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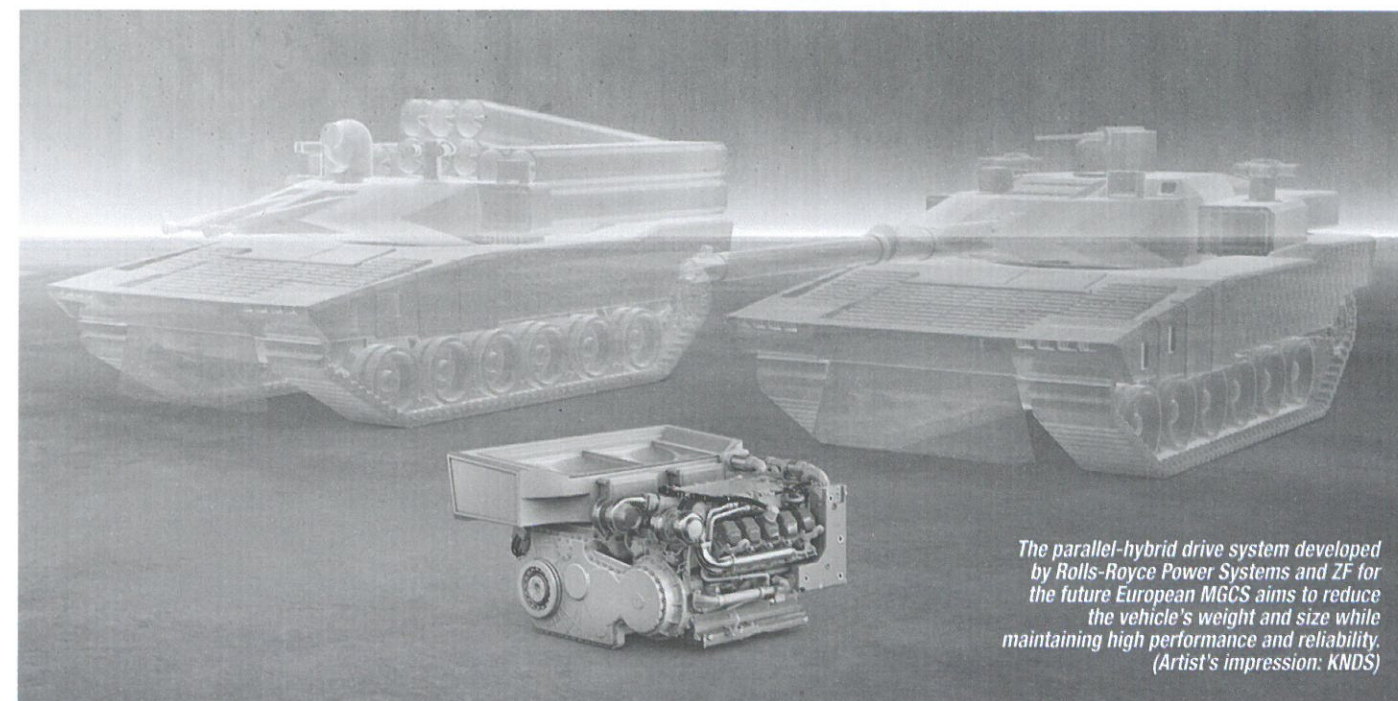
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Rolls-Royce and ZF Develop Drive System for MGCS



The parallel-hybrid drive system developed by Rolls-Royce Power Systems and ZF for the future European MGCS aims to reduce the vehicle's weight and size while maintaining high performance and reliability. (Artist's impression: KNDS)

The German Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) has commissioned Rolls-Royce Power Systems to develop the drive system for the European Main Ground Combat System (MGCS).

Rolls-Royce and ZF are developing the world's first parallel hybrid drive system for heavy military tracked vehicles. Preliminary studies show further potential: a newly-developed electrified steering and shift transmission with continuously variable transmission makes for more agile manoeuvring and increases efficiency. Also new is a hybrid cooling system which, together with an adaptively controlled motor, significantly increases overall efficiency. At the same time, the main drive requires minimal installation space and weighs little. Rolls-Royce Power Systems, as prime contractor, and ZF, as subcontractor, are thus contributing to a high-performance, efficient, compact and agile combat vehicle.

The Main Ground Combat System (MGCS) is a joint European project by Germany and France to develop a next-generation combat vehicle. The platform is intended to replace the current LEOPARD 2 and LECLERC MBTs and combine capabilities for the battlefield of the future – from increased mobility and integrated sensors to significantly enhanced energy efficiency through new digital systems. MGCS is being developed as a system comprising the vehicle, weapons, command and control architecture and new protection concepts. The goal is a superior overall platform that raises mobility, survivability and connectivity to a new technological level.

An MBT For a New Demand

At the heart of the MGCS drive is a newly developed ten-cylinder engine from the mtu Series 199 family – a high-performance engine designed for extreme load switching, driving dynamics, special military requirements and the increased electrical energy demand of future combat vehicles. With approximately 1,100kW of mechanical power, it delivers the majority

of the hybrid powerpack's system output of over 1,400kW and is the first to operate in a heavy tracked vehicle as part of a parallel hybrid drive system. The engine combines modern electronics with the robustness demanded by the battlefield: it uses a particularly robust PLD injection system that can also run on lower-grade fuel and remains multi-fuel capable.

Dr. Jörg Stratmann, CEO of Rolls-Royce Power Systems AG, explained "Europe needs a strong and reliable defence architecture to ensure its long-term defence capabilities. Our drive system is a robust and powerful component for this, designed for current and future operational profiles. It strengthens the operational capability of European armed forces, increases operational reliability, and at the same time helps to sustainably anchor technological expertise and industrial value creation in Europe."

Andreas Moser, ZF Board Member, added "With the Main Ground Combat System [...] the European partner nations are investing in modern defence technology and, beyond that, in the long-term stability and operational capability of a resilient democracy in Europe [...] We are proud to be making a significant contribution to a compact and powerful drive module with an innovative, electrified powershift transmission, giving the vehicles the necessary mobility and responsiveness."

The 10V configuration is built on a revised platform with optimised combustion, higher power density and improved thermal efficiency. The cooling system offers reserves for additional electrical consumers. The Military Off-The-Shelf approach of the 199 series is being consistently pursued, thus creating the foundation for a resilient and scalable supply chain. Initial powerpack prototypes are slated for testing before the end of the 2020s; series production could begin in the early 2030s.

The 10V 199 remains closely related to existing variants such as the 8V 199. This technical similarity simplifies logistics and supply. Furthermore, its proven track record – over 4,500 engines of the 199 series have proven their reliability worldwide – strengthens the system's dependability and security of supply for all users.

