

# Construction

Off-Highway Drive and Motion Systems



# **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**











MATERIAL HANDLING

# 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** 



AGRICULTURE

COMMERCIAL TURF CARE

#### Industrial







ONSHORE AND OFFSHORE MARINE



INDUSTRIAL AND STATIONARY EQUIPMENT





WASTE MANAGEMENT AND RENEWABLE ENERGY



PLASTIC AND RUBBER

# HEAVY INDUSTRY: STEEL, SUGAR, AND CEMENT







# Fully Integrated e-Drive and e-Motion Systems for your **Construction Vehicles**

Dana helps manufacturers bring vehicles to market through its collaborative, system-oriented approach and decades of expertise. We offer a full product portfolio and multiple technologies for electrified and conventional vehicles. You can rely on our products to work continuously in challenging environments where vehicle performance, efficiency, and reliability are critically important.

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Articulated Booms

**Scissor Lifts** 

Wheel Loaders

Wheeled Excavators

Telehandlers

Compact Track Loaders

Site Dumpers



# Full-System Solutions for **Wheel Loaders**

Dana's solutions cover the complete range of wheel loaders, from compact to heavy-duty.

For electrified compact wheel loaders we offer a full electrified driveline, which offers power-loss reduction, noise emission, improved efficiency, reduced TCO, and precision-engineered interface for connecting high-performance motors. With the best match between mechanical, electric components and control software, we are delivering the best-in-class and most efficient drivetrain solution suitable for many construction vehicles.



#### **Spicer®** Planetary **Non-Steering Axle**

- Available with disc or drum brakes
- Multiple configurations available



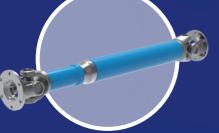
#### **Spicer® Electronic Controls**

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



#### **Graziano<sup>®</sup> Shifting Solutions**

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



### **Spicer<sup>®</sup> Driveshafts**

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





#### Spicer<sup>®</sup> eSG001

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



- Ideal for high-performance motors
- Enhances vehicle mobility

#### SYR and IPM technology for high-efficiency

operation with a compact design

TM4<sup>™</sup> e-Pump Motor

Effective performance and

#### TM4<sup>™</sup> LVI430 Low Voltage Inverter

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

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### Spicer<sup>®</sup> Hydrodynamic Transmissions

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

### Spicer<sup>®</sup> Hydrostatic Transmissions

- Allows forward, reverse,
- Delivers high torque at low speeds



■ High-efficiency single-speed



#### Spicer<sup>®</sup> eSG102

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



#### Spicer<sup>®</sup> eSP502

- No downtime,
- no working interruptions
- Dual-motor setup for system redundancy



and braking with hydrostatic motor

#### **Spicer® HVT**

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

# Full-System Solutions for **Mini Excavators**

Dana's solutions improve the worksite performance of electric-driven mini excavators through numerous advanced technologies. Improved rotational efficiency and controllability enable smooth, precise positioning, while electronic load-sensing capabilities improve system efficiency and safety.

Dana electric systems covers all the functions that allow the best balance between cost and performance. This system includes an e-Pump motor, e-Slew drive, and inverters working in synergy to create the best conditions for sustainable work.



#### **Brevini® e-Slew Drive**

- Compact and efficient
- Allows the drive to fit into the existing machine frame
- Delivers the best efficiency for longer battery life



