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Corporate Communications
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www.bosch-presse.de

Press release

PI9182

April 8, 2016
PI 9182 CC joe/KB

The future of parking
Bosch looks to shake up the market with revolutionary ideas

- Bosch simplifies the search for parking and automates the parking process
- Bosch board of management member Hoheisel: “The mobility of the future starts today – with smart parking”
- Bosch sales in driver assistance to grow to over one billion euros in 2016
- Some 2,500 Bosch engineers are working on automated driving and parking

Stuttgart – Bosch is tapping a whole new market by offering parking technologies and services. In doing so, the supplier of technology and services takes a standardized approach: Bosch is simplifying the search for parking spaces and is gradually automating the parking process. “The mobility of the future starts today – with smart parking,” says Dr. Dirk Hoheisel, member of the board of management of Robert Bosch GmbH, commenting on the technology’s significance. Potential customers for Bosch parking solutions include vehicle manufacturers and parking garage operators as well as cities and communities around the globe. The company has already made major achievements in this area, especially with its systems for automated parking and driving; this progress is also moving Bosch toward an important milestone this year. “In 2016, our sales in driver assistance will exceed one billion euros,” says Hoheisel. Worldwide, almost 2,500 Bosch engineers – some 500 more than last year – are working to further develop driver assistance systems and automated driving.

Half of all new cars come with a parking assistance system

As part of the move toward fully automated parking, over the next few years Bosch plans to launch a host of parking assistance systems. These systems help drivers park accident-free, or even completely guide them into a space at the touch of a button. In Germany, parking assistance systems are the most common assistants in today’s cars. According to a Bosch evaluation of the 2014 vehicle registration statistics, of the nearly three million cars that were registered that

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year, half of them (52 percent) feature just such a system. The picture is fairly similar in other countries: in Belgium and the Netherlands, half of all new cars in 2014 (50 percent) came equipped with a parking assistant. In the U.K., the figure is 19 percent. These systems are mainly based on ultrasonic sensors, which Bosch has been making since 1993. Bosch has been making the ultrasonic sensors critical to these systems since 1993.

Bosch services relieve drivers of the search for parking

For Bosch, automated parking begins in the vehicle – but it goes much further than that. “In offering intelligent services, Bosch also takes on the often arduous task of looking for available parking, thereby saving time and reducing stress,” Hoheisel says. In Germany, it takes an average of ten minutes to find a parking space. Bosch shortens this search in two ways: one, special occupancy sensors in parking lots or garages detect and report empty spaces. Two, Bosch uses the sensors that are becoming standard in an increasing number of vehicles and employs them in the search for curbside parking. The information is processed in the Bosch IoT Cloud to generate digital maps of parking spaces. Drivers can access the maps, for instance online or via their vehicle’s navigation system, and let themselves be guided directly to areas with free parking spaces. “Having cars drive directly to available parking spaces will also mean a reduction in pollution,” Hoheisel points out. On average, drivers in Germany today clock up as many as 4.5 kilometers in unnecessary driving each time they look for parking.

In the future, a night out at a concert no longer starts in a parking garage

“Parking as we know it today won’t exist in the future,” Hoheisel says. Even before the end of this decade, cars will drive themselves to a space in a parking garage, thanks to Bosch technology. Drivers will simply leave their car in a handover zone outside a parking garage and instruct it by smartphone, for example, to search for a parking space. When ready to leave, they call the car back to the drop-off point in the same way. “Going to a concert no longer means starting and ending your evening in a drafty parking garage,” Hoheisel says. This innovation is made possible by smart Bosch technology present in the vehicle and parking garage as well as the communication between the two. “Fully automated parking will be ready for production before fully automated driving,” Hoheisel says. Another reason parking will be realized first is that the legal hurdles for introducing fully automatic parking are easier to surmount, especially with regard to vehicle registration requirements. The necessary adjustments to regulatory law, which in Germany is in part aligned with the Vienna Convention on Road Traffic, are on political agendas around the world.

Press photos: 1-BBM-22054, 1-BBM-22053, 1-CC-22090, 1-BBM-22088

Related link: www.bosch-connected-parking.com

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Mobility Solutions is the largest Bosch Group business sector. According to preliminary figures, its 2015 sales came to 41.7 billion euros, or 60 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector combines the group's expertise in three mobility domains – automation, electrification, and connectivity – and offers its customers integrated mobility solutions. Its 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 375,000 associates worldwide (as of December 31, 2015). According to preliminary figures, the company generated sales of more than 70 billion euros in 2015. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing and sales network covers some 150 countries. The basis for the company's future growth is its innovative strength. Bosch employs 55,800 associates in research and development at roughly 115 locations across the globe. 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."

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Parken der Zukunft

Mit Technologien und Services im Bereich Parken erschließt Bosch einen neuen Markt. Dabei verfolgt das Technologie- und Dienstleistungsunternehmen einen ganzheitlichen Ansatz: Bosch vereinfacht die Parkplatzsuche und automatisiert Schritt für Schritt das Einparken.

The future of parking

Bosch is tapping a whole new market by offering parking technologies and services. In doing so, the supplier of technology and services takes a standardized approach: Bosch is simplifying the search for parking spaces and is gradually automating the parking process.

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Parken der Zukunft

In Deutschland dauert es im Schnitt fast zehn Minuten, bis ein Platz zum Parken gefunden ist. Bosch kürzt die Suche ab: Zum einen erkennen und melden spezielle Belegungssensoren freie Lücken auf Parkplätzen, in Parkhäusern oder Tiefgaragen. Zum anderen nutzt Bosch die ohnehin in immer mehr Fahrzeugen vorhandenen Sensoren für die Suche nach Stellplätzen am Straßenrand.

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Parken der Zukunft

Auf dem Weg zum vollautomatisierten Parken bringt Bosch in den kommenden Jahren noch eine Reihe von Parkassistenzsystemen auf den Markt. Diese unterstützen Autofahrer beim unfallfreien Einparken oder nehmen ihnen das Rangieren in die Parklücke auf Knopfdruck komplett ab. In Deutschland sind Parkassistenzsysteme die am weitesten verbreiteten Helfer in modernen Autos. Laut einer Bosch-Auswertung auf Basis der Zulassungsstatistik 2014 kommen sie in jedem zweiten der knapp drei Millionen im vergangenen Jahr neu zugelassenen Pkw (52 Prozent) zum Einsatz.

The future of parking

As part of the move toward fully automated parking, over the next few years Bosch plans to launch a host of parking assistance systems. These systems help drivers park accident-free, or even completely guide them into a space at the touch of a button. In Germany, parking assistance systems are the most common assistants in today's cars. According to a Bosch evaluation of the 2014 vehicle registration statistics, of the nearly three million cars that were registered that year, half of them (52 percent) feature just such a system.

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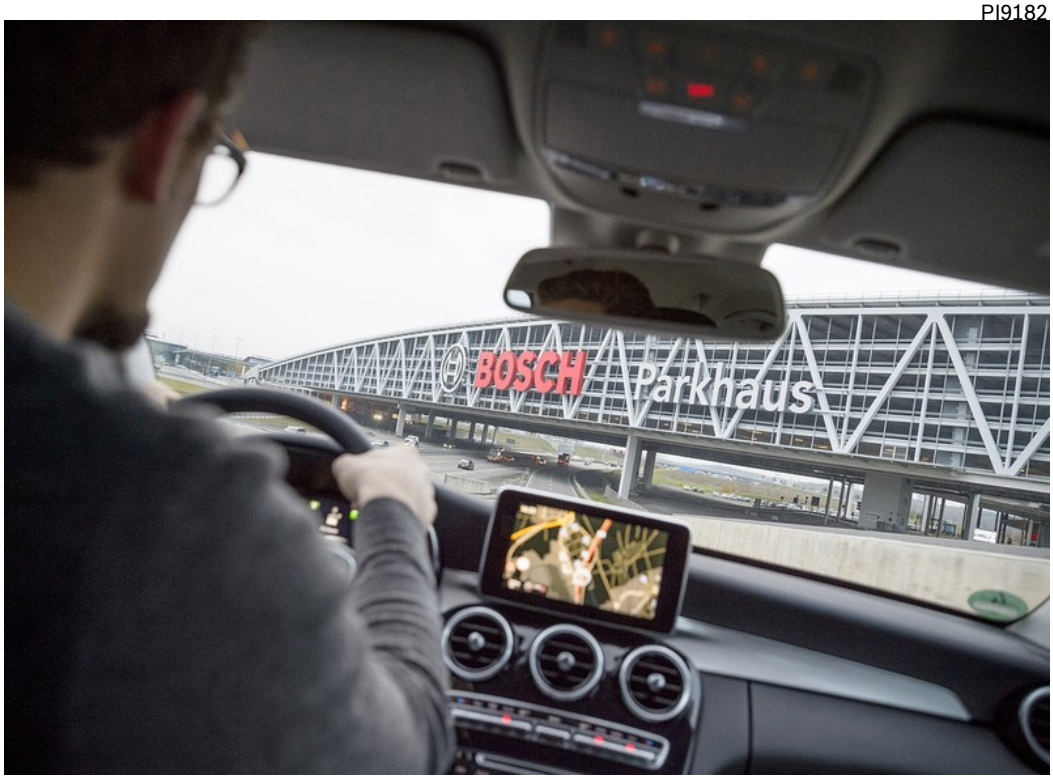

