



Fitness Concepts
8301 Arlington Blvd, #T3
Fairfax, VA 22031

Climbing Faster

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Every cyclist wants to climb faster, but not all are blessed with the classic climber's build or Lance's VO₂ max. Every rider can learn to climb faster with specific preparation. Following these guidelines will help you climb faster than ever this year.

Improve your technique

Riding fast uphill isn't just about being strong and lightweight, but also about applying your power efficiently to the pedals. Only power directed at a perfect tangent to the arc described by the pedals propels the bike. The rest is wasted energy.

VO₂ max tests are a good indicator of an athlete's capacity for work and an indirect predictor of performance. Essentially, this test tells how strong an athlete's legs and cardiovascular system are, but also how efficiently he or she pedals. This last part is not given nearly enough credence by test technicians, coaches or athletes.

During this test we measure the energy expenditure (oxygen consumption) of riding at a given wattage. The higher the oxygen consumption, the stronger the rider is, but the lower the oxygen consumption at a given wattage, the more efficiently the rider pedals. This may be compared with a car's fuel efficiency. We have found that, 84% of the time, efficiency explains more than half of the wattage differences between riders. If one rider produces 10% greater wattage at lactate threshold, 84% of the time the rider uses less than 5% more energy to do so indicating greater efficiency.

Pedal stroke technique is especially critical when climbing. On the flats, where 180 pounds of bike and rider may be moving 28 miles per hour, there is a tremendous amount of momentum to help a rider through pedal stroke dead spots. On climbs, gravity constantly tugs and the speed is too low to create enough momentum to help through dead spots, so minimizing them is critical. When one pedal is at 12 o'clock and the other at 6 o'clock, neither leg is engaged in the downstroke. Creating just a little more wattage through this top and bottom dead center range effectively carries more momentum through to the next downstroke. This allows a rider's wattage to be more steady instead of requiring great reacceleration on every stroke. The difference is remarkable.

Downstroke: Drive Forward and Down

Most riders initiate the downstroke at about 2 o'clock, driving straight down. This produces good peak power, but within a very short power zone. Good climbers initiate the downstroke earlier, elongating their peak power zone. Try to start the downstroke



early, driving diagonally forward and down from 12 o'clock toward 3 o'clock (Diagram 1). This optimally overlaps the peak torque of the hip extensors (glutes) and the knee extensors (quadriceps) creating a longer downstroke power zone. You'll know you are pedaling well when you feel your toes press against the front of your shoes across the top of the pedal stroke.

Backstroke: Start Earlier

We've all heard that good riders pull back across the bottom of the pedal stroke like they were scraping mud off the bottom of their shoes. While this is an accurate description of what actually happens during an efficient climber's stroke, attempting to initiate this movement earlier produces a power curve that more closely replicates the arc of the pedal (see Diagram 2). When your pedal reaches the 3 o'clock position, try to pull your heel straight backward, directly through the bottom bracket. Obviously this is impossible, but the downstroke is such a naturally dominant part of the pedal stroke that concentrating 100% on the horizontal aspect during this phase of the pedal stroke and trying to initiate the backstroke too early actually create the optimal downward-backward arc.

Unload on the Upstroke

Most riders use the right leg's downstroke to lift the weight of the left leg. This reduces propulsion. Good climbers attempt to lift the weight of recovering leg off the pedal using that leg's hip flexor muscle so that all of the opposite leg's downstroke power gets to the rear wheel.

At the conclusion of the backstroke, when the pedal reaches 7 o'clock, drive the knee up and forward powerfully toward the handlebar (see Diagram 3). Feel the effort in the hip flexor muscles at the front of the hip and the very upper thigh. On a long, steady climb, concentrate on lifting the knee to unweight the pedal on the upstroke and see how much lighter the downstroke becomes without any drop-off in power.

Feel Power in the Top Half

Efficient riders feel their effort concentrated in the top half of the pedal stroke (see Diagram 4). When your legs do what they're supposed to in the top half of the pedal stroke, the bottom half generally takes care of itself. The next time you hit a tough climb, think triangles and your legs will make circles more effectively than ever before.

