

Form approved
OMB No 0704-0188

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DODISS SPECIFIED IN THE SOLICITATION MIL-B-7038

(E) TABLE I BOLT DIMENSIONS AND TENSILE STRENGTH

BASIC MS PART NO	(a) THREAD T	(a) A DIA		(a) B DIA		(a) C DIA	D	E	F MIN	(a) H HEX		J	K	M +.005 -.000 DIA	N MAX RAD
		MAX	MIN	MAX	MIN					MAX	MIN				
MS20004	1/4-28 UNJF-3A	.2492	.2477	.438	.428	.342	.250	.112	.068	.1900	.1880	.078			.010
MS20005	5/16-24 UNJF-3A	.3117	.3102	.531	.521	.394	.312	.144	.094	2.210	2.190	.094			.011
MS20006	3/8-24 UNJF-3A	.3742	.3727	.649	.639	.520	.375	.183	.116	3.150	3.130	.125			.019
MS20007	7/16-20 UNJF-3A	.4367	.4347	.750	.740	.534	.438	.208	.147	3.785	3.755	.172			.022
MS20008	1/2-20 UNJF-3A	.4991	.4971	.828	.818	.625	.500	.247	.169	4.410	4.380	.203			.022
MS20009	9/16-18 UNJF-3A	.5616	.5596	.938	.928	.723	.562	.279	.190	5.035	5.005	.234			.022
MS20010	5/8-18 UNJF-3A	.6240	.6220	1.050	1.040	.826	.625	.317	.216	5.660	5.630	.281			.022
MS20012	3/4-16 UNJF-3A	.7488	.7468	1.230	1.220	.921	.750	.385	.273	6.295	6.257	.344			.022
MS20014	7/8-14 UNJF-3A	.8737	.8707	1.438	1.428	1.083	.875	.450	.327	7.547	7.507	.391			.022
MS20016 *	1-14 NS-3A		.9955	1.625	1.615	1.249	1.000	.527	.381			.453			.022
MS20017	1-12 UNJF-3A	9985								7.547	7.507	.391			.022
MS20018	1-1/8-12 UNJF-3A	1.124								1.125	.589	.443			.022
MS20020	1-1/4-12 UNJF-3A	2.249								1.005	1.001	.500			.125
MS20022	1-3/8-12 UNJF-3A	3.74								1.375	.746	.531			.125
MS20024	1-1/2-12 UNJF-3A	4.99								1.500	.823	.586			.156
MS20012A	3/4-16 UNJF-3A	.7488	.7468	1.230	1.220	.921	.750	.385	.273	6.295	6.257	.344			.022

(E) SEE NOTE (f)

TABLE I (CONTINUED)

BASIC MS PART NO	P RAD		P RAD		(b) S MIN REF	U ±.016	(c) V MAX	(c) W MAX	(b) (c) CENTER DRILL SIZE REF	TENSILE STRENGTH LB MIN	(a) CONCENTRICITY		
	MAX	MIN	MAX	MIN							X	Y	Z
MS20004			.041	.031	.475	.031				6,190	.005	.007	
MS20005					.537					9,820	.006	.008	0045
MS20006					.662	.047				15,200	.008	.010	
MS20007	020	010			.787					20,400	.009	.011	
MS20008			.057	.047						27,400	.010	.012	
MS20009					.850					34,800	.011	.014	.006
MS20010					.912	.062				43,600	.012	.016	
MS20012					1.037					63,200	.015	.018	
MS20014					1.162		187	200	2	86,100	.018	.022	
MS20016 *			073	063		.078				112,000	.020	.025	.009
MS20017	030	015			1.287		250	260	3	114,000			
MS20018					1.475					144,000	.022	.026	
MS20020					1.600					180,000	.025	.032	
MS20022			.089	.077	1.725	.094	.312	320	4	219,000	.028	.035	.012
MS20024					1.850					263,000	.030	.039	
MS20012A			.073	.063	1.730	.062	187	200	2	63,200	.015	.018	.006

(E) SEE NOTE (f)

* SEE NOTE (a)

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

PREPARING ACTIVITY NAVY - AS
CUSTODIANS ARMY - AP NAVY -
AIR FORCE - 99 DLA -
REVIEW ARMY - EP, ME, MI DLA - IS AF - HC
USER ARMY - AV
PROJECT NUMBER 5306-1233

