

INCH-POUND

MS51960D  
20 April 2011  
SUPERSEDING  
MS51960C  
29 March 1991

DETAIL SPECIFICATION SHEET

SCREW, MACHINE – FLAT COUNTERSUNK HEAD, 82 DEGREE,  
CROSS-RECESSED, CORROSION RESISTANT STEEL, UNF-2A

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

The requirements for acquiring the product described herein shall consist of this specification sheet and FF-S-92.

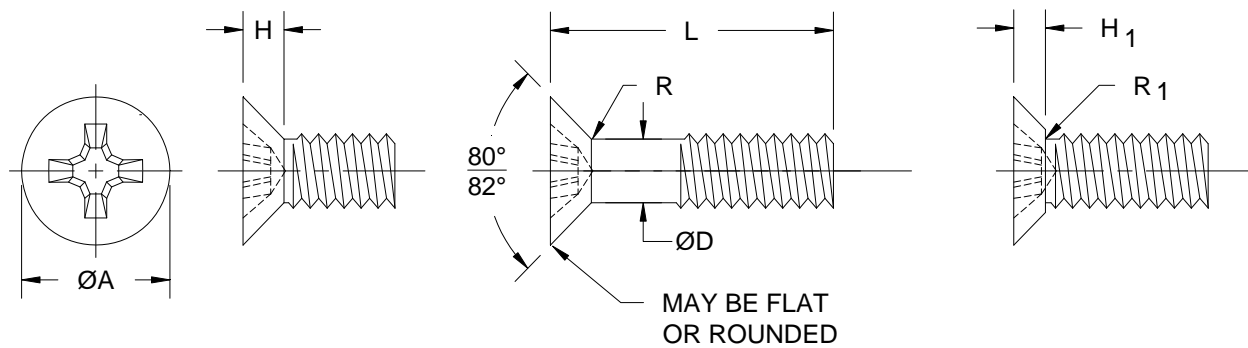


FIGURE 1. Screw.

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TABLE I. Dash numbers and dimensions

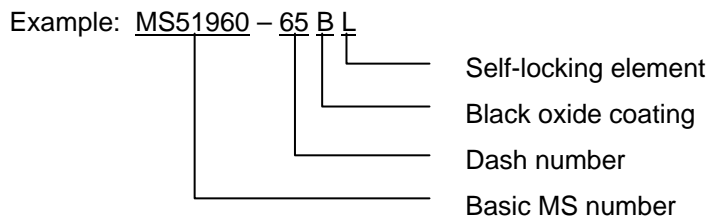
NOMINAL SIZE		.060	.086	.112	.138	.164	.190	.250	.3125	.375	.4375	.500	.5625	.625	.750
THREADS PER INCH UNF-2A		80	64	48	40	36	32	28	24	24	20	20	18	18	16
ØD	BODY MAX	.0600	.0860	.1120	.1380	.1640	.1900	.2500	.3125	.3750	.4375	.5000	.5625	.6250	.7500
	DIAMETER MIN	.0496	.0733	.0954	.1184	.1424	.1658	.2225	.2806	.3430	.3995	.4619	.5205	.5828	.7029
ØA	MAX SHARP	.119	.172	.225	.279	.332	.385	.507	.635	.762	.812	.875	1.000	1.125	1.375
	HEAD MIN SHARP	.105	.156	.207	.257	.308	.359	.477	.600	.722	.767	.831	.950	1.069	1.306
	DIAMETER ABS MIN	.099	.147	.195	.244	.292	.340	.452	.568	.685	.723	.775	.889	1.002	1.230
H	HEAD HEIGHT - REF FULL HEAD	.035	.051	.067	.083	.100	.116	.153	.191	.230	.223	.223	.260	.298	.372
H <sub>1</sub>	HEAD HEIGHT MAX	.025	.036	.047	.059	.070	.081	.107	.134	.161	.156	.156	.182	.208	.260
	UNDERCUT HEAD MIN	.018	.028	.038	.048	.058	.068	.092	.116	.140	.133	.130	.153	.176	.223
R	RADIUS - FULL HEAD MAX	.024	.034	.045	.055	.066	.076	.100	.125	.150	.175	.200	.225	.250	.300
R <sub>1</sub>	RADIUS - UNDERCUT HEAD MAX	.009	.013	.017	.021	.025	.028	.038	.047	.056	.066	.075	.084	.094	.112
DRIVER SIZE		0	1	1	2	2	2	3	4	4	4	4	4	5	5
TENSILE STRENGTH ** LOAD LBS-MIN		140	310	530	810	1180	1600	2910	4640	7020	9500	12800	16200	20500	29800
L LENGTH	TOL.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.
.12		1	6	15	26	41									
.19		2	7	16	27	42	60								
.25		3	8	17	28	43	61	78							
.31		4	9	18	29	44	62	79							
.38	+.00 -.03	5	10	19	30	45	63	80	95						
.44			11	20	31	46	64	81	96						
.50			12	21	32	47	65	82	97	110					
.62			13	22	33	48	66	83	98	111	123*				
.75			14	23	34	49	67	84	99	112	124*	135*			
.88				24	35	50	68	85	100	113	125*	136*	146*	156*	
1.00				25	36	51	69	86	101	114	126*	137*	147*	157*	166*
1.25					37	52	70	87	102	115	127*	138*	148*	158*	167*
1.50					38	53	71	88	103	116	128*	139*	149*	159*	168*
1.75	+.00 -.06				39	54	72	89	104	117	129*	140*	150*	160*	169*
2.00		40	55	73	90	105	118	130*	141*	151*	161*	170*			
2.25					56*	74	91	106	119	131*	142*	152*	162*	171*	
2.50	+.00 -.09				57*	75	92	107	120	132*	143*	153*	163*	172*	
2.75		58*	76*	93*	108*	121	133*	144*	154*	164*	173*				
3.00		59*	77*	94*	109*	122	134*	145*	155*	165*	174*				

