

INCH-POUND
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SUPERSEDING
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PERFORMANCE SPECIFICATION

SEMITRAILER, TACTICAL, DUAL PURPOSE BREAKBULK/CONTAINER TRANSPORTER, 22-1/2 TON, M871A2

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

1. SCOPE

1.1 Scope. This specification covers a commercially designed 22-1/2 ton platform, tandem axle, dual purpose (breakbulk/container) semitrailer, M871A2, for use in ammunition transport, breakbulk, and 20 feet (ft) and smaller containers while being towed by a tractor.

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

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

AMSC N/A

FSC 2330

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2.2 Government documents.

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

SPECIFICATIONS

DEPARTMENT OF DEFENSE

- MIL-C-46168 - Coating, Aliphatic Polyurethane, Chemical Agent Resistant.
- MIL-C-53039 - Coating, Aliphatic Polyurethane, Single Component, Chemical Agent Resistant.

STANDARDS

FEDERAL

- A-A-50271 - Plate, Identification.
- A-A-52483 - Plate, Identification: Emergency.

DEPARTMENT OF DEFENSE

- MS52125 - Composite Light-Tail, Stop, Turn and Marker.
- MS75021 - Connector, Receptacle, Electrical-12 Contact, Intervehicular, 28-Volt, Waterproof.

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

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

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DRAWINGS

DEPARTMENT OF DEFENSE

| | |
|----------|---------------------------------------|
| 7388820 | - Wheel Assembly. |
| 7417585 | - Ground Board Assembly, Jack. |
| 7731428 | - Cover Assembly, Receptacle. |
| 7979195 | - Tarpaulin. |
| 8750159 | - Truck, Tractor, 5 Ton, 6x6, M931A1. |
| 12255591 | - Bow Assembly, Tarpaulin Support. |

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

NUCLEAR REGULATORY COMMISSION (NRC)

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

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

DEPARTMENT OF TRANSPORTATION (DoT)

Code of Federal Regulations (CFR) - Title 49, Part 53.

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

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

ASSOCIATION OF AMERICAN RAILROADS (AAR)

| | |
|------|--|
| M931 | - Highway Trailers, All Types, for TOFC Service. |
| M943 | - Container Chassis for TOFC Service. |

(Copies of AAR publications may be obtained from the Association of American Railroads, 50 F. Street, N.W., Washington, DC 20001.)

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AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

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

(Copies of ANSI documents are available from the American National Standards Institute,
11 W. 42nd Street, New York, NY 10036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

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

(Copies of ASTM documents are available from the American Society for Testing and
Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

GENERAL MOTORS CORPORATION

GM 9540P - General Motors Accelerated Corrosion Test.

(Copies of GM 9540P are available from Global Engineering, 15 Inverness Way,
Englewood, CO 80112.)

SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE)

J534 - Lubrication Fittings (DoD Adopted).
J560 - Seven-Conductor Electrical Connector for Truck-Trailer
Jumper Cable (DoD Adopted).
J700 - Upper Coupler Kingpin - Commercial Trailers and
Semitrailers (DoD Adopted).
J702 - Brake and Electrical Connection Locations - Truck-
Tractor and Truck-Trailer (DoD Adopted).
J1292 - Automobile, Truck, Truck-Tractor, Trailer, and Motor
Coach Wiring (DoD Adopted).

(Application for copies of SAE publications may be obtained from the Society of
Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

TIRE AND RIM ASSOCIATION, INC.

Tire and Rim Association Yearbook.

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(Application for copies should be addressed to the Tire and Rim Association, Inc., 175 Montrose West Ave., Suite 150, Copley, OH 44321.)

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

3. REQUIREMENTS

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

3.2 Life cycle operations. The durability and maintainability requirements shall be demonstrated over the life cycle operations of the semitrailer when operated for a total of 12 000 miles (mi.) [19 300 kilometers (km)] per vehicle in accordance with the operational profile in table I, the payload requirement of 3.2.1, and the environmental conditions of 3.2.2 (see 4.5.1).

TABLE I. Operational profile, 12 000 mi. (19 300 km). ^{1/}

| Course | Distance mi. (km) | Speed ^{2/} mph (km/h) | Loading condition |
|------------------------------|----------------------|-----------------------------------|----------------------|
| Highway ^{3/} | 1400 (2255) | up to 55 (88) | loaded ^{4/} |
| | 1400 (2255) | up to 55 (88) | loaded ^{5/} |
| | 200 (320) | up to 55 (88) | empty |
| Secondary road ^{3/} | 3300 (5310) | up to 20 (32) | loaded ^{4/} |
| | 3300 (5310) | up to 20 (32) | loaded ^{5/} |
| | 600 (966) | up to 20 (32) | empty |
| Off-road ^{3/} | 800 (1288) | up to 10 (16) | loaded ^{4/} |
| | 800 (1288) | up to 10 (16) | loaded ^{5/} |
| | 200 (320) | up to 10 (16) | empty |

^{1/} The side slope for all courses shall be not more than 20 percent (%).

^{2/} mph (km/h) = miles per hour (kilometers per hour).

^{3/} Definitions and examples of above courses are specified in 6.3.

^{4/} The payload shall consist of two 10-foot (ft) [3.1 meter (m)] or one 20-ft (6.1 m) container with its center of gravity approximately 48 inches (in.) [122 centimeters (cm)] and with a total load of 44 800 pounds (lb) [20 300 kilograms (kg)].

^{5/} The payload shall consist of breakbulk cargo evenly distributed total load of 45 000 lb (20 400 kg).

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3.2.1 Payloads. The semitrailer shall be capable of transporting 45 000 lb (20 400 kg) of breakbulk cargo uniformly distributed over the deck and any combination of containers and shelters as listed in table II, without permanent deformation of the frame while operating at the speeds and terrain profile as specified in table I. The 20-ft (6.1 m) container, with loadings as specified in table II, shall be located on the semitrailer (see 4.5.1).

TABLE II. Payload containers and shelters.

| Qty | Length | | Weight | |
|--------|--------|-------|--------------|----------|
| | ft | (cm) | lb | (kg) |
| 1 | 20 | (610) | 44 800 | (20 300) |
| 2 or 1 | 10 | (305) | total 44 800 | (20 300) |
| | | | each 22 400 | (10 200) |
| 3 | 6-2/3 | (203) | total 44 800 | (20 300) |
| | | | each 14 933 | (6700) |
| 4 | 5 | (107) | total 44 800 | (20 300) |
| | | | each 11 200 | (5100) |

3.2.2 Environmental. The semitrailer shall be capable of operating in ambient temperatures ranging from minus (-) 40 degrees Fahrenheit (°F) [-32 degrees Celsius (°C)] at 1200 ft in altitude to plus (+) 125°F (52°C) at -500 ft in altitude. The semitrailer shall also be capable of being stored in temperatures up to 160°F (71°C) (see 4.6).

