

Full-System Solutions for Tractors

Tractors are growing in size to improve yield, with increased specialization across geographies and crop requirements. Dana offers Spicer® modular axles, suspended axles, and independent suspension axles that deliver improved speed and operator comfort, as well as highly engineered Graziano™ shifting solutions for enhanced performance and efficiency.



Spicer® Independent Suspension Axle

- Improved traction and increased speed
- Decreased body vibration and enhanced maneuverability
- Transit speed up to 60 Km/h



Spicer® Mono-Suspension Axle

- Active suspension system enhances driving quality and comfort
- Improved maneuverability and traction
- Easy of assembly
- Improved controllability in transit



Spicer® Modular Axle

- Flexible platform assembled from three interchangeable modules
- Cost-effective technology reduces product development lead times
- Available with suspension connection



Spicer® Portal Axle

- Designed for compact utility tractors
- Increased ground clearance, enhanced traction and performance
- Smooth turning capability
- Suitable for all terrain applications



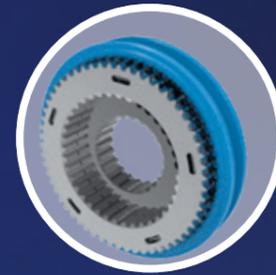
Spicer® Driveshaft

- Multiple driveshaft and end-fitting combinations
- Designed for minimal maintenance, longer life and reduced operating cost



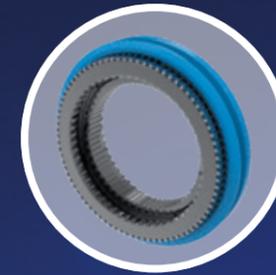
Graziano™ Bevel gear sets

- State-of-the art gear technologies – Gleason and Klingelberg
- Fine-tuned micro-geometry to minimize noise and optimize durability



Graziano™ Synchronizer DC 95/100

- Double cone solution for faster synchronization time
- Higher engagement torque in the same size
- Reduced axial package with overall transmission weight saving



Graziano™ Synchronizer SC 184

- Three sizes with single or double cone modular design
- Reduced axial package with overall transmission weight saving
- High torque capacity up to 27,000 Nm



Graziano™ Synchronizer TC 102/110/118

- First triple cone design for agricultural market
- High power density in compact radial package
- Integrated activation system for long life
- Special friction material developed for high stress capacity



Graziano™ Synchronizer CSS

- Roller working ramp obtained on the tooth flank of the sliding sleeve
- Wider friction surfaces in same envelope
- Simpler and stronger hub geometry minimizes heat treatment deformations
- Optimized synchro ring geometry reduces stress and knocking effect



Graziano™ Powerhifft units

- Designed for high efficiency, enhanced shifting performance, and driver comfort
- Electron Beam Welding Technology minimizes distortions



Comprehensive design methodology for integrated suspension solutions

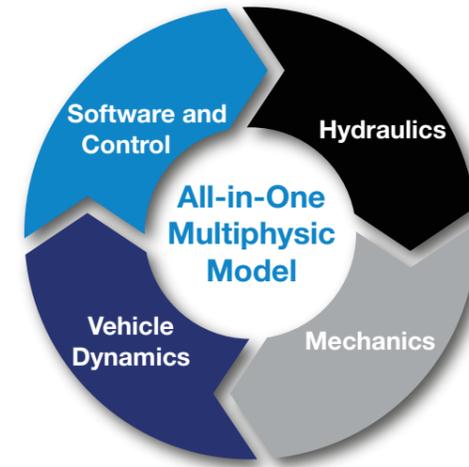
As the market expands for high-performance, feature-rich tractors, Dana supports OEMs by reducing the development time of **complete suspension solutions**.

Our engineers use an advanced **multiphysics approach** to produce virtual prototypes and conduct **real-time simulations** that help reduce development time and accelerate the introduction of new vehicles to market.

Dana's engineering capabilities are especially valuable for OEMs with limited in-house resources.



Multiphysics Approach Produces All-in-One Model



Our engineers use a powerful software and simulation toolbox to model the complexity of advanced suspension systems across multiple dimensions, including vehicle dynamics, mechanics, hydraulics, and software and controls.

Reduced design time

Identification of the optimized solution

Risk of experimental iterations reduced

Proven Process for Complete Suspension Solutions

We have leveraged our decades of expertise in agriculture equipment to cultivate a sophisticated, all-encompassing development methodology that optimizes the performance of suspension solutions.

- Improved vehicle traction
- Better handling
- Greater operator comfort

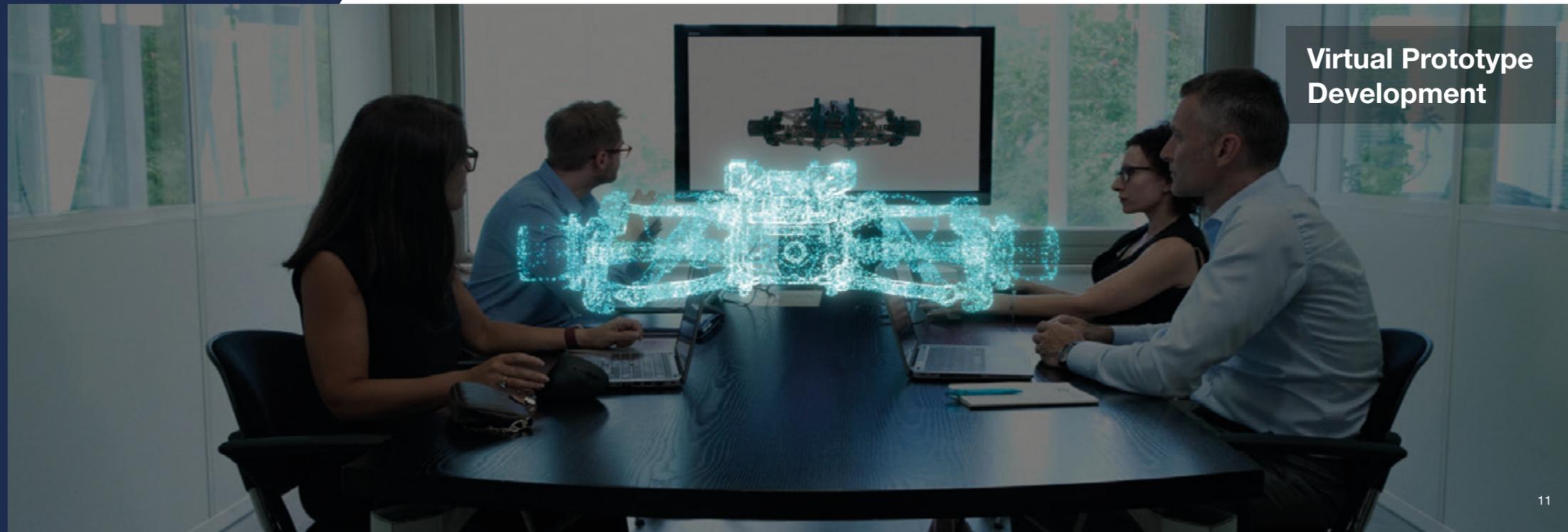
Enhanced Suspension System Performance

Our comprehensive approach produces fully integrated suspension systems that excel across every aspect of performance and deliver unmatched long-term value.

- Vehicle performance definition
- Comprehensive data acquisition
- Virtual prototype development
- Real-time simulation
- Prototype test track validation

Characterization of Vehicle Performance

Define Comfort and Handling KPIs



Virtual Prototype Development