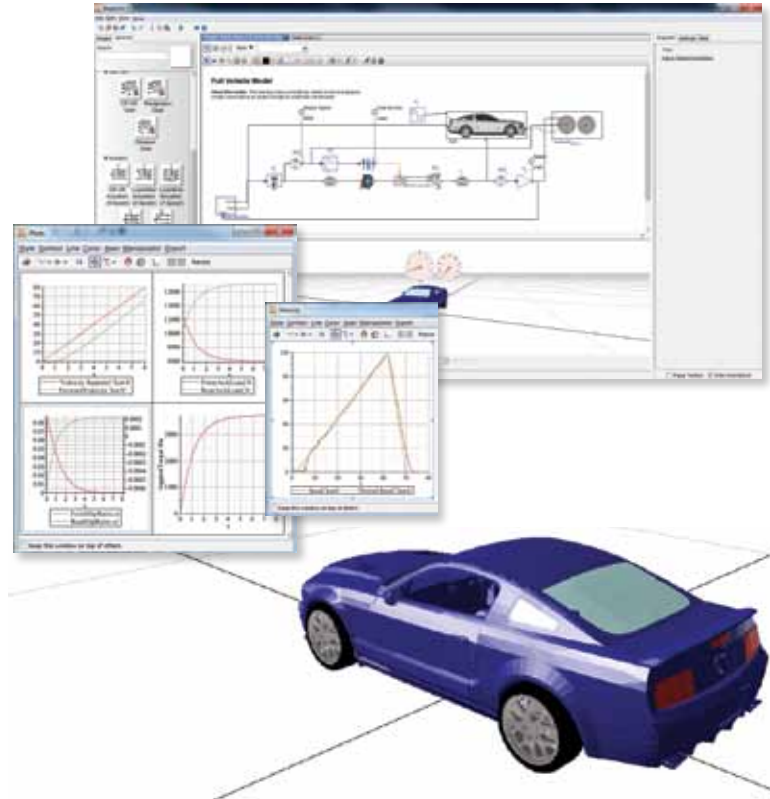# MapleSim™ Driveline Component Library

As automotive manufacturers strive to improve vehicle fuel efficiency, much of the focus is on the engine as the primary source of power loss in the vehicle powertrain. However, there is arguably as much loss through the transmission. Engineers are putting a lot of effort into assessing exactly how much power is lost, and what can be done to reduce losses and improve overall efficiency.

Maplesoft has developed the MapleSim™ Driveline Component Library, a collection of components, transmission sub-assemblies, and complete powertrain examples that show the use of these components in driveline applications. Built with guidance from several transmission manufacturers, this MapleSim library allows you to mix the best of physical models and empirical data to maximize model fidelity, optimize your designs, and improve overall vehicle fuel-efficiency.

Key Features

- Covers all aspects of the powertrain, from the engine to the differential, wheels, and road loads
- Includes transmission configuration examples such as manual, automatic, and dual-clutch
- Provides "lossy" versions of many components that allow losses due to tooth meshing, bearing friction, and slip to be readily incorporated using external calculations and empirical look-up tables
- Supports an acausal approach to model development, so you can simply connect components together without worrying about issues such as torque/speed directions and load flow
- Allows you to modify the pre-built components to suit your specific requirements and increase the model fidelity
- Provides building blocks so you can easily create new transmission models

Components

The MapleSim Driveline Component Library includes the following components:

- Basic Gear
- Planet Ring Gear
- Planetary Gear
- Dual-ratio Planetary Gear
- Counter-rotating Planetary Gear
- CR-CR Gear
- Ravigneaux Gear
- Simpson Gear
- Simpson Actuation (3-Speed)
- CR-CR Actuation (4-Speed)
- Ravigneaux Actuation (4-Speed)
- Lepelletier Actuation (6-Speed)
- Lepelletier Actuation (7-Speed)
- Dog Clutch Clutch

- One Way Clutch
- Brake
- CVT
- Torque Converter
- Engine Dynamometer
- Loss element
- Bearing Friction
- Damper Differential
- Active Limited Slip
- Differential (ALSD)
- Vehicle
- Tire
- Gear Shifter
- Ratio Selector

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