

FED. SUP CLASS
5306

USER SYMBOLS:

REVIEWER SYMBOLS:

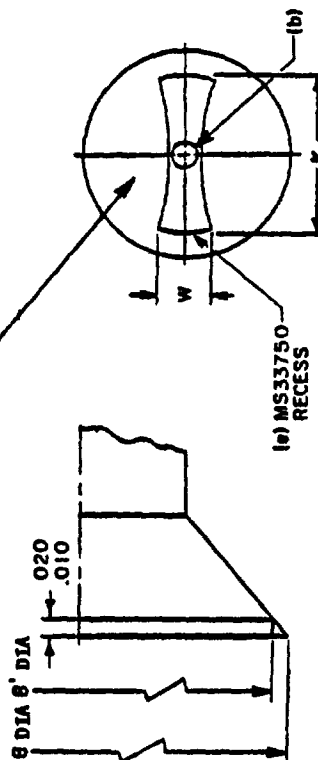
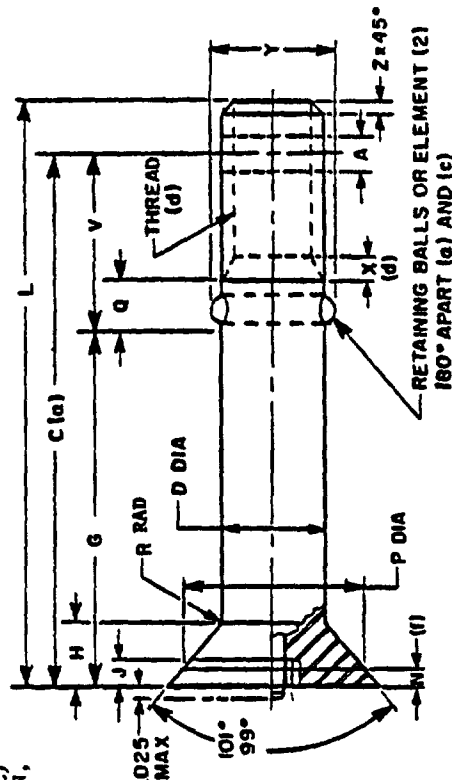
NAVY - AS
USAF - 99
ARMY - AV
DLA - 18

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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.

E

MARK MS21130A (FOR A-286 MATERIAL) OR
MS21130B (FOR F413-8MG MATERIAL)
AND MANUFACTURERS IDENTIFICATION,
DEPRESSED .010 MAX.



FOR NOTE REQUIREMENTS SEE SHEET 6

E DENOTES CHANGE

P.A. NAVY - AS Other Code USAF - 11 ARMY - AV PROCUREMENT SPECIFICATION MIL-B-23964	TITLE BOLTS, SELF-RETAINING, POSITIVE LOCKING, CRES E 90 KSI F _{tu} , 63 KSI F _{ty} , 100° FLUSH HEAD, 450°F & 650°F SUPERSEDES MS21130 (ASG)	MILITARY STANDARD MS21130 SHEET 1 OF 6
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DD FORM 672-1 (Coordinated)

