AEROSPACE STANDARD

AS85731™	REV. B

Issued 2004-06
Revised 2011-01
Cancelled 2015-12

Superseded by MIL-F-85731

Fastener, Positive Locking, Electronic Equipment, General Specification For

FSC 5340

RATIONALE

AS85731 was written to permit the cancellation and supersession of MIL-F-85731 without change in requirements. The military Preparing Activity has decided not to adopt AS85731. Users are recommended to use MIL-F-85731 for the same requirements.

CANCELLATION NOTICE

This Technical Report has been declared “CANCELLED” as of December 2012 and has been superseded by MIL-F-85731. By this action, this document will remain listed in the respective index, if applicable. Cancelled Technical Reports are available from SAE.

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http://www.sae.org/technical/standards/AS85731B

1. SCOPE

1.1 Scope

This specification covers positive locking fasteners intended for use in aircraft to secure electronic line replaceable units (LRUs).

2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of the other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and 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.

2.1 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, http://assist.daps.dla.mil/quicksearch/.

2.1.1 Specifications, Standards and Handbooks

Unless otherwise specified, the following specifications, standards and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

QQ-P-35 Passivation Treatments for Corrosion Resistant Steel

QQ-P-416 Plating, Cadmium (Electrodeposited)

PPP-B-566 Box, Folding, Paperboard

PPP-B-576 Box, Wood, Cleated, Veneer, Paper Overlaid

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PPP-B-585 Box, Wood, Wirebound

PPP-B-591 Boxes, Shipping, Fiberboard, Wood-Cleated

PPP-B-601 Boxes, Wood, Cleated Plywood

PPP-B-621 Box, Wood, Nailed and Lock Corner

PPP-B-636 Box, Shipping, Fiberboard

PPP-B-665 Boxes, Paperboard, Metal Edge and Components

PPP-B-676 Boxes, Setup

PPP-H-1581 Hardware (Fasteners and Related Items), Packaging of

PPP-T-60 Tape, Packaging, Waterproof

MILITARY

MIL-P-116 Preservation, Methods of

MIL-H-6088 Heat Treatment of Aluminum Alloys

MIL-H-6875 Heat Treatment of Steels (Aircraft Practices), Process For

MIL-A-8625 Anodic Coatings, for Aluminum and Aluminum Alloys

MIL-L-8937 Lubricant, Solid Film, Heat Cured, Corrosion Inhibiting, NATO Code S-1738

MIL-L-10547 Liner, Case and Sheet, Overwrap, Water Vaporproof Or Waterproof, Flexible

STANDARDS

MILITARY

MIL-STD-129 Marking for Shipment and Storage

MIL-STD-130 Identification Marking of U. S. Military Property

MIL-STD-810 Environmental Test Methods and Engineering Guidelines

DOD-STD-1788 Avionics Interface Design Standard

(Copies of specifications, standards, handbooks, drawings and publications required by manufacturer's in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other Publications

The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

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2.2.1 ASQ Publications

Available from American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203, Tel: 800-248-1946 (United States or Canada)) or +1-414-272-8575 (International), www.asq.org

ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes

2.2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585 www.astm.org

ASTM B117 Method of Salt Spray (Fog) Testing

2.3 Order of Precedence

In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Specification Sheet

The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 First Article Inspection

When specified (see 6.2.1), a sample shall be subjected to first article inspection in accordance with 4.3.

3.2.1 Requalification

Requalification will be required in the event any change is made in the product design, material, heat treatment, finish or lubrication.

3.2.2 Retention of Qualification

To maintain status on the Qualified Product List, certification shall be submitted at two year intervals to indicate continued compliance with the requirements of this specification (see 4.3.1).

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3.3 Material

The material shall be as specified herein in the applicable specification sheet.

3.3.1 Heat Treatment

3.3.1.1 Aluminum Alloy

Heat treatment of aluminum alloy components shall be in accordance with MIL-H-6088.

3.3.1.2 Corrosion Resistant Steel (CRES) and Alloy Steel

Heat treatment of CRES and alloy steel components shall be in accordance with MIL-H-6875.

3.3.2 Protective Treatment

Fastener components shall be plated or treated as specified herein or in the applicable specification sheet or standard.

3.3.2.1 Passivation

Fastener components fabricated from corrosion resistant steel shall be passivated in accordance with QQ-P-35.

3.3.2.2 Surface Oxide

After heat treatment of corrosion-resistant steel fastener components, all surface oxide shall be removed by a means that will produce no intergranular or surface corrosion.

3.3.2.3 Alloy Steel

Fastener components fabricated from alloy steel shall be cadmium plated in accordance with QQ-P-416, Type II, Class 2.

