

Feal Suspension Damping Adjuster Tech

So you purchased some super sweet coilovers that claim 24 clicks of damping adjustment, or even 32 clicks! Wow, sounds like so much control of vehicle dynamics at your finger tips right?

If you opted for some budget coilovers, chances are those clicks are not doing what you would expect. We grabbed some readily available low cost coilovers, strapped them into the dyno, and ran through the range of damping adjustment. We tested some really low budget units to find that the damping adjusters literally did not adjust anything past the first couple of clicks. But for this educational segment we will not even waste time with the bottom of the barrel shocks. Let's look at some coilovers that you actually may be tempted to buy, because your buddies homie said they go hella low.

First, let's look at the damping adjuster technology that we at Feal Suspension have been perfecting over the last decade of continuous improvement. Here is what a Feal 441 shock looks like every 3 clicks of damping adjustability. The blue line is full stiff, green 3 clicks out, yellow 6 clicks out, and so on.

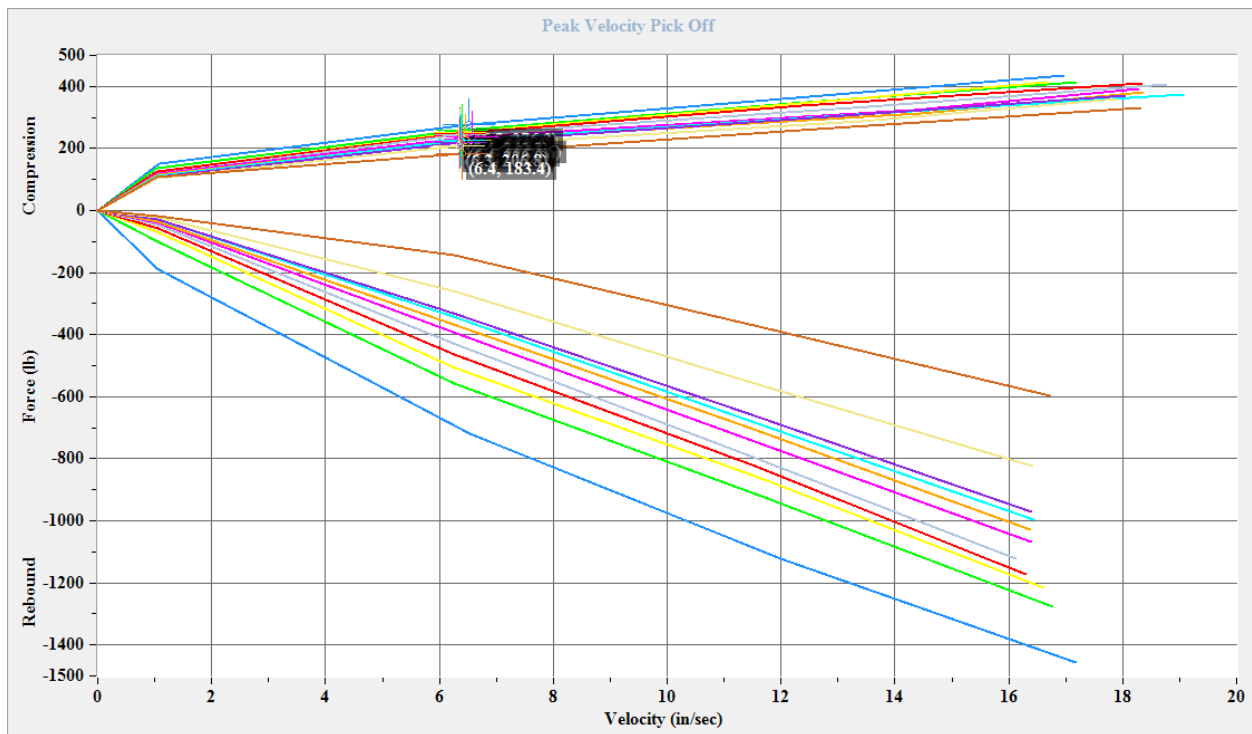


Figure 1. Feal 441 0 - 30 clicks, every 3 clicks

The reason you can adjust Feal coilovers with predictability and precision is because each click is an incremental difference in damping force. Basically, when you adjust one or 3 clicks at a time, even if you are over half way of the adjustment range, the shock gets firmer or softer in the same increments you expect it to. Well isn't that how it is supposed to work? Yes, but it is rare to find this precision and technology in lower cost coilovers.

Here is a dyno plot of every 3 clicks of adjustment from a lower cost brand that you may be tempted to buy. Blue is full stiff, green is 3 clicks out, yellow is 6 clicks out, and so on.

