

Applications

The veDYNA Truck & Trailer simulation environment allows efficiently performing vehicle dynamics simulation tasks in the development process of various types of commercial vehicles and vehicle trains. Applications range from investigations of design variants and driving stability to the development and test of vehicle dynamics controllers and driver assistance systems:

- Stability investigations in critical driving situations, e.g. jack-knifing and skidding
- Simulation of moving or swaying loads
- Safety analysis of commercial vehicles subject to road disturbances, e.g. lane grooves and patches of different road surfaces
- Pre-calibration of control devices on the hardware-in-the-loop simulator
- Development and hardware-in-the-loop test of vehicle dynamics controllers for truck and trailer stabilisation
- Integration tests in laboratory vehicles
- Development and test of driver assistance systems, e.g. lane departure warning, adaptive cruise control, lane change aid, collision warning or brake assist
- Virtual test drives and animation in the driving simulator

Simulation Framework

The veDYNA Truck & Trailer modules enable the simulation of commercial vehicles with multiple axles as well as of vehicle-trailer combinations. Truck & Trailer extensions are available for both veDYNA Light and veDYNA Standard.

- **Truck Extension**
Characteristic model extensions, e.g. additional rear axles, specific suspension types and twin tyres, to account for commercial vehicles design features.
- **Hook & Trailer Extension**
Model extensions for the simulation of trailers with multiple axles and their coupling with the towing vehicle.
- **Graphical User Interface**
Graphical user interface for all important simulation tasks and guided data assignment.
- **Ready-to-Use Examples**
Pre-defined simulation models and data sets for typical vehicle types, test manoeuvres and tracks.
- **Documentation and Online-Help**
Comprehensive documentation, context-sensitive and printable.
- **Based on Matlab/Simulink**
Open Matlab/Simulink implementation for model based design and rapid controller prototyping.
- **All major Real-Time Platforms Supported**
RTW code generation for PC executables and all major real-time targets.



Stability Investigations for Commercial Vehicles

Features at a Glance

Truck Extension

- Torsion flexible vehicle frame to consider twisting of truck body.
- Specific suspension types, e.g. rigid or leafspring axles.
- Moving engine body, driver cabin and truck load elastically coupled to main truck body by means of up to 10 mounts.
- Up to three rear axles. All axles steerable for simulation of special purpose vehicles, including heavy duty trucks and military vehicles.
- All rear axles configurable with twin tyres.
- Variable drivetrain configuration with arbitrary 8x2 or 8x4 drives.
- Up to 16 forward and 4 reverse gears.

Hook & Trailer Extension

- Trailer modelled as separate vehicle body (without steering system and drivetrain).
- Variable parameterisation and numerical stability of the hitch.
- Up to three nondriven rear axles. All axles steerable.
- All axles configurable with twin tyres



Stability Investigation of Various Types of Tractor-Trailer Systems

Graphical User Interface

- Efficient support of the user by clearly arranged functions, commented model data, visual data check and data analysis.

Ready-to-Use Examples

- Standard manoeuvres, e.g. roll-rate feedback fishhook manoeuvre, as well as test courses of different complexity already preconfigured.
- Example parameter sets and simulation models for different vehicle types ready to use and as templates for user specific adjustments.

Documentation and Online-Help

- User manual, data requirements
- Printable documents
- Context-sensitive online-help

Based on Matlab/Simulink

- Matlab interface for external data assignment and script-based simulation control. Many options for automated test runs as well as programmed pre- and postprocessing.
- Standard Simulink interface for user-defined model extension and integration of control functions.

All major Real-Time Platforms Supported

- dSPACE, ETAS, Mathworks xPC, National Instruments, Opal-RT. Other targets available on request.

All DYNAware products are continuously being enhanced and improved according to requirements of our customers. A team of specialists is available to help you realise individual and specific solutions. Get more information at <http://www.thesis-dynaware.com>. Write an e-mail to thesis.dynaware@thesis.de or call us: +49 89 74 73 77-0.

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