3.2.3 Durability. The semitrailer shall demonstrate a 0.75 probability with 0.5 confidence of completing 12 000 mi. (19 300 km) without replacement or overhaul of the major components and subassemblies; that is frame, body, platform, suspension assembly including axles and wheels less tires, landing gear, major brake system components less brake shoes, and common hardware (see 4.5.1).

3.2.4 Maintainability. Total maintenance time, total scheduled and unscheduled maintenance excluding driver and crew checks and services, shall be no more than 30 manhours during 12 000 mi. (19 300 km). This equates to a maintenance ratio (MR) not greater than 0.0025 maintenance manhours per operating mile (see 4.5.1).

3.2.5 Materials. Materials used shall be in accordance with the manufacturer's materials specifications for this type of item. The materials shall be free from defects which adversely affect appearance, performance or serviceability of the finished product (see 4.5.1).

3.2.5.1 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.

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3.2.5.2 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 in. (1.6 mm) thick, 2.5 mils (64 micrometers) on steel sheet greater than 0.0625 in. thick, or 0.75 mil (19 micrometers) on pregalvanized 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 (see 4.5.1).

3.2.5.3 Prohibited materials. Asbestos, cadmium, and radioactive materials shall not be used in this item. Radioactive material is defined by title 10, CFR, part 40, and material in which the radioactivity is greater than 0.002 microcuries per gram or 0.01 microcuries total activity for the item (see 4.5.1).

3.3 Design and construction. The semitrailer shall be of the heavy duty commercial container transporter type, modified as necessary to accommodate all containers, and breakbulk cargo, capabilities specified herein. Except as specified herein, vehicle components, assemblies and accessories to be delivered under contract shall be manufacturer's standard or optional items which meet or exceed the requirements of this specification. The vehicle shall be a standard commercial vehicle, of a model sold to a significant number of buyers other than the Government, in the course of normal business operations. The model furnished shall be not older than the manufacturer's current model on the date of invitation for bids. The automotive vehicles, components, assemblies and accessories to be procured hereunder shall conform to all Federal Motor Vehicle Safety Standard (FMVSS) applicable on the date of manufacture to non-military, non-export semitrailer products, except as otherwise specified herein.

3.3.1 Dimensions and clearances. The semitrailer, without payload, uncoupled from the towing vehicle, shall conform to the dimensions specified in table III. The semitrailer shall not exceed the Passe-Partout International (PPI) clearance dimensions as shown in figure 1 (see 4.5.2).

3.3.2 Upper fifth wheel plate. The upper fifth wheel plate shall be adequate for coupling to a full oscillating military fifth wheel, and the fore and aft rocking commercial fifth wheel. It shall be of sufficient size to cover a fifth wheel 36 in. (91.4 cm) in diameter (see 4.5.2).

3.3.2.1 Kingpin. The upper fifth wheel kingpin shall be 2 in. (5 cm) and shall conform to SAE J700 (see 4.5.2).

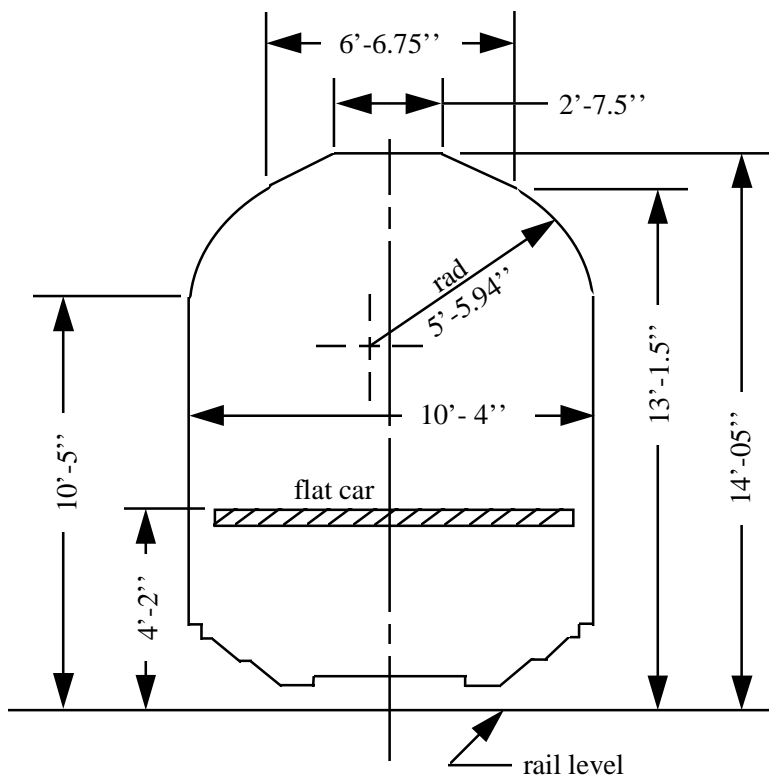
3.3.3 Maintenance characteristics. The semitrailer design, together with components and accessories shall permit ready access to all items requiring periodic services or maintenance in the field. Periodic service and maintenance shall be accomplished with the use of conventional,

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common, automotive tools normally associated with equipment of this type. The adjustment of components and accessories shall be accomplished with minimum disturbance to other components of the semitrailer (see 4.7).

TABLE III. Dimensions.

| Feature | Dimensions |
|---|--------------------------------------|
| Length of load space. | 29 ft (884 cm) |
| Vehicle width (maximum). | 96 in. (244 cm) |
| Platform height (maximum). | 55 in. (140 cm) |
| Distance from front of semitrailer to vertical centerline of kingpin. | 30 ± 2 in. (76 ± 5 cm) |
| Upper fifth wheel height, (empty) from the underside of the upper fifth wheel plate. | 49 ± 1 in. (124.5 ± 2.5 cm) |
| Swing clearance (minimum) from the centerline of the kingpin to any portion of the semitrailer 6 in. (15 cm) or more below upper fifth wheel plate. | 87 in. (223 cm) |
| Swing radius (minimum) from centerline of the kingpin to the most distance point on the semitrailer nose. | 58 in. (147 cm) |

FIGURE 1. PPI gauge.

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3.3.4 Frame. Main frame members shall be adequately braced to prevent permanent deformation with the semitrailer statically loaded and the load distributed as specified in 3.2.1 and table II. The maximum fiber stress in any frame members shall not be greater than 1/3 of the material yield strength (see 4.5.1).

