

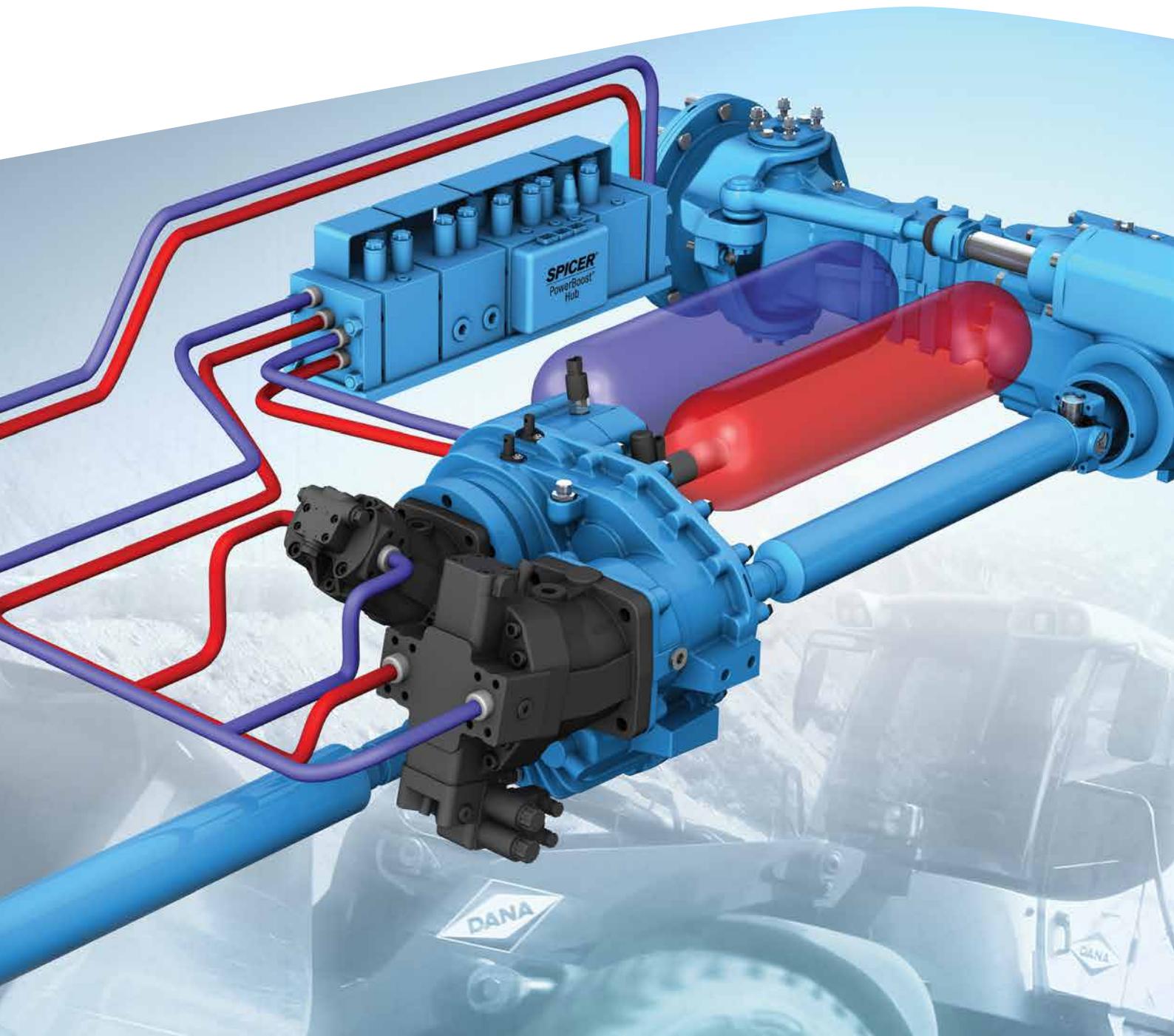
# Spicer® PowerBoost® Hydraulic-Hybrid System

Advancing powertrain technology in agriculture  
and construction vehicles.



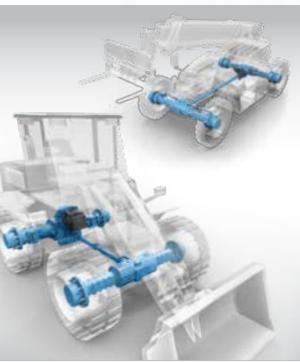
**SPICER®**

PowerBoost® System



The ultimate energy efficiency solution for off-highway machines.





