

Speeding the acceptance of speed pedelecs

It's hard to imagine roads in most European countries that don't have cyclists cruising along on Electric Power Assisted Cycles (EPACs), also known as pedelecs. If one believes sales statistics, these standard pedelecs, which are limited to assisted speeds of 25 kph (15 mph), outsell traditional bicycles by 10 percent in some markets.



A well-traveled speed EPAC, or speed pedelec

But it's a different story for speed, or s-pedelecs — bikes that are capable of reaching assisted speeds of 45 kph (28 mph). The market for s-pedelecs is doomed to the shadows. No more than a few thousand s-pedelecs now find their way from dealers to customers.

The main reason speed pedelec sales haven't accelerated as they have for standard pedelecs is probably due to use restrictions imposed by some countries.

In core markets, authorities have banned the use of s-pedelecs on bike lanes in cities and in other built-up areas. S-pedelecs are forced onto regular roads, where they have to contend with vehicular traffic traveling at speeds of around 50 kph.

In practice, speed pedelecs rarely reach 45 kph — and only if the rider works extra hard. But no one, especially someone commuting to the office, wants to arrive soaked in sweat, so cyclists typically ride at lower speeds.

Yet that leaves many s-pedelec riders in an uncomfortable position. Many don't feel at ease on a roadway, so they "cheat": They may remove the rearview mirror, side reflectors and license plate — all hallmarks of an s-pedelec — and ride them illegally on bicycle lanes, through parks and the like.

Accidents can lead to serious consequences, and if there are too many accidents involving wayward s-pedelecs, insurance companies and politicians may be encouraged to ban them entirely.

For this reason the bicycle industry has to compromise with the traffic associations, and begin lobbying authorities to ensure that traffic rules explicitly allow this new kind of mobility. It is in everyone's interests to support the use of these vehicles because a speed pedelec can be an excellent car replacement, especially for commuters who live outside the city.

A new type of type approval. In addition to restrictions on their use, s-pedelec manufacturers are also grappling with the uncertainty of the type approval process.

New EU regulations, scheduled to

become effective on Jan. 1, 2017, should help resolve some of these uncertainties. The forthcoming regulation, No. 168/2013, will replace existing regulation 2002/24/EC. Type approvals granted under the existing regulation will remain valid.

The new regulation outlines a more precise method for determining type approval. It also enhances the authority of EU member states to supervise the s-pedelec market.

Manufacturers that are outside of the EU will need to name an EU-based representative, which can be an importer or distributor.

Manufacturers within the EU will bear increased responsibility for potential safety risks. The new regulations also spell out the obligations of manufacturers and retailers for product recalls.

Before authorities grant type approval, the manufacturer has to declare whether it can provide engineering calculations, simulations or actual test results for components in case of a recall. If there is any doubt that a manufacturer can supply such documents, the authorities may deny type approval.

In other words, manufacturers will have to do their homework before seeking type approval. They will no longer be able

to assume that, if a particular component hasn't failed before, it won't fail in the future. Instead, the demands of licensing a speed pedelec will be comparable to those for cars.

Manufacturers will also be required to provide technical documents covering maintenance and repair data to all for an appropriate fee

Staying in tune. The regulations lay out several technical prerequisites for speed pedelecs. For example, lights have to turn on automatically. Manufacturers also have to make provisions to prevent

manufacturing process for speed pedelecs. Manufacturers will need to use a quality assurance system that ensures the implementation of production continuity. This is unknown territory for many bicycle manufacturers, but it also gives them the chance to redesign and improve their processes.

To be perfectly honest, how many manufacturers are currently able to track frame and fork numbers, and know with certainty which batch of stems or handlebars was mounted on a standard bicycle, and which on a pedelec?

Although the new regulations are



Dirk Zedler at the Zedler Institute

retailers or customers from "tuning" an e-bike system so it performs at higher speeds than allowed.

Currently, speed pedelecs are required to comply with existing standards for trekking bikes and, as of Aug. 1, with the ISO standard 4210.

This author believes these test requirements fall significantly short, and recommends that speed pedelecs at a minimum be tested to meet the requirements for mountain bikes included in the ISO standard 4210. Ideally, they should be tested beyond these requirements.

The reasoning will be familiar to many dealers: In hilly areas, s-pedelec owners often return to the shop after just a few hundred kilometers because their brake pads need to be replaced. High brake loads also affect the frame and fork.

Unknown territory. The new regulations will have far-reaching effects on the

becoming stricter and more detailed, there are still gray areas. For example, vehicles weighing less than 35kg (77 lbs.) aren't required to have a fluid level window on the brake fluid reservoir. There is no provision for anti-theft devices, or for kickstands that fold automatically.

Speeding market acceptance. These new regulations offer a roadmap for the bike industry to help meet the technical and safety requirements associated with this emerging class of bicycles.

Speed pedelecs have great potential to become attractive car replacements, but conditions are not yet ideal to encourage their use and marketability.

The industry and political leaders need to work together to either allow faster speeds for speed pedelecs, or slow down urban traffic. Only then will the speed pedelec market gather speed.

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Since 1993, graduate engineer Dirk Zedler has served as an expert witness on bicycle accidents and material failures on behalf of courts, manufacturers, insurance companies and individuals. He has been an officially appointed and sworn expert for bicycles since 1994, and for e-bikes since 2014. His team currently publishes some 800 expert's reports a year.

The Zedler – Institut für Fahrradtechnik und- Sicherheit GmbH benefits from this enormous wealth of knowledge. It offers extensive research and development services to help bicycle manufacturers improve their products.

The Zedler Institute offers testing systems for purchase by manufacturers, and also tests products from customers around the world in its own laboratory.

The Institute staff applies its long legal experience in writing thousands of expert reports and testifying in numerous court proceedings to writing user manuals, and helping release manufacturers from liability.

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