



Agriculture

Off-Highway Drive and Motion Systems



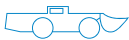
Market-leading solutions to enhance
agriculture performance, efficiency
and productivity.

Off-Highway Drive and Motion Systems

As an innovative leader, Dana Off-highway continuously improves the performance and efficiency of vehicles and machines worldwide. We aim to be the global pacesetter in efficient power conveyance and energy-management solutions.

Mobile

**AGRICULTURE**

**MINING**

**MATERIAL HANDLING**

**CONSTRUCTION AND FORESTRY**

**COMMERCIAL TURF CARE**

Industrial

**BULK MATERIAL AND MINING**

**ONSHORE AND OFFSHORE MARINE**

**INDUSTRIAL AND STATIONARY EQUIPMENT**

**HEAVY INDUSTRY: STEEL, SUGAR, AND CEMENT**

**WASTE MANAGEMENT AND RENEWABLE ENERGY**

**PLASTIC AND RUBBER**

Off-Highway **Brand Portfolio**

Supported by a legacy of innovation in conventional drivetrains, Dana Off-Highway is at the forefront of integrating mechanical and electrical components for alternative propulsion applications. We embrace evolution to be a step ahead in supporting new applications as they emerge and collaborating with customers as they develop tomorrow's vehicles.

Drivetrain and e-Drive Systems



Motion and e-Motion Systems



Gears and Shifting Solutions



Thermal Management



Sealing



Electric and Hybrid e-Drive Systems



Fully Integrated e-Drive and e-Motion Systems for your Agriculture vehicles

The agriculture industry is facing unprecedented change from rising global demand, market diversification, and the drive toward more environmentally responsible farming. Dana is strategically positioned to help OEMs navigate the changes in the agriculture sector through a global footprint, decades of vehicle engineering expertise, and a diverse and growing portfolio of innovations that include next-generation clean-energy technologies.



Cattle Feeder Mixer

Tractor

Telehandler

Windrower

Sprayer

Combine Harvester

Zero Turn Mower

Compact Electric Tractor

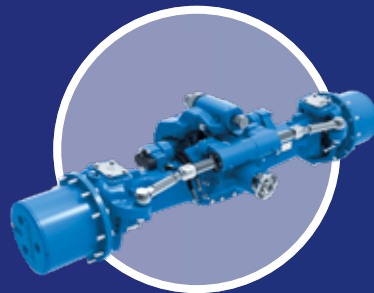
Full-System Solutions for Tractors

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



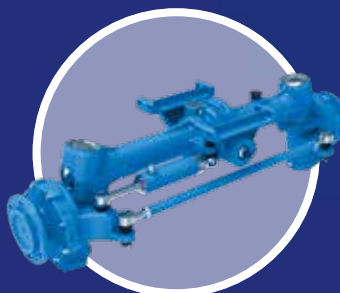
Graziano™ Bevel gear sets

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



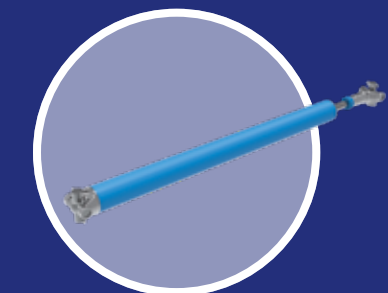
Spicer® Modular Axle

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



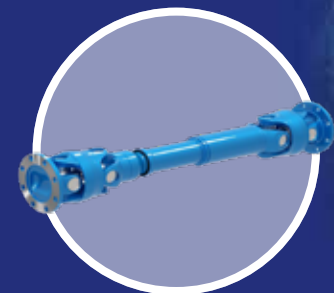
Spicer® Portal Axle

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



Spicer® Driveshafts

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



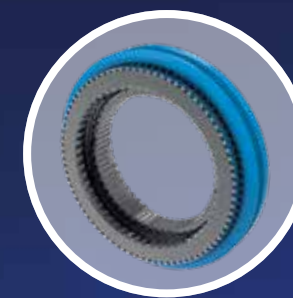
Spicer® Driveshafts

- Centered double cardan permanently lubricated
- Round and wing-bearing styles available



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™ Powerhift 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.

