

Load Development: Ladder Test Method

June 3, 2020 by [AJ](#) [5 Comments](#)

As mentioned previously, there are three main methods to use to develop a load for your rifle, they are the OBT (optimal barrel time) method, the OCW (optimal charge weight) load development method and then our preferred method based on efficiency of ammunition use and simplicity of determination, the ladder test method.

In this article we will share with you how the ladder test method, also sometimes called the sweet spot method, works, and the steps to follow to develop a accurate load for you rifle using this method.

If you load from your min to max range across the spectrum, you always see two sweet spots. I always use the highest one only because the shooting discipline I do has unknown distances, and I have to estimate the distance, that's why I want to shoot as flat as possible, and use the higher sweat spot. In many cases, the lower sweat spot is more constant in variable atmospheric conditions, as it is not near a point where your pressure levels can make a sudden upward curve due to very high temperatures.

Method:

Very important. In order for you to do accurate load development, the test must be shot over a [chronograph](#) and the speed of each shot must be recorded.

If you have no idea where your sweatspot is in terms of load and speed, you should start about a 1/4 above your minimum load. Suppose your minimum is 39gr, and max is 43gr, you should start at 40gr and increase your load with 0.2gr increments to maximum, loading only 1 cartridge at each load weight increment.

You then shoot these cartridges at a minimum of 300 yards, and mark the shots from shot 1 to the last shot on the target.

If however you have an idea of where your sweatspot is in speed, you should start at about 1.0gr below your expected load and load only 1 cartridge at that specific load weight, then load in 0.1gr increments from load 1 to max load.

Again you shoot at minimum 300 yards and again mark your shots on target from shot 1 (min) to the last shot (max).


It is very important to shoot this test when there is no mirage, early morning, or late afternoon. You should also shoot the shots fairly quickly after one another to prevent to great variance in conditions from affecting your result. This one time your barrel is fired until a little hot will not notably damage your barrel, and you will get a much better end result.

How you mark your shots 300 yards away from you when shooting in quick succession can seem tricky, but there is a easy method, read about it on [this link](#).

There are now two things to look at, minimum vertical spread between 5 consecutive shots, and where your measured speed also shows a flat spot (as in, where two or more shots at increasing loads, stay at around the same speed). Usually the shots where the holes are close to each other on a vertical band, and the flat spot between the shots' speed, are the same shots.

Take a look at this ladder shot with a 6.5mm Creedmoor caliber from a Tikka rifle with 139gr Lapua Scenar bullets. The increments were 0.1 gr.

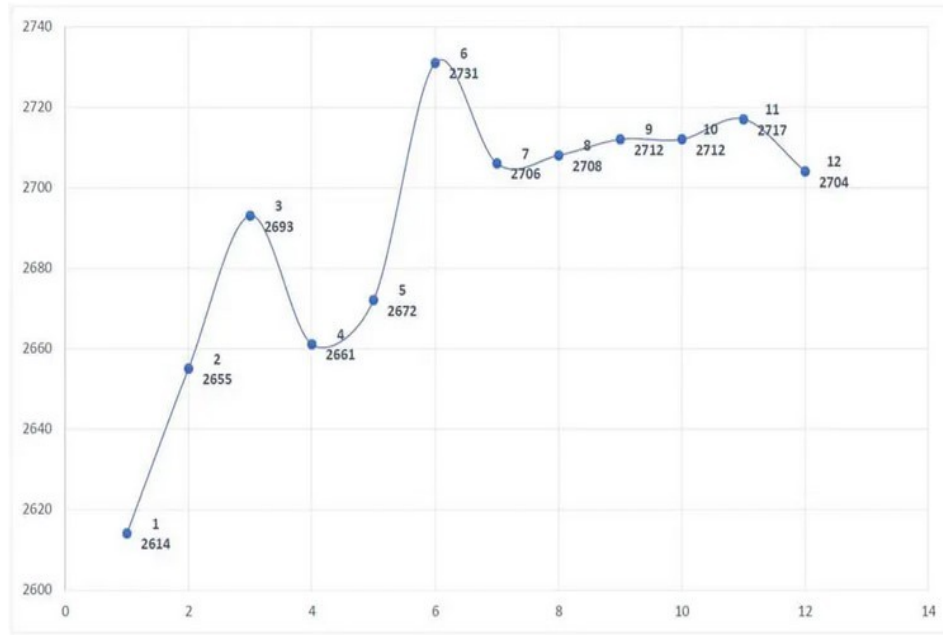
Note that from shot 8 to 12 differ with less than a 1/4 inch in height (vertical spread). Ignore shot 10 which sits slightly higher and consider it human error.

