

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DOCS SPECIFIED IN THE SOLICITATION:

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

Form Approved
OMB No. 0704-0188

GENERAL INSTRUCTIONS

1. (E) **DESCRIPTION:** Helical coil inserts are screw thread bushings coiled from diamond shaped cross-section wire. They are screwed into tapped holes to form nominal size internal threads. Inserts are installed by torquing through a diametral tang which is notched for tang removal.
2. **MATERIAL:** As specified on the drawing.
3. **TYPING:** Assembled inserts, Classes 2B and 3B, are controlled by the tolerance range of the tapped hole into which insert is fitted. Due to the radius on the crest of the insert at the minor diameter, the assembled insert will accept external threaded parts which are threaded to MIL-S-8879. The grip coil or coils of the screw locking insert are shaped to provide a prevailing torque when the screw is installed in the assembled insert.
4. **TAPPED HOLE:** 60° Unified internal thread form with the minimum major diameter based on a truncation to 0.125p.
- 4.1 (E) **Designation for Tapped Hole:** The drawing note for the tapped hole, per Table IV, that will accept the helical coil insert shall be in accordance with the following example:

EXAMPLE

.3125-24 UNF-3B HELICAL COIL INSERT
TID PER MS33537
.67 MIN FULL TID DEPTH

For Blind Hole (Based on 2 Diameter Engagement) (Minor Diameter Drill Depth Tolerance approx. .060 or as otherwise appropriate)

.3125-24 UNF-3B HELICAL COIL INSERT
TID THRU PER MS33537
INSTALL INSERT .75-1.5 TURNS
BELOW SURFACE
REMOVE TANG

For Thru Hole with Insert being Assembled (Based on 2 Diameter Engagement)

5. **REDUCED FIRST COIL:** The first coil of the free insert adjacent to the tang has been reduced in diameter on the larger inserts to facilitate starting the insert into the tapped hole.
6. (E) **DIMENSIONAL DATA:**
 - 6.1 For free running and screw locking inserts having a nominal length of 1, 1.5, 2, 2.5, and 3 times the nominal major diameter of the screw thread, dimensional data for the following features have been calculated and are listed in Table IV:
 - Nominal length (L_n)
 - Length of assembled insert (L)
 - Tapped hole diameters (V , V_1 , V_2)
 - Depth of drilling and tapping (FP , FB , and U)
 - Countersink diameters (M)
 - Required bolt thread projection (J and K)

For all other nonstandard variations in nominal length, the above dimensions shall be calculated from the formulas given in Table III, using rounding procedures contained in ASTM E 380-84.
 - 6.2 See Table I for MS part numbers and nominal lengths of available inserts.
 - 6.3 **Insert length selection:** For applications where the tensile strength of the installed insert is a consideration, Table II will aid in applying the standard design practice of relating the tensile strength of the bolt material against the shear strength of the parent or boss material to develop the full load value of the bolt rather than stripping the parent or tapped material. In using this table, the following factors must be considered:
 - 6.3.1 Actual bolt tensile strength, particularly in the lower bolt tensile ranges, may be significantly higher than the nominal values. This should be considered in insert length selection.
 - 6.3.2 The parent material shear strengths are for room temperature. Elevated temperatures significantly reduce shear strength values; compensation should be made when required.
 - 6.3.3 When parent material shear strength falls between two tabulated values, use the lower of the two.
 7. (E) **DEPTH OF RECOMMENDED MINIMUM TAP DRILL HOLE:** The tabulated depth of blind hole for thread tapping allows sufficient depth for assembled insert top coil to be 1.5 pitches below boss surface. For insert sizes .3125 and smaller, drill depth FP provides for minimum full thread depth H , using a plug tap having 4 pitches tap chamfer, plus a length equal to 0.5 x nominal insert size to clear the tap external center (conical end), plus 1 pitch tap end clearance. For insert sizes larger than .3125, drill depth FP is for plug tap having 4 pitches tap chamfer, plus 1 pitch tap end clearance. Drill depth FB is for bottoming taps having 2 pitches tap chamfer, plus 1 pitch tap end clearance. If tap drill holes are not countersunk, the assembled insert top coil may be 0.5 pitch max below boss surface which allows for a 1 pitch reduction in tabulated depth of blind drilled hole dimensions.

(E) DENOTES CHANGES

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82 CUSTODIANS: ARMY-AV NAVY-AS AIR FORCE-89 OLA-		MILITARY SPECIFICATION SHEET TITLE INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR		SPECIFICATION SHEET NUMBER MS33537E 11 JUNE 1991 SUPERSEDING MS33537D 27 JUNE 74 ANSC- N/A FSC-8340	
REVIEW: USER: PROJECT NUMBER: 5340-1986		INTERNATIONAL INTEREST		DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.	
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9. (E) DEPTH OF FULL THREAD OF TAPPED HOLE: For thru or blind tapped holes with a countersink as specified in Table IV, the Minimum Full Thread, H (also minimum flange thickness for thru hole), equals nominal length of insert, L_H , as specified in the tabulation, plus 1 pitch. For thru or blind tapped holes without countersink, the minimum full thread (also minimum flange thickness for thru hole) shall not be less than the nominal length of insert, L_H .
9. (E) LENGTH OF BOLT THREAD PROJECTION:
 - 9.1 (E) Insert with tang removed: The maximum length of bolt thread projection, J, into the assembled insert in a blind hole is equal to the minimum design depth of the tap drill hole, FP or FB. The minimum length of bolt thread projection to provide full thread engagement and thus to ensure full development of potential joint tensile strength is J_{min} . It is equal to the maximum length, L, of the insert, plus 3 pitch (the maximum depth of the assembled insert top coil from boss surface, 1.5 pitch, plus bolt chamfer 1.5 pitch). Bolt projection, J_{min} , will also ensure full engagement with the grip coil or coils of a screw locking insert.
 - 9.2 Insert without tang removed: The maximum length of bolt thread projection, K, into the assembled insert when tang is not removed is the minimum length of insert plus 0.25 pitch.
10. (E) COUNTERSINK AND COUNTERBORE: The values given in Table IV for Depth of Hole, FP, FB; Minimum Full Thread, H; and Length of Bolt Projection, J and K, are measured from the top surface of the boss or piece and are based on installing the insert below the countersink as in 11.1. If a counterbore or countersink other than that shown is required or no countersink is used, the values for FP, FB, H, J, and K must be modified to compensate.
11. INSTALLATION OF INSERT:
 - 11.1 (E) With countersink hole: The top edge of the insert shall be installed 0.75p to 1.5p below top surface of the tapped hole.
 - 11.2 Without countersink hole: The top edge of the insert shall be installed 0.25p to 0.5p below top surface of tapped hole.
 - 11.3 Tang removal: The tang should be removed from the insert after installation.
12. (E) BLIND HOLE ASSEMBLY (WITHOUT REMOVAL OF TANG): When the insert tang is not removed, as may be the case with blind hole applications, an insert 0.5 diameter longer than the required nominal length will fulfill the necessary bolt-insert full thread engagement, provided that the bolt projection satisfies the original J_{min} and the longer insert K_{max} tabulated values.
13. GAGING PRACTICE: Accuracy of the finished thread, when the insert is installed, is dependent upon the accuracy of the tapped hole. If the finished tapped hole gages satisfactorily, the installed insert will be within the thread tolerance when the insert meets the MS drawing requirements. It is, therefore, not necessary to gage the installed insert. After the insert is installed, the OD thread plug gage may not enter freely because the insert may not have been fully seated in the tapped hole; however, the insert should become seated after a bolt or screw is installed and tightened.
14. (E) PERMITTED MODIFICATIONS: Values for FP, FB, H, J, K, M, and installation depth of insert may be modified to suit requirements for production tooling, design, assembly, etc. See Table III for formulas. Countersink included angle may be modified from $120^\circ \pm 5^\circ$ to $90^\circ \pm 5^\circ$ provided that for UNC sizes .190-24 and smaller and UNF sizes .4375-20 and smaller, the top edge of the insert shall be installed 1.0 to 1.5p below top surface of the tapped hole.

