

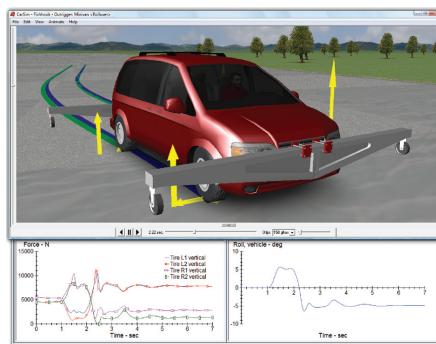
## Mechanical Simulation

### Chassis control simulation at GM

General Motors (GM) has made a tremendous investment in facilities, equipment, manpower, and training to support a high level of vehicle performance testing. At GM, every opportunity needs to be explored to maximize vehicle safety and performance and simultaneously reduce the cost of testing vehicles.

The capability of vehicle dynamics simulation has reached a level of sophistication where it can be relied upon to replace some physical vehicle testing. In several regions throughout the world, GM engineers use CarSim from Mechanical Simulation in a wide range of vehicle design and testing tasks. This includes hardware-in-the-loop (HIL) simulation, which is extensively used by GM Milford Proving Grounds (MPG) engineers to support the integration of chassis control systems. For example, the hardware part of an ABS HIL simulation may include the brake controller/modulator from an actual base brake system with the vacuum assist and a master cylinder. At the GM

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MPG, this 'wet bench' approach is most commonly used, because it has proven to yield results close to real world testing.

CarSim is ideally suited for simulating vehicle performance, because its data requirements are compatible with GM's vehicle development process.

**For more information** go online at:  
[www.ukipme.com/recard/vdmcard.html](http://www.ukipme.com/recard/vdmcard.html) quoting reference VDI 010

## GeneSys

### ACC evaluation kit

In the field of automotive testing GeneSys Elektronik GmbH, in cooperation with Dewetron Ges.m.b.H and TÜV SÜD Automotive GmbH, has developed CAPS-ACC to validate driver assistance systems such as ACC. It allows the recording of relative data, especially the position, velocity and angle of several vehicles dynamically and simultaneously. The position can be precisely

determined with the help of base station DGPS correction data. Chronological synchronism is ensured by using GPS synchronization.

Among other features, CAPS-ACC also provides online data transfer via WLAN from one vehicle to another and online driver guidance.

**For more information** go online at:  
[www.ukipme.com/recard/vdmcard.html](http://www.ukipme.com/recard/vdmcard.html) quoting reference VDI 011

## Kistler Instrumente

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design. The knowledge of wheel loads under different driving conditions are crucial to verify the computer models. For tractors and construction vehicles, it is obvious that the tires play an important role for vehicle dynamics. Load, power, torque and speed increases can only be utilized when the tires and rims can transfer them to the road, so traction, torque, stability, and braking energy need to be carefully evaluated.

**For more information** go online at:  
[www.ukipme.com/recard/vdmcard.html](http://www.ukipme.com/recard/vdmcard.html) quoting reference VDI 012

### Wheel force transducers

A new generation of lightweight, heavy-duty wheel force transducers (WFTs) perfectly meets the requirements of today's development scenario for commercial vehicles, trailers, tractors and construction vehicles with rim sizes varying from 17.5in- 42in diameter. Their design is based on the well-proven technology of Kistler's RoaDyn S-series of WFTs. The flexible design of the WFT allows the developer to test single, dual and supersingle wheel configurations using the same set of load cells. Typical applications are: road load data acquisition for vehicle dynamics simulation and tire modeling, structural and durability analysis, and durability testing on axle test rigs.

For standard trucks and trailers, the dynamics of the vehicle will be determined by the interaction of tire, suspension, load distribution and the vehicle

## TESIS DYNAware

### Hybrid vehicle evaluation

TESIS DYNAware's new simulation framework DYNA4 provides a special toolbox for hybrid electric vehicle (HEV) simulation. The DYNA4 virtual test vehicle therefore integrates the proven veDYNA and enDYNA models as well as comprehensive know-how from energy management engineering projects. The application areas range from design of control algorithms to the investigation and optimization of driving strategies and energy management functions with regard to fuel consumption and driving performance.

For HEV simulation, DYNA4 contains a new hybrid toolbox that includes a dual voltage powernet system, electric motor and battery models, modular mechanical drivetrains, power split device and combustion engine models. Various topologies of hybrid-electric power trains from micro- to full hybrid can be configured. Furthermore, the driver model provided is a welcome feature to achieve reproducible and realistic results in official, and user defined driving cycles. Due to the modular architecture in Matlab/Simulink, the DYNA4 virtual test vehicle easily integrates additional modules and adjusts to customers' processes.

The DYNA4 Hybrid Toolbox can be used through all phases of hybrid ECU development: from conceptual function design on the PC to operating tests with HIL systems. TESIS DYNAware's experience and reliable tools help engineers keep pace with HEV technology.

**For more information** go online at:  
[www.ukipme.com/recard/vdmcard.html](http://www.ukipme.com/recard/vdmcard.html) quoting reference VDI 013

## Simpack

### Multibody simulation software

SIMPACK is high-end, multibody simulation software developed by INTEC, based in Wessling, Germany. With SIMPACK, it is possible to: analyze the vibration response, calculate forces and accelerations, and describe and/or forecast the movement of all multi-body systems accurately.

SIMPACK's integrated functionality to create and export the model in Fortran or C enables a high connectivity to other simulation tools and applications. Additionally, it is possible to use the exported code in many HIL applications.

Further information can be found at  
[www.simpack.com](http://www.simpack.com).

**For more information** go online at:  
[www.ukipme.com/recard/vdmcard.html](http://www.ukipme.com/recard/vdmcard.html) quoting reference VDI 014