Adams 2015

MSC Software

Welcome to Adams 2015!

The Adams 2015 release delivers new functionalities and major enhancements in many areas, including Adams/Machinery, Adams/Car and especially Non-linear flexibility integration in system dynamics.

Highlights of the release include:

Adams/Machinery Compatibility in Adams/Car
High fidelity gear and motor modeling in car and driveline

Nonlinear FE Part Support for Adams/Car
Geometric nonlinearity for vehicle subsystems modeling and simulation

Full-vehicle Suspension Parameter Measurement Machine (SPMM)
Tune suspension parameters for desired vehicle behavior without costly iteration with physical prototypes

Static Vehicle Characteristics (SVC)
Computes and reports key metrics of the vehicle at static equilibrium

Tandem Axle Suspension Analysis (TASA)
Delivers support for tuning of multi-axle architectures

New Vehicle Database
Provides availability of key vehicle types out of the box

Adams-Marc Cosimulation Enhancements
Easier and faster MBD-Nonlinear FEA Integration

For more details on this release, please review the Release Guide and the other manuals. Several examples are also available to help you use these capabilities.

Thank you for your continued support of Adams.

Adams Product Team

Adams/Machinery Gear in Adams/Car - High fidelity gear modeling in car & driveline

Adams/Machinery Gear capability is now available directly within Adams/Car and the related vertical products. These gears can be created in template builder mode and adjusted in standard interface mode and in the subsystem file.

These representations provide higher-fidelity modeling options for gears which can help to more accurately predict gear loads as well as predict and address backlash and rattle. This capability could prove valuable in driveline and steering applications especially.
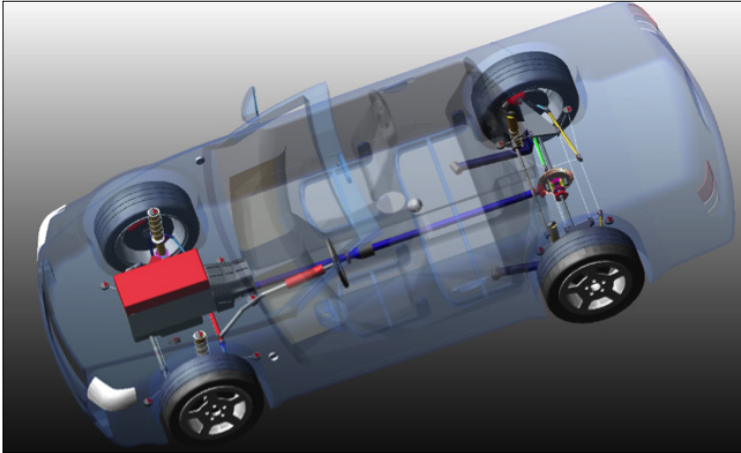

Adams/Machinery Motor in Adams/Car – Multi-fidelity motor modeling in car & driveline

Adams/Machinery Motor capability is now available directly within Adams/Car and the related vertical products. It can be created in template builder mode and adjusted in standard interface mode and in the subsystem file. The Adams/Machinery Motor supports three modeling methodology options:

- **Curve Based Method**
- **Analytical Method**
- **External Method**

This capability could prove useful for hybrid and electric powertrain modeling, power steering applications and accessory applications (for example, power windows and wipers).
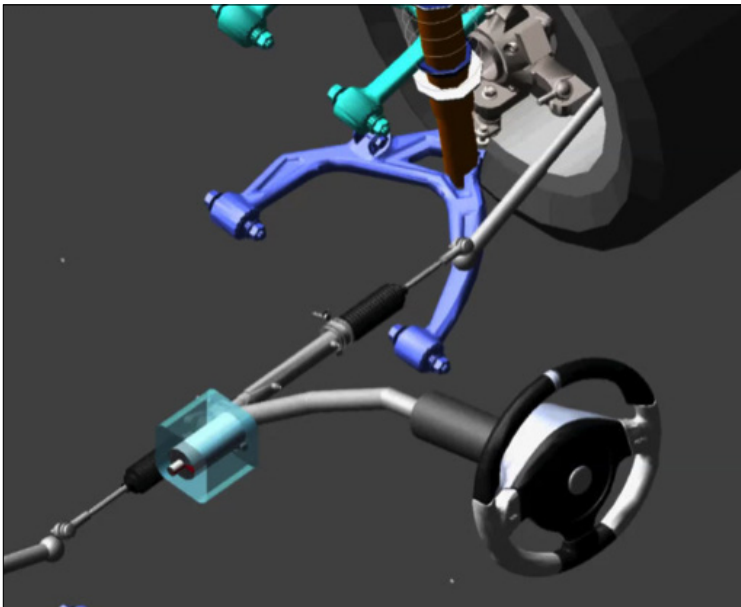

Nonlinear FE Part Support for Adams/Car – Geometric nonlinearity for vehicle subsystems modeling and simulation

In Adams 2014 the FE Part was introduced. It is a wholly Adams-native modeling object which has mass and is accurate for very large deformation cases (that is, geometric nonlinearity) of beam-like structures.