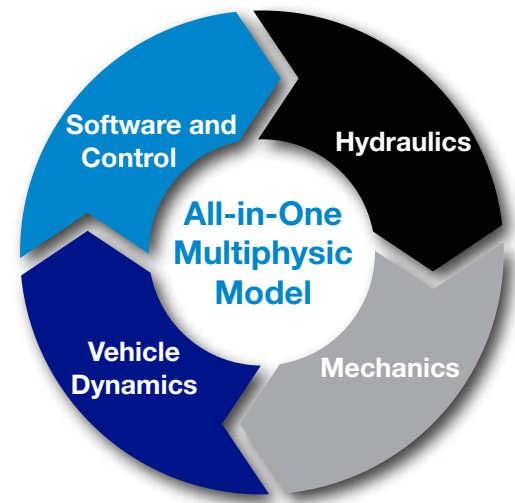


Characterization of Vehicle Performance

Define Comfort and Handling KPIs



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.

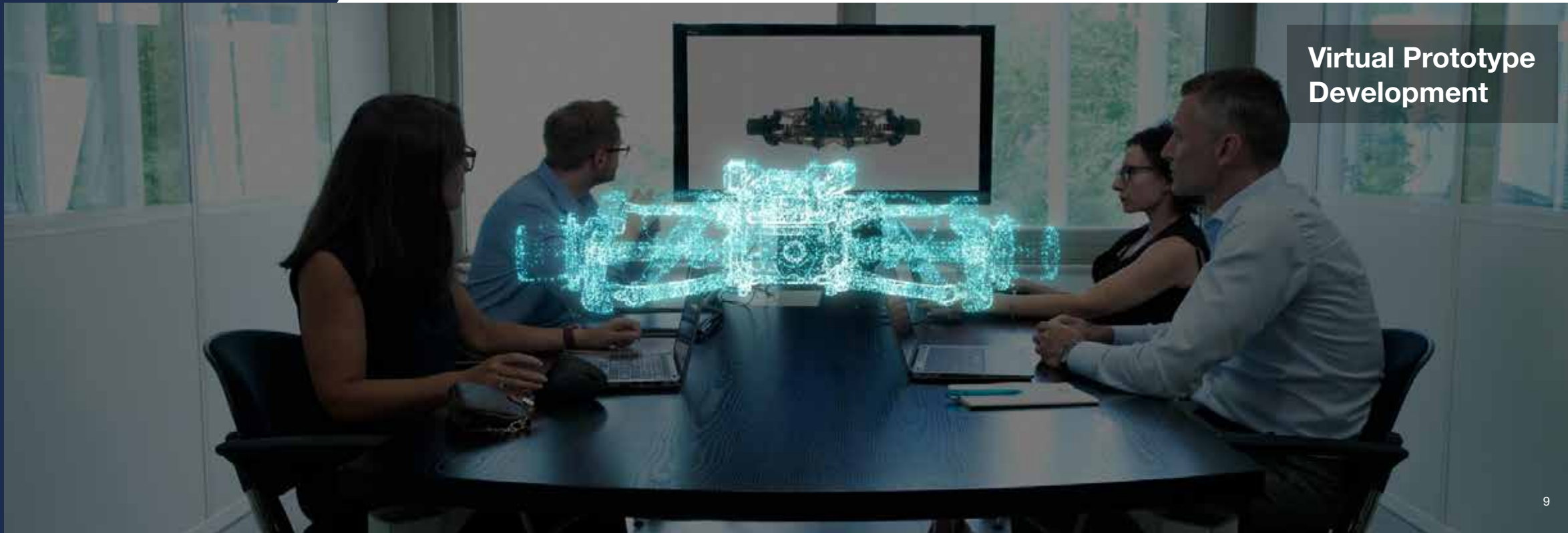
- Improved vehicle traction
- Better handling
- Greater operator comfort

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.

