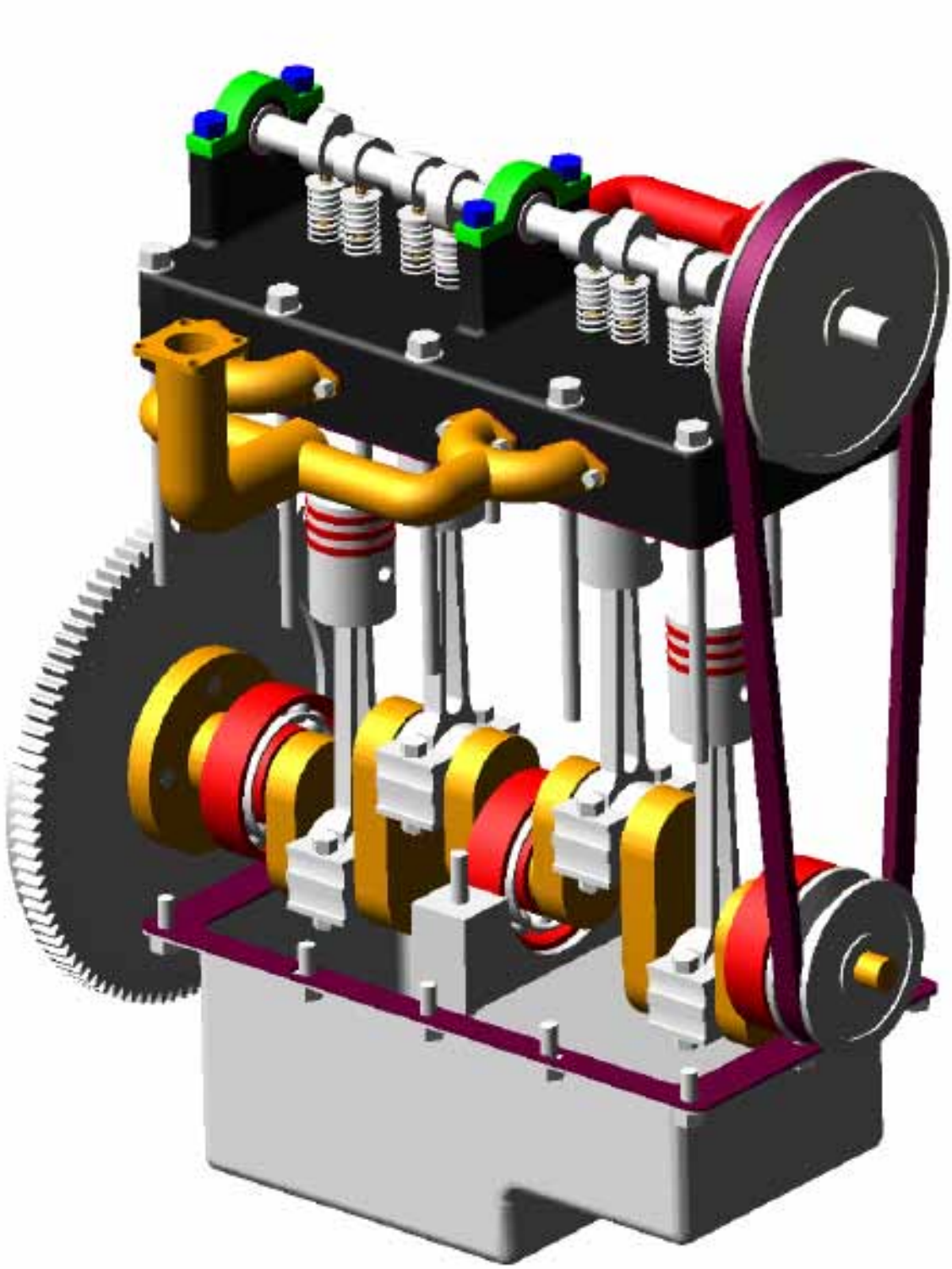
PRODUCT BRIEF

MD Adams 2011



MSC Software

Welcome to MD Adams 2011

With this release of the Adams product family, MSC.Software proudly presents extensions to recent innovations, exciting new capabilities and continued speed of use improvements. Major areas of focus for this release include the following:

Capability Extensions

New or extended capabilities are included in this release for both general core functionality, like CAD interoperability and run-time clearance, and for application specific functionality, like the capability to perform a tilt-table analysis in Adams/Car in dynamic or quasi-static mode and adding Adams/car Animation Objects.

