INCH-POUND

MS16995H 25 April 1997 SUPERSEDING MS16995G 27 June 1995

MILITARY SPECIFICATION SHEET

SCREW, CAP, SOCKET HEAD- HEXAGON, CORROSION RESISTANT STEEL, UNC-3A

This specification 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 the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: FF-S-86.

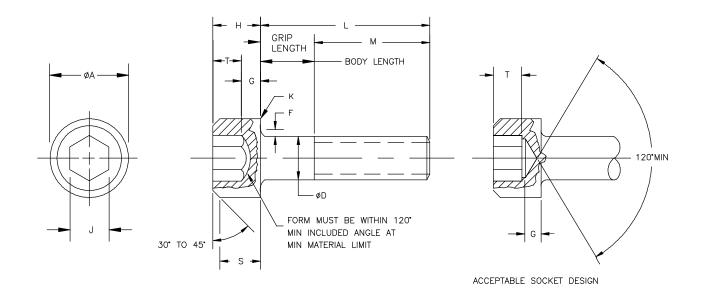


FIGURE 1. <u>Dimensions and configurations</u>.

AMSC N/A 1 of 9 FSC 5305

<u>DISTRIBUTION STATEMENT A.</u> Approved for public release; distribution is unlimited.

NOTES: TABLE I. <u>DIMENSIONS AND DASH NUMBERS</u>

Nominal Size				#2 (.08	50)	#4 (.1120)			#6 (.1380)			
,	Threads Per Inch		56 UNC-3A			40 UNC-3A			32 UNC-3A			
ØD Body		Max		.0860			.1120		.1380			
		Min		.0822			.1075			.1329		
ØA Head		Max		.140			.183			.226		
		Min		.134			.176			.218		
				00.5						400		
H Head He	eight	Max		.086			.112		.138			
		Min		.083			.108			.134		
0.11.10	1 77 1 1	3.41		.077			101			124		
S Head Sid	le Height	Min		.077			.101		.124			
J Socket W	/idth	Max		.0791			.0952		.1111			
Across Fl		Min		.0781			.0937		.1094			
Across 11	ats	IVIIII		10701			.0737			.1074		
T Key Enga	agement	Min	.038			.051			.064			
1 110) Lings		1,111										
G Wall Thi	ckness	Min	.029			.038			.047			
			!									
K Chamfer	or Radius	Max	.003				.005			.005		
F Fillet Ext	ension	Max	.008				.009			.010		
		Min		.004			.005			.006		
			625				7500			7500		
	read Length 1_/		.625			.7500			.7500			
	Min Tensile Strength Load Lbs		300		480			730				
L Length	Tolerance	e	Dash	Grip	Body	Dash	Grip	Body	Dash	Grip	Body	
			No	Length	Length	No	Length	Length	No	Length	Length	
100				Max	Min		Max	Min		Max	Min	
.188			1			9			16			
.250 .375	. 000		2 3			10			16 17			
.500	+.000 030		3 4			10			18			
.625	030		4			12			18			
.023						12			19			
.750						13			20			
1.000						13			21			
1.000	l		L	J	l	·		1		l		

¹_/ See note 2.

