



PRESS RELEASE

Westport Fuel Systems Unveils Hydrogen HPDI Fuel System for Internal Combustion Engines for Heavy-Duty Truck Applications

May 3, 2022

VANCOUVER, British Columbia, May 3, 2022 -- Westport Fuel Systems Inc. (TSX:WPRT / Nasdaq:WPRT) a global leader in alternative fuel, low-emissions transportation technologies today revealed their H₂ HPDI fuel system in a demonstrator truck. Westport's HPDI™ fuel system technology enables heavy-duty trucks to operate on bio-methane (renewable natural gas) and natural gas with the same power, torque, efficiency, and performance as diesel engines, and with even better results running on hydrogen, all while meeting global emissions regulations.

The H₂ HPDI fuel system is in a fully functional demonstrator vehicle, to show the ease with which a commercially available, production LNG HPDI system can operate on a zero-carbon fuel like green hydrogen. The H₂ HPDI fuel system offers a cost-effective solution with a zero-carbon solution, that delivers, tank to tailpipe, up to 98% CO₂ reduction over diesel, and allows manufacturers to leverage their investment in vehicle drivetrain design, supply chain and manufacturing by continuing to plan around low carbon hydrogen internal combustion engines. The H₂ HPDI demonstrator truck will be on display at the 2022 ACT Expo in Long Beach, California, May 9-12, 2022.

H₂ HPDI Engine Specifications:

- Power & torque: 20% higher power and torque than the base diesel engine
- Efficiency: 5 to 10% better thermal efficiency than the base diesel engine
- Turbocharged 13 liter, in-line six-cylinder engine
- Fuel: Hydrogen, with pilot ignition
- Four-cycle, compression ignition, direct injection

H₂ HPDI

"We believe H₂ HPDI is compelling, with near-zero greenhouse gas emissions at a lower cost than fuel cell vehicles or battery electric vehicles, particularly for heavy-duty, long-haul trucking," said David Johnson, CEO, Westport Fuel Systems. "We have developed the engine to utilize the capability of HPDI to deliver what is needed today in the marketplace, using hydrogen in place of natural gas, with development work happening at Westport Fuel Systems facilities, and through previously announced programs with AVL/TUPY, and Scania. And we expect new H₂ HPDI programs with other partners to come soon."

The HPDI fuel system technology uses compression ignition combustion with the overwhelming majority of the energy derived from the combustion of, typically, a gaseous fuel. Combustion is initiated via late cycle direct injection of a small quantity of pilot fuel, followed by direct injection of the primary gaseous fuel; both fuels are injected via a proprietary dual concentric needle injector design. By utilizing Diesel-Cycle thermodynamics, the HPDI fuel system retains the thermal efficiency, power, torque, and engine braking of the base diesel internal combustion engine.

"HPDI has long been established as matching diesel engine performance, and efficiency, and now we have demonstrated power, torque, and efficiency significantly exceeding that of the diesel base engine by migrating from Natural Gas HPDI to H₂ HPDI," said Scott Baker, vice president of Engineering, Westport Fuel Systems. "The advantage of HPDI combustion is that it retains the high compression ratio of the base diesel engine and does not suffer from engine knocking as the H₂ is injected towards the end of the compression stroke just after pilot ignition and combustion begins."

Opportunity For HPDI

The HPDI Fuel System technology has seen growth in global markets as OEMs and operators are looking for ways to meet environmental regulations without sacrificing their power density and range. There are thousands of HPDI trucks on the road today, growth of HPDI sales in Europe have averaged over 100% per year over the last three years, and other markets around the globe are taking notice as well. Moreover, many of these European trucks are running on significant blends of biogas or renewables natural gas. This represents a deep reduction in carbon emissions as a result of the commercial maturity and availability of the HPDI technology today.

"Hydrogen is a promising next step for carbon neutral heavy-duty transportation applications, as a hydrogen fueled internal combustion engine enables carbon neutral transportation utilizing existing base engine technology, like our proven LNG HPDI fuel system

technology,” said Anders Johansson, vice president Heavy-Duty OEM, Westport Fuel Systems. “With the H₂ HPDI fuel system we have the opportunity to make a significant positive impact on the global transportation market.”

About Westport Fuel Systems

Westport Fuel Systems is driving innovation to power a cleaner tomorrow. The company is a leading supplier of advanced fuel delivery components and systems for clean, low-carbon fuels such as natural gas, renewable natural gas, propane, and hydrogen to the global automotive industry. Westport’s technology delivers the performance and fuel efficiency required by transportation applications and the environmental benefits that address climate change and urban air quality challenges. Headquartered in Vancouver, Canada, with operations in Europe, Asia, North America and South America, the company serves customers in more than 70 countries with leading global transportation brands. For more information, visit www.wfsinc.com.

Source: Westport Fuel Systems Inc.