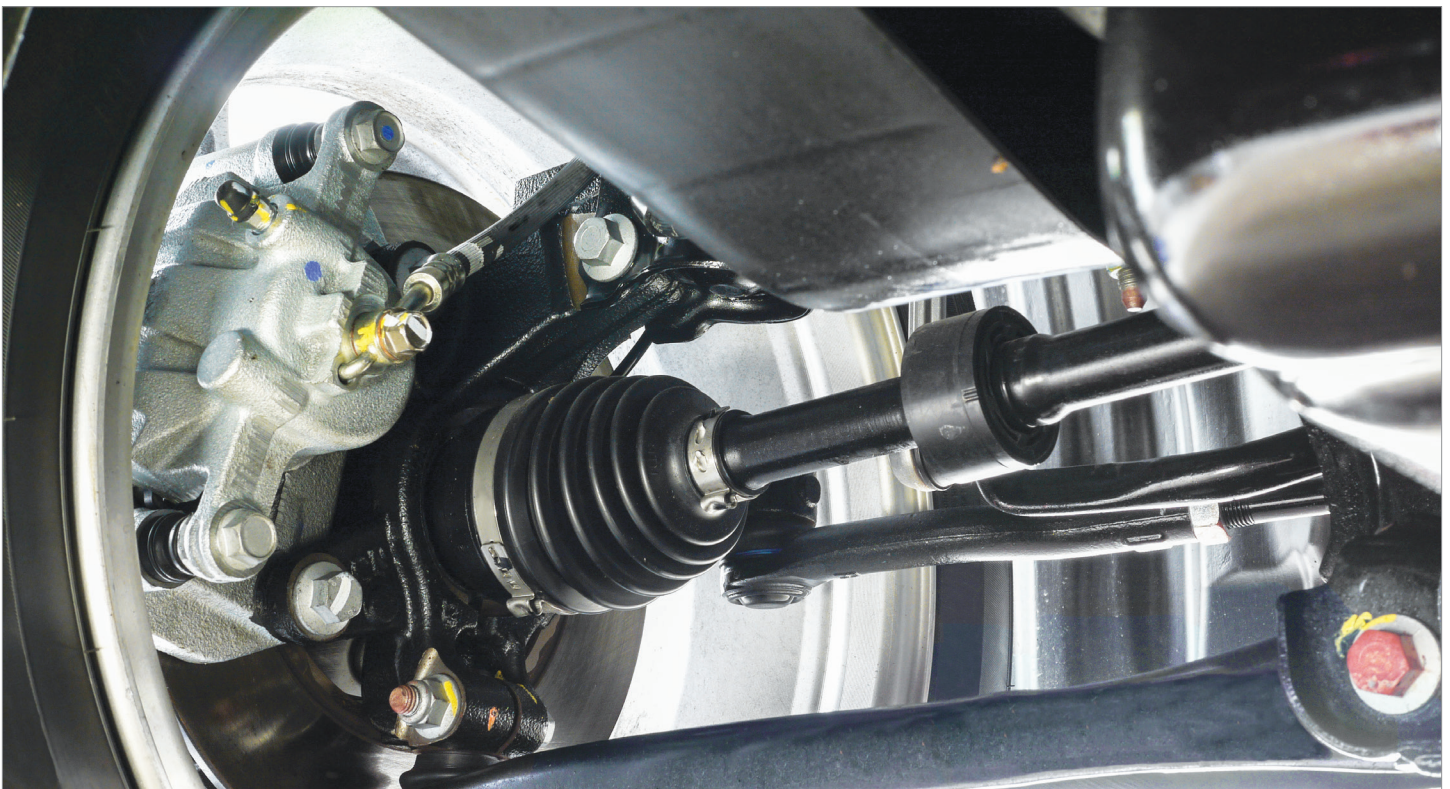


MotionSolve for Automotive

Optimize Automotive System Performance

MotionSolve – Altair’s multi-body solution is an integrated solution to analyze and improve mechanical system performance. In the automotive industry, MotionSolve is used to design and evaluate new suspension systems, optimize the ride and handling characteristics of vehicles, assess system durability, simulate for low frequency vibration avoidance, design and optimize steering systems, and validate mechatronics components.

