

REVISIONS  
 1 SER AT 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

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

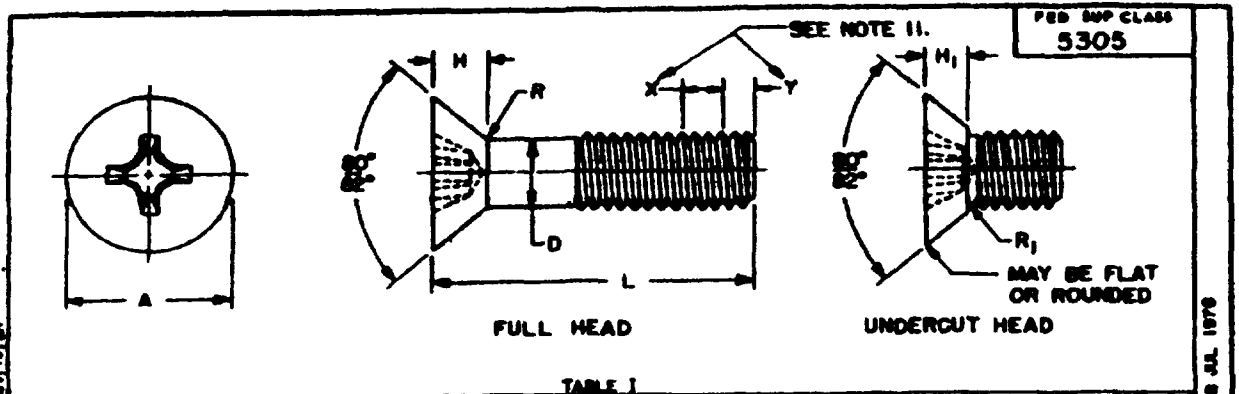


TABLE I

NOMINAL SIZE	(#1) .073	(#2) .086	(#4) .112	(#6) .138	(#8) .164	(#10) .190	(1/4) .250	(5/16) .3125	(3/8) .375	(7/16) .4375	(1/2) .500		
THREADS PER INCH, UNC-2A	64	56	40	32	32	24	20	18	16	14	13		
D BODY DIAMETER	MAX .0730 MIN .0603	MAX .0860 MIN .0717	MAX .1120 MIN .0923	MAX .1380 MIN .1141	MAX .1640 MIN .1399	MAX .1900 MIN .1586	MAX .2500 MIN .2127	MAX .3125 MIN .2712	MAX .3750 MIN .3287	MAX .4375 MIN .3850	MAX .5000 MIN .4435		
A HEAD DIAMETER	MAX SHARP .146 MIN SHARP .130 ABS MIN .123	MAX SHARP .172 MIN SHARP .156 ABS MIN .147	MAX SHARP .225 MIN SHARP .207 ABS MIN .195	MAX SHARP .278 MIN SHARP .257 ABS MIN .244	MAX SHARP .332 MIN SHARP .308 ABS MIN .292	MAX SHARP .385 MIN SHARP .359 ABS MIN .340	MAX SHARP .507 MIN SHARP .477 ABS MIN .452	MAX SHARP .635 MIN SHARP .600 ABS MIN .568	MAX SHARP .762 MIN SHARP .722 ABS MIN .685	MAX SHARP .812 MIN SHARP .767 ABS MIN .723	MAX SHARP .875 MIN SHARP .831 ABS MIN .775		
H HEAD HEIGHT	REF .043	REF .051	REF .067	REF .083	REF .100	REF .116	REF .153	REF .191	REF .230	REF .223	REF .223		
H1 HEAD HEIGHT UNDERCUT	MAX .031 MIN .023	MAX .036 MIN .028	MAX .047 MIN .038	MAX .059 MIN .048	MAX .070 MIN .058	MAX .081 MIN .068	MAX .107 MIN .092	MAX .134 MIN .116	MAX .161 MIN .140	MAX .156 MIN .133	MAX .156 MIN .130		
R RADIUS	MAX .029	MAX .034	MAX .045	MAX .055	MAX .066	MAX .076	MAX 100	MAX .125	MAX .150	MAX .175	MAX .200		
R1 RADIUS-UNDERCUT	MAX .011	MAX .013	MAX .017	MAX .021	MAX .025	MAX .029	MAX .038	MAX .047	MAX .056	MAX .066	MAX .075		
TENSILE STRENGTH LBS-MIN	160	220	360	545	840	1,050	1,910	3,140	4,650	6,380	8,500		
L LENGTH	TOLERANCE		DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.		
.125	+0 -.031		201*	202*	219	232	247	284	300	315	328*		
.188			202*	210	220	233	248						
.250			203*	211	221	234	249						
.312			204*	212	222	235	250						
.375	+0 -.031		205*	213	223	236	251	269	285	300	317	329*	
.438			206*	214	224	237	252	270	286	301	318	330*	
.500			207*	215	225	238	253	271	287	302	319	331*	
.625			208*	216	226	239	254	272	288	303	320	332*	
.750	+0 -.062			217	227	240	255	273	289	304	317	329*	340
.875				218	228	241	256	274	290	305	320	333*	341
1.000				219	229	242	257	275	291	306	321	334*	342
1.250				+0 -.062			230	243	258	276	292	307	320
1.500	231	244	259				277	293	308	321	333*	344	
1.750	245	260	278				294	309	322	334*	345		
2.000	246	261	279				295	310	323	335*	346		
2.250	+0 -.094				262	280	296	311	324	336*	347		
2.500					263	281	297	312	325	337*	348		
2.750					264	282	298	313	326	338*	349		
3.000					265	283	299	314	327	339*	350		

