

PRESS RELEASE

The world's most accurate vehicle K&C machine launched by AB Dynamics

- *AB Dynamics launches the SPMM Plus, a next-generation K&C test machine*
- *A critical tool in the industry's shift to virtual test and validation*
- *Major Japanese OEM invests in the first machine*

Bradford on Avon, UK, 16th November 2022. Leading automotive test solution supplier AB Dynamics has launched its next-generation vehicle Kinematics and Compliance (K&C) test machine, the SPMM Plus (Suspension Parameter Measurement Machine).

It is the world's most accurate K&C machine for the automotive industry and enables OEMs to accelerate the design and testing of a vehicle's suspension system. It accurately measures and analyses suspension movement whilst subjecting it to a faithful replication of on-road vehicle behaviour. A major Japanese vehicle manufacturer has already invested in the first SPMM Plus and it is currently being installed in Asia.

“The industry is shifting rapidly towards virtual testing and validation, and the SPMM Plus is a key tool in that process,” said Matthew Dustan, Director of Laboratory Test Systems at AB Dynamics. “Its superior level of accuracy directly translates into better correlating vehicle models, which can be exported in one-click directly into the popular modelling packages. Importantly, in this latest generation of the SPMM, we have also made it Hardware-in-the-Loop (HIL) capable, further increasing its value in an OEM's virtual development toolchain.”

Traditional K&C machines manipulate the wheels of the vehicle to create the movement and force inputs to the suspension system for analysis. However, the SPMM Plus utilises a novel moving centre table design that manipulates a vehicle's body to generate the necessary movement and force. This design means the ground plane (road) remains fixed when simulating vehicle cornering and braking to replicate on-road vehicle behaviour more accurately.

The benefit of this architecture is the measurement equipment connected to the vehicle's wheels remains relatively static. Compared to traditional K&C systems, the travel being measured is an order of magnitude less and the loads being received to the cells are direct, resulting in a highly accurate measurement solution.

The table is precisely controlled in six degrees of freedom by precision electromechanical actuators, which enable a combination of roll, pitch, bounce and yaw motion to be applied to the vehicle body. As

a closed-loop system, it requires no iteration to reach the desired drive commands, which significantly reduces testing time.

Another benefit of electromechanical actuators is that the machine does not need to be housed in a separate control room for safety reasons, which is required for a hydraulic machine. The SPMM Plus provides the operator with a safe, clean, and quiet working environment. This significantly reduces the cost of installation and maintenance and allows operators to closely inspect the suspension in action.

The SPMM Plus can also be used as a Moment of Inertia Measurement System, measuring a vehicle's Centre of Gravity (CoG) and Moment of Inertia (MoI), making it two machines in one. Due to the unique moving body fixed ground design, the vehicle can be subjected to the full axis rotation required to generate the CoG and MoI significantly faster and more accurately than traditional machines. As a result, the SPMM Plus generates all the necessary chassis-based data required to create and correlate virtual vehicle models. In this latest version of the SPMM, it is also possible to measure large subsystems, such as battery packs or Electric Drive Units (EDU), to further improve the quality of the vehicle simulations.

The SPMM Plus is the latest generation of an industry-recognised test rig that has been established for nearly 30 years. The design of this latest iteration focuses on accommodating future trends in the automotive industry. It features a suite of table extenders to cater for the broadening variety of vehicle sizes, particularly longer and lower electric vehicles. The Plus is also now fully digitised, running a new and optimised control system, including a high-bandwidth EtherCAT real-time protocol; that is essential for HIL testing.

The SPMM Plus has also been designed with a modular architecture to optimise each customer's testing needs and be easily upgraded for future requirements. For example, this includes the ability to increase the speed of the machine. Increasing the standard speed from 140mm/s to 280mm/s at test frequencies up to 5Hz allows the influence of the damper at the wheel to be explored.

"The first SPMM we manufactured in 1995 is still being used regularly today," said Dustan. "Not only does this highlight the reliability of the machine but also the importance of ensuring that the SPMM Plus will still be relevant for the automotive industry in another 30 years. We have future-proofed the Plus by accommodating all types and sizes of vehicles and ensured that it will be a highly valuable tool in an OEMs virtual development process."

