

MIL-F-8490A (ASG)

28 FEBRUARY 1958

Superseding
MIL-F-8490 (USAF)
17 May 1954

MILITARY SPECIFICATION

FASTENER, CASE, FOR EQUIPMENT RACK SYSTEM IN AIRCRAFT

This specification has been approved by the Department of the Air Force and by the Navy Bureau of Aeronautics.

1. SCOPE

1.1 This specification covers the detail requirements for one type of fastener used on cases for the equipment-rack system in aircraft.

2. APPLICABLE DOCUMENTS

2.1 The following publications, of the issue in effect on date of invitation for bids, form a part of this specification to the extent specified herein:

SPECIFICATIONS

Federal

QQ-A-318	Aluminum Alloy 52S; Plate and Sheet
QQ-P-416	Plating, Cadmium (Electrodeposited)
PPP-B-566	Boxes, Folding, Paperboard
PPP-B-585	Boxes, Wood, Wirebound
PPP-B-591	Boxes, Fiberboard, Wood-Cleated
PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-621	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	Boxes, Fiber
PPP-B-676	Boxes, Set-Up, Paperboard
PPP-T-60	Tape, Pressure-sensitive, Adhesive, Waterproof - for Packaging and Sealing.

Military

JAN-P-100	Packaging and Packing for Overseas Shipment, General Specification
MIL-P-116	Preservation, Methods of
MIL-B-138	Boxes, Wood, Fiberboard-Lined for Overseas Shipment (For Weight Contents Not Exceeding 500 Pounds)
MIL-B-4229	Boxes; Paperboard, Metal Stayed
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-B-10377	Box, Wood, Cleated Veneer, Paper Overlaid
MIL-L-10547	Liners, Case, Waterproof

FSC 5325

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STANDARDSFederal

Fed. Test Method
Std. No. 151 Metals; Test Methods

Military

MIL-STD-105 Sampling Procedures and Tables for Inspection
by Attributes
MIL-STD-129 Marking for Shipment and Storage

PUBLICATIONSAir Force-Navy Aeronautical Bulletin

No. 143 Specifications and Standards; Use of

(Copies of specifications, standards, and drawings required by contractors 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 document forms a part of this specification. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

National Bureau of Standards

Handbook H28 - Screw Thread Standards for Federal Services

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.)

3. REQUIREMENTS

3.1 Qualification.- The nut-strip and fastener assembly furnished under this specification shall be a product which has been tested and has passed the Qualification test specified herein.

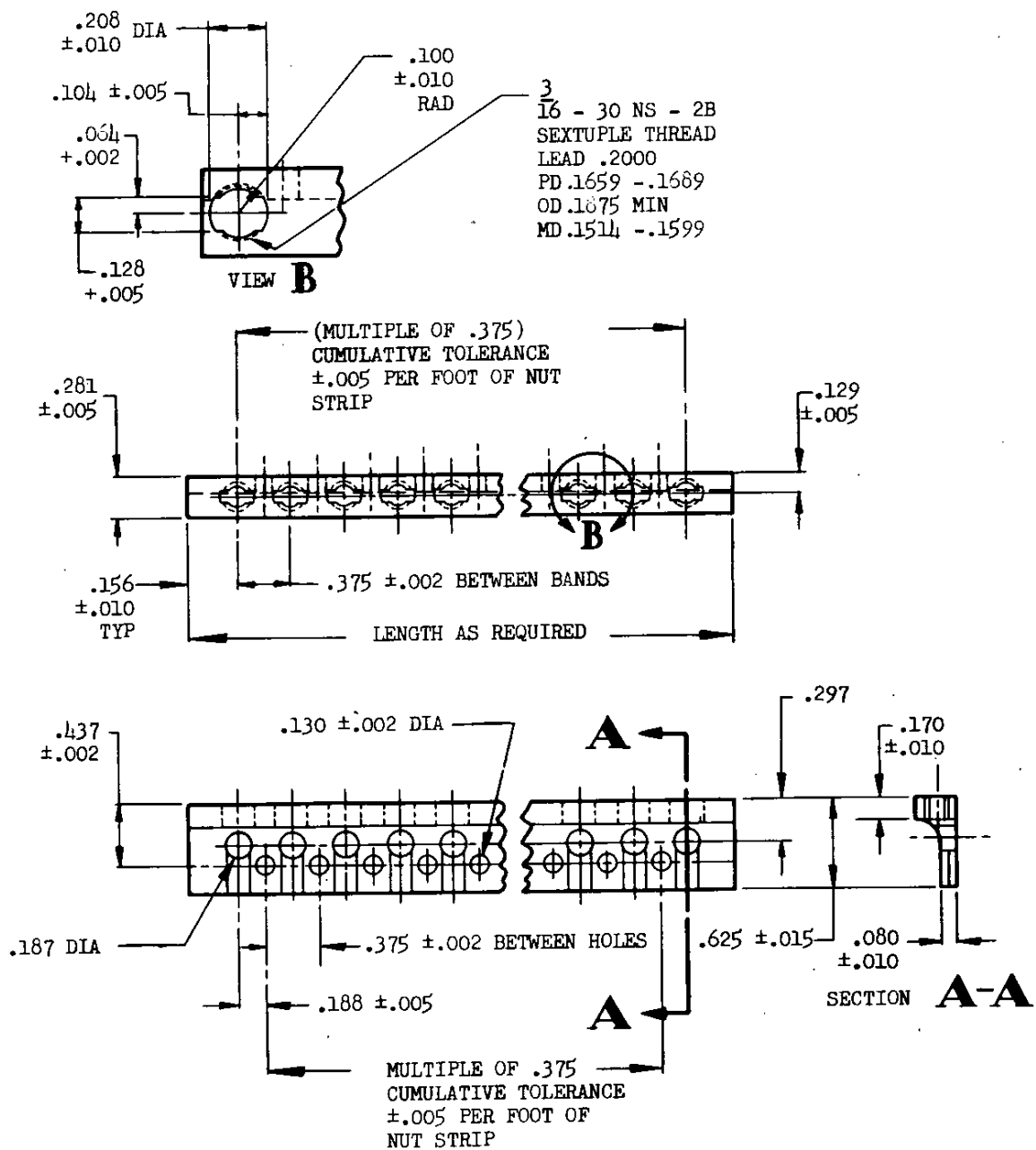
3.2 Materials.- Materials shall conform to applicable specifications as specified herein. Materials which are not covered by applicable specifications or which are not specifically described herein shall be of the best quality, of the lightest practicable weight, and suitable for the purpose intended.

3.2.1 Selection of materials.- Except as indicated in this specification, material shall be specified in the applicable equipment specification. Where a definite material is not specified, the material used shall be in accordance with ANA Bulletin No. 143. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.3 Design.- The fastener shall be of the stud nut-strip design so that when the fastener is unlocked or open, the stud assembly is retained by the case panel and the nut-strip is retained by the rack structure support.

