

User activities
 ARMY - ME
 NAVY - MC
 AIR FORCE

ARMY - AV, EA
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 AIR FORCE - B 2
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Review activities

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 applicable.

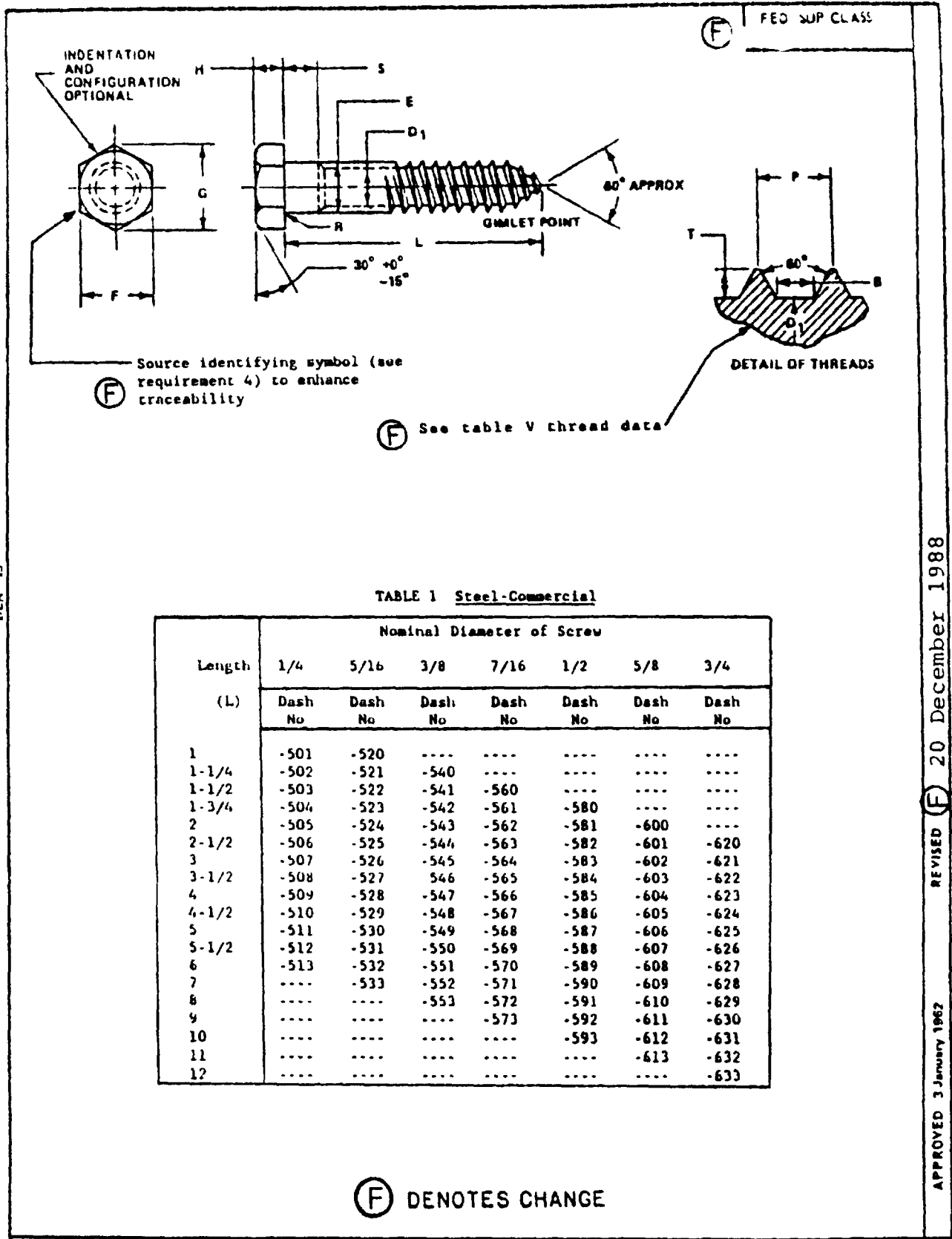


TABLE 1 Steel-Commercial

Length (L)	Nominal Diameter of Screw						
	1/4	5/16	3/8	7/16	1/2	5/8	3/4
	Dash No	Dash No	Dash No	Dash No	Dash No	Dash No	Dash No
1	-501	-520	----	----	----	----	----
1-1/4	-502	-521	-540	----	----	----	----
1-1/2	-503	-522	-541	-560	----	----	----
1-3/4	-504	-523	-542	-561	-580	----	----
2	-505	-524	-543	-562	-581	-600	----
2-1/2	-506	-525	-544	-563	-582	-601	-620
3	-507	-526	-545	-564	-583	-602	-621
3-1/2	-508	-527	-546	-565	-584	-603	-622
4	-509	-528	-547	-566	-585	-604	-623
4-1/2	-510	-529	-548	-567	-586	-605	-624
5	-511	-530	-549	-568	-587	-606	-625
5-1/2	-512	-531	-550	-569	-588	-607	-626
6	-513	-532	-551	-570	-589	-608	-627
7	----	-533	-552	-571	-590	-609	-628
8	----	----	-553	-572	-591	-610	-629
9	----	----	----	-573	-592	-611	-630
10	----	----	----	----	-593	-612	-631
11	----	----	----	----	----	-613	-632
12	----	----	----	----	----	----	-633

