

Kohler Engines Introduces Hydrogen Technology with New KDH Engine

Hanover, Germany | November 13th, 2023 – Kohler Engines unveils its new Kohler Direct Injection Hydrogen (KDH) engine, an internal combustion engine running on hydrogen, at the 2023 Agritechnica tradeshow. This move aligns seamlessly with Kohler Engines' ongoing commitment to develop cutting-edge technologies with reduced environmental impact as well as the evolving landscape of the engine industry, which is increasingly driven by the imperative of decarbonization and finding viable alternative solutions.

The new pioneering hydrogen engine technology is being applied for the first time to the KDI 2504 TCR derivative engine, which takes advantage of conventional combustion engine architecture but replaces diesel with hydrogen. This new engine solution maintains the same in-machine installation, dimensions, PTOs and performance as conventional diesel engines, while using a zero-carbon solution.

Kohler Engines is investing in a range of innovative technologies to enhance energy efficiency, meticulously tailored to meet diverse machinery requirements. Among these solutions, hydrogen has emerged as a versatile, green energy fuel with rapidly evolving technology. Renowned for its wide flammability range, high flame speed, low ignition energy, and high diffusivity, hydrogen holds promise as a cleaner alternate fuel for internal combustion engines.

The choice of direct injection (DI) technology, as opposed to port fuel injection (PFI), allows to preserve diesel performance, including transient response, by avoiding the backfire problem. The design aims to provide the same performance as the original diesel engine, such as max power, peak and low-end torque, as well as transient response and drivability, to ensure and maximize productivity of the equipment.

Hydrogen plays a pivotal role in emissions and GHG reduction due to its capacity to provide clean and highly efficient energy. The most outstanding feature of hydrogen as a fuel is its inherent ability to produce energy through combustion without generating carbon dioxide (CO₂). This means that hydrogen as a fuel allows to zero-out the carbon footprint of internal combustion engines.

The combustion of a hydrogen engine is cleaner than a standard diesel engine. Moreover, when an aftertreatment system (ATS) is applied to a hydrogen internal combustion engine, the environmental benefits of using hydrogen are further amplified. Indeed, the addition of the ATS results in a reduction of exhaust emissions to extremely low values, thus making the engine near zero-emission according to the most recent agencies' definitions. The ATS reduces particulate matter (PM), nitrogen oxides (NOx) and hydrocarbons (HC) to negligible levels at tail pipe. As a result, this dual approach not only complies with emission standards, but also underscores the commitment to cleaner air quality.

Notably, the hydrogen internal combustion engine is designed to be a drop-in solution, making it potentially adaptable to a wide range of equipment applications.

Kohler Engine's commitment to providing a convenient solution for OEMs is evident in the fact that no major changes to the engine compartment will be required, as this solution fits the current size of KOHLER compact diesel engines: the KDH hydrogen engine has the same engine envelope as the KDI diesel engine. The engine platform of the machine will keep the same cooling circuit, power take-off and flywheel, engine mounting points, and intake line; in addition, the exhaust line does not need ATS in Stage 5. Therefore, OEMs can expect compatibility with existing machine platforms.

Kohler Engines remains aligned with OEMs' development programs, ensuring that the hydrogen engine production schedule aligns with industry demands. Kohler Engines also offers support to customers in conducting proof-of-concept evaluations, addressing any challenges that may arise, and identifying mitigations.

Kohler Engines is committed to pioneering sustainable solutions in the engine industry. The transition from conventional fossil fuels to hydrogen not only significantly reduces carbon emissions but also enhances overall energy efficiency, aligning with Kohler's broader "Believing in Better" goals.

"We look forward to unveiling this evolving technology and working closely with our partners to drive innovation, sustainability and decarbonization in the industry," says Vincenzo Perrone, President of Kohler Engines.

About Kohler Engines

Kohler has been manufacturing engines for more than a century and has continued to grow its product portfolio ever since its inception to increasingly bring ease and convenience to the lives of end users worldwide. The company offers a comprehensive range of diesel, petrol and gas engines up to 140 hp of power – adopted globally by machine and equipment manufacturers in the most important sectors of industry (construction, earth-moving, agriculture, generators and gardening). For more details, please visit kohlerengines.com.

About Kohler Energy

Kohler Energy, a global leader in energy resilience solutions, brings bold design and powerful impact to the energy systems that sustain people and communities everywhere around the world. It is an integral part of Kohler Co., with solutions across Home Energy, Industrial Power Systems, and Powertrain Technologies. Leveraging the strength of its portfolio of brands – Power Systems, Home Generators, Kohler Uninterruptible Power, Clarke Energy, Heila Technologies, Curtis Instruments, and Engines. With more than a century of industry leadership, Kohler Energy builds resilience and goes beyond functional, individual recovery to create better lives and communities. For more details, please visit kohler.com/energy.

About Kohler Co.

For 150 years, Kohler Co. has been a global leader in design and innovation, dedicated to providing gracious living through kitchen and bath products; luxury cabinetry, tile and lighting; distributed energy solutions – home energy, industrial power systems, and powertrain technologies – and luxury hospitality experiences and major championship golf. Privately held Kohler Co. was founded in 1873 and is headquartered in Kohler, Wisconsin. The company also develops solutions to address pressing issues, such as clean water and sanitation, for underserved communities around the world to enhance the quality of life for current and future generations.

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