3.3.5 Weight. The semitrailer curb weight shall be no more than 16 000 lb (7256 kg). When the semitrailer is loaded with any payload and distribution described in 3.2.1 and table II, the load at the kingpin shall not be more than 25 000 lb (11 337 kg) (see 4.5.2).

3.3.6 Platform. The platform shall be constructed for securing fixed and movable tiedown devices and side and rear racks. Stake pockets for the racks shall be located to provide for at least a 90 in. (230 cm) clear load space width inside the racks for the entire length of the load surface. The platform deck shall be completely covered extending from the rear of the semitrailer with no protrusions or cutouts except those areas required for cargo securement devices described in 3.4.18. The forward deck may be covered with a plate to reduce the profile of the gooseneck area (see 4.5.2).

3.3.6.1 Deck. The deck shall not project above the side or rear rails, or shall be no more than 0.25 in. (6.5 mm) below the top of the side or rear rails. The semitrailer deck shall present no restrictions on the sides or end to the opening and closing of the doors of mounted containers or to access by forklifts to tine pockets in pallets. The entire deck shall provide a continuous surface for bulk cargo transport (see 4.5.2).

3.3.7 Cover plates. Removable plates shall cover exposed holes in the platform rails with the racks and stakes installed in position (see 4.5.2).

3.3.8 Front panel. Each semitrailer shall be equipped with a combination of a front-end structure and front panel. The front panel shall be of permanent construction and without openings. The top portion shall fold rearward and in the upright position and shall be locked in position to prevent loss (see 4.5.2).

3.3.9 Side and rear racks. The semitrailer shall be furnished with side and rear racks. They shall be located in the stake pocket holes as shown in figure 2. A rail top section shall be provided on each rack panel over the edge, which has openings to facilitate removal of each rack by forklift trucks. The top of rack assemblies, with the rail top section shall be flush with the top of the front panel. All sections shall be easily removable by one soldier and show no evidence of warping, binding, or jamming. Any rack section shall be removable without removing any adjacent rack section. All sections shall mate and fit so that locking device engage and disengage freely. Interchangeability of racks with each other and between other M871 and M871A semitrailers is required. The racks, when not in use, shall be capable of being stored and secured on the semitrailer (see 4.5.2).

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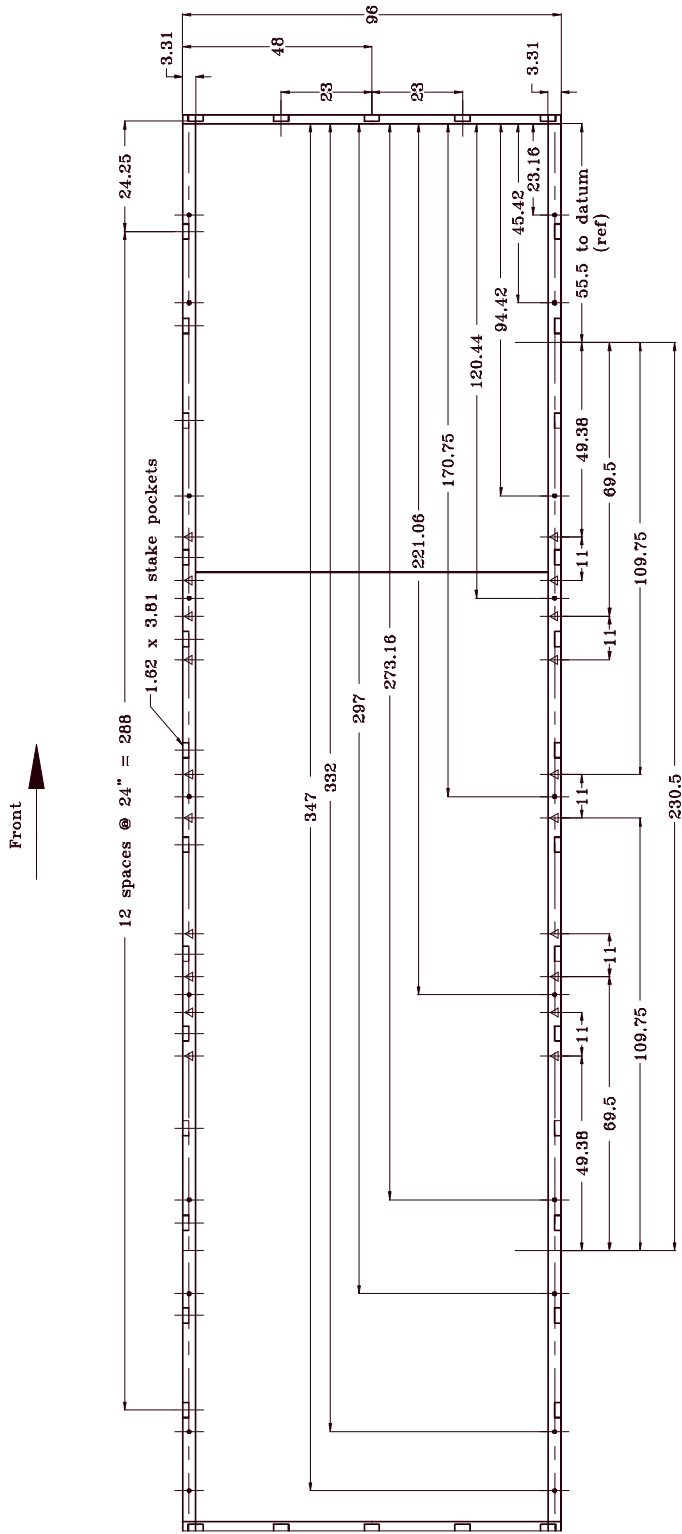


FIGURE 2. Provisions for movable securement devices, locations.

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3.3.9.1 Stakes. The bow assembly, shall have stakes appropriately positioned and the top of each stake shall have an opening for the installation of side and rear rack stakes to be positively locked in the stake pockets to prevent accidental dislodging. To prevent loss, locking devices shall be secured to the semitrailer (see 4.5.2).

3.3.9.2 Tarpaulin and bows. Provisions shall be made enabling the bow assembly, drawing number 12255591, and tarpaulin, drawing number 7979195, to be installed on the semitrailer. Cotton duck tarpaulins shall not be used (see 4.5.2).

3.3.9.3 Wing panel. The front wings shall allow for removal of the adjacent side rack without removal of the front wing (see 4.5.2).

3.3.9.4 Securement. The semitrailer shall have a device for securement to the breakbulk cargo tiedowns on the trailer bed floor and to the top of the racks. Rack stakes, side and rear, shall be positively locked to the stake pockets and locking device(s) shall be secured to the trailer to prevent accidental dislodging when traveling over various type of terrain, including highway (see 4.5.2).