\* INACTIVE FOR NEW DESIGN AFTER 2 FEBRUARY 1976.

FOR CHANGE SEE SHEET 2

P.A. 5C Other Code AS 99	TITLE SCREW, MACHINE - 82° FLAT COUNTERSUNK HEAD, CROSS-RECESSED, CARBON STEEL, CADMIUM PLATED, UNC-2A	MILITARY STANDARD <b>MS35190</b>	
		PROCUREMENT SPECIFICATION FF-S-92	SUPERSEDES MS35159, MS35192, MS35194, and in part MS24583(USAF), MS35237, MS35219, MS35241, MS 5243, MS35358, MS35363 & AN505

APPROVED 25 JUN 1953 REVISED 9 APR 1962 10 JUN 1962 24 FEB 1965 22 OCT 1970 2 FEB 76 28 JUL 1976

NOTES

1. **MATERIAL:** Carbon steel in accordance with Fed. Std. No. 66 having minimum ultimate tensile strength of 60,000 PSI.
2. **PROTECTIVE COATING:** Cadmium plated in accordance with Type II, Class 3 of QQ-P-416 or MIL-C-81562.
3. **THREADS:** The threads shall be in accordance with Screw-Thread Standards for Federal Services, Handbook H-28.
4. **THREAD LENGTH:** Screws 2.00 inches long and shorter shall have complete threads extending to within two threads of the head, or closer if practicable. Longer screws shall have a minimum thread length of 1.50 inches.
5. **UNDERCUT HEADS:** Screws above dotted lines shall have undercut heads.
6. **DIMENSIONS:** All dimensions are in inches, unless otherwise specified.
7. **RECESS:** The recess shall be in accordance with MS9006.
8. **PART NUMBER:** The M5 part number consists of the MS number, plus the dash number.  
Example MS35190-209 plain screw or MS35190-2091 self-locking screw.
9. Referenced documents shall be of the issue in effect on date of invitations for bid.
10. For design feature purposes, this standard takes precedence over procurement documents referenced herein.
11. **SELF-LOCKING ELEMENT**
  - (a) The self-locking element shall be a patch type or longitudinal strip in accordance with MIL-P-18240.
  - (b) Maximum ring gage diameter that locking region of screw must pass thru freely or with finger pressure shall be the nominal size plus 0.008.
  - (c) For "X" and "Y" dimensions and design and usage limitations, see MS15981.

TABLE II  
INTERCHANGEABILITY

Screws covered by the following dash numbers given in ANSOS are cancelled after 24 February 1965. The cancelled screws cannot always replace the new screws, and should be used until existing stocks are depleted. Use only the new screws for design and replacement. Replacement shall be in accordance with this table.

