INCH-POUND

MIL-STD-1312-13A
23 AUGUST 1991
SUPERSEDING
MIL-STD-1312-13
26 JULY 1985

MILITARY STANDARD

FASTENER TEST METHODS

METHOD 13

DOUBLE SHEAR TEST

AMSC N/A

FSC 53GP

FOREWARD

Fastener Test Methods, Method 13, Double Shear Test

MIL-STD-1312-13A

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.

2. 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 Standarization Department (SESD), Code 53, Lakehurst, NJ 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

This standard sets forth a standard test method to define the procedure and apparatus for testing fasteners in double shear in a half-hole shear fixture.

CONTENTS

1. SCOPE

1.1. Applicability. this test method covers the procedure and apparatus for testing fasteners in double shear in a half-hole shear fixture.

2. REFERENCED DOCUMENTS

2.1 Government documents.

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

SPECIFICATION

MILITARY

MIL-STD-45662 Calibration System Requirements

(Copies of specifications, standards and handbooks, are available from the Naval Publications and Printings Service, Standardization Documents Ordering Desk, Bldg. 4D, 700 Robbins Ave., Philadelphia, PA 19111-5094).

2.2 Other 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 shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DoDISS shall be the issue of the nongovernment documents which are current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E4 Standard Method of Verification of Testing Machines

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

3. DEFINITIONS

Not applicable.

4. GENERAL REQUIREMENTS

4.1 Test apparatus.

4.1.1 Testing machine. The testing machine shall be capable of applying a compressive load at a controllable rate. The calibrating system for the machine shall conform to MIL-STD-45662. Its accuracy shall be verified every 12 months by a meethod complying with ASTM E4, using a calibration device

which has been calibrated by the National Bureau of Standards not more than 2 years prior to its use. The loads of the fasteners tested shall be within the range of the testing machine as defined in ASTM E4.

4.1.2 Test fixtures. Test fixtures shall be in accordance with figure 1.

4.1.3 Grip length. Unless otherwise specified, the minimum grip length of the test specimen shall be 3D.

5. DETAIL REQUIREMENTS

5.1 Test procedures. The ultimate double shear strength shall be obtained as follows:

5.1.1 Test fixture. The fastener is placed in the receiving half-holes of the fixture base with neither threads nor fillet in bearing.

5.1.2 Test specimen. The blade (guillotine) portion is placed in position on the specimen and the preload applied.

5.1.3 Load rates. The test load is then applied at a uniform rate as specified in Table I. Load rates for larger or smaller size fasteners shall be calculated to give an initial stress rate of 100,000 pounds per minute per square inch of nominal double shear area. A tolerance of + or - 10 percent shall apply on the load rate. The nominal double shear area is twice the nominal shank area for the load rate calculation only. The test may be discontinued and the specimen removed without a complete shear failure after the ultimate load has been reached.

TABLE I. Double shear load rates.

Nominal diameter	Load rate lb./min.	Nominal diameter	Load rate lb./min.
0.125	2,480	0.563	49,600
0.156	3,840	0.625	61,200
0.164	4,200	0.750	88,000
0.188	5,600	0.875	120,000
0.250	10,000	1.000	156,000
0.313	15,400	1.125	200,000
0.375	22,000	1.250	244,000
0.438	30,000	1.375	296,000
0.500	39,200	1.500	352,000

The testing laboratory, at their option, may use a constant strain rate which will produce the specified load rate (+ or - 10 percent) in the elastic range. That is, the strain rate shall be equal to the initial stress rate of 100,000 pounds per minutes per square inch divided by the elastic modulus in shear.

6. NOTES

6.1 Test report. Unless otherwise prescribed in the product specification, for the material being tested, the test report shall contain the following data:

a. Fasterner description.

b. Part number.

c. Material.

d. Manufacturer.

e. Measured diameter of each specimen.