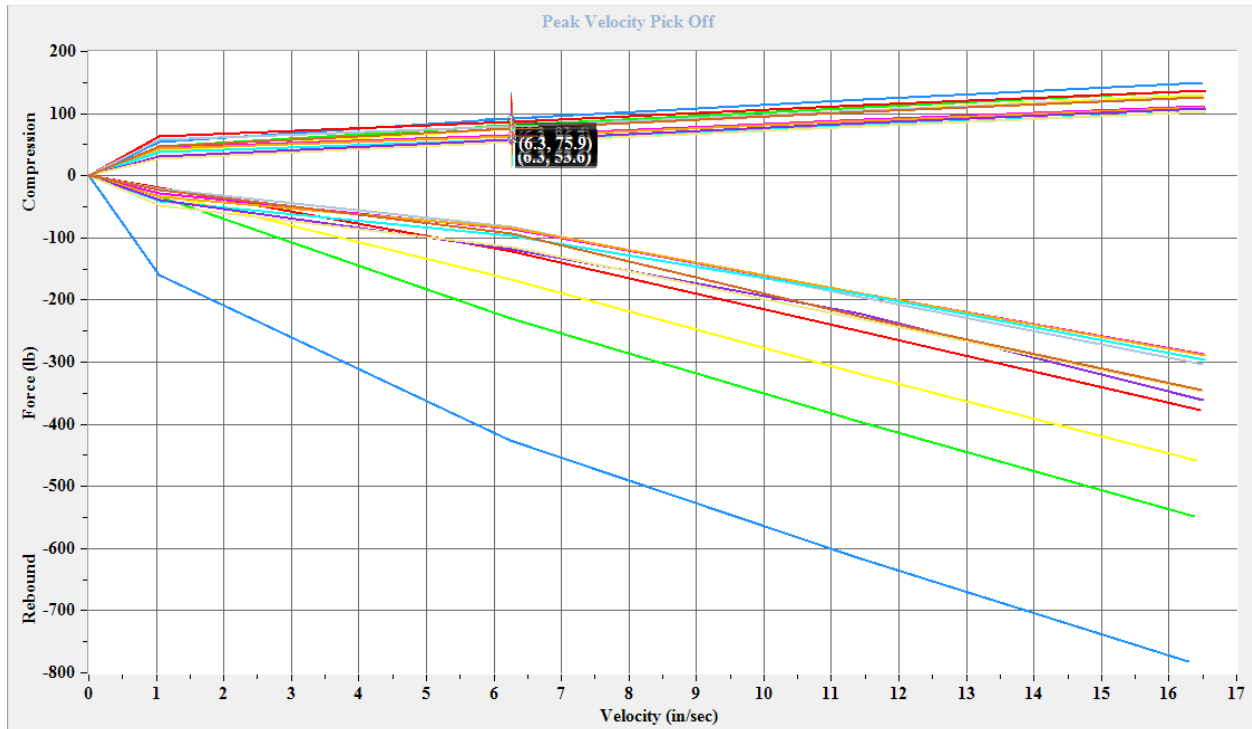


Figure 2. "Other Brand" 0 -30 clicks, every 3 clicks.

By the time you click out 6 clicks you are over half way done with the adjustability of the shock! And 9 - 30 clicks barely make a difference at low to mid shock shaft speeds. Basically, the first 6 clicks will adjust more than you can wrap your head around, and then 9 clicks on you will get puzzled why nothing is changing.

If you are still reading you are either curious to learn more, or about to flush the toilet and get back to what ever else you were doing. If you want to learn more, let's dig into what is happening after 6 clicks on each coilover. When at full stiff, the Feal and other brand have a nice digressive curve. As soon as you get past 6 clicks on the "Other" brand coilover, the digressive curve disappears and the curve starts to get progressive.

We see this all the time and worked hard to keep our shocks digressive and linear for the majority of the adjustment range (for most applications where digressive or linear is desired). This is achieved by not only designing a proper adjuster mechanism, but also tuning the rest of the shock to flow fluid precisely.

At the end of the adjustment range, you will notice the other brand coilover starts to not make a difference in damping force. The Feal coilover does the exact opposite. We figured if you are maxing out the shock to be as soft as possible, let's make it count! We designed by pass routes inside the shock that open up in the last 5 clicks of the adjustability range. We call this network of bypasses the "Comfort Flow Valve". The last clicks of adjustment are intended to drop damping force significantly and allow the shock to hit a low damping ratio.

Comfort Flow Valve

- last 5 clicks (25-30) enable low resistance shock fluid by pass stage.
- Dramatically drops damping ratio to mimic luxury car ride.
- 0-25 clicks remain the same as non Comfort Flow Valve equipped shocks.
- Standard on most Feal 441 and Feal 441+ kits.

How is the Comfort Flow Valve utilized in motorsports?

We run our own race team, so every new part we create is heavily evaluated as a competitive advantage at the track. The Comfort Flow Valve is a great tuning tool when a drastic shock change is required. We have found enabling the Comfort Flow Valve can be a great "wet track" setting, and a way to drastically speed up weight transfer. We are sure there are additional applications your team will find with this increased level of adjustability.

I hope you enjoyed reading about our damping adjuster technology. You should be proud that you learned something new today!

Cheers,

Odi Bakchis

President
Feal Suspension, INC.