



The Science and Logic Behind the Catalyst Pedal



Why don't you need stiff
soled shoes in the gym?

The arch is one of the strongest
forms in nature...
but only if it is supported on
both ends.

Every pedal out there has
one major design flaw...

They all assume that you want to push through the ball of the foot.

This is based on an outdated
view of the pedal stroke.

Your foot doesn't always want to
apply force through the ball of
the foot.

If the foot comes off the ground
then push through the ball of
the foot. But...



If the foot doesn't break contact with the ground then the foot stays balanced and you push mid-foot/ through the arch.



Since the foot doesn't come off of the pedal during the pedal stroke, pushing through the ball of the foot destabilizes the arch.

That sounds great in theory,
but where's your *science*?

Funny you should ask...

J.R. Van Sickle Jr, M.L Hull/ Journal of Biomechanics 2007

This study showed no difference in power or economy between pushing through the ball of the foot and the mid-foot pedal position.

They thought that there would be a decrease in those factors since you couldn't use the ankles for leverage and push with them.

However, this wasn't the case and they found that pushing through the ball of the foot wasn't "better" or the optimal way to apply power into the pedals.

In fact, they also found that the mid-foot position took stress off of the calf and Achilles tendon, placing it on the hips.

ELMER, S. J., P. R. BARRATT, T. KORFF, and J. C. MARTIN. Medicine & Science in Sports & Exercise 2011

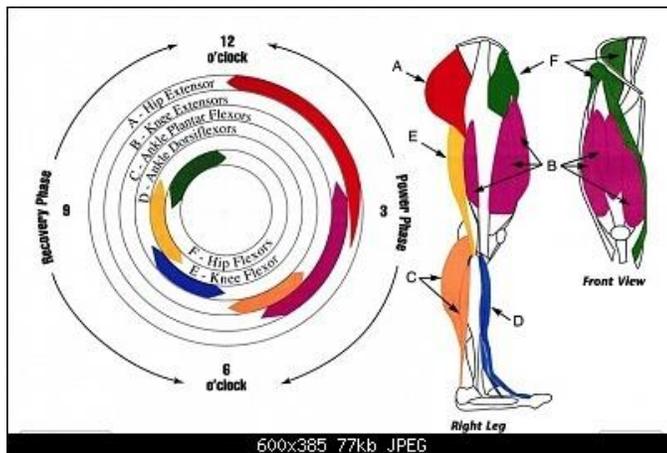
This study found that the hips (glutes and hamstrings acting to extend the hip joint) were the major drivers of the pedal stroke at all intensity levels.

They thought they would find that the quads were the major driver of the pedal stroke at lower intensities but instead found that the quads are never the major driver of the pedal stroke.

Korff (et al. Med Sci Sports Exerc 2007; 39:991-995) and Mornieux (et al. Int J Sports Med 2008; 29:817-822) Cycling Efficiency Studies

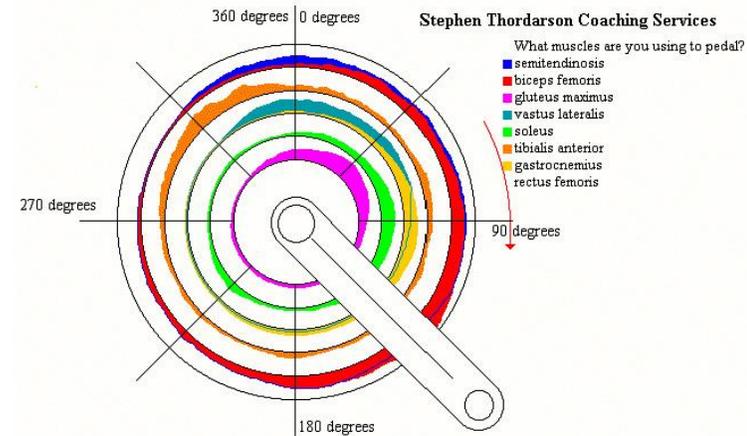
These two studies showed that pulling up on the backstroke produces less power and burns more energy than simply driving hard on the downstroke and letting the trail leg come up just hard enough to get ready for the next hard downstroke push.

Everything that I have seen, including EMG readings and anecdotal evidence, show that there is little to no power created on the backstroke and when you try to increase power by pulling up you decrease the power and efficiency of the whole pedal stroke.



← Bullshit

The Truth →



Collectively, these studies have shown that:

- 1 - The mid-foot position also allows for better recruitment of the hips.
- 2 - The hips are the major muscles used in the pedal stroke.
- 3 - There is no need to pull up on the backstroke.

So, if your hips are the *major drivers of the pedal stroke* and the *mid-foot position allows you to better recruit the hips* then it would seem that *the science favors a pedal that optimizes a mid-foot position for hip recruitment.*

And since you don't need to pull up on the back of the pedal stroke then you don't "need" to be attached to your pedals.

So why haven't you heard of
these studies before?

There is a lot of money and a lot of egos tied up in the traditional view of
the pedal stroke.

This new foot position improves
your pedal stroke in 3 way...

1) POWER - By supporting both ends of the arch of the foot you naturally support the arch itself, which gets rid of flex in the arch.

2) EFFICIENCY - The mid-foot placement of the axle balances the foot, which takes stress off of the ankle joint and allows for better recruitment of the hips.

3) COMFORT & STABILITY - The more balanced foot position achieved from this pedal design will result in a more balanced application of force into the pedals.



← Forward Push & Pressure

Balanced Push & Pressure →



As you can see the Catalyst Pedal is based on real science, not just theories and marketing hype.

How many other pedals can make that same claim?

Frequently Asked Questions

Q: What is the Guarantee and Warranty on your pedals?

A: We feel so strongly that our pedals are the best in the world that we back them up with an industry-leading 30 Day Money Back Guarantee, Limited Lifetime Warranty and a Crash Replacement Plan.

In other words, no one stands behind their products like we do.

Q: Don't I need my ankles to help smooth out bumps on the trail/
act as extra suspension?

A: While you may lose a few inches in movement out of your ankles, a more stable foot allow the rest of your body to relax and move better.

Your body needs a certain amount of stability – if you take it away from the foot it will get it from somewhere else.

Q: Don't you need a concave design and/ or more pins in the middle?

A: Not with this design. When you are on the ball of the foot then your pressure points on the pedal are more in the middle of the pedal body and pushing forward. This requires a lot of pins and/ or a concave design to fight.



← Forward Push & Pressure

Balanced Push & Pressure →



Q: How reliable are they and can I easily find replacement parts/rebuild kits?

A: I am having these pedals manufactured for me by VP Components, makers of VP Pedals and 3rd party manufacturer for a lot of people in the bike industry.

This means that they will use parts that are already proven to last and you can find replacement parts and rebuild kits very easily.

Q: What about extra rock strikes?

A: This is a tough one because a lot of it really boils down to riding style. All I can say is that we have really rocky trails where I live and I have had no issues.

In fact, since my foot is more level and I'm not leading with my toes as much I have noticed that I don't catch my foot as much as I used to.

And since the Catalyst Pedal is no wider than your foot you don't have to worry about extra rock strikes like you do with every other "oversized" flat pedal.

Get your Catalyst Pedals at
www.pedalinginnovations.com

