

SENDING BRASS FOR FACTORY MODIFICATION

Your brass cases can be sent to the factory for modification. This includes all sizes of centerfire style cases, from 17 caliber to 50 caliber BMG, including WILDCATS and IMPROVED brass (Caseheads smaller than the 223 Rem. family will require a "Hornet Adaptor" which allows you to attach these small cases to the O.A.L. Gauge). We prefer that you send brass that has been fired (fireformed) in the gun that you want the brass to fit. We prefer that you DO NOT RESIZE THE FIRED BRASS. This will ensure a proper fit with your chamber after factory modification.

Hornady will deprime, drill, and tap threads in the customer's furnished case, as well as inside ream the neck to a diameter that is .002" over the bullet diameter. This is done so that the bullet will slip easily in the modified case. The Modified Case will be packaged in a plastic storage tube.

When sending cases to Hornady for factory modification, please follow this procedure:

We need to know: Bullet diameter for the cases sent in and name of the cartridge (i.e.: 243 Ackley Improved). Please send two cases. We will provide one modified case and return any excess brass sent to us with the modified case. Normally we will provide this service within a few days of receiving your brass. It is very important that you send fired cases in a padded envelope and include another self-addressed padded envelope with sufficient postage for return to you. If you don't use a padded envelope, it is likely that your brass will be damaged in shipment. Hornady requires a check or money order for \$11.00 for each order.

**IMPORTANT: Chamfer/Deburr all Modified Cases before use!
DO NOT RESIZE MODIFIED CASES!**

Modified Cases Available

17 REM	6 PPC .261 NECK
218 BEE	30/30 WIN
204 RUGER	308 WIN
221 FIREBALL	30/06
222 REM	300 H&H
223 REM	300 WIN MAG
223 WSSM	300 WBY MAG
22-250	30-40 KRAG
220 SWIFT	7.62 X 39
243 WIN	303 BRIT
243 WSSM	8 X 57MM
6MM REM	8MM REM MAG
6MM BR	338 WIN MAG
257 ROB	35 WHELEN
250 SAV	35 REM
25/06 REM	350 REM MAG
260 REM	375 H&H
264 WIN MAG	416 REM MAG
270 WIN	45/70 GOV'T
7 X 57 MAUSER	270 WBY MAG
7MM BR	270 WSM
7MM/08 REM	7MM WBY
280 REM	7MM STW
284 WIN	7MM ULTRA MAG
7MM REM MAG	7MM REM SA UM
240 WBY MAG	7MM WSM
6 PPC	7 X 64MM
257 WBY MAG	300 ULTRA
6.5 X 55 MAUSER	300 REM SA UM
6.5 X 284	340 WBY MAG
300 WSM	378 WBY MAG
338 ULTRA MAG	30/378 WBY MAG