TABLE I. DIMENSIONS AND DASH NUMBERS - continued

Non		#8 (.1640)		#	[‡] 10 (.1900)			1/4 (.250)			
Threads Per Inch		32 UNC-3A				24 UNC-3A			20 UNC-3A		
ØD Body	Max		.1640			.1900			.2500		
	Min		.1585			.1840			.2435		
ØA Head	Max		.270			.312			.375		
	Min		.262			.303			.365		
II Haad Haia	ht Max		.164			.190			.250		
H Head Heig	Min		.159			.185			.244		
	IVIIII		.137			.103			.277		
S Head Side	Height Min		.148			.171			.225		
J Socket Wid			.1426			.1587			.1900		
Across Flats	s Min		.1406			.1562			.1875		
T Key Engag	gement Min		.077			.090			.120		
i Key Eligag	gement win		.077			.070			.120		
G Wall Thic	kness Min		.056			. 065			.095		
K Chamfer o	r Radius Max		.005			.005			.008		
			0.4.0			0.1.1			0.1.1		
F Fillet Exter			.012 .007			.014			.014 .009		
	Min		.007			.009			.009		
M Basic Thre	ad Length 1_/ Ref		.875			. 875			1.000		
W Busic Tine	ad Length 1_/ Ref		.075			. 075			1,000		
Min Tensile St	rength Load Lbs	1,120				1,400		2,540			
L Length	Tolerance	Dash	Grip	Body	Dash	Grip	Body	Dash	Grip	Body	
		No	Length	Length	No	Length	Length	No	Length	Length	
			Max	Min		Max	Min		Max	Min	
.375		25			35			47			
.500		26			36			48			
.625	+.000	27			37			49			
.750	030	28			38			50			
.875		29			39			51			
1.000		30			40			52			
1.250	+.000	 30	+		41	.375	.167	53			
1.500	040				42	.375	.167	54	.500	.250	
1.750	.070				72	.575	.107	55	.500	.250	
2.000								56	1.000	.750	
2.000	J		l	I	l	l	L	50	1.000	./30	

¹_/ See note 2.

TABLE I. DIMENSIONS AND DASH NUMBERS - continued

Nominal Size			5/16(.3125)			3/8 (.375)			1/2 (.500)		
Threads Per Inch		18 UNC-3A		16 UNC-3A			13 UNC-3A				
ØD Body Max		.3125		.3750			.5000				
		Min		.3053			.3678			.4919	
ØA Head	l	Max		.469			.563			.750	
		Min		.457			.550			.735	
H Head	Height	Max		.313			.375			.500	
11 Ticad	Ticigiii	Min		.306			.368			.492	
		Willi								,2	
S Head	Side Height	Min		.281			.337			.450	
J Sock	et Width	Max		.2530			.3160			.3790	
	ss Flats	Min		.2500			.3125			.3750	
11010	55 1 1415	1,111									
T Key l	Engagement	Min		.151			.182			.245	
G Wall	Thickness	Min		.119			.143		.190		
K Cham	fer or Radius	Max		.008			.008			.010	
F Fillet	F Fillet Extension Max		.017			.020		.026			
		Min		.012			.015			.020	
M Basic	Thread Length 1_/	Ref		1.125			1.250			1.500	
Min Tensil	e Strength Load Lbs			4,190			6,200			11,300	
TVIIII TCIISII	Tolerance			1,170			0,200			11,500	
L Length	Size 5/16 (.3125)	Size	Dash	Grip	Body	Dash	Grip	Body	Dash	Grip	Body
E Bengui	and 3/8 (.375)	1/2 (.500)	No	Length	Length	No	Length	Length	No	Length	Length
		-/- (1000)		Max	Min		Max	Min		Max	Min
.375			61								
.500	+.000	+.000	62			77					
.625	030	030	63			78					
.750			64			79			92		
.875			65			80			93		
1.000			66			81			94		
1.250			67			82			95		1
1.500			68			83			96		
1.750	+.000	+.000	69	.625	.347	84	.500	.187	97		
2.000	040	060	70			85	.500	.187	98		
2.250			71	1.125	.847	86	1.000	697	99	.750	.365
2.500			71 72	1.125	.847	87	1.000	.687 .687	100	.750	.365
2.750	+.000	+.000	1 '-	1.123	.04/	07	1.000	.007	100	.750	.365
3.000	060	+.000 080							101	1.500	1.115
2.500	.000	.500	1	1		1	1	1	102	1.000	1.110