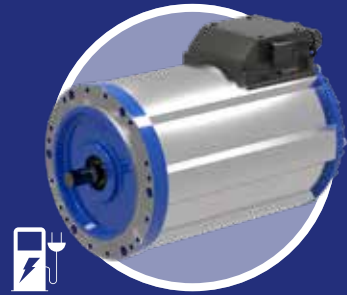
- Vehicle performance definition
- Comprehensive data acquisition
- Virtual prototype development
- Real-time simulation
- Prototype test track validation

Virtual Prototype Development



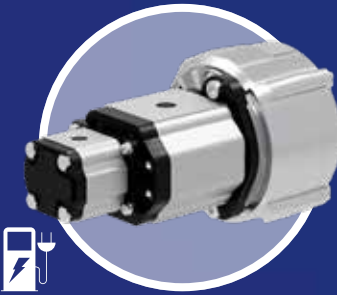
Full-System Solutions for **Compact Electric Tractors**

Ideal for small farms, livestock operations, and equestrian centers, compact electric tractors offer a compelling combination of torque, power density and emissions-free operation. Dana supplies e-Propulsion drive solutions and vehicle integration expertise to meet the performance expectations of this fast-growing segment of the market.



TM4™ SRIPM e-Mobility Motor

- Premium motor technology
- Multiple solution including IPM and SR and SRIPM
- Superior Efficiency level



TM4™ e-Pump Motor

- Effective performance and operation with a compact design
- SYR and IPM technology for high-efficiency
- Modular approach



TM4™ LVI430 Low Voltage Inverter

- Most power-dense inverter with patented in-house MOSFET multilayer power modules
- Open and fully flexible application software configuration



