



- 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  $\pm 2^\circ$ .
  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.

(B) REVISED AND REDRAWN

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

APPROVED 13 SEPT 74 (A) REVISED 30 JUNE 1977 (B) 15 AUGUST 1978

This drawing is approved for use by all Departments, Bases, and the Department of Defense. Section for the use of this drawing shall be made from this drawing.

REVIEWER SYMBOLS:  
 ARMY - AV, EL, AT, ME, NC  
 DIA-IS  
 USER SYMBOLS:  
 STAMP MS14157, DIA, DASH NO. GRIP  
 DASH NO. AND MANUFACTURER'S IDENTIFICATION, DEPRESSED .010 MAX

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 (c) -.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	055
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	.0045
05	.070	.061	.057	.047	.638	.052	7,500	8,900	11,500	16,600	.006	.005	
06	.070	.069			.708	.063	11,100	13,200	17,100	23,900	.008	.006	
07	.082	.094	.073	.063	.803	.069	15,100	17,900	23,200	32,500	.009	.008	
08	.102				.878	.069	20,100	23,800	30,900	42,400	.010	.008	
09	.112	.123	.073	.063	.970	.069	25,500	28,200	39,200	53,700	.011	.009	
10	.123				1,040	.078	31,900	35,400	49,100	66,300	.012	.010	
12	.155	.180	.073	.063	1,201	.078	46,200	51,100	71,000	95,400	.015	.012	
14	.180				1,367	.089	63,000	69,800	97,000	129,900	.018	.014	

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 Cust  
USAF - 11  
ARMY - AV  
PROCUREMENT 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

REVIEWER SYMBOLS: ARMY - AV, EL, AT, HE, WC  
 DIA-IS  
 "Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DDISS."  
 This military standard is approved for use by all Departments, 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) FOR CHANGES SEE SHEETS 1 (C), 15 AUGUST 1978

