

Form Approved  
 OMB No. 0704-0188

GENERAL INSTRUCTIONS

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.

- 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 20 and 30, 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:  

<p><u>EXAMPLE</u></p> <p>.3125-24 UNF-30 HELICAL COIL INSERT          TID PER MG33537          .67 MIN FULL THD DEPTH</p> <p>For Blind Hole (Based on 2 Diameter Engagement) (Minor Diameter Drill Depth Tolerance approx. .060 or as otherwise appropriate)</p>	<p>.3125-24 UNF-30 HELICAL COIL INSERT          TID THRU PER MG33537          INSTALL INSERT .75-1.5 TURNS BELOW SURFACE          REMOVE TANG</p> <p>For Thru Hole with Insert being Assembled (Based on 2 Diameter Engagement)</p>
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- 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<sub>n</sub>)
    - Length of assembled insert (L)
    - Tapped hole diameters (V, V<sub>1</sub>, V<sub>2</sub>)
    - Depth of drilling and tapping (FP, FB, and H)
    - 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 1.3 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 CUSTOMANS: ARMY-AV      NAVY-AS AIR FORCE-89      OLA-	<b>MILITARY SPECIFICATION SHEET</b> TITLE <b>INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR</b>	SPECIFICATION SHEET NUMBER <b>MS33537E</b> 11 JUNE 1991 SUPERSADING MS33537D   27 JUNE 74 AMSC- N/A      FSC-8340
REVIEW: USER: PROJECT NUMBER: S340-1986 DISTRIBUTION STATEMENT	INTERNATIONAL INTEREST	
A. Approved for public release; distribution is unlimited.		Page <u>1</u> of <u>11</u>

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

8. (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. (F) **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. **GAUGE 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 CUSTODIANS: ARMY- AV     NAVY- AS AIR FORCE- 99     DLA-	<b>MILITARY SPECIFICATION SHEET</b> TITLE <b>INSERT, SCREW THREAD, HELICAL COIL,          INCH SERIES, COARSE AND FINE THREAD,          STANDARD ASSEMBLY DIMENSIONS FOR</b>	SPECIFICATION SHEET NUMBER <b>MS33537E</b> SUPERSIDING <b>MS33537D    27 JUNE 74</b> AMSC-    N/A                    FSC- 5340
REVIEW: USER: PROJECT NUMBER: 6340-1088	INTERNATIONAL INTEREST	DISTRIBUTION STATEMENT <p style="font-size: small; margin-top: 5px;">A. Approved for public release; distribution is unlimited.</p>
		Page 2 of 11

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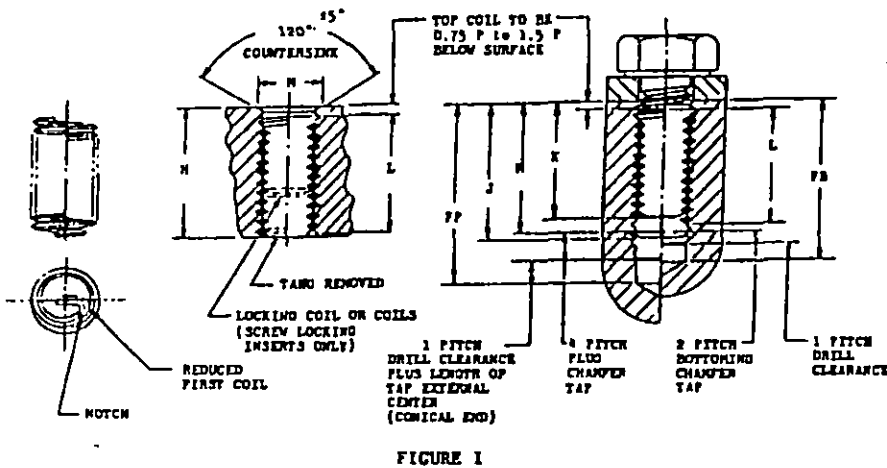
THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE BOOKS SPECIFIED IN THE SOLICITATION:

TABLE I (E)

MS PART NUMBERS				
INSERT NOMINAL LENGTH	FREE RUNNING INSERTS		SCREW LOCKING INSERTS	
	GRES AMS 7243		GRES MIL-I-8846	
	COARSE	FINE	COARSE	FINE
1 DIA	MS122076 thru MS122113	MS124631 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.