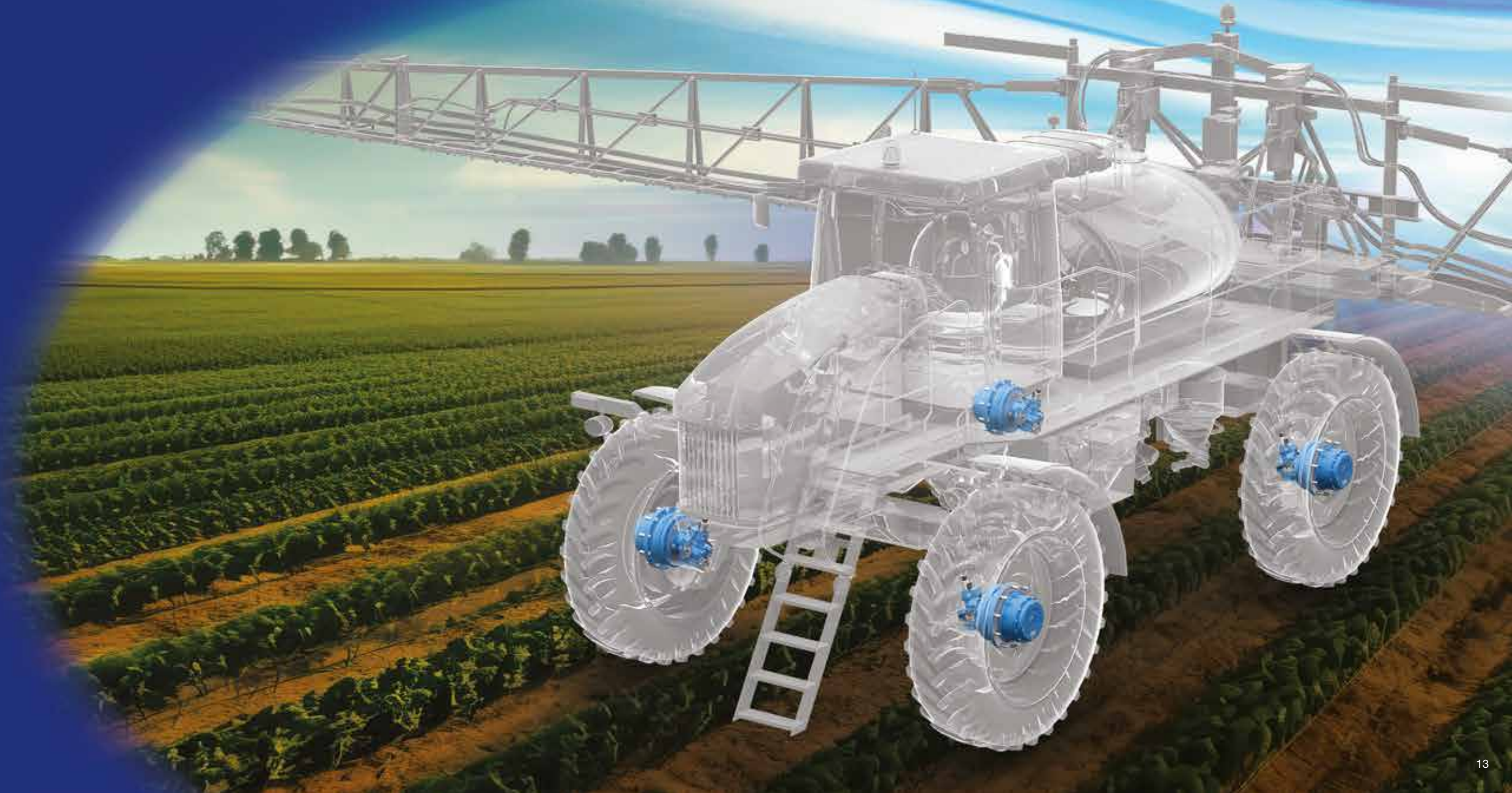
Full-System Solutions for **Sprayers**

Precision farming, increasing sizes of farms, and sustainable agriculture practices are driving the demand for improved sprayer performance. Spicer Torque-Hub™ wheel drives are specifically designed to improve speed, maneuverability, efficiency, and safety.



Spicer Torque-Hub™ C0 Series

- Patented service brake to meet on-road stopping requirements
- Heavy duty main bearings and retention for high wheel offsets and side loads
- High speed thermal stability for fast operating machines
- Low maintenance requirements and easy to service



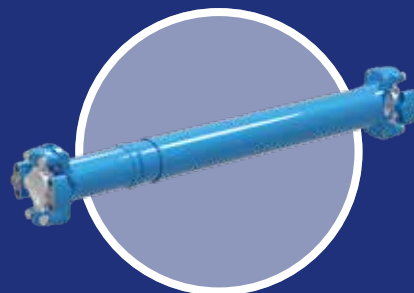
Full-System Solutions for Telehandlers

Offering a rare combination of efficiency, versatility, sustainability, and power, telehandlers have become the workhorses for a wide variety of tasks on the farm. Spicer® drivetrain systems and Brevini™ motion systems support powerful, efficient, and safe performance on the worksite while maximizing speed and fuel economy on the road between tasks.



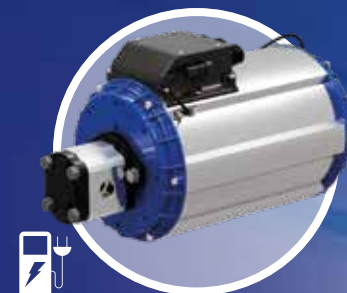
Spicer® Planetary Steering Axles

- High driveline efficiency
- Reduce heat generation and minimize power loss



Spicer® Driveshafts

- Ideal for the rigorous demands of most mobile off-highway applications
- Designed for minimal maintenance, longer life, and reduced operating costs



