

INCH-POUND

MIL-PRF-62270A(AT)

30 October 1996

SUPERSEDING

MIL-C-62270(AT)

5 March 1984

## PERFORMANCE SPECIFICATION

### CHASSIS, TANK: ARMORED VEHICLE, BRIDGE LAUNCHER, M48A5

This specification is approved for use by the U.S. Army Tank-automotive and Armaments Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification covers one type of full-tracked tank chassis which with subsequent adaptation mounts a 60 foot (ft) launched bridge. This specification is limited to the vehicular chassis of the launcher.

#### 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.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/BLUE, Warren, MI 48397-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 2350

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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 supplement thereto, cited in the solicitation (see 6.2).

## SPECIFICATIONS

## DEPARTMENT OF DEFENSE

MIL-L-2104 - Lubricating Oil, Internal-Combustion Engine, Heavy-Duty.

## STANDARDS

## DEPARTMENT OF DEFENSE

MIL-STD-1474 - Noise Limits for Military Materiel (Metric).

(Unless otherwise indicated, copies of the above specifications, standards and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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 are those cited in the solicitation.

## DRAWINGS

## ARMY

8736997 - Tank, Chassis, M48A5, Transporter, AVL Bridge.  
 12257352 - Production Lubrication Chart.  
 12369003 - Steel Exterior Surfaces, Green 383.  
 12369004 - Steel Interior Surfaces, White.  
 12369008 - Galvanized Exterior Surfaces, Green 383.  
 12369010 - Galvanized Interior Surfaces, White.

(Copies of U.S. Army drawings are available from the U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/BLUE, Warren, MI 48397-5000.)

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NUCLEAR REGULATORY COMMISSION (NRC)

Code Of Federal Regulations (CFR) - Title 10, Parts 30 and 40.

(Copies of the Code of Federal Regulations (CFR) are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)

ANSI/ASQC Z1.4 - Sampling Procedures and Tables for Inspection by Attributes (DoD Adopted).

(Application for copies should be addressed to American National Standard Institute (ANSI), 11 West 42nd Street, New York, NY 10036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus (DoD Adopted).  
ASTM D610 - Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces (SSPC-VIS-2) (DoD Adopted).  
ASTM D3359 - Standard Test Methods for Measuring Adhesion by Tape Test (DoD Adopted).

(Copies of ASTM publications may be obtained from the American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

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 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

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3.2 Materials.

3.2.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided the material meets or exceeds all specified requirements and promotes economically advantageous life cycle costs.

3.2.2 Prohibited material. Asbestos, Cadmium, and radioactive materials shall not be used in this item. Radioactive material is defined by 1) Title 10, Code of Federal Regulations (CFR), Parts 30 and 40, and 2) Other radioactive material in which the specific activity is greater than 0.002 microcuries per gram or the activity per item equals or exceeds 0.01 microcuries (see 3.5.1).

3.3 Operational profile. The operational profile of the vehicle shall consist of:

- a. 25 percent (%) on paved roads, either concrete or asphalt or any combination of the two.
- b. 25 % on gravel and dirt roads with at least 10 % of this distance under mud conditions.
- c. 25 % on level, cross-country.
- d. 25 % on hilly, cross-country.

3.4 Construction. Chassis components, subassemblies, and assemblies shall be fabricated into a complete chassis in accordance with Drawing 8736997 and applicable specifications and standards. All parts requiring identification shall be marked in accordance with good commercial practice (see 4.5.1).

3.4.1 Shroud seal. The space between the upper metal surface of the engine shroud and the sealing surface of the top deck grille shall be not less than 0.82 nor more than 1.25 inches (in.) (see 4.5.1).

3.4.2 Stowed equipment. The chassis shall be capable of stowing all on-vehicle equipment (OVE) items in the spaces provided (see 4.5.2).

3.4.3 Electrical system. The chassis electrical system shall consist of the hull electrical subsystem as described below. The system shall be 24 volts direct current (Vdc), nominal (see 4.5.2).

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3.4.3.1 Power plant electrical. The power plant electrical equipment shall consist of the following: sending units necessary to provide engine data in the form of electrical signals to the operator instrument panel, an engine electrical disconnect to facilitate engine removal and replacement, an electrical starter motor capable of starting the engine, and an air-cooled generator (see 4.5.1).

3.4.3.2 Interior lighting. Each crew position shall contain a domelight to provide general illumination when required. The domelight shall contain provisions for adjusting light intensity and a blue filter for night vision adaptation (see 4.5.1).

3.4.3.3 Auxiliary outlet. One outlet (24 Vdc nominal) shall be provided in the hull to mate with the OVE trouble light assembly. The auxiliary outlet circuit shall be protected with a 15 ampere (A), automatic reset, circuit breaker (see 4.5.1).

3.4.3.4 Engine manifold heater. The wiring for the engine manifold heater shall provide a switch-actuated chassis battery circuit to the engine. Operation of the push-button switch on the purge pump handle, with the starter switch depressed, shall provide chassis battery voltage to pin "a" of the multiple connector at the engine electrical quick disconnect (see 4.5.1).

3.4.3.5 Communications system power supply. Provisions shall be made through a mating connector to supply power to the communications system from the hull electrical system (see 4.5.1).

#### 3.4.4 Fluid systems.

3.4.4.1 Hydraulic system. Provisions shall be made to assure internal cleanliness of the (chassis) hydraulic system. Hydraulic lines and connections shall be free from leakage in excess of a seep (see 4.5.2 and 6.3.1).

3.4.4.2 Fuel system. Provisions shall be made to assure internal cleanliness of the fuel system prior to initial fueling. Fuel system shall be free from leaks (see 4.5.2).

3.4.4.3 Fuel tanks (rapid fill). Fuel tanks shall be capable of receiving 50 gallons (gal) of fuel per minute (see 4.5.1).

3.5 Performance. After being subjected to the break-in run and procedures of 3.5.17, the chassis, loaded to simulate an M48A5 vehicle weight of 104 000 pounds (lb), shall perform as specified herein under all operating conditions (see 4.5.3).

