INCH-POUND
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DETAIL SPECIFICATION

SEMITRAILER, VAN: FOR INSTALLATION OF SPECIAL EQUIPMENT, MILITARY DESIGN

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers eight models of special purpose 6 ton, tactical, 2- and 4-wheel van semitrailers, herein referred to as semitrailers. The semitrailers are used primarily to transport and house repair parts and shop equipment (electrical or mechanical) over all types of roads and limited cross-country terrain and under extreme climate conditions.

1.2 Classification. Semitrailers are of the following models specified in table I.

Comments, suggestions, or questions on this document should be addressed to 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 or emailed to DAMI_STANDARDIZATION@conus.army.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.daps.dla.mil.

AMSC N/A FSC 2330

TABLE I. Classification (see 6.2).

Model	Army part number	Vehicle type
M146	8736091	Semitrailer, van, shop: 6 ton, 2 wheel
M146C	8736160	Semitrailer, van, shop: 6 ton, 2 wheel
M146F	8736617	Semitrailer, van, shop: 6 ton, 2 wheel
M313	8736316	Semitrailer, van, expansible side: 6 ton, 4 wheel, with air conditioning interface
M447	8736226	Semitrailer, van, shop: folding side, 6 ton, 4 wheel
M447C	8736383	Semitrailer, van, shop: folding side, 6 ton, 4 wheel, with air conditioning interface
M447C (Mod.)	8750165	Semitrailer, van, shop: folding side, 6 ton, 4 wheel, with air conditioning interface
M750	8736759	Semitrailer, van, repair parts storage, 6 ton, 4 wheel

1.3 Part or identifying number (PIN). The PINs to be used for vehicles acquired to this specification are created as follows:

M 62049 - X

- X: Model (see 1.2):
  - 1 - M146
  - 2 - M146C
  - 3 - M146F
  - 4 - M313
  - 5 - M447
  - 6 - M447C
  - 7 - M447C (Mod.)
  - 8 - M750
- 62049: Specification number
- M: Prefix for military specification

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 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 requirements of documents cited in sections 3, 4, or 5 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 cited in the solicitation or contract (see 6.2).

FEDERAL SPECIFICATIONS

ZZ-I-550	-	Inner Tube, Pneumatic Tire

FEDERAL STANDARDS

FED-STD-595/24533	-	Green, Semigloss
FED-STD-595/26152	-	Gray, Semigloss

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-461	-	Requirements for the Control of Electromagnetic Interference Emissions and Susceptibility
MIL-STD-642	-	Identification Marking of Combat and Tactical Transport Vehicles

(Copies of these documents are available online at https://assist.daps.dla.mil/quicksearch/ or 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 of these documents are those cited in the solicitation or contract.

CODE OF FEDERAL REGULATIONS (CFR)

10CFR30	-	Rules of general applicability to domestic licensing of byproduct material
10CFR40	-	Domestic licensing of source material
49CFR571	-	Federal Motor Vehicle Safety Standards (FMVSS)
49CFR390	-	Federal Motor Carrier Safety Regulations (FMCSR)

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

US ARMY TACOM DRAWINGS

8736091	-	Semitrailer, Van, Shop, 6 Ton, 2 Wheel, M146

8736160	-	Semitrailer, Van, 6 Ton, 2 Wheel, M146C
8736226	-	Semitrailer, Van, Folding Sides, 6 Ton, 4 Wheel, M447 and M750
8736316	-	Supplementary Quality Assurance Provisions for Semitrailer, Van: Expansible Sides, 6 Ton, 4 Wheel, M313
8736383	-	Semitrailer, Van, Shop, Folding Side, Air Conditioned, 6 Ton, 4 Wheel, M447C
8736617	-	Semitrailer, Van, 6 Ton, 2 Wheel, M146F
8736759	-	Semitrailer, Van: Repair Parts Storage, 6 Ton, 4 Wheel, M750
8750165	-	Semitrailer, Van, Shop, Folding Side, Air Conditioned, 6 Ton, 4 Wheel, M447C Mod
12258212	-	Stop and Tail Lamp Blackout Lighting Kit

(Copies of these documents are available from 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.)

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 these documents are those cited in the solicitation or contract (see 6.2).

AMERICAN SOCIETY FOR QUALITY (ASQ)

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

(Copies of this document are available from www.asq.org or American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203.)

ASTM INTERNATIONAL

ASTM D522	-	Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings (DoD Adopted)

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

GENERAL MOTORS CORPORATION

GM 9540P	-	Accelerated Corrosion Test

(Copies of this document are available from General Motors North America, c/o Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112 or www.ihs.com.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA Handbook of the National Electric Code

(Copies of this document are available from www.nfpa.org or National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269.)

SAE INTERNATIONAL

SAE J2014 - (R) Pneumatic Tires for Military Tactical Wheeled Vehicles

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

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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.

3.2 Materials. Unless otherwise specified herein or specified in the applicable drawings, materials used shall be in accordance with the manufacturer's materials specifications for semitrailers. The materials shall be capable of meeting all the operational and environmental requirements specified herein (see 4.5.1). Recovered materials shall be used to the maximum extent practicable. Materials and special treatments shall be utilized to prevent corrosion and to resist harmful effects of dust, water and fungi. Dissimilar metals shall not be used in intimate contact without protection from galvanic corrosion.

3.2.1 Hazardous materials. All hazardous materials including asbestos, cadmium, and radioactive material shall be eliminated or minimized (where elimination is not possible) (see 6.8). Radioactive material is defined by CFR, Title 10, Parts 30 and 40, and 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.

