Jackal 1 moves towards hybrid electric drive installation

Date Posted: 20-Jan-2021

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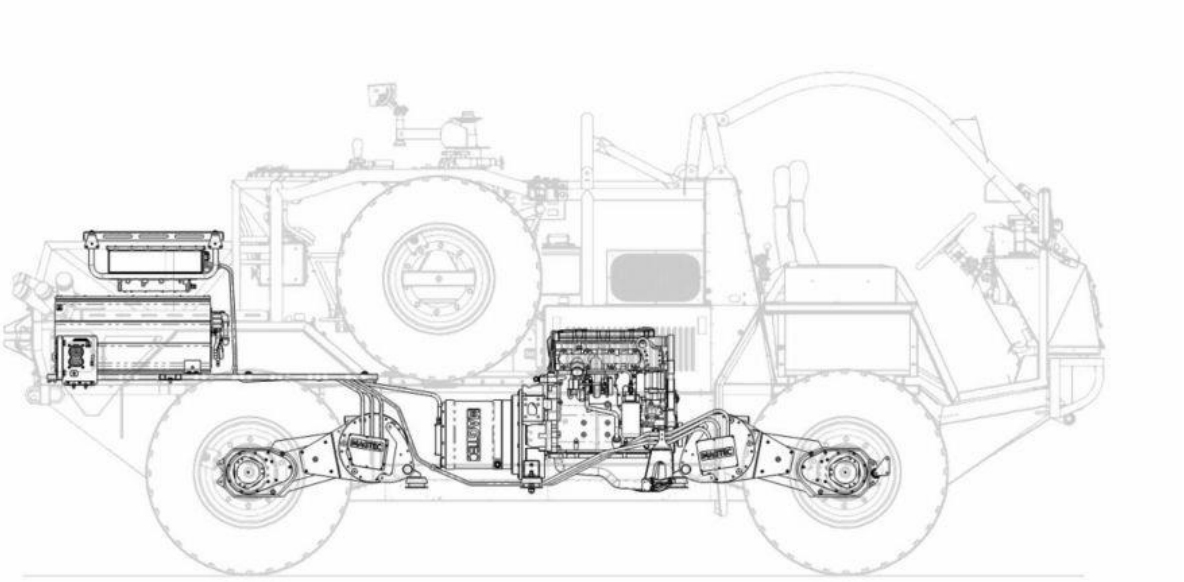
Publication: Jane's International Defence Review

The UK's Supacat completed physical modifications to a Jackal 1 4x4 surveillance and reconnaissance vehicle (SRV) in mid-December 2020, and is ready for Magtec to integrate its hybrid electric drive (HED) system.

Jackal 1 4x4 SRVs are powered by a six-cylinder Cummins diesel engine developing 185 hp, coupled to an Allison 2500 five-speed automatic transmission and a two-speed transfer case. This gives a maximum road speed of up to 120 km/h, and a range of up to 800 km.

For the HED application, the six-cylinder engine has been replaced by a four-cylinder Cummins diesel engine coupled to a generator that provides power to a bank of batteries located in the rear cargo area, which in turn provides power to the four wheels.



Side drawing of the Jackal 1 4x4 hybrid electric drive, which has a Cummins four-cylinder diesel coupled to a Magtec generator. (Supacat)

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Magtec was selected in August 2020 by NP Aerospace, the lead contractor for the Protected Mobility Engineering & Technical Support (PMETS) contract. The company was assessed by NP Aerospace and the UK Ministry of Defence (MoD) as able to offer a high Technology Readiness

Level (TRL) HED application for the Jackal 1 with low developmental and programme risk.

When integration is completed, the vehicle will undergo a series of trials at the Millbrook Proving Ground (MPG) in the first quarter of 2021, with these trials expected to be completed in mid-2021.

Steve Austen, engineering director at Supacat parent SC Group, told *Janes,* "The Jackal 1 4x4 SRV with HED will offer the user a number of advantages including the capability to move under electric power so reducing its acoustic signature, which is especially useful in special forces applications, use its onboard radios and surveillance equipment with main diesel engine off, and use its onboard power to supply other systems away from the vehicle."

"By the end of the trials, Jackal 1 4x4 SRV HED is expected to be at Technology Readiness Level 6," he said, meaning it has achieved a technical model or prototype demonstration in a relevant environment.

Supacat have supplied 600 of its Jackal 4x4s and larger Coyote 6x6s to the UK MoD. Australia, Denmark, and others account for export sales, but the largest user is the UK.

Supacat has previously developed, using internal funding, an HED version of its All-Terrain Mobility Platform (ATMP) 6x6 that had undertaken some company trials at the Supacat facility in Devon.

In conjunction with the University of Exeter, and as part of an Innovate UK-supported Knowledge Transfer Partnership (KTP), Supacat also developed an optionally manned hybrid Technology Demonstrator with a payload of up to 1,600 kg, shown for the first time in late 2019. According to Austen, "The vehicle architecture employed for the optionally manning functionality is scaleable and open, so an option would be to transfer this technology to the Jackal 1 4x4 HED to further enhance its capability."

Comment

Following a competition run by the Defence Equipment & Support organisation in December 2019, it was announced that NP Aerospace had been awarded a GBP63 million contract for the PMETS and runs for a minimum of six years.

It covers the MoD fleet of 2,200 Protected Mobility Vehicles (PMV) including Mastiff, Wolfhound, Ridgeback, Buffalo, Choker, RODET, Foxhound, Jackal, Coyote, and Husky, most of which were procured under Urgent Operational Requirement (UOR) funding.

As NP Aerospace is responsible for PMETS, they awarded a contract to Supacat, as well as a similar contract to General Dynamics Land Systems – UK to install a HED system for the Foxhound 4x4 with Magtec as the electric drive and battery technology partner. The UK MoD is looking to explore the potential advantages of optionally manned vehicles for its future force structure.