MILITARY SPECIFICATION SHEET
TITLE BOLTS, INTERNAL WRENCHING, 160 KSI FTU
AND 96 KSI FSL

SPECIFICATION SHEET NUMBER 30 MAY 1989
MS20004E THRU 20024E
SUPERSEDING
MS20004D THRU 20024D 10 AUGUST 1981
AMSC - N/A FSC 5306

DISTRIBUTION STATEMENT A Approved for public release, distribution is unlimited

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DD FORM 672 MAY 1988

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

14 2004

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TABLE II DASH NOS., GRIP LENGTHS AND BOLT LENGTH

DASH NO	GRIP = 010	LENGTH = D15														
		MS20004 1/4	MS20005 5/16	MS20006 3/8	MS20007 7/16	MS20008 1/2	MS20009 9/16	MS20010 5/8	MS20012 3/4	MS20014 7/8	MS20016 1	MS20017 1	MS20018 1-1/8	MS20020 1-1/4	MS20022 1-3/8	MS20024 1-1/2
4	.250	.750														
6	.375	.875	938	1 062												
8	.500	1.000	1 062	1 188	1 312	1 312										
10	.625	1.125	1 188	1 312	1 438	1 438	1.500	1.562	1.688	1 812						
12	.750	1.250	1 312	1 438	1 562	1 562	1 625	1.688	1 812	1 938						
14	.875	1.375	1 438	1 562	1 688	1 688	1 750	1 812	1 938	2 062						
16	1.000	1.500	1.562	1 688	1 812	1 812	1.875	1 938	2 062	2 188	2 312	2 312				
18	1.125	1.625	1 688	1 812	1 938	1 938	2 000	2 062	2 188	2 312	2 438	2 438	2 625			
20	1.250	1.750	1 812	1 938	2 062	2 062	2 125	2 188	2 312	2 438	2 562	2 562	2 750	2 875		
22	1.375	1.875	1 938	2 062	2 188	2 188	2 250	2 312	2 438	2 562	2 688	2 688	2 875	3 000	3 125	
24	1.500	2.000	2.062	2 188	2 312	2 312	2 375	2 438	2.562	2.688	2 812	2 812	3 000	3 125	3 250	3 375
26	1.625	2.125	2 188	2 312	2 438	2 438	2 500	2.562	2 688	2 812	2 938	2 938	3 125	3 250	3 375	3 500
28	1.750	2.250	2 312	2 438	2.562	2 562	2 625	2 688	2 812	2 938	3 062	3 062	3 250	3 375	3 500	3 625
30	1.875	2.375	2 438	2 562	2 688	2 688	2 750	2.812	2 938	3 062	3 188	3 188	3 375	3 500	3 625	3 750
32	2.000	2 500	2 562	2 688	2 812	2 812	2 875	2 938	3.062	3 188	3 312	3 312	3 500	3 625	3 750	3 875
34	2.125	2 625	2 688	2 812	2 938	2 938	3 000	3 062	3 188	3 312	3 438	3 438	3 625	3 750	3 875	4 000
36	2 250	2 750	2 812	2 938	3 062	3 062	3 125	3 188	3 312	3 438	3 562	3 562	3 750	3 875	4 000	4 125
38	2 375	2 875	2 938	3 062	3 188	3 188	3 250	3 312	3 438	3 562	3 688	3 688	3 875	4 000	4 125	4 250
40	2 500	3 000	3 062	3 188	3 312	3 312	3 375	3 438	3 562	3 688	3 812	3 812	4 000	4 125	4 250	4 375
42	2 625	3 125	3 188	3 312	3 438	3 438	3 500	3 562	3 688	3 812	3 938	3 938	4 125	4 250	4 375	4 500
44	2 750	3 250	3 312	3 438	3 562	3 562	3 625	3 688	3 812	3 938	4 062	4 062	4 250	4 375	4 500	4 625
46	2 875	3 375	3 438	3 562	3 688	3 688	3 750	3 812	3 938	4 062	4 188	4 188	4 375	4 500	4 625	4 750
48	3 000	3 500	3 562	3 688	3 812	3 812	3 875	3 938	4 062	4 188	4 312	4 312	4 500	4 625	4 750	4 875
50	3 125	3 625	3 688	3 812	3 938	3 938	4 000	4 062	4 188	4 312	4 438	4 438	4 625	4 750	4 875	5 000
52	3 250	3 750	3 812	3 938	4 062	4 062	4 125	4 188	4 312	4 438	4 562	4 562	4 750	4 875	5 000	5 125
54	3 375	3 875	3 938	4 062	4 188	4 188	4 250	4 312	4 438	4 562	4 688	4 688	4 875	5 000	5 125	5 250