Usability and Productivity

Significant usability enhancements have been made in this release of Adams. Support for road and path visualization in pre-processing makes it easier to inspect both the road and path during preprocessing and modeling stages. Adams/Car road builder now offers direct and simple modification of a road's position and orientation. With the direct interface to SimManager on both Linux and Windows, engineers can easily track and manage Adams models and results. This helps to better answer questions of model pedigree and share important results with their colleagues.

Performance

Some of the new modeling functionality will result in models which solve faster. Additionally with MD Adams/Solver (C++) users will observe significant robustness and performance improvements in suspension events that utilize the Suspension Design Module.

3rd Party Support Updates

Significant additions have been in the area of FTire support to increase the accuracy in tire dynamics. Adams now supports FTire 2010-4 and with this release, FTire parameters are now exposed in the Adams data set enabling design of experiments (DOE) using these parameters. Support for MATLAB/Simulink models continues to be updated and expanded and is updated MATLAB R2010b.

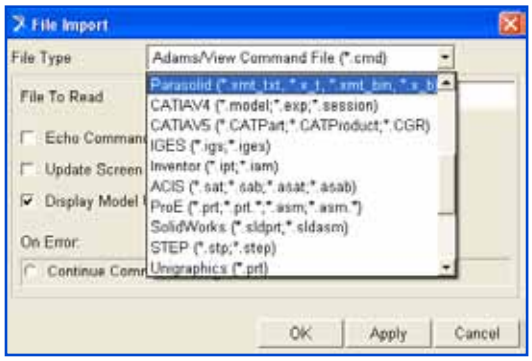
In summary, this MD Adams release combines functionality extensions and enhancements with new capability innovation all aimed at enabling you to do more, faster with your multibody dynamics simulation investment.

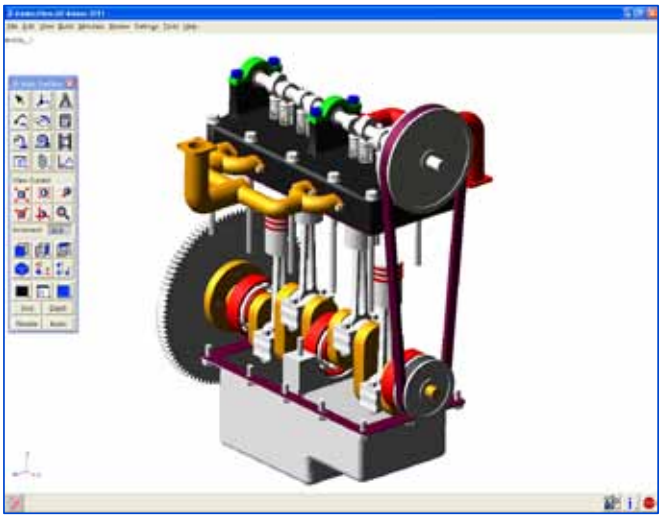
Thank you very much for your continued support of MD Adams.

The MSC.Software Product team

CAD Interoperability

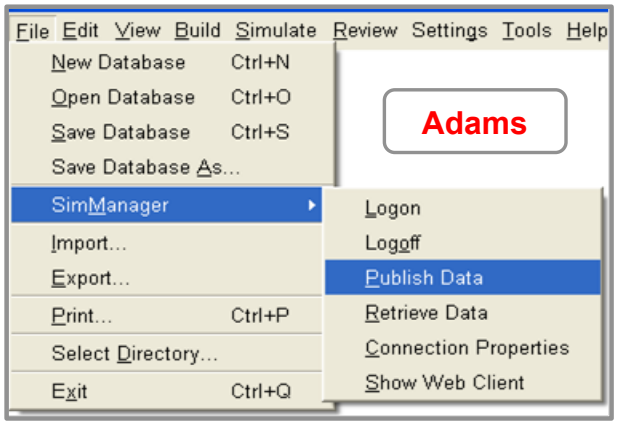
Often one of the most important aspects of multibody dynamics modeling is defining an accurate geometric representation of the system at hand. In this release a number of new geometry formats are now supported for direct import and export in Adams. This ease of use improvement saves time by eliminating the need to pass CAD geometry through neutral formats for import to, or export from, Adams. Newly supported geometry formats for this direct import/export include: CATIA v4 and v5, Pro/Engineer, SolidWorks (import only), Unigraphics NX, Inventor, ACIS and VDA.

