THE POWER OF DESIGN OF EXPERIMENTS METHODS FOR RAPID OPTIMIZATION OF YOUR AUTOMOTIVE DESIGNS

In automotive design, the window for computer-aided engineering (CAE) is short, and the results are critical. If dynamic testing could be integrated into the CAE cycle with fast, accurate results, the whole process could be shortened and design optimization could be reached more quickly. That’s the promise of ADAMS/Chassis.

Built on the powerful MSC.ADAMS dynamic solution engine, ADAMS/Chassis provides automakers and their suppliers with a suite of specialized pre-processing capabilities to quickly create a complete computer model of a full-vehicle or vehicle subsystem design. Then, just as quickly, users can test, refine, and optimize the performance of that design – all before building a single hardware prototype. This allows engineering teams to:

• See, study, and understand vehicle dynamics, including handling, tire wear, and gross ride characteristics
• Compare a vehicle subsystem design's performance against pre-defined design targets

ADAMS/Chassis offers full-vehicle events, such as steady state drift, throttle off in turn, and constant radius, and half-vehicle events, including dynamic load case and static vehicle characteristics.

In addition, ADAMS/Chassis brings to users the power of design of experiments (DOE) methods with ADAMS/Insight. ADAMS/Insight lets you see the effects of multiple design variations tested simultaneously – and to what degree each variation affects the overall system.
FEATURES

Data File Editor

Stabilizer Bar Editor

Spline Editor

Archive Capabilities
- Automatically encodes and compresses data files for easy, efficient file sharing

Bushings
- Offers different bushings models from standard linear MSC.ADAMS bushings to non-linear spline models with hysteresis

Graphical Difference Function
- Quickly highlights differences between data files

Fingerprints Function
- Saves up to 50 events for design studies and post-processing
- Automatically saves vehicle state on exit and reloads on startup

Geometry Table Editor
- Defines suspension location
- Includes individual tables for front suspension, rear suspension, steering system, and powertrain
VEHICLE EVENTS

Steady State Drift
- Drift pull events providing accurate prediction of lateral drift
- Vehicle can be set up to drive straight, even on cambered road

Constant Radius
- Robust quasi-static event runs fast, minimizes CPU time
- Tells where understeer or oversteer originates

Tire Wear
- Simulates vehicle driving through tire wear course
- Provides time histories of tire forces to run on tire testing machine
- Lets you compare tire patches from test group for wear

Step Steer
- Quasi-static routines find steering angle
- Full transient event accurately predicts transient overshoot metrics

Static Vehicle Characteristics (SVC)
- Full vehicle analysis of front and rear suspension using tire model in calculations
- Uses Jacobian compliance matrix to report metrics (suspension compliance, wheel rate, roll rate, anti-lift/dive, etc.)
FEATURES

- Data File Editor
- Stabilizer Bar Editor
- Spline Editor
- Fingerprints Function
- Archive Capabilities
- Graphical Difference Function
- Geometry Table Editor
- Bushings

FIND YOUR OPTIMUM DESIGN IN LESS TIME WITH ADAMS/INSIGHT

Until recently, an engineering team using MSC.ADAMS for virtual prototyping of automotive designs was limited to studying the effects of design changes in serial fashion – that is, one factor at a time.

Using ADAMS/Chassis and ADAMS/Insight, you can run a statistically significant battery of tests to determine your design’s sensitivity to variations. You define the variables you wish to test – including specific value ranges or tolerances – then produce an array of simulation permutations required for a complete experiment and plot the comparative results for trend analysis.

In this way, ADAMS/Chassis helps you get to your optimum design quickly – a critical capability when time to market is key to your company’s competitiveness.

A PROVEN SOLUTION

ADAMS/Chassis has been used for more than 10 years to build and test automotive models in these functional areas of our customers’ organizations:

- Vehicle dynamics
- Durability
- Powertrain
- Truck vehicle characteristics
- Large luxury car vehicle characteristics
- Small car vehicle characteristics
- Tools and methods
- Road load methods group
- Road load acquisition group
- Research center

SERVICE AND SUPPORT

- Beginning and advanced training
- Complete, online documentation
- Help Desk staffed onsite and offsite

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