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GROUND VEHICLE **POWER&MOBILITY**

DRIVING THE **ARMY** FORWARD

TARDEC

Testing Evaluation and Assessment (TEAMS) Team

The TARDEC Ground Vehicle Power and Mobility Team **MISSION** is to:

- Provide customers with characterization, evaluation, functional assessments and testing data and analysis by utilizing our current and future laboratory assets.
- Provide high technical fidelity and evaluation of component level, system level and vehicle level mobility and propulsion systems for the Army's current and future ground vehicle platforms.

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

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TARDEC's Ground Vehicle Power and Mobility (GVPM) Testing Evaluation and Assessment Team provides full life-cycle testing support for research, development and engineering of primary power systems, including but not limited to Complete Vehicle Systems, power trains, engines, transmissions, axles, differentials and generators.

The GVPM Labs are also the Army's go-to laboratories for controlled testing resources for non-primary power solutions, including: auxiliary power units, power management systems, advanced energy storage systems, hydrogen fuel cells, hybrid-electric systems, air and fluid filtration systems, vehicle cooling systems and track and suspension systems. The GVPM Test Evaluation and Assessment Team provides timely testing and evaluation to all of our customers, allowing them to make sound purchasing decisions, providing U.S. ground forces with the best ground vehicle systems in the world.

Mobility Test Laboratory

Laboratory testing is intended to simulate field test conditions in a more controlled environment. It allows the use of standardized or customized test procedures. The mobility laboratory can assist you in conducting the following tests: vehicle full load cooling; tractive effort versus speed; fuel economy, air conditioning and engine, including performance, endurance, qualification and acceptance; transmission, tests including performance and efficiency; and drive axle endurance.

The Mobility Test Laboratory contains 10 test cells, 6 of which are "dynamometer" cells that are typically used for engine research, performance, endurance and qualification testing. There are also 3 full vehicle/transmission/drive axle test cells in the laboratory, which include facilities designed for steady-state tests as well as transient tests. The total sprocket output load absorbing capacity of these test cells permits testing of any known military ground vehicle in any transmission gear range. All of the test cells in this laboratory can simulate desert heat, wind and solar conditions to an ambient temperature of 160°F and wind speeds up to 20 miles per hour. Test Cell # 10, the Electric Drive Components test cell, can test batteries, power electronics, generators and motors. It has programmable power absorption and supply capability with voltage, current and power control and contains a 175 hp eddy current dynamometer. This laboratory frequently evaluates hybrid-electric components.

Track and Suspension Laboratory

The Track and Suspension Laboratory is increasingly important to the Army's *Operations Enduring* and *Iraqi Freedom* efforts. This facility provides a wide range of testing for Track and Suspension Systems on ground mobility vehicles for both current and future vehicles. This laboratory has 2 vibration tables used for Track Pad Blowout Testing, along with a Track Pad Test Machine used for further track testing. The laboratory contains 2 actuators used for Pull-to Failure tests to determine track strength. The laboratory has also performed extensive torsion bar and quarter-scale suspension testing.

Additional GVPM Laboratory

An additional facility includes the Air Flow Laboratory, which has air cleaner, grille and radiator testing capability. Engineering teams can measure the service life, filter efficiency and total restriction of air cleaners and perform leakage, pressure cycling and thermal performance of radiators and heat exchangers. This facility also hosts the Power and Component Test Laboratory for fuel cells and batteries. This laboratory contains environmental chambers to conduct temperature and humidity control tests to +150°F and -100°F.

Power & Energy Hardware in the Loop Systems Integration Laboratory

The Power and Energy Hardware in the Loop Systems Integration Laboratory (P&E SIL), located in Santa Clara, CA, is the Army's primary lab for research and development of hybrid-electric propulsion system technology. The P&E SIL provides a cost-effective, advanced and highly instrumented environment for evaluating, integrating and demonstrating performance of the enabling technologies for a compact, reduced weight hybrid-electric power system for Future Combat Systems ground vehicles in the 20- to 25-ton range. The P&E SIL can develop, characterize and demonstrate advanced architectures, system controls, power and energy generation, thermal management, power distribution, intelligent management, and compact components and subsystems and can iteratively evolve system designs and configurations.

Power and Inertia Simulation provide road load testing capabilities using dynamometer system for tracked vehicles of up to 850 hp.

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