

INCH-POUND
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MIL-PRF-62180D(AT)

28 August 1997

SUPERSEDING

MIL-S-62180C(AT)

9 July 1992

## PERFORMANCE SPECIFICATION

SEMITRAILER, FUEL TANKERS: 5000 GALLON, BULKHAUL,  
AUTOMOTIVE AND AIRCRAFT FUEL SERVICING

This specification is approved for use by 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 the M900 series tankers, bulkhaul self-load/unload semitrailer; fuel dispensing automotive semitrailer; and fuel dispensing, underwing/overwing aircraft semitrailer. These semitrailers travel over primary and secondary roads and over limited cross-country terrain.

1.2 Classification. Trailers will be of the following models, as specified (see 6.2):

Semitrailer, Tank	- 5000 Gallon, Bulkhaul Selfload/Unload, M967A2.
Semitrailer, Tank	- 5000 Gallon, Fuel Dispensing, Automotive, M969A3.
Semitrailer, Tank	- 5000 Gallon, Fuel Dispensing, Under/overwing Aircraft, M970A2.

<p>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/BUE, Warren, MI 48397-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.</p>
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AMSC N/A

FSC 2330

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## MIL-PRF-62180D(AT)

## 2. APPLICABLE DOCUMENTS

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

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

## SPECIFICATIONS

## FEDERAL

- |           |  |
|-----------|--|
| A-A-50271 | - Plate, Identification, Instruction and Marking Blank.      |
| A-A-52522 | - Lining, Brakes; And Lining Material, Brake:<br>Automotive. |

## DEPARTMENT OF DEFENSE

- |             |   |
|-------------|---|
| MIL-C-46168 | - Coating, Aliphatic Polyurethane, Chemical Agent<br>Resistant. |
|-------------|---|

## STANDARDS

## FEDERAL

- |             |  |
|-------------|--|
| FED-STD-595 | - Colors Used in Government Procurement. |
|-------------|--|

## DEPARTMENT OF DEFENSE

- |             |   |
|-------------|---|
| MIL-STD-209 | - Slings and Tie down Provision for Lifting and<br>Tying Down Military Equipment. |
| MIL-STD-810 | - Environmental Test Methods and Engineering<br>Guidelines.                       |

(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.)

## MIL-PRF-62180D(AT)

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.

### DEPARTMENT OF TRANSPORTATION (DoT)

Federal Motor Vehicle Safety Standards.  
Federal Motor Carrier Safety Regulations.  
Regulations Governing Transportation of Dangerous Articles in Tank Motor Vehicles.

(Application for copies should be addressed to the Department of Transportation, National Highway Traffic Safety Administration, Room 5307J, Washington, DC 20590-0001.)

### DRAWINGS

#### ARMY

7417585	- Ground Board Assembly (Interface).
12275441	- Nozzle Fuel Dispensing (Interface).
12355846	- Treatment and Paint Specification - Tactical Trailers (Interface).

(Copies of these drawings are available from the U. S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/BLUE, 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 the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issue of the documents cited in the solicitation (see 6.2).

### AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)

ANSI/ASQC Z1.4	- Sampling Procedures and Tables For Inspection by Attributes (DoD Adopted).
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(Application for copies should be addressed to American National Standard Institute, 11 West 42nd Street, New York, NY 10036.)

MIL-PRF-62180D(AT)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

Boiler and Pressure Vessel Code; Section VIII for Unfired Pressure Vessels.

(Application for copies should be addressed to the American Society of Mechanical Engineers, Order Dept., 345 East 47th Street, New York, NY 10017-2392.)

AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)

- |            |   |
|------------|---|
| ASTM D610  | - Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces (SSPC-VIS-2) (DoD Adopted). |
| ASTM D3359 | - Standard Test Method for Measuring Adhesion by Tape Test (DoD Adopted).                                     |

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

AMERICAN WELDING SOCIETY (AWS)

- |          |  |
|----------|--|
| AWS B2.1 | - Standard for Welding Process and Performance Qualifications (DoD Adopted). |
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(Application for copies should be addressed to American Welding Society, 550 N.W. LeJeune, Miami, FL 33126.)

ASSOCIATION OF AMERICAN RAILROADS (AAR)

- |          |   |
|----------|---|
| M-931-88 | - Highway Trailers, All Types for TOFC Service. |
|----------|---|

(Applications for copies should be addressed to the Association of American Railroads, 50 F Street, NW, Washington, DC 20001-1564.)

GENERAL MOTORS CORPORATION (GM)

- |          |  |
|----------|--|
| GM 9540P | - GM Engineering Standards for Materials, Process Procedures and Accelerated Corrosion Test. |
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(Copies of GM publications may be obtained from General Motors Corporation, c/o Global Engineering, 15 Inverness Way, Englewood, CO 80112.)

# MIL-PRF-62180D(AT)

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- |              |  |
|--------------|--|
| NFPA No. 407 | - Standard for Aircraft Fuel Servicing.                |
| NFPA No. 385 | - Tank Vehicles for Flammable and Combustible Liquids. |

(Applications for copies should be addressed to the National Fire Protection Association, Battery March Park, Quincy, MA 02269.)

## SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE)

- |           |  |
|-----------|--|
| SAE J115  | - (R) Safety Signs, Standard.  |
| SAE J551  | - Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles and Devices (60 Hz to 18 GHz).                              |
| SAE J576  | - Plastic Materials For Use in Optical Parts Such As Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices, Recommended Practice (DoD Adopted). |
| SAE J592  | - Clearance, Side Marker and Identification Lamps, Information Report (DoD Adopted).   |
| SAE J700  | - Upper Coupler Kingpin, Commercial Trailers and Semitrailers, Standard (DoD Adopted).   |
| SAE J702  | - Brake and Electrical Connection Locations, Truck Tractor and Truck-Trailer, Recommended Practice (DoD Adopted).  |
| SAE J833  | - Human Physical Dimensions, Recommended Practice (DoD Adopted).   |
| SAE J925  | - Minimum Service Access Dimensions For Off-Road Machines; Standard (DoD Adopted).   |
| SAE J1292 | - Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring, Recommended Practice (DoD Adopted).   |
| SAE J1315 | - Off-Road Tire and Rim Selection and Application, Standard.   |
| SAE J2013 | - Military Tire Glossary, Recommended Practice.  |
| SAE J2222 | - Coiled Electrical Cable, Technical Report.   |

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

## MIL-PRF-62180D(AT)

## UNDERWRITERS LABORATORIES, INC. (UL)

UL 711

- Standard for Safety Fire Extinguishers, Rating and Fire Testing (DoD Adopted).

(Application for copies should be addressed to the Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.)

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 (initial production) semitrailer. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.4 (see 4.3.1).

3.1.1 Durability. The semitrailer shall possess not less than 0.60 probability of completing a minimum of 6000 miles of operation, without replacement or overhaul of major components and/or subassemblies; i.e. suspension at full semitrailer load weight, axles and wheels (less tires and tubes), brake system components (less brake shoes), landing gear, kingpin, and tank shell or frame (based on binomial distribution assumptions). The criteria for replacement or overhaul shall be as prescribed by the appropriate maintenance manual (see 4.4.1).

3.1.1.1 Operational profile. The 6000 miles of operation, speed, and slope limitations shall meet the requirements of 3.4.2 and 3.4.3.

3.1.1.2 Assembly(ies) Mean-Time-Between-Failure(MTBF). The assembly(ies) (see 3.3.4) on the 5000 gallon tankers shall have a minimum MTBF of 100 hours when subjected to requirements specified in 3.4 (see 4.4.2).

3.1.2 Maintainability. (See 4.4.3).

3.1.2.1 Maintainability requirements of basic semitrailer.

- a. The total active combined scheduled and unscheduled maintenance of the 5000 gallon tankers (excluding driver/crew checks and services in accordance with Failure Definition and Scoring Criteria (FD/SC)) shall not exceed twelve manhours during the first 6000 miles of Product Qualification Test (PQT). This equates to a Maintenance Ratio (MR) of no greater than 0.04 Maintenance Man Hours (MMH)/Operating hour at 20 mph (NOTE: 20 miles of operation at 20 mph is equivalent to one operational hour.)

## MIL-PRF-62180D(AT)

- b. The scheduled maintenance as recommended by the appropriate maintenance manual shall be conducted throughout the test.

### 3.1.2.2 Maintainability requirements for assembly(ies) on each vehicle model (see 4.4.3).

- a. The total active scheduled maintenance for the assembly(ies) on the semitrailers (excluding crew checks and services in accordance with FD/SC) shall not exceed 3 manhours, and the total active unscheduled maintenance shall not exceed 3 manhours during 100 hours of operation in accordance with the requirements specified herein. This equates to each vehicle assembly(ies) MR of no greater than 0.06.
- b. The scheduled maintenance intervals shall be as recommended by the appropriate maintenance manual throughout the test.

### 3.1.3 Reliability. (See 4.4.4.)

3.1.3.1 Reliability semitrailer. The reliability of the semitrailer shall achieve not less than 6000 Mean Miles Between Hardware Mission Failures (MMBHMf) when subjected to the speed and slope limitations in table I.

TABLE I. Speed and slope limitations.

Course	Mileage Percentage <sup>1/</sup>	Speed (mph)	Longitudinal slope, max.
Hard surface roads	45	0-50	10%
Gravel and dirt roads (Unimproved roads)	25	0-35	10%
Level cross country	20	0-20	10%
Hilly cross country	8	0-15	10%
Belgian block course	2	0-10	10%

<sup>1/</sup> 90 percent of mileage in each course shall be accomplished with full payload.  
The remaining ten percent of mileage shall be performed without payload.

3.1.3.2 Assembly(ies) Mean-Time-Between Failure (MTBF). The engine pump, fuel dispensing and filter separator assemblies shall have a minimum MTBF of 100 hours when subjected to requirements specified in 3.3.4.

3.1.3.3 Cyclic testing of assemblies. The fuel loading/unloading system shall be demonstrated every 500 miles during the 6000 miles of operation.

## MIL-PRF-62180D(AT)

3.2 Materials. Materials shall be as specified herein and in referenced specifications, standards, and drawings. Material shall be free of defects which adversely affect performance or appearance of the finished product (see 4.1 and 6.8). Asbestos, cadmium, and radioactive material shall not be used in this item. 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.

