



## **Dana Advances Development of VariGlide™ Continuously Variable Planetary Technology**

May 19, 2014

HANOVER, Germany, May 19, 2014 /PRNewswire/ -- Dana Holding Corporation (NYSE: DAN) today announced new milestones in the development of VariGlide™ technology, a revolutionary new transmission design that incorporates continuously variable planetary (CVP) technology. This patented, planetary traction drive will be integrated into a variety of power paths to optimize the transmission assembly, significantly reducing fuel consumption and maximizing performance.

Developed through a strategic licensing relationship with Fallbrook Technologies Inc., this product can replace the torque converter in some transmission configurations to decouple engine speed from the vehicle's travel or working speed. Ideal for the rapid acceleration, deceleration, and precise positioning required by material-handling applications, it also eliminates the need for forward and reverse clutches while reducing overall engine speeds, allowing the engine to operate at its optimum efficiency level and reduce noise levels.

Numerous powersplit power path concepts for forklift truck applications have been analyzed, and initial simulations show projected fuel savings of up to 20 percent for a standard-sized forklift truck operating in a typical pick-and-place duty cycle. Dana is currently upfitting a 2.2-tonne forklift truck with VariGlide technology for functional evaluation.

VariGlide technology will be offered as a pre-assembled module providing a standard powersplit configuration for forklift truck transmissions produced by original-equipment manufacturers. Dana will also implement VariGlide technology in a premium configuration optimized to supply further fuel efficiency and productivity gains in select Spicer® powershift transmissions.

"Dana devotes considerable resources to advanced engineering to produce breakthroughs in fuel efficiency and productivity," said Aziz Aghili, president of Dana Off-Highway Driveline Technologies. "The momentum behind our VariGlide technology program shows how Dana is accelerating the development of innovations that can offer substantial gains with minimal changes to existing equipment designs."

"We are delighted to be working with Dana toward successfully commercializing the Fallbrook technology licensed in the VariGlide CVP for the material-handling market," said William G. Klehm III, chairman and CEO of Fallbrook. "The product has significant advantages that we believe will assist users in meeting future operating cost, vehicle performance, and legislative goals."

VariGlide technology is ideally suited to optimize the productivity of 1.5- to 3-tonne forklift trucks, which account for about 80 percent of the global material-handling equipment market today.

It provides unparalleled power-path flexibility through a unique variator design configuration. A set of spinning planets is fitted between an input disc driven by the engine and an output disc that transfers power from the variator to downstream transmission components. As power enters the input disc, the planets tilt on their axes and change ratios, depending on engine demands and controller input.

To efficiently transfer torque, a thin layer of traction fluid flows between the planets. When compressed, this traction fluid becomes momentarily rigid, allowing the torque to transfer between the planets and discs without slipping. With numerous power paths and no abrupt ratio changes, VariGlide technology provides an infinite number of gear ratios for improved shifting, driver comfort, durability, scalability, and efficiency when compared to conventional CVTs.

The CVP technology used by VariGlide has undergone more than 70,000 hours of durability testing, and leverages more than 600 U.S. and international patents and patent applications. In addition to forklift trucks, it is optimal for compact front-end loaders, skid steer loaders, and compact utility tractors.

Dana will showcase VariGlide technology at CeMAT this week in hall 25, stand G29. For more information about Dana's drivetrain solutions for the material-handling market, visit [www.dana.com/offhighway](http://www.dana.com/offhighway).

### **About Dana Holding Corporation**

Dana is a global leader in the supply of highly engineered driveline, 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 vehicles, commercial trucks, 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, Dana employs 23,000 people in 26 countries on six continents. In 2013, Dana generated sales of \$6.8 billion. For more information, please visit [dana.com](http://dana.com).

### **About Fallbrook Technologies**

Fallbrook Technologies is the developer of the patented NuVinci® continuously variable planetary (CVP) technology, which can improve the performance and efficiency of machines that use a transmission, including bicycles, electric vehicles, automobiles, off-highway vehicles, stationary equipment, wind turbines and others. Fallbrook has built an extensive portfolio of over 600 patents and patent applications worldwide. For more information, visit [www.fallbrooktech.com](http://www.fallbrooktech.com).

SOURCE Dana Holding Corporation

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