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	1.328	1.403	1.478	1.553	1.628	1.703
008	0.500	1.075	1.163	1.233	1.328	1.403	1.478	1.553	1.628	1.703	1.778
010	0.625	1.200	1.288	1.358	1.453	1.528	1.603	1.678	1.753	1.828	1.903
012	0.750	1.325	1.413	1.483	1.578	1.653	1.728	1.803	1.878	1.953	2.028
014	0.875	1.450	1.538	1.608	1.703	1.778	1.853	1.928	2.003	2.078	2.153
016	1.000	1.575	1.663	1.733	1.828	1.903	1.978	2.053	2.128	2.203	2.278
018	1.125	1.700	1.788	1.858	1.953	2.028	2.103	2.178	2.253	2.328	2.403
020	1.250	1.825	1.913	1.983	2.078	2.153	2.228	2.303	2.378	2.453	2.528
022	1.375	1.950	2.038	2.108	2.203	2.278	2.353	2.428	2.503	2.578	2.653
024	1.500	2.075	2.163	2.233	2.328	2.403	2.478	2.553	2.628	2.703	2.778
026	1.625	2.200	2.288	2.358	2.453	2.528	2.603	2.678	2.753	2.828	2.903
028	1.750	2.325	2.413	2.483	2.578	2.653	2.728	2.803	2.878	2.953	3.028
030	1.875	2.450	2.538	2.608	2.703	2.778	2.853	2.928	3.003	3.078	3.153
032	2.000	2.575	2.663	2.733	2.828	2.903	2.978	3.053	3.128	3.203	3.278
034	2.125	2.700	2.788	2.858	2.953	3.028	3.103	3.178	3.253	3.328	3.403
036	2.250	2.825	2.913	2.983	3.078	3.153	3.228	3.303	3.378	3.453	3.528
038	2.375	2.950	3.038	3.108	3.203	3.278	3.353	3.428	3.503	3.578	3.653
040	2.500	3.075	3.163	3.233	3.328	3.403	3.478	3.553	3.628	3.703	3.778
042	2.625	3.200	3.288	3.358	3.453	3.528	3.603	3.678	3.753	3.828	3.903
044	2.750	3.325	3.413	3.483	3.578	3.653	3.728	3.803	3.878	3.953	4.028
046	2.875	3.450	3.538	3.608	3.703	3.778	3.853	3.928	4.003	4.078	4.153
048	3.000	3.575	3.663	3.733	3.828	3.903	3.978	4.053	4.128	4.203	4.278
050	3.125	3.700	3.788	3.858	3.953	4.028	4.103	4.178	4.253	4.328	4.403
052	3.250	3.825	3.913	3.983	4.078	4.153	4.228	4.303	4.378	4.453	4.528
054	3.375	3.950	4.038	4.108	4.203	4.278	4.353	4.428	4.503	4.578	4.653
056	3.500	4.075	4.163	4.233	4.328	4.403	4.478	4.553	4.628	4.703	4.778
058	3.625	4.200	4.288	4.358	4.453	4.528	4.603	4.678	4.753	4.828	4.903
060	3.750	4.325	4.413	4.483	4.578	4.653	4.728	4.803	4.878	4.953	5.028
062	3.875	4.450	4.538	4.608	4.703	4.778	4.853	4.928	5.003	5.078	5.153
064	4.000	4.575	4.663	4.733	4.828	4.903	4.978	5.053	5.128	5.203	5.278
066	4.125	4.700	4.788	4.858	4.953	5.028	5.103	5.178	5.253	5.328	5.403
068	4.250	4.825	4.913	4.983	5.078	5.153	5.228	5.303	5.378	5.453	5.528
070	4.375	4.950	5.038	5.108	5.203	5.278	5.353	5.428	5.503	5.578	5.653
072	4.500	5.075	5.163	5.233	5.328	5.403	5.478	5.553	5.628	5.703	5.778
074	4.625	5.200	5.288	5.358	5.453	5.528	5.603	5.678	5.753	5.828	5.903
076	4.750	5.325	5.413	5.483	5.578	5.653	5.728	5.803	5.878	5.953	6.028
078	4.875	5.450	5.538	5.608	5.703	5.778	5.853	5.928	6.003	6.078	6.153
080	5.000	5.575	5.663	5.733	5.828	5.903	5.978	6.053	6.128	6.203	6.278
082	5.125	5.700	5.788	5.858	5.953	6.028	6.103	6.178	6.253	6.328	6.403
084	5.250	5.825	5.913	5.983	6.078	6.153	6.228	6.303	6.378	6.453	6.528
086	5.375	5.950	6.038	6.108	6.203	6.278	6.353	6.428	6.503	6.578	6.653
088	5.500	6.075	6.163	6.233	6.328	6.403	6.478	6.553	6.628	6.703	6.778
090	5.625	6.200	6.288	6.358	6.453	6.528	6.603	6.678	6.753	6.828	6.903
092	5.750	6.325	6.413	6.483	6.578	6.653	6.728	6.803	6.878	6.953	7.028
094	5.875	6.450	6.538	6.608	6.703	6.778	6.853	6.928	7.003	7.078	7.153
096	6.000	6.575	6.663	6.733	6.828	6.903	6.978	7.053	7.128	7.203	7.278
098	6.125	6.700	6.788	6.858	6.953	7.028	7.103	7.178	7.253	7.328	7.403
100	6.250	6.825	6.913	6.983	7.078	7.153	7.228	7.303	7.378	7.453	7.528
102	6.375	6.950	7.038	7.108	7.203	7.278	7.353	7.428	7.503	7.578	7.653
104	6.500	7.075	7.163	7.233	7.328	7.403	7.478	7.553	7.628	7.703	7.778
106	6.625	7.200	7.288	7.358	7.453	7.528	7.603	7.678	7.753	7.828	7.903
108	6.750	7.325	7.413	7.483	7.578	7.653	7.728	7.803	7.878	7.953	8.028
110	6.875	7.450	7.538	7.608	7.703	7.778	7.853	7.928	8.003	8.078	8.153
112	7.000	7.575	7.663	7.733	7.828	7.903	7.978	8.053	8.128	8.203	8.278
114	7.125	7.700	7.788	7.858	7.953	8.028	8.103	8.178	8.253	8.328	8.403
116	7.250	7.825	7.913	7.983	8.078	8.153	8.228	8.303	8.378	8.453	8.528
118	7.375	7.950	8.038	8.108	8.203	8.278	8.353	8.428	8.503	8.578	8.653
120	7.500	8.075	8.163	8.233	8.328	8.403	8.478	8.553	8.628	8.703	8.778
122	7.625	8.200	8.288	8.358	8.453	8.528	8.603	8.678	8.753	8.828	8.903
124	7.750	8.325	8.413	8.483	8.578	8.653	8.728	8.803	8.878	8.953	9.028
126	7.875	8.450	8.538	8.608	8.703	8.778	8.853	8.928	9.003	9.078	9.153

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 Cust  
 USAF - 11  
 ARMY - AV

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

MILITARY STANDARD

MS 14157

PROCUREMENT SPECIFICATION  
 MIL-B-8831

SUPERSEDES

SHEET 3 OF 3

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

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 REVIEWER SYMBOLS:  
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