



ARNIE BAKER CYCLING

Time Trialing With Hills

Disc or Light-Weight Wheel?

On flat time trials, a rear disc wheel is generally the fastest.

On hill climbs, lighter climbing wheels are generally faster.

A time trial that is neither strictly flat nor strictly a hill climb presents the rider with a dilemma: How much climbing is too much for a disc wheel?



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The Issue

On flat time trials, a rear disc wheel is generally the fastest. How much does a disc help on a flat course? An often quoted figure is that a disc is 40 seconds per hour faster than a “standard” wheel. A standard wheel has 32 spokes, 14-gauge, and a box-shaped rim.

On hill climbs, lighter climbing wheels are generally faster. Each pound of extra rotating weight increases climbing time about 40 seconds per hour for a 150 pound rider. The increase in climbing time is less for heavier riders.

A time trial that is neither strictly flat nor strictly a hill climb presents the rider with a dilemma: How much climbing is too much for a disc wheel?

Let's Refine the Weight Issue

In out-and-back time trials, the time saved going down hill with heavier equipment partially compensates for the time lost going uphill.

Generally each pound of extra rotating weight slows you down about 20 seconds per hour of climbing when feet descended match feet climbed.

How much heavier is a disc than a light-weight climbing wheel? Let's look at state-of-the-art standard-size tubular wheels:

The 2003 Zipp disc weighs 960 grams. The 2003 Zipp Z3 rear wheel weighs about 660 grams, or about 2/3rd of a pound less than the Zipp disc.

This means that a disc will cost about 14 seconds per hour of climbing.

An elite 40-year-old male cyclist, an elite female cyclist, or Cat 2 male cyclists might climb 4,000 feet per hour.

The cost of a disc is therefore about 1 second for every 250 to 300 feet of climbing.

Let's Refine the Aerodynamic Issue

Your light-weight 21-spoke climbing wheel is aerodynamically considerably better than the “standard” wheel. The disc may be only 10 seconds per hour faster. A little less with no wind, a little more with crosswinds.

If you can ride 25 miles an hour, the disc will improve your time by about 1 second every 2.5 miles.

Balancing the Issues

A disc, relative to a state-of-the-art lightweight wheel will cost about 1 second for each 250 feet of climbing. It will benefit you about 1 second for every 2.5 miles ridden.

A heavier rider, or a heavier or less aerodynamic climbing wheel means that a disc is a better choice even with more climbing.

Rule of Thumb

As figured above, balance the 1 second disc disadvantage in 250 feet of climbing with the 1 second advantage in 2.5 miles.

Bottom Line

Unless the course has an average of more than 100 feet of climbing per mile, use a disc. **AB**



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