

Heavy Truck Dynamics

1. Heavy Truck Dynamics Terminology

- Definitions and Terms
- Vectors
- Forces and Moments

2. Mechanics of Pneumatic Tires

- Basic Properties
- Tire Models
- Wheel Dynamics
- Tire Slip and Traction

3. Mechanics and Kinematics of Steering Systems

- Kinematics and Dynamics of Steering
- Understeering and Oversteering
- Steering Vibrations

4. Mechanics and Kinematics of Suspension Systems

- Suspension Configurations
- Primary and Secondary Suspensions
- Effect of Secondary Suspensions
- Primary Suspension Kinematics
- Primary Suspension Dynamic Loading
- Primary Damper Tuning Effects
- Primary Spring Design

5. Heavy Truck Ride Dynamics

- Roll Stiffness of Tractor
- Braking and Acceleration Analysis
- Lane Change and Maneuvering Analysis
- Vehicle Handling and Stability
- Ride Comfort
- Measurement Technique

6. Ride Dynamics Design Simulation Tools

- Definitions
- Mathematical Basics
- Multi-body Dynamics Concepts
- Derivation of Dynamic Equations
- Commercially Available Software
- Typical Use of Simulation Tools for Design and Production-Mod Analysis