3.3.1 Nut-strip.- The design of the nut-strip shall be in accordance with Figure 1.

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DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED,
TOLERANCES: DECIMALS ±.016.
REMOVE ALL BURRS.

FIGURE 1. Nut strip, fastener aircraft equipment panel

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3.3.2 Fastener assembly.- Design of the fastener assembly shall meet the performance requirements of this specification, and shall be in accordance with the dimensional requirements of figure 2.

3.3.3 Engaging.- The stud shall engage the receptacle strip within 90° of rotation in the clockwise direction.

3.3.4 Locking.- The stud shall be positively locked at 90° of rotation in clockwise direction. The screwdriver slot shall be parallel to the long axis of the nut-strip when in the locked position. The stud shall be positively unlocked at 90° of rotation in the counter clockwise direction and screwdriver slot shall be perpendicular to the long axis of the nut-strip. A positive lock and unlock shall be present in the fastener assembly when the stud is not inserted in the nut-strip.

3.3.5 Stop.- A positive stop shall be provided to prevent the stud from being turned past the positions of full lock and full unlock.

3.3.6 Screw threads.- Screw threads shall be in accordance with Handbook H28 and figures 1 and 2.

3.4 Finish.- Parts of steel shall be cadmium plated in accordance with Specification QQ-P-416, Class B, Type II, black. Where aluminum or aluminum-alloy parts are used they shall be covered with an anodic film in accordance with Specification MIL-A-8625 except where otherwise specified.

3.5 Interchangeability.- All parts having the same manufacturer's part number shall be directly and completely interchangeable with each other with respect to installation and performance.

3.6 Fastener stud head.- With the fastener stud unlocked, the top surface of the head shall remain within the outline dimensions of the fastener assembly shown on figure 2.

3.7 Screwdriver slot.- The screwdriver slot in the fastener stud head shall conform to the dimensions on figure 2. With the fastener in the locked position, the screwdriver slot shall be in line with the long axis of the nut-strip.

3.8 Corrosion resistance.- The fastener shall withstand the corrosion test specified (see 4.4.13).

3.9 Hardness.- Fastener studs shall be hardened to prevent damage to screwdriver slots. They shall have Rockwell hardness of 15-N-80 minimum, or, if fabricated of through hardening steel, shall be heat-treated to a Rockwell hardness of C-30 minimum.

3.10 Installation of fastener assembly.- Installation provisions of a fastener assembly to a case panel shall be in accordance with figure 2. It shall be possible to remove a damaged fastener assembly and install a new one without damaging the panel, by the use of simple hand tools which shall be designed and furnished by the fastener manufacturer.

3.11 Performance.-

3.11.1 Locking torque.-

3.11.1.1 Maximum locking torque.- The maximum torque required to lock the fastener shall be 15 pound-inches. (See 4.4.1, 4.4.4, 4.4.9, and 4.4.10.)

3.11.1.2 Minimum locking torque.- The minimum torque required to lock the fastener shall be 2 pound-inches. (See 4.4.1, 4.4.4, 4.4.9, and 4.4.10.)

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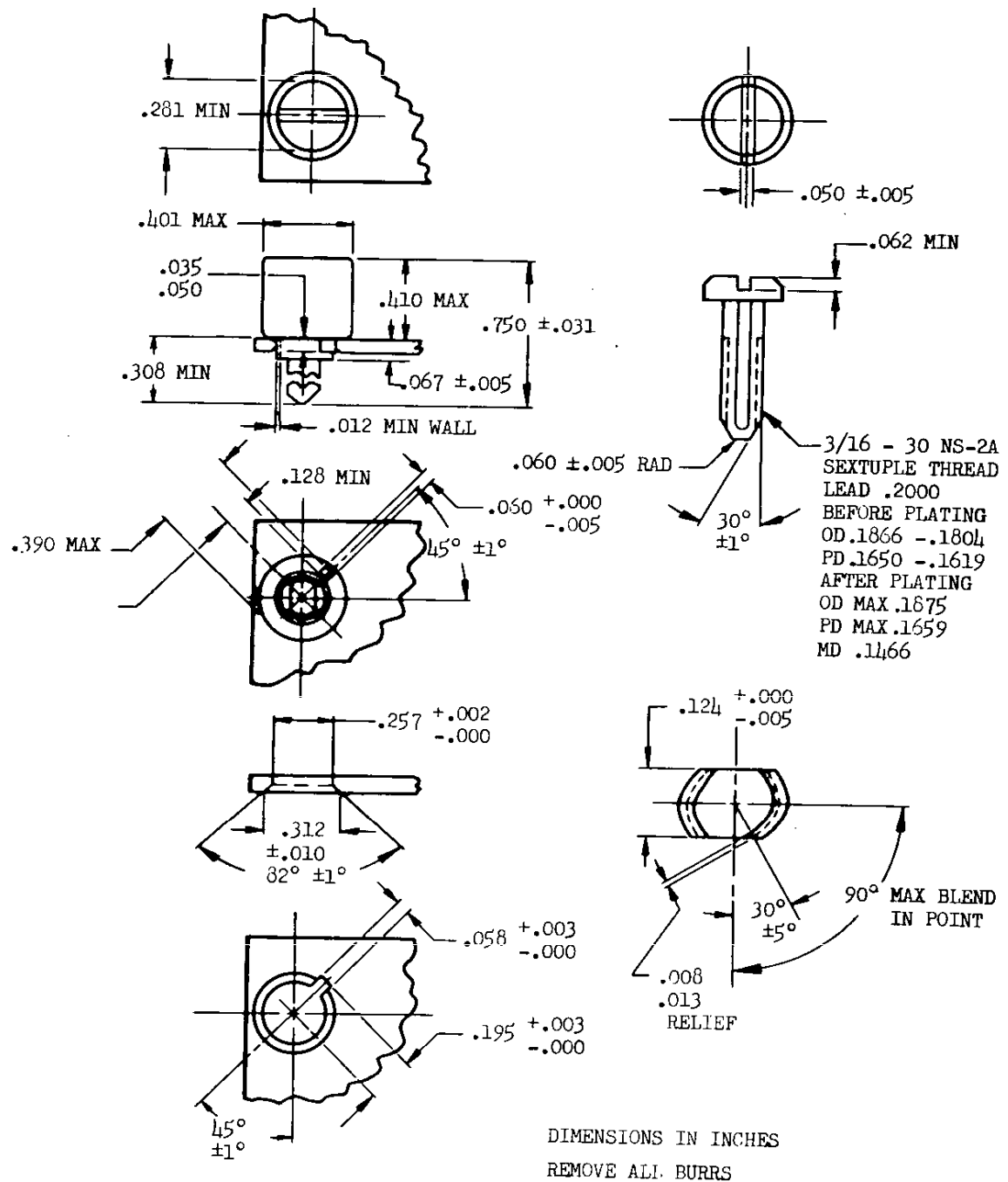


FIGURE 2. Fastener assembly aircraft equipment panel

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3.11.2 Unlocking torque.-

3.11.2.1 Maximum unlocking torque.- The maximum torque required to unlock the fastener shall be 16 pound-inches. (See 4.4.2, 4.4.4, 4.4.9, and 4.4.10.)