3.3.10 Stowage. Provisions shall be incorporated into all semitrailers which shall provide secured storage space for tarpaulin, ropes, straps, basic issue items (BII), tiedown devices and manifests (see 4.5.2).

3.3.10.1 Tarpaulin and bows storage. Provisions shall be incorporated into all semitrailers for a storage box, 26-1/4 in. (66.7 cm) wide by 26-1/4 in. (66.7 cm) long by 23-1/4 in. (59.1 cm) high, to be installed under the trailer bed and forward of the axles for the purpose of storing tarpaulin. The box shall have provisions for securement by staples and swivel snaps and for holding in an open position. Each corner shall have a hole for drain purposes. The design of the door shall allow for locking the compartment with a padlock.

3.3.10.2 General equipment storage. Provisions shall be incorporated into all semitrailers for a storage box with a minimum of 3.8 cubic feet (ft³) [0.108 cubic meter (m³)] of area to be installed under the trailer bed and forward of the axles for the purpose of storing load binders, load securing hardware and BII. The box shall have provisions for securement by staples and swivel snaps and for holding in an open position. Each corner shall have a hole for drain purposes. The design of the door shall allow for locking the compartment with a padlock.

3.3.10.3 Manifest holder. A waterproof manifest holder with a minimum inside dimension of 8-1/2 x 11 x 1 in. (21.6 x 28 x 2.54 cm) shall be permanently attached to the forward edge of the front panel.

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3.3.11 Landing gear. The semitrailer shall have two vertical lifts, telescopic, nonrotating landing legs with two speed gears and a handcrank on the curbside. The landing legs shall be equipped with self-leveling skid pads. Support for the crank extension shaft and a clip for holding the crank when folded shall be provided. Each landing leg shall withstand, without deformation, the combined static and dynamic forces resulting from impact during coupling or uncoupling operations of the loaded semitrailers as specified in 3.2.1. When placed in travel position, the landing gear legs shall remain positively locked. The landing gear shall be protected to prevent the entrance of foreign matter which would impair its functioning or mechanical efficiency. The landing gear shall have sufficient extension to couple and uncouple the semitrailer based on the M931A1 5-ton tractor, described in drawing 8750159, equipped with 14.00R20 super single tires. The coupled semitrailer on level ground shall have at least 12 in. (30.5 cm) of clearance under the landing legs with maximum payload conditions as specified in 3.2.1 (see 4.5.2).

3.3.11.1 Ground board. Two ground boards conforming to drawing 7417585 shall be furnished and stowage space provided in the vicinity of the landing legs. A device shall be provided to secure the ground boards to the semitrailer (see 4.5.2).

3.3.12 Axles and suspension. The axle and suspension system shall have manufacturer's rated capacity at least equal to the load imposed at the ground when the semitrailer is loaded with its rated payload of 22.5 tons (20 400 kg). The axles shall be physically interchangeable commercial and military equivalents, and shall mount the military type wheel described in Drawing 7388820. Suspension clearances shall prevent interference between wheels and any other portion of the trailer when the trailer is operating under any condition of its intended purpose (see 4.5.1).

3.3.12.1 Wheel bearing seals. The seals used shall prevent the leakage of lubricants and the entrance of water, sand, or any other foreign matter into the bearings during normal operation.

3.3.12.2 Suspension system. The semitrailer shall incorporate a suspension system as specified herein, fail-safe brakes are required on these axles, or a physically interchangeable commercial and military equivalent, as applicable, with the following performance specifications:

- a. The wheel travel shall be 10 to 12 in. (25.5 to 30.5 cm) for off-road operations.
- b. The suspension spring shall have a deflection rate sufficient to provide stability when transporting specified payloads under adverse conditions.
- c. The suspension shall have sufficient articulation to maintain equal loading on each axle under all operating conditions.

3.3.13 Wheels, rims, and tires. Wheels shall be 7.50 x 20 disc type with 11.25 stud circles in accordance with Drawing 7388820. Rims and tire ratings shall conform to Tire and Rim Association recommendations for this type of vehicle (see 4.5.2).

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3.3.13.1 Tires. The tires shall be rated to carry the vehicle rated payloads at highway speeds in accordance with Tire and Rim Association standards. Standard highway tread shall be employed.

3.3.13.2 Spare wheel and tire. A spare tire and wheel assembly shall be furnished and stored securely in a readily accessible space which shall permit removal of the assembly when the vehicle is loaded. The spare tire shall be of the same size and tread design and of the same ply rating as the tires furnished on the semitrailer.

3.3.13.3 Tire changing capability. The semitrailer shall be provided with a means of raising each tire off the ground so that the wheel and tire assembly may be removed and replaced from both an unloaded and fully loaded semitrailer under all terrain conditions in no more than 30 man/minutes. All tools necessary to remove and replace the wheel and tire assembly in no more than 30 man/minutes, shall be provided. Storage space for the above tools and lockable capability shall also be provided.

3.3.14 Brakes. Brakes shall be of the full air, internal expanding type and conform to Federal Motor Carrier Safety Regulations (FMCSR). Air hose fittings and locations shall comply with SAE J702. The braking system shall be installed in a manner which provides road clearance for travel over uneven terrain and protection against damage caused by objects striking components. No parts of the braking system shall extend below the bottom of the wheel rims (see 4.5.2).

3.3.14.1 Gladhand tags. Gladhand tags conforming to A-A-52483 shall be furnished and properly installed.

3.3.14.2 Wheel chock blocks. Four nonwood wheel chock blocks with grabhandles shall be provided on each semitrailer. Stowage provisions and safety features fastened to the vehicle shall be provided for the chock blocks near the wheels.

3.3.14.3 Air lines and fittings. All air lines and fittings shall be internally clean prior to and after making connections. Brake air lines shall be free from leaks.

3.3.14.4 Caging tool. One caging tool shall be furnished. Stowage provisions shall be made to store the tool on one of the spring brake housings.

3.3.15 Electrical. The electrical and lighting system of the semitrailer shall conform to the requirements of 3.3.15.1 through 3.3.15.3 (see 4.5.2).

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3.3.15.1 Lighting system. The lighting system shall be 12 volts (V) direct current (dc). The system shall include no less than two composite lights as specified in MS52125-1. Lights and reflectors shall be recessed or guarded to protect them from damage during normal operation of the semitrailer. Lights and reflectors shall not be mounted on vertical surfaces of the rub rails or semitrailer bumpers. All electrical wiring shall conform to SAE J1292.

