

PURCHASE DESCRIPTION  
U.S. ARMY JOINT ASSAULT BRIDGE

FORWARD

This Purchase Description entails the technical requirements and the means for verification for the Joint Assault Bridge (JAB) Capability. Comments, suggestions, or questions regarding this document may be addressed to Contract Specialist, Army Contracting Command - Warren (DTA), CCTA-HBF-B

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## 1. SCOPE

### 1.1. Scope

This Purchase Description (PD) covers the performance requirements for the Joint Assault Bridge (JAB) system. The purpose of the JAB system is to meet the gap crossing requirements of the Operating Forces by providing a rapidly employable, short gap, assault crossing system for the armored / mechanized forces, capable of spanning natural and manmade obstacles up to 60 feet.

### 1.2. Required/Desired

Within this PD, the requirement refers to the minimum threshold that will be expected or accepted (required). Desired refers to the Army's objective that it would like to achieve. Required is also referred to as Threshold (T), and Desired is also referred to as Objective (O). Unless otherwise stated, if a requirement does not contain a T or O, the requirement is a threshold.

## 2. APPLICABLE DOCUMENTS

### 2.1. General

The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirement documents cited in sections 3 and 4 of this specification, whether or not they are listed.

### 2.2. Government documents

#### 2.2.1. Specifications, Standards, and Handbooks

The following specifications, standards, and handbooks form a part of this document 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 in effect on the date of Request for Proposal (RFP).

#### FEDERAL STANDARDS

- FED-STD-313 - Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities
- FED-STD-595/33446 - Yellow, Flat or Lusterless (Tan 686)

#### DEPARTMENT OF DEFENSE SPECIFICATIONS

- MIL-PRF-6083 - Hydraulic Fluid, Petroleum Base, for Preservation and Operation
- MIL-DTL-46100 - Armor Plate, Steel, Wrought, High-Hardness
- MIL-PRF-46170 - Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base, North Atlantic Treaty Organization (NATO) Code No. H-544
- MIL-DTL-53072 - Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection
- MIL-DTL-64159 - Camouflage Coating, Water Dispersible Aliphatic Polyurethane, Chemical Agent Resistant
- MIL-V-81940/1B - Valve, Sampling And Bleed, Hydraulic, Type II Systems
- MIL-PRF-46167 - Lubricating Oil, Internal Combustion Engine, Arctic

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- MIL-PRF-2104 - Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
- MIL-PRF-21260 - Lubricating Oil, Internal Combustion Engine, Preservative Break-In
- MIL-PRF-10924 - Grease, Automotive And Artillery
- MIL-PRF-680 - Degreasing Solvent
- MIL-P-14105 - Paint, Heat-Resisting (For Steel Surfaces)
- TT-P-28 - Paint, Aluminum, Heat Resisting

DEPARTMENT OF DEFENSE STANDARDS

- MIL-STD-130 - Identification Marking of U.S. 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-810 - Environmental Engineering Considerations and Laboratory Tests
- MIL-STD-882 - System Safety
- MIL-STD-1366 - Transportability Criteria
- MIL-STD-1472 - Human Engineering
- MIL-STD-1474 - Noise Limits
- MIL-STD-1791 - Designing For Internal Aerial Delivery In Fixed Wing Aircraft
- MIL-STD-2169 - HEMP (Classified)

DEPARTMENT OF DEFENSE HANDBOOKS

- MIL-HDBK-454 - General Guidelines for Electronic Equipment
- MIL-HDBK-759 - Human Engineering Design Guidelines

(Copies of the above specifications, standards, and handbooks are available from Document Automation and Production Service, Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094 or website: <https://assist.daps.dla.mil/quicksearch/>.)

2.2.2. Other Government Documents, Drawings, and Publications

The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 5.2).

MILITARY SURFACE DEPLOYMENT AND DISTRIBUTION COMMAND TRANSPORTATION ENGINEERING AGENCY (SDDCTEA) – Pamphlet (PAM)

- SDDCTEA-PAM 55-19 - Tiedown Handbook for Rail Movements
- SDDCTEA-PAM 55-20 - Tiedown Handbook for Truck Movement
- SDDCTEA-PAM 55-22 - Marine Lifting and Lashing Handbook
- SDDCTEA-PAM 55-24 - Vehicle Preparation Handbook for Fixed Wing Air Movements
- SDDCTEA-PAM 70-1 - Transportability for Better Deployability

(Copies of these pamphlets are available from [http://www.tea.army.mil/pubs/pubs\\_order.htm](http://www.tea.army.mil/pubs/pubs_order.htm) or from Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA), 709 Ward Drive, Bldg. 1990, Scott AFB, IL 62225.)

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TRILATERAL AGREEMENTS

TRILATERAL DESIGN AND TEST CODE (TDTC) FOR MILITARY BRIDGING AND GAP CROSSING EQUIPMENT

(Copies of these documents are available online at [www.dtic.mil](http://www.dtic.mil) or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

CODE OF FEDERAL REGULATIONS

- Title 10 - Energy
- Title 19 - Customs Duties
- Title 29 - Labor
- Title 49 - Transportation
  - o Part 571 (FMVSS) No. 207 - Seating Systems
  - o Part 571 (FMVSS) No. 209 - Seat Belt Assemblies
  - o Part 571 (FMVSS) No. 210 - Seatbelt Assembly Anchorages

(Copies of these documents are available from [www.gpoaccess.gov/cfr/index.html](http://www.gpoaccess.gov/cfr/index.html) or U.S. Government Printing Office, P.O. Box 979050, St. Louis, MO 63197-9000.)

U.S. ARMY PUBLICATIONS

- AR 750-1 - Army Material Maintenance Policy
- FM 3-11.4 - Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection
- FM 4-30.31 - Recovery and Battle Damage Assessment and Repair
- TM 5-5420-203-14 - Operator's, Unit, Direct Support, and General Support Maintenance. Bridge, Armored-Vehicle Launched: Scissoring Type Class 60 & Class 70 Aluminum, 60 Foot Span; For M48A5 and M60 Launcher
- TM 5-5420-202-10 - AVLB Operators Manual
- TM 9-2350-264-10-1 - Operator's manual for tank, combat, full tracked: 120 mm gun, M1A1 general Abrams volume 1 of 3
- TM 9-2350-264-10-3 - Operator's manual for tank, combat, full tracked: 120 mm gun, M1A1 general Abrams volume 3 of 3

(Copies of these documents are available from <http://www.army.mil/usapa/index.html>.)

U.S. ARMY DRAWINGS

- 12345756 - Non-slip Paint Spec
- 12479550 - Ground Vehicle Combat Welding Code - Steel
- Engineering Change Proposal (ECP) GDLT8891: Alternate Fire Suppression Agent
- SC-X15110F - M1 Tank Program Critical Item Product Fabrication Specification for Harness/ Cable
- ATEC Test Operating Procedure (TOP) 01-1-065

(Copies of these drawings are available from [DAMI\\_STANDARDIZATION@conus.army.mil](mailto:DAMI_STANDARDIZATION@conus.army.mil) or U.S. Army RDECOM, Tank Automotive Research, Development and Engineering Center, ATTN: RDTA-EN/STND/TRANS MS #268, 6501 E. 11 Mile Road, Warren, MI 48397-5000.)

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2.3. Non-Government Publications

The following documents form a part of this PD to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 5.2).

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

Threshold Limit Values and Biological Exposure Indices

(Copies of this document are available from [www.acgih.org](http://www.acgih.org) or American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH 45240.)

ASTM INTERNATIONAL

- ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- ASTM B663 - Standard Specification for Silver-Tungsten Carbide Electrical Contact Material
- ASTM D610 - Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces
- ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications

(Copies of these documents are available from [www.astm.org](http://www.astm.org) or ASTM International, P.O. Box C700, West Conshohocken, PA 19428-2959.)

AMERICAN WELDING SOCIETY (AWS)

- AWS D1.1/D1.1M - Structural Welding Code - Steel
- AWS D1.2/D1.2M - Structural Welding Code - Aluminum
- AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel
- AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel
- AWS D1.9/D1.9M - Structural Welding Code - Titanium
- AWS D8.1M - Specification for Automotive Weld Quality - Resistance Spot Welding of Steel
- AWS D8.6 - Specification for Automotive Resistance Spot Welding Electrodes
- AWS D8.9M - Recommended Practices for Test Methods for Evaluating the Resistance Spot Welding Behavior of Automotive Sheet Steel Materials

(Copies of these documents are available from [www.aws.org](http://www.aws.org) or American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

- ISO 2631-1 - Mechanical Vibration and Shock – Evaluation of Human Exposure to Whole-Body Vibration – Part 1: General Requirements.
- ISO 10055 - Mechanical Vibration – Vibration Testing Requirements for Shipboard Equipment and Machinery Components

(Copies of these documents are available from [www.iso.org](http://www.iso.org) or [www.ansi.org](http://www.ansi.org) or ANSI Customer Service Department, 25 W. 43rd Street, 4th Floor, New York, NY 10036.)

SAE INTERNATIONAL

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- SAE J514 - Hydraulic Tube Fittings
- SAE J516 - Hydraulic Hose Fittings
- SAE J517 - Hydraulic Hose
- SAE J1273 - Recommended Practices for Hydraulic Hose Assemblies
- SAE J1708 - Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications
- SAE J1939 - Serial Control and Communications Heavy-Duty Vehicle Network – Top Level Document
- SAE J1939/13 - Off-Board Diagnostic Connector
- SAE J2360 - Automotive Gear Lubricants for Commercial and Military Use

(Copies of these documents are available from [www.sae.org](http://www.sae.org) or SAE Customer Service, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4. Order of Precedence

In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

#### 3.1. Description

The JAB system shall employ a turret-less Army M1A1 Abrams Main Battle Tank with the M1A2 Heavy suspension, Tiger engine installed and a Bridge Launch Mechanism (BLM) to launch and retrieve the Military Load Class-85 (MLC-85) Armored Vehicle Launched Bridge (AVLB), accomplishing the mission requirements as set forth in this document. The JAB chassis is defined as the M1A1 Chassis and BLM installed, while the JAB system is defined as the M1A1 Chassis, BLM and MLC-85 AVLB stowed on top of the M1A1 Chassis. The JAB system shall accomplish mission requirements while maintaining pace and maneuvering with the Mobility Augmentation Command (MAC) and Brigade Engineer Battalion (BEB) wherever and whenever they are deployed. A combat loaded JAB system is defined as the M1A1 Chassis, MLC-85 AVLB, BLM, full fuel and hydraulics, and 2 crew members. All functions of the JAB system shall be performed by no more than the two-person crew.

#### 3.2. MLC-85 AVLB

The MLC-70 AVLB has undergone reclassification to MLC-85. The reclassification of the bridge will not change the configuration. TM 5-5420-203-14 will reflect the MLC-85 reclassification in a forthcoming revision. Throughout this PD, MLC-85 AVLB Scissor Bridge will be referenced as MLC-85 AVLB. The MLC-85 AVLB shall not be modified from the current design. The MLC-85 AVLB is an existing end-item; this PD does not address or verify its performance.

#### 3.3. Technical and Verification Requirements

Table 1 consists of Section 3 Technical Requirements and Section 4 Verification Requirements for which the JAB system shall comply.

##### 3.3.1. Table 1 Definitions

For definitions of Verification Methods and Verification Events, see section 4.3 and 4.4 respectively of this document.

#### 3.4. Design

The design of the JAB system shall be in accordance with the performance standards invoked in this PD. Unless otherwise specified, the design, materials and manufacturing processes selected are the prerogative of the contractor so long as the final product conforms to the requirements set forth in this performance based PD.

#### 3.5. Regulations

All systems and components shall be designed to prevent environmental hazards and inadvertent product discharge or leakage during operation, storage, and maintenance. The JAB system shall incorporate commercial design features, while ensuring the design considers mission requirements and combat capability as primary considerations.

**Table 1: Technical and Verification Requirements**

3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<b>3.6. <u>JAB chassis Characteristics</u></b>					
<p>The M1A1 basic performance characteristics shall be maintained through the design of the JAB chassis. The M1A1 basic characteristics are listed in Annex B (Distribution C FOUO).</p>					<p>Verify the JAB chassis maintains the characteristics equivalent to Annex B, 3.6 and the subsections listed.</p>
<b>3.7. <u>Operating Environment</u></b>					
<p>The JAB system shall be operable, maintainable, storable, and transportable day or night, in hot and basic climate design types as defined in MIL-STD-810. Additional environmental effects consist of the following conditions as defined in MIL-STD-810 without degradation or installation of special kits while maintaining full mission capability.</p> <ul style="list-style-type: none"> <li>• rain</li> <li>• sand and dust</li> <li>• salt fog</li> <li>• humidity</li> </ul>				<p>T T T T</p>	<p>To determine conformance to 3.7, the JAB system shall be tested with both hatches closed in accordance with MIL-STD-810, Test Method 501.5, Procedures I, II, and III, (high temperature), Test Method 502.5, (low temperature).</p> <ul style="list-style-type: none"> <li>• Rain tested in accordance with MIL-STD-810, Method 506.5, Procedure I</li> <li>• Sand and dust tested in accordance with MIL-STD-810, Test Method 510.5, Procedures I and II</li> <li>• Salt fog tested in accordance with MIL-STD-810, Method 509.4</li> <li>• Humidity tested in accordance with MIL-STD-810, Method 507.5, Procedure I</li> </ul>
<b>3.7.1. <u>Operation altitude</u></b>					
<p>The JAB system shall meet the threshold requirements of this document while operating at altitudes up to 8,000 ft (T), 12,000 ft (O).</p>	A			A/T	<p>To determine conformance to 3.7.1, verify the JAB system meets all threshold performance requirements at operational altitude of 8,000 ft (T), 12,000 ft (O).</p>

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<b>3.7.2. <u>Operating Temperature</u></b>					
The operating ambient temperature range of the JAB system without starting aids shall be -25 degrees F to 125 degrees F (-32 degrees C to 52 degrees C) (T), installation of cold weather kits may be used for starting to operate at -50 degrees F (-46 degrees C) (O). Launch and retrieve operations shall be conducted within 5 minutes of main engine start.	A			T	To determine conformance to 3.7.2, the JAB system shall be tested in the operating ambient temperature ranges without starting aids at -25 degrees F to 125 degrees F (-32 degrees C to 52 degrees C) (T), installation of cold weather kits to aid in starting at -50 degrees F (-46 degrees C) (O). Verify launch and retrieve operations within 5 minutes of main engine start.
<b>3.7.3. <u>Storage Temperature</u></b>					
The JAB system shall remain fully operational after exposed to a storage temperature range of -50 to 160 degrees F in accordance with MIL-STD-810.	A			T	To determine the conformance to 3.7.3, verify the JAB system is fully operational after storage in the temperature range of -50 to 160 degrees F in accordance with MIL-STD-810 Method 501.5, Procedure I.
<b>3.7.4. <u>Wind</u></b>					
The JAB system shall launch and retrieve the MLC-85 AVLB in winds up to 29.2 knots as defined in the TDTC.	A			A/T	To determine conformance to 3.7.4, the JAB system shall be tested and analyzed through a simulated wind load.
<b>3.7.5. <u>MLC-85 AVLB Mud Buildup Conditions</u></b>					
The JAB system shall launch and retrieve the MLC-85 AVLB with 2438 lbs of mud distributed over the roadway surface in all modes of launch operation as detailed in 3.7.8		D	D	T	To determine conformance to 3.7.5, verify the JAB system has the ability to launch and retrieve an MLC-85 AVLB bearing an area load distributed over the roadway surface equivalent to 2438 lbs of mud in all modes of launch operation.
<b>3.7.6. <u>Water Fording</u></b>					
The JAB system shall conduct shallow water fording up to a depth of 48 inches without preparation or use of fording kit.				T	To determine conformance to 3.7.6, the JAB system shall be tested with the front drain valve closed, engine running, JAB System on level ground, the bilge pump OFF, and the system standing in 48 inches of water for 10 minutes and, verify there is no accumulation of water over the center of the crew compartment floor after 10 minutes.