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

PROJECT NO. 5306-0700 PLATE NO. 2

REVISED (A) 28 SEP 73 (C) 13 SEP 74 (D) 12 OCT 79 (E) 11 MARCH 1981

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<p>TABLE 1</p> <p>(f) HEAD PROTRUSION</p> <table border="1"> <thead> <tr> <th rowspan="2">DIAMETER DASH NO.</th> <th rowspan="2">THREAD DESIGNATION MIL-S-8879</th> <th colspan="2">d₁</th> <th colspan="2">d₂</th> <th rowspan="2">H</th> <th colspan="2">J</th> <th rowspan="2">K</th> <th colspan="2">N</th> <th colspan="2">Q (c)</th> <th colspan="2">R</th> <th rowspan="2">V</th> <th rowspan="2">W</th> </tr> <tr> <th>MAX.</th> <th>MIN.</th> <th>MAX.</th> <th>MIN.</th> <th>MAX.</th> <th>MIN.</th> <th>MAX.</th> <th>MIN.</th> <th>MAX.</th> <th>MIN.</th> <th>MAX.</th> <th>MIN.</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>.1900 - 32UNJF-3A</td> <td>.080</td> <td>.070</td> <td>.385</td> <td>.328</td> <td>.1894</td> <td>.1889</td> <td>.080</td> <td>.057</td> <td>.054</td> <td>.270</td> <td>.0290</td> <td>.0263</td> <td>.3147</td> <td>.3143</td> <td>.094</td> <td>.094</td> </tr> <tr> <td>4</td> <td>.2500 - 28UNJF-3A</td> <td>.086</td> <td>.076</td> <td>.507</td> <td>.449</td> <td>.2492</td> <td>.2487</td> <td>.108</td> <td>.072</td> <td>.069</td> <td>.390</td> <td>.0342</td> <td>.0316</td> <td>.4245</td> <td>.4241</td> <td>.111</td> <td>.107</td> </tr> <tr> <td>5</td> <td>.3125 - 24UNJF-3A</td> <td></td> <td></td> <td>.635</td> <td>.577</td> <td>.3117</td> <td>.3112</td> <td>.135</td> <td>.097</td> <td>.094</td> <td>.545</td> <td>.0395</td> <td>.0370</td> <td>.5389</td> <td>.5385</td> <td>.141</td> <td>.143</td> </tr> <tr> <td>6</td> <td>.3750 - 24UNJF-3A</td> <td></td> <td></td> <td>.762</td> <td>.704</td> <td>.3742</td> <td>.3737</td> <td>.162</td> <td>.111</td> <td>.107</td> <td>.630</td> <td>.0450</td> <td>.0426</td> <td>.6532</td> <td>.6528</td> <td>.156</td> <td>.160</td> </tr> <tr> <td>7</td> <td>.4375 - 20UNJF-3A</td> <td>.116</td> <td>.106</td> <td>.890</td> <td>.832</td> <td>.4367</td> <td>.4362</td> <td>.190</td> <td>.118</td> <td>.114</td> <td>.730</td> <td>.0503</td> <td>.0481</td> <td>.7676</td> <td>.7672</td> <td>.202</td> <td>.188</td> </tr> <tr> <td>8</td> <td>.5000 - 20UNJF-3A</td> <td></td> <td></td> <td>1.017</td> <td>.959</td> <td>.4991</td> <td>.4986</td> <td>.216</td> <td>.134</td> <td>.130</td> <td>.815</td> <td>.0557</td> <td>.0537</td> <td>.8620</td> <td>.8616</td> <td>.234</td> <td>.216</td> </tr> <tr> <td>9</td> <td>.5625 - 18UNJF-3A</td> <td>.151</td> <td>.141</td> <td>1.145</td> <td>1.087</td> <td>.5616</td> <td>.5611</td> <td>.243</td> <td>.149</td> <td>.145</td> <td>.909</td> <td>.0611</td> <td>.0592</td> <td>.9964</td> <td>.9960</td> <td>.265</td> <td>.257</td> </tr> </tbody> </table>						DIAMETER DASH NO.	THREAD DESIGNATION MIL-S-8879	d ₁		d ₂		H	J		K	N		Q (c)		R		V	W	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	3	.1900 - 32UNJF-3A	.080	.070	.385	.328	.1894	.1889	.080	.057	.054	.270	.0290	.0263	.3147	.3143	.094	.094	4	.2500 - 28UNJF-3A	.086	.076	.507	.449	.2492	.2487	.108	.072	.069	.390	.0342	.0316	.4245	.4241	.111	.107	5	.3125 - 24UNJF-3A			.635	.577	.3117	.3112	.135	.097	.094	.545	.0395	.0370	.5389	.5385	.141	.143	6	.3750 - 24UNJF-3A			.762	.704	.3742	.3737	.162	.111	.107	.630	.0450	.0426	.6532	.6528	.156	.160	7	.4375 - 20UNJF-3A	.116	.106	.890	.832	.4367	.4362	.190	.118	.114	.730	.0503	.0481	.7676	.7672	.202	.188	8	.5000 - 20UNJF-3A			1.017	.959	.4991	.4986	.216	.134	.130	.815	.0557	.0537	.8620	.8616	.234	.216	9	.5625 - 18UNJF-3A	.151	.141	1.145	1.087	.5616	.5611	.243	.149	.145	.909	.0611	.0592	.9964	.9960	.265	.257
