

INCH-POUND

MIL-B-85667A  
 AMENDMENT 2  
 15 JUNE 1998

## MILITARY SPECIFICATION

BOLT, SLEEVE, STRAIGHT SHANK, PROTRUDING AND FLUSH HEAD  
 GENERAL SPECIFICATION FOR

This amendment forms a part of Military Specification MIL-B-85667A, dated 28 January 1991, and is approved for use by all Departments and Agencies of the Department of Defense.

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2.1.1 Specifications and standards. Under STANDARDS, MILITARY, Delete: "MIL-STD-105", "MIL-STD-1312" , and "MIL-STD-1949" and associated titles.

2.2 Non-government publications. Under AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) Add: "ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes" Under AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) Add: "ASTM E1444 Inspection, Liquid Penetrant"

2.2 At bottom of paragraph, add: "NATIONAL AEROSPACE STANDARDS (NAS) NASM1312 Fastener Test Methods (Application for copies should be addressed to Aerospace Industries Association, 1250 Eye Street, N.W. , Suite 1200, Washington, D.C. 20005-3922.)"

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3.2 Delete and substitute: "3.2 Qualification. The sleeve bolts furnished under this specification shall be products which have met all requirements specified herein. Subsequent sleeve bolt production lots shall be produced in the same manner as parts which have passed qualification testing. Proof of passing qualification tests shall be maintained and be available for inspection, when requested, by the purchaser."

3.2.1 Delete and substitute: "3.2.1 Retention of Qualification. To maintain product qualification status, the supplier responsible for the fasteners shall maintain on file a certified qualification test inspection report (see 4.3.2)."

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3.4.3 Heads. Delete: "Forged or machined lightening holes for reduction of weight are acceptable for protruding head sleeve bolts."

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AMSC N/A

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TABLE III. Discontinuity depths. Delete heading: ".5000 thru 1.5000 incl"  
Substitute: ".5000 thru 1.0000 incl."

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3.13 Stress durability. Delete: "Stress durability test is not required for sleeve bolts with pins manufactured from Nickel Alloy 718 or titanium."  
Substitute: "Stress durability is required for sleeve bolts with pins manufactured from alloy steel only."

3.15 Sleeve expansion. Add: " NOTE: Due to various installation methods, the expanded sleeve diameter within the "P" Ref. Length, as indicated in specification sheets, shall be a reference dimension."

\* 3.16 Metallurgical condition. 2<sup>nd</sup> sentence, Delete and substitute:  
"Slight overheating on the non-bearing surfaces of the pin head is permissible providing the measurement of the greatest depth of overheating, measured normal to the surface, does not exceed the value specified for the applicable component in Table IIIA."

Delete entire TABLE IIIA and substitute the following:

TABLE IIIA. Discontinuity depth.

Component	Nominal diameter (inch)				
	#10, .2500	.3125, .3750	.4375, .5000	.5625- .7500	.8750-1.000
Pin	.015	.025	.040	.060	.080

3.18 Identification of product. Delete paragraph and substitute: "Each sleeve bolt shall be marked on the top of the head or the side of the flange. The manufacturer's identification and lot traceability symbols shall be marked on the top or the side of the head. Markings may be raised or indented not more than 0.010-inch. Markings may be forged or stamped at the discretion of the manufacturer."

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4.1 Second and third sentences, delete: "Government" and substitute "purchaser".

4.1.1 Third and fourth sentences, delete "Government" and substitute "purchaser".

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4.3 Delete and substitute: "4.3 Qualification inspections. The qualification inspections shall consist of all the tests listed in Table IV as specified under 4.5. The number of samples for each test shall be three, except ductility, work effect, carburization, and head structure and grain flow tests, in which the number of samples shall be one."

4.3.1 Sampling size. Delete in first and last sentence: "15" Delete "...up to and including 1.5000-inch diameter..." and substitute "...up to and including 1.0000-inch diameter..." Delete "MIL-STD-1312-11" and substitute "NASM1312-11"

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TABLE IV. Qualification Inspections. In table, in between "Fatigue Strength" and "Work Effect" add "Ductility." Under No. of inspections: "1". Requirement paragraph: "3.10.4" Test paragraph: "4.5.4.13"

4.3.2 Delete and substitute: "4.3.2 Retention of Qualification. To comply with the requirements of 3.2.1, the supplier shall maintain on file, a certified qualification test inspection report. The test inspection report shall be signed by an authorized representative of the organization assuming responsibility for the fasteners, stating that the fasteners were manufactured, inspected and accepted in accordance with the requirements of this specification. Additionally the report shall contain the results of individual qualification tests, identified by part-number, inspection lot number, and a copy of the raw material supplier's certification to the applicable raw material specification."