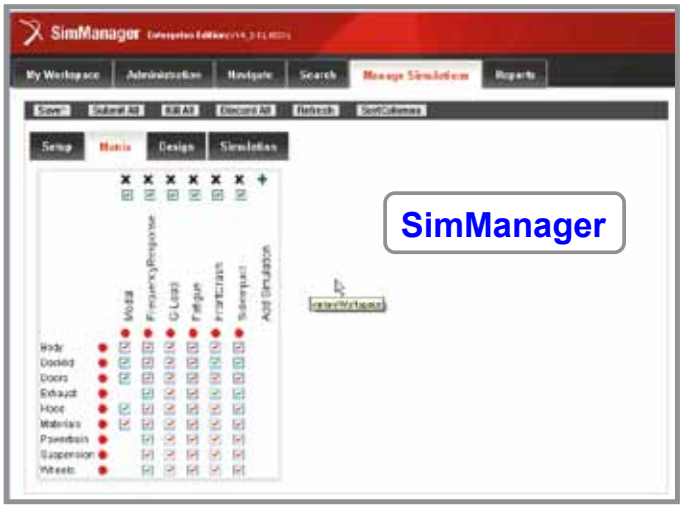




Updated SimManager Client Interface

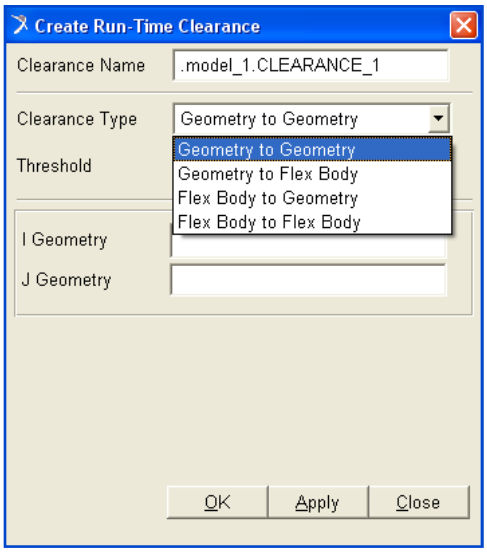
Managing Adams simulation activity with SimManager is a powerful for engineers to track and manage Adams models and results. With it, Adams engineers can better answer questions of model pedigree and share important results with their colleagues, suppliers and customers. In this release, the Adams SimManager interface has been updated to support all Windows and Linux platforms. It is also now compatible with SimManager 2010 and allows for easier-than-ever publish and retrieval of Adams models and results to and from an organization's SimManager environment.