3.3.15.2 Blackout lighting. The light emitting diode (LED) blackout stop and marker shall operate on 24 V. The emission of any vehicle light source, which may be illuminated in the blackout mode, shall be limited to the visible spectrum, 380 to 700 nanometers (nm). No energy shall be emitted in the 700 to 1200 nm portion of the electromagnetic (EM) spectrum. Emission peaks shall not be more than 1% of the peak emission in the visible spectrum. Turn signals and clearance lights are to be inoperative during blackout drive conditions. Turn signals and clearance lights are to be inoperative during blackout drive conditions.

3.3.15.3 Receptacle system, 12-24 V. The semitrailer shall be equipped with one 12 contact receptacle with cover, and one 7 contact receptacle with cover installed at the front of the semitrailer. The 12 contact receptacle shall be physically interchangeable with MS75021-1 and be equipped with a cover assembly conforming to Drawing 7731428. The 7 contact receptacle shall conform to SAE J560 round socket for an intervehicle connector cable. The 12 contact receptacle shall be provided with necessary components to each circuit to reduce the voltage of a tactical military design truck tractor from 24 V to 12 V shall be connected through the necessary resistors into the 12 V semitrailer circuits as follows:

- a. Not used.
- b. Connect to circuit number 3.
- c. Not used.
- d. Connect to circuit number 1.
- e. Connect to circuit numbers 2 and 6.
- f. Not used.
- g. Not used.
- h. Connect to circuit number 5.
- i. Not used.
- j. Not used.
- k. Not used.
- l. Not used.

In addition, the connection between circuit 2 and 6, on the 7 pin connector, shall have a readily accessible external switch to allow for breaking of this circuit when the 7 pin connector is attached to the towing tractor in lieu of the 12 pin MS connector. Circuits b and j on tactical truck tractors, M818, M931, and M931A1, are combination stop and turn signal indicator circuits. The normal 12 V turn signal lights shall function both as turn signals and stop lights and

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the normal 12 V stop lights shall not be in operation when the semitrailer is connected to a towing vehicle with a 24 V power supply. Because of this condition, the number 4 stop light circuit is not connected to the 24 V, 12 contact receptacle.

3.3.16 Transportability. The fully loaded semitrailer shall be equipped with lifting and tiedown provision that allow the semitrailer to be lifted and secured on a railroad flat car, breakbulk ship, C-130 aircraft, and CH-47 helicopter. Preparation of the semitrailer for air transport shall be accomplished in 15 minutes total or less by no more than two individuals using only common hand tools on board (see 4.5.2 and 6.6).

3.3.16.1 Slinging provision. The semitrailer, with the lifting apparatus attached to the International Organization for Standardization (ISO) container and the twist locks engaged, shall have the capacity to safely lift both the trailer and the ISO container when a vertical acceleration of 2.7 gravity units (g) is exerted (see 6.6.1).

3.3.16.2 Vehicle tiedown. The semitrailer shall be equipped with tiedown hardware to permit its transport with the rated payload and for air transport without payload. In addition, the fully loaded semitrailer shall be suited for Trailer-On-Flat-Car (TOFC) transport in accordance with AAR M943 and AAR M931. The rear tiedown lugs shall be located so that the semitrailer with the towing vehicle connected can be pulled by these lugs from the rear.

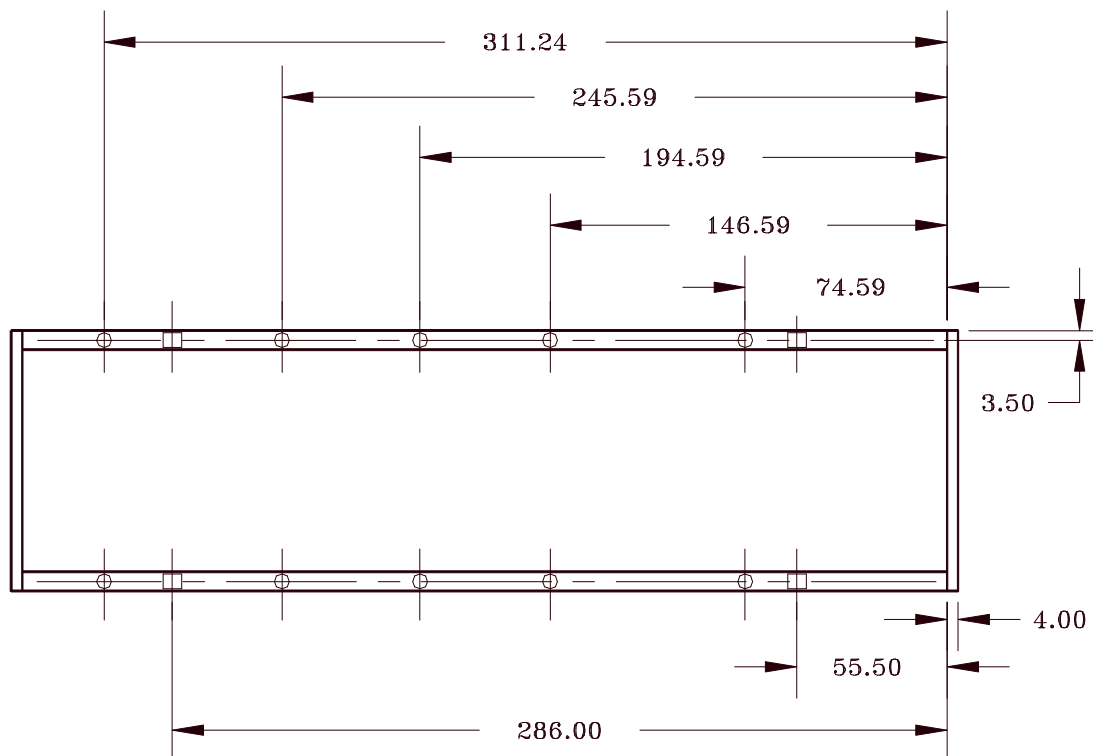
3.3.17 Cargo securement. The semitrailer side and rear rail to horizontal surfaces shall be fitted with fixed devices and provisions for movable devices for securement of cargo as follows (see 4.5.2):

- a. Fixed devices:
 1. Retractable twist locks (see 3.3.17.1).
 2. Ring type tiedowns (see 3.3.17.2).
- b. Movable device provisions:
 1. For "Big Foot" tiedowns (see 3.3.17.3).
 2. For twist locks with F pin and "Mickey Mouse" tiedowns (see 3.3.17.4).
 3. Stake pockets (see 3.3.17.5).

Fixed and movable installations shall secure rated payloads in all conditions of specified vehicle transport and shall meet all applicable requirements of FMSCR. Twist locks shall be certified by the AAR, shall be in commercial use, and be adequate to safely secure containers with rated payload in an 8 mph (13 km/h) impact test in both directions, using a conventional type rail flat car and during TOFC service. Twist locks are to be used to secure the 20 ft (610 cm) container or the outermost securement points for all load combinations specified in 3.3.1 and table II.

