



DEVCOM
GROUND VEHICLE
SYSTEMS CENTER

CVSSC CAPABILITIES

Summary brochure



U.S. ARMY GROUND VEHICLE SYSTEMS CENTER

GVSC LABS

FULL VEHICLE SHAKERS (N-POST)

This test rig is a tire coupled roadway system for testing most Army wheeled ground systems in a controlled environment for repeatability.

TRAILER SHAKER (PINTLE BASED MOTION SIMULATOR)

This test rig is used to conduct durability and performance tests on trailers and can eliminate performance variables such as weather conditions, driver variability and course maintenance.

ADDITIVE MANUFACTURING

Additive Manufacturing, aka 3D printing, is defined as a process of joining materials layer upon layer to create or repair parts using 3D data/models involving less waste product and fewer processing/assembly steps.

AIR FLOW TESTING

The Air Flow Laboratory supports the execution of component level testing on several critical mobility systems on a variety of military vehicles by use of Calorimeter and Air Filtration Testing.

APPLICATION & INTEGRATION

The Application and Integration Team investigates and matures material technologies; provides weight reduction and design optimization engineering support for integration into DoD ground vehicle systems and support systems.

ANTHROPOMORPHIC TEST DEVICE CERTIFICATION LAB

The lab enables GVSC to certify ATDs in-house, reducing the time and cost of certifying ATDs and downtime between testing.

CREW COMPARTMENT UNDERBODY BLAST SIMULATOR

This simulator is a pneumatically-actuated test device made of a large platform capable of holding up to four seated occupants, and used to evaluate vehicle crew compartments in simulated underbody blast events.

CHARACTERIZATION & FAILURE ANALYSIS

The C&FA team provides experimental data to GVSC material R&D efforts, corroborating theories and production methods with anticipated properties.

COMPONENT IMPACT SIMULATOR (CIS)

This simulator is a multipurpose test fixture used for component and subcomponent shock impulse testing with results used to identify input parameters significant to component failure or occupant injury.

ELECTRIC COMPONENT TESTING

This lab supports research, development, characterization and testing of high-voltage, high-power components necessary for military vehicle electrification and hybrid-electric technology.

ELECTRO-DYNAMIC SHAKERS

These shaker tables perform high frequency, single axis testing to Military Vibration Test Standards and produce simulated road vibration, supporting multiple tracked- and wheeled-vehicle military programs.

ELECTROMAGNETIC COMPATIBILITY TEST FACILITY

This semi-anechoic shielded enclosure has high voltage (HV) feedthrough panel rated to $\pm 750\text{VDC}$ and 400ADC .

ENERGY STORAGE LABORATORY

The ESL, an ISO/IEC 17025 accredited laboratory, supports testing and evaluation of batteries and electrochemical technologies at cell, module and battery pack level.

FLOOR INTERFACE TECHNOLOGY ACCELERATOR

The FITA is a leg impact system used to evaluate the performance of energy absorbing floor materials, simulating an underbody blast.

FULL VEHICLE ENVIRONMENTAL CHAMBER

This test rig is used to test vehicles in extreme ambient temperatures and used to represent the most severe temperature conditions that a vehicle may be exposed to during use.

HEAVY SUSPENSION SYSTEM TESTER

The Suspension Test Analysis Rig, known as STAR, is capable of conducting durability testing of suspension systems, including road arms for tracked vehicles, and is capable of extreme velocity, and can simulate shock events in line with MIL-STD 810.

FUELS & LUBRICANTS LABORATORY

The FLL has the ability to conduct research, development, testing, analysis, and investigation of ground system performance fluids.

U.S. ARMY PETROLEUM LABORATORY

APL provides quality surveillance testing of bulk fuels including jet fuel, aviation (AV) gas, automotive gasoline, diesel fuel, burner fuel, kerosene, E-85 and bio-diesels in accordance with Military Standard (MIL-STD) 3004.

BRIDGE TECHNOLOGY LABORATORY

BTL, located at Selfridge Air National Guard Base, is designed to conduct strength and durability testing of military bridges, can evaluate bridging/structural components, sub-assemblies and complete systems in simulated environments.