56	3 500	4 000	4 062	4 188	4 312	4 312	4 375	4 438	4 562	4 688	4 812	4 812	5 000	5 125	5 250	5 375
58	3 625	4 125	4 188	4 312	4 438	4 438	4 500	4 562	4 688	4 812	4 938	4 938	5 125	5 250	5 375	5 500
60	3 750	4 250	4 312	4 438	4 562	4 562	4 625	4 688	4 812	4 938	5 062	5 062	5 250	5 375	5 500	5 625
62	3 875	4 375	4 438	4 562	4 688	4 688	4 750	4 812	4 938	5 062	5 188	5 188	5 375	5 500	5 625	5 750
64	4 000	4 500	4 562	4 688	4 812	4 812	4 875	4 938	5 062	5 188	5 312	5 312	5 500	5 625	5 750	5 875
66	4 125	4 625	4 688	4 812	4 938	4 938	5 000	5 062	5 188	5 312	5 438	5 438	5 625	5 750	5 875	6 000
68	4 250	4 750	4 812	4 938	5 062	5 062	5 125	5 188	5 312	5 438	5 562	5 562	5 750	5 875	6 000	6 125
70	4 375	4 875	4 938	5 062	5 188	5 188	5 250	5 312	5 438	5 562	5 688	5 688	5 875	6 000	6 125	6 250
72	4 500	5 000	5 062	5 188	5 312	5 312	5 375	5 438	5 562	5 688	5 812	5 812	6 000	6 125	6 250	6 375
74	4 625	5 125	5 188	5 312	5 438	5 438	5 500	5 562	5 688	5 812	5 938	5 938	6 125	6 250	6 375	6 500
76	4 750	5 250	5 312	5 438	5 562	5 562	5 625	5 688	5 812	5 938	6 062	6 062	6 250	6 375	6 500	6 625
78	4 875	5 375	5 438	5 562	5 688	5 688	5 750	5 812	5 938	6 062	6 188	6 188	6 375	6 500	6 625	6 750
80	5 000	5 500	5 562	5 688	5 812	5 812	5 875	5 938	6 062	6 188	6 312	6 312	6 500	6 625	6 750	6 875
82	5 125	5 625	5 688	5 812	5 938	5 938	6 000	6 062	6 188	6 312	6 438	6 438	6 625	6 750	6 875	7 000
84	5 250	5 750	5 812	5 938	6 062	6 062	6 125	6 188	6 312	6 438	6 562	6 562	6 750	6 875	7 000	7 125
86	5 375	5 875	5 938	6 062	6 188	6 188	6 250	6 312	6 438	6 562	6 688	6 688	6 875	7 000	7 125	7 250
88	5 500	6 000	6 062	6 188	6 312	6 312	6 375	6 438	6 562	6 688	6 812	6 812	7 000	7 125	7 250	7 375
90	5 625	6 125	6 188	6 312	6 438	6 438	6 500	6 562	6 688	6 812	6 938	6 938	7 125	7 250	7 375	7 500
92	5 750	6 250	6 312	6 438	6 562	6 562	6 625	6 688	6 812	6 938	7 062	7 062	7 250	7 375	7 500	7 625
94	5 875	6 375	6 438	6 562	6 688	6 688	6 750	6 812	6 938	7 062	7 188	7 188	7 375	7 500	7 625	7 750
96	6 000	6 500	6 562	6 688	6 812	6 812	6 875	6 938	7 062	7 188	7 312	7 312	7 500	7 625	7 750	7 875
98	6 125						7 000	7 062	7 188	7 312	7 438	7 438	7 625	7 750	7 875	8 000
100	6 250						7 125	7 188	7 312	7 438	7 562	7 562	7 750	7 875	8 000	8 125
102	6 375						7 250	7 312	7 438	7 562	7 688	7 688	7 875	8 000	8 125	8 250
104	6 500						7 375	7 438	7 562	7 688	7 812	7 812	8 000	8 125	8 250	8 375
106	6 625						7 500	7 562	7 688	7 812	7 938	7 938	8 125	8 250	8 375	8 500
108	6 750						7 625	7 688	7 812	7 938	8 062	8 062	8 250	8 375	8 500	8 625
110	6 875						7 750	7 812	7 938	8 062	8 188	8 188	8 375	8 500	8 625	8 750
112	7 000						7 875	7 938	8 062	8 188	8 312	8 312	8 500	8 625	8 750	8 875
114	7 125												8 625	8 750	8 875	9 000
116	7 250												8 750	8 875	9 000	9 125
118	7 375												8 875	9 000	9 125	9 250
120	7 500												9 000	9 125	9 250	9 375
122	7 625												9 125	9 250	9 375	9 500
124	7 750												9 250	9 375	9 500	9 625
126	7 875												9 375	9 500	9 625	9 750
128	8 000												9 500	9 625	9 750	9 875