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<u>3.7.6.1. Waterproofing</u>					
<p>All internal / external electronic components of the JAB system shall be waterproof without additional equipment or preparation.</p>				T	<p>To determine conformance to 3.7.6.1, verify there is no electrical component damage after rain testing and water fording.</p>
<u>3.7.7. Driver and Commander Vision</u>					
<u>3.7.7.1. Vision System</u>					
<p>The JAB system shall incorporate a vision system that provides the driver 165 degrees and the commander 165 degrees of visibility to the front (+/- 82.5 degrees of the centerline) (T) provides 360 degree field of view (O). Visibility shall be provided under closed hatch, day and night, in smoke, and all weather conditions as defined in section 3.7.</p> <p>The Vision system shall also provide the driver and commander visibility of any part of the BLM that contacts the ground and bridge near side of the MLC-85 AVLB, before and as they contact the ground on the near bank side for preparation and during launch and retrieval. Visibility shall be provided under closed hatch, day and night, in smoke, and all weather conditions as defined in section 3.7</p> <p>The rearward vision requirement of the JAB system shall be through the use of the Rear View Sensor System (RVSS) provided as GFP. If the vision system obtains a minimum field of view as provided by the RVSS system or is designed for a 360 degree field of view the use of the RVSS is not required.</p>	A	D	D	T	<p>To determine conformance to 3.7.7.1, verify the JAB system incorporates a vision system that provides the driver and commander each a minimum of 165 degrees of visibility to the front under closed hatch during day and night, in smoke, and all weather conditions as defined in section 3.7.</p> <p>Verify the driver and commander's vision system displays the launcher and bridge on the near side of the bank as they touch the ground during launch and retrieval.</p> <p>Verify the JAB System uses the RVSS to meet the rearward vision requirement, or has a 360 degree field of view vision system.</p>

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<b>3.7.7.2. <u>Vision Periscopes</u></b>					
<p>Under closed hatch and driver's head against the head rest, the view through the three (3) driver's hatch vision periscopes shall remain 100% unobstructed (see 5.3.11) (T).</p> <p>The combined view through the six (6) commander's hatch vision periscopes shall remain at least 50% unobstructed (T), 100% unobstructed (O), by placement of JAB system components under closed hatch.</p> <p>This driver and commander vision requirement does not apply during launch and retrieve operations.</p>	E	D	D	T	<p>To determine conformance to 3.7.7.2, verify the view through the three (3) driver's hatch vision periscopes of the JAB system remain 100% unobstructed by placement of JAB system components under closed hatch.</p> <p>Verify the combined view through the six (6) commander's hatch vision periscopes remains at least 50% unobstructed by placement of JAB system components under closed hatch.</p>
<b>3.7.8. <u>Hydraulic Power</u></b>					
<p>The JAB system shall have two independent hydraulic and electrical power sources for launch and retrieval of the MLC-85 AVLB. At least one of the hydraulic power sources shall be completely independent of the chassis engine. The independent hydraulic power source shall meet all of the requirements stated in section 3.7.8.8. Crewmembers are not allowed to exit the JAB system during launch operations; the commander is allowed to exit the JAB chassis to connect the hydraulic lines during retrieval operations. Launch and retrieve times shall be in accordance with times defined in Table 2 while operating the tank parking brake.</p>	A	D	D	T	<p>To determine conformance to 3.7.8, verify the JAB system has two independent hydraulic power sources, one of which is completely independent of the JAB chassis engine and meets the requirements stated in section 3.7.8.8. Verify each hydraulic power source is sufficient to launch and retrieve the MLC-85 AVLB within the threshold times stated in Table 2 while operating the tank parking brake.</p>
<b>3.7.8.1. <u>MLC-85 AVLB Primary Hydraulic Power Launch</u></b>					
<p>After positioning the vehicle at the gap, and with crew members inside the vehicle, the JAB system shall launch the MLC-85 AVLB (without mud load) using primary hydraulic and electrical power only across a 60-foot gap within the time limits specified in Table 2.</p>	A	D	D	T	<p>To determine conformance to 3.7.8.1, verify the time required to launch the MLC-85 AVLB using only primary hydraulic and electrical power does not exceed the time limits specified in Table 2. The launch begins when the vehicle is positioned at the obstacle and ends when the MLC-85 AVLB is detached from the JAB chassis.</p>

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<b>3.7.8.2. <u>Backup Hydraulic Power Launch</u></b>					
<p>After positioning the vehicle at the gap and with crew members inside the vehicle, the JAB system shall launch the MLC-85 AVLB (without mud load) using only the backup hydraulic and electrical power within the time limits specified in Table 2.</p>	A	D	D	T	<p>To determine conformance to 3.7.8.2, verify the time required to launch the MLC-85 AVLB does not exceed the time limits specified in Table 2 while operating using backup hydraulic and electrical power only. The launch begins when the vehicle is positioned at the obstacle and ends when the MLC-85 AVLB is detached.</p>
<b>3.7.8.3. <u>Electric and Hydraulic Slave Power Launch (O)</u></b>					
<p>In addition to the primary and backup hydraulic power requirements in sections 3.7.8.1 and 3.7.8.2 the JAB system shall launch the MLC-85 AVLB (without mud load) through hydraulic and electrical power supplied through slave of another JAB system within the time limits specified in Table 2. Operation shall be completely independent of the primary and backup hydraulic systems and JAB chassis power. (O)</p>	A	D	D	T	<p>To determine conformance to 3.7.8.3, verify the time required to launch the MLC-85 AVLB does not exceed the time limits specified in Table 2 while operating under slaved hydraulic and electrical power from another JAB system. The launch begins when the vehicle is positioned at the obstacle, JAB chassis engine shutdown is complete, hydraulic and electrical slaving is connected, and ends when the MLC-85 AVLB is fully launched.</p>
<b>3.7.8.4. <u>MLC-85 AVLB Primary Hydraulic Power Retrieval</u></b>					
<p>With a crewmember allowed to exit the vehicle, the JAB chassis shall retrieve the MLC-85 AVLB (with mud load) into the fully stowed position using primary hydraulic and electrical power only within the time limits specified in Table 2. This time requirement excludes the time necessary for initial positioning and connection of the hydraulic lines to the MLC-85 AVLB.</p>	A	D	D	T	<p>To determine conformance to 3.7.8.4, verify the time required to retrieve the MLC-85 AVLB does not exceed the time limits specified in Table 2. The retrieval begins when the vehicle is positioned to connect with the MLC-85 AVLB with the BLM deployed, and ends when the MLC-85 AVLB is in the fully stowed position.</p>

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**3.7.8.5. Backup Hydraulic Power Retrieval**

After initial positioning and connection of the hydraulic lines complete, the JAB chassis shall retrieve the MLC-85 AVLB (with mud load) into the fully stowed position using only backup hydraulic and electrical power within the time limits specified in Table 2.	A	D	D	T	To determine conformance to 3.7.8.5, verify the time required to retrieve the MLC-85 AVLB using only backup hydraulic and electric power does not exceed the time limits specified in Table 2. The retrieval time begins when the vehicle is positioned and connected to the MLC-85 AVLB and ends when the MLC-85 AVLB is in the fully stowed position.
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**3.7.8.6. Electric and Hydraulic Slave Power Retrieval (O)**

In addition to the primary and backup hydraulic power requirements in sections 3.7.8.4 and 3.7.8.5 the JAB system shall retrieve the MLC-85 AVLB (with mud load) through hydraulic and electrical power supplied only through slave of another JAB system within the time limits specified in Table 2. Operation shall be completely independent of the primary and backup hydraulic systems and the disabled JAB chassis power. (O)	A	D	D	T	To determine conformance to 3.7.8.3, verify the time required to retrieve the MLC-85 AVLB does not exceed the time limits specified in Table 2 while operating under slaved hydraulic and electrical power from another JAB system. The retrieval begins when the vehicle is positioned and connected to the MLC-85 AVLB, JAB chassis engine shutdown is complete, hydraulic and electrical slaving is connected, and ends when the MLC-85 AVLB is in the fully stowed position.
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Table 2: MLC-85 AVLB Launch and Retrieval Times

Action	Threshold (min)	Objective (min)
<b>MLC-85 AVLB Launch</b>		
Primary Hydraulic Power	5	3
Backup Hydraulic Power	10	6
Electric and Hydraulic Slave Power	-	10
<b>MLC-85 AVLB Retrieval</b>		
Primary Hydraulic Power	15	6
Backup Hydraulic Power	30	12
Electric and Hydraulic Slave Power	-	30

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<b>3.7.8.7. <u>Duty Cycle</u></b>					
The JAB system shall conduct three MLC-85 AVL launch and retrieve cycles per hour using primary hydraulic power.	A	D	D	T	To determine conformance to 3.7.8.7, verify the JAB system primary hydraulic power conducts three launch and retrieve cycles per hour.
<b>3.7.8.8. <u>Hydraulic Power Unit (HPU) Requirements</u></b>					
<b>3.7.8.8.1. <u>Batteries (if an engine is used)</u></b>					
The HPU shall utilize the JAB chassis batteries for starting.	E	D	D	T	To determine conformance to 3.7.8.8.1 verify the HPU utilizes only the JAB chassis batteries for starting.
<b>3.7.8.8.2. <u>Fuel compatibility (if an engine is used)</u></b>					
The HPU shall operate on JP-8, F-24 and Ultra Low Sulfur Diesel fuels. The engine shall not require any modifications when switching between fuels.	A			T	To determine conformance to 3.7.8.8.2 verify the HPU operates on JP-8, F-24 and Ultra Low Sulfur Diesel fuels without modifications.
<b>3.7.8.8.3. <u>Emissions Technologies (if an engine is used)</u></b>					
The JAB system is not subject to Environmental Protection Agency (EPA) non-road exhaust emissions standards since it will contain permanent armor. This determination is in accordance with 40 CFR 89.908 and 1068.225. Contractor shall ensure National Security Exemption labeling requirements are met in accordance with EPA regulations. Due to the sulfur level of the JP-8 fuel (up to 3000 parts per million sulfur), pollution control technologies that impact the HPU engine effectiveness, maintenance, or life expectancy shall not be used.	A			E	To determine conformance to 3.7.8.8.3, verify that National Security Exemption labeling requirements are met in accordance with EPA regulations and the HPU engine does not have pollution control technologies that negatively impact engine effectiveness, maintenance, or life expectancy due to the sulfur level of JP-8.

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<u>3.7.8.8.4. Fuel System (if an engine is used)</u>					
<p>The HPU shall use fuel from the JAB chassis onboard fuel system. The HPU shall have a fuel pump in accordance with engine manufacturer recommendations. Priming the empty fuel system from the fuel tank shall be performed without use of the starter. Fuel shutoff valves shall be positioned to prevent excess spillage when removing components or performing service operations.</p>	E	E	E	T	<p>To determine conformance to 3.7.8.8.4 verify the HPU uses the fuel available through the JAB chassis onboard fuel tanks at any fuel level. Verify the fuel system can be primed without the use of the HPU starter and the fuel shutoff valves are positioned to prevent excess fuel spillage when removing components or performing service operations.</p>
<u>3.7.8.8.5. Electrical Power</u>					
<p>When the HPU is used to launch and retrieve the MLC-85 AVLB it shall have an electrical power source that provides power to launch and retrieve the MLC-85 AVLB without drawing power from the JAB chassis batteries. If an engine is used, the alternator shall also charge the JAB chassis batteries.</p>	E	D	D	T	<p>To determine conformance to 3.7.8.8.5, verify the HPU electrical power source has sufficient power to launch and retrieve the MLC-85 AVLB without use of the JAB chassis batteries. If an engine is used verify the alternator also charges the JAB chassis batteries.</p>
<u>3.7.8.8.6. HPU cooling</u>					
<p>The HPU shall have a cooling system which provides cooling in accordance with manufacturer recommendations while operating under ballistic protection.</p>	A	D	D	T	<p>To determine conformance to 3.7.8.8.6, verify the HPU has sufficient cooling under ballistic protection during operations in accordance with manufacturer's specification.</p>

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<b>3.7.8.8.7. <u>Gauges</u></b>					
<p>The following analog style gauges shall be provided to the driver for the HPU indicating high and low operating limits as applicable:</p> <ul style="list-style-type: none"> <li>• Engine oil pressure (if an engine is used)</li> <li>• Operating temperature</li> <li>• Engine RPM Tachometer (if an engine is used)</li> <li>• Hydraulic fluid temperature</li> <li>• Battery level indicator (if additional batteries are used)</li> </ul>	E	D	D	T	<p>To determine conformance to 3.7.8.8.7, verify the listed gauges are provided to the driver and operate properly indicating applicable high and low operating limits.</p>
<b>3.7.8.8.8. <u>Battery disconnect master switch</u></b>					
<p>A battery disconnect master switch for the HPU shall be provided in the chassis battery compartment to isolate the HPU from the JAB chassis electrical system and batteries.</p>	E	E	D	T	<p>To determine conformance to 3.7.8.8.8, verify the HPU battery disconnect switch is located in the chassis battery compartment and isolates the HPU from the JAB chassis batteries.</p>
<b>3.7.8.8.9. <u>Malfunction indicators</u></b>					
<p>An audible alarm with a mute function shall be provided through the intercom system which indicates these adverse conditions, as well as visual indicator(s) to the driver at a minimum:</p> <ul style="list-style-type: none"> <li>• Low oil pressure (if an engine is used)</li> <li>• High temperature</li> <li>• High Hydraulic fluid temperature</li> <li>• High Hydraulic pressure</li> <li>• HPU Fire sensing</li> <li>• AFES system discharge</li> </ul>	E	D	D	T	<p>To determine conformance to 3.7.8.8.9, verify the malfunction indicators listed are visually provided to the driver. Verify upon indication of any of the listed malfunction an audible alarm is provided through the intercom system and mute function operates properly.</p>

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
3.7.8.8.10. <u>HPU shutdown</u>					
The HPU shall have both primary and emergency shutdown methods provided to the driver and commander. If an engine is used, the emergency shutdown method shall be either a fuel or air shutoff.	E	D	D	T	To determine conformance to 3.7.8.8.10, verify the driver and commander each have the means to normally shutdown the HPU as well as emergency shutdown method. If an engine is used, verify the emergency shutoff is either through fuel or air intake shutoff.
3.7.8.8.11. <u>Lubricants and Fluids</u>					
All fluids and lubricants shall be compatible with the following unless approved by the PCO: <ul style="list-style-type: none"> <li>• Engine Oils: MIL-PRF-2104 (OE/HDO), MIL-PRF-46167 (OEA-30)</li> <li>• Automotive Engine/Preservation Oils: MIL-PRF-21260 (PE)</li> <li>• Antifreezes and Test Kit: A-A-52624</li> <li>• Gear Lubricants: SAE J2360 (GO)</li> <li>• Multi-purpose Grease: MIL-PRF-10924 (GAA)</li> <li>• Degreasing Solvents: MIL-PRF-680</li> </ul>	A			T	To determine conformance to 3.7.8.8.11, verify the HPU is compatible with the lubricants listed unless approved in writing by the PCO.
3.7.8.8.12. <u>Oil filter (if an engine is used)</u>					
Oil filter(s) shall be replaceable with common tools as defined in section 3.13.2 without having to remove or disconnect any other equipment, excluding removal of ballistic covers to gain access.	A	E	E	T	To determine conformance to 3.7.8.8.12, verify the HPU oil filter is replaceable through the use of common tools as defined in 3.13.2 without removal or disconnection of other equipment, excluding removal of ballistic covers to gain access.

