

MIL-S-45933/2A
22 September 1977
SUPERSEDING
MIL-S-45933/2
30 June 1971

MILITARY SPECIFICATION SHEET

STUD, KEYRING LOCKED, 160 KSI FTU, MULTIPLE STEP

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

The complete requirements for procuring the studs described herein shall consist of this document and the latest issue of specification MIL-S-45933.

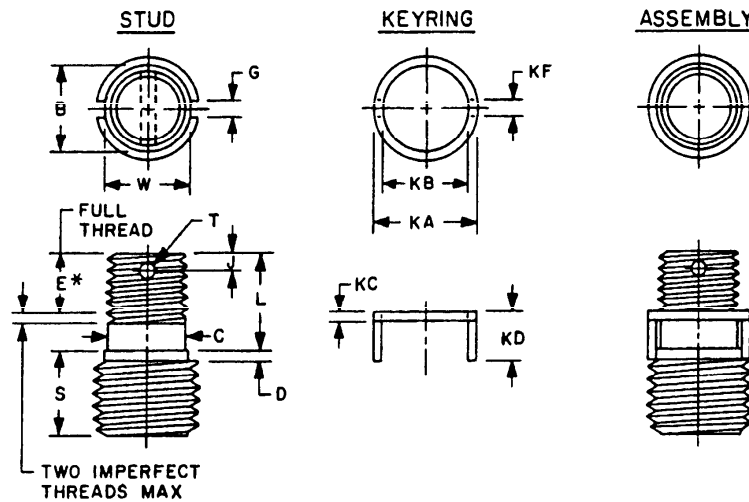


TABLE I - Sizes and Dimensions

| DASH NO. 1/ | NUT END THREADS UNJF-3A | STUD END THREADS UNJF-3A | B ±.005 | C ±.005 | D ±.005 | E ±.030 | G ±.005 |
|----------------|-------------------------------|--------------------------------|------------|------------|------------|------------|------------|
| 1 | .1120-40 | .1640-32 | .121 | .112 | .025 | .343 | .035 |
| 2 | .1380-32 | .1900-32 | .135 | .135 | .032 | .375 | .035 |
| 3 | .1640-32 | .2500-28 | .179 | .164 | .037 | .406 | .065 |
| 4 | .1900-32 | .3125-24 | .236 | .190 | .040 | .437 | .065 |
| 5 | .2500-28 | .3750-24 | .289 | .250 | .045 | .500 | .081 |
| 6 | .3125-24 | .4375-20 | .338 | .312 | .052 | .562 | .081 |
| 7 | .3750-24 | .5625-18 | .447 | .375 | .060 | .625 | .128 |

| DASH NO. | J ±.010 | S ±.015 | T ±.005 | W REF | KA +.000 -.005 | KB +.010 -.000 | KC +.005 -.000 | KD ±.010 | KF REF |
|----------|------------|------------|------------|----------|----------------------|----------------------|----------------------|-------------|-----------|
| 1 | - | .190 | - | .117 | .164 | .127 | .025 | .098 | .030 |
| 2 | - | .250 | - | .129 | .190 | .140 | .027 | .122 | .030 |
| 3 | .109 | .250 | .070 | .172 | .250 | .185 | .032 | .127 | .060 |
| 4 | .125 | .312 | .070 | .233 | .312 | .242 | .035 | .145 | .060 |
| 5 | .156 | .437 | .076 | .284 | .375 | .295 | .040 | .175 | .076 |
| 6 | .156 | .562 | .076 | .334 | .437 | .344 | .047 | .203 | .076 |
| 7 | .172 | .625 | .106 | .434 | .562 | .453 | .055 | .255 | .123 |

1/ Dash No. 1, 2 and 3 nut end threads are UNJC-3A:
Dash No. 1 stud end is UNJC-3A

* When "L" is equal to or less than "E", then "E" shall equal "L" minus two imperfect threads.

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TABLE I - Continued

| DASH NO. | NUT END THREADS UNJF-3A | STUD END THREADS UNJF-3A | B ±.005 | C ±.005 | D ±.005 | E ±.030 | G ±.005 |
|----------|-------------------------------|--------------------------------|------------|------------|------------|------------|------------|
| 8 | .4375-20 | .6250-18 | .507 | .437 | .060 | .687 | .128 |
| 9 | .5000-20 | .7500-16 | .619 | .500 | .067 | .812 | .159 |
| 10 | .5625-18 | .8750-14 | .728 | .562 | .075 | .875 | .159 |
| 11 | .6250-18 | 1.0000-12 | .836 | .625 | .083 | .937 | .190 |
| 12 | .7500-16 | 1.1250-12 | .930 | .750 | .099 | 1.062 | .190 |
| 14 | .8750-14 | 1.3750-12 | 1.149 | .875 | .114 | 1.187 | .253 |
| 16 | 1.0000-12 | 1.5000-12 | 1.273 | 1.000 | .114 | 1.312 | .253 |

| DASH NO. | J ±.010 | S ±.015 | T ±.005 | W REF | KA +.000 -.005 | KB +.010 -.000 | KC +.005 -.000 | KD ±.010 | KF REF |
|----------|------------|------------|------------|----------|----------------------|----------------------|----------------------|-------------|-----------|
| 8 | .172 | .750 | .106 | .496 | .625 | .516 | .055 | .255 | .123 |
| 9 | .187 | .875 | .106 | .605 | .750 | .625 | .062 | .312 | .154 |
| 10 | .220 | .937 | .141 | .717 | .875 | .734 | .070 | .351 | .154 |
| 11 | .220 | 1.000 | .141 | .820 | 1.000 | .846 | .078 | .390 | .185 |
| 12 | .220 | 1.250 | .141 | .913 | 1.125 | .938 | .094 | .437 | .185 |
| 14 | .250 | 1.375 | .141 | 1.126 | 1.375 | 1.156 | .109 | .531 | .248 |
| 16 | .250 | 1.625 | .141 | 1.253 | 1.500 | 1.281 | .109 | .531 | .248 |

