Headspace Gauge Manual

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1. Introduction

This manual provides a description of Oregon Gauge Company's headspace gauges, and instructions for using them.

Headspace is, essentially, a measure of how well a cartridge fits into a rifle's chamber. With modern, high-powered cartridges, headspace is an essential concern. Rifles with excessive headspace are very dangerous. Such rifles can easily backfire, causing injuries and in some cases, fatalities. Insufficient headspace is not as much of a concern since the cartridge will not even fit into the chamber.

Since headspace is not a concern for people who load their rifle with factory-made cartridges of the correct caliber[1], this manual is intended for those people who need to be concerned about headspace (gunsmiths, handloaders, and other advanced gun users).

2. Gauge Description

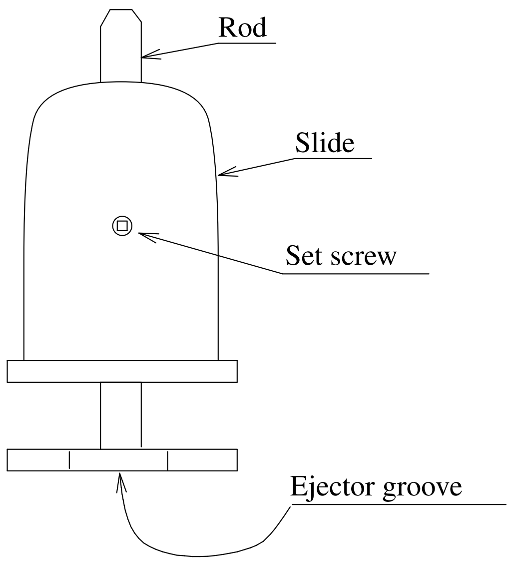
Figure 1 shows the construction of Oregon headspace gauges. These gauges have 4 major components:

- The slide
- The set screw
- The rod (headpiece)
- The ejector groove

The slide

The slide is a cylindrical piece of soft steel with either the front or the rim machined to the same size

Figure 1. Oregon Headspace Gauge Components



[1] P. O. Ackley, *Home Gun Care and Repair*, Stackpole Books: Harrisburg, PA, 1969

as the front of the chamber. It also has a hole down the center for the rod, and a threaded hole on the side to hold the set screw.

The set screw
: The set screw is a 4-40×3⁄32 allen head screw. Its purpose is to maintain tension between the slide and the rod. The tension between the rod and the slide prevents the slide from moving other than by force. Since the set screw is harder than the gauge, a piece of lead shot is put between it and the rod as a cushion. This lead shot prevents the rod from being scratched, and smooths the movement of the slide.

The rod (headpiece)
: The rod is a steel shaft with a wider, cylindrical base (shaped the same as the bottom of the corresponding cartridge). It is made of the same steel as the slide.

The ejector groove
: The ejector grove is a semi-circular cut in the base of the rod. The ejector grove is present so that spring or plunger type ejectors will not have to be removed from rifles which have them.

Conclusion

Oregon gauges may be placed into a rifle's chamber like a cartridge. When the bolt is closed, the slide is forced to move according to the headspace. The gauge is then taken out and measured, providing an accurate headspace measurement.

Since both the slide and rod are made of a softer steel than rifle chambers, the gauges will not damage the rifle's chamber. **However, the set screws are much harder and could, if left extended too far, damage the the rifle's chamber.**

Oregon headspace gauges have a number of advantages over current methods of measuring headspace.

Accuracy
: The current methods of measuring headspace require that you have 3 gauges per cartridge.

  - If the go gauge fits, headspace is at or above the minimum.
  - If the no-go gauge fits, headspace is at or above maximum.
  - If the field gauge fits, the rifle has excessive headspace.

  However, this method does not indicate the exact headspace, it merely indicates the range. Unlike the current methods for measuring headspace, Oregon headspace gauges will give an exact headspace. However, this will require the possession of, and the ability to use, a micrometer. The accuracy of micrometer (and the skill of its user) will determine the accuracy of the gauges. Even if high quality dial calipers are used, the measurements will still be more accurate than the current methods of measuring headspace.

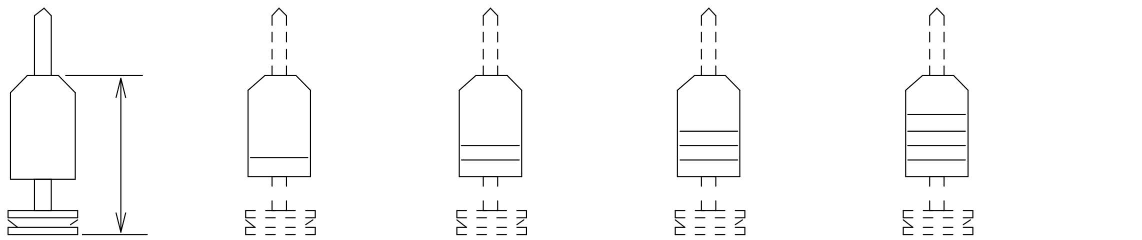
Speed
: Current methods of measuring headspace requires the rifle to be disassembled before measuring. This can be quite a time consuming task. Oregon headspace gauges require only that the chamber be cleaned, not that the rifle be disassembled (except in the case of rimmed with a plunger ejector), therefore saving time.

