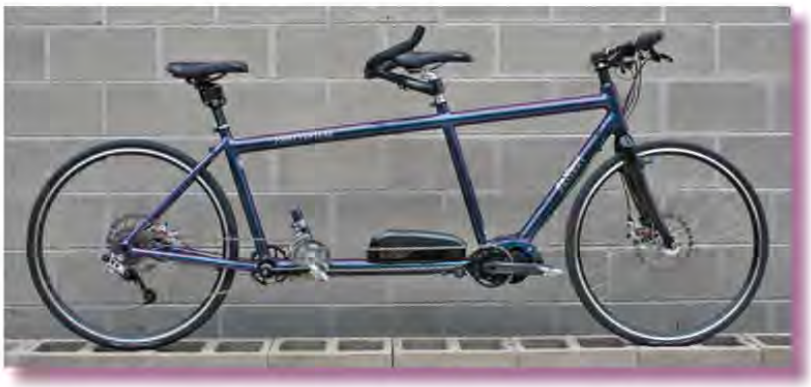
E-Assist da Vinci Joint Venture Tandem

By Neil M. Hanson



Overall, author Neil M Hanson was favorable impressed with the Shimano STEPS-equipped da Vinci Joint Venture.

I'll confess to my prejudice right up front here: When the option to review the new Shimano STEPS Assist option on a Joint Venture tandem from daVinci Designs presented itself, the fact that I jumped on it had more to do with the bike than with the electric assist option. Like many cyclists, I've always considered it cheating to put an electric assist option on a bike. Riding an "eBike" just didn't seem like real bicycling to me – more like riding a motor scooter than riding a bike. My logic seemed sound – riding a bike is about the fitness and exercise as much as anything else, so if I take that component away, is it still bicycling?

Having made that confession, I'll say that my recent experience running a new Joint Venture model from daVinci Designs through its paces with the Shimano STEPS E8000 Electric Assist option installed helped me see things from a fresh perspective.

I'll start by summarizing the experience as extremely positive from the perspective of both the bicycle, and the electric assist perspective. Christine and I had never spent any time on one of Todd Shusterman's daVinci Design's tandems, and found that we loved the fit, the feel, and especially the ICS (Independent Coasting System.) In addition, we had a lot of conversations during our ride about how the electric assist notion might not be right for everyone, but that it would be excellent for many people, and more importantly it could dramatically increase the number of people who participate in cycling.

Now for the details. I'll address the bike and the assist somewhat separately, as they each deserve their own time in the spotlight.

Joint Venture Tandem

When Christine and I bought our current tandem, we looked a bit at the da Vinci bikes, as they're built where we live in Denver. The unique IfCS seemed like a great idea to me, but I was ultimately swayed to the Rohloff Hub option that we have on our CoMotion, as the ability to coast and pedal independently didn't seem that important to either Christine or me. However, now that we spent a little time riding a bike using ICS, we are absolutely fans.

For readers who aren't aware of the system, da Vinci implements a drive train on their tandems that seems to me to be a better design than traditional drive trains by nearly any measure. Check out their website if you want more detail, but here's a snip that gives a good summary:

"The main component of da Vinci Designs' ICS is an intermediate drive shaft six inches in front of the rear bottom bracket. The intermediate shaft has two single-speed freewheels on the left side that are independently driven by the cranks at twice the rotating speed and half the torque. On the right side of the shaft, four Hyperglide™ cogs drive the bike. The chain rings are half the size as those on a conventional tandem because of the double rotation of the intermediate shaft. The combination of 12-, 18-, 24-, 30-tooth driving gears equals 24-, 36-, 48-, 60-tooth chain rings. The combination of the small 6-tooth gap, doubled rotation and the Hyperglide cogs give da Vinci Designs' tandems these technical advantages:

- *Smooth and fast front shifting – The closer the chain rings are to the same size, the easier it is to shift. Other tandems, and even single bikes, are forced to use a 12-tooth gap between chain rings.*
- *Unprecedented range of gears – Four chain rings and* eight *rear sprockets mean 32 gears that range from 18 to 140 gear-inches. No other tandem gives you that many gears or that kind of range.*
- *More ground clearance – Nice when you lift your tandem over a curb, out of a truck, or when you are off road.*
- *Stronger, lighter chain rings that are less prone to bending*

