



Market launch of Bosch eBike ABS **Focus on safety – ABS now also available for the eBike**

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- ▶ Bosch eBike Systems is announcing the market launch of ABS
- ▶ The ABS was first mass-produced for cars 40 years ago
- ▶ In a few years, ABS will become the standard on high-end pedelecs
- ▶ More road safety for eBikers

Stuttgart/Reutlingen – From airplanes to cars to motorcycles, and now for eBikes, the anti-lock braking system (ABS) has had a decisive impact on different means of transport and has boosted safety. At the end of 2018, the ABS for pedelecs became commercially available on selected models. With this, Bosch opens a new chapter in the success story of the anti-lock braking system. Forty years have passed since Bosch brought the world's first production-ready ABS for cars into the market, initially as an extra feature in the Mercedes-Benz S-Class. In light of this, Bosch had the term ABS patented. In 1936, the Stuttgart technology company applied for a patent for a "device to prevent a vehicle's wheel brakes from locking". Since its invention, the system has become even smaller, lighter and more powerful. Bosch has been making anti-lock braking systems for motorcycles since 1995, and now for the eBike as well. Claus Fleischer, CEO of Bosch eBike Systems, says there is great potential: "Safety is an important factor in ensuring that this trendsetting form of mobility becomes sustainable on the market. I am convinced that ABS will become standard equipment on high-end pedelecs. In a few years, most city and trekking eBikes will be equipped with ABS."

Safer braking

The ABS has become indispensable in cars. Today, the installation of ABS in new vehicles is even mandatory in Europe. However, it has been proved that the system makes sense for the eBike as well. Bosch accident research has shown that the anti-lock braking system prevented almost one out of four pedelec accidents and reduced the number of accidents involving serious injuries. Incorrect use of brakes often plays a central role in causes of accidents. When braking, many cyclists ignore the front brake which produces a much higher

braking action than the rear brake. The reason for this is fear of crashing. The ABS counteracts this risk since the brakes can be used more efficiently. This reduces the braking distance and the risk of crashing and rollovers.

ABS for bicycles – how does it work?

With front wheel ABS, wheel speed sensors monitor the speed of both wheels. When the front wheel is on the verge of locking, the Bosch eBike ABS controls the brake pressure. The ABS reacts quicker than any rider. In particular, the pedelec can be better controlled and brought to a stop on slippery road conditions and loose, wet ground. Rear wheel lift control is another function of the Bosch eBike ABS. It reduces the chance of the rear wheel lifting off the ground when applying the brake aggressively. This is how it works: Wheel speed sensors detect lifting of the rear wheel through sudden changes in the wheel speed. This results in regulation of the amount of braking force applied to the front wheel. The Bosch eBike ABS briefly reduces the braking force on the front wheel so that the rear wheel quickly regains ground contact. This reduces the likelihood of the eBiker flying over the handlebar.

Perfect interplay

The hydraulic brakes and electronic braking system are precisely matched. Bosch developed the eBike ABS together with its long-standing partner Magura, which provides a special braking system with the Magura CMe ABS. eBike components and the ABS must be in tune with each other as a system as optimally as possible. For this reason, bicycle makers only build the ABS directly on the eBike. Retrofitting is impossible. The power source of the anti-lock braking system is the eBike battery. However, the ABS has no noticeable effect on the battery's range since power is only used when the ABS is actively controlling the braking process. In addition, it is ensured that ABS, light and display also run in backup mode. These safety-relevant functions only switch off when the backup has been used up. The end of backup mode is indicated by an ABS indicator light flashing briefly. The brake then operates as a conventional brake.

Safety comes first

Bosch eBike Systems takes another step towards safe cycling with the ABS and electronic systems. This also includes an on-board computer. Nowadays, the Bosch displays, for example, provide all information like speed, cadence or range at a glance. Whilst operating the eBike, the eBiker keeps both hands on the handlebar and controls the on-board computer easily and comfortably via a separate control unit during the ride. "Safety is of the utmost priority for Bosch. We work continuously on the enhancement of safety products. In principle, many things that are now the standard for cars are also conceivable for eBikes

because fundamental elements, such as power supply and intelligence, are already on board in the form of sensors", says Mr Fleischer.

Facts & figures about the Bosch eBike ABS

Availability:	Available for purchase in Europe starting autumn 2018
Dealer search:	www.bosch-ebike.com/dealers
As of Spring 2018:	Rollout phase with fleet partners Centurion, Cresta, Flyer, Kalkhoff and Riese & Müller
Weight:	approx. 800 grams
Components:	ABS control unit, ABS control light, ABS wheel speed sensors (front and rear), Magura brake CMe ABS with sensor disc
Functions:	Anti-lock braking system on the front wheel Intelligent rear wheel lift control Automatic switching with on-board computer
Benefits:	Optimised riding stability and manoeuvrability Less chance of riders flying over the handlebar More efficient use of brake Greater safety More riding enjoyment
Price:	Prices are determined by bicycle manufacturers
Manufacturer:	E BIKE Advanced, Flyer, KTM, Riese & Müller, ZEG (Zemo) etc.
Retrofitting option:	No, only available as original equipment
Compatibility:	28-inch city and trekking eBikes combined with all Bosch eBike drive systems

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About Bosch eBike Systems

A new generation of bikes is taking town and country by storm and is already a part of everyday life. eBikes are a modern means of transport for modern people: people in a hurry and people who prefer to take it easy, the fit and the comfort lovers, commuters and pleasure cyclists and, of course, young and old. The tailwind of technology-leading eBikes made by what are already more than 70 leading brands in Europe is powered by components that Bosch is developing to perfection. The Bosch portfolio ranges from the highly efficient drive unit (motor and gearbox) and high-quality batteries to a smart on-board and cycle computer that can be used intuitively. Perfect coordination of components holds the key to typical Bosch performance in terms of both comfort and efficiency.

Like other Bosch products, the eBike systems benefit from the Bosch Group's technology and production know-how. From conception and engineering to manufacturing, marketing and after-sales service, Bosch eBike Systems constantly set new standards for the eBike industry. The Bosch Group's experience in the areas of electric motors, sensor technology, displays and lithium-ion batteries ensures that Bosch eBike systems use technology that is invented for life and that eBike users have their fun.

For more information please visit www.bosch-ebike.com

About Bosch

The Bosch Group is a leading global supplier of technology and services. It employs roughly 400,500 associates worldwide (as of December 31, 2017). According to preliminary figures, the company generated sales of 78 billion euros in 2017. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected industry. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to create solutions for a connected life, and to improve quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 125 locations across the globe, Bosch employs 62,500 associates in research and development.

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