TMSI Tactical Mobility Solutions International

VECTOR

The VECTOR system revolutionises weapon deployment and tactical mobility for lightweight military platforms. This transformative hydraulic suspension stabilisation system provides real-time, terrain-adaptive control, enabling light vehicles to mount and operate larger calibre weapon systems with unprecedented stability and accuracy. VECTOR ensures optimal platform posture during high-speed manoeuvres or static firing positions, significantly enhancing operational versatility and firepower projection. By managing vehicle dynamics and intelligently adjusting ride height, levelling, and damping, VECTOR offers a decisive tactical advantage across the full spectrum of combat operations.

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VECTOR

Vehicle
Enhanced
Control for
Terrain
Optimisation and
Response

VEHICLE ENHANCED CONTROL FOR TERRAIN OPTIMISATION AND RESPONSE

The VECTOR system represents a transformative advancement in vehicle-borne weapon deployment and tactical mobility. Developed specifically to meet the demanding requirements of modern defence operations, VECTOR empowers lightweight and low-GVM military platforms to mount, transport, and operate larger calibre weapon systems with a degree of stability, control, and accuracy previously reserved for much heavier armoured vehicles.

By providing real-time stabilisation and terrain adaptive suspension management, VECTOR allows tactical vehicles to maintain optimal platform posture across all operational conditions, from high-speed manoeuvres to static firing positions, without sacrificing manoeuvrability, agility, or mission flexibility. This expanded capability drastically improves the operational versatility and firepower projection of light forces in both expeditionary and conventional warfare environments.

VEHICLE ENHANCED CONTROL FOR TERRAIN OPTIMISATION AND RESPONSE

At its core, VECTOR is a fully integrated, automated hydraulic suspension stabilisation system governed by a sophisticated network of gyroscopic sensors, accelerometers, and electronic control modules. This advanced closed-loop system continuously monitors vehicle dynamics, including pitch, roll, yaw, and terrain response, in real time. Using these inputs, VECTOR autonomously adjusts ride height, platform levelling, and suspension damping to preserve vehicle stability during movement, abrupt manoeuvres, or while stationary for weapon system deployment.

By intelligently managing the platform's centre of gravity and dynamic profile, VECTOR ensures superior ride quality, enhances firing stability, and extends the mission capability of lightweight platforms, offering modern forces a decisive tactical advantage across the full spectrum of combat operations.

KEY CAPABILITIES

ON-THE-MOVE STABILISATION:

VECTOR actively stabilises the platform during dynamic operations across varied terrains, reducing pitch, roll, and yaw to maintain a level and smooth ride. This improves weapon accuracy during fire-on-the-move missions and minimises crew fatigue.

STATIONARY WEAPON DEPLOYMENT OPTIMISATION:

Upon halt, VECTOR automatically levels the platform across uneven ground, providing a stable firing base for heavy weapon systems. Operators can fully lock the suspension to suppress recoil-induced movement, greatly enhancing firing precision and crew survivability.

KEY CAPABILITIES

HEIGHT MODULATION FOR MISSION FLEXIBILITY:

Operators predefine ride heights to match mission profiles, including:

- Low Profile Mode for air transport compatibility or signature reduction.
- High Clearance Mode for increased mobility over rough terrain.
- Predefined Weapon Deployment Profiles that automatically adjust height, level and suspension locking based on mounted weapon system parameters.

REDUNDANCY AND FAIL-SAFE ARCHITECTURE:

VECTOR is designed with full system redundancy. In the highly unlikely event of a system failure, the suspension defaults to standard passive mechanical operation, preserving baseline vehicle mobility without mission degradation.

KEY CAPABILITIES

EASE OF INTEGRATION:

The system is modular and adaptable, requiring minimal modification to existing chassis configurations. It interfaces seamlessly with various fire control units, and vehicle electronic architectures.

OPERATIONAL ADVANTAGES:

- **Enhanced Fire-on-the-Move Capability**

  Maintains platform stability and weapon accuracy while manoeuvring across rough terrain.

- **Reduced Setup Time for Fire Missions**

  Automatic levelling and suspension lock reduce preparation time, enabling faster engagement cycles.

KEY CAPABILITIES

OPERATIONAL ADVANTAGES:

- **On-the-Fly Damping and Rebound Adjustment**

  Real-time adjustment of suspension damping and rebound rates to optimise platform stability across changing terrain conditions without interrupting operations.

- **Adaptive Terrain Response**

  Dynamic adjustment to ground conditions including soft soil, rocky terrain, and urban environments, preserving vehicle control and platform integrity.

- **Increased Tactical Flexibility Across Mission Sets**

  Predefined and customisable ride profiles support rapid reconfiguration for multiple mission types, from reconnaissance to fire support.

KEY CAPABILITIES

OPERATIONAL ADVANTAGES:

- **Extended Operational Envelope for Lightweight Vehicle Platforms**

  Enables light tactical vehicles to effectively deploy heavier weapon systems across a broader range of combat environments.

- **Minimised Platform Signature Through Ride Height Management**

  Adjustable low-profile settings reduce visual and radar signatures for enhanced survivability in contested environments.

- **Increased Survivability and System Redundancy**

  Dual-path control architecture ensures continuous vehicle mobility and suspension functionality even in the unlikely event of primary system failure.

KEY CAPABILITIES

OPERATIONAL ADVANTAGES:

- **Superior Ride Comfort and Crew Fatigue Reduction**

  Dynamic suspension management improves ride smoothness over rough terrain, reducing physical stress and fatigue on the crew during extended operations.

- **Enhanced Precision for Static Weapon Deployment**

  Full platform levelling and suspension lockdown minimise movement during weapon discharge, greatly improving firing accuracy and repeatability.

- **Optimised Air Transportability**

  Low-profile height adjustment modes enable rapid preparation for airlift operations, including fixed-wing and rotary-wing transport.

KEY CAPABILITIES

OPERATIONAL ADVANTAGES:

- **Reduced Mechanical Stress and Extended Platform Lifecycle**

  Intelligent suspension control lowers shock loads on the vehicle chassis, weapon systems, and critical components, extending operational lifespan and reducing maintenance burdens.

CAPABILITY STATEMENT:

The VECTOR system redefines the operational potential of light tactical vehicles, enabling them to fulfil combat roles traditionally reserved for heavier, more logistically demanding armoured platforms. By delivering superior stability, precision mobility, of weapon deployment capability, VECTOR empowers smaller forces to project greater firepower with increased agility and reduced support requirements. In asymmetric, expeditionary, and conventional warfare environments alike, VECTOR provides a decisive overmatch capability, enhancing mobility, survivability, and lethality for modern forces operating across the full spectrum of operational settings.