

How to Perfect Your Riding Position & Technique

By Ed Pavelka

Cycling is full of prodigious numbers—the distances ridden, the calories consumed, the tires trashed. Another statistic that can seem astounding is the number of pedal strokes made.

Let's suppose it takes you six hours to ride a century and you pedal at the rate of 90 rpm throughout. As you cross the finish line, you will be making pedal stroke number 64,800.

Whoa, that's a lot! But it barely registers on the scale of what happens during a full season. For example, during the year in which I had my biggest mileage total, I figure that I got there by pushing the pedals around approximately 13,340,000 times.

Can you say, repetitive use injury? You can see why cyclists are good candidates, especially if we aren't pedaling from a nearly perfect position.

Your body and bike must fit together and work together in near-perfect harmony for you to be efficient, comfortable, and injury-free. The more you ride, the more essential this is. If even one thing is out of whack, it's a good bet that it will cause a problem during thousands of pedal strokes.

Fortunately, it isn't difficult to arrive at an excellent riding position. But it does take time and attention. You need to be careful with your initial bike set-up, then conscientiously stay aware of your body and the need for occasional refinements. As time goes by, your position will stabilize and you'll be riding in a smooth groove.

The following guidelines come from my experience and the advice of various experts. One is Andy Pruitt, Ed.D., the director of Colorado's Boulder Center for Sports Medicine. Andy has probably solved more position problems than anyone during his years of work with elite cyclists.

As you work on your riding position, always remember Pruitt Rule No. 1:

“Adjust your bike to fit your body. Don't force your body to fit the bike.”

- **Frame:** Measure your inseam from crotch to floor with bare feet 6 inches apart, then multiply by 0.68. The answer is a good approximation of your road frame size, measured along the seat tube from the center of the crank axle to the center of the top tube. As a double check, this should produce 4 to 5 inches of exposed seatpost when your saddle height is correct. When the crankarms are horizontal, the top tube should be right between your knees when you squeeze them together.
- **Arms:** Keep your elbows bent and relaxed to absorb shock and prevent veering when you hit a bump or brush another rider. Hold arms in line with your body, not splayed to the side, to be more compact and aerodynamic.
- **Upper Body/Shoulders:** Don't be rigid, but do be fairly still. Imagine the energy wasted by rocking side to side with every pedal stroke on a 25-mile ride. Save it for pedaling. Also, beware of creeping forward on the saddle and hunching your shoulders. There's a tendency to do this when pushing for more speed. Shift to a higher gear and stand periodically to prevent stiffness in your hips and back.

- **Head and Neck:** Resist the temptation to put your head down when you're going hard or getting tired. It takes just a second for something dangerous to pop out of nowhere. Occasionally tilt your head to one side and the other instead of holding it dead center. Change your hand location to reposition your upper body and give your neck a new angle.
- **Hands:** Prevent finger numbness by moving your hands frequently. Grip the bar firmly enough to keep hands from bouncing off on unexpected bumps, but not so tightly that it tenses your arms. For the same safety reason, keep your thumbs wrapped around the bar instead of resting on top. Move to the drops for descents or high-speed riding, and the brake lever hoods for relaxed cruising. On long climbs, grip the top of the bar to sit upright and open your chest for easier breathing. When standing, hold the lever hoods lightly and sway the bike side to side in synch with your pedal strokes, directly driving each pedal with your body weight.
- **Handlebar:** Bar width should equal shoulder width to open your chest for better breathing. A bit too wide is better than too narrow. Make sure the hooks are large enough for your hands. Modified "anatomic" curves may feel more comfortable to your palms. Position the bottom, flat portion of the bar horizontal or pointed slightly down toward the rear brake.
- **Brake Levers:** Move them around the curve of the bar to give you the best compromise between holding the hoods and braking when your hands are in the hooks. Most riders do best if the lever tips touch a straightedge extended forward from under the flat, bottom portion of the bar. The levers don't have to be positioned symmetrically—remember Andy Pruitt's rule. If your reach is more comfortable with one lever closer to you than the other, put 'em that way.
- **Stem Height:** Start with the top of the stem about one inch below the top of the saddle. This should give you comfortable access to every hand position. As time goes by, think about lowering the stem as much as another inch (not all at once) to improve your aerodynamics. If your lower back or neck starts complaining, or if you notice you've stopped using the drops, go back up. Never put the stem so high that its maximum extension line shows, or it could be snapped off by your weight on the bar.
- **Top-tube and Stem Lengths:** Combined, these two dimensions determine "reach." Depending on your anatomy and flexibility, your reach could be longer for better aerodynamics, or it may need to be shorter for back or neck comfort. For most riders, when they're comfortably seated with their elbows slightly bent and their hands on the lever hoods, the front hub will be obscured by the handlebar.
- **Back:** A flat back is the defining mark of a stylish rider. Notice I didn't say a great rider. Anatomy and flexibility have a lot to do with how flat you can get. Lance Armstrong, for instance, has a rounded back that's not picture perfect and yet he still manages to go down the road pretty well. The same was true for John Howard, once America's dominant road racer. I'm in their boat (back-wise, not speed-wise). Once you have the correct reach, work on flattening your back by imagining touching the top tube with your belly button. This helps your hips rotate forward. You don't want to ride this way all of the time, but it'll help you get more aero when you need to.
- **Saddle Height:** This is the biggie. You'll find various methods for calculating this critical number. Here's the one I like best. It has become known as the **LeMond Method**, because Greg brought it to us from his Renault team in the 1980s. (Invite a friend over so you can help each other and both wind up with primo positions.)

