

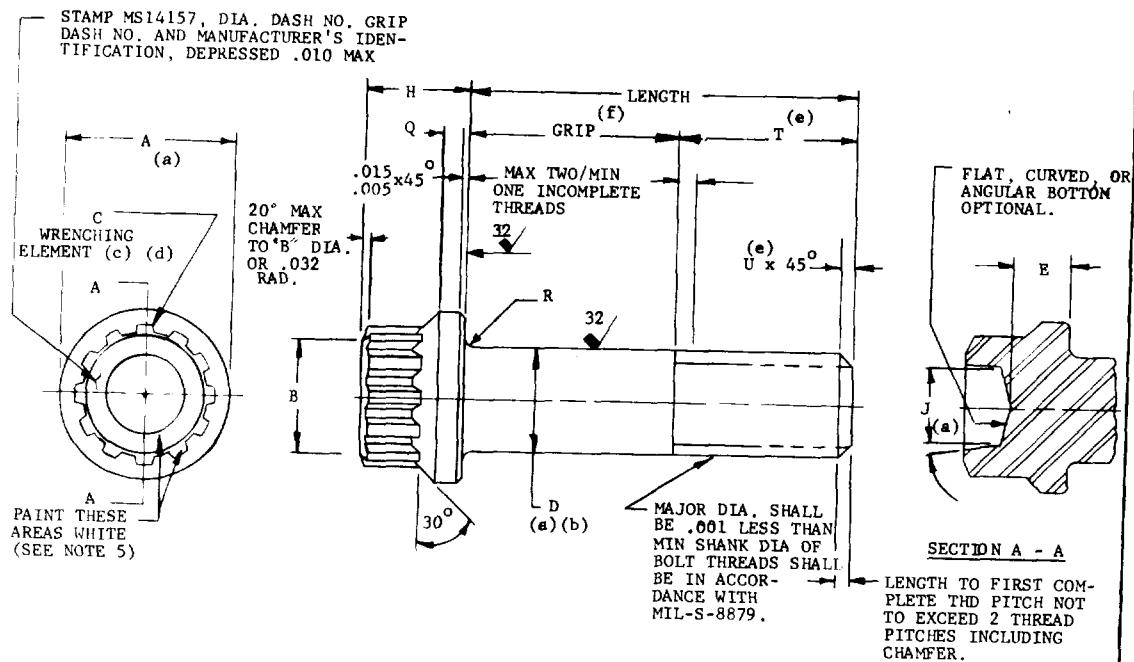
USER BY: 4:

REVIEWER SYMBOLS:

ARMY - AV. FL. AT. ME. MC
DIA-IC

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NOTES :

1. MATERIAL: ALLOY STEEL, MIL-S-6049 (AISI 8740) OR MIL-S-5000 (AISI 4340)
2. HARDNESS: ROCKWELL "C" 39-43.
3. SURFACE TEXTURE IN ACCORDANCE WITH ANSI B46.1, 1971.
4. PLATING: CADMIUM PLATE IN ACCORDANCE WITH NAS 672. SUPPLEMENTARY CHROMATE TREATMENT PER QQ-P-416.
5. PAINT: AFTER BAKE, TOP OF BOLT HEAD WITH NO. 17875 WHITE PER TT-E-489.
6. DIMENSIONS IN INCHES, UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS $\pm .010$, ANGLES $+2^{\circ}$.
7. DIMENSIONS TO BE MET AFTER PLATING.
8. DESIGN AND USAGE INFORMATION: THESE BOLTS ARE DESIGNED TO BE USED WITH MS14156 NUTS AND MS14155 WASHERS.
9. PERFORMANCE:
 - (a) FATIGUE PER MIL-B-8831 EXCEPT THAT LOADING SHALL BE AS SHOWN IN MS 14157 TABLE II AND MS 14156 NUTS AND MS 14155 WASHERS SHALL BE USED, AND NO BOLT SHALL FAIL AT LESS THAN 2,000,000 CYCLES. THREADS AND BEARING SURFACES OF MS 14157 BOLTS, MS 14156 NUTS AND MS 14155 WASHERS SHALL BE LUBRICATED WITH MIL-T-5544 COMPOUND FOR THIS TEST.

FOR DESIGN FEATURE PURPOSES THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BID.