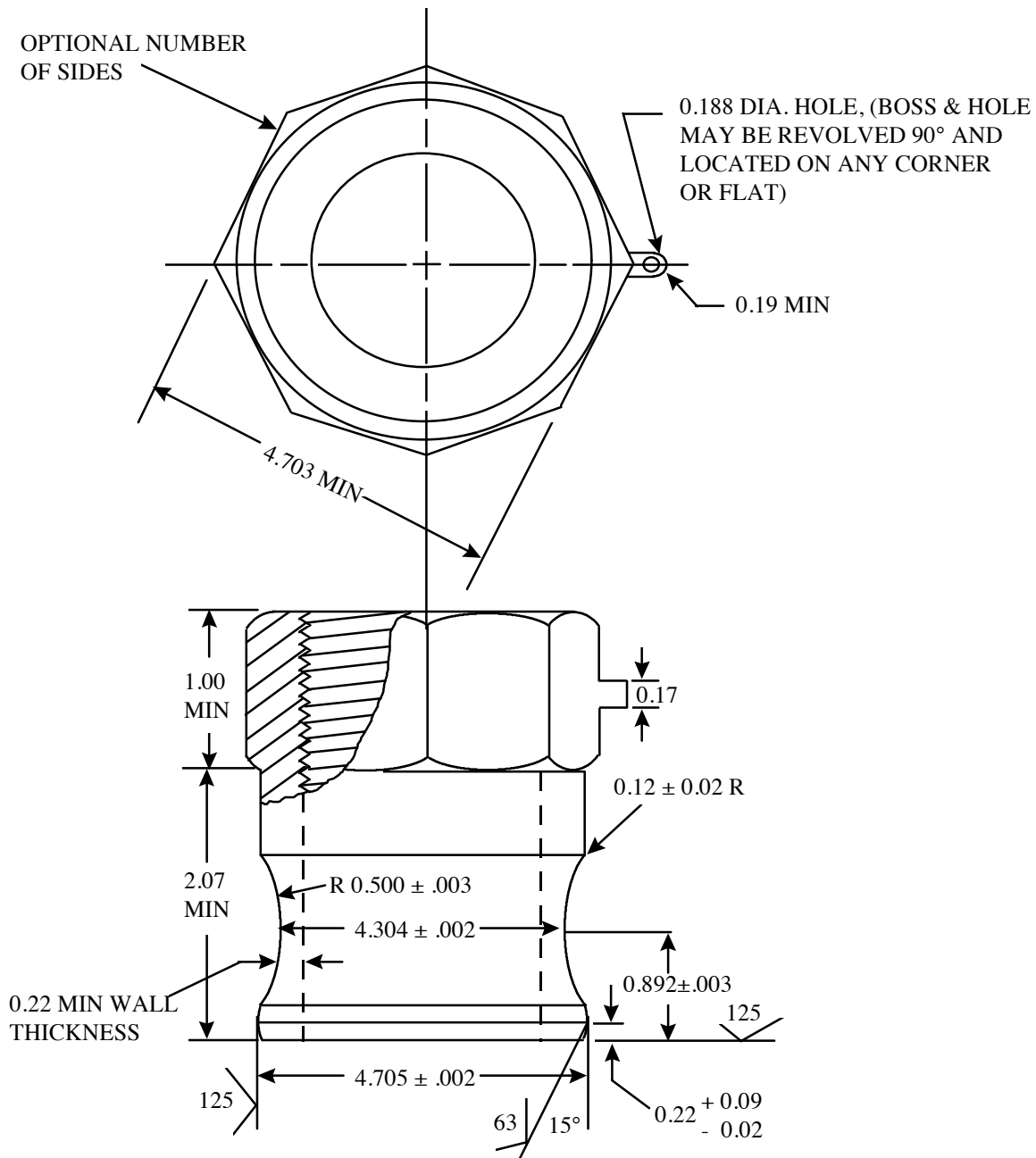
3.2.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs (see 6.8).

3.3 Construction/configuration. (See 4.1.)

3.3.1 Basic construction. The basic construction is essentially a low profile bulkhaul semitrailer with a stainless steel, single compartment tank, of 5000 gallon capacity, plus 3 percent capacity provided for expansion of the fuel. Provisions shall be made for automatic bottom-loading, using an adapter which operates in an environment where the temperature is -25 degrees Fahrenheit (°F) to +125°F, having an automatic overflow shutoff device and gravity discharge capability. The tanker shall be provided with a manhole on top to facilitate inspection, cleaning and fuel loading. The tank shell assembly shall also conform to all other DoT 406 requirements such as structural rigidity, baffles, accident and damage protection, venting, and shell thickness. The tanker shall be equipped with radial tires which conform to SAE J1315 and SAE J2013, a fuel capacity measuring device and a vapor recovery system/kit. The end adapter of the vapor recovery system/kit (see figure 1) shall be compatible with a four inch quick-disconnect field connection, such as used at fuel depots (see 4.5.1 and 4.5.2).



## MIL-PRF-62180D(AT)

FIGURE 1. Adapter.

## MIL-PRF-62180D(AT)

## NOTES:

1. Unless otherwise specified, dimensions are in inches.
2. Tolerances: Unless otherwise specified, decimals 2 places (0.02), 3 places (0.005); degrees  $\pm 1/2$ .
3. Material: Class 1. Aluminum alloys UNS A03560-T6, A07120-T5 or A07130-T5 per ASTM B26.
4. Finish: Coatings. Finish coatings shall be treated aluminum or aluminum alloys electrolytically in a bath containing sulfuric acid or equivalent to produce a uniform anodic coating on the metal surface. Heat treatable alloys shall be tempered by heat treatment, such as -T4, -T6, or T73, or equivalent prior to anodizing.
5. Anodic coating. When specified in the contract or purchase order, the anodic coating shall not be dyed or pigmented. Any natural coloration resulting from anodic treatment with the various alloy compositions shall not be considered coloration. The characteristic color imparted by the sealing process shall also be considered as non-dyed.
6. Weight of coating. Prior to sealing, coatings shall meet the coating weight minimum of 1000 milligrams per square foot (mg/ft<sup>2</sup>).
7. Sealing. When specified, sealing shall be accomplished by immersion in a sealing medium such as a 5 percent aqueous solution of sodium or potassium dichromate (pH 5.0 to 6.0) for 15 minutes at 194°F to 212°F (90°C to 100°C), in boiling deionized water, cobalt or nickel acetate, or other suitable chemical solutions.
8. Identification marking. The couplings shall be legibly marked by either casting, die-stamping, embossing, or stenciling. The marking shall include the manufacturer's identification and size.
9. Threads: National tapered pipe thread per ANSI/ASME B1.20.1.
10. Hydrostatic test pressure: 300 psig.
11. Working pressure: 150 psi.
12. Certain provisions (dimensions) of this document are the subject of International Standardization agreement. Prior to revision or cancellation of this adapter. The Preparing Activity shall take appropriate action through International Standardization channels.

FIGURE 1. Adapter - Continued.

3.3.2 Tanker configuration. The automotive fuel tanker shall be equipped with a self-priming pump assembly, filter separator assembly and dispensing assembly for automotive fuels. Similarly, the aircraft fuel tanker shall be equipped with a self-priming pump assembly, filter separator assembly, recirculation assembly, and dispensing assembly for underwing/overwing aircraft fuel (see 4.5.1 and 4.5.2).

## MIL-PRF-62180D(AT)

3.3.2.1 National Fire Protection Association (NFPA) Standards. The bulkhaul and automotive semitrailers shall meet the requirements of NFPA Standard No. 385. The aircraft fuel servicing semitrailers shall meet the requirements of NFPA Standard No. 407.

3.3.3 Dimensional limitations. (With semitrailer on level ground on landing legs)  
(see 4.5.3).

- a. Loaded weight max. 50,000 pounds (lb) with payload weight 35,350 lb.  
(Maximum load for each single axle 20,000 lb and 34,000 lb for tandem axle with full payload, maximum king pin load 15,000 lb)
- b. Overall length max. - 368 inches (in.)
- c. Overall width max. - 96 in. excluding tire bulge.
- d. Overall height max. - 102 in.
- e. Upper fifth wheel height with tanker level - 56 in.
- f. Ground clearance min. under axle - 17 in.
- g. Ground clearance min. midship - 19 in.
- h. Angle of departure min. - 60 degrees

3.3.4 Assembly(ies).

3.3.4.1 Pump assembly. A diesel engine, capable of operating on JP-8 fuel, shall drive a self-priming pump assembly, which shall provide the bulk fuel delivery at rates shown in table II (see 4.5.4).

## MIL-PRF-62180D(AT)

TABLE II. Loading and unloading rates.

Operation and semitrailer configuration	Loading/unloading methods	Loading rates (gal/min) for fuel	Unloading rates (gal/min) for diesel fuels	Unloading rates for other than diesel fuels
Operation No. 1. Bulkhauler	1.1.1. Loading: Automatic bottom loading using external pump (other than semitrailer's pump); or automatic bottom loading using gravity feed; or self-load using semitrailer's pump.  1.1.2. Unloading: Gravity discharge, bulk delivery (unfiltered); or bulk delivery (unfiltered) using external pump; or bulk delivery (unfiltered) using semitrailer's pump.	1.2.1. Up to 800 gal/min (external pump).  1.2.2. 250-300 gal/min (self-load using semitrailer's pump)	1.3.1. 175-225 gal/min gravity discharge, bulk delivery.  1.3.2. 475-600 gal/min, bulk delivery through pump.	1.4.1. 175-225 gal/min, gravity discharge, bulk delivery.  1.4.2. 475-600 gal/min, bulk delivery through pump.
Operation No. 2. Automotive refueler	2.1.1. Loading: Same as 1.1.1. above.  2.1.2. Unloading: Fuel delivery through filter/water separator and automotive dispensing assembly using pump or bulk delivery through filter/water separator with semitrailer's pump; or same as 1.1.2 above.	2.2. Same as 1.2.1. and 1.2.2. above. NOTE: Filter separator and automotive fuel dispensing assembly are not used during loading.	2.3.1. 40-60 gal/min (through one or both nozzles simultaneously) automotive fuel servicing.  2.3.2. 80-100 gal/min, bulk delivery through filter/ water separator; or same as 1.3.1. above	2.4.1. 40-60 gal/min (through one or both nozzles simultaneously) automotive fuel servicing.  2.4.2. 80-100 gal/min (through filter/water separator), or same as 1.4.1 above.
Operation No.3. Aircraft fuel servicing semitrailer	3.1.1. Loading: Same as 1.1.1. above.  3.1.2. Unloading: Fuel delivery through filter/water separator and underwing/overwing dispensing assembly using semitrailer's pump; or same as 1.1.2. above.	3.2. Same as 1.2.1 & 1.2.2. above. NOTE: Filter separator and underwing/overwing fuel dispensing assembly are not used during loading.	N/A	3.4.1 Up to 300 gal/min (through large closed-circuit underwing nozzle) underwing fuel servicing, 1/ or  3.4.2 80-100 gal/min through overwing fuel servicing or  3.4.3 80-100 gal/min through small closed circuit nozzle underwing fuel servicing, 1/ or  3.4.4 Same as 2.4.2 above

1/ Pump delivery with use of semitrailer's pump

## MIL-PRF-62180D(AT)

3.3.4.2 Filter separator assembly liquid, fuel, 300 gallons per minute (gal/min). The filter/water separator assembly shall consist of a filter/water separator with fuel monitors, an automatic water drain valve and a differential pressure gage. The filter/water separator shall provide fuel with no more than 250 parts per million (ppm) impurity. The filter separator shall include a feature for monitoring the purity of fuel being dispensed by the filter/water separator. Fuel monitors shall completely shut off the fuel flow if the fuel is contaminated over the purity level specified above. Jet fuel (JP-4, JP-5, JP-8) and aviation kerosene shall be filtered at flow rates up to 300 gal/min. Diesel fuel (No. 1 & 2) flowing through the filter/water separator shall be limited to a minimum flow rate of 100 gal/min. The filter/water separator shall be ASME code stamped, certifying that the filter/water separator complies with the requirements of specified code (see 4.5.5).