PART NUMBERS

CANCELLED ANSOS	NEW MS35190	CANCELLED ANSOS	NEW MS35190	CANCELLED ANSOS	NEW MS35190	CANCELLED ANSOS	NEW MS35190	CANCELLED ANSOS	NEW MS35190
2R3	210	5R6	NR	8R4	249	10R26	NR	516R13	NR
2R4	211	5R7	NR	8R5	250	10R28	278	516R14	305
2R5	212	5R8	NR	8R6	251	10R30	NR	516R15	NR
2R6	213	5R9	NR	8R7	252	10R32	279	516R16	306
2R7	214	5R10	NR	8R8	253	10R34	NR	516R18	NR
2R8	215	5R11	NR	8R9	NR	10R36	280	516R20	307
2R9	NR	5R12	NR	8R10	234	10R38	NR	516R22	NR
2R10	216	5R13	NR	8R11	NR	10R40	281	516R24	308
2R11	NR	5R14	NR	8R12	235	10R42	NR	516R26	NR
2R12	217	5R15	NR	8R13	NR	10R44	282	516R28	309
3R3	NR	5R16	NR	8R14	236	10R46	NR	516R30	NR
3R4	NR	5R18	NR	8R15	NR	10R48	283	516R32	310
3R5	NR	5R20	NR	8R16	237	416R15	284	516R34	NR
3R6	NR	5R22	NR	8R18	NR	416R16	285	516R36	311
3R7	NR	5R24	NR	8R20	238	416R17	286	516R38	NR
3R8	NR	6R3	233	8R22	NR	416R18	287	516R40	312
3R9	NR	6R4	234	8R24	239	416R19	NR	516R42	NR
3R10	NR	6R5	235	8R26	NR	416R20	288	516R44	313
3R11	NR	6R6	236	8R28	240	416R21	NR	516R46	NR
3R12	NR	6R7	237	8R30	NR	416R22	289	516R48	314
3R13	NR	6R8	238	8R32	241	416R23	NR	616R10	315
3R14	NR	6R9	NR	8R34	NR	416R24	290	616R11	NR
3R15	NR	6R10	239	8R36	242	416R25	NR	616R12	316
3R16	NR	6R11	NR	8R38	NR	416R26	291	616R13	NR
4R3	220	6R12	240	8R40	243	416R28	NR	616R14	317
4R4	221	6R13	NR	8R42	NR	416R20	292	616R15	NR
4R5	222	6R14	241	8R44	244	416R22	NR	616R16	318
4R6	223	6R15	NR	8R46	NR	416R24	293	616R17	NR
4R7	224	6R16	242	8R48	245	416R26	NR	616R18	319
4R8	225	6R18	NR	10R5	246	416R28	294	616R19	NR
4R9	NR	6R20	243	10R6	247	416R30	NR	616R20	320
4R10	226	6R22	NR	10R7	248	416R32	295	616R22	NR
4R11	NR	6R24	244	10R8	249	416R34	NR	616R24	321
4R12	227	6R26	NR	10R9	NR	416R36	296	616R26	NR
4R13	NR	6R28	245	10R10	250	416R38	NR	616R28	322
4R14	228	6R30	NR	10R11	NR	416R40	297	616R30	NR
4R15	NR	6R32	246	10R12	251	416R42	NR	616R32	323
4R16	229	6R34	NR	10R13	NR	416R44	298	616R34	NR
4R18	NR	6R36	NR	10R14	252	416R46	NR	616R36	324
4R20	230	6R38	NR	10R15	NR	416R48	299	616R38	NR
4R22	NR	6R40	NR	10R16	253	516R10	302	616R40	325
4R24	231	6R42	NR	10R18	NR	516R11	NR	616R42	NR
5R3	NR	6R44	NR	10R20	254	516R12	303	616R44	326
5R4	NR	6R46	NR	10R22	NR	516R13	NR	616R46	NR
5R5	NR	6R48	NR	10R24	255	516R14	304	616R48	327

NR - No replacement

PA	6C	TITLE	MILITARY STANDARD
Other Code	AS	SCREW, MACHINE - B2° FLAT COUNTERSUNK HEAD, CROSS-RECESSED, CARBON STEEL, CADIUM PLATED, UNC - 2A	MS 35190
PROCUREMENT SPECIFICATION	FF-S-92	SUPERSEDES MS35188, MS35192, MS35194 and in part MS24983(USA), MS35237, MS35239, MS35241, MS35243, MS35158 & ANSOS B MS35363	SHEET 2 OF 4

APPROVED 25 JUN 1953 REVISED A 5 APR 1962 B 18 JUN 1962 C 24 FEB 1965 D 22 OCT 1970 E 8 FEB 1975 F FOR CHANGE SEE SHEET 2

