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Series hybrid at Eurobike 2023: Leading trade fair of the bicycle industry shows the development status of the "virtual chain" on pedelecs

The future of e-bike drives: No chain, no belt, no wear?

Frankfurt am Main – The second Frankfurt edition of the world's leading trade fair Eurobike will go even more in depth and discuss the idea of new mobility by bicycle and beyond. This includes a separate fair area – Light Electric Mobility Hall 8, including the Start-Up and Cargo Area, but of course also a presentation of the technical developments that are necessary to drive such a profound change as the mobility transition. One of them is arguably the series-hybrid system: The idea of completely digitalizing the drive on the bicycle without having to do away with pedaling altogether.

In 2023, Eurobike will again open up new horizons that were inconceivable just until recently. The series hybrid is one of them. Resourceful minds came up with the idea years ago, but its consistent implementation on the bicycle has been figured out just a little while back: The drivetrain made of chainring, chain or belt and sprocket (set) needs to be replaced with a digital counterpart. The German mobility and automotive company Schaeffler has already accomplished this, partly in cooperation with the hub motor manufacturer Heinzmann. You will be able to see the cur-

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rent version of their Free Drive firsthand at Eurobike 2023. The system can already be found installed in new business cargo bikes, but also in sharing bikes with cargo options such as those from Munich-based specialist Mocci. Especially on the cargo bike, digital technology leads to benefits that can create space and provide new impetus.

Digital drives: More freedom and less wear

First of all, there are design-related advantages: The complete mechanical drive is gotten rid of. The vehicle designer is thus freer and can plan more creatively. Completely new bicycle architectures become possible. Wear: The wheel is almost maintenance-free because the high-maintenance components most prone to wear are gone. Mobility advantages: A reverse mode, whose implementation would require great effort with a mechanical drive, is particularly suitable for three-wheelers. With the series hybrid, this poses no problem, just like the virtual shifting system, which suggests to the driver when a certain speed is reached that the automatic transmission has switched to a higher gear.

The e-bike system familiar to us is the parallel hybrid: The pedals turn the rear wheel via the crank and chain or belt drive. Proportional to this power, the motor also supplies power for propulsion in parallel, either via the chain or directly via the hub motor.

With the series hybrid, the power from the pedal does not go into the mechanical drive but into a kind of generator, which requires a converter: The resulting electricity is temporarily stored in the battery. Irrespective of the incoming energy, it then supplies the motor with power for propulsion. There is therefore no mechanical connection between the pedal and motor activity.

Software takes care of the "chain feeling"



According to expert opinions such as that of Hannes Neupert of ExtraEnergy, the series hybrid has already begun its triumphal procession through various areas of the industry. Some companies, often dealing with the topic out of the public eye, still have a development task in their books – to digitally map the resistance that occurs when pedaling. Mando, a subsidiary of the Halla automotive group, is a pioneer in the field of series drives. In its system, which is used in the Citkar, a business cargo bike, for example, this resistance can be digitally adapted via software, as visitors will be able to see at Eurobike 2023.

Groundbreaking innovations can always be optimized in detail. In the case of the series hybrid, this still affects efficiency. Among other things, the input and output of electrical energy is energy-intensive. Further development here is certainly strongly dependent on the battery industry and cell technology as well.

Chain-free thanks to change in law

Important for the future development of mobility: The legislators have also given the green light to the series hybrid, among other things thanks to successful lobbying by a network of companies from the field. In 2022, the responsible EU Commission classified e-bikes with corresponding drives as EPACs – electrically power assisted cycles. For these, the usual standards and rules apply as for pedelecs: Same position under traffic law as bicycles, motor's continuous power up to 250 watts, assistance up to a speed of 25 kilometers per hour. This key data is the primary prerequisite for the market success of the series hybrid in Europe.

"What better place for forward-looking technologies from the bike and new mobility sector than the world's leading trade fair in Frankfurt?" asks Dirk Heidrich, Eurobike project manager. "We are convinced that the fair can play a major role in paving the



way for the mobility transition from a technical point of view. The presentation and discussion of the technical possibilities of entirely new systems is a focal point here. We also see this as one of our central tasks."

Only series hybrid in the future?

Even if experts predict a very bright future for the series-hybrid system, everyone agrees that classically driven pedelecs, especially those for the sports sector, are not going to vanish. If you ride a racing bike or mountain bike with an assist system, you may place the greatest importance on a classic chain feeling, as well as on weight minimization. But even so, the application range of the series hybrid will grow strongly. Eurobike in Frankfurt will continue to document this with great enthusiasm.

About Eurobike:

EUROBIKE is the central platform of the cycling and future mobility universe. Together with visionaries from politics, business, society and the mobility industry, it creates space for communication, new ideas, change of perspective, and strong partnerships for innovative mobility solutions and new business models. With EUROBIKE, the booming and rapidly changing bicycle and future mobility industries have found a common platform. It sets new standards and identifies key topics in the areas of sports, leisure, health and mobility, makes continuous progress and brings the global community together live. Eurobike 2023 takes place from June 21 to 25, 2023 on the fair grounds of Messe Frankfurt.

About fairnamic GmbH:

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**31st International
Bicycle Trade Exhibition**
June 21–25, 2023
Exhibition Center Frankfurt



**31. Internationale
Fahrradmesse**
21.–25. Juni 2023
Messe Frankfurt

With the founding of fairnamic GmbH, the trade fair companies Frankfurt and Friedrichshafen are sealing a partnership focusing on innovative mobility. The market position in the future markets of bicycles, e-bikes, micromobility and general aviation is strengthened by pooling expertise and market knowledge, global positioning, brand strength and speed. The joint venture focuses on the EUROBIKE and AERO brands and their satellites. The objective is to expand and further develop the two flagship trade fairs.

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fairnamic GmbH
Neue Messe 1, 88046 Friedrichshafen
GERMANY
Phone: +49 7541 95995-0
www.fairnamic.com

Media and Communications:
Messe Friedrichshafen
Frank Gauß
Phone: +49 7541 708-307
E-Mail: presse@messe-fn.de