Adams/Car
Advanced Simulation Environment for Vehicle Design and Testing

Capabilities
- Easily modify the topology and the properties of the components of your suspension and run a standard set of suspension and steering maneuvers
- Evaluate handling characteristics of your virtual prototype and view the vehicle states and other characteristics through plots.
- Ensure best practices by using expert-created assembly and Test Rig templates throughout the design team.
- Use the Driving Machine to save the time you previously needed to set proper gains for closed-loop controllers. The Driving Machine incorporates proprietary control algorithms from MSC.Software.

Benefits
- Reduce risk by having better information at every stage of vehicle design and development.
- Run analyses and what-if scenarios without the costs associated with physical testing on a test track or proving ground.
- Analyze design changes much faster and at a lower cost than physical prototype testing would require.
- Vary the kinds of analyses faster and more easily than if you had to modify instrumentation, test fixtures, and test procedures.
- Spend your time improving your designs. The easy to use interface will let you focus on what’s important.

Overview
With Adams/Car 2007 r1, engineering teams can quickly build and test functional virtual prototypes of complete vehicles and vehicle subsystems. This helps cut time, cost, and risk in vehicle development and improves the quality of the new vehicle designs. Working in the Adams/Car 2007 r1 simulation environment, automotive engineering teams can exercise their vehicle designs under various road conditions, performing the same tests they normally run in a test lab or on a test track, but in a fraction of the time.

The Adams/Car package includes many functional modules to perform advanced analyses. These modules are listed below in more detail.

Adams/Car Vehicle Dynamics
With Adams/Car, you can perform various analyses on the vehicle to test the design of the different subsystems and see how they influence the overall vehicle dynamics. You can also examine the influence of component modifications, including changes in spring rates, damper rates, bushing rates, and anti-rollbar rates, on the vehicle dynamics. This module includes standard testing procedures for cornering, courses, steering, quasi-static, and straight-line analyses.

Adams/Car Suspension Design
With Adams/Car, you can learn how a suspension controls the wheel motions and transmits load from the wheels to the chassis. Built into the Suspension Template are standard suspension analyses to predict roll and vertical forces, static loads, steering characteristics, and wheel travel.
Adams/Driveline
Adams/Driveline provides engineers and analysts with specialized tools for modeling and simulating driveline components and studying the dynamic behavior of the entire driveline during different operating conditions. It can also be used to explore the interaction between the driveline and chassis components, such as suspensions, steering system, brakes, and the vehicle body.

Adams/3D Road
Adams/3D Road lets you simulate many types of three-dimensional smooth roads, such as highways, race tracks, test tracks, and parking structures. Adams/3D Road helps you study various effects of smooth roads, such as bank angle and slope, on vehicle dynamics. You can simulate particular roads including your company's own closed-circuit test track.

Adams/SmartDriver
The Adams/SmartDriver is an advanced driver simulator that can bring a vehicle design to its dynamic limits or user-specified targets, such as a percentage of maximum longitudinal acceleration. Using Adams/SmartDriver, vehicle handling, durability, and ride performance can be improved with minimal set-up.

Adams/Tire
The Adams/Tire module is used with Adams/Car, Adams/Chassis, Adams/Solver, or Adams/View to add realistic tires to your mechanical model and to simulate maneuvers such as braking, steering, acceleration, free-rolling, or skidding. Adams/Tire lets you model the forces and torques that act on a tire as it moves over roadways or irregular terrain.

Adams/Chassis
Adams/Chassis enables simulation of 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. The power of Adams/Chassis is further enhanced when used with Adams/Insight to perform systematic experiments on the vehicle model. The effect of multiple design variations can be studied, the design can be optimized, and robustness issues can be addressed effectively.

Adams/Car Ride
Adams/Car Ride is an extension of the Adams/Car capabilities to allow virtual ride and comfort engineering up-front in the vehicle design process. Adams/Car Ride includes the required elements, models, and event definitions for building, testing, and post processing within the ride frequency regime. The same model database used for handling can now be used for ride and comfort engineering.

Adams/Car Package includes:
• Adams/Car
• Adams/Car Vehicle Dynamics
• Adams/Car Suspension Design
• Adams/Chassis
• Adams/Driveline
• Adams/SmartDriver
• Adams/Tire
• Adams/3D Road
• Adams/Car Ride

Optional Adams/Car Modules:
• Adams/Tire FTire

Prerequisites:
• Adams/Car requires the Adams/Solver and Adams/View