Begin by standing on a hard surface with your shoes off and your feet about 6 inches apart. Using a metric tape, measure from the floor to your crotch, pressing with the same force that a saddle does. **Multiply this number by 0.883.** The result is your saddle height, measured from the middle of the crank axle, along the seat tube, to the top of the saddle.

Add 2 or 3 mm if you have long feet in proportion to your height. If you suffer from chondromalacia (knee pain caused by damage to the underside of the kneecap), a slightly higher saddle may feel better. However, it should never be so high that your hips must rock to help you reach the pedals. If this formula results in a big change from the height you've been using, make the adjustment by 2 or 3 mm per week, with several rides between, till you reach the new position. Changing too fast could strain something.

- **Saddle Tilt:** The saddle should be level, which you can check by laying a yardstick along its length and comparing it to something horizontal like a tabletop or windowsill. A slight downward tilt may be more comfortable, but be careful. More than a degree or two could cause you to continually slide forward, putting pressure on your arms and hands.
- **Fore/Aft Saddle Position:** Sit comfortably in the center of the saddle, click into the pedals, and set the crankarms horizontal. Hold a weighted string to the front of your forward kneecap. For most of us, the string should touch the end of the crankarm. This is known as the neutral position. Loosen the seatpost clamp so you can slide the saddle to get it right. Seated climbers, time trialists, and some road racers may like the line to fall a centimeter or two behind the end of the crankarm to increase pedaling leverage. On the other hand, track and criterium racers may like a more forward position that breeds leg speed. **Remember, if your reach to the handlebar is wrong, use stem length to correct it, not fore/aft saddle position.**
- **Butt:** By sliding fore or aft on the saddle you can bring some muscles into play while resting others. This is a technique favored by Skip Hamilton, my teammate in the 1996 Race Across America. Moving forward emphasizes the quadriceps muscles on the front of the thighs, while moving back highlights the hamstrings and glutes—the powerful butt muscles.
- **Feet:** Some of us walk like pigeons, others like Charlie Chaplin. Your footprints as you leave a swimming pool will tip you off. To make cycling easier on your knees, shoe cleats must put your feet at their natural angle. This is a snap with clipless pedal systems that allow feet to pivot freely (“float”) several degrees before release. Then all you need to do is set the cleats’ fore/aft position, which is easy. Simply position them so the widest part of each foot is centered on the pedal axle. If you experience discomfort such as tingling, numbness or burning (especially on long rides), move the cleats rearward as much as a centimeter.
- **Crankarm Length:** In general, if your inseam is less than 29 inches, use 165-mm crankarms; 29-32 inches, 170 mm; 33-34 inches, 172.5; and more than 34 inches, 175 mm. A crankarm’s length is measured from the center of its fixing bolt to the center of the pedal mounting hole. The length is usually stamped on the back of the arm. If you use longer crankarms than recommended, you’ll gain leverage for pushing big gears but lose some pedaling speed.