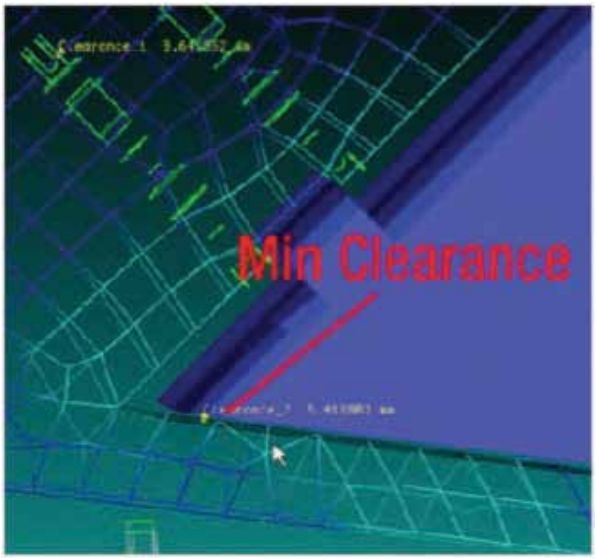




Run Time Clearance

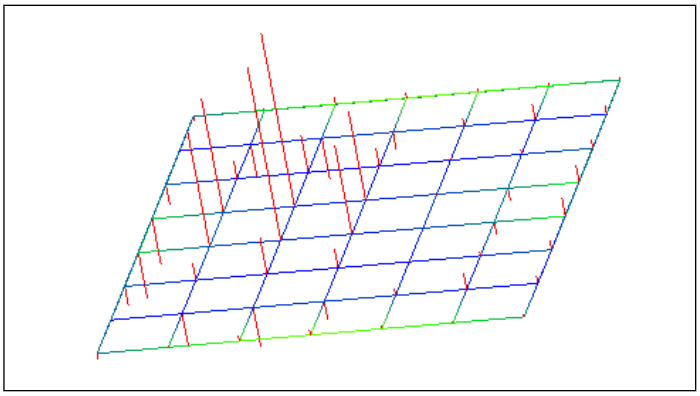
Clearance studies have long been supported as a post-processing step in Adams. With this release engineers have the added capability to act on general geometry-to-geometry clearance during a simulation. This represents a major ease-of-use and functional improvement over manual run-time clearance definitions via markers. Now engineers can select entire geometry pairs for clearance detection eliminating the often time-consuming iterative process of determining the correct individual points for virtual instrumentation. Any 3D state can be detected during runtime: displacement, velocity or acceleration. A rich set of Adams/Solver function support provides engineers with great flexibility in defining forces, motions, simulation controls and a host of other modeling entities.





Modal Force Visualization

The modal force is popular option with engineers incorporating flexible bodies into their Adams models. It provides an easy means to pass distributed loads defined in the finite-element model of the flexible body to Adams. Until now visualization of these forces within Adams was done via a nodal mass weighted pseudo method, which does not guarantee that accurate visualization of modal force in Adams/Postprocessor. The enhancements implemented in this release of Adams and MD Nastran 2010 enable the accurate visualization of modal forces within Adams.



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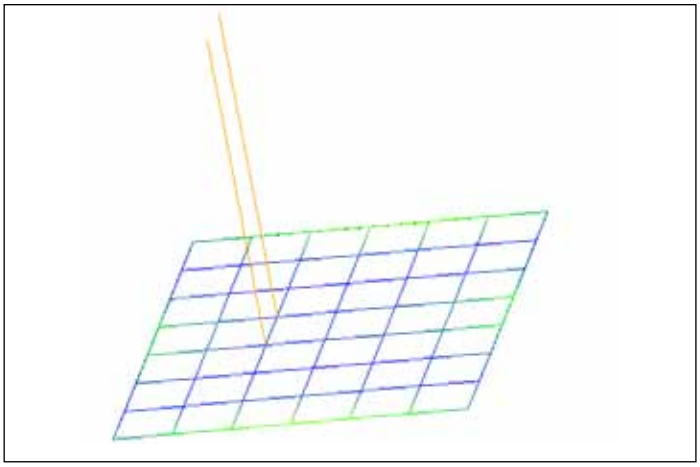
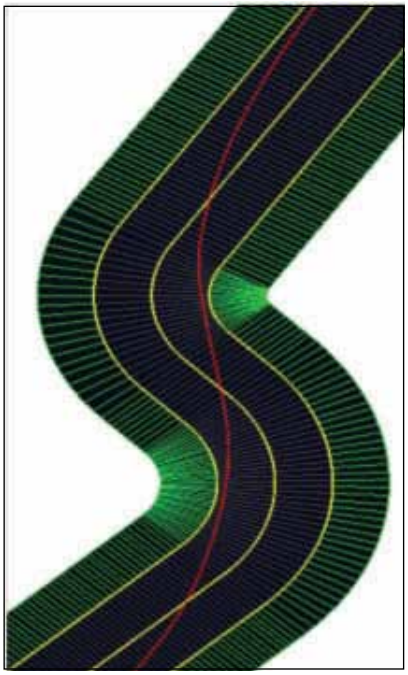
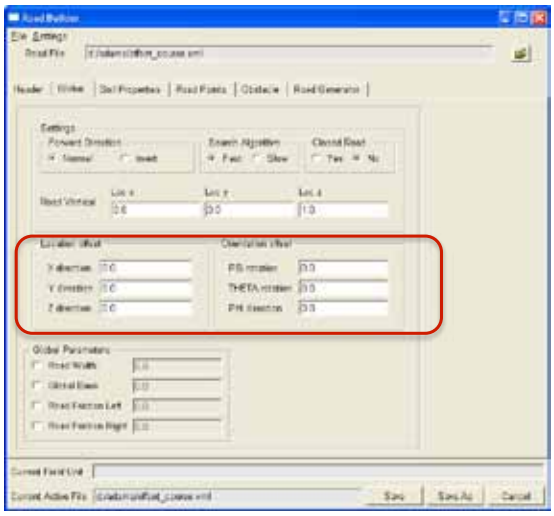


