



MIL-L-81558

26 September 1967

MILITARY SPECIFICATION

LUG, SUSPENSION, (1000 POUND) AIRBORNE EQUIPMENT

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

1. SCOPE

1.1 This specification covers the requirements for a 1000 pound suspension lug for airborne equipment.

2. APPLICABLE DOCUMENTS

2.1 Government documents normally furnished - The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein.

SPECIFICATIONS

Federal

PPP-B-585	Box, Wood, Wirebound
PPP-B-591	Box, Fiberboard, Wood-cleated
PPP-B-601	Box, Wood, Cleated-Plywood
PPP-B-636	Box, Fiberboard
PPP-B-676	Box, Setup
PPP-T-60	Tape, Pressure-sensitive Adhesive, Waterproof, For Packaging
PPP-T-76	Tape Pressure Sensitive, Adhesive Paper, Water Resistant, For Carton Sealing

Military

MIL-P-116	Preservation, Methods of
MIL-I-6868	Inspection Process, Magnetic Particle

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SPECIFICATIONS

Military (Cont'd)

MIL-F-7190	Forgings, Steel, For Aircraft and Special Ordnance Applications
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STANDARDS

Federal

FED-STD-151	Metals, Test Methods
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Military

MIL-STD-129	Marking for Shipment and Storage
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MS3314	Lug, Suspension, (1000 Lb. Class), Airborne Equipment
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PUBLICATIONS

National Bureau of Standards

Handbook H28	Screw-Thread Standards for Federal Services
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(When requesting applicable documents, refer to both title and number. Copies of unclassified documents may be obtained from the Commanding Officer, Naval Supply Depot (Code 1051), 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120. Requests for copies of classified documents should be addressed to the Naval Supply Depot, via the cognizant Government inspector.)

3. REQUIREMENTS

3.1 Preproduction - The suspension lug furnished under this specification shall be a product which has been inspected and passed the preproduction inspection specified herein.

3.2 Materials - Materials shall conform to applicable specifications and shall be as specified herein and on applicable drawings.

3.3 Design and construction - The design and construction of the suspension lug shall be as specified herein and in accordance with MS3314.

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- 3.3.1 Forging - The suspension lugs shall be constructed from forgings in accordance with MIL-F-7190, Grade B.
- 3.3.2 Threads - Thread dimensions and designations shall be interpreted in accordance with Handbook H28.
- 3.4 Performance - The suspension lug shall meet the performance requirements specified in Section 4 when subjected to the applicable inspections.
- 3.5 Hardness - The suspension lug shall meet the hardness requirement indicated on MS3314.
- 3.6 Magnetic particle inspection - The suspension lugs furnished under this specification shall pass the magnetic particle inspection specified in Section 4.
- 3.7 Workmanship - The workmanship displayed in fabrication of the suspension lug shall be such as to assure, within design limitations, ability of the suspension lug to meet its performance requirements under all applicable environmental conditions. Unauthorized repair, welding, heavy burrs, are typical signs of inferior workmanship. The standards of workmanship exhibited in any approved preproduction sample, subject to any qualification stated in the Government's notice of approval, shall be determinative of the requirements of the contract relative to workmanship insofar as not specifically covered by applicable specifications.

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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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.

4.2 Classification of inspection - The inspection of the suspension lugs shall be classified as follows:

- (a) Preproduction inspection
- (b) Quality conformance inspection

4.3 Preproduction inspection - Preproduction inspection shall consist of all the inspections of this specification conducted in accordance with the inspection schedule listed below:

- (a) Each suspension lug shall be subjected to the following tests:

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- (1) Examination of product (4.6.1)
 - (2) Hardness test (4.6.4)
 - (3) Magnetic particle inspection (4.6.6)
- (b) Having passed the inspections in 4.3(a) the preproduction sample shall be divided into six (6) groups of 25 each. Each group shall be subjected to one of the following tests:
- (1) Tensile test (4.6.2 (c)) Group 1 (25 lugs)
 - (2) Tensile test (4.6.2 (d)) Group 2 (25 lugs)
 - (3) Tensile test (4.6.2 (a)) Group 3 (25 lugs)
 - (4) Tensile test (4.6.2 (b)) Group 4 (25 lugs)
 - (5) Tensile test (4.6.2 (e)) Group 5 (25 lugs)
 - (6) Impact test (4.6.3) Group 6 (25 lugs)

