

MILITARY SPECIFICATION

TRAILER, MUNITIONS, MHU-185/M

This specification is approved for use by the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of The Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the requirements for the procurement of a munitions trailer designated as MHU-185/M.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on the date of invitation for bids, or request for proposal, form a part of this document to the extent specified herein.

SPECIFICATIONSMilitary

MIL-L-2104	Lubricating Oil, Internal Combustion Engine, Heavy-Duty
MIL-I-6866	Inspection, Penetrant Methods of
MIL-I-6868	Inspection Process, Magnetic Particle
MIL-G-10924	Grease, Automotive and Artillery
MIL-G-17745	Graphite, Colloidal (in Polyalkylene Glycol)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Engineering Specifications and Standards Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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SPECIFICATIONS

Military (Continued)

- MIL-W-21157 Weldment, Steel, Carbon and Low Alloy
- MIL-W-22248 Weldments, Aluminum and Aluminum Alloy
- MIL-I-45208 General Specifications for Inspection Requirements

STANDARDS

Military

- MIL-STD-129 Marking for Shipment and Storage
- MIL-STD-281 Automobile, Trucks, Truck-Tractors, and Trailer Dollies; Preservation and Packaging of
- MIL-STD-410 Non-Destructive Testing Personnel Qualification and Certification (Eddy Current, Liquid Penetrant, Magnetic Particle, Radiographic, and Ultrasonic)
- MIL-STD-831 Test Reports, Preparation of

DRAWINGS

Naval Air Systems Command Data List DL1318AS100, Trailer Munitions (and all documents listed thereon).

(Copies of specifications, standards, and drawings required by suppliers in connection with specific procurement functions, should be obtained from the procuring activity or as directed by the Contracting Officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Welding Society (AWS)
AWS D1.1 - Structural Welding Code

3. REQUIREMENTS

3.1 Design and Construction

3.1.1 Construction. The trailer shall be manufactured in accordance with Data List DL1318AS100 and all documents listed thereon.

3.1.2 Welding. All welding shall be in accordance with MIL-W-22248, AWS D1.1, or MIL-W-21157, Class 5, as applicable.

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3.1.2.1 Welding Inspection. During fabrication, all welding shall be inspected in accordance with MIL-I-6866 and MIL-I-6868 by personnel qualified under MIL-STD-410.

3.1.3 Lubrication. The trailer shall be lubricated with grease MIL-G-10924 or Lubricating oil MIL-L-2104, or graphite MIL-G-17745 as applicable.

3.2 First Article. When specified in the contract or purchase order, a first article sample shall comply with the requirements of this document, the drawings, and the contract.

3.2.1 First Article Sample. A first article sample shall be manufactured by the same procedures and processes, and at the same locations as proposed for the balance of the contract production.

3.3 Performance Requirements

3.3.1 Proof Load. The trailer, when supported by its running gear, shall withstand a proof load of 8000(+100 -0)pounds.

3.3.2 Brake System

3.3.2.1 Parking Brakes. The parking brakes shall be capable of holding the trailer, loaded with a 4000(+100 -0)pound test load, on a 15° grade in either direction.

3.3.2.2 Service Brakes. The service brakes shall be capable of stopping the trailer, loaded with 4000(+100 -0)pound test load, within 30 feet when traveling at 20 miles per hour, on level, dry concrete.

3.4 Towing Force. The towing force required to move the trailer from rest on smooth, dry, level, paved surface, such as brushed concrete, shall not exceed 50 pounds per ton of maximum gross weight, measured at the drawbar.

3.5 Workmanship. The trailer, including all parts and accessories, shall be fabricated in a manner that will insure that appearance, fit and adherence to specified tolerances shall be observed, and to assure within design limitations, the ability of the trailer to meet its performance requirements. Equipment having missing, inoperative, defective, bent, broken, or otherwise damaged parts, will not be acceptable. The installation of hardware parts, such as catches, pins, handles, nuts, bolts, etc. shall be accomplished in such a manner as to avoid damaging the hardware or the mounting surface. Hardware or mounting surfaces damaged in this way shall be touched up to provide a continuous protective coating. Screws, nuts, and bolts showing cross threading, mutilation, detrimental or hazardous burrs shall not be acceptable. Insulated wires shall be formed into cables or ducted whenever possible. Wires, cables, and brake lines shall be routed and positioned in a protective manner to avoid contact with rough or irregular surfaces

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and sharp edges. All welds shall be free of harmful defects such as cracks, porosity, undercuts, voids, and gaps. There shall be no evidence of burn through. Fillets shall be uniform and smooth. Angular or thickness misalignment, warpage, or dimensional change due to heat from the welding operation shall be within permitted tolerances. There shall be no damage to adjacent parts resulting from welding.