3.2.2 Corrosion protection. The vehicle shall be fabricated from compatible materials providing corrosion protection and coating adherence equal to or exceeding that provided by hot dip galvanized 1010 steel with a minimum coating thickness of 2 mils (50 micrometers) on steel sheet less than 0.0625 inches (in.) thick, 2.5 mils (63.5 micrometers) on steel sheet greater than 0.0625 in. thick or 0.75 mil (19 micrometers) on pre-galvanized steel sheet 0.0625 in. thick or less. A material sample shall be capable of meeting or exceeding the corrosion resistance provided by a galvanized sample (as described above) when subjected to the Mandrel Bend Test

of ASTM D522, and followed by the Accelerated Corrosion Test of GM 9540P Method B, 120 cycles.

3.2.3 Ozone resistance. When specified (see 6.2), rubber components shall be ozone resistant, as specified in applicable specifications or drawings (see 4.5.1).

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

3.3 Construction. The semitrailer shall be fabricated and assembled in accordance with applicable drawings and specifications specified herein and as supplemented by contractor processing to assure delivery of a semitrailer in full compliance with the performance requirements noted herein. If more than one unit of a particular component is used on the semitrailer, the components used shall be identical in make, material, and quality. Riveting and welding practices shall be the same on each semitrailer (see 4.5.1).

3.3.1 Wheel bearing seals. When fording or operating in mud, sand, or snow, seals shall prevent the entrance of foreign matter into the bearings. Bearing seals shall prevent leakage of lubricants from the bearings. Water contamination of wheel bearing lubricant after fording operations, shall be not more than 2 percent by volume (see 4.5.2 and 4.5.3).

3.3.2 Electrical.

3.3.2.1 Electrical circuits. Electrical circuits shall maintain continuity from end to end without evidence of internal or external shorts during all semitrailer operating conditions. All 120 volt (V), 60 Hertz (Hz), single-phase and 220 V, 60 Hz, 3-phase alternating current (ac) electrical system components, installation, and workmanship shall comply with the NFPA National Electric Code (see 4.5.2 and 4.5.4.1).

3.3.2.2 Lighting system. The lighting system shall function under all semitrailer operating conditions at the voltages listed in table II. All electrical contacts and connections shall maintain positive contact and exhibit continuity from end to end of each circuit (see 4.5.2 and 4.5.4.2).

3.3.2.3 Light emitting diode (LED) blackout light. A blackout light shall be a 24 V (nominal) lamp assembly (see 12258212) including one yellow solid-state lamp in the center and a pair of red solid-state lamps on each side of the center lamp. The four red lamps shall appear as individual lights from a 60-foot distance. From a 60- to 120-foot distance, the four red lights shall converge into two points of light. Lights shall be visible from a 1000-foot distance, plus or minus (±) 200 feet. When the semitrailer is on a 20-percent downgrade, no light shall be visible from an altitude greater than 400 feet (see 4.5.2 and 4.5.4.2.1).

TABLE II. Lighting system voltage.

Model	External voltage (nominal)	Internal voltage (nominal)
M146C	24 Vdc 1/	110 V ac system
M146	24 Vdc	110 V ac system
M146F	24 Vdc	110 V ac system
M447	24 Vdc	110 V ac system
M750	24 Vdc	110 V ac system
M313	24 Vdc	110/220 V ac system
M447C	24 Vdc	110/220 V ac system

1/ Direct current (dc)

3.3.2.4 Blackout lights, ON. Blackout light assemblies, when turned on completely, shall not emit energy above 700 nanometers wavelength (see 4.5.2 and 4.5.4.2.1).

3.3.3 Controls. All electrical, mechanical, and hydraulic controls shall operate without malfunction under all semitrailer operating conditions (see 4.5.2 and 4.5.5).

3.3.4 Adjustment mechanism. All adjustment mechanisms shall function properly and maintain adjustment within required settings during all semitrailer operating conditions (see 4.5.2 and 4.5.5).

3.3.5 Tires and tubes.

3.3.5.1 Tires. Tires shall be class CC, style A, size 9.00-20, 8-ply rating conforming to SAE J2014 (see 4.5.6).

3.3.5.2 Inner tubes. Inner tubes shall conform to group 2 of ZZ-I-550 for the proper size tire specified (see 4.5.6).

3.3.6 Brake air lines. Brake air lines and fittings shall be internally clean prior to their assembly on the semitrailer. Loss of air pressure in the service brake air line and in the emergency brake air line shall be not greater than 5 pounds per square inch (psi) in 5 minutes. Brake air lines shall be “snuggled” and routed against the semitrailer components; that is, brake air lines shall be nested against flat surfaces or protective areas (see 4.5.2 and 4.5.7).

3.3.7 Torque. Torque for fasteners without specific torque requirements stated on applicable drawings shall be torqued according to accepted industry standards for the particular size and type of fastener used (see 4.5.2).

3.4 Reliability. The reliability of the semitrailer shall be 6000 mean miles between failure (MMBF) (see 4.5.2 and 4.5.8).

3.5 Maintainability. Total maintenance, excluding driver/crew checks and services, shall be not greater than 6 manhours during 6000 miles of operation. This equates to a maintenance

ratio of 0.02 at 200 operational miles, equivalent to 1 operational hour. The scheduled maintenance interval shall be 6 months or 6000 miles, whichever comes first (see 4.5.9).

3.6 Performance. The semitrailer shall meet the performance requirements when it is fully equipped, serviced (see 6.6), and loaded with the applicable payload (see table V and 4.5.10).

3.6.1 Environmental operation. The semitrailer shall be capable of operation as specified herein, in ambient operating temperatures ranging from -50 to +125 °F without deterioration that causes failure of any component (see 4.5.10.1).

3.6.2 Payloads and speeds.

3.6.2.1 Highway operation. The semitrailer shall provide satisfactory operation over relatively smooth, hard surfaced roads when loaded with the rated highway payload at the specified speeds (see 4.5.8.1).