4.3.1 Sampling for preproduction inspection - Unless otherwise specified, as soon as practicable after award of contract or order, the contractor shall furnish preproduction samples for inspection to determine conformance with this specification and MS3314. Preproduction samples shall consist of one hundred fifty (150) suspension lugs. The samples shall be identified with the manufacturer's part number and contract number and shall be inspected as specified herein and in accordance with the contract or order (see 6.2).

4.4 Quality conformance inspection - The quality conformance inspection shall consist of individual inspection and sampling tests.

4.4.1 Individual inspection - Unless otherwise specified each suspension lug on the contract or order shall be subjected to the following inspection in the order listed. Any lug containing a defect or failing to pass any of these inspections shall be rejected:

- (a) Examination of product (4.6.1)
- (b) Hardness test (4.6.4)
- (c) Proof load (4.6.5)
- (d) Magnetic particle test (4.6.6)

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4.4.2 Sampling inspection - A random sample of 150 suspension lugs shall be selected from each production lot and shall be subjected to the following tests in the order listed. Failure of any suspension lug shall be cause for rejection of the entire lot.

- (a) Tensile test (4.6.2 (c)) Group 1 (25 lugs)
- (b) Tensile test (4.6.2 (d)) Group 2 (25 lugs)
- (c) Tensile test (4.6.2 (a)) Group 3 (25 lugs)
- (d) Tensile test (4.6.2 (b)) Group 4 (25 lugs)
- (e) Tensile test (4.6.2 (e)) Group 5 (25 lugs)
- (f) Impact test (4.6.3) Group 6 (25 lugs)

4.4.2.1 Production lot - A production lot shall consist of 2000 suspension lugs heat treated at one time in one furnace and which are all subjected to the same treatment operations. If a continuous heat treating operation is employed, a lot will be defined as a quantity of 2000 lugs from a continuous run through one furnace or treating process under one set of unchanged conditions.

4.5 Test fixture - The test fixture shall be designed to simulate a bomb rack hook having a bearing surface 13/32 inch in width. The length of thread engagement between the suspension lug and the test fixture shall not exceed 1/2 inch.

The thread in the fixture shall meet the following special conditions:

- (a) Pitch diameter 1.7013 (min)
- (b) Minor diameter 1.6696 (min)

4.6 Inspection methods -

4.6.1 Examination - Each suspension lug shall be thoroughly examined to determine conformance to all of the requirements of the specification and applicable military standard for which no specific tests are described.

4.6.1.1 The suspension lugs shall be examined to ascertain that the preparation for delivery conforms to this specification.

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4.6.2 Tensile tests - Tensile loads shall be applied using the test fixture described in 4.5 and in the directions as shown in Figure 1. Tensile loads (a) thru (e) shall be applied at ambient room temperature and the speed of testing shall be in accordance with Federal Test Method Standard No. 151, method 211.1, paragraph 5.4 and the load shall be held for a period of one (1) minute as follows:

- (a) Load, direction "W", 27000 lbs. There shall be no permanent deformation.
- (b) Load, direction "W", 35000 lbs. There shall be no rupture.
- (c) Load, direction "X", 18000 lbs. There shall be no permanent deformation.
- (d) Load, direction "X", 23300 lbs. There shall be no rupture.
- (e) Load, direction "Y". Each suspension lug shall be sufficiently ductile to withstand a deflection of 0.1 inch measured at the center of the cross bar in direction "Y" without rupture when mounted in the test fixture.

4.6.3 Impact test - The finished suspension lug, notched as shown in Figure 1, maintained in a uniform temperature of -65°F, shall be subjected to an impact load of 200 ft lbs applied in direction "Z" as shown in Figure 1. The impact load shall be produced by a body weighing 20 lbs falling freely through a distance of 10 feet. The impact shall be applied by an anvil having a flat surface 1/4 inch in diameter and a minimum hardness of Rockwell C 60. There shall be no failure.