3.3.4.3 Recirculation assembly aircraft fuel servicing. Aircraft fuel servicing semitrailers shall consist of an overwing nozzle adapter converter, with a fuel sampling port and fuel sampling components. The recirculation assembly shall purge the fuel lines of the complete tanker overwing dispensing unit of the underwing/overwing dispensing assembly, including hoses. It shall remove condensation and fuel contamination by circulating fuel through the complete delivery system, for a maximum of one minute, prior to dispensing fuel to the aircraft. Purging the underwing delivery system shall require recirculation assembly components. The fuel sampling capability shall provide for the use of components which are compatible with both the overwing system fuel sampling port and the underwing system fuel sampling port (see 4.5.6 and 6.6).

3.3.4.4 Vapor recovery system/kit. Fuel vapor recovery system shall be compatible with the four inch diameter quick-disconnect field vapor recovery system connections used at a majority of fuel depots (see 4.5.7).

3.3.4.5 Dispensing assembly: fuel, automotive. The dispensing assembly shall consist of dual automotive refueling systems which are pressurized, to deliver fuel, by a diesel engine and centrifugal pump combination. Each refueling system shall be composed of a meter, electric rewind hose reel, 50 feet (ft) of dispensing hose and a dispensing nozzle conforming to Drawing 12275441. The dispensing assembly shall provide delivery of fuel for vehicles or containers at flow rates as shown in table II. Dead man and overflow prevention features shall be provided as part of the dispensing assembly (see 4.5.8).

3.3.4.6 Dispensing assembly fuel, underwing/overwing, aircraft. The dispensing assembly shall consist of two separate refueling systems; one for overwing and one for underwing servicing. The underwing system shall consist of a centrifugal pump, diesel engine, a meter, a 50 ft length of 2-1/2 in. hose, electric rewind hose reel, deadman control, static grounding reel and a closed-circuit underwing dispensing nozzle. The overwing system shall consist of a 50 ft length of 1-1/2 in. hose, an overwing dispensing nozzle, and an electric rewind hose reel. This system shall utilize the same engine, pump, filter/water separator and static grounding reel as the underwing servicing system. A small, closed-circuit dispensing nozzle (interchangeable with the overwing

## MIL-PRF-62180D(AT)

nozzle) shall be provided for underwing refueling. The underwing system of the dispensing assembly shall provide for metered delivery of fuel for underwing servicing of aircraft at flow rates shown in table II using the large nozzle. Pressure at the large, closed-circuit nozzle shall be controlled to 40 - 50 pounds per square inch (psi). The overwing system of this dispensing assembly shall provide for metered delivery of fuel for overwing servicing of aircraft at flow rates as shown in table II using the small nozzle (see 4.5.9 and 4.5.10).

3.3.5 Tank shell assembly. The 5000 gallon tank vessel shall not leak at seams, joints, sealed vents and closed valves and not deform when tested in accordance with DoT 406, paragraphs 178.345 and 178.346, governing the Transportation of Hazardous Materials in Tank Motor Vehicles (see 4.5.11).

3.3.6 Tank capacity indicator. The top fill tank capacity indicator shall be set at the full tank capacity with an accuracy of  $\pm 25$  gallons (see 4.5.12).

3.3.7 Controls. Valves and controls shall be identified with the respective identifying letters specified on the instruction plate installed on the semitrailer. The letters and numeral markings shall be painted on the valve and shall be one inch high. Electrical and mechanical controls shall operate without malfunction throughout the ranges of tanker operating conditions and fuel flow shall automatically stop when automotive's fuel tank or container becomes full (see 4.5.17 and 4.5.18).

### 3.3.8 Fuel loading/unloading system.

3.3.8.1 System components. Fuel loading/unloading system components shall meet the following specified pressure requirements (see 4.5.14.2).

3.3.8.1.1 Pipe assemblies. Pipe assemblies with welds shall be subjected to a minimum pressure of 125 psi. There shall be no leakage.

3.3.8.1.2 Hose assemblies. Hose assemblies shall be subjected to a pressure of 65-70 psi. There shall be no leakage.

3.3.8.1.3 Hose reels. Hose reel assemblies shall include a crank handle for manual operation of each hose reel. Hose reels shall operate at -25°F and the hose shall not crack.

3.3.8.2 Bulkhaul and automotive fuel servicing tankers fuel loading/unloading system. Fuel loading/unloading pipe assembly shall be subjected to the following pressures:

- a. Pipe assembly, after pump outlet of  $65 \pm 2$  psi .
- b. Pipe assembly, before pump outlet of  $30 \pm 1$  psi.

There shall be no leakage at the joints, closed valves, or any component part of the pressurized system.

## MIL-PRF-62180D(AT)

3.3.8.3 Aircraft fuel servicing tankers, fuel loading/unloading system. Fuel loading/unloading pipe assembly shall be subjected to the following pressures:

- a. Pipe assembly, after pump outlet of  $120 \pm 3$  psi.
- b. Pipe assembly, before pump inlet of  $30 \pm 1$  psi.

There shall be no leakage at the joints, closed valves, or any component part of the pressurized system.

3.3.9 Electrical system. The semitrailer shall be equipped with a 24-volt electrical system. All assemblies shall be equipped with an independent 12-volt electrical system. The electrical circuits shall maintain continuity from end to end, without evidence of internal or external shorts during all operating conditions (see 4.5.15).

3.3.9.1 Lighting system. The lighting system and reflectors shall conform to Federal Motor Carrier Safety Regulations 393.14, 393.20, 393.26(a), and the requirements of Chapter 4 of National Fire Protection Association, Standard No. 407. Electrical systems shall conform to SAE J576, J702, J1292, and J2222. The electrical lamp assemblies shall comply with SAE J592. Tail lights shall be replaceable by removal of the lamp assembly cover (see 4.5.16).

3.3.10 Air lines and fittings. All air lines and fittings shall be internally clear prior to, and after making connections. Brake air lines shall be free of leaks when air pressure of  $120 \pm 4$  psi is applied (see 4.5.19).

3.3.11 Certification data plate. A certification data plate and manufacturer's certificate shall be provided with the required data and permanently affixed to the semitrailer in accordance with Regulation DoT 406, governing the Transportation of Hazardous Materials in Tank Motor Vehicles (see 4.5.20).

3.3.12 Instruction plates. Each tanker shall be equipped with manufacturer's standard instruction plates or labels, including all warnings and cautions conforming to SAE J115. Any special or important procedures to be followed in assembling, operating or servicing the tanker shall be identified. Plates or labels shall be attached by screws, bolts, or rivets where the plate or label will be both visible and legible per SAE J115 (see 4.5.20).

3.3.13 Transportability data plates. Shipping data plates shall be provided for each tanker. Data plates shall show a silhouette of side and end view of the tanker system. Overall dimensions, lifting and tie down provisions, center of gravity location and carrying capacity shall be depicted. Plates or labels shall be attached by screws, bolts, or riveted in a location visible and legible, per SAE J115 (see 4.5.20.3).

## MIL-PRF-62180D(AT)

3.3.14 Spare tire assembly. When specified (see 6.2), one spare wheel and tire assembly shall be furnished and stored securely on the provided carrier. It shall facilitate safe one-man (5th percentile female soldier) operation for lowering and stowing a spare wheel and tire assembly (see 4.5.21).

3.3.15 Fire extinguisher. The semitrailer shall be equipped with two fully charged fire extinguishers each having an UL rating of 40 BC as defined in UL 711. The fire extinguishers shall be rechargeable (see 4.5.22).

3.3.16 Transportability. The semitrailer shall be transportable worldwide by highway, rail, water, and shall be roll on roll off transportable in operational configuration with full payload. The semitrailer shall be transportable without payload by C-130 and larger aircraft. For air transport, approach shoring may not be used for ramp clearance (see 4.5.23).

3.3.16.1 Lifting and tiedown provisions. The lifting and tiedown provisions on the semitrailer shall be in accordance with requirements of MIL-STD-209. The semitrailer shall be able to be lifted with full payload. The semitrailer shall be able to be tied down on any American railroad car and be transported with full payload designed for this purpose (see 4.5.2.3.1 and 4.5.2.3.2).

3.3.17 Upper fifth wheel plate. The upper fifth wheel plate shall be designed for coupling to a full oscillating and fore and aft-rocking fifth wheel. It shall be of sufficient size to cover a fifth wheel 36 in. in diameter and shall conform to Federal Motor Vehicle Carrier Safety Regulations 393.70(b) as applicable to trailers. The kingpin and its securement shall be adequate to withstand the load imposed by Trailer On Flat Cars (TOFC) in accordance with M931 of Association of American Railroads. A greaseless upper fifth wheel plate is preferred.

3.3.17.1 Kingpin. The kingpin shall conform to SAE J700 and be compatible with the prime movers specified for the semitrailer.

3.3.18 Seals. When fording (see 3.4.7) or operating in mud, sand or snow, seals shall prevent entrance of foreign matter into bearings which are exposed to contamination during these operations. All bearing seals shall restrict lubricant leakage. All seals and gaskets shall be compatible with the product being transported (see table III and 4.5.24).

3.3.19 Brakes. The tanker shall be equipped with service, emergency, and parking brake systems conforming to subpart C, Federal Motor Carrier Safety Regulations. Service brake linings shall be non-asbestos in accordance with A-A-52522 (see 4.5.25).

3.3.20 Human factors engineering. The tanker shall be designed and manufactured with human factors engineering requirements:



## MIL-PRF-62180D(AT)

- a. To be operated and maintained by personnel in the 5% to 95% size, weight, and strength range in accordance with SAE J833.
- b. Operation of the landing gear locking and releasing by one operator .
- c. Operation of the spare wheel removal and stowage mechanism by one operator.
- d. Tanker operation and maintenance in nuclear, biological, and chemical protective clothing.
- e. Tanker operation and maintenance in arctic protection clothing (cold weather gear), per SAE J925.

