DRAFT

Draft Performance Specification

FOR

HMMWV Modernized Expanded Capacity Vehicle (MECV)

VERSION 2.99

09 Sep 2011

This document is intended to be used for informational/planning purposes only.
This information is preliminary and subject to change.
Changes from version 2.93 appear in red.

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1 SCOPE

The release of the Draft Modernized Expanded Capacity Vehicle (MECV) Performance Specification, Classified Annex A, and Unclassified Annexes is for informational and planning purposes only and is not to be construed as a commitment or obligation by the US Government. Multiple revisions of the Performance Spec and Annexes are expected between now and any potential release of the RFP. The intent for releasing this Draft is to provide industry with the forecasted direction of the US Army MECV program requirements and is not final. This website will be updated with the latest version of the Draft Performance Spec, Classified Annex, and/or Unclassified Annexes as available.

The High Mobility Multipurpose Wheeled Vehicle (HMMWV) MECV missions are the same as their predecessors. The MECVs are Expanded Capacity Vehicle (ECV) HMMWVs that have been Recapitalized (RECAP) with system improvements to regain vehicle performance and payload consumed by the addition of armor to the legacy force, adequately protect the crew from operational threats, and incorporate lessons learned from current operations. The current ECV models which may be consumed by this effort include the following:

M1151	Truck, Utility, Expanded Capacity, Armament Carrier, 11,500 GVW, Base with AC
M1151A1	Truck, Utility, Expanded Capacity, Armament Carrier, IAP/Armor Ready, 12,100 GVW
M1151A1 w/B1 Kit	Truck, Utility, Interim Armored, Armament Carrier, 12,100 GVW, IAP W/B1 Armor Kit
M1152	Truck, Utility, Expanded Capacity, Enhanced, 11,500 GVW, Base with AC
M1152A1	Truck, Utility, Expanded Capacity, Enhanced, IAP/Armor Ready, 12,100 GVW
M1152A1 w/B2 Kit	Truck, Utility, Interim Armored, Enhanced, 12,100 GVW, IAP W/B2 Armor Kit
M1165	Truck, Utility, Command and Control / General Purpose Vehicle, 11,500 GVW, Base with AC
M1165A1	Truck, Utility, Command and Control / General Purpose Vehicle, IAP/Armor Ready, 12,100 GVW
M1165A1 w/B3 Kit	Truck, Utility, Interim Armored, Command and Control / General Purpose Vehicle, 12,100 GVW, IAP W/B3 Armor Kit
M1167	Truck, Utility, TOW Carrier, Armored, 13,100 GVW, IAP W/B1 Armor Kit.

The output shall be the following variants:

Truck, Utility, Armament Carrier
Truck, Utility, Troop/Cargo/Shelter Carrier
Truck, Utility, Command and Control
Truck, Utility, TOW Carrier

2 APPLICABLE DOCUMENTS

The documents listed in this section are specified in sections 3 and 4 of this Performance Specification. While every effort has been made to ensure completeness of this list, document users are cautioned that all specified requirements documents cited in sections 3 and 4 of this Performance Specification must be met if specifically called out in the performance specification. Unless exempted by the Code of Federal Regulations (CFR), Title 49 Volume 5, §571.7(c), or a National Security Exemption, all Federal Motor Vehicle Safety Standards (FMVSS), Federal Motor Carrier Safety Regulations (FMCSR), Environmental Protection Agency (EPA), Federal, State, and Municipal requirements, Military Specifications extracts from performance sections, Military Standards extracts from requirements sections, Published Commercial Item Descriptions, Society of Automotive Engineers (SAE) standards, and American Society for Testing and Materials (ASTM) standards specified herein shall apply to this program.

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2.1 GOVERNMENT DOCUMENTS

The following Government documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

2.1.1 Specification Standards, And Handbooks

DEPARTMENT OF DEFENSE

A-A-50271	-	Plate, Identification
A-A-52030	-	Nozzles, Fuel And Oil Servicing, Nonautomatic Shutoff and Nozzles, Fuel Servicing, Automatic Shutoff
A-A-52426	-	Hose and Hose Assemblies, Non-Metallic, Silicone, Polyester and Wire Reinforced (for coolant and heating systems of diesel and gasoline powered engines)
A-A-52464	-	Coupler, Drawbar, Ring: Light Duty, 60,000lb ECC; Offset (Taper Shank), 60,000lb ECC; and Heavy Duty 120,000lb ECC
A-A-52550	-	Pintle Assembly, Towing, Manual Release, 18,000, 50, 000, and 100,000
A-A-52624	-	Antifreeze, Multi Engine Type
A-A-59487	-	Padlock (Key Operated)
ATPD 2206	-	Batteries, Storage: Lead-Acid "Maintenance Free"
ATPD 2241	-	Vehicles, Wheeled: Preparation for Shipment and Storage of
ATPD 2352	-	Purchase Specification Transparent Armor
~~MIL-A-12560~~	~~-~~	~~Armor Plate, Steel, Wrought, Homogeneous (for use in Combat-Vehicles and for Ammunition Testing)~~
~~MIL-A-46100~~	~~-~~	~~Armor, Plate, Steel, Wrought, High-Hardness~~
MIL-DTL-0053084	-	Primer, Cathodic Electrodeposition, Chemical Agent Resistant
MIL-DTL-12560	-	Armor Plate, Steel, Wrought, Homogeneous (For Use in Combat-Vehicles and for Ammunition Testing)
MIL-DTL-16884	-	Fuel, Naval Distillate
MIL-DTL-32262	-	Armor Plate, Aluminum Alloy, Unweldable Applique 6061
MIL-DTL-46027	-	Armor Plate, Aluminum Alloy, Weldable 5083, 5456, and 5059
MIL-DTL-46100	-	Armor, Plate, Steel, Wrought, High-Hardness
MIL-DTL-46593	-	Projectile, Calibers .22, .30, .50 and 20 mm Fragment - Simulating
MIL-DTL-53072	-	Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection
MIL-DTL-5624	-	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-DTL-83133	-	Turbine Fuels, Aviation, Kerosene Types, NATO F-34 (JP-8), NATO F-35, and JP-8+100
MIL-HDBK-310	-	Global Climatic Data for Developing Military Products
MIL-HDBK-508	-	Wiring and Wiring Devices for Combat and Tactical Vehicles, Selection and Installation of
MIL-HDBK-669	-	Loading Environment and Related Requirements for Platform Rigged Airdrop Material
MIL-HDBK-759	-	Human Engineering Design Guidelines
MIL-HDBK-1223	-	Non-tactical Wheeled Vehicles Treatment, Painting, Identification Marking and Data Plate Standards
MIL-HDBK-1791	-	Designing for Internal Aerial Delivery in Fixed Winged Aircraft
MIL-I-24391	-	Insulation Tape, Electrical, Plastic, Pressure-Sensitive
MIL-P-14105	-	Paint, Heat-Resisting (For Steel Surfaces)

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MIL-PRF-2104	-	Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-PRF-6083	-	Hydraulic Fluid, Petroleum Base, for Preservation and Operation
MIL-PRF-10924	-	Grease, Automotive and Artillery
MIL-PRF-23377	-	Primer Coatings: Epoxy, High-Solids
MIL-PRF-32143	-	Batteries, Storage: Automotive, Valve Regulated Lead Acid (VRLA)
MIL-PRF-46167	-	Lubricating Oil, Internal Combustion Engine, Arctic
MIL-PRF-62048	-	Air Cleaners, Automotive: Heavy Duty, Dry-Type
MIL-PRF-81733	-	Sealing and Coating Compound, Corrosion Inhibitive
MIL-S-40626	-	Sign Kit, Vehicle Class
MIL-STD-130	-	Identification and Marking of US Military Property
MIL-STD-209	-	Lifting and Tiedown Provisions
MIL-STD-461	-	Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment.
MIL-STD-464	-	Electromagnetic Environmental Effects Requirements for Systems
MIL-STD-642	-	Identification Marking of Combat and Tactical Transport Vehicles
MIL-STD-662	-	V-50 Ballistic Test for Armor
MIL-STD-705	-	Generator Sets, Engine-Driven, Methods of Tests and Instructions
MIL-STD-810	-	Environmental Engineering Considerations and Laboratory Tests.
MIL-STD-814	-	Requirements for Tiedown, Suspension and Extraction Provisions on Military Materiel for Airdrop
MIL-STD-882	-	System Safety
MIL-STD-889	-	Dissimilar Metals
MIL-STD-913	-	Requirements for the Certification of Sling Loaded Military Equipment for External Transportation by Department of Defense Helicopters
MIL-STD-1179	-	Lamps, Reflectors and Associated Signaling Equipment for Military Vehicles
MIL-STD-1180	-	Safety Standards for Military Ground Vehicles
MIL-STD-1275	-	Characteristics of 28 Volt DC Electrical Systems in Military Vehicles
MIL-STD-1366	-	Transportability Criteria
MIL-STD-1472	-	Human Engineering
MIL-STD-1474	-	Noise Limits

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094 or on their website at http://assist.daps.dla.mil/online/start/.)

FEDERAL

FEDERAL MOTOR CARRIER SAFETY ADMINISTRATION REGULATIONS

The following Federal Motor Carrier Safety Administration Regulations (FMCSR) is the revision published in Code of Federal Regulations Title 49, Volume 4:

FMCSR 393	-	Parts and Accessories Necessary for Safe Operation

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(Copies of the above document are available from the Code of Federal Regulations from their website http://www.gpoaccess.gov/cfr/index.html)

FEDERAL MOTOR VEHICLE SAFETY STANDARDS

The following Federal Motor Vehicle Safety Standards (FMVSS) are published in Code of Federal Regulations Title 49, Volume 5:

FMVSS 101	-	Controls and Displays
FMVSS 102	-	Transmission Shift Lever Sequence, Starter Interlock, and Transmission Braking Effect
FMVSS 103	-	Windshield Defrosting and Defogging Systems
FMVSS 104	-	Windshield Wiping and Washing Systems
FMVSS 105	-	Hydraulic and Electric Brake Systems
FMVSS 106	-	Brake Hoses
FMVSS 108	-	Lamps, Reflective Devices and Associated Equipment
FMVSS 111	-	Rearview Mirrors
FMVSS 113	-	Hood Latch System
FMVSS 116	-	Motor Vehicle Brake Fluids
FMVSS 119	-	New pneumatic tires for motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds) and motorcycles
FMVSS 120	-	Tire selection and rims for motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds)
FMVSS 124	-	Accelerator Control Systems
FMVSS 203	-	Impact Protection for the Driver from the Steering Control System
FMVSS 204	-	Steering Control Rearward Displacement
FMVSS 205	-	Glazing Materials
FMVSS 206	-	Door Locks and Door Retention Components
FMVSS 207	-	Seating Systems
FMVSS 208	-	Occupant Crash Protection
FMVSS 209	-	Seat Belt Assemblies
FMVSS 210	-	Seat Belt Assembly Anchorages
FMVSS 212	-	Windshield Mounting
FMVSS 216	-	Roof Crush Resistance
FMVSS 219	-	Windshield Zone Intrusion
FMVSS 301	-	Fuel System Integrity

(Copies of the above documents are available from the Code of Federal Regulations from their website http://www.gpoaccess.gov/cfr/index.html)

2.1.2 Other Government Documents, Drawings, and Publications

CODE OF FEDERAL REGULATIONS (CFR)

CFR Title 29, Part 1910.1200	-	Occupational Health and Safety
CFR Title 49, Parts 400-499	-	Transportation
CFR Title 40, Parts 85, 89, 1068	-	Environmental Protection

(Copies of the above documents are available online at www.gpoaccess.gov/cfr)

TARDEC PUBLICATIONS

DISTRIBUTION STATEMENT A. Approved for Public Release; distribution unlimited.

POL Products Guide for Ground Vehicle and Equipment Materiel Systems

(Copies of the above document are available from the U.S. Army Tank-automotive and Armaments Command, Fuels and Lubricants Technology Team, RDTA-DP/MS-110, Warren, MI 48397-5000)

DRAWINGS

12340789	-	Accessory and Supplementary Kit List
12342917	-	Receptacle Assembly
12446845	-	LED Marker light
12447109	-	Alternator Assembly, 200 Amp Dual Voltage
12469057	-	Alternator Assembly, 400 Amp Dual Voltage
12472301	-	(Ground Combat Vehicle Welding Code) Aluminum
12479550	-	(Ground Combat Vehicle Welding Code) Steel
12480561	-	Waterproofness Requirement for Automotive Electrical Components
12518337	-	LED Rear Composite
12518338	-	LED Blackout Drive Light
12518339	-	LED Front Composite
12518475	-	Shelter Assy, Gunner (TOW)
~~12518691~~	~~-~~	~~Alternator Assy, 400 Amp Dual Voltage~~
12518721	-	Weapon System Installation (TOW)
13013616	-	LED Headlight Assembly
13014408	-	Manual Traversing Gear Kit
13014413	-	Picatinny Seat Assembly
13018185	-	Objective Gunner Protection Kit
13018187	-	BPMTU Kit (M1151 Version)
13021081	-	Overhead Cover
~~13480670~~	~~-~~	~~TOW ITAS Weapon System~~

(Copies of drawings are available from the U.S. Army Tank-automotive and Armaments Command, AMSTA-AQ-ATCA/416, Warren, MI 48397-5000.)

ARMY REGULATIONS

AR 70-75	-	Survivability of Army Personnel and Materiel

(Copies of Army Regulations are available online from the Army Publishing Directorate www.usapa.army.mil)

INTERNATIONAL STANDARDS

AVTP 1	-	Allied Vehicle Testing Publication
STANAG 2040	-	Stretchers, Bearing Brackets and Attachment Supports
STANAG 4015	-	Starter Battery Spaces for Tactical Land Vehicles
STANAG 4074	-	Auxiliary Power Unit Connections for Starting Tactical Land Vehicles
STANAG 4195	-	NATO Standard Engine Laboratory Test for Diesel and Gasoline Engines and Gas Turbine Engines-ED AMD 3
STANAG 4381	-	Blackout Lighting Systems for Tactical Land Vehicles

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(Copies of the above documents are available from North Atlantic Treaty Organization (NATO), Military Agency for Standardization (MAS), 1110 Brussels, Belgium or can be found on the ASSIST website at http://assist.daps.dla.mil/online/start/)

QSTAG-244 - High Altitude Electromagnetic Pulse

(Copies of the above document can be obtained from the ABCA website at www.abca-armies.org)

MILITARY PUBLICATIONS

TB 750-651	-	Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds, and Test Kit in Engine Cooling Systems
TM 4795-34	-	Rust Proofing and Underbody Coating Procedures for Tactical Vehicles, Trailers, and Underbody Equipment
TM 4750-15/1	-	Painting and Registration Marking for Marine Corps Combat and Tactical Equipment
TM 9-2320-387-10	-	HMMWV Technical Manual
TM 9-2320-387-24 & P	-	HMMWV Technical Manual
TM 9-2815-237-34 & P	-	HMMWV Engine Technical Manual

(Copies of manuals are available from the U.S. Army Tank-automotive and Armaments Command, AMSTA-AQ-ATBA/416, Warren, MI 48397-5000.)

IOP 385-082701	-	Procedure for Accelerated Corrosion Durability Measurement and Control Tests
TOP 2-2-602	-	Acceleration; Maximum and Minimum Speeds
TOP 2-2-603	-	Vehicle Fuel Consumption
TOP 2-2-607	-	Cooling Systems (Automotive)
TOP 2-2-608	-	Braking, Wheeled Vehicles (Jennerstown Brake Test Procedure)
TOP 2-2-609	-	Steering
TOP 2-2-610	-	Slope, Military Vehicles, Test Methods, Operation, Braking, Climbing
TOP 2-2-611	-	Standard Obstacles
TOP 2-2-612	-	Fording
TOP 2-2-650	-	Engine Cold-Starting and Warm-Up Tests
TOP 2-2-800	-	Tracked Vehicle Center of Gravity
TOP 2-2-816	-	High and Low-Temperature Tests of Vehicles

(Copies of the above documents can be obtained from https://vdls.atc.army.mil.)

2.2 Non-Government Publications

The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issue of the documents cited in the solicitation.

ASSOCIATION OF AMERICAN RAILROADS (AAR)

AAR Open-Top Loading Rules Manual

DISTRIBUTION STATEMENT A. Approved for Public Release; distribution unlimited.

(Copies of the above document are available from the Association of American Railroads, 50 F Street, NW, Dept. 6015, Washington, DC 20042-6015 or through their website www.aar.org.)

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME PALD-2009 - Safety Standard for Portable Automotive Lifting Devices

(For copies of ASME Standards, contact ASME, 22 Law Drive, Box 2900, Fairfield, NJ 07007-2900, United States, 800-843-2763 (phone), 973-882-1717 (fax), or infocentral@asme.org (e-mail) or check their website at www.asme.org.)