3.6.2.2 Cross-country operation. The semitrailer shall provide satisfactory operation over unimproved roads and open, rolling, or hilly terrain when loaded with the rated cross-country payload specified in table V and at the specified speeds (see 4.5.8.1).

3.6.3 Brakes.

3.6.3.1 Service brakes. With rated payload on the semitrailer the service brakes of the combination semitrailer and towing vehicle shall control, decelerate, and stop the semitrailer within 30 feet from a speed of 20 mph on a dry, hard, paved, level, smooth surface. Application of the brakes on all wheels of the semitrailer and the towing vehicle is required within a 12-foot wide lane (see 4.5.2 and 4.5.10.2.1).

3.6.3.2 Automatic actuation. The semitrailer shall be equipped with an automatic actuating device to apply the semitrailer brakes upon breakaway from the towing vehicle. When loaded with maximum payload specified herein, the automatic actuating device shall maintain application of the brakes and hold the semitrailer stationary on a 20-percent grade for not less than 15 minutes (see 4.5.2 and 4.5.10.3).

3.6.4 Fording. The semitrailer shall ford hard-bottomed, salt or fresh water crossings of sufficient depth to cover the top rear portion of the main chassis frame without immersion of the semitrailer body for up to 15 minutes duration, without damage to the semitrailer or its components, and without special preparation or servicing before and after fording operations. No evidence of water leakage or moisture penetration into the sealed wheeled bearings shall be permitted (see 4.5.10.4).

3.6.5 Tracking ability. When towed over the specified roads and terrains, the semitrailer shall be capable of transporting the rated payload of 6 tons, evenly distributed, without failure or

permanent deformation. The semitrailer shall track the towing vehicle within 2 inches to each side of its path when it is moving in a straight line (see 4.5.2 and 4.5.10.5).

3.6.6 Turning ability. The semitrailer when coupled to the towing vehicle, shall be capable of making complete turns to the right and to the left with the semitrailer assuming a 90° angle to the towing vehicle without cramping, side slipping, or damage to either the towing vehicle or the semitrailer (see 4.5.2 and 4.5.10.6).

3.6.7 Landing device. The landing device and combined leveling mechanism shall support the fully loaded semitrailer. The landing device shall withstand, without damage, the strains imposed upon it when coupling or uncoupling the towing vehicle, and raising or lowering the fully loaded semitrailer (see 4.5.2 and 4.5.10.7).

3.6.8 Watertightness/rain. Each semitrailer body shall be waterproof to provide a watertight structure. The installed door assembly shall provide a watertight seal. The interior of the semitrailer shall show no evidence of water leakage or moisture penetration from any cause (rain, road splash, etc.). The interior of the semitrailer includes the space between the outer wall skins and interior. Semitrailer watertightness requirements are applicable prior to and after exposure to all of the requirements specified herein (see 4.5.10.8).

3.6.9 M313, M447, and M750 models of semitrailers.

3.6.9.1 Heaters interface. Provision shall be made for heater installation. Interface connections shall be provided for electrical wiring, plumbing, and exhaust in accordance with applicable drawings. The unit shall operate from a 120 Vac, 60 Hz, single-phase electrical source (see 4.5.2, 4.5.10.9.1 and 4.5.10.9.2).

3.6.9.2 Lightproofness. Light from the semitrailer interior (with all interior lights operating) shall not be visible within a 50-foot radius of the vehicle (see 4.5.2 and 4.5.10.10).

3.6.9.3 Air conditioner interface for M313 and M447C models. Provisions shall be made for air conditioner installation. Interface connections shall be provided for electrical wiring and the condensate drain in accordance with applicable drawings. The unit that will be installed shall have a cooling output capacity of not less than 36 000 British thermal units (Btu) per hour and operate from a 208 Vac, 60 Hz, 3-phase electrical source (see 4.5.2, 4.5.4.1, and 4.5.10.9.1). However, the contractor shall not use an ozone-depleting chemical (ODC) as the refrigerant.

3.6.10 Gradeability.

3.6.10.1 Longitudinal grades. The semitrailer, loaded with the cross-country payload (see 4.5.8.1), shall follow the towing vehicle at a sustained speed of 20 mph without sliding, shifting, or deviating more than 3 in. to either side of the path of the towing vehicle when ascending and descending 20 percent longitudinal grades (see 4.5.11.1).

3.6.10.2 Side slopes. The semitrailer shall follow the towing vehicle without slipping or upsetting. The semitrailer shall be operated, alternately to the left and to the right, on side slopes having a 20 percent grade, at 20 miles per hour (mph) (see 4.5.11.2).

3.7 Electromagnetic compatibility (M313, M447, M447C, and M750 models, only). When specified (see 6.2), the semitrailers shall conform to the electromagnetic compatibility requirements CE102, CS 101, CS 114, RE 102 and RS 103 of MIL-STD-461 for ground equipment (see 4.5.12).

3.8 Painting (see 4.5.2 and 4.5.16).

3.8.1 Exterior and interior surfaces. All semitrailer exterior and interior surfaces shall be cleaned, treated, primed and painted with finish coat (aliphatic polyurethane paint) as specified in the contract (see 6.2 and 6.7). Painting and marking shall be as specified in the contract (see 6.2).

3.8.2 M313 model semitrailer interior finish. Light green, semigloss enamel matching color chip No. 24533 of FED-STD-595 shall be applied on walls, doors, fittings, and mounted equipment, except fire extinguishers and their brackets. Gray, semigloss enamel matching color chip No. 26152 of FED-STD-595 shall be applied on the folding floor and floor proper.