3.3.17.1 Retractable twist locks. Four retractable locks, two on each side rail, shall be located as specified in figure 3.

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Dimensions are in inches.

○ Ring Type tiedown.

□ Retractable twist lock.

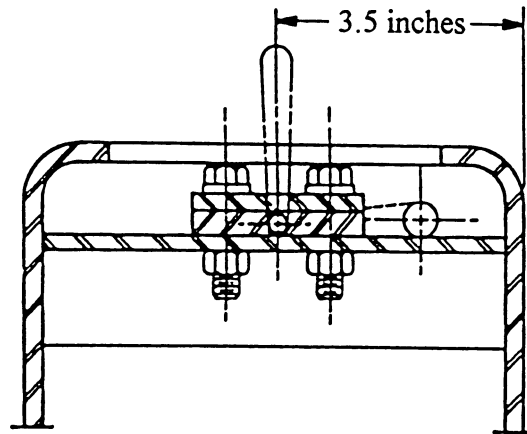
FIGURE 3. Fixed securement devices, locations.

3.3.17.2 Ring type tiedowns. Ten fixed, ring type tiedowns, five on each side rail, shall be located as specified in figure 3. Tiedowns shall conform to figure 4, and each shall have a rated capacity of 10 000 lb (4500 kg).

3.3.17.3 “Big Foot” tiedowns. Twenty provisions, ten on each side rail, for “Big Foot”, removable tiedowns shall be located as specified in figure 2.

3.3.17.4 Twist locks with F pin and “Mickey Mouse”. Twenty provisions, ten on each side rail, for removable twist locks with “F” pin or “Mickey Mouse” tiedowns shall be located as specified in figure 2. Four twist locks with “F” pin shall be provided. The pin must be connected to the container twist lock in such a manner and have sufficient strength that the “F” pin will not fail or separate under normal handling conditions. Twist locks and “Mickey Mouse” tiedowns shall be as specified in figure 5.

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FIGURE 4. Fixed, ring type tiedown.

3.3.17.5 Stake pockets. Thirty-one stake pockets shall be located on the side and rear rails as specified in figure 2. Stake pockets shall be as specified in figure 5 for locations along the rail edges and at the rear corners.

3.3.18 Rear end protection. Semitrailer rear end protection shall be in accordance with FMCSR in effect at the time of manufacture (see 4.5.2).

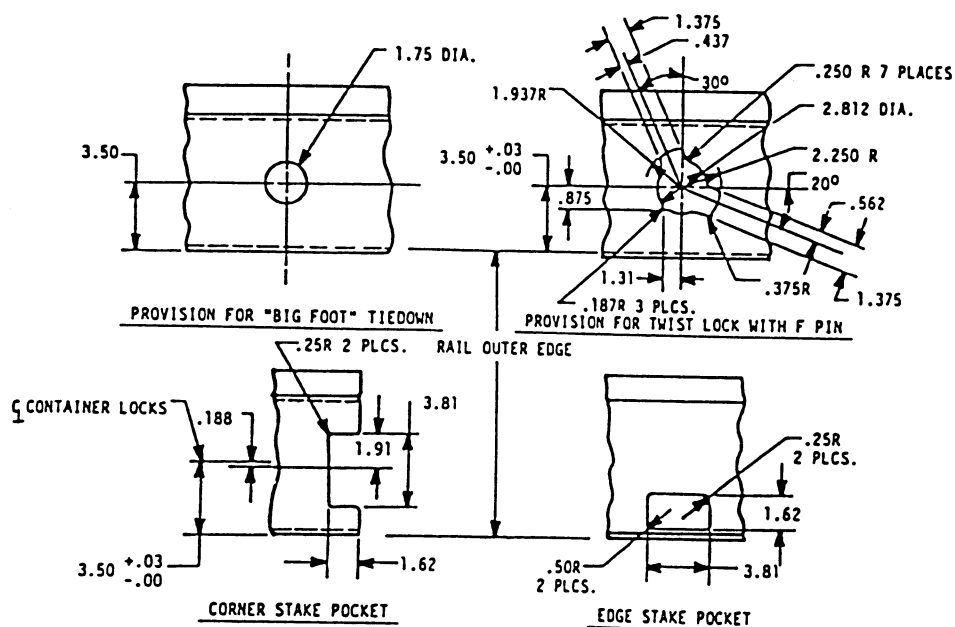
3.3.19 Dock bumper. A dock bumper, extending not less than 1.5 in. (3.8 cm) beyond the rear of the semitrailer, shall be furnished. The dock bumper shall be the full vehicle width and shall be located approximately at the trailer dock level. The rear of the trailer shall have four equally spaced-rubber stops which shall extend 1.5 in. (3.8 cm) beyond the bumper (see 4.5.2).

3.3.20 Wheel splash and stone throw protection. The semitrailer shall be furnished with mud flaps at the front and rear of the axles (see 4.5.2).

3.4 Performance.

3.4.1 Automotive. The semitrailer, fully equipped and loaded with 45 000 lb (20 400 kg) payload shall meet all the requirements specified herein without failure or damage to the vehicle and payload where coupled to and operated by suitable tractors. Performance shall be demonstrated over highways, secondary roads and off-roads (see 6.3).

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NOTE:

Dimensions are in inches.

FIGURE 5. Provisions for movable securement devices, configuration.

3.4.2 Turning ability. The semitrailer shall be capable of assuming a 90 degree (°) angle in both directions to the coupled towing vehicle (see 4.8).

3.4.3 Side slopes. The loaded semitrailer when towed by the specified truck tractors shall be capable of operating on a 20% side slope without slipping or upsetting (see 4.9).

3.4.4 Fording ability. The semitrailer shall ford salt and fresh water without any evidence of water leakage or moisture penetration into wheel bearings or electrical components (see 4.10).

3.4.5 Tracking ability. The semitrailer path shall not deviate more than 3 in. to either side of the path of a towing truck-tractor (see 4.11).

3.4.6 Braking. The service brakes of the semitrailer shall be capable of stopping the semitrailer, when fully loaded with full payload, in not more than 80 ft (2440 cm) when traveling at 20 mph (32.2 km/h) (see 4.12).

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3.4.7 Tractor compatibility. The semitrailer shall have the ability to transport its payload in its area of operation while connected to the fifth wheel, electrical and air brake systems of the military 5 ton tractors M931, M931A1 and M932A1, or the line haul tractor M915A1 (see 4.5.2).

3.5 Manprint.

3.5.1 Human factor engineering (HFE). The semitrailer shall be operable and maintainable by the full range of Army personnel while wearing the full range of Army protective garments, including arctic and Mission Oriented Protective Posture (MOPP) IV (see 4.5.1).