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Parken der Zukunft

Noch vor Ende dieser Dekade finden Autos mit Bosch-Technik ganz alleine den Weg ins Parkhaus. Dazu stellt der Fahrer sein Fahrzeug nur noch in einer Übergabezone vor dem Parkhaus ab und gibt ihm zum Beispiel per Smartphone den Befehl, sich einen Parkplatz zu suchen. Genauso kommt das Auto auf Wunsch jederzeit auch wieder vorgefahren.

The future of parking

Even before the end of this decade, cars will drive themselves to a space in a parking garage, thanks to Bosch technology. Drivers will simply leave their car in a handover zone outside a parking garage and instruct it by smartphone, for example, to search for a parking space. When ready to leave, they call the car back to the drop-off point in the same way.

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Presse release
Bosch Compact

PI9214

Facts, statistics, and incredible things about parking
Did you know that...

April 8, 2016
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- ... Bosch engineers invest at least 5,000 hours in the development of a new parking function.

- ... looking for somewhere to park is the tenth greatest concern of German drivers.[1]

- ... 64 percent of city dwellers in Germany are unhappy with the parking situation in downtown areas.[2]

- ... 63 percent of drivers in Germany would be happy to surrender control when executing a parking maneuver.[3]

Parking in Germany is stressful and time-consuming

- ... looking for a parking space in Germany accounts for about 30 percent of urban traffic.[4]

- ... looking for a parking space takes about 10 minutes and requires driving about 4.5 kilometers on average. This corresponds to vehicle costs of 1.35 euros and CO_2 emissions of 1.3 kilograms per kilometer.[5]

- ... parking in a parking garage in Germany costs an average of 60 euros per year.[6]

- ... drivers in Germany pay an average of 16 euros a year for tickets due to parking violations.[7]

- ... nearly every second German driver sometimes forgets where they have parked their own car.[8]

- ... parking and maneuvering accidents make up 40 percent of all car accidents where there is material damage.[9]

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Who parks better: women or men, the young or the old?

- ... women park faster than men, but require more steering movements to do so. Women require an average of 17 seconds and 1.62 steering movements in order to park. Men need 3 seconds more, but are in their parking space after just 1.5 steering movements.[10]

- ... drivers aged 55 to 65 park faster than young drivers aged between 18 and 25. Older drivers require an average of just 15 seconds, while beginners take 22 seconds to get into their parking space.[11]

- ... cheaper cars can be parked in just 17 seconds, 7 seconds less than expensive cars.[12]

- ... compact cars only take 13 seconds to park, while SUVs and sedans take an average of 28 seconds.[13]

Parking around the world: an expensive pleasure

- ... Japanese law requires drivers to prove that they have their own parking space when purchasing a car.[14]

- ... in the U.S. city of Boston, two parking spaces were sold for 560,000 dollars. That is almost twice as much as an average single-family home in the state of Massachusetts.[15]

- ... the largest parking lot in the world has more than 20,000 spaces. It belongs to the West Edmonton Mall in Edmonton, Canada.[16]

- ... parcel delivery service UPS gets about 15,000 parking tickets a month in New York.[17]

- ... in Keene, New Hampshire, it is illegal to put money into other drivers' parking meters that are about to expire.[18]

- ... U.K. resident Alastair Moffatt has the world record for parallel parking. The parking space was only 7.5 centimeters longer than his car.[19]

- ... 15 percent of those surveyed in Germany, Brazil, Russia, China, the U.K., and the U.S. are worried about parking costs. The U.K. is out in front here – this topic is on the mind of 22 percent of those surveyed. Russia is at the bottom with 7 percent.[20]

- ... 17 percent of those surveyed in Germany, Brazil, Russia, China, the U.K., and the U.S. are worried about finding a parking space. At 24 percent, parking space worries are greatest in China and Russia; they are at just 10 percent in the U.S.[21]

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[5] APCOA PARKING Deutschland (2013): APCOA PARKING Study 2013
[6] APCOA PARKING Deutschland (2013): APCOA PARKING Study 2013
[7] APCOA PARKING Deutschland (2013): APCOA PARKING Study 2013
[8] AutoScout24 (2015): Parkplatzsuche im Großstadtdschungel nervt ["Looking for Somewhere to Park in the Big City Jungle is Annoying"], http://about.autoscout24.com/de-de/au-press/au-press-news-as24.aspx?pid=453390
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Press photos: 1-CC-22109, 1-CC-22110, 1-CC-22111, 1-CC-22112

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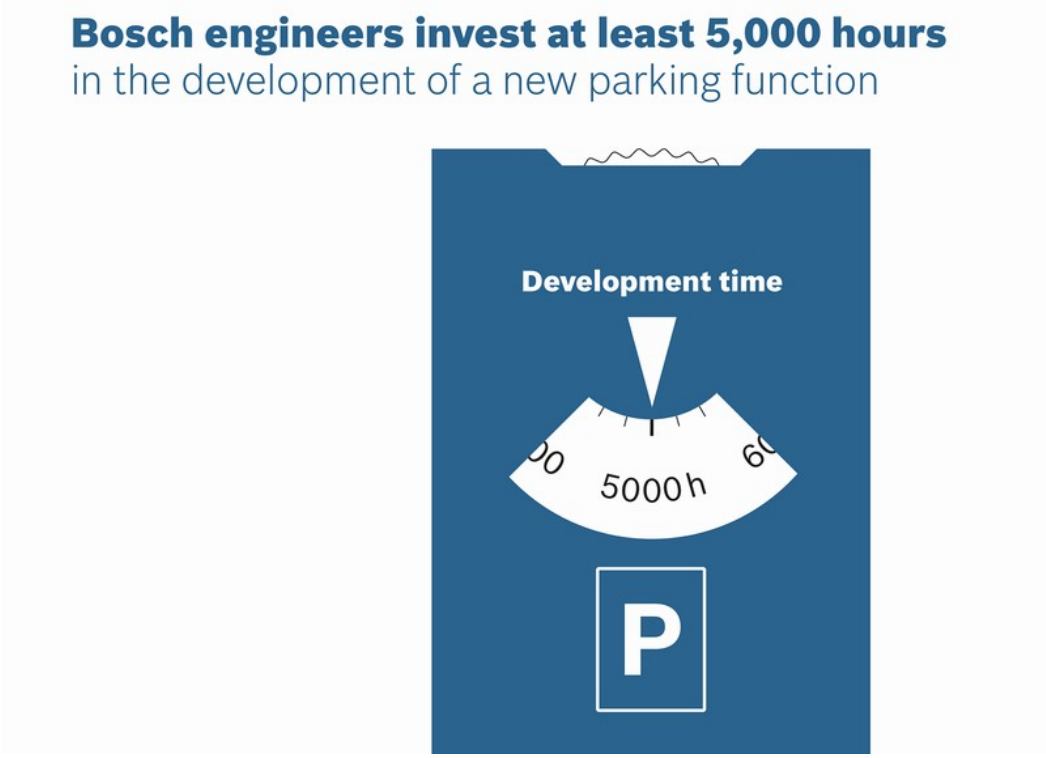

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Fakten, Statistiken und Unglaubliches zum Parken

Wussten Sie schon, dass Bosch-Entwickler mindestens 5 000 Stunden in die Entwicklung einer neuen Parkfunktion investieren?

