

The SPMM™: HORIBA MIRA's enduring K&C testing solution

Providing market-leading accuracy and reliability, the SPMM enables HORIBA MIRA to accelerate vehicle testing.



Kinematics and compliance (K&C) testing in the automotive industry

How to evaluate a vehicle's suspension characteristics and steering behaviour without relying entirely on extensive real-world testing has always been a major challenge in vehicle development. It resulted in the first generation of K&C test machines, which were largely developed and built in-house by vehicle manufacturers and therefore unique to their organisations.

Nearly 30 years ago HORIBA MIRA wanted to improve its test capabilities for customers and sought to install its own K&C test machine. It required the machine to be cost-effective, simple, and compact. In use, the machine needed to be efficient, require the minimum number of operators and little maintenance. HORIBA MIRA also wanted the machine to test both axles simultaneously, to significantly reduce test times, and be capable of testing the smallest city cars to the largest light trucks.

The solution

Developing its own in-house solution would involve a lengthy and costly development programme that would ultimately reinvent what was already in use in the industry. So instead, HORIBA MIRA turned to AB Dynamics to develop a solution. The result was the SPMM (Suspension Parameter Measurement Machine).

The core of the solution was the principle of replicating on-road vehicle behaviour as closely as possible, which is why AB Dynamics chose a moving body and fixed ground-plane architecture. This setup faithfully mimics a vehicle's interactions with the road surface, offering precision that is unmatched in the industry. Additionally, the SPMM provides market-leading throughput (installing the test vehicle, running the test sequence, retrieving the results, and removing the vehicle) that is three times faster than the nearest competitor.

The outcome

HORIBA MIRA's first SPMM was commissioned in 1996. An increasing demand for accurate K&C testing led to HORIBA MIRA installing a second machine in 2014. With the implementation of its SPMMs, HORIBA MIRA witnessed a profound transformation in its testing process. The full suite of industry-standard K&C tests, which normally took up to two weeks, is now being completed in only two days. This order of magnitude reduction in testing time allows vehicle innovators to quickly gather insightful data and make more informed decisions swiftly.

Another big part of the SPMM's success has been its design ethos, which has always been focused on quality and future-proofing. The SPMM features the finest quality components to ensure the highest levels of accuracy, plus there is an extensive range of options available so upgrades for changing industry requirements are possible.

A testament to the SPMM's longevity, HORIBA MIRA's first machine is still being used today. The second, meanwhile, has recently celebrated a key milestone, the 1000th vehicle loaded for suspension characterisation, a BMW Alpina B7.

"The SPMM has proven to be an excellent product; efficient and flexible in use, accurate and exceptionally reliable."

Ian Willows, Consultant Engineer, HORIBA MIRA



HORIBA MIRA is a global provider of pioneering engineering, research and test services to the automotive, defence, aerospace and rail sectors. Working in close collaboration with vehicle manufacturers and suppliers around the world they provide comprehensive support.

About AB Dynamics

AB Dynamics is a leading global provider of automotive test and verification solutions that facilitate the development of vehicles that are safer, more efficient and sustainable. As part of the AB Dynamics Group of companies we enable customers to develop and test in virtual environments, validate on the track and then evaluate vehicles on public roads.

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