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Sauer-Danfoss Launches SIL 2 Certified Automotive Control

New Automotive Control solution provides consistent and reliable vehicle performance, with improvements in efficiency, productivity and operator comfort.

NORDBORG, Denmark, March 1, 2010 – Sauer-Danfoss Inc. (NYSE:SHS)

Sauer-Danfoss' new Automotive Control (AC) solution offers OEMs a complete SIL 2 (Safety Integrity Level 2 according to IEC 61508) certified transmission system that significantly reduces OEM vehicle development, qualification expenses and new product time to market. The PLUS+1™ Compliant system incorporates an H1 variable piston pump with embedded electronic control, H1 bent axis variable piston motor, sensors and associated Human Machine Interface (HMI) devices. Combined with intelligent software, AC provides an automotive style automatic transmission driving experience that allows operators to adjust hydrostatic transmission characteristics to suit specific operating requirements. Combining state-of-the-art H1 technology and 25 years of electronic automotive control development, AC not only helps increase vehicle performance and overall efficiency, but also provides improvements in productivity and comfort.

Functional Safety and Easy Installation

The H1 embedded controller (H1 AC), features robust electronics mounted directly on the H1 pump. All electrical connections are conveniently located for easy OEM vehicle installation and complete semi-automatic sensor calibration for PLUS+1 Compliant drive and inching foot pedals, for example. The embedded controller also features additional “watch dog” circuitry, which provides real time fault monitoring of the electronic hardware. Combined with optional software to monitor redundant HMI input channels, H1 AC provides single fault tolerance for AC vehicle transmission systems, SIL 2 certified by TÜV (Technischer Überwachungsverein). This helps vehicle manufacturers meet European Machinery Directive 2006/42/EC and related safety standard (ISO 13849-1:2006), and also reduces OEM cost and time required for system qualification and vehicle certification.

“Our H1 Automotive Control is the first solution on the market to offer the precision and consistent performance of intelligent electronics, combined with complete drive system functionality, system qualification and SIL 2 certification.” said Joseph P. Maher, System Portfolio Manager. “OEMs will be able to reduce time to market for new vehicles and model variants while still customizing vehicle behavior and providing differentiation for their products.”

The H1 AC software is easily configured to OEM requirements, and is also designed to SIL 2 IEC 61508 standard. Features include engine anti-stall and protection against engine over-speed, extreme high and low hydraulic oil temperature conditions, and hydraulic motor over-speed. In addition, variations in hydraulic oil viscosity affecting control performance are compensated for automatically. The result is consistent, predictable vehicle performance irrespective of operating temperature.

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Complete Vehicle Propel Functionality and Customization

The H1 AC is customizable via the PLUS+1 Service Tool between four operator selectable system modes that can be programmed according to three main propel methods or mode types.

Automotive Mode:

Hydrostatic pump and motor displacement are controlled automatically according to an OEM configured automotive curve as a function of engine rpm. Typically used for vehicle transport or to provide engine anti-stall functionality during heavy load conditions common on wheel loaders, telehandlers, or site dumpers.

Non-automotive Mode:

Hydrostatic pump displacement is controlled directly through a foot pedal or joystick input from the operator and is independent of engine rpm. Typically used during vehicle work requiring a specific engine speed setting for work functions common on sweepers, snow blowers, or mowers.

Creep-automotive Mode:

The creep-automotive mode provides pump control via an algorithm that combines both the engine rpm and the foot pedal or joystick inputs.

Additional benefits include the ability to further customize hydraulic pump and motor displacement control profile and ramp times, provide constant speed drive functionality, interface to vehicle systems via CAN, and easy-to-use diagnostics.

Using the PLUS+1 Service Tool AC software service screens, the OEM can configure up to 4 different operator-selectable system modes with varying vehicle drive behaviors to meet a variety of application requirements. The system modes are selected through switch settings on the vehicle, and allow OEMs to configure working and driving modes, tailor driving behavior to suit specific working conditions or even the skill levels of operators. This enables the OEM to use the same hardware for a range of vehicles with different software settings, significantly improving vehicle manufacturing flexibility. The software set-up service screens provide OEMs with a step reduction in both development time and expense for highly differentiated new vehicle designs.

About Sauer-Danfoss

Sauer-Danfoss Inc. is a worldwide leader in the design, manufacture, and sale of engineered hydraulic, electric and electronic systems and components for use primarily in applications of mobile equipment. Sauer-Danfoss, with 2009 revenues of approximately \$1.2 billion, has sales, manufacturing, and engineering capabilities in Europe, the Americas, and the Asia-Pacific region.

More details online at www.sauer-danfoss.com/acolutions

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PHOTO CAPTION: Sauer-Danfoss' new Automotive Control solution offers OEMs a complete SIL 2 (Safety Integrity Level 2), certified transmission system.

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SYSTEM CAPTION: The PLUS+1™ Compliant system incorporates an H1 variable piston pump with embedded electronic control, H1 bent axis variable piston motor, sensors and associated Human Machine Interface (HMI) devices.

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[PLUS+1™ Compliant – PLUS+1™ Compliance ties our advanced mobile control technology together – ensuring all our electrohydraulic products integrate seamlessly in the customized control system developed using PLUS+1 GUIDE.]

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