Ⓑ REVISED AND REDRAWN

P. A. NAVY - AS Other Cust USAF-11 ARMY-AV	TITLE BOLT, WHEEL, TENSION, FLANGED STEEL, 180KSI Ftu, 450° F. EXTERNAL SPLINE DRIVE	MILITARY STANDARD MS14157
PROCUREMENT SPECIFICATION MIL-B-8831	SUPERSEDES	SHEET 1 OF 3

DD FORM 672-1 (Coordinated)
MAR 72

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

PLATE NO 2J065

PROJECT NUMBER 5306-0519

APPROVED 13 SEPT 74
REVISED A 30 JUNE 1977 R 15 AUGUST 1978

FED. SUP CLASS
5306

TABLE I

DIA DASH NO.	NOMINAL SIZE	THREAD UNJF-3A (b)	A DIA (a)		B DIA		C (c) (d) WRENCHING ELEMENT	D DIA (a) (b)		E MIN	H +.010	J (a) (c) +.010 -.030	K +.005
			MAX	MIN	MAX	MIN		MAX	MIN				
04*	1/4	.2500-28	.438	.428	.250	.235	10	.2495	.2485	.135	.250	.180	.037
05	5/16	.3125-24	.531	.521	.395	.360	12	.3120	.3110	.162	.312	.215	
06	3/8	.3750-24	.649	.639	.438	.423	14	.3745	.3735	.197	.337	.260	
07	7/16	.4375-20	.750	.740	.500	.485	16	.4370	.4360	.228	.393	.320	
08	1/2	.5000-20	.828	.818	.562	.547	20	.4995	.4985	.254	.450	.380	
09	9/16	.5625-18	.938	.928	.625	.610	22	.5615	.5605	.289	.505	.440	
10	5/8	.6250-18	1.050	1.040	.688	.673	24	.6240	.6230	.327	.562	.500	
12	3/4	.7500-16	1.230	1.220	.812	.797	28	.7490	.7480	.380	.600	.570	
14	7/8	.8750-14	1.438	1.428	.938	.923	32	.8740	.8730	.438	.700	.650	

TABLE II

DIA. DASH NO.	M +.010	Q +.010	R RAD		T MIN REF (e)	U REF (e)	FATIGUE LOADING		ULTIMATE TENSILE STRENGTH LB MIN	DOUBLE SHEAR STRENGTH LB MIN	CONCENTRICITY		
			MAX	MIN			LOW TENSION LOAD LB+2%(g)	HIGH TENSION LOAD LB+2%(h)			X (a)	Y (c)	Z (b)
04	.062	.045	.041	.031	.550	.045	4,700	5,600	7,270	10,600	.005	.004	
05		.061			.638	.052	7,500	8,900	11,500	16,600	.006	.005	.0045
06	.070	.069			.708		11,100	13,200	17,100	23,900	.008	.006	
07		.082	.057	.047	.803	.063	15,100	17,900	23,200	32,500	.009	.008	
08		.102			.878		20,100	23,800	30,900	42,400	.010	.008	
09		.112			.970	.069	25,500	28,200	39,200	53,700	.011	.009	.006
10	.094	.123			1.040		31,900	35,400	49,100	66,300	.012	.010	
12		.155			1.201	.078	46,200	51,100	71,000	95,400	.015	.012	
14		.180	.073	.063	1.367	.089	63,000	69,800	97,000	129,900	.018	.014	.009

NOTES:

- (a) DIMENSIONS A, D, AND J SHALL BE CONCENTRIC TO EACH OTHER WITHIN VALUES SPECIFIED FOR Y T.I.R.
 (b) DIMENSIONS D AND THREAD PITCH DIAMETER SHALL BE CONCENTRIC TO EACH OTHER WITHIN VALUES SPECIFIED FOR Z T.I.R.
 (c) DIMENSION J AND WRENCHING ELEMENT SHALL BE CONCENTRIC TO EACH OTHER WITHIN VALUES SPECIFIED FOR Y T.I.R.
 (d) WRENCHING ELEMENT PER MS 33787. DRIVERS PER MIL-W-8982.
 (e) REFERENCE DIMENSIONS ARE FOR DESIGN PURPOSES ONLY AND ARE NOT INSPECTION OR MANUFACTURING REQUIREMENTS. T MIN = H MAX (MS 14156) + 3 THDS + .153.
 (f) GRIP LENGTH OF BOLT SHALL BE MEASURED FROM UNDERSIDE OF HEAD TO THE END OF FULL CYLINDRICAL PORTION OF SHANK.
 (g) LOW TENSION FATIGUE LOAD IS BASED ON .65 x Ftu OF TABLE II.
 (h) HIGH TENSION FATIGUE LOAD FOR SIZES 1/4 THROUGH 1/2 INCH ARE BASED ON .77 x Ftu AND SIZES 9/16 THROUGH 7/8 INCH ARE BASED ON .72 x Ftu OF TABLE II.