3.8.3 M447 and M750 models semitrailer interior finish. Light green, semigloss enamel matching color chip No. 24533 of FED-STD-595 shall be applied on the ceiling and upper interior walls. Gray semigloss enamel matching color chip No. 26132 of FED-STD-595 shall be applied on the floor, on the M750 model stowage bins (as applicable), and on the lower interior walls.

3.9 Marking. Marking of the semitrailer shall be in accordance with MIL-STD-642. As a minimum, marking shall include the semitrailer model number, the manufacturer's identification, and the part or identifying number (PIN) (see 1.3 and 6.2). Marking of component parts shall be permanent and legible (see 4.5.2 and 4.5.15).

3.9.1 Interior marking. Interior marking color shall be white.

3.10 Name, shipping, and service data plates. Unless otherwise specified (see 6.2), data plates shall be marked, with information as specified on the applicable data plate drawings (see 4.5.2 and 4.5.14).

3.11 Safety. The semitrailer shall comply with all requirements of Federal Motor Carrier Safety Regulations (FMCSR) and Federal Motor Vehicle Safety Standards (FMVSS) applicable to this vehicle at the time of manufacture. All exposed parts which are energized electrically shall be located, insulated, and fully enclosed or guarded so as to prevent hazards to operation or maintenance personnel, and equipment functioning. All moving parts which are of such nature or so located as to be a hazard to operation or maintenance personnel shall be enclosed or guarded. Protective devices shall not impair operating functions (see 4.5.17).

3.12 Servicing and adjustment. Prior to acceptance by the Government, the semitrailer shall be serviced and adjusted for immediate operational use. The brake system shall be adjusted, the electrical system checked, all tires inflated, and the chassis and running gear completely lubricated with grades of lubricants, specified for ambient temperature at the delivery point (see table VI, 4.5.2, and 4.5.13).

3.13 Workmanship. Vehicles shall be free of defects, improper manufacturing or assembly practices, and meet or exceed requirements specified herein. Defective components, or parts and assemblies which have been repaired or modified to overcome deficiencies shall not be furnished (see 4.5.2):

4. VERIFICATION

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

a. First article inspection and test (see 4.2).
   1. First production vehicle inspection (FPVI) (see 4.2.1.).
   2. Initial production test (IPT) (see 4.2.2).
b. Conformance inspections (see 4.3).

4.2 First article inspection. Unless otherwise specified (see 6.2), the inspection shall be performed on FPVI or IPT samples as specified when a first article sample is required (see 3.1). This inspection shall include the examinations of 4.4 (see table III) and the tests of 4.5 (see table IV).

TABLE III. Classification of defects.

Category	Defect	Method of examination
Critical	None	
Major:		
101	Inoperative electrical system components (see 3.3.2).	Visual and functional
102	Discontinuity of electrical circuits (see 3.3.2.1).	Visual and functional
103	Incorrect blackout light assembly (see 3.3.2.3).	Visual and functional
104	Improper locking action of compartment door ventilator (see 3.3.3).	Visual and functional
105	Damage to wheels or tires (see 3.3.5).	Visual
106	Leakage or other malfunction of service brakes; nonconformance in stopping distance (see 3.6.3.1).	Visual and functional

TABLE III. Classification of defects – Continued.

107	Malfunction of automatic brake actuation (see 3.6.3.2).	Functional
108	Nonconformance in tracking ability (see 3.6.5).	Visual and functional
109	Nonconformance in turning ability (see 3.6.6).	Visual and functional
110	Improper extension, retraction, stowage action; improper locking action of landing gear when raising or lowering (see 3.6.7).	Visual and functional
111	Nonconformance in or damage to heater connection (see 3.6.9.1).	Visual and functional
112	Improper lightproofness (see 3.6.9.2).	Visual
113	Damage to or nonconformance in air conditioning connection (see 3.6.9.3).	Visual and functional
114	Improper sheet metal, structure, riveting of frame (see 3.3).	Visual
115	Damaged suspension system components (see 3.3).	Visual
116	Damaged batteries (see 3.3).	Visual
117	Malfunctioning hold-open or locking devices; other damaged body components (doors, covers, folding sides, grilles, ducts, vents, stowage boxes, brackets, racks, stops, controls, windows) (see 3.3).	Visual and functional
118	Misaligned access ladders and stowage brackets (see 3.3).	Visual
119	Damaged telephone receptacle and plugs (see 3.3).	Visual
120	Damaged, improper length of, malfunction in cable and reel assembly (see 3.3).	Visual and functional
121	Malfunction in, damage to instrumentation (switches, warning, indicating, safety devices, control boxes) (see 3.3).	Visual and functional
122	Damage to, improper assembly of body extension counter, balancing mechanisms (see 3.3).	Visual and functional
123	Damage to, improper length of intervehicle hose, cables, tubing (see 3.3).	Visual
124	Damaged or missing accessories (see 3.3).	Visual
125	Nonconformance in highway towing speeds (see 3.3).	Functional
126	Overheating in operating units (see 3.3).	Tactile
127	Workmanship, faulty, affecting performance (see 3.13).	Visual and functional
Minor:		
201	Improper seals (see 3.3.1).	Visual and functional
202	Improper installation or assembly of electrical system components (see 3.3.2).	Visual
203	Improper adjustment, assembly clearance of compartment door ventilator (see 3.3.3).	Visual and functional

TABLE III. Classification of defects – Continued.