3.6 Marking. Marking for shipment shall be in accordance with MIL-STD-129.

3.7 Test Report. A test report shall be prepared in accordance with MIL-STD-831 delineating the results of testing the first article as described in paragraph 4.3.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Inspection System. The contractor shall provide and maintain an inspection system in accordance with MIL-I-45208.

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

- a. First Article Inspection (see 4.3)
- b. Individual Inspection (see 4.4)
- c. Sampling Inspection (see 4.5)

4.3 First Article Inspection. The first article sample (see 3.2.1) shall be subjected to the tests noted in Table I under first article and in the sequence as shown.

4.4 Individual Inspection. Each trailer shall be subjected to the tests noted in Table I under individual, and in the sequence as shown.

4.5 Sampling Inspection. Trailer components shall be inspected using sampling plans as noted on the detail drawings or if none is specified, as directed by the procuring activity.

4.5.1 Rejection and Retest. When a unit fails to satisfy the tests noted in paragraphs 4.3 and 4.4, no item still on hand or later produced shall be accepted until the extent and cause of failure are determined and resolved.

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4.5.2 Defects in Items Already Accepted. The investigation of a test failure could indicate that defects may exist in items already accepted. If so, the contractor shall fully advise the procuring activity of all defects likely to be found and methods of correcting them.

TABLE I

SEQUENCE	TEST	REQUIREMENT	TEST PARAGRAPH	FIRST ARTICLE	INDIVIDUAL
1	Examination of Product	3.1.1	4.6.1	x	x
2	Conformance to Drawings	3.1.1	4.6.1.2	x	x
3	Functioning		4.6.2	x	x
4	Towing Force	3.4	4.6.4	x	
5	Breakaway		4.6.4.1	x	
6	Side Slope		4.6.6.3	x	
7	Service Break	3.3.2.2	4.6.3.2	x	
8	Mobility		4.6.6	x	
9	Parking Brake	3.3.2.1	4.6.3.1	x	
10	Over Load	3.3.1	4.6.5.1	x	x

4.6 Test Methods

4.6.1 Examination of Product. Each trailer shall be examined visually to determine compliance with the requirements of this specification for which tests are not specified, including materials and workmanship. Particular attention shall be given to routing protection and functioning of the lighting circuits and brake lines.

4.6.1.2 Conformance to Drawings. Each trailer shall be inspected to determine conformance to the engineering drawings. Dimensions and attributes not in compliance with drawing tolerances shall not be acceptable.

4.6.2 Functioning. Each trailer shall be examined to determine that wheels are correctly aligned, that all brake systems function, including back-up, and are correctly adjusted, that the electrical system is in proper working order, that all points requiring lubrication are properly lubricated, and the wheel bearings are properly adjusted and lubricated. To check alignment, trailer shall be on a level surface and with front wheels straight ahead, measure the distance between the front wheels at hub height. Mark point where measurement was made.

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Roll trailer forward until these marks are on the opposite side of the axle (180°). Measure the distance between the wheels at hub height at this point. The difference between the two measurements is the actual toe-in; it should not be over 1/4 inch. If toe-in is not as stated, adjust to 0 to 1/4 inch. For adjustment, loosen jam nuts on both ends of the tie-rods and rotate tie-rods in or out as required. To adjust wheel bearings, jack or prop trailer to raise wheel off the ground. Spin the wheel and tighten adjusting nut until a heavy drag is felt. Then loosen nut until wheel rotates freely and bearing end play does not exceed 0.002 to 0.003 inches. Install cotter pin through nut and axle and replace grease cap.

4.6.3 Brake System Tests

4.6.3.1 Parking Brake Tests. The trailer, loaded with a 4000(+100 -0) pound test load (see paragraph 4.6.5.2), shall be placed on a +5 -0 degree inclined ramp, facing uphill, and with parking brakes applied, the trailer shall not roll. The loaded trailer shall then be tested facing downhill. This test should be performed after all mobility testing to insure that the brakes have been burnished sufficiently to achieve a successful test.

4.6.3.2 Service Brakes. The trailer loaded with 4000(+100 -0) pound test load (see paragraph 4.6.5.2), shall be connected to a prime mover and the trailer test brakes will then be tested in the following manner.

4.6.3.2.1 Brake Stopping Capability Test. Tow the loaded trailer at a speed of 20 MPH on a level, dry concrete surface. Stop by applying brakes of towing vehicle thus actuating the trailer inertia brake. The trailer shall stop within 30 feet or less of the point where brakes were first applied. The trailer shall exhibit no tendency to jackknife. At the end of five test cycles, inspect the service brakes and actuating mechanism. Failure to operate satisfactorily or evidence of excessive heating or distortion shall be cause for rejection.