Facts, statistics, and incredible things about parking

Did you know that Bosch engineers invest at least 5,000 hours in the development of a new parking function?

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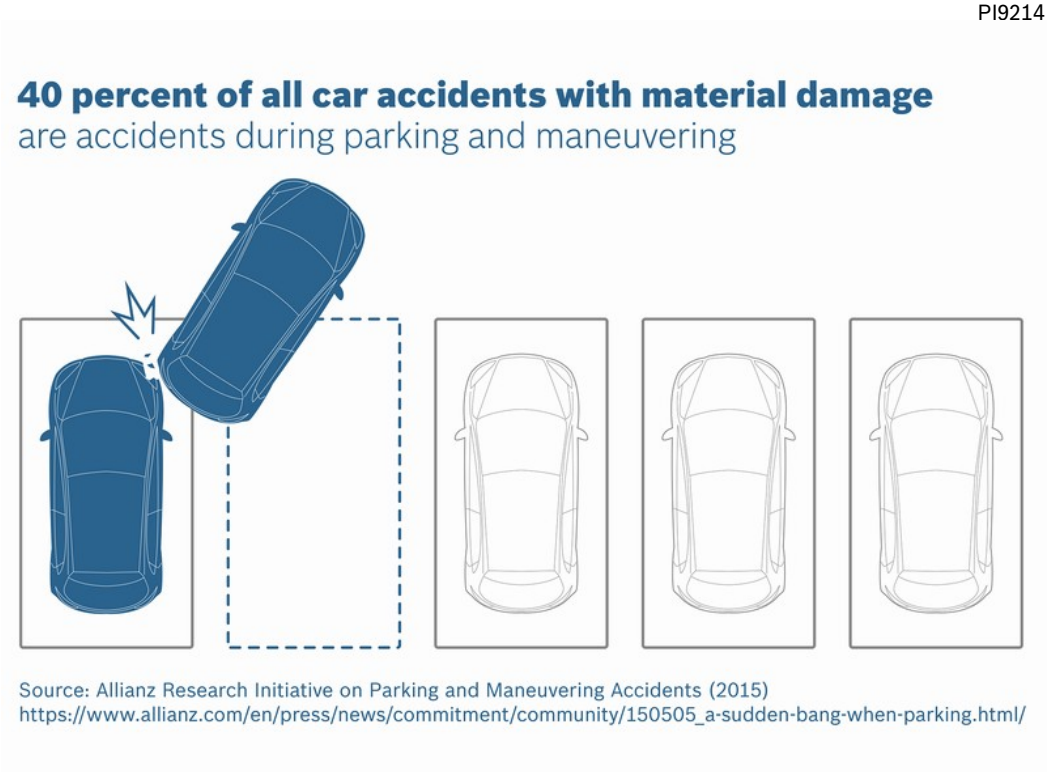

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Fakten, Statistiken und Unglaubliches zum Parken

Wussten Sie schon, dass Park- und Rangierunfälle 40 Prozent aller Pkw-Unfälle mit Sachschaden ausmachen?[9]

[9] Allianz Forschungsinitiative zu Park- und Rangierunfällen ["Allianz Research Initiative on Parking and Maneuvering Accidents"] (2015): https://www.allianz.com/de/presse/news/engagement/gesellschaft/150505_es-kracht-beim-ausparken.html/

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[9] Allianz Forschungsinitiative zu Park- und Rangierunfällen ["Allianz Research Initiative on Parking and Maneuvering Accidents"] (2015): https://www.allianz.com/de/presse/news/engagement/gesellschaft/150505_es-kracht-beim-ausparken.html/

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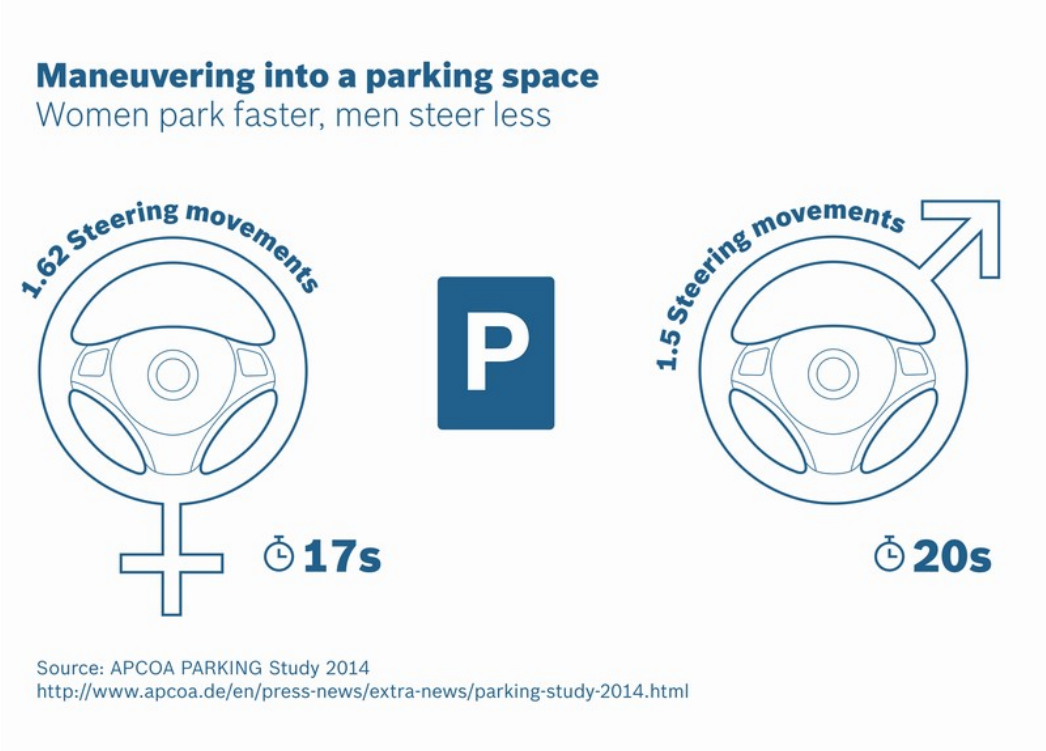

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Fakten, Statistiken und Unglaubliches zum Parken

Wussten Sie schon, dass Frauen schneller als Männer einparken, sie dafür aber mehr Lenkbewegungen benötigen? Frauen brauchen im Schnitt 17 Sekunden und 1,62 Lenkbewegungen für den Parkvorgang. Männer benötigen 3 Sekunden länger, dafür stehen sie nach nur 1,5 Lenkbewegungen in der Parklücke.[10]

[10] APCOA PARKING Deutschland (2014): APCOA PARKING Study 2014

Facts, statistics, and incredible things about parking

Did you know that women park faster than men, but require more steering movements to do so? Women require an average of 17 seconds and 1.62 steering movements in order to park. Men need 3 seconds more, but are in their parking space after just 1.5 steering movements.[10]