ASTM INTERNATIONAL

ASTM D975	-	Standard Specification for Diesel Fuel Oils
ASTM D1149	-	Standard Test Method for Rubber
ASTM D2000	-	Standard Classification System for Rubber Products in Automotive Applications
ASTM D3699	-	Standard Specification for Kerosene
ASTM D5486	-	Standard Specification for Pressure-Sensitive Tape for Packaging, Box Closure, and Sealing
ASTM E2462	-	Standard Performance Specification for Cargo Bed Cover (CBC) HMMWV, Type I
ASTM G21	-	Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

(For copies of ASTM Standards, contact ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, United States, 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail) or check their website at www.astm.org.)

SAE INTERNATIONAL

SAE J20	-	Coolant System Hoses
SAE J163	-	Low Tension Wiring and Cable Terminals and Splice Clips
SAE J198	-	Windshield Wiper System - Trucks, Buses, and Multi-Purpose Vehicles
SAE J294	-	Service Brake Structural Integrity Test Procedure-Vehicles over 4500 kg (10 000 lb) GVW
SAE J318	-	Automotive Air Brake Line Couplers (Glad hands)
SAE J336	-	Sound Level for Truck Cab Interior
SAE J366	-	Exterior Sound Level for Heavy Trucks and Busses
SAE J377	-	Performance of Vehicle Traffic Horns
SAE J381	-	Windshield Defroster Systems Performance Guidelines - Trucks, Buses, and Multi-Purpose Vehicles
SAE J645	-	Automotive Transmission Terminology
SAE J680	-	Location and Operation of Instruments and Controls in Motor Truck Cabs
SAE J753	-	Maintenance Interval Chart
SAE J849	-	Connection and Accessory Locations for Towing Multiple Trailers – Truck and Bus
SAE J902	-	Passenger Car Windshield Defrosting Systems
SAE J903	-	Passenger Car Windshield Wiper Systems
SAE J942	-	Passenger Car Windshield Washer Systems
SAE J986	-	Sound Level for Passenger Cars and Light Trucks
SAE J1100	-	Motor Vehicle Dimensions

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SAE J1247	-	Simulated Mountain-Brake Performance Test Procedure
SAE J1292	-	Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring
SAE J1362	-	Graphical Symbols for Operator Controls and Displays on Off-Road Self Propelled Work Machines
SAE J1404		Service Brake Structural Integrity Requirements - Vehicles over 10,000 lb (4500 kg) GVW
SAE J1436	-	Requirements for Engine Cooling, System Filling, Duration and Drawdown Tests
SAE J1455	-	Joint SAE/TMC Recommended Environmental Practices for Electronic Equipment Design (Heavy Duty Trucks)
SAE J1503	-	Performance Test for Air-conditioned, Heated, and Ventilated Off-road, Self-propelled Work Machines
SAE J1508	-	Hose Clamp Specifications
SAE J1517	-	Driver Selected Seat Position (A)
SAE J1992	-	Wheels/Rims-Military Vehicles-Test Procedures and Performance Requirements
SAE J2014	-	Pneumatic Tires for Military Tactical Wheeled Vehicles
SAE J2180	-	A Tilt Table Procedure for Measuring the Static Rollover Threshold for Heavy Trucks
SAE J2181	-	Steady-State Circular Test Procedure for Trucks and Buses
SAE J2360	-	Lubricating Oil, Gear Multipurpose (Metric) Military Use
SAE J2402	-	Symbols for Controls, Indicators, and Tell-Tales
SAE J2422	-	Cab Roof Strength Evaluation-Quasi-Static Loading Heavy Trucks

(Copies of the above documents are available from the SAE International 400 Commonwealth Drive, Warrendale, PA, 15096 or on their website www.sae.org.)

ISO INTERNATIONAL

ISO 2631	-	Mechanical vibration and shock - Evaluation of Human Exposure to Whole-Body Vibration

(Copies of the above documents are available from the ISO, 1 ch. de la Voie-Creuse, Case postale 56, CH-1211 Geneva 20, Switzerland or on their website www.iso.org.)

THE SOCIETY FOR PROTECTIVE COATINGS

SSPC-Paint30	-	Weld-Through Inorganic Zinc Primer

(Copies of the above document can be obtained from their website at www.sspc.org.)

UNDERWRITERS LABORATORIES INC. (UL)

UL94	-	Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

(Instructions for obtaining copies of the above document can be obtained from their website at www.ul.com.)

EUROPEAN COMMITTEE FOR ELECTROTECHNICAL STANDARDIZATION

EN 60529 IP67	-	Degrees of Protection Provided by Enclosures (IP Code)

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(Copies of the above document can be obtained from their website at www.cenelec.eu.)

2.4 ORDER OF PRECEDENCE

In the event of a conflict between this Performance Specification and cited references, this Performance Specification shall take precedence. If there is a conflict between references, the Contractor is required to contact, in writing, the contracting activity for clarification. Nothing in this performance specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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Section 3	Method	Section 4
3. REQUIREMENTS. Requirements specified in section 3 are defined as thresholds unless noted as objectives. Unless otherwise stated, the MECV shall meet all requirements herein at vehicle weights from Curb Weight (ref 3.2.2) to Gross Vehicle Weight (ref 3.2.7).		4. VERIFICATION. 4.1 Responsibility for inspection. Unless otherwise specified in the contract or this purchase description, the Contractor is responsible for the performance of all inspection requirements as specified herein. The Government reserves the right to perform or witness any of the inspections set forth in this purchase description where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements. 4.1.1 Responsibility for compliance. All items must meet the requirements of sections 3 and 4. The absence of any inspection requirements in the specification does not relieve the Contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance shall comply with all requirements of the contract. 4.2 Classification of inspection/test. The inspection requirements specified herein are classified as follows: a. Competitive Run off Test (CRT) b. First Production Vehicle Inspection (FPVI) c. Production Qualification Test (PQT) d. Follow-on Production Test (FPT) 4.2.1 Test locations. Tests shall be conducted at the following locations: TEST LOCATION CRT Government Proving Ground FPVI Place of manufacture PQT Government Proving Ground FPT Government Proving Ground

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Section 3	Method	Section 4
		4.3 First Production Vehicle Inspection. 4.3.1 In-process inspection. During fabrication of the vehicles, in-process inspections will be conducted by Government representatives to evaluate conformance of materials and workmanship to requirements of specified documents. Vehicles and all components shall be available for inspection. The inspections shall be made at the Contractor or subcontractor's facility prior to application of primer and paint. Processing and weld procedures, quality system, inspection records, calibration procedures and certifications will be reviewed and evaluated during in-process inspection. 4.3.2 Completed vehicle inspection. This requirement will be done in two phases. The first FPVI vehicle shall be selected at random by the Government representative from the Contractor's Production Qualification Vehicle (PQT) build. The second vehicle shall be selected at random by the Government representative from Low Rate Initial Production (LRIP). The FPVI vehicle selected shall be road tested and inspected by the Government and Contractor at the place of manufacture. At the time of this inspection, the Contractor shall make available to the Government the Inspection Plan, inspection records and all certifications pertinent to the vehicle and its components. The road test shall be conducted with actual or simulated payload on a smooth, relatively level hard-surfaced road for not less than 20 miles. Prior to the 20-mile road test, a vehicle at CW shall be subjected to a 10-mile road test to verify brakes, steering, and basic safety of operation. The Government, at its option, may witness and/or participate in any/all inspections and road tests performed by the Contractor. 4.3.2.1 Vehicle disposition. After completion of inspection, the first production vehicle from LRIP shall remain at the manufacturing facility, as a production sample, and be the last

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Section 3	Method	Section 4
		vehicle of its type shipped on the contract. The vehicle(s) may be released sooner at the discretion of the contracting officer. The offeror shall service and maintain the vehicle(s) during this period per applicable documents for care and preservation while in storage. All configuration changes taking place after the first production inspection shall be made to the first production vehicle(s) so that the vehicle(s) will be representative of the current configuration throughout the life of the contract. No configuration changes may be implemented on production vehicles after Government conditional acceptance of the first production vehicle (applicable vehicle type) without written authorization from the Government. 4.3.2.2 Parts and components. The Contractor when requested shall make available to the Government at the time of any Government inspection, legible drawings and printed specifications to which the end item or any of its parts/components were manufactured. Such drawings and specifications shall be annotated to reflect the latest revision incorporated therein. Upon completion of inspection(s) by the Government, all drawings and specifications will be returned to the Contractor. The Government reserves the right to inspect end items or any parts/components during all manufacturing processes and to advise the Contractor of any material that does not conform to either Government or Contractor drawings/specifications. Vehicles will not be shipped to the test site until all defects have been corrected and vehicles are fully functional. During any Government inspection, the Contractor shall provide inspection assistance upon request. 4.4 Production Qualification Test. To determine conformance to Section 3 (inclusive), after completion of FPVI (section 4.3), production vehicles shall be randomly selected by the Government at the Contractor's manufacturing facility. These vehicles will be subjected to a 20,000-mile RAM-D test per the

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Section 3	Method	Section 4
		following table:

20,000 MILE PER VEHICLE DURABILITY TEST SCENARIO TEST COURSE	%	MILES	VEHICLE SPEED
Paved Roads	30	6000	Varying up to maximum safe speed
Secondary	30	6000	
Cross Country	40	8000	

In the event the production contract delineates test mileage less than 20,000 miles, the mileage mix (i.e. Paved Roads - 30%, Secondary Roads - 30%, and Cross country Roads - 40%) shall remain the same for the revised mileage. Quantity of test vehicles to be tested shall be specified in the production contract. Such testing shall be conducted at Government-selected test site(s). The vehicles shall be tested with actual or simulated payload and towed load to reflect vehicle GCW. Unless otherwise specified by the Government procuring activity, the Contractor shall refurbish vehicles after test completion.

4.5 Methods of Verification. To determine conformance to the requirements of Section 3 ,various methods will be utilized as described below:

Inspection (I). Inspections constitute those activities conducted by the Government inspector for the purpose of evaluating vehicle attributes and characteristics against the requirements. Verification shall be accomplished by visual or physical examination of the end item or its subsystems/components, and may include but are not limited to recording measurements, evaluating physical characteristics and interfaces with respect to form, fit, and function, and reviewing descriptive documentation.

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		Test (T). Testing shall be conducted by the Government, and shall be accomplished through the systematic physical operation of the MECV, its subsystems or components, under appropriate and specified conditions, with or without instrumentation, and the collection, analysis, and evaluation of resulting data. Certification (C). Certifications are defined as Contractor-furnished documents certifying compliance with the specific requirement criteria. Certifications shall be signed by the Contractor's certifying official or responsible party, and shall include all supporting performance, inspection, and analytical data, as applicable. As directed by the Government, certifications may be used in lieu of additional verification methods. Certifications are subject to Government verification. Analysis (A). Analyses shall be conducted by the Government and shall consist of technical or mathematical evaluations, mathematical models, simulations, algorithms, charts, diagrams, representative data, or other appropriate means to demonstrate compliance with the Section 3 requirement.
3.1 MECV Variants. There shall be two primary MECV variants as follows:		
3.1.1 Two Door Variant. The 2 door variant requirements apply to the MECV Troop/Cargo/Shelter Carrier.		
3.1.2 Four Door Variant. The 4 door variant requirements apply to the MECV Armament Carrier, TOW Carrier, and Command and Control vehicle.		

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MECV CONFIGURATION REFERENCE TABLE

MECV Configurations		Base Vehicle	Crew		Payload			B-Kit	Towed Load
			2-door • Troop/Cargo/ Shelter Carrier	4-door • All 4-door variants	2-door • Troop/Cargo/ Shelter Carrier	4-door • Armament Carrier • TOW Carrier	4-door • Command & Control		
Curb Weight	**CW**	×							
Essential Combat Configuration	**ECC**	×			2000 lbs	2000 lbs	2000 lbs		
Gross Vehicle Weight	**GVW**	×	2 (698 lbs)	3 (1023 lbs)	4550 lbs	1800 lbs	2300 lbs		
B-Kit Configuration	**BKC**	×	2 (698 lbs)	3 (1023 lbs)	4550 lbs	1800 lbs	2300 lbs	×	
Gross Combined Weight	**GCW**	×	2 (698 lbs)	3 (1023 lbs)	4550 lbs	1800 lbs	2300 lbs		4200 lbs
Gross Vehicle Weight Rating	**GVWR**	**Manufacturer's maximum weight rating for vehicle**							

3.2 Definitions.		
3.2.1 Basic Issue Items (BII). Essential items furnished with the vehicle that are required for vehicle emplacement, operation, and emergency repair.		
3.2.2 Curb Weight (CW). The weight of the empty vehicle with integrated base cab protection (3.8.1.1), BII, integrated equipment (ref. 6.2.7), and full fluids including fuel, lubricants, and coolants.		

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3.2.3 Crew Weight. The 2 door variant crew weight is 698 lbs, and is based on the weight of a two-soldier crew with their individual equipment (clothing, body armor, ammunition, weapon, food, etc.). The 4 door variant crew weight is 1023 lbs, and is based on the weight of a three-soldier crew with their individual equipment. The weight of ~~additional~~ crew members and their individual equipment in excess of the weights defined above is included in vehicle payload.		
3.2.4 Vehicle Payload. Vehicle payload consists of vehicle-carried items that are not included in curb weight. Vehicle payload includes items such as cargo, kits, gunner protection kits (3.8.7), crew served weapons, ammunition, subsystems, shelters, radios, and trailer tongue weight. Vehicle payload does not include the crew weights listed in section 3.2.3.		
3.2.5 B-kit. Removable armor protection kit per section 3.8.1.2.		
3.2.6 Essential Combat Configuration (ECC). The vehicle at CW plus 2000 lbs (configurable between crew weight and vehicle payload).		
3.2.7 Gross Vehicle Weight (GVW). The vehicle at CW + required payload + crew weight.		
3.2.8 B-kit Configuration (BKC). The vehicle at GVW + B-kit.		
3.2.9 Gross Combined Weight (GCW). The vehicle at GVW with towed load per section 3.3.2. Trailer tongue weight is included in vehicle payload.		
3.2.10 Gross Vehicle Weight Rating (GVWR). The maximum total vehicle weight for which the vehicle is rated by the manufacturer.		
3.3 MECV Capacity.		
3.3.1 Required Payload. The 2 door variant MECV shall accommodate a vehicle payload of no less than 4,550 pounds with a shelter having a Center of Gravity	T	Weight determined at start of test phase per TOP 2-2-801 & TOP 2-2-800.

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(CG) at 39 inches above the cargo bed floor. The Armament Carrier and TOW Carrier variants shall accommodate a vehicle payload of no less than 1,800 pounds. The Command and Control variant shall accommodate a vehicle payload of no less than 2,300 pounds.		
3.3.2 Towed Load. The MECV, over the Operational Mode Summaries/Mission Profiles (OMS/MP), shall accommodate towed loads of at least 4,200 pounds. The tongue weight shall not exceed 10% of the total towed load, and is included as part of the vehicle payload.	T	The MECV variants will be tested for ability to meet the requirement.
3.3.3 Crew Capacity. The 2 door variant MECV shall accommodate two crew in the primary crew seats (ref. 3.17.1). The 4 door variant MECVs shall simultaneously accommodate two crew in the primary crew seats and two crew in the secondary crew seats (ref. 3.17.2). The Armament Carrier and TOW Carrier variants shall additionally accommodate a fifth crewmember (gunner) in the gunner station (ref. 3.32.1.3).	I	The MECV will be inspected per this requirement.
3.3.4 BII Contents. The MECV BII shall be furnished with the vehicle. BII shall include items with equivalent functionality to the current HMMWV BII listed in Annex C, and as necessary to meet all requirements specified herein.	I	BII will be inspected for completeness.
3.3.5 ECC Weight Limit. The MECV at ECC shall not exceed 14,669 lbs for all variants.	T	Weight determined at start of test phase per TOP 2-2-801 & TOP 2-2-800.
3.3.6 GVW Weight Limit. The MECV at GVW shall not exceed 15,500 lbs for all variants.	T	Weight determined at start of test phase per TOP 2-2-801 & TOP 2-2-800.
3.4 Service Life. The MECV shall have a total service life of not less than 15 years, which may include varying or extended periods in corrosive environments to include high humidity, salt spray, road deicing agents, gravel impingement, and atmospheric contamination. Corrosion control techniques shall be compatible with Nuclear, Biological and Chemical (NBC) decontamination procedures. No action beyond normal washing and/or repair of damaged areas shall be necessary to keep the corrosion protection in effect. Damaged areas are defined to mean any fault that is not a result of a deficiency	T	To determine conformance, the MECVs will be tested per IOP 385-082701.