THIS STANDARD WAS DEVELOPED COOPERATIVELY WITH THE MILITARY SERVICES BY SAE COMMITTEE E-25.
GENERAL STANDARDS FOR AEROSPACE PROPULSION SYSTEMS.

INCH POUND

PREPARING ACTIVITY: AIR FORCE-82		MILITARY SPECIFICATION SHEET		SPECIFICATION SHEET NUMBER	
CUSTODIANS: ARMY- AV NAVY- AS		TITLE		MS33537E	
AIR FORCE- 99		INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR		SUPERSEDING MS33537D 27 JUNE 74	
REVIEW: USER:		INTERNATIONAL INTEREST		AMSC- N/A FSC- 5340	
PROJECT NUMBER: 5340-1088		DISTRIBUTION STATEMENT		Page 2 of 11	

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TABLE I (E)

MS PART NUMBERS				
INSERT NOMINAL LENGTH	FREE RUNNING INSERTS		SCREW LOCKING INSERTS	
	CRES AMS 7243		CRES MIL-I-8846	
	COARSE	FINE	COARSE	FINE
1 DIA	MS122076 thru MS122113	MS124651 thru MS124690	MS21209C0210 thru MS21209C2410	MS21209F0310 thru MS21209F2410
1.5 DIA	MS122116 thru MS122153	MS124691 thru MS124730	MS21209C0215 thru MS21209C2415	MS21209F0315 thru MS21209F2415
2 DIA	MS122156 thru MS122193	MS124731 thru MS124770	MS21209C0220 thru MS21209C2420	MS21209F0320 thru MS21209F2420
2.5 DIA	MS122196 thru MS122233	MS124771 thru MS124810	MS21209C0225 thru MS21209C2425	MS21209F0325 thru MS21209F2425
3 DIA	MS122236 thru MS122275	MS124811 thru MS124850	MS21209C0230 thru MS21209C2430	MS21209F0330 thru MS21209F2430
MS21209 offers Cadmium Plating and Dry Film Lubricant Coating options.				

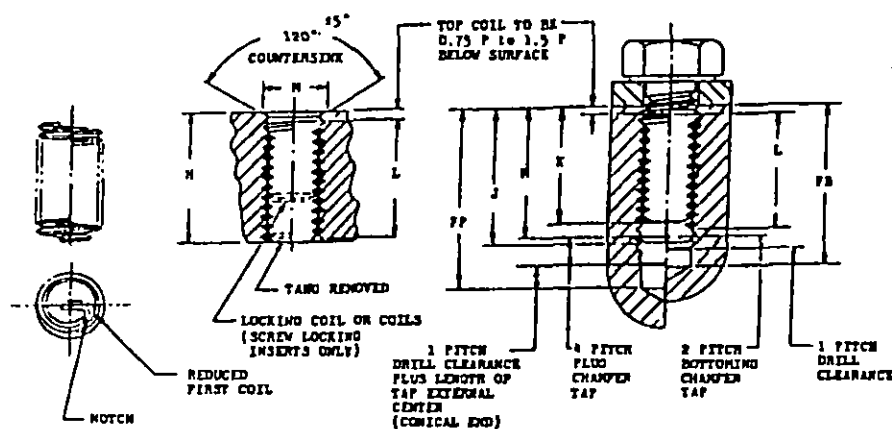


FIGURE 1

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82

CUSTODIANS: ARMY- AV

NAVY- AS

AIR FORCE- 99

DLA-

REVIEW:

USER:

PROJECT NUMBER: 6340-1886

DISTRIBUTION STATEMENT

INTERNATIONAL
INTEREST

MILITARY SPECIFICATION SHEET

TITLE

INSERT, SCREW THREAD, HELICAL COIL,
INCH SERIES, COARSE AND FINE THREAD,
STANDARD ASSEMBLY DIMENSIONS FOR

SPECIFICATION SHEET NUMBER

MS33537E

SUPERSEDED

MS33537D

27 JUNE 74

AMSC-

N/A

FSC- 5340

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TABLE II
LENGTHS OF THREAD ENGAGEMENT
IN TERMS OF NOMINAL THREAD SIZE

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OMB No. 0704-0168

Shear Strength of Material (psi) (Alum., Mag., Steel)	Bolt Material Minimum Ultimate Tensile Strength (psi)								
	34,000	75,000	96,000	108,000	125,000	132,000	160,000	180,000	220,000
10,000	2	2-1/2	3	3	-	-	-	-	-
15,000	1-1/2	1-1/2	2	2-1/2	2-1/2	3	3	-	-
20,000	1	1-1/2	1-1/2	2	2	2	2-1/2	3	3
25,000	1	1	1-1/2	1-1/2	1-1/2	2	2	2-1/2	2-1/2
30,000	1	1	1	1-1/2	1-1/2	1-1/2	2	2	2-1/2
40,000	1	1	1	1	1	1-1/2	1-1/2	1-1/2	2
50,000	1	1	1	1	1	1	1	1-1/2	1-1/2

TABLE III (E)

INFORMATION REQUIRED (SEE FIGURE 1)	FORMULA
Length of Assembled Insert (L) Free Running and Screw Locking	$L_{min} = L_n - 0.75P$ $L_{max} = L_n - 0.5P$
Depth of Recommended Minimum Tap Drill (FP or FB) for Blind Holes (Paragraph 7.)	1. For Plug Taps .3125 Nominal Diameter and smaller: $FP = L_n + 6P + 0.5 D_n$ 2. For Plug Taps larger than .3125: $FP = L_n + 6P$ 3. For Bottoming Taps $FB = L_n + 4P$
Depth of Full Thread of Blind Tapped Hole also Min. Flange Thickness for Thru Tapped Hole (H) (Paragraph 8.)	$H_{min} = L_n + 1P$
Countersink or Counterbore (M) (Paragraph 10.)	$M_{min} = V_{2max} \text{ Class } 3B + D_{max} - D_{min}$ $M_{max} = M_{min} + .030$
Length of Bolt Thread Projection into Assembled Insert (J or K) (Paragraph 9.)	1. <u>Insert - Tang Removed</u> $J_{max} = FP_{min}$ (blind hole depth for plug tap) $J_{max} = FB_{min}$ (blind hole depth for bottoming tap) $J_{min} = L_{max} + 3P$ or $J_{min} = L_n + 2.5P$ 2. <u>Insert - Tang Not Removed</u> $K_{max} = L_{min} + 0.25P$