[10] APCOA PARKING Deutschland (2014): APCOA PARKING Study 2014

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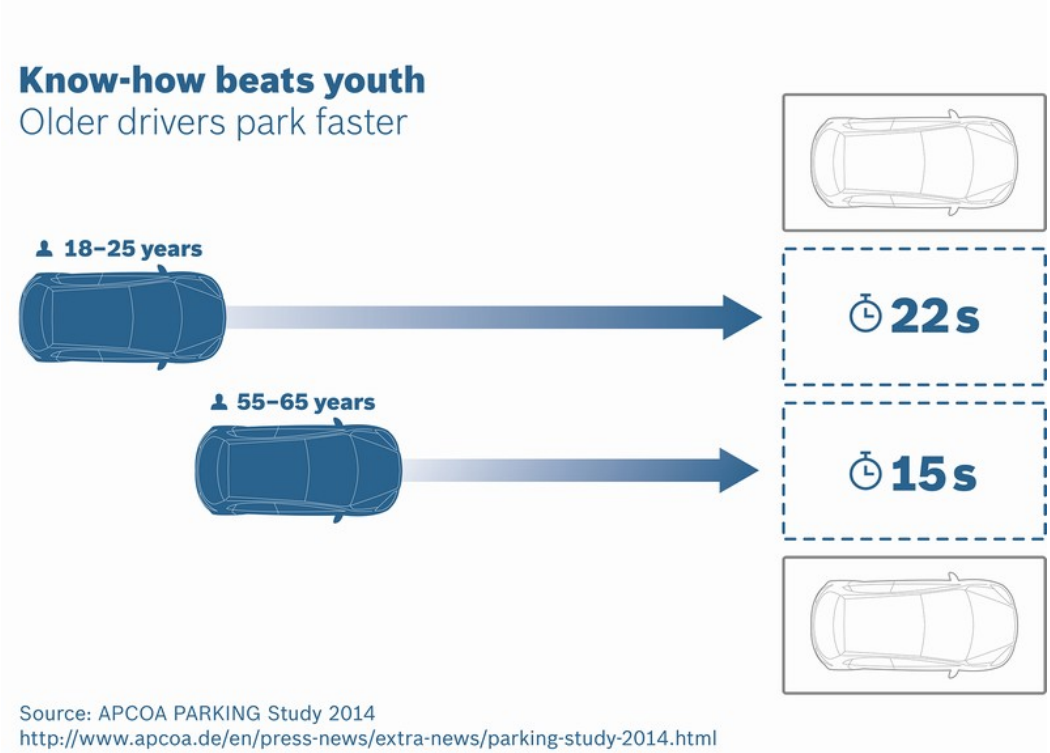

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Fakten, Statistiken und Unglaubliches zum Parken

Wussten Sie schon, dass Autofahrer im Alter von 55 bis 65 Jahren schneller parken als junge Autofahrer zwischen 18 und 25 Jahren? Die älteren Autofahrer benötigen im Schnitt nur 15 Sekunden, die Anfänger stehen nach 22 Sekunden in der Parklücke.[11]

[11] APCOA PARKING Deutschland (2014): APCOA PARKING Study 2014

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April 8, 2016
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An easier way to find parking
New service for drivers: Bosch lets cars find parking spaces themselves

- Community-based parking helps drivers navigate straight to a suitable parking space
- Cars report the available curbside spaces they detect as they drive by
- Dr. Dirk Hoheisel: “Searching for a parking space is inconvenient, stressful, and time-consuming”
- Bosch service expected to be available to drivers by 2018 or earlier

Stuttgart – Typically, any trip in a car ends up at a parking space. Of course, the driver has to find one first. In downtown areas, the search for parking spaces is responsible for roughly one-third of traffic, and curbside spaces are especially rare. No wonder that according to the online portal Statista, 87 percent of drivers are interested in solutions that make it easier to find parking. “Searching for an empty parking space is inconvenient, and usually time-consuming and stressful,” says Dr. Dirk Hoheisel, member of the board of management of Robert Bosch GmbH. Bosch has found a way to take the stress out of this process with its community-based parking, an open service platform. What makes this solution so special is that the car itself identifies and reports available available curbside parking spaces that it finds itself. This information is entered into a digital parking map and is provided to all vehicles participating in the service, for example via the navigation system. Drivers can then navigate straight to an available parking space. The service considerably shortens the search for a parking space and lessens its environmental impact in cities. It is scheduled to be rolled out for drivers by 2018 at the latest.

One for all, all for one: identifying parking spaces while driving past

“With community-based parking, we are turning cars into sensors on the internet of things and making cities smarter,” explains Hoheisel. Nearly one-third of new

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vehicles are equipped with a park assist function. Bosch takes the ultrasonic sensors in these assistants and programs them to detect curbside parking spaces. Cars can then identify curbside spaces between parked cars as they drive past – even at speeds of 50 kph and above. The information is sent to the respective vehicle manufacturer by means of a communication interface such as Bosch's connectivity control unit (CCU), and then forwarded in anonymized form to the Bosch IoT Cloud (BIC). Using an intelligent process, Bosch pools the data from all vehicles to generate a digital parking map that is based on a standard street map, and which it delivers to the vehicle manufacturers. They in turn can share the map with all of their cars that are connected to the server. Bosch expects that by 2020, all newly registered vehicles in markets such as Europe or North America will be connected in this way.

Motorhome or compact car – size matters

The secret of community-based parking lies in the way the data is handled. Simply because the car detects and reports a curbside gap does not mean that it automatically qualifies as a valid parking spot. It could just as easily be a driveway, a bus stop, or a no-parking zone. Bosch applies data mining methods in order to identify gaps next to the curb unequivocally as parking spaces. "Data mining lets us quickly and precisely filter the information we need out of a wealth of data," says Hoheisel. For instance, should several vehicles repeatedly report a curbside gap as unoccupied, it is most likely not a valid parking space. Accordingly, these gaps are not labeled as parking spaces on the digital parking map. The more vehicles that participate in community-based parking, the more accurate and comprehensive the Bosch service will be. Once a certain number of users are participating, Bosch will even be able to provide information on a space's length and width. This will make it possible to search for spaces that fit a specific vehicle, for instance a motorhome or compact car.

Service platform open to all interested vehicle manufacturers

Bosch community-based parking requires a certain population of data on curbside spaces. To this end, Bosch conducted a study in cooperation with the Technical University of Munich. The survey's key concern was how many vehicles have to drive along a street and send information about curbside spaces in order for a digital parking map to be generated. The findings were that depending on the type of street – main traffic route, side road, or similar – a little more than one percent of all cars will suffice. To be able to offer the service in different cities throughout Germany, Bosch ideally wants to work with multiple automakers. Hoheisel says, "We purposely set up community-based parking to be an open service platform." As a result, multiple vehicle manufacturers can participate at the same time.

Press photos: 1-BBM-22055, 1-BBM-22056, 1-BBM-22108

Related link: www.bosch-connected-parking.com

Contact person for press inquiries: Joern Ebberg, phone: +49 711 811-26223

Mobility Solutions is the largest Bosch Group business sector. According to preliminary figures, its 2015 sales came to 41.7 billion euros, or 60 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector combines the group's expertise in three mobility domains – automation, electrification, and connectivity – and offers its customers integrated mobility solutions. Its 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.

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Additional information is available online at www.bosch.com, www.bosch-press.com, twitter.com/BoschPresse

Press Photo 1-BBM-22055

PI9183

Bildtext | Caption

Bosch schickt Autos auf Parkplatzsuche

Mit dem Community-based Parking hat Bosch eine offene Service-Plattform für die stressfreie Parkplatzsuche entwickelt. Der Clou dabei: Autos selbst finden und melden freie Stellplätze am Straßenrand.

Bosch lets cars find parking spaces themselves

Bosch has found a way to take the stress out of finding a parking space with its community-based parking, an open service platform. What makes this solution so special is that the car itself identifies and reports available curbside parking spaces that it finds itself.

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Pressebild-Nr.
Press Photo No.
1-BBM-22055

zu Presse-Information
See Press Release
PI9183

Press Photo 1-BBM-22056

PI9183

Bildtext | Caption

Bosch schickt Autos auf Parkplatzsuche

Um Parklücken am Straßenrand zu erkennen, nutzt Bosch die Ultraschallsensoren des bereits in fast jedem dritten Neufahrzeug vorhandenen Parkassistenten. Damit erkennen Autos im Vorbeifahren – auch bei Geschwindigkeiten von über 50 Stundenkilometern –, wo sich am Straßenrand Lücken zwischen schon geparkten Fahrzeugen befinden.

Bosch lets cars find parking spaces themselves

Bosch takes the ultrasonic sensors in the park assist function and programs them to detect curbside parking spaces. Nearly one-third of new vehicles are equipped with these assistants. Cars can then identify curbside spaces between parked cars as they drive past – even at speeds of 50 kph and above.

