

## Life is a Circle: Be in the Right Gear

In my last article, I introduced my Efficiency is Everything Training Principle and how it applied to pedaling a bike. The article discussed as its primary points the need to develop a more efficient pedal stroke by learning to spin at higher cadences and to vary muscle recruitment within the pedal stroke so as to spread the workload over a wider range of muscles.

In this article, we will look at how gearing relates to efficiency in the pedal stroke. Remember, seeking out maximum efficiency should be a fundamental goal for all endurance athletes. Your goal is to go fast, but to do so while using as little energy as possible.

### What is Optimal Gearing?

As I said in my previous article, many triathletes make the mistake of being in too big (difficult) a gear both in training and racing. In neutral territory (no wind, a good road surface, and flat terrain), an optimal gear will yield a cadence of 90-95. For hills, typically the steeper the grade the lower the optimal cadence, although a sub-80 cadence begins to border on inefficient.

### How do you know if you are in an optimal gear?

Try using a subtle sense of feel such that if you are working at your prescribed intensity, you can at a second's notice smoothly increase cadence by 1-3 rpm without undue motion in the saddle.

If you cannot quickly and smoothly increase cadence by 1-3 rpm, then chances are you are getting bogged down in too big a gear and are unduly taxing leg muscles and energy stores. On the other hand, if you can increase by 5rpm or more and this is not a pure recovery day, then you are in too easy a gear.

In your next training ride, experiment with this optimal gear test and see how often you find yourself being inefficient in too big a gear. Athletes that are preparing Ironman events should see their long training rides exhibiting a tight cadence range of 85-95. You should shift gears as often as necessary to maintain the described optimal cadence sweet-spot.

### Gearing Choices

Poor gearing choices often contribute to a triathlete being inefficient in his pedal stroke. Most bikes these days come equipped with 9 speeds to choose from in the rear derailleur. I remember when Shimano first introduced its 8-speed and thinking how good it was that I would no longer have to make choices about which gears to sacrifice for a race. Yet, even with 8 speeds, there were those extreme courses that always left either a gap in the middle or one gear shy on the climbs. With 9 speeds now to choose from, life has become much easier.

For those that are very new to the sport, gear cassettes come in 8 or 9 speeds and are referred to by the number of teeth in each sprocket. The lower the number, say 11 or 12, the more difficult the gear and vice versa. Both your ability and the courses that you train and race on should influence the cassette that you choose to ride.

A flat course with little variation should see a tightly packed cluster so that you do not have inefficient jumps from one gear to another, and thus are either in too easy or too hard a gear. Using an automobile analogy, gaps in gearing sequence (15>17 with no 16 for example) are akin to having to shift from 2<sup>nd</sup> gear to 4<sup>th</sup> because you lack a 3<sup>rd</sup> gear. **Ironman Florida athletes** are you listening? Athletes doing this race should absolutely have a cassette that has contiguous gearing.

A hilly course should see you looking at the hills and determining what gear you will need to get up the most difficult climbs. Using a 39 small chainring instead of a 42 on the front will also give you more gearing range. This three tooth difference equates to approximately to one tooth easier in the back.

I think it far more important to have the proper gear for the uphill, than to have a monster gear for downhill. A 12 cog is more than ample for 99% of the triathlon community. Most athletes would be far better served to forego the sexy sound of having an 11 cog for maximum speed and to use a 16 in the

middle of their cogset where they will spend most of their time riding. **Ironman Canada athletes** would do well to heed this advice.

### **When to Shift Gears?**

The short answer is as often as necessary to maintain an optimal gear status. You should be constantly evaluating your feel for the gear that you are using to determine if you might be more efficient in a more difficult or easier gear. Time spent in an inefficient gear punishes your legs with cycling's equivalent of boxing "body blows" that will take their toll later in the race.

Those of you who watched Lance Armstrong destroy the Tour de France field in each of his Time-trial stages will have a vivid memory of a high and unerring cadence. As the terrain changed, Lance's changed gears as often as necessary to maintain his most efficient cadence. It is better to anticipate gear changes so that you change before getting bogged down and losing momentum.