204	Faulty adjustment mechanism (see 3.3.4).	Visual and functional
205	Improper size, type, mounting of wheels and tires (see 3.3.5).	Visual
206	Incorrect loss of air pressure in brake air lines (see 3.3.6).	Functional
207	Incorrect torque for fasteners (see 3.3.7).	Visual
208	Nonconformance or incomplete servicing and adjustment (see 3.12).	Visual and functional
209	Improper assembly or installation of landing gear (see 3.6.7).	Visual
210	Nonconformance in heaters (see 3.6.9.1).	Visual
211	Nonconformance in air conditioning unit (see 3.6.9.3).	Visual
212	Improper paint application or color; improper application, coverage, materials for protective coating (see 3.8).	Visual
213	Improper identification marking (see 3.9).	Visual
214	Incomplete, missing, improper location and size of decal marking, data and instruction plates (see 3.10).	Visual
215	Faulty workmanship not affecting performance (see 3.13).	Visual
216	Improperly mounted, coded, protected; defective wiring or tubing (see 3.3).	Visual
217	Improper installation or assembly of suspension system components (see 3.3).	Visual
218	Low electrolyte or specific gravity; improper installation and cable lengths of batteries and cables (see 3.3).	Visual and hydrometer
219	Improper fits, adjustments, assembly, installation; defective straps, rivets, hardware sheet metal of body (doors, covers, folding sides, grilles, ducts, vents, stowage boxes, brackets, racks, stops, controls, windows) (see 3.3).	Visual and functional
220	Improper assembly or installation of access ladder and stowage brackets (see 3.3).	Visual
221	Improper assembly or installation of telephone receptacle and plugs (see 3.3).	Visual
222	Improper assembly or installation, fit; canvas damage to cable and reel assembly (see 3.3).	Visual
223	Improper assembly or installation; missing; defective reflectors (see 3.3).	Visual
224	Improper adjustment, assembly, alignment of instrumentation (switches, warning, indicating, safety devices, control boxes) (see 3.3).	Visual and functional
225	Improper assembly or installation of body extension counter, balancing mechanisms (see 3.3).	Visual
226	Missing, improper assembly or installation, defective accessories (see 3.3).	Visual
227	Missing, improperly processed or secured tools (see 3.3).	Visual

TABLE IV. Classification of inspections.

Title	Requirements	Inspection	First article		Conformance
			FPVI	IPT	
Reliability	3.4	4.5.8	X	X	
Maintainability	3.5	4.5.9	X	X	
Materials and construction	3.2 thru 3.3, 3.3.1 thru 3.3.4	4.5.1, 4.5.2	X		
Defects	3.3.6, 3.3.7, 3.6.3, 3.6.5 thru 3.6.7, 3.6.9 thru 3.6.9.3, 3.8 thru 3.10, 3.13	4.5.2	X	X	X
Servicing and adjustment	3.12	4.5.2	X	X	X
Seals	3.3.1	4.5.3	X	X	
Electrical circuits	3.3.2.1, 3.6.9.1, 3.6.9.3	4.5.4.1, 4.5.2	X	X	X
Lighting system	3.3.2.2	4.5.4.2	X	X	X
LED blackout light	3.3.2.3	4.5.2, 4.5.4.2.1	X	X	X
Features	3.3.3, 3.3.4	4.5.5	X	X	
Controls	3.3.3	4.5.2, 4.5.5	X	X	X
Adjustment mechanism	3.3.4	4.5.2, 4.5.5	X	X	X
Tires and tubes	3.3.5	4.5.6	X	X	X
Brake air lines	3.3.6	4.5.7	X	X	X
Environmental operation	3.6.1	4.5.10.1	X	X	
Highway operation	3.6.2.1	4.5.8.1	X	X	X
Cross-country operation	3.6.2.2	4.5.8.1	X	X	X
Service brakes	3.6.3.1	4.5.10.2.1	X	X	X
Automatic actuation	3.6.3.2	4.5.10.3	X	X	X
Fording	3.6.4	4.5.10.4	X		
Tracking ability	3.6.5	4.5.10.5	X	X	
Turning ability	3.6.6	4.5.10.6	X	X	X
Landing device	3.6.7	4.5.10.7	X	X	
Watertightness/rain	3.6.8	4.5.10.8	X	X	X
Semitrailer, van bodies, expansible	3.6.8	4.5.10.8.1.2	X	X	
Heaters, air conditioner interface	3.6.9.1, 3.6.9.3	4.5.10.9.1	X	X	X
Air flow modulation	3.6.9.1	4.5.10.9.2	X	X	
Lightproofness	3.6.9.2	4.5.10.10	X	X	X

TABLE IV. Classification of inspections – Continued.

Longitudinal grades	3.6.10.1	4.5.11.1	X	X	
Side slopes	3.6.10.2	4.5.11.2	X	X	
Electromagnetic compatibility	3.7	4.5.12	X	X	
Painting	3.8	4.5.16	X	X	X
Safety	3.11	4.5.17	X	X	X

4.2.1 FPVI. Unless otherwise specified (see 6.2), first article FPVI shall be performed on the first production semitrailer of each model on each contract.

4.2.2 IPT. Unless otherwise specified (see 6.2), first article IPT shall be performed on two semitrailers selected from the first months production.

4.3 Conformance inspection.

4.3.1 Sampling. Samples from an inspection lot for conformance inspection shall be selected in accordance with ANSI/ASQC Z1.4.

4.4 Examination. Each semitrailer shall be examined for compliance with the requirements specified in 3.2 through 3.3.7 and 3.8 through 3.12. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet the specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.5 Methods of inspection.

4.5.1 Materials and construction. Conformance to 3.2 through 3.3 shall be determined by inspection of contractor records providing proof or certification that design, construction, processing, and materials 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 3.3.1 through 3.4, 3.6.3, 3.6.5 through 3.6.7, 3.6.9.1 through 3.6.9.3, 3.8 through 3.10, 3.11, 3.12 and 3.13 shall be determined by examination for the defects listed in table III. Examination shall be visual, tactile, or by measurement with a hydrometer.