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Bosch schickt Autos auf Parkplatzsuche

Bosch bereitet die Daten aller Fahrzeuge intelligent zu einer digitalen Parkplatzkarte auf, die auf einer Standard-Navigationsstraßenkarte basiert, und stellt sie den Fahrzeugherstellern zur Verfügung. Diese können die Karte dann mit allen Autos teilen, die über eine Serveranbindung verfügen. Autofahrer können sich dann ohne Umwege zu freien Parklücken navigieren lassen.

Bosch lets cars find parking spaces themselves

Using an intelligent process, Bosch pools the data from all vehicles to generate a digital parking map that is based on a standard street map, and which it delivers to the vehicle manufacturers. They in turn can share the map with all of their cars that are connected to the server. Drivers can then navigate straight to an available parking space.

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Press Photo No.
1-BBM-22108

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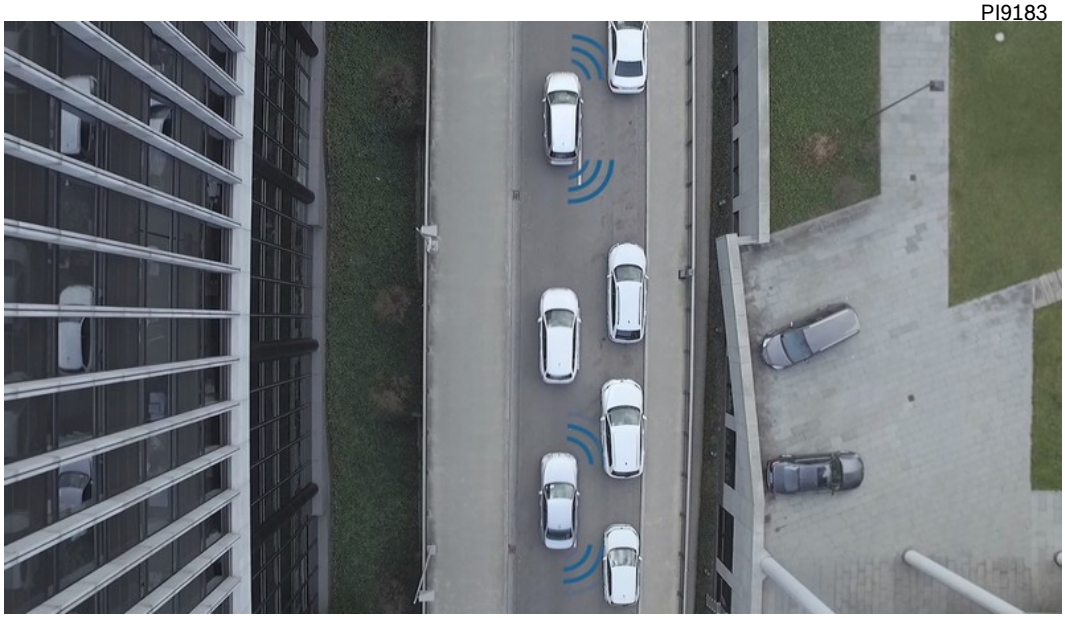
PI9183

Press Photo Bosch_CbP_EN

PI9183



Press release

PI9184

April 8, 2016
PI 9184 CC joe/KB

Accident-free parking
Bosch technology makes anyone a professional parker

- According to a study, collisions while parking and maneuvering account for 40 percent of all car accidents with material damage
- Bosch board of management member Hoheisel: “Bosch technology takes over when people get overwhelmed”
- Home Zone park assist can handle recurring parking maneuvers completely autonomously
- New Bosch system should be ready for production in 2019

Stuttgart – Parking a vehicle can sometimes turn into a real drama. More and more often, a driver’s attempt to squeeze a car into a parking space ends with dents and scratches. Over the past ten years, the number of parking and maneuvering accidents has increased by more than 30 percent. This type of incident now accounts for some 40 percent of all car accidents with material damage, according to a study conducted in 2015 by the Allianz insurance company. One of the main causes is vehicles with poor visibility. “When people can’t handle the parking themselves, that’s when our technology steps in,” says Dr. Dirk Hoheisel, member of the board of management of Robert Bosch GmbH. For example, the automated park assist can maneuver a car into a parking space at the touch of a button – and without causing an accident. The driver can control the process conveniently by smartphone, even from outside the vehicle. Bosch takes it a step further with Home Zone park assist, which is expected to be production-ready in 2019. This assistant can guide the car, completely autonomously if needed, to parking spaces up to 100 meters away, where it then maneuvers the car into the space.

Drivers can train Bosch’s Home Zone park assist themselves

Home Zone park assist is a partially automated function that still requires some monitoring by the driver. It was designed for recurring parking maneuvers – for

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example, at home or into an assigned parking garage space. The special thing about this technology is that Home Zone park assist learns and saves individual driving maneuvers. Once it does so, it can perform them independently; all the driver has to do is press a button. Even better, the Bosch system has to be instructed only once. Here's how it works: the driver activates the assistant's learning function when the car is in the desired starting position. Then, they drive the car slowly (walking pace) to a parking space no more than 100 meters away in a dummy run. The system saves the starting position, destination, and the route driven between them. From now on, Home Zone park assist can take over parking the car from the defined starting position. Drivers can choose to remain inside the car or to control the process from outside, either using a dead man's switch on the ignition key or via smartphone. The Bosch system is capable of learning and retrieving up to ten different driving maneuvers for repeated parking situations.

Assistant independently detours around static obstacles

Various Bosch sensors go into realizing Home Zone park assist. The solution draws on, for example, a total of twelve ultrasonic sensors installed in the front and rear bumpers plus a stereo video camera mounted near the rear-view mirror. Instead of the stereo video camera, the solution could also use four radar sensors, one on each corner of the vehicle. Home Zone park assist uses the sensors for orienting itself for the drive to and into the parking space. It can also recall any objects noted during the dummy run, such as posts or trees. The system is constantly comparing the position of the car with the stored position of objects in the vehicle's surroundings. If the sensors detect an unknown static obstacle such as a garbage can left in the car's path, the car automatically stops dead. If the obstacle can be avoided by deviating slightly from the preset route, the car will steer independently around it.

"Cars with Bosch technology are better at parking than most people"

While parking, the Bosch system also automatically corrects for inaccuracies. Even if the driver has not left the car precisely at the saved starting position before activating Home Zone park assist, that is no problem for the system. It is also not a problem if the driver parked the car incorrectly at the end of the dummy run. The reason is that the assistant can correct for deviations of up to two meters when planning its route. "Bosch technology is better at parking than most people," says Hoheisel. And that's not all: Home Zone park assist is also capable of pulling out of a parking space. At the mere touch of a button on a smartphone or ignition key, the system brings the car automatically to the defined starting position, so that the driver can simply step in and drive off. This saves the driver from having to squeeze in or out of the vehicle when it is parked in a tight space.

Press photos: 1-CC-22113, 1-CC-22114

Related link: www.bosch-connected-parking.com

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Press Photo 1-CC-22113

PI9184

Bildtext | Caption

Mit Bosch-Technik macht beim Einparken jeder eine gute Figur

Der Homezone Parkassistent steuert ein Auto ganz allein bis zu einem maximal 100 Meter entfernten Stellplatz, wo er das Fahrzeug dann parkt.

Bosch technology makes anyone a professional parker

The Home zone park assist can guide a car, completely autonomously, to parking spaces up to 100 meters away, where it then maneuvers the car into the space.

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Press Photo 1-CC-22114

PI9184

Bildtext | Caption

Mit Bosch-Technik macht beim Einparken jeder eine gute Figur

Der Homezone Parkassistent ist eine teilautomatisierte Funktion, die vom Autofahrer nur noch überwacht werden muss. Gedacht ist der Assistent für wiederkehrende Parksituationen – zum Beispiel im heimischen Carport oder auf einem fest zugeordneten Stellplatz in einer Tiefgarage.

Bosch technology makes anyone a professional parker

Home zone park assist is a partially automated function that still requires some monitoring by the driver. It was designed for recurring parking maneuvers – for example, at home or into an assigned parking garage space.