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in design, material and/or manufacturing.		
3.5 Maintainability. The MECV shall be maintainable by the Army's 2-Level Maintenance System, and shall attain a fully mission capable readiness status using the Army's standard logistics system plus Army standard test, measurement, and diagnostic equipment (TMDE).	A	The MECV maintainability characteristics will be assessed after completion of 20,000 miles of operation. Miles will follow the 30% primary, 30% secondary and 40% cross-country mission profile. Repairs and maintenance shall be completed per user manuals.
3.5.1 Reserved.		
3.5.2 Tools. The MECV shall allow all Field Level Maintenance Actions to be accomplished with tools included in the Forward Repair System (FRS), NSN 4940-01-463-7940, Standard Automotive Tool Set (SATS), NSN 4910-01-490-6453, General Mechanic's Tool Kit (GMTK), NSN 5180-01-548-7634, and the HMMWV Special and Supplemental Tool Kits listed in TM 9-2320-387-24P. No additional special tools shall be required for maintenance on the MECV.	A/C	The MECV will be assessed to determine conformance with this requirement. Contractor shall provide documentation of tools required for vehicle maintenance. ~~Component listings of the GMTK, FRS, and SATS tool kits will be made available.~~ The component listings for the HMMWV Special and Supplemental tool kits are listed in TM 9-2320-387-24P (RPSTL).
3.5.3 Mean Time To Repair (MTTR). The Mean Time to Repair for all Essential Unscheduled Maintenance Demands (EUMD) ($MeanTTR_{EUMD}$) shall not exceed 2 hours for the MECV at GVW.	T	During PQT, the Mean Time to Repair for all Essential Unscheduled Maintenance Demands (EUMD) ($MeanTTR_{EUMD}$) shall be calculated by dividing vehicle maintenance time (in man hours) by the number of unscheduled maintenance actions required.
3.5.4 Max Time to Repair (MaxTTR). The Maximum Time to Repair for 90% of EUMDs (MaximumTTREUMD) shall not exceed 4 hours for the MECV at GVW.	T	Verification will consist of a calculation in which the number of EUMDs requiring less than 2 hours is divided by the total number of EUMD actions.

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3.5.5 Component Removal. Removal and replacement of any major sub-component or assembly on the MECV at GVW shall require no more than 14 clock hours using two maintenance personnel. Clock hours shall be measured from the start of the removal (i.e., "hood-up"), to the completion and subsequent drive off of the vehicle (i.e., "hood-down").	A	To determine conformance, the Contractor shall validate the Interactive Electronic Technical Manual (IETM) instructions for removal and replacement of major sub-components and assemblies. The Government reserves the right to witness validations. Validation documentation shall be provided upon request. Verification of requirement will be performed on vehicle system per IETM procedures using target audience soldiers, RPSTL, and SKO.
3.5.6 Maintenance Ratio. Maintenance Ratios (MR) in terms of Maintenance Man-Hours per Operating Mile (MMH/OM) shall not exceed the .0092 for the MECV at GVW.	T	During PQT, the Maintenance Ratio (MR) for Field Level Maintenance, in terms of Maintenance-Man-Hours per Operating Hour (MMH/OH), shall be calculated using the cumulative maintenance man-hours divided by the total hours of vehicle operation. Maintenance induced errors, crew errors, and operator/inspection times shall be excluded.
3.5.7. Preventive Maintenance Checks and Services (PMCS). Preventive maintenance on the MECV at GVW shall not exceed 10 minutes daily for pre-operation PMCS, 10 minutes daily for post-operation PMCS, and 30 minutes weekly for weekly PMCS. PMCS shall be capable of being performed by operator using only Basic Issue Items.	A	Prior to vehicle operation, test personnel will perform all non-automated PMCS actions. Time to administer PMCS shall be notated.
3.5.8 Test Equipment Compatibility. The MECV vehicle maintenance system shall be compatible with the current U. S. Army Standard Field Level Automatic Test Equipment (ATE), including the Maintenance Support Device (MSD).		
3.6 Reliability.		
3.6.1 Mean Miles Between Operational Mission Failure (MMBOMF). The MECV at GVW shall demonstrate a MMBOMF of no less than 1440 (point estimate).	A	The MECV will be assessed to determine the conformance to requirement during PQT.
3.7 Durability.		

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3.7.1 Engine Test. The engine shall pass the STANAG 4195 NATO Standard Engine Test.	C	The Contractor shall provide test results of NATO 400 hour engine test with both JP-8 and Diesel Fuel.
3.8 Force Protection.		
3.8.1 Armor.	T	Performance validation testing will be performed at a Government testing facility. Contractor data, and other test data generated elsewhere, will not be accepted by the Government as proof of compliance. The MECV survivability will be evaluated at the recipe (coupon), exploitation, and system levels. Exploitation testing will be conducted to determine or confirm excluded zones and vulnerable areas, and to provide a basis to determine if the armor system is sufficient in meeting requirements. All requirements in Annex A may be tested as a system level test in lieu of or in addition to the method indicated. Some coupon testing may be waived by the Government if the recipe's performance has been characterized by the Government on other efforts. Underbody threat requirements as detailed in Annex A will be tested on the most vulnerable part of the underbody as determined by the Government.
3.8.1.1 Base Cab Protection. The MECV at CW shall have an integrated level of base armor that provides 360 degree protection (side, front, rear, and overhead) and underbody protection per Annex A, section 7.1. Base cab underbody protection shall meet requirements listed in Annex A, Tables A-1 and A-1a, at vehicle weights of CW and above. Base cab 360 degree protection shall meet requirements listed in Annex A, Table A-1.	T	Base cab protection will be tested against threats detailed in Annex A, Tables A-1 and A-1a.
3.8.1.2 B-kit Protection. A removable B-kit shall provide enhanced protection per Annex A, section 7.2. B-kit shall provide enhanced 360 degree protection per Annex A, Table A-2, and enhanced underbody protection per Annex A, Tables A-2 and A-2a. B-kit may combine additional protection with the base cab protection (3.8.1.1) to achieve required results. The addition of the B-kit shall not degrade the ballistic protection of the base armor.	T	B-kit protection will be tested against the threats detailed in Annex A, Tables A-2 and A-2a.

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3.8.1.2.1 B-kit Division. The MECV B-kit shall allow flexible vehicle installation in three configurations: 1. Underbody protection only 2. 360 degree protection only 3. Entire B-kit (underbody and 360 degree protection)	I	
3.8.1.3 Armor Weak Areas. The crew compartment shall have no weak areas, as defined in AEP 55-1, Volume 1, against the threats specified in Annex A.	T	Performance will be tested at ballistic cab and system level.
3.8.1.4 Coverage Areas.		
3.8.1.4.1 Diagrams. Diagrams contained within this specification and in Annex A may be similar to the current vehicles, and do not necessarily reflect any potential solution for the crew compartment protection scheme or layout.		
3.8.1.4.2 Current Vehicle. Protection areas shown do not necessarily mean the current vehicle meets the coverage and protection requirements described in this specification and in Annex A.		
3.8.1.5 Transparent Armor. Transparent armor shall be per the requirements of ATPD 2352, with the exception of ballistic protection requirements, which are detailed in Annex A.	I	Transparent armor performance verification shall be per ATPD 2352.
3.8.1.6 Armor Welding Procedures & Weld Repair Procedures. All welds of armor materials shall be developed per Ground Combat Vehicle Welding Code Steel, TACOM drawing number 12479550, and Ground Combat Vehicle Welding Code Aluminum, TACOM drawing number 12472301. The use of pre-qualified weld joints as specified in AWS D1.1 does not preclude submittal of welding procedures.	C	Contractor shall provide weld procedures to Government for approval.
3.8.2 Armor Doors		
3.8.2.1 Door Latches.		

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3.8.2.1.1 Latch Operation. Door latches shall automatically engage upon closing. Latches shall be operated by a single interior handle and a single exterior handle on each door. The handles shall engage or disengage the door latches with one constant motion using one hand. Handles shall return to the neutral position when released. The handles shall operate in the same manner with and without B-kit installed.	I	Performance will be verified by inspection and demonstration.
3.8.2.1.2 Latch Door Retention. Doors shall not inadvertently open in crash and rollover events. Doors shall not inadvertently open when subjected to threats listed in Annex A, and shall be operable after these events.	T	Door retention in crash events will be evaluated per FMVSS 206. Door retention during threats listed in Annex A will be evaluated during ballistic testing.
3.8.2.1.3 Interior Override. Interior door handle shall be operable regardless of any security locks (ref. 3.19) or other obstruction preventing movement of the exterior handle.	I	Performance will be verified by inspection and demonstration.
3.8.2.1.4 Combat Locks. The latches shall provide a combat lock feature that, when engaged, prevents the exterior door handles from operating the latch mechanism. The combat lock feature shall be operable by one hand.	I	Performance will be verified by inspection and demonstration.
3.8.2.2 Door Control. Doors shall be controllable and operable by crewmembers during opening and closing on the longitudinal and side slopes specified in section 3.10.10. If a powered mechanism is used to meet this requirement, the mechanism shall have necessary provisions to prevent injury to crewmembers, simplify crew tasks to initiate, and provide for manual override.	T	Performance will be verified by testing for compliance.
3.8.2.3 Door Sequencing. There shall be no door sequencing issues where one door or its hardware restricts another door from full independent operation.	I	Performance will be verified by inspection and demonstration.
3.8.3 B-kit Mounting Provisions. The MECV shall have permanent B-kit armor mounting provisions, as well as all necessary structure and reinforcements required for B-kit installation. No welding shall be required to mount the armor kits on factory installed mounting provisions.	I	The MECV will be inspected throughout testing to verify compliance to this requirement.
3.8.4 B-kit Installation. The B-kit shall be mountable and demountable by two	T	Compliance will be verified during Logistics Validation and

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personnel using only tools, personnel, and Material Handling Equipment (MHE) found at Field Maintenance Level.		Verification.
3.8.5 B-kit Maintenance Impact. The A-cab/B-kit shall minimize interference with maintenance of the vehicle to which attached. Easy access to frequent vehicle maintenance areas shall be inherent in the kit design. The B-kit shall require no regularly scheduled maintenance beyond standard Preventive Maintenance Checks and Services (PMCS) performed by the operator using onboard BII tools.	I/A	Compliance shall be verified by inspection and demonstration with kits installed.
3.8.6 Emergency Egress Provisions. The crew compartment shall have the following emergency egress features:		
3.8.6.1 First Responder Emergency Extraction. Each door shall have an emergency extraction capability that provides a first responder the means to disengage the door securing hardware and open the door from outside the vehicle. The extraction provisions shall be compatible with the emergency ingress tool, NSN 2590-01-550-2593, and shall include measures to prevent extraction with tools other than the emergency ingress tool. Emergency ingress shall not be hindered when the door is secured with a lock (ref. 3.19). Direction of movement to disengage shall be clearly marked for the rescuer to see, with vehicle upright or inverted.	I	Compliance will be verified by inspection and demonstration.
3.8.6.2 Crew Extraction Bracket. Each door shall have an external crew extraction bracket, that when rigged to a chain or strap of proper working capacity attached to another vehicle, shall allow that other vehicle to open the door by pulling the crew extraction bracket. The force required for door opening via the crew extraction bracket shall not exceed 15,000 lbs in a direction perpendicular to the exterior plane of the door. Door design shall prevent injury to crewmembers inside the vehicle from secondary projectiles created from failing latches, locks, or other vehicle components (complete penetration criteria per MIL-STD 662).	T	Compliance will be verified by testing.
3.8.6.3 Independent Emergency Egress. The crew compartment shall incorporate an emergency exit independent of the side doors and gunner	T	Compliance will be verified by testing.

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station hatch. Egress route shall be operable from inside the vehicle by occupants. External hardware shall not impede the emergency functions of this egress route.		
3.8.7 Gunner Protection Kit Compatibility.		
3.8.7.1 OGPK Compatibility. The Armament Carrier variant MECV gunner station shall be compatible with the Objective Gunner Protection Kit (OGPK) part number 13018185, including battery-powered motorized traversing unit (BPMTU) part number 13018187, and manual traversing mechanism part number 13014408.	I	Compliance will be verified by inspection, demonstration, and fitment.
3.8.7.2 TGPK Compatibility. The TOW Carrier variant MECV gunner station shall be compatible with the TOW Gunner Protection Kit (TGPK), part number 12518475, and shall accommodate mounting of the components of the TOW Weapon Station Installation, drawing 12518721.	I	Compliance will be verified by inspection, demonstration, and fitment.
3.9 Transportability. Per MIL-STD-1366, the MECV shall meet the following transportability requirements. Unless otherwise specified, these requirements shall be met at GCW and at weights ranging from CW to the greater of BKC or manufacturer's published GVWR.	T	The MECV will be tested per MIL-STD-1366 to verify transportability requirements. The Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) will have the final say as to whether or not the MECV passes the transportability requirements.
3.9.1 Vehicle Preparation. The MECV shall require no more than two persons to prepare vehicle for all modes of transportation and for subsequent operation, using only authorized BII and Components of the End Item (COEI). All parts that require removal and subsequent replacement shall have a place for stowage on the vehicle from which removed.	I/T	Requirement will be demonstrated during Logistics Validation and Verification.
3.9.2 Provisions for Lifting, Tiedown, Sling Load, and Airdrop. The MECV shall have military standard provisions for lifting, tiedown, helicopter sling loading, and airdrop suspension at BKC or at manufacturer's published GVWR, whichever is greater. Provisions shall comply with the design and performance criteria specified in MIL-STD-209, MIL-STD-814, and MIL-STD-913, and shall allow loading and securing vehicles for transport by highway, rail, marine, and	C/I/T	Contractor shall provide certification that lift and tiedown points have been designed to meet MIL-STD requirements. Lifting and tiedown provisions will be inspected for required provisions, and tested and validated to verify compliance with this requirement.

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air means. Stencil markings conforming to MIL-STD-209 shall be applied to the vehicle at each lifting and tiedown point. Additional provision guidance is available in MIL-HDBK-1791. The MECV shall be capable of single and dual-point sling lift with subsystems/shelters installed. Additional guidance and information regarding LVAD is available in MIL-HDBK-669.		
3.9.3 Highway Transport. The MECV at CW, GVW, and GCW shall be capable of self-deployment on highways, without waivers or special permits, for all U.S. & NATO countries, per the criteria published in MIL-STD-1366.	I	The MECV will be inspected for compliance to dimension and weight requirements of U.S. and NATO highway limits as published by the American Trucking Association (ATA) and International Road Federation (IRF) and MIL-STD-1366. Details are available from Director, Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA), ATTN: SDTE-DP, 1 Soldier Way, Scott AFB, IL 62225-5006.
3.9.4 Rail Transport. The MECV shall be rail transportable worldwide per the criteria published in MIL-STD-1366, and withstand the rail impact requirements of MIL-STD-810 without damage or performance degradation.	I/T	The MECV will be tested to transportation levels per the American Association of Railroads (AAR) impact tests and method 526 of MIL-STD-810. The MECV will be inspected for compliance to AAR and Gabarit International de Chargement (GIC) diagrams. Following each impact, the HMMWV will be inspected for spillage of lubricants, fuel or coolant, structural damage, electrical shorts and normal operations/performance.
3.9.5 Marine Transport. The MECV shall be marine transportable by Landing Craft Mechanized, Mark 8 (LCM-8) and larger vessels and ships to include break bulk (general cargo) and roll-on/roll-off vessels (RORO) per the criteria published in MIL-STD-1366.	I	The MECV will be inspected and measured per MIL-STD-1366 to determine conformance to dimension and weight limitations imposed.
3.9.6 C-130 Transport. The MECV shall be air transportable (without removal of payload) by C-130 and larger aircraft, per the criteria specified in MIL-STD-1366 and MIL-HDBK-1791, in the following configurations:	A/T	The MECV will be tested per MIL-STD-1366 and MIL-HDBK-1791 to verify the MECV, without prior preparation, can be driven on and off of a C-130 aircraft in the forward and reverse direction. An S-250 shelter will be installed on 2 door variant. Analysis will be done to ensure MECV weights and dimensions meet C-130

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		transport requirements.
3.9.6.1 C-130 GVW Transport. A minimum of two GVW MECVs shall be air transportable by a single C-130 without demounting subsystems/shelters, with a minimum of 12" between vehicles, with crew being passengers on the same aircraft.	T	The MECV at specified configuration will be tested per MIL-HDBK-1791 to verify requirement.
3.9.6.2 C-130 BKC Transport. A single BKC MECV shall be air transportable by C-130 without demounting subsystems/shelters, with crew being passengers on the same aircraft.	T	The MECV at specified configuration will be tested per MIL-HDBK-1791 to verify requirement.
3.9.6.3 C-130 GCW Transport. A single GCW MECV shall be air transportable by C-130 with towed load (either trailer or howitzer) and without demounting subsystems/shelters, with crew being passengers on the same aircraft.	T	The MECV at specified configuration will be tested per MIL-HDBK-1791 to verify requirement.
3.9.7 External Air Transport.		
3.9.7.1 Wind Forces. The MECV shall withstand, without damage, the forces imposed by the wind during external air transport at 130 knots indicated air speed (KIAS)..	T	The MECV will be tested to demonstrate the ability to withstand wind forces at required air speed.
3.9.7.2 CH-47F Lift. The MECV shall be externally transportable at ECC by CH-47F without removal of vehicle subsystems, and without risk to aircraft, in the following conditions: 4,000 feet above sea level, 95° Fahrenheit (F), with a 30 Nautical Mile (NM) radius of action. Payload positioning shall be at commander's discretion.	T	The MECV will be tested to demonstrate the ability to be externally transported by a CH-47F aircraft within respective performance envelopes. Tests will be monitored for performance degradation of the aircraft as well as any physical damage that the vehicle may incur.