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

REVISED 1953 1 SER AL 03, MIL, PA, RV, TD, 24

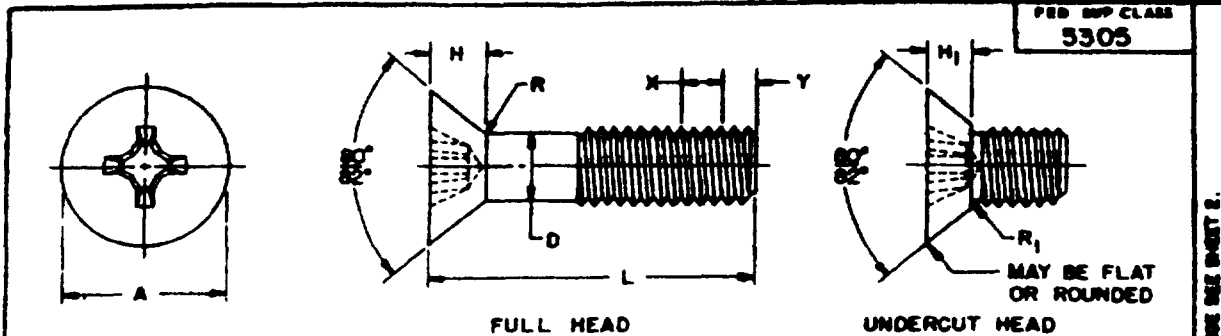


TABLE IV  
METRIC TRANSLATION OF TABLE I

NOMINAL SIZE	MM	1.854	2.184	2.845	3.505	4.166	4.826	6.350	7.938	9.525	11.112	12.700
PITCH		.40	.45	.64	.79	.79	1.06	1.27	1.41	1.59	1.81	1.95
D BODY DIAMETER	MAX MIN	1.85 1.53	2.18 1.82	2.85 2.35	3.51 2.90	4.17 3.55	4.83 4.03	6.35 5.40	7.94 6.89	9.53 8.35	11.11 9.78	12.70 11.27
A HEAD DIA	MAX SHARP MIN SHARP ABS MIN	3.71 3.30 3.12	4.37 3.96 3.73	5.72 5.26 4.95	7.09 6.53 6.20	8.43 7.82 7.42	9.78 9.12 8.64	12.88 12.12 11.48	16.13 15.24 14.43	19.36 18.34 17.40	20.63 19.48 18.36	22.23 21.11 19.69
H HEAD HEIGHT	REF	1.09	1.30	1.70	2.11	2.54	2.95	3.89	4.85	5.84	5.66	5.66
H1 HEAD HEIGHT UNDERCUT	MAX MIN	.79 .58	.91 .71	1.19 .97	1.50 1.22	1.78 1.47	2.06 1.73	2.72 2.34	3.40 2.95	4.09 3.56	3.96 3.38	3.96 3.30
R RADIUS	MAX	.74	.86	1.14	1.40	1.68	1.93	2.54	3.18	3.81	4.45	5.08
R1 RADIUS-UNDERCUT	MAX	.28	.33	.43	.53	.64	.74	.97	1.19	1.42	1.68	1.91
TENSILE STRENGTH IN MIN		.71	.98	1.60	2.42	3.74	4.67	8.50	14.0	20.7	28.4	37.8
L LENGTH	TOLERANCE	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.
3.17		201*	209	219	232	247						
4.78		202*	210	220	233	248	266					
6.35		203*	211	221	234	249	267					
7.93		204*	212	222	235	250	268	284				
9.53	+0	205*	213	223	236	251	269	285	300			
11.13	-.79	206*	214	224	237	252	270	286	301			
12.70		207*	215	225	238	253	271	287	302	315		
15.88		208*	216	226	239	254	272	288	303	316	328*	
19.05			217	227	240	255	273	289	304	317	329*	340
22.23			218	228	241	256	274	290	305	318	330*	341
25.40				229	242	257	275	291	306	319	331*	342
31.75				230	243	258	276	292	307	320	332*	343
38.10	+0			231	244	259	277	293	308	321	333*	344
44.45	-1.58				245	260	278	294	309	322	334*	345
50.80					246	261	279	295	310	323	335*	346
57.15	+0					262	280	296	311	324	336*	347
63.50	-2.39					263	281	297	312	325	337*	348
69.85						264	282	298	313	326	338*	349
76.20						265	283	299	314	327	339*	350

NOTE All dimensions are in millimeters (MM), unless otherwise specified.

\* INACTIVE FOR NEW DESIGN AFTER 1 FEBRUARY 1978.

REVIEWER: NSA, IS, G, EA, BU, EL, CL, RW, BM  
 USER: AT, OS, ME, PA, VV, YD, BM  
 This standard is approved for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document, was approved.

APPROVED 25 JUN 1963 REVISED (A) 6 APR 1962 (B) 18 JUN 1962 (C) 7 FEB 1968 (D) 22 OCT 1970 (E) 2 FEB 1978 (F) FOR CHANGE SEE SHEET 2.

