

INCH-POUND
------------

MIL-DTL-85405A(AS)

22 September 1997

SUPERSEDING

MIL-T-85405(AS)

28 July 1980

## DETAIL 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 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 requirements 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).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division, Code 414100B120-3, Highway 547, Lakehurst, NJ 08733-5100, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.
--

AMSC N/A

FSC 1740

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

## MIL-DTL-85405A(AS)

## SPECIFICATIONS

## DEPARTMENT OF DEFENSE

MIL-PRF-2104	-	Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-PRF-10924	-	Grease, Automotive and Artillery
MIL-L-3572	-	Lubricant, Colloidal Graphite in Oil
MIL-W-21157	-	Weldment, Steel, Carbon and Low Alloy
MIL-W-22248	-	Weldments, Aluminum and Aluminum Alloy
MIL-V-62038	-	Vehicles, Wheeled; Preparation for Shipment and Storage Of

## STANDARDS

## DEPARTMENT OF DEFENSE

MIL-STD-129	-	Marking for Shipment and Storage
MIL-STD-410	-	Non-Destructive Testing Personnel Qualification and Certification (Eddy Current, Liquid Penetrant, Magnetic Particle, Radiographic, and Ultrasonic)

(Unless otherwise indicated, copies of the above specifications and standards 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

## PUBLICATIONS

## NAVAL AIR SYSTEMS COMMAND (NAVAIRSYSCOM)

DL1318AS100	-	Data List - Trailer, Munitions
-------------	---	--------------------------------

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).

## MIL-DTL-85405A(AS)

### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM-E1417 - Liquid Penetrant Examination, Standard Practice For (DoD Adopted)
- ASTM-E1444 - Particle Examination, Magnetic (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-D1.1 - Steel - Structural Welding Code, Standard For (DoD Adopted)

(Application for copies should be addressed to the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.)

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 Design and construction

3.1.1 Construction. The trailer shall be constructed in accordance with NAVAIR DL1318AS100 and all documents listed thereon.

3.1.2 Welding. All welding shall be in accordance with AWS-D1.1 for structural steel, MIL-W-21157, Class 5, for steel weldments or MIL-W-22248 for aluminum weldments.

3.1.2.1 Welding inspection. During fabrication, all welding shall be inspected in accordance with ASTM-E1417 and ASTM-E1444 by personnel qualified under MIL-STD-410.

3.1.3 Lubrication. The trailer shall be lubricated with grease in accordance with MIL-PRF-10924; lubricating oil, MIL-PRF-2104; or graphite, MIL-L-3572, as applicable.

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

## MIL-DTL-85405A(AS)

3.3 Performance requirements.

3.3.1 Functioning. The trailer shall be examined for proper functioning of wheels, brake systems, and electrical systems (see 4.5.2).

3.3.2 Proof load. The trailer, when supported by its running gear, shall withstand a proof load of 8,000 (+100, -0) pounds when subjected to the overload test specified in 4.5.5.1

3.3.3 Brake system.

3.3.3.1 Parking brakes. The parking brakes shall hold the trailer, loaded with a 4,000 (+100, -0) pound test load, on a 15° grade in either direction, front or rear when subjected to the test specified in 4.5.3.1.

3.3.3.2 Service brakes. The service brakes shall stop the trailer, loaded with a 4,000 (+100, -0) pound test load, within 30 feet when traveling at 20 miles per hour, on level, dry concrete when subjected to the test specified in 4.5.3.2.

3.4 Towing force. The towing force required to move the trailer from rest on a smooth, dry, level, paved surface, such as brushed concrete, shall be not greater than 50 pounds per ton of maximum gross weight, measured at the drawbar when subjected to the test specified in 4.5.4.

3.5 Mobility. The trailer shall be subjected to and pass the road tests (see 4.5.6.1), the maneuverability test (see 4.5.6.2), and the side slope test (see 4.5.6.3).