Desired loading

Event Road and Path Visualization

Adams/Car now supports road and path visualization in pre-processing! Engineers can now launch road and path geometry creation directly from the full-vehicle analysis setup dialogs. This feature makes it easier to inspect both the road and path during preprocessing and modeling stages. This is most helpful when positioning the road relative to the vehicle model to eliminate unexpected behavior.





Road Offsets

Since visualization of roads is now supported in Adams/Car pre-processing and modeling steps, the Adams/Car road builder now offers direct and simple modification of a road's position and orientation. This represents a time saving ease of use gain compared to the manual file manipulation methods required in the past.

3D Spline Road Improvements

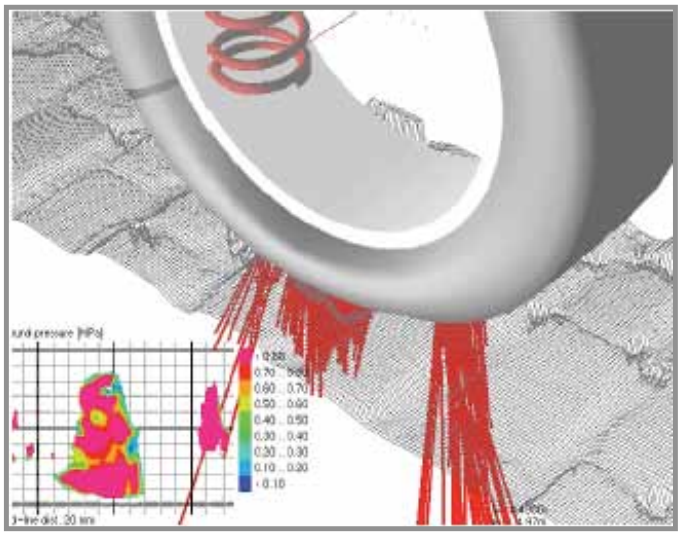
Improved road normal calculations have been made in this release of Adams/Car. The 3D Spline normal force calculation algorithm has been modified to even more accurately account or changes in road normal force direction. The more efficient contact point calculation and road overlap algorithm will also result in improved performance reducing simulation times. Users will find this to be particularly valuable for road surfaces that involve large bank angles and steep uphill climbs.

Tire and Road Quasi-Statics Constraint

For this release of Adams/Car an additional first order differential equation that is designed to increase robustness for static solutions involving dual tires has been added. This equation is designed to constrain the rotational velocity of both tires to be equal during quasi static simulation events. Heavy vehicle engineers can experience improved quasi-static simulations like parallel and opposite wheel travel suspension events of vehicles with dual wheels.