TM4™ e-Pump Motor

- Effective performance and operation with a compact design
- SYR and IPM technology for high-efficiency
- Modular approach



Spicer® Electronic Controls

- Enables communication between driveline components
- Support for OEM movement in digitalization and automation
- Full library of Driveline Controls and Safety Functions



TM4™ LVI430 Low Voltage Inverter

- Most power-dense inverter with patented in-house MOSFET multilayer power modules
- Open and fully flexible application software configuration



Graziano™ Shifting Solutions

- High-efficiency powershifts
- Enhanced shifting performance and driver comfort



Spicer™ eSG001

- High-efficiency single-speed
- Ideal for high-performance motors
- Compact and light



Spicer™ eSG101

- High-efficiency single-speed
- Ideal for high-performance motors
- Enhances vehicle mobility



Spicer™ eSG102

- High-efficiency, two speed
- Ideal for high-performance motors
- Enhances vehicle mobility



Spicer® HVT

- Maximizes fuel savings
- Precise low-speed maneuvering control
- Increased travel speeds



Spicer® Hydrostatic Transmissions

- Allows forward, reverse, and braking with hydrostatic motor
- Delivers high torque at low speeds



Spicer® Hydrodynamic Transmissions

- Advanced electronic controls
- Highly-efficient aluminum-cast converter

Full-System Solutions for Combines Harvesters

Combine harvesters are expected to maximize throughput regardless of the weather conditions. Our Spicer® drivetrain and Brevini™ motion solutions for combines and forage harvesters are engineered for superior performance, maneuverability, and durability in the field as well as optimal speed and fuel consumption on the road between crops.



Spicer® Gear Box

- Modular concept, two or three speeds
- Shift on Fly, stand-still shifting option available
- Integrated Service and SAHR
- Wet Brake "self-adjust"



Spicer® Rear Adjustable Axle

- Ideal for application requiring different flange to flange
- Compact full retract dimension for shipping purpose
- Disconnect option improves traction at low speed and maximize efficiency at high speed
- Optimize lubrication oil quantity, limited to center section and final hub



Spicer® Rear Mono-Suspension Axle

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



Spicer® Rear Standard Axle

- Four-wheel drive configuration for more maneuverability and traction
- Improved controllability in transit



Full-System Solutions for **Windrowers**

Windrowers are built to move quickly and precisely across fields and on the road. We supply Spicer® drivetrains engineered for durability and maneuverability on uneven terrain as well as speed and economy on the highway.



Spicer Torque-Hub™ C0 Series

- Patented service brake to meet on-road stopping requirements
- Heavy duty main bearings and retention for high wheel offsets and side loads
- High speed thermal stability for fast operating machines
- Low maintenance requirements and easy to service



Spicer Torque-Hub™ HW5 Model

- Heavy duty main bearings and retention for high wheel offsets and side loads
- High speed thermal stability for fast operating machines
- Low maintenance requirements and easy to service



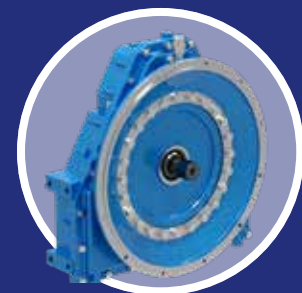
Full-System Solutions for Self Propelled Cattle Feeder Mixers

As a single-source supplier for self-propelled cattle feed mixers, we offer Spicer® drive and Brevini™ motion technologies that maximize performance through a potent combination of torque, maneuverability, efficiency, and throughput capacity.