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3.9.8 Low Velocity Aerial Delivery (LVAD). The MECV at GVW shall withstand, without damage or degradation in performance, LVAD from a C-130 and from a C-17. The MECV at GVW and GCW shall withstand, without damage or degradation in performance, LVAD from a C-17 with towed howitzer on standard Type 5 airdrop platforms configured to 32-foot length. For vehicles carrying a shelter, the shelter may be removed prior to LVAD. After LVAD, vehicle preparation time for subsequent operation shall not exceed 15 minutes. If removal of shelter, gunner protection kit, or B-kit is allowed for vehicle transport, then time required for such removal and installation is excluded from this requirement.	T	The MECV will be tested per MIL-STD-1366, MIK-STD-1791 and current LVAD policies to demonstrate it can be dropped out of a C-130 or C-17 (depending on availability). After impact, the vehicle shall be inspected for spillage of lubricants, fuel or coolant, structural damage, electrical shorts and normal operation/performance.
3.10 Mobility. Unless otherwise specified, the following mobility characteristics apply at GCW and at weights ranging from CW to GVW.		
3.10.1 Scope of Operations. The MECV shall be capable of operating at the mobility levels specified per the Operational Mode Summary/Mission Profile (OMS/MP), Annex B, during blackout conditions, day/night operations, inclement weather (rain, snow, hail, ice, fog), periods of limited visibility, and in geographical areas that include desert, grassland, forest, urban areas, mountain, snow, ice, salt water, sand, mud, swamp, tundra, and jungle.	T	The MECV will be tested per the OMS/MP profile to determine it is capable of operating at the specified mobility levels. The MECV will be tested per Frame-Twister Course test of TOP 2-2-611. Doors, latches, and controls shall be operable at points of maximum twist, and during operation there shall be no hunting of transmission gears at any speed or gear ratio. The MECV will be tested per Trench Crossing test of TOP 2-2-611 to determine it is capable of negotiating a V-ditch trench without damage to the vehicle.
3.10.2 Forward Speed. On dry, level, hard surface roads, the MECV at GVW shall maintain a minimum forward speed of 62 mph.	T	The MECV will be driven on a dry, level, hard surface road. The MECV will be tested for achieving and maintaining a speed of not less than the requirement. Reference TOP 2-2-602.
3.10.3 Speed on Grade. The MECV at GVW shall ascend a paved surface with a 5% grade at a speed of 45 mph (T). The MECV at BKC shall ascend a paved surface with a 5% grade at a speed of 50 mph (O).	T	The MECV will be fitted with a dynamometer to simulate the effort required to climb a 5% grade. Under these conditions, the vehicle will be required to travel 3 miles at indicated speed. Any stopping during the test is considered a failure.
3.10.4 Acceleration. On dry, level, hard surface roads, the MECV at GVW shall accelerate from 0 to 30 mph within 14 seconds and from 0 to 50 mph within 42	T	The MECV at specified configuration will be driven on a dry, level, hard surface road. With the MECV at operating temperature and

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seconds .		from a standing start, accelerator is fully depressed to until the specified speed is obtained. Time measurement shall begin with engagement of accelerator pedal. The times from three consecutive runs will be averaged to obtain final results. Reference TOP 2-2-602.
3.10.5 Soft Soil Mobility. The MECV at GVW shall be capable of traversing fine grain soils with a Rating Cone Index (RCI) of 31 in a single pass.	T/A	The MECV single-pass vehicle cone index (VCI_1) will be calculated per Appendix E. Further guidance is available in FM 5-430-00-1.
3.10.6 Standard Obstacles.		
3.10.6.1 Vertical Wall. The MECV shall be capable of climbing a vertical step of 18" in forward direction without damage to the vehicle.	T	The MECV will be tested with winch kit installed per Wall Climbing test of TOP 2-2-611 to determine it is capable of climbing a vertical step in forward direction without damage to the MECV.
3.10.6.2 Simulated Load Ramp. The MECV with winch kit installed shall be capable of negotiating a loading ramp with a 15 degree slope. The approach and departure surfaces shall be horizontal. The length of the inclined surface shall be greater than the overall length of the vehicle and trailer combination. During test, no contact shall be made by the vehicle or trailer (other than wheels) with the ramp, approach surface, or departure surface.	T	The MECV with M1101 or M1102 trailer will be tested per Simulated Loading Ramp test of TOP 2-2-611, except that ramp angle shall be 15 degrees.
3.10.7 Ride Quality.		
3.10.7.1 Ride Limiting Speed. The MECV at GVW shall attain no more than 6 watts average vertical absorbed power, as measured at the driver's seat bottom location, while negotiating the following Root Mean Square (RMS) ride courses at speeds listed below, with the tires at normal tire pressure.	T	Vehicle will be tested per TOP 1-1-014. Ride quality testing will be performed with tires set to normal inflation pressure. Vehicle operations will be conducted by Government Test site personnel.

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Section 3	Method	Section 4
6-Watt Speeds RMS (inches): 1.0, 1.5, 2.0, 2.5 MPH: 30, 20, 15, 13		
3.10.7.2 Vertical Acceleration. The MECV at GVW shall attain no more than 2.5 g of peak vertical acceleration as measured at the floorboard beneath all occupant seats while negotiating a non-deformable, half-round obstacle as listed below with tires at normal pressure:	T	Vehicle will be tested per TOP 1-1-014. Half round is a single, raised ridge consisting of a semicircular cross-section with a constant radius and sufficiently wide such that both wheels on the axle contact simultaneously. The half round shall be made of a non-deformable material. Reference NATO AVTP 03-170 Annex A Semicircular Obstacle where r=4, 6, 8, or 10 inches.
Obstacle Crossing Speeds Obstacle Height (inches): 4, 6, 8, 10 MPH: 50, 16, 15, 5		
3.10.8 Range. The MECV at GVW shall operate on fuel carried in integral fuel tanks for a distance of at least 300 miles at an average speed of 30 to 40 mph on hard-surfaced roads over rolling terrain, with fuel tanks at no more than 95% full.	T	The MECV will be tested per TOP 2-2-603 with fuel tanks filled to 95% capacity. The MECV shall be driven on hard surface roads over Harford Loop Fuel Consumption Course at specified speeds until fuel tanks are empty. Minimum vehicle electrical load during test will be the integrated suite of communications equipment (normal use), and headlights on. Vehicle air conditioning will be operated during test if weather permits.
3.10.9 Reserved.		
3.10.10 Gradability. During execution of the following scenarios, there shall be no slipping, wheel lift, stalling, overheating, loss of stability, loss of oil pressure or fuel supply to engine, or leakage of any fluids.	T	The MECV will be tested per TOP 2-2-610 to determine if it meets the gradability requirements. Gradability tests will be performed on a dry hard surface that is free of loose material.

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Section 3	Method	Section 4
3.10.10.1 Longitudinal Slopes.	T	Longitudinal slope operation shall be performed in both forward and reverse directions, on a dry hard surface that is free of loose material.
3.10.10.1.1 Longitudinal Slope (60%). The MECV at GVW shall be capable of ascending, descending, stopping, and starting on slopes up to and including 60%.	I/T	The MECV will be tested per TOP 2-2-610 to ascend/descend grades in the forward and reverse directions. The MECV service brakes will be applied with the MECV completely on the grade. The MECV, once restarted shall continue ascending/descending the grade at the same speed. Any stalling, slipping, overheating, upsetting or hesitation is not permitted. The MECV will be inspected for no leaking of fuel, lubricants or coolants. There will be no loss of mobility or stability, and no loss of fuel to the engine while performing these operations. Fuel tank will not be more than 10% full.
3.10.10.1.2 Longitudinal Slope (40%). The MECV at GCW shall be capable of ascending, descending, stopping, and starting on a 40% longitudinal slope.	I/T	The MECV will be tested with a M1101 or M1102 trailer per TOP 2-2-610 to ascend/descend grades in the forward and reverse directions. The MECV service brakes will be applied with the MECV completely on the grade. The MECV, once restarted shall continue ascending/descending the grade at the same speed. Any stalling, slipping, overheating, upsetting or hesitation is not permitted. The MECV will be inspected for no leaking of fuel, lubricants or coolants. There will be no loss of mobility or stability, and no loss of fuel to the engine while performing these operations. Fuel tank will not be more than 10% full.
3.10.10.1.3 Longitudinal Slope (30%). The MECV at GCW shall be capable of holding on a 30% longitudinal slope in forward and reverse directions using only the parking brake, with engine off and transmission in neutral.	I/T	The MECV will be tested per TOP 2-2-610 to ascend/descend grades in the forward and reverse directions. The MECV service brakes will be applied with the MECV completely on the grade. The parking brake will be applied, the transmission place in neutral, and the engine shut off. The service brake will be released. The MECV will be inspected for ability to hold motionless on the grade.

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Section 3	Method	Section 4
3.10.10.2 Side Slopes. The MECV at GVW shall traverse a side slope of 40% with no tire lift with either side of the vehicle facing up the slope.	I/T	The MECV will be tested per TOP 2-2-610 to determine it meets the slide slope requirements by having the MECV traverse across a 40% side slope in both directions with an intermediate stop and start while facing each direction. Operations shall be performed without evidence of stalling, slipping, overheating, upsetting, hesitation, loss of mobility or stability, leaking of fuels, lubricants or coolants, or loss of fuel flow to engine. Fuel tank will not be more than 10% full.
3.10.11 Approach/Departure Angles. The MECV at GVW shall have an approach angle of no less than 47° and a departure angle of no less than 36°.	I	The MECV will have approach and departure angles measured per SAE-J1100.
3.10.12 Fording. The MECV shall be capable of hard bottom fresh and salt water crossings at a minimum of 5 mph and a minimum water depth of 30 inches without preparation, kits, or any increased after-action requirements. Vehicle shall be capable of continuing operation after fording without additional maintenance. While the vehicle is immersed to the specified depth for a period of at least 15 minutes, the engine shall be capable of being stopped and kept inoperative for one minute. After the one minute period the engine shall be capable of being restarted and attaining normal operating capability within one minute from commencement of starting cycle. The engine shall be capable of being operated at idle speed during the remainder of the 15 minute period. All vehicular instruments, components, and accessories shall function normally before, during and after the fording cycle. Contamination of fuels and lubricants by water and water borne contaminants shall not exceed 2% by volume.	I/T	The MECV will be tested per TOP 6-6-612 to ford a hard bottom water crossing without preparation or fording kit in both salt and fresh water. MECV will be inspected for contaminants. All system components will be inspected for waterproofness and proper operation at the competition of the test.
3.11 Automatic Transmission. The MECV shall have an automatic transmission with 4 or more forward gears. All forward gears shall be selectable during forward motion to provide enhanced off-road control and engine braking. Shift lock mechanism shall prevent Reverse (R") or Park ("P") selections while shifting through forward gears. Shift lever shall lock in Drive ("D") when up shifting from positions "1" through "D" without the use of a shift release button. All other positions shall be locked.	T	The MECV transmission shall demonstrate proper automatic operation through all gears ranges during testing.

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Section 3	Method	Section 4
3.12 Cooling Systems.		
3.12.1 Road Load/Tractive Effort. The steady state fluid temperatures of the MECV shall not exceed the limits of standard Army petroleum oils and lubes (POLs), nor the limits recommended by component manufacturers, when operating at: a) sustained road load conditions b) a continuous .61 tractive effort to GVW (TE/GVW) in 120°F ambient air.	T	The MECV will be loaded to GVW and driven on a flat hard surfaced road at 55 mph until all lubrication, coolant, and component temperatures stabilize. The MECV will also be subjected to a continuous .61 tractive effort to GVW, at wide-open throttle, until all lubrication, coolant, and component temperatures stabilize. Both tests will be completed at a temperature of 120°F. Once temperatures are stabilized the lubrication, coolant and components will be checked to insure that they are within recommended limits.
3.12.2 Cooling System Fans. Cooling system fan design shall preclude inadvertent activation during vehicle maintenance procedures. Fan clutches and control systems shall be designed so that fan continues to operate in case of fan clutch or control system failure.	T	MECV will be tested to determine conformance with this requirement.
3.13 Vehicle Handling and Safe Operation. The MECV at BKC shall be capable of safely operating throughout the OMS/MP. Unless otherwise specified, the following operational characteristics apply at CW, GCW, and BKC.		
3.13.1 Steering. The MECV steering system characteristics shall be within operator capability over the OMS/MP, and shall allow the operator to maintain steering control of the vehicle at all speeds. The MECV shall exhibit understeer during steady state turns, demonstrating an understeer gradient of at least 1.0 deg/g at the wheels when tested per SAE Procedure J266.	T	The MECV steering system will be tested per TOP 2-2-609 and SAE J266.
3.13.2 Braking. The MECV shall be equipped with service brakes and parking brakes in compliance with SAE J1404 (except for the structural endurance test of paragraph 6.3 of SAE J294, which does not apply), FMVSS 105, 106, 116, and FMCSR 393 Subpart C (393.40-55). The MECV shall exhibit no mechanical failures when tested per SAE J294, section 6.5, Structural Ultimate Strength Test. The MECV braking system characteristics, including parking and service brake pedal effort, shall be within operator capability over the OMS/MP.	T	The MECV braking system characteristics will be tested per the test methods listed in the requirement.

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Section 3	Method	Section 4
3.13.2.1 Stopping Distance. At GVW, MECV service brakes shall stop the vehicle from a speed of 20 mph in 23 feet or less, and from a speed of 40 mph in 112 feet or less, on a dry, hard, approximately level road surface that is free from loose material. At BKC, MECV service brakes shall stop within distances prescribed in FMVSS 105.	T	The service brakes shall stop an MECV within the distances prescribed. The vehicle shall not experience more than a 1' drift to either side. The MECV is to be tested on a dry, hard, approximately level road that is free of loose material. Measurement for total stopping distance will begin from the point where the brake pedal is initially engaged. Conformance will be determined from the averaging of three consecutive runs. During each test, the MECV will be monitored for pulling to the left or right and wheel lock.
3.13.2.2 Safety and Mountain Braking Tests. At GVW and GCW, the MECV brake system shall meet the requirements of the Wheeled Vehicles Braking Test Operation Procedure 2-2-608, section 4.2 Safety Evaluation (with the exception of section 4.2.5 trailer breakaway), and section 4.3.3 (Mountain Highway Brake System Tests).	T	The MECV braking system will be tested per TOP 2-2-608. MECV at GCW will be tested with M1101 or M1102 trailer.
3.13.2.3 B-Kit Brake Fade Test. The MECV at BKC shall not exhibit brake fade when tested per SAE J1247.	T	The MECV braking system will be tested per SAE J1247, with the exception that the test will be performed at BKC.
3.13.3 Turning Radius. The MECV shall not exceed a 25-foot curb-to-curb turning radius.	T	The MECV turning radius will be tested by making full 360° turns in both the clockwise and counterclockwise directions per TOP 2-2-609 Minimum Turning Circle. Turning stop adjustments between directions is not permissible.
3.13.4. NATO Lane Change. The MECV at weights from CW to GVW shall meet NATO lane change requirements per AVTP 03-160 W at a minimum speed of 43 mph.	T	The MECV will be tested to meet NATO lane change requirements at the required speed per AVTP 03-160 W.
3.13.5 Lateral Acceleration. The MECV shall be capable of sustaining 0.4 g lateral acceleration in a steady state cornering maneuver on a paved surface without wheel lift.	T	The MECV will be tested per SAE J2181 and TOP 2-2-609.
3.13.6 Roll Gradient. The MECV shall exhibit a roll gradient not to exceed 12 deg/g during steady state turns, as defined in SAE Procedure J266.	T	The MECV will be tested per SAE J266.