WHERE:-

L_n = Nominal Length of Insert (Table IV)

D = Wire Pitch Line from MS21209

P = Pitch = 1/Threads Per Inch

D_n = Nominal Insert Size (Diameter)

B = Wire Height from MS21209

V_2 = Tapped Hole Pitch Diameter (Table IV)

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82		MILITARY SPECIFICATION SHEET		SPECIFICATION SHEET NUMBER	
CUSTODIANS: ARMY- AV NAVY- AS		TITLE		MS33537E	
AIR FORCE-99 DLA-		INSERT, SCREW THREAD, HELICAL COIL,		SUPERSEDING	
REVIEW: USER:		INCH SERIES, COARSE AND FINE THREAD,		MS33537D 27 JUNE 74	
PROJECT NUMBER: 6340-1986		STANDARD ASSEMBLY DIMENSIONS FOR		AMSC- N/A FSC- 5340	
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TABLE IV (E)

Nominal Insert Size		.073		.086		.099		.112		.125	
Threads Per Inch		64		56		48		40		40	
L _n	Insert Nominal Length, 1 Dia	.073	.086	.086	.099	.099	.112	.112	.125	.125	.125
	" " 1.5 Dia	.110	.129	.129	.148	.148	.168	.168	.188	.188	.188
	" " 2 Dia	.146	.172	.172	.198	.198	.224	.224	.250	.250	.250
	" " 2.5 Dia	.182	.215	.215	.248	.248	.280	.280	.312	.312	.312
	" " 3 Dia	.219	.258	.258	.297	.297	.336	.336	.375	.375	.375
ASSEMBLED INSERT	L	Min Length of Insert when		.061		.073		.086		.093	
		Nominal Length = 1 Dia		.098		.116		.135		.152	
		" " = 1.5 Dia		.134		.159		.185		.208	
		" " = 2 Dia		.170		.202		.234		.261	
		" " = 2.5 Dia		.207		.246		.284		.320	
		" " = 3 Dia									
	D ₂	PD, Max, Class 2B		.0655		.0772		.0885		.0991	
		PD, Max, Class 3B		.0648		.0765		.0877		.0982	
		PD, Min, Classes 2B & 3B		.0629		.0744		.0853		.0958	
	D ₁	Minor Dia, Max, Class 2B		.0623		.0737		.0845		.0939	
		Minor Dia, Max, Class 3B		.0623		.0737		.0845		.0939	
		Minor Dia, Min, Classes 2B & 3B		.0561		.0667		.0764		.0849	
TAPPED HOLE	FP	Depth of Blind Hole for Plug Taps,		.203		.236		.273		.318	
		Min when Nominal Length = 1 Dia		.240		.279		.323		.374	
		" " = 1.5 Dia		.276		.322		.372		.430	
		" " = 2 Dia		.313		.365		.422		.486	
		" " = 2.5 Dia		.349		.408		.471		.542	
	FB	Depth of Blind Hole for Bottoming		.136		.157		.182		.212	
		Taps, Min when Nominal Length = 1 Dia		.172		.200		.232		.268	
		" " = 1.5 Dia		.209		.243		.281		.324	
		" " = 2 Dia		.245		.286		.331		.380	
		" " = 2.5 Dia		.282		.329		.380		.436	
	B	Min. Full Thread when		.090		.100		.120		.140	
		Nominal Length = 1 Dia		.125		.150		.170		.190	
		" " = 1.5 Dia		.160		.190		.220		.250	
		" " = 2 Dia		.200		.230		.270		.310	
		" " = 2.5 Dia		.235		.280		.320		.360	
	V ₂	PD, Max, Class 2B		.0850		.0996		.1148		.1308	
		PD, Max, Class 3B		.0843		.0989		.1140		.1299	
		PD, Min, Classes 2B & 3B		.0832		.0976		.1126		.1283	
	V ₁	Minor Dia, Max, Class 2B		.0823		.0961		.1104		.1252	
		Minor Dia, Max, Class 3B		.0823		.0961		.1104		.1252	
		Minor Dia, Min, Class 2B & 3B		.0764		.0899		.1036		.1175	
	V	Major Dia, Max, Class 2B		.0974		.1138		.1313		.1506	
		Major Dia, Max, Class 3B		.0967		.1131		.1305		.1497	
		Major Dia, Min, Classes 2B & 3B		.0933		.1092		.1261		.1445	
	H	Countersink, 120° Included Angle		.100		.110		.140		.170	
		Maximum		.095		.090		.110		.140	
THREAD PROJECTION	J	Min. Tang Removed, when Insert		.112		.131		.151		.174	
		Nominal Length = 1 Dia		.149		.174		.200		.230	
		" " = 1.5 Dia		.185		.217		.250		.286	
		" " = 2 Dia		.221		.260		.300		.342	
		" " = 2.5 Dia		.258		.303		.349		.398	
	K	Max. Tang Not Removed, when Insert		.065		.077		.090		.100	
		Nominal Length = 1 Dia		.102		.120		.138		.156	
		" " = 1.5 Dia		.138		.163		.187		.212	
		" " = 2 Dia		.174		.206		.238		.268	
		" " = 2.5 Dia		.211		.249		.285		.324	

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82

CUSTOMERS: ARMY-AV

NAVY-AS

AIR FORCE-99

DLA-

REVIEW:

USER:

PROJECT NUMBER 5340-1088

DISTRIBUTION STATEMENT

MILITARY SPECIFICATION SHEET

TITLE

INSERT, SCREW THREAD, HELICAL COIL,
INCH SERIES, COARSE AND FINE THREAD,
STANDARD ASSEMBLY DIMENSIONS FOR

SPECIFICATION SHEET NUMBER

MS33537E

SUPERSEDING

MS33537D 27 JUNE 74

AMSC-

N/A

FSC-5340

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TABLE IV (continued)

