



On Road Rear Derailleur Adjustment

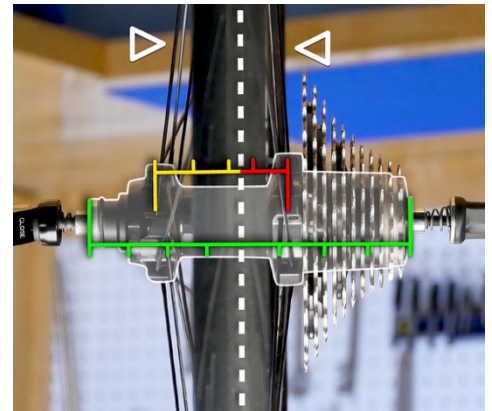
We've all experienced this to some degree, the rattling clacking sound of an upset rear derailleur – and this was going to be such a good day for a ride. What to do? Well let's first look at the function of a typical rear derailleur and then look at an in-the-field adjustment that just might get you out of trouble.

The bicycle derailleur was developed in 1895 by Frenchman Jean Loubeyre, but they were not allowed in racing, the crucible of cycling improvement, until the 1930's. They are at once very simple devices whilst also being devilishly intricate in their details.

So, what can go wrong?

First let's look at two operations/adjustments that are best left to your local bike shop. These are not field service items since many require specialized tools and skills.

1. **Wheel dish.** If you look down from the top of the rear wheel (white arrows right) you will see that the spokes on the gear side are almost vertical from the hub to the rim. The non-gear side are angled from hub to rim. In effect this positions the cassette in relation to chain line. Consequently, if you change out a rear wheel (e.g., winter wheels to summer wheels) the two wheels must be the same dish, otherwise the derailleur will complain bitterly. Normally this is very unlikely to go out of specification except in the case of a crash.



2. **Derailleur Hanger Alignment.** The derailleur hanger on a quality bike will be replaceable. This is done so that, in the event of a crash, the hanger will bend and hopefully save the derailleur. Since these are bolt-on they may not necessarily be correctly aligned for your frame.



In addition, they can become misaligned if you drop the bike down on the drive side – don't do this! Even brand-new bikes can have misaligned derailleur hangers. Again, this normally is not something that just goes out of specification. A technician in a bike shop can correct this in as little as 15 minutes.



Now, there are some adjustments that should normally not go out of adjustment and that should not be touched unless you have some training and experience.

High/Low Limit

These screws are often where the average cyclist will try to solve a shifting problem because they are accessible, but an adjustment error here can have catastrophic results. These screws marked "H" and "L" set the limit of travel of the derailleur, so if the derailleur travels too far inward ("L") can cause the chain to jump off between the spokes and the

cassette – not good! If the derailleur travels too far outward (“H”) the chain can jump off the gear and jam between the bike frame and the small cog. This can gouge a carbon frame – again not good!

“B” Adjustment

The “B” adjustment doesn’t need to be touched unless you have changed cassettes with a radically different array of gears.

Okay, so what can you adjust?

The last adjustment is both the easiest adjustment and the one that most often goes out of adjustment as cables stretch and wear occurs in the cable housing.

Cable Tension

Cable tension is critical for today’s indexed (click-shift) derailleur systems. As a result, we must look at the entire rear gear system to understand the full function from “Brifter” (Brake/Shifter) to the cassette and everything in between.

Except for some rare touring derailleurs, your movement of the right “Brifter” lever makes the downshift (easier) and spring tension from the rear derailleur makes any upshifts (harder). The amount of movement that is required to centre the chain on the cassette gears is controlled by a cogged wheel inside of the brifter. As a result, a 7-speed shifter cannot be used on a 10-speed cassette. In addition, shifters need to be matched to derailleurs because the amount of cable that can be taken up varies between manufacturers and even within brands. If cable tension is not correct there may be too much, or too little tension and shift performance will be affected. Before we get to adjusting cable tension there are a few things that can mess up shifting.

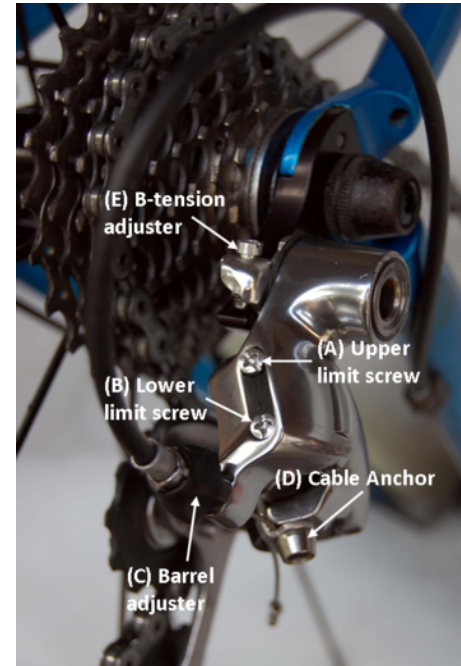
1. Cables can become corroded or dirty inside the cable housing causing “ghost shifting.” You call for an upshift and there is a delay, and then suddenly it shifts because the cable first sticks in the housing, then suddenly releases. The cable needs to be removed and cleaned or replaced.
2. Additional drag can be caused by a kinked cable housing.
3. The inner liner of the cable housing can be worn, causing the cable to run metal-on-metal with the cable housing. The housing must be replaced.
4. Any lubricants used in the system can turn into “varnish” over time, causing excessive drag and shifter dogs to stick and not engage with the shifter cog.