Being stubborn with a gear and muscling your way over short hills rather than switching to an easier gear or standing will only come back to haunt you later in the race. Waiting too long to shift only serves to break your rhythm with the cost being you often have to shift again to an even easier gear and your legs have suffered in the process. More body blows.

### **Gearing and Cadence on Hills**

Unless you are Lance Armstrong, your optimal cadence on hills will be a function of the steepness of the grade. You might expect cadence to range from 80-90 to remain efficient. Your optimal gear litmus test remains your ability to subtly increase cadence in the existing gear without undue motion in the saddle. If you cannot increase cadence one iota, odds are you are pushing too big a gear. Body blows.

There are cadence nuances that can also help you get in a rhythm on difficult climbs. One such nuance that many of my athletes find useful is to subtly accelerate through the drive phase as opposed to desperately stabbing the pedal at the top and then kind of losing it through the drive.

This exercise is especially useful on very steep climbs that exceed your optimal gearing capacity. Slow cadence down to whatever point you need to allow yourself to accelerate, however subtly, through the predominant drive phase. You will be surprised at how despite the hill's treachery, you are able to get into a manageable groove without crushing your legs in the process.

Another cadence nuance is to perceive yourself "shutting off" your driving leg quad muscle just prior to reaching the bottom of the pedal stroke. By practicing this, you will find yourself less likely to get into a less efficient left/right hammering cadence mode. This exercise also helps you to more easily transition to the pullback phase of the pedal stroke, thus facilitating a better overall rhythm.

### **Shifting Gears on Hills**

A common mistake I see riders make when approaching a hill is to simply drop into their small chainring upon reaching the hill. This practice is akin to shifting from 4<sup>th</sup> gear to 2<sup>nd</sup> gear in a car, with the result being the cyclist either has to race his cadence, or wait until his speed has slowed sufficiently to accommodate the easier gear. Using our boxing analogy, here the cyclist experiences rapid-fire raps in the ribs when the referee is separating two fighters in a clinch.

When changing to the small chainring, the rider should simultaneously drop down 1-3 cogs in the rear cassette in order that the easing of the gear is not overly dramatic. The two things to keep in mind are the steepness of the hill (drop down less cogs) and what your gearing pattern is in the front and back. More simply, the gear should be incrementally easier to match your speed.

One final tip on gearing applies to rollers. Many times I will see riders near the crest of a short hill, begin to struggle with a gear, and then shift into an easier gear. A better option in this scenario would be to simply stand as the gear begins to approach less than optimal. This practice will allow you to crest the hill sooner, vary muscle recruitment, rest your primary sitting muscles, and carry more speed into the ensuing

downhill. **Ironman Canada athletes** might apply this to the long series of rollers between Richter Pass and Keremeos.

Well folks, that's all there is for this dispatch! If life is too short to drink cheap wine, then Ironman is too long to be in the wrong gear.

**From the Mailbox:**

Dear M2:

"I am turning 50 in Nov., have been at the triathlon scene for 16 years and have done relatively well. In 1999 I incorporated a well-known coach to help me get to the next level.

Well, I did get to the next level and qualified for Hawai'i twice that year and had a 4:27 Half Ironman at Gulf Coast where I accepted the qualifier slot. Also a 2nd at St. Anthony's, 4th at MIM, and 2nd at Vineman Half. I was pleased with my racing.

However, at the same time I was, occasionally, a walking zombie. In fact I went to my coach's "training camp" gearing up for Hawaii and ended up with 37.5 hours of training in 6 days. I would stare at people waiting for oxygen to get to my brain for a few days.

In Hawaii and I was right on target at T2, except for the huge amount of people that had passed me on the way to Hawi and around the 70 mile mark. I could not respond. The run started well as I passed many back and then at 10 miles I just crashed and burned, walked the last 16 miles and finished in 11:00.27. Not the top five as I had hoped and trained."

From a talented but tired and fried triathlete

Dear Walking Dead-man,

The zombie like status should have been your first clue. A ball of fire usually experiences a dramatic flame-up as in your qualifying efforts, before disintegrating into ashes as in your Hawaii experience.