4.5.3 Seals. To determine conformance to 3.3.1, during operation and after the 6000 mile test (see 4.5.8.1), examine the semitrailer external bearing areas for evidence of lubricant leakage. Immediately after performing the fording test (see 4.5.10.4), remove the

wheels and hubs, and examine the lubricant for evidence of water contamination and foreign matter. Water exceeding 2 percent or entrance of any foreign matter shall be indications of bearings seal failure.

4.5.4 Electrical.

4.5.4.1 Electrical circuits. To determine conformance to 3.3.2.1, test the electrical circuits of the semitrailer as specified, with no discontinuity, or internal or external shorts allowed. Examine 110/220 V ac components and circuits to determine conformance to specified code. Measure the voltage output at the heater and air conditioner interface points to determine conformance to 3.6.9.1 and 3.6.9.3.

4.5.4.2 Lighting system. To determine conformance to 3.3.2.2, operate all external and internal lights, and examine them for functionability prior to start, and during, and at completion of all road tests specified herein. Corrective action taken for deficiencies or failures noted in the external or internal lighting systems shall include investigation and correction of the cause of such deficiencies or failures.

4.5.4.2.1 LED blackout light test. To determine conformance to 3.3.2.3 and 3.3.2.4, examine LED blackout lamp assemblies, performing all operational tests and examinations at the place of manufacture at completion of the 50 mile control test, except the 400 foot altitude test and the 700 nanometer energy emission test. The certificate of conformance from the manufacturer of the LED blackout lights shall be backed by test data indicating that all tests were performed and met. Proving ground tests shall include all tests, except the 400 foot altitude test. Corrective action shall be as in 4.5.4.2.

4.5.5 Features. Conformance to 3.3.3 and 3.3.4 shall be determined by exercising the semitrailer and by qualitative observation sufficient to demonstrate that specified characteristics and features are present and functional.

4.5.6 Tires and tubes. To determine conformance to 3.3.5, examine the tires and tubes as specified in table III and exercise the semitrailer to observe that the specified characteristics of the tires and tubes are present and that they are functional.

4.5.7 Brake air lines. To determine conformance to 3.3.6, examine and test both brake air lines (service and emergency) and fittings; and establish manufacturing procedures and/or controls to assure brake line cleanliness, and that protective routing is accomplished on semitrailers, and that the specified brake line test for loss not greater than 5 psi in 5 minutes, is conducted and met prior to road testing. Corrective action for deficiencies found during examination and test shall include determination of the cause and appropriate correction to avoid recurrence.

4.5.8 Reliability. To determine conformance to 3.4, point estimate value equal to or greater than 8000 miles shall be demonstrated during testing. Point estimate shall be computed using the cumulative test mileage of all vehicles, divided by the cumulative number of

chargeable failures of all vehicles. The reliability shall be demonstrated in accordance with the operational profile during testing (see 4.5.3). For calculation of MMBF, a failure shall be defined as a condition which:

a. Prevents operations, or
b. Reduces performance below essential levels, or
c. Indicates to the crew that further operations would be unsafe, or
d. Indicates to the crew that further operations might result in extensiveness damage to the equipment.

Any of the four conditions which cannot be corrected by the crew in one hour using basic issue items that are carried on the truck-tractor or the semitrailer constitutes a failure. Maintenance and human induced failures are excluded.

4.5.8.1 Operational profile. The 6000 miles of testing plus the remaining terrain testing with the required speeds and payload on each type of road and terrain shall be in accordance with table V.

TABLE V. Operational profile.

Road/terrain	Total test distance	Percentage of test mileage 6-ton payload	Maximum speed (mph) 1/ allowed 2/	Minimum speed (mph) allowed 2/
Hard surface (paved) road	2400 miles	40	55	45
Gravel and dirt (secondary) road	1620 miles	27	30	20
Level cross-country terrain 3/	1500 miles	25	30	20
Hilly cross-country terrain 4/	360 miles	6	30	20
Belgian block	120 miles	2	20	15
Side slope, 20 percent	200 feet	--	5	3
Longitudinal slope, 20 percent	200 feet	--	5	3

1/ miles per hour (mph)
2/ Speed may vary between the maximum and minimum speeds allowed based on terrain and environmental conditions, and may be determined safe by the operator of the prime mover.
3/ Per No. 1 Perryman Cross-Country Course (at Aberdeen Test Center (ATC), Aberdeen, MD)
4/ Per Churchville Course (at ATC, Aberdeen, MD)

4.5.8.2 Road and terrain course regulations. The semitrailer shall complete not less than 6000 miles of operation when loaded with payload of 12 000 pounds (lb) (approximately evenly distributed, fore and aft, within 3 percent) without failure of: (a) components and subassemblies,

semitrailer body undercarriage frame assembly (including kingpin), semitrailer bogie structure (including suspension brackets), semitrailer suspension and (b) performance requirements specified herein. A failure also includes weld cracks, base metal cracks, and permanent deformation of items. The prime manufacturer shall be responsible to correct and repair any failure(s) that occurred during testing on each semitrailer produced at no additional cost to the Government and no modification in the contract delivery schedule.

4.5.8.3 Expansibility reliability. The shop equipment shall be tested for a total of 12 operations with zero chargeable failure. A chargeable failure is defined as any malfunction which cannot be corrected by an organizational repair or replacement action (using controls on equipment, tool, or parts).

4.5.9 Maintainability. To determine conformance to 3.5, a maintenance ratio less than or equal to that specified shall be demonstrated during testing. The maintenance ratio will be calculated using the total cumulative maintenance manhours, except those incurred through maintenance induced errors.

4.5.10 Performance. To determine conformance to 3.6, the semitrailer shall be operated for a distance of not less than 50 miles. Test course shall be smooth, approximately level, hard surfaced road.

4.5.10.1 Environmental operation. To determine conformance to 3.6.1, operate the semitrailer and store it at the temperatures specified. The semitrailer shall evidence no deterioration of operation and performance, or failure of any component.