### TM4<sup>™</sup> e-Pump Motor

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

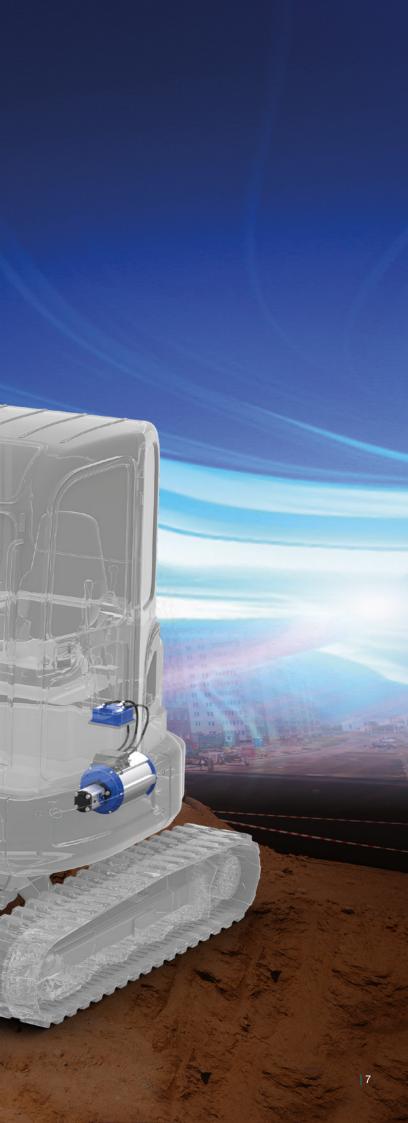
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Modular approach



### TM4<sup>™</sup> LVI420 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 **Wheeled Excavators**

Dana's innovative approach delivers best-in-class engineering solutions to help OEMs maximize their offerings. For wheeled excavators, we provide a complete drivetrain featuring front and rear axles, driveshaft, and transmission for both conventional and electrified vehicles. Dana's Spicer® drivetrain system integrates outboard wet disc brakes to ensure jerk-free braking and smoother operation. This contributes to the already excellent comfort enjoyed by the driver, who also benefits from precise maneuvering capabilities and ease of use. Built to accept a broad range of power units, customers are free to choose the motor that works best.



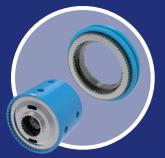
### Spicer<sup>®</sup> Planetary **Steering Axle**

- Unique brake design reduces parasitic power loss
- Precise maneuvering capabilities and ease of use



#### **Spicer<sup>®</sup> Driveshafts**

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



#### **Graziano® Shifting Solutions**

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

#### **Spicer® Planetary Non-Steering Axle**

- Multiple configurations available
- Outboard wet disc brakes for smoother operation



### **Spicer<sup>®</sup> Powershift** Transmission

- Traction continuity and smooth operations in all conditions
- Enables the engine to run at its most efficient speed for better fuel economy



### High-efficiency single-speed

- Ideal for high-performance motors
- Compact and light



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### Spicer<sup>®</sup> Two-Speed Gearbox

- Extremely compact and versatile
- Enhances vehicle mobility
- and precise shifting

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

#### Spicer<sup>®</sup> eSG102

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

# Full-System Solutions for **Telehandlers**

Reliability, durability, and optimal cost of ownership are the common expectations from both rental fleets and individual machine purchasers in the construction market. Dana has the expertise, global reach, and system know-how to support the needs of construction telehandler manufacturers worldwide.



#### **Spicer®** Planetary **Steering Axles**

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



#### **Spicer® Electronic** Controls

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



### **Graziano® Shifting Solutions**

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



#### **Spicer**<sup>®</sup> **Driveshafts**

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



#### TM4<sup>™</sup> e-Pump Motor

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

### 7 TM4<sup>™</sup> LVI430 Low Voltage Inverter

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

### Spicer<sup>®</sup> Hydrodynamic Transmissions

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



### Spicer<sup>®</sup> eSG101

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

Spicer<sup>®</sup> eSG001

High-efficiency single-speed

- Transmissions Allows forward, reverse,
- Delivers high torque at low speeds



- Ideal for high-performance motors Enhances vehicle mobility



#### Spicer<sup>®</sup> eSG102

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

#### Spicer<sup>®</sup> Hydrostatic

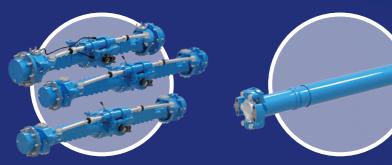
- and braking with hydrostatic motor

#### Spicer<sup>®</sup> HVT

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

# Full-System Solutions for **MEWPs**

Dana designs and manufactures a complete range of best-in-class drive and motion products for mobile elevated work platforms (MEWPs). Our expertise, global reach, and systems know-how support the needs of manufacturers worldwide with dedicated and customized solutions.