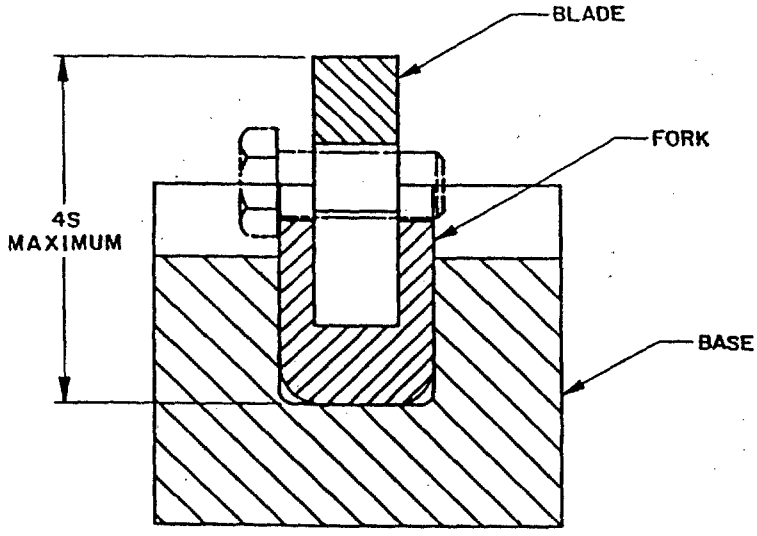
f. Individual ultimate load.

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

Review Activities:
Army - AV
Navy - SH
DLA - IS

Preparing activity:
Navy - AS

(Project 53GP-0251-03)



NOMINAL FASTENER SIZE	∅ D		S1 +0.0010 -0.0000	T +0.0000 -0.0010	W +0.0010 -0.0000	R
	MAX.	MIN.				
0.112	0.1130	0.1123	0.056	0.1120	0.1130	0.156
0.125	0.1260	0.1253	0.063	0.1250	0.1260	0.156
0.138	0.1390	0.1383	0.069	0.1380	0.1390	0.188
0.156	0.1573	0.1566	0.078	0.1563	0.1573	0.188
0.164	0.1650	0.1643	0.082	0.1640	0.1650	0.188
0.188	0.1885	0.1878	0.094	0.1875	0.1885	0.219
0.190	0.1910	0.1903	0.095	0.1900	0.1910	0.219
0.250	0.2510	0.2503	0.125	0.2500	0.2510	0.281
0.313	0.3135	0.3128	0.156	0.3125	0.3135	0.344
0.375	0.3760	0.3753	0.188	0.3750	0.3760	0.406
0.438	0.4385	0.4378	0.219	0.4375	0.4385	0.468
0.500	0.5010	0.5003	0.250	0.5000	0.5010	0.531
0.563	0.5635	0.5628	0.281	0.5625	0.5635	0.594
0.625	0.6260	0.6253	0.313	0.6250	0.6260	0.656
0.750	0.7510	0.7503	0.375	0.7500	0.7510	0.781
0.875	0.8760	0.8753	0.438	0.8750	0.8760	0.906
1.000	1.0010	1.0003	0.500	1.0000	1.0010	1.031
1.125	1.1260	1.1253	0.563	1.1250	1.1260	1.156
1.250	1.2510	1.2503	0.625	1.2500	1.2510	1.281
1.375	1.3760	1.3753	0.688	1.3750	1.3760	1.406
1.500	1.5010	1.5003	0.750	1.5000	1.5010	1.531

Notes:

1. Break blade edges, 0.005 minimum. Fixture shall be reworked when wear results in chamfer or radius of 0.010. In the event of controversy, the blade edges shall be sharp.

2. For fixture sizes other than those listed, the government proportions specified herein shall be maintained.

FIGURE 1. Double shear fixture.