Nominal Insert Size		.138		.164		.190		.216
Threads Per Inch		32	40	32	36	24	32	24
F	Insert Nominal Length, 1 Dia	.138	.138	.164	.164	.190	.190	.216
	" " 1.5 Dia	.207	.207	.246	.246	.285	.285	.324
	" " 2 Dia	.276	.276	.328	.328	.380	.380	.432
	" " 2.5 Dia	.345	.345	.410	.410	.475	.475	.540
	" " 3 Dia	.414	.414	.492	.492	.570	.570	.648
ASSEMBLED INSERT	L	Min Length of Insert when Nominal Length = 1 Dia	.115	.119	.141	.143	.159	.167
		" " = 1.5 Dia	.104	.108	.123	.125	.154	.162
		" " = 2 Dia	.253	.257	.305	.307	.349	.357
		" " = 2.5 Dia	.322	.326	.387	.389	.444	.452
		" " = 3 Dia	.391	.395	.469	.471	.539	.547
	D ₂	PD, Max, Class 2B	.1214	.1232	.1475	.1496	.1672	.1736
		PD, Max, Class 3B	.1204	.1243	.1465	.1487	.1661	.1726
		PD, Min, Classes 2B & 3B	.1177	.1218	.1437	.1460	.1629	.1697
	D ₁	Minor Dia, Max, Class 2B	.114	.119	.139	.142	.156	.164
		Minor Dia, Max, Class 3B	.1140	.1186	.1389	.1416	.1555	.1641
		Minor Dia, Min, Classes 2B & 3B	.1040	.1110	.1300	.1340	.1450	.1560
TAPPED HOLE	FP	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia	.394	.357	.434	.413	.535	.472
		" " = 1.5 Dia	.464	.426	.516	.495	.630	.568
		" " = 2 Dia	.532	.495	.598	.577	.725	.662
		" " = 2.5 Dia	.602	.564	.680	.659	.820	.758
		" " = 3 Dia	.670	.633	.762	.741	.915	.852
	FB	Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia	.263	.238	.289	.275	.357	.315
		" " = 1.5 Dia	.332	.307	.371	.357	.452	.410
		" " = 2 Dia	.401	.376	.453	.439	.547	.505
		" " = 2.5 Dia	.470	.445	.535	.521	.642	.600
		" " = 3 Dia	.539	.514	.617	.603	.737	.695
	H	Min. Full Thread when Nominal Length = 1 Dia	.170	.160	.200	.190	.230	.220
		" " = 1.5 Dia	.240	.230	.280	.270	.330	.320
		" " = 2 Dia	.310	.300	.360	.360	.420	.410
		" " = 2.5 Dia	.380	.370	.440	.440	.520	.510
		" " = 3 Dia	.450	.440	.520	.520	.610	.600
	V ₂	PD, Max, Class 2B	.1611	.1569	.1872	.1849	.2203	.2133
		PD, Max, Class 3B	.1601	.1560	.1862	.1840	.2192	.2123
		PD, Min, Classes 2B & 3B	.1583	.1543	.1843	.1821	.2170	.2103
	V ₁	Minor Dia, Max, Class 2B	.1527	.1503	.1781	.1771	.2087	.2041
		Minor Dia, Max, Class 3B	.1527	.1503	.1781	.1771	.2080	.2041
		Minor Dia, Min, Classes 2B & 3B	.1448	.1435	.1708	.1701	.1990	.1968
	V	Major Dia, Max, Class 2B	.1859	.1767	.2120	.2069	.2534	.2381
		Major Dia, Max, Class 3B	.1849	.1758	.2110	.2060	.2523	.2371
		Major Dia, Min, Classes 2B & 3B	.1786	.1705	.2046	.2001	.2441	.2306
	M	Countersink, 120° Included Angle	.210	.200	.230	.230	.270	.260
		Maximum	.180	.170	.200	.200	.240	.230
		Minimum						
THREAD PROJECTION	J	Min. Tang Removed, when Insert Nominal Length = 1 Dia	.216	.200	.242	.233	.294	.268
		" " = 1.5 Dia	.285	.270	.324	.315	.389	.363
		" " = 2 Dia	.354	.338	.406	.397	.484	.458
		" " = 2.5 Dia	.423	.408	.488	.479	.579	.553
		" " = 3 Dia	.492	.476	.570	.561	.674	.648
	K	Max. Tang Not Removed, when Insert Nominal Length = 1 Dia	.122	.126	.149	.150	.169	.175
		" " = 1.5 Dia	.191	.194	.231	.232	.264	.270
		" " = 2 Dia	.260	.264	.313	.314	.359	.365
		" " = 2.5 Dia	.329	.332	.395	.396	.454	.460
		" " = 3 Dia	.398	.402	.477	.478	.549	.555

[INCH-POUND]

PREPARING ACTIVITY: AIR FORCE-82

CUSTODIANS: ARMY-AV NAVY-A9

AIR FORCE-99 DLA-

REVIEW:

USER:

PROJECT NUMBER: 5340-1886

DISTRIBUTION STATEMENT

INTERNATIONAL
INTEREST

MILITARY SPECIFICATION SHEET

TITLE
INSERT, SCREW THREAD, HELICAL COIL,
INCH SERIES, COARSE AND FINE THREAD,
STANDARD ASSEMBLY DIMENSIONS FOR

SPECIFICATION SHEET NUMBER

MS33537E

SUPERSEDING

MS33537D 27 JUNE 74

AMSC- N/A

FSC- 5340

A Approved for public release; distribution is unlimited

Page 6 of 11

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DOCS SPECIFIED IN THE SOLICITATION

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

TABLE IV (continued)