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3.5.1 Power plant and powertrain. The power plant shall function throughout all gear and speed ranges without loss of lubricants or damage that may cause failure of the chassis. The powertrain and associated controls shall be capable of operation throughout all speed and steering ranges without binding of linkages, loss of lubricants, grabbing, chattering, or slippage when controls are applied to steer, stop, or hold chassis (see 4.5.4).

3.5.2 Environments. The chassis shall operate in ambient air temperatures of 115 degrees Fahrenheit (°F) to minus (-) 25°F and, with special equipment installed, at temperatures to -65°F. The chassis, when prepared for storage, shall withstand climatical extremes of plus (+) 160°F to -65°F without deterioration of any component (see 4.5.5).

3.5.2.1 Cooling system. With the chassis operating in an ambient temperature of 115°F, the engine oil temperature shall not exceed 250°F at the heat exchanger outlet. The transmission oil temperature shall not exceed 300°F at the heat exchanger inlet. Temperature indicators on the driver panel shall remain in the green area (see 4.5.5.1).

3.5.2.2 Level road acceleration. The chassis shall accelerate from a standing start to a distance of 200 ft in not more than 13 seconds when tested in accordance with 4.5.6.

3.5.2.3 Level road speeds. The chassis shall operate at sustained speeds of 30 miles per hour (mph) and 2.5 mph on level road without damage to the power plant and powertrain (see 4.5.7).

3.5.2.4 Level road drift. The chassis drift shall not exceed 3 ft in 100 ft without manual steer correction (see 4.5.8).

3.5.2.5 Level road stopping. The chassis shall stop within 60 ft from the point of brake application. Drift shall not exceed 4 ft. Steering correction is allowed (see 4.5.9).

3.5.2.6 Grades and slopes. The chassis shall ascend longitudinal grades of 60 % in forward and reverse gear without stalling or damage to the power plant and powertrain. The chassis shall operate on right and left side slopes of 30 %. During grade and slope operations, normal engine lubricating oil pressures shall be maintained (see 4.5.10).

3.5.2.6.1 Engine starting (grades and slopes). The engine shall restart in not more than 1 minute, after being stopped for 2 minutes, with the chassis parked on a 60 % grade facing up or down grade. The engine shall restart in not more than 1 minute, after being stopped for 2 minutes, with the chassis parked on 30 % side slopes with left or right side up-slope (see 4.5.10).

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3.5.2.6.2 Fuel supply (grades and slopes). During engine operation, the fuel system shall maintain fuel supply to the engine when ascending and descending 60 % grades in forward and reverse gear and when the chassis is being operated on 30 % side slopes with either side of chassis up slope (see 4.5.10).

3.5.2.6.3 Holding. With the chassis standing on a 60 % grade, with service brakes applied, the chassis shall be held stationary when headed either up or down grade. With parking brake engaged and all other holding devices inoperative, the chassis shall be held stationary when headed either up or down grade (see 4.5.10).

3.5.2.6.4 Grade speeds. The chassis shall operate at a sustained speed of 10 mph while ascending a 10 % grade and at 20 mph while ascending a 3 % grade (see 4.5.10).

3.5.2.7 Shallow water fording. The chassis shall ford a level, hard-bottom body of water 48 in. in depth, including wave, without special equipment. The accumulation of water shall be not more than 2 in. on the crew compartment hull floor measured in the center of the “V” when tested in accordance with 4.5.11. All accessories shall operate satisfactorily during and after fording operations.

3.5.2.7.1 Engine starting (shallow water). The engine shall restart in not more than 3 minutes when tested in accordance with 4.5.11.1.

3.5.2.7.2 Lubricant contaminations. After fording operations, the water content of the transmission, engine, final drives, and suspension system lubricants shall be not more than 2 % by volume (see 4.5.11.2).

3.5.2.8 Trench crossing. The chassis shall cross trenches 36 in. in depth and 102 in. in width without stalling or damage to suspension and other vehicle equipment (see 4.5.12).

3.5.2.9 Vertical obstacles. The chassis shall cross over vertical obstacles 36 in. in height while moving forward, without stalling or damage to the suspension and hull floor (see 4.5.13).

3.5.2.10 Turning. The chassis shall turn 360° to the right and left in pivot and in neutral steer within a circle 35 ft in diameter (see 4.5.14).

3.5.2.11 Sealing. Except as specified in 3.5.2.7.2, all seals and sealer shall prevent the entrance of water and foreign matter under all operating conditions. Static seals shall provide an interference fit of sealing surfaces preventing the leakage of fluids intended to be contained by the seals. Dynamic seals shall prevent fluid leakage in the form of a drop (see 6.3.1) when the chassis is standing idle. Evidence of lubricant at seals specifically designed to allow exit of flushed lubricants shall be permitted (see 4.5.15).

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3.5.2.11.1 Escape hatch seal. The escape hatch seal shall prevent entrance of water into the crew compartment under all operating conditions (see 4.5.16).

3.5.3 Controls and instrumentation. When installed in accordance with applicable drawings, all electrical, mechanical, and hydraulic controls and instruments shall operate without malfunction throughout all ranges of operation under all chassis operating conditions (see 4.5.17).

3.5.4 Adjustment mechanisms. When installed and adjusted in accordance with applicable drawings, all adjustment mechanisms shall function properly and maintain adjustment settings during all chassis operating conditions (see 4.5.17).

3.5.5 Generator voltage. Generator voltage shall be regulated to not less than 25.8 Vdc and not more than 30.2 Vdc (see 4.5.18).

3.5.5.1 Generator blower motor. The generator blower motor shall be capable of delivering a constant flow of air through the generator. The electrical circuit for the blower shall contain a switch to allow shut-off during fording (see 4.5.18).

3.5.6 Air cleaner blower motors. Each air cleaner blower motor shall provide a flow of air through each blower outlet. The air cleaner blower motors shall be wired to preclude blower operation when the engine is not running (see 4.5.19).

3.5.7 Lights. All lights shall operate as specified on applicable drawings through all chassis operating conditions. All electrical contacts and connections shall maintain positive contact under all chassis operating conditions (see 4.5.20).

3.5.7.1 Driver night viewer power circuit. The voltage output at the driver night viewer connector shall be within 0.2 volt of the positive battery potential when operating into a 1 A load (see 4.5.20).