3.5.2 System safety. The semitrailer shall conform to all AAR and FMVSS regulations applicable to semitrailers of this weight class at the time of manufacture (see 4.5.1).

3.6 Treatment and painting. Unless otherwise specified (see 6.2), the semitrailer shall be cleaned, treated, and painted in accordance with normal commercial practice to assure complete coverage and durability of the finish. Paint shall conform to MIL-C-53039 or MIL-C-46168. Any special painting requirements (see 6.2), shall be listed in the contract (see 4.5.2).

3.7 Rustproofing. Unless otherwise specified (see 6.2), vehicles shall be rustproofed in accordance with the best commercial practice. When specified (see 6.2), tropical rustproofing shall be required (see 4.5.2).

3.8 Markings. Markings, such as tire pressure, tiedown points, center of gravity (empty), etc. shall be applied to the semitrailer in block letters or numbers and shall be permanent and legible. Any special markings required (see 6.2), shall be listed in the contract (see 4.5.2).

3.9 Data plates. Metal data plates conforming with A-A-50271 shall be provided. Semitrailer registration number and manufacturer's serial number shall be placed on the data plate. The transportation, instruction, safety, warning, caution, air transport, tiedown and notice plate shall also be listed. The size of the plates shall not exceed the surface they are mounted on and shall be legible and readily visible. The plates shall be attached to the main frame rail at the road side with non-ferrous metal fasteners (see 4.5.2).

3.9.1 Identification plate. A metal identification plate shall be provided and shall include a blank space which will be used to indicate Government acceptance.

3.9.2 Shipping. A metal shipping data plate shall be provided to show the semitrailer in transport position indicating the location and capability of the tiedown attachments, supplementary points of tiedown, the semitrailer center of gravity location, weight, and cubic measurements. A metal data plate showing slinging through a 20 ft (610 cm) container shall also be provided.

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3.9.3 Lubrication plate. The semitrailer shall be equipped with a lubrication plate referencing military lubricants.

3.9.4 Warning decal. A yellow warning decal shall be placed on the outer side of the front panel with the following warning: “DO NOT USE WITH M52, M52A1, or M52A2 5-TON TRACTORS.” The word “WARNING” in yellow letters on a black background shall be centered over the letters.

3.10 Lubrication. Lubrication means shall be provided for all parts of the semitrailer normally requiring lubrication. When the use of high lubricating pressure will damage grease seals or other parts, fittings with pressure release shall be used. The semitrailer shall be operable with applicable lubricants without adverse effect on its contents or warranty. Lubrication intervals shall be required by the component manufacturer. Grease lubrication fittings shall conform to SAE J534 (see 4.5.2).

3.11 Servicing and adjusting. The contractor shall service and adjust each vehicle and its mounted material for operational use including the following: Adjustment of brake system; inflation of all tires, check of the electrical system for operation; complete lubrication of chassis. Axles, and mounted material with grades of lubricants recommended for the ambient temperatures at the delivery point (see 4.5.1).

4. VERIFICATION

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

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

4.2 First article inspection. Unless otherwise specified (see 6.2), first article inspection shall be performed on preproduction or initial production samples as specified when a first article sample is required (see 3.1).

4.2.1 Preproduction inspection. When specified (see 6.2), first article preproduction inspection shall be performed on three trailers. This inspection shall include the tests of table IV and the examinations of table V.

4.2.2 Initial production inspection. Unless otherwise specified (see 6.2), first article initial preproduction inspection shall be performed on three trailers. This inspection shall include the tests of table IV and the examinations of table V.

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TABLE IV. Classification of inspections.

| Title | Requirements | Inspection | First Article | CI |
|------------------|--------------|------------|---------------|----|
| Environmental | 3.2.2 | 4.6 | X | X |
| Maintainability | 3.3.3 | 4.7 | X | X |
| Turning ability | 3.4.2 | 4.8 | X | X |
| Side slopes | 3.4.3 | 4.9 | X | X |
| Fording ability | 3.4.4 | 4.10 | X | X |
| Tracking ability | 3.4.5 | 4.11 | X | X |
| Braking | 3.4.6 | 4.12 | X | X |

4.2.2.1 Initial production trailers (IPT). The trailers will be tested for 12 000 mi. to include endurance, performance, reliability, maintainability, design, materials, and workmanship, as specified in 4.2.2. All the tests shall be performed by the Government at a Government selected test site. The contractor shall have repair parts prepositioned at the test sites to provide for support of the tests at no cost to the Government.

4.3 CI. CI shall include the tests of table IV and the examinations table V.

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 section 3. 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 Method of inspection.

4.5.1 Materials and design. Conformance to 3.2 thru 3.2.5, 3.2.5.2, 3.2.5.3, 3.3.4, 3.3.12, 3.5.1, 3.5.2, and 3.11 shall be determined by inspection of contractor records providing proof or certification that materials and design conform to requirements. Applicable records shall include drawings, specifications, design data, receiving inspection records, processing and quality control standards, vendor catalogs and certifications, industry standards, test reports, and rating data.

4.5.2 Defects. Conformance to 3.3.1 thru 3.3.2.1, 3.3.5 thru 3.3.11.1, 3.3.13 thru 3.3.20, 3.4.7, 3.6 thru 3.10 shall be determined by examination for the defects listed in table V. Examination shall be visual, tactile, or by measurement with Standard Inspection Equipment (SIE).

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TABLE V. Classification of defects.