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3.7.8.8.13. <u>Oil sample valve (if an engine is used)</u>					
An engine oil sampling valve shall be located to allow an in-stream sample to be taken before the HPU oil filter. The valve shall be manually operated and shall close automatically when released. It shall be made of material resistant to corrosion such that it will not contaminate the sample. The discharge port of the valve shall be covered with a captive chain cap conforming to MIL-V-81940/1B and SAE J514.	A	D	D	T	To determine conformance to 3.7.8.8.13, verify the oil sampling port is located in-stream and before the HPU oil filter. Verify the valve is manually operated and closes automatically when released; it is of a corrosive resistant material and has a captive chain cap for covering the discharge port of the manually operated valve.
3.7.8.8.14. <u>Fuel filter (If an engine is used)</u>					
Fuel filter(s) shall be installed in accordance with the engine manufacturer specification. Fuel filter(s) shall be replaceable with common tools as defined in section 3.13.2 without having to remove or disconnect any other equipment, excluding removal of ballistic covers to gain access.	A	E	D	T	To determine conformance to 3.7.8.8.14, verify the HPU fuel filter is installed and meets the manufacturer specifications for location and filtration.
3.7.8.8.15. <u>Hour Meter</u>					
The HPU shall have an accessible and visually readable hour meter attached, ballistic covers may be opened to gain access to the hour meter.	E	D	D	T	To determine conformance to 3.7.8.8.15, verify the HPU has an accessible and visually readable hour meter attached. Ballistic covers may be opened or removed to gain access.
3.7.9. <u>MLC-85 AVLB Launch/Retrieve Bank Conditions</u>					
The JAB system shall launch and retrieve the MLC-85 AVLB from both ends of the MLC-85 AVLB in any combination of the bank conditions listed in 3.7.9.1, 3.7.9.2, and 3.7.9.3.		D		T	To determine conformance to 3.7.9, verify the JAB system can launch and retrieve an MLC-85 AVLB from both ends of the MLC-85 AVLB in any combination of the following bank conditions 3.7.9.1, 3.7.9.2, and 3.7.9.3.

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<b>3.7.9.1. <u>Transverse Bank Slope</u></b>					
The JAB system shall launch and retrieve the MLC-85 AVLB at a vehicle transverse bank slope of $\pm 5$ percent. Near and far banks can have like or opposing transverse slopes; $\pm 5$ percent near bank, $\pm 5$ percent far bank as defined in section 4.2.5.4 of the TDTC.				T	To determine conformance to 3.7.9.1, verify the JAB system launches and retrieves the MLC-85 AVLB at a vehicle transverse bank slope condition of $\pm 5$ percent with near and far banks having like or opposing transverse slopes.
<b>3.7.9.2. <u>Longitudinal Bank Slope</u></b>					
The JAB system shall launch and retrieve the MLC-85 AVLB at a longitudinal bank slope condition of $\pm 15$ percent as defined in TM 5-5420-202-10 AVLB operators manual.				T	To determine conformance to 3.7.9.2, verify the JAB system launches and retrieves an MLC-85 AVLB with a longitudinal bank slope condition of $\pm 15$ percent.
<b>3.7.9.3. <u>Bank height difference</u></b>					
The JAB system shall launch and retrieve the MLC-85 AVLB at a maximum height difference between the near and far bank of 6.0 ft as defined in section 4.2.5.1 of the TDTC.		D		T	To determine conformance to 3.7.9.3, verify the JAB system launches and retrieves an MLC-85 AVLB with a maximum height difference between near and far bank condition of 6.0 ft.
<b>3.8. <u>Survivability and Vulnerability</u></b>					
<b>3.8.1. <u>CBRN System</u></b>					
The JAB system shall retain the capability of the M1A1 Abrams Tank CBRN system; the CBRN system shall be operated and maintained by personnel while in Mission Oriented Protective Posture (MOPP) level IV as described in FM 3-11.4.	A			T	To determine conformance to 3.8.1, verify the JAB system has the same CBRN capabilities as used on the M1A1 Abrams Tank, modified for JAB system. Verify the CBRN system can be operated and maintained while in MOPP IV.

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<b>3.8.2. <u>Electromagnetic Environmental Effects (E3) and Spectrum Supportability</u></b>					
<p>The JAB system shall retain the M1A1 Abrams Tank ability to be mutually compatible within itself and with other electronic systems in its intended operational electromagnetic environment in accordance with MIL-STD-464. E3 control shall be verified at the system level in accordance with MIL-STD-464, section 5. Mutual compatibility of subsystems and electronics components, including Commercial Off The Shelf (COTS) items shall be verified in accordance with MIL-STD-461.</p>	A			T	<p>To determine conformance to 3.8.2, verify through testing the JAB system meets the requirements of MIL-STD-461, Table V requirements marked as applicable "A" in the Ground, Army row. Certify through the Joint Spectrum Certification Process that the JAB system operates in frequency bands per the national and international tables of spectrum allocation and conforms to applicable spectrum management regulations, directives and specifications. Verify through testing that the JAB system meets the requirements of MIL-STD-464.</p>
<b>3.8.3. <u>High-Altitude Electromagnetic Pulse (HEMP)</u></b>					
<p>The JAB system shall survive HEMP in accordance with MIL-STD-2169 (classified). System electronics upset is acceptable and may be rebooted or power cycled to restore the JAB system to the operational status prior to the reboot within 15 minutes with no loss of data.</p>	A			T	<p>To determine conformance to 3.8.3, verify the JAB system complies with all requirements MIL-STD-2169 (classified).</p>
<b>3.8.4. <u>Equipment Vibration and Basic Shock</u></b>					
<p>Components used in the development of the JAB system shall comply with basic shock and vibration as specified in SB-X10001B in accordance with MIL-STD-810 methods 514.6 and 516.6 and ISO 2631 to minimize the effect of shock and vibration to on-board equipment.</p>	A			T	<p>To determine conformance to 3.8.4, verify the JAB system is designed to meet all performance requirements during and after exposure to basic shock and vibration to minimize the effect of shock and vibration to on-board equipment.</p> <p>Verify conformance in accordance with SB-X10001B for basic shock and vibration in accordance with MIL-STD-810 methods 514.6 and 516.6 and ISO 2631.</p>

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<b>3.8.5. <u>Ballistic Protection</u></b>					
Survivability of the JAB chassis shall be in accordance with the requirements in Annex C (FOUO).				A/T	To determine conformance to 3.8.5 Survivability requirements will be verified in according with Annex C.
<b>3.8.5.1. <u>Turret Cap</u></b>					
The JAB Turret cap shall be in accordance with requirements stated in Annex C.				A	To determine conformance to 3.8.5.1, verify the JAB turret cap is constructed in accordance with Annex C.
<b>3.8.5.2. <u>BLM Components</u></b>					
If any hydraulic or electrical BLM components are placed on or attached only to the exterior of the M1A1 Chassis (not attached to the BLM), these components shall have ballistic protection as defined in Annex C. If hydraulic lines or wiring harnesses are attached to the M1A1 Chassis at multiple points then continues to the BLM they shall have ballistic protection over the hull portion of the component, protection is not required to continue on the BLM.				A	To determine conformance to 3.8.5.2, verify the JAB chassis hydraulic and electrical BLM components attached only to the exterior of the M1A1 Chassis (not attached to the BLM) are protected to the level of protection specified in Annex C.
<b>3.8.5.3. <u>Front Armor Section</u></b>					
No external mounting of components requiring drilling or cutting into or on the enclosed front armor section of the JAB chassis as defined in Annex C shall be allowed. This area shall not be opened or penetrated by any means to include cutting, drilling or flame cutting. For attachment of components to this area, external welding is allowable. If items require bolts for attachment, the items shall be bolted / secured to pads welded to the external surface.	C/I	I	I	I	To determine conformance to 3.8.5.3, verify the front section of the JAB chassis was not opened or penetrated, if components were added to this area verify the attachment of these items were bolted / secured to pads welded to the external surface per Annex C.

3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<b>3.8.6. <u>Smoke Grenade Launchers</u></b>					
<p>The JAB chassis shall be equipped with two (2) M250 smoke grenade launchers that can launch a salvo of six at a time and a salvo of 12 non explosive grenades at a time (except during launch and retrieve operations). The smoke grenade system shall be operable from the commander's station and the obscuration system shall create 110 degree forward self-obscuration smoke capability</p> <p>The JAB chassis shall have two Army M1A1 smoke grenade storage containers for spare grenade storage. One (1) Smoke grenade launcher and storage container shall be mounted and located on each side of the vehicle and be accessible by crew on the ground. The system shall be re-loaded in 10 minutes or less by the crew.</p>	E	E	E	T	<p>To determine conformance to 3.8.6, verify that both M250 smoke grenade launchers and both storage containers are located properly, and can be reloaded in 10 minutes or less by the crew. Verify the smoke grenade system is operable by the commander and creates 110 degrees self obscuration to the front.</p>
<b>3.8.7. <u>System Fire Survivability</u></b>					
<b>3.8.7.1. <u>Crew Compartment Fire Survivability</u></b>					
<p>The JAB chassis shall utilize the M1A1 Automatic Fire Extinguishing System (AFES) that provides both automatic and internal manual activation of a single shot fire extinguishing capability for the crew compartment. The AFES shall utilize the M1A1 extinguishing agent.</p>	E	E	E	T	<p>To determine conformance to 3.8.7.1, verify that each sensor can identify and discriminate between fire and non-fire stimulus. Verify the manual discharge operates when activated. Verify the AFES system utilizes the M1A1 extinguishing agent.</p>

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<b>3.8.7.2. <u>Engine Compartment Fire Survivability</u></b>					
<p>The JAB chassis shall utilize the M1A1 engine compartment AFES that provides both automatic and manual discharge of a first shot, manual discharge of a second shot from inside the vehicle, and manual discharge of a second shot from outside the vehicle. The M1A1 AFES system sensors discriminate between fire and non-fire events. The AFES shall utilize the M1A1 approved extinguishing agent. AFES system power indicator, fire extinguisher discharge indicator light and a reset capability shall be provided to the driver. Engine shutdown shall be initiated as part of the second shot activation. The engine system compartment AFES shall be in accordance with Engineering Change Proposal (ECP) GDLT8891.</p>	E	E	E	T	<p>To determine conformance to 3.8.7.2, verify that each sensor can identify and discriminate between fire and non-fire stimulus. Verify AFES system status is provided to the driver and the reset capability operates when activated. Verify the engine compartment AFES is not degraded from the M1A1. Verify the engine system compartment AFES is in accordance with ECP GDLT8891.</p>
<b>3.8.7.3. <u>Portable Extinguishers</u></b>					
<p>The JAB chassis shall provide mounting provisions for a minimum of two internal portable fire extinguishers and one external portable fire extinguisher. Extinguishers shall be mounted in an easily recognizable and readily accessible position for service and use during a fire not addressed by the AFES, an external fire incident, and while refueling the vehicle. The hand held fire extinguishers shall be in accordance with ECP L05T1020.</p>	E	E	E	T	<p>To determine conformance to 3.8.7.3, verify the JAB chassis has a minimum of two portable fire extinguishers mounted on the inside and a minimum of one portable fire extinguisher mounted outside of the vehicle and in a readily accessible location. Verify the hand held fire extinguishers are in accordance with ECP L05T1020.</p>
<b>3.8.7.4. <u>HPU Fire Survivability</u></b>					
<p>The HPU shall have an AFES that provides both automatic and manual activation of a single shot fire extinguishing capability. The following are approved agents: Water, CO2, HFC-125, HFC-227, and Baking Soda.</p>	A	E	E	T	<p>To determine conformance to 3.8.7.4, verify the HPU has an AFES that provides both automatic and manual activation of a single shot fire extinguishing capability. Verify that the HPU AFES utilizes any of the following agents: Water, CO2, HFC-125, HFC-227, or Baking Soda.</p>

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
3.9. <u>Interoperability and Compatibility</u>					
3.9.1. <u>Communications and Navigation System</u>					
<p>The JAB system shall provide space claim for current (JV5) and future (JCR, JBC-P) communication equipment and battle command situational awareness equipment that are operable by the commander. The following equipment shall be fully functional and operational in open and closed hatch modes with and without the MLC-85 AVLB mounted.: Defense Advanced GPS Receiver (DAGR), , Force XXI Battle Command, Brigade and Below (FBCB2) JV5, and Blue Force Tracking (BFT).</p> <p>During launch and retrieve of the MLC-85 AVLB each of the communication signals shall not be degraded for more than one minute.</p>	A	E	E	T	<p>To determine conformance to 3.9.1, verify correct installation of the equipment listed by installing the components and conducting operations by the commander in open and closed hatch modes with and without the MLC-85 AVLB mounted.</p> <p>Verify each of the communication signals during launch and retrieve of the MLC-85 AVLB is not degraded for more than one minute.</p>
3.9.1.1. <u>Intercommunication Equipment</u>					
<p>The JAB chassis shall provide intercommunication of the VIC-3 intercommunication system that is on the M1A1. The JAB chassis shall provide intercommunication between the driver and commander at all times during operations, and ground forces of the Tank Infantry Phone (TIP) located on the rear of the chassis.</p>	A	E	D	T	<p>To determine conformance to 3.9.1.1, verify the JAB chassis provides intercommunication of the VIC-3 intercommunication system. With the Combat Vehicle Crewman (CVC) helmet connected to the intercommunication control set, verify internal voice communications between the driver's station and the commander's station, as well as the Tank Infantry Phone (TIP) located on the rear of the chassis.</p>
3.9.1.2. <u>Communications</u>					
<p>The JAB system command and control system shall provide space claim for a tactical radio, SINCGARS AN/VRC-89 or AN/VRC-90, which shall be able to communicate in all modes of operation 1.24 miles on flat, level, unobstructed ground in open and closed hatch modes, with and without the MLC-85 AVLB mounted and during launch and retrieve operations.</p>	A		E	A/T	<p>To determine conformance to 3.9.1.2, verify the JAB system radio for inter-vehicle communication operates properly. Verify the JAB system is equipped with a tactical radio and is able to communicate with another tactical radio. Verify through demonstration that the JAB system can communicate 1.24 miles to another JAB system on flat, level, and unobstructed ground with and without the MLC-85 AVLB mounted and during launch and retrieve operations.</p>