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- *Less strain on the chain while shifting."*
- *(Editor's Note: The above describes the standard da Vinci ICS drive train. The STEPS-equipped tandem features some design differences, such as the timing chain on the right side of the bike, as can be seen in the photos.)*

Christine and I found that the option did seem to deliver on all the upsides da Vinci advertises to their system. We did, however, feel less "connected" as a tandem team. As with nearly everything in life, there are tradeoffs to every design decision, and we both noticed the tradeoff in the fact that while it was convenient to pedal independently, we missed the strong sense of connection we both get when we feel our partner pedaling with us. I should mention that our good friends Bob and Debbie took a ride as well, and this was their primary negative finding as well.

A key upside to the independent pedaling option made itself apparent at stoplights and is worth mentioning here. Any tandem team is aware of the dance we all do when we leave a dead stop (such as at a stoplight) on an uphill trajectory. If there's not traffic and plenty of room to maneuver, it's not that big a deal to do the dance and get going again. However, in those situations where automobile traffic around you requires that you get going smoothly and quickly while pointed uphill, it's sometimes a clumsy dance while the captain tries to get clipped in while the cranks are spinning and the stoker is trying to deliver enough watts to get the bike moving quickly. With independent pedaling, I could push some quick watts into the cranks as we began moving, then Christine could keep pedaling at high revs while I clipped into a stationary pedal (obviously much quicker and easier since I don't have to try to hit a spinning pedal) then start cranking to help her out much more quickly.

One of the exciting things to me about the da Vinci ICS drive train is the ability to get an extremely wide range of gear options, allowing the team to keep cranking on those days with a glorious tailwind out on the flats, while also enabling earnest uphill spinning when the front of the bike starts pointing toward the sky. While we were certainly able to experience that 140" gear on a long stretch with a slight decline, we never got to experience the other end of that range, which is the 18" gear for serious climbing. The feathering wasn't quite right for me to drop into that tiniest of the four chain rings, which meant that the lowest gear I could find was the equivalent to a 36-tooth ring on a traditional drive train, along with the 32-tooth cog, which nets us a gear of slightly less than 30 inches. This was more than enough to move up the hills that we played with on our ride, even with the assist off and the extra weight of the motor, but I was disappointed that I didn't get to spin an 18-inch gear just to see what it feels like. Note that we have a Rohloff on our CoMotion, and have it geared so that our lowest spin is about 20 inches.

While the difference between 20 inches and 18 inches might not seem like a lot, it's ten percent, which would be the difference between hard work and misery on a long slog that's absurdly steep, and we have one or two slogs like that in Colorado.

Over the last twenty years or so, I've become pretty spoiled to STI shifters. When I saw that the front shifter mechanism for the Joint Venture that we rode was set up as an older style incremental shifter, I was somewhat skeptical. The older style shifter is necessary to get to all four of the chain rings, and while it wasn't adjusted correctly for me to find that smallest ring as I mentioned above, I did find that the shifting was easy and intuitive, just like it was in the olden days before STI shifters. I wouldn't consider the non-STI shifters to be a downside to the whole experience.

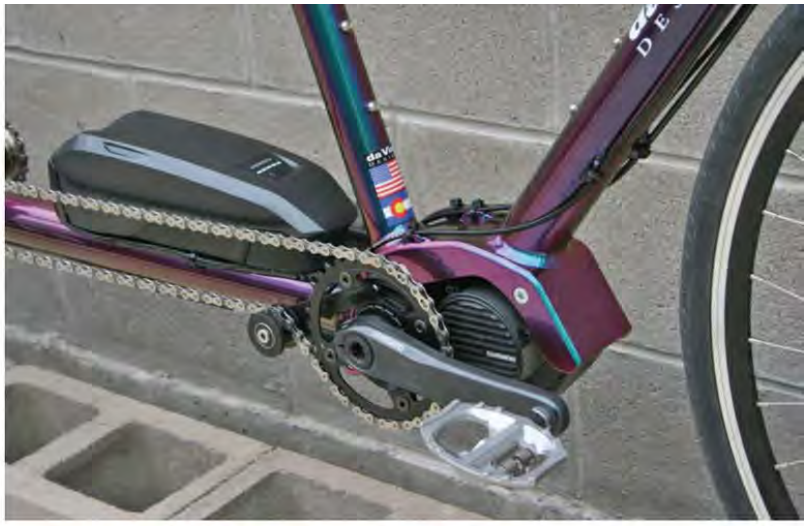
All in, I can say that both Christine and I are fans of the da Vinci Joint Venture. If we ever replace our CoMotion Equator, a da Vinci bike will be very high on our list of options.