3.11.2.2 Minimum unlocking torque.- The minimum torque required to unlock the fastener shall be 2 pound-inches. (See 4.4.2, 4.4.4, 4.4.9, and 4.4.10.)

3.11.3 Initial tension.- The initial tension (bearing pressure), measured in accordance with the procedure specified herein, shall be not less than 30 pounds. (See 4.4.3.)

3.11.4 Rated tensile load.- The rated tensile load for the fastener shall be 400 pounds. (See 4.4.4.)

3.11.5 Panel and nut-strip separation.- The panel and nut-strip separation shall not exceed 3/64 inch when the fastener is subjected to the rated tensile load. (See 3.11.4.)

3.11.6 Endurance.- The fastener shall withstand, without failure, 4,000 locking and unlocking operational cycles at approximately 110 cpm.

3.11.7 Locking stop strength.- The locking stop strength of the fastener assembly is 30 pound-inches. (See 4.4.7.)

3.11.8 Tensile overload.- The fastener shall withstand without failure any tensile load up to 150 per cent of rated tensile load, five succeeding times, each of 5 seconds duration. (See 4.4.8.)

3.11.9 Nut-strip spacing tolerance.- The fastener assembly shall satisfactorily engage and disengage the nut-strip and shall operate into the locked and unlocked positions without exceeding the maximum or minimum torque values specified when subjected to the nut-strip spacing tolerance test as specified in 4.4.9.

3.11.10 Rated shear load.- The rated shear load for the fastener shall be 200 pounds.

3.11.11 Shear overload.- The fastener shall withstand without failure any shear load up to 150 percent of the rated shear load, five successive times, each of 5 seconds duration.

3.11.12 Vibration.- The fastener shall withstand the vibration test as specified in 4.4.12 without evidence of damage or impairment. This requirement shall apply for any feasible attitude of the mounting of the test jig, (Figure 9) that is, vertical, horizontal, or oblique.

3.11.13 Fastener assembly mounting flange.- The fastener assembly mounting flange shall retain the fastener assembly within the panel with no degree of looseness.

3.12 Workmanship.- Workmanship shall be in accordance with high-grade aircraft manufacturing practices. Fastener parts shall be free from tool marks, burrs, flaws, and other defects.

4. QUALITY ASSURANCE PROVISIONS

4.1 Classification of tests.- The inspection and testing of the fasteners shall be classified as follows:

- (a) Qualification tests (see 4.2).
- (b) Acceptance tests (see 4.3).

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4.2 Qualification tests.— Qualification tests shall be conducted at a Government laboratory or as designated by the procuring agency.

4.2.1 Qualification test samples.— The Qualification test samples shall consist of four lengths of nut-strip as shown in figure 1, each 2 feet long; 12 fasteners as shown in figure 2, 4 specimens as shown in figure 3, 4 specimens as shown on figure 4, and 4 as shown in figure 5. Samples submitted for qualification testing shall be accompanied by two complete sets of manufacturing detail drawings of the sample submitted for test. These samples shall be clearly identified by securely attached durable tags marked with the following information:

Sample for Qualification test
 Name of item
 Name of manufacturer
 Manufacturer's part number
 Submitted by (name) (date) for Qualification Test
 in accordance with the requirements of Specification
 MIL-F-8490A under authorization (reference authorizing
 letter)

4.2.2 Tests.— Qualification tests of fasteners shall consist of all the tests contained in this specification.

4.3 Acceptance tests.— Acceptance tests shall consist of Sampling plan A and Sampling plan B or C.

4.3.1 Sampling plan A.— A sample of the size specified by table IV-A of Standard MIL-STD-105 shall be selected at random from each lot and dimensionally and visually inspected in accordance with the appropriate classification of defects shown in table I and table II.

4.3.1.1 Inspection lot.— Unless otherwise specified, a lot for inspection purposes shall be as is defined in Standard MIL-STD-105.

4.3.1.2 AQL's.— AQL's for major, minor A, and minor B classes of characteristics shall be as follows:

Major 1.0 percent
 Minor A 2.5 percent
 Minor B 4.0 percent

4.3.1.3 Definitions of defect classes.— Major and minor defects are defined in Standard MIL-STD-105. Minor defects are broken down into two classes, minor A and Minor B defects, as follows:

- (a) Minor A: A minor A defect is classified as a defect which has a slight effect on usability.
- (b) Minor B: A minor B defect is classified as a defect which has no effect on usability but which does not conform to workmanship standards.

4.3.1.4 Classification of defects.— All dimensional characteristics are considered defective when out of tolerance. The classification of defects shall be as specified in table I and table II.

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TABLE I

Nut-strip

Class	No.	Defects
Major	101	Width of strip (0.281) undersize (see minor B 309).
	102	Thread pitch, major, or minor diameters oversize or undersize.
	103	Material, flaws, cracks, or imperfections.
Minor A	201	Locating dimension for threaded holes (0.129) oversize or undersize.
	202	Distance between threaded holes (0.375) oversize or undersize.
	203	Distance between end threaded holes (multiple of 0.375) oversize or undersize.
	204	Width of slot in threads (0.128) oversize or undersize.
	205	Locating dimensions for slot (0.064) oversize or undersize.
	206	Locating dimension for rivet holes (0.437) oversize or undersize.
	207	Locating dimension rivet holes (0.188) oversize or undersize.
	208	Locating dimension for rivet holes (0.375) oversize or undersize.
	209	Distance between end rivet holes (multiple of 0.375) oversize or undersize.
	210	Rivet hole diameter (0.130) oversize or undersize.
	211	Anodic film - missing or inadequate.
Minor B	301	Locating dimension for first hole (0.156) oversize or undersize.
	302	Length of strip undersize.
	303	Clearance radius (0.100) oversize or undersize.
	304	Diameter of slot in threads (0.208) oversize or undersize.
	305	Lightening hole diameter (0.187) oversize.
	306	Depth of strip (0.625) oversize.
	307	Thickness of projecting face (0.170) oversize or undersize.
	308	Thickness of mounting face (0.080) oversize or undersize.
	309	Width of strip (0.281) oversize (see major 101).
	310	Burrs and scratches.
	311	Radius of slot in threads (0.104) oversize or undersize.
	312	Locating dimension for lightening hole (19/64) oversize or undersize.