Nominal Insert Size		.250		.3125		.375		.4375	
Threads Per Inch		20	28	18	24	16	24	14	20
Ln	Insert Nominal Length, 1 Dia	.250	.250	.312	.312	.375	.375	.438	.438
	" " 1.5 Dia	.375	.375	.469	.469	.562	.562	.656	.656
	" " 2 Dia	.500	.500	.625	.625	.750	.750	.875	.875
	" " 2.5 Dia	.625	.625	.781	.781	.938	.938	1.094	1.094
	" " 3 Dia	.750	.750	.938	.938	1.125	1.125	1.312	1.312
ASSEMBLED INSERT	L	Min Length of Insert when Nominal Length = 1 Dia		.212	.223	.271	.281	.328	.344
		" " = 1.5 Dia		.338	.348	.427	.438	.516	.531
		" " = 2 Dia		.462	.473	.583	.594	.703	.719
		" " = 2.5 Dia		.588	.598	.740	.750	.891	.906
		" " = 3 Dia		.712	.723	.896	.906	1.078	1.094
	D ₂	PD, Max, Class 2B		.2224	.2311	.2817	.2902	.3401	.3528
		PD, Max, Class 3B		.2211	.2300	.2803	.2890	.3387	.3516
		PD, Min, Classes 2B & 3B		.2175	.2268	.2764	.2854	.3344	.3479
	D ₁	Minor Dia, Max, Class 2B		.207	.220	.265	.277	.321	.340
		Minor Dia, Max, Class 3B		.2067	.2190	.2630	.2754	.3182	.3372
		Minor Dia, Min, Classes 2B & 3B		.1960	.2110	.2520	.2670	.3070	.3300
TAPPED HOLE	FP	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia		.675	.589	.801	.718	.750	.625
		" " = 1.5 Dia		.800	.714	.957	.874	.938	.812
		" " = 2 Dia		.925	.839	1.113	1.030	1.125	1.000
		" " = 2.5 Dia		1.050	.964	1.269	1.186	1.312	1.188
		" " = 3 Dia		1.175	1.089	1.425	1.342	1.500	1.375
	FB	Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia		.450	.393	.534	.479	.625	.542
		" " = 1.5 Dia		.575	.518	.690	.635	.812	.729
		" " = 2 Dia		.700	.643	.846	.791	1.000	.917
		" " = 2.5 Dia		.825	.768	1.002	.947	1.188	1.104
		" " = 3 Dia		.950	.893	1.158	1.103	1.375	1.292
	R	Min. Full Thread when Nominal Length = 1 Dia		.300	.290	.370	.350	.440	.420
		" " = 1.5 Dia		.430	.410	.530	.510	.630	.600
		" " = 2 Dia		.550	.540	.680	.670	.810	.790
		" " = 2.5 Dia		.680	.660	.840	.820	1.000	.980
		" " = 3 Dia		.800	.790	.990	.980	1.190	1.170
	V ₂	PD, Max, Class 2B		.2864	.2765	.3529	.3433	.4203	.4059
		PD, Max, Class 3B		.2851	.2754	.3515	.3421	.4189	.4047
		PD, Min, Classes 2B & 3B		.2825	.2732	.3486	.3393	.4156	.4020
	V ₁	Minor Dia, Max, Class 2B		.2723	.2661	.3372	.3312	.4026	.3937
		Minor Dia, Max, Class 3B		.2704	.2646	.3342	.3288	.3987	.3910
		Minor Dia, Min, Classes 2B & 3B		.2609	.2577	.3245	.3215	.3885	.3840
	V	Major Dia, Max, Class 2B		.3261	.3049	.3970	.3764	.4699	.4390
		Major Dia, Max, Class 3B		.3248	.3039	.3956	.3752	.4685	.4378
		Major Dia, Min, Classes 2B & 3B		.3150	.2964	.3847	.3666	.4562	.4291
	M	Countersink, 120° Included Angle							
		Maximum Minimum		.340 .310	.320 .290	.410 .380	.390 .360	.480 .450	.450 .420
THREAD PROJECTION	J	Min. Tang Removed, when Insert Nominal Length = 1 Dia		.375	.339	.431	.416	.531	.479
		" " = 1.5 Dia		.500	.464	.608	.573	.718	.666
		" " = 2 Dia		.625	.589	.764	.729	.906	.854
		" " = 2.5 Dia		.750	.714	.920	.885	1.094	1.042
		" " = 3 Dia		.875	.839	1.077	1.042	1.281	1.229
	K	Max. Tang Not Removed, when Insert Nominal Length = 1 Dia		.225	.232	.285	.291	.344	.354
		" " = 1.5 Dia		.351	.357	.441	.448	.532	.541
		" " = 2 Dia		.475	.482	.597	.604	.719	.729
		" " = 2.5 Dia		.601	.607	.754	.760	.907	.916
		" " = 3 Dia		.725	.732	.910	.916	1.094	1.104

[INCH-POUND]

PREPARING ACTIVITY: AIR FORCE-82

CUSTODIANS: ARMY-AV

NAVY-AS

AIR FORCE-99

DLA-

REVIEW:

USER:

PROJECT NUMBER: 5340-1986

INTERNATIONAL
INTEREST

MILITARY SPECIFICATION SHEET

TITLE

INSERT, SCREW THREAD, HELICAL COIL,
INCH SERIES, COARSE AND FINE THREAD,
STANDARD ASSEMBLY DIMENSIONS FOR

SPECIFICATION SHEET NUMBER

MS33537E

SUPERSEDING

MS33537D 27 JUNE 74

AMSC- N/A

FSC- 8340

DISTRIBUTION STATEMENT

A. Approved for public release; distribution is unlimited.

Page 7 of 11

THE REQUIREMENTS FOR ASSEMBLING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DOCS SPECIFIED IN THE SOLICITATION.

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.

Form Approved
OMB No. 0704-0188

TABLE IV (continued)

Nominal Insert Size		.500		.5625		.625		.750	
Threads Per Inch		13	20	12	18	11	18	10	16
L _n	Insert Nominal Length, 1 Dia	.500	.500	.562	.562	.625	.625	.750	.750
	" " 1.5 Dia	.750	.750	.844	.844	.938	.938	1.125	1.125
	" " 2 Dia	1.000	1.000	1.125	1.125	1.250	1.250	1.500	1.500
	" " 2.5 Dia	1.250	1.250	1.406	1.406	1.562	1.562	1.875	1.875
	" " 3 Dia	1.500	1.500	1.688	1.688	1.875	1.875	2.250	2.250
ASSEMBLED INSERT	L	Min Length of Insert when Nominal Length = 1 Dia	.442	.462	.500	.521	.557	.583	.675
		" " " 1.5 Dia	.692	.712	.781	.802	.869	.896	1.078
		" " " 2 Dia	.942	.962	1.062	1.083	1.182	1.208	1.453
		" " " 2.5 Dia	1.192	1.212	1.344	1.365	1.494	1.521	1.828
		" " " 3 Dia	1.442	1.462	1.625	1.646	1.807	1.833	2.203
	D ₂	PD, Max, Class 2B	.4565	.4731	.5152	.5323	.5732	.5949	.6927
		PD, Max, Class 3B	.4548	.4717	.5135	.5308	.5714	.5934	.6907
	D ₁	PD, Min, Classes 2B & 3B	.4500	.4675	.5084	.5264	.5660	.5889	.6850
		Minor Dia, Max, Class 2B	.434	.457	.490	.515	.546	.578	.663
		Minor Dia, Max, Class 3B	.4284	.4537	.4843	.5106	.5391	.5730	.6545
		Minor Dia, Min, Classes 2B & 3B	.4170	.4460	.4720	.5020	.5270	.5650	.6420
TAPPED HOLE	FP	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia	.962	.800	1.062	.895	1.170	.958	1.350
		" " " 1.5 Dia	1.212	1.050	1.343	1.176	1.483	1.271	1.725
		" " " 2 Dia	1.462	1.300	1.624	1.457	1.795	1.583	2.100
		" " " 2.5 Dia	1.712	1.550	1.905	1.738	2.108	1.896	2.475
		" " " 3 Dia	1.962	1.800	2.186	2.019	2.420	2.208	2.850
	FB	Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia	.800	.700	.895	.784	.989	.847	1.150
		" " " 1.5 Dia	1.058	.950	1.176	1.065	1.301	1.160	1.525
		" " " 2 Dia	1.308	1.200	1.457	1.346	1.614	1.472	1.900
		" " " 2.5 Dia	1.558	1.450	1.738	1.627	1.926	1.785	2.275
		" " " 3 Dia	1.808	1.700	2.019	1.908	2.239	2.097	2.650
	H	Min Full Thread when Nominal Length = 1 Dia	.580	.550	.650	.620	.720	.680	.850
		" " " 1.5 Dia	.830	.800	.930	.900	1.030	.990	1.230
		" " " 2 Dia	1.080	1.050	1.210	1.180	1.340	1.310	1.600
		" " " 2.5 Dia	1.330	1.300	1.490	1.460	1.650	1.620	1.980
		" " " 3 Dia	1.580	1.550	1.770	1.740	1.970	1.930	2.350
	V ₂	PD, Max, Class 2B	.5554	.5371	.6225	.6035	.6903	.6661	.8216
		PD, Max, Class 3B	.5537	.5357	.6208	.6020	.6885	.6646	.8196
		PD, Min, Classes 2B & 3B	.5499	.5325	.6167	.5986	.6841	.6611	.8149
	V ₁	Minor Dia, Max, Class 2B	.5335	.5223	.5986	.5872	.6641	.6497	.7926
		Minor Dia, Max, Class 3B	.5273	.5186	.5918	.5826	.6564	.6451	.7838
		Minor Dia, Min, Classes 2B & 3B	.5166	.5108	.5806	.5745	.6447	.6370	.7716
	V	Major Dia, Max, Class 2B	.6165	.5768	.6887	.6476	.7625	.7102	.9010
		Major Dia, Max, Class 3B	.6148	.5754	.6870	.6461	.7607	.7087	.8990
		Major Dia, Min, Classes 2B & 3B	.5999	.5650	.6708	.6347	.7431	.6972	.8799
	H	Countersink, 120° Included Angle Maximum	.620	.590	.690	.660	.760	.720	.900
		Minimum	.590	.560	.660	.630	.730	.690	.870
THREAD PROJECTION	J	Min. Tang Removed, when Insert Nominal Length = 1 Dia	.692	.625	.770	.701	.852	.764	1.000
		" " " 1.5 Dia	.942	.875	1.052	.983	1.165	1.077	1.375
		" " " 2 Dia	1.192	1.125	1.333	1.264	1.477	1.389	1.750
		" " " 2.5 Dia	1.442	1.375	1.614	1.545	1.789	1.701	2.125
		" " " 3 Dia	1.692	1.625	1.896	1.827	2.102	2.014	2.500
	K	Max. Tang Not Removed, when Insert Nominal Length = 1 Dia	.461	.475	.521	.535	.580	.597	.700
		" " " 1.5 Dia	.711	.725	.802	.816	.892	.910	1.075
		" " " 2 Dia	.961	.975	1.083	1.097	1.205	1.222	1.450
		" " " 2.5 Dia	1.211	1.225	1.365	1.379	1.517	1.535	1.825
		" " " 3 Dia	1.461	1.475	1.646	1.660	1.830	1.847	2.200