3.4 Performance. The semitrailers, shall meet performance requirements of this specification when equipped as specified herein, and serviced with appropriate lubrication oils and greases (see 6.7) that meet the temperature operational environments and loaded with rated payload and coupled to the designated prime movers ( M1088, M818 series, and M915 series). Semitrailers serviced and equipped for existing climatic conditions, shall operate without special equipment (see 4.5.26).

3.4.1 Environmental operation. Semitrailer shall operate under extreme conditions of weather in ambient air temperatures ranging from -25°F to +125°F. The complete semitrailer, when in storage, shall withstand a temperature of -80°F, without deterioration that may cause failure of any component (see 4.5.26.1).

3.4.2 Payload towing speeds and trailing ability.

3.4.2.1 Highway (paved) and gravel roads payload and speeds. The semitrailer, loaded with rated payload, shall operate satisfactorily when towed over level, smooth, improved and prepared hard-surfaced roads and gravel roads at average speeds of the ranges specified in table IV without damage to semitrailer or prime mover. When loaded and towed at speeds specified, in a straight line, on a level, smooth, paved surface, the path of the towed chassis shall not deviate more than 3 in. to either side of the path of the towing vehicle (see 4.5.26.2).

3.4.2.2 Cross-country payload and speeds. The semitrailer loaded with rated payload shall operate satisfactorily while being towed over unimproved roads, trails, open fields, rolling hills, and cross-country terrain at sustained speeds without damage to semitrailer or the primer mover (see table I and 4.5.26.3).

3.4.3 Grade and side slope operation. The semitrailer, with rated load, shall operate satisfactorily and maintain stability on a 20 percent maximum side slope without leakage of fuel through the vents. The semitrailer with rated payload shall operate on a 10 percent maximum longitudinal slope without leakage of fuel through the vents. NOTE: The semitrailer's full load will be adjusted so that there is no leakage of fuel through the manhole cover vent, on longitudinal slopes in excess of 10 % (see 4.5.26.4).

## MIL-PRF-62180D(AT)

3.4.4 Brake holding ability.

3.4.4.1 Service brakes. The combined service brakes of the tanker and towing vehicle shall, under all conditions of loading, bring the combination to a stop in accordance with Federal Motor Carriers Safety Regulations 393.52 (see 4.5.26.5).

3.4.4.1.1 Automatic brake actuation. Tankers shall be equipped with an automatically actuated device to apply the tanker brakes upon breakaway from the towing vehicle. With semitrailer rated payload adjusted for satisfactory operation on a 20 percent longitudinal slope, the automatically actuated device shall apply the semitrailer brakes upon emergency line break-away from the towing vehicle, and shall maintain application of brakes for not less than 15 minutes and hold semitrailer-towing vehicle combination stationary on a  $20 \pm 2$  percent longitudinal slope. Semitrailer's wheels shall not roll when the semitrailer is towed by the prime mover with application of the brakes still maintained (see 4.5.26.6).

3.4.4.1.2 Parking brake systems. A parking brake system shall be included in the tanker design which shall automatically apply the semitrailer brakes in the event air pressure in the air reservoir line fall below specified levels (see 4.5.26.7).

3.4.4.1.3 Brake interlock system. A brake interlock system shall be provided which automatically sets the semitrailer parking/emergency brakes during fuel bottom loading and unloading (see 4.5.26.8).

3.4.4.1.4 Automatic slack adjusters. Automatic slack adjusters shall be provided in the brake system (see 4.5.26.9).

3.4.5 Turning and tracking ability. The semitrailer, when coupled to the prime mover operating in its minimum turning circle, shall follow without cramping and without damage or interference to the towed tanker or prime mover (see 4.5.26.10).

3.4.6 Landing gear. Landing gear shall support the fully loaded semitrailer and shall withstand without damage the force imposed upon it when uncoupling from the coupling to the towing vehicle and when raising and lowering the fully loaded semitrailer. The landing gear shall extend and retract, and when retracted, shall provide adequate ground clearance for cross-country operation. The landing gear of a fully loaded semitrailer shall be able to be raised and lowered by a single person in the 5% to 95% size, weight, and strength range in accordance with SAE J833 (see 4.5.26.11).

3.4.6.1 Ground board. Two ground boards conforming to Drawing 7417585 shall be provided as a part of the Onboard Vehicle Equipment (OVE). Stowage compartments for the ground boards shall be provided in the vicinity of the landing legs (see 4.5.26.12).

## MIL-PRF-62180D(AT)

3.4.7 Fording ability. Semitrailer shall ford salt or fresh water to a depth of 24 in. without any special servicing or protection before or after fording. No evidence of water leakage or moisture penetration into sealed wheel bearings or fuel tanks shall be permitted (see 4.5.26.13).

3.4.8 Refueling system.

3.4.8.1 Loading and unloading rates. The loading and unloading rates for specific fuel and specific semitrailer configurations shall be part of the applicable fueling application (see tables II, III and 4.5.26.14).

3.4.8.2 Fuel removal. When specified (see 6.2), the fuel tankers, shall be capable of defueling aircraft, automotive fuel tanks and other fuel tankers. All required fittings, hoses, and equipment shall be provided on the fuel tanker (see 4.5.26.15).

3.4.8.3 Automatic bottom loading system. The automatic bottom-loading system, capable of receiving fuel from an outside pump source, shall be adjusted to automatically shut off flow of fuel into the tank when the fuel in the tank reaches the full rated capacity minus 100 gallons. This automatic shut off system shall utilize an optical type of device to sense the fuel level in the tanker. The automatic bottom loading/unloading ports and all associated controls shall be located on the driver's side of the semitrailer tanker (see 4.5.26.16).

3.5 Painting, marking, and identification plates.

3.5.1 Painting. Unless otherwise specified (see 6.2), all semitrailer exterior surfaces shall be cleaned, treated, primed, and painted with Chemical Agent Resistant Coating (CARC) in accordance with MIL-C-46168 with the exception of stainless steel. Stainless steel surfaces shall be cleaned and abrasive blasted to a 0.5 mil minimum surface profile. The surfaces shall be primed within 24 hours after abrasive blasting. Painting and marking shall be per Drawing 12355846, along with painting requirements on components. Unless otherwise specified (see 6.2), color shall conform to green 383 per FED-STD-595. After application of the final film of paint, the painted surface shall conform to the following (see 4.5.27.1).

- a. Painted surfaces shall be smooth and uniform and shall be free from grit, streaks, running, sagging, wrinkles, pin holes, craters, and free of nonuniformity of specified color.
- b. Dividing line between markings and regular exterior paint shall be sharp and clear.
- c. Vehicle exterior surfaces shall be cleaned, treated, primed, and painted to include the following:
  1. All metal surfaces under the electrical harness, brake air lines, reflectors, and marker/clearance lights.

## MIL-PRF-62180D(AT)

2. Surface(s) between the vehicle body landing gear leg assembly and the vehicle body undercarriage frame; the surface between the semitrailer dolly frame and the vehicle body undercarriage frame and all cabinets or other bolted components.
3. All metal exterior surfaces of vehicle miscellaneous equipment, etc. (except fusible vent).
4. All exterior mating surfaces/joints/seams that are bolted/riveted/ fastened together and are located outside the vehicle body.
- d. Surfaces of the following shall not be painted over:
  1. Rubber items (including tires, seals, hoses, etc.).
  2. Electrical grounding surfaces.
  3. Lenses (including clearance light lens, taillight lens, etc.).
  4. Data and instruction plates.
  5. Stencil markings.
  6. Mating surfaces of fittings.
  7. Vent valve areas.

TABLE III. Various uses of each semitrailer configuration.

Semitrailer configurations	Commodities compatible with each semitrailer configuration	<u>Possible uses</u> General bulk transporter (bulkhauler)	<u>Possible uses</u> Fuel servicing unit
5000 gal bulkhauler M967A2	Diesel, JP-4, JP-5, JP-8, kerosene, and some compatible liquid chemicals. Motor/aviation gasoline	X	N/A
5000 gal automotive fueler M969A3	Diesel (No.1&No.2), Motor gasoline, and JP-8	X	X
5000 gal aircraft fueler M970A2	JP-4, JP-5, and aviation kerosene/gasoline	X	X

3.5.2 Markings. Military registration numbers shall be as specified by the procuring activity (see 6.2). Exterior marking, such as "Flammable" and "No Smoking Within 50 Feet" shall be painted on the semitrailer tank shell assembly (see 4.5.27.2).

3.5.3 Identification plates. Identification plates of any special marking required by the using service shall be as specified by the procuring activity (see 4.5.27.3 and 6.2).

3.6 Corrosion prevention and control design requirement. The corrosion control systems on the tanker shall provide a minimum service life of 10 years with no more than Stage I corrosion (see 4.5.28).

## MIL-PRF-62180D(AT)

3.7 Electromagnetic interference characteristics. The fuel tankers shall conform to emission levels which comply with SAE J551 for general purpose ground vehicles (see 4.5.29).

3.8 Safety. No condition shall exist which may create a safety hazard to operating or maintenance personnel. The characteristics of the tanker shall provide for operation by personnel in standard uniform components of non-synthetic fabrics suitable for the operational environment (see 4.5.30).

3.8.1 Battery arc protection. The battery covers shall be coated with plastisol primer or equivalent to provide protection from corrosion and abrasion. The plastisol coating shall be smooth, having a  $40 \pm 10$  mils thickness and a maximum variation of thickness from top to bottom of 5 mils.

3.8.2 Noise level. The noise produced by the engine on the semitrailer shall not exceed the noise limit of 85 db(A). If the noise level exceeds this limit, then a warning shall be provided on the semitrailer at the engine location that states the following: "WARNING: Hearing Protection Required Within 50 Ft of the Engine-Pump Assembly" (see 4.5.30.1).

3.9 Cleaning. The inside of the fuel tanker and the complete fuel delivery system (including fuel dispensing hoses) shall be cleaned of all contaminants which may have accumulated during fabrication or testing. Precautions shall be taken to insure that the tank and fuel delivery system remain clean until shipment of semitrailer and that all dust caps are installed (see 4.5.31).

3.10 Workmanship. Workmanship shall be of such quality as to assure that the semitrailer and its components shall be free of defects that compromise, limit, or reduce the capability of the semitrailer in the performance of its intended use. In addition to general appearance, the defects listed in table VI shall be considered cause for failure (see 4.5.32).

3.11 Welding. Welding procedures shall be in accordance with AWS Standards, as appropriate. Any stainless steel alloy that is welded shall be stabilized against sensitization to intergranular attack (see 4.5.33).

