The Los Angeles Silhouette Club

Leading Defined

By JIM TAYLOR

Leading is: Deposits of bullet alloy that have been smeared into the surface of the gun's bore. In extreme cases, it will build to the point where the rifling is completely choked with deposits and the barrel appears to be smooth-bored. Once leading begins, it will have a tendency to strip alloy from the next bullet which builds the deposit with the next shot. Each successive bullet fired will "iron" the lead into the surface of the bore and make it more difficult to remove the deposit.

Chamber and Forcing Cone Leading:

This is normally caused by shooting a bullet that is too hard (BHN too high) for the velocities used. Either use a softer alloy, or increase the charge (within published loading data, of course!) to correct this problem. This can also be caused by shooting a bullet that is too small in diameter. Revolvers will lead in the chamber and forcing cone while closed breech weapons will lead in the chamber and the beginning of the rifling area. Have the cylinders measured for revolvers and size the bullets to them, not the bore (unless the bore is larger than the chambers, in which case the problem will have to be corrected by a gunsmith or the factory) and measure the bore in closed breech weapons to determine proper bullet diameter. Rule of thumb says the bullet should be .001" larger than the bore or equal to (or very slightly larger than) cylinder diameter in a revolver. If the alloy is soft enough, you can get away with a slight "push fit" in a revolver cylinder, but certainly the bullet should be large enough to not fall through the small diameter portion of the cylinder freely!

Breech Leading:

This is lead fouling that begins in the rifled portion of the bore, but after the chamber or forcing cone, and extends into the bore for a distance of up to several inches. This is normally caused by shooting a bullet that has a low BHN (too soft) for the pressures or velocities used. The bullet will actually strip as it enters the rifling as it does not have the strength to properly engage and begin rotation due to the forces pushing it through the barrel. It doesn't mean it's a bad bullet alloy, it just means you are driving it too hard. If you want to go faster, you will need a stronger alloy with a higher BHN number. Alloys must be used which fit the application. There is no such thing as a "magic" alloy that works for every single application!

Bore Leading, Muzzle End:

When lead fouling occurs at the muzzle end, you have run out of bullet lubricant. Either use a better lube, or more of it to correct the problem. If you can, use a bullet with more, or deeper and/or wider lube grooves. After firing a box of cast bullets, say 20 to 50 rounds, there could be a lube "star" on the muzzle. This indicates that there is simply left over lubricant and the bullet exited the muzzle with plenty of lube. If, however, you find a lead "star" instead you need to try something different as the bullet ran out of lube. You may be able to simply reduce the charge (lower velocity) and correct this. The alternatives are use a better lube or a different bullet design that can carry more lube. As an example, there are .45-70 Govt. 405 grain bullets on the market with only a single

lube groove. Barrels over 16"-18" long using this single lube groove design bullet will exhibit muzzle leading after only a few shots! Frankly, the only reason this bullet exists is that it is simple to manufacture!

Bore Leading, Entire Bore:
Normally, this is caused by shooting a bullet that is too small in diameter for the bore. If the bullet doesn't seal the bore, gas will be able to escape past the bullet causing a cutting action similar to the way a cutting torch cuts steel. By the way, gas cutting will only occur if gas can flow. If it flows, what you have in effect is leak. The bullet is not sealing the bore.

The burning propellant will ***not melt*** the base of a lead bullet! There is simply too much physical mass to heat to the melting point of lead (about 600-700F) in the short time a bullet is exposed to the propellant gas to bring it to it's melting point! If you want proof, examine wads used in shotguns or black powder cartridge loads after firing. They may show slight darkening, but won't be consumed in flames either! If the burning powder won't melt the plastic or burn up the cardboard, why would it melt a bullet base? The answer is, it can't.

Some years ago my Dad and I ran tests to see if heat could actually melt the bullet bases. We used .357 and .44 Magnums as the test vehicles. To the bullet bases we glued flash paper, the kind magicians use. No matter which powder we used, we were never able to ignite the flash paper. We also put low temperature wax on the bases of the bullets and again were unable to get any wax to melt. As was said already, if you can't melt the wax you sure won't melt lead.

Damaged bullet bases are caused from other things, principally incorrect bullet fit to the bore or a bad bullet to begin with!

Optimum Accuracy:
Cast bullet accuracy is directly related to the pressure levels your cartridge is loaded to. If the operating pressure is too low relative to the bullet's BHN (hardness), you will not achieve obturation and the bore will not seal. This will cause gas leakage and erosion (gas cutting) that causes leading at low pressure and low velocity! Optimum accuracy occurs at a point just below the pressure levels that induce breech leading for a given bullet alloy. In other words, if you are shooting an excessively hard bullet for Cowboy Action pressure levels, you will get leading, usually in the forcing cone or chamber area.

Optimum Bullets:
Use a bullet of proper alloy for the velocity you are shooting. Many shooters today are using bullets much harder than is called for. In addition use the best lubrication you can get. These three things, proper fit to the bore, proper hardness for the velocity/pressure, and proper lube can make shooting cast bullets an enjoyable time instead of a headache.

Webmaster's note - much of the above information was originally published on the old Mid-Kansas Cast Bullet website. Unfortunately they are no longer in business. There are a number of good cast bullet providers available if you do not cast your own. Those that

I personally know are: MONTANA BULLET WORKS - CAST PERFORMANCE - BEAR TOOTH BULLETS. There are many others also, but I know these people.

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