

INCH-POUND
MIL-W-8982D
27 February 1989
SUPERSEDING
MIL-W-8982C
6 June 1986

MILITARY SPECIFICATION

WRENCHES, SPLINED, HIGH STRENGTH, THIN WALL, GENERAL SPECIFICATION FOR

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

1. SCOPE

1.1 Scope. This specification covers high strength, splined, thin-wall wrenches used for the installation and removal of spline, high strength and high temperature aircraft fasteners (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

QQ-C-320	Chromium Plating (Electrodeposited)
QQ-N-290	Nickel Plating (Electrodeposited)
PPP-P-40	Packaging and Packing of Hand Tools; Tools and Tool Accessories for Power Driven, Metal and Woodworking Machinery

(See supplement 1 for list of associated specification sheets)

<p>Beneficial comments, (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Engineering Center, Systems Engineering and Standardization Department (Code 53), Lakehurst, NJ 8733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.</p>

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STANDARDS

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-130	Identification Marking of U.S. Military Property
MS33787	Wrenching Element, External Spline, Dimensions for

(Unless otherwise indicated, copies of federal and military specifications, standards and handbooks are available from the Naval Publications and Forms Center (Attn: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.2 Non-government publications. The following document(s) form a part of this specification 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 specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issue of the non-government documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASME B46.1	Surface Texture (Surface Roughness, Waviness and Lay)
ANSI-B107.4	Driving and Spindle Ends for Portable Hand, Air and Electric Tools
ANSI-B107.6	Wrenches, Box, Open End, Combination and Flare Nut (Inch Series)

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, NY 10018.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM-B571	Adhesion of Metallic Coatings, Test Methods for
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(Application for copies should be addressed to the American Society For Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

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3. REQUIREMENTS

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

3.2 Materials. The materials used in the manufacture of the wrenches shall be as specified in the individual specification sheet/military standard (MS).

3.3 Marking. The wrench shall be permanently marked with the manufacturer's name/CAGE code, or with a trademark of such known character that the source of manufacture may be readily determined. In addition, the tools shall be marked permanently with the nominal wrench opening (wrench size in fraction). Marking requirements shall be in accordance with MIL-STD-130.

3.4 Dimension/design requirements. The wrench shall conform to the applicable specification sheet. Spline and chamfer dimensions shall conform to MS33787.

3.5 Hardness. The wrench shall be hardened in accordance with the applicable specification sheet (see 4.6.1 and 3.1).

3.6 Plating. Unless otherwise specified the wrench shall be chromium plated in accordance with QQ-C-320, Class 1, Type I and nickel underplated in accordance with QQ-N-290, Class 1, Grade G. The plating shall be adherent to the base material (see 4.6.4 and 3.2).

3.7 Ultimate strength. The wrench shall withstand the ultimate strength (endurance torque and ultimate torque) loads specified in the applicable specification sheet. There shall be no damage or permanent deformation (set) to the wrenches (see 4.6.2).

3.8 Workmanship. The wrenches shall be of uniform quality. They shall be free from nicks, splits, cracks, laps, seams and scale. They shall have no imperfections that will adversely affect serviceability, reliability and safety.

3.9 Surface Texture. The surface texture shall be as specified in the applicable specification sheet and measured per ANSI/ASME B46.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility of 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 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 ensure supplies and services conform to prescribed requirements.

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4.2 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.3 Inspection lot. The inspection lot shall consist of wrenches of the same size and configuration (Military Part Number, see 3.1) produced under the same conditions and offered for inspection at the same time.

4.4 Sampling.

4.4.1 Visual sampling. A random sample of wrenches shall be selected from each lot offered for examination in accordance with MIL-STD-105 Inspection Level I. The Acceptable Quality Level (AQL) shall be 1.5.

4.4.2 Sampling (Ultimate Strength Testing). A random sample of wrenches shall be selected from each lot offered for examination in accordance with MIL-STD-105 at Inspection Level S-2. The AQL shall be 2.5.

4.4.3 Sampling (Plating). A random sample of wrenches shall be selected from each lot offered for examination in accordance with MIL-STD-105 at Inspection Level S-1. The AQL shall be 2.5.

4.5 Examination. Each sample selected in accordance with 4.3.1 shall be visually and dimensionally examined to verify compliance with this specification. Any wrench containing one or more defects shall be rejected and if the number of defective items in any sample exceeds the acceptance number for that sample, the lot shall be rejected.

4.6 Tests. Each sample selected in accordance with 4.3.2 shall be tested to verify compliance with this specification (see 4.6). Any tool in the sample containing one or more defects shall be rejected and if the number of defective items in any sample exceeds the acceptance number for that sample, the lot shall be rejected.

4.7 Test procedures. Test procedures shall be in accordance with applicable specification sheets.

4.7.1 Hardness. The hardness requirements shall be verified on a Rockwell tester, using a diamond penetrator and employing a 150-kilogram major load. Surfaces shall be suitably ground for the test. Plating, decarburization and hardened cases shall be removed for testing.

4.7.2 Ultimate strength tests.

4.7.2.1 Test procedure. Loads shall be applied using any suitable mechanical means. Test procedure shall prevent slippage of wrenches on mandrels during tests.

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4.7.2.1.1 Spline mandrel. Spline mandrel test shall be conducted as follows:

- a. Select a spline mandrel (hardened to not less than 55 HRC) equal to the basic size of the specified wrench (+0.000 -0.002 inches).
- b. Engage the wrench with the spline mandrel in accordance with MS33787, Table I, except that C and W diameters (on MS33787) shall be held to the minimum dimension (+0.002 -0.000 inches).
- c. Apply the ultimate torque loads specified on the applicable specification sheet for not less than 10 seconds.

4.7.3 Endurance torque tests. One sample wrench from each lot shall be tested to 500 cycles of the applicable spline endurance torque using the procedure in 4.7.2.1.1 steps (a) and (b).

4.7.4 Plating tests. Total plating thickness on each sample wrench shall be measured. The sample wrenches shall be tested for plating adhesion using Method 9.1 Heat-Quench Test of ASTM B571.

4.8 Inspection of packaging. The sampling and inspection of the preservation, packing and container marking shall be in accordance with the requirements of 5.1.

5. PACKAGING

5.1 Packaging requirements. Packaging requirements shall be in accordance with PPP-P-40 and shall be level A, B or C, as specified (see 6.2).

6. NOTES

6.1 Intended use. The tools manufactured in accordance with the requirements of this specification are intended to be used for installation and detachment of spline, high strength, high temperature aircraft fasteners.

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6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of this specification.
- b. Title, number and date of applicable specification (slash) sheet (see 3.1).
- c. Type and size of tools required.
- d. Level of preservation, packaging and packing requirements (see 5.1).
- e. Whether special marking for shipment is required.
- f. Type of finish (plating) if other than chromium (see 3.6).

6.3 Subject term (key Word) listing.

Wrenches
Splined
High Strength
Thin Wall

Custodians:
Army - AV
Air Force -99
Navy - AS

Preparing activity:
Navy - AS
(Project No. 5120-C041)

Review:
Army - GL

