

Long Range Shooting Secrets

Rifle Chamber Tips

The Small Arms and Ammunition Manufacturers Institute (SAAMI) was established to standardize case and chamber specifications. These specifications insure any ammunition produced for a given cartridge will fit and function safely in any firearm chambered for the same cartridge. As with any manufacturing process there are always variations due to tool wear, equipment alignment, and material differences. SAAMI specifications are actually pretty loose, especially for chamber dimensions. All rifle barrels, bar none, have variations in their chambers, even high dollar custom barrels. Even though the barrels are “in SAAMI spec”, the variations can mean the difference of 5 minute of angle (MOA) accuracy with the same ammunition in different guns.

To overcome these variations, shooters have to tailor their own loads. Unfortunately, reloading manuals don't address chamber variations because they too have to follow SAAMI specs with case dimensions, bullet seating depth, and cartridge overall length. By measuring the rifle's chamber, reloaders can trim brass for best fit and seat bullets at optimum depth. **Bullet seating depth and brass length have a profound impact on accuracy.** Most chambers are cut with too much “free bore”. This dimension is the distance from the rifled bore to where the shoulder starts. The free bore is at least .025” larger than the bullet diameter and up to .100” deeper than needed. As the bullet jumps from the case to the bore, it has room to move laterally resulting in less than perfect bore alignment. This causes the bullet to strike the bore off center and be deformed. As the deformed bullet travels down range, it actually wobbles a little. The greater the wobble, the worse the accuracy. Compensations for chamber variations can be made in the reloading process.

First, measure the chamber case neck length using a **Case Neck Length Gauge**. After you measure the case length, trim your brass .005” shorter than the measurement. This will allow room for the brass to “grow” when fired. **Recommended SAAMI trim length is usually way too short for most chambers.**

Second, you need to know the exact bullet seating depth to compensate for forward bullet jump. A long established fact: **the less the bullet jump, the better the accuracy.** Different bullet styles, shapes, and weights, will require different seating depths. Use a **Bullet Depth Gauge** to determine the exact bullet seating depth for each different bullet type. The bullet should be .010” from touching the bore. If the bullet touches the bore, chamber pressure may increase.

Once you have worked up a load, use the above techniques to improve accuracy. **Case Neck Length Gauges** and **Bullet Depth Gauges** are available from [Cactus Tactical](#) in all cartridges with .224, 7mm, and .308 diameter bullets. These tools are very easy to use and come with simple instructions. Unfortunately, they are only available for guns with direct in-line chamber access such as a bolt action, single shot, AR-15, etc.

Next in Series: Long Range Shooting Secrets: Bullet Tips.