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PI9184

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PI9184

Press release
Bosch Compact

PI9185

Connected and automated parking
Bosch technology makes parking a piece of cake

8. April 2016
PI 9185 CC joe/KB

- Connected parking: taking the hassle out of finding a parking space
- Automated parking: parking without fender benders

When it comes to parking, Bosch takes an integrated approach. The supplier of technology and services offers innovative services that help drivers find parking spaces. And when parking, modern assistance systems help them avoid collisions.

Connected parking: taking the hassle out of finding a parking space
Active parking lot management: Bosch's active parking lot management makes it easier for drivers to find a parking space and helps parking garage operators improve capacity utilization. Sensors installed in the pavement indicate whether or not a space is occupied. The sensors wirelessly relay this information via a gateway to a server, where the data can be incorporated into a real-time map. Drivers can then access this map over their smartphones or the internet. This allows drivers to pick out an available space and navigate to it.

Automated valet parking: Automated valet parking is a Bosch function that not only relieves drivers of having to search for a parking space, but also enables the vehicle to park itself. Drivers simply drop off their vehicle at the entrance to a parking garage. Using a smartphone app, they instruct the car to find itself a place to park. They instruct the car to return to the drop-off point in exactly the same way. Fully automated parking will require several things, including an intelligent parking garage infrastructure, on-board vehicle sensors, and connectivity for both. The car and parking garage communicate with each other: sensors in the pavement identify where free parking spaces are located, and transmit this information to the car. Bosch is developing all the necessary components for fully automated parking in-house.

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Community-based parking: In residential and inner-city areas, on-road parking spaces are a scarce commodity. Bosch community-based parking makes the search for suitable spaces easier. Using the sensors of their parking assist system, cars identify and measure the gaps between parked cars as they drive past them. The information is transferred to a digital parking-space map. Using smart information processing, Bosch then corroborates the data to supply a prediction of the parking situation. The digital map is available in the cloud for vehicles in the vicinity, allowing drivers to navigate straight to a vacant spot. Once the size of the available parking spaces has been determined, it is also possible to search for spaces for a specific type of vehicle, such as a compact car or motorhome. The more cars that participate in the community-based parking system, the more detailed and up-to-date the map.

Automated parking: parking without fender benders

Smart trailer parking: Maneuvering a car and trailer into a parking space is truly an art. The smart trailer parking system offers a convenient way for drivers to control their vehicle and trailer from the curbside using a smartphone or tablet computer. It is based on electric power steering, the ESP electronic stability program, the electronic gas pedal, and a trailer hitch featuring a trailer angle sensor. Users can select steering angle and vehicle speed with an app. The driver can stand anywhere that offers a good view of the procedure.

Parking aid: Most accidents occur when parking. At speeds of up to ten kilometers per hour during parking maneuvers, ultrasonic sensors integrated into the bumpers constantly monitor the distance to any obstacles in the parking area. Drivers are also warned optically and/or acoustically about other vehicles that are parking. The closer the car gets to an obstacle, the more frequently the acoustic warning is sounded, until it becomes a continuous tone.

Remote park assist: With the remote park assist, vehicles park themselves as if by magic. All drivers need to do is press and hold a button on their ignition key or smartphone. This tells the vehicle to automatically maneuver itself into the parking space it has previously detected and measured using ultrasonic sensors. However, drivers retain responsibility for the parking maneuver. As soon as they release the button on their ignition key or smartphone, the assist system immediately stops parking.

Home Zone park assist: This function is for cars that regularly park in a private garage, car port, or underground parking space. Home Zone park assist takes on this recurring maneuver, including the approach (up to 100 meters) to the parking space. For this, all drivers have to do is teach in the maneuver just once in a dummy run, then save it. After that, their car will park itself independently in the

preset parking space. Drivers monitor the system from the driver's seat or from outside the vehicle, where they can use a smartphone to regain control. For the maneuver, the vehicle uses twelve ultrasonic sensors and a stereo video camera to orient to the objects it registered in its vicinity during the dummy run. If the sensors detect an unknown static obstacle such as a garbage can left in the car's path, the car automatically stops dead. If the obstacle can be avoided by deviating slightly from the preset route, the car will steer independently around it.

Maneuver emergency braking: At a speed of up to ten kilometers per hour, ultrasonic sensors permanently monitor the entire area around the vehicle up to a distance of four meters. The system uses this sensor data to detect relevant and non-relevant obstacles and to calculate the path the car should travel. If there is a risk of collision, the driver is warned. If the driver fails to react, the system itself intervenes to stop the car.

Multi-camera system: Four near-range cameras fitted in the vehicle provide drivers with good all-round vision while parking. With an aperture of 190 degrees each, the cameras capture the vehicle's entire surroundings. Thanks to special visualization technology, the display unit provides 3D images that are practically distortion-free. Drivers are also free to choose any perspective they wish, so they can see even small obstacles in the parking area.

Park assist: This system uses ultrasonic sensors to detect parallel or perpendicular parking spaces suitable for the vehicle in question and informs the driver. Upon activation, the system then automatically steers the car into the space. The driver remains responsible for accelerating and braking.

Rear cross-traffic alert: When reversing out of a perpendicular parking space, this radar-supported system detects vehicles, bicycles, and pedestrians that are crossing behind the car up to 50 meters away. It then gives the driver an acoustic or optical warning when there is a risk of collision.

Press photos: 1-BBM-22106, 1-BBM-22089, 1-BBM-22107, 1-BBM-22102, 1-CC-21173, 1-CC-22103, 1-CC-22105, 1-CC-22104, 1-CC-21501, 1-CC-21176, 1-CC-22091

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Press Photo 1-BBM-22106

PI9185

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Aktives Parkraum-Management

Am Boden installierte Sensoren erkennen, ob ein Parkplatz belegt ist oder nicht. Diese Information leiten die Sensoren über ein Gateway an einen Server weiter, wo sie in eine Echtzeit-Karte eingetragen werden kann. Diese Karte ist dann für Autofahrer zum Beispiel auf dem Smartphone oder im Internet abrufbar.

Active parking lot management

Sensors installed in the pavement indicate whether or not a space is occupied. The sensors wirelessly relay this information via a gateway to a server, where the data can be incorporated into a real-time map. Drivers can then access this map over their smartphones or the internet.

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Press Photo 1-BBM-22089

PI9185

Bildtext | Caption

Automatisiertes Valet Parken

Automatisiertes Valet Parken heißt die Funktion, mit der Bosch Autofahrern nicht nur die Suche nach einem Parkplatz abnimmt, sondern das Auto auch alleine parken lässt. Dazu stellen Autofahrer ihr Fahrzeug im Einfahrtsbereich eines Parkhauses ab. Per Smartphone-App geben sie ihm dann den Befehl, sich selber einen Stellplatz zu suchen. Genauso kommt das Auto auf Wunsch auch wieder vorgefahren.

Automated Valet Parking

Automated valet parking is a Bosch function that not only relieves drivers of having to search for a parking space, but also enables the vehicle to park itself. Drivers simply drop off their vehicle at the entrance to a parking garage. Using a smartphone app, they instruct the car to find itself a place to park. They instruct the car to return to the drop-off point in exactly the same way.

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Press Photo No.
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Press Photo 1-BBM-22107

PI9185

Bildtext | Caption

Community-based parking

Mit Community-based Parking nimmt Bosch Autofahrern die Suche nach einer passenden Parklücke ab: Im Vorbeifahren erkennt und vermisst das Auto Lücken zwischen parkenden Fahrzeugen. Dabei nutzt es die Sensoren des Parkassistenten. Die erfassten Informationen werden in eine digitale Parkplatzkarte übertragen.

Community-based parking

Bosch community-based parking makes the search for suitable spaces easier. Using the sensors of their parking assist system, cars identify and measure the gaps between parked cars as they drive past them. The information is transferred to a digital parking-space map.

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1-BBM-22107

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Press Photo 1-BBM-22102

PI9185

Bildtext | Caption

Anhänger-Rückfahr-Assistent

Mit dem Anhänger-Rückfahr-Assistent können Autofahrer ihr Fahrzeug mit Anhänger bequem per Smartphone oder Tablet-Computer von außen steuern. Per App lassen sich Lenkwinkel und Geschwindigkeit wählen. Der Fahrer kann sich so positionieren, dass er einen guten Überblick über das Geschehen hat.