P A VL Draw Case AS 82	TITLE <b>SCREW, MACHINE - 82° FLAT COUNTERSUNK HEAD, CROSS-RECESSED, CARBON STEEL, CADMIUM PLATED, UNC-2A</b>	<b>MILITARY STANDARD</b> <b>MS 35190</b>
DOCUMENT SPECIFICATION FF-S-92	SUPERSEDES MS35188, MS35192, MS35194; and in part MS24583 (USAF), MS35237, MS35239, MS35241, MS35243, MS35338, MS35363 & AN405	SHEET 4 OF 4

TABLE III - INTERCHANGEABILITY

The screws covered by the following cancelled part numbers are cancelled after 5 April 1962. The cancelled screws cannot always replace the new screws and should be used until existing stocks are depleted. Use only the new screws for design and replacement. Replacement shall be in accordance with this table.

PART NUMBERS										
NEW	CANCELLED		NEW	CANCELLED	NEW	CANCELLED	NEW	CANCELLED	NEW	CANCELLED
MS35190	MS24503	MS35100, MS35190, MS35192, MS35194	MS35190	MS35100, MS35190, MS35192, MS35194	MS35190	MS35237, MS35239, MS35241, MS35243	MS35190	MS35237, MS35239, MS35241, MS35243	MS35190	MS35237, MS35239, MS35241, MS35243
209	1	1	267	1	201	1	251	50	301	100
210	2	2	268	2	202	2	252	51	302	101
211	3	3	269	3	203	3	253	52	303	102
212	4	4	270	4	204	4	254	53	304	103
213	5	5	271	5	205	5	255	54	305	104
214	6	6	272	6	206	6	256	55	306	105
215	7	7	273	7	207	7	257	56	307	106
216	8	8	274	8	209	8	258	57	308	107
217	9	9	275	9	210	9	259	58	309	108
219	10	10	276	10	211	10	260	59	310	109
220	11	11	277	11	212	11	261	60	311	110
221	12	12	278	12	213	12	262	61	312	111
222	13	13	279	13	214	13	263	62	313	112
223	14	14	280	14	215	14	264	63	314	113
224	15	15	281	15	216	15	265	64	315	114
225	16	16	284	16	217	16	266	65	316	115
226	17	17	285	17	218	17	267	66	317	116
227	18	18	286	18	219	18	268	67	318	117
228	19	19	287	19	220	19	269	68	319	118
229	20	20	288	20	221	20	270	69	320	119
232	21	21	289	21	222	21	271	70	321	120
233	22	22	290	22	223	22	272	71	322	121
234	23	23	291	23	224	23	273	72	323	122
235	24	24	292	24	225	24	274	73	324	123
236	25	25	293	25	226	25	275	74	325	124
237	26	26	294	26	227	26	276	75	326	125
238	27	27	295	27	228	27	277	76	327	126
239	28	28	296	28	229	28	278	77	328	127
240	29	29	297	29	230	29	279	78	329	128
241	30	30	300	30	231	30	300	79	330	129
242	31	31	301	31	232	31	281	80	331	130
243	32	32	302	32	233	32	282	81	332	131
244	33	33	303	33	234	33	283	82	333	132
245	34	34	304	34	235	34	284	83	334	133
246	35	35	305	35	236	35	285	84	335	134
247	36	36	306	36	237	36	286	85	336	135
248	37	37	307	37	238	37	287	86	337	136
249	38	38	308	38	239	38	288	87	338	137
250	39	39	309	39	240	39	289	88	339	138
251	40	40	310	40	241	40	290	89	340	139
252	41	41	311	41	242	41	291	90	341	140
253	42	42	312	42	243	42	292	91	342	141
254	43	43	315	43	244	43	293	92	343	142
255	44	44	316	44	245	44	294	93	344	143
256	45	45	317	45	246	45	295	94	345	144
257	46	46	318	46	247	46	296	95	346	145
258	47	47	319	47	248	47	297	96	347	146
259	48	48	320	48	249	48	298	97	348	147
260	49	49	321	49	250	49	299	98	349	148
261	50	50	322	50			300	99	350	149
			323	101						
			324	102						
			325	103						
			326	104						
			327	105						

\* Dash numbers 150 thru 176 are cancelled with no replacements

REVISER: HMA, W. G., SA, MA, EL, M, M  
USER AT: ON, ME, PA, WV, VA, WI

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

APPROVED 29 JUN 1955 REVISED (A) 5 APR 1962 (B) 19 JUN 1962 (C) 24 FEB 1965 (D) 22 OCT 1970 (E) 2 FEB 1978 (F) FOR CHANGE SEE SHEET 2

MILITARY STANDARD <b>MS 35190</b>	TITLE SCREW, MACHINE - 82° FLAT COUNTERSUNK HEAD, GROSS-RECESSED, CARBON STEEL, CADMIUM PLATED, UMC-2A
	PROCUREMENT SPECIFICATION FF-5-92