Clearly, you have a lot of athletic ability that is being squandered as you pummel your body into submission prior to racing. There are very few pros who train 40hrs in a week, much less work a full-time job. I happen to coach one woman pro who works a full-time job, averages 6-8hrs/week training on the bike, and finished 2<sup>nd</sup> overall at Ironman Germany in 9hr27min. You can read about Ginakehr on my website.

Dear M2:

"I have lost the love and find just the drudgery of long bike rides & runs after doing 8 marathons in '98 and keeping my streak of triathlon for 14 years & 120+ of them. Can you help, Doctor?"

From a Team in Training Triathlon Coach

Dear Coach,

I hope that you don't have your athletes on the same program.

I really am not so sure I can help you. Yours is a case of addiction, and until you truly recognize you have a problem that is not healthy, no coach will be able to help you.

Short answer is to let enjoyment and health of body and spirit be your primary criteria for evaluating your athletic participation. If you cannot prevent yourself from doing all of these endurance events, I would encourage you to make the events themselves your primary training, and to focus more on recovery between events than on re-training for them.

Dear M2:

"I did IM California at the end of May and then did very little afterwards in order to recover. The week before a Sprint race, I did a speed workout to get some zip. I raced the Cheyenne Mnt Sprint race at the end of June and was real slow, I had no speed. I have all the endurance and strength in the world but no speed.

In recent weeks I have completed some very high mileage weeks with multiple 90+ mile rides over mountainous terrain. Again, I seem to have plenty of endurance, but no speed.

I was thinking of cutting my weekly hours in 1/2 and just doing fast speed workouts, but I'm not sure this is right. I would like to race the Boulder Peak Triathlon but more importantly I want to do well at USAT Nationals in September. I am also contemplating doing IMFL in November

Can you give me some advice on what the heck is wrong with me?  
From an on-line triathlon coach

Dear On-line Triathlon Coach,

Given your training, a speed-less condition is to be expected. Nothing is wrong with you; you have saturated your body with endurance training, have done little to no speed work, so of course you have no zip. You represent 90% of the triathlete population.

Reducing volume is certainly the right course. Specifically, no need to ride over 3hrs., and no need to run over 1hr10'. If you choose to ride or run longer, understand that it is doing absolutely nothing to help you go faster at Nationals. More likely, it is unnecessarily tiring you such that you cannot do the more intense workouts that will make you faster.

Once your body has rested a bit from the reduction in volume, you can make your focus higher intensity workouts. You should only do these when body is psyched and ready, else you are just finding another medium with which to be counterproductive in your training.

Perfectly okay to contemplate IMFL, just don't train for it until after Nationals; absolutely no IMFL training until then. Your previous endurance training is not going to suddenly disappear, and you have all of September and October to focus on IMFL. In my opinion, your higher intensity focus should continue through September lest you land in the same rut you currently find yourself in.

Dear M2:

“Last week training for IM Canada, I think I overdid it a little. I did hard Computrainer workouts Wed and Thurs, a speed run workout Thurs night and the Escape bike loop on Friday. We did an easy 20-mile run Saturday and by Sunday, my legs were fried. We did a 5,000 foot climb, 100-mile loop in the east bay and I was hurting the whole way. I had trouble keeping my heart rate up and was much slower than usual.

I took the last couple of days off biking or running and spun today for about an hour. I'm a little concerned that my legs still felt tired today. Any advice?”

Dear Concerned,  
Where do I begin?

Back to back quality bike workouts; an *easy* 20 mile run; scheduling a 100m major climb ride the next day; dragging yourself through the ride on legs that were clearly not up to the task?

Rx: Active recovery until your legs come back to life. Avoid repeating all of the above mistakes. While it is normal to feel tired after long and hard training, the general trend should be that you are getting stronger. It serves no constructive purpose to drag yourself through entire workouts at an increasingly slower pace.

Too many athletes confuse effective Ironman training with measuring how much torture they can cram in, all the while ignoring the obvious body signs that they are only getting slower and weaker.