#### 4. VERIFICATION

4.1 Materials and products. The contractor's inspection records shall be examined to determine contractor conformance with 3.2 through 3.3.

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

- a. First article inspection (see 4.3 and 4.4).
- b. Conformance inspection (see 4.6).

## MIL-PRF-62180D(AT)

4.3 First article inspection.

4.3.1 In-process inspection. During fabrication of the first production tanker, an in-process inspection (see 3.1) shall be conducted by the Government to evaluate conformance of materials and workmanship to specified requirements. This inspection shall be made at the contractor's or subcontractor's facility prior to application of primer and paint (see 4.3.2.1).

4.3.2 Completed first tanker inspection. The first production tanker, including required assemblies and with full payload, shall be subjected to a 50 mile road test at the manufacturer/contractor facility and the initial production tests shall be conducted by the manufacturer as designated in table V. Upon completion, the contractor shall submit the semitrailer (and make available all inspection records and certifications) to the responsible government inspection element at contractor's plant for acceptance.

4.3.3 Final approval and acceptance. Final approval and acceptance by the Government of the first production vehicle shall be withheld until the 6000 mile test of the second vehicle produced shall be completed and a final determination has been made regarding conformity of the vehicle to contractual requirements.

4.4 First article (initial production) test. To determine conformance to 3.1 (inclusive), after completion of the first production vehicle inspection, a quantity of vehicle(s) specified in contract shall be selected from the first month's production, or from the first 20 produced, and subjected to examination (see 4.6.2). The selected semitrailer shall be subjected to a road test of 6000 miles as specified in table IV and all tests specified in table V, at a site approved by the Government. These tests shall be performed by the Government. The contractor shall furnish spare parts, as required, to support the test at no cost to the Government. Initial production test shall require a maximum of 90 days, per vehicle, to complete the 6000 mile test. When specified (see 6.2), the contractor shall recondition the test semitrailer to code "A" condition after the tests are completed.

TABLE IV. 6000 mile test (Government proving ground).

Course	Distance and speed	Vehicle payload
Hard surface roads	2700 miles at varying speeds up to 50 mph	5000 gallons
Gravel and dirt roads	1500 miles at varying speeds up to 35 mph	5000 gallons
Level cross-country	1200 miles at varying speeds up to 20 mph	5000 gallons
Hilly cross-country	600 miles at varying speeds up to 15 mph	5000 gallons

## MIL-PRF-62180D(AT)

4.4.1 Durability verification. To determine conformance to 3.1.1, the durability requirement shall be verified at a 50 percent confidence level while the vehicle is subjected to initial production test.

4.4.2 MTBF verification. To determine conformance to 3.1.1.2, a minimum acceptable value of 100 hours MTBF for assemblies shall be demonstrated at an 80 percent confidence level. This shall be demonstrated during a minimum of 160 hours of testing.

4.4.3 Maintainability verification. To determine conformance to 3.1.2.1 and 3.1.2.2, maintainability requirements shall also be verified during testing.

4.4.4 Reliability verification. To determine conformance to 3.1.3, reliability requirements of a minimum of 6000 MMBHMF for the semitrailer and a minimum MTBF of 100 hours for the assemblies (see 3.1.3.2) shall be demonstrated during testing.

4.4.5 Failure definition. The Government shall determine the classification and number of failures based on incidents that have occurred on each semitrailer/assemblies in accordance with the Failure Definition and Scoring Criteria (see 6.3.2, 6.4 and 6.5).

4.4.6 Test failure. Failure of the vehicle as the result of any deficiency of a workmanship or materials nature found during, or as a result of, the 6000 mile test, shall be cause for rejection of the vehicle. Further, the Government may refuse to continue acceptance of production vehicles until action has been taken to eliminate the deficiency. Any deficiency found during, or as a result of the 6000 mile test, shall be prima facie evidence that all vehicles already accepted, prior to completion of the 6000 mile test, are similarly deficient unless evidence, satisfactory to the contracting officer, is furnished by the contractor that they are not similarly deficient. Such deficiencies on all vehicles shall be corrected by the contractor at no cost to the Government.

TABLE V. Classification and location of inspections and tests.

Title	Require- ments	Initial production test-GPG <u>1/</u>	Acceptance test-mfg. <u>2/</u>	Initial production <u>2/</u>	Comparison test-GPG <u>1/</u>
First article vehicles	3.1	4.4			
Durability verification	3.1.1	4.4.1			
Mean-Time-Between-Failure (MTBF)	3.1.1.2	4.4.2			
Maintainability	3.1.2	4.4.3			
Reliability	3.1.3	4.4.4			
Basic construction examination	3.3.1	4.5.1, 4.5.2	4.5.1	4.5.1	4.5.1

## MIL-PRF-62180D(AT)

TABLE V. Classification and location of inspections and tests - Continued.

Title	Requirements	Initial production test-GPG <u>1</u> /	Acceptance test-mfg. <u>2</u> /	Initial production <u>2</u> /	Comparison test-GPG <u>1</u> /
Semitrailer assemblies	3.3.2 thru 3.3.2.1	4.5.1, 4.5.2	4.5.2	4.5.2	4.5.2
Vehicle dimensions and weights	3.3.3	4.5.3			4.5.3
Pump assembly	3.3.4.1	4.5.4		4.5.4	4.5.4
Filter separator assembly	3.3.4.2	4.5.5			4.5.5
Recirculation assembly, fuel servicing	3.3.4.3	4.5.6		4.5.6	4.5.6
Vapor recovery system/kit	3.3.4.4	4.5.7			4.5.7
Dispensing assembly, fuel 60 gal/min, automotive	3.3.4.5	4.5.8		4.5.8	4.5.8
Dispensing assembly, fuel 100 gal/min, overwing aircraft	3.3.4.6	4.5.9		4.5.9	4.5.9
Dispensing assembly, fuel under/overwing aircraft	3.3.4.6	4.5.10			
Tank shell assembly	3.3.5	4.5.11	4.5.11		
Tank capacity indicator	3.3.6	4.5.12	4.5.12		4.5.12
System components	3.3.8.1 thru 3.3.8.1.3	4.5.14.2	4.5.14.2		
Electrical system	3.3.9	4.5.15	4.5.15		4.5.15
Lighting system	3.3.9.1	4.5.16	4.5.16		4.5.16
Controls and servicing & adjustment mechanisms	3.3.7	4.5.17 and 4.5.18	4.5.17 and 4.5.18	4.5.17 and 4.5.18	4.5.17 and 4.5.18
Air lines and fittings	3.3.10	4.5.19	4.5.19		4.5.19
Data and instruction plates	3.3.11 thru 3.3.13	4.5.20	4.5.20		4.5.20
Spare tire assembly	3.3.14	4.5.21	4.5.21		4.5.21
Fire extinguisher	3.3.15	4.5.22	4.5.22		4.5.22
Transportability	3.3.16	4.5.23	4.5.23		4.5.23
Tiedown provisions	3.3.16.1	4.5.23.1 & 4.5.23.2	4.5.23.1 & 4.5.23.2		



## MIL-PRF-62180D(AT)

TABLE V. Classification and location of inspections and tests - Continued.

Title	Requirements	Initial production test-GPG <u>1/</u>	Acceptance test-mfg. <u>2/</u>	Initial production <u>2/</u>	Comparison test-GPG <u>1/</u>
Seals	3.3.18	4.5.24			4.5.24
Brakes	3.3.19	4.5.25			4.5.25
Performance	3.4	4.5.26			
Environmental	3.4.1	4.5.26.1			4.5.26.1
Highway (paved) and gravel roads and speeds	3.4.2.1	4.5.26.2	4.5.26.2	4.5.26.2	4.5.26.2
Cross-country payload and speeds	3.4.2.2	4.5.26.3			4.5.26.3
Grade and slope operation	3.4.3	4.5.26.4			4.5.26.4
Service brakes	3.4.4.1	4.5.26.5	4.5.26.5	4.5.26.5	4.5.26.5
Automatic brake actuation	3.4.4.1.1	4.5.26.6		4.5.26.6	4.5.26.6
Parking brake	3.4.4.1.2	4.5.26.7		4.5.26.7	4.5.26.7
Brake interlock	3.4.4.1.3	4.5.26.8		4.5.26.8	4.5.26.8
Automatic slack adjuster	3.4.4.1.4	4.5.26.9		4.5.26.9	4.5.26.9
Turning and tracking ability	3.4.5	4.5.26.10	4.5.26.10		4.5.26.10
Landing gear	3.4.6	4.5.26.11	4.5.26.11	4.5.26.11	4.5.26.11
Ground board	3.4.6.1	4.5.26.12	4.5.26.12	4.5.26.12	4.5.26.12
Fording ability	3.4.7	4.5.26.13			4.5.26.13
Loading and unloading rates	3.4.8.1	4.5.26.14			4.5.26.14
Fuel removal	3.4.8.2	4.5.26.15			4.5.26.15
Automatic bottom loading systems	3.4.8.3	4.5.26.16	4.5.26.16		4.5.26.16
Painting	3.5.1	4.5.27.1	4.5.27.1		4.5.27.1
Marking	3.5.2	4.5.27.2	4.5.27.2		4.5.27.2
Identification plates	3.5.3	4.5.27.3	4.5.27.3		4.5.27.3
Rustproofing	3.6	4.5.28	4.5.28	4.5.28	4.5.28
Electromagnetic interference characteristics	3.7	4.5.29			
Safety	3.8	4.5.30	4.5.30	4.5.30	4.5.30
Noise Level	3.8.2	4.5.30.1	4.5.30.1	4.5.30.1	4.5.30.1
Cleaning	3.9	4.5.31	4.5.31	4.5.31	4.5.31
Workmanship	3.10	4.5.32	4.5.32	4.5.32	4.5.32

## MIL-PRF-62180D(AT)

TABLE V. Classification and location of inspections and tests - Continued.

Title	Requirements	Initial production test-GPG <u>1/</u>	Acceptance test-mfg. <u>2/</u>	Initial production <u>2/</u>	Comparison test-GPG <u>1/</u>
Welding	3.11	4.5.33			
Packaging	5.1				

1/ Government proving grounds

2/ Manufacturer/Contractor facility

#### 4.5 Conformance verification.

4.5.1 Basic construction examination. To determine conformance to 3.3.1, the semitrailer shall be examined for proper installation of assembly(ies) and completeness of construction. The semitrailer shall be examined for proper function of the following:

- a. Unloading by gravity discharge method.
- b. Bottom loading from an outside source, with an automatic shutoff device and specified loading rates as specified in table II.
- c. Proper operation of the fill opening cover.

During operations, the semitrailer shall be examined for leaks.