## Move forward with fuel savings of up to 40 percent

Each day, off-highway equipment buyers are searching for technologies that can reduce overall vehicle operating expenses. They'll find this and more with the Spicer® PowerBoost® hydraulic-hybrid system – the ultimate in machine energy efficiency. In making wise use of a vehicle's excess energy, this advanced solution provides lower costs by reducing fuel expenses considerably. PowerBoost captures otherwise wasted energy and puts it to work in the vehicle.

### Capturing Wasted Energy

PowerBoost captures and stores wasted energy from braking and other functions to provide an additional source of hybrid power to supplement the diesel engine. Advanced system controls ensure that the engine and hybrid system work in tandem to operate at optimum efficiency while also providing additional power on demand for working tasks.

### Operating modes include:



#### Dynamic Eco Mode

- Optimizes balance of engine and hydraulic power
- Engine operates at most efficient speed
- Fuel savings of up to 40%
- Reduced emissions
- Lower noise and vibration
- Improved driver comfort

#### Power Mode

- Engine and PowerBoost system work in tandem for maximum power
- Machine peak-power increased by minimum of 25 kW
- Enhanced acceleration performance
- Maximum power for working tasks

#### Regenerative Braking Mode

- Braking energy recaptured by PowerBoost system
- Fuel savings
- Reduced emissions

#### Zero Emissions Mode

- Machine operates on hydraulic energy from PowerBoost system only
- Zero emissions
- Fuel savings
- Reduced noise and vibration
- Engine horometer stops

#### Stop/Start Mode

- Engine shuts down automatically under extended idling
- Restarts instantly on driver demand
- Eliminates fuel consumption and emissions while machine otherwise would be idling
- Engine horometer stops