(F) DENOTES CHANGE

P A Y D Other Cust. AK 99	International Interest	TITLE (F) SCREW, LAG (BOLT), HEX HEAD GIMLET POINT	MILITARY STANDARD
			MS16992
Procurement Specification (F) ASME B18 2.1	SUPERSEDES	1	PAGE 1 OF 5

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(F) 5306 -1200

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(F)

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Table II Copper-Silicon Alloy

Length (L)	Nominal Diameter of Screw				
	1/4	3/8	1/2	5/8	3/4
	Dash No	Dash No	Dash No	Dash No	Dash No.
1	-634	----	----	----	----
1-1/2	-635	-641	-651	----	----
2	-636	-642	-652	----	----
2-1/2	-637	-643	-653	-663	-675
3	-638	-644	-654	-664	-676
3-1/2	-639	-645	-655	-665	-677
4	-640	-646	-656	-666	-678
4-1/2	----	-647	-657	-667	-679
5	----	-648	-658	-668	-680
6	----	-649	-659	-669	-681
7	----	-650	-660	-670	-682
8	----	----	-661	-671	-683
9	----	----	-662	-672	-684
10	----	----	----	-673	-685
11	----	----	----	-674	-686
12	----	----	----	----	-687

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TABLE III Corrosion-Resistant Steel (Non-Magnetic).

Length (L)	Nominal Diameter of Screw				
	1/4	3/8	1/2	5/8	3/4
	Dash No	Dash No	Dash No	Dash No	Dash No
1	-688	----	----	----	----
1-1/2	-689	-697	-708	----	----
2	-690	-698	-709	-720	----
2-1/2	-691	-699	-710	-721	-733
3	-692	-700	-711	-722	-734
3-1/2	-693	-701	-712	-723	-735
4	-694	-702	-713	-724	-736
4-1/2	-695	-703	-714	-725	-737
5	-696	-704	-715	-726	-738
6	----	-705	-716	-727	-739
7	----	-706	-717	-728	-740
8	----	-707	-718	-729	-741
9	----	----	-719	-730	-742
10	----	----	----	-731	-743
11	----	----	----	-732	-744
12	----	----	----	----	-745
14	----	----	----	----	-746

For changes see pages 1,2,3,4, and 5

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PAYD	Interchange (optional)	TITLE	MILITARY STANDARD
Other Cust. AK 99		(F) SCREW, LAG (BOLT), HEX HEAD, CIMLET POINT	MS 16992
Procurement Specifications		SUPERSEDES:	PAGE 2 OF 5
(F) ASME B18.2.1			

(F)

(F)

MATERIAL

- 1 Steel Commercial Shall conform to the physical and chemical requirements of grade A of ASTM A307 with a minimum Rockwell Hardness 69HRB and a minimum tensile strength of 60 Ksi
- 2 Copper-silicon Shall conform to the UNS No C65100 of ASTM B98 with temper and tensile strength as in table IV
- (F) 3 Corrosion-resisting steel Shall conform to type 302, 303, 304, 305, 310, or 316 and shall conform to the chemical and mechanical properties of ASTM A320

Table IV Temper and Tensile Strength

New Designation	Old Designation	Minimal Tensile Strength (Ksi)
O60	soft	40
H01	quarterhard	--
H02	half hard	55
H04	hard	65
H06	extra hard	--
H66	bolt temper (1/2 in and smaller)	85
H66	bolt temper (over 1/2 in)	75
		--

FINISHES

- 1 Commercial steel bolts shall be treated in accordance with one or more of the following procedures as specified
 - a Hot-dip galvanize conforming to class C of ASTM A153 and tested for embrittlement
 - b Electro-deposited zinc, for service condition SC3 conforming to ASTM B633 and tested for embrittlement
 - (F) c Mechanically-deposited zinc for class 13 or 25 of ASTM B695 and tested for embrittlement
 - d Manganese base phosphate coating of 0.0002 in min to 0.0004 in max thick
 - e Black oxide coated by treating with an alkaline oxidizing solution of sodium hydroxide (NaOH), sodium nitrate (NaNO3) and water, or other oxidizing solution of equal performance
- 2 Corrosion resistant steel bolts
 - a Shall be cleaned, descaled, and passivated in accordance with ASTM A380
 - b Magnetic permeability shall not exceed 20 when tested in accordance with method No 2 of ASTM A342

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 REVISED (F)
 APPROVED 3 January 1962