3.6 Workmanship. The trailer, including all parts and accessories, shall be constructed to ensure that appearance, fit, and adherence to specified tolerances shall be within design limitations. Equipment having missing, inoperative, defective, bent, broken, or otherwise damaged parts, shall not be acceptable. The installation of hardware parts, such as catches, pins, handles, nuts, bolts, shall not damage 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. Wires, cables, and brake lines shall be routed, positioned, and protected to avoid contact with rough or irregular surfaces 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.

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

## MIL-DTL-85405A(AS)

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 inspection (see 4.3).
- c. Sampling inspection (see 4.4).

4.2 First article inspection. First article inspection shall be performed on one complete trailer assembly. This inspection shall include the tests in table I under First Article and in the sequence shown.

4.3 Conformance inspection. Each trailer shall be subjected to the examinations and tests noted in table I under Conformance and in the sequence shown.

4.4 Sampling inspection. Trailer components shall be inspected using sampling plans noted on the components' detail drawings or if none are specified, as directed by the procuring activity (see 6.2).

4.4.1 Rejection and retest. When a unit fails the inspections (see 4.2 and 4.3), no item still on hand or later produced shall be accepted until the extent and cause of failure are determined and resolved.

4.5 Test methods.

4.5.1 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.

4.5.1.1 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.

4.5.2 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, the

## MIL-DTL-85405A(AS)

TABLE I. First article and conformance inspection.

SEQUENCE	TEST	REQUIREMENT	TEST PARAGRAPH	FIRST ARTICLE	CONFORMANCE
1	Examination of Product	3.1.1	4.5.1	X	X
2	Conformance to Drawings	3.1.1	4.5.1.1	X	X
3	Functioning	3.3.1	4.5.2	X	X
4	Towing Force	3.4	4.5.4	X	
5	Breakaway	3.4	4.5.4.1	X	
6	Side Slope	3.5	4.5.6.3	X	
7	Service Brake	3.3.3.2	4.5.3.2	X	
8	Mobility	3.5	4.5.6	X	
9	Parking Brake	3.3.3.1	4.5.3.1	X	
10	Overload	3.3.2	4.5.5.1	X	X

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. 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 0.250 inch. If toe-in is not as stated, adjust to 0 to 0.250 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.

## MIL-DTL-85405A(AS)

4.5.3 Brake system tests.

4.5.3.1 Parking brake tests. The trailer, loaded with a 4,000 (+100, -0) pound test load (see 4.5.5.2), 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 ensure that the brakes have been burnished to achieve a successful test.

4.5.3.2 Service brakes. The trailer loaded with 4,000 (+100, -0) pound test load (see 4.5.5.2), shall be connected to a prime mover and the trailer test brakes shall be tested in the following manner.

4.5.3.2.1 Brake stopping capability test. Tow the loaded trailer at a speed of 20 mph on level, dry concrete. Stop by applying brakes of towing vehicle thus actuating the trailer inertia brake. The trailer shall stop within 30 feet or less from the point where the brakes were first applied. The trailer shall not exhibit any tendency to jackknife. At the end of five test cycles, inspect the service brakes and actuating mechanism. Failure to operate or evidence of excessive heating or distortion shall be cause for rejection.

4.5.3.2.2 Back-up test. After acceptance under 4.5.3.2.1, 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.

4.5.4 Towing force test. A scale shall be placed between the prime mover and the towbar of the trailer, loaded with a 4,000 (+100, -0) pound test load (see 4.5.5.2). 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, dry concrete. The trailer shall roll before the scale registers 100 pounds.

4.5.4.1 Breakaway test. Manually tow the trailer loaded with a 4,000 (+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 shall 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.

4.5.5 Load tests.

4.5.5.1 Overload test. The overload test shall be accomplished by placing an 8,000 (+100, -0) pound test load evenly distributed over the entire trailer deck for a 10 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.

## MIL-DTL-85405A(AS)

4.5.5.2 4,000 pound test load. The 4,000 (+100, -0) pound test load shall consist of bulk material, such as steel or concrete evenly distributed over the entire trailer deck, and shall not restrict the trailer cramping angle or drawbar movement.