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82

CUSTODIANS: ARMY-- AV NAVY-- AS

AIR FORCE-- 89

DLA--

REVIEW:

USER:

PROJECT NUMBER: 6340-1988

DISTRIBUTION STATEMENT

MILITARY SPECIFICATION SHEET

TITLE
INSERT, SCREW THREAD, HELICAL COIL,
INCH SERIES, COARSE AND FINE THREAD,
STANDARD ASSEMBLY DIMENSIONS FOR

SPECIFICATION SHEET NUMBER

MS33537E

SUPERSEDING

MS33537D 27 JUNE 74

AMSC-- N/A

FSC- 6340

A. Approved for public release; distribution is unlimited.

Page 8 of 11

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE BOOKS SPECIFIED IN THE SOLICITATION:

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE BOOKS SPECIFIED IN THE SOLICITATION.

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Form Approved
OMB No. 0704-0188

TABLE IV (continued)

Nominal Insert Size		.8125	.875	1.000			1.0625			
Threads Per Inch		16	9	14	8	12	(a) 14	12		
In	Insert Nominal Length, 1 Dia	.812	.875	.875	1.000	1.000	1.000	1.062		
	" " 1.5 Dia	1.219	1.312	1.312	1.500	1.500	1.500	1.594		
	" " 2 Dia	1.625	1.750	1.750	2.000	2.000	2.000	2.125		
	" " 2.5 Dia	2.031	2.188	2.188	2.500	2.500	2.500	2.656		
	" " 3 Dia	2.438	2.625	2.625	3.000	3.000	3.000	3.188		
ASSEMBLED INSERT	L	Min Length of Insert when Nominal Length = 1 Dia	.766	.792	.821	.906	.938	.946	1.000	
		" " = 1.5 Dia	1.172	1.229	1.259	1.406	1.438	1.446	1.531	
		" " = 2 Dia	1.578	1.667	1.696	1.906	1.938	1.946	2.062	
		" " = 2.5 Dia	1.984	2.104	2.134	2.406	2.438	2.446	2.594	
		" " = 3 Dia	2.391	2.542	2.571	2.906	2.938	2.946	3.125	
	D ₂	FD, Max, Class 2B	.7782	.8110	.8356	.9276	.9535	.9609	1.0138	
		FD, Max, Class 3B	.7766	.8089	.8339	.9254	.9516	.9590	1.0139	
		FD, Min, Classes 2B & 3B	.7719	.8028	.8286	.9188	.9439	.9536	1.0084	
	D ₁	Minor Dia, Max, Class 2B	.759	.778	.814	.890	.928	.939	.990	
		Minor Dia, Max, Class 3B	.7533	.7681	.8068	.8797	.9198	.9315	.9823	
		Minor Dia, Min, Classes 2B & 3B	.7450	.7550	.7980	.8650	.9100	.9227	.9720	
	TAPPED HOLE	FP	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia	1.188	1.542	1.304	1.750	1.500	1.429	1.562
			" " = 1.5 dia.	1.594	1.979	1.741	2.250	2.000	1.929	2.094
			" " = 2 Dia	2.000	2.417	2.179	2.750	2.500	2.429	2.625
			" " = 2.5 Dia	2.406	2.854	2.616	3.250	3.000	2.929	3.156
			" " = 3 Dia	2.813	3.292	3.054	3.750	3.500	3.429	3.688
		FB	Depth of Blind Hole for Bottoming Taps Min when Nominal Length = 1 Dia	1.063	1.319	1.161	1.500	1.333	1.286	1.396
			" " = 1.5 Dia	1.469	1.757	1.598	2.000	1.833	1.786	1.927
" " = 2 Dia			1.875	2.194	2.036	2.500	2.333	2.286	2.438	
" " = 2.5 Dia			2.281	2.632	2.473	3.000	2.833	2.786	2.990	
" " = 3 Dia			2.688	3.069	2.911	3.500	3.333	3.286	3.521	
H		Min Full Thread when Nominal Length = 1 Dia	.880	.990	.950	1.130	1.080	1.070	1.150	
		" " = 1.5 Dia	1.280	1.420	1.380	1.630	1.580	1.570	1.680	
		" " = 2 Dia	1.690	1.860	1.820	2.130	2.080	2.070	2.210	
		" " = 2.5 Dia	2.090	2.300	2.260	2.630	2.580	2.570	2.740	
		" " = 3 Dia	2.500	2.740	2.700	3.130	3.080	3.070	3.270	
V ₂		FD, Max, Class 2B	.8584	.9543	.9274	1.0890	1.0608	1.0527	1.1231	
		FD, Max, Class 3B	.8568	.9522	.9257	1.0868	1.0589	1.0508	1.1212	
		FD, Min, Classes 2B & 3B	.8531	.9471	.9214	1.0812	1.0542	1.0464	1.1167	
V ₁		Minor Dia, Max, Class 2B	.8401	.9218	.9063	1.0521	1.0361	1.0313	1.0986	
		Minor Dia, Max, Class 3B	.8345	.9119	.8994	1.0421	1.0281	1.0243	1.0906	
	Minor Dia, Min, Classes 2B & 3B	.8260	.8990	.8905	1.0271	1.0181	1.0155	1.0806		
V	Major Dia, Max, Class 2B	.9080	1.0425	.9841	1.1882	1.1270	1.1094	1.1893		
	Major Dia, Max, Class 3B	.9064	1.0404	.9824	1.1860	1.1251	1.1075	1.1874		
	Major Dia, Min, Classes 2B & 3B	.8937	1.0193	.9678	1.1624	1.1083	1.0928	1.1708		
H	Countersink, 120° Included Angle									
	Maximum	.915	1.030	.990	1.170	1.130	1.110	1.190		
	Minimum	.885	1.000	.960	1.140	1.100	1.080	1.160		
THREAD PROJECTION	J	Min, Tang Removed, when Insert Nominal Length = 1 Dia	.968	1.153	1.054	1.312	1.208	1.179	1.270	
		" " = 1.5 Dia	1.375	1.590	1.491	1.812	1.708	1.679	1.802	
		" " = 2 Dia	1.781	2.028	1.929	2.312	2.208	2.179	2.333	
		" " = 2.5 Dia	2.197	2.466	2.367	2.812	2.708	2.679	2.864	
		" " = 3 Dia	2.594	2.903	2.804	3.312	3.208	3.179	3.396	
	K	Max, Tang Not Removed, when Insert Nominal Length = 1 Dia	.782	.820	.840	.937	.958	.964	1.021	
		" " = 1.5 Dia	1.189	1.257	1.277	1.437	1.458	1.464	1.552	
		" " = 2 Dia	1.594	1.695	1.714	1.937	1.958	1.964	2.083	
		" " = 2.5 Dia	2.000	2.132	2.152	2.437	2.458	2.464	2.615	
		" " = 3 Dia	2.407	2.570	2.589	2.937	2.958	2.964	3.146	