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<p>(a) GENERAL DIMENSIONAL AND MECHANICAL REQUIREMENTS:</p> <p>(e) COTTER PIN HOLE SHALL BE WITHIN .010 INCH OF BOLT CENTERLINE FOR BOLTS .3125 DIA. AND SMALLER AND WITHIN .015 INCH FOR BOLTS .3750 DIA AND LARGER.</p> <p>(e) THE PIN HOLE SHALL BE PERPENDICULAR TO BOLT CENTERLINE.</p> <p>(e) THE COTTER PIN HOLE SHALL BE PERPENDICULAR TO THE SLOT IN HEAD WITHIN 5°. ORIENTATION OF BALLS OR ELEMENT TO COTTER PIN HOLE SHALL BE IN LINE WITHIN 3°. BALL OR ELEMENT PROTRUSION FROM THE BOLT CENTERLINE SHALL BE EQUAL OR LESS THAN 1/2 Y MAX.</p> <p>(b) THE RETAINING DEVICE SHALL BE RELEASED ONLY BY DEPRESSING THE PLUNGER LOCATED IN THE HEAD OF THE BOLT. MAX DIAMETER OF PLUNGER RECESS HEAD SHALL BE THE MINIMUM VALUE FOR THE "M" DIMENSIONS ON MS33750.</p> <p>(c) BALLS OR RETAINING ELEMENTS SHALL BE LOCATED WITHIN THE LIMITS OF Q DIMENSION AND AT MAXIMUM PROTRUSION SHALL FIT WITHIN THE GROOVES OF THE APPROPRIATE SPACER OF MS21126 AND MS21128 WITHOUT INTERFERENCE OR BINDING.</p> <p>(d) THREAD: IN ACCORDANCE WITH MIL-S-8879 EXCEPT THAT INCOMPLETE THREAD LENGTH (X) SHALL BE A MAXIMUM OF 1-1/2 AND A MINIMUM OF 1/2 THREAD PITCHES IN LENGTH AND MAJOR DIA. TO BE A MIN. OF .001 LESS THAN MEASURED SHANK DIA.</p> <p>(e) RECESS SHALL BE LOCATED AT TRUE POSITION TO "B" WITHIN .010 AND SHALL CONFORM TO MS33750 EXCEPT THAT RECESS DIMPLE IS OPTIONAL.</p> <p>(f) REFERENCE NAS518 AND NAS519 FOR FLUSH GAGING DETAILS.</p> <p>(g) CONCENTRICITY: D AND B TO BE CONCENTRIC TO P.D. OF THREAD WITHIN .002 TIR AT MAXIMUM MATERIAL CONDITION.</p>																																																																																																																																																																	
<table border="1"> <thead> <tr> <th rowspan="2">DIAMETER DASH NO.</th> <th colspan="2">Y</th> <th rowspan="2">Z</th> <th colspan="2">(e) RECESS NO.</th> </tr> <tr> <th>MAX.</th> <th>MIN.</th> <th>MAX.</th> <th>MIN.</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>.225</td> <td>.215</td> <td>.041</td> <td>.021</td> <td>2</td> </tr> <tr> <td>4</td> <td>.294</td> <td>.284</td> <td></td> <td></td> <td>3</td> </tr> <tr> <td>5</td> <td>.380</td> <td>.370</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td>6</td> <td>.445</td> <td>.435</td> <td>.057</td> <td>.037</td> <td>5</td> </tr> <tr> <td>7</td> <td>.514</td> <td>.504</td> <td></td> <td></td> <td>6</td> </tr> <tr> <td>8</td> <td>.599</td> <td>.589</td> <td></td> <td></td> <td>7</td> </tr> <tr> <td>9</td> <td>.671</td> <td>.661</td> <td>.072</td> <td>.052</td> <td>8</td> </tr> </tbody> </table>						DIAMETER DASH NO.	Y		Z	(e) RECESS NO.		MAX.	MIN.	MAX.	MIN.	3	.225	.215	.041	.021	2	4	.294	.284			3	5	.380	.370			4	6	.445	.435	.057	.037	5	7	.514	.504			6	8	.599	.589			7	9	.671	.661	.072	.052	8																																																																																																								
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APPROVED 15 DEC 67 REVISED FOR CHANGES SEE SHEETS 1, 2 and 6