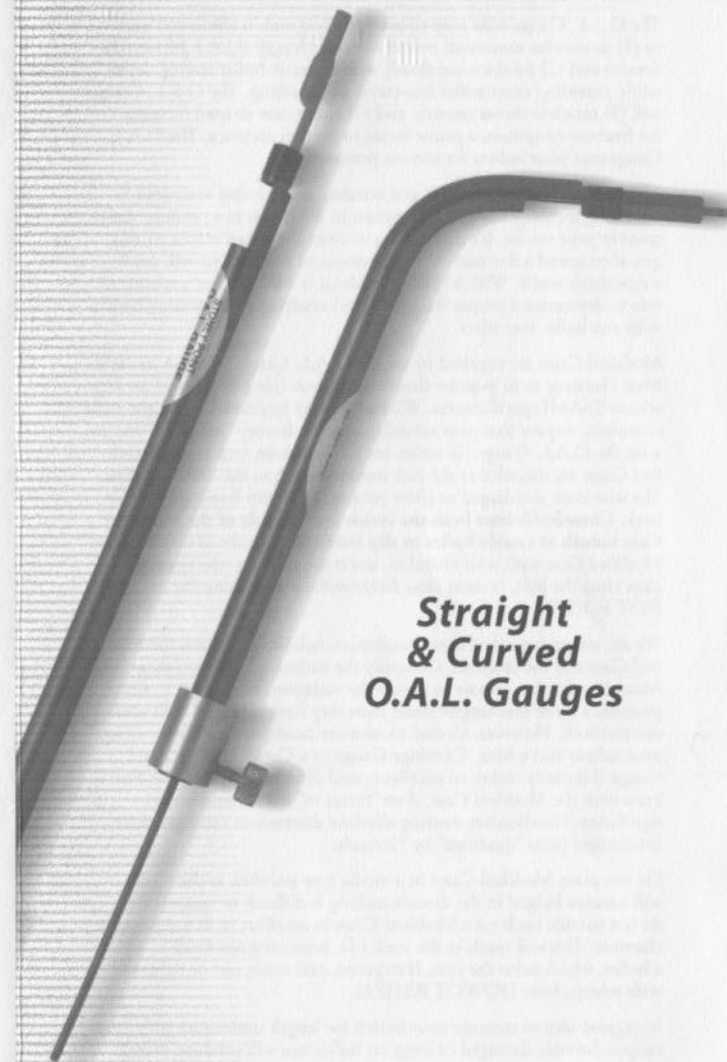


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Hornady is proud to contribute a percentage of our sales to the National Shooting Sports Heritage Fund to foster a better understanding of and greater participation in the shooting sports.



INSTRUCTIONS



**Straight
& Curved
O.A.L. Gauges**



The initial distance a bullet travels is critical to an accurate handload. Any loss of alignment, as the bullet travels from the cartridge case to the rifling, will affect accuracy. Minimal changes in clearance (free-travel), between the bullet and the rifling will often yield substantial improvements in accuracy.

The O.A.L. Gauge is an easy-to-use precision tool. It allows the user to (1) determine maximum overall cartridge length (O.A.L.) from any firearm and (2) produce handloads with a precise bullet seating depth while providing exact bullet free-travel to the rifling. The O.A.L. Gauge will (3) monitor throat erosion, and (4) check new or used firearms for freebore condition, a prime factor in firearm accuracy. The O.A.L. Gauge uses your bullets for utmost precision.

The O.A.L. Gauge is sensitive and accurate enough that variations in operating technique or grit and carbon in the throat can produce variations in your results. It's a good idea to clean the barrel before you begin, then spend a few minutes to develop a technique that will produce a repeatable result. With a little experience, it will take but a minute or two to determine a proper free-travel and resulting bullet seating depth with any bullet you select.

Modified Cases are required to use the O.A.L. Gauge. They are available from Hornady to fit popular firearm chambers (see listing), and are kept within SAAMI specifications. Wildcat, Ackley Improved, and tight-neck chambers, require that your cartridge brass be factory "modified" for use with the O.A.L. Gauge. To order, see procedure on reverse side. Modified Cases are threaded at the case head to attach to the O.A.L. Gauge. The case-neck is enlarged to allow your bullet to slip freely within the neck. **Chamfer/deburr both the inside and outside of the Modified Case mouth to enable bullet to slip freely.** If in doubt of the fit of the Modified Case with your chamber, insert the case into the chamber, then close the bolt. It must close freely without distorting the case. **DO NOT FORCE.**

We are sometimes asked about headspace variations between the Modified Case and the chamber. Generally the variation is a few thousandths. Many handloaders choose to ignore the variation, as the O.A.L. Gauge provides a more meaningful result than they have achieved with previous methods. However, it's easy to measure headspace variations using your caliper and a Max. Cartridge Gauge or a Cartridge Headspace Gauge (Hornady makes an excellent one.) Simply compare your fired brass with the Modified Case, then "factor in" the variation, if it's significant. Handloaders desiring absolute dimensions can have their fire-formed brass "modified" by Hornady.