3.5.8 Locking, unlocking, and actuated mechanisms.

3.5.8.1 Hull drain valves. After unlocking the lever, the force required to operate the front drain valve lever shall not exceed 17 lb at the hand grip to actuate the valve a minimum of 0.38 in. travel. After unlocking the lever, the force required to operate the rear drain valve lever shall not exceed 25 lb at a point just below the knob to actuate the valve through a minimum of 0.69 in. travel (see 4.5.21).

3.5.8.2 Escape hatch release. The force required to operate the handle to release the escape hatch shall be  $50 \pm 10$  lb pull at a point 0.5 in. from the end of the handle (see 4.5.22).



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3.5.8.3 Operator and assistant operator seat. With the operator or assistant operator in seated position, the force required to actuate the fore and aft seat adjustment lever shall not exceed 12 lb at the hand grip. With the seats vacated, the force required to actuate the seat vertical adjustment lever shall not exceed 14 lb at the hand grip. The force required to trip the seat dumping lever shall not exceed 14 lb at the hand grip. The seats shall be moveable forward, backward and vertically when the appropriate levers are actuated (see 4.5.23).

3.5.8.4 Fuel shutoff valve. The engine shall stop firing and rotating within a maximum of 30 seconds after the manual fuel shutoff valve is actuated to the “OFF” position (see 4.5.24).

3.5.9 Fire extinguisher. The fixed fire extinguisher system, when installed in accordance with applicable drawings, shall be readily accessible for operation internally or externally. Actuating the internal control shall simultaneously stop the supply of fuel to the engine and discharge the extinguisher. Actuating the external control shall discharge the extinguisher, but not stop the fuel supply to the engine. The effort required to discharge the system either internally or externally shall be not more than 55 lb. A time delay of more than 6 seconds but less than 11 seconds shall occur on the first shot between actuation of the release mechanism and entrance of carbon dioxide (CO<sub>2</sub>) into the engine compartment (see 4.5.25).

3.5.10 Personnel heater. The placement of the heater ignition switch in either “high” or “low” position run mode shall cause the blower motor to operate at low speed and the heater to ignite within 4 minutes. Subsequent to ignition, the placement of the heater switch in the “high” position run mode shall cause the blower motor to operate at high speed. The placement of the heater switch in the “off” position mode shall cause the burner to extinguish and the blower motor to shut off within 3.5 minutes (see 4.5.26).

3.5.11 Smoke discharging systems.

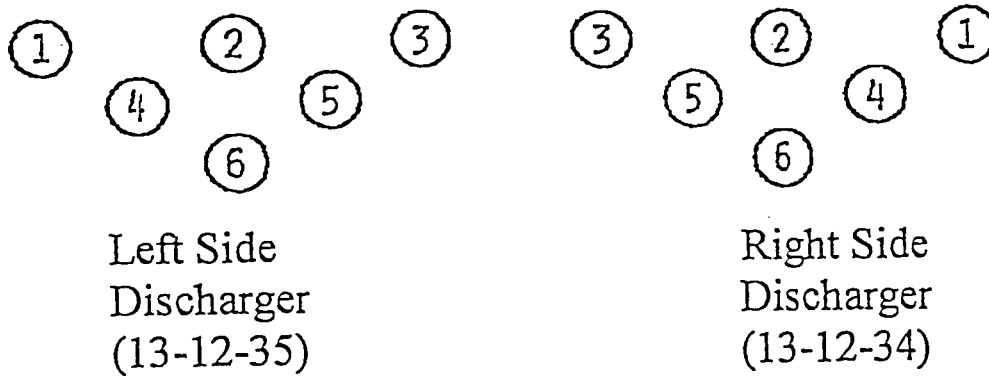
3.5.11.1 Engine smoke generator. The chassis shall discharge smoke from both exhaust pipes when the engine is running and the smoke generator switch is in the “ON” position (see 4.5.27).

3.5.11.2 Smoke grenade discharger circuits.

3.5.11.2.1 Arming. The power-on (ready) lamp in the grenade power box shall illuminate when the master battery switch and the grenade system power switch are both on (see 4.5.27.1.1).

3.5.11.2.2 Circuit voltage. Voltage at the smoke grenade discharger firing pins shown in figure 1 shall be as indicated in table I when the power-on firing push-button is actuated (see 4.5.27.1.2).

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## View from driver's position

FIGURE 1. Firing pin positions.TABLE I. Smoke grenade discharger firing pin voltage.

Firing push-button	Left side discharger firing pins	Right side discharger firing pins	Voltage
Right	1, 2, 5	3, 4, 6	Vehicle (Ref. 3.4.4)
Right	3, 4, 6	1, 2, 5	$0 \pm 0.5$ Vdc
Left	3, 4, 6	1, 2, 5	Vehicle (Ref. 3.4.4)
Left	1, 2, 5	3, 4, 6	$0 \pm 0.5$ Vdc

3.5.12 Vibration and noise level.

3.5.12.1 Equipment operation. Equipment in operation shall not exceed the maximum acceptable noise levels specified in table II (see 4.5.28).

3.5.12.2 Operator protection. Noise levels at crew positions shall not exceed 100 dB(A). Noise hazard caution signs shall be posted in all crew stations. The signs shall be clearly visible to all personnel (see 4.5.28).

3.5.13 In-tank fuel pumps. Each pump shall be capable of producing a minimum pressure of 5 pounds per square inch gage (psig) at the engine end of the fuel line disconnect under no-flow conditions (see 4.5.29).

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TABLE II. Maximum acceptable noise levels for military equipment (continuous noise).

Octave band center frequency [Hertz (Hz)]	Maximum acceptable noise level [decibels (dB) ref. 0.0002 microbar]
63	121
125	111
250	103
500	102
1000	100
2000	100
4000	100
8000	100

3.5.14 Fuel return system. The fuel return selector valve shall divert fuel to the tanks as indicated by the pointer on top of the valve (see 4.5.30).

3.5.15 Air cleaner outlet system. The air cleaner outlet system (air cleaner to turbo charger) shall be air tight to the extent that when a vacuum of 25 to 30 in. of water is applied, the loss of vacuum shall be not more than 3 in. of water during a 3 minute period (see 4.5.31).