Note to editors:

Kinematics is the motion of the suspension, which is determined by its geometry. The lengths of linkages and number of pivots govern the way the suspension will move through an arc. These connections affect

the motion in all six degrees of freedom, impacting aspects such as camber and toe. This is all in the absence of force.

Compliance is the assessment of how the suspension system moves with the addition of load inputs. This helps to account for movement in rubber bushes and isolation components as well as the bending of linkages.

About AB Dynamics

AB Dynamics is an automotive test system supplier with a diverse range of track and lab testing equipment. From Kinematics & Compliance machines and ADAS targets to state-of-the-art driving simulators, AB Dynamics supplies the 25 most successful car manufacturers in the world. If you would like to learn more about AB Dynamics and its products, please visit ABDynamics.com

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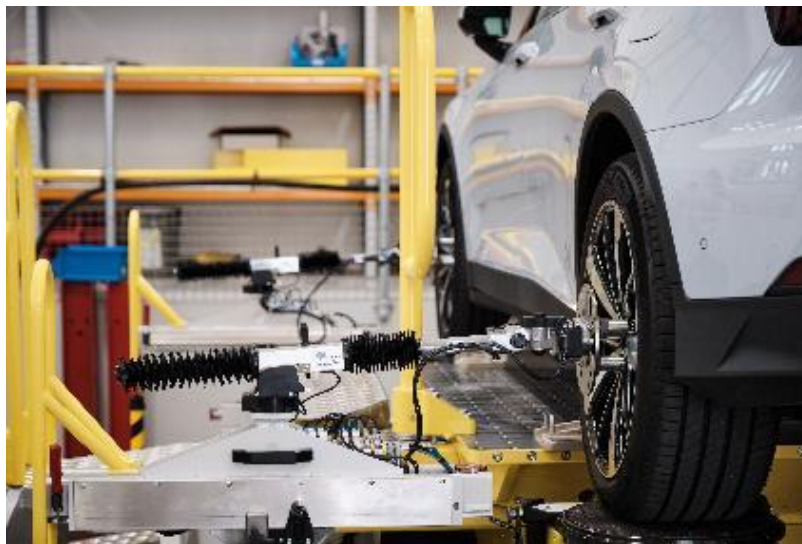
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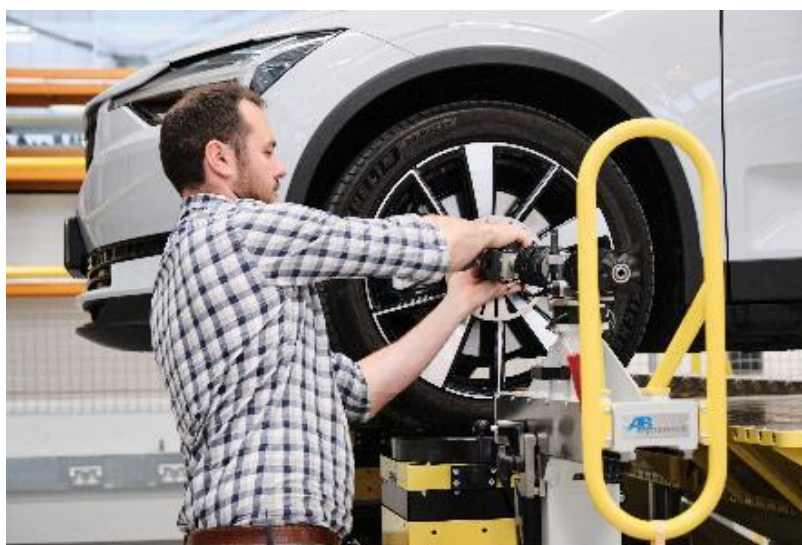
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AB Dynamics launches the SPMM Plus, a next-generation K&C test machine



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The SPMM Plus features a suite of table extenders to cater for the broadening variety of vehicle sizes



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