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GRIP DASH NO:		NOMINAL SIZE		.1900 (10)		.2500 (1/4)		.3125 (5/16)		.3750 (3/8)		.4375 (7/16)		.5000 (1/2)		.5625 (9/16)		GRIP DASH NO.	
				32 UNJF-3A		28 UNJF-3A		24 UNJF-3A		24 UNJF-3A		20 UNJF-3A		20 UNJF-3A		18 UNJF-3A			
				L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH			
				MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.		
03		.204	.188	.580	.560	.626	.606												03
04		.206	.250	.642	.622	.688	.668	.748	.728	.808	.789								04
05		.328	.312	.705	.685	.751	.731	.810	.790	.871	.851								05
06		.390	.375	.767	.747	.813	.793	.873	.853	.934	.914	.978	.958	1.041	1.021				06
07		.454	.438	.830	.810	.876	.856	.935	.915	.996	.976	1.040	1.020	1.103	1.083	1.244	1.224		07
08		.516	.500	.892	.872	.938	.918	.998	.978	1.059	1.039	1.103	1.083	1.166	1.146	1.306	1.286		08
09		.578	.562	.955	.935	1.001	.981	1.060	1.040	1.121	1.101	1.165	1.145	1.228	1.208	1.369	1.349		09
10		.641	.625	1.017	.997	1.063	1.043	1.123	1.103	1.184	1.164	1.228	1.208	1.291	1.271	1.431	1.411		10
11		.704	.688	1.080	1.060	1.126	1.106	1.185	1.165	1.246	1.226	1.290	1.270	1.353	1.333	1.494	1.474		11
12		.766	.750	1.142	1.122	1.188	1.168	1.248	1.228	1.309	1.289	1.353	1.333	1.416	1.396	1.556	1.536		12
13		.828	.812	1.205	1.185	1.251	1.231	1.310	1.290	1.371	1.351	1.415	1.395	1.478	1.459	1.619	1.599		13
14		.891	.875	1.267	1.247	1.313	1.293	1.373	1.353	1.434	1.414	1.478	1.458	1.541	1.521	1.681	1.661		14
15		.954	.938	1.330	1.310	1.376	1.356	1.435	1.415	1.496	1.476	1.540	1.520	1.603	1.583	1.744	1.724		15
16		1.016	1.000	1.392	1.372	1.438	1.418	1.498	1.478	1.559	1.539	1.603	1.583	1.666	1.646	1.806	1.786		16
17		1.078	1.062	1.455	1.435	1.501	1.481	1.560	1.540	1.621	1.601	1.665	1.645	1.728	1.708	1.869	1.849		17
18		1.141	1.125	1.517	1.497	1.563	1.543	1.623	1.603	1.684	1.664	1.728	1.708	1.791	1.771	1.931	1.911		18
19		1.203	1.188	1.580	1.560	1.626	1.606	1.685	1.665	1.746	1.726	1.790	1.770	1.853	1.833	1.994	1.974		19
20		1.266	1.250	1.642	1.622	1.688	1.668	1.748	1.728	1.809	1.789	1.853	1.833	1.916	1.896	2.056	2.036		20
21		1.328	1.312	1.705	1.685	1.751	1.731	1.810	1.790	1.871	1.851	1.915	1.895	1.978	1.958	2.119	2.099		21
22		1.391	1.375	1.767	1.747	1.813	1.793	1.873	1.853	1.934	1.914	1.978	1.958	2.041	2.021	2.181	2.161		22
23		1.454	1.438	1.830	1.810	1.876	1.856	1.935	1.915	1.998	1.978	2.040	2.020	2.103	2.083	2.244	2.224		23
24		1.516	1.500	1.892	1.872	1.938	1.918	1.998	1.978	2.059	2.039	2.103	2.083	2.166	2.146	2.306	2.286		24
25		1.578	1.562	1.954	1.934	2.001	1.981	2.060	2.040	2.121	2.101	2.165	2.145	2.228	2.208	2.369	2.349		25
26		1.641	1.625	2.017	1.997	2.063	2.043	2.123	2.103	2.184	2.164	2.228	2.208	2.291	2.271	2.431	2.411		26
27		1.704	1.688	2.080	2.060	2.126	2.106	2.185	2.165	2.246	2.226	2.290	2.270	2.353	2.333	2.494	2.474		27
28		1.766	1.750	2.142	2.122	2.188	2.168	2.248	2.228	2.309	2.289	2.353	2.333	2.416	2.396	2.556	2.536		28
29		1.828	1.812	2.205	2.185	2.251	2.231	2.310	2.290	2.371	2.351	2.415	2.395	2.478	2.458	2.619	2.599		29
30		1.891	1.875	2.267	2.247	2.313	2.293	2.373	2.353	2.434	2.414	2.478	2.458	2.541	2.521	2.681	2.661		30
31		1.953	1.937	2.330	2.310	2.376	2.356	2.435	2.415	2.496	2.476	2.540	2.520	2.603	2.583	2.744	2.724		31
32		2.016	2.000	2.392	2.372	2.438	2.418	2.498	2.478	2.559	2.539	2.603	2.583	2.666	2.646	2.806	2.786		32
33		2.078	2.062	2.455	2.435	2.501	2.481	2.560	2.540	2.621	2.601	2.665	2.645	2.728	2.708	2.869	2.849		33
34		2.141	2.125	2.517	2.497	2.563	2.543	2.623	2.603	2.684	2.664	2.728	2.708	2.791	2.771	2.931	2.911		34

