understand how a bullet in free flight is going to improve. It would seem to me that things could only get worse. Please explain how this works.

A: A bullet has two centers of rotation. One is rotational but runs the length of the bullet around the outside like a tire balance. The other is a static balance point and is a fore and aft differential like a teeter-totter. When a bullet is released at the muzzle by the crown it can emerge slightly canted or off axis with the nose pointed slightly off line. When this occurs the bullet is in a yaw condition and travels some distance before it "settles" to become gyroscopically stable. The exact distance this requires is not readily determined but is commonly thought to be about 200 yards. To get a better grasp of this, think of a bullet and a toy top. They are very similar. A long thin top must be spun at a very high rotation rate but a short fat one can spin at a very low rotational rate and still stand up. Bullets are the same. When you first drop that fast spinning long thin top it will probably wobble momentarily but will quickly stabilize. Exactly like a long bullet emerging from a barrel and regaining its original shape after being contorted by pressure and torque from the lands. It takes but a nano second so the distance traveled is not great. The two most unstable times in a bullets flight is upon exit and as the bullet goes trans-sonic down range.

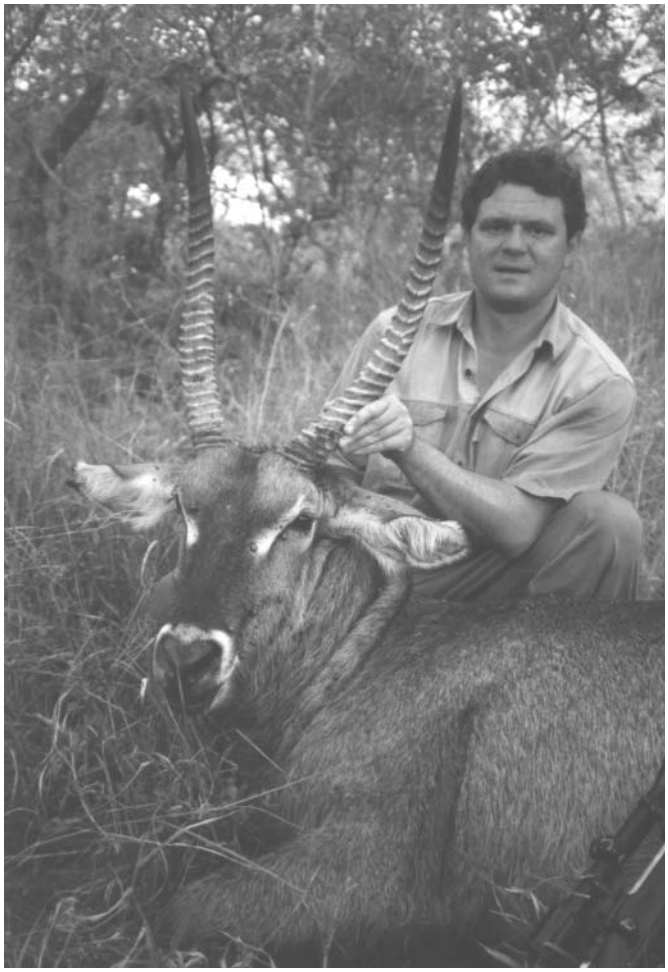
Compressed loads - What is too full?