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INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82 CUSTODIANS: ARMY-AV NAVY-AS AIR FORCE-99 DLA-INTERNATIONAL INTEREST	MILITARY SPECIFICATION SHEET TITLE INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR	SPECIFICATION SHEET NUMBER <b>MS33537E</b> SUPERSEDING MS33537D 27 JUNE 74 AMSC- N/A FSC-5340
REVIEW USER: PROJECT NUMBER: 6340-1886 DISTRIBUTION STATEMENT Approved for public release; distribution is unlimited.	Page 3 of 11	

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

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Shear Strength of Material (psi) (Alum., Mag., Steel)	Bolt Material Minimum Ultimate Tensile Strength (psi)								
	54,000	75,000	96,000	108,000	125,000	132,000	160,000	180,000	210,000
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.)	$M_{min} = V_{2max} \text{ Class } 3B + M_{max} - D_{min}$ $M_{max} = M_{min} + .030$
Length of Bolt Thread Projection into Assembled Insert (J or K) (Paragraph 9.)	1. <u>Insert - Tang Removed</u> $J_{max} = FF_{min}$ (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)  
 P = Pitch = 1/Threads Per Inch  
 B = Wire Height from MS21209

D = Wire Pitch Line from MS21209  
 $D_n$  = Nominal Insert Size (Diameter)

$V_2$  = Tapped Hole Pitch Diameter (Table IV)

INCH-POUNDS

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

A. Approved for public release; distribution is unlimited.

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TABLE IV (E)

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 DOCSIS SPECIFIED IN THE SOLICITATION:

Nominal Insert Size		.073	.086		.099		.112		.125	
Threads Per Inch		64	56	64	48	56	40	48	40	
<b>L</b>	Insert Nominal Length, 1 Dia	.073	.086	.086	.099	.099	.112	.112	.125	
	" " 1.5 Dia	.110	.129	.129	.148	.148	.168	.168	.188	
	" " 2 Dia	.146	.172	.172	.198	.198	.224	.224	.250	
	" " 2.5 Dia	.182	.215	.215	.248	.248	.280	.280	.312	
	" " 3 Dia	.219	.258	.258	.297	.297	.336	.336	.375	
<b>ASSEMBLED INSERT</b>	<b>L</b>	Min Length of Insert when Nominal Length = 1 Dia	.061	.073	.074	.083	.086	.093	.096	.106
		" " = 1.5 Dia	.098	.116	.117	.133	.135	.149	.152	.169
		" " = 2 Dia	.134	.159	.160	.182	.185	.205	.208	.231
		" " = 2.5 Dia	.170	.202	.203	.232	.234	.261	.264	.293
		" " = 3 Dia	.207	.245	.246	.281	.284	.317	.320	.356
	<b>D<sub>2</sub></b>	PD, Max, Class 2B	.0655	.0772	.0786	.0885	.0902	.0991	.1016	.1121
		PD, Max, Class 3B	.0648	.0765	.0779	.0877	.0895	.0982	.1008	.1113
		PD, Min, Classes 2B & 3B	.0629	.0744	.0759	.0855	.0874	.0958	.0985	.1088
	<b>D<sub>1</sub></b>	Minor Dia, Max, Class 2B	.0623	.0737	.0753	.0845	.0865	.0939	.0968	.1062
		Minor Dia, Max, Class 3B	.0623	.0737	.0753	.0845	.0865	.0939	.0968	.1062
Minor Dia, Min, Classes 2B & 3B		.0561	.0667	.0691	.0764	.0797	.0849	.0894	.0979	
<b>TAPPED HOLE</b>	<b>FP</b>	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia	.203	.236	.223	.273	.256	.318	.293	.338
		" " = 1.5 Dia	.240	.279	.266	.323	.305	.374	.349	.400
		" " = 2 Dia	.276	.322	.309	.372	.355	.430	.405	.462
		" " = 2.5 Dia	.313	.365	.352	.422	.404	.486	.461	.525
		" " = 3 Dia	.349	.408	.395	.471	.454	.542	.517	.588
	<b>FB</b>	Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia	.136	.157	.149	.182	.170	.212	.195	.225
		" " = 1.5 Dia	.172	.200	.192	.232	.220	.268	.251	.288
		" " = 2 Dia	.209	.243	.235	.281	.269	.324	.307	.350
		" " = 2.5 Dia	.245	.266	.278	.331	.319	.380	.363	.412
		" " = 3 Dia	.282	.329	.321	.380	.368	.436	.419	.475
<b>B</b>	Min. Full Thread when Nominal Length = 1 Dia	.090	.100	.100	.120	.120	.140	.130	.150	
	" " = 1.5 Dia	.125	.150	.145	.170	.170	.190	.190	.210	
	" " = 2 Dia	.160	.190	.190	.220	.220	.250	.240	.280	
	" " = 2.5 Dia	.200	.230	.230	.270	.270	.310	.300	.340	
	" " = 3 Dia	.235	.280	.275	.320	.310	.360	.360	.400	
<b>V<sub>2</sub></b>	PD, Max, Class 2B	.0850	.0996	.0981	.1148	.1126	.1308	.1279	.1438	
	PD, Max, Class 3B	.0843	.0989	.0974	.1140	.1119	.1299	.1271	.1430	
	PD, Min, Classes 2B & 3B	.0832	.0976	.0962	.1126	.1106	.1283	.1256	.1413	
	Minor Dia, Max, Class 2B	.0823	.0961	.0947	.1104	.1086	.1252	.1229	.1373	
<b>V<sub>1</sub></b>	Minor Dia, Max, Class 3B	.0823	.0961	.0947	.1104	.1086	.1252	.1229	.1373	
	Minor Dia, Min, Class 2B & 3B	.0764	.0899	.0894	.1036	.1029	.1175	.1166	.1305	
	Major Dia, Max, Class 2B	.0974	.1138	.1105	.1313	.1268	.1506	.1444	.1636	
<b>V</b>	Major Dia, Max, Class 3B	.0967	.1131	.1098	.1305	.1261	.1497	.1436	.1628	
	Major Dia, Min, Classes 2B & 3B	.0933	.1092	.1063	.1261	.1222	.1445	.1391	.1575	
	Countersink, 120° Included Angle	.100	.110	.110	.140	.140	.170	.170	.190	
<b>H</b>	Maximum	.085	.090	.090	.110	.110	.140	.140	.160	
	Minimum	.085	.090	.090	.110	.110	.140	.140	.160	
<b>THREAD PROJECTION</b>	<b>J</b>	Min. Tang Removed, when Insert Nominal Length = 1 Dia	.112	.131	.125	.151	.144	.174	.164	.188
		" " = 1.5 Dia	.149	.174	.168	.200	.193	.230	.220	.250
		" " = 2 Dia	.185	.217	.211	.250	.243	.286	.276	.312
		" " = 2.5 Dia	.221	.260	.254	.300	.293	.342	.332	.374
		" " = 3 Dia	.258	.303	.297	.349	.342	.398	.388	.438
	<b>K</b>	Max. Tang Not Removed, when Insert Nominal Length = 1 Dia	.065	.077	.078	.088	.090	.100	.102	.112
		" " = 1.5 Dia	.102	.120	.121	.138	.140	.156	.158	.176
		" " = 2 Dia	.138	.163	.164	.187	.189	.212	.214	.238
		" " = 2.5 Dia	.174	.206	.207	.236	.238	.268	.270	.300
		" " = 3 Dia	.211	.249	.250	.285	.288	.324	.326	.362

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82 CUSTODIANS: ARMY-AV      NAVY-AS AIR FORCE-99      DIA-	MILITARY SPECIFICATION SHEET  TITLE INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR	SPECIFICATION SHEET NUMBER <b>MS33537E</b>  SUPERSUCCESSING MS33537D    27 JUNE 74  AMSC-    N/A                      FSC- 5340
REVIEW: _____ USER: _____ PROJECT NUMBER 5340-1988	INTERNATIONAL INTEREST	
DISTRIBUTION STATEMENT A Approved for public release; distribution is unlimited.		Page 5 of 11