4.5.2 Semitrailer examination. To determine conformance to 3.3.2 through 3.3.2.1, each semitrailer model shall be examined for proper installation of assembly(ies), and completeness of construction.

4.5.3 Semitrailer dimensional limitations examination. To determine conformance to 3.3.3, all semitrailer models shall be weighed and measured as specified for each model.

4.5.4 Pump assembly examination. To determine conformance to 3.3.4.1, the engine pump assembly shall be installed and operated at varying speeds and examined for specified self-loading and delivery rates.

4.5.5 Filter separator assembly: liquid fuel. 300 gal/min examination. To determine conformance to 3.3.4.2, the filter separator assembly shall be installed in conjunction with pump assembly and operated utilizing specified fuels. Quality of the discharged fuel shall not exceed five parts per million (ppm) by volume of undissolved water. The average weight of solids in the effluent fuel samples shall not exceed 0.5 milligram per liter (mg/L) and the weight of solids in any single sample shall not exceed 1.0 mg/L (see 4.5.26).

## MIL-PRF-62180D(AT)

4.5.6 Recirculation assembly: fuel servicing, examination. To determine conformance to 3.3.4.3, the recirculation assembly shall be installed and operated for the specified period for both overwing/underwing systems. Recirculation of fuel shall be conducted and assembly examined for specified capability to purge tanker delivery system and obtain fuel samples.

4.5.7 Vapor recovery system/kit fuel servicing, examination. To determine conformance to 3.3.4.4, the vapor recovery kit shall terminate in an adapter conforming to Figure 1 and it shall be examined during loading operations for proper collection and recovery of hydrocarbon vapors (see 4.5.26).

4.5.8 Dispensing assembly fuel, automotive, examination. To determine conformance to 3.3.4.5, the dispensing assembly shall be installed in conjunction with specified assemblies. During operation, the assembly shall be examined for specified metered delivery flow rates for either one, or both, nozzles as shown in table II.

4.5.9 Dispensing assembly fuel, overwing aircraft, examination. To determine conformance to 3.3.4.6, the dispensing assembly shall be installed in conjunction with specified assemblies. During operation of either one or both nozzles, and a small closed-circuit nozzle, the assembly shall be examined for specified metered delivery flow rates as shown in table II.

4.5.10 Dispensing assembly fuel underwing/overwing aircraft, examination. To determine conformance to 3.3.4.6, dispensing assembly shall be installed in conjunction with specified assemblies. During operation of the two separate systems, one each for overwing and underwing servicing, and using large and small closed-circuit nozzles, the assembly shall be examined for each specified metered delivery flow rate and for underwing system nozzles pressure as shown in table II.

4.5.11 Tank shell examination. To determine conformance to 3.3.5, each tank shell shall be examined for completeness of construction and subjected to specified pressure. Pressure shall be supplied by air pressure or by hydrostatic pressure as follows:

- a. Air pressure. When air pressure is used, tank vessels shall be pressurized to required level, and pressure shall be maintained throughout the inspection period.
- b. Hydrostatic pressure. When hydrostatic pressure is used, tank vessels shall be pressurized to required level for a minimum of 5 minutes prior to start of inspection for leaks. Required hydrostatic pressure shall be maintained throughout the inspection period.

During the specified air or hydrostatic pressure test, each tank shell, emergency valve vent, front inspection/cleaning hole, cap/vent and assembly fuel tank shall be examined for leakage, damage and deformation.

## MIL-PRF-62180D(AT)

4.5.12 Tank capacity indicator examination. To determine conformance to 3.3.6, the tank compartment capacity indicator shall be examined for the specified setting.

4.5.13 Marking of controls examination. To determine conformance to 3.3.7, each valve and control shall be examined for the respective identifying letter specified on the instruction plate.

4.5.14 Fuel loading/unloading system test.

4.5.14.1 Test procedures. During the specified fuel loading/unloading system test, the pump drain/plug and manifold drain valve/plug shall be in closed position. Specified pressures shall be air or hydrostatically applied as follows (see 4.5.14.2):

- a. Air pressure. When air pressure is used, lines shall be pressurized to required level and the pressure shall be maintained throughout the inspection period.
- b. Hydrostatic pressure. When hydrostatic pressure is used, lines shall be pressurized to required level for a minimum of 5 minutes prior to start of inspection for leaks. Required hydrostatic pressure shall be maintained throughout the inspection period.
- c. Pipe assemblies will be pressure checked to meet the requirements of 3.3.8.1.1.

4.5.14.2 System component test. To determine conformance to 3.3.8.1, prior to installation on semitrailer, pipe assemblies and hose assemblies shall be subjected to 65-70 psi pressure and examined for leaks (see 3.3.8.1.2). There shall be no leakage. Hoses on hose reels shall unreel and be reeled on the hose reels at -25°F and not crack or leak. This test shall be performed prior to the pressure test 4.5.14.1.

4.5.14.3 Bulkhaul semitrailers loading/unloading system test. To determine conformance to 3.3.8.2, the fuel loading/unloading pipe assembly shall be tested to withstand a pressure of  $30 \pm 1$  psi without any leakage.

4.5.14.4 Automotive refueler semitrailers loading/unloading system test. To determine conformance to 3.3.8.2, fuel loading/unloading pipe assemblies shall be pressure tested in accordance with the following procedure:

- a. Pipe assembly after pump outlet shall be tested to withstand a pressure of  $65 \pm 2$  psi without any leakage.
- b. Pipe assembly before pump inlet shall be tested to withstand a pressure of  $30 \pm 1$  psi without any leakage.

## MIL-PRF-62180D(AT)

4.5.14.5 Aircraft fuel servicing semitrailers loading/unloading system test. To determine conformance to 3.3.8.3, fuel loading/unloading pipe assembly shall be pressure tested in accordance with the following procedure:

- a. Pipe assembly after pump outlet shall be tested to withstand a pressure of  $120 \pm 3$  psi without any leakage.
- b. Pipe assembly before pump inlet shall be tested to withstand a pressure of  $30 \pm 1$  psi without any leakage.

4.5.15 Electrical circuit examination. To determine conformance to 3.3.9, current and voltage output level, and continuity of the electrical system shall be measured.

4.5.16 Lighting system examination. To determine conformance to 3.3.9.1, lights shall be operated and examined in accordance with Federal Motor Carrier Safety Regulations 393.14, 393.20, 393.26.(a), and the requirements of Chapter 4 of NFPA Standard No. 407.

4.5.17 Controls examination. To determine conformance to 3.3.7, all controls shall be operated and examined.

4.5.18 Servicing and adjustment mechanism examination. To determine conformance to 3.3.12, all adjustment mechanisms shall be examined for required adjustment and function. The manufacturer/contractor shall adjust/service the following for each tanker for immediate operational use before acceptance by the Government: inflate all tires; for dispensing assemblies, check hose reels if employed for proper operation; completely lubricate the tanker and all running gear with grades of lubricants recommended for ambient temperatures at the delivery point (see table VII).

4.5.19 Air line and fittings. To determine conformance to 3.3.10, the air lines/fittings shall be examined for cleanliness prior to their installation and shall be examined for leakage during the specified air pressure test.

4.5.20 Data plate examination.

4.5.20.1 Certification data plate. To determine conformance to 3.3.11, the affixed plate shall be examined for conformance to applicable requirements of DoT Regulations Governing the Transportation of Hazardous Materials in Tank Motor Vehicles.

4.5.20.2 Instruction plate. To determine conformance to 3.3.12, the plate shall be examined to meet the requirements of SAE J115 and it shall identify special or important procedures.

## MIL-PRF-62180D(AT)

4.5.20.3 Transportability data plate. To determine conformance to 3.3.13, the data plate shall be examined for necessary transportability information.

4.5.21 Spare tire assembly examination. To determine conformance to 3.3.14, the spare tire assembly shall be statically tested for completeness of construction and a properly secured mounting.

4.5.22 Fire extinguishers examination. To determine conformance to 3.3.15, the fire extinguishers shall be examined for proper installation, evidence of charge (pressure) and specified data plate rating.

4.5.23 Transportability examination. To determine conformance to 3.3.16, the semitrailer shall be examined for conformance to specified requirements.

4.5.23.1 Tiedown provision test. To determine conformance to 3.3.16.1, each tiedown and or provision eye (class 2) shall be inspected and evaluated for correct location and tested for specified yield strength per class 2 of MIL-STD-209. The semitrailer at gross vehicle weight shall be rail impact tested on a standard draft-gear rail car in accordance with Method 516.4, Procedure VIII of MIL-STD-810.

4.5.23.2 Tiedown and lift point markings examination. To determine conformance to 3.3.16.1, each tiedown and lift points shall be examined for proper markings and identification in accordance with MIL-STD-209.

4.5.24 Seals examination. To determine conformance to 3.3.18, all applicable bearings shall be examined for lubricant leakage after fording operation.

4.5.25 Brakes examination. To determine conformance to 3.3.19, brakes shall be examined for conformance to applicable requirements of Federal Motor Carrier Safety Regulations.

4.5.26 Performance. Conditions for performance shall be as specified in 3.4 with the following exception: Payload - The payload may consist of an applicable test fluid in place of fuel for all performance tests specified herein, except performance tests involving the filter/water separator assembly (see 4.5.5) and the vapor recovery system/kit (see 4.5.7).

4.5.26.1 Environmental operation test. To determine conformance to 3.4.1, semitrailer shall be operated and stored at specified temperatures. The semitrailer shall evidence no damage as a result of such operation or storage.

## MIL-PRF-62180D(AT)

4.5.26.2 Highway operation test. To determine conformance to 3.4.2.1, the semitrailer shall be operated as specified on paved and gravel roads and performance and towing observed.

4.5.26.3 Cross-country operation test. To determine conformance to 3.4.2.2 and table I, the semitrailer shall be operated over cross-country terrain, as specified, without damage to the semitrailer or the prime mover.

4.5.26.4 Grade and slope operation. To determine conformance to 3.4.3 and table I, the semitrailer shall be operated on 10 percent grades headed up and down grade, and on 20 percent side slopes with each side of semitrailer up-slope.

4.5.26.5 Service brakes test. To determine conformance to 3.4.4.1, the vehicle combination shall be operated as specified and observed for the distance to stop the semitrailer and towing vehicle. Brake stopping distance shall not exceed 35 ft. from a speed of 20 mph on a dry smooth level road free of loose materials.

4.5.26.6 Automatic actuation brake test. To determine conformance to 3.4.4.1.1, the semitrailer shall be placed on a 20 percent grade and the automatic break-away device actuated. The brakes shall hold the semitrailer stationary for time specified. Semitrailer shall be towed by prime mover with application of the brakes still maintained after holding test. Wheels shall not roll.

