

It's in Your Hands Now

By Dario Fredrick

In the most recent installment from our precision bike fitting series, [By the Seat of Your Shorts](#), we looked at various aspects of saddle selection and placement, which followed the first article in the series, [Start at the Foot to Reach the Peak Fit](#). Progressing to the final point of the three-contact-points fitting model, we come to the front end of the bike: the handlebars. To simplify the wide array of variations and applications, let's divide handlebars into three main categories: flat and riser bars (mountain bike), drop bars (road, cyclocross & track), and aero bars (time trial & triathlon). Each of these categories in itself deserves a separate article, but rather than go into full detail here, we will examine some of the fundamental differences within each category and touch upon preliminary setup and general fitting characteristics of each.

Flat and Riser Handlebars

Typically found on mountain bikes, but occasionally on road, touring or town bikes as well, flat bars are measured by their length and sweep. Most flat bars come very wide, allowing them to be cut down to the desired width. Sweep variations accommodate different lateral angles at the wrist and range from five to 11 degrees or more. Riser bars are simply flat bars with vertical rise, also coming wide enough to be cut down if desired, varying from as little as 15 mm to as much as 50 mm of rise and more. Riser bars conveniently allow a change in saddle to handlebar drop without altering stem length or angle. Keep in mind that rotation of the bars directly affects both sweep and rise relative to your position.



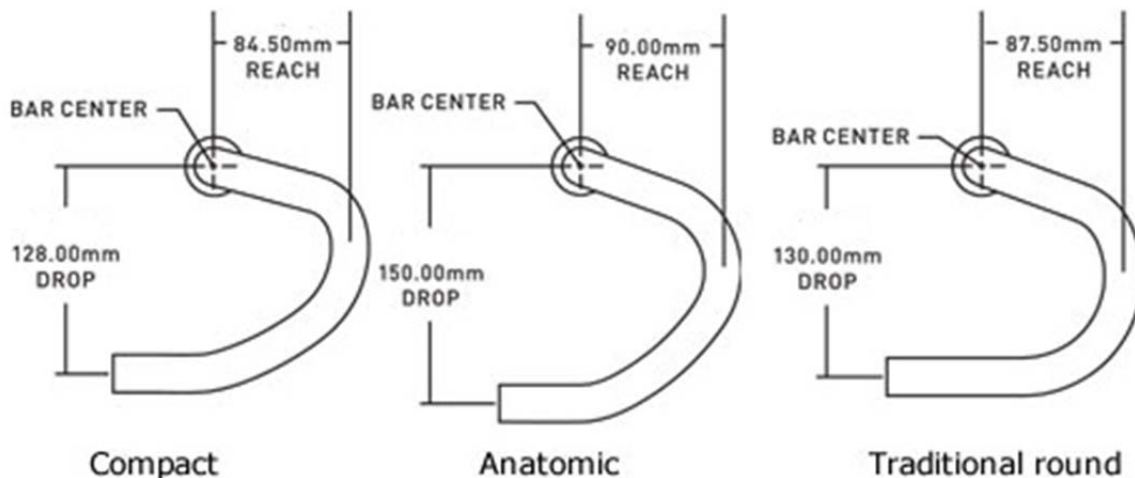
Orientation of the controls (shifter and brake levers) on flat and riser bars is often overlooked, but proper positioning can really improve handling and control. While holding the grips where your hands are most comfortable, you should be able to extend your index finger forward and contact close to the end of the brake lever. If using disc brakes, a single finger is often all you need, and pulling at the far end of the lever provides maximal leverage and power while keeping most of the hand on the grip when descending.

Where do you place the bars to accommodate the appropriate reach and drop/ rise? Assuming your saddle position has been optimized, a *neutral* mountain bike position is one where your torso and arms are approximately 45 degrees to horizontal. This is very general setup, but a safe place to start for many people. The handlebar width selected is highly individual, particularly on the mountain bike. Wider bars can give a bit more stability at higher speeds, but can limit technical handling, especially at slower speeds or climbing. A very general guideline to translating road to MTB bar width would be to multiply

your road bar size by 1.53. Be conservative when first cutting down your bars. You can always cut more, but once they're cut...

Drop Handlebars

Drop bars have evolved quite a bit over the years, but still retain the same general shape. Most drop bars fall into classic/ traditional bend (semicircular curved drops) or anatomic bend (angular or shaped-curve drops) categories. The three primary dimensions of drop bars are width (typically measured center to center), reach and drop. Width should be selected based on your shoulders, matching the center to center width of the humerus heads. Or if you prefer a wider feel, match the bar to your outer shoulder width measurement. Reach is the distance from the center (where the stem clamps) to the forward-most point at the front of the drops, while drop is simply the vertical depth of the drops also measured from the bar center. The shape of the drops can vary considerably and affects the positioning of your hands relative to the levers. The diagram below illustrates different bar shapes – note that actual dimensions vary by model and manufacturer.