(a) INACTIVE FOR NEW DESIGN AFTER 3 MARCH 1969.
NO SUPERSEDING STANDARD.

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82	MILITARY SPECIFICATION SHEET	SPECIFICATION SHEET NUMBER
CUSTODIANS: ARMY-AV NAVY-AS	TITLE	MS33537E
AIR FORCE-88 DLA-	INSERT, SCREW THREAD, HELICAL COIL,	SUPERSEDING
REVIEW: USER:	INCH SERIES, COARSE AND FINE THREAD,	MS33537D 27 JUNE 74
PROJECT NUMBER 5340-1986	STANDARD ASSEMBLY DIMENSIONS FOR	AMSC- N/A FSC-5340
DISTRIBUTION STATEMENT	A. Approved for public release; distribution is unlimited.	Page 8 of 11

Form Approved
OMB No. 0794-0188

TABLE IV (continued)

Nominal Insert Size		1.125		1.1875	1.250		1.3125	1.375	
Threads Per Inch		7	12	12	7	12	12	6	12
L ₁	Insert Nominal Length, 1 Dia	1.125	1.125	1.188	1.250	1.250	1.312	1.375	1.375
	" " 1.5 Dia	1.683	1.688	1.781	1.875	1.875	1.969	2.062	2.062
	" " 2 Dia	2.250	2.250	2.375	2.500	2.500	2.625	2.750	2.750
	" " 2.5 Dia	2.812	2.812	2.969	3.125	3.125	3.281	3.438	3.438
	" " 3 Dia	3.375	3.375	3.562	3.750	3.750	3.938	4.125	4.125
ASSEMBLED INSERT	L	Min Length of Insert when Nominal Length = 1 Dia		1.018	1.062	1.125	1.143	1.188	1.250
		" " = 1.5 Dia		1.580	1.625	1.719	1.768	1.812	1.906
		" " = 2 Dia		2.143	2.188	2.312	2.393	2.438	2.562
		" " = 2.5 Dia		2.705	2.750	2.906	3.018	3.062	3.219
		" " = 3 Dia		3.268	3.312	3.500	3.643	3.688	3.875
	D ₂	PD, Max, Class 2B		1.0416	1.0787	1.1409	1.1668	1.2039	1.2659
		PD, Max, Class 3B		1.0393	1.0768	1.1390	1.1644	1.2019	1.2640
	D ₁	PD, Min, Classes 2B & 3B		1.0322	1.0709	1.1334	1.1572	1.1959	1.2584
		Minor Dia, Max, Class 2B		.998	1.053	1.115	1.123	1.178	1.240
		Minor Dia, Max, Class 3B		.9875	1.0448	1.1073	1.1125	1.1698	1.2323
TAPPED HOLE	FP	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia		1.982	1.625	1.688	2.107	1.750	1.812
		" " = 1.5 Dia		2.545	2.188	1.281	2.732	2.375	2.469
		" " = 2 Dia		3.107	2.750	2.875	3.357	3.000	3.125
		" " = 2.5 Dia		3.670	3.312	3.469	3.982	3.625	3.781
		" " = 3 Dia		4.232	3.875	4.062	4.607	4.250	4.438
	FB	Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia		1.696	1.458	1.521	1.821	1.583	1.646
		" " = 1.5 Dia		2.259	2.021	2.115	2.446	2.208	2.302
		" " = 2 Dia		2.821	2.583	2.708	3.071	2.833	2.958
		" " = 2.5 Dia		3.384	3.146	3.302	3.696	3.458	3.615
		" " = 3 Dia		3.946	3.708	3.896	4.321	4.083	4.271
	R	Min Full Thread when Nominal Length = 1 Dia		1.270	1.210	1.270	1.390	1.330	1.400
		" " = 1.5 Dia		1.830	1.770	1.870	2.020	1.960	2.050
		" " = 2 Dia		2.390	2.330	2.460	2.640	2.580	2.710
		" " = 2.5 Dia		2.960	2.900	3.030	3.270	3.210	3.360
		" " = 3 Dia		3.520	3.460	3.650	3.890	3.830	4.020
	V ₂	PD, Max, Class 2B		1.2262	1.1860	1.2482	1.3514	1.3112	1.3732
		PD, Max, Class 3B		1.2239	1.1841	1.2463	1.3490	1.3092	1.3713
		PD, Min, Classes 2B & 3B		1.2178	1.1792	1.2417	1.3428	1.3042	1.3667
	V ₁	Minor Dia, Max, Class 2B		1.1834	1.1611	1.2236	1.3084	1.2861	1.3486
		Minor Dia, Max, Class 3B		1.1730	1.1531	1.2156	1.2980	1.2781	1.3406
		Minor Dia, Min, Classes 2B & 3B		1.1559	1.1431	1.2056	1.2809	1.2681	1.3306
	V	Major Dia, Max, Class 2B		1.3396	1.2522	1.3144	1.4648	1.3774	1.4394
		Major Dia, Max, Class 3B		1.3373	1.2503	1.3125	1.4624	1.3754	1.4375
		Major Dia, Min, Classes 2B & 3B		1.3106	1.2333	1.2958	1.4356	1.3583	1.4208
	H	Countersink, 120° Included Angle Maximum		1.320	1.250	1.315	1.440	1.380	1.440
		Minimum		1.290	1.220	1.283	1.410	1.350	1.410
THREAD PROJECTION	J	Min, Tang Removed, when Insert Nominal Length = 1 Dia		1.482	1.333	1.396	1.607	1.458	1.520
		" " = 1.5 Dia		2.045	1.896	1.989	2.232	2.083	2.177
		" " = 2 Dia		2.607	2.458	2.583	2.857	2.708	2.833
		" " = 2.5 Dia		3.169	3.020	3.177	3.482	3.333	3.489
		" " = 3 Dia		3.732	3.583	3.770	4.107	3.958	4.146
	K	Max, Tang Not Removed, when Insert Nominal Length = 1 Dia		1.054	1.083	1.146	1.179	1.208	1.271
		" " = 1.5 Dia		1.616	1.646	1.740	1.804	1.833	1.927
		" " = 2 Dia		2.179	2.208	2.333	2.429	2.458	2.583
		" " = 2.5 Dia		2.741	2.771	2.927	3.054	3.083	3.239
		" " = 3 Dia		3.304	3.333	3.521	3.679	3.708	3.896

