

## TTIPS VOL. 6/22 - Insights Bike Fit\*

*"I'm no expert, but it seems that the best way to win the Tour de France is to wear a yellow jersey"*

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Greetings fellow KABC riders. To refresh, we have been discussing bicycle "fit," and more specifically, the three points where our bodies are in contact with our bikes - handlebars, saddles, and pedals. In the last two volumes we covered handlebars and saddles. Today, let's talk about shoes and pedals.

If this is the first time you've read TTIPS, let me review my intent. Without a good "fit" you likely will not realize your most comfortable position and most energy efficient posture on your bike. With a poor fit you might even injure yourself, and in any case, you likely will not enjoy your bike as much as you might with a better fit.

Many of us are fit to our bikes by bike shop employees, or we are not fit at all. In my experience bike shop fitters, unless specifically trained, often ignore the finer points of proper fit, including consideration for issues where your body contacts the bike. The three contact points - handlebars, saddles, and pedals - are often the source of hidden fit issues that may never get resolved and thus cause lasting frustration, or worse, cause riders to quit the sport.

OK, with that out of the way let's get into pedals and shoes. You may find some of this surprising.

Let's start with a few points on pedal types. Most of us started riding as children and we used "platform pedals," also known as flat pedals. These pedals are simply a flat platform on which your shoe rests. Flat pedals are great because you can just jump on and ride, with no special equipment. Next there are pedals with toe clips, or "clips" for short. These are pedals that have an attached plastic, metal, or leather strap "toe cage" into which the rider slides the front of their shoes as they mount their bike. Finally, there are "clipless" pedals. Clipless pedals allow a rider with a "cleat" attached to the sole of a specially configured shoe to attach firmly to compatible pedals that hold the shoe in a precise and repeatable position. Ironically, riders that use "clipless" pedals refer to their shoes as "clipped-in" while they are riding. That's right, they are "clipped-in" to "clipless" pedals. It doesn't make complete sense, but just go with it. As you move from platform to clipless pedals, there is a greater degree of mechanical attachment to the bike.

To review, there are flat pedals, clip pedals, and clipless pedals. Why might a rider want or need clipless pedals?

Before we address that question, let's talk briefly about shoes. Riders who use flat pedals or clips usually wear recreational shoes designed for walking, running, or other athletic endeavors. They are secured to the foot with laces or Velcro straps, generally have a great deal of cushion and have extremely flexible soles. In contrast, riders who use clipless pedals usually wear a shoe that is specifically designed for bike riding, is precisely sized, is secured to the foot with adjustable Velcro straps and/or a "boa" wire system and have extremely rigid soles. Boa systems allow the wearer to snug the shoe to their foot to a fine degree.

Now let's address the question of clipless pedals and why might a rider need them. Simply stated, the normally claimed reason for a greater degree of attachment to the bike is that the greater the attachment, the more power the rider can efficiently deliver to the pedals. To a lesser extent, but importantly, greater attachment also enables better control of the bike: this is especially true for off-road riding.

I have done hours of research on this topic. To keep it simple, there are laboratory studies and field studies on the topic. For the sake of brevity, I will boil down hours of research to give you the bottom lines.

Earlier in this article I said that you may find some of this information surprising. So, here it is. In the laboratory, on a stationary bike, there is almost no difference in the amount of energy that any given rider can deliver to the pedals, irrespective of the type of pedal. In the field, however, in actual riding conditions, clipless pedals are more efficient and allow the rider to deliver greater power when seated or standing, sprinting, or climbing. Why are laboratory results different from actual riding conditions?

Some riders believe that clipless pedals are more effective and efficient because the rider can pedal on the upstroke. In volume 1 of this series, however, we showed that pulling on the upstroke with hip flexors is practically not effective in increasing power. The more insightful answer to this question, however, is believed to be related to a combination of laboratory conditions, rider habits, continuous shoe/pedal contact, shoe design, and shoe/pedal position.

**Shoe flexibility:** Shoe flexibility is an important factor. Highly rigid soles allow for greater transfer of energy across the surface of the foot, and less foot muscle fatigue over time (and fewer injuries, by the way). Rider's feet in recreational shoes flex greatly on their pedals, resulting in inefficient power transfer and much greater fatigue in foot muscles.

**Shoe fit:** Precisely fitted bike shoes prevent slipping of the foot fore-and-aft inside the shoe (power loss) during pedal strokes, and thus eliminate power loss.

**Shoe position:** Clipless pedals enable the shoe to be placed precisely, and repeatedly in the exact same position every time the rider clips in. When the rider is properly fit to the bike, this allows the most powerful part of the foot (from an energy transfer perspective, the ball of the foot) to be positioned exactly over the pedal spindle every time and at all times while pedaling. Riders with flat pedals found it difficult in some field conditions, especially when

sprinting, to keep their shoes in exactly the correct position on the pedals which resulted in power loss and greater leg muscle fatigue.

Continuous pedal contact: Third, in field conditions, especially during sprinting and hill climbing, riders with flat pedals frequently lost momentary contact with the pedals repeatedly resulting in accumulated power loss. Also, the riders' feeling that their shoes were less secure compared to their clipless pedals decreased their sense of security/stability resulting in a more conservative/less powerful power stroke.

All that makes a strong argument for clipless pedals. Clipless pedals and cleats, however, are relatively expensive. Some riders don't like the feeling of being mechanically attached to their bikes, and some feel that they can't "unclip" fast enough when stopping. Some riders prefer the convenience of flat pedals. These are all good points.

As always, the purpose of this series of tips and insights is not to prescribe or recommend to you any product or practice. My purpose is only to provide information that you can use to make your cycling choices. I emphasize that you should choose what is right for you and your riding preferences.

That concludes this mini-series on handlebars, saddles, and pedals, and opens the door for broader discussion of bike "fit." We'll get to that in time. Next week we will take a break from the "fit" topic and talk a little about maintenance of one of the most important parts on your bike. That article will be provided by a contributing author, and another fellow KABC member, John Pedigo. Until then,

Make Every Ride Epic,  
Darryl

\*Information in this article is excerpted, in part, from a variety of contributors on the Global Cycling Network (GCN online), and from research performed by Dylan Johnson, rider and cycling coach.