However, that’s not what this article is about. We’re out on a bike ride and we know that our bike is in good repair, but there is that “clacking” noise, and the shifts are not as crisp as they should be – what to do?

Barrel adjusters and in-line barrel adjusters are there for you to be able to adjust cable tension without even getting off your bike in many cases. You can see the two types of adjusters in the images (right and next page). You will find an additional barrel adjuster where the cable enters the rear derailleur (next page).

When the clacking noise occurs, it means that the chain is not centered over the cog of the cassette. The barrel adjuster fine tunes the derailleur position.

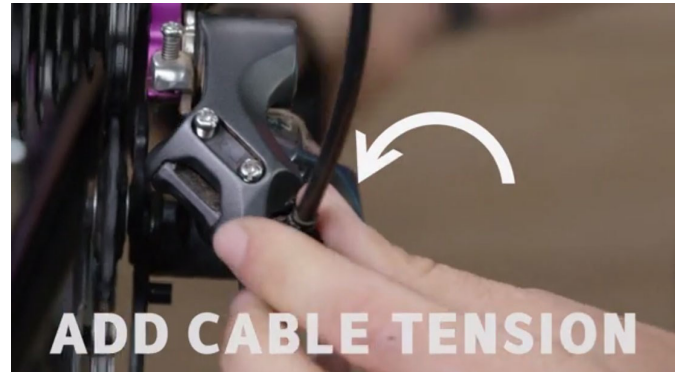
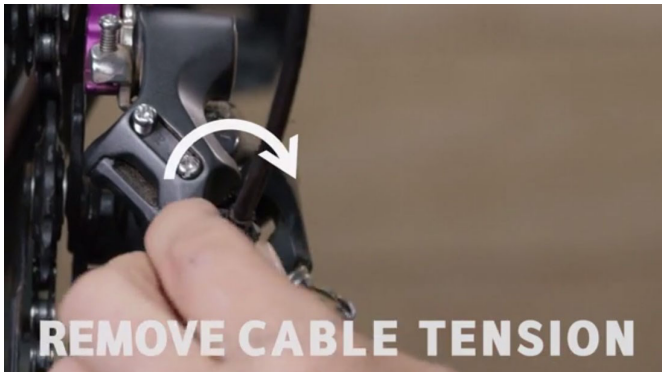
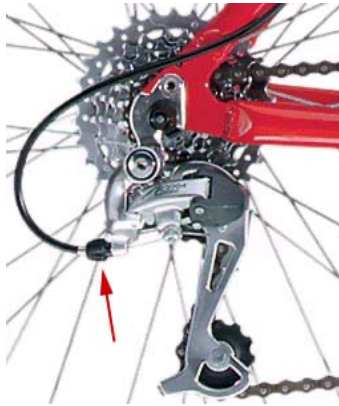
So now the question becomes which way do I turn it? As a reference, a properly tuned rear derailleur will shift the chain one cog for every half revolution of the crankset.



If you find the upshift (harder gear) to be too slow or doesn't quite shift up - cable tension is too high.

If you find that downshifts (easier gear) are too slow or don't quite happen – cable tension is too little.

Looking at the end of the barrel adjuster – tension is increased by turning the adjuster counter-clockwise and decreased by turning the adjuster clockwise. The adjuster shown below is on the derailleur, but the same principle is applied to the downtube or inline adjusters.



Some manufacturers will specify which gear you should be in, to fine tune the derailleur. Campagnolo asks that you shift to the 4th cog (10 speed) or 5th cog (11 and 12 speed) down from top gear (smallest).

Remember that the downtube barrel adjusters are facing away from you. Also, the barrel adjusters have detents so that if you turn the barrel 3 stops one way - you can always count 3 stops back to where you started.

Listen as you make your adjustments – is the drivetrain getting quieter or noisier? If you adjusted the barrel clockwise 2 stops and the noise increases you need to go back 2 stops (where you started) plus 1 stop counter-clockwise – the noise should be less. Continue counter-clockwise until the noise disappears.

All of this of course can usually be accomplished while you are riding the bike and will become second nature the more times that you do it. There really isn't any harm that you can do to the system when adjusting cable tension provided that you didn't touch the high and low limits screws. So go forth and ride, confident that you can adjust your rear derailleur cable tension on-the-fly!