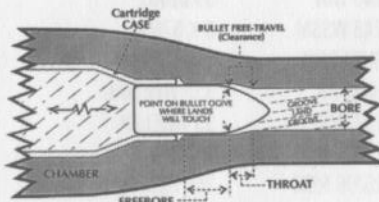
Do not place Modified Cases in a media type polisher, as the media will become lodged in the threads making it difficult to remove. Also, do not outside neck-turn Modified Cases in an effort to fit a tight-neck chamber. This will result in the neck I.D. becoming too small to accept a bullet, which ruins the case. If required, case necks can be reduced with emery cloth. **DO NOT RESIZE!**

It's a good idea to measure your bullets for length uniformity with your caliper. Severely damaged or irregular bullet tips will produce overall length variations when measurements are taken. Variations of .010" or more will produce irregular O.A.L. results requiring the use of a suitable bullet comparator, described later.

TO USE THE O.A.L. GAUGE: Remove the bolt or open the action to allow access to chamber. Thread-on appropriate Modified Case to the O.A.L. Gauge. Insert a bullet, with undamaged tip, deeply into the case mouth. Insert assembly into firearm chamber, then slide bullet adjustment rod (plunger) forward until contact with the rifling is felt. Lock adjustment rod in place with thumb screw. The bullet will most often "stick" to the rifling. To remove the O.A.L. Gauge assembly intact, gently push the assembly out, using a wooden dowel or cleaning rod inserted from the muzzle.

We recommend using no more than 3 or 4 lbs. pressure on the bullet adjustment rod (about that of a light trigger pull). Then, gently tap the bullet adjustment rod with your index finger to ensure the bullet is in light contact with the lands. **The most preferred method is to use the bullet adjustment rod in one hand and a wooden dowel inserted through the muzzle in the other hand, "sandwiching" the bullet. This allows a positive feel as the bullet contacts and releases from the rifling.**

Remember to use the same pressure or "tapping technique" on the bullet adjustment rod each time you use the tool. Keep in mind that you can "drive" the bullet into the lands as much as .025" by using excessive pressure or a "heavy-handed" approach. The key is to find a relatively light, yet positive "touch point" of the bullet's ogive with the origin of the rifling. It is from this "touch point" that adjustments can be made in bullet seating depth.

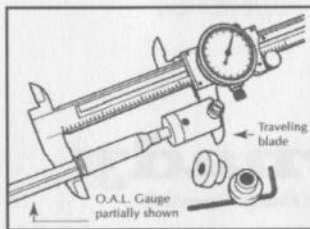


This illustration shows the variable relationship of the bullet to the bore. Chamber pressure, accuracy and firearm function can be affected by changes as small as .005" in free-travel.

When removing the O.A.L. Gauge assembly from the chamber, oftentimes the bullet will slip out of the case mouth. There is no need to repeat the procedure; simply replace the bullet into the case-neck, where the bullet adjustment rod remains correctly positioned.

With the O.A.L. Gauge in hand, you are now able to measure the maximum overall cartridge (max. O.A.L.) that will fit your firearm with the selected bullet. Place the fixed blade of your caliper in the measuring port on the O.A.L. Gauge, then ease the traveling blade against the bullet tip. Remove all slack, then take a reading. Record data for future use.

With the maximum O.A.L. now known, you can produce loads of the same length or shorter, using your caliper and bullet seating die. Simply compare the O.A.L. Gauge round with the initial rounds produced by your seating die, as you adjust the seating die's stem. The rounds produced should be made **shorter** by the desired bullet free-travel; typically .020" to .040".