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<b>3.9.1.3. <u>Navigation System</u></b>					
<p>The JAB system shall provide space claim for the DAGR. With its antenna, the DAGR shall be integrated into the JAB system to permit operation of the Global Positioning System (GPS) in open and closed hatch modes, with and without the MLC-85 AVLB mounted and during launch and retrieve operations.</p>	A		E	T	<p>To determine conformance to 3.9.1.3, verify that adequate space claim and all required brackets, connectors and antennas for the GPS and operate the equipment to ensure it is fully functional with and without the MLC-85 AVLB mounted and during launch and retrieve operations.</p>
<b>3.9.1.4. <u>Electrical Harnesses/Cables</u></b>					
<p>All electrical harness and cables added to the JAB chassis shall be in accordance with SC-X15110F.</p>	A			T	<p>To determine conformance to 3.9.1.4, verify all JAB chassis electrical harnesses and cables added are in accordance with SC-X15110F.</p>
<b>3.10. <u>Maintainability / Reliability</u></b>					
<b>3.10.1. <u>Preventative Maintenance (PM)</u></b>					
<p>Preventive Maintenance (PM) of the JAB system shall require no more than one (1) weekly, one (1) semi-annual and one (1) annual PM. This does not include mandatory operational Preventative Maintenance Checks and Services (PMCS) that are to be performed before and after system operation.</p> <p>All operator PMCS inspection points shall be accessible by crew while the MLC-85 AVLB is in the stowed position.</p> <p>The mean time to perform weekly PM shall not exceed 3 man hours. The mean time to perform annual PM shall be less than or equal to 25 man hours (T); 20 man hours (O).</p>	A	E	D	T	<p>To determine conformance to 3.10.1, verify that the PM of the JAB system requires no more than one (1) weekly, one (1) semi-annual, and one (1) annual PM. Verify that all operator PMCS inspection points are accessible with the MLC-85 AVLB in the stowed position. Verify the mean time to perform weekly PMs shall not exceed 3 man hours. Verify the mean time to perform annual PMs shall be less than or equal to 25 man hours (T); 20 man hours (O).</p>

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<u>3.10.2. Corrective Maintenance (CM)</u>					
<p>Corrective maintenance (CM) includes the adjustment, removal, repair, reinstallation, and alignment of repairable parts, modules, subassemblies, and assemblies. The JAB system shall have a Maximum Time to Repair (MaxTTR) no greater than 4 man hours (T); 2 man hours (O) at the crew level. The MaxTTR must be no greater than 16 man hours (T); 12 man hours (O) at the field level.</p>	A			A/T	<p>To determine conformance to 3.10.2, verify the JAB system has a Maximum Time To Repair (MaxTTR) no greater than 4 man hours (T); 2 man hours (O) at the crew level. The MaxTTR must be no greater than 16 man hours (T); 12 man hours (O) at the field level. Evaluate the impact on mission performance and maintenance burden due to failure to meet the overall system reliability requirements in accordance with the Failure Definitions/Scoring Criteria (FD/SC).</p>
<u>3.10.3. Maintenance Ratio (MR)</u>					
<p>Maintenance Ratio (MR) of the JAB launch mechanism shall not exceed 0.10 Maintenance Man Hours per Operating Hour (MMH/OH).</p>	A			A/T	<p>To determine conformance to 3.10.3, verify through test the JAB launch mechanism achieves a MR of 0.10 MMH/OH.</p>
<u>3.10.4. Steam and Water Jet Cleaning</u>					
<p>The JAB system exterior surfaces and components shall withstand cleaning in accordance with TM 9-2350-264-10-3 using high pressure steam or water jet cleaner compatible to A-A-59133 without deterioration of seals, hoses, electrical fittings, insulation, thermal barrier material, or removal of paint and rust proofing.</p> <p>The JAB interior surfaces and components shall withstand water jet cleaning.</p>	A			A/T	<p>To determine conformance to 3.10.4, verify the vehicle exterior surfaces and all of its components withstand cleaning with high pressure steam or water jet in accordance with TM 9-2350-264-10-3.</p> <p>The nozzle will be held at a distance not less than one (1) foot from the surface for steam cleaning and not less than 5 feet from the surface for water jet cleaning perpendicular to the surface with a maximum of 110 psi and a maximum nozzle diameter of 0.25 inch. Verify cleaner A-A-59133 does not deteriorate seals, hoses, electrical fittings, insulation, thermal barrier material, or removal of paint and rust proofing.</p> <p>Verify there is no damage to interior surfaces and components after water jet spraying at a distance of no less than one (1) foot perpendicular to the surface with maximum pressure of 25 psi and a maximum nozzle diameter of 0.25 inch.</p>

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3.10.5. <u>Lubrication Fittings</u>					
Lubrication fittings shall be provided for lubricating all moving parts that require application of lubrication. Fittings shall be located where accessible by a grease gun with a 10-inch flexible extension. Fittings shall be accessible without removing or adjusting hardware; ballistic access doors may be opened.	A	E	D	T	To determine conformance to 3.10.5, verify lubrication fittings are provided on the JAB chassis for all moving parts that require application of lubrication. Verify all lubrication fittings are accessible by a grease gun with a 10-inch flexible extension and removal of hardware is not required. Ballistic access doors may be opened to gain access to fittings.
3.10.6. <u>Mean Miles Between Operational Mission Failures (MMBOMF)</u>					
The JAB system shall have a Mean Miles Between Operational Mission Failure (MMBOMF) of no less than 157 miles of operation (21 launch and retrieve cycles per 157 miles).				A/T	To determine conformance to 3.10.6, verify through test the JAB system has a MMBOMF of no less than 157 miles of operation (21 launch and retrieve cycles per 157 miles) at an 80 percent confidence level.
3.10.7. <u>Mean Cycles Between Operational Mission Failure (MCBOMF)</u>					
<p>The JAB launch mechanism shall achieve a Mean Cycles Between Operational Mission Failure (MCBOMF) rate of 120 launch and retrieve cycles when subjected to the attack mission profile in the JAB Operational Mode Summary/Mission Profile (OMS/MP). If a chassis failure is due to integration of the launch mechanism on the M1A1 chassis, that failure will be charged and assessed against the launch mechanism.</p> <p>An Operational Mission Failure (OMF) includes any failures induced by operator or maintainer errors, as well as any hardware or software related failures.</p>				A/T	<p>To determine conformance to 3.10.7.3.10.7, the BLM shall demonstrate Mean Cycles Between Operational Mission Failure (MCBOMF) rate of 120 launch and retrieve as a point estimate during PQT.</p> <p>PQT will consist of 3 JAB systems operating for a total of 360 launch/retrieve cycles and 1650 miles while using the attack mission profile detailed in the JAB OMS/MP.</p> <p>The Government will unilaterally score test data in accordance with the JAB FDSC to assess the MCBOMF requirement.</p>

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<u>3.10.8. Painting</u>					
<p>The JAB system shall be cleaned, pre-treated, primed, and top-coated in accordance with MIL-DTL-53072. Paint processes shall be controlled so that applied pre-treatments, primers and top-coats meet the minimum dry film thickness, adhesion and corrosion resistance requirements of MIL-DTL-53072. Dry film thickness shall be based on the film thickness above the peaks of the surface profile of the substrate. Only water based or water dispersible primers and top-coats shall be used. Zinc-rich primers shall not be used as a pre-treatment without Government approval.</p> <p>Exterior JAB surfaces and components shall be painted tan 686, #33446 of FED-STD-595. The JAB chassis interior surfaces and components shall be painted white, #37875 or #17925 of FED-STD-595. CARC paint shall not be applied to items attaining temperatures in excess of 400°F; items attaining temperatures in excess of 400°F shall be painted in accordance with MIL-P-14105 or TT-P-28, as applicable. COTS items placed in the interior of the JAB are not required to be repainted.</p> <p>Use of any other paint types or guiding specifications requires Government review and approval prior to application.</p>	E		E		<p>To determine conformance to 3.10.8, verify the JAB system exterior surfaces and components are painted with only water based or water dispersible primers and top-coats in accordance with MIL-DTL-53072 and that the top-coat is tan 686, #33446 of FED-STD-595.</p> <p>Verify MIL-P-14105 or TT-P-28 is applied to items attaining temperatures in excess of 400°F.</p> <p>Verify the JAB chassis interior surfaces and components are painted with only water based or water dispersible primers and top-coats in accordance with MIL-DTL-53072 and that the top-coat is white, #37875 or #17925 of FED-STD-595.</p> <p>Verify minimum dry film thickness, adhesion and corrosion resistance requirements are satisfied per MIL-DTL-53072 verification requirements.</p>

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<b>3.10.9. <u>Rust and Corrosion</u></b>					
<p>The JAB chassis shall be resistant to the corrosive effects of a severe marine atmospheric environment consisting of seawater splash and spray and occasional seawater immersion during operation, transport, and storage corrosion susceptibility. The JAB chassis shall operate for a 5 (T) / 20 year (O) service life, which shall include varying or extended periods in corrosive environments involving one or more of the following: high humidity, salt spray, road de-icing agents, ground contact, gravel impingement, atmospheric contamination and temperature extremes (-40 to 140 degrees F).</p> <p>Excluding the existing M1A1 Chassis material, the susceptibility of the JAB chassis to corrosion shall be reduced by design, workmanship, materials of construction, and by specific preservation techniques employed. During the specified service life, surface corrosion shall meet or exceed corrosion grade 8 in accordance with ASTM D610 on any metal surfaces.</p>	A			T	<p>To determine conformance to 3.10.9, verify through Salt Fog Verification section 3.7 and testing a JAB chassis in a 5 test year Accelerated Corrosion Durability Test (ACDT) in accordance with ATEC Test Operating Procedure (TOP) 01-1-065.</p>
<b>3.10.9.1. <u>Corrosion Control</u></b>					
<p>Components shall be resistant to moisture, corrosion, fungus, and oxidation that may affect its structural integrity or performance levels. During the JAB chassis service life, corrosion, which may include red, black and/or white corrosion products, shall not exceed a numeric rating of 1 per ATEC TOP 01-1-065 during the first 5 years of service. At no point in the JAB chassis service life shall corrosion exceed a numeric rating of 3 per ATEC TOP 01-1-065. There shall be no functional failures resulting from corrosion during the JAB chassis service life.</p>	A		E	A/T	<p>To determine conformance to 3.10.9.1, , verify through Salt Fog Verification section 3.7 and testing a JAB chassis in a 5 test year ACDT in accordance with ATEC TOP 01-1-065.</p>

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<b>3.10.10. <u>Welding</u></b>					
<p>Welds shall be free from defects indicative of poor workmanship. All welding shall be in accordance with the following documents listed in Annex F. The edition (year) to be used shall be the year in effect at time of solicitation release date. If new materials are to be used that do not follow the guidelines in the applicable code book in Annex F, then the Contractor is responsible to demonstrate the correct code book to the Procuring Contract Office (PCO) for approval.</p>	A/E	A	A	A	To determine conformance to 3.10.10, certify that all welding is in accordance with requirements of Annex F.
<b>3.10.10.1. <u>Alternate Welding Standards</u></b>					
<p>Subject to PCO written approval, the Contractor may utilize alternate standards or codes once the Contractor or Contractor's suppliers have demonstrated that equivalent or better quality and performance can be obtained by their use. It is the Contractor's responsibility to demonstrate such equivalence to the Government. If the Contractor's component supplier shall not release specific proprietary information, the Government reserves the right to conduct an on-site review of the Contractor's supplier(s) quality system and weld processes to verify the capability of producing acceptable welds. The Government reserves the right to approve/disapprove the use of any and all such alternative weld standards and specifications. The demonstrated equivalent shall be verified prior to fabrication of any weldment under Governmental guidance.</p>	A		A		To determine conformance to 3.10.10.1, certify that all welding is in accordance with requirements of Annex F.
<b>3.10.10.2. <u>Armor Steel Heat Affect Zone (HAZ) Hardness Test</u></b>					
<p>When MIL-DTL-46100, Armor Plate, Steel, Wrought, High-Hardness is added to the JAB chassis, at any location of weldment, the Brinell hardness shall not be lower than permitted by MIL-DTL-46100 for minimum hardness requirements.</p>	D		A	A/T	To determine conformance to 3.10.10.2, the Brinell hardness shall be checked at least 5/8 inch from the toe of the weld on any ballistic surface to certify armor added to the existing system meets the minimum hardness requirements permitted by MIL-DTL-46100.