3.5.16 Painting, marking, and data plates.

3.5.16.1 Painting. The exterior and interior surfaces of the vehicle shall be cleaned, pre-treated, primed and painted to the following minimum performance requirements (see 4.5.32):

- a. Cleaning. Surface free of surface oxides, rust, weld spatter, and other organic contaminants providing a water break-free surface.
- b. Pre-treatment. Surface pre-treated within 4 hours after cleaning with chemical conversion coating or equivalent.
- c. Painting system. Primed and top-coat painted with the total dry film thickness not to exceed 5.0 mils.

The chassis exterior paint shall be forest green camouflage, lusterless, alkyd enamel; the engine compartment paint shall be gloss white and the crew compartment shall be semigloss green. All sliding parts and operating contact surfaces shall be free from paint. When Chemical Agent Resistant Coatings (CARC) paint is specified (see 6.2), for non-galvanized steel the exterior surface shall be painted per CARC "A" Size Drawing Number 12369003, and the interior surface shall be painted per CARC "A" Size Drawing Number 12369004. For galvanized steel, the exterior surface shall be painted per CARC "A" Size Drawing Number 12369008, and the interior surface shall be painted per CARC "A" Size Drawing Number 12369010.

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3.5.16.2 Marking. Marking shall be lusterless black and be clear and permanent (see 4.5.32).

3.5.16.3 Identification and data plates. All plates shall be in accordance with applicable drawings (see 4.5.32).

3.5.17 Break-in run. The break-in run shall include preliminary checks of suspension, controls, power plant, etc., and provide wear-in for final adjustments (see 4.5.33).

#### 4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.2).
- b. Conformance inspections (CI) (see 4.3).

4.2 First article inspection. First article inspections shall be performed on preproduction and initial production samples as specified herein.

4.2.1 Preproduction inspection. One preproduction chassis shall be inspected at a location approved by the Government to determine conformance to the requirements of this specification. Inspections shall consist of the examinations of table III and the tests of table IV.

4.2.2 Initial production inspection. On beginning production, three chassis shall undergo, and shall pass, initial production inspections. Inspections shall include the examinations of table III and the tests of table IV.

4.3 Conformance inspection. Conformance inspection shall include the examinations and tests specified in 4.3.1 and 4.3.2.

4.3.1 Examinations. Visual, dimensional, and primary functional examination shall consist of examination of the chassis for conformance to applicable drawings and this specification. Examinations shall be performed against the classification of defects specified in table III. The following constitutes a part of the classification of defects (see 6.3.1):

- a. Any weep constitutes a minor defect.
- b. Any seep constitutes a minor defect.
- c. Any drip constitutes a major defect when the vehicle has been standing idle and the components are at ambient temperature.
- d. Any droplet that occurs at a static fit, metal to metal or gasket combination shall constitute a major defect.

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TABLE III. Classification of defects.

Category	Defect	Method of examination
<u>Major:</u>		
101	Towing pintle, lifting eyes, hooks and bracket: malfunction, defects (see 3.4).	Visual & Functional
102	Wire, tubing, or hoses: defective, damage (see 3.4).	Visual
103	Covers, grilles, ducts, vents, panels, stowage boxes, seats, fenders, and hardware: malfunction, locking devices, damage (see 3.4.2).	Visual & Functional
104	Electrical system components circuits, and communication system: malfunction, lighting sequence improper (see 3.4.3). <u>2/</u>	Visual & Functional
105	Hydraulic components: malfunction, leaks, damage (see 3.4.4.1).	Visual & Functional
106	Hydraulic control system: malfunction, damage droplets (see 3.4.4.1).	Visual & Functional
107	Manual back-up hydraulic pump: damaged, malfunction, clearance improper (see 3.4.4.1).	Visual & Functional
108	Fuel system components: malfunction, leaks (see 3.4.4.2). <u>1/</u>	Visual & Functional
109	Engine: malfunction, leaks, mounting improper (see 3.5.1). <u>1/</u>	Visual & Functional
110	Transmission: malfunction, leaks (see 3.5.1).	Visual & Functional
111	Transfer gear differential steer and final drive units: malfunction, leaks (see 3.5.1).	Visual & Functional
112	Tracks: damage, pad separation (see 3.5.1).	Visual, Functional & SIE <u>3/</u>
113	Track drive sprockets and drive shafts: damage, clearance improper (see 3.5.1).	Visual & SIE
114	Cooling system components: malfunction, damage, leaks (see 3.5.2.1).	Visual & Functional
115	Lubrication and lubricants: contamination (see 3.5.2.7.2).	Visual
116	Suspension system components: adjustment, damage, leaks, clearance improper, misalignment (see 3.5.2.9).	Visual, Functional & SIE
117	Hatch covers: fit improper, malfunction, leaks, damage, non-conformance (see 3.5.2.11.1 and 3.5.8.2).	Visual & Functional
118	Instrumentation, switches, warning, indicating and safety devices: malfunction, damage, calibration (see 3.5.3).	Visual & Functional
119	Controls: malfunction, clearance improper (see 3.5.3).	Visual & Functional

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TABLE III. Classification of defects - Continued.