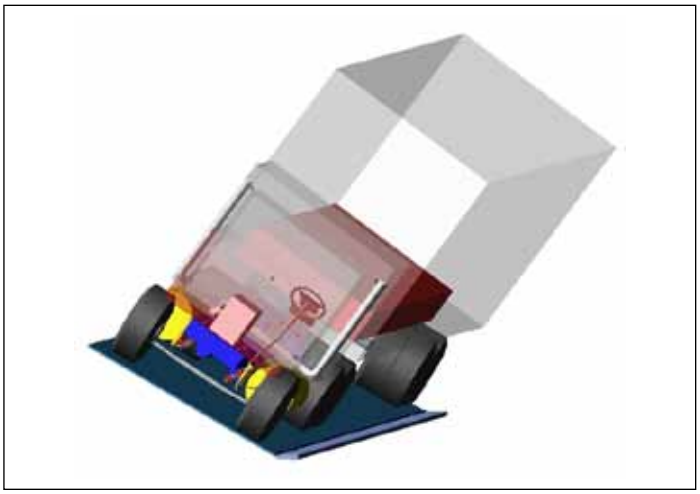
FTire Support Enhancements

FTire supports a set of user defined parameters in the FTire property file that can be used in any arbitrary expression for FTire parameters. With the new release, Adams/Car supports this functionality by creating an array for each tire containing these parameters and which are then referenced by Adams/View Design Variables. These Design Variables can be used in for example, Adams/Insight to change FTire properties in design of experiments (DOE) studies.



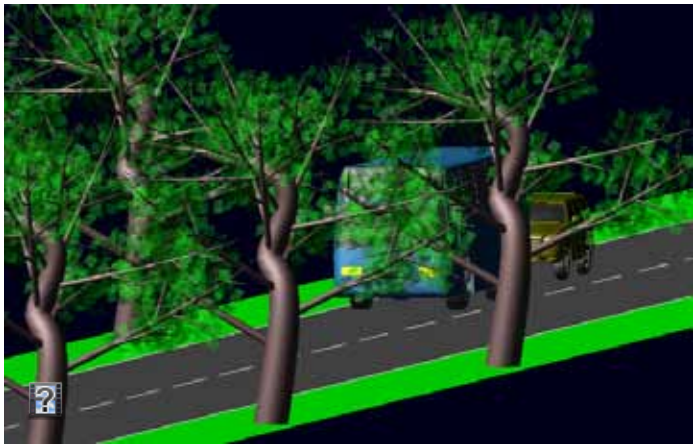
Tilt Table Analysis

The Adams/Car Truck plugin now includes a tilt table analysis capability bringing the power of simulation to engineers determining the stability properties of vehicles with this important test. The angle of inclination of the tilt table is increased either quasi-statically or dynamically and the simulation is terminated automatically when tire vertical forces reach a user defined threshold value. This capability is supported for all Adams/Car full vehicle models provided that they are assembled with the tilt table test rig from the Truck plugin.



Adams/Car Animation Objects

Trees, buildings and moving traffic can now all be easily represented within Adams/Car simulations. In addition to the obvious aesthetic improvements for supplier, customer and management reviews, this new capability can also be a powerful tool in vehicle performance evaluations. These animation parts can be fixed to ground (for environmental objects such as trees, buildings, street signs, landscaping, etc.) or moving objects (other traffic participants like cars, pedestrians, etc.). Animation graphics will be added to the assembly model and - optionally - to an existing analysis object as well.



MD Adams – Your Future Assured

With your continued support, MSC.Software remains committed to the persistent enhancement of our core multibody dynamics solution, MD Adams. The content of this release demonstrates that commitment on multiple levels.

Customer Driven Features

We take requests. MSC commits itself to meeting customer needs and requirements. Many of the new capabilities and enhancements in this release are a direct result of customer feedback. This includes the new Adams-to-Nastran output styles, MD Adams/Car SmartDriver enhancements, the post-processing automation capabilities and the new MD Adams/Car Truck Plugin and Database.

Leading Edge Innovation

We push the envelope. MSC continues to bring exciting new capability to multibody dynamics simulation. Evidence in this release of Adams includes the new parameter identification tools, experimental new features like the deformable road, and the extensions to our industry-leading contact modeling methods.

Speed of Use

We help you go faster. MSC is focused on helping you get the job of CAE analysis done more efficiently. For many of our customers it is no longer enough to simply use simulation to accelerate product development. The process of simulation, itself, must now be accelerated. The numerous ease-of-use enhancements in the interface and performance improvements in the solvers and methods featured in this release of MD Adams are there for this reason.

Thank You

MSC.Software appreciates the confidence and trust that you, our customers, have placed in our products all these years. This is also demonstrated by the customizations of the product and level of integration of our products into your CAE processes. You will continue to see more advances going into the product and we, as always, are pleased to have you as a customer and partner.

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