- | | |
|--|--|
| <ol style="list-style-type: none">1. 41.5grn – 2614 fps2. 41.6grn – 2655 fps3. 41.7grn – 2693 fps4. 41.8grn – 2661 fps5. 41.9grn – 2672 fps6. 42grn – 2731 fps7. 42.1grn – 2706 fps8. 42.2grn – 2708 fps9. 42.3grn – 2712 fps10. 42.4grn – 2712 fps11. 42.5grn – 2717 fps12. 42.6grn – 2704 fps |  |
|--|--|



Now look at the speed of those 5 shots, and you will see that the total extreme spread is only 9 fps. This indicates a clear flat spot, even with a 0.5gr difference in propellant from shot 8 – 12. Also look at shot 10 which we considered to be human error and see that it also lies exactly in the flat spot, and therefore can be considered human error, and still be used in the test.

So clearly our sweet spot lies between the loads of shot 8-12. We then take the middle load, namely: load 10 and use it as our chosen load. The reason you take the middle one is because it is the load that lies in the middle of the sweetspot. The highest load, ie: shot 12 now simulates a typical hot day where your pressures are higher, and load 8 alternatively simulates a cold day, or a day when the air pressure suddenly drops, but still your load is shooting at the same height.



Flat spot or sweet spot clear when drawn on a graph.

Now that you have your load, you can get your groups smaller by experimenting with seating depth, and jump of your bullet. Load some of them deeper, and others closer to the lands and see where you get the best groups. Congratulations, you have developed a suitable load for your rifle.

We would love to hear your feedback on how the method works for you, or how you feel it can be improved on.

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Load Development: Marking Your Shots

June 5, 2020 by [AJ](#) [1 Comment](#)

When using the ladder method of load development, it is crucial that all the shots are shot in quick succession, during the same session. This is done, to ensure similar environmental and other changing conditions for all the shots, in order to obtain a consistent result and accurate difference. The other problem with this, is that for the ladder method to work effectively, you need to ensure that the hole on the target is matched to the correct charge load cartridge that was shot, so as to know which ones provided you the desired result.

This sounds simple enough, except for the fact that you are 300 yards away from your target, so it is not practical to run 600m between each of the 12 or more shots and mark each one.

The old method we used to do, was having someone else hide behind a gravel mound or wall, downrange close to the target with a two-way radio, and the shooter would clear the rifle after each shot, radio the other person to go to the target and mark the shot, and then chamber and shoot the next round as soon as that person downrange is safely hidden again. This can still work, but only if you have a buddy with you, and if you have a two-way radio.

Nowadays, it is much easier with the advent of technology, and we use the [Longshot target cameras](#),

which makes it much quicker and easier, and you get real-time feedback right next to you as you shoot on your tablet or smartphone screen, and you can mark each shot and keep the marked image of the target for later use and reference.

Not only for ladder test load development, but even for long range target shooting to check you hits, or to true your DOPE, the top of the range model has a 2 mile reach, truly remarkable.

It is a purpose built camera that connects with Wi Fi to your phone or tablet so you can see your target and shots on it and can tag every shot on your phone or tablet screen. It saves a lot of time and allows you to shoot the ladder effectively before the conditions change. With this camera you can shoot multiple guns during the same session with a ladder test.

This image is one where I tagged the shots on my phone, so excuse the low smartphone image quality, it is much better on newer smartphones and tablets.