(E) *APPLIES TO MS20012A ONLY.

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

PREPARING ACTIVITY NAVY - AS CUSTODIANS ARMY-AP NAVY- AIR FORCE-99 DLA- REVIEW ARMY - EP, ME, MI DLA - IS AF-R? USER APPY - AV PROJECT NUMBER 530E-123E	MILITARY SPECIFICATION SHEET TITLE BOLTS, INTERNAL WRENCHING, 160 KSI FTU AND 9E KSI FSL	SPECIFICATION SHEET NUMBER 30 MAY 1969 MS20004E THRU 20024E SUPERSEEDING MS20004D THRU 20024D 1C AUGUST 1961 AMSC- N/A FSC 5306
DISTRIBUTION STATEMENT A Approved for public release distribution is unlimited		Page 1 of 1

GPO: 1968 O - 350-000

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UNASSIGNED DASH NUMBERS SHALL NOT BE USED, EXCEPT THOSE DASH NUMBERS COVERED BY THE FOLLOWING CODING NOTE

DASH NUMBERS INDICATE PREFERRED GRIP LENGTHS IN 125 INCREMENTS. INTERMEDIATE GRIP LENGTHS BETWEEN THOSE LENGTHS LISTED, MAY BE SPECIFIED IN .062 INCREMENTS BY INTERMEDIATE DASH NUMBERS. LENGTH AND GRIP OF A BOLT WITH AN ODD NUMBER FOR THE DASH NUMBER WILL BE .062 GREATER THAN SHOWN FOR THE BOLTS WITH THE PRECEDING EVEN DASH NUMBER. ONLY BOLT DIAMETER FOR WHICH THERE ARE QUALIFIED PRODUCTS LISTED ON QPL-7838 SHALL BE USED FOR DESIGN.

FOR EACH BOLT DIAMETER GRIP LENGTHS GREATER OR LESS THAN THOSE DESIGNATED BY ASSIGNED DASH NUMBERS ON TABLE II ARE INACTIVE FOR DESIGN.

ADD "H" BEFORE DASH NUMBER FOR BOLT WITH DRILLED HEAD

EXAMPLES OF PART NUMBERS MS20017-18 = 1-12 BOLT, 2.438 INCH LONG, 1.125 INCH GRIP, UNDRILLED HEAD
MS20017H18 = 1-12 BOLT, 2.438 INCH LONG, 1.125 INCH GRIP, DRILLED HEAD.

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PREPARING ACTIVITY NAVY - AS
CUSTODIANS ARMY - AR NAVY -
AIR FORCE - 99 DLA -
REVIEW ARMY - ER, ME, MI DLA - 15 AF - 62
USER ARMY - AV
PROJECT NUMBER 5306-12 14

MILITARY SPECIFICATION SHEET
TITLE BOLT - INTERNAL WRENCHING, 160 KS; FTU
AND 96 KS; FSL

SPECIFICATION SHEET NUMBER 30 MAY 1989
MS20004E THRU 20024E
SUPERSEDING
MS20004D THRU 20024D 10 AUGUST 1981
AWSC - N/A FSC 5306

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