To set up drop handlebars, first angle the bars so that the shape of the drops feels best to you and puts your hands in a favorable position relative to the brake lever for descending or cornering at speed. Keep in mind that if you rotate the bars up, it effectively increases the reach measurement of the bar. Then adjust the placement of the shifter/ levers so that the orientation allows both a comfortable position on the hoods and the ability to reach the brake levers from the forward part of the drops. When adjusting the anatomical reach (distance from the saddle to the bars) and handlebar drop from the saddle, be sure that saddle position has first been optimized for pedaling biomechanics then orient the bars relative to the saddle.

Proper positional/ anatomical reach and drop for the bike are highly specific to the rider. The only rules of thumb are to be sure that the position on the lever hoods is your primary, go-to position, and can be maintained without strain or difficulty. Arms should have a slight bend at the elbow (never locked) and shoulders should be allowed to relax. There should certainly be some weight into the hands, necessary

for proper handling and weight distribution, but it should not create excessive fatigue (note that sometimes saddle discomfort is due to an unnecessarily upright posture seeking to avoid any weight on the hands). You should also be able to descend relatively comfortably in the drops, with the ability to reach the brakes without compromising hold of the bars while keeping your head up to maximize visual perception and balance.

Aero Handlebars

Time trial and triathlon positions are very specific and mostly fixed, often challenging the body's limits of flexibility and power. There are myriad options of aero bars and aero fitting is a multi-step process when done right. Nonetheless, we'll touch on some of the very basic aspects of aero bar selection and preliminary set up here.

Aero bars have two distinct segments: the base bar and aero extensions. There are one-piece integrated base and aero bars available, but I don't recommend them until you have perfected your position, as they tend to be virtually non-adjustable. Separate base bar and clip-on aero bar extensions offer much more variability in positioning and aero extensions come in a variety of shapes, ranging from straight to R-bend, S-bend or L-bend (sometimes called ski bend).



S-bend



R-bend



L-bend

Why use an aero bar setup in the first place? Most cyclists are seeking to alter the shape of their body on the bike to minimize air resistance and maximize speed for a given power output, while some use aero extensions for an additional position or added comfort on long rides. Some cyclists simply convert their road bike setup by clamping aero bars to drop bars. To make this work, the drop bars must be aluminum or carbon models rated to allow clip on bars, and the aero extensions need to be fairly short to prevent overly stretching out the front end of your position. Try to keep the angle of your shoulder/torso and elbows both at approximately at 90 degrees, which often means tilting the aero bars upward.



Drop bars with clip-on extensions



Integrated one-piece base/aero bars



Separate base & aero bars

For the more traditional time trial/ triathlon bike setup, the base bar width should be as narrow as the center to center width of your shoulders. Very generally speaking, the aero extensions should allow your elbows to come under your shoulders or close to it, with the elbow angle close to 90 degrees and hands able to hold the bar end shifters. Keep in mind that the shape of the aero bar (e.g. R-bend vs. L-bend) and height of the armrest pads both play a role in the elbow angle. The width of the armrests should be only as narrow as you can maintain without strain and without impeding full breathing at high intensity.

The vertical drop from the saddle to the armrest pads should only be as low as your ability to maintain a controlled pedal stroke, good power - and most important to aerodynamics - allow your head to drop low while looking forward. The high point of the helmet is typically the highest point of a cyclist's aero-profile, and keeping it down is one of the most significant ways to reduce aerodynamic drag.

Getting a Handle on the Right Bar

Most handlebars come in both aluminum and carbon options. Aluminum is less expensive and more durable, while carbon tends to be lighter and can dampen vibration. If selecting a flat or riser bar, consider the width, sweep and rise. The controls, especially the brake levers, should easily accessed without compromising a stable hand position on the grips. For drop bars, recognize the variability in reach and drop dimensions as well as overall shape, making sure they fit your hands well. You should be able to use all of the available positions without difficulty (including the drops) otherwise your fit can be improved. For aero bars, pick the extensions that are most appropriate to optimize your position where you can rest your arms easily and hold the ends without strain while producing good power. With so many bars to choose from, don't settle for less than what works best for your body. The optimal fit is in your hands now.

Whole Athlete founder, [Dario Fredrick](#) brings a unique blend of experience and well-rounded qualifications to the bike fitting profession. With over a decade of experience fitting a multitude of cyclists, a Master's degree in applied exercise science including formal training in biomechanics, 13 years teaching Iyengar Yoga and an accomplished cyclist himself, Dario is uniquely qualified in the fitting world. His fitting philosophy is to work with each individual in a holistic fashion without limits or confines of any one fitting system, formula or tool.