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TABLE IV (continued)

		Nominal Insert Size	.138		.164		.190		.216	
			32	40	32	36	24	32	24	
		Threads Per Inch								
J	Insert Nominal Length, I Dia	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	.185	
		" " = 1.5 Dia	.184	.188	.223	.225	.254	.262	.293	
		" " = 2 Dia	.253	.257	.305	.307	.349	.357	.401	
		" " = 2.5 Dia	.322	.326	.387	.389	.444	.444	.509	
			3 Dia	.391	.395	.469	.471	.539	.547	.617
	D <sub>2</sub>	PD, Max, Class 2B	.1214	.1232	.1475	.1496	.1672	.1736	.1933	
		PD, Max, Class 3B	.1204	.1243	.1465	.1487	.1661	.1726	.1922	
		PD, Min, Classes 2B & 3B	.1177	.1218	.1437	.1460	.1629	.1697	.1889	
	D <sub>1</sub>	Minor Dia, Max, Class 2B	.114	.119	.139	.142	.156	.164	.181	
		Minor Dia, Max, Class 3B	.1140	.1186	.1389	.1416	.1555	.1641	.1807	
		Minor Dia, Min, Classes 2B & 3B	.1040	.1110	.1300	.1340	.1450	.1560	.1710	
	TAPPED HOLE	FP	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia	.394	.357	.434	.413	.535	.472	.574
" " = 1.5 Dia			.464	.426	.516	.495	.630	.568	.682	
" " = 2 Dia			.532	.495	.598	.577	.725	.662	.790	
" " = 2.5 Dia			.602	.564	.680	.659	.820	.758	.898	
			3 Dia	.670	.633	.762	.741	.915	.852	1.006
FB		Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia	.263	.238	.289	.275	.357	.315	.383	
		" " = 1.5 Dia	.332	.307	.371	.357	.452	.410	.491	
		" " = 2 Dia	.401	.376	.453	.439	.547	.505	.599	
		" " = 2.5 Dia	.470	.445	.535	.521	.642	.600	.707	
			3 Dia	.539	.514	.617	.603	.737	.695	.815
H		Min. Full Thread when Nominal Length = 1 Dia	.170	.160	.200	.190	.230	.220	.260	
		" " = 1.5 Dia	.240	.230	.280	.270	.330	.320	.370	
		" " = 2 Dia	.310	.300	.360	.360	.420	.410	.470	
		" " = 2.5 Dia	.380	.370	.440	.440	.520	.510	.580	
			3 Dia	.450	.440	.520	.520	.610	.600	.690
V <sub>2</sub>		PD, Max, Class 2B	.1611	.1569	.1872	.1849	.2203	.2133	.2464	
		PD, Max, Class 3B	.1601	.1560	.1862	.1840	.2192	.2123	.2453	
		PD, Min, Classes 2B & 3B	.1583	.1543	.1843	.1821	.2170	.2103	.2430	
V <sub>1</sub>		Minor Dia, Max, Class 2B	.1527	.1503	.1781	.1771	.2087	.2041	.2347	
		Minor Dia, Max, Class 3B	.1527	.1503	.1781	.1771	.2080	.2041	.2340	
	Minor Dia, Min, Classes 2B & 3B	.1448	.1435	.1708	.1701	.1990	.1968	.2250		
V	Major Dia, Max, Class 2B	.1859	.1767	.2120	.2069	.2534	.2381	.2795		
	Major Dia, Max, Class 3B	.1849	.1758	.2110	.2060	.2523	.2371	.2784		
	Major Dia, Min, Classes 2B & 3B	.1786	.1705	.2046	.2001	.2441	.2306	.2701		
M	Countersink, 120° Included Angle									
	Maximum	.210	.200	.230	.230	.270	.260	.290		
	Minimum	.180	.170	.200	.200	.240	.230	.260		
THREAD PROJECTION	J	Min. Tang Removed, when Insert Nominal Length = 1 Dia	.216	.200	.242	.233	.294	.268	.320	
		" " = 1.5 Dia	.285	.270	.324	.315	.389	.363	.428	
		" " = 2 Dia	.354	.338	.406	.397	.484	.458	.536	
		" " = 2.5 Dia	.423	.408	.488	.479	.579	.553	.644	
			3 Dia	.492	.476	.570	.561	.674	.648	.752
	K	Max. Tang Not Removed, when Insert Nominal Length = 1 Dia	.122	.126	.149	.150	.169	.175	.195	
		" " = 1.5 Dia	.191	.194	.231	.232	.264	.270	.303	
		" " = 2 Dia	.260	.264	.313	.314	.359	.365	.411	
		" " = 2.5 Dia	.329	.332	.393	.396	.454	.460	.519	
		" " = 3 Dia	.398	.402	.477	.478	.549	.555	.627	