Smart trailer parking

The smart trailer parking system offers a convenient way for drivers to control their vehicle and trailer from the curbside using a smartphone or tablet computer. Users can select steering angle and vehicle speed with an app. The driver can stand anywhere that offers a good view of the procedure.

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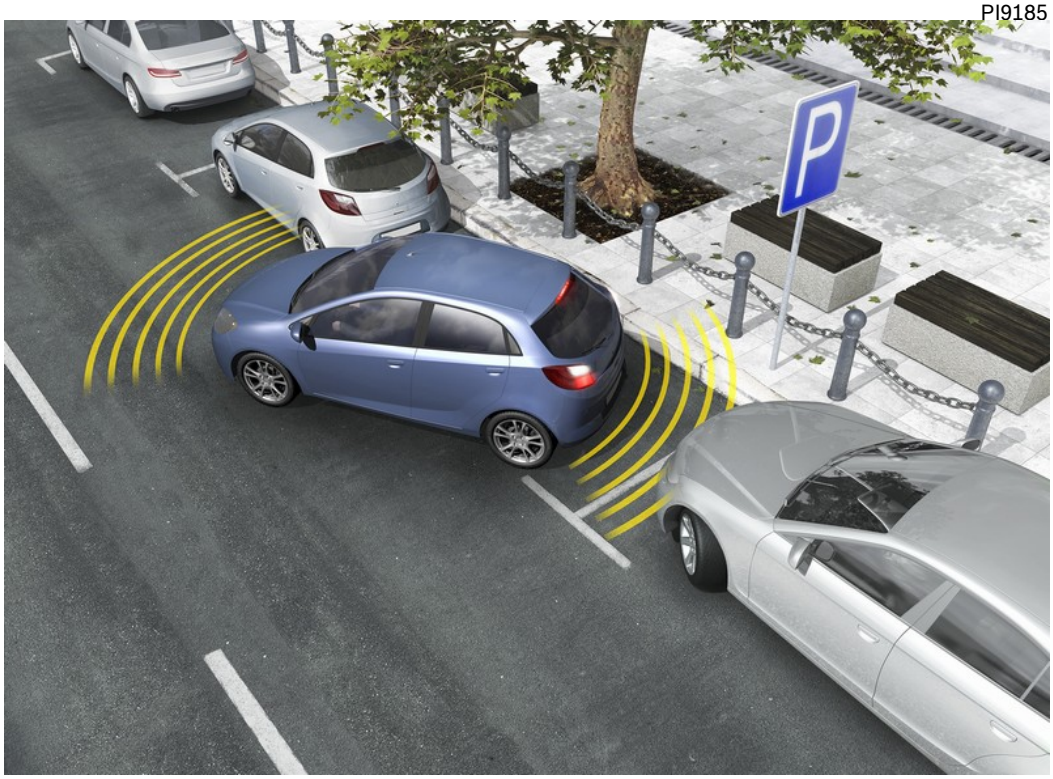
Pressebild-Nr.
Press Photo No.
1-BBM-22102

zu Presse-Information
See Press Release
PI9185

Press Photo 1-CC-21173

PI9185



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Einparkhilfe

In die Stoßfänger integrierte Ultraschallsensoren messen bei einer Fahrgeschwindigkeit von bis zu zehn Stundenkilometer während des Parkmanövers permanent die Distanz zu etwaigen Hindernissen im Parkraum. Der Fahrer wird optisch und/oder akustisch zum Beispiel vor anderen parkenden Fahrzeugen gewarnt.

Parking aid

At speeds of up to ten kilometers per hour during parking maneuvers, ultrasonic sensors integrated into the bumpers constantly monitor the distance to any obstacles in the parking area. Drivers are also warned optically and/or acoustically about other vehicles that are parking.

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Press Photo No.
1-CC-21173

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See Press Release
PI8924, PI9185

Press Photo 1-CC-22103

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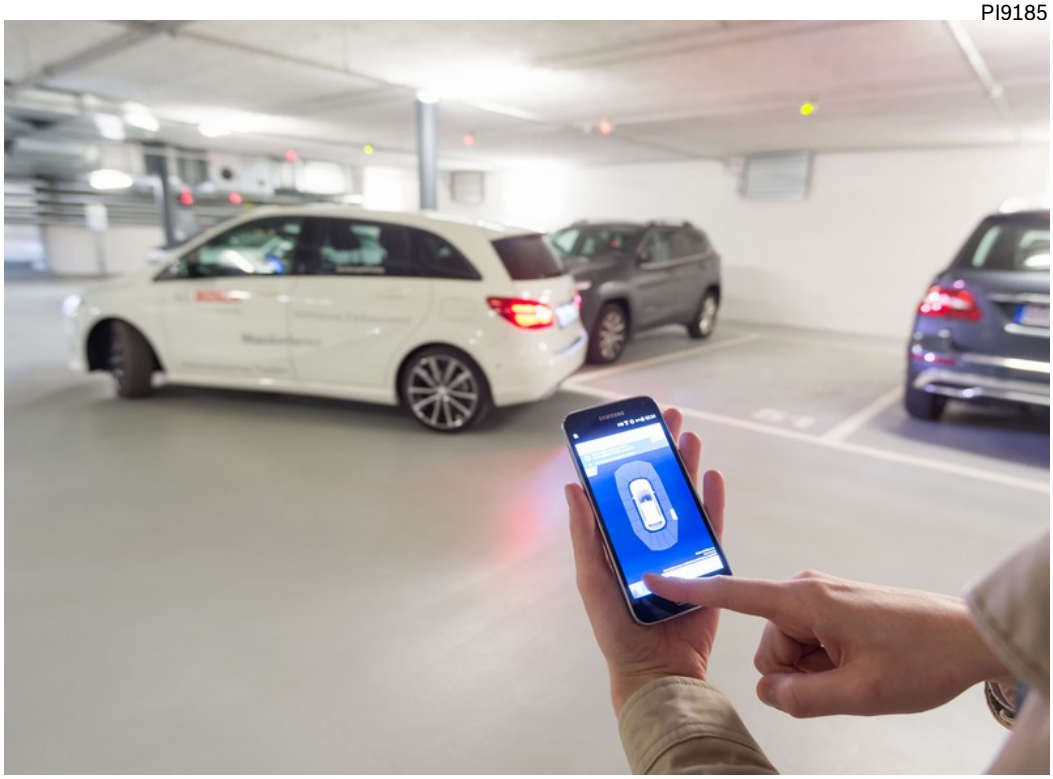

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Ferngesteuerter Parkassistent

Wie von Geisterhand parken sich Fahrzeuge mit dem ferngesteuerten Parkassistenten selbst. Der Fahrer muss nur eine Taste am Zündschlüssel oder auf dem Smartphone drücken und gedrückt halten. Sodann manövriert sich das Auto automatisch in die zuvor mit Ultraschallsensoren erkannte und vermessene Parklücke.

Remote park assist

With the remote park assist, vehicles park themselves as if by magic. All drivers need to do is press and hold a button on their ignition key or smartphone. This tells the vehicle to automatically maneuver itself into the parking space it has previously detected and measured using ultrasonic sensors.

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Pressebild-Nr.
Press Photo No.
1-CC-22103

zu Presse-Information
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PI9185

Press Photo 1-CC-22105

PI9185

Bildtext | Caption

Homezone Parkassistent

Der Homezone Parkassistent übernimmt wiederkehrende Parkvorgänge – inklusive der bis zu 100 Meter langen Anfahrt zum Stellplatz. Dazu muss der Autofahrer das Manöver nur einmalig im Rahmen einer Trainingsfahrt einlernen und speichern. Beim nächsten Mal fährt das Auto dann ganz alleine in die Zielparklücke.

Home Zone park assist

Home Zone park assist takes on recurring maneuver, including the approach (up to 100 meters) to the parking space. For this, all drivers have to do is teach in the maneuver just once in a dummy run, then save it. After that, their car will park itself independently in the preset parking space.