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3.10.11. <u>Diagnostic Capability</u>					
3.10.11.1. <u>Chassis Diagnostic Capability</u>					
<p>The JAB chassis shall maintain the capability for fault identification, fault isolation, and health checks consistent with the M1A1 electrical system (Hull Distribution Box (HDB), Driver's Instrument Panel (DIP), Driver's Master Panel (DMP), Digital Electronic Control Unit (DECU), Fire Extinguisher Amplifier (FEA), Transmission (Shift Solenoids/Speed Sensor) (XMSN), Shift Select Assembly (SSA), Hull Networks Box (HNB), Upgraded Tank Commander's Panel (UTCP)), and Tiger Engine Memory Unit (EMU) (T). The JAB system shall incorporate fault identification, fault isolation, and health checks on all Line Replaceable Units (LRUs) (O).</p>	A		A	A/T	<p>To determine conformance to 3.10.11.1, verify through demonstration that the fault identification, fault isolation, and health checks are consistent with the M1A1 electrical system.</p>
3.10.11.2. <u>BLM Diagnostic Capability</u>					
<p>JAB BLM diagnostics shall feature either a single data bus network as specified by SAE J1939, SAE J1708, or a multiple data bus network in accordance with SAE J1939, which defines the interface between SAE J1708 and SAE J1939.</p> <p>The data bus shall have built in sensors that provide fault isolation capability sufficient to identify failures of the components of each system monitored by the data bus. Diagnostic outputs shall be retrieved from the vehicle through the existing Redesigned Turret Networks Box J16 Embedded Diagnostics connection or via Ethernet or RS-232 connection (T). All diagnostic outputs shall be retrieved from the vehicle through the existing Redesigned Turret Networks Box J16 Embedded Diagnostics connection (O).</p> <p>Software shall display operator/driver informational data associated with each error code.</p>	A		D	T	<p>To determine conformance to 3.10.11.2, verify through demonstration that the fault identification, fault isolation, and health checks monitored by the data bus can be retrieved with the Maintenance Support Device (MSD) through the existing Redesigned Turret Networks Box J16 Embedded Diagnostics connection or Ethernet or RS-232 connection (T), or retrieved with the MSD through the existing Redesigned Turret Networks Box J16 Embedded Diagnostics connection (O).</p>

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<b>3.10.11.3. <u>Diagnostic Information</u></b>					
<p>The JAB system shall be compatible with U.S. Army Standard Unit Level Test Equipment which is presently the MSD. The MSD shall be used to retrieve and display diagnostic information from the Embedded Diagnostics systems through an Ethernet or RS-232 port.</p>	A	E	D	T	<p>To determine conformance to 3.10.11.3, verify through demonstration that the MSD retrieves and displays diagnostic information from the Embedded Diagnostics system.</p>
<b>3.10.11.4. <u>Diagnostic Connection Check Points</u></b>					
<p>Diagnostic connectors and circuits shall be compatible with the MSD. Diagnostic connectors shall be easily accessible, hard mounted and environmentally protected. The diagnostic connectors shall be equipped with a cover, which shall prevent entrance of moisture and contaminants and does not require removal of additional components to connect.</p>	A	E	D	T	<p>To determine conformance to 3.10.11.4, verify that all diagnostic check points are easily accessible, hard mounted, environmentally protected, have a cover installed and does not require removal of additional components to connect.</p>
<b>3.11. <u>Mobility, Deployability, and Transportability</u></b>					
<b>3.11.1. <u>Physical Dimensions and Weight</u></b>					
<p>When combat-loaded the JAB system shall weigh less than 72 tons (T), 70 tons (O), and have an overall height less than 13.1ft. The JAB system shall have ground clearance of at least 18.5 in measured at the centerline of the vehicle.</p>	A	E	E	T	<p>To determine conformance to 3.11.1, Verify if the JAB system, when combat loaded, is less than 72 tons and has an overall height less than 13.1ft. Verify the ground clearance is no less than 18.5 in measured at the centerline of the vehicle.</p>

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<b>3.11.2. <u>Transportability</u></b>					
<p>The JAB chassis shall be transported separately from the MLC-85 AVLB (T). The JAB system shall be transported via commercial and military maritime with the MLC-85 AVLB installed (O).</p> <p>The JAB may be reduced for transport. Any components removed for transport shall have lifting and tiedown provisions in accordance with MIL-STD-209 to secure for transport.</p>	A			A/T	<p>To determine conformance to 3.11.2, verify the JAB chassis can be transported separately from the MLC-85 AVLB. SDDC will assess the feasibility of transporting the JAB chassis by the designated modes. The SDDC assessment will be used as the primary data source to address transportability of the JAB system. The Transportability Test (TT) will be determined and directed by SDDC to determine the most effective and efficient configuration and method of transport for the JAB system.</p> <p>Verify any components removed from the JAB chassis for transport have lifting and tiedowns as defined in MIL-STD-209.</p>
<b>3.11.2.1. <u>Lifting and Tie down Provisions</u></b>					
<p>The JAB chassis shall be equipped with built in non-removable tie down provisions that meet the requirements for transportation by highway, rail, maritime, and internal aircraft modes. Components removed from the JAB chassis for transport shall also have lifting and tie down provisions as necessary to satisfy transportability requirements. All lifting and tie down provisions shall conform to MIL-STD-209 and to MIL-STD-1791 for equipment restraint criteria.</p>	A			A/T	<p>To determine conformance to 3.11.2.1, verify the JAB chassis is equipped with built in non-removable tie down provisions and conform to all the requirements specified in MIL-STD-209 and MIL-STD-1791. Operational testing of loading/unloading tie-down procedures will be conducted using available transports.</p>
<b>3.11.2.2. <u>Commercial Rail</u></b>					
<p>The JAB chassis shall be transportable by rail in accordance with MIL-STD-810 and fit within the DOD rail envelope as defined in MIL-STD-1366, and the Korean rail envelope as defined in Annex Annex D - Korean Rail EnvelopeD. The JAB chassis shall be transportable in accordance with guidelines in the Military SDDC TEA-PAM 55-19 and SDDC TEA-PAM 70-1.</p>	A			A/T	<p>To determine conformance to 3.11.2.2, verify the JAB chassis shall conform to all the requirements specified in MIL-STD-810, Method 526, and fit within the DOD envelope as defined in MIL-STD-1366 and the Korean rail envelope as defined in Annex D - Korean Rail Envelope. Verify the JAB chassis is transportable in accordance with SDDC TEA-PAM 55-19 and 70-1 for worldwide commercial rail guidelines.</p>

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<b>3.11.2.3. <u>Highway</u></b>					
<p>The JAB chassis shall be highway transportable in accordance with U.S. and NATO standards and guidelines in SDDC TEA-PAM 55-20 and SDDC TEA-PAM 70-1.</p>	A			A/T	<p>To determine conformance to 3.11.2.3, verify the JAB chassis can be transported separately from the MLC-85 AVLB for highway transport. SDDC will assess the feasibility of transporting the JAB chassis. The SDDC assessment will be used as the primary data source to address transportability of the JAB chassis. The Transportability Test (TT) will be determined and directed by SDDC to determine the most effective and efficient configuration and method for rail and highway transport of the JAB chassis.</p>
<b>3.11.2.4. <u>Commercial and Military Maritime</u></b>					
<p>The JAB chassis shall be transportable via commercial shipping (roll-on and roll-off), U.S. Navy amphibious shipping Landing Craft Air Cushioned (LCAC) and Landing Craft Utility (LCU), and military Maritime Prepositioned Forces (MPF) ships. The JAB chassis shall traverse a 15-degree ramp and clear the door to enter the ship without disassembly or dunnage in accordance with guidelines in MIL-STD-1366, TEA-PAM 55-22 and SDDC TEA-PAM 70-1(T) with the MLC-85 AVLB installed (O)</p>	A			A/T	<p>To determine conformance to 3.11.2.4, verify that the JAB chassis will traverse a 15 degree ramp and clear the door to enter the ship without disassembly or dunnage in accordance with MIL-STD-1366, TEA-PAM 55-22 and SDDC TEA-PAM 70-1.</p>
<b>3.11.2.5. <u>Internal Aircraft</u></b>					
<p>The JAB chassis shall be transportable on C-5 and C-17 aircraft and meet the requirements of MIL-STD-1791, MIL-STD-1366, SDDC TEA-PAM 70-1 and SDDC TEA PAM 55-24 and respective loading manuals.</p>	A			A/T	<p>To determine conformance to 3.11.2.5, verify through certification from Air Transportability Test Loading Agency (ATTLA) that the JAB chassis can be transported aboard C-5 and C-17 aircraft.</p>

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<b>3.11.2.6. <u>MLC-85 AVLB Travel Lock</u></b>					
<p>The JAB system shall have a manual travel lock to secure the MLC-85 AVLB while traveling (T). The JAB system shall have an automated travel lock, operable by the driver under closed hatch, to lock the MLC-85 AVLB while traveling and provide visual indication to the driver and commander the MLC-85 AVLB is in the locked position (O).</p>	A	D	D	T	<p>To determine conformance to 3.11.2.6, verify the travel locking mechanism locks the MLC-85 AVLB to the JAB chassis when the MLC-85 AVLB is stowed on the BLM by either manual or automatic means. Verify the automatic Bridge lock release is operable from the driver station and provides visual indication to the commander and driver when in the locked position.</p>
<b>3.11.2.7. <u>Load and Unload MLC-85 AVLB</u></b>					
<p>The JAB system shall unload a folded MLC-85 AVLB onto the ground and onto any military flatbed trailer with sufficient load rating and capability to transport the MLC-85 AVLB in accordance with TM 5-5420-203-14. When the MLC-85 AVLB is removed for travel, the JAB chassis shall load a folded MLC-85 AVLB from the ground in less than 2.5 hours (T), 2 hours (O).</p>	A	D	D	T	<p>To determine conformance to 3.11.2.7, verify the JAB system unloads a folded MLC-85 AVLB onto the ground and onto any flatbed military trailer with sufficient load rating and capability in accordance with TM 5-5420-203-14. Verify the JAB chassis loads a folded MLC-85 AVLB from the ground and is prepared for travel in less than 2.5 hours (T), 2 hours (O).</p>
<b>3.11.2.8. <u>Towing/Recovery</u></b>					
<p>The JAB system shall be towed and recovered separately by M88 family of recovery vehicles, another JAB system, or the M1 family of vehicles using tow cables of sufficient length or the Heavy Duty Lightweight Tow bar with the Heavy Assault Bridge Tow Bar Extension (HAB TBE) kit. Towing and recovery conditions and operations are defined in FM 4-30.31 Recovery and Battle Damage Assessment and Repair.</p>	A			T	<p>To determine conformance to 3.11.2.8, verify the JAB system can be towed by tow cables of sufficient length or the Heavy Duty Lightweight Towbar with the HAB TBE kit by M88 family of Recovery Vehicles, another JAB system, or the M1 family of vehicles separately. Verify the JAB system can be recovered by an M88 family of Recovery Vehicles (fender mired condition), another JAB system, and the M1 family of vehicles (wheeled mired condition) as defined in FM 4-30.31.</p>
<b>3.11.3. <u>Acceleration, Maximum and Minimum Speeds</u></b>					

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The combat loaded JAB system shall perform the requirements stated in this section per the environmental conditions as detailed in section 3.7 of this document and paragraph B1.7 of Annex B.				T	To determine conformance to 3.11.3, the combat loaded JAB system shall perform the requirements stated in this section while operating in the environmental conditions as detailed in section 3.7 of this document and paragraph B1.7 of Annex B.																			
<b>3.11.3.1. <u>Range</u></b>																								
The JAB system shall operate for the minimum threshold ranges provided in Table 3 in the CBRN system operating conditions specified, on a paved surface level road without refueling, at a sustained speed of 29 miles per hour using only the JAB chassis primary fuel system.	A			A/T	To determine conformance with 3.11.3.1, verify through mathematical means, that the JAB system range is 210 miles with the CBRN system ON and 220 miles with CBRN system OFF while maintaining a speed of 29 mph without refueling on dry, paved surface level roads.																			
<p><b>Table 3: Range</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="5">Threshold and Objective Range in Miles</th> </tr> <tr> <th rowspan="2">Action</th> <th colspan="2">Paved Surface level Road (CBRN ON)</th> <th colspan="2">Paved Surface level Road (CBRN OFF)</th> </tr> <tr> <th>Threshold</th> <th>Objective</th> <th>Threshold</th> <th>Objective</th> </tr> </thead> <tbody> <tr> <td>Operating Range</td> <td>210</td> <td>279</td> <td>220</td> <td>289</td> </tr> </tbody> </table>						Threshold and Objective Range in Miles					Action	Paved Surface level Road (CBRN ON)		Paved Surface level Road (CBRN OFF)		Threshold	Objective	Threshold	Objective	Operating Range	210	279	220	289
Threshold and Objective Range in Miles																								
Action	Paved Surface level Road (CBRN ON)		Paved Surface level Road (CBRN OFF)																					
	Threshold	Objective	Threshold	Objective																				
Operating Range	210	279	220	289																				
<b>3.11.3.2. <u>Forward Acceleration</u></b>																								
The JAB system, at combat loaded weight, shall accelerate on a dry, level surface in the forward direction from 0 to 20 mph in 8.5 seconds or less with CBRN System ON.				T	To determine conformance with 3.11.3.2, verify that the JAB system on a hard level surface combat loaded can accelerate from 0 to 20 mph in 8.5 seconds or less with CBRN System ON.																			
<b>3.11.3.3. <u>Maximum Speeds</u></b>																								
The JAB system shall meet the speed thresholds provided in Table 4 under the required operating temperature range of -25 degrees F to 125 degrees F without consideration to time or visibility. Each speed requirement shall be attained and sustained in the terrain condition specified at the top of each column.				T	To determine conformance with 3.11.3.3, verify that the JAB system on a dry, paved surface level roads that the vehicle can attain and sustain speeds as defined in Table 4.																			

3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
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**Table 4: Maximum Speed**

Threshold Speed in Miles Per Hour			
Action	Hard Surf/Paved Road (CBRN On and Off)		Cross Country Terrain (CBRN Off)
	Threshold		Objective
Forward Speed *	29	5	10
Reverse Speed *	20	-	-

\* Shall travel in a controlled manner

**3.11.4. Braking**

The combat loaded JAB system shall perform the requirements stated in this section per the environmental conditions as detailed in section 3.7 of this document.				T	To determine conformance with 3.11.4, the combat loaded JAB system shall perform the requirements stated in this section per the environmental conditions as detailed in section 3.7 of this document.
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**3.11.4.1. Deceleration**

The JAB system shall stop within 75 feet after the service brake application from initial forward speed of 20 mph on a dry, level, hard surface. After service brake application has been maintained for 2 minutes ± 24 seconds, a SERVICE BRAKE WARNING indication shall be provided to the driver and remain until acknowledged and reset by the driver.				T	To determine conformance with 3.11.4.1, verify the JAB system operating at a forward speed of 20 mph on a dry, paved surface level road can stop within 75 feet. Verify the Service Brake Warning indication is provided to the driver after the service brake has been applied for 2 minutes ± 24 seconds, and remains on until acknowledged and reset by the driver.
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**3.11.4.2. Deceleration Control**

The JAB system shall not deviate from a straight line greater than 6 feet left or right of centerline in 50 feet distance without steering corrections after service brake application from initial forward speed of 20 mph on a dry, level, hard surface.				T	To determine conformance with 3.11.4.2, verify the JAB system operating at a forward speed of 20 mph on a dry, paved surface level roads does not deviate from a straight line more than 6 feet left or right of centerline during the 50 ft braking distance.
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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<u>3.11.4.3. Parking Brake</u>					
With the engine OFF and engine ON and the transmission in neutral with the parking brake applied, the JAB system shall remain stationary on a 40 percent grade when headed either up and down the grade. The driver shall be provided a visual parking brake indicator with a reset.				T	To determine conformance with 3.11.4.3, verify the JAB system facing forward on a 40 percent grade, apply the service brake, set the parking brake, place the transmission in neutral, and release the service brake, the JAB system does not move. Shut the system OFF and verify the JAB system remains stationary. Repeat in a reverse direction.
<u>3.11.5. Turning, Steering, Handling</u>					
<u>3.11.5.1. Pivot Steer</u>					
The JAB system shall execute a 360-degree pivot turn, in accordance with TM 9-2350-264-10-1.				T	To determine conformance with 3.11.5.1, verify the JAB system, with the transmission selector level in Pivot (PVT), verify the system can execute a 360-degree in accordance with TM 9-2350-264-10-1.
<u>3.11.5.2. Turning Radius</u>					
The JAB system shall traverse a 90 degree turn in no greater than a 20 foot radius with the system moving at a speed greater than 4 mph, but less than 8 mph, in first transmission range. Turning radius shall be measured from the center of the turn to the centerline of the vehicle.				T	To determine conformance with 3.11.5.2, verify the JAB system, with the vehicle operating at a speed of 4 mph to 8 mph in the first transmission range, can traverse a 90 degree turn in no greater than a 20 ft radius in both directions. Turning radius is defined as the center of the turn to the centerline of the JAB chassis.
<u>3.11.6. Negotiating Obstacles</u>					
<u>3.11.6.1. Vertical Step</u>					
Without assistance or accessory attachments, the JAB system shall climb a vertical step of at least 18 inches high, in forward and reverse.				T	To determine conformance with 3.11.6.1, verify the JAB system can climb a vertical step of 18 inches high in forward and reverse.