P A Y D Other Cust AR 90	International Interest	TITLE (F) SCREW LAG (BOLT), HEX HEAD, GIMLET POINT	MILITARY STANDARD MS16992
Procurement Specifications (F) ASMF B 1 B 2 1	SUPERSEDES	PAGE 3	OF 5

(F) TABLE V Dimensions of Lag Screw Threads

Nominal Size of Basic Product Dia	Threads Per Inch	P Pitch	E Flat at Root	T Depth of Thread	D1 Root Dia
1/4 0 2500	10	0 100	0 043	0 039	0 173
5/16 0 3125	9	0 111	0 048	0 043	0 227
3/8 0 3750	7	0 143	0 062	0 055	0 265
7/16 0 4375	7	0 143	0 062	0 055	0 238
1/2 0 5000	6	0 167	0 072	0 064	0 371
5/8 0 6250	5	0 200	0 086	0 077	0 471
3/4 0 7500	4-1/2	0 222	0 096	0 085	0 579

THREAD DATA

(F) 1 Threads may be rolled or cut Diameter of rolled thread shank is not dimensioned, but is indicated by D1(see detail of threads on page one) All rolled thread lag bolts shall be provided with shoulder length "S" of Table VI

(F) TABLE VI Dimensions and Tolerances

Nominal Size or Basic Dia	E Body or Shoulder		F Width Across Flats			G Width Across Corners			H Height		S Shoulder Length	R Radius of Fillet	
	Max	Min	Basic	Max	Min	Basic	Max	Min	Max	Min	Min	Max	Min
1/4 0 2500	0 260	0 237	7/16 0 438	0 425		11/64 0 505	0 484		0 188	0 150	0 094	0 03	0 01
5/16 0 3125	0 324	0 298	1/2 0 500	0 484		7/32 0 577	0 552		0 235	0 195	0 125	0 03	0 01
3/8 0 3750	0 388	0 360	9/16 0 562	0 544		1/4 0 650	0 620		0 268	0 226	0 125	0 03	0 01
7/16 0 4375	0 452	0 421	5/8 0 625	0 603		19/64 0 722	0 687		0 316	0 272	0 156	0 03	0 01
1/2 0 5000	0 515	0 482	3/4 0 750	0 725		11/32 0 866	0 826		0 364	0 302	0 156	0 03	0 01
5/8 0 6250	0 642	0 605	15/16 0 938	0 906		27/64 1 083	1 033		0 444	0 378	0 312	0 06	0 02
3/4 0 7500	0 768	0 729	1 1/8 1 125	1 088		1/2 1 299	1 240		0 524	0 455	0 375	0 06	0 02

(F) TABLE VII Length Tolerances

Screw (Bolt) Length	1/2 and Smaller	Over 1/2
Screw (Bolt) Length	Tolerance on Length	
Up to and including 6 in	+ or - 0 12	+ or - 0 25
Over 6 inches	+ or - 0 25	+ or - 0 25

PAYD Other Cust AR 99	International Interest	TITLE (F) SCREW, LAG (BOLT), HEX HEAD, GIMLET POINT	MILITARY STANDARD MS16992
Procurement Specification (F) ASME B18.2.1		SUPERSEDES	PAGE 4 OF 5

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REQUIREMENTS

- (F) 1 Bolts shall retain the original tensile strength after final finish when tested in accordance with ASTM A370
- 2 Unless otherwise specified, sample bolts shall be subjected to the salt spray test of ASTM B117 Unless other wise specified, duration of the test shall be 96 hours
- (F) 3 Packaging shall be in accordance with PPP-H-1581, Hardware (Fasteners and Related Items), Packaging of
- (F) 4 The top of the head shall be marked to identify the source accepting responsibility for the conformance of the screw to this standard Source marking shall be an identification symbol or CAGE (Commercial and Government Entity) code to enhance traceability Marks may be either raised or depressed
- (F) 5 Quality assurances provisions shall be in accordance with ASME B18 18 1M

NOTES

- 1 Referenced Government (or non-government) documents of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this standard to the extent specified herein
- 2 The MS part number consists of the MS number plus dash number from table I, II or III The MS part number shall be followed with a dash and capital alpha code to indicate the type of coating
 - a C (for hot dip zinc coating)
 - b ZE (for electroplate with zinc)
 - c ZM (for mechanical deposit of zinc)
 - d M (for manganese base phosphate)
 - e BOX (for black oxide coated)
- 3 Example of MS part number MS16992-501-ZE is screw, lag, 1-inch long 1/4 inch diameter, commercial steel, electro-deposited zinc
- (F) 4 All dimensions are in inches and in accordance with ASME B18 2.1
- (F) 5 For additional requirements, refer to the general data paragraphs and hex lag screw table of ASME B18 2 1

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Procurement Specification (F) ASME B18 2.1	SUPERSEDES		PAGE 5 OF 5