4.5.10.2 Brakes.

4.5.10.2.1 Service brake test. To determine conformance to 3.6.3.1, the loaded semitrailer and towing vehicle combination shall be operated as specified and the performance measured. The vehicle combination shall control, decelerate, and stop the semitrailer within 30 feet from a speed of 20 miles per hour on a dry, hard, paved, level, smooth surface. Brakes shall apply evenly on all semitrailer and towing vehicle wheels and maintain the vehicle combination within a 12 foot wide lane. The service brake test shall also be conducted on acceptance test with the semitrailer, van without payload and the same performance measured.

4.5.10.3 Automatic brake actuation test. To determine conformance to 3.6.3.2, the semitrailer and towing vehicle shall be placed on the specified grade and the automatic breakaway device actuated. Brakes shall hold the semitrailer stationary for the specified time. A satisfactory test technique for this test shall be developed by the tester whereby a simulation of the breakaway is accomplished without complete mechanical disconnect of the semitrailer from the prime mover. A satisfactory technique shall be one that assures safety of manpower and equipment in the event of brake system failure.

4.5.10.3.1 Optional acceptance test. To determine conformance to 3.6.3.2, the semitrailer without rated payload shall maintain application of the brakes and be held stationary on a 10 to 20 percent grade for not less than 5 minutes.

4.5.10.3.2 Optional Government test. To determine conformance to 3.6.3.2, the semitrailer with rated payload shall maintain application of the brakes and be held stationary on a 10 to 20 percent grade for not less than 5 minutes. Immediately thereafter, the semitrailer shall be towed and all the semitrailer wheels shall skid after brakes have been burnished.

4.5.10.4 Fording test. To determine conformance to 3.6.4, the semitrailer shall be towed through water crossings at the depth specified for 15 minutes without special preparation. The wheel bearings shall be examined for water contamination and shall not be greater than specified in 3.3.1.

4.5.10.5 Tracking ability. To determine conformance to 3.6.5, the semitrailer loaded with payload and towed as specified, shall track the towing vehicle within 2 inches to each side of the towing vehicle when the towing vehicle is moving in a straight line. Conduct this test on hard surface, relatively level highway terrain at varying speeds from 30 to 55 miles per hour.

4.5.10.6 Turning ability. To determine conformance to 3.6.6, the semitrailer shall meet the requirements specified, without cramping, side-slipping, or damage to either the towing vehicle or the semitrailer.

4.5.10.7 Landing device. To determine conformance to 3.6.7, place the semitrailer on a firm surface, and operate the landing device and leveling mechanism. Couple and uncouple the towing vehicle, and raise and lower the leveling mechanism.

4.5.10.8 Watertightness/rain. To determine conformance to 3.6.8, after subjecting each semitrailer to the applicable road test, subject each semitrailer to a rain/water spray test for not less than 45 minutes in accordance with 4.5.10.8.1.1 or 4.5.10.8.1.2. Subject each semitrailer to rain/water spray testing in its closed position and in its expanded position (with panels installed and properly adjusted). Water leakage shall not be allowed.

4.5.10.8.1 Simulated rain testing. Line-water pressure within 3 feet from the nozzle furthest away from the water source shall be not less than 55 psi. Completely spray the sides, roof, front, and rear of the semitrailer body, with individual nozzle sprays impinging and impacting all areas of the exterior of the semitrailer body (except the underside) at angles of 20 to 90 degrees to the sprayed surface. Nozzle spray shall be the full cone type. All visible inboard and inside surfaces of the semitrailer outer shell and interior shall show no moisture penetration or water leakage during the spray period. The inside surface of the clearance/marker/ taillights/blackout lights lens shall show no evidence of moisture penetration. During the spray test, the semitrailer body door seals and door handles shall not require supplemental sealing methods. If leakage occurs, the semitrailer body shall be rejected. Upon completion of repairs, retest the entire body in accordance with the above.

4.5.10.8.1.1 Watertightness test-body closed (non-expanded). To determine conformance to 3.6.8, the semitrailer body shall be tested in the closed (non-expanded) mode for watertightness as specified in 4.5.10.8, for the specified period. Water leakage or evidence of moisture penetration into the semitrailer interior or outside of the outer walls or roof skins are not acceptable. Water leakage is acceptable through the exhaust pipe stacks and bonnet side door louvers; however, these areas shall be covered or taped prior to the test. In the event the body fails to meet the water test requirement, rework the semitrailer body in accordance with 3.6.8.

4.5.10.8.1.2 Watertightness test body expanded. After the semitrailer body has satisfactorily met 4.5.10.8.1 and 4.5.10.8.3, test the semitrailer body in the expanded mode. Subject the expanded semitrailer to 4.5.10.8.1 for not less than 45 minutes while observing the body for interior leakage. Water leakage or evidence of moisture penetration into the semitrailer interior, including expanded walls, joints, corners, and seals are not acceptable. Water leakage is acceptable through the exhaust pipe stacks and bonnet side door louvers, however, these areas shall be covered or taped prior to the test. In the event the body fails to meet the water test requirement, rework the semitrailer body in accordance with 3.6.8.

4.5.10.8.2 Optional test assemblage. To determine conformance to 3.6.8, an optional test assemblage may be utilized in 4.5.10.8 to test the semitrailer body with bogie assembly and landing gear assembly installed. The final performance requirements and the test method shall remain the same.