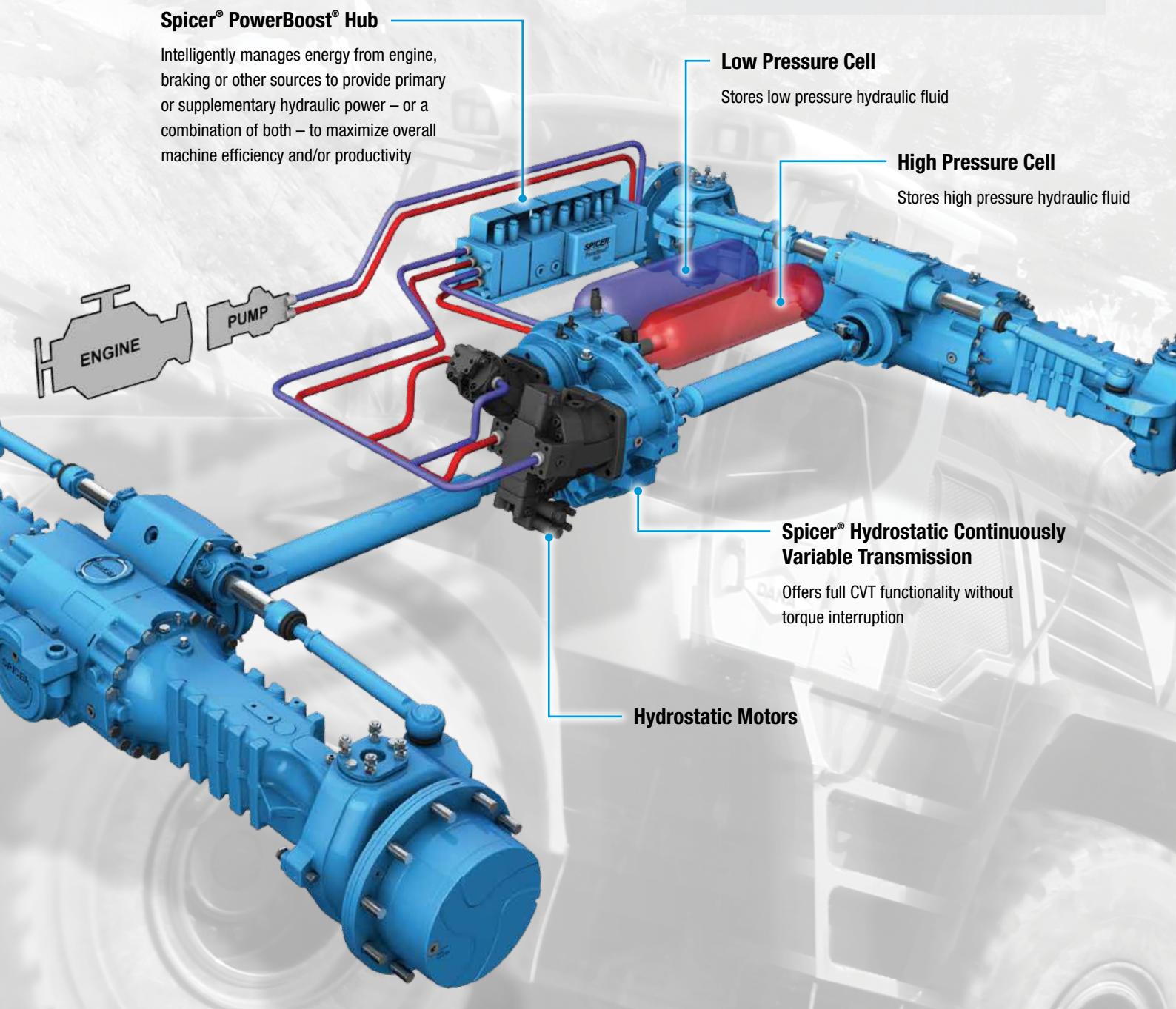
Up to  
**40% FUEL SAVINGS\***

**REDUCES Total Cost of Ownership**

\*Compared to conventional transmission technology



# The ultimate in machine energy efficiency



PowerBoost uses its pressure cells to capture wasted energy, which is used to power the vehicle.

## Spicer® PowerBoost® Hub

Intelligently manages energy from engine, braking or other sources to provide primary or supplementary hydraulic power – or a combination of both – to maximize overall machine efficiency and/or productivity

## Low Pressure Cell

Stores low pressure hydraulic fluid

## High Pressure Cell

Stores high pressure hydraulic fluid

## Spicer® Hydrostatic Continuously Variable Transmission

Offers full CVT functionality without torque interruption

## Hydrostatic Motors



## Experience Spicer® PowerBoost®

The full benefits of PowerBoost can be experienced with a live demonstration of the technology on both telehandler and wheel-loader applications. Please contact a Dana representative for more details and to arrange an appointment.



## SPICER®

*Drivetrain Systems*

Axles

Driveshafts

Transmissions

## VICTOR REINZ®

*Sealing Products*

Gaskets and Seals

Cylinder-Head Cover Modules

Thermal-Acoustical Protective Shielding

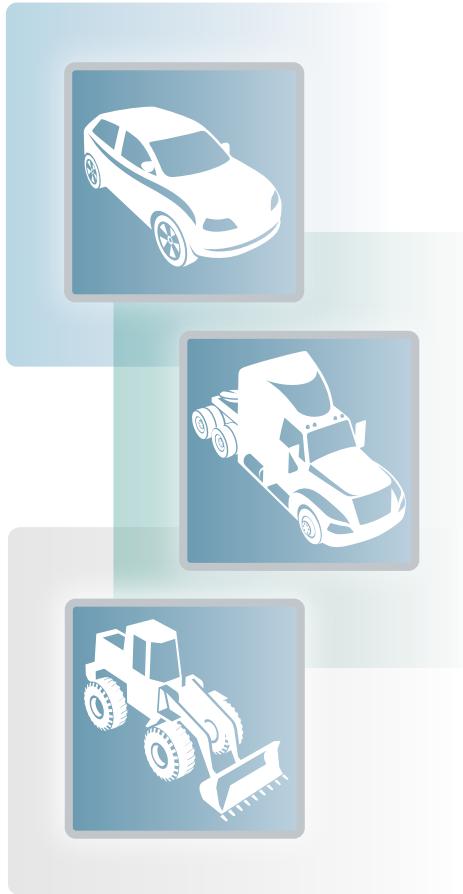
## LONG®

*Thermal Products*

Transmission Oil Coolers

Engine Oil Coolers

Battery Coolers



## About Dana Holding Corporation

Dana is an integral partner for virtually every major vehicle and engine manufacturer worldwide. We are a leading supplier of drivetrain, sealing, and thermal technologies to the global automotive, commercial-vehicle, and off-highway markets. Founded in 1904, we employ thousands of people across six continents.

## About Dana Off-Highway Driveline Technologies

Dana delivers fully optimized Spicer drivetrain systems and individual product solutions to customers in construction, agriculture, material-handling, underground-mining, and forestry markets, bringing global expertise to the local level with technologies customized to individual requirements through a network of strategically located technical centers, manufacturing locations, and distribution facilities.

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Italy



## SPICER®

*PowerBoost® System*

### 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.