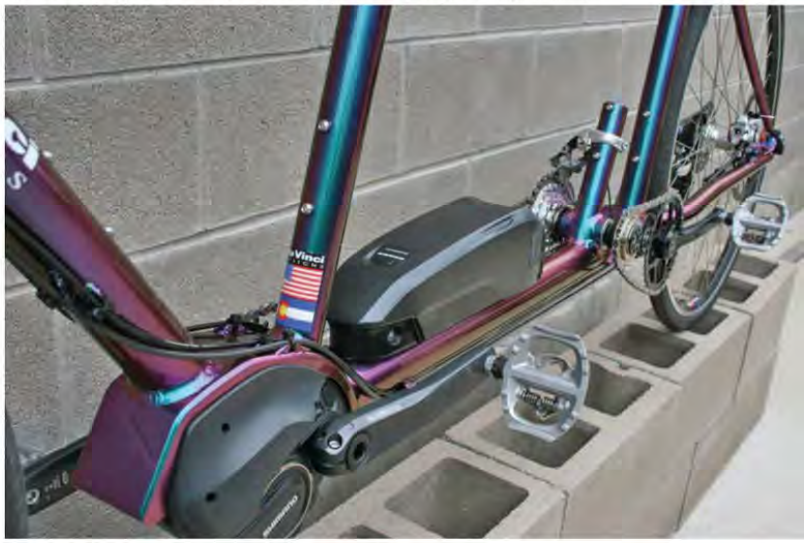
The Shimano STEPS E8000

I'm not an expert on electronic assist systems. Right up front, let's get that out there. In fact, as I said before, I've always been a bit of an arrogant snob when it comes to the notion of adding a motor of some type to your bicycle. Real cyclists would never add such an abomination to the pristine elegance and beauty of a pure bicycle. If you want two wheels with a motor, then ride a motorcycle, right?

However, wait a minute. Maybe there's more to the story, and I need to be a little arrogant snob. Or at least, that's what Christine said as she noticed me hiding my face as we passed several "real" cyclists going the other way, and I was afraid someone would recognize me on a "cheater bike."

That's one of the many things we love about tandem cycling – the ability to carry on great conversations as we ride, real conversations over the couple hours of a ride. And on this ride, the key topic of conversation was the electric assist that we had under us, and how good it could be for cycling overall.





Above and below: Changes to the da Vinci ICS drive system required in order to incorporate the Shimano STEPS drive inluded moving the timing chain between the captain's and stoker's cranks for the left side to the right side. Battery is mounted on the boom tube just being the motor.

"If eBikes are able to expand the population of folks who're out on bikes in America, then count me as a solid supporter of the notion. More people on bikes means that we, as a nation, focus more energy on making cycling safe and accessible for everyone."