4.5.10.8.3 M313, M447, M447C, and M447C Mod, models semitrailer, van bodies. To determine conformance to 3.6.8, test the M313, M447, M447C, and M447C Mod. models of semitrailer bodies for damage, interference, or binding to the extending or retracting mechanisms, or walls and panels; and that all locks and fasteners are positive in locking and fastening the extended portion in such a manner that they provide watertight and lightproof joints. Perform the expansion/extension operations within a maximum of 90 minutes for the M447C and M447C Mod. models, within a maximum of 30 minutes for the M313 model, and within a maximum of 60 minutes for the M750 model; and with a maximum of three installers using only equipment that will be furnished with the specific semitrailer. Expand the semitrailers on relatively level surfaces, or level the semitrailers by using leveling jacks in combination with the independently operated landing legs. Removal of storage containers from the front deck is excluded from expansion time, and the leveling time shall be included.

4.5.10.9 M313, M447, and M750 models of semitrailers.

4.5.10.9.1 Heaters interface; and air conditioner interface for M313 and M447C models. To determine conformance to 3.6.9.1 and 3.6.9.3, examine current and voltage output levels of circuits supplying the semitrailer electrical system.

4.5.10.9.2 Air flow modulation. To determine conformance to 3.6.9.1, operate and examine the damper rod and linkages.

4.5.10.10 Lightproofness. To determine conformance to 3.6.9.2, close blackout shades, and operate all interior sources of illumination. Semitrailer bodies in the expanded mode shall be tested in an enclosed environment with no artificial/natural lighting present.

4.5.11 Gradeability.

4.5.11.1 Longitudinal grades. To determine conformance to 3.6.10.1, tow the semitrailer up and down longitudinal grades at the specified speed and grade.

4.5.11.2 Side slopes. To determine conformance to 3.6.10.2, operate the semitrailer alternately to the left and to the right, on side slopes at the specified speed and grade.

4.5.12 Electromagnetic compatibility (M313, M447, M447C, and M750 models, only). To determine conformance to 3.7, test the semitrailer in accordance with the applicable provisions of MIL-STD-461.

4.5.13 Servicing and adjustment. Servicing and adjustment of semitrailer shall be examined to determine conformance to 3.12.

4.5.14 Name, shipping, and service data plates. Location, installation and information on name, shipping, and service data plates shall be examined to determine conformance to 3.10.

4.5.15 Marking. The semitrailer and component markings shall be examined to determine conformance to 3.9.

4.5.16 Painting. To determine conformance to 3.8 (CARC system), examine preparation and painting procedures during and after application.

4.5.17 Safety. To determine conformance to 3.11, examine the semitrailer to assure that hazards to operating and maintenance personnel have been eliminated or controlled. Equipment which creates a hazard shall be considered a failure.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's 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.

6. NOTES

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

6.1 Intended use. Semitrailers covered by this specification are military unique. The semitrailer is intended for use as a command post, a field medical station, or a large portable shop to house maintenance shop sets, tools, or other supplies for installing, maintaining, and repairing equipment in the field. With the performance needed to perform in adverse conditions, the semitrailer exceeds the criteria of a commercial type semitrailer, and is therefore considered military unique.

6.1.1 General use of M447, M447C, and M447C Mod. models. M447, M447C, and M447C Mod. models of semitrailers are used primarily to transport and house shop equipment over all types of roads and limited cross-country terrain, including paved roads, secondary roads, hilly and level cross-country terrain, Belgian block roads, etc.; and under extreme climatic conditions in arctic, desert, and tropic environments. Other uses for these mobile shelters include maintenance (electrical, mechanical, or electronic) shops, parts storage and transport, etc. These semitrailers are tactical vehicles with full spare part and Department of the Army Technical Manual support.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Model and drawing number of required item (see 1.2 and 2.2.2).
c. If required, the specific issue of individual documents referenced (see 2.2.1, 2.2.2 and 2.3).
d. If first article samples are required (see 3.1).
e. If rubber components are ozone resistant (see 3.2.3).
f. If electromagnetic compatibility is required (see 3.7).
g. Painting and marking (see 3.8.1 and 3.9).
h. If data plates are other than as specified (see 3.10).
i. If first article inspection and test are to be performed (see 4.2).
j. If FPVI does not apply (see 4.2.1).
k. If other than two vehicles are to be selected for the IPT (see 4.2.2).
l. Packaging requirements (see 5.1).

6.3 Subject term (key word) listing.

Fording
House repair
Shop equipment
Tactical
Transport part

6.4 International standardization agreement. Certain provisions (see 3.6.4) of this specification are the subject of international standardization agreement NATO STANAG 2805-A. When amendment, revision, or cancellation of this specification is proposed, the preparing activity must coordinate the action with the U.S. National Point of Contact for the international standardization agreement, as identified in the ASSIST database at https://assist.daps.dla.mil.

6.5 Recommended service products. Typically, the semitrailer, van should be serviced with the following products listed in table VI or equivalent.

TABLE VI. Service products.

Product use	Ambient air temperature	
	-65 to 0 °F	-10 to 115 °F
Oil:		
For hydraulic brakes	MIL-PRF-46176 1/	MIL-PRF-46176 1/
For shock absorbers	MIL-PRF-87257 1/	MIL-PRF-83282 1/
For general purpose lubrication	MIL-PRF-23827 1/	MIL-PRF-3150 1/
Grease:		
For sealed bearings	MIL-PRF-23827 1/	MIL-PRF-23827 1/
For general chassis lubrication, including wheel bearings	MIL-PRF-10924 1/	MIL-PRF-10924 1/

1/ or commercial equivalent, if available.

6.6 Exterior and interior surfaces. Semitrailer exterior and interior surfaces have been cleaned, treated, primed and painted with finish coat (aliphatic polyurethane paint) in accordance with MIL-DTL-53039 or MIL-DTL-64159.

6.7 Hazardous material. Hazardous material as listed at http://www.epa.gov/ebtpages/pollutants.html should be eliminated or minimized.

6.8 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Army - AT
Air Force - 99

Review Activity:
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Army - AT

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NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.daps.dla.mil.