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
3.11.6.2. <u>Trench Crossing</u>					
Without assistance or accessory attachments, the JAB system shall cross a trench of at least 7 feet in width in forward and reverse.				T	To determine conformance with 3.11.6.2, verify the JAB system can cross a trench of 7 ft in width in forward and reverse.
3.11.6.3. <u>Slope</u>					
Without assistance or accessory attachments, the JAB system shall ascend and descend (in forward and reverse) a 40 percent slope (T) and 60 percent slope (O) while operating at 3 mph.	A			T	To determine conformance with 3.11.6.3, verify the JAB system without assistance or attachments negotiates a 40 percent slope (T) and 60 percent (O) in forward and reverse while operating at 3 mph.
3.11.6.4. <u>Side Slope</u>					
Without assistance or accessory attachments, the JAB system shall negotiate a 25 percent side slope in forward and reverse.	A			T	To determine conformance with 3.11.6.4, verify the JAB system without assistance or attachments negotiates a 25 percent side slope in forward and reverse.
3.12. <u>Human Factors Engineering (HFE) and Safety</u>					
3.12.1. <u>General</u>					
The JAB system shall minimize exposure of the crew and maintenance personnel to hazards during its use in accordance with MIL-HDBK-454, MIL-STD-882, MIL-STD-1472 and MIL-STD-1474. The JAB contractor shall mitigate any identified hazards to acceptable levels.	A	E	E	A/T	Verify the JAB system minimizes exposure of the crew and maintenance personnel to hazards during its use in accordance with MIL-HDBK-454, MIL-STD-882, MIL-STD-1472 and MIL-STD-1474. Verify the JAB contractor has mitigated any identified hazards to acceptable levels.
3.12.2. <u>Maintenance—General</u>					
The JAB system parts and components shall be serviced and replaced by a range of 5 <sup>th</sup> percentile female to 95 <sup>th</sup> percentile male Soldiers dressed in Arctic clothing per MIL-STD-1472, Section 5.9 and CBRN MOPP IV attire per MIL-STD 1472, Table VII.	A		A	T	To determine conformance with 3.12.2, certify that all JAB system provisions for servicing and replacing all components of the JAB system shall be maintained by Soldiers ranging between a 5 <sup>th</sup> percentile female and 95 <sup>th</sup> percentile male Soldier dressed in Arctic clothing per MIL-STD-1472, Section 5.9 and CBRN MOPP IV attire per MIL-STD 1472, Table VII.

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
3.12.3. <u>Operator—General</u>					
The JAB system shall be operated by two (2) Soldiers within a range of 5 <sup>th</sup> percentile male to 95 <sup>th</sup> percentile male Soldiers dressed in Arctic and CBRN MOPP IV clothing per MIL-STD-1472, Section 5.7. All JAB BLM controls, warnings and indicators shall be provided to the driver to conduct launch and retrieval of the MLC-85 AVLB.	A	E	E	T	To determine conformance with 3.12.3, certify that all JAB system provisions are made for two (2) operators ranging between a 5 <sup>th</sup> percentile male and 95 <sup>th</sup> percentile male Soldiers dressed in Arctic and CBRN MOPP IV clothing per MIL-STD-1472, Section 5.7. Verify all BLM controls, warnings and indicators are provided to the driver for launch and retrieve operations.
3.12.4. <u>Non-Skid Surfaces</u>					
Surfaces of the JAB system, which are to be used as walkways, working areas, and/or steps, shall have non-skid protection equivalent to TACOM non-slip paint spec drawing number 12345756.	E	E	E	E	To determine conformance with 3.12.4, verify that surfaces of the JAB system, which are to be used as walkways, working areas, or steps, have non-skid protection applied in accordance with TACOM non-slip paint spec drawing number 12345756 or equivalent.
3.12.5. <u>Audible Alarms and Visual Warnings</u>					
Audible alarms and visual warnings shall be provided to the driver and commander to alert when system design limitations are exceeded during mobility, launch, and retrieve operations. All audible alarms and visual warnings shall comply with MIL-STD-1472.	A	D	E	T	To determine conformance with 3.12.5, verify that audible alarms and visual warnings are provided to the driver and commander in accordance with MIL-STD-1472.
3.12.6. <u>Vibration</u>					
The JAB system shall meet whole-body vibration requirements as prescribed by ISO 2631 for fatigued-decreased-proficiency on an 8-hour exposure limit curve.	A	A		T	To determine conformance with 3.12.6, the JAB system will be tested for whole-body vibration requirements as prescribed by ISO 2631 for fatigue-decreased-proficiency on an 8-hour exposure limit curve.
3.12.7. <u>Electrical Hazards</u>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
The JAB system electrical hazards shall be controlled in accordance with MIL-HDBK-454.	A	E	E		To determine conformance with 3.12.7, verify that electrical hazards have been controlled in accordance with MIL-HDBK-454.
<b>3.12.8. <u>MLC-85 AVLB Drop Prevention</u></b>					
The JAB launch mechanism shall have an automatic means to prevent dropping of the MLC-85 AVLB in the event of a failure of the hydraulic or electrical system. The MLC-85 AVLB shall be lowered and returned to a secured position, under crew control, in the event of a failure of the hydraulic system, excluding catastrophic structural failure or damage to hydraulic actuators.	A	E	D	T	To determine conformance with 3.12.8, verify the JAB system through testing to verify the launch mechanism has an automatic means preventing the dropping of the MLC-85 AVLB in the event of a failure of the hydraulic or electrical system. Verification will also be made to verify the MLC-85 AVLB can be lowered and returned to a secure position, under crew control, in the event of a failure of the hydraulic system, excluding catastrophic structural failure or damage to hydraulic actuators.
<b>3.12.9. <u>Controls</u></b>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<p>Controls for the BLM and vehicle driving controls for the JAB system shall be provided within reach of the driver while operating in both open and closed hatch modes.</p> <p>The controls shall be of a dead man control type per MIL-STD-1472 which results in a system shut-down to a no movement operating state when force or input is removed.</p>		E	D	T	<p>To determine conformance with 3.12.9, verify the JAB system launch mechanism and driving controls are within reach of the driver while in open and closed hatch modes. Verify the controls are of a dead man type in accordance with MIL-STD-1472.</p>
<p>3.12.10. <u>Toxic Gases and Carbon Monoxide</u></p>					
<p>The JAB system design shall ensure the crew is not exposed to Toxic Gas levels in excess of the requirements in MIL-STD-1472. The equation used to estimate the percent COHb blood levels shall be in accordance with MIL-HDBK-759 using work stress level 3 for all mission activities. Other gases shall be limited to concentration not to exceed those specified in "Threshold Limit Values and Biological Exposure Indices" written by the American Conference of Governmental Industrial Hygienists.</p>			A	A/T	<p>To determine conformance with 3.12.10, verify the JAB system crew is not exposed to Carbon Monoxide (CO) levels in excess of the requirements in MIL-STD-1472. The equation used to estimate the percent COHb blood levels shall be in accordance with MIL-HDBK-759 using work stress level 3 for all mission activities. Other gases shall be limited to concentration not to exceed those specified in the latest publication of the "Threshold Limit Values and Biological Exposure Indices" written by the American Conference of Governmental Industrial Hygienists.</p>
<p>3.12.11. <u>Crew Heat and Cold Protection</u></p>					
<p>The JAB chassis shall provide cooling to the crew to prevent heat stress through the use of the M1A1 personnel heater and cooling system. Crew shall be protected against heat and cold injury while inside the JAB chassis.</p>		E	D	D	<p>To determine conformance with 3.12.11, verify that the JAB chassis utilizes the M1A1 personnel heater and cooling system.</p>

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
3.12.12. <u>Materials</u>					
<p>The Hazardous Material requirements of 3.12.13 shall apply to all components except GFP. Excluding the existing M1A1 Chassis material, dissimilar metals shall be electrically insulated from one another to minimize or prevent galvanic corrosion.</p>	A		A		<p>To determine conformance with 3.12.12, review contractor analysis to ensure dissimilar metals are insulated from one another to prevent galvanic corrosion.</p>
3.12.13. <u>Hazardous Materials</u>					
<p>The contractor shall not introduce hazardous materials when a non-hazardous alternative is available which meets the performance requirements of this specification. Asbestos, beryllium, hexavalent chromium, lead, cadmium, mercury and other Group 1 Agents classified as “carcinogenic to humans” by the International Agency for Research on Cancer (IARC) Monographs, shall not be present in or on any delivered materials, including alloys, or other highly toxic or carcinogenic materials, as defined in FED-STD-313 Section 3.2, shall not be used in the manufacture, assembly, operation or sustainment of this system, or used in final system manufacture and assembly processes.</p> <p>Hazardous materials requirements shall apply to any components/parts provided under this contract, including items purchased through a subcontractor/vendor, COTS components or Original Equipment Manufacturer (OEM) parts, and manufactured parts.</p>	A		A/E		<p>To determine conformance with 3.12.13, review and certify the Material Safety Data Sheet (MSDS) documentation for any hazardous materials.</p>

