Triathlon Bike Fitting 101: What's So Important About Bike Fit?

With all of the time and money you invest in the sport why limit your performance with a poor cycling position? A professional fit is one of the easiest ways to maximize your abilities and conserve critical energy to make your overall triathlon event as successful as possible. A correct position is the result of your fitter's first compiling several pieces of information: the rider's cycling experience, previous injuries, body size, flexibility, and technique.

Prior cycling experience is a critical factor because it is important to know how long an athlete has been riding in a certain position. Due to our body's adaptable nature it is possible to ride a saddle two inches below optimal, but this will not activate the hamstring and gluteal muscles correctly, and will limit the amount of power generated. Previous injuries, too, can have a huge impact on your cycling position. A broken ankle from 15 years ago can change riding symmetry and result in imbalances. Many imbalances can be corrected or reduced by shimming, tiling, offsetting, etc. An experienced fit specialist will be able to explain which option is ideal for a given circumstance.

Once all the pieces have been put together a correct cycling position boils down to a matter of arranging three contact points between the rider and the bike: 1) where the feet clip into the pedals, 2) where the sit bones contact the saddle, and 3) where the hands/elbows hold the handlebars. The cleats are the only contact point locked into position and changes here can influence the action of the entire leg; seat height and fore/aft position influence the transfer of power between the legs and the pedals; and, aerobar height determines comfort and aerodynamics--but be careful, bars that are too low relative to seat height can decrease power production! For triathletes, these factors are especially important because they must be maintained while trying to get the athlete as low and aerodynamic as possible.

A comprehensive bike fit that includes a dynamic assessment, for instance using a tool like Dartfish video analysis software, can determine if cycling posture and pedaling mechanics need improvement. This software can reveal problems with joint motions and display pre- and post-positions simultaneously using an overlay function that can fade in and out between the two. This software can also determine if changes made to the bike affect technique or dynamic fit, i.e. how an increase in seat height can increase ankle plantar flexion. These changes to form are not always readily apparent visually, but by using slow motion video layback or zooming in on a joint angle it can be very

discernible.

The figure above displays some of the analysis tools of Dartfish. This software can accurately determine joint angles and provides instant feedback to dial in the perfect position. Using these two images we see that this rider is too compact and low on the bike in the pre position (picture on the left). By increasing seat height, moving the saddle forward, and changing the bar position, the hip and knee angles increase at the top of the pedal stroke. This change increases the mechanical advantage and the power he can generate in an aerodynamic position. These changes also brought the arm angle in tighter thereby decreasing the tension and stress on his upper body musculature.

This video analysis tool also allows us to see changes post fit otherwise not obvious with the naked eye. An increase in seat height may cause excessive planter flexion of the foot or reaching of the toes at bottom dead center of the pedal stroke (too much planter flexion is a sign the seat has moved to high, too soon). Trying to see this with the naked eye can be difficult but slowing down captured video or viewing an overlay of pre- and post-positions can make this very detectable.

Minus a pair of Zipp 999s and several thousand dollars one of the easiest ways to increase cycling performance can be acquired in as little as two hours. A proper bike fit is the most overlooked factor in cycling performance and one of the easiest ways to increase speed. In the wrong position, an increase in fitness will not always transfer to increased speed.

Chad Butts | Exercise Physiologist & Cycling Coach
CADENCE CYCLING & MULTISPORT CENTERS
T: 1-8PRO-CADENCE | 212-226-4400
174 Hudson Street | New York City
Please visit us on the web at: www.CADENCECYCLING.com