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Section 3	Method	Section 4
3.14 Fuel, Lubrication, and Fluids. The MECV shall fully operate with applicable military standard fuels, lubricants and fluids as required by the climatic operating requirements without adverse effect on vehicle or components. The MECV shall not require the introduction of new fuels, lubricants, or fluids into the Army inventory. Reference TARDEC POL Products Guide.	C	The Contractor shall certify that the MECV can operate with applicable military standard fuels, lubricants and fluids per the TARDEC POL Products Guide.
3.14.1 Fuel.		
3.14.1.1 Fuel Compatibility. The MECV shall operate without adverse affects under sustained operation and meet the requirements of this specification utilizing fuels complying with ASTM D975 (1-DS15) and MIL-DTL-83133 (JP-8).	C	The Contractor shall certify and warrant that the MECV is capable of operating with fuels complying with ASTM D975~~, MIL-DTL-5624,~~ and MIL-DTL-83133~~, and MIL-DTL-16884~~. All performance and endurance testing will be completed using either JP-8 or 1-DS15 at the Government's discretion.
3.14.1.2 Fuel System. The MECV fuel system shall meet the requirements of FMCSR 393.65, FMCSR 393.67, and FMVSS 301. Fuel system components, including fuel tanks, drain plugs, fuel filters, shut-off valves, and supply and return lines, shall be protected from damage from external objects such as rocks, limbs, and logs. Fuel tank port(s) shall be compatible with A-A-52030 Type II, size 2 nozzles and shall permit refueling at a rate of at least 20 gallons/minute. ~~Reference NSN 4930-01-318-6091.~~ Fuel tank ports shall be armored to the same level as the surface they are located on, and shall only allow opening the access cover by the crew.	C/I/T	Contractor shall certify that the fuel tank(s), vents, and caps shall meet the requirements of FMCSR 393.65, FMCSR 393.67, and FMVSS 301. The fuel tank(s) will be examined/tested to all other requirements as specified. Fuel tank(s) will be inspected for the proper installation, and evidence of leaks. Fuel tank port(s) will be examined/tested for conformance with A-A-52030 Type II, size 2 nozzles and the required fuel flow rate.
3.14.1.3 Drain Plug. A drain plug shall be provided at the lowest point of the fuel tank(s). Drain plug shall not be manually removable. ~~Drain plug shall be removable using vehicle BII.~~	I	
3.14.1.4 Fuel Tank Location. Fuel tank(s) shall not be located on or under the crew compartment.		
3.14.2 Lube. The MECV shall operate with lubricating oils and grease complying with MIL-PRF-2104, SAE J2360, MIL-PRF-46167, and MIL-PRF-10924.	T	The MECV will operate with lubricating oils and grease complying with MIL-PRF-2104, SAE J2360, MIL-PRF-46167, and MIL-PRF-10924 during all phases of test.

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Section 3	Method	Section 4
3.14.3 Antifreeze. The M-ECV shall operate with Type I and Type II antifreeze complying with A-A-52624, concentration B (antifreeze to water ratio not exceeding 60% by volume).	T	Throughout testing, the MECV will operate with antifreeze complying with A-A-52624 ~~Type II~~.
3.14.4 Brake Fluid. Hydraulic brake systems shall operate with brake fluid complying with MIL-PRF-46176.	T	Throughout testing, the MECV will operate with brake fluid complying with MIL-PRF-46176.
3.15 Towing. Unless otherwise specified, these requirements apply at GVW and BKC.		
3.15.1 Trailers. The MECV at GVW shall be capable of towing the following trailers (or their equivalent replacements) over the OMS/MP (within the safe operating limit of the trailer). Trailers shall be loaded to the towed load requirements of 3.3.2, but not more than trailer maximum capacity. a) M1101 trailer b) M1102 trailer c) 3/4 ton M101 series cargo trailer d) M119A0/A1 howitzer	T	To determine conformance, the MECV will be tested for the ability to tow a trailer of maximum gross weight of 4200 lbs with no degradation in performance.
3.15.2 Like-vehicle Towing. The MECV, without preparation, shall be capable of flat towing another MECV or legacy HMMWV and being towed by another MECV, over the OMS/MP, using tow bar part number 7551383.	T	Like vehicle towing requirement is considered met if MECV can be towed by another MECV, and if MECV can tow a ECV family truck under the following scenario: both trucks have all four wheels on the ground while one vehicle tows the other for 50 miles over the OMS/MP. Preparation shall not exceed connecting the two trucks with the standard Army tow bar.

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Section 3	Method	Section 4
3.15.3 Recovery Vehicle Compatibility. The MECV shall be capable of being recovered, flat towed, and lift towed from both the front and rear by the following recovery vehicles: a) 5-ton M939 series b) Family of Medium Tactical Vehicles (FMTV) c) Heavy Expanded Mobility Tactical Truck (HEMTT) wreckers.	I/T	The MECV will be hooked up to a 5-ton M939 series wrecker, a Family of Medium Tactical Vehicles (FMTV) wrecker, and a Heavy Expanded Mobility Tactical Truck (HEMTT) wrecker to simulate a towing mission. The MECV will be at GVW and will be lifted from the front and rear. Test will be repeated at BKC. Vehicle components including lift shackles, bumpers, and frame shall not deform during lift tow. Vehicle combination will be inspected to verify form, fit and function and may be driven up to 100 miles.
3.15.4 Towing Provisions. MECV towing provisions (tow lugs, lift-tow rings, tow brackets, safety chain provisions, rear pintle, and front pintle), and associated mounts and supporting vehicle structure shall be capable of withstanding the maximum forces encountered while being used for the towing and winch recovery operations described in sections 3.15 and 3.33.2. Towing provisions shall accept attachment to tow bars and recovery vehicle equipment without interference or modification to vehicle, and without requiring special adapters other than those present with the towing equipment. Towing provisions shall provide adequate hand clearance for attachment of tow bars and recovery vehicle equipment to towing provisions. Tiedown provisions shall not be used as towing provisions if such use requires the removal of shackles or rings.	T	The MECV tow eyes, lift-tow rings, tow brackets, rear pintle, and front pintle will be tested to withstand the maximum forces encountered while being used for towing and winch recovery operations. Towbar and recovery vehicle hookup operations shall be tested while wearing MOPP 4 gloves or Arctic gloves.
3.15.4.1 Tow Lugs. The vehicle shall have clearly identified and accessible front and rear tow points. “TOW” shall be stenciled in 1” high lettering next to each tow lug.	I	Vehicle shall be inspected for compliance with this requirement.
3.15.4.2 Safety Chain Provisions. The MECV shall have provisions to accept two trailer safety chain hooks. The safety chains shall not attach to the pintle hook or any other device on vehicle to which the tow-bar is attached. Safety chain hook attachments shall have an ultimate strength of no less than BKC. The safety chain hook attachment points shall allow the safety chains to be connected in a manner which prevents the tow-bar from dropping to the ground in the event it fails or becomes disconnected.	I	Vehicle shall be inspected for compliance with this requirement.

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Section 3	Method	Section 4
3.15.4.3 Rear Pintle. The MECV shall have a pintle on the rear of the vehicle for towing/recovery operations. The pintle shall have the capacity to support recovered towing of a like vehicle at BKC. The pintle assembly shall conform to the size and strength described in A-A-52550.	I	The MECV will be examined for provisions, connections and mounting hardware for front mounting of a pintle assembly.
3.15.5 Towing Electrical Connectors. A 24 volt connector (socket type) conforming to STANAG 4007 shall be provided at the rear of the vehicle and shall be integrated into the blackout lighting system.	I	Vehicle shall be inspected for compliance with this requirement.
3.16 Tires/Wheels.		
3.16.1 Tire and Rim Assembly. Rims and tires shall meet the Mechanical Reliability and Tire Treadlife Durability requirements of SAE J2014 with no failures, and shall conform to FMVSS 119 and FMVSS 120. Tires shall have a minimum tread life of 12,000 miles over OMS/MP without re-treading. Tire and rim ratings and dimensions shall conform to the Tire and Rim Association (T&RA) or the European Tire and Rim Technical Organization (ETRTO) Standards Manual at GVW and maximum speed of the vehicle. Tire and rim assembly shall allow for manual adjustment of tire pressure from highway to cross-country pressures. All mobility requirements shall be met using a single tire, rim, and tread design used at all wheel locations, including spare. Tire valves shall be per CID A-A-52611, shall be readily accessible for manual inflation, and shall be provided with valve cap. Tires shall be repairable and replaceable by Field Level Maintenance. Tire and rim assembly shall be replaceable by vehicle crew.	T	Tread wear, while completing PQT endurance miles, will periodically be assessed. Tires shall not need to be replaced due to wear prior to the accumulation of 12,000 miles. The MECV tires/wheels will be tested per SAE-J2014/J1992.
3.16.2 Runflat. The MECV tires shall have a runflat capability that shall permit controlled driving after total loss of air pressure in any two corners for 30 miles over the OMS/MP at the prescribed speeds for each terrain listed in the following table:	T	The tires on two corners, on opposite axles, will be completely deflated. Vehicle will be driven for 30 miles over varying terrain (per OMS/MP) at the prescribed speeds for each terrain listed in the following table:

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Section 3	Method	Section 4
Run-flat Operation Mileage Accumulation Sequence: 1, Distance (Miles): 12.0, Terrain Type: Cross Country, Average Speed (mph): 12.0 Sequence: 2, Distance (Miles): 9.0, Terrain Type: Secondary Road, Average Speed (mph): 21.0 Sequence: 3, Distance (Miles): 9.0, Terrain Type: Paved Road, Average Speed (mph): 30.0		
3.16.3 Tire Change. BII shall contain necessary tools for crew to complete a tire change.	I/T	To be demonstrated during Logistics Validation and Verification.
3.16.4 Vehicle Jack. The MECV BII shall include a lifting jack capable of vehicle jacking operations sufficient for removal and replacement of any wheel assembly on MECV with and without B-kit installed, and at weights up to BKC. Jack slope lifting capability shall be not less than a 7% lateral slope and a 7% longitudinal slope.	T	MECV shall be tested for ability to change wheel assembly using HMMWV Lifting Jack Kit. Jack will be subjected to the requirements of the compound slope stability test per ASME PALD-2009, 5-4.1.4.
3.16.5 Tire Chains. Each MECV wheel location shall accommodate tire chains per CID A-A-52507. Vehicle shall provide stowage for chains when not in use. Vehicle shall have sufficient clearance for operation with tire chains without limiting turning radius and shall induce no damage to tire, wheel well, and adjacent components at speeds up to chain manufacturer's recommended limit. Vehicle components shall be protected as necessary to prevent functional damage from a broken tire chain.	I	Tire chains will be installed and inspected for form, fit, and function per CID A-A-52507.
3.17 Seating. All seats and seat belts shall conform to the dimensions stated in MIL-STD-1472 and accommodate a soldier with their worn equipment (ref 3.26.2) without interfering with vehicle or crew operation.	A	The MECV will be inspected to verify conformance to this requirement.
3.17.1 Primary Crew Seats. The MECV shall have two primary crew seats which are ergonomically designed to provide leg, back, shoulder, and head support. The driver's seat shall be adjustable to accommodate vehicle operation per SAE	I	The MECV, using FMVSS 207, 208, and 210 as a guide, will be inspected and checked for seating that meets this requirement.

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J1517.		
3.17.2 Secondary Crew Seats. The 4 door variant MECVs shall have secondary seating for at least two additional soldiers which are ergonomically designed to provide leg, back, shoulder, and head support.	I	The MECV, using FMVSS 207, 208, and 210 as a guide, will be inspected and checked for seating that meets this requirement.
3.17.3 Crew Restraint System. Each occupant seat (seats in the primary and secondary seating areas but excluding troop seats and ambulance kits) shall have modern safety restraint equipment that meets or exceeds Federal Motor Vehicle Safety Standards (FMVSS) 208 when operated over the full vehicle mission profile at rated speeds. The system shall provide crash protection and support maintaining vehicle control over the full range of operations. The crew restraint system shall be integrated into the primary and secondary seats. Unless otherwise directed in this performance specification, restraint systems shall meet applicable requirements of FMVSS 207, 208, 209, and 210.	I/C	The Contractor shall certify that the MECV meets all FMVSS requirements as specified. The MECV will be inspected and checked for compliance to the requirement.
3.17.3.1 Seat Belts. All seatbelts shall release away from the body. All seat belts shall come to rest in a consistent position relative to the seat such that belts may be located without hunting. Vehicle occupants shall not have to stoop or turn their bodies to find seat belts. All seatbelt length adjusters shall move smoothly and easily and in a manner easy to understand and intuitive to the user. No seatbelt webbing or straps shall contact or rub against any surface (such as bolts, seat hardware, or metal seat edge structure) that may cause the webbing to fray, wear, or degrade. Seatbelt webbing shall be durable and of a material other than nylon.	I/C/T	Vehicle shall be inspected and tested per MIL-STD-1472 and FMVSS 209 to verify compliance with this requirement. The Contractor shall certify that the seat belt meet the requirements of FMVSS 209.
3.17.3.2 Quick Release Buckle. Seatbelt system shall have a quick release buckle, allowing simultaneous and separate belt release. The quick release buckle shall have a single step release that is easily operable and guarded from inadvertent release.	I	Vehicle will be inspected to FMVSS 209 to verify compliance to this requirement.
3.17.3.3 Seatbelt Connections. All belts shall be permanently anchored to their respective anchor mounts, and shall connect only to the quick release buckle.	I	Vehicle shall be inspected per FMVSS 210 to verify compliance to this requirement.

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Section 3	Method	Section 4
3.17.3.4 Inertial Reels. All belts on inertial reels shall have lock-up sensitivity tuned for off-road operations per the OMS/MP mobility requirements of this performance specification. Reels shall not be of automatic-locking retractor type.	I/T	Vehicle shall be inspected and tested per FMVSS 209 and 210 to verify compliance to this requirement
3.17.4 Seating and Window Layout. The primary and secondary crew seats and window layout shall allow a seated and restrained soldier to comfortably observe their assigned sector outside of the vehicle. Vehicle occupants shall not have to lower their head, stoop, or raise their bodies out of their seat to observe out of windows.	I/T	Vehicle shall be inspected and tested per MIL-STD-1472 to verify compliance with this requirement.
3.18 Rollover Roof Crush Resistance. Crew compartment roof crush shall not exceed 1" permanent deformation after being subjected to a dynamic rollover load equivalent to a MECV at GVW being dropped from 18" onto a hard surface anywhere along the top, corner, and side of the A pillar, with the vehicle oriented upside down. Vehicle doors and the independent emergency egress route shall remain operable after the drop.	C/T	Contractor shall certify that their design will meet this requirement. Vehicle will be tested per SAE J996. With Government approval, alternate sub-system testing may be acceptable in lieu of full vehicle testing.
3.19 Vehicle Security. The MECV shall have a means to provide vehicle security (e.g., door locks, locking hatches and fuel tanks and ports, etc.). The security system shall provide the capability to lock the entry points from inside the vehicle without inhibiting a quick exit from the vehicle. Exterior entry point locks shall be compatible with key operated padlock, NSN 5340-00-158-3805, part number AA59487-2S. When the MECV is locked from the outside, it shall be in compliance with requirements for securing communications equipment when vehicle is unattended, but shall not inhibit opening of the doors from the inside, and shall not inhibit opening of the doors during first responder emergency extraction (3.8.6.1).	I	The MECV shall be examined for form, fit and function the securing system. The ability of the crew to exit a locked vehicle will be assessed during PQT.
3.20 Windshield Wipers and Washers. The MECV shall have windshield wipers and washers that meet the requirements of SAE J198 and FMVSS 104. The wipers and washer nozzles shall flexibly accommodate all windshield configurations including with and without B-kit installed.	C/I	Contractor shall certify to verify this requirement is met. The vehicle will be examined for the required windshield washer capability and the system will be inspected for proper installation, electrical and mechanical connections, and function.
3.21 Tactical Security.		

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3.21.1 Secure Lighting. The vehicle shall be operable by personnel utilizing night vision or thermal imaging driving devices. The vehicle instrumentation, windshield, and dashboard lighting shall be compatible with night vision devices and shall not reduce night vision visibility. The warning systems (e.g. horn) and lighting systems shall incorporate a "blackout" system that allows them to be easily disabled or limited in intensity per STANAG 4381. A dimmer switch for instrumentation lighting shall allow viewing the instruments with the unaided eye while driving with the AN/PVS-7 or AN/PVS-14. This dimmer switch shall allow adjustment of the instrumentation lighting so that it is not visually detectable outside the vehicle. Emission of any interior lamp (warning lights included) in the blackout mode of operation shall be predominately in the visible spectrum (380-700 nanometers). Emission peaks in the 700-1100 nanometer spectrum shall not exceed 10% of the peak emission in the visible spectrum. Audible warnings shall be inactive while in blackout mode.	T	The MECV will be tested to determine conformance to MIL-STD-1179 and STANAG 4381, and to determine compatibility with night vision and thermal imaging driving devices.
3.21.2 Noise. MECV steady state interior noise levels shall not exceed the category D limits defined in MIL-STD-1474 when measured at any crew seat location. Impulse noise levels at each seating position shall be per with MIL-STD-1474. The MECV shall conform to the marking and hearing protection requirements of MIL-STD-1474 at all crew seat locations for impulse noise levels resulting from primary and secondary weapon operation.	T	The MECV interior steady state will be tested and measured per TOP 1-2-608 and MIL-STD-1474.
3.21.3 Exterior Paint. The MECV shall be finished or painted per MIL-DTL-53072 to provide a low reflectance surface using Chemical Agent Resistant Coating (CARC) topcoat conforming to MIL-DTL-64159 Type II.	C/I	The Contractor shall provide certification that CARC paint was used and documentation that primer used is compatible with CARC. Visually check for proper application of paint.
3.22 Safety. The MECV shall comply with the safety requirements of MIL-STD-882 and MIL-STD-1180.	T/A/C	The MECV safety requirements will be tested and analyzed per MIL-STD-882 and MIL-STD-1180. The Contractor shall provide certification of compliance with the safety requirements and analysis required by MIL-STD-882.
3.22.1 Federal Safety Standards and Regulations. To the extent that compliance does not degrade essential military characteristics, the MECV shall meet all applicable Federal Motor Vehicle Safety Standards (FMVSS) and all	C	The Contractor shall certify that the MECV meets all FMVSS requirements as specified.

