

Velo Vision Sample Article



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If you have any comments, problems or suggestions about the magazine in general, or this PDF in particular, please email me at howard@velovision.com

I hope you enjoy the read!

A handwritten signature in black ink that reads 'Howard Yeomans'. The signature is written in a cursive, flowing style.

Howard Yeomans

Editor and publisher, *Velo Vision* magazine.

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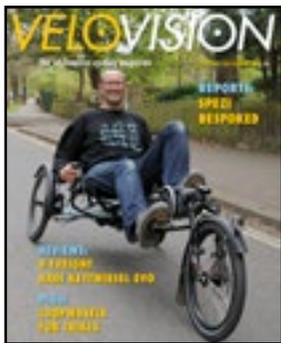
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COVER: Oliver Taylor of London Recumbents bearing the classic trike 'grin' while riding the Hase Kettwiesel Evo. Read all about it on page 28.

OPPOSITE: The Workhaus Artist's Bike on display at the Bespoked 2015 Constructors Challenge, designed and built by Duncan Henderson for his friend and artist Sam Hewitt. Read more in the Bespoked show report on page 37.
Sam Hewitt. samhewittpaintings.com

PHOTOS: Howard Yeomans.

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Fresh fields

My first issue is finished and 'under my belt'. We've had some busy months, relocating *Velo Vision*, virtually and literally, to pastures new – note the new contact address! May I first thank Peter for a great deal of support this year and, naturally, for his sterling work: first, in setting up this amazing publication and, second, for running the magazine. Fourteen great years – congratulations, Peter!

Peter and I attended two productive trade shows this year – SPEZI and Bespoked – where we gathered much material. Also, I was delighted to meet so many enthusiastic

readers at the York Cycle Rally in June.

To complement the news and reports, we also bring you the essential reviews. In future issues, I aim to maintain the established balance of content, unless you tell me otherwise – your opinion is the one that matters, so please do tell me what you think. Your inventions and designs, too, are always welcome, so if you want to share anything, small or large, please write in.

Finally, I'm sorry for the delay in publication. We're learning as we go, so we'll continue publishing at a rate of two issues per year. I'm working on Issue 50 already!

Howard Yeomans

TRIKING ON LOOPWHEELS



The unique carbon composite Loopwheel has been fully redesigned to meet the demands of recumbent trike riding. We tried a set on an ICE Sprint and an Anthrotech fitted with the first production wheels to see how they roll.

BACKGROUND

The concept of in-wheel suspension is more than 100 years old, dating back to around the time when the tension-spoked wheel was still under development. Back then, the objective was to improve rider comfort on the harsh road surfaces of the day, but, when the pneumatic tyre was invented, the idea was abandoned.

Nowadays, tyre technology is better than ever and we have suspension on our cycles if we want. Therefore, it must take a determined visionary, who, in spite of the longevity and sheer elegance of the 'normal' spoked wheel, tries to, in his words, "reinvent the wheel". Enter Sam Pearce, inventor of the very 21st-century looking Loopwheel.

Sam, who has an extensive background of industrial design, conceived of the idea to make the springs from three carbon fibre loops, each one actually made from two sections. The springs join to an un-drilled aluminium rim and the spoke flange of the hub body which in the case of rear wheels, may be either an internally-geared or a derailleur hub. Until now, all hubs have been hub braked because the usable travel at the top of the rim is around 45 – 50 mm, making rim brakes out of the question.

The geometry and layout of the original carbon fibre loops were painstakingly developed over 70 iterations in conjunction with Keith Gascoigne, a maker of world-renowned archery bows. Not only was it a question of obtaining sufficient

compliance in the vertical direction, at right angles to the axle, but also of minimising undesirable deflection and twisting in other directions.

Production springs are all made in a resin transfer moulding tool, where dry carbon layup is set inside a mould, the mould closed, then resin is injected and cured. The uncut springs that emerge are then ready for finishing and assembly.

While early adopters of 20" wheels have been enjoying their application to bicycles, the springs are not suitable for the vastly different forces imparted by a recumbent trike. An entirely new spring for the front wheels of tadpole trikes (or the rear wheels of delta trikes) has, therefore, been developed, and its release coincides with a move towards a die-cast aluminium hub.





ABOVE: The off-road potential of Loopwheels is, for some, their main appeal.

LEFT: Close your eyes when riding on-road and the Loopwheels experience is indistinguishable from normal-spoked wheels.

BELOW LEFT: Sturmey Archer hub brake rear wheel with nine-speed cassette. A die cast rear wheel hub for disc brakes is on the way.

The new looks add more than a touch of style to the wheel and reduce the complexity of the build, using only nine nuts and bolts in the whole wheel, the remaining parts being bonded. A matching cast aluminium disc-braked rear wheel is still in development, so the one shown in these photographs is based around the Sturmey Archer X-RDC.

THE RIDE

Before starting out, I was wary of the potential for subjectivity on any test ride, so, aiming for a before-and-after view, I persuaded Graeme Sharrocks (production manager) to fit the standard spoked wheels to his ICE Sprint for my first ride, then swap everything over to Loopwheels for a comparison. I also tried an Anthrotech trike with Loopwheels, an unsuspended machine with a

very sturdy square section frame.