1_/ See note 2

TABLE I. DIMENSIONS AND DASH NUMBERS - continued

Threads Per Inch		N	ominal Size	#5	5/8(.625)					
Min .6163 ØA Head Max Min .936 Min H Head Height Max Min .625 Min S Head Side Height Min .562 J Socket Width Max Across Flats Min .5000 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min M Basic Thread Length 1 / Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash Grip Length Max Body Length Min 1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.250 111 2.250 2.295 2.500 2.112 2.250 2.295<		Th	reads Per Inch	11 UNC-3A						
ØA Head Max Min .936 .921 H Head Height Max Min .625 .616 S Head Side Height Min .562 J Socket Width Across Flats Min .5050 .5000 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 .024 M Basic Thread Length 1 / Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash Grip Length Length Length Max Loo0 +.000,030 107 1.250 108 1.500 1.500 109 1.750 2.000 +.000,060 111 2.250 112 2.250 2.750 +.000,080 114 .750 .295	ØD	Body		Max		.6250				
Min .921 H Head Height Max Min .625 Min S Head Side Height Min .562 J Socket Width Across Flats Min .5050 Min T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min M Basic Thread Length 1_/ Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Dash Orip Length Max L Length Tolerance No Length Max 1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 2.750 +.000,080 114 .750 .295				Min		.6163				
Min .921 H Head Height Max Min .625 Min S Head Side Height Min .562 J Socket Width Across Flats Min .5050 Min T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min M Basic Thread Length 1_/ Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Dash Orip Length Max L Length Tolerance No Length Max 1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 2.750 +.000,080 114 .750 .295										
H Head Height Max Min .625 Min .616 S Head Side Height Min .562 J Socket Width Max Across Flats Min .5000 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .024 M Basic Thread Length 1 / Ref .024 Min Tensile Strength Load Lbs .18,100 L Length Tolerance Dash Grip Length Length Max Min .1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 2.750 +.000,080 114 .750 .295	ØA	Head		Max		.936				
Min .616 S Head Side Height Min .562 J Socket Width Across Flats Min .5050 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max .032 Min .024 M Basic Thread Length 1 / Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash No Grip Length Max Hength Min 1.000 +.000,030 107 108 1.250 108 1.500 109 1.750 110 109 1.750 2.000 +.000,060 111 112 2.250 2.250 2.250 2.295 2.750 +.000,080 114 .750 .295				Min		.921				
Min .616 S Head Side Height Min .562 J Socket Width Across Flats Min .5050 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max .032 Min .024 M Basic Thread Length 1 / Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash No Grip Length Max Hength Min 1.000 +.000,030 107 108 1.250 108 1.500 109 1.750 110 109 1.750 2.000 +.000,060 111 112 2.250 2.250 2.250 2.295 2.750 +.000,080 114 .750 .295										
S Head Side Height Min .562 J Socket Width Max .5050 Across Flats Min .5000 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max .032 Min .024 M Basic Thread Length 1 / Ref .1.750 Min Tensile Strength Load Lbs .18,100 L Length Tolerance Dash No Length Length Max Min .1000	Н	Head l	Height	Max		.625				
J Socket Width Max Across Flats Min .5000 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1/Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash Grip Length Max Min .000 L Length Tolerance No Length Length Max Min .000 1.250 1.08 1.500 109 1.750 2.000 +.000,060 111 2.250 112 2.500 2.750 +.000,080 114 .750 .295				Min		.616				
J Socket Width Max Across Flats Min .5000 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1/Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash Grip Length Max Min .000 L Length Tolerance No Length Length Max Min .000 1.250 1.08 1.500 109 1.750 2.000 +.000,060 111 2.250 112 2.500 2.750 +.000,080 114 .750 .295										
Across Flats Min .5000 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1_/ Ref .1.750 Min Tensile Strength Load Lbs .18,100 L Length Tolerance Dash Grip Length Length Max Min .1.000	S	Head S	Side Height	Min		.562				
Across Flats Min .5000 T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1_/ Ref .1.750 Min Tensile Strength Load Lbs .18,100 L Length Tolerance Dash Grip Length Length Max Min .1.000										
T Key Engagement Min .307 G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1_/ Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash Grip Length Length Max Min .000 L Length Tolerance No Length Length Max Min .000	J									
G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1_/ Ref .1.750 Min Tensile Strength Load Lbs .18,100 L Length Tolerance Dash Grip Body Length Max Min .1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 112 2.500 2.750 +.000,080 114 .750 .295		Acros	s Flats	Min		.5000				
G Wall Thickness Min .238 K Chamfer or Radius Max .010 F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1_/ Ref .1.750 Min Tensile Strength Load Lbs .18,100 L Length Tolerance Dash Grip Body Length Max Min .1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 112 2.500 2.750 +.000,080 114 .750 .295				3.61		207				
K Chamfer or Radius Max .010	T	Key E	ngagement	Mın		.307				
K Chamfer or Radius Max .010		XX 11 70	4 . 1	3.4"		229				
F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1_/ Ref	G	wan i	nickness	Min	.238					
F Fillet Extension Max Min .032 Min .024 M Basic Thread Length 1_/ Ref	T CI C D I			Mar	010					
Min .024 M Basic Thread Length 1_/ Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Dash Crip No Length Length Max 1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295	K '	Chaim	er or Radius	Max		.010				
Min .024 M Basic Thread Length 1_/ Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Length Dash Crip No Length Length Max 1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295	E Eillet Extension		Mov		032					
M Basic Thread Length 1_/ Ref 1.750 Min Tensile Strength Load Lbs 18,100 L Dash No Length Length Max Grip Length Length Max 1.000 +.000,030 107 1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295	F Fillet Extension									
Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash No Length Length Max Body Length Length Max 1.000 +.000,030 107 108 1.500 109 110 1.750 110 110 2.000 +.000,060 111 2.250 112 113 2.750 +.000,080 114 .750 .295				IVIIII		.024				
Min Tensile Strength Load Lbs 18,100 L Length Tolerance Dash No Length Length Max Body Length Length Max 1.000 +.000,030 107 1.250 108 109 1.750 110 110 2.000 +.000,060 111 2.250 112 113 2.500 2.750 +.000,080 114 .750 .295 2.750 +.000,080 114 .750 .295	M I	Basic T	Thread Length 1	/ Ref		1.750				
L Length Tolerance Dash No Grip Length Length Max Body Length Min 1.000 +.000,030 107 1.250 108 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295						18,100				
L Length Tolerance No Length Max Length Min 1.000 +.000,030 107 1.250 108 108 1.500 109 110 2.000 +.000,060 111 2.250 112 113 2.500 2.750 114 2.750 2.95 2.750 2.95			<i>a.</i>				Body			
Max Min	L Le	ength	Tolerance	e						
1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295		U								
1.250 108 1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295	1.000	1.000 +.000,030			107					
1.500 109 1.750 110 2.000 +.000,060 111 2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295					108					
1.750 110 2.000 +.000,060 111 2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295										
2.250 112 2.500 113 .750 .295 2.750 +.000,080 114 .750 .295	1.750									
2.500 2.750 +.000,080 113 .750 .295 114 .750 .295	2.000	2.000 +.000,		060	111					
2.500 2.750 +.000,080 113 .750 .295 114 .750 .295										
2.750 +.000,080 114 .750 .295	2.250				112	L	L			
	2.500				113	.750	.295			
3.000 115 .750 .295	2.750		+.000,	080	114	.750	.295			
	3.000				115	.750	.295			

