Press release

April 17, 2019
PI10914 BBM IEh/Bär

Commercial vehicle innovation enabler: Bosch brings advanced solutions to the new Nikola Two truck

Bosch has worked hand-in-hand with Nikola in helping develop the Nikola powertrain

- Nikola and Bosch develop fuel cell powertrain for the Nikola Two Alpha– together.
- Nikola trucks feature Bosch innovations such as Mirror Cam system, Perfectly Keyless and Servotwin steering system.
- Jason Roycht, vice president and regional business unit leader, Commercial Vehicles & Off-Road for Bosch in North America: “This has been a two-and-a-half year cooperation targeted at implementing advanced technology into a totally new and unique approach to trucking with the highest levels of engineering excellence.”
- “Bosch has been our innovation partner to help make our vision a reality.” – Trevor Milton, Nikola founder and CEO.

Scottsdale, Arizona – Nikola Motor Company showcased its hydrogen-electric powered semi-truck, the Nikola Two, live in action for the first time to the general public at its Nikola World event. Bosch technology and expertise helped Nikola to realize the fully functional Nikola Two hydrogen-electric truck with industry-ready heavy-duty truck components and systems. The technology and system approach is adaptable for use in Nikola’s full line of vehicles, including the Nikola One Sleeper Cab and the Nikola Tre, a hydrogen-electric truck for European markets.

The Nikola trucks feature innovations in automation, connectivity and electrification enabled with Bosch’s assistance. The supplier of technology and services offers solutions for commercial vehicles to improve efficiency and safety in logistics. To enable the distinctive Nikola approach, engineering teams from Bosch locations in the United States and Germany contributed more than 220,000 hours into the development of the Nikola trucks.

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“This has been a two-and-a-half year cooperation targeted at implementing advanced technology into a totally new and unique approach to trucking with the highest levels of engineering excellence,” said Jason Roycht, vice president and regional business unit leader, Commercial Vehicles & Off-Road for Bosch in North America. “We’ve learned from each other and together pushed ourselves to achieve what seemed to everyone else to be impossible. The Nikola Two is not just a simple evolution of today’s heavy duty truck. It’s a revolution in both sophisticated control and design.”

“Bosch has been our innovation partner to help make our vision a reality,” said Trevor Milton, founder and CEO of Nikola Motor Company. “We look for partners who provide us expertise and world-class solutions, but also ones that are willing to dream alongside us.”

The brain of the future – engineered by Nikola and Bosch
The Nikola truck is more than just a fuel cell vehicle; it’s a rolling super computer. Bosch systems, software and engineering expertise have helped Nikola to build the brains of its Nikola Two super truck.

One of the key elements of Nikola’s advanced system is the Bosch **Vehicle Control Unit (VCU)**, which provides higher computing power for advanced functions while reducing the number of standalone units. The VCU enables future innovations by providing a scalable platform for the highly complex electric/electronic (E/E) architecture needed to support the advanced features of the Nikola truck. The Nikola family of trucks will be connected with an advanced and secure operating system that provides real-time, over-the-air updates and monitoring.

The commercial vehicle powertrain reimagined
The essence of the Nikola truck lineup is a new commercial vehicle powertrain achieved thanks to a development partnership between Nikola and Bosch. The two organizations have reimagined the powertrain – and the vehicle chassis integrated together with it – from the ground up. The fuel-cell system designed to deliver benchmark vehicle range was custom-designed together by Nikola and Bosch. The two organizations also worked in tandem to develop the first true dual-motor commercial-vehicle eAxle for a long-haul truck. The eAxle features Bosch rotors and stators, and Bosch has also contributed functional safety efforts throughout the truck.

Mirrorless and keyless - Bosch technology pervades the Nikola trucks
Bosch technology is also prevalent in other areas of the Nikola trucks. Nikola’s vehicles will be missing one standard feature of previous class-8 trucks: side

mirrors. In the place of the conventional main and wide-angle mirrors is a camera system, known as **Mirror Cam System**, which offers drivers a digital side and rear view from the truck cab. Two cameras, fitted left and right in place of traditional mirrors, feed real-time images to high-resolution displays mounted inside the cab. The system, developed by Bosch and Mekra Lang, adjusts the monitor display to match the driving situation digitally. It captures both rear-view fields of vision of a CV mirror with just one camera lens on each side of the vehicle cab. In addition to increasing safety, compact digital cameras instead of mirrors offer aerodynamic advantages as the cameras are considerably smaller than mirrors and therefore reduce drag.

Fleet operators will be able to digitally manage vehicle keys for the Nikola trucks in their fleet thanks to the **Perfectly Keyless** system from Bosch. Freight and commercial vehicle rental companies can use a smartphone app to give their drivers access to specific fleet vehicles and to flexibly manage who has access and when. Sensors on the Nikola vehicles will connect with an app on a driver's smartphone so that when the driver approaches the vehicle, Perfectly Keyless recognizes the smartphone, identifies the unique security key assigned to the driver's phone, and unlocks the door. As soon as the driver moves away from the truck again, the vehicle is automatically securely locked.

Nikola's trucks are equipped for driver assistance and future automation thanks in part to the Bosch **Servotwin** electrohydraulic steering system. The steering system will enable driver assistance systems that actively support the driver to enhance driving comfort and improve safety. On the Nikola vehicles, the Servotwin will help to enable features such as lane-keeping assistance, side-wind compensation and traffic jam assist. The system also provides a key building block for the rollout of automated features in the future.

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aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 410,000 associates worldwide (as of December 31, 2018). According to preliminary figures, the company generated sales from operations of 77.9 billion euros in 2018. 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 manufacturing. 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 deliver innovations for a connected life. Bosch improves 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 subsidiary 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 some 69,500 associates in research and development.

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