Flexibility
: Current methods of measuring headspace have no way of determining how undersized the chamber is when cutting a new one. Oregon headspace gauges will allow you to read the exact headspace, whether it is over or under sized.

3. Rifle Cartridges Covered By Oregon Headspace Gauges

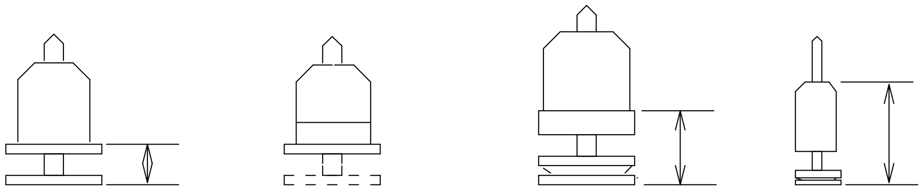
The following tables show which gauges are for which cartridges. Grooves differentiate slides that are used with the same rod. Gauges with rods drawn with dotted lines use the same rods as the gauge to the left.

Rimless



No groove	1 groove	2 grooves	3 grooves	4 grooves
.25-06 Rem.	.243 Win.	.257 Roberts	.250 Savage	.22/250 Rem.
.270 Win.	7mm-08 Rem.	7×57mm Mauser		
.280 Win.	.308 Win.	8×57mm Mauser		
.30-06 Spfd.				

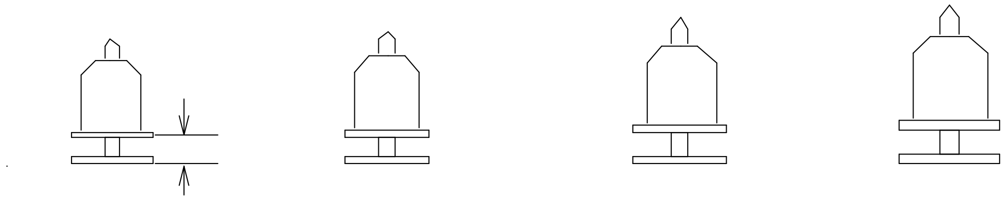
Rimmed | Belted | Rimless



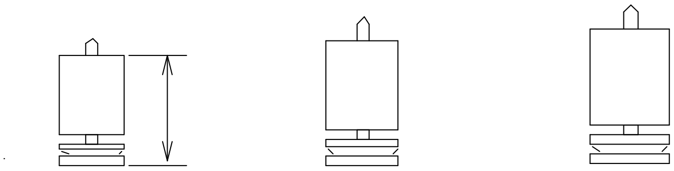
No groove	1 groove	No groove	No groove
.219 Zipper	.356 Win.	.257 Wea.	.17 Rem.
.22 Hi power	.307 Win.	.264 Win.	.221 Fireball
.25/35 Win.	.444 Marlin	6.5 Rem.	.222 Rem.
7mm-Waters		.270 Wea.	.222 Rem. mag.
.30/30 Win.		7mm Rem.	.223 Rem.
.32 Win.		7mm Wea.	
.32/40 Win. & Ballard		.300 H&H	
.38/55 Win. & Ballard		.300 Wea.	
.375 Big Bore		.300 Win.	
		8mm Rem.	
		.338 Win.	
		.340 Wea.	
		.350 Rem.	
		.375 H&H	
		.416 Rem.	
		.458 Win.	
		.244 H&H	
		.275 H&H	

4. Pistol Cartridges Covered By Oregon Headspace Gauges

The following tables show which gauges are for which cartridges.



.38 Spec. .357 Mag. .357 Max. .22 Jet .256 Win.Mag.	.41 Mag	.44 Spec. .44 Mag.	.45 Colt(long) .45 Auto. Rim.



9mm Par. 9mm Win. Mag.	10mm Auto. Colt	.45 ACP .45 Win. Mag.

5. Equipment List

To measure headspace with Oregon Headspace gauges you will need:

- Oregon headspace gauges
- An allen wrench (included)
- A micrometer (or dial calipers)
- Lead shot #9 (or #12 in .222 gauge)

6. Instructions

Measuring headspace with Oregon headspace gauges requires some practice. Therefore do not rely upon measurements until you have gone through this procedure several times.

NOTICE
Oregon Gauge Company can not be held responsible for Measurement errors.

