Harsh environment, high-mobility vehicle development and prototyping

For the past 30 years, MillenWorks has developed advanced engineering solutions for a diverse set of customers, ranging from motorsports to various branches of the US military. Our design expertise includes lightweight vehicle systems, high-mobility suspensions, internally transportable vehicles, and fuel efficient drivetrains. Using computer-aided modeling and design, we can rapidly develop the most advanced ground vehicles for defense applications. MillenWorks offers our customers the ability to create a design, fabricate the concept, and verify the performance prior to mass production.
MillenWorks offers a full range of vehicle engineering services - from systems engineering and concept development through prototype vehicle manufacturing and integration.

**Prototype Vehicle Design & Development**
- Ground-up custom vehicles
- System upgrades on existing vehicles
- Specialty vehicles

**Modeling and Simulation**
- Vehicle dynamics and performance
- Control system modeling
- Mechanical and electrical system modeling

**High-Mobility Solutions**
- Advanced suspension systems
- Ride height management
- Advanced steering systems

**Powertrain System Integration**
- Custom gearbox design, ranging from standard transmissions to full electric
- Hybrid and electric drivetrains, including battery pack design
- OEM controls integration for engines, transmissions and driveline components

**Prototype Manufacturing**
- Five-axis machining capability
- Certified welders – alloy and armor steel; aluminum
- CNC sheet metal fabrication
- PCB Assembly and harness fabrication

**Testing Services**
- Instrumentation and data acquisition
- In-house suspension testing (shock dynomometer)
- On-road and off-road field testing

*Ground-up technology demonstrator vehicle development completed in 18 months.*

*Custom two-speed electric transaxle development including powertrain controls.*

*USMC LAV25 suspension upgrade - magnetorheologic (MR) suspension system with integrated ride height control.*

*MillenWorks offers a full range of prototype manufacturing capabilities, including sheet metal, fabrication, CNC machining and assembly.*
From components, to major subsystems, to complete vehicle integration, MillenWorks has the expertise necessary to rapidly turn concepts into reality. Our capabilities range from design and development to full systems integration. Our core capabilities are listed below:

**CAPABILITIES**

**ADVANCED POWERTRAIN**
- Transmission & gearbox development
- Electric & hybrid electric powertrain development
- Combustion engine integration
- Exportable power/vehicle to grid
- Advanced powertrain controls
- Thermal management systems
- Powertrain system modeling

**OCCUPANT SURVIVABILITY**
- Passive and active seat restraints
- Crash detection
- Ballistic protection
- Shock and blast mitigation

**ELECTRICAL SYSTEMS**
- High and low voltage power distribution
- Custom controller development
- MIL-spec harness development
- Communication protocol architecture

**SUSPENSION AND STEERING**
- Advanced passive and semi-active (MRF) suspension systems
- Ride height management
- Steer-by-wire
- Four wheel steering
- Vehicle dynamic simulation

**VEHICLE INTEGRATION**
- Ground-up design and build
- Integration of subsystems into new and existing vehicles
- Optimized chassis & structures

**ENERGY STORAGE & MANAGEMENT**
- High voltage battery pack and module development
- Battery management systems
- Battery thermal management
- Battery integration, validation and testing
For more information visit us at www.millenworks.com