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

4.5.6.1 Road tests. The trailer loaded with a 4,000 (+100, -0) pound test load, shall be subjected to the following road tests:

SURFACE	SPEED	DISTANCE
Level Paved Highway	15-20 mph	100 miles
Graded Gravel Road	5-10 mph	50 miles
Level Course <u>1/</u>	5-10 mph	5 miles

1/ On a level course with a length of 0.625 inch chain temporarily welded to the outside of the wheel rim running over the tire to the inside of the wheel rim. This length of chain will be welded in the same manner on all four tires.

4.5.6.2 Maneuverability. Upon completion of road testing (see 4.5.6.1), the loaded trailer shall be towed over level paved highway, at speeds of 8 mph through 25 right circle turns and 25 left circle turns, both at maximum cramping angle. It shall then perform 25 sudden stops at speeds of 20 mph. At the conclusion of these tests and those described in 4.5.6.1, the vehicle shall be closely examined. Any evidence of excessive wear or damage shall be cause for rejection.

4.5.6.3 Side slope test. At a speed of 5 to 10 mph for a distance of 20 feet, the trailer, loaded with a 4,000 (+100, -0) pound test load (see 4.5.5.2), 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 (1.750 inch rise/foot) side slope without overturning.

4.6 Magnetic particle inspection test. Stressed weldments and castings, when required by the detail drawing, shall be subjected to magnetic particle inspection described in ASTM-E1444. Cracks are a cause for rejection.

4.7 Penetrant inspection. All aluminum welded joints shall be inspected in accordance with ASTM-E1417. Cracks are a cause for rejection.



## MIL-DTL-85405A(AS)

4.8 Non-destructive testing. Magnetic particle (see 4.6) and dye penetrant (see 4.7) testing shall be performed on all stress weld areas at completion of all the aforementioned tests on the first article unit and at the discretion of the Government inspector.

## 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 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. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2 and 2.3).
- c. Whether first article inspection is required (see 3.2 and 6.3).
- d. Sampling inspection (see 4.4)
- e. Packaging requirements (see 5.1).

6.3 First article provision. When first article samples are required, the manufacture of the trailer on the contract should not commence until the samples submitted are pronounced satisfactory by the acquiring activity. The submission of further first article samples on subsequent contracts may be waived at the discretion of the acquiring activity. Approval of first

## MIL-DTL-85405A(AS)

article samples or the waiving of first article tests does not eliminate the requirements of conformance inspection, see 4.3. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations and test approval of the first article. The activity responsible for first article is Commander, Naval Air Warfare Center Aircraft Division, Code 4.8.2.6, M/S 562-3, Highway 547, Lakehurst, NJ 08733-5130, and information pertaining to first article inspection may be obtained from that activity.

## 6.4 Subject term (key word) listing.

- Ammunition
- Bombs
- Loader
- Magazine
- Ordnance
- Vehicle
- Weapons

6.5 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.

## CONCLUDING MATERIAL

Preparing activity:  
Navy - AS  
(Project 1740-0182)

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.  
NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

**I RECOMMEND A CHANGE:**

**1. DOCUMENT NUMBER**

MIL-DTL-85405A(AS)

**2. DOCUMENT DATE**

(YYMMDD)

970922

**3. DOCUMENT TITLE**

TRAILER, MUNITIONS, MHU-185/M

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

**5. REASON FOR RECOMMENDATION**

**6. SUBMITTER**

**a. NAME** (*Last, First, Middle Initial*)

**b. ORGANIZATION**

**c. ADDRESS** (*Include Zip Code*)

**d. TELEPHONE**  
(*Include Area Code*)

**7. DATE SUBMITTED**  
(YYMMDD)

(1) Commercial:

(2) DSN:  
(*If Applicable*)

**8. PREPARING ACTIVITY**

**a. NAME**  
COMMANDER  
NAVAL AIR WARFARE CENTER  
AIRCRAFT DIVISION

**b. TELEPHONE NUMBER** (*Include Area Code*)  
(1) Commercial (908) 323-2970 (2) DSN 624-2970

**c. ADDRESS** (*Include Zip Code*)  
CODE 4.1.4.2B120-3  
HIGHWAY 547  
LAKEHURST, NJ 08733-5100

**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