In this version, support for the FE Part has been added to Adams/Car and the related vertical products.

Applications within Adams/Car include anti-roll bars and twist beams. In future releases when certain FE Part limitations are removed (allowing a preloaded condition, self-contact and hollow geometry contact) it will be more conveniently applied to such components as coil springs, leaf springs and struts.
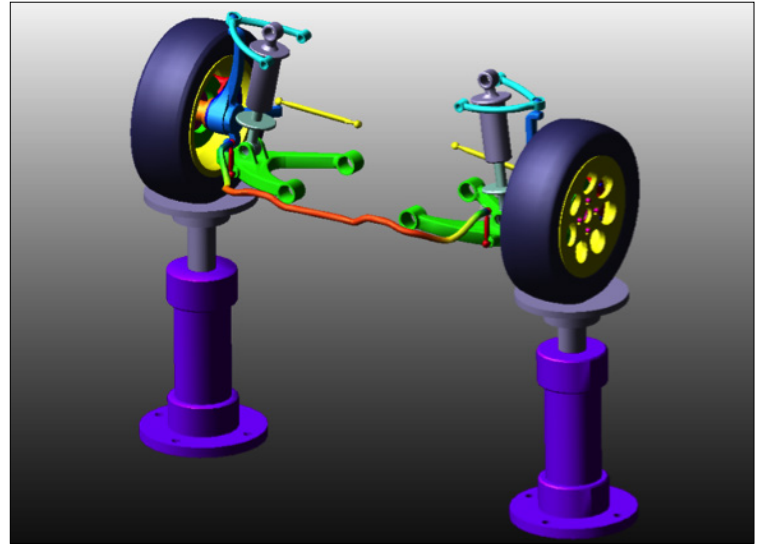
Full-vehicle Suspension Parameter Measurement Machine (SPMM) - Tune suspension parameters for desired vehicle behavior without costly iteration with physical prototypes

The new Suspension Parameter Measurement Machine (SPMM) event and accompanying new testrig is used to measure Kinematic and Compliance (K&C) characteristics of a full vehicle. The SPMM event measures the kinematic characteristics due to suspension and steering system geometries, and compliances due to suspension springs, anti-roll bars, elastomeric bushes and component deformations.

The testrig is based on the SPMM machine from Anthony Best Dynamics. The event supports a number of sub-events, namely: vertical motion, roll motion, steer motion, compliance and aligning torque.
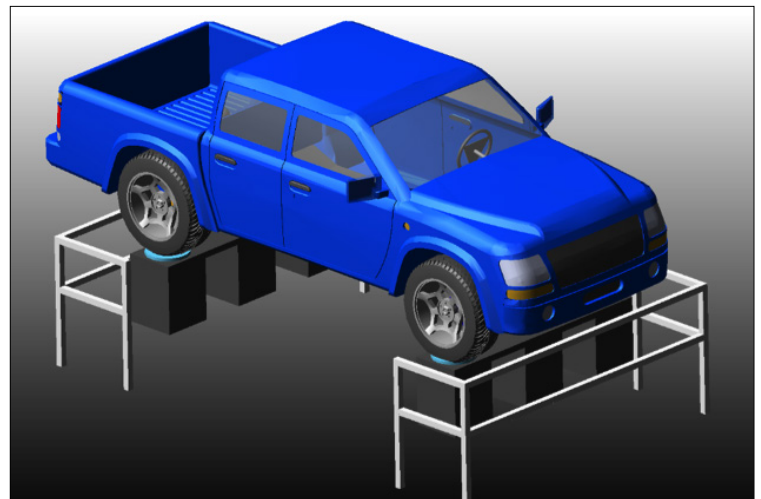
Static Vehicle Characteristics (SVC) – Computes and reports key metrics of the vehicle at static equilibrium

The new Static Vehicle Characteristics (SVC) event computes vehicle characteristics at a static equilibrium condition for passenger cars or light trucks (four-wheeled vehicles). Examples of such characteristics include wheel rate and front suspension percent anti-dive. SVC analysis is available for both full-vehicle and half-vehicle models. The main output of the event is a detailed standard SVC report.