PA NAVY - AS		TITLE		MILITARY STANDARD	
Other Case		BOLTS, SELF-RETAINING, POSITIVE LOCKING, CRES		MS21130	
USAF - 11		.90 KSI Fsu, 63 KSI Ftu, 100° FLUSH HEAD, 450°F & 650°F			
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PROCUREMENT SPECIFICATION		SUPERSEDES		SHEET 3 OF 6	
MIL-B-23964		MS 21130 (ASG)			

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TABLE III

GRIP DASH NO.	NOMINAL SIZE		.1800 (10)		.2500 (1/4)		.3125 (5/16)		.3750 (3/8)		.4375 (7/16)		.5000 (1/2)		.5625 (9/16)		GRIP DASH NO.
			32 UNJF-3A		28 UNJF-3A		24 UNJF-3A		24 UNJF-3A		20 UNJF-3A		20 UNJF-3A		18 UNJF-3A		
	L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
35	2.204	2.188	2.580	2.560	2.626	2.606	2.685	2.665	2.746	2.726	2.790	2.770	2.853	2.833	2.994	2.974	35
36	2.266	2.250	2.642	2.622	2.698	2.668	2.748	2.728	2.809	2.789	2.853	2.833	2.916	2.896	3.056	3.036	36
37	2.328	2.312	2.705	2.685	2.751	2.731	2.810	2.790	2.871	2.851	2.915	2.895	2.978	2.958	3.119	3.099	37
38	2.390	2.375	2.767	2.747	2.813	2.793	2.873	2.853	2.934	2.914	2.978	2.958	3.041	3.021	3.181	3.161	38
39	2.454	2.438	2.830	2.810	2.876	2.856	2.935	2.915	2.996	2.976	3.040	3.020	3.103	3.083	3.244	3.224	39
40	2.516	2.500	2.892	2.872	2.938	2.918	2.998	2.978	3.059	3.039	3.103	3.083	3.166	3.146	3.306	3.286	40
41	2.578	2.562	2.954	2.934	3.001	2.981	3.060	3.040	3.121	3.101	3.165	3.145	3.228	3.208	3.369	3.349	41
42	2.641	2.625	3.017	2.997	3.063	3.043	3.123	3.103	3.184	3.164	3.228	3.208	3.291	3.271	3.431	3.411	42
43	2.704	2.688	3.080	3.060	3.126	3.106	3.185	3.165	3.246	3.226	3.290	3.270	3.353	3.333	3.494	3.474	43
44	2.766	2.750	3.142	3.122	3.188	3.168	3.248	3.228	3.309	3.289	3.353	3.333	3.416	3.396	3.556	3.536	44
45	2.828	2.812	3.205	3.185	3.251	3.231	3.310	3.290	3.371	3.351	3.415	3.395	3.478	3.458	3.619	3.599	45
46	2.891	2.875	3.267	3.247	3.313	3.293	3.373	3.353	3.434	3.414	3.478	3.458	3.541	3.521	3.681	3.661	46
47	2.954	2.938	3.330	3.310	3.376	3.356	3.435	3.415	3.496	3.476	3.540	3.520	3.603	3.583	3.744	3.724	47
48	3.016	3.000	3.392	3.372	3.438	3.418	3.498	3.478	3.559	3.539	3.603	3.583	3.666	3.646	3.806	3.786	48
49	3.078	3.062	3.455	3.435	3.501	3.481	3.560	3.540	3.621	3.601	3.665	3.645	3.728	3.708	3.869	3.849	49
50	3.141	3.125	3.517	3.497	3.563	3.543	3.623	3.603	3.684	3.664	3.728	3.708	3.791	3.771	3.931	3.911	50
51	3.203	3.188	3.580	3.560	3.626	3.606	3.685	3.665	3.746	3.726	3.790	3.770	3.853	3.833	3.994	3.974	51
52	3.266	3.250	3.642	3.622	3.688	3.668	3.748	3.728	3.809	3.789	3.853	3.833	3.916	3.896	4.056	4.036	52
53	3.328	3.312	3.705	3.685	3.751	3.731	3.810	3.790	3.871	3.851	3.915	3.895	3.978	3.958	4.119	4.099	53
54	3.391	3.375	3.767	3.747	3.813	3.793	3.873	3.853	3.934	3.914	3.978	3.958	4.041	4.021	4.181	4.161	54
55	3.454	3.438	3.830	3.810	3.876	3.856	3.935	3.915	3.996	3.976	4.040	4.020	4.103	4.083	4.244	4.224	55
56	3.516	3.500	3.892	3.872	3.938	3.918	3.998	3.978	4.059	4.039	4.103	4.083	4.166	4.146	4.306	4.286	56
57	3.578	3.562	3.954	3.934	4.001	3.981	4.060	4.040	4.121	4.101	4.165	4.145	4.228	4.208	4.369	4.349	57
58	3.641	3.625	4.017	3.997	4.063	4.043	4.123	4.103	4.184	4.164	4.228	4.208	4.291	4.271	4.431	4.411	58
59	3.704	3.688	4.080	4.060	4.126	4.106	4.185	4.165	4.246	4.226	4.290	4.270	4.353	4.333	4.494	4.474	59
60	3.766	3.750	4.142	4.122	4.188	4.168	4.248	4.228	4.309	4.289	4.353	4.333	4.416	4.396	4.556	4.536	60
61	3.828	3.812	4.205	4.185	4.251	4.231	4.310	4.290	4.371	4.351	4.415	4.395	4.478	4.458	4.619	4.599	61

