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Contact: Bridgette LaRose Gollinger
DENSO International America, Inc.
(248) 372-8266
bridgette_gollinger@denso-diam.com

DENSO Offers Direct Fuel Savings with Gasoline Direct Injection *—DENSO's First North American Gasoline Direct Injection Application—*

DENSO's first North American gasoline direct injection (GDI) system will hit U.S. roads later this year on Ford's 2.0 liter Focus and 3.5 liter F-150 engines. The system can support customers to achieve up to 20 percent improvement in fuel economy while also helping reduce CO₂ emissions of up to 15 percent compared to larger displacement engines.

"DENSO first mass produced GDI components in 1996, and we're now starting production of our third generation of GDI technology," said Doug Patton, senior vice president of Engineering at DENSO International America, Inc. "This latest generation technology is geared to deliver more power and lower emissions while being more compact. Its reliability and flexibility allows it to be used in markets around the world."

DENSO's GDI Technology

DENSO produces the high-pressure fuel pump, high-pressure injector and pressure sensor.

High-Pressure Pump

DENSO has created the de facto standard for GDI pumps with a single plunger, cam-driven, demand-controlled pump technology. The pump plunger is driven by either the exhaust or intake cam on the engine. Its output is metered by controlling the pre-stroke of the pump – a solenoid controlled valve is actuated to precisely control the amount of fuel delivered. The fundamental operation concept has remained unchanged since its inception in the late 1990s.

DENSO's third generation high-pressure fuel pump is more compact by approximately 10 percent than leading competitors' products. A larger plunger diameter and advanced manufacturing capability enable tight tolerancing and improved efficiency to cover higher demand applications and improve fuel economy. The plunger has a proprietary coating for durability and the pump is capable of handling alternative fuels and can be used in different markets worldwide.

High-Pressure Fuel Injectors

DENSO's high-pressure fuel injectors allow for more precise controlling of combustion and emissions. A solenoid-controlled injector with a multi-hole nozzle creates finely atomized fuel for better mixing and combustion performance, which yields more power and lower emissions. The configuration – the number of holes and the spray pattern – are developed uniquely for each application depending on the customers' engine performance targets. A deposit-resistant nozzle design resists performance deterioration due to combustion residue deposits. The injector also has very low seat leakage which helps reduce hydrocarbon emissions.

Pressure Sensors

The sensor provides accurate pressure feedback to the engine controller to allow precise control over fuel metering for optimum engine performance.

The company first began production of GDI components in 1996. Currently, DENSO is working with other customers around the world to help make engines more efficient with GDI technology.