Tandem Axle Suspension Analysis (TASA) – Delivers support for tuning of multi-axle architectures

The Adams/Car Truck plugin has been extended to provide direct support for tandem axle configurations. A new testrig has been created: "__MDI_TASA_ TESTRIG." It supports the fore and aft axles to be modeled either as separate subsystems or within the same subsystem and includes support for dual wheels.
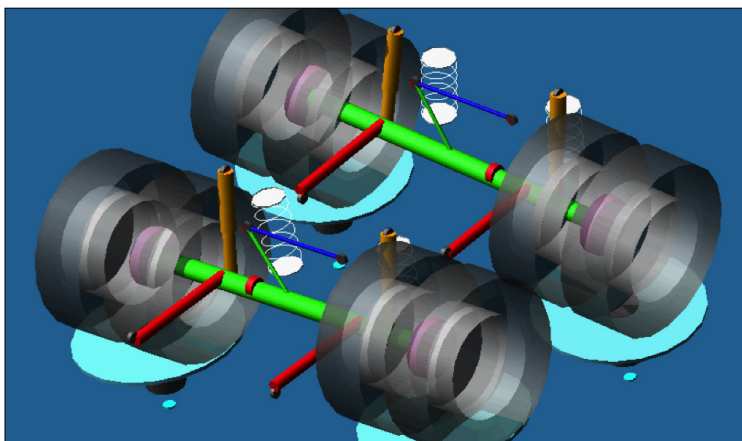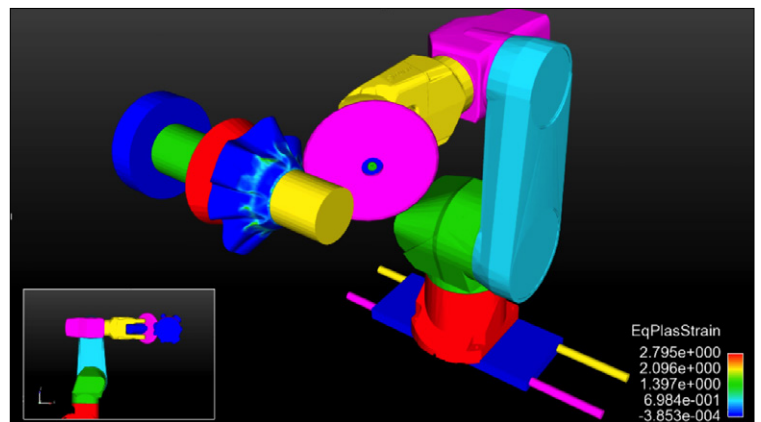

New Vehicle Database – Provides availability of key vehicle types out of the box

In Adams/Car 2015, a new database has been added to the installation: acar_concept.cdb. This database contains several new full-vehicle assemblies. These models include body graphics, wheel and tire graphics, and several new powertrain topologies.
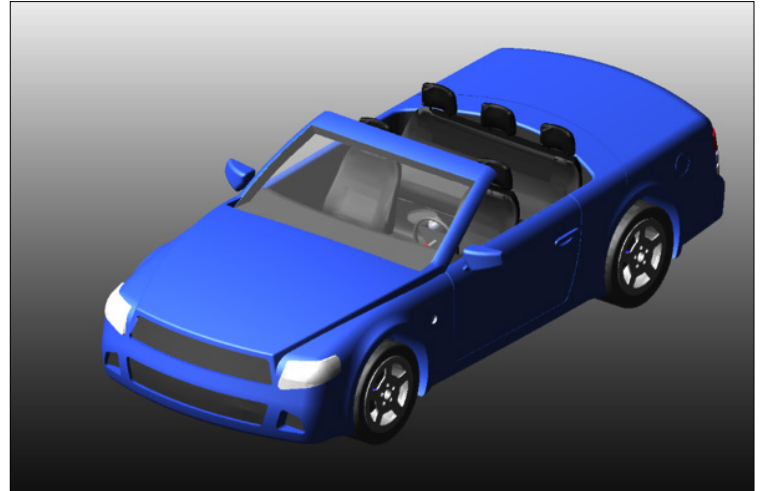
Adams-Marc Cosimulation Enhancements – Easier and faster MBD-Nonlinear FEA Integration

- **Formulation Improvements:** Bigger time steps can be taken so as to solve many co-simulations faster especially on problems where the Marc model is relatively stiff, the so-called "strain-dominant" cases

- **Support for Static Equilibrium:** ACSI now supports static and quasi-static co-simulations

- **Marc Nodes as Interfaces to Adams:** With this release, model setup for cosimulation via ACSI has changed. At each interaction point there must be a GFORCE in the Adams model and a NODE in the Marc model.

- **Co-Simulation Launch Ease-of-Use Improvements:** Prior to launching Adams-Marc co-simulations via earlier releases of ACSI one had to manually copy a number of files from the Adams installation to appropriate working directories. With ACSI 2015, this file copy step has been eliminated.

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