

Pedal Systems for Touring

A positive connection

By Sheldon Brown

Your bicycle's drive train actually begins with your pedals and shoes. There are greater differences among different types of pedals than any other part of the drive train, and as a touring cyclist, your requirements differ from those of other cyclists.

Efficiency and safety are important to touring cyclists, making a "positive" pedal attachment that holds your foot firmly in place essential. Also, because touring cyclists spend more hours on the bike than any other type of cyclist, comfort is a priority for pedals and shoes. And finally, because touring cyclists actually have a destination, touring shoes need to be suitable for walking, as well as for cycling.

Attachment

A shoe that connects positively to the pedal enhances both efficiency and safety. If you use plain pedals, a certain amount of your energy and coordination will be spent keeping the right part of your foot in contact with the pedal. In addition, having your foot slip off of the pedal is one of the

Clipless pedals save you from expending energy on keeping your foot in contact with the pedal.



PHOTO BY GREG SIPPLE

best ways to lose control of your bike.

Toe Clips and Straps. The traditional pedal system for touring was to use metal pedals with toe clips and straps attached. These work with basically any shoe, though most

riders find it more comfortable to ride in a shoe with a fairly stiff sole.

There's a steep learning curve with toe clips; while you can learn to get out of them pretty quickly, it takes a long time and lots of practice to get to the point of being able to clip in quickly and smoothly.

Toe Clips with Cleats. Older racing shoes supplemented the clip and strap with a "cleat" nailed or bolted to the bottom of the shoe. The cleat, usually made of metal or plastic, had a slot on the bottom that would engage the rear of the pedal cage. The cleat would hold the foot in exactly the same position on the pedal every time you rode. If the strap was overtightened, however, you might not be able to get your foot off the pedal without first reaching down and loosening the strap, which made for some awkward moments to say the least. This system is now obsolete, except for track racing. It never was a good choice for touring, partly because of the awkwardness of dismounting, but mainly because the cleats and the pedals designed to work with them were not suitable for walking.

Clipless Pedals. The newer approach to shoes and pedals is to use "clipless" (a.k.a. "step-in") pedals. Clipless pedals also use cleats, but they don't require toe clips or straps. Similar to ski bindings, the cleat of a clipless pedal snaps firmly into the pedal when you step down, positively connecting the foot to the pedal — until you twist your heel sideways to release the attachment.

Clipless pedals are much easier to use than clips and straps, both for entry and exit. In addition, they're much more comfortable. If you've been riding with straps for a while, you've gotten used to it, but you don't realize how uncomfortable the straps are until they're gone. Clipless pedals eliminate the concentrated pressure of the strap on your foot, and allows free circulation of the blood to your toes.

"Road" vs "Mountain" Clipless Systems. The early clipless pedal systems used large, bulky cleats that were designed to attach to racing shoes. These shoes were no more "walkable" than the old-style cleated shoes made for use with clips and straps.

Early mountain bikes took gear and brake technology from touring bikes; the mountain bike movement has returned the favor by creating cleated shoes that also allow you to walk as if you were a normal person! Modern cleat designs, most notably Shimano's widely imitated SPD™ system, use a small metal cleat recessed into the sole of the shoe. This system is so far superior to older systems that it is becoming nearly universal for touring cyclists. It makes it possible to tour with only one pair of shoes for use both on and off the bike, while still having the advantages of a positive, cleated pedal connection. SPD™ sandals are the ultimate in touring comfort, keeping your feet cool and perspiration-free even in the hottest weather.

Pedal Threading

If you travel by airplane with your bike, you'll need to remove the pedals with a 15 mm open-end wrench. There

Which Part of the Foot?

Conventional wisdom dictates that you should pedal with the ball of your foot. This advice is widely repeated, but what is its origin? What is the biomechanical reason for it? I've never seen any studies answering these questions, but the recommendation goes back to the late 19th century.

I have two theories about this subject:

1. If you are wearing soft-soled shoes, the ball of the foot is best suited to take the pressure, while the arch is not normally intended to be a load-bearing part of the foot. Hence, the recommendation. But what if you're wearing stiff-soled cycling shoes? This brings us to:

2. The "high-wheeler" theory: In the 1880s, the high-wheel bicycle was the state of the art. Since bicycles of the era had direct drive, with the pedals attached directly to the driving wheel, the only way to vary the bicycle's "gear" was to use a

larger or smaller wheel.

In practice, the limiting factor in wheel size wasn't how high a gear you could push (typical gearing for single-speed bikes is in the range of 65-75 inch equivalent) but rather how big a wheel you could stretch your legs around and still keep your feet on the pedal at the bottom of the stroke. Back then, the longer your legs were, the higher the "gear" your bike could have.

It turns out that by pedaling on the balls of your feet and pointing your toes, you could ride a slightly larger wheel than you would otherwise be able to straddle. It is my belief that the custom of pedaling on the ball of the foot arose from this, and has stayed with us by sheer momentum.

Following this line of reasoning, I've started setting my cleats as far back in my shoes as they'll go, lowered my saddle a smidgen, and have had no ill effects.

are special wrenches for this task, thinner than average, but with longer handles. Depending on your particular pedals, you may need an actual pedal wrench, or you may be able to use an adjustable wrench. (Note: pack the wrench with your bike, don't take it in your carry-on, or you may have trouble with airport security ... some people can't tell a tool from a weapon!)

Bear in mind that the left pedal has a reverse, left-hand (left-foot?) thread to keep it from unscrewing itself from the crank arm. This can cause confusion as to which way to turn the wrench. The best way to keep this straight is to remember that you must turn the wrench in the backpedaling direction to remove the pedal, and the forward pedaling direction to tighten it.

When it comes time to re-install the pedals, look at the threaded end for a side marking: The right pedal will have an "R" (or "D" if it's French or Italian). The left pedal will have an "L" (or "G" (French) or "S" (Italian.)) Many left pedals also have an extra knurling on the side to make it easier to tell which pedal has the reverse thread.

Cleat Adjustments

Shoe cleats are adjustable in three directions: front-to-back, angle and side-to-side.

Front-to-back Adjustment. Conventional wisdom is to set the cleat so that the pedal axle is directly under the ball of the foot. Many cyclists, however (myself included), prefer to set the cleat farther back. This reduces stress to the Achilles tendon at the back of the heel. (See sidebar: Which Part of the Foot?)

Angle Adjustment. When you ride in plain shoes, your foot naturally finds its most comfortable angle. It is important that you set the cleat to allow the foot to assume this angle. If the cleat forces your foot to a different angle, you are very likely to suffer knee problems. This is the most critical of the three cleat adjustments.

There are elaborate appliances for setting this, but most cyclists don't need this angle, but just pay attention to how

your foot feels as you pedal, and if it seems to be trying to rotate in the shoe, it's a sign that your cleat is set to the wrong angle. Take the time to experiment and get this setting right — your knees will thank you! And note that many people require different angles for their left and right feet.

Left-to-right Adjustment. For most cyclists, it is desirable to set the shoe as far inboard as possible without causing the heel or ankle to strike the crank.

Lube threads. It is very important that the threads and the undersides of the screw heads for the cleats be greased, or at least oiled. You need to make them very tight to keep the cleat securely attached. ●

Sheldon Brown has his own website, loaded with cycling info, together with Harris Cyclery in West Newton, Massachusetts, at sheldonbrown.com/harris