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82

CUSTODIANS: ARMY-AV NAVY-AS

AIR FORCE-99

DIA-

REVIEW:

USER:

PROJECT NUMBER: 6340-1988

DISTRIBUTION STATEMENT

MILITARY SPECIFICATION SHEET

TITLE
INSERT, SCREW THREAD, HELICAL COIL,
INCH SERIES, COARSE AND FINE THREAD,
STANDARD ASSEMBLY DIMENSIONS FOR

SPECIFICATION SHEET NUMBER

MS33537E

SUPERSEDING
MS33537D 27 JUNE 74

AMSC-

N/A

FSC-5340

A. Approved for public release; distribution is unlimited.

Page 10 of 11

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THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.

Form Approved
OMB No. 0704-0188

TABLE IV (continued)

Nominal Insert Size		1.500	1.625	1.875	2.250	2.500
Threads Per Inch		6	12	12	12	12
Ln	Insert Nominal Length, 1 Dia	1.500	1.500	1.625	1.875	2.250
	" " 1.5 Dia	2.250	2.250	2.438	2.812	3.375
	" " 2 Dia	3.000	3.000	3.250	3.750	4.500
	" " 2.5 Dia	3.750	3.750	4.062	4.688	5.625
	" " 3 Dia	4.500	4.500	4.875	5.625	6.750
ASSEMBLED INSERT	L	Min Length of Insert when Nominal Length = 1 Dia	1.375	1.438	1.562	1.812
		" " = 1.5 Dia	2.125	2.188	2.375	2.750
		" " = 2 Dia	2.875	2.938	3.188	3.688
		" " = 2.5 Dia	3.625	3.688	4.000	4.625
		" " = 3 Dia	4.375	4.438	4.812	5.562
	D ₂	PD, Max, Class 2B	1.4022	1.4542	1.5785	1.8287
		PD, Max, Class 3B	1.3996	1.4522	1.5766	1.8267
		PD, Min, Classes 2B & 3B	1.3917	1.4459	1.5709	1.8209
	D ₁	Minor Dia, Max, Class 2B	1.350	1.428	1.553	1.803
		Minor Dia, Max, Class 3B	1.3396	1.4198	1.5448	1.7948
		Minor Dia, Min, Classes 2B & 3B	1.3200	1.4100	1.5350	1.7850
TAPPED HOLE	FP	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia	2.500	2.000	2.125	2.375
		" " = 1.5 Dia	3.250	2.750	2.938	3.312
		" " = 2 Dia	4.000	3.500	3.750	4.250
		" " = 2.5 Dia	4.750	4.250	4.562	5.188
		" " = 3 Dia	5.500	5.000	5.375	6.125
	FB	Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia	2.167	1.833	1.958	2.208
		" " = 1.5 Dia	2.917	2.583	2.771	3.146
		" " = 2 Dia	3.667	3.333	3.583	4.083
		" " = 2.5 Dia	4.417	4.083	4.396	5.021
		" " = 3 Dia	5.167	4.833	5.208	5.958
	H	Min Full Thread when Nominal Length = 1 Dia	1.670	1.580	1.710	1.960
		" " = 1.5 Dia	2.420	2.330	2.520	2.900
		" " = 2 Dia	3.170	3.080	3.330	3.830
		" " = 2.5 Dia	3.920	3.830	4.150	4.770
		" " = 3 Dia	4.670	4.580	4.960	5.710
	V ₂	PD, Max, Class 2B	1.6177	1.5615	1.6858	1.9360
		PD, Max, Class 3B	1.6151	1.5595	1.6839	1.9340
		PD, Min, Classes 2B & 3B	1.6082	1.5542	1.6792	1.9292
	V ₁	Minor Dia, Max, Class 2B	1.5666	1.5361	1.6611	1.9111
		Minor Dia, Max, Class 3B	1.5560	1.5281	1.6531	1.9031
		Minor Dia, Min, Classes 2B & 3B	1.5360	1.5181	1.6431	1.8931
	V	Major Dia, Max, Class 2B	1.7500	1.6277	1.7520	2.0022
		Major Dia, Max, Class 3B	1.7474	1.6257	1.7501	2.0002
		Major Dia, Min, Classes 2B & 3B	1.7165	1.6083	1.7333	1.9833
	M	Countersink, 120° Included Angle	1.720	1.630	1.750	2.000
		Maximum	1.690	1.600	1.720	1.970
THREAD PROJECTION	J	Min, Tang Removed, when Insert Nominal Length = 1 Dia	1.917	1.708	1.833	2.083
		" " = 1.5 Dia	2.667	2.458	2.646	3.020
		" " = 2 Dia	3.417	3.208	3.458	3.958
		" " = 2.5 Dia	4.167	3.958	4.270	4.896
		" " = 3 Dia	4.917	4.708	5.083	5.833
	K	Max, Tang Removed, when Insert Nominal Length = 1 Dia	1.417	1.458	1.583	1.833
		" " = 1.5 Dia	2.167	2.208	2.396	2.771
		" " = 2 Dia	2.917	2.958	3.209	3.708
		" " = 2.5 Dia	3.667	3.708	4.021	4.646
		" " = 3 Dia	4.417	4.458	4.833	5.583

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82
CUSTODIANS: ARMY-AV NAVY-AS
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