

## Press release



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## World first: Bosch and Daimler obtain approval for driverless parking without human supervision

- Automated valet parking is the world's first fully automated driverless (SAE Level 4)<sup>1</sup> parking function to be approved by the authorities.
- System to be in daily use in the Mercedes-Benz Museum parking garage in Stuttgart.
- Automated parking system collects and returns the vehicle completely independently.
- Bosch supplies the infrastructure; Daimler the vehicle technology.

Stuttgart, Germany – Bosch and Daimler have reached a milestone on the way to automated driving: the two companies have now obtained approval from the relevant authorities in Baden-Württemberg for their automated parking system in the Mercedes-Benz Museum parking garage in Stuttgart. The automated valet parking service is accessed via a smartphone app and requires no safety driver. This makes it the world's first fully automated driverless SAE Level 4 parking function to be officially approved for everyday use.

"This decision by the authorities shows that innovations like automated valet parking are possible in Germany first," says Dr. Markus Heyn, member of the board of management of Robert Bosch GmbH. "Driverless driving and parking are important building blocks for tomorrow's mobility. The automated parking system shows just how far we have already progressed along this development path."

"This approval from the Baden-Württemberg authorities sets a precedent for obtaining approval in the future for the parking service in parking garages around the world," says Dr. Michael Hafner, the head of drive technologies and automated driving at Daimler AG. "As a pioneer in automated driving, our project paves the way for automated valet parking to go into mass production in the future."

### Playing it safe: two partners with a common objective

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From the very beginning, Bosch and Daimler's top priority for the driverless parking service was safety. Since there is as yet no official approval process for automated driving functions that do not require a driver, the local authorities – the Stuttgart regional administrative authority and the state of Baden-Württemberg's transportation ministry – oversaw the project along with experts from the German certification authority TÜV Rheinland from the outset. Their aim was to assess the operating safety of the automotive and parking-garage technology.

The result is a comprehensive safety concept with appropriate testing and approval criteria that can be applied beyond this pilot project. In the concept, the developers defined how the driverless vehicle detects pedestrians and other cars in its path and reliably comes to a halt when it encounters an obstacle. They also set up secure communications between all system components and took steps to ensure the reliable activation of the parking maneuver.

### **The technology behind driverless parking**

Drive in to the parking garage, get out, and send the car to a parking space just by tapping on a smartphone screen – automated valet parking has no need for a driver. Once the driver has left the parking garage to go about their business, the car drives itself to an assigned space and parks. Later, the car returns to the drop-off point in exactly the same way. This process relies on the interplay between the intelligent parking garage infrastructure supplied by Bosch and Mercedes-Benz automotive technology. Bosch sensors in the parking garage monitor the driving corridor and its surroundings and provide the information needed to guide the vehicle. The technology in the car converts the commands from the infrastructure into driving maneuvers. This way, cars can even drive themselves up and down ramps to move between stories in the parking garage. If the infrastructure sensors detect an obstacle, the vehicle stops immediately.

### **Project milestones**

Bosch and Daimler started developing fully automated driverless parking in 2015, and in the summer of 2017, their pilot solution in the Mercedes-Benz Museum parking garage in Stuttgart reached an important milestone: automated valet parking in real conditions, with and without drivers at the wheel, was presented to the public for the first time. This premiere was followed by an intensive testing and start-up phase. Starting in 2018, museum visitors could use the parking service live, accompanied by trained safety personnel, and share their experience. One aspect of the pilot project involved testing lighting concepts on the vehicles. Turquoise lighting indicates that a vehicle is in automated driving mode and informs passers-by and other road users that the vehicle is driving itself. The insights from these tests are reflected in the recently issued SAE standard 3134. Obtaining final approval from the authorities is a further major milestone for Bosch and Daimler: soon, interested parties will be able to experience the innovative valet parking service live in daily operation in the

Mercedes-Benz Museum parking garage without additional supervision from a safety driver.

<sup>1</sup> [SAE Level 4: Driverless driving in a geographically discrete area, as defined by the Society of Automotive Engineers \(SAE\) in its recommended practice J 3016](#)

## **More information:**

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## **Basic information:**

Mobility Solutions is the largest Bosch Group business sector. In 2018, its sales came to 47.6 billion euros, or 61 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector pursues a vision of mobility that is accident-free, emissions-free, and fascinating, and combines the group's expertise in the domains of automation, electrification, and connectivity. For its customers, the outcome is integrated mobility solutions. The business sector's main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and automated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive 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). The company generated sales of 78.5 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 460 subsidiary and regional companies in over 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 nearly 130 locations across the globe, Bosch employs some 68,700 associates in research and development.

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