3.3.2.4 Aluminum Alloy

Fastener components fabricated from aluminum alloy shall be anodized in accordance with MIL-A-8625.

3.4 Design

The fastener is designed to secure line replaceable units (LRUs) in military aircraft. When used in conjunction with a mating holddown device, it will secure the LRU in a stable position in the aircraft (see 6.1).

3.5 Lubricant

When specified in the applicable specification sheet or standard, the lubricant used on the fastener shall be in accordance with MIL-L-8937.

3.6 Environmental Requirements

The fasteners shall be capable of functioning without damage when subjected to the environmental conditions in 3.6.1 through 3.6.3.

3.6.1 Endurance

The fastener shall be capable of withstanding 2000 cycles (as described in 3.6.1.1) of locking and unlocking without degradation of performance (see 4.5.2).

3.6.1.1 Cycle

One complete performance of the fastener from zero pound to the preload poundage and then back to the initial zero poundage.

3.6.2 Corrosion

The fastener shall be capable of five (5) lock and unlock endurance cycles described in 3.6.1.1 after being subjected to the corrosion test (see 4.5.3).

3.6.3 Sand and Dust

The fastener shall be capable of five (5) lock and unlock endurance cycles described in 4.5.2 after being subjected to the sand and dust test (see 4.5.4).

3.6.4 Vibration and Shock

The fastener shall not become loose or unlocked when subjected to the vibration and shock test (see 4.5.5).

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3.6.5 Static Load

The fastener shall meet the loads specified in the applicable specification sheet when subjected to the static load test (see 4.5.6).

3.6.6 Equipment Interface

The unattached extractor front holddown assembly will not hang in a position that will interface with the installation or removal of other equipment.

3.6.7 Thermal Shock

The extractor front holddown shall maintain its functional characteristics during alternate exposure to extremities of high and low temperatures according to MIL-STD-202, Test Condition “B”.

3.6.8 Fungus

The extractor shall demonstrate a resistance to fungus development according to MIL-STD-810, Method 508.1, Procedure I.

3.6.9 Fluid Immersion

Clutch function, parts and spindle travel will not deteriorate after being immersed in MIL-N-5606 hydraulic fluid and MIL-L-7808 oil for eight hours.

3.6.10 Box Lift During Extraction

The fastener front holddown shall not allow more than 0.917 in. (5mm) of lift at the front end of the box.

3.7 Identification Marking

The fasteners shall be marked for identification in accordance with the applicable specification sheet or standard and MIL-STD-130.

3.8 Workmanship

Workmanship shall be consistent with the type of product, finish and the class of thread fit specified. Sharp edges shall be broken; hanging burrs and slivers that might become dislodged during usage shall be removed.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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 Test Equipment and Inspection Facilities

The manufacturer shall insure that test and inspection facilities of sufficient accuracy, quality and quantity are established and maintained to permit performance of required inspections.

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4.2 Classification of Inspections

The inspection requirements specified herein are classified as follows:

a. First article inspection (4.3)

b. Quality conformance inspection (4.4)

4.3 First Article Inspection

First article inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with equipment and procedures normally used in production.

4.3.1 Sample

The qualification test samples shall consist of twenty units.

4.3.2 Inspection Routine

Sample units shall be subjected to the first article inspection specified in Table 1 in the order shown.

TABLE 1 - FIRST ARTICLE INSPECTION

Inspection	Number of samples	Requirement paragraph	Test method paragraph
Visual and dimensional examination	3	--	4.5.1
Endurance	3	3.6.1	4.5.2
Corrosion	3	3.6.2	4.5.3
Sand and dust	3	3.6.3	4.5.4
Vibration and shock	4	3.6.4	4.5.5
Static load	4	3.6.5	4.5.6

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4.3.3 This paragraph was deleted per Amendment 1.

4.3.4 Certified Test Report

The manufacturer shall furnish a certified test report showing that the manufacturer's product satisfactorily conforms to this specification. The test report shall include as a minimum actual results of the tests specified herein. When this report is submitted, it shall be accompanied by a dated drawing which describes the manufacturer's product by specifying all dimensions and tolerances, composition of materials selected, coating or plating applied, and the hardness. The manufacturer's part number for each size shall be included on the drawing.

4.4 Quality Conformance Inspections

Quality conformance inspections shall consist of the tests specified in Table 2.

TABLE 2 - QUALITY CONFORMANCE INSPECTIONS

Inspection	Requirement paragraph	Test method paragraph
Visual and dimensional examination	--	4.5.1
Endurance (5 cycles)	3.6.1	4.5.2
Corrosion (2 hours)	3.6.2	4.5.3

4.4.1 Inspection Lot

The inspection lot shall be as defined in ANSI/ASQC Z1.4.