4.5.26.7 Parking brake test. To test parking brakes, the semitrailer, with rated payload, shall be placed on a grade, first headed up the grade and then headed down the grade, and tested to determine conformance to 3.4.4.1.2. These tests shall be conducted with the semitrailer still connected with the towing vehicle with the tractor brakes not activated.

4.5.26.8 Brake interlock system test. To determine conformance to 3.4.4.1.3, the semitrailer parking/emergency brakes shall be applied when a hose assembly is connected to the semitrailer for bottom loading/unloading operation.

4.5.26.9 Automatic slack adjuster test. To determine conformance to 3.4.4.1.4, presence of automatic slack adjusters in the semitrailer brake system shall be verified.

4.5.26.10 Turning and tracking ability test. To determine conformance to 3.4.5, the prime mover shall be coupled to the semitrailer and driven to the mover's minimum turning circle to the right and to the left until the axis of the prime mover makes 90 degrees with the axis of the semitrailer, without interference between the prime mover and the towed semitrailer. During road test, semitrailer's tracking ability shall be observed for conformance to FMCSR 393.70.

## MIL-PRF-62180D(AT)

4.5.26.11 Landing gear test. To determine conformance to 3.4.6, the semitrailer shall be placed on a firm surface and the landing gear operated. The towing vehicle shall be coupled and uncoupled and the landing gear raised and lowered.

4.5.26.12 Grounding board. To determine conformance to 3.4.6.1, presence of grounding boards, as specified, will be verified.

4.5.26.13 Fording test. To determine conformance to 3.4.7, the semitrailer shall be towed through water crossings at depth specified. The wheel bearings and electrical components shall be examined for water contamination.

4.5.26.14 Loading and unloading rates test. To determine conformance to 3.4.8.1, the loading and unloading rates shall be examined for configurations specified and engine-pump and throttle adjustment shall be examined for applicable type of fueling to be accomplished.

4.5.26.15 Fuel removal test. To determine conformance to 3.4.8.2, the semitrailer with applicable assembly shall defuel aircraft and automotive fuel tanks as specified.

4.5.26.16 Automatic bottom-loading system test. To determine conformance to 3.4.8.3, the automatic bottom-loading system shall be operated and observed for conformance to automatic fuel flow shut-off requirements. The locations of controls and ports shall be verified.

4.5.27 Painting markings and identification plates.

4.5.27.1 Painting examination. To determine conformance to 3.5.1, preparation and painting shall be examined during, and after application per Drawing 12355846. Conformance to all the requirements in 3.5.1.(a) through (d) shall be verified.

4.5.27.2 Marking examination. To determine conformance to 3.5.2, vehicle markings shall be examined after application per A-A-50271.

4.5.27.3 Identification plates and examination. To determine conformance to 3.5.3, all identification plates shall be examined.

4.5.28 Corrosion prevention control design validation. All material and coating systems shall be validated by the successful performance of 80 cycles of accelerated corrosion testing per GM 9540B, Method B. A statistically significant number of 4 x 12 in. test panels representative of production processes shall be prepared for each material and coating system used. Upon completion of 80 cycles the scribed test panels shall show no more than a trace of corrosion (grade 9 of ASTM D610) in the field or no more than five scattered blisters, none larger than 1 mm. Corrosion creep from the scribe line shall be no more than 3 mm. In addition, after 30 minutes of recovery from the test, the panels shall be subjected to a cross hatch adhesion test



## MIL-PRF-62180D(AT)

per ASTM D3359, Method B using the 6 line pattern and 2 mm spacing. Removal of 3 or more squares of coating to the substrate constitutes failure. Failure to meet any of the acceptance criteria constitutes rejection of that corrosion control system.

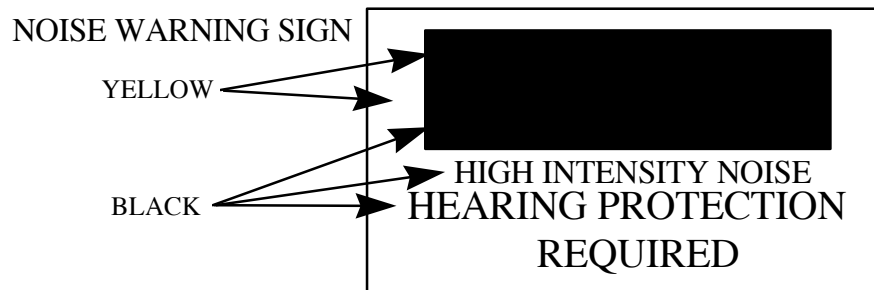
4.5.29 Electromagnetic interference characteristics examination. To determine conformance to 3.7, the semitrailers shall comply with emission levels tested as specified in SAE J551.

4.5.30 Safety examination. To determine conformance to 3.8 through 3.8.2, all exposed parts which are energized electrically shall be located, insulated, fully enclosed or guarded so as to prevent hazards to operating personnel and equipment functioning. All moving parts which are of such nature, or so located, as to be a hazard to operating or maintenance personnel, shall be enclosed or guarded. Protective devices shall not impair operating functions.

4.5.30.1 Noise test. To determine conformance to 3.8.2, the engine noise level test shall be performed in accordance with 4.5.30.1.1 and 4.5.30.1.2.

4.5.30.1.1 Posting of noise hazard areas. If steady-state noise levels are 85 dB(A) or greater, at occasionally occupied positions during typical operation or maintenance of the item/system (e.g., the space in and around a generator set, pump, or arc welder), noise hazard caution signs shall be permanently posted on (or in) the equipment. This provision shall not apply to the exterior of military combat equipment. Signs shall conform to figure 2. This posting is required regardless of exposure time or duty cycle acceptance. Where operating or maintenance conditions seldom exceed 85 dB(A), posting may be unnecessary.

NOTE: Where the operator, crew, or passenger station(s) is not clearly defined or where unattended use of equipment is intended (e.g., some mobile electric power, pumps), the noise measurement position(s) shall be designated by the procuring activity.



NOTE: Appropriate hearing protection and distances from the equipment at which it must be worn should be specified on the sign. Sizes should be sufficiently large to ensure legibility at required reading distances.

FIGURE 2. Noise warning sign.

## MIL-PRF-62180D(AT)

4.5.30.1.2 Manuals. Where steady-state noise is 85 dB(A) or greater at personnel-occupied areas (e.g., operator, maintenance, observer, and other control positions), operation and maintenance manuals (e.g., field and technical manuals) shall contain appropriate discussion of noise hazards. Discussions shall include the requirements for hearing protection, the type of hearing protection recommended, the noise level of the equipment at specified locations and the distance at which the 85 dB(A) limit will be met.

4.5.31 Cleaning examination. To determine conformance to 3.9, the interior of the tank and the complete fuel delivery system, including fuel dispensing hoses, shall be examined for contamination.

4.5.32 Workmanship examination. Semitrailers shall be examined to determine conformance to 3.10 (see table VI).

4.5.33 Welding examination: To determine conformance to 3.11, a certification of contractor's welding procedures in accordance with AWS B2.1 shall be examined.

#### 4.6 Conformance inspection.

##### 4.6.1 Inspection provisions.

4.6.1.1 Lot size. An inspection lot shall consist of all semitrailers from an identifiable production period (one week's production) submitted at one time for examination and test.

4.6.1.1.1 Sampling for inspection. For the purposes of visual, dimensional, and primary functional inspection, a representative sample shall be selected from each inspection lot in accordance with ANSI/ASQC Z1.4. Before sampling, the contractor shall 100 percent inspect the first 20 semitrailers to establish a process average, to allow normal sampling in accordance with ANSI/ASQC Z1.4.

4.6.2 Examinations. Visual, dimensional, and primary functional examinations shall consist of examination of the semitrailer for conformance to applicable drawings and this specification. Examinations shall be performed against the classification of defects specified in table VI. These examinations shall be performed during all phases of manufacturing and subsequent to road test (see 4.4 and 4.7. 1).

4.6.2.1 Unclassified defects. All defects that have no effect on function, safety, interchangeability or life, but that are considered departures from good workmanship shall be noted in writing. Workmanship deficiencies falling within this category and recurring in five consecutive lots, or ten lots or more within a thirty-day period, shall be added to the minor defects classification. This deficiency shall be deleted when five consecutive lots are found free of the deficiency.

## MIL-PRF-62180D(AT)

4.6.2.2 Recurring major defects. A major defect is considered recurring when the same defect occurs more than once in the same sample, or when the defect occurs in two successive samples. A major defect shall be considered recurring when the historical inspection records ("P" chart or equivalent) reflect such a condition. Recurring major defects shall be cause for the entire lot or lots to be inspected for the recurring defects (see 6.3).

4.6.2.3 Recurring minor defects. A minor defect is recurring if it occurs more than twice in the same sample or when the defect occurs in four successive samples. Recurring minor defects shall be cause for the entire lot or lots to be inspected for the recurring defects (see 6.3).

4.7 Classification of tests. Classification of tests shall be as follows:

- a. Acceptance tests (see 4.7.1).
- b. Comparison tests (see 4.7.2).

4.7.1 Acceptance tests. To determine conformance to Section 3 (inclusive) each semitrailer shall be examined as specified in 4.6.2 and operated for a distance of not less than 5 miles without payload, by the contractor. Semitrailer shall be completely assembled and serviced. Acceptance tests shall be those specified in table V. Performance of semitrailer shall be demonstrated on smooth hard-surfaced roads. After completion of the 5 miles road test the semitrailer shall be examined for lubrication leakage and other deficiencies.

4.7.1.1 Test failure. If the semitrailer fails to pass any acceptance test specified herein, the Government shall stop acceptance of subsequent vehicles until evidence has been provided by the contractor that corrective actions have been accomplished.

TABLE VI. Classification of defects.

Category	Defect	Method of examination
<u>Major:</u>		
101	Frame structural and welding defects (see 3.3.1).	Visual and fillet weld gages
102	Fifth wheel plate and kingpin: improper mounting or assembly (see 3.3.17 and 3.3.17.1).	Visual
103	Landing gear malfunction; extended, retracted or stowed, component damage (see 3.4.6).	Visual and Functional
104	Axles; improper assembly or installation; welding defects (see 3.3.1).	Visual and functional
105	Electrical systems components; malfunction and damage (see 3.3.9).	Visual

## MIL-PRF-62180D(AT)

TABLE VI. Classification of defects - Continued.

