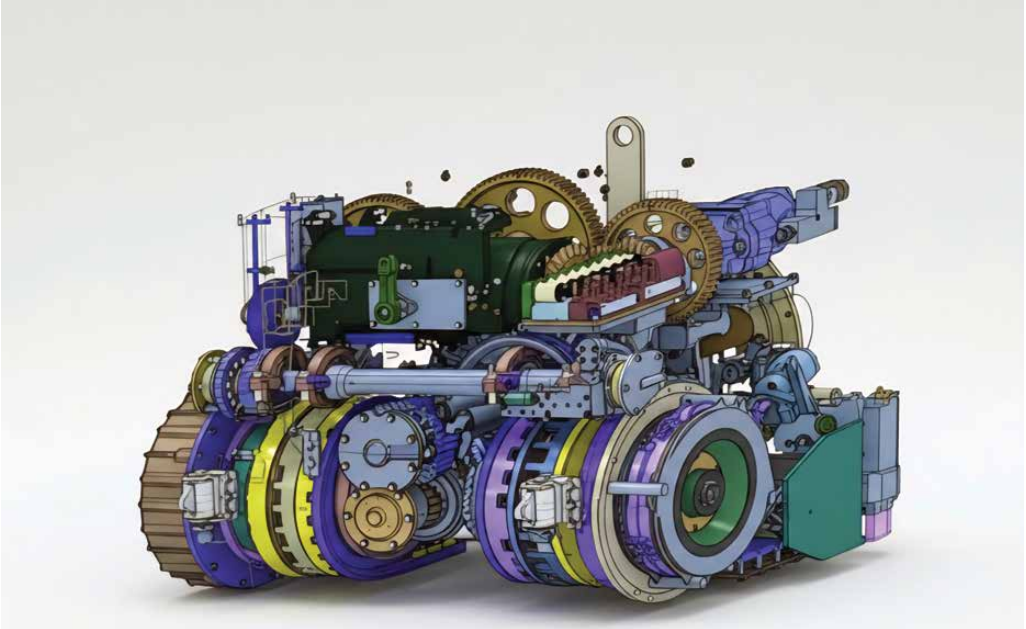
The Heart of the Beast: Inside DRDO's new powerpacks for India's next–gen armour



600 hp transmission system

"True sovereignty needs self–reliance in critical technologies," stated Dr. A.P.J. Abdul Kalam. As the quote suggests, self–reliance and major breakthroughs in critical technology are essential today in military research and development. One such niche domain is the propulsion and transmission of the platform. Modern geopolitics and the monopoly over this domain have raised significant concerns in the Strategic Indian military programme.

When it comes to land systems in particular, the majority of India's main battle tank fleet consists of thousands of T–72 and T–90 tanks that utilise Russian designed engines. Many of these engines are made under license in India, which allows for some industrial capacity, but it doesn't lead to true self–sufficiency. The licensed production model still depends on the original equipment manufacturer for essential parts, raw materials and technical updates. As a result, the Indian Army often encounters ongoing but minor issues with these systems. These problems appear as lower–than–expected mean time between failures (MTBF), maintenance heavy service cycles, and performance limits under the tough and diverse conditions along India's borders, from the hot deserts of Rajasthan to the high altitude plateaus of Ladakh.

This reliance becomes even more apparent with India's leading homegrown tank, the Arjun Mk–1A. Created to showcase India's design and manufacturing skills, the "Hunter Killer" is ironically powered by a foreign engine—the powerful German 1400 hp MTU 838 Ka–501 diesel engine. Choosing this engine was a practical decision at the time, based on its proven reliability and excellent power–to–weight ratio.

However, this choice has turned into a major issue. The German manufacturer has shut down the original production line for this engine model due to changing global demands for newer technologies. To meet the Indian Army's order for 118 new Arjun Mk.1A tanks, this inactive production line must be restarted, which is a complicated and very costly process. It requires re–establishing supply chains for hundreds of sub–components, retooling equipment, and reallocating skilled workers, resulting in significant delays for the Indian Army. This situation clearly shows the risk of relying on foreign sources; the defence procurement schedule of a sovereign nation now depends on the production logistics of a foreign company.

Having the future in mind, DRDO labs, along with private players, have put in a significant amount of work to develop a whole new spectrum of power plants and transmission for the future combat platforms of the Indian Army.

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