TABLE II - Length Dash Numbers

| L NUT END ±.015 | LENGTH DASH NUMBER | | | | | | | | |
|--------------------------|--------------------|-------|----------------|-------|----------------|-------|-------|----------------|-----------------|
| | NUT END DIAMETER | | | | | | | | |
| | .1120 .1380 | .1640 | .1900 .2500 | .3125 | .3750 .4375 | .5000 | .5625 | .6250 .7500 | .8750 1.0000 |
| .250 | 4 | | | | | | | | |
| .312 | 5 | | | | | | | | |
| .375 | 6 | 6 | 6 | | | | | | |
| .437 | 7 | 7 | 7 | | | | | | |
| .500 | 8 | 8 | 8 | | | | | | |
| .562 | 9 | 9 | 9 | 9 | | | | | |
| .625 | 10 | 10 | 10 | 10 | 10 | | | | |
| .687 | | 11 | 11 | 11 | 11 | | | | |
| .750 | | 12 | 12 | 12 | 12 | 12 | | | |
| .812 | | 13 | 13 | 13 | 13 | 13 | | | |
| .875 | | 14 | 14 | 14 | 14 | 14 | 14 | | |
| .937 | | 15 | 15 | 15 | 15 | 15 | 15 | | |
| 1.000 | | 16 | 16 | 16 | 16 | 16 | 16 | 16 | |
| 1.062 | | 17 | 17 | 17 | 17 | 17 | 17 | 17 | |
| 1.125 | | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| 1.187 | | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| 1.250 | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 1.312 | | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 |
| 1.375 | | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| 1.437 | | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |

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TABLE II - Continued

| L NUT END ±.015 | LENGTH DASH NO. | | L NUT END ±.015 | LENGTH DASH NO. | |
|--------------------------|-----------------|----------------------|--------------------------|----------------------|--|
| | NUT END DIA | | | NUT END DIA | |
| | .1900 | .2500 Thru 1.0000 | | .2500 Thru 1.0000 | |
| 1.500 | 24 | 24 | 2.625 | 42 | |
| 1.562 | 25 | 25 | 2.750 | 44 | |
| 1.625 | 26 | 26 | 2.875 | 46 | |
| 1.687 | 27 | 27 | 3.000 | 48 | |
| 1.750 | 28 | 28 | 3.125 | 50 | |
| 1.812 | 29 | 29 | 3.250 | 52 | |
| 1.875 | 30 | 30 | 3.375 | 54 | |
| 1.937 | 31 | 31 | 3.500 | 56 | |
| 2.000 | 32 | 32 | 3.625 | 58 | |
| 2.125 | | 34 | 3.750 | 60 | |
| 2.250 | | 36 | 3.875 | 62 | |
| 2.375 | | 38 | 4.000 | 64 | |
| 2.500 | | 40 | | | |

NOTES:

1. MATERIAL: Studs: Alloy steel in accordance with MIL-S-6758 (4130) or MIL-S-5626 (4140).
Corrosion-resisting steel in accordance with AMS 5737, composition A286.
Keyrings: Corrosion-resisting steel, composition 410, in accordance with AMS 5504 or AMS 5613.
2. PROTECTIVE COATING: Alloy steel studs, with keyrings, shall be cadmium plated in accordance with QQ-P-416, Type II, Class 2.
Corrosion-resisting steel studs, with keyrings, shall be passivated in accordance with QQ-P-35 or silver plated in accordance with AMS 2411.
3. SURFACE ROUGHNESS: Thread surfaces shall be 63 microinches, turned surfaces shall be 125 microinches and milled areas shall be 125-250 microinches, in accordance with ANSI B46.1.
4. THREADS: Threads shall be in accordance with MIL-S-8879.
5. HARDNESS: Alloy steel studs shall be Rockwell C36-40.
Corrosion-resisting steel studs shall be Rockwell C35-39.
Keyrings shall be Rockwell C35-45.

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6. DIMENSIONS: All dimensions are in inches and shall apply after protective coating.
7. CONCENTRICITY: Nut end and stud end threads shall be concentric within 0.006 at the pitch diameter.
8. PART NUMBER: The part number consists of M45933/2 plus a size dash number from Table I, plus a length dash number from Table II.
 Add "A" in lieu of the first "dash" for A286 corrosion-resisting steel.
 Add "D" in lieu of the second "dash" for drilled hole in nut end.
 Add "P" as suffix to length dash number for silver plating.
 Examples:
 M45933/2-5-16 Alloy steel stud, not drilled, 1.000 nut end length.
 M45933/2A5D16P Corrosion-resisting steel stud, drilled nut end, 1.000 nut end length, silver plated.
9. Studs shall be free of all hanging burrs and slivers which might become dislodged under usage.
10. These studs are manufactured under U.S. Patent No. 2,980,929 which expires 25 March 1978. The Government does not have a royalty free license.
11. Install studs in accordance with MIL-S-45933/3.
12. Revision letters are not used to denote changes due to the extensiveness of the changes.

Custodians:

Army - WC
 Air Force - 99

Preparing Activity:

Army - WC

Project No. 5307-0199

Reviewer Activities:

Army - AV, EL
 DSA - IS
 NSA - NS

User Activities:

Navy - AS, OS

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