P.A. NAVY - AS Other Cust USAF-11 ARMY-AV	TITLE BOLTS, SELF-RETAINING, POSITIVE LOCKING, CRES 90 KSI Fsu, 63 KSI Ftu, 100° FLUSH HEAD, 450°F & 650°F	MILITARY STANDARD MS21130
PROCUREMENT SPECIFICATION MIL-B-23964	SUPERSEDES MS21130 (ASG)	SHEET 4 OF 6

APPROVED 15 Dec 87
REVISED 16
For changes see sheets 1, 2, and 3

P.A. NAVY - AS Other Cost USAF-11 ARMY-AV		TITLE BOLTS, SELF-RETAINING, POSITIVE LOCKING, CRES 90 KSI Fsu, 63 KSI Ftu, 100° FLUSH HEAD, 450°F & 650°F		MILITARY STANDARD	
PROCUREMENT SPECIFICATION MIL-B-23984		SUPERSEDES MS21130 (ASG)		MS21130	
				SHEET 4 OF 6	

DD FORM 672-1 (Coordinated)

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

PLATE NO 17709

APPROVED 15 Dec 87 REVISED 6 For changes see sheets 1, 2 and 6

REVIEWER SYMBOLS:

NAVY-AS
USAF-99
ARMY-AV
DLA-IS

"Review/see information is current as of the date of this document.
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should be based on the information in the current 6081SS."

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

P.A. NAVY - AS
Other Cast
USAF-11
ARMY-AV

PROCUREMENT SPECIFICATION
MIL-B-23984

TITLE

BOLTS, SELF-RETAINING, POSITIVE LOCKING, CRES
90 KSI Fsu, 63 KSI Ftu, 100° FLUSH HEAD, 450° F & 650° F

SUPERSEDES

MS21130 (ASG)