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<b>3.12.13.1. <u>Corrosion Mitigation</u></b>					
<p>To prevent galvanic corrosion, connectors on both sides of electrical connections shall be of the same material. Hazardous Materials may be used without PCO approval on electrical connectors which interface with GFP electrical connectors as long as the same Hazardous Material is used on each side of the connection.</p>	A		A/E		<p>To determine conformance with 3.12.13.1, verify the JAB system electrical connectors are the same material on both sides of the connection to prevent galvanic corrosion.</p>
<b>3.12.13.2. <u>Radioactive Materials</u></b>					
<p>Radioactive materials shall not be used on the JAB system without the prior written approval of the PCO. Radioactive material is defined as Thorium or any other source material, as defined by Title 10, Code of Federal Regulations, Part 40, "Domestic Licensing of Source Material", in excess of 0.05 percent by weight.</p>	A		A		<p>To determine conformance with 3.12.13.2, verify that no radioactive material except as approved in writing by the PCO have been included in the JAB system.</p>
<b>3.12.13.3. <u>Exceptions</u></b>					
<p>Waivers from the hazardous materials requirements shall not be permissible except where a suitable alternative does not exist. The Contractor shall submit formal waiver requests to the PCO using the Request for Use of Prohibited Materials. The Government will make the final determination on whether sufficient justification has been provided to support approval of any waiver requests. The contractor shall not use or deliver any prohibited hazardous materials without prior written waiver approval from the PCO.</p> <p>The list of materials that can be used without written PCO approval is shown in Annex E</p>	A/E		E		<p>To determine conformance with 3.12.13.3, verify the JAB system has not utilized lead without prior written approval by the PCO with the exception of items listed in Annex E.</p>
<b>3.12.14. <u>Ozone Depleting Substances</u></b>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
All materials and components of the JAB system shall be free of Class I and Class II ozone depleting substances except as already used in the GFP Chassis for AFES.	E	E	E		To determine conformance with 3.12.14, certify that all materials and components are free of Class I and II ozone depleting substances per applicable Federal regulations in effect on the date of manufacture except for those used for AFES.
3.12.15. <u>Ozone Resistant Products</u>					
Excluding the existing M1A1 Chassis material, all rubber products introduced on the JAB chassis shall satisfy requirements of ASTM D2000 and be ozone resistant consistent with best commercial practice.	A/E				To determine conformance with 3.12.15, certify that all rubber products introduced to the JAB chassis satisfy the requirements of ASTM D2000 and are ozone resistant consistent with best commercial practice.
3.12.16. <u>Hydraulic System Design</u>					
3.12.16.1. <u>Hydraulic Fluid</u>					
The JAB system shall operate on all fire resistant type hydraulic fluids on the Qualified Products List per MIL-PRF-46170. High-pressure hydraulic components and hoses shall operate with fire resistant hydraulic fluid Type I (MIL-PRF-46170) and with MIL-PRF-6083. There shall be no excessive leakage of hydraulic fluid, as defined by class III leaks per AR 750-1, past couplings or seals at a maximum load, speed and pressure when operated within the technical requirements of this ATPD.	E	E	E	T	To determine conformance with 3.12.16.1, verify that the JAB system hydraulic fluid is of the fire resistant type per MIL-PRF-46170 and is on the qualified product list, and high pressure components use the fire resistant Type 1 MIL-PRF-46170 and MIL-PRF-6083. Verify the JAB hydraulics do not have leakage greater than that as defined by class III leaks of AR 750-1 while under pressure and maximum loading.
3.12.16.2. <u>Hydraulic Lines and Filters</u>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
The hydraulic filters and strainers shall be located so as to provide direct access and to allow replacement without removal of components with the exception of shielding as defined in 3.12.16.4 when located in the crew compartment. Bypasses shall be furnished where necessary to protect filters during cold temperature operations. The JAB hydraulics shall allow for automatic removal of air trapped in the hydraulic system.	A	D	E	T	To determine conformance with 3.12.16.2, verify that provisions are installed to prevent injury to crew by rupturing of lines routed through an operator compartment. Verify hydraulic filters and strainers are located with direct access for removal without removal of other components with the exception of shielding as defined in 3.12.16.4 when located in the crew compartment.
<b>3.12.16.3. <u>Hydraulic Fluid Loss from Penetration and Rupture</u></b>					
The JAB system crew shall be protected from injury caused by exposure to both high pressure and hot hydraulic fluid resulting from ruptured hydraulic lines and reservoirs.	A	E	E		To determine conformance with 3.12.16.3, verify the crew is protected from injury caused by exposure to hot and/or high pressure hydraulic fluid resulting from ruptured lines and reservoirs.
<b>3.12.16.4. <u>Hydraulic Line Routing and Location</u></b>					
All hydraulic lines and components of the JAB system, when routed through the crew compartment, shall be located and shielded to minimize their vulnerability during mission operation and to prevent injury to crew and damage to the vehicle in case of ruptured lines, broken or loose fittings and couplings, fire, or other heat sources. Hydraulic lines shall be routed and mounted properly to prevent damage in accordance with SAE J1273.	E	E	E	E	To determine conformance with 3.12.16.4, verify that all hydraulic lines and components are located, routed, or shielded to minimize vulnerability during mission operation and to prevent injury to the crew and damage to the vehicle in accordance with SAE J1273.
<b>3.12.16.5. <u>Hydraulic Lines and Connections</u></b>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
All JAB system hydraulic connections shall be in accordance with SAE J516. Hoses and tubing shall conform to SAE J517 or equivalent for burst and test pressure.	A	E	E		To determine conformance with 3.12.16.5, verify all hydraulic connections are in conformance with SAE J516. Verify hoses and tubing conform to SAE J517 for burst and test pressure.
<b>3.12.16.6. <u>Hydraulic Pressure Relief</u></b>					
The JAB system shall incorporate a pressure relief valve, either manual or automatic, for reducing pressure to zero pressure for maintenance of the hydraulic system and during MLC-85 AVLB hydraulic line connection and disconnection.	E	D	D	T	To determine conformance with 3.12.16.6, verify the JAB hydraulics system incorporates a pressure relief valve, either manual or automatic, for reducing pressure in the hydraulic system to zero pressure.
<b>3.12.17. <u>Noise Limits</u></b>					
Noise levels produced by the JAB system shall comply with requirements of MIL-STD-1474 with the exception of MIL-STD-1474, Requirement 2 and 3. The noise level at all crew operating positions shall not exceed Category B of MIL-STD-1474 (noise attenuating helmet/headsets shall be used by the crew). The vehicle interior shall be posted with warning decals indicating high noise area.	A		A	T	To determine conformance with 3.12.17, the JAB system noise limits and hearing protection requirements will be assessed in accordance with MIL-STD-1474.
<b>3.12.18. <u>Emergency Egress</u></b>					
The JAB system shall maintain at least two independent escape routes in all modes of operation. Escape routes shall be usable by Soldiers ranging from a 5 <sup>th</sup> percentile female to a 95 <sup>th</sup> percentile male. Maximum escape time, for both crewmembers evacuating the vehicle, shall not exceed 20 seconds (T), 10 seconds (O). The time stops when both crew members get out of the vehicle onto the chassis.	A		D	T	To determine conformance with 3.12.18, JAB system egress time trials will be conducted with the MLC-85 AVLB on and off the JAB chassis to determine that crew can safely egress the vehicle. Times will be evaluated against requirements outlined.
<b>3.12.19. <u>Crew Evacuation</u></b>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
The JAB system shall allow any disabled crewman located in his assigned crew position to be evacuated from the vehicle with the vehicle oriented in the upright position.	A		D	T	To determine conformance with 3.12.19, an evaluation will be conducted to confirm that the JAB system requirement for disabled crew evacuation can be safely conducted.
3.12.20. <u>Crew Compartment</u>					
3.12.20.1. <u>Display Light Emission</u>					
The JAB chassis shall incorporate adjustable illumination for visual displays (including display, control, and panel labels and critical markings) that must be read under darkened conditions. Illumination shall be continuously adjustable or permit adjustment to a minimum of 30 increments from completely OFF to maximum brightness per MIL-STD-1472.	E		E	T	To determine conformance with 3.12.20.1, verify the JAB chassis visual displays can be read under darkened conditions and the illumination is adjustable from completely OFF to maximum brightness per MIL-STD-1472.
3.12.20.2. <u>Hatches</u>					
The JAB chassis shall utilize the M1A1 driver's and commander's hatches that allow the crew to safely operate the vehicle in both open and closed hatch modes. The hatch shall provide ingress and egress when open. The hatch shall provide ballistic, environmental, and CBRN protection when closed. The hatch shall lock in both its fully open and fully closed positions.	E		E	T	To determine conformance with 3.12.20.2, verify the JAB chassis crew hatches are unmodified M1A1 hatches that provide ballistic, environmental, and CBRN protection when closed. Verify both hatches lock in both the open and closed position and can be secured from the inside to prevent unauthorized access.
3.12.20.3. <u>Driver's Hatch</u>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<p>The driver's hatch shall retain the mounting of three (3) vision periscopes providing a field of view that permits the driver to safely operate the vehicle with the driver's hatch closed as stated in section 3.7.7 of this document. The driver's hatch shall be secured from inside the vehicle to prevent the hatch from being opened from outside the vehicle.</p>	E		E	D	<p>To determine conformance with 3.12.20.3, Verify the driver's hatch has an unobstructed view through the three (3) vision periscopes providing a field of view that permits the driver to safely operate the vehicle with the driver's hatch closed.</p>
<p>3.12.20.4. <u>Commander's Hatch</u></p>					
<p>The commander's hatch shall retain the mounting of six (6) vision periscopes providing a field of view stated in section 3.7.7 of this document. The commander's hatch shall be secured from inside the vehicle to prevent the hatch from being opened from outside the vehicle. The commander's hatch shall retain the current brackets that allow the hatch to be secured from the outside to prevent unauthorized access.</p>	E		E	D	<p>To determine conformance with 3.12.20.4, verify the commander's hatch has an unobstructed view through the six (6) vision periscopes providing a field of view stated in section 3.7.7 of this document. The commander's hatch shall retain the M1A1 capability to allow the hatch to be secured from the outside to prevent unauthorized access.</p>
<p>3.12.20.5. <u>Commander's Hatch Location</u></p>					
<p>The JAB chassis shall utilize the M1A1 commander's hatch, which shall be located on the turret cap centered above the commander's station seat.</p>	E		E	T	<p>To determine conformance with 3.12.20.5, verify the JAB chassis commander's hatch is positioned on the turret cap above the commander's station seat.</p>
<p>3.12.20.6. <u>Seats</u></p>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
<p>The JAB chassis commander and driver shall have a seat that facilitates performance of crew functions in both open and closed hatch modes. The M1A1 driver's seat shall be utilized in the driver's compartment.</p> <p>The commander's seat shall comply with Federal Motor Vehicle Safety Standard (FMVSS) 207 and FMVSS 210. The commander's seat shall provide a full range of adjustability to optimize vision, comfort, and performance of the crew's functions. The seat design and positioning shall facilitate ingress to and egress. The commander's seat shall have Type 2 seat belt assembly which is defined as a combination of pelvic and upper torso restraints, and shall be in accordance with FMVSS 209.</p> <p>For Open hatch operations for the commander, the commander shall be seated in his seat with his seat belt on. The seat shall be activated to allow him to drop into the vehicle in the event of a rollover, and in the need to egress the vehicle in an emergency situation. The seat handle shall be accessible and operated with one hand allowing him to take protection within the confines of the chassis structure. The seat shall provide the commander easy access to the seat lowering mechanism in all modes of operation. provide rapid lowering for the aforementioned function.</p>	E		D/E	E/T	To determine conformance with 3.12.20.6, verify the driver's seat is the M1A1 seat. Verify the commander's seat is adjustable in open and closed hatch modes, and the commander's seat has Type 2 seat belt assemblies installed and compliant with FMVSS 207, 209, and 210.
<b>3.12.20.7. <u>Autoflug Seat</u></b>					
<p>The JAB chassis driver's compartment shall retain the current brackets for mounting of the Autoflug seat kit. The brackets and provisions for the Autoflug seat shall not be removed or covered by the placement of components.</p>	E		E	D	To determine conformance with 3.12.20.7, verify the JAB chassis driver's compartment has the current brackets for mounting of the Autoflug seat kit installed. Verify the brackets and provisions for the Autoflug seat are not removed or covered by the placement of components.
<b>3.12.20.8. <u>Dome Lights</u></b>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
The JAB chassis driver's and commander's crew compartment shall be equipped with M1A1 dome lights with adjustable intensity of illumination from fully extinguished to full brightness.	E		E	D	To determine conformance with 3.12.20.8, verify the JAB chassis has the M1A1 dome lights for the driver and commander installed and function properly. Verify these can be adjusted for intensity from fully extinguished to full brightness.
3.12.21. <u>Smoke Grenade Impulse Noise</u>					
The JAB chassis smoke grenade positioning shall meet MIL-STD-1474, Requirement 4 for impulse noise during deployment of the smoke grenades using the M250 smoke grenade launchers.			A	A/T	To determine conformance with 3.12.21, verify the JAB chassis smoke grenade launchers meet MIL-STD-1474, Requirement 4 for impulse noise during deployment of the smoke grenades using the M1A1 smoke grenade launchers using a 140dB noise contour.
3.13. <u>Logistic Support</u>					
3.13.1. <u>Commonality</u>					
The JAB system shall integrate Government Off The Shelf (GOTS) and COTS components. Parts that have a National Stock Number (NSN) shall be used (O).			E		To determine conformance with 3.13.1, verify through examination that JAB system components use GOTS/COTS and uses parts with existing NSN's.
3.13.2. <u>Maintainability / Supportability</u>					
<p>All JAB system maintenance shall be performed through the use of tools found in the following tool sets. Tools not contained in these tool sets require prior written PCO approval and shall be provided with the JAB system.</p> <ul style="list-style-type: none"> <li>• Battalion Maintenance Team Tool Set: NSN 4940-01-140-2364</li> <li>• General Mechanics Tool Kit: NSN 5180-01-548-7634</li> <li>• Forward Repair System: NSN 4940-01-463-7940</li> <li>• Standard Automotive Tool Sets: NSN 4910-01-490-6453</li> <li>• Ground Hop Kit: NSN 4910-01-231-0343</li> <li>• Army General Mechanics Tool Kit, Automotive, NSN 5180-00-177-7033</li> </ul>			E	T	To determine conformance with 3.13.2, verify the tools required for JAB system maintenance shall be found in the list of tool sets in section 3.13.2. Verify that if there are any tools not listed in the common tool sets that these special tools are provided.
3.13.3. <u>Pulse Jet System (PJS)</u>					

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3. <u>Technical Requirements</u>	PUI	FT	QC I	PQT	4. <u>Verification Requirements</u>
The JAB system shall utilize the self-cleaning air filtration system equivalent to that of the M1A1 PJS, which automatically monitors the status of the air filter and performs its self-cleaning function as required to maintain effective functioning of the main engine and prevent contaminants from entering the engine.			D	D	To determine conformance with 3.13.3, verify that the JAB system has a self-cleaning air filtration system and that the system functionally is equal to that of the M1A1.
<b>3.13.4. <u>Stowage</u></b>					
The JAB system shall have adequate storage for all Basic Issue Items (BII). All items shall be stowed in a manner that shall not hinder the operation or transport of the JAB system. BII shall not be stowed on the JAB chassis side skirts to allow mounting of additional armor kits as necessary. Items shall be stowed in toolboxes and cases. All BII shall be secured in place during operation and transportation.	E		E	D	To determine conformance with 3.13.4, verify there is sufficient internal and external storage for all JAB system BII. Verify BII is not stowed on the side skirts of the JAB chassis and that BII does not hinder operations. Verify that all BII is secured in place for operation and transportation.
<b>3.13.5. <u>Marking</u></b>					
The JAB chassis shall have markings in accordance with MIL-STD-130.	E		E		To determine conformance with 3.13.5, verify the JAB chassis has markings in accordance with MIL-STD-130.

## 4. VERIFICATION REQUIREMENTS

### 4.1. General

Section 4 in Table 1 consists of the methods used to verify the product meets the requirements shown in Section 3. All tests and test parameters are defined in Section 4. Conformance with Section 3 requirements shall be verified as defined in Section 4, using the verification methods, as identified in Table 1 and defined in section 4.3 respectively: Analysis, Demonstration, Examination and Test.

#### 4.1.1. Prototype System Inspection

The contractor at the place of manufacture shall inspect the first two prototype JAB systems. The inspection shall include as a minimum the inspections referenced in Table 1. Upon completion of inspection, the contractor shall submit both prototype JAB systems and all inspection records and certifications to the Government Quality Assurance Representative (QAR) for review. The Government, at its option, may elect to witness the contractor's inspection or conduct its own inspection.

### 4.2. Approval and Acceptance

Approval and acceptance by the PCO of the JAB systems shall be withheld until the Final Inspection Record (FIR) has been completed and final determination has been made by the PCO regarding conformity of the JAB system to contractual requirements.

### 4.3. Verification Methods

Methods utilized to accomplish verification (reference MIL-STD-961E) are described below. If multiple verifications methods are identified in Table 1, the contractor shall complete all verifications indicated.

#### 4.3.1. Analysis (A)

An element of verification that utilizes established technical or mathematical models or simulations, algorithms, charts, graphs, circuit diagrams, or other scientific principles and procedures to provide evidence that stated requirements were met

#### 4.3.2. Demonstration (D)

An element of verification which denotes the actual operation, adjustment, or reconfiguration of items to provide evidence that the designed functions were accomplished under specific scenarios. The items may be instrumented and quantitative limits of performance monitored.

#### 4.3.3. Examination (E)

An element of verification that is generally nondestructive and typically includes the use of sight, hearing, smell, touch, and taste; simple physical manipulation; and mechanical and electrical gauging and measurement

#### 4.3.4. Test (T)

An element of verification and inspection which generally denotes the determination, by technical means, of the properties or elements of items, including functional operation, and involves the application of established scientific principles and procedures.

#### 4.4. Verification Events

##### 4.4.1. Production Unit Inspection (PUI)

During fabrication, inspections shall be performed by the contractor to certify conformance with the requirements of the contract and specifications. Upon completion of PUI, the contractor shall submit the JAB systems and make available all inspection records and certifications to the responsible Government inspection element at the contractor's facility. The approved FIR shall be submitted to the PCO with each JAB system offered for acceptance.

##### 4.4.1.1. In-Process Inspection

During fabrication of the JAB systems, the contractor shall conduct in-process inspections. The Government reserves the right to witness any inspection where such inspections are deemed necessary to evaluate conformance of materials and workmanship to the requirements referenced in Table 1. Government representatives shall have access to the contractor's or subcontractor's facility as appropriate to evaluate conformance of materials and workmanship to the requirements set forth by this document. All components of the JAB chassis shall be available for inspection; these inspections shall be made prior to application of primer and paint. Welding procedures, welder certifications, workstation instructions, control plans, in-process quality check sheets, inspection records, and calibration procedures shall be properly documented. These documents shall be made available for review and evaluation during the in-process inspections. Deficiencies found during in-process inspections shall be corrected prior to presentation to the Government for acceptance.

##### 4.4.2. Functional Test (FT)

The contractor shall conduct a FT which consists of five (5) launch and retrieve cycles and all items marked with an A, D, E, or T in Table 1 at the contractor's facility. Each of these cycles shall be conducted in an alternating manner (launch from one end then retrieval of the MLC-85 AVL B from the opposite end). The Government reserves the right to witness this inspection as set forth in this document.

##### 4.4.3. Quality Conformance Inspection (QCI)

The QCI is a final inspection by the Contractor of the end item performed prior to presentation to the Government for acceptance of a production unit utilizing a Final Inspection Record (FIR). The FIR is a quality record, which documents all verification actions performed on each production unit, both in process and final, with documented results and corrective action.

Each unit produced shall undergo a complete final inspection by the Contractor to the degree necessary to assure a defect-free product. This inspection shall include those performance requirements as referenced in Table 1. The QCI shall be conducted and documented using a Contractor prepared and Government approved FIR. All QCIs shall be performed at prevailing ambient temperatures.

Deficiencies found during QCI shall be corrected prior to presentation to the Government for acceptance.

##### 4.4.4. Production Qualification Testing (PQT)

The PQT is a test of the end item conducted by the Government and performed at a Government test site to establish product conformance to requirements as stated in Table 1. Upon completion of the QCI, one or more production units shall undergo production qualification testing at designated Government approved test sites to evaluate conformance to performance requirements as referenced in the table below.