BOSCH

Pressebild-Nr.
Press Photo No.
1-CC-22105

zu Presse-Information
See Press Release
PI9185

Press Photo 1-CC-22104

PI9185

Bildtext | Caption

Manövrier-Notbremsassistent

Bei Geschwindigkeiten bis zehn Stundenkilometer überwachen Ultraschallsensoren in einer Entfernung von bis zu vier Metern permanent das komplette Umfeld rund um das Fahrzeug. Anhand der Sensorinformationen erkennt der Assistent relevante und nicht-relevante Hindernisse und errechnet den Fahrweg. Droht eine Kollision, erhält der Fahrer eine Warnung. Reagiert er nicht, stoppt das System das Auto von alleine.

Maneuver emergency braking

At a speed of up to ten kilometers per hour, ultrasonic sensors permanently monitor the entire area around the vehicle up to a distance of four meters. The system uses this sensor data to detect relevant and non-relevant obstacles and to calculate the path the car should travel. If there is a risk of collision, the driver is warned. If the driver fails to react, the system itself intervenes to stop the car.

BOSCH

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Press Photo No.
1-CC-22104

zu Presse-Information
See Press Release
PI9185

Press Photo 1-CC-21501

PI9185

Bildtext | Caption

Mit Special-Effects-Technik sicher in jede Parklücke

Bosch zeigt auf der IAA sein neues Multikamerasystem, das aktuell bei einem europäischen Premiumhersteller in Serie geht. Damit können Autofahrer ihre Augen beim Rangieren überall dort haben, wo sie gerade gebraucht werden. Im Monitorbild verschmelzen virtuelle und reale Welt. Sein Fahrzeug sieht der Fahrer als detailgetreues 3D-Modell mit Designmerkmalen wie Sicken und Kanten. Über zum Beispiel einen berührungsempfindlichen Bildschirm kann der Fahrer fast alle erdenklichen Perspektiven wählen.

Special-effects technology for safe parking

Bosch has developed a new multi-camera system, which is featuring in a new production model from a premium European automaker. Currently being showcased at the IAA, this system gives drivers a clear view of what is happening during parking – all around the vehicle. The ingenious part is in the display, which blends the real and virtual worlds. Drivers see their vehicle as a true-to-life 3D model complete with detailed design features. Using a touchscreen, for instance, drivers can select almost any perspective imaginable.

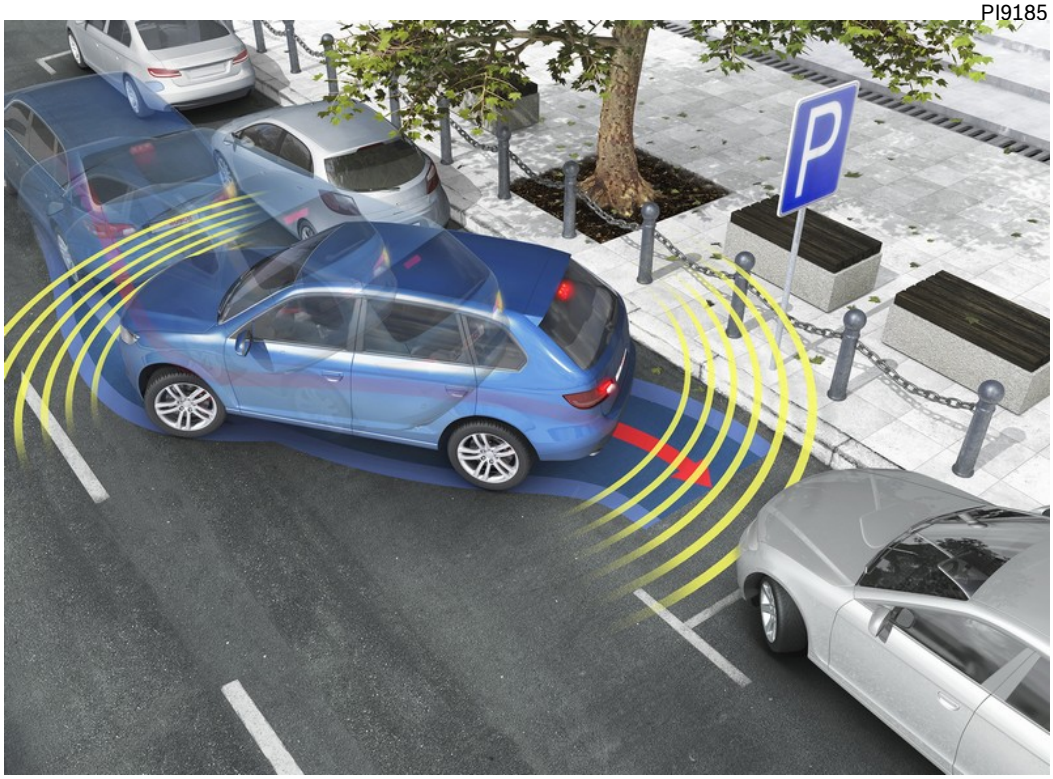
BOSCH

Pressebild-Nr.
Press Photo No.
1-CC-21501

zu Presse-Information
See Press Release
PI9015, PI9185

Press Photo 1-CC-21176

PI9185



Bildtext | Caption

Parkassistent

Mit Hilfe von Ultraschallsensoren erkennt das System die für den jeweiligen Fahrzeugtyp passende Längs- oder Querparkbucht und informiert den Fahrer. Bei Aktivierung lenkt der Assistent das Auto dann selbstständig in die Lücke. Der Fahrer bleibt fürs Gasgeben und Bremsen verantwortlich.

Park steering control

His system uses ultrasonic sensors to detect parallel or perpendicular parking spaces suitable for the vehicle in question and informs the driver. Upon activation, the system then automatically steers the car into the space. The driver remains responsible for accelerating and braking.

BOSCH

Pressebild-Nr.
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zu Presse-Information
See Press Release
PI8924, PI9185

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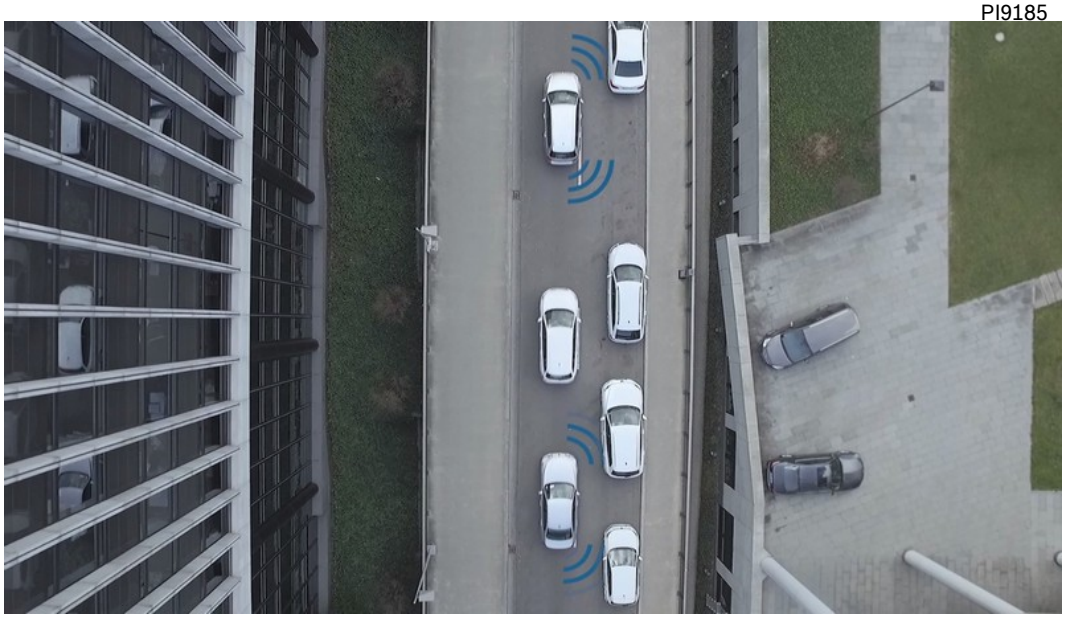

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