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applicable Federal Motor Carrier Safety Administration Regulations (FMCSR). The MECV shall meet the exceptions and additions listed in the following table:		

FMVSS	Title	Additions/Exceptions
101	Controls and Displays	Controls and displays shall comply with secure lighting requirements of section 3.21.1.
102	Transmission Shift Lever Sequence, Starter Interlock, and Transmission Braking Effect	None.
103	Windshield Defrosting and Defogging Systems	Defrost/Defogging systems shall comply with requirements of section 3.26.1.5.
104	Windshield Wiping and Washing Systems	Windshield wiping and washing systems shall comply with the requirements of section 3.20.
105	Hydraulic Brake Systems	None.
106	Brake Hoses	None.
108	Lamps, Reflective Devices and Associated Equipment	Lamps, Reflective Devices, and Associated Equipment shall comply with the requirements of section 3.29.
111	Rearview Mirrors (Sideview Mirrors)	Inside rearview mirror not required. Outside rearview mirrors (sideview mirrors): In addition to requirement for two unit magnification mirrors, MECV shall include two convex mirrors that meet the requirements of FMVSS 111 section 5.4 (S5.4), and have not less than 25 square inches of reflective surface. Convex mirrors may be separate or integrated into a combination flat/convex mirror unit. Outside mirrors shall be collapsible against the cab.
113	Hood Latch System	None.
116	Brake Fluids	Brake fluids shall comply with requirements of section 3.14.4.
119	New pneumatic tires for motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds) and motorcycles	Tires shall comply with requirements of sections 3.16.1 and 3.16.2.
120	Tire selection and rims for motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds)	None.
124	Accelerator Control Systems	None.
203	Impact Protection for the Driver from the Steering Control System	Applicable to vehicles with GVWR greater than 10,000 lbs.

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204	Steering Control Rearward Displacement	Applicable to vehicles with GVWR greater than 10,000 lbs.	
205	Glazing Materials		
206	Door Locks and Door Retention Components	Door locks and door retention components shall comply with requirements of section 3.8.2.1.	
207	Seating Systems	None.	
208	Occupant Crash Protection	Seat belt warning system is not required. Vehicle Crash Tests will not be required.	
209	Seat Belt Assemblies	Seat belt assemblies shall comply with requirements of section 3.17.3.	
210	Seat Belt Assembly Anchorages	None.	
212	Windshield Mounting	Applicable to vehicles with GVWR greater than 10,000 lbs.	
219	Windshield Zone Intrusion	Applicable to vehicles with GVWR greater than 10,000 lbs, except vehicle Crash Tests will not be required.	
301	Fuel System Integrity	Applicable to vehicles with GVWR greater than 10,000 lbs, except vehicle crash tests will not be required.	
3.23 Fire Suppression.			
3.23.1 AFES. The MECV shall have an automatic fire extinguishing system (AFES) that protects within crew and cargo compartments from rapidly-developing fuel fires generated by flame-enhanced explosives and other peacetime or combat threats, including petroleum, oil, and lubricants (POL) fires. Compartment parameters shall not exceed the following crew incapacitation levels during and following any fire event:		C/T	To determine conformance, the Contractor shall provide certification and test results demonstrating compliance prior to FPVI. Actual performance will be measured during PQT using inert bottles or a test kit.

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Crew Casualty Criteria		
3.23.1.1 Triggering. The AFES shall be capable of both automatic sensing and extinguishing and manually triggered extinguisher capability. The manually triggered activation shall be clearly identified and located within easy reach of the driver, and may utilize either an electrical release or a mechanical release. Electrical release, if provided, shall utilize a guarded toggle switch (with safety wire).	C/T	The contractor shall certify that their system will meet both automatic and manual triggering capability. Actual performance will be tested during PQT.
3.23.1.2 Visual Indicator. A system status indicator(s) shall be provided that visually informs crewmembers that the AFES is powered and operational.	I	The vehicle will be inspected for visual indicator.
3.23.1.3 Electrical Power Sources. Primary electrical power for the AFES shall be provided by the vehicle electrical system. An auxiliary power source located away from the vehicle batteries shall be provided that keeps the AFES fully functional for at least 15 minutes after loss of vehicle power to AFES. The auxiliary power source shall maintain its charge from the vehicle electrical system when vehicle power is on, but shall not draw any power from the vehicle electrical system when vehicle power is off. A means shall be provided to shut off the auxiliary power source for vehicle maintenance.	C/T	The Contractor shall certify that Electrical system meets the requirement. The system will be tested during PQT to verify conformance to the requirement.

Crew Casualty Criteria

Parameter	Requirement
Fire Suppression	Extinguish all flames without reflash
Skin Burns	Less than second degree burns (<2400˚F-sec over 10 seconds or heat flux < 3.9 cal/cm²)
Overpressure	Less than 11.6 psi
Agent Concentration	Not to exceed Lowest Observed Adverse Effects Level
Acid Gases (HF + HBr + 2 COF2)	Less than 746 ppm-min (5 min dose)
Oxygen Levels	Not below 16%
Discharge Impulse Noise	No hearing protection limit: < 140 dBP Single hearing protection limit: < 165 dBP
Discharge Forces	Not to exceed 8 g and < 20 psi at 5 inches

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3.23.1.4 Automatic Shutdown. AFES shall remain active for at least 15 minutes, but no longer than 60 minutes, after vehicle power is turned off.	C/T	The vehicle shall be tested to verify conformance to the requirement.
3.23.1.5 Automatic Protection. Automatic protection shall be provided to preclude false activation of any extinguisher(s) during removal or replacement of any AFES component.	C/T	The Contractor shall certify and testing will be done to verify conformance to this requirement.
3.23.1.6 False Alarm Susceptibility. The MECV AFES shall meet the false alarm susceptibility requirements of MIL-PRF-62546 section 3.3.3.2.1 ('Large Fire' in Table I).	C	The Contractor shall provide certification that the requirements of MIL-PRF-62546 section 3.3.3.2.1 have been met.
3.23.2 External Manual Fire Suppression. The MECV shall have a separate manually activated extinguishing system that provides coverage to the crew compartment and is manually activated from outside the vehicle. The manual activation handle shall be positioned such that it cannot be unintentionally activated or be readily visible to unauthorized personnel. The manual system shall be capable of preventing crewmember incapacitation per the crew casualty criteria specified in 3.23.1.	C/T	The Contractor shall certify that their system meets the requirement. The vehicle shall be tested during PQT to verify conformance to this requirement.
3.23.3 Portable Fire Extinguisher. The MECV BII shall include at least one separate handheld fire extinguisher of type 1, class 2, size 5 minimum, mounted within easy reach of the vehicle driver.	C/I	The Contractor shall certify fire extinguisher meets the type, class, and size specified . The vehicle will be inspected for proper mounting.
3.23.4 Fuel Tank(s) Fire Suppression. A fire protection method shall be provided to allow safe egress of the crew and minimize fire damage to the vehicle when the fuel tank(s) are penetrated by a threat described in annex A, or other overmatching ballistic threats.	C/I/T	To determine conformance, the Contractor shall provide documentation, certification, and test results demonstrating capabilities of MECV to protect crewmember egress areas from fuel-fed fires. The MECV will be tested to ensure that breach of fuel tank(s) from overmatching ballistic threats does not result in fires that block safe crew egress.
3.23.5 Fire Suppression Agents. MECV fire suppression agents shall comply with 3.25.1 (Environmental Compliance). Alternative fire suppression agents, other than HFC-227ea with sodium bicarbonate powder, must obtain prior	C	To determine conformance, the Contractor shall provide documentation and/or certification comply with requirement.

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Army and EPA approval.		
3.24 Materials. Materials shall be free of all defects and imperfections that might affect the serviceability and function of the finished product. Materials not specified shall be selected by the Contractor and shall be compatible with commercial engineering standards of the automotive and truck equipment industries.	C/I	To determine conformance, the Contractor shall provide documentation, certification, and test results demonstrating compliance prior to FPVI. The MECV materials will be checked for defects/imperfections during Initial Inspection.
3.24.1 Fungus Resistance. Materials chosen shall not support fungus growth when tested per ASTM G21.	C	The Contractor shall provide certification and test results demonstrating fungus resistance of materials chosen.
3.24.2 Fluid Compatibility. Components which will be in contact with fuels lubricants, coolants, and other vehicle fluids utilized in the operation and maintenance of the MECV shall be compatible with and intended for use in contact with those fluids.	C	The Contractor shall provide certification demonstrating components in contact with fuels and lubricants are compatible.
3.24.3 Rubber Components.		
3.24.3.1 Low Temperatures. Rubber components which are subject to flexing, compression, tension or otherwise subjected to movement or change in shape shall satisfy the F-19 low temperature requirement as specified in ASTM D2000, except test temperature shall be a minus 50 degrees F (minus 45.6 degrees C). All other rubber products not included in the above definition shall meet the F-17 low temperature requirement as specified in ASTM D2000.	C	The Contractor shall certify the rubber components shall meet either the F-19 or F-17 low temperature requirements per ASTM D2000.
3.24.3.2 Ozone Resistance. Exposed rubber components shall show no evidence of cracking after 72 hours of exposure in an ozone chamber per ASTM D-1149, using Type B specimens with the ozone partial pressure maintained at 50 MPa.	C/T	Exposed rubber components shall show no signs of degradation when subjected to the requirements of ASTM D1149 (Type B specimens, ozone partial pressure of 50 MPa) for 72 hours
3.24.4 Dissimilar Metals. Dissimilar metals shall be electrically insulated from one another per MIL-STD-889.	C/I	To determine conformance, the Contractor shall provide certification that the MECV complies with the requirement per MIL-STD-889.
3.24.5 Interior Materials Burn Resistance. Interior materials shall meet or	C	To determine conformance, the Contractor shall provide

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exceed the burn resistance criteria of UL94 V-0.		certification that the MECV complies with the requirement per UL94 V-0.
3.25 Environment.		
3.25.1 Environmental Compliance. The design, production, operation, maintenance, and disposal of the MECV system shall eliminate, or minimize to the greatest extent possible, the use of hazardous materials, generation of hazardous wastes, and potential for adverse environmental impacts. Asbestos, beryllium, radioactive materials, hexavalent chromium, cadmium, mercury, or other highly toxic or carcinogenic materials, as defined in 29 CFR 1910.1200, with the exception of the Chemical Agent Resistant Coating (CARC), shall not be used in the manufacture, assembly, operation, or sustainment of the MECV. All Class I and Class II Ozone Depleting Substances, including Halon, shall not be used. Lead shall not be used without prior approval of the Government. The use of lead solder may be approved for electrical components where a suitable alternative is not available. Lead-acid batteries may be used without approval from the Government. Hazardous materials requirements shall apply to any components/parts purchased through a subcontractor/vendor or OEM parts, as well as manufactured parts.	C	To determine conformance, the Contractor shall provide certification that the MECV complies with the requirement.
3.25.2 Air Pollution. The MECV is not subject to EPA Motor Vehicle Heavy Duty Diesel Exhaust emission standards, nor the EPA nonroad exhaust emission standards, since the vehicles will contain permanent armor protection. This determination is per 40 CFR, Sections 85.1703, 89.908, and 1068.225. Contractor shall ensure National Security Exemption labeling requirements are met per EPA regulations. Pollution control technologies that are affected by the sulfur level of the JP-8 fuel either in maintenance or life expectancy shall not be used (e.g. externally cooled Exhaust Gas Recirculation (EGR), NOX traps, catalytic converters). Externally cooled EGR is defined as an engine emissions control subsystem that removes portion of the exhaust gas from the exhaust system, cools this exhaust gas through some type of heat exchanger, and introduces this cooled exhaust gas back into the engine induction system.		

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3.25.3 Climatic Conditions. The MECV shall be capable of full vehicle and crew (occupants of primary and secondary seating area) operation, transport, and storage in the climatic design types of hot, basic, and cold as defined in MIL-STD-810 (including daily cycle temperatures, solar radiation, and humidity), and also in the additional environmental elements of wind, rain, snow, ice, hail, atmospheric pressure, ozone concentration, sand and dust, freeze-thaw cycles, salt fog, microbial growth, combined environmental effects, high elevations, and upper air conditions as described in MIL-STD-810, without the use of kits or additional operator procedures, except as noted below.	C/T	The MECV climatic conditions will be tested per the test methods of MIL-STD-810. Prior to any extreme climate testing, the Contractor shall certify all rubber components. Rubber components that are subject to flexing, compression, tension or otherwise subjected to movement or change in shape shall satisfy the F-19 low temperature requirement of ASTM D2000 at -50°F. All other rubber products shall satisfy the F-17 low temperature requirement of ASTM D2000.
3.25.3.1 Operations.		
3.25.3.1.1 Altitude Operations. The MECV shall be capable of meeting all operational requirements in altitudes from 500 ft below sea level to 12,000 ft above sea level.	T	
3.25.3.1.2 Starting.		
3.25.3.1.2.1 Normal Start. The MECV shall start and be capable of performing mission within one minute in temperatures ranging from 33°F to 120°F.	T	The MECV will be tested per TOP 2-2-816 and TOP 2-2-650.
3.25.3.1.2.2 Cold Start. The MECV shall start and be capable of performing mission within ten minutes in temperatures ranging from -25°F to 32°F.	T	The MECV will be tested per TOP 2-2-816 and TOP 2-2-650.
3.25.3.1.2.3 Extreme Cold Start. Start within 45 minutes and be capable of performing mission within 60 minutes total in temperatures ranging from -50°F to -26°F. A kit, installable by Field Level Maintenance, may be used to meet this requirement.	T	The MECV will be tested per TOP 2-2-816 and TOP 2-2-650.
3.25.3.2 Storage. The MECV shall be capable of uncovered long term storage in hot, basic, and cold climatic areas as defined in MIL-HDBK-310, to include storage on Prepositioned (PREPO) ships, for up to 30 months without loss of mission essential functions. Scheduled Field Level Maintenance requirements are to be maintained. Minimum processing and deprocessing is permitted. After extended storage with power source disconnected, vehicle electrical function	C	To determine conformance, the Contractor shall certify that the vehicle design, materials and construction shall allow long term storage up to 30 months in referenced environmental conditions without loss of essential mission functions.

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shall be restored upon reconnection of power, and shall require no reloading of software.		
3.25.4 Nuclear, Biological, and Chemical (NBC). The MECV shall be capable of being decontaminated to negligible risk levels as defined in AR 70-75. The decontamination process shall not degrade vehicle service life.	T	The MECV will be subjected to prescribed cycling of DS2 decontamination cleaning for this class of vehicle per AR 70-75
3.26 Human Engineering. The MECV and its user interface shall meet the design criteria of MIL-STD-1472. Additional guidance is available in MIL-HDBK-759.	A/T	The MECV will be examined for compliance with MIL-STD-1472 and MIL-HDBK-759.
3.26.1 Cab Operating Environment.		
3.26.1.1 Temperature Ranges. Per MIL-STD-1472 (5.8.1 and 5.12.6) the MECV shall prohibit permanent physical injury and prevent fatigue from temperature extremes of -50°F to 120°F for personnel during 10 hours of continuous operation.	T	The MECV shall be tested per MIL-STD-1472 to assure this requirement has been met.
3.26.1.2 Heating. The MECV with engine running shall be capable of raising the crew compartment temperature from minus 50°F to the values specified by MIL-STD-1472 at all crew seat positions within 60 minutes of turning the heater on.	T	The MECV will be tested per MIL-STD-1472. The heating requirement shall be verified during the -50°F test.
3.26.1.3 Cooling. The MECV with engine running shall be capable of lowering the crew compartment temperature from 120°F to the values specified by MIL-STD-1472 at all crew seat positions within 60 minutes of turning the cooling system on, with windows and hatches closed, and while subjected to a 1120W/m^2 solar load. Requirement shall be met regardless of whether vehicle is parked, stopped, or moving.	T	The MECV air conditioning system shall demonstrate that the required cooling performance can be met.
3.26.1.4 Airflow. The cooling and heating systems shall provide total interior airflow per MIL-STD-1472. The systems shall provide variable control of airflow, for crew space air distribution, with no less than three (e.g. off, low, high) selectable airflow settings (speeds). Non-adjustable vents shall not be directly discharged on personnel. Individual vents/ducts shall have hand-moveable controls to adjust the amount of air output and position the air flow in a range	T	The MECV cooling and heating systems shall demonstrate that the required interior airflow can be met. Airflow throughout the vehicle will be measured at all seating locations for even cooling.