Category	Defect	Method of examination
120	Control panel: malfunction, damage, improper indicators (see 3.5.3).	Visual & Functional
121	Adjustment mechanisms: malfunction, clearance improper (see 3.5.4).	Visual & Functional
122	Vision devices and receptacles: damage, malfunction (see 3.5.7.1).	Visual & Functional
123	Seats, crash pads, and straps: damaged, seat control malfunction (see 3.5.8.3).	Visual
124	Fire extinguisher system control: seals missing, components damage (see 3.5.9).	Visual
<u>Minor:</u>		
201	Towing pintle, lifting eyes, hooks and brackets: improper fit, installation assembly, or adhesion welding defects, damaged (see 3.4).	Visual & Functional
202	Wiring, tubing or hoses: defective, missing, improper installation, coding or protection (see 3.4).	Visual
203	Covers, grilles, ducts, vents, panels, stowage boxes, seats, fenders, and hardware: improper fits, adjustment, installation or defective welds, seals, adhesion, hardware or sheet metal (see 3.4.2).	Visual & Functional
204	Electrical system components, circuits, & communication system: improper assembly or installation (see 3.4.3). <u>2/</u>	Visual & Functional
205	Hydraulic components: improper assembly or installation, fluid level and type (see 3.4.4.1).	Visual & Functional
206	Manual backup, hydraulic pump: improper installation (see 3.4.4.1).	Visual & Functional
207	Hydraulic control system: improper assembly, installation, fluid level, precharge pressure (see 3.4.4.1).	Visual & Functional
208	Fuel system components: improper assembly or installation (see 3.4.4.2). <u>1/</u>	Visual & Functional
209	Engine: improper component assembly (see 3.5.1).	Visual & Functional
210	Transmission: improper component assembly or installation (see 3.5.1).	Visual & Functional
211	Transfer gear, differential steer and final drive unit: improper component assembly or installation (see 3.5.1).	Visual & Functional
212	Tracks: tension, installation or assembly including bolt torque damage (see 3.5.1).	Visual & SIE
213	Track drive sprockets and drive shafts: improper assembly, installation or bolt torque (see 3.5.1).	Visual & SIE

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TABLE III. Classification of defects - Continued.

Category	Defect	Method of examination
214	Cooling system components: improper assembly or installation (see 3.5.2.1).	Visual & Functional
215	Suspension system components & adjustments: improper installation or assembly, bolt or nut torque (see 3.5.2.9).	Functional & SIE
216	Hatches, covers: improper assembly or installation (see 3.5.2.11.1 and 3.5.8.2).	Visual & Functional
217	Instrumentation, switches, warning, indicating safety devices: improper assembly or installation (see 3.5.3).	Visual & Functional
218	Controls: improper assembly, or installation (see 3.5.3).	Visual & SIE
219	Adjustment mechanism: improper assembly, or installation (see 3.5.4).	Visual & Functional
220	Vision devices and receptacles; improper assembly, installation, or clearance (see 3.5.7.1).	Visual & Functional
221	Seats, crash pads, and straps: data card incomplete, improper assembly or installation, fit or adhesion, welding defects (see 3.5.8.3).	Visual & Functional
222	Fire extinguisher system control: data card incomplete, improper assembly, installation coding or protection (see 3.5.9).	Visual
223	Paint: application or color improper (see 3.5.16.1).	Visual
224	Decals, marking data and instruction plates; missing, improper location or size, defective (see 3.5.16.2).	Visual
225	Lubrication and lubricants: improper application, types and levels (see 3.5.17).	Visual

1/ Fuel leaks constitute a special defect and will result in a total inspection of the lot for this defect.

2/ Filament failures are not to be classified as major or minor defects.

3/ SIE = Standard Inspection Equipment.

4.3.2 Acceptance tests. To determine conformance to section 3 (inclusive), the contractor shall subject each chassis to the acceptance tests specified in table IV. After the tests, the chassis shall be examined for evidence of fuel or lubricant leakage or other defects.

#### 4.4 Examination.

4.4.1 Sampling. Samples from an inspection lot for conformance inspection shall be selected in accordance with ANSI/ASQC Z1.4. Any redesign or modification of the contractor's standard to comply with specified requirements shall receive particular attention for adequacy and

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suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirement or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

TABLE IV. Classification of inspection and tests.

Title	Requirement	First article test <u>1</u> /	Acceptance test <u>2</u> /
Power plant & powertrain	3.5.1	4.5.4	
Environments	3.5.2	4.5.5	
Cooling system	3.5.2.1	4.5.5.1	
Acceleration	3.5.2.2	4.5.6	4.5.6
Level road speeds	3.5.2.3	4.5.7	4.5.7
Level road drift	3.5.2.4	4.5.8	4.5.8
Level road stopping	3.5.2.5	4.5.9	4.5.9
Grades and slopes	3.5.2.6	4.5.10	4.5.10
Engine starting (grades & slopes)	3.5.2.6.1	4.5.10	4.5.10
Fuel supply (grades & slopes)	3.5.2.6.2	4.5.10	4.5.10
Holding	3.5.2.6.3	4.5.10	4.5.10
Grade speeds	3.5.2.6.4	4.5.10	4.5.10
Shallow water fording	3.5.2.7	4.5.11	4.5.11
Engine starting (shallow water)	3.5.2.7.1	4.5.11.1	4.5.11.1
Lubricant contamination	3.5.2.7.2	4.5.11.2	4.5.11.2
Trench crossing	3.5.2.8	4.5.12	
Vertical obstacles	3.5.2.9	4.5.13	
Turning	3.5.2.10	4.5.14	4.5.14
Sealing	3.5.2.11	4.5.15	
Escape hatch seal	3.5.2.11.1	4.5.16	4.5.16
Controls	3.5.3	4.5.17	4.5.17
Adjustment mechanism	3.5.4	4.5.17	4.5.17
Generator voltage	3.5.5	4.5.18	4.5.18
Generator blower motor	3.5.5.1	4.5.18	4.5.18
Air cleaner blower motor	3.5.6	4.5.19	
Lights	3.5.7	4.5.20	4.5.20
Driver night viewer power circuit	3.5.7.1	4.5.20	
Hull drain valves	3.5.8.1	4.5.21	
Escape hatch release	3.5.8.2	4.5.22	4.5.22
Operator & assistant operator seat	3.5.8.3	4.5.23	4.5.23
Fuel shutoff valve	3.5.8.4	4.5.24	
Fire extinguisher	3.5.9	4.5.25	4.5.25



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TABLE IV. Classification of inspection and tests - Continued.

Title	Requirement	First article test <u>1/</u>	Acceptance test <u>2/</u>
Personnel heater	3.5.10	4.5.26	4.5.26
Engine smoke generator	3.5.11.1	4.5.27	
Arming test	3.5.11.2.1	4.5.27.1.1	4.5.27.1.1
Circuit test	3.5.11.2.2	4.5.27.1.2	4.5.27.1.2
Equipment operation	3.5.12.1	4.5.28	
Operator protection	3.5.12.2	4.5.28	4.5.28
In-tank pumps	3.5.13	4.5.29	
Fuel return	3.5.14	4.5.30	
Air cleaner	3.5.15	4.5.31	4.5.31
Painting	3.5.16.1	4.5.32	4.5.32
Marking	3.5.16.2	4.5.32	4.5.32
Plates	3.5.16.3	4.5.32	4.5.32
Break-in	3.5.17	4.5.33	4.5.33

1/ = Chassis shall be tested at Government proving ground.