\* Inactive for new design after 20 August 1974.

\*\* Based on 80,000 PSI minimum tensile strength, load pounds are calculated by the stress areas in accordance with FED-STD-H28/2.

Requirements:

1. Material. Corrosion resistant steel, 300 series as specified in SAE AMS-QQ-S-763. Type 304 or 316 or equal to or interchangeable with 16:18 or 18:8 chromium-nickel alloy steel.
2. Surface treatment. Passivated in accordance with procurement specification.
3. Protective coating. Black oxide coating in accordance with procurement specification. (When black oxide coating is required, the dash number shall be followed by a code letter "B").
4. Magnetic permeability. The screw shall meet the magnetic permeability requirements of the procurement specification.
5. Threads. Threads shall be in accordance with FED-STD-H28/2. Acceptability of screw threads shall be in accordance with FED-STD-H28/20, System 21.
6. Thread length. Full form threads shall extend to within 2 threads or less of head bearing surface for lengths thru 2.00 inches. Longer lengths shall have a minimum full form thread length of 1.50 inches.
7. Recess. The recess shall be in accordance with NASM9006.
8. Self-locking element. The self-locking element shall be in accordance with MIL-DTL-18240. (When a self-locking element is required, the dash number shall be followed by a code letter "L". If black oxide coating is also required, the dash number would first be proceeded with a "B" followed by a "L").
9. Part number. The part number shall consist of the basic MS number, followed by a dash number from Table I. A code letter "B" for black oxide then a code letter "L" for self-locking will follow the dash number, if applicable. If black oxide is not required, and self-locking is required, an "L" will follow the dash number.



MS51960-65BL - Screw, machine-flat countersunk head, 82°, cross-recessed-corrosion resistant steel, UNF-2A; .190-32UNF-2A nominal thread size; .50 length; black oxide coated with self-locking element.

Notes:

1. All dimensions in inches.
2. Sizes above dotted line have undercut heads.
3. MS51960 supersedes MS35201, MS35250 and in part: MS35358, MS35363 and AN510.
4. In the event of a conflict between the text of this standard and the references cited herein, the text of this standard shall take precedence.
5. Changes from previous issue: Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

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Table II. AN510 Interchangeability.

The screws covered by the following dash numbers given in AN510 in part are canceled after the date indicated on the document. The canceled screws cannot always replace the new screws and should be used until existing stocks are depleted. Use only the new screws for new design and engineering. Replacement shall be in accordance with this table and as follows: AN510 dash numbers having an "R" in place of the "-" are superseded by MS51960 dash numbers as those having the "-".