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from directly on occupants to completely off occupants.		
3.26.1.5 Defroster/Defogger. At GVW and BKC, the MECV shall be capable of defrosting and defogging ballistic windshields in 60 minutes or less at -30°F, and maintain windows fog-free for continuous operation.	T	The defroster and defogger will be tested per MIL-STD-1180 and the general guidance of SAE J381. An ice removal tool may be used on ballistic windshield exterior prior to test.
3.26.2 Human Factors. All requirements in this specification, unless otherwise specified, shall apply to operation by 5th percentile female through 95th percentile male soldiers wearing individual Arctic protective clothing, MOPP 4 protective gear, Interceptor Body Armor (IBA), Advanced Combat Helmet (ACH), and Modular Lightweight Load-carrying Equipment (MOLLE) gear with hydration system, minus backpacks/rucksacks. The MECV shall be safely, efficiently, and effectively operable by such personnel.	A/T	The MECV will be rigorously scrutinized for accommodation of 5th percentile female through 95th percentile male soldiers. The vehicle will be assessed for a safe, efficient working environment. The MECV will also be assessed for operations and maintenance by full range of military personnel.
3.26.3 Operators. The MECV shall be capable of being operated by licensed motor vehicle operators.	A/C	Contractor shall certify in order to verify compliance with this requirement. Analysis shall be performed to verify compliance with this requirement.
3.26.4 Toxic Substances. Personnel, while in primary/secondary seating, gunner station, or cargo operating area shall not be exposed to concentrations of toxic substances in excess of the limits specified by OSHA 29 CFR 1910 and 1926, or to concentrations of Carbon Monoxide (CO) that will result in carboxyhemoglobin (COHb) blood levels greater than 10%, at any time during operation over OMS/MP.	A/T	Toxic substances will be tested per Department of Defense Occupational Safety and Health standards. Personnel areas will be monitored for toxic substances and concentration levels of CO. Reference TOP 2-2-614.
3.26.5 Reserved.		
3.26.6 Controls, Displays, and Gauges.		
3.26.6.1 General Requirements. Controls, displays, gauges, indicators, symbols, and tell-tales shall meet the requirements of FMVSS 101, SAE J680, SAE J209, SAE J1362, and SAE J2402.	C/I	Contractor shall certify and vehicle will be inspected to verify compliance with this requirement. All controls will be inspected for correct operation, proper mounting, ease of operation, and proper electrical connections.
3.26.6.2 Instrument Panel Gauge Cluster. The vehicle instrument panel gauge	I	Vehicle shall be inspected to verify compliance with this

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cluster shall at a minimum include the following: • Voltmeter • Fuel gauge • Engine oil pressure gauge • Coolant temperature gauge • Speedometer that displays both KPH and MPH • Turn signal and emergency flashers indicator lights • Odometer • Air filter restriction indicator • Headlight high beam indicator light • Emergency brake engaged indicator light • ABS error indicator light (if equipped with ABS)		requirement.
3.26.6.3 Starter Switch. The MECV shall be equipped with a non-key ignition/starter switch that meets notes 4 - 10, 12 - 32, 36, 38, and 39 of drawing 12506826.	C	The contractor shall provide certification through contractor test data indicating that the starter switch complies with the requirements of drawing 12506826.
3.26.6.4 Horn. A horn shall be provided per SAE J377 and FMCSR 393.81. The horn shall be inactive while in blackout mode.	C/T	Contractor shall certify and vehicle will be tested to verify compliance with this requirement.
3.27 Vehicle Marking.		
3.27.1 Marking. Exterior vehicle markings shall be marked with lusterless CARC paint per MIL- DTL-53072, and placed and sized per MIL-STD-642. "U.S. Army" in 3-inch high letters shall be used in lieu of the five-pointed star. Letters and numbers shall be black, except for exterior markings over a black background, which shall be 383 Green (color 34094). A stenciled notice shall be added in the driver's compartment near the vehicle designation plate which shall say "CARC", using 1-in. letters using CARC paint (color 37030).	I	The MECV will be visually checked and verified that non-reflective exterior markings are placed and sized per MIL-STD-642. Verify data plates are compliant with requirements and that all stowed on-vehicle equipment is identified.
3.27.1.1 Stowed Item Locations. All stowed on-vehicle equipment item locations shall be identified.	I	Vehicle will be inspected to verify compliance with this requirement.

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3.27.2 Data Plates. All data plates and safety related markings shall be per A-A-50271. Additional guidance is available in MIL-HDBK-1223. All data plates shall be permanently affixed.	I	Vehicle will be inspected to verify compliance with this requirement.
3.27.2.1 Vehicle Designation Plate. The vehicle designation plate shall be per MIL-STD-130 and A-A-50271.	I	Vehicle will be inspected to verify compliance with this requirement.
3.27.2.2 Shipping Data Plate. A shipping data plate per MIL-STD-209 shall be mounted to the vehicle in an easily accessible location. B-kit shall include a shipping data plate to be installed with B-kit armor, reflecting vehicle characteristics with B-kit installed.	I	Vehicle will be inspected to verify compliance with this requirement.
3.27.2.3 Hazard Markings. Danger and caution signs, labels, and markings shall be used to warn personnel of hazards. The signs, labels, and markings shall conform to SAE J115, be visible from any angle of approach, and legible at a safe distance from the hazard.	I	Vehicle will be inspected to verify compliance with this requirement.
3.28 Electrical System.		
3.28.1 Electromagnetic Compatibility (EMC).		
3.28.1.1 Electromagnetic Interference Characteristics. The vehicle shall satisfy survivability requirements in MIL-STD-464 for External RF EME, Near Lightning Strike, HAEMP, Bonding and Electrostatic Charge Control. The vehicle shall be capable of operation after exposure to HAEMP, Near Lightning Strike, or Vertical Lift Electrostatic Discharge event. Maintenance by the crew is allowed using on board tools to meet the requirement. Vehicle shall also meet requirements of MIL-STD-464 for Power Current Return Path and Mechanical Interfaces.	C/T	The MECV shall be subjected to the tests indicated in QSTAG-244 to assure that electronic components are properly shielded from HAEMP. Vehicle will be tested per MIL-STD-464 for Power Current Return Path and Mechanical Interfaces.
3.28.1.2 Electromagnetic Environmental Effects. Electrical and electronic vehicle components shall comply with the susceptibility and emission requirements specified in RE102, RS103, CE102, CS101, CS114, CS115 and CS116 of MIL-STD-461 for Army ground platforms.	C/T	The Contractor shall provide certification through Contractor test data indicating that individual components comply with CE102, RE102, CS101, CS114, CS115, CS116, and RS103. The MECV as a system will be tested per RE102 and RS103. Testing will be per MIL-STD-461.

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3.28.2 Electrical System Environmental Requirements.		
3.28.2.1 Shock. All electronic components shall operate without damage or degradation after being subjected to the shock requirements of MIL-STD-202, Method 213B, Test Condition I.	C	The contractor shall provide certification through contractor test data indicating that the components were subjected to the shock testing of MIL-STD-202, Method 213B, Test Condition I and operated successfully without damage or degradation after testing.
3.28.2.2 Vibration. All electronic components shall operate without damage or degradation after being subjected to the vibration requirements of MIL-STD-202, Method 201A.	C	The contractor shall provide certification through contractor test data indicating that the components were subjected to the vibration testing of MIL-STD-202, Method 202G with the following exceptions: The vibration shall be a simple harmonic motion having an amplitude of 0.03 inch (0.06 inch maximum excursion) at a frequency varying uniformly between the approximate limits of 10 to 55 Hz. The entire frequency range, from 10 to 55 Hz and return to 10 Hz, shall be traversed in approximately 1 minute for a period of 2 hours in each of the 3 mutually orthogonal directions for a total of 6 hours. The components shall operate successfully without damage or degradation after testing.
3.28.2.3 Submergence. All electronic components shall meet the requirements of drawing 12480561 defined for a Test Type I, Class 2 device.	C	The contractor shall provide certification through contractor test data indicating that the components were subjected to the requirements of drawing 12480561 for a Test Type I, Class 2 Device and operated successfully without damage or degradation. Components shall be destructively disassembled, if necessary, and inspected for out of the ordinary behavior in accordance with the requirements specified on drawing 12480561 for a Class 2 Device.
3.28.2.4 Electrical Exposure. All 12 volt components shall be capable of being exposed to continuous 30 VDC without malfunction or damage to equipment.	C	The contractor shall provide certification through contractor test data indicating compliance of individual components with operating voltage requirements.
3.28.2.5 Transient Voltage. The MECV shall have a 28-volt DC electrical system	C/T	The contractor shall provide certification through contractor test

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that conforms to MIL-STD-1275. If a 12 volt electrical system is installed, the system shall meet the requirements of MIL-STD-1275 with the voltages specified as half of that for a 28 VDC system.		data indicating compliance of individual components with MIL-STD-1275. The MECV electrical system will be tested per MIL-STD-1275 and TOP 2-2-601 to verify conformance.
3.28.2.6 Thermal Shock. Electrical components shall be capable of continuous operation during and after the Thermal Shock Immersion Test of drawing 12480561 for a Test Type II, Class 2 Device.	C	The contractor shall provide certification through contractor test data indicating the components operated without degradation or damage during and after the Thermal Shock Immersion Test of drawing 12480561 for a Test Type II, Class 2 Device. The test shall be conducted a minimum of 10 times for each component.
3.28.2 Electrical System Characteristics. The MECV shall have a 28-volt DC electrical system that conforms to MIL-STD-1275. All 12 volt components shall be capable of being exposed to continuous 30 VDC without malfunction or damage to equipment.	T	The MECV electrical system will be tested to verify conformance to requirements specified in MIL-STD-1275. Reference TOP 2-2-601. The Contractor shall provide certification through Contractor test data indicating compliance of individual components with environmental requirements.
3.28.3 Slave Start. Per STANAG 4074 the MECV shall have the capability of providing/receiving emergency electrical power and starting capability via NATO electrical slave receptacle. Reference drawing 12342917. There shall be no damage to MECV electrical system from the slaving process, including during slave cable attachment/detachment.	T	The MECV will be tested per STANAG 4074 using a NATO slave cable to demonstrate the ability to start disabled vehicles that have 24 Volt systems. A disabled MECV with fully discharged batteries shall demonstrate the ability to be started by another vehicle through a NATO slave cable, and slave cable removed once started. Vehicle electrical system will be inspected afterward for damage.
3.28.4 Vehicle Electric Power Source. The MECV shall have a minimum 200 amp dual voltage 14/28 Volt nominal DC power source that meets notes 3, 4, 5, 6, 11, 12, and 13 of drawing 12447109. Compliance with AC requirements is only necessary if the alternator produces an AC output. The alternator shall rotate above 1,400 RPM at engine idle.	C	The contractor shall provide certification through contractor test data indicating that the Vehicle Electric Power Source complies with the requirements ~~of drawing 12518690~~. Testing will be per the drawing.
3.28.5. Vehicle Batteries. Vehicle batteries shall meet all requirements of either ATPD 2206 or MIL-PRF-32143, and shall meet the configuration requirements of NATO STANAG 4015. Batteries shall be in sufficient quantities	A/T	The MECV will be examined to assure batteries comply with ATPD 2066 or MIL-PRF-32143 and configuration of NATO STANAG 4015. During PQT the ability of the batteries to start the vehicle and

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to power vehicle starting and electrical performance requirements in all climatic conditions. Batteries shall not be located within the crew compartment.		operate all required equipment will be assessed.
3.28.6 Communication Equipment. The MECV shall integrate the suite of communication equipment listed in Annex D, and shall include provisions for adequate power, space, cabling, thru-hull penetration of antenna leads and cabling, mounting bracketry, orientation devices, shock and vibration isolation, grounding, bonding, docking, and undocking. Equipment shall be operable by crew directly from the cab without interfering with vehicle operations while vehicle is in motion. Provisions for thru-hull penetration of antenna leads and cabling shall meet armor protection requirements of Annex A regardless of the quantity of antenna leads and cables installed. There shall be no entry of water or gases via the through-hull holes. Antennas and antenna mounts, as well as the communication equipment itself (e.g. radio units) will be considered vehicle payload. The mounting brackets, cabling, antenna leads, etc. shall be integrated into and considered part of the CW vehicle.	I	The MECV will be examined to assure required provisions, connections, and mounting points are installed for all required communications equipment.
3.28.6.1 Intercom System. The intercom system shall allow both internal and external communications, and shall at a minimum have one station per crewmember. A connection for at least one adjustable volume level external speaker with on/off capability shall be provided. Armament Carrier variant shall provide an intercom station operable by a gunner in the traversable gunner station.	I	Vehicle will be inspected to verify compliance to this requirement.

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3.28.7 Ancillary Electronic Equipment. The MECV shall accommodate integration of the ancillary electronic equipment listed in Annex D as kits (kits to include all components necessary for installation including mounting bracketry, adapters, antennas, cabling, etc.), by providing the following base vehicle capabilities: • provisions for secure attachment to vehicle of all kit components • power connection points capable of supplying adequate power • space claim for all kit components, including cabling • provisions necessary for cable/antenna routing • provisions for thru-hull penetration of antenna leads and cabling Provisions for thru-hull penetration of antenna leads and cabling shall meet armor protection requirements of Annex A regardless of the quantity of antennas and cables installed. There shall be no entry of water or gases via the through-hull holes. Ancillary electronic equipment and installation kits shall be considered vehicle payload. Installation of ancillary electronic equipment and installation kits shall require no welding, and shall minimize drilling to the greatest extent possible.	I	The MECV will be examined for adequate space claim, and to assure required provisions, connections, and mounting points are installed.
3.29 Exterior Markers and Lighting. MECV exterior lamps and reflective devices shall comply with MIL-STD-1179. Front and rear identification lamps are not to be included. Backup lamps are not required. The Convoy Warning Light receptacles, switch, and wiring capability may be provided as part of the Flashing Warning Beacon Kit (ref section 3.33.3). LED-based exterior lights, if used, shall meet or exceed the performance requirements of the following TACOM drawings: • Service Marker Lights – 12446845 • Rear Composite Lights – 12518337 • Blackout Drive Light – 12518338 • Front Composite Lights – 12518339 • Headlight Assemblies - 13013616		
3.30 Stowage and Tiedown Provisions.		

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3.30.1 Cargo Tiedown Provisions. The MECV shall have cargo tiedown provisions in the cargo area that meet MIL-STD-209 and are certified to transport ammunition. Tiedown provisions shall be spaced around the perimeter of the cargo area, with one provision near each of the corners of the cargo area, and with equally spaced provision(s) along each perimeter edge (front, rear, left, right) of the cargo area. Tiedown provisions along any single edge shall be spaced no greater than every 18" (average distance – location may be adjusted as necessary due to structural members).	C/I	The Contractor shall certify through Contractor testing that the cargo tiedown provisions meet the requirements of MIL-STD-209. The MECV will be examined for required mounting points and other required hardware.
3.30.2 BII Stowage. The MECV shall have provisions for securely stowing all BII items. Provisions shall allow the stowage and removal of BII items by hand, without the use of tools.	I	The MECV will be examined for required mounting points and other required hardware.
3.31 Shelter Compatibility. The MECV 2 door variant, with and without B-kit installed, shall be capable of carrying the current S-250, S-787 (SICPS), and S-788 (Lightweight, Multipurpose) shelters, loaded within payload, without modification to shelter or vehicle.	I	The MECV will be inspected to insure that form, fit and function of specified shelters has not been compromised.
3.32 Armament Carrier Provisions. The following requirements apply to the Armament Carrier and TOW Carrier MECV variants.		
3.32.1 Gunner Station. The Armament Carrier and TOW Carrier MECV variants shall have an integrated traversable gunner station.	I	The vehicle will be inspected for integrated traversable gunner station.
3.32.1.1 Gunner Station Design. The gunner station shall be located on top of the vehicle. Gunner station design and placement shall prevent interference between gunner and cab-mounted equipment and other crew members. The gunner station shall prevent spent brass and links from entering the crew compartment. Gunner station shall interface with motorized and manual traversing components of the OGPK and TGPK, allowing manual and motorized traversing of the gunner station.	I/C	The MECV gunner station design and placement will be examined for interference between gunner and interior equipment or occupants. The Contractor shall provide documentation, analysis, and test results demonstrating vehicle stability, braking, transportability and occupant safety during MECV operation with fully weighted gunner station.