Setting off on Loopwheels, I felt no difference to normal – no pogo, bounce or oscillation in the front or rear wheels. The whole setup was much stiffer than I expected, so riding on tarmac wasn't going to prove much until I started to be provocative and deliberately aim to hit some bumps. Add to this the fact that it generally takes the equivalent of 500 miles to fully 'soften' the spring, adding around 10 – 12% more vertical deflection at the rim.

Improving rider comfort is possibly one reason to consider Loopwheels. I found the greatest effect on comfort at the rear end of the trike, where the wheel took up a large part of any thump in the back, which on a trike can often be more uncomfortable than a jolt from a front wheel. On my 'reference pot hole' I definitely noticed the wheels taking a large proportion of the energy out of the impact. Big bumps are always still very noticeable though, not having the travel of a frame suspension system. On the smaller bumps, like those encountered on a grass verge or rough gravel, the wheels definitely seem more in their element, soaking up vibration well and without any audible noise.

Loopwheels have a low unsprung mass – comprising only the tyre, tube, rim and part of the spring, so they have some theoretical advantage over frame suspension.

One other difference worth





mentioning between Loopwheels and frame suspension is how there is no specific 'bump direction'. It can, in theory, move just as easily in the fore-aft or up-down direction. The wheels are also naturally relaxed (not preloaded), until supporting the rider's weight. Once preloaded, they have more capacity to deflect in the non-vertical direction. When the wheel strikes a significantly high object, it will move backwards as well as upwards.

The carbon springs have their own inherent damping and they certainly did not bounce or oscillate on my test ride. Pulling up harshly on the front disc brakes was one of my trials to check for 'wind up' around the hub—but all appeared normal. I detected no issue with the rear wheel either. In that respect, when pedalling hard, the rear wheel is actually a shade stiffer than the trike front wheels.

Trike riders are sometimes partial to a bit of enthusiastic cornering, enjoying, as they do, the rail-like handling of the sportier trikes out there, the ICE Sprint included. One assumes that lateral stiffness needs to be high enough to resist those forces, but unlike a pre-tensioned metal spoke wheel, there may be less concern for the wheel becoming Pringled. Whatever the theory, I was required to disregard the wheel's durability and therefore cornered on the trike until dizzy.

As I expected, the trike cornered very well, even when hitting bumps mid-corner. At the point where the

inside wheel was off the tarmac, I chanced a look at the outside contact patch to notice the rim itself leaning out from vertical, perhaps not as worrying as it sounds. The top of the wheel actually moves to the outside almost as much as the bottom of the wheel moves inward—not a problem, but a feature that may require a little more mudguard clearance. My static rough handling test showed the rim can be pulled sideways a fair distance and doing the same on the bike wheel was much easier, so I was left wondering if lateral stiffness is more of a perceived problem than a real one.

In terms of weight, Loopwheels are a little on the heavy side, but, taking the greater view, if they were fitted to an unsuspended trike, the



ABOVE: Rear wheel with Shimano Alfine 11-speed hub and Gates Carbon Drive sprocket.

ABOVE LEFT: What happens when striking a bump is perhaps a matter of some conjecture...

BELOW: Jouta rear-steer trike, now available from the factory with a full set of Loopwheels fitted. See joutaligfietsen.eu.

extra weight is probably less than the equivalent trike frame with suspension.

It will not have gone unnoticed that the springs themselves look, in aerodynamic terms, a bit 'draggy'. Given that there are only six springs in each wheel swishing through the air, I'm not sure how the figures stack up, but at the speeds I was testing the trike, up to 20 mph (32 km/h), I couldn't detect additional resistance. Anyone who buys a set of Loopwheels can, of course, keep their original metal-spoked wheels for faster rides on smoother surfaces.

CONCLUSIONS

A great deal of thought and development time has been put into the enchantingly simple Loopwheels. Having seen the assembly facility and the fatigue and strength testing jigs used to simulate close to 10,000 harsh miles, I'm as confident in the integrity of the product as any other high quality wheel.

A set of Loopwheels may offer the extra comfort some trike riders are looking for, whether it be for all-terrain riding or general use. Add to that a possible advantage in the long term—no more metal spoke failures—a further consideration for more demanding riders.

AVAILABILITY

Prices depend on the specification of the hub. The 20" Sturmey Archer hub rear wheel for a nine-speed derailleur cassette as shown retails at £299. A disc-brake ready 20" rear wheel with Shimano Alfine 11-speed hub gear is £559. Add to either of those a pair of front wheels with Sturmey Archer X-SD 70 mm hub brakes for £541. The front disc brake wheels shown are yet to reach production, but Loopwheels are registering names now for when the wheels reach market, some time in early 2016. All prices exclude UK VAT and delivery.

Wheels can be bought directly from the website or stockists in Europe and beyond. Loopwheels are also available for wheelchairs. See the website, www.loopwheels.com or call UK 01623 860909 for more information.

Howard Yeomans