Part Number		Part Number		Part Number		Part Number		Part Number	
Canceled	New	Canceled	New	Canceled	New	Canceled	New	Canceled	New
AN510	MS51960	AN510	MS51960	AN510	MS51960	AN510	MS51960	AN510	MS51960
C0-2	1	C4-11	**	C6-30	**	C8-42	**	C10-44	76
C0-3	2	C4-12	23	C6-32	40	C8-44	58	C10-46	**
C0-4	3	C4-13	**	C6-34	**	C8-46	**	C10-48	77
C0-5	4	C4-14	24	C6-36	**	C8-48	59	C416-6	80
C0-6	5	C4-15	**	C6-38	**	C10-4	61	C416-7	81
C0-7	**	C4-16	25	C6-40	**	C10-5	62	C416-8	82
C0-8	**	C4-18	**	C8-4	43	C10-6	63	C416-9	**
C1-2	**	THRU	**	C8-5	44	C10-7	64	C416-10	83
THRU	**	C4-28	**	C8-6	45	C10-8	65	C416-11	**
C1-8	**	C5-4	**	C8-7	46	C10-9	**	C416-12	84
C2-3	7	THRU	**	C8-8	47	C10-10	66	C416-13	**
C2-4	8	C5-28	**	C8-9	**	C10-11	**	C416-14	85
C2-5	9	C6-4	28	C8-10	48	C10-12	67	C416-15	**
C2-6	10	C6-5	29	C8-11	**	C10-13	**	C416-16	86
C2-7	11	C6-6	30	C8-12	49	C10-14	68	C416-18	**
C2-8	12	C6-7	31	C8-13	**	C10-15	**	C416-20	87
C2-9	**	C6-8	32	C8-14	50	C10-16	69	C416-22	**
C2-10	13	C6-9	**	C8-15	**	C10-18	**	C416-24	88
C2-11	**	C6-10	33	C8-16	51	C10-20	70	C416-26	**
C2-12	14	C6-11	**	C8-18	**	C10-22	**	C416-28	89
C3-3	**	C6-12	34	C8-20	52	C10-24	71	C416-30	**
THRU	**	C6-13	**	C8-22	**	C10-26	**	C416-32	90
C3-12	**	C6-14	35	C8-24	53	C10-28	72	C416-34	**
C4-3	16	C6-15	**	C8-26	**	C10-30	**	C416-36	91
C4-4	17	C6-16	36	C8-28	54	C10-32	73	C416-38	**
C4-5	18	C6-18	**	C8-30	**	C10-34	**	C416-40	92
C4-6	19	C6-20	37	C8-32	55	C10-36	74	C416-42	**
C4-7	20	C6-22	**	C8-34	**	C10-38	**	C416-44	93
C4-8	21	C6-24	38	C8-36	56	C10-40	75	C416-46	**
C4-9	**	C6-26	**	C8-38	**	C10-42	**	C416-48	94
C4-10	22	C6-28	39	C8-40	57				

\*\* No replacement

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TABLE III. MS35201 and MS35250 Interchangeability.

The screws covered by the following dash numbers given in MS35201 and MS35250 are canceled after 19 December 1963. The canceled screws cannot always replace the new screws and should be used until existing stocks are depleted. Use only the new screws for new design and engineering. Replacement shall be in accordance with this table.

Part Number			Part Number			Part Number			Part Number	
Canceled		New	Canceled		New	Canceled		New	Canceled	New
MS35201	MS35250	MS51960	MS35201	MS35250	MS51960	MS35201	MS35250	MS51960	MS35250	MS51960
	1	1	37	49	42	73	93	86	137	130
	2	2	38	50	43	74	94	87	138	131
	3	3	39	51	44	75	95	88	139	132
	4	4	40	52	45	76	96	89	140	133
	5	5	41	53	46	77	97	90	141	134
	6	**	42	54	47	78	98	91	142	135
	THRU	**	43	55	48	79	99	92	143	136
	12	**	44	56	49		100	93	144	137
1	13	6	45	57	50		101	94	145	138
2	14	7	46	58	51	80	102	95	146	139
3	15	8	47	59	52	81	103	96	147	140
4	16	9	48	60	53	82	104	97	148	141
5	17	10	49	61	54	83	105	98	149	142
6	18	11	50	62	55	84	106	99	150	143
7	19	12		63	56	85	107	100	151	144
8	20	13		64	57	86	108	101	152	145
9	21	14		65	58	87	109	102	153	146
10	22	15		66	59	88	110	103	154	147
11	23	16		67	60	89	111	104	155	148
12	24	17	51	68	61	90	112	105	156	149
13	25	18	52	69	62	91	113	106	157	150
14	26	19	53	70	63	92	114	107	158	151
15	27	20	54	71	64		115	108	159	152
16	28	21	55	72	65		116	109	160	153
17	29	22	56	73	66	93	117	110	161	154
18	30	23	57	74	67	94	118	111	162	155
19	31	24	58	75	68	95	119	112	163	156
20	32	25	59	76	69	96	120	113	164	157
21	33	26	60	77	70	97	121	114	165	158
22	34	27	61	78	71	98	122	115	166	159
23	35	28	62	79	72	99	123	116	167	160
24	36	29	63	80	73	100	124	117	168	161
25	37	30	64	81	74	101	125	118	169	162
26	38	31	65	82	75	102	126	119	170	163
27	39	32		83	76	103	127	120	171	164
28	40	33		84	77	104	128	121	172	165
29	41	34		85	78	105	129	122	173	166
30	42	35	66	86	79		130	123	174	167
31	43	36	67	87	80		131	124	175	168
32	44	37	68	88	81		132	125	176	169
33	45	38	69	89	82		133	126	177	170
34	46	39	70	90	83		134	127	178	171
35	47	40	71	91	84		135	128	179	172
36	48	41	72	92	85		136	129	180	173
									181	174

\*\* No replacement

Custodians:

Army - AV  
Navy - SH  
Air Force - 99

Preparing activity:

DLA - IS

(Project 5305-2011-007)

Review activities:

Army – AT,EA,MI  
Navy – MC, OS

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