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Section 3	Method	Section 4
3.32.1.2 Gunner Station Capacity. While carrying the weight of the following equipment and personnel on the traversable gunner station, the MECV shall not be damaged from forces resulting from vehicle operations or from firing the primary and secondary weapons: a) TGPK or OGPK, including battery powered motorized traversing unit and manual traversing unit b) primary weapon and mount (3.32.1.7) with ammunition can ~~c) secondary weapon and mount (3.32.1.8) with ammunition can~~ ~~d)~~c) gunner restraint system (3.32.1.6) ~~e)~~d) gunner seat (3.32.1.11) ~~f)~~e) gunner (3.32.1.3) ~~g)~~f) overhead cover (part number 13021081)	A/C/T	The Contractor shall provide documentation, certification, and test results demonstrating that required weight can be safely located on the roof. The ability for the MECV to carry weight will be assessed during test at the mission profile. Weapons operations and vehicle operations will be conducted.
3.32.1.3 Gunner. The gunner station shall accommodate a gunner standing on gunner platform (3.32.3) and also while seated in gunner seat (3.32.1.11). The MECV shall allow the gunner to traverse the gunner station, and to operate and traverse (relative to the gunner station) the primary and secondary weapons without interfering with other crew operations.	I/T	The ability of the gunner station to be safely operated per the requirements of 3.26.2 will be assessed during test at the mission profile.
3.32.1.4 Gunner Station Hatch. The gunner station shall provide a closeable hatch. Hatch system when opened shall remain locked in place during operations over OMS/MP, and shall not interfere with gunner station operation or gunner tasks. The locking release mechanism shall require only one hand to disengage, and shall have a positive locking mechanism to prevent the hatch from unlocking during severe vehicle shock and vibration. With hatch closed, gunner station and hatch shall meet or exceed crew compartment overhead protection requirements (3.8.1.1).	I	Compliance will be verified by inspection and demonstration.
3.32.1.5 Traversing. The gunner station shall allow controlled 360° traversing in azimuth without interfering with other crew operations. The gunner station shall possess no limit to the number of degrees that can be traversed in either direction. A positive travel lock shall be provided. Uncontrolled free rotation of the gunner station shall be prevented at all times, including when unlocked for manual rotation.	I/T	Compliance will be verified by inspection, demonstration, and testing.

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Section 3	Method	Section 4
3.32.1.5.1 Manual Traversing. The gunner station shall be compatible with the manual traversing mechanism and traversing locking mechanisms of the OGPK and the TGPK, allowing the gunner to manually traverse the gunner station's rotation in azimuth, and to lock the gunner station in place.	I/T	Compliance will be verified by inspection, demonstration, and testing.
3.32.1.5.2 Motorized Traversing. The gunner station shall be compatible with the motorized traversing mechanism of the OGPK, allowing the gunner to control the gunner station's rotation in azimuth.	I/T	Compliance will be verified by inspection, demonstration, and testing.
3.32.1.6 Gunner Restraint System. The gunner station shall have a gunner restraint system that allows 360° weapon operations while preventing ejection of the gunner in case of an accident or rollover. This system shall not hinder quick exit from or re-entry into the vehicle.	I	The MECV will be examined for form, fit, function and proper operation of the Gunner Restraint System, including operation while inverted.
3.32.1.7 Primary Weapon. The gunner station shall have provisions for mounting a primary weapon. The weapon mount shall permit operation of the weapon while traversing the gunner station 360° in azimuth. The weapon mount shall allow gunner to manually rotate the primary weapon in azimuth +/- 15° relative to the gunner station. The weapon mount shall allow gunner to perform all crew service functions on the weapon while it is mounted in operating position. The weapon mount shall allow elevation when firing of +85°/-20° (angle measured from the plane of the roof) for weapons listed in 3.32.1.9, and +20°/-10° for TOW weapon (3.32.1.10).	I/T	Compliance will be verified by inspection, demonstration, and testing.
3.32.1.8 Reserved.		
3.32.1.9 Weapon Compatibility. The gunner station primary and secondary weapon mounts (secondary weapon mount – TOW Carrier version) shall allow mounting and safe operation of the following weapons with ammunition can (if required for that particular weapon): a) M2 HB .50 Caliber Machine Gun b) MK-19 Automatic Grenade Launcher c) M60 7.62mm Machine Gun	I/A	The MECV will be examined for provisions, connections and mounting hardware for prescribed weapons and associate hardware. Actual performance will be assessed by mounting of weapons and operation during test.

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d) M240B 7.62mm Machine Gun e) M249 Light Machine Gun (all barrel lengths)		
3.32.1.10 TOW ITAS Compatibility. The gunner station primary weapon mount on the TOW Carrier variant shall allow mounting and safe operation of the TOW ITAS. A kit may be used to meet this requirement. (Reference drawing 12518721.)		
3.32.1.11 Gunner Seat. The gunner station shall have mounting provisions for gunner seat part number 13014413, NSN 2540-01-550-7246, to allow 360° weapon operations with gunner seated. The gunner seat mounting provisions with gunner seat installed shall not hinder quick exit from or re-entry into the vehicle, or rapid transition to a standing position to operate the weapons. Stowage provisions shall be provided for seat when not in use. The seat stowage provisions shall allow easy and convenient accessibility to the seat, yet shall not interfere with gunner operations when seat is stowed.	I/T	Compliance will be verified by inspection, demonstration, and testing.
3.32.2 Vehicle Ammunition Storage. Provisions shall be made within the MECV for self-defense weapon ammunition storage that meets U.S. Army Defense Ammunition Center and School (USADACS) security certification requirements to transport ammunition over the vehicle mission profile. Storage provisions shall have a readily accessible quick release. Space allocations shall be provided for simultaneous storage of the following type and quantity of standard Army ammunition:	I	Ammunition storage shall meet USADACS requirements. Ammunition storage capabilities will be verified and containers inspected for security of mounting, fastener condition, accessibility and ease of ammo removal. Stowed ammo shall not spill out or come free during vehicle operation. Reference TOP 2-2-802.

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Section 3	Method	Section 4
Vehicle Ammunition Storage Ammunition Type (simultaneous storage) / Quantity M16/M4 (5.56mm) / 2 cans M203 (40mm) / 1 can Any combination of: M2 (.50 cal), M60/M240 (7.62mm), MK-19 (40mm) / 6 cans M249 (5.56mm) / 4 cans		
3.32.3 Gunner Platform. The MECV shall provide a platform for gunner to stand on while operating traversable gunner station and its weapons. The platform shall adjust for varying soldier heights, and shall firmly support the weight of a gunner while lifting ammunition or equipment (375 lbs total), during all vehicle and gunner station operations. The platform standing area shall have a non-removable nonskid surface.	I/T	Compliance will be verified by inspection, demonstration, and testing.
3.33 Kits. The MECV shall accommodate installation of the following capabilities as add-on kits, providing mounting points and power supply provisions as necessary. All kits shall be installable by Field Level Maintenance. Legacy kits may be used (national stock numbers (NSN) and part numbers found in TM 9-2320-387-24p, -1, and -2). Reference drawing 12340789 Accessory and Supplementary Kit List for existing kit part numbers.	I	Verification will be accomplished by the mounting/dismounting of the applicable kits using personnel and tools at the appropriate maintenance level.
3.33.1 400 Amp Alternator Kit. A 400 amp power source that meets Notes 3, 4, 5, 6, 11, 12, and 13 of drawing 12469057 shall be available as an optional kit. Compliance with AC requirements is only necessary if the alternator produces an AC output.	C/A	The Contractor shall provide certification through contractor test data indicated that the 400 amp power source meets the requirements. Testing will be per the drawing.

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3.33.2 Winch Kit. A winch kit shall include winch with cable, chain, shackle, and snatch block.	I	The MECV will be inspected for winch kit with cable, chain, shackle and snatch block.
3.33.2.1 Load Capability. Using the snatch block, the winch, cable, and winch accessories shall be able to retrieve a load equal to two times the weight of the GVW MECV, measured at the interface between snatch block and retrieved load. At this load, and starting at the bare drum, the winch shall retrieve the entire length of cable without stalling, overheating, or circuit interruption.	C/T	The Contractor shall certify the winch, cable, and winch accessories are rated to withstand and overcome specified loads. The winch shall be tested at the specified load to verify compliance with this requirement.
3.33.2.2 Cable Length. The winch cable must be long enough to reach an anchor no less than 45 feet from the MECV and return (using the snatch block) to enable self-recovery with a 2:1 mechanical advantage.	T	The MECV winch cable will be tested to verify compliance with this requirement.
3.33.2.3 Brake. The winch shall incorporate an automatic brake that stops the cable from paying out when not under power.	I	The winch will be inspected for compliance with this requirement.
3.33.2.4 Free Spooling Capability. The winch shall have a free spooling capability.	I	The winch will be inspected for compliance with this requirement.
3.33.2.5 Winch Durability. The winch shall be capable of performing fifty durability cycles without stalling, overheating, or circuit interruption, with less than 1 minute between cycles. Each cycle shall consist of the winch pulling a load of 40% of GVW a minimum distance of 60 feet within a maximum time period of 28 minutes.	T	The winch will be tested for compliance with this requirement, at an ambient air temperature between 60 and 90 degrees F. At the start of every 10 cycles, cable will be checked for wear.
3.33.2.6 Winch Integrated Protection. The winch shall possess integrated protection mechanisms to prevent winch overheating and overloading.	T	The winch will be tested for compliance with this requirement.
3.33.2.7 Winch Controls. The MECV winch kit shall provide control for winch operations from inside and outside the vehicle.	I	The winch kit controls will be inspected for compliance with this requirement.
3.33.3 Flashing Warning Beacon Kit. A 360-degree flashing warning beacon kit shall mount on the roof of the MECV, and shall provide control for inside-vehicle operations.	I	The MECV flashing warning beacon kit will be inspected for compliance with this requirement.

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Section 3	Method	Section 4
3.33.4 Ambulance Kits.		
3.33.4.1 4-Litter Kit. The 2 door variant MECV demountable 4-litter ambulance shelter kit shall have capabilities similar to the current chassis mounted M997 ambulance body. Kit demount/remount shall use Field Maintenance Level tools, equipment, and personnel.	I	The MECV 4-litter kit will be inspected for compliance with this requirement.
3.33.4.2 2-Litter Kit. The 2 door variant MECV demountable 2-litter ambulance kit shall have capabilities similar to the current M996 2-litter ambulance. Kit demount/remount time shall be no greater than that required for the S832 shelter using Field Maintenance Level tools, equipment, and personnel.	I	The MECV 2-litter kit will be inspected for compliance with this requirement.
3.33.5 Troop Seating Kit. The 2 door variant MECV troop seating kit shall accommodate transport of at least eight combat equipped soldiers in the cargo compartment through application of a field-installable troop seat kit. Kit shall install on MECV with and without B-kit installed. Troop seating kit seats shall permit the soldiers to face inboard, as well as outboard based on the tactical situation.	I	The MECV troop seating kit will be inspected for compliance with this requirement.
3.33.6 Tarp and Bows Kit. A tarp and bows kit for the MECV cargo compartment shall be made available.	I	The MECV tarp and bows kit will be inspected for fit and function.
3.33.7 Cargo Bed Cover. Cargo bed cover kit shall be per ASTM E2462.	I	The MECV cargo bed cover will be inspected for compliance with this requirement.
3.33.8 Spare Tire Carrier Kit. The Spare Tire Carrier Kit shall include a spare wheel/tire assembly, identical to vehicle set, and its stowage provisions. The spare tire carrier kit shall provide a mechanism to allow a crewmember to safely raise and lower the spare tire independent of vehicle power. The spare tire carrier kit, when loaded, shall not adversely affect the access and operation of other vehicle equipment. The kit shall be removable at Field Level Maintenance. The weight of spare tire carrier kit with wheel/tire assembly shall be considered vehicle payload.	I/T	To be demonstrated during Logistics Validation and Verification.

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5 RESERVED

6 NOTES

This section contains information of an explanatory nature which may be helpful, but is not mandatory.

6.1 INTENDED USE

The vehicle covered by this specification is intended for use by the United States Joint Services (Army, Navy, Marines, Air Force) in transporting personnel or cargo or in providing for special tasks (weapon carrier, reconnaissance vehicle, etc.) during tactical military operations in the forward area. The vehicle is intended for use under extreme conditions of climate, weather, terrain, and military service. Such use includes ground, rail, and air transportation, and tactical air drop by parachute.

6.2 REFERENCE

6.2.1 Highway. Four or more lanes, often divided, all-weather primary roads used for heavy and high-density traffic usually with a limited access to/from other roads.

6.2.2 Primary roads. Two or more lanes, all-weather, maintained, hard surface (paved) roads with good driving visibility used for heavy and high density traffic. These roads have lanes with a minimum width of 9', road crown to 2 degrees, and all bridges assured for the legal maximum GVW/GCW for the country or state.

6.2.3 Secondary roads. Two lanes, all weather, occasionally maintained, hard or loose surface (e.g., large rock, paved, crushed rock, gravel) roads intended for medium-weight, low-density traffic. These roads have lanes with minimum width of 8 feet and no guarantee that the legal maximum GVW/GCW for the country or state is assured for all bridges.

6.2.4 Cross country. Vehicle operations over terrain not subjected to repeated traffic and where no roads, routes, well-worn trails or man-made improvements exist. (This definition does not apply to vehicle test courses that are used to simulate cross-country terrain.)

6.2.5 Field Level Maintenance. Field Level Maintenance encompasses all work that can be physically completed on/around the truck. A system/component that must be evacuated for repair becomes a Sustainment Level Maintenance item. For example: Removing the transmission and replacing the torque converter is Field Level Maintenance whereas taking removing/replacing a camshaft is a Sustainment Level Maintenance action.

6.2.6 Integrated Armor. Armor protection components that are integrated into and included as part of the base vehicle. Integrated armor is not intended to be removed as part of flexibly installable vehicle armor protection solutions (armor kits). Integrated armor is included in vehicle curb weight (CW).

6.2.7 Integrated Equipment. Integrated Equipment consists of components that are integrated into and included as part of the base vehicle, as opposed to kits and add-on equipment. Integrated Equipment is included in vehicle CW, and includes base vehicle capabilities such as AFES. Integrated Equipment includes power wiring and mounting provisions for the integrated suite of communication equipment (ref. 3.28.6), but does not include the communication equipment itself or its antennas and antenna mounts. Integrated Equipment does not include add-on ancillary electronic equipment (ref 3.28.7) or its power wiring and mounting bracketry. Integrated Equipment does not include any kits (e.g. cargo compartment heater kit, winch kit).

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6.3 GLOSSARY OF ACRONYMS AND INITIALISMS

AAR	Association of American Railroads
ACH	Advanced Combat Helmet
AFES	Automatic Fire Extinguishing System
APS	Auxiliary Power Source
ASTM	American Society for Testing and Materials
ATA	American Trucking Association
ATE	Automatic Test Equipment
BII	Basic Issue Items
BKC	B-kit Configuration
BPMTU	Battery-Powered Motorized Traversing Unit
CFR	Code of Federal Regulations
CG	Center of Gravity
COEI	Components of End Item
CW	Curb Weight
DoDISS	Department of Defense Index of Specifications and Standards
E3	Electromagnetic Environmental Effects
ECC	Essential Combat Configuration
ECU	Electronic Control Unit
ECV	Expanded Capacity Vehicle
EPA	Environmental Protection Agency
EUMD	Essential Unscheduled Maintenance Demands
EMS	Electronic Maintenance Systems
FMCSR	Federal Motor Carrier Safety Regulations
FMVSS	Federal Motor Vehicle Safety Standards
FRS	Forward Repair System
GIC	Gabarit International de Chargement
GMTK	General Mechanic's Tool Kit
GCW	Gross Combined Weight
GVW	Gross Vehicle Weight
GVWR	Gross Vehicle Weight Rating
HEMP	High-altitude Electromagnetic Pulse
HMMWV	High Mobility Multipurpose Wheeled Vehicle
IBA	Interceptor Body Armor
ICD	Interface Control Document
IETM	Integrated Electronic Technical Manual
IOP	Internal Operating Procedure
IRF	International Road Federation
ISO	International Organization for Standardization
KIAS	Knots Indicated Air Speed
LCM-8	Landing Craft Mechanized, Mark 8
LMI	Logistics Management Information
LVAD	Low Velocity Aerial Delivery
MaxTTR	Max Time To Repair
MAS	Military Agency for Standardization
MeanTTR	Mean Time To Repair
MECV	Modernized Expanded Capacity Vehicle
MHE	Material Handling Equipment
MMBOMF	Mean Miles Between Operational Mission Failure
MMH/OM	Maintenance Man-Hours per Operating Mile
MOLLE	Modular Lightweight Load-carrying Equipment
MOS	Military Occupational Specialties
MR	Maintenance Ratio
MSD	Maintenance Support Device
NBC	Nuclear, Biological, and Chemical
NATO	North Atlantic Treaty Organization
NM	Nautical Mile
OGPK	Objective Gunner Protection Kit
OMS/MP	Operational Mode Summaries/Mission Profiles
PMCS	Preventive Maintenance Checks and Services
POL	Petroleum, oil, and lubricants
PQT	Production Qualification Test
RCI	Rating Cone Index
RECAP	Recapitalized
RORO	Roll-on/Roll-off
SAE	Society of Automotive Engineers
SATS	Standard Automotive Tool Set
TB	Technical Bulletin
TGPK	TOW Gunner Protection Kit
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
TOP	Test Operation Procedure
TOW	Tube-launched, Optically tracked, Wire-guided (TOW)
TOW ITAS	TOW Improved Target Acquisition System
UL	Underwriters Laboratories Inc.
VCI	Vehicle Cone Index

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