BMW GROUP
Corporate Communications

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The virtual new BMW 5 Series: High-precision, fully-automated measuring technology generates 3D data model of upcoming generation

Unique system concept with fully-automated, optical measuring cell used for the first time in the automotive industry
Measurement data creates complete virtual vehicle
Next-generation BMW 5 Series Sedan benefits from new process

Munich. The BMW Group is the first automobile manufacturer to introduce a unique system concept with a fully-automated, optical measuring cell in its pilot plant in Munich. Freely moving robot arms use sensors to create a three-dimensional image of the entire vehicle and generate a 3D data model from the data captured, with an accuracy of less than 100 µm. This allows barely visible deviations to be identified at an early stage.

The optical measuring cell is deployed at the interface between development and series production. It forms part of the BMW Group's digitalisation strategy for production and supports the high quality standards for production of premium vehicles. The next generation of the BMW 5 Series Sedan will be the first to benefit from this new technology.

Eduard Obst, Head of Geometric Analysis, Measuring Technology and Cubing, Total Vehicle, explains: "We are delighted to reach this genuine milestone in preproduction with the optical measuring cell: A single measurement provides us with a 3D data model of the total vehicle. Lengthy individual measurements and data collation are no longer needed – saving time and enhancing quality at the start of series production."

A robot arm on rails mounted on each longitudinal axis of the optical measuring cell moves freely as it maps the vehicle in complete space. Occupying a relatively small area, this set-up allows two small, flexible robots to be used in parallel in an optimum working range. Compared with previous processes, in which robots use a single sensor to record one side of the vehicle after the other, measurements now only take around half the time and are completed within just a few days.

Company
Bayerische Motoren Werke Aktiengesellschaft

Postal address
BMW AG
80788 Munich

Telephone
+49 89 382 12225

Internet:
www.bmwgroup.com

The robots are fitted with two sensors that record reference points and then capture individual surface areas of approx. 80 x 80 cm each. These are combined to form a scan of the entire vehicle. Analysis of the data quickly reveals any deviations, allowing technical integration specialists in the Production division to take appropriate action early on.

Three-dimensional vehicle scanning can be fully automated and performed at off-peak hours or at night, so the measuring cell can be utilised to full capacity. With results delivered promptly, update cycles are shorter or no longer needed. The measurement data and analysis findings are shared online within the production network and also made available to the plant responsible for series production to assist with their preparations.

The fully-automated optical measuring cell is gaining increasing importance within the BMW Group. This technology has been successfully used in toolmaking in Munich since 2015 for complete measurement of individual sheet-metal parts, as well as tool inspection.

The BMW Group is currently exploring the use of automated optical measurement at its automobile plants.

The BMW Group

With its three brands BMW, MINI and Rolls-Royce, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial and mobility services. As a global company, the BMW Group operates 31 production and assembly facilities in 14 countries and has a global sales network in more than 140 countries.

In 2015, the BMW Group sold approximately 2.247 million cars and nearly 137,000 motorcycles worldwide. The profit before tax for the financial year 2015 was approximately € 9.22 billion on revenues amounting to € 92.18 billion. As of 31 December 2015, the BMW Group had a workforce of 122,244 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy.

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