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TABLE V. Delete column in table for "No. of inspections" and all values under the column.

TABLE V. Quality conformance inspections in table, in between "Fatigue Strength" and "Work Effect" add "Ductility" Requirement paragraph: "3.10.4" Test paragraph: "4.5.4.13."

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4.5.1 Sampling. Delete "MIL-STD-105" and substitute "ANSI/ASQC Z1.4"

4.5.3.1 Sampling plan. Delete "MIL-STD-105" and substitute "ANSI/ASQC Z1.4"

4.5.3.1.2 Inspection methods. Delete "MIL-STD-1949" and substitute "ASTM E1444"

4.5.3.2 Hardness. Delete "MIL-STD-1312-6" and substitute "NASM1312-6"

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4.5.4.1 Sampling Plan. Delete "MIL-STD-105" and substitute "ANSI/ASQC Z1.4" Delete: "The AQL shall be 1.0 percent defective and the inspection level shall be S-2." And substitute: "The inspection level shall be S-2, with acceptance of 0 and rejection on 1."

4.5.4.2 Fatigue strength. Delete "MIL-STD-1312-11" and substitute "NASM1312-11" Delete: "Bolts having a grip length less than twice their shank diameter need not be fatigue tested. The bolt with the expandable sleeve installed at the bolt head shall be used for this test." Substitute: "Bolts having a grip length less than twice their thread diameter need not be fatigue tested. The bolt may be tested in tapered adapters without the sleeve installed."

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4.5.4.3 Ultimate tensile load. Delete paragraph and substitute: "The sleeve bolt shall be tested in tension between the head of the pin and a threaded member in accordance with NASM1312-8. This test shall be conducted on the pin only, with the sleeve removed from the pin. In the event the bolts to be tested in tensile have a grip of less than one thread diameter, acceptance shall be based on the double shear of the material specimens of 4.5.4.4."

4.5.4.4 Double shear strength. Delete "MIL-STD-1312-13" and substitute "NASM1312-13"

4.5.4.5 Traverse hardness. Delete "The acceptance of bolts having grip lengths less than twice the nominal diameter size shall be based on the traverse hardness test..." Substitute "The acceptance of bolts having grip lengths less than the thread diameter shall be based on the traverse hardness test..."

4.5.4.6 Stress durability. Delete "MIL-STD-1312-5" and substitute "NASM1312-5"

4.5.4.7 Stress corrosion. Delete "MIL-STD-1312-9" and substitute "NASM1312-9"

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4.5.5 Resubmitted inspection lots. Last sentence, delete "Government inspector" and substitute "purchaser".

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6.1 Intended use. Add subparagraph: "d. 160 KSI Ftu tensile and 95 KSI Fsu shear strength (CRES A286 pin, CRES 304 sleeve)."

6.3 Delete and substitute: 6.3 Qualification. This paragraph intentionally blank.

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6.7 Subject term (keyword listing). Delete "Bolt" and Add "Pin".

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FIGURE 4. Head Angularity. Delete, in flush head (right) figure only: "100° ±.001". Substitute: "Sleeve angle 100° +/- 1° Pin angle 102°30' +/- 30' "

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FIGURE 5. Permissible Fillet Distortion, left figure, Delete under figure: "REDUCED FLUSH HEAD" and substitute "FLUSH HEAD"

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FIGURE 8. Alpha case limitations. In top figure only (protruding head configuration), shorten coverage of flagnote 1 so that it extends only from the thread end to the bearing surface of the head. Also in top figure only (protruding head configuration), extend coverage of flagnote 2 to encompass all of the non-bearing surfaces of the head. In both figures, add a flagnote 2 to the chamfers on the threaded end of the bolt. Under figure, change "...TO MAX. DEPTH OF .002" to "...TO MAX DEPTH OF .003 ON ALL NON-BEARING SURFACES OF HEAD AND CHAMFERED END"

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