Train Torque

Climbing requires producing great muscular force. Riders who have specifically trained their legs for this will obviously climb faster. During appropriate times of season, strength training is an important supplement for almost every rider. A full discussion is beyond the scope of this article, but using heavy weights is effective for improving sustained climbing.



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Strength-transfer training, low cadence efforts which train the muscles to efficiently apply their weight-room strength to the pedals is critical to bridge the gap between the weight room and climbing. During base period, do efforts of 5 to 20 minutes at heart rate zone 3 or power zone CP 90 intensity and a cadence of 50 to 60 rpm. During build and peak periods, perform one workout per week of LT training at 70 to 75 rpm to maintain muscular force. While efficient climbers generally use relatively high cadence in racing, specific low cadence training segments enable high cadence climbing in a harder gear.

Seated or Standing

Thin riders (less than 2 pounds per inch) climb out of the saddle effectively for sustained periods. The rest of us will be more efficient staying seated most of the time on long, steady climbs.

Prepare for accelerations

The ability to put out high, steady wattage on sustained climbs is critical, but your opponents won't keep the effort steady. Preparing for surges and accelerations is critical to be able to match moves made by other riders and to drop them. Long sets of hill repeats on a very short, steep hill that takes about 20 seconds to climb with minimal recovery time between efforts will improve this skill. Also simulate attacks during LT workouts. Accelerating hard for 20 seconds every 3 minutes during an otherwise steady LT climb will enable you to surge even when you are hurting on race day.

Standing to attack can be an effective tactic, quickly opening a gap, but staying seated and increasing wattage without any flourish can be effective in different circumstances. Pulling up forcefully on the pedal during the upstroke makes this possible. At steady state, efficient climbers don't actually pull up on the pedal, creating wattage, but they unload to avoid creating negative wattage. For short periods requiring extremely high wattage, lifting forcefully on the pedal can provide tremendous reserve power. The hip flexor muscles are extremely powerful, but lack endurance in most riders. Driving the knee upward powerfully for a few seconds can be useful for accelerating or maintaining momentum on steep pitches.

Use Your Head and Your Legs

We're frequently amazed at how cyclists tend to think that the top riders train and race the same way they do ... only more and harder. Maybe the top guys actually do something differently. Effective climbing isn't just about getting strong from hard workouts, but also about efficiency – applying power in a way that the energy gets transferred effectively to the rear wheel and at times in the race when the additional expenditure will benefit.



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Diagram 1

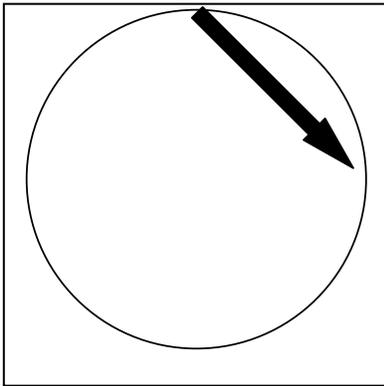


Diagram 2

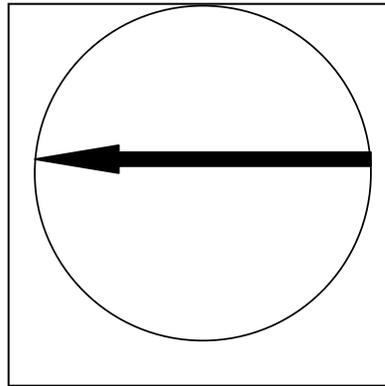


Diagram 3

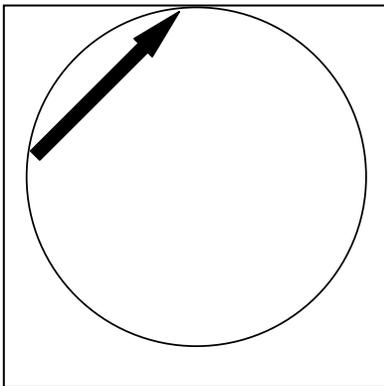


Diagram 4