Category	Defect	Method of examination
106	Suspension system; damage, improper assembly or installation (see 3.3.1).	Visual
107	Service and automatic brake actuation device; malfunction, leaks, non-conformance (see 3.3.7, 3.4.4.1 and 3.4.4.1.1).	Visual and functional
108	Tank shell; contamination, structural and welding defects (see 3.3.5).	Visual
109	Tank valves control and safety devices; malfunction, improper assembly or installation; component damage (see 3.3.7).	Visual
110	Wheel and tires condition (see 3.3.1).	Visual
111	Engine and pump assembly; improper assembly or installation (see 3.3.4.1).	Visual
112	Trailing ability; non-conformance (see 3.4.5).	Functional
113	Turning ability; non-conformance (see 3.4.5).	Functional
114	Tanks and piping; improper assembly (see 3.3.4 and 3.3.8.1.1).	Visual
115	Manhole assembly; improper mounting and assembly, gaskets, defective (see 3.3.1)	Visual
116	Basic vehicle; structural and welding defects (see 3.3.1).	Visual
117	Engine-pump assembly; improper mounting or assembly (see 3.3.4.1).	Visual
118	Filter separator assembly; improper mounting or assembly (see 3.3.4.2).	Visual
119	Recirculation assembly; fuel servicing, completeness of assembly, damage (see 3.3.4.3).	Visual
120	Vapor recovery kit; improper mounting (see 3.3.4.4).	Visual
121	Dispensing assembly kit; fuel 60 gal/min, automotive, improper mounting (see 3.3.4.5).	Visual
122	Dispensing assembly kit, fuel, 100 gal/min, overwing aircraft, improper mounting (see 3.3.4.6).	Visual
123	Dispensing assembly kit, underwing/overwing, aircraft, improper mounting (see 3.3.4.6).	Visual
124	Marking of controls; missing, illegible, improper location or size (see 3.3.7 and 3.5.2).	Visual
125	Flammable markings; missing, illegible, improper location or size (see 3.5.2).	Visual

## MIL-PRF-62180D(AT)

TABLE VI. Classification of defects - Continued.

Category	Defect	Method of examination
126	Fuel loading/unloading system; defective, improper assembly, installation, coding or protection (see 3.4.8).	Visual
127	Lifting/tiedown provision; missing, welding defects (see 3.3.16.1).	Visual
128	Fire extinguishers; not fully charged (see 3.3.15).	Visual
<u>Minor:</u>		
201	Wheels and tires; tire pressure (see 3.3.1).	Gage
202	Wiring, tubing and hose; defective, improper assembly, installation, coding or protection (see 3.3.9 and 3.3.8.12).	Visual
203	Brake system components; improper assembly installation, clearance (see 3.4.4).	Visual
204	Electrical system; improper assembly or installation (see 3.3.9).	Visual
205	Seals and lube fittings; defective, missing or improperly installed (see 3.3.18).	Visual
206	Paint; improper application or color (see 3.5.1).	Visual and paint adhesion and thickness gages
207	Decals, marking, and instruction plates; missing, incomplete data, improper location or size (see 3.5.2 and 3.5.3).	Visual
208	Tank capacity indicator; improper mounting, setting (see 3.3.1 and 3.3.6).	Visual
209	Certification data plate; missing, illegible; improper mounting (see 3.3.11).	Visual
210	Lubrication; improper application (see 3.4).	Visual
211	Protective coatings; improper application, materials or coverage (see 3.5.1 and 3.6).	Visual
212	Fuel tank tubing; improper installation (see 3.3.8.1.1 and 3.3.8.1.2).	Visual
213	Fire extinguishers; improper installation (see 4.5.22).	Visual

4.7.2 Comparison tests. The Government may select a semitrailer at any time during the contract production period and subject the semitrailer to all applicable tests listed in tables V and VI to reveal deficiencies of a workmanship or materials nature that may reduce their effective operation in the field, and to compare existing quality with previous standards. These tests shall

## MIL-PRF-62180D(AT)

be conducted at Government laboratories or proving grounds designated by the contracting officer. Selection of semitrailer shall be on a spot check basis. Comparison test semitrailer shall be loaded with rated payload. Semitrailer selected shall not include any semitrailer previously tested for conformance to 4.7.2

4.7.2.1 Test failure. Failure of any semitrailer to comply with any of the requirements specified in the contract or any major defects of a workmanship or materials nature, occurring as a result of the test cycle, may be cause for refusal to continue acceptance of semitrailers until objective evidence has been provided by the manufacturer that corrective actions had been taken. Any defects found during, or as a result of the test, shall be prima facie evidence that semitrailers accepted subsequent to the previous acceptable comparison test semitrailer are similarly defective, unless evidence satisfactory to the contracting officer is furnished by the contractor that they are not similarly defective. Such defects on all semitrailers shall be corrected by the contractor at no cost to the Government.

## 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. Possible use(s) of the various semitrailer configurations covered by this specification are listed in table III. Liquid commodities compatible with each semitrailer configuration are also listed in table III. The semitrailer is towed by the military standard truck tractor (M52 or M818) or suitable substitute truck tractor.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Model of semitrailer required (see 1.2).
- c. 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).

## MIL-PRF-62180D(AT)

- d. If first article semitrailer is required (see 3.1).
- e. Whether spare tire assembly is required (see 3.3.14).
- f. If defueling capabilities are required (see 3.4.8.2).
- g. Painting procedure, color of paint and type of CARC required, if other than specified (see 3.5.1).
- h. Military registration number as specified (see 3.5.2).
- i. Information to be shown on identification plates (see 3.5.3).
- j. If reconditioning of test vehicle is required (see 4.4).
- k. Packaging requirements (see 5.1).

### 6.3 Definitions.

6.3.1 Recurring major and minor defects. The Government inspector will verify that a thorough inspection of each semitrailer is performed by the contractor for the listed characteristics, and for any departures from good workmanship. The Government inspector should assure that all defects encountered during inspection are enumerated on deficiency sheets for the semitrailer. Defects noted on a Deficiency Sheet should contain sufficient description to enable the Government inspector and the contractor's representative to classify the defects in accordance with the classification of defects (see table VI) and definitions contained in ANSI/ASQC Z1.4. Corrective action should be taken for recurring defects (see 4.6.2.2 and 4.6.2.3).

6.3.2 Mission operational profile (quantitative evaluation). The tanker is a single compartment vehicle, having a capacity for hauling 5000 gallons of a variety of liquids.

6.3.3 Semitrailer failure. Failure of the semitrailer is defined as the inability to perform its specified operational functions during fueling or mobile events (see 4.4.5). NOTE: Only mission essential failures are chargeable to MMBHMF (semitrailer) and MTBF (assemblies). All active hours of scheduled and unscheduled maintenance are assigned to the calculation of maintenance ratio (MR). The evaluation of RAM characteristics will begin when test results become available, utilizing the Failure Definition and Scoring Criteria, (FD/SC) contained herein.

6.4 Failure classifications. The analysis of all test incidents (except "No-test") should be classified in the following categories (see 4.4.5):

- a. Mission essential function.
- b. Non-mission essential function.
- c. Critical or hazard to personnel or equipment per MIL-STD-882.

## MIL-PRF-62180D(AT)

6.5 Scoring criteria. (See 4.4.5.)6.5.1 Chargeable failures.

- a. Failures resulting from workmanship deficiencies.
- b. Failures which are discounted during maintenance action but not induced by maintenance action.
- c. Failures which require component replacement or adjustment at other than prescribed intervals and (e.).
- d. Failures which are caused by substandard design which cause or could cause performance below a level required to successfully complete a mission.
- e. All incidents which, if allowed to operate/continue, would have a severe effect on accomplishing a mission.
- f. All class III (SAE class V) leaks.

6.5.2 Non-chargeable failures.

- a. Secondary failures induced by chargeable primary failure.
- b. Failures which occur as a result of incorrect test or peculiar maintenance activities.
- c. Failures which occur as a result of misuse or abuse.
- d. Failures resulting from the failure to perform prescribed preventative maintenance.
- e. All incidents which are corrected by driver/crew within one (1) hour, using On Vehicle Equipment (OVE) tools and/or OVE spare parts.

6.6 Recirculation assembly. Marine Corps recirculation and fuel sampling requirements are described in Naval Handbook (NAVAIR) 06-5-502 titled: "Aircraft Refueling for Shore Activities". Copies can be obtained from the Department of the Navy, Naval Air Systems Command, Washington, DC 20361 (see 3.3.4.3).

6.7 Recommended service products. The vehicle (i.e., truck, trailer) should be serviced with the following products listed in Table VII and VIII or equivalents.

TABLE VII. Service products specifications.

Lubricant used	Ambient air temperature 0 to -25°F	Ambient air temperature -10 to +125°F
Oil: For general purpose lubrication	A-A-52557	SAE AMS 3054
Grease: For sealed lubrication	MIL-G-23827	MIL-G-23827
For general lubrication including bearings	MIL-PRF-10924	MIL-PRF-10924



## MIL-PRF-62180D(AT)

TABLE VIII. Engine oil service products specifications.

Ambient air temperature	Viscosity	Specification
Above +40 to +125°F	Grade 30	MIL-PRF-2104
0 to +40°F	Grade 10	MIL-PRF-2104
-25 TO 0°F	Grade 10	MIL-L-46167

6.8 Recycled materials. The use of recycled materials which meet the requirements of the applicable material specifications without jeopardizing the intended use of the item should be encouraged (see 3.2.1).

6.9 Vehicle supersession. This specification supersedes MIL-S-62180C(AT), except for replacement parts of Models M967, M967A1, M969, M969A1, M961A2, M970 and M970A1 for which specification MIL-S-62180C(AT) is to be used.

Custodian:  
Army- AT

Preparing Activity:  
Army - AT

(Project 2330-0208)

# 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, 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>		<b>1. DOCUMENT NUMBER</b> MIL-PRF-62180D(AT)	<b>2. DOCUMENT DATE (YYMMDD)</b> 970828
<b>3. DOCUMENT TITLE</b> SEMITRAILER, FUEL TANKERS: 5000 GALLON, BULKHAUL, AUTOMOTIVE AND AIRCRAFT FUEL SERVICING			
<b>4. NATURE OF CHANGE</b> ( <i>Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.</i> )			
<b>5. REASON FOR RECOMMENDATION</b>			
<b>6. SUBMITTER</b>			
<b>a. NAME (Last, First, Middle Initial)</b>		<b>b. ORGANIZATION</b>	
<b>c. ADDRESS (Include Zip Code)</b>		<b>d. TELEPHONE (Include Area Code)</b> (1) Commercial (2) AUTOVON (If applicable)	<b>7. DATE SUBMITTED (YYMMDD)</b>
<b>8. PREPARING ACTIVITY</b>			
<b>a. NAME</b>		<b>b. TELEPHONE (Include Area Code)</b> (1) Commercial (810) 574-8745 (2) AUTOVON 786-8745	
<b>c. ADDRESS (Include Zip Code)</b> 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	