1_/ See note 2.

NOTES:

- 1. All dimensions are in inches.
- 2. The basic thread length "M" (Table I) is a referenced value controlled by the grip length and "L" length as specified.
- 3. MS16995 supersedes MS35461 in part.
- 4. In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence.
- 5. Unless otherwise specified, issues of referenced documents are those in effect at the time of solicitation.
- 6. MS16995 Socket Head Cap Screws manufactured prior to 25 April 1997 may be used until stock is depleted.

REQUIREMENTS:

1. MATERIAL:

Austenitic Corrosion-Resistant Steel screws shall be manufactured from Type 304 (UNS S30400), Type 304L (UNS S30403), Type 305 (UNS S30500), Type 316 (UNS S31600), Type 316L (UNS S31603), Type 384 (UNS S38400), or Type XM-7(UNS S30430) in accordance with the chemical compositions specified in ASTM F 593.

(See Material Identification Marking and Material Code).

2. FINISH:

Passivate in accordance with QQ-P-35 or

Black Oxide coating in accordance with MIL-C-13924, Class 4. (Except for Type 316 or Type 316L).

(See Finish Code).

3. MECHANICAL PROPERTIES:

The minimum tensile strength in load pounds, indicated for each size in Table I, is based on 80,000 PSI minimum tensile strength. Load pounds are calculated by the stress areas indicated in FED-STD-H28/2. The yield strength, based on 0.2 percent offset, shall be 30,000 PSI minimum. The minimum hardness shall be HRB 80.