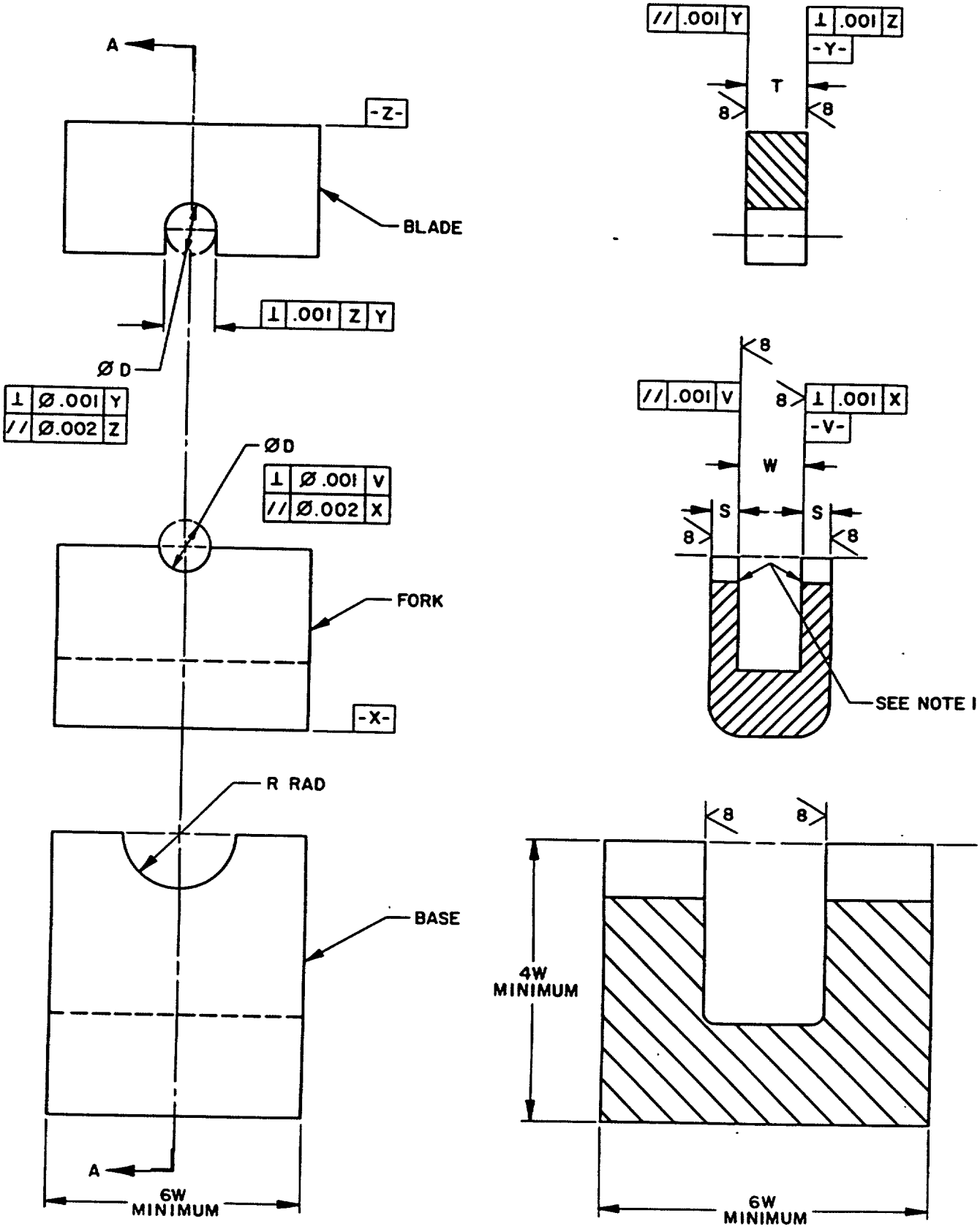


FIGURE 1. Double shear fixture. - Continued

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-STD-1312-13A	2. DOCUMENT DATE (YYMMDD) (91 08 23)

3. DOCUMENT TITLE
Fastener Test Methods, Method 13, Double Shear Test

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME Commanding Officer	b. TELEPHONE (Include Area Code) (1) Commercial: (908) 323-2326 (2) AUTOVON: (AV) 624-2326
c. ADDRESS (Include Zip Code) Naval Air Engineering Center SESD-Code 5311 Lakehurst, NJ 08733-5100	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340