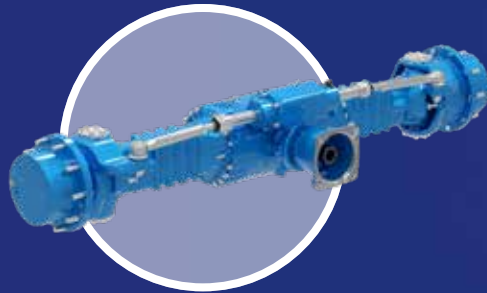
Spicer Torque-Hub™ CT Series Track Drive

- Wheel drive equipped by hydraulic or electric motors
- Robustness, compactness and reliable solution to match the high performances required by agriculture machines
- Parking and dynamic braking system integrated
- Mechanical disconnect device for towing



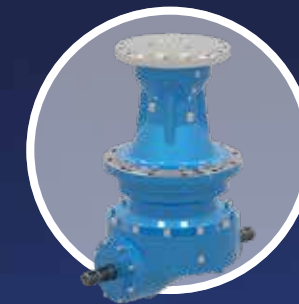
Brevini™ Pump Drive

- Input Power up to 480 kW
- Suitable for internal combustion engine or electric motor as input
- Output connection for 2, 3 or 4 hydraulic pumps
- Additional pump for lubrication or cooling system available on request.



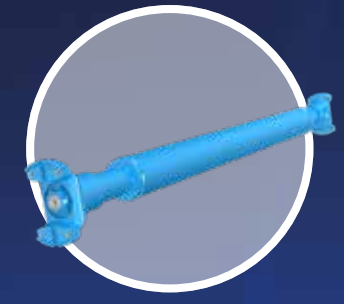
Spicer® Axle

- Multiple configurations available
- Bevel set and two different hub reduction sizes produce different ratios
- Suitable for hydrostatic or hydrodynamic drivelines
- Different design implemented to fulfill market demand



Brevini™ Slew Drive

- Robust output frame to sustain and drive the auger
- Maximum output torque up to 48 kNm
- Integer shaft flange frame mounted
- Strong construction and high bearings capacity layout



Spicer® Driveshafts

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



Full-System Solutions for Zero-Turn Mowers

Our Spicer Torque-Hub™ electrified drives and TM4 Electrodynamic™ electric motor technologies for zero-turn mowers deliver maneuverability and speed in a compact solution that provides superior performance while minimizing emissions.



Spicer Torque-Hub™ eS10S

- Engineered to fulfill industry targets for performance, serviceability and durability
- Internal electric parking brake design for maximum holding power
- Integrated Dana TM4™ IPM advanced motor technologies for greater efficiency with compact size and weight
- Mechanical Disengage for ease of towing under no power condition
- IP67 motor protection from environmental hazards



Spicer Torque-Hub™ eS10H

- Dana TM4™ IPM and ASY advanced motor technologies for greater efficiency with compact size and weight
- Compact three-stage planetary gear design provides superior gradeability
- Mechanical Disengage for ease of towing under no power condition
- IP67 motor protection from environmental hazards
- Integrated motor options for design flexibility



Spicer Torque-Hub™ eSAW04

- Dana TM4™ IPM and ASY advanced motor technologies for greater efficiency with compact size and weight
- Compact three-stage planetary gear design provides superior gradeability
- Integrated motor options for design flexibility



Spicer Torque-Hub™ eIPM120

- Effective performance and operation with a compact design
- IPM technology for high-efficiency
- Modular approach



TM4™ LVI430 Low Voltage Inverter

- Most power-dense inverter with patented in-house MOSFET multilayer power modules
- Open and fully flexible application software configuration



Market-Driven Off-Highway Innovation

About Dana Incorporated

Over 39,000 Dana dreamers in over 30 countries drive mobility and transportation forward — wherever the road, or offroad, takes our customers and communities.

A leader in the design and manufacture of propulsion and energy-management solutions, Dana powers vehicles and machines in all mobility markets across the globe.

Delivering groundbreaking drive systems. Advancing revolutionary motion technologies. Championing leading-edge power management innovations across thermal technologies for e-Propulsion; controls and software; battery management systems; and fuel cell plates.

With a balanced portfolio — including complete in-house electrification capabilities — Dana provides class-leading products and systems supporting traditional, hybrid, and EV manufacturers. **Everywhere.**



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Application Policy
Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Dana; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.