We strongly recommend the use of a Bullet Comparator (compare-a-tor). A comparator allows measurements to be taken from the bullet's ogive instead of the bullet's tip, providing a much more reliable measuring surface. A comparator is essential when seating bullets closer than .020" from the rifling, as bullet tips may vary considerable (as much as .020"). The Hornady Lock-N-Load™ Bullet Comparator is ideal for use with the O.A.L. Gauge. It is designed to properly align the O.A.L. Gauge and bullet ogive on your caliper, allowing precision measurement and ease of use (see instructions furnished with Bullet Comparator).

USE COMMON SENSE WHEN SELECTING A BULLET SEATING DEPTH. We recommend a free-travel (clearance) of .020" to .040" between the bullet and rifling lands for hunting rounds. In

our experience, excessive bullet free-travel (over .040") will most often result in a loss of accuracy. However, each gun will have its own preference, and it is up to the handloader to determine the optimum bullet free-travel by range testing the loads. There are no short cuts in this area. However, once the optimum free-travel is determined with one brand of bullets, this same free-travel dimension will most often be preferred with other bullet brands or weights. Remember, if other bullet models or weights are chosen, they will have differently shaped ogives, which will require that you repeat the O.A.L. Gauge process with the new bullet.

While not absolute, there are several reasons for our free-travel recommendation: (1) A more uniform chamber pressure is produced to start the bullet down the bore. This reduces pressure "spikes" resulting from an interference fit. The result is a more uniform velocity which produces accuracy. (2) As the bullet is aligned in close proximity to the rifling, it will stabilize quickly as it exits the bore. (3) Safety and reliability; a .020" to .040" free-travel produces reliable feeding and extraction.

CAUTION ... Often-times benchrest shooters, competitive shooters, and varmint hunters will seat bullets closer than the above suggested free-travel in an effort to gain a more accurate load. Use caution if you do so. This should only be attempted by experienced handloaders ... those familiar with the results of this practice. A Bullet Comparator is required to measure such rounds as the variation in bullet tips will produce inconsistencies in length dimensions, which may cause an interference fit with the rifling. This, in turn, can produce substantially higher (excessive) pressure with the loads you may presently be using. Also, the bullet may become jammed in the rifling which could pull the bullet from the case when unloading a round from the chamber. Remember, seating bullets without free-travel ("on" the rifling, or "into" the rifling) will require that you develop a new load with reduced powder charge, then work up, or down, until you develop a load that is both accurate and safe. If in doubt, recheck dimensions, or obtain capable assistance. Consult reloading manuals for proper data and reloading practices.

The above being said, it's doubtful that loads "on" or "into" the rifling will result in accuracy improvements with hunting guns. Instead, we feel they will result in a loss of accuracy. This is due, in part, to the variable chamber pressures required to start bullets down the bore when the bullets have an interference fit. Our belief is that some free-travel is always required to produce an accurate load.

PROBLEM RIFLES. Some firearm magazines will not accept rounds loaded to an O.A.L. as suggested by the rifling. In this situation, some hunters will load a few rounds as determined by the O.A.L. Gauge, chambering these loads only for the first shot. The backup rounds are loaded to lengths as required by the magazine.

Some firearms (new or used) have excess freebore conditions which will not allow bullets to be seated near the rifling, as the bullet exits the case mouth before contacting the lands of the rifling. This may be due to the manufacturer's chamber throating practices, cartridge or bullet design criteria, or the manufacturer's viewpoint on freebore. Also, barrels become "shot out" or "throated" after considerable use.

Some of the foregoing may be due to the firearm manufacturer's need to fit a wide variety of bullet models and weights into the barrel. We have no control over this (we don't build the guns) and cannot resolve these situations—only identify them. Some alternatives to excessive freebore are: a change in bullets (brand, weight, style, or ogive shape), re-chambering the barrel or re-barreling the gun.

Remember that as the barrel's throat erodes from firing, accuracy will diminish. To restore accuracy, you should seat the bullets longer, to match the erosion, using the O.A.L. Gauge.

CAUTION ... After using the O.A.L. Gauge, always check the bore and remove any obstructions before firing.

See readily available MODIFIED CASE listing on back panel.