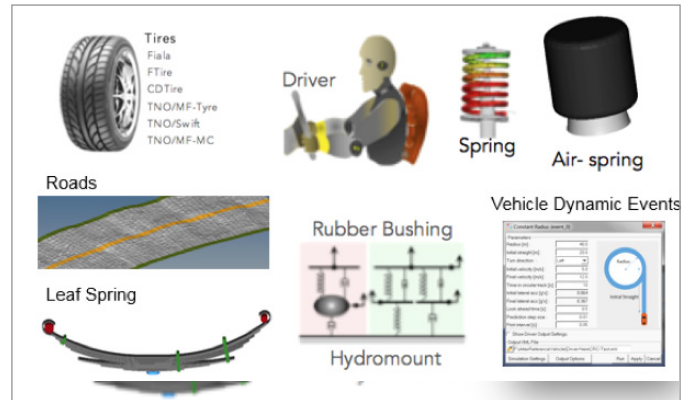


Solution Highlights

- Model-Simulate-Evaluate-Improve usage paradigm for cars and truck simulations
- Assess automotive vehicle dynamics, determine road loads, compute system NVH characteristics and evaluate vehicle control
- Create detailed models to validate subsystem design
- Minimize component mass safely by providing accurate loads to downstream topology, size and shape optimization efforts
- Perform multi-disciplinary analyses with controls, 1D, CFD and hydraulics to assess new concepts in vehicle design
- Send component loads to fatigue solvers for evaluating component fatigue life
- Obtain reliable designs through stochastic simulations
- Perform simulations to extract performance targets for key vehicle subsystems

Model

- A user-extensible, hierarchical language for building models:
- Library of components including leaf springs, dampers, bushings and stops
- Tire and road models of varying fidelities for handling, ride, comfort, durability and NVH evaluations
- Parametric templates for common subsystems such as suspensions, steering and powertrain
- Wizards to easily assemble half and full vehicle systems



A large library of automotive modeling components in MotionSolve allows you to quickly build vehicles and evaluate or improve attributes such as Vehicle Dynamics, Durability or NVH

Analyze

- Driver models for driving car or truck
- Simple graphical interfaces to execute standard vehicle events
- Scripting for user-defined maneuvers
- Co-simulation to solve multi-disciplinary problems
- Model exchange using FMI/FMU 2.0
- Compute system dynamic behavior, analyze vibration characteristics and export linearized models



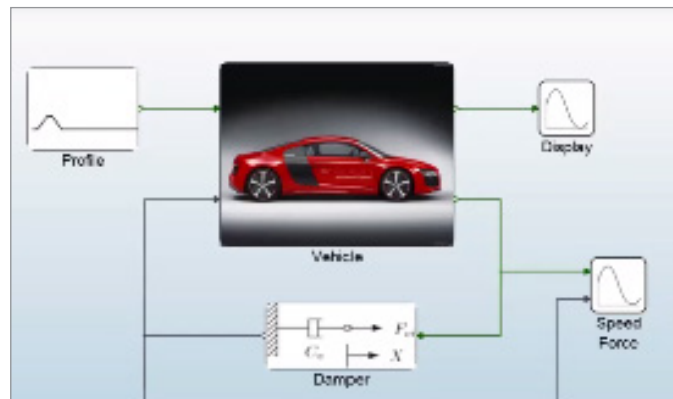
With MotionSolve you can build complex truck systems and prove that they meet government mandated safety and performance standards

Evaluate

- Output time histories of displacement, velocity, acceleration, force and user-defined results
- Examine plots and animations to understand product behavior
- Assess requirements compliance using automatically generated reports

Improve

- Perform design studies to evaluate design robustness
- Do design optimization to maximize system performance
- Use private or public clouds to undertake large scale simulations



High fidelity MotionSolve vehicle models can be imported as FMU blocks in control simulation environments to validate the behavior of controllers on a variety of realistic scenarios