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Deficiencies found during the PQT shall be cause to refuse acceptance of the vehicle and any number of vehicles dependent upon the nature of the deficiency until corrective action has been taken. All PQT performance requirement failures shall be reported to the Contractor by the Government. These failures shall be reviewed by the Contractor for system design or manufacturing processes corrective action.

### 4.5. Repair of Defects

Failure of the vehicle to comply with any of the requirements specified or any deficiency of a workmanship or materials nature found on the vehicle during, or as a result of, any verification method specified in the table below, except those incidents caused by operator or maintainer error, accident, or causes other than workmanship or material defects, will be cause for rejection of the vehicle and any number of vehicles dependent upon the nature of the deficiency. The Contractor shall identify the root cause, propose a correction, and ensure recurrence is prevented.

### 4.1. Packaging

For acquisition purposes, the packaging requirements shall be as specified in the contract or delivery order. When packaging of material is to be performed by Department of Defense (DoD) or in-house contractor personnel, these personnel may need to contact the responsible packaging activity to ascertain the packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Services System Commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products or by contacting the responsible packaging activity.

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## 5. NOTES

### 5.1. Intended Use

The purpose of the JAB system is to meet the gap crossing requirements of the Operating Forces by providing a rapidly employable, short gap, assault crossing system for the armored / mechanized forces, capable of spanning natural and manmade obstacles up to 60 feet. The JAB system will replace the fielded M60A1 Armored Vehicle Launched Bridge (AVLB) used to launch and retrieve an MLC-85 AVLB.

### 5.2. Acquisition Documents

Acquisition documents must specify the following:

- a. Title, number, and date of this purchase description
- b. If required, the specific issue of individual documents referenced (see 2.2.1, 0, and 0 of this document).
- c. Packaging requirements (see 4.1 of this document)

### 5.3. Definitions

The following definitions apply to the entire PD:

#### 5.3.1. Combat Loaded JAB system

A combat loaded JAB system is defined as the M1A1 Chassis, MLC-85 AVLB, BLM including all of sub-components, BII, full fuel and hydraulic fluid, 2 crew members (driver and commander) and all items listed in the 72 hour mission equipment list located in Annex E.

#### 5.3.2. JAB system

The JAB system is defined as the M1A1 Chassis, launch mechanism and MLC-85 AVLB stowed on top of the M1A1 Chassis.

#### 5.3.3. JAB chassis

The JAB chassis is defined as the M1A1 Chassis and launch mechanism installed.

#### 5.3.4. M1A1 Chassis

M1A1 Chassis is defined as the M1A1 vehicle with turret removed.

#### 5.3.5. Launch and retrieve cycle

One launch and retrieve cycle of the MLC-85 AVLB is defined as completing a full launch from the fully stowed position on the JAB chassis and then retrieving a launched MLC-85 AVLB to the fully stowed position.

#### 5.3.6. Full launch

Full launch is defined as deploying the MLC-85 AVLB from the fully stowed position, such that the MLC-85 AVLB is disconnected from the launching mechanism and ready for vehicle crossings.

#### 5.3.7. Fully stowed position

Fully stowed position is defined as the MLC-85 AVLB being positioned on the top of the JAB chassis, without the travel locks engaged.

#### 5.3.8. Corrective maintenance

Corrective maintenance includes the adjustment, removal, repair, reinstallation, and alignment of repairable parts, modules, subassemblies, and assemblies.

5.3.9. Cross Country Terrain

Vehicle operations over terrain not subject to repeated traffic and where no roads, routes, well-worn trails or man-made improvements exist. These are surfaces having a root mean square roughness value greater than 3.8 cm (1.5 in).

5.3.10. Manual travel lock

Manual travel lock is defined as a travel lock that can be manually disengaged by the crew while the crew is inside the JAB system with all hatches closed. The crew is allowed to exit the JAB system after retrieval to engage the travel lock.

5.3.11. Unobstructed Vision Periscopes

Unobstructed vision through the periscopes as referenced in section 3.7.7.2 is defined as not being able to see any contractor added component (with the exception of vision system components) through the periscopes under closed hatch.

5.4. MLC-85 AVLB Remounting

The MLC-85 AVLB does not require more than a 20 ton crane or M88 family of vehicles support during transition of removing the transported mode to the ground for remounting on the JAB chassis.

Custodian:  
Army – AT

Preparing activity:  
Army – AT

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Annex A - ACRONYM LIST

The following acronyms are used within this Purchase Description:

AFES	Automatic Fire Extinguishing System
AR	Army regulation
ARL	Army Research Labs
ATTLA	Air Transportability Test Loading Agency
AVLB	Armored Vehicle Launched Bridge
AFES	Automatic Fire Extinguishing System
BFT	Blue Force Tracker
BII	Basic Issue Items
CBRN	Chemical, Biological, Radiological and Nuclear
CM	Corrective maintenance
COMSEC	Communication Security
COTS	Commercial-Off-The-Shelf
CVS	Command Vehicle Crewman
DAGR	Defense Advanced GPS Receiver
DECU	Digital Electronic Control Unit
DIP	Driver's Instrument Panel
DMP	Driver's Master Panel
ECP	Engineering Change Proposal
E3	Electromagnetic Environmental Effects
EMU	Engine Memory Unit
EPA	Environmental Protection Agency
FAT	First Article Test
FBCB2	Force XXI Battle Command, Brigade and Below
FD/SC	Failure Definitions/Scoring Criteria
FEA	Fire Extinguisher Amplifier
FIR	Final Inspection Record
FM	Field Manual
FMVSS	Federal Motor Vehicle Safety Standards
FT	Functional Trial
GFP	Government Furnished Property
GOTS	Government Off the Shelf
GPS	Global Positioning System
HAB TBE	Heavy Assault Bridge Tow Bar Extension
HAZ	Heat Effect Zone
HDB	Hull Distribution Box
HEMP	High-Altitude Electromagnetic Pulse
HFE	Human Factor Engineering
HNB	Hull Networks Box
HPU	Hydraulic Power Unit

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IUID	Item Unique Identification Marking
JAB	Joint Assault Bridge
LCAC	Landing Craft Air Cushioned
LCU	Landing Craft Utility
LRU	Line Replacement Unit
MAC	Mobility Augmentation Command
MBT	Main Battle Tank
MaxTTR	Maximum Time to Repair
MPF	Maritime Prepositioned Forces
MLC	Military Load Class
MMBOMF	Mean Miles Between Operational Mission Failures
MMH/OH	Maintenance Man Hour per Operating Hour
MN	Material Need
MOPP	Mission Oriented Protective Posture
MOS	Military Occupational Specialty
MR	Maintenance Ratio
MSD	Maintenance Support Device
MCBOMF	Mean Cycles Between Operational Mission Failure
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, Chemical
NSN	National Stock Number
ODS	Ozone Depleting Substances
OEM	Original Equipment Manufacturer
PCO	Procuring Contracting Officer
PD	Purchase Description
PdM	Product Manager
PJS	Pulse Jet System
PM	Preventive Maintenance
PMCS	Preventive Maintenance Checks and Services
PPQT	Pre Production Qualification Test
PPUI	Pre Production Unit Inspection
QAR	Quality Assurance Representative
QCI	Quality Conformance Inspection
SDDCTEA	Surface Deployment And Distribution Command Transportation Engineering Agency
SINGGARS	Single Channel Ground and Airborne Radio System
SSA	Shift Select Assembly
TACOM	Tank-automotive and Armaments Command
TARDEC	Tank and Automotive Research, Development and Engineering Center
TDTC	Trilateral Design and Test Code
TIP	Tank Infantry Phone
TM	Technical Manual

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TMDE	Test, Measurement, and Diagnostic Equipment
TT	Transportability Test
UTCP	Upgraded Tank Commander's Panel
XMSN	Transmission (Shift Solenoids/Speed Sensor)

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**Annex B - Abrams Mandatory Performance Levels**

See Annex B (FOUO/Export Controlled)

**Annex C - Ballistic Survivability**

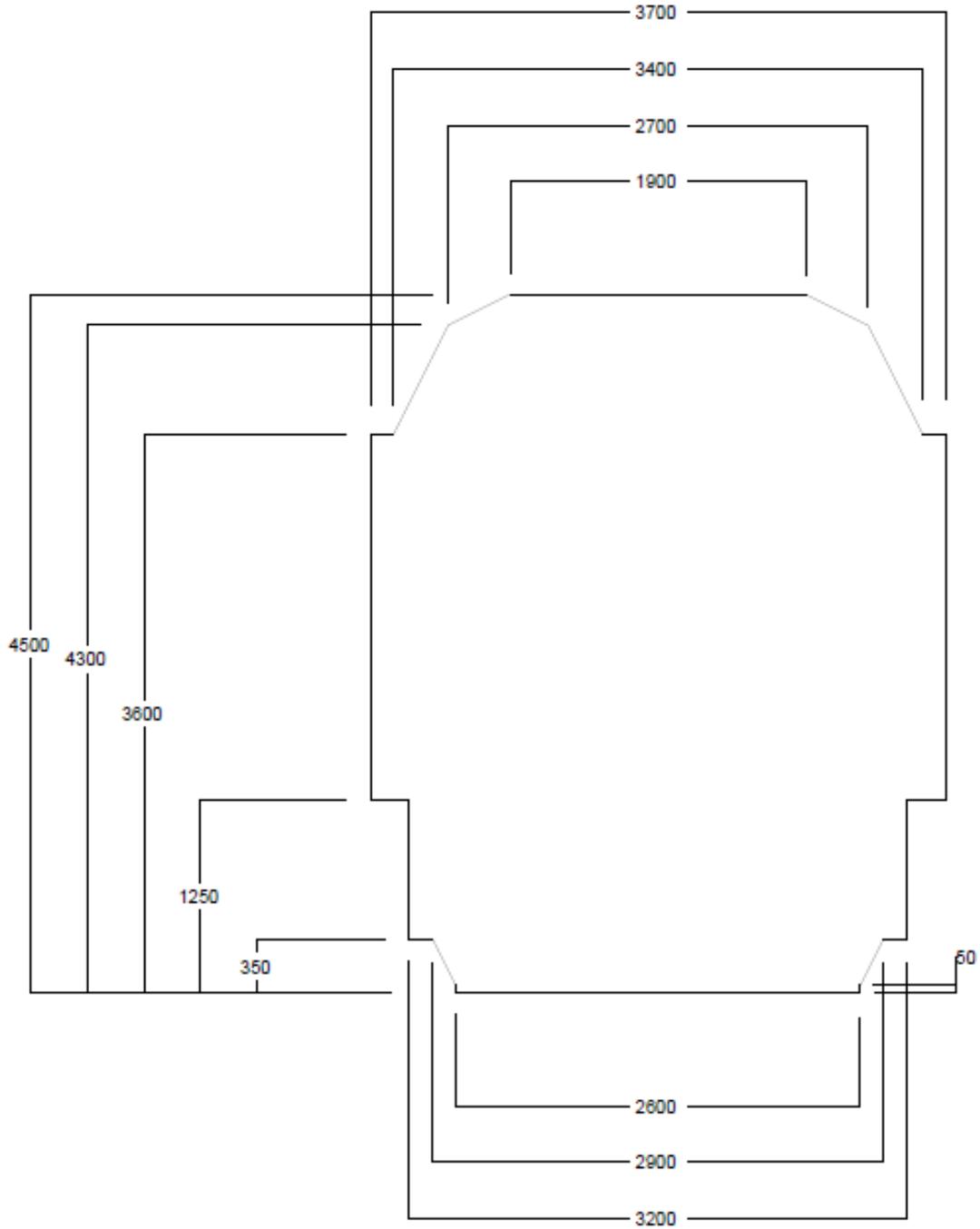
See Annex C (FOUO/Export Controlled)

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Annex D - Korean Rail Envelope

ALL DIMENSIONS ARE IN mm



**Annex E – Hazardous Material Exemption List**

The following materials can be used without written PCO approval:

- Chemical Agent Resistant Coating (CARC) primers and topcoats
- Cadmium and hexavalent chromium on electrical connectors used in Automatic Fire Extinguishing Systems (AFES)
- Lead solder
- Lead-acid batteries
- Lead in engine bearings
- Lead battery terminal adaptors/clamps
- Steel containing up to 0.35 % lead by weight
- Aluminum containing up to 0.4 % lead by weight
- Copper and Brass alloys containing up to 4 % lead by weight
- Beryllium and Beryllium alloys used in electrical components
- Mercury containing components compliant with European Union (EU) Directive 2002/95/EC (RoHS)
- Hard Chromed Components
- Trace amounts of identified prohibited materials contained in base materials and/or alloys. For the purposes of this contract, trace amounts are defined as <0.1% by weight for carcinogens and <1%by weight for all other materials

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Annex F – Welding Standards

Structural Steel	American Welding Society (AWS) D1.1
Structural Aluminum	American Welding Society (AWS) D1.2
Structural Sheet Metal	American Welding Society (AWS) D1.3
Stainless Steel	American Welding Society (AWS) D1.6
Titanium	American Welding Society (AWS) D1.9
Specification for Automotive Weld Quality – Resistance Spot Welding of Steel	American Welding Society (AWS) D8.1
Specification for Automotive Spot Welding Electrodes	American Welding Society (AWS) D8.6
Recommended Practices for Automotive Weld Quality – Resistance Spot Welding	American Welding Society (AWS) D8.7
Recommended Practices for Test Methods for Evaluating the Resistance Spot Welding Behavior of Automotive Sheet Steel Materials	American Welding Society (AWS) D8.9
Specification for Robotic Arc Welding Safety	American Welding Society (AWS) D16.1
Guide for Components of Robotic Arc Welding Installations	American Welding Society (AWS) D16.2
Risk Assessment Guide for Robotic Arc Welding	American Welding Society (AWS) D16.3
Specification for the Qualification of Robotic Arc Welding Personnel	American Welding Society (AWS) D16.4
Specification for Friction Stir Welding of Aluminum Alloys for Aerospace Applications	American Welding Society (AWS) D17.3
Recommended Practices for Resistance Welding	American Welding Society (AWS) C1.1
Armor Steel	Ground Combat Vehicle Welding Code – Steel TACOM Drawing Number 12479550 <a href="http://contracting.tacom.army.mil/engr/gcv_weldingcodes.htm">http://contracting.tacom.army.mil/engr/gcv_weldingcodes.htm</a>
Section IX qualification standard for welding and brazing procedures, welders, braziers, and welding and brazing operators	ASME Section IX

**Annex G – 72 Hour Mission Equipment List**

1. Stowed inside the JAB Chassis
  - a. 2 EA – Case of MREs (1 per crewmember)  
Dimensions of each case - 10"x12"x18"
  - b. 2 EA - MOLLE Large Rucksack (1 per crewmember)  
NSN - 8465-01-523-6276  
Capacity of 4000 cubic inches
  - c. 2 EA – 210 Rounds of M16/M-4 Ammunition (1 per crewmember)
  
2. Stowed on the exterior of the JAB Chassis
  - a. 2 EA - Can, water, military, 5 gal.  
MIL-C-43613DD Type 2 (81349)  
NSN - 7240-01-365-5317  
Dimensions - 18.5" x 14" x 6.75"