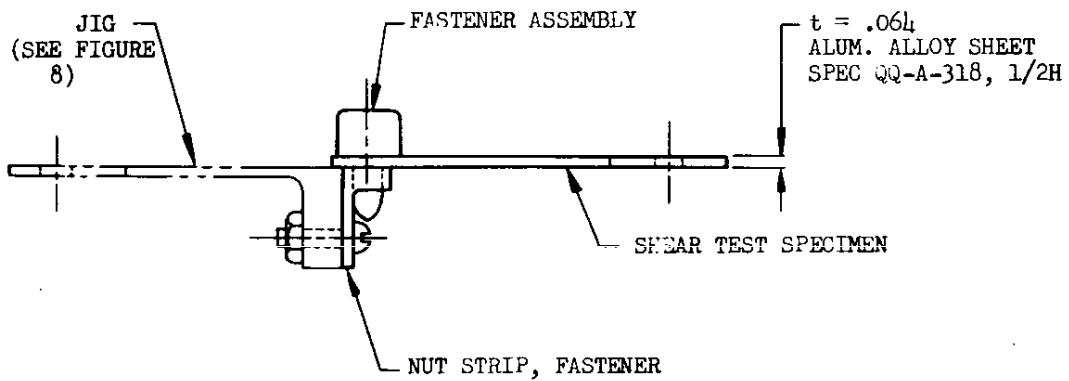
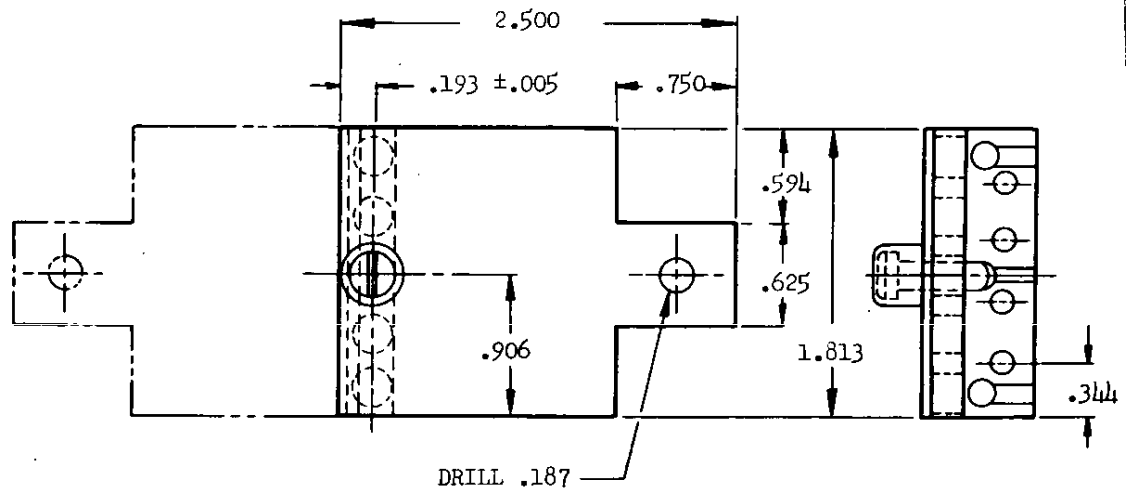
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TABLE II
Fastener assembly

Class	No.	Defects
Major	101	Thread pitch, major and minor diameters oversize or undersize.
	102	Material, flaws, cracks, or imperfection.
	<u>1/</u> 103	Neck diameter (0.257) oversize.
	104	Dimension across flats (0.124) oversize and undersize.
	<u>1/</u> 105	Wall thickness (0.012) undersize.
	201	Locating dimension for pin (45°) oversize or undersize.
	<u>1/</u> 202	Locating dimensions for pin (0.128) undersize.
	203	Locating pin dimension (0.060) oversize or undersize.
	204	Thread relief (30°) oversize or undersize.
	205	Thread relief (0.008 -0.013) (three diameters) oversize or undersize.
	206	Thread relief (90° max blend in point) oversize.
	207	Length of locating pin (0.035 -0.050) undersize.
	208	Length of grip (0.308 min) undersize.
	209	Plating missing or inadequate.
Minor B	301	Visible clearance diameter (9/32) undersize.
	302	Outside diameter of fastener head (0.401) oversize.
	303	Height of fastener head (0.410) oversize or undersize.
	304	Length of neck (0.067) oversize or undersize.
	305	Length of Locating Pin (0.035 -0.050) oversize.
	306	Length of fastener assembly (3/4) oversize or undersize.
	307	Screw tip radius (0.060) oversize or undersize.
	308	Screw tip angle (30°) oversize or undersize.
	309	Screw driver slot width (0.050) oversize or undersize.
	310	Screw driver slot depth (0.062) undersize.
	311	Burrs and scratches.

1/ Dimensions (No. 103 undersize, No. 105 oversize and No. 202 oversize respectively) to be controlled by 4.4.15 and 3.11.13.

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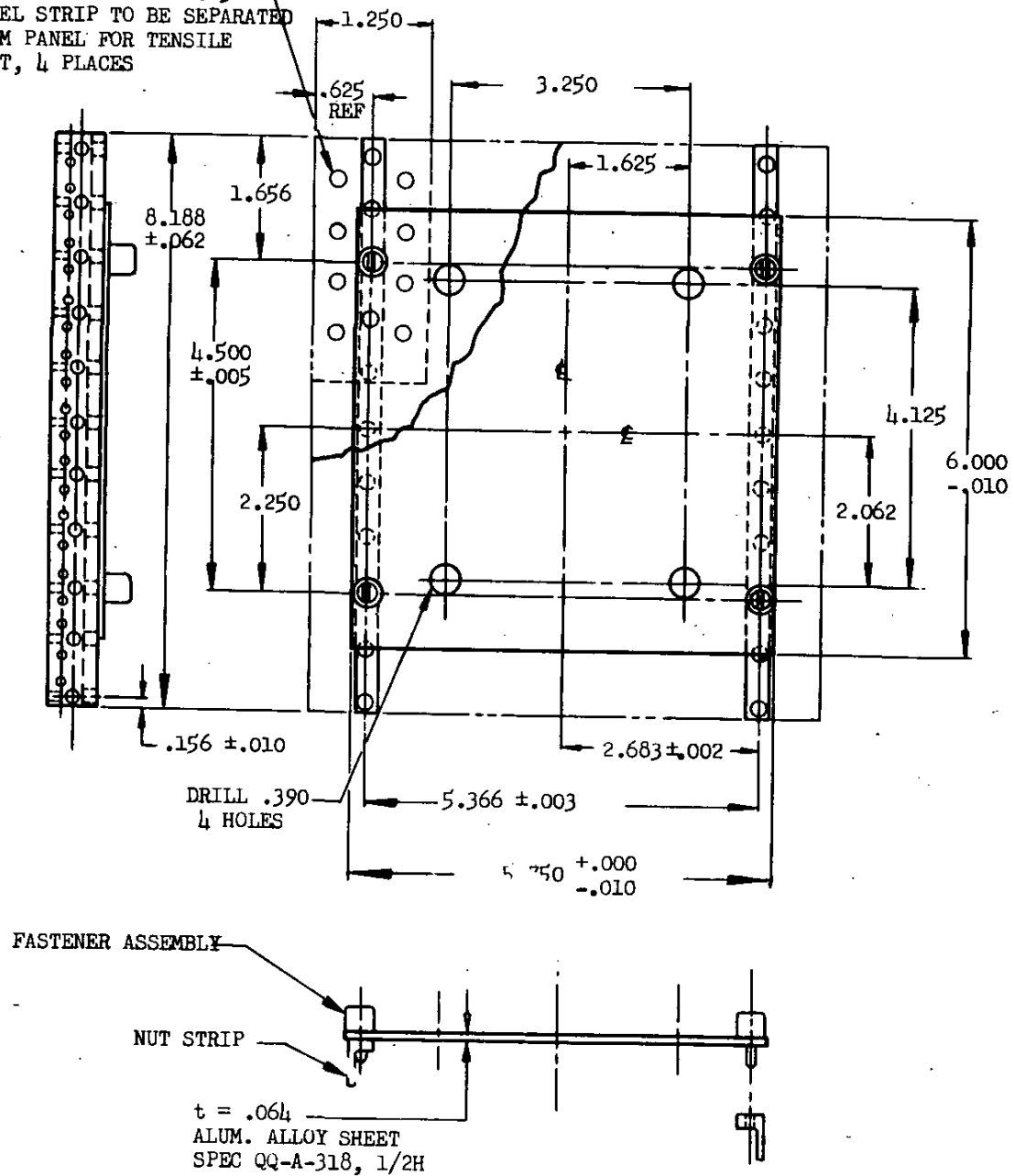


DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS ±.016

FIGURE 4. Typical shear test specimen

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REF. FIG. 3
 PANEL STRIP TO BE SEPARATED
 FROM PANEL FOR TENSILE
 TEST, 4 PLACES



DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS $\pm .016$

FIGURE 5. Typical vibration and alignment tests specimen

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4.3.2 Sampling plan B.- From the fasteners comprising the inspection sample of Sampling plan A, a new random sample shall be selected in accordance with table VII of the Appendix, MIL-STD-105, Inspection level L4, and shall be subjected to the following tests, in the sequence listed:

Test	Paragraph	
	Requirements	Test methods
Locking torque	3.11.1	4.4.1
Unlocking torque	3.11.2	4.4.2
Initial tension	3.11.3	4.4.3
Rated tensile load	3.11.4	4.4.4
Fastener assembly mounting flange	3.11.13	4.4.15

4.3.2.1 AQL.- The AQL of 1 percent shall be employed for the Sampling plan B tests.

4.3.2.2 Rejection and retest.- In the event of rejection, acceptance of all items in the lot shall be withheld until the extent and cause of failure has been determined. After investigation and corrective action, the Government Inspector shall be advised of the cause of rejection and the corrective action taken. After corrections have been made, all necessary tests shall be repeated taking a new random sample from the lot, employing Inspection Level L8, of the Appendix, to Standard MIL-STD-105. In the event that the sample again fails to pass the required tests, the entire lot shall be rejected, and shall not be resubmitted for Government acceptance. In any event fasteners subjected to Sampling plan B test will not be included in those submitted for delivery to the Government.

4.3.3 Sampling plan C.- Five fasteners shall be selected at random from each 5,000 items produced and subjected to the following test in the sequence listed:

Test	Paragraph	
	Requirements	Test methods
Locking torque	3.11.1	4.4.1
Unlocking torque	3.11.2	4.4.2
Initial tension	3.11.3	4.4.3
Rated tensile load	3.11.4	4.4.4
Locking stop strength	3.11.7	4.4.7
Fastener assembly mounting flange	3.11.13	4.4.15

4.3.3.1 When sampling tests are specified on a number of items that are selected from a production run and 1 or more of this number fails to meet the specified test(s), acceptance of all items still on hand and subsequent production will be withheld until the extent and cause of failure is determined. For operational reasons, Sampling plan A tests may be continued pending investigations of a sampling test failure. However, final acceptance of the item on hand and subsequent production will be withheld until the extent and cause of failure is determined. For operational reasons, individual tests may be continued pending investigation of a sampling test failure. However, final acceptance of the item on hand and subsequent production is contingent upon the Inspector's decision regarding the over-all conformance of the product to specification requirements. When corrective action has been accomplished, all necessary tests shall be repeated. If investigation indicates that the defects may exist in items previously accepted, full particulars concerning the defects, including recommendation for correction will be furnished to the contracting officer. In any event, fasteners subject to destruction test will not be included in those submitted for delivery to the Government.

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4.4 Test methods.-

4.4.1 Locking torque.- The torque required to lock the fasteners shall be measured on unlubricated fasteners mounted on specimens fabricated to the nominal thickness of panel as shown in figure 3, 4, and 5. The maximum and minimum torque required to lock the fastener shall be as specified. For qualification, the fastener shall be subjected to and shall withstand this test after the endurance test. (See 3.11.1.1 and 3.11.1.2 and 4.4.6.)

4.4.2 Unlocking torque.- The torque required to unlock the fastener shall be measured on the samples which have been subjected to the unlocking torque test. The maximum and minimum torque required to unlock the fastener shall be as specified. For qualification, the fastener shall be subjected to and shall withstand this test after the endurance and rated tensile load tests. (See 3.11.2.1, 3.11.2.2, 4.4.4, and 4.4.6.)

4.4.3 Initial tension.- The initial tension shall be established by determining the tensile load that produces a separation of 0.003 inch between the panel and the nut-strip at the area immediately around the fastener. The initial tension (bearing pressure) between the panel and nut-strip, shall be not less than 30 pounds. (See 3.11.3.) A typical tension test jig is shown in figure 6.

4.4.4 Rated tensile load.- After the fastener specimen shown in figure 3 has been subjected to the locking, unlocking torque, and initial tension tests, the rated tensile load of 400 pounds shall be applied normal to the test panel and tending to pull the fastener apart, 5 successive times, each of 5 seconds duration. The fastener shall then again be subjected to the locking and unlocking torque test of 4.4.1 and 4.4.2. A positive lock and unlock shall be present in the fastener assembly when the stud is removed from the nut-strip after this tension test. (See 3.3.4 and 3.11.4.)

4.4.5 Panel and nut-strip separation.- The fastener shall be loaded at its rated tensile load. (See 3.11.4.) The panel and nut-strip separation at the area immediately around the fastener shall be measured. The panel and nut-strip separation shall not exceed 3/64 inch. (See 3.11.5.)

