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SAUER-DANFOSS INTRODUCES THE NEXT GENERATION OF HYDRAULIC SYSTEM SOLUTIONS FOR MOBILE MACHINERY

Integrated machine management one step further, with H1 hydrostatics, PVG 100 electronically actuated valves and PLUS 1™ electronic control network

AMES, IOWA, USA – Sauer-Danfoss Inc. (NYSE: SHS; FSE: SAR) Necessity has been the mother of invention as engine manufacturers and mobile machinery OEMs have sought to meet increasingly strict engine emission requirements in the United States. The well-known "Tiers" driving current engine and machine development have extended their influence to hydraulic systems manufacturing and, thus, implementation of work and propel functions.

Kells Hall, Vice President, Sales and Marketing - Americas, Sauer-Danfoss states, "The Clean Air Act Amendments impact not only engines, but also create the need for more efficient transmissions and related components - often to compensate for reductions in engine horsepower. While the requirements have come from the U.S. EPA, the implications are global. We try to anticipate the needs of mobile machine manufacturers, with more efficient transmissions and machine management solutions. And that's precisely what our new generation of systems solutions is all about."

Maximizing the hydraulic system efficiency of mobile machinery and adding value to machine performance were the driving factors in the development of three new Sauer-Danfoss products. The new generation of H1 servo controlled hydrostatic pumps, PVG 100 electrohydraulic proportional valves and the PLUS 1™ electronic communications network bring a new dimension of connectivity and performance to the marketplace.

"The future of hydraulics is system integration and more efficient machine performance," said Hall. "Our new hydrostats and valves are optimized around electronic control, resulting in a multitude of

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benefits for the manufacturer who wants to get to market faster, improve overall efficiency and control installed costs as they relate to the service life of the vehicle. In addition, it benefits the operators, who want reliable, customizable control for their machines."

The H1 family - the new generation of hydrostatics

The H1 family brings intelligent incorporation of the propulsion drive into the machine management architecture and expands the functionality of the entire vehicle. All H1 products are compatible with PLUS 1™ microcontrollers. The H1 pumps feature common design technologies and assembly techniques. Overall, they offer simpler, high performance designs with fewer parts than previous hydrostatic products. Significant performance benefits include improved pump efficiency, which reduces unit power losses, even reduced noise levels. These performance factors help reduce operating costs of machinery, as well.

Engineered for exceptional reliability and durability, H1 is suited for medium and high power mobile markets to even the most complex applications with high productivity demands. A sampling of appropriate industries includes: construction, agriculture, materials handling, forestry and turf care. Fewer parts and fewer linkages in controls and pumps promote longer operational life and greater ease in design, assembly and maintenance of machinery.

The initial product release is a single pump configuration with displacements of 147 cc/rev and 165 cc/rev. Additional releases in mid-2005 will include: 78 cc/rev, 45 cc/rev and 53 cc/rev. The 45 cc and 53 cc will be available in both single and tandem pump configurations. Other displacements will follow. The H1 pump family is designed for smaller package sizes with a significant reduction in the length of the units, giving design engineers more freedom and flexibility in design. Most H1 pumps will be available with a selection of optional electronic sensors offering the capability to track speed, temperature, angle and pressure.

"By meeting engine emission requirements, effective engine horsepower ratings are often diminished," said Randy Rodgers, Hydrostatic Product Portfolio Manager at Sauer-Danfoss. "By making hydraulic components more efficient, such as reducing unit power loss in pumps, we are in effect, restoring some machine efficiency and in many cases, improving overall performance by maximizing the transmission performance without compromising somewhere else."

PVG 100 valves - for optimization and customization

Designed as a smart valve, PVG 100 electronically interfaces with mobile machinery. Well suited for open circuit applications that require maximum control, Sauer-Danfoss technology offers exceptional performance. As a load independent proportional valve, it provides equitable flow under all load and supply conditions, with post-compensated flow-sharing technology. PLUS 1™ compatible, the PVG 100 valves enable OEM engineers to design vehicles with optimized flow and power without sacrificing productivity while minimizing energy consumption.

Positioned between the Sauer-Danfoss PVG 32 and PVG 120, the PVG 100 provides a needed addition to the family of compensated valves to ensure smooth machine control and reliability across a wide flow range. Due to PVG load sensing, wear and tear on other components is reduced. Because PVG 100 is modular and shares commonality with other PVG family products, design engineers can easily configure valve groups for most requirements. Effective working pressures for PVG 100 are up to 350 bar (5076 psi); compensated flow to 180 lpm (48 gpm) with return flows up to 360 lpm (95 gpm).

Sauer-Danfoss' Ian MacLeod, Product Portfolio Manager, Valves, added, "Integrated valves can also contribute to overall mobile machine efficiency and capability. Providing flow-sharing capability and commonality of components across the PVG family in a flexible package allows the manufacturer to meet vehicle system requirements while achieving time-to-market deadlines."

PLUS 1™ - customizing control for mobile machinery

Introduced at Bauma in March 2004, PLUS 1™ provides connectivity to make intelligent control of work and propel functions a viable option for OEMs. Using DSP technology and CAN communication, PLUS 1™ enables both OEMs and end users to easily customize mobile machinery control.

The foundation of PLUS 1™ is a line of rugged, reliable microcontroller and input/output modules - along with PLUS 1™ compatible joysticks and graphical terminals. Both hardware and software are designed to make configuration and expansion easy.

Dan Ricklefs, Product Portfolio Manager, Mobile Electronics, Sauer-Danfoss, comments, "PLUS 1™ has been well received in the marketplace and because it provides the enabling technology for connectivity in a machine, we're able to help achieve better machinery management with greater functionality and value."

Innovation provides enhanced vehicle integration

"Taken together, Sauer-Danfoss innovative products are providing enhanced integration into vehicle architecture. They offer machine designers more options, such as the ability to have a machine switch from low noise operating mode to a higher productivity mode," said Hall. "Our approach to hydraulics system solutions is also a definite positive factor in compensating for challenges machine designers face with engine horsepower loss. We're always working to improve machine performance and extend its service life at the same time. For OEMs, the design cycles and implementation are faster. End users benefit from easier diagnostics and machine servicing. We want it to be 'win-win' for everybody - and continuing to connect people with better performing machines will always be our sole focus."