6.1. Preparing the Chamber & the Gauge

1. Clean and lightly oil chamber and bolt head. If the rifle is rimmed and has a plunger ejector (for example, Model 90 Win. or Model 788 Rem), remove the ejector.
2. Select the proper gauge according to the chart in Section 3.
3. Take the set screw out.
4. Place a #9 (or #12) lead shot in the set screw hole
5. Replace the set screw, making sure the the slide moves freely.
6. Move slide to a length of .020" to .030" more than the maximum length of the chamber being measured.
7. Tighten the set screw to cause enough drag so that the slide can be moved with a little effort, but will not move on it's own. Getting the proper amount of drag will take some practice.

6.2. Measuring the Headspace

CAUTION
Make sure the set screw does not protrude from the slide. The rifle's chamber could be scratched otherwise.

1. Insert gauge into the chamber, making sure that the ejector groove is lined up over the rifle's ejector, if it has one.
2. Close action. If difficult, the set screw is too tight, loosen it slightly and try again.
3. Open the action and remove the gauge.
4. Measure the gauge at proper points to obtain the headspace. See Appendix A.

7. Maintenance of Gauges

The #9 (or #12) lead shot under the set screw should be replaced after every fifth or sixth use, and the rod cleaned with steel wool.

Like other headspace gauges, Oregon gauges should not be allowed to get damaged. If this happens you may get inaccurate results.

Headspace Specifications (rifles)

This appendix gives the headspace specifications (in inches) for the cartridges covered by Oregon headspace gauges.

Oregon Gauge Co. cannot be held responsible for typographical errors contained in this table. For authoritative figures consult Sporting Arms & Ammunition Manufacturers Institute (SAAMI) P.O. Box 1075, Riverside, CT 06878.

Belted			
Cartridge	**go**	**no-go**	**field**
.244 H&H.	.220	.225	.227
.257 Wea.	"	"	"
.264 Win.	"	"	"
6.5 Rem.	"	"	"
.270 Wea.	"	"	"
.275 H&H	"	"	"
7mm Rem.	"	"	"
7mm Wea.	"	"	"
.300 H&H	"	"	"
.300 Wea.	"	"	"
.300 Win.	"	"	"
8mm Rem.	"	"	"
.338 Win.	"	"	"
.340 Wea.	"	"	"
.350 Rem.	"	"	"
.375 H&H	"	"	"
.416 Rem.	"	"	"
.458 Win.	"	"	"

Rimmed			
Cartridge	**go**	**no-go**	**field**
.219 Zipper	.063	.067	.070
.22 Hi power	"	"	"
.25/35 Win.	"	"	"
7mm-Waters	"	"	"
.30/30 Win.	"	"	"
.32 Win.	"	"	"
.32/40 Win. & Ballard	"	"	"
.38/55 Win. & Ballard	"	"	"
.307 Win.	"	"	"
.356 Win.	"	"	"
.375 Big Bore	"	"	"
.444 Marlin	"	"	"

Rimless			
Cartridge	**go**	**no-go**	**field**
.17 Rem.	1.3785	1.3845	1.3885
.221 Fireball	1.1038	1.1098	1.1138
.222 Rem.	1.2936	1.2996	1.3036
.222 Rem. mag.	1.4925	1.4985	1.5025
.223 Rem.	1.4636	1.4696	1.4736
.243 Win.	1.630	1.636	1.640
7mm-08 Rem.	"	"	"
.308 Win.	"	"	"
.25-06 Rem.	2.0487	2.0547	2.0587
.270 Win.	2.0487	2.0547	2.0587
.280 Rem.	2.100	2.106	2.110
.30-06 Spfd.	2.0487	2.0547	2.0587
.257 Rem.	1.7937	1.7997	1.8037
7mm Mauser	1.7947	1.8007	1.8047
8mm Mauser	1.896	1.902	1.906
.250 Savage	1.5792	1.5852	1.5892
.22/250 Rem.	1.5749	1.5809	1.5849

Headspace Specifications (pistol & carbine)

Rimmed			
Cartridge	**go**	**no-go**	**field**
.22 Jet	.060	.066	.070
.256 Win. Mag.	.061	.065	.068
.38 Special	.060	.070	.074
.357 Mag.	"	.066	.070
.357 Max.	"	"	"
.41 Mag.	"	"	"
.44 Spec.	"	.070	.074
.44 Mag.	"	.066	.070
.45 Colt (long)	"	.070	.074
.45 Auto. Rim.	.090	.100	.104

Rimless			
Cartridge	**go**	**no-go**	**field**
9mm Par.	.754	.762	.776
9mm Win. Mag.	1.160	1.168	1.172
10mm Auto Colt	.992	1.000	1.004
.45 ACP	.898	.914	.920
.45 Win. Mag.	1.198	1.206	1.210