#### **Spicer<sup>®</sup> Planetary Axles**

- Rigid and steering planetary axles with a modular design
- Available in a variety of configurations and ratios



#### TM4<sup>™</sup> LVI420 Low Voltage ¶ Inverter

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



### Spicer<sup>®</sup> eSG001

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



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



#### Spicer Torque-Hub<sup>™</sup>

- Torque outputs engineered to fulfill industry targets for performance, serviceability and durability
- Improves machine performance with hybrid and fully electric drive systems
- Fully integrated electro-mechanical system



#### Spicer Torque-Hub<sup>™</sup> **H** Series

- Product range engineered for best-in-class efficiency and reliability
- Low maintenance requirements
  - and easy to service

#### **Brevini<sup>®</sup> Slew Drive P** Series

- Plug and play assembly complete with lifting lugs
- Two-stage reduction with multiple ratios available
- Complete solution with hydraulic orbital motor and valve

### **Brevini<sup>®</sup> Electronic** Sensors

- Flexible and configurable to meet application needs
- Waterproof robust body
- Easy to install



Delivers exceptional maneuverability and proven robustness to final drive



#### Spicer Torque-Hub<sup>™</sup> eS10H

- Available in multiple sizes
- Designed for high-efficiency scissors
- Fully integrated electro-mechanical system



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# Full-System Solutions for Site Dumpers

Dana works with leading OEMs in electric innovation to build the construction equipment of the future today. Our electrified driveline for site dumpers offer improved efficiency, reduced power losses, and lower noise-all in emission, all in a compact and high-performance solution. These machines are able to withstand the toughest working conditions with improved operator comfort and exceptional productivity in any conditions.



#### **Spicer®** Planetary **Non-Steering Axle**

- Available with disk or drum brake
- Multiple configurations available



#### **Spicer® Electronic** Controls

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



### **Graziano® Shifting Solutions**

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



#### **Spicer® Driveshafts**

- Ideal for the rigorous demand of most off-highway applications
- Designed for minimal maintenance, longer life and reduced operating cost



#### TM4<sup>™</sup> LVI430 Low Voltage Inverter

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



#### TM4<sup>™</sup> e-Pump Motor

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



#### Spicer<sup>®</sup> eSG001

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



### Spicer<sup>®</sup> eSG101

- High-efficiency single-speed

- Enhances vehicle mobility



Ideal for high-performance motors



### Spicer<sup>®</sup> eSG102

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

#### Spicer<sup>®</sup> Two-Speed Gearbox

Extremely compact and versatile Enhances vehicle mobility and precise shifting

## Power-dense performance for **Compact Track Loaders**

Suitable for hydraulic and electric vehicles, our Spicer Torque-Hub™ CT Series track drives feature an integral parking brake, soft shift control and optimized drive design.

Assembled using advanced automation technologies with error proofing, each unit receives a quality certificate and will ensure at least 10,000 service hours.

The integrated package, consisting of a two-seed hydraulic motor and a track drive, provides superior torque, maneuverability, and travel speeds.

Engineered for low maintenance requirements, these track drives will keep the cost of ownership to a minimum.

# Full-System Solutions for **Single-Drum Rollers**

Dana designs and manufactures fully integrated drive systems for a range of compactors, including road compactors and waste compactors.

Compactors are used globally across many markets for a variety of purposes, including road and waste compaction. The compactor market is transforming rapidly as machine weight ranges are becoming wider while end users demand increased performance and lower environmental impact. Drum roller designs are becoming increasingly versatile, enhancing operator comfort, productivity, and fuel economy, while accommodating advanced emissions controls and other new systems. Dana has emerged as the market and technology leader, supporting OEMs of all sizes with this application.



# **Spicer® Planetary Rigid Non-Steering Axle**

Designed for small-and medium-sized machines

Enables OEMs to reduce the package size of motors, pumps, and other hydraulic components

#### TM4<sup>™</sup> e-Pump Motor

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

# 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 classleading 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.