2/ = Chassis shall be tested on Contractor's premises.

#### 4.5 Methods of inspection.

4.5.1 Materials and design. Conformance to 3.2.2, 3.4, 3.4.1, 3.4.3.1 through 3.4.3.5, and 3.4.4.3 shall be determined by inspection of contractor records providing proof or certification that materials and design conform to requirements. Applicable records shall include drawings, specifications, design data, receiving inspection records, processing and quality control standards, vendor catalogs and certifications, industry standards, test reports, and rating data.

4.5.2 Defects. Conformance to 3.4, 3.4.2, 3.4.3, 3.4.4.1, 3.4.4.2, 3.5.1, 3.5.2.1, 3.5.2.7.2, 3.5.2.9, 3.5.2.11.1, 3.5.3, 3.5.4, 3.5.7, 3.5.7.1, 3.5.8.2, 3.5.8.3, 3.5.9, 3.5.16.1, 3.5.16.2, and 3.5.17 shall be determine by examination for the defects listed in table III. Examination shall be visual, tactile, or by measurement with SIE.

4.5.2.1 Test profile. The test chassis shall be subjected to all tests specified herein and then to four repetitions of the 1000 mile cycle contained in table V.

4.5.3 Performance tests. Conformance to 3.5 through 3.5.17 shall be determined during all tests specified in table IV.

4.5.4 Power plant and powertrain test. Conformance to 3.5.1 shall be determined during steering and braking tests (see 4.5.9 and 4.5.14). None of the malfunctions stated in 3.5.1 shall exist.

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TABLE V. One-thousand mile test cycle.

Course	Mileage & speed <u>1/</u>
Hard-surfaced roads	250
Gravel & dirt roads	250
Level cross-country	250
Hilly cross-country	250

1/ Speeds shall be varying up to the maximum safe speed in all applicable gear ranges depending on course and conditions.

4.5.5 Environments test. Conformance to 3.5.2 shall be determined during initial examinations (see 4.3.1). The vehicle shall operate properly under all ambient temperatures stated in 3.5.2.

4.5.5.1 Cooling system test. Conformance to 3.5.2.1 shall be determined during initial examinations (see 4.3.1).

4.5.6 Acceleration test. To determine conformance to 3.5.2.2, the chassis shall be operated on a level road as specified and performance timed.

4.5.7 Level road speeds test. To determine conformance to 3.5.2.3, the chassis shall be operated under specified conditions. A speed of not less than 30 mph shall be maintained for 10 minutes with engine at full governed speed. A speed of not less than 2.5 mph shall be maintained for 5 minutes with engine at full governed speed and transmission in low gear.

4.5.8 Level road drift test. To determine conformance to 3.5.2.4, the chassis shall be operated on a smooth, paved surface between 25 and 30 mph on a level road in a straight line. The test shall be run twice in each direction and the average drift at end of four runs shall not exceed 3 ft.

4.5.9 Level road stopping test. To determine conformance to 3.5.2.5, the chassis shall be operated on a smooth, paved surface at 20 mph on a level road. The stopping distance shall be determined.

4.5.10 Grade and slope tests. To determine conformance to 3.5.2.6 through 3.5.2.6.4, the chassis shall be operated on the grades and slopes indicated and performance observed. The chassis shall meet all grade and slope requirements.

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4.5.11 Shallow water fording test. To determine conformance to 3.5.2.7, the chassis shall be operated in 48 in. of water. After standing in 48 in. of water for not less than 30 minutes the water depth in the hull shall be determined. Accessories and instruments shall be observed for proper operation.

4.5.11.1 Engine starting (shallow water) test. To determine conformance to 3.5.2.7.1, the chassis and engine shall be operated in water 48 in. in depth for 30 minutes, the engine operating at 1000 revolutions per minute (rpm) for 15 minutes and stopped for 15 minutes. The engine shall be observed for proper restart within indicated time. Accessories and instruments shall be observed for proper operation.

4.5.11.2 Lubricant contamination test. To determine conformance to 3.5.2.7.2, after completion of fording test, lubricant samples shall be tested for water content.

4.5.12 Trench crossing test. To determine conformance to 3.5.2.8, the chassis shall be operated over trenches of the dimensions specified.

4.5.13 Vertical obstacles test. To determine conformance to 3.5.2.9, the chassis shall be operated over obstacles of the dimensions specified. Speed shall not exceed 5 mph.

4.5.14 Turning test. To determine conformance to 3.5.2.10, the chassis shall be operated as specified. When measured, the pivot-circle shall not exceed 35 ft.

4.5.15 Sealing test. To determine conformance to 3.5.2.11, seals shall be visually examined after completion of all mobile tests.

4.5.16 Escape hatch seal test. To determine conformance to 3.5.2.11.1, the chassis shall be exposed to heavy rain conditions (natural or simulated) and the hatch seal visually examined for leakage.

4.5.17 Controls instruments and adjustment mechanisms test. To determine conformance to 3.5.3 and 3.5.4, controls and instruments shall be observed for proper function during mobile test operations. After mobile test operations, adjustment mechanisms shall be examined for adjustment maintenance.

4.5.18 Generator and blower tests. To determine conformance to 3.5.5 and 3.5.5.1 with the engine running at various speeds, generator voltage shall be determined. Air flow to the generator shall be observed for continuous flow.

4.5.19 Air cleaner blower test. To determine conformance to 3.5.6 with engine running, all air outlets shall be examined for continuous air flow. Further examination shall show that air flow stops when the engine is stopped.

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4.5.20 Lights. To determine conformance to 3.5.7 and 3.5.7.1, lights shall be operated and verified to be functioning and in working order.