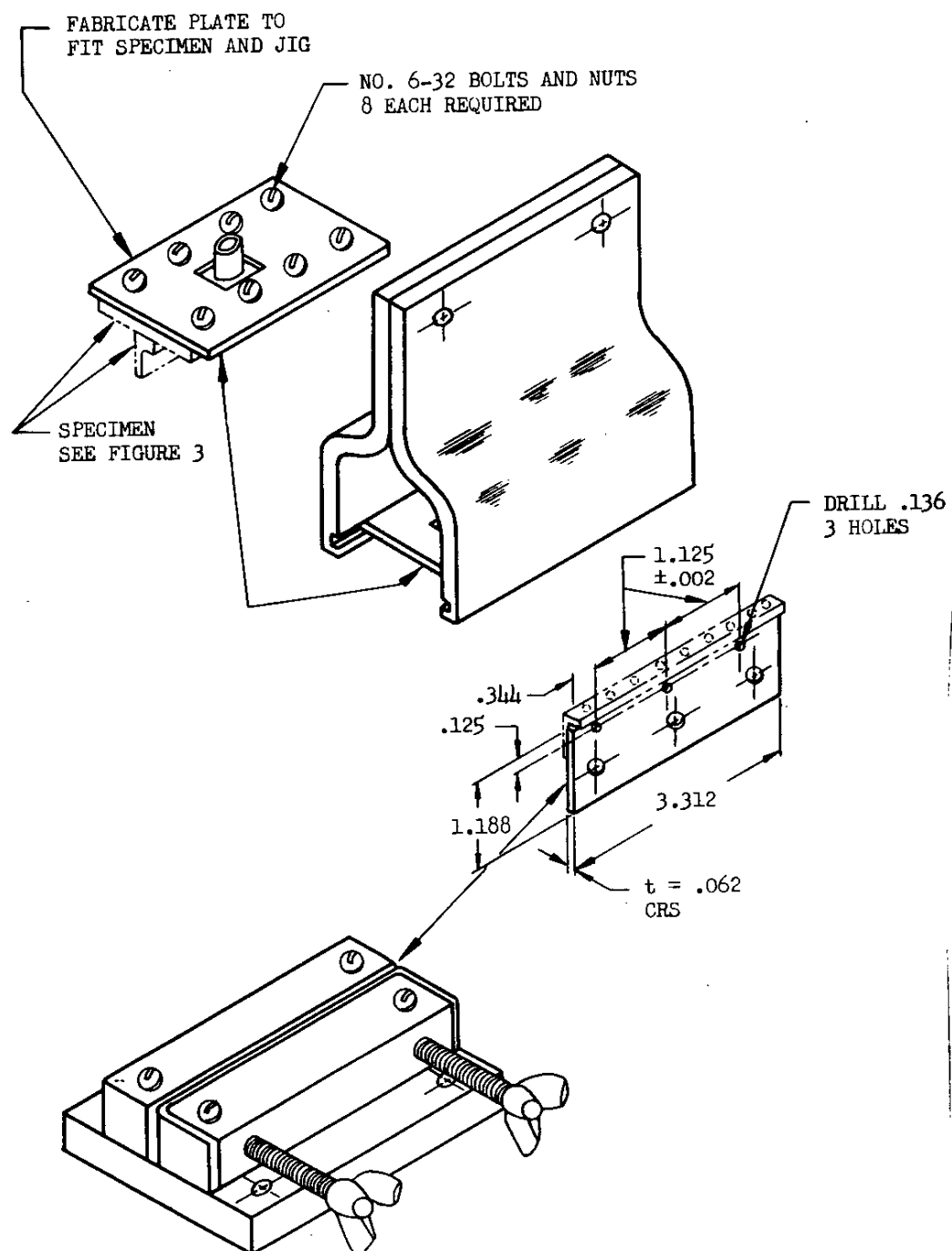
4.4.6 Endurance.- The fastener shall withstand without failure, 4,000 locking and unlocking operational cycles at a maximum rate of 110 cycles per minute. For qualification, the fastener shall withstand this test after vibration. (See 3.11.6 and 3.11.12.)

4.4.7 Locking stop strength.- Locking stop torque shall be applied to the fastener through a screwdriver bit. The width and thickness of the bit shall not exceed 75 percent of the width and thickness of the screwdriver slot. The fastener mounted as shown in figure 3 shall support, without damage to the fastener assembly or nut strip, a minimum locking stop strength of 30 pound-inches. (See 3.11.7.)

4.4.8 Tensile overload.- After all other tension, torque, stop strength, and endurance tests have been made, the fastener shall withstand, without failure, a load in tension of 600 pounds. (See 3.11.8.)

4.4.9 Nut-strip spacing tolerance.- A test panel shall be fabricated as shown in figure 5. The assembled test panel shall be tried for fit and fastener operation with test jig of figure 7. The fastener assembly shall satisfactorily engage and disengage the nut-strip and shall operate into the locked and unlocked positions without exceeding the maximum or minimum torque values specified, for any spacing of the nut-strips within +0.020 inch of the nominal value, with an allowable misalignment between opposite hole centers up to 0.010 inch and a difference between the top surface rail levels up to 1/16 inch. (See 3.11.1, 3.11.2 and 3.11.9.)

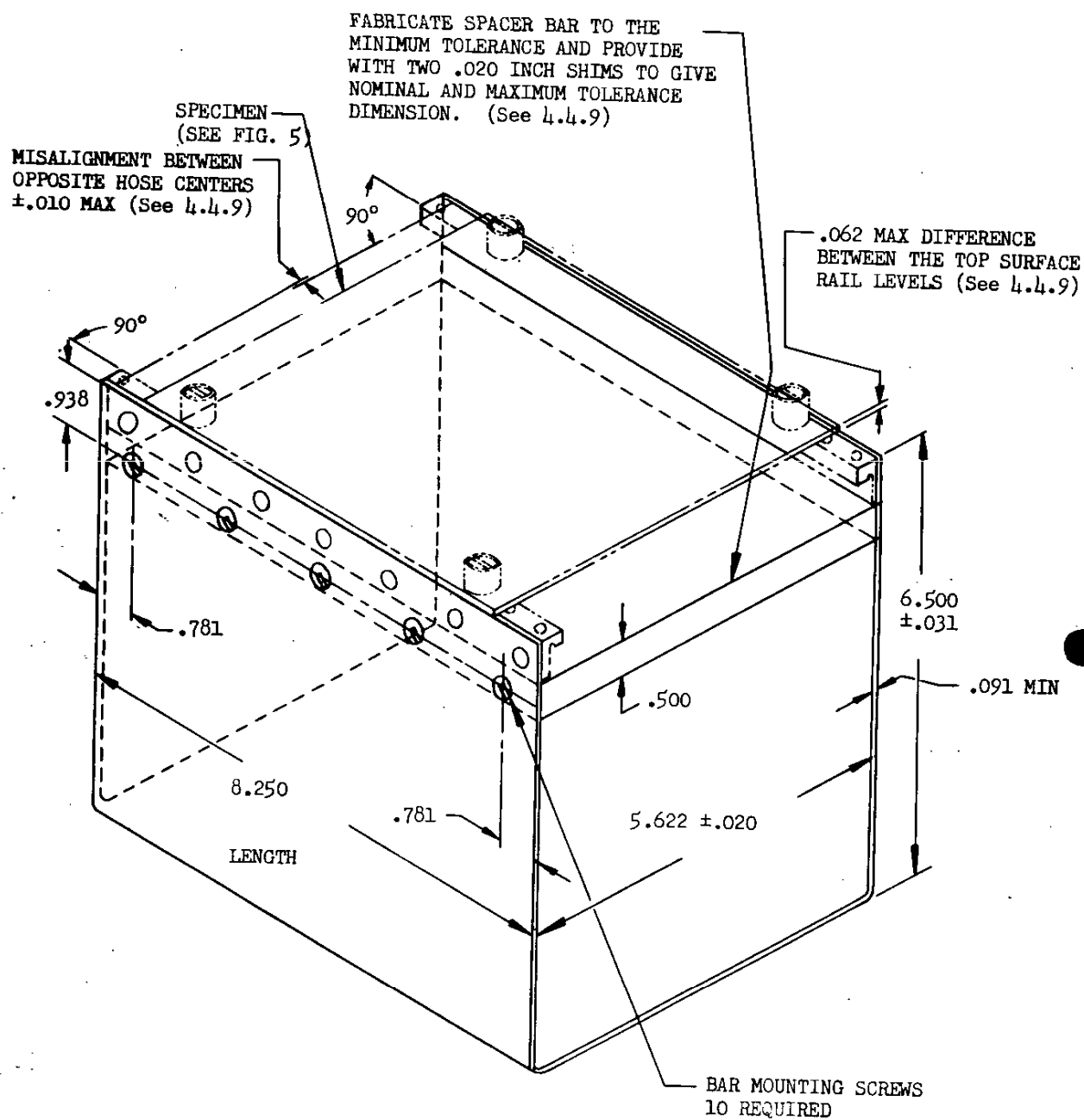
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DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS $\pm .016$

