



Dana Enables Telehandlers to Perform Work Functions up to Three Times Faster through Spicer® PowerBoost® Hydraulic-Hybrid Powertrain Technology

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MUNICH, April 11, 2016 /PRNewswire/ -- Dana Holding Corporation (NYSE: DAN) today announced enhancements to its Spicer® PowerBoost® hydraulic-hybrid powertrain technology that further increase the performance, productivity, and fuel economy of telehandlers and other off-highway vehicles.

Customized configurations of Spicer PowerBoost technology now enable vehicles to supply up to 20 percent more hydraulic power to the work circuits and perform work functions up to three times faster than vehicles that are not equipped with this advanced hydraulic-hybrid technology. These improvements can further enhance overall productivity by up to 10 percent and generate additional fuel savings of up to 5 percent over and above the substantial efficiency gains previously demonstrated by Spicer PowerBoost technology.

Ultimately, Spicer PowerBoost technology can enable fuel savings of up to 45 percent, depending on the application and duty cycle.

Dana engineers confirmed these work-circuit performance gains through recent field tests on a telehandler with a 7-meter (23-foot) boom and a 2.8-tonne (6,200-pound) lift capacity powered by an 83 kW (111 hp) engine. This new functionality can also be implemented on wheel loaders, lift trucks, and other construction, material-handling, and on-highway vocational vehicles that perform lifting or digging operations.

"For off-highway machine owners and operators, increased productivity is key to the success of their businesses, and vehicles that can perform faster in a reliable and safe way will significantly improve their profitability," said Aziz Aghili, president of Dana Off-Highway Driveline Technologies. "This latest enhancement to Spicer PowerBoost technology enables a much higher level of vehicle performance without increasing the size of the engine or the capacity of hydraulic pumps."

Field-Proven Performance

In November, Dana and Manitou Group revealed the results of tests in the companies' development of the Manitou MLT960 Eco-Booster 6-tonne telehandler machine equipped with Dana's Spicer PowerBoost hydraulic-hybrid powertrain technology.

Extensive performance analyses of Spicer PowerBoost technology on the MLT960 Eco-Booster hybrid telehandler indicate a reduced fuel consumption averaging 15 percent across a range of duty cycles when compared with the standard MLT960 configuration.

Flexible Operating Modes

Ideally suited for hydrostatically-driven drivetrains, Spicer PowerBoost technology uses an advanced energy-management system to evaluate the levels of power needed in the entire vehicle and distribute energy captured in the drivetrain, resulting in reduced fuel consumption and improved productivity. It features a modular design engineered to leverage hybrid power for several operating modes, including:

- Dynamic Eco Mode – Enables the vehicle to achieve maximum fuel efficiency in normal operating cycles;
- Power Mode – Provides enhanced vehicle acceleration and working performance in operations requiring maximum power;
- Regenerative Braking Mode – Captures and stores energy otherwise wasted during vehicle braking;
- Stop/Start Mode – Shuts down the engine during prolonged idle conditions and then restarts instantly at the operator's command; and
- Zero Emission Mode – Operates the vehicle exclusively from stored energy captured by the Spicer PowerBoost system.

Spicer PowerBoost technology can reduce total ownership and operating costs by increasing productivity, reducing maintenance, and allowing for the use of a downsized engine. It can also enhance vehicle resale value by using stop/start mode to reduce the overall operating hours of the engine over the life of the vehicle.

Spicer PowerBoost solutions are ideal for applications with frequent, intense bursts of acceleration, deceleration, lifting, and lowering during cyclic maneuvering that support the recuperation of braking energy. Construction and agricultural equipment, material-handling machines, and on-highway vocational vehicles are the optimal targets for the Spicer PowerBoost system.

Dana has supported the development of the Spicer PowerBoost system over the past five years at the company's advanced technology centers in Belgium, Italy, and the United States. Dana has 20 approved and pending patents from development activities for Spicer PowerBoost technology.

Spicer PowerBoost technology, including the faster work-cycle capability is now available for pre-production testing by machine manufacturers.

Dana's wide range of advanced drivetrain technology concepts, including the upgraded Spicer PowerBoost system, will be showcased at Bauma 2016 in hall A4, stand 326. To learn more, visit www.dana.com/offhighway.

About Dana Holding Corporation

Dana is a world leader in the supply of highly engineered drivetrain, sealing, and thermal-management technologies that improve the efficiency and performance of vehicles with both conventional and alternative-energy powertrains. Serving three primary markets – passenger vehicle, commercial truck, and off-highway equipment – Dana provides the world's original-equipment manufacturers and the aftermarket with local product and service support through a network of nearly 100 engineering, manufacturing, and distribution facilities. Founded in 1904 and based in Maumee, Ohio, the company employs more than 23,000 people in 25 countries on six continents. In 2015, Dana generated sales of nearly \$6.1 billion. For more information, please visit dana.com.

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