4.5.21 Hull drain valves test. To determine conformance to 3.5.8.1, drain valve levers shall be unlocked and the effort required to open the valves measured. Effort shall not exceed the requirement for each valve.

CAUTION: Valves shall be closed and locked after test.

4.5.22 Escape hatch release test. To determine conformance to 3.5.8.2, the force required to release the hatch locking device shall be measured and shall be within required tolerances.

4.5.23 Operator seat test. To determine conformance to 3.5.8.3, with an average weight person (180 lb nominal) in the seat, force required to actuate adjustment levers shall be measured and shall not exceed the requirement. A person in-seat is only required for the fore and aft adjustment test.

4.5.24 Fuel shut-off test. To determine conformance to 3.5.8.4, the engine shall be operated at 50 % of governed rpm, the manual shut-off valve shall be actuated to the "OFF" position. Time required for the engine to stop shall be determined. The fuel valve shall be returned to "ON" position and the system primed and bled of air.

4.5.25 Fire extinguisher. To determine conformance to 3.5.9, with the engine idling at 700 to 800 rpm, the internal control shall be pulled with a force gage. The first shot shall actuate one bottle. After a time delay of more than 6 seconds but less than 11 seconds, the engine shall have stopped and the system shall begin discharging CO<sub>2</sub> into the engine compartment and in the center of the engine "V". After the handle has returned to its original position, a second actuation shall discharge the remaining two bottles of CO<sub>2</sub>. Removal and weighing of each CO<sub>2</sub> bottle after test shall show not less than 9 lb of CO<sub>2</sub> discharged during test. The CO<sub>2</sub> bottles shall be recharged and reinstalled and the test shall be repeated using the external control. Actuation of the external control shall not stop the engine. When conducting these tests, safety precautions shall be exercised (see 6.5.1).

4.5.26 Personnel heater test. To determine conformance to 3.5.10, the heater shall be activated by placing the heater ignition switch in the "high" or "low" position run mode. The heater blower motor shall operate at low speed. Determine the time until the heater ignites. After ignition, the heater ignition switch shall be placed in the "high" position run mode, if the initial activation was made in the "low" position run mode, and the blower motor shall operate at high speed. The heater ignition switch shall be placed in the "off" mode and the burner shall extinguish. Determine the time until blower motor shut off.

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4.5.27 Engine smoke generator test. To determine conformance to 3.5.11.1, the engine smoke generator switch shall be activated when the engine is warm and operating at 1600 rpm. Both right and left exhaust ducts shall emit white smoke.

NOTE: The engine smoke generator shall not be tested for more than 15 seconds, nor within a building, nor with personnel exposed to the exhaust plume.

4.5.27.1 Smoke grenade discharger circuit tests.

4.5.27.1.1 Arming test. To determine conformance to 3.5.11.2.1, the master battery switch and the grenade system power switch shall be moved to "ON". The grenade system power switch shall be moved to "OFF" and the power-on (ready) lamp shall extinguish.

4.5.27.1.2 Circuit voltage test. To determine conformance to 3.5.11.2.2, the circuit as specified in 4.5.27.1.1 shall be armed and the power-on (ready) lamp shall illuminate. The RIGHT firing push-button shall be actuated and the voltage on the smoke grenade discharger pins shown in figure 1 shall be as specified in 3.5.11.1.2. The LEFT firing push-button shall be actuated and the voltage on the smoke grenade discharger pins shall be as specified. The power-on (ready) switch shall be returned to "OFF" and voltage shall not be present on any of the firing pins.

4.5.28 Vibration and noise level test. To determine conformance to 3.5.12.1 and 3.5.12.2, the average of three noise level readings at each octave band shall be determined at each operator head position under normal operating conditions. The sound level meter, microphone related equipment, and techniques employed shall be in accordance with MIL-STD-1474.

4.5.29 In-tank fuel pumps. To determine conformance to 3.5.12, a pressure gage shall be attached to the engine end of the fuel line disconnect. The pumps shall be electrically activated and the pressure shall be determined for each pump.

4.5.30 Fuel return system. To determine conformance to 3.5.14, air pressure of 3 to 5 psig shall be applied to the fuel return line and the return selector valve shall be checked in the "LEFT" and the "RIGHT" positions to verify that the fuel is diverted into the correct tank as indicated by the pointer. After the test, the selector valve shall be placed in the "BOTH" position and lockwired in that position.

4.5.31 Air cleaner outlet system. To determine conformance to 3.5.15, the filter shall be removed. The hose clamp at the turbocharger inlet shall be loosened and the outlet system shall be sealed off at both ends and pressurized to a vacuum pressure between 25 to 30 in. of water. After 3 minutes, any pressure drop shall not exceed 3 in. of water.

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**CAUTION:** The turbocharger inlet cleanliness shall be maintained during testing and when reattaching the hose clamp.

4.5.32 Painting, marking, and data plates examination. Conformance to 3.5.16.1, 3.5.16.2, and 3.5.16.3 shall be determined during visual, dimensional, and primary functional examination. The corrosion protection, when tested per ASTM B117 for 336 hours shall produce a Rust Grade 8 or higher per ASTM D610. None of the spots or pits shall be larger than 0.04 in. diameter. For the paint adhesion test, no intercoat separation shall occur for the paint system between the paint system and the conversion coating or between the conversion coating and the base metal when the specimen test panels are tested as follows: Two specimen panels shall be tested for wet tape adhesion test. The test shall be conducted per ASTM D3359, Method B. The semitransparent pressure-sensitive tape shall have an average adhesion of 60 ounces per inch (oz/in.).

4.5.33 Break-in run. To determine conformance to 3.5.17, the break-in run shall include the following activities and conditions.