4.6.3.2.2 Back-up Test. After acceptance under paragraph 4.6.3.2.1, the trailer shall be subjected to a back-up force. The service brakes shall hold momentarily but with continued force, shall release and allow unrestricted rearward travel. The test shall be performed five times.

4.6.4 Towing Force Test. A scale shall be placed between the prime mover and the towbar of the trailer, loaded with a 4000(+100 -0) pound test load (see paragraph 4.6.5.2). The prime mover shall apply a gradual towing force through the scale to the loaded trailer, with its brakes released and with the trailer on level concrete. The trailer shall roll before the scale registers 100 pounds.

4.6.4.1 Breakaway Test. Manually tow the trailer loaded with a 4000(+100 -0) pound test load. While under tow, exert a pull on the breakaway cable to actuate the brake system. The wheels should lock, bringing the trailer to a halt. This test will then be repeated, but this time, actuating the brake system with the manual device affixed to the surge brake, to bring the trailer to a halt.

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4.6.5 Load Tests

4.6.5.1 Over Load Test. The over load testing shall be accomplished by placing a 8000(+100 -0)pound test load evenly distributed over the entire trailer deck for a ten minute period. At completion of the test, evidence of permanent distortion such as warpage of trailer deck, or damage such as dents or breakage of component parts; or misalignment of wheels or other defects detrimental to the intended end use, shall be cause for rejection.

4.6.5.2 4000 Pound Test Load. The 4000(+100 -0)pound test load shall consist of bulk material, such as steel or concrete evenly distributed over the entire trailer deck, which shall not restrict the trailer cramping angle or drawbar movement.

4.6.6 Mobility Tests. During the following tests, the trailer shall be closely observed for its ease of handling. Any undesirable tendency to yaw, sway, dog walk, or jackknife, shall be cause for rejection.

4.6.6.1 Road Tests. The trailer loaded with a 4000(+100 -0)pound test load, shall be subjected to the following road tests:

<u>SURFACE</u>	<u>SPEED</u>	<u>DI STANCE</u>
Level Paved Highway	15-20 MPH	100 Miles
Graded Gravel Road	5-10 MPH	50 Miles
	5-10 MPH	5 Miles

*On a level course with a length of 5/8" chain temporarily welded to the outside of the wheel rim running over the tire to the inside of the wheel rim, installed on all tires.

4.6.6.2 Maneuverability. Upon completion of testing in paragraph 4.6.6.1, the loaded trailer shall be towed over level paved highway, at speeds of eight (8) MPH through twenty-five (25) right circle turns and twenty-five (25) left circle turns, both at maximum cramping angle. It shall then perform twenty-five (25) sudden stops at speeds of 20 MPH. At the conclusion of these tests and those described in paragraph 4.6.6.1, the vehicle shall be closely examined. Any evidence of excessive wear or damage shall be cause for rejection.

4.6.6.3 Side Slope Test. The trailer, loaded with a 4000(+100 -0) pound test load (see paragraph 4.6.5.2), evenly distributed over the entire deck and to a maximum height of 18 inches above the deck, shall be made to traverse a minimum 8 degree (1-3/4" rise/ft.) slope, at a speed of 5-10 MPH for a distance of 20 feet without overturning.

4.7 Magnetic Particle Inspection Test. Stressed weldments and castings, when required by the detail drawing, shall be subjected to magnetic particle inspection described in MIL-I-6868. No cracks are acceptable.

4.8 Penetrant Inspection. All aluminum welded joints shall be inspected in accordance with MIL-I-6866. No cracks are acceptable.

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4.9 Non-Destructive Testing. Magnetic particle and dye penetrant testing as required, shall be performed on all stress weld areas at completion of all the aforementioned tests on the first article unit, at the discretion of the Government inspector.

5. PREPARATION FOR DELIVERY

5.1 Preservation and Packaging. Preservation and packaging shall be in accordance with MIL-STD-281, Level C, or as required in the contract or purchase order.

6. NOTES

6.1 Intended Use. The MHU-185/M Munitions Trailer is intended for use at Navy shorebase stations to transport munitions and practice bombs from magazine to aircraft, for rocket build-up and transport, and general utility usage.

6.2 Ordering Data. Procurement documents should specify the following:

- a. Title, Number and Date of this Specification.
- b. Conditions under which Government loaned property, if any, will be made available to the Contractor.
- c. Selection of applicable levels of preservation, packaging, and packing required (see paragraph 5.1).
- d. Whether First Article Inspection is required (see paragraph 3.2).

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