FIGURE 6. Typical tension and torque test jig

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NUT STRIP
MOUNTING RIVETS
SPACED 1.125

DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS $\pm .016$

FIGURE 7. Typical alignment test jig

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4.4.10 Shear.-- The fastener shall be mounted as shown in figure 4 and tested with the test jig shown in figure 8. The rated shear load of 200 pounds (see 3.11.10) shall be applied parallel to the test panel 5 successive times, each of 5 seconds duration. The fastener shall then again be subjected to the locking and unlocking torque tests of 4.4.1 and 4.4.2. A positive lock and unlock shall be present in the fastener assembly when the stud is removed from the nut-strip after this shear test. (See 3.3.4.)

4.4.11 Shear overload.-- After the rated shear load test, the fastener shall then be loaded in the same manner as for the rated shear load test. There shall be no failures at any load up to 150 percent of the rated shear load. (See 3.11.11.)

4.4.12 Vibration.-- Fasteners shall be assembled with a test panel as shown in figure 5. The assembly shall be loaded and attached to the test jig as shown in figure 9. The base of the test jig shall be vibrated at a frequency varying between 10 and 55 cycles per second at an amplitude of 0.036-inch total excursion, the frequency varying uniformly from 10 to 55 cycles per second and returning to 10 cycles per second in approximately one minute. The fasteners shall withstand, without failure, 45 minutes of continuous vibration in each of three mutually perpendicular directions. The vibration test as outlined herein is to be again repeated, but this time a space of 0.032 inch or more shall exist between rear face of test panel and nut-strip. Vibration shall be in the vertical direction only for a period of 30 minutes. (See 3.11.12.)

4.4.13 Corrosion resistance.-- The fasteners shall be subjected to salt spray in accordance with Fed. Test Method Standard No. 151 for 100 hours. Exposure to the salt spray shall cause no corrosion of the fastener. (See 3.4 and 3.8.)

4.4.14 Hardness.-- Case-hardened studs shall be tested for hardness on either side of the screwdriver slot, using the 15-N Rockwell superficial scale; or if fabricated of through hardening steel, the heat-treated through-hardened studs shall be tested on the slots, using Rockwell "C" scale. (See 3.9.)

4.4.15 Fastener assembly mounting flange.-- The fastener assembly shall be checked for looseness in panel after all other tests are performed. (See 3.11.13.)

5. PREPARATION FOR DELIVERY

5.1 Levels of packaging.--

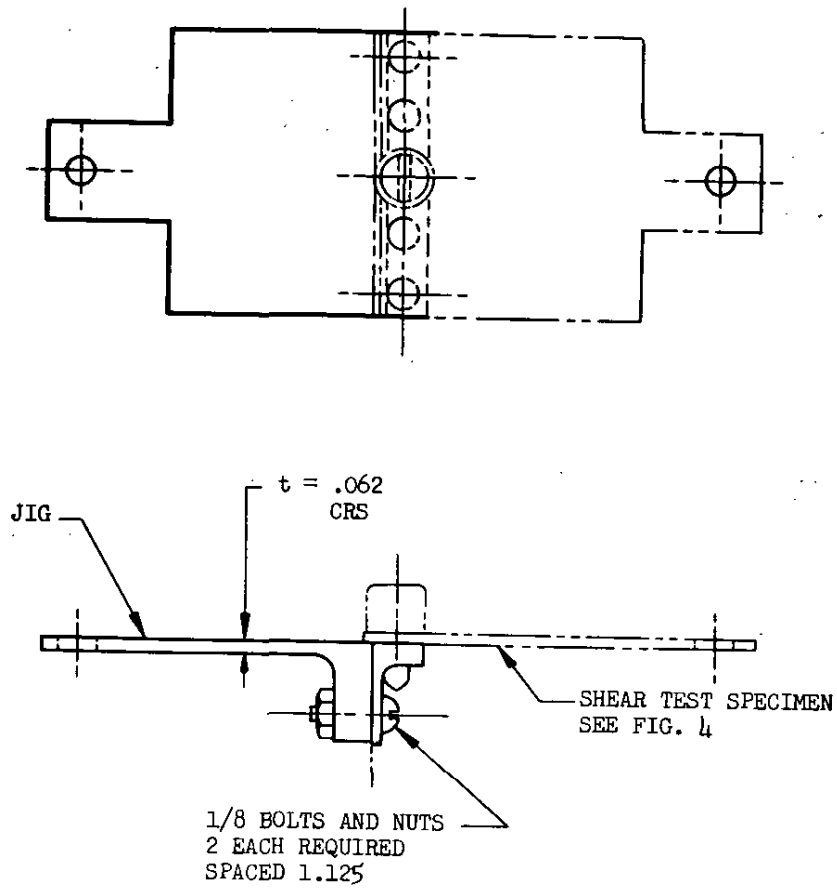
5.1.1 Level A.-- The fastener assembly shall be packed in containers meeting Specification MIL-B-4229, PPP-B-566, PPP-B-676, or PPP-B-636. Unit quantities shall be as specified by the procuring agency.

5.1.2 Level C.-- The fastener shall be preserved and packaged in accordance with manufacturer's commercial practice.

5.2 Levels of packing.--

5.2.1 Level A.-- The fastener preserved and packaged to meet 5.1 shall be packed in exterior-type overseas shipping containers meeting Specification PPP-B-591, PPP-B-636, MIL-B-138, PPP-B-585, PPP-B-621, PPP-B-601, or MIL-B-10377. As far as practicable, exterior containers shall be of uniform shape and size, be of minimum cube and tare consistent with the protection required, and contain identical quantities. The gross weight of each pack shall be limited to approximately 200 pounds. Containers shall be closed and strapped in accordance with the applicable container specification or appendix thereto. Containers shall be provided with a case liner conforming to Specification MIL-L-10547 and shall be sealed in accordance with the appendix thereto. The case liner will not be required when the unit, intermediate, or exterior container conforms to Specification PPP-B-636 and is sealed at all joints and seams, including manufacturer's joint, with tape conforming to Specification PPP-T-60.