MILITARY STANDARD

MS21130

SHEET 5 OF 6

TABLE IX

TABLE IV																	
GRIP DASH NO.	NOMINAL SIZE		.1900 (10)		.2500 (1/4)		.3125 (5/16)		.3750 (3/8)		.4375 (7/16)		.5000 (1/2)		.5625 (9/16)		GRIP DASH NO.
	THREAD DESIGNATION		32 UNJF-3A		28 UNJF-3A		24 UNJF-3A		24 UNJF-3A		20 UNJF-3A		20 UNJF-3A		18 UNJF-3A		
	G-GRIP LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		L-LENGTH		
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
62	3.891	3.975	4.267	4.247	4.313	4.293	4.373	4.353	4.434	4.414	4.478	4.458	4.541	4.521	4.681	4.661	62
63	3.953	3.937	4.330	4.310	4.376	4.356	4.435	4.415	4.496	4.476	4.540	4.520	4.553	4.533	4.744	4.724	63
64	4.016	4.000	4.392	4.372	4.438	4.418	4.498	4.478	4.559	4.539	4.603	4.583	4.556	4.536	4.806	4.786	64
65	4.078	4.062	4.455	4.435	4.501	4.481	4.560	4.540	4.621	4.601	4.665	4.645	4.728	4.708	4.869	4.849	65
66	4.141	4.125	4.517	4.497	4.563	4.543	4.623	4.603	4.684	4.664	4.728	4.708	4.791	4.771	4.931	4.911	66
67	4.203	4.188	4.580	4.560	4.626	4.606	4.685	4.665	4.746	4.726	4.790	4.770	4.853	4.833	4.994	4.974	67
68	4.266	4.250	4.642	4.622	4.688	4.668	4.748	4.728	4.809	4.789	4.853	4.833	4.916	4.896	5.056	5.036	68
69	4.328	4.312	4.705	4.685	4.751	4.731	4.810	4.790	4.871	4.851	4.915	4.895	4.978	4.958	5.119	5.099	69
70	4.391	4.375	4.767	4.747	4.813	4.793	4.873	4.853	4.934	4.914	4.978	4.958	5.041	5.021	5.181	5.161	70
71	4.454	4.438	4.830	4.810	4.876	4.856	4.935	4.915	4.996	4.976	5.040	5.020	5.103	5.083	5.244	5.224	71
72	4.516	4.500	4.892	4.872	4.938	4.918	4.998	4.978	5.059	5.039	5.103	5.083	5.165	5.145	5.306	5.286	72
73	4.578	4.562	4.954	4.934	5.001	4.981	5.060	5.040	5.121	5.101	5.165	5.145	5.228	5.208	5.369	5.349	73
74	4.641	4.625	5.017	4.997	5.063	5.043	5.123	5.103	5.184	5.164	5.228	5.208	5.291	5.271	5.431	5.411	74
75	4.704	4.688	5.080	5.060	5.126	5.106	5.185	5.165	5.246	5.226	5.290	5.270	5.353	5.333	5.494	5.474	75
76	4.766	4.750	5.142	5.122	5.188	5.168	5.248	5.228	5.309	5.289	5.353	5.333	5.416	5.396	5.556	5.536	76
77	4.828	4.812	5.205	5.185	5.251	5.231	5.310	5.290	5.371	5.351	5.415	5.395	5.478	5.458	5.619	5.599	77
78	4.891	4.875	5.267	5.247	5.313	5.293	5.373	5.353	5.434	5.414	5.478	5.458	5.541	5.521	5.681	5.661	78
79	4.953	4.937	5.330	5.310	5.376	5.356	5.435	5.415	5.496	5.476	5.540	5.520	5.603	5.583	5.744	5.724	79
80	5.016	5.000	5.392	5.372	5.438	5.418	5.498	5.478	5.559	5.539	5.603	5.583	5.665	5.645	5.806	5.786	80
81	5.078	5.062	5.455	5.435	5.501	5.481	5.560	5.540	5.621	5.601	5.665	5.645	5.728	5.708	5.869	5.849	81
82	5.141	5.125	5.517	5.497	5.563	5.543	5.623	5.603	5.684	5.664	5.728	5.708	5.791	5.771	5.931	5.911	82
83	5.203	5.188	5.580	5.560	5.626	5.606	5.685	5.665	5.746	5.726	5.790	5.770	5.853	5.833	5.994	5.974	83
84	5.266	5.250	5.642	5.622	5.688	5.668	5.748	5.728	5.809	5.789	5.853	5.833	5.916	5.896	6.056	6.036	84
85	5.328	5.312	5.705	5.685	5.751	5.731	5.810	5.790	5.871	5.851	5.915	5.895	5.978	5.958	6.119	6.099	85
86	5.390	5.375	5.767	5.747	5.813	5.793	5.873	5.853	5.934	5.914	5.978	5.958	6.041	6.021	6.181	6.161	86

FED. SUP CLASS
5306

USER SYMBOLS:

REVIEWER SYMBOLS:

NAVY - AS
USAF - 99
ARMY - AV
DLA - IS

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engineering and design applications and for repetitive use shall
be made from this document.

TABLE V			
SIZE	SHANK DOUBLE SHEAR ULTIMATE STRENGTH LBS MIN	BOLT AND NUT ASSEMBLY ULTIMATE TENSILE STRENGTH LBS MIN SEE NOTE 13	RETAINING DEVICE ULTIMATE TENSILE LOAD LBS MIN
.1900	5,150	1,110	110
.2500	9,200	2,040	230
.3125	14,400	3,250	510
.3750	20,800	5,050	575
.4375	28,000	6,800	710
.5000	36,800	9,250	1,180
.5625	46,000	11,800	1,420

FED. SUP CLASS
5306

NOTES:

- MATERIALS, MAGNETIC: BOLT AND PLUNGER: CORROSION RESISTING STEEL PH 13-8Mo CHEMISTRY OF AMS5629 (E)
BALLS OR ELEMENT: CORROSION RESISTING STEEL PER QQ-S-763 CLASS FSC 440C
SPRING: CORROSION RESISTING STEEL WIRE, SPRING TEMPER PER AMS 5673, 17-7 PH OR
QQ-W-423, CLASS FS302, CONDITION B.
- HEAT TREATMENT: BOLT AND PLUNGER: PER MIL-H-6875 TO CONDITION H1000 RC 43 TO 47 (E) (E)
BALLS: PER MIL-H-6875 TO ROCKWELL C50 TO C62, 255 KSI
- MATERIALS, NONMAGNETIC: BOLT AND PLUNGER: CORROSION RESISTING STEEL A-286 CHEMISTRY OF AMS 5737
(E) BALLS OR ELEMENT: CORROSION RESISTING STEEL PER MIL-S-7720 18-8 MARGINAL FOR MAG. PERM.
SPRING: NICKEL-CROMIUM-IRON ALLOY PER QQ-W-390 CONDITION C OR
NICKEL-ALLOY SPRING PER AMS 5699, SPRING TEMPER
- HEAT TREATMENT: BALLS: PER MIL-H-6875 TO ROCKWELL C25 MINIMUM 120 KSI (E)
- PROTECTIVE TREATMENT: CRES MATERIAL PASSIVATED PER QQ-P-35
- SURFACE TEXTURE: UNTHEADED SHANK AND BEARING SURFACE UNDER HEAD SHALL BE 32 MICROINCHES, ALL OTHER SURFACES
SHALL BE 125 MICROINCHES IN ACCORDANCE WITH ANSI B46.1.
- BOLTS SHALL BE FREE FROM BURRS AND SLIVERS.
- EXAMPLE OF PART NUMBER: SEE TABLES I, II, III AND IV FOR DASH NUMBERS
MS21130A-416 = .2500 UNJF-3A BOLT, 1 INCH NOMINAL GRIP, SLOTTED HEAD A-286 MATERIAL (E)
GRIP DASH NUMBER
DIAMETER DASH NUMBER
MATERIAL - "A" FOR A-286 OR "B" FOR PH 13-8Mo (E)
MS NUMBER
- DESIGN USAGE: FOR DESIGN AND USAGE LIMITATIONS, SEE MS33602.
- (E) MAGNETIC PERMEABILITY: FOR BOLT ASSEMBLY WITH BOLT AND PLUNGER MADE FROM A-286 MATERIAL. MAGNETIC
PERMEABILITY SHALL BE LESS THAN 2.0 (AIR-1.0) FOR A FIELD STRENGTH =200
ORSTEADS USING MAGNETIC PERMEABILITY INDICATOR PER MIL-I-17214 OR EQUIVALENT.
- TEMPERATURE LIMITATION: 450°F MAX. FOR PH 13-8Mo AND 650°F MAX. FOR A-286 MATERIAL.
- (E) 12. INTERCHANGEABILITY RELATIONSHIP: BOLTS MADE FROM PH17-4 (CODE "-") ARE INACTIVE FOR NEW DESIGN AND
AND CHANCELLED AFTER 15 MAY 1981.
BOLTS MADE FROM CRES PH13-8Mo (CODE "B") MAY BE SUBSTITUTED FOR BOLTS MADE FROM PH17-4 IN ALL
APPLICATIONS.
BOLTS MADE FROM PH17-4 (CODE "-") SHALL NOT BE USED IN PLACE OF BOLTS MADE FROM CRES PH13-8Mo.
BOLTS MADE FROM CRES PH 17-4 SHALL NOT BE USED AFTER 1 JAN 1983.
- TENSILE LOAD IS BASED ON THE AREA AT MINOR DIAMETER IN FED-STD-H28/2 AND 62.5 KSI Ftu.
- BOLT PLUNGER MANUFACTURED FROM PH 13-8Mo AND A-286 MATERIAL SHALL BE COATED WITH DRY FILM LUBRICANT PER MIL-L-8937
AND MIL-L-46010 RESPECTIVELY.
- REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BIDS OR REQUEST FOR PROPOSAL, EXCEPT
THAT REFERENCED ADOPTED INDUSTRY DOCUMENTS SHALL GIVE THE DATE OF THE ISSUE ADOPTED.
- FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN.

APPROVED 15 DEC 67 REVISED (E) FOR CHANGES SEE SHEETS 1, 2 & 6

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

TITLE

BOLTS, SELF-RETAINING, POSITIVE LOCKING, CRES
90 KSI Ftu, 63 KSI Ftu, 100" FLUSH HEAD, 450°F & 650°F

MILITARY STANDARD

MS21130

PROCUREMENT SPECIFICATION
MIL-B-23964

SUPERSEDES

MS21130(ASG)

SHEET 6 OF 6