B REVISED AND REDRAWN

P.A.
NAVY - AS
Other CustUSAF - 11
ARMY - AVPROCUREMENT SPECIFICATION
MIL-B-8831

TITLE

BOLT, WHEEL, TENSION, FLANGED, STEEL, 180KSI Ftu
450°F EXTERNAL SPLINE DRIVE

SUPERSEDES

MILITARY STANDARD

MS14157

SHEET 2 OF 3

DD FORM 672-1 (Coordinated)
MAY 72

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

PLATE NO. 2

USER SYMBOLS:

REVIEWER SYMBOLS:

ARMY - AV, EL, AT, HE, WC
DIA-IS

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This military standard is approved for use by all Departments
 B. Agencies of the Department of Defense. Selection for all new
 engineering and design applications and for repetitive use shall
 be made from this document.

APPROVED 13 SEPT 74 REVISED A 15 AUGUST 1978
 FOR CHANGES SEE SHEETS 1 (C), 15 AUGUST 1978

FED. SUP CLASS

5306

TABLE III

GRIP DASH NO.	GRIP ± .010	DIAMETER DASH NUMBER								
		04	05	06	07	08	09	10	12	14
		LENGTH ± .015								
004	0.250	0.825	0.913	—	—	—	—	—	—	—
006	0.375	0.950	1.038	1.108	1.203	—	—	—	—	—
008	0.500	1.075	1.163	1.233	1.328	1.403	—	—	—	—
010	0.625	1.200	1.288	1.358	1.453	1.528	1.620	1.690	—	—
012	0.750	1.325	1.413	1.483	1.578	1.653	1.745	1.815	1.976	—
014	0.875	1.450	1.538	1.608	1.703	1.778	1.870	1.940	2.101	2.267
016	1.000	1.575	1.663	1.733	1.828	1.903	1.995	2.065	2.226	2.392
018	1.125	1.700	1.788	1.858	1.953	2.028	2.120	2.190	2.351	2.517
020	1.250	1.825	1.913	1.983	2.078	2.153	2.245	2.315	2.476	2.642
022	1.375	1.950	2.038	2.108	2.203	2.278	2.370	2.440	2.601	2.767
024	1.500	2.075	2.163	2.233	2.328	2.403	2.495	2.565	2.726	2.892
026	1.625	2.200	2.288	2.358	2.453	2.528	2.620	2.690	2.851	3.017
028	1.750	2.325	2.413	2.483	2.578	2.653	2.745	2.815	2.976	3.142
030	1.875	2.450	2.538	2.608	2.703	2.778	2.870	2.940	3.101	3.267
032	2.000	2.575	2.663	2.733	2.828	2.903	2.995	3.065	3.226	3.392
034	2.125	2.700	2.788	2.858	2.953	3.028	3.120	3.190	3.351	3.517
036	2.250	2.825	2.913	2.983	3.078	3.153	3.245	3.315	3.476	3.642
038	2.375	2.950	3.038	3.108	3.203	3.278	3.370	3.440	3.601	3.767
040	2.500	3.075	3.163	3.233	3.328	3.403	3.495	3.565	3.726	3.892
042	2.625	3.200	3.288	3.358	3.453	3.528	3.620	3.690	3.851	4.017
044	2.750	3.325	3.413	3.483	3.578	3.653	3.745	3.815	3.976	4.142
046	2.875	3.450	3.538	3.608	3.703	3.778	3.870	3.940	4.101	4.267
048	3.000	3.575	3.663	3.733	3.828	3.903	3.995	4.065	4.226	4.392
050	3.125	3.700	3.788	3.858	3.953	4.028	4.120	4.190	4.351	4.517
052	3.250	3.825	3.913	3.983	4.078	4.153	4.245	4.315	4.476	4.642
054	3.375	3.950	4.038	4.108	4.203	4.278	4.370	4.440	4.601	4.767
056	3.500	4.075	4.163	4.233	4.328	4.403	4.495	4.565	4.726	4.892
058	3.625	4.200	4.288	4.358	4.453	4.528	4.620	4.690	4.851	5.017
060	3.750	4.325	4.413	4.483	4.578	4.653	4.745	4.815	4.976	5.142
062	3.875	4.450	4.538	4.608	4.703	4.778	4.870	4.940	5.101	5.267
064	4.000	4.575	4.663	4.733	4.828	4.903	4.995	5.065	5.226	5.392
066	4.125	4.700	4.788	4.858	4.953	5.028	5.120	5.190	5.351	5.517
068	4.250	4.825	4.913	4.983	5.078	5.153	5.245	5.315	5.476	5.642
070	4.375	4.950	5.038	5.108	5.203	5.278	5.370	5.440	5.601	5.767
072	4.500	5.075	5.163	5.233	5.328	5.403	5.495	5.565	5.726	5.892
074	4.625	5.200	5.288	5.358	5.453	5.528	5.620	5.690	5.851	6.017
076	4.750	5.325	5.413	5.483	5.578	5.653	5.745	5.815	5.976	6.142
078	4.875	5.450	5.538	5.608	5.703	5.778	5.870	5.940	6.101	6.267
080	5.000	5.575	5.663	5.733	5.828	5.903	5.995	6.065	6.226	6.392
082	5.125	5.700	5.788	5.858	5.953	6.028	6.120	6.190	6.351	6.517
084	5.250	5.825	5.913	5.983	6.078	6.153	6.245	6.315	6.476	6.642
086	5.375	5.950	6.038	6.108	6.203	6.278	6.370	6.440	6.601	6.767
088	5.500	6.075	6.163	6.233	6.328	6.403	6.495	6.565	6.726	6.892
090	5.625	6.200	6.288	6.358	6.453	6.528	6.620	6.690	6.851	7.017
092	5.750	6.325	6.413	6.483	6.578	6.653	6.745	6.815	6.976	7.142
094	5.875	6.450	6.538	6.608	6.703	6.778	6.870	6.940	7.101	7.267
096	6.000	6.575	6.663	6.733	6.828	6.903	6.995	7.065	7.226	7.392
098	6.125	6.700	6.788	6.858	6.953	7.028	7.120	7.190	7.351	7.517
100	6.250	6.825	6.913	6.983	7.078	7.153	7.245	7.315	7.476	7.642
102	6.375	6.950	7.038	7.108	7.203	7.278	7.370	7.440	7.601	7.767
104	6.500	7.075	7.163	7.233	7.328	7.403	7.495	7.565	7.726	7.892
106	6.625	7.200	7.288	7.358	7.453	7.528	7.620	7.690	7.851	8.017
108	6.750	7.325	7.413	7.483	7.578	7.653	7.745	7.815	7.976	8.142
110	6.875	7.450	7.538	7.608	7.703	7.778	7.870	7.940	8.101	8.267
112	7.000	7.575	7.663	7.733	7.828	7.903	7.995	8.065	8.226	8.392
114	7.125	7.700	7.788	7.858	7.953	8.028	8.120	8.190	8.351	8.517
116	7.250	7.825	7.913	7.983	8.078	8.153	8.245	8.315	8.476	8.642
118	7.375	7.950	8.038	8.108	8.203	8.278	8.370	8.440	8.601	8.767
120	7.500	8.075	8.163	8.233	8.328	8.403	8.495	8.565	8.726	8.892
122	7.625	8.200	8.288	8.358	8.453	8.528	8.620	8.690	8.851	9.017
124	7.750	8.325	8.413	8.483	8.578	8.653	8.745	8.815	8.976	9.142
126	7.875	8.450	8.538	8.608	8.703	8.778	8.870	8.940	9.101	9.267