by Rich Machholz

Every now and then a caller will remind me that some writer said that for a load to be accurate it must be near 100 percent density or full to over-flowing. Often times a load in the manual will call for a charge that fills the case with powder above the juncture of the neck and shoulder or maybe even half way up the neck and the caller wants to know it it's safe. Just the fact that the bullet will compress the powder does not make the load unsafe anymore than it guarantees an accurate round. Jack O'Conner's timeless 60 grains of H4831 in a W-W case and a 130-grain bullet is a prime example. But if a case is so full that you must use a long drop tube and tap the side of the case as the powder is poured into the case to get all the powder in the case, the chances are very good that this isn't a very good load for several reasons. First the powder choice is not the best and is probably too slow for the case/bullet combination judging from the sheer volume. The effort it takes to get so much powder in the case is very time consuming. It could be hard to keep the bullet at its OAL because the powder may be compressed so heavily that it could push the bullet out, especially with a big temperature or altitude change. Then you have the mess you make when you spill a couple of loads or have frequent overflows. Not to mention the aggravation of trying to fit 60 grains into a 58-grain space. If this were H4831 you could switch to IMR4831 which is slightly faster and will take up less space due to a slightly lighter charge or any of the 4350s and have even more room because you will use even less powder. So, while the highly compressed load may not unsafe it is inconvenient at best. A good workable knowledge of powder burn rates is invaluable when it comes to high-density high yield loads. Normally any load of an appropriate powder that occupies between 75% and 100+% of the potential available powder space of a given cartridge case could be potentially the most accurate. However a full case does not guarantee maximum fulfillment of a rifles accuracy potential.

Got Any Good Pictures?

We are always looking for good photos from your latest hunt, a recovered bullet you want to share, or targets you are particularly proud of. Who knows, they may end up in an issue of the X-Ring, or in a future Sierra reloading manual. Please remember to include your name, the cartridge/bullet combination and some of the details about the shot. Send these items to Sierra Bullets, Attn. AB, 1400 West Henry, Sedalia, MO 65301. You may e-mail .tiff or .jpeg photos to sierra@sierrabullets.com, but make sure you include a description in the subject line. I don't open e-mail with attachments from blind locations.



Rob Brown from South Africa, made the SCI Trophy list with this Waterbuck taken with Sierra's 165 gr. HPBT Gameking in his 300 Winchester Magnum.

Frequently Asked Questions

Q: I've worked up to your maximum load in your manual with a standard primer. Can I switch to a magnum primer?

A: Not without reducing your load by 5%. Magnum primers give a hotter and longer flame which causes the powder to be ignited faster, and in turn may raise pressure. Reduce your load whenever you change or substitute any component.

Q: What is the difference between turning the outside of case necks and reaming the inside?

A: Outside neck turning is done to match case necks to the tight tolerance of chambers with tight necks. Reaming the inside is a procedure done when necking a larger caliber down to a smaller one. Unless this dimension is reduced by inside neck reaming, this results in a case neck that is too thick to allow the bullet to be released when it is fired, causing pressure to sky rocket.

Q: Are all hollow point bullets designed for rapid expansion?

A: Absolutely not. Our hollow-points vary in their jacket thickness, antimony content, distance the lead is away from the mouth, degree that the mouth is open and so forth depending on the use and range for which the bullet is designed. Hollow-point configurations can be found in match bullets that may show no mushrooming through tough controlled expansion big game bullets to the varmint bullets.

Sportsman Team Challenge

by Carroll Pilant

The 2001 Sportsman Team Challenge was held at the National Shooting Complex in San Antonio, Texas on April 27 and 28th. This match is composed of 3 man teams, which shoot shotgun, rimfire rifle, rimfire pistol, and centerfire pistol. The top 3 place teams in each division (Open, Sportsman, Women, Industry, Etc) go into a final Championship round. With a first place cash prize of $24,000 at stake for the Open teams, Team Sierra/Starline (Doug Koenig, David Tubb, and J. Michael Plaxco) edged out Team Dillon Precision (Arnt Myhre, Michael Voigt, and Carl Bernosky). The second place team had to settle for $12,000 dollars. The 2001 victory marks the sixth time in the last seven years that Team Sierra/Starline has won this prestigious match. Congratulations to both teams for some fine shooting.

2001 NRA Show!!

The 2001 NRA Show was held May 18 - 20 in Kansas City, and was one of the best-attended shows ever. It was great to see our friends and customers who came by the Sierra booth and shared many good reports and success stories with us. We appreciate our loyal customers who came by and said "Hi" and also the many new people that stopped by. The 2002 NRA Show will be held in Reno, Nevada, April 26 thru 28. We certainly hope to see each one again in Reno, and remember that if you have a question or need help, give us a call at 1-800-223-8799 or E-mail us at sierra@sierrabullets.com.

We take your privacy seriously!!!

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