[INCH-POUND]

PREPARING ACTIVITY: AIR FORCE-82 CUSTODIANS: ARMY-AV NAVY-AS AIR FORCE-99 DLA-		MILITARY SPECIFICATION SHEET TITLE INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR		SPECIFICATION SHEET NUMBER <b>MS33537E</b> SUPERSEDING MS33537D 27 JUNE 74	
REVIEW: USER: PROJECT NUMBER: 6340-1886		INTERNATIONAL INTEREST		ANSC- N/A FSC- 5340	
DISTRIBUTION STATEMENT				A Approved for public release; distribution is unlimited	
				Page <u> 6 </u> of <u> 11 </u>	

THE REQUIREMENTS FOR ACCOUNTING 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		
		20	28	18	24	16	24	14	20	
Threads Per Inch		.250	.250	.312	.312	.375	.375	.438	.438	
L <sub>n</sub>	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	.384	.400
		" " 1.5 Dia	.338	.348	.427	.438	.516	.531	.603	.619
		" " 2 Dia	.462	.473	.583	.594	.703	.719	.821	.838
		" " 2.5 Dia	.588	.598	.740	.750	.891	.906	1.040	1.056
		" " 3 Dia	.712	.723	.896	.906	1.078	1.094	1.239	1.273
D <sub>2</sub>	PD, Max, Class 2B	.2224	.2311	.2817	.2902	.3401	.3528	.3972	.4104	
	PD, Max, Class 3B	.2211	.2300	.2803	.2890	.3387	.3516	.3957	.4091	
	PD, Min, Classes 2B & 3B	.2175	.2268	.2764	.2854	.3344	.3479	.3911	.4050	
D <sub>1</sub>	Minor Dia, Max, Class 2B	.207	.220	.265	.277	.321	.340	.376	.395	
	Minor Dia, Max, Class 3B	.2067	.2190	.2630	.2754	.3182	.3372	.3717	.3916	
	Minor Dia, Min, Classes 2B & 3B	.1960	.2110	.2520	.2670	.3070	.3300	.3600	.3830	
FP	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia	.675	.589	.801	.718	.750	.625	.867	.738	
	" " 1.5 Dia	.800	.714	.957	.874	.938	.812	1.086	.957	
	" " 2 Dia	.925	.839	1.113	1.030	1.125	1.000	1.305	1.176	
	" " 2.5 Dia	1.050	.964	1.269	1.186	1.312	1.188	1.524	1.395	
	" " 3 Dia	1.175	1.089	1.425	1.342	1.500	1.375	1.743	1.614	
FB	Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia	.450	.393	.534	.479	.625	.542	.724	.638	
	" " 1.5 Dia	.575	.518	.690	.635	.812	.729	.943	.857	
	" " 2 Dia	.700	.643	.846	.791	1.000	.917	1.162	1.076	
	" " 2.5 Dia	.825	.768	1.002	.947	1.188	1.104	1.381	1.295	
	" " 3 Dia	.950	.893	1.158	1.103	1.375	1.292	1.600	1.514	
R	Min. Full Thread when Nominal Length = 1 Dia	.300	.290	.370	.350	.440	.420	.510	.490	
	" " 1.5 Dia	.430	.410	.530	.510	.630	.600	.730	.710	
	" " 2 Dia	.550	.540	.680	.670	.810	.790	.950	.930	
	" " 2.5 Dia	.680	.660	.840	.820	1.000	.980	1.170	1.140	
	" " 3 Dia	.800	.790	.990	.980	1.190	1.170	1.380	1.360	
V <sub>2</sub>	PD, Max, Class 2B	.2864	.2765	.3529	.3433	.4203	.4059	.4890	.4744	
	PD, Max, Class 3B	.2851	.2754	.3515	.3421	.4189	.4047	.4875	.4731	
	PD, Min, Classes 2B & 3B	.2825	.2732	.3486	.3395	.4156	.4020	.4839	.4700	
V <sub>1</sub>	Minor Dia, Max, Class 2B	.2723	.2661	.3372	.3312	.4026	.3937	.4688	.4598	
	Minor Dia, Max, Class 3B	.2704	.2646	.3342	.3288	.3987	.3910	.4639	.4561	
	Minor Dia, Min, Classes 2B & 3B	.2609	.2577	.3245	.3215	.3885	.3840	.4530	.4483	
V	Major Dia, Max, Class 2B	.3261	.3049	.3970	.3764	.4699	.4390	.5457	.5141	
	Major Dia, Max, Class 3B	.3248	.3039	.3956	.3752	.4685	.4378	.5442	.5128	
	Major Dia, Min, Classes 2B & 3B	.3150	.2964	.3847	.3666	.4562	.4291	.5303	.5025	
M	Countersink, 120° Includ Angle	.340	.320	.410	.390	.480	.450	.550	.530	
	Minimum	.310	.290	.380	.360	.450	.420	.520	.500	
THREAD PROJECTION	J	Min. Tang Removed, when Insert Nominal Length = 1 Dia	.375	.339	.431	.416	.531	.479	.617	.563
		" " 1.5 Dia	.500	.464	.608	.573	.718	.666	.835	.781
		" " 2 Dia	.625	.589	.764	.729	.906	.854	1.054	1.000
		" " 2.5 Dia	.750	.714	.920	.885	1.094	1.042	1.273	1.219
		" " 3 Dia	.875	.839	1.077	1.042	1.281	1.229	1.491	1.437
K	Max. Tang Not Removed, when Insert Nominal Length = 1 Dia	.225	.232	.285	.291	.344	.354	.402	.423	
	" " 1.5 Dia	.351	.357	.441	.448	.532	.541	.621	.632	
	" " 2 Dia	.475	.482	.597	.604	.719	.729	.840	.851	
	" " 2.5 Dia	.601	.607	.754	.760	.907	.916	1.058	1.069	
	" " 3 Dia	.725	.732	.910	.916	1.094	1.104	1.277	1.288	