DIAMETER DASH NO. AT TOP OF TABLE, PLUS GRIP DASH NO. CONSTITUTES A COMPLETE PART NO.

FIRST TWO DASH NUMBERS DESIGNATE DIAMETER IN SIXTEENTHS. LAST THREE DASH NUMBERS DESIGNATE GRIP LENGTH IN SIXTEENTHS.

UNASSIGNED DASH NUMBERS SHALL NOT BE USED.

EXAMPLE OF PART NUMBER: MS14157-04008

B REVISED AND REDRAWN

500 GRIP - 1.075 LENGTH

1/4-28 BOLT

BASIC NUMBER

P.A.
NAVY - AS
Other CustUSAF - 11
ARMY - AV

TITLE

BOLT, WHEEL, TENSION, FLANGED, STEEL, 180 KSI, Ftu,
450°F, EXTERNAL SPLINE DRIVE

MILITARY STANDARD

MS14157

PROCUREMENT SPECIFICATION
MIL-B-8831

SUPERSEDES

SHEET 3 OF 3

DD FORM 672-1 (Coordinated)
1 MAR 72

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

PLATE NO. 21065

U.S. GOVERNMENT PRINTING OFFICE: 1978-703-122/3876

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APPROVED 13 SEP 74 REVISED (A) FOR CHANGES SEE SHEETS 1 THRU 3 (B) 15 AUGUST 1978