4.6.4 Hardness test - Each suspension lug shall be subjected to the hardness test in accordance with FED-STD-151, Method 243.1. The hardness shall be as indicated on MS3314.

4.6.5 Proof load - Each suspension lug shall be subjected to the tensile test in 4.6.2 (a) except the load shall be held for a period of five (5) seconds.

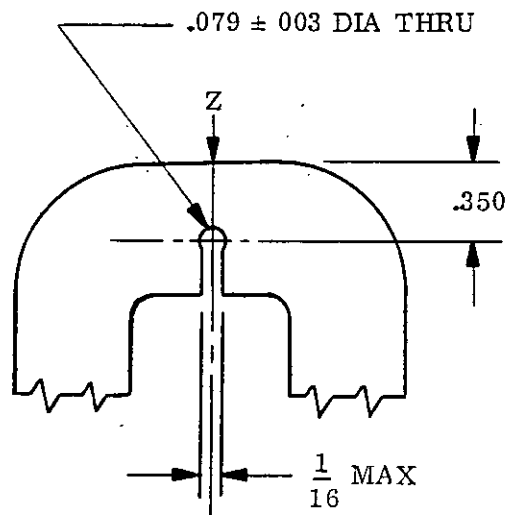
4.6.6 Magnetic particle inspection - Each suspension lug shall be inspected in accordance with MIL-I-6868. There shall be no evidence of cracks, seams, laps, or other detrimental defects.

5. PREPARATION FOR DELIVERY

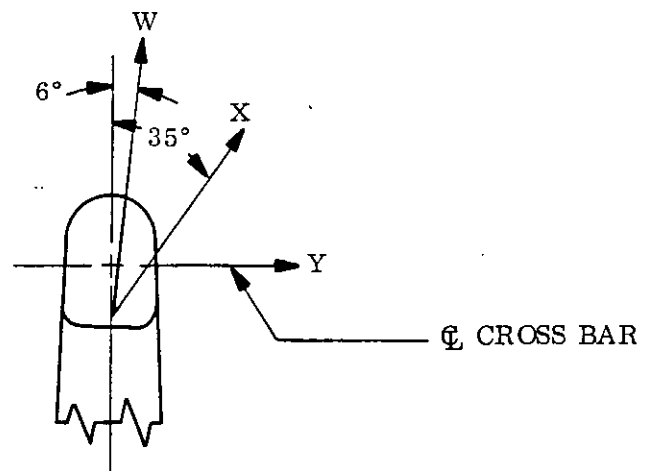
5.1 Packaging - Packaging shall be Level A or C, as specified.

5.1.1 Level A - Suspension lugs shall be unit packaged, one each, in accordance with Method 1 C of MIL-P-116. The threads shall be adequately protected in the process. Preservative compound is not required.

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DETAIL - IMPACT NOTCH



VIEW OF LOAD APPLICATION

FIGURE 1

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5.1.1.1 Intermediate packaging - The intermediate package shall not weigh more than 25 pounds. The container shall conform to PPP-B-676 except when packed in wirebound boxes (See 5.2.1). When packed in wirebound boxes, weather resistant classes of fiberboard boxes per PPP-B-636 shall be used. The center seam, side seams and manufacturer's joint shall be sealed with tape conforming to PPP-T-60 or PPP-T-76.

5.1.2 Level C - Suspension lugs shall be packaged in a manner which will afford adequate protection from physical damage during shipment from the supply source to the first receiving activity for immediate use. This level, as a minimum, will conform to applicable carrier rules and regulations and may be the suppliers commercial practice when such meets the requirements of this level.

5.2 Packing - Packing shall be A, B or C as specified.

5.2.1 Level A - Suspension lugs, packaged as specified above, shall be packed in containers conforming to the overseas requirements of PPP-B-585, PPP-B-591, PPP-B-601 or weather resistant classes PPP-B-636. Closure shall be in accordance with the closure requirements of the applicable box specifications. PPP-B-591 and PPP-B-636 are not to be used for South East Asia (SEA) shipments.