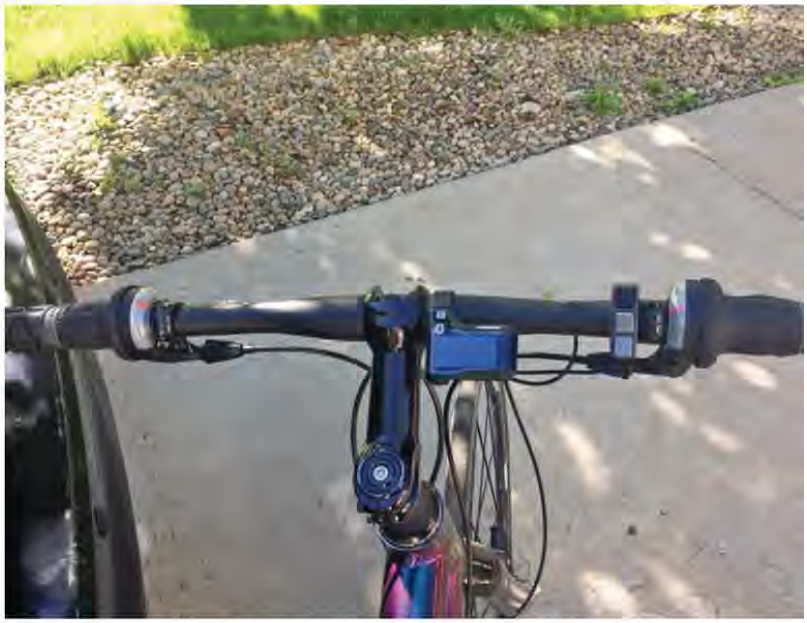
Because here's the deal; having the electric assist on the bike made the ride more pleasant and enjoyable. It's just a fact. And there are probably quite a few people out there who might be intimidated by the notion of spending a lot of time on a bicycle or taking long rides. However, this intelligent assist option really provides a whole new dimension of possibilities.

For me, after experiencing the eBike and thinking through it, I've arrived at a new conclusion about how I feel about them. If eBikes are able to expand the population of folks who're out on bikes in America, then count me as a solid supporter of the notion. More people on bikes means that we, as a nation, focus more energy on making cycling safe and accessible for everyone.

The E8000 is the mountain-bike version of Shimano's electronic assist system. It has three settings on the controller: Eco, Trail, and Boost. The controller was easy to read right on the handlebar, and I found myself using it as my primary speed indicator as we rode. Each setting provides progressively more assistance to the drive train.

- **On the "Eco" setting**, the pedaling was noticeably assisted as we went up hills or found ourselves applying more pressure to the cranks. On the flats or when our pedaling effort was low or moderate, there was no discernible assist. When the assist did kick in, I'd compare it to a mild tailwind giving a little extra push from behind.
- **On the "Trail" setting**, the assist was noticeable earlier in the effort curve, and was far more pronounced. You know what it feels like when you've been pounding yourself against a headwind for an hour, and suddenly you get to make the turn and put that 25 mph wind at your back? That's what the "Trail" setting felt like to me.
- **The "Boost" setting** was like having a third rider cranking the pedals. Really, it was that strong. They say that the max output on the "Boost" setting is 250 watts, which is certainly equivalent to an added pedaler without having the additional 170-pounds to drag up the hill. Every time I kicked it into this highest setting, words like "wow" kept coming out of my mouth. It truly is amazing.

Note that on all settings, the assist stopped completely by the time the bicycle is going through 20 mph. The controller is a speedometer as well, and somehow in the magical world of electrons flying around inside the unit, it's able to keep track of how fast the bicycle is going and how much effort is being applied to the cranks. As a result, it applies the right amount of assist at just the right time, and once you're going over 20 mph it decides you don't need any more help.



Electric system controller mounts right on the handlebar, captain can select from various output settings while underway, from Eco, to Trail, to Boost.

Wow.

The battery will store 504wh of juice, so how long it lasts depends on which setting you use and how hard you push it. If you pushed it as industriously as you could on the boost setting I suppose that the 504wh would translate into two hours of charge. On the other hand, based on our experience and the experience of Bob and Debbie, I would expect that the battery would last all day long for us with a very moderate use. For example, when Christine and I rode the Katy Trail with daily totals of 60 to 80 miles, I think we might use half a charge on most days, asking it to help only on those occasions when the day has become long, the air hot and sticky, and the warm shower still several miles away.

I doubt we'll be adding an electric assist motor to our tandem any time soon, but if we did, this Shimano STEPS E8000 would be an ideal candidate. I suspect our rides would get easier since we'd surely turn it on occasionally, and I'm not certain that it wouldn't even lead to more frequent rides. For now, we'll go without, but the experience has changed my mind completely on the notion of eBikes.

More power to 'em. Literally.

Author Bio: *Best selling author and speaker Neil M Hanson lives in Colorado. He's the author of several cycling books, most recently his new release, "Cycling the Katy Trail". Other books currently available include "Pilgrim Wheels", "Pilgrim Spokes", "Cycling Across America – The Pilgrim Bundle", and "The Pilgrim Way". Learn more at NeilHanson.com.* RTR