4. MAGNETIC PERMEABILITY:

When specified, screws shall have a magnetic permeability of less than 2.0 (air = 1.0) for a field strength H = 200 oersteds using a magnetic permeability indicator per ASTM A 342.

Note: Cold worked screws may not be capable of meeting permeability and strength requirements simultaneously.

5. THREADS:

Screw threads shall be Unified external threads Class 3A UNC in accordance with FED-STD-H28/2. Acceptability of screw threads shall be in accordance with FED-STD-H28/20, System 22. Screws above the dashed lines shall have complete (full form) threads extended to within two (2) threads of the head as measured with a thread ring gage.

6. HEAD STYLE:

Head of screw may be plain or knurled at manufacturer's option.

7. MANUFACTURER IDENTIFICATION MARKING:

Screws nominal size #10 (.1900) and larger shall be permanently marked with the manufacturer's symbol. Marking size, type, and location of marks at manufacturer's option. Screws shall not be marked on bearing surfaces. Markings shall be raised or depressed on the screw head.

8. MATERIAL IDENTIFICATION MARKING:

Type 316 (UNS S31600) or 316L (UNS S31603) CRES screws nominal size #10 (.1900) and larger shall be permanently marked "316". Markings shall be raised or depressed on the screw head at the manufacturer's option.

9. MATERIAL CODE:

For 300 Series CRES - No code after dash number indicates any 300 Series Austenitic Corrosion-Resistant Steel listed in material requirement.

For Type 316 or 316L CRES - "S316" after dash number indicates Austenitic Corrosion-Resistant Steel

Type 316 or Type 316L.

10. FINISH CODE:

Passivate - No code letter after dash number, or after material code (if applicable), indicates passivate.

Black Oxide - "B" after dash number indicates black oxide coating (except for Type 316 or 316L CRES).

11. PART NUMBER:

The part number shall consist of the basic MS number, followed by a dash number from Table I, a material code (if applicable), and a finish code (if applicable).

EXAMPLES: MS16995-1

MS16995-1 indicates Screw, Cap, Socket Head, Hexagon, 300 Series Corrosion-Resistant Steel; .0860-56 UNC-3A Nominal Thread Size, .188 Length, Passivated

MS16995-1S316 indicates Screw, Cap, Socket Head, Hexagon, Corrosion-Resistant Steel Type 316 or Type 316L; .0860-56 UNC-3A Nominal Thread Size, .188 Length, Passivated

MS16995-1B indicates Screw, Cap, Socket Head, Hexagon, 300 Series Corrosion-Resistant Steel; .0860-56 UNC-3A Nominal Thread Size, .188 Length, Black Oxide Coating

The screws covered by dash numbers given in MS35461 that are replaced by applicable dash numbers in this document are <u>canceled after 5 April 62.</u> Use the dash numbers given in the preceding sheets. The canceled 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. Interchangeability information regarding part numbers on superseded drawings are also contained in this table.

TABLE II. INTERCHANGEABILITY TABLE

Part N	umbers	Part Num	bers	Part Numbers		
Canceled	Superseding	Canceled	Superseding	Canceled	Superseding	
MS35461	MS16995	MS35461	MS16995	MS35461	MS16995	
Dash Number	Dash Number	Dash Number	Dash Numbers	Dash Number	Dash Numbers	
1	25	23	49	54	83	
2	26	24	50	55	84	
3	27	25	51	56	85	
4	28	26	52	57	86	
5	29	27	53	58	87	
6	30	28	54	62	92	
11	35	29	55	63	93	
12	36	30	56	64	94	
13	37	48	77	65	95	
14	38	49	78	66	96	
15	39	50	79	67	97	
16	40	51	80	68	98	
21	47	52	81	69	99	
22	48	53	82	70	100	

Screws covered by the following part numbers are inactive for new design and engineering. They shall be used for maintenance of existing equipment to replace the 5/16 inch size screws used in counterbored holes or other close applications.

Part Numbers						
Inactive						
MS35461						
Dash Number						
33						
34						
35						
36						
37						
38						

39	
40	
41	
42	
43	
44	

Custodians:

Army - AR Navy - OS

Air Force - 82

Review activities:

Army - MI

Navy - MC, SH Air Force - 11

NSA-NS

Preparing activity: DLA - IS

(Project 5305-2126)