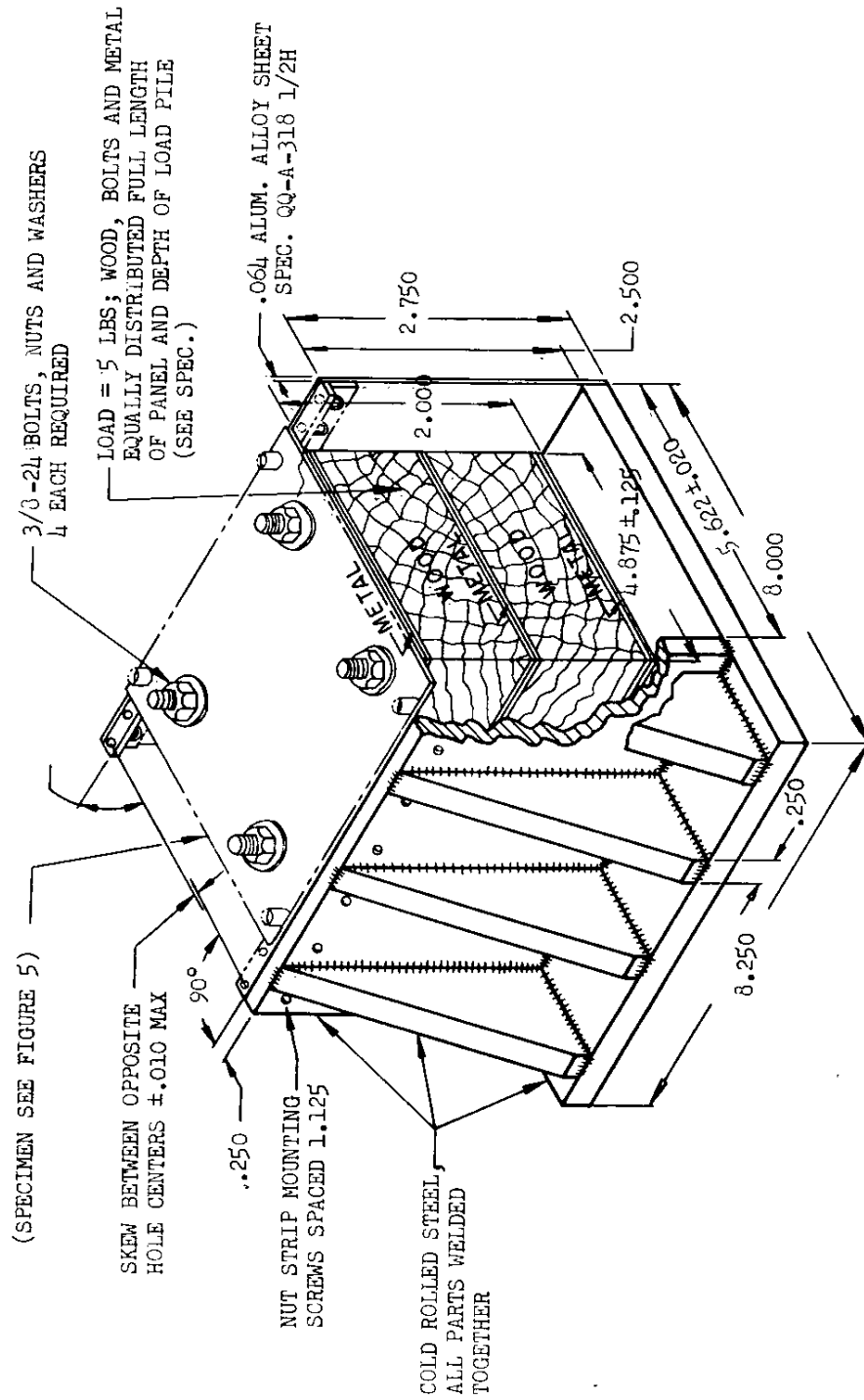
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DIMENSIONS IN INCHES.

FIGURE 8. Typical shear test jig

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DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS $\pm .016$

FIGURE 9. Typical vibration test jig

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5.2.2 Level B.- The fastener preserved and packaged to meet 5.1 shall be packed in domestic-type exterior containers meeting Specification PPP-B-591, PPP-B-601, PPP-B-585, PPP-B-621, PPP-B-636, or MIL-B-10377. Exterior containers shall be of minimum cube and tare consistent with the protection required. As far as practicable, exterior containers shall be of uniform shape and size and contain identical quantities. The gross weight of each pack shall be limited to approximately 500 pounds. Containers shall be closed and strapped in accordance with the applicable container specification or appendix thereto. When fiberboard containers are used, the fiberboard shall meet the requirements of table I titled "Requirements for types I and II, class 1, domestic service fiberboard" of Specification PPP-B-636.

5.2.3 Level C.- Packages which require overpacking for acceptance by carrier shall be packed in exterior-type shipping containers in a manner that will insure safe transportation at the lowest rate to the point of delivery. Containers shall meet Consolidated Freight Classification Rules or regulations of other common carriers as applicable to the mode of transportation.

5.3 Physical protection.- Cushioning, blocking, bracing and bolting as required shall be in accordance with Specification JAN-P-100 except that for domestic shipments, waterproofing requirements for cushioning materials and containers shall be waived. Drop tests of Specification JAN-P-100 shall be waived when preservation, packaging, and packing of the item is for immediate use or when drop tests of Specification MIL-P-116 are applicable.

5.4 Marking.- Interior and exterior containers shall be marked in accordance with Standard MIL-STD-129.

5.4.1 Special marking.- In addition, when special installation requirements are required for the fastener assembly, instructions shall appear on the face of all containers.

6. NOTES

6.1 Intended use.- The case fastener covered by this specification is intended for use on cases for the equipment-rack system in aircraft.

6.2 Ordering data.- Procurement documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Selection of applicable levels of preservation and packaging and packing.

6.2.1 Indirect shipments.- The packaging, packing and marking specified in section 5 apply only to direct purchases by or direct shipments to the Government and are not intended to apply to contracts or orders between the manufacturer and prime contractor.

6.3 Sampling procedure.- Procurement documents should specify either Sampling plan B of 4.3.2 or Sampling plan C of 4.3.3. The applicability of Sampling plan B or Sampling plan C will be determined.

6.4 Qualification test.- With respect to products requiring qualification, awards will be made only for such products as have, prior to the bid opening date, been tested and approved for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date.

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6.4.1 The attention of suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government, tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products covered by this specification may be obtained from the Commander, Wright Air Development Center, Attention: WCREG-2, Wright-Patterson Air Force Base, Ohio the activity responsible for qualification, with a copy to the Bureau of Aeronautics, Navy Department, Washington 25, D. C.

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

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