| Category | Defect | Method of examination |
|------------------|---|--------------------------------|
| <u>Critical:</u> | | |
| 01 | Landing legs inoperative (see 3.3.11). | Functional |
| 02 | Airlines and fittings not free of leaks (see 3.3.14.3). | Functional & SIE <u>1</u> / |
| 03 | Electrical system not as specified (see 3.3.15.1 & 3.3.15.2). | Functional |
| 04 | Intervehicular connecting plugs not as specified (see 3.3.15.3). | Visual |
| <u>Major:</u> | | |
| 101 | Dimensions and clearances not as specified (see 3.3.1). | SIE |
| 102 | Upper fifth wheel plate and kingpin not as specified (see 3.3.2 & 3.3.2.1). | Visual |
| 103 | Weight not as specified (see 3.3.5). | SIE |
| 104 | Platform and deck not as specified (see 3.3.6 & 3.3.6.1). | Visual |
| 105 | Folding front panels not as specified (see 3.3.8). | Visual & Functional |
| 106 | Panels, stakes and racks not as specified (see 3.3.9 thru 3.3.9.4). | Visual & Functional |
| 107 | Wheels, rims and tires not as specified (see 3.3.13 thru 3.3.13.2). | Visual |
| 108 | Tire changing capability not as specified (see 3.3.13.3). | Visual |
| 109 | Brake system malfunction (see 3.3.14). | Functional |
| 110 | Gladhand tags and wheel choke blocks not furnished (see 3.3.14.1 & 3.3.14.2). | Visual |
| 111 | Vehicle transportability not as specified (see 3.3.16 thru 3.3.16.2). | Visual |
| 112 | Cargo securement not as specified (see 3.3.17 thru 3.3.17.5). | Visual |
| 113 | Dock bumper and rear end protection not as specified (see 3.3.18 & 3.3.19). | Visual |
| 114 | Tractor compatibility not as specified (see 3.4.7). | Visual |
| 115 | Treatment and Painting not as specified (see 3.6). | Visual |
| 116 | Rustproofing not as specified (see 3.7). | Visual |
| 117 | Lubrication not as specified (see 3.10). | Visual & Functional |
| <u>Minor:</u> | | |
| 201 | Cover plates not provided (see 3.3.7). | Visual |
| 202 | Stowage provisions not as specified (see 3.3.10 thru 3.3.10.3). | Visual |
| 203 | Caging tool not furnished (see 3.3.14.4). | Visual |

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TABLE V. Classification of defects - Continued.

| Category | Defect | Method of examination |
|----------|--|-----------------------|
| 204 | Wheel splash and throw protection not as specified (see 3.3.20). | Visual |
| 205 | Marking not as specified (see 3.8). | Visual |
| 206 | Data plates not as specified (see 3.9 thru 3.9.3). | Visual |

1/ SIE = Standard Inspection Equipment.

4.6 Environmental. To determine conformance to 3.2.2, the semitrailer shall be cold soaked at -25°F (-4°C) for 24 hours, briefly operated, and then heat soaked at 125°F (52°C) (for 24 hours and then again operated). Altitude conditions may be simulated or the contractor shall certify that the semitrailer is capable of operating under the specified altitudes at the specified temperatures.

4.7 Maintainability. To determine conformance to 3.2.4 and 3.3.3, a maintenance ratio of less than or equal to that specified in 3.3.3 shall be demonstrated during tests. The maintenance ratio shall include all maintenance actions except for driver/crew checks and services, and maintenance induced errors.

4.8 Turning ability. To determine conformance to 3.4.2, the semitrailer-towing vehicle combination shall be operated as specified in 3.4.2 and checked for turning angle in both directions, observed for interference with the prime mover, and checked for damage to the trailer or prime mover.

4.9 Side slopes. To determine conformance to 3.4.3, the semitrailer shall be operated on a 20% side slope with the center of gravity 48 in. (122 cm) above the deck while proceeding in a sine wave, left to right mode, at 15 mph (24 km/h).

4.10 Fording ability. To determine conformance to 3.4.4, the semitrailer shall operate in fresh and salt water to a depth of 18 in. (45.5 cm). Immediately following the fording test, the wheel bearings and electrical components shall be examined for water contamination.

4.11 Tracking ability. To determine conformance to 3.4.5, the semitrailer shall be operated on a level, smooth, and paved surface and checked for tracking deviation.

4.12 Braking. To determine conformance to 3.4.6, the fully loaded semitrailer shall be towed with a prime mover to a speed of 20 mph at a slope of up to 20%. When the specified speed is obtained, the operator shall apply the semitrailer brake handle. Following the operation, the vehicle travel distance from brake application to full stop shall be measured.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. The semitrailer (M871A2) covered by this specification is intended for use by the Armed Service for transporting containerized or breakbulk cargo and shelters, of the configurations and weights specified in 3.2.1 to tactical military operations, while being towed by either the M818, M931, M931A1, M932A1, or the M915A1 truck-tractor fifth wheel, electrical and air brake system. The M871A2 semitrailer operates primarily within the area from Corps General Support Supply Activities to the Division Support Command.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
- c. When first article is required (see 3.1).
- d. The identification of special paint or camouflage pattern required (see 3.6).
- e. If special or tropical rustproofing is required (see 3.7).
- f. If special markings are required (see 3.8).
- g. If first article inspection is not required (see 4.2).
- h. If preproduction inspection is required (see 4.2.1).
- i. If initial production inspection is not required (see 4.2.2).
- j. Packaging requirements (see 5.1).

6.3 Test courses. Test courses used for the specified road tests are defined as follows:

- a. Highway. Paved hard surface with grades up to 10%.
- b. Secondary road. Maintained gravel and dirt with grades up to 12%.
- c. Off-road. Level to slightly hilly cross country with grades up to 20%.

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6.4 BII. BII supplied by the contractor and stowed on the semitrailer are as follows:

| Item | Reference Paragraph |
|---------------------------------|---------------------|
| Side and rear racks | 3.3.9 |
| Chains, 4 each | 3.3.9.4 |
| Ground board assembly, 2 each | 3.3.11.1 |
| Tire changing tools | 3.3.13.3 |
| Chock blocks | 3.3.14.2 |
| Caging tool | 3.3.14.4 |
| Twist lock with "F" pin, 4 each | 3.3.18.4 |

6.5 Tiedowns. The following specifies the corresponding National Stock Number (NSN) for each of the tiedowns specified in section 3.

| Tiedown | NSN |
|-------------------------|------------------|
| "Big foot" | 2540-01-117-3043 |
| "Mickey Mouse" | 2540-01-112-1732 |
| Twist lock with "F" pin | 2590-01-062-3520 |

6.6 Transportability. Information on the applicable transportability criterion is set forth in MIL-STD-1366 and MIL-STD-1791.

6.6.1 Slinging provision. Information on lift points to permit slinging a fully loaded semitrailer are set forth in accordance with type II of MIL-STD-209.

6.7 Subject term (key word) listing.

Ammunition transport
Trailer

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

Custodian:
Army - AT

Preparing Activity:
Army - AT

(Project 2330-0228)

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.
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I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER

MIL-PRF-62272C(AT)

2. DOCUMENT DATE (YYMMDD)

970122

3. DOCUMENT TITLE Semitrailer, Tactical, Dual Purpose Breakbulk/Container Transporter, 22-1/2 Ton, M871A2

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)

(1) Commercial

(2) AUTOVON
(If applicable)

7. DATE SUBMITTED
(YYMMDD)

8. PREPARING ACTIVITY

a. NAME

b. TELEPHONE (Include Area Code)

(1) Commercial

(810) 574-8745

(2) AUTOVON

786-8745

c. ADDRESS (Include Zip Code) Commander
U.S. Army Tank-automotive and Armaments Command
ATTN: AMSTA-TR-E/BLUE
Warren, MI 48397-5000

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