WATER EQUIPMENT BRANCH LABORATORIES

Water Research Laboratory and Water Treatment Test Facility in Southeast Michigan provide water and wastewater related products and technical services that capitalize on emerging technologies ensuring the best possible products are available to the soldier.

JOINING – WELDING/MECHANICAL FASTENERS ADHESIVES

Practically every segment of ground vehicle systems involves at least one aspect of joining and welding, which is a complex engineering discipline that involves multiple characteristics.

KINEMATICS AND COMPLIANCE TESTER

The testing rig is capable of actuating up to two axles simultaneously, and one steered axle at a time and any vehicle up to a per-axle weight of 50,000 lb.

MATERIALS – ENVIRONMENTAL COATINGS & CORROSION TEAM

The M-ECC Team provides environmental support to ground vehicles and support systems from R&D through disposal.

MULTI-AXIS SHAKER TABLE

This shaker table provides capability to perform multi-axis testing in six concurrent degrees of freedom while controlling temperature to replicate simulated road vibration and environmental loads.

OCCUPANT PROTECTION LAB OFF-SITE TESTING SUPPORT

This lab is a full-service test facility with the resources, capabilities, equipment, and partnerships needed to perform dynamic impact/impulse testing on components, subsystems, or systems.

POWER ENERGY VEHICLE ENVIRONMENTAL LABORATORY

The PEVEL's reconfigurable dynamometers can support up to a 5-axle wheeled vehicle with 34,000 lbf-ft (per wheel) and tracked vehicles up to 42,000 lbf-ft (per side) and offers controlled environmental conditions with temperatures ranging from -60 to 160 °F.

SURVIVABILITY ARMOR BALLISTICS LAB (SABL)

Our SABL lab performs ballistic tests to multiple specifications.

VEHICLE ELECTRONICS AND ARCHITECTURE

VEA's lab is used for architecture development and electronics integration for tech-based R&D projects.

SUB-SYSTEM DROP TOWER

The drop tower is a device used to evaluate technologies that must endure dynamic impact testing.

SOLDIER SYSTEM INTERFACE IMPACTOR

This impact test machine is used to test vehicle interior impact points that cause injuries to the head and extremities.

TIRE TESTING MACHINE

This is a fatigue rated test rig for long term tire testing.

UNIAXIAL TENSION/COMPRESSION TESTERS

The rig conducts comprehensive tests of rim and tire characteristics under a wide range of duty-cycle and environmental conditions, providing the most accurate simulation of real-world usage available in North America.

VEHICLE SUSPENSION DYNAMOMETER

The rig is capable of characterizing and conducting durability testing of vehicle dampers and springs, as well as quarter suspension systems from wheeled vehicles.

VEHICLE INERTIAL PROPERTIES EVALUATION RIG

The VIPER system is used to accurately measure system and subsystem inertial characteristics and center of gravity (CG) for vehicles, trailers, and turrets.

For a comprehensive look at all of GVSC lab capabilities, go to our website at:

<https://www.usarmygvsc.com/capabilities>



COLLABORATE WITH GVSC FOR PURPOSEFUL ENGAGEMENTS

The Ground Vehicle Systems Center (GVSC), located in Warren, Mich., on the Detroit Arsenal, is the United States Army's laboratory for developing advanced military ground vehicle technologies and providing systems engineering and integration expertise that delivers unmatched ground vehicle solutions. GVSC is part of the U.S. Army Combat Capabilities Development Command, a major subordinate command of the U.S. Army Futures Command.

GVSC provides innovative research, development, and engineering to support ground systems and provide and integrate ground system capabilities for decisive overmatch in the future. In order to accomplish this we must:

- Connect with others who innovate, develop, demonstrate and accelerate technology;
- Communicate the Army's ground vehicle technical needs;
- Create collaborative business agreements.

If your organization would like to partner with GVSC, we employ several collaborative methods to engage industry, academia and other government agencies, depending upon stakeholder requirements. Some options are: Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), Cooperative Research and Development Agreements (CRADAs) and Test Service Agreements (TSAs).

Connect with GVSC -- submit your ideas and make inquiries on the GVSC website.

<https://www.usarmygvsc.com>

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