4.4.2 Sampling

4.4.2.1 Sampling for Quality Conformance Inspections

A random sample of each item shall be selected in accordance with ANSI/ASQC Z1.4 inspection level S-1, Acceptable Quality Level (AQL) of 1.5 percent defective. For visual examination, fasteners shall be selected in accordance with ANSI/ASQC Z1.4, inspection level 1, AQL of 2.5 percent defective. Major and minor defects shall be as defined herein (see 6.2).

4.4.3 Resubmitted Inspection Lots

Resubmitted inspection lots shall be in accordance with MIL-STD-105. A resubmitted inspection lot shall be inspected using a tightened inspection. Where the original acceptance number was zero, a sample size represented by the next higher sample size code letter shall be selected.

4.4.4 Manufacturer's Inspection Report

Each production lot of fasteners shall be accompanied by two copies of the manufacturer's inspection report signed by an authorized representative of the manufacturer. This report shall state that the fasteners are from a production lot(s) which was manufactured, inspected and accepted in accordance with requirements of this specification. The report shall identify the part number and the production lot number(s) and shall include all actual test results or certifications of conformance.

4.5 Test Methods

4.5.1 Visual and Dimensional Examination

The fasteners shall be examined for conformance to the requirements of this specification and the applicable specification sheet.

4.5.2 Endurance

The fasteners shall be mounted in a suitable tray fixture, as defined in 3.6.1. During lock operation, a preload of 103 lbs to 126 lbs (460N to 560N) shall be exerted on each hook and maintain the reading as specified in DOD-STD-1788. During this test there shall be a check reading of the forces every 50 cycles. The force reading must be within the force tolerance range.

4.5.3 Corrosion

The fasteners shall be subjected to the salt spray (fog) test of ASTM B117 for 168 hours. Upon completion of this test, the samples shall be subjected to the endurance test of 4.5.2 for Five (5) cycles only.

4.5.4 Sand and Dust

The fasteners shall be subjected to the sand and dust test of MIL-STD-810, Method 510.1. Upon completion of this test the samples shall then be subjected to the endurance test of 4.5.2 for five (5) cycles only.

4.5.5 Vibration and Shock

The fasteners shall be subjected to the vibration and shock test of MIL-STD-810. For vibration, use Method 514.2, Procedure I, Curve E. For shock, use Method 516.2, Procedure I, Figure 516.2-2.

4.5.5.1 The test specimens shall be mounted in a fixture conforming to Figure 1 using a 60 pound weight simulated "black box" (15.29 inches wide x 12.52 inches long x 7.64 inches high). Hooks shall be mounted as shown in Figure 2.

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4.5.6 Static Load

The fastener shall be mounted to the tray containing the simulated black box as shown in Figure 1. The fastener shall be subjected to the test specified in 4.5.5.1. Upon completion of the static load test the fastener shall be capable of one complete lock and unlock cycle as defined in 3.6.1.1.

4.6 Inspection and Packaging

The sampling and inspection of the preservation, packing and container marking shall be in accordance with PPP-H-1581.

5. PACKAGING

5.1 Packaging

5.1.1 Level A

The fasteners in a unit quantity of 1 each, of the same part number, shall be packaged in accordance with MIL-P-116, Method III.

5.1.2 Level C

The fasteners shall be packaged in accordance with commercial practice. When the quantity permits, twenty-five unit packages, or a multiple thereof, shall be packaged in intermediate containers conforming to PPP-B-566, PPP-B-676, or PPP-B-665. The gross weight of the intermediate containers conforming to PPP-B-665 shall not be greater than 20 pounds.

5.2 Packing

Fasteners shall be packed level A or C, as specified (see 6.2).

5.2.1 Level A

Fasteners shall be packed in overseas wether resistant type boxes conforming to any of the following: PPP-B-585, Class 3; PPP-B-591; PPP-B-621; PPP-B-636. Gross weight of wood and wood-cleated boxes shall not be greater than 200 pounds; fiberboard boxes shall not be greater than the weight limitations of the box specification. Box closures shall be in accordance with the box specification and the appendix thereto. Boxes shall be provided with case liners conforming to MIL-L-10547, sealed in accordance with the appendix thereto. Case liners may be omitted when weather resistant fiberboard boxes conforming to PPP-B-636 are used, provided that all joints and seams are sealed with tape conforming to PPP-T-60, Type III, Class 1.

5.2.2 Level C

Fasteners shall be packed to ensure adequate protection against damage during direct shipment from the source to the first receiving activity for immediate use. This level shall conform to applicable carrier rules and regulations and may be the supplier's commercial practice, if this practice meets the requirements of this level.

5.3 Marking

In addition to any special markings required by the contract, interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129.

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