- a. Preparation. Prior to the break-in run, except for equipment and component installations and servicing performed by the contractor as a final processing of the chassis for acceptance, the chassis shall be completely assembled and all adjustments completed. The chassis, including all applicable components requiring lubrication, shall be lubricated in accordance with production lubrication chart 12257352. Engine oil conforming to the applicable seasonal grade of MIL- L-2104 shall be used. Specific applications by grades or types for various expected seasonal temperature ranges shall be as specified. The fuel and water separator and primary fuel filter shall be bled of air by loosening each respective bleed plug and operating the in-tank fuel pump. After air is bled, tighten the bleed plugs.
- b. Oil pressure and temperature. Prior to the start of the break-in run, the engine shall be operated at 800 to 1200 rpm until lubricating oil is at operating pressure and temperature. If at any time during break-in run, the engine has been stopped for at least 30 minutes, the engine shall again be operated as above before continuing break-in run. Proper oil pressure and temperature shall be maintained during operation on level ground, 60 % grades, and 30 % side slopes.
- c. Operation and distance. Each chassis shall be given a break-in run for the distances specified in table VI on smooth, level hard-surfaced roads. The chassis shall be operated over the undulating section of road as specified on figure 2. During “A” and “B” divisions of the break-in run, the undulating section shall be bypassed.

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TABLE VI. Speeds and distance for break-in run.

Division of run	Speed mph	Distance miles	Test conditions
A	0 to 10	10	Track (road)
B	11 to 15	15	Track (road)
C	16 to 20	10	Track (road)
D	21 to Max.	10	Track (road)

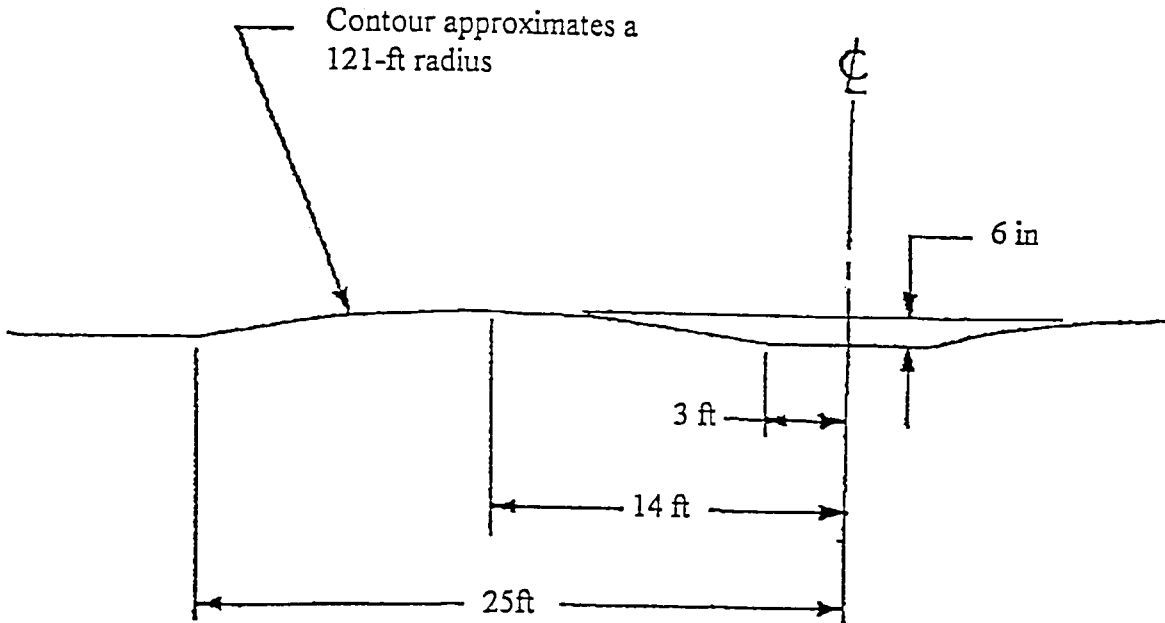


FIGURE 2. Profile of test track (artificial bump).

- d. Reverse operation. After each division of the break-in run, the chassis shall be stopped, the engine allowed to idle for not less than 2 minutes, and then driven in reverse for a distance of not less than 50 ft at speeds between 2 and 7 mph.
- e. Condition after run. After completion of the break-in run, the engine shall idle between 700 and 750 rpm. Prior to the chassis being submitted to the Government for acceptance, all suspension wheel bearings shall be checked to determine if adjustments are correct and readjusted as required. There shall be no defects indicative of damaged components or maladjustments that may cause faulty chassis operation.

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## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite 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 Department's System Command. 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.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The tank chassis is intended for use as a transporting launcher for an AVL bridge after subsequent adaptation of the launching and bridge mechanism to the chassis.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
- c. If first article is required (see 3.1).
- d. If painting other than as specified (see 3.5.16.1).
- e. If comparison tests are required (see 4.4).
- f. Packaging requirements (see 5.1).

6.3 Definitions.

6.3.1 Leaks. The following definitions are used for the examination of defects for leaks:

- a. Weep: - Any evidence of fluid beyond the seal.
- b. Seep: - Any evidence of fluid beyond the seal that does not result in formation of a droplet.
- c. Droplet: - Any evidence of fluid beyond the seal that results in the formation of a droplet.
- d. Drip: - Any evidence of fluid beyond the seal where a droplet forms and falls.



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6.4 Subject term (key word) listing.

AVL  
Transporter

6.5 Safety precautions.

6.5.1 Fire extinguisher (see 4.5.25). Caution should be exercised in handling carbon dioxide fire extinguisher cylinders. They should not be dropped, permitted to strike each other, or handled roughly. Extreme care should be exercised during reinstallation to avoid tripping the fire extinguisher control system since physical injury is highly probable.

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodian:  
Army - AT

Preparing Activity:  
Army - AT

(Project 2350-0476)

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

<b>I RECOMMEND A CHANGE:</b>	1. DOCUMENT NUMBER MIL-PRF-62270A(AT)	2. DOCUMENT DATE (YYMMDD) 961030
3. DOCUMENT TITLE <b>Chassis, Tank, Armored Vehicle, Bridge Launcher, M48A5</b>		
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code)	7. DATE SUBMITTED (YYMMDD)
	(1) Commercial (2) AUTOVON (if applicable)	
8. PREPARING ACTIVITY		
a. NAME	b. TELEPHONE (Include Area Code)	
	(1) Commercial (810) 574-8745	(2) AUTOVON 786-8745
c. ADDRESS (Include Zip Code) Commander - U.S. Army Tank-automotive and Armaments Command ATTN: AMSTA-TR-E/BLUE Warren, MI 48397-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	