5.2.2 Level B - Suspension lugs, packaged as specified above, shall be packed in containers conforming to the domestic requirements of PPP-B-585, PPP-B-591, PPP-B-601 or PPP-B-636. Closure shall be in accordance with the closure requirements of the applicable box specifications.

5.2.3 Level C - Suspension lugs shall be packed in a manner which will provide protection from corrosion, deterioration and damage during direct shipment from the contractor or supply source to the first receiving activity for immediate use. The type of containers used shall conform to applicable carrier rules and regulations.

5.3 Marking - In addition to any special marking required by the contract or order, all marking shall be in accordance with MIL-STD-129.

6. NOTES

- 6.1 Intended use - The suspension lug covered by this specification is intended for use to support airborne equipment from aircraft suspension racks with 14 inch centers.

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6.2 Information for contracting officer - Contracts or orders should specify the following:

- (a) Title, number, and date of this specification.
- (b) Selection of applicable levels of preservation, packaging, and packing required.
- (c) Samples subjected to sampling inspection (see 4.4.2) are not to be considered or shipped as part of the contract or order.
- (d) Items of data required (see 6.3).
- (e) Inspection equipment (see 6.4).

6.2.1 Contracts or orders should specify the following provisions for preproduction inspection.

6.2.1.1 Whether preproduction inspection is required. When a contractor is in continuous production of the suspension lugs from contract to contract, consideration should be given to waive the preproduction inspections. If preproduction inspection is required, indicate:

- (a) where the preproduction inspection is to be conducted (at the contractor's plant or Government or commercial laboratory).
- (b) that the approval of preproduction samples or the waiving of the preproduction inspection shall not relieve the contractor of his obligation to fulfill all other requirements of the specification and contract.

6.3 Data - For the information of Contractors and Contracting Officers, any of the data specified in (a) subparagraphs below, (b) applicable documents listed in Section 2 of this specification, or (c) referenced lower-tier documents need not be prepared for the Government and shall not be furnished to the Government unless specified in the contract or order. The data to be furnished shall be listed on DD Form 1423 (Contractor Data Requirements List), which shall be attached to and made a part of the contract or order.

6.3.1 Preproduction data - When preproduction samples are submitted (see 6.2) they should be accompanied by a complete inspection report showing the results of the contractor's inspections. The inspection report should include the following:

- (a) Report of all inspections graphically presented when possible, together with a detailed statement indicating compliance or

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extent of noncompliance with all requirements of this specification and applicable military standard referring specifically to paragraph numbers. Wherever a requirement is considered to be not applicable, the report should so state.

- (b) Diagrams of inspection set-ups. A complete description of inspection equipment and inspection procedures.
- (c) Reproducible outline and description of inspection conditions. Where inspections specified in this specification are not considered applicable, the reason, and the substituted inspection should be clearly described.
- (d) Copies of inspection log sheets.
- (e) Photographs when available.

6.4 Inspection equipment - The supply and maintenance of inspection equipment should be in accordance with MIL-I-45607.

Custodians:

Navy - AS
Air Force - 18
Army - MU

Preparing Activity:

Navy - AS
Coordination Method
Code "C"
Project No. 1325-0121

Review Activities:

Navy - AS
Air Force - 11, 18, 70
Army - MU

User Activities:

Army - MI, AV

Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current Federal Supply Classification Listing of DOD Standardization Documents.

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Naval Air Engineering Center
Philadelphia, Pennsylvania 19112

POSTAGE AND FEES PAID
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Weapons Engineering Standardization Office (Code X)
Naval Air Engineering Center
Philadelphia, Pennsylvania 19112

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SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
<u>INSTRUCTIONS</u>		
This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).		
SPECIFICATION MIL-L-81558, Lug, Suspension, (1000 pound), Airborne Equipment		
ORGANIZATION (of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?		
A. GIVE PARAGRAPH NUMBER AND WORDING.		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE?		
<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE