

Getting Cognisant About Gears and Shifting

The cycling industry have thankfully ceased the numbers race when it comes to how many gears can be fitted on a bicycle. The high numbers always appealed to the novice cyclist – more is better right? We are now seeing a well-chosen lower number of gears with simpler drive trains that just plain work better. It must be pointed out that when you purchase a bike there is nothing saying that you have to accept the gears that are installed on the bike. A good dealer should happily change out rear cassettes and front chain rings to accommodate your current strength and abilities. So, gears how do they work and how do you master their use?

One of the first concepts to understand is that anytime that you are shifting gears, whether it is the front chainrings or the rear cassette, moving the chain in towards the centreline of the bike means an easier gear. Conversely, moving the chain away from the centreline of the bike means a harder gear (see diagram 1). Unless you purchased your bike in the U.K. bicycle shifters are always right-side rear derailleur, left-side front derailleur. So, let's start shifting.

“Development” is a term used in understanding the mechanical advantage that a particular gear selection offers. Think of it as how far will the bicycle move forward in one revolution of the crankset. A gear that is perceived as “harder” will move the bicycle further in one revolution of the crankset. A gear combination that is perceived as “easier” will move the bicycle forward less. So, by using the various gear combinations you are able to keep your pedaling cadence in around the 80-90 rpm that is biomechanically efficient, regardless of the terrain or wind conditions.

Think of your front chainrings as giving you a range of gears that you fine tune using your rear derailleur and cassette. Depending upon your fitness and strength you need to assess the terrain and wind conditions (the load) and select an appropriate range of gears that you think you can use to maintain an 80-90 rpm cadence. If your bike has the correct components for your abilities, you should find that you are using the middle cogs of the cassette most of the time. Generally, in rolling terrain and on hills you will be on the smaller front chain ring. When the terrain is flat and/or the wind is at your back you should be on the larger chainring, again fine tuning the range of gears using your back derailleur and cassette. Some other points to keep in mind:

1. Anticipate the workload ahead of time and be sure to be in the correct range of gears to tackle that workload whether its wind or hills. Leaving shifting to the last moment on a hill for example will lead to a loss of momentum, mis-shifts or a chain being dropped. Modern good quality drive trains can shift under excessively high loads, but it isn't pretty and can result in a twisted or broken chain.
2. Avoid cross-chaining – big chainring/big rear cog or small chainring/small rear cog (see diagram 1). This forces the chain to bend laterally excessively and will accelerate wear on the chain and the gears involved. It's usually very apparent because of excessive chain noise.
3. When approaching a stoplight/stop sign gear down to a lower (easier) gear, so that when you start pedaling away from the stop you're not struggling to get on top of a too high (hard) gear or you're fumbling for an easier gear.
4. Treat your drivetrain with respect. When shifting let up just a little on pedal pressure when you make a shift. If you initiate the shift as one or the other foot is at bottom-dead-centre the pedal pressure is less, even if you are practicing your nice round pedal stroke.
5. When shifting down the front derailleur (i.e., to the small chain ring), it is approximately a 20% difference (easier). To avoid the whirling legs scenario, shift up your rear cassette (harder gear) a split second after the front shift is completed – usually about 2 to 3 cogs. The opposite is also true – shifting from the small chainring to the large chainring means a 20% harder gear, so in this case a split second after the front shift has occurred downshift 2 -3 cogs (easier) on the rear cassette. It takes some practice, but it means that you will experience a more seamless transition between ranges

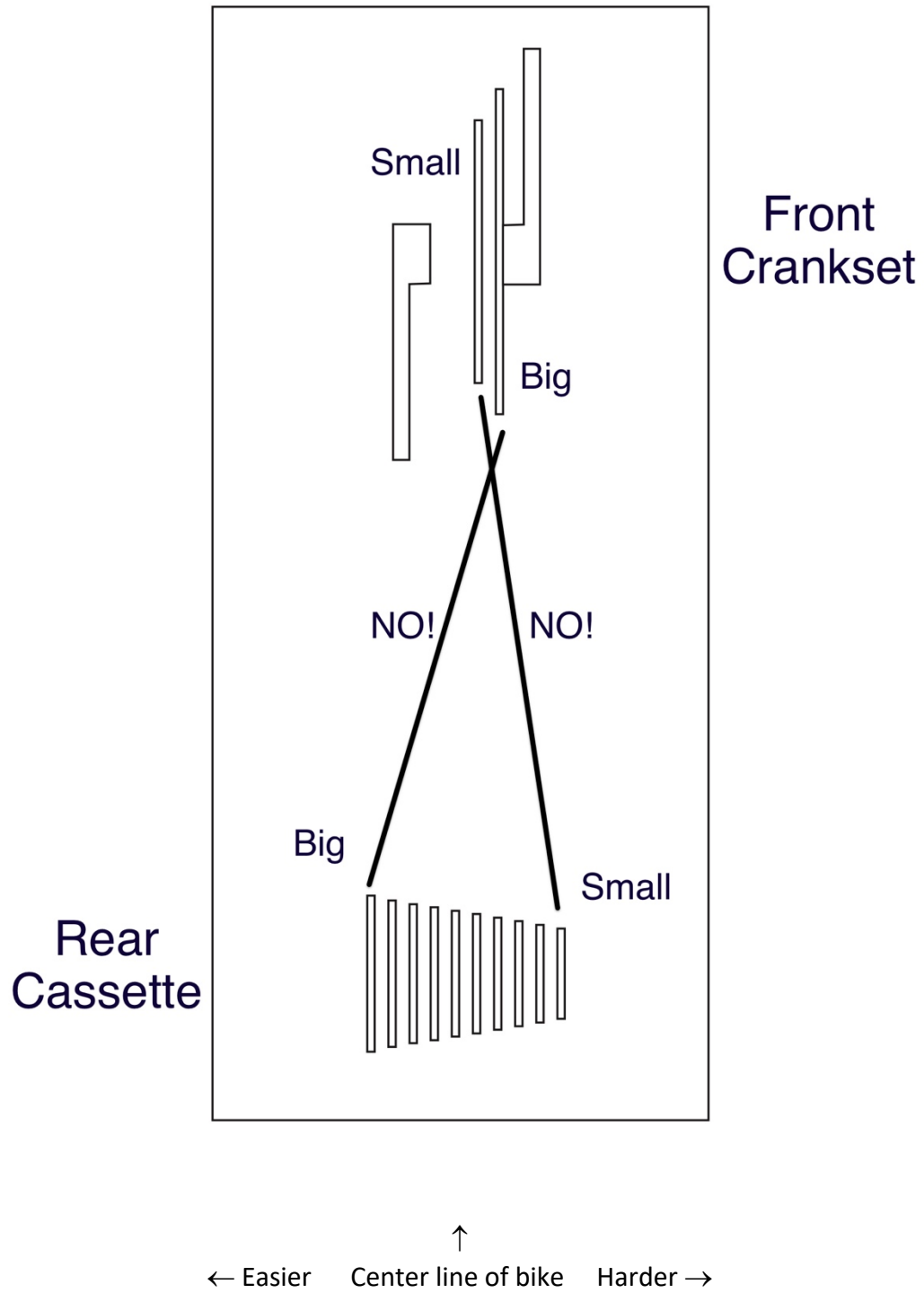


Diagram 1 showing cross-chaining and perceived effort