[INCH-POUND]

PREPARING ACTIVITY: AIR FORCE-82	MILITARY SPECIFICATION SHEET	SPECIFICATION SHEET NUMBER <b>MS33537E</b>	
CUSTODIANS: ARMY- AV NAVY-AS AIR FORCE-99 DIA-		SUPERSEDING MS33537D 27 JUNE 74	
REVIEW: USER: PROJECT NUMBER: 5340-1886	TITLE <b>INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR</b>	AMSC- N/A FSC- 8340	
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.		Page <u>7</u> of <u>11</u>	

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

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.

TABLE IV (continued)

Nominal Insert Size		.500		.5625		.625		.750		
		13	20	12	18	11	18	10	16	
Threads Per Inch										
<b>L<sub>I</sub></b>	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	
<b>ASSEMBLED INSERT</b>	<b>L</b>	Min Length of Insert when Nominal Length = 1 Dia	.442	.462	.500	.521	.557	.583	.675	.703
		"      "      1.5 Dia	.692	.712	.781	.802	.869	.896	1.050	1.078
		"      "      2 Dia	.942	.962	1.062	1.083	1.182	1.208	1.425	1.453
		"      "      2.5 Dia	1.192	1.212	1.344	1.365	1.494	1.521	1.800	1.828
		"      "      3 Dia	1.442	1.462	1.625	1.646	1.807	1.833	2.175	2.203
	<b>D<sub>2</sub></b>	PD, Max, Class 2B	.4565	.4731	.5152	.5323	.5732	.5949	.6927	.7159
		PD, Max, Class 3B	.4548	.4717	.5135	.5308	.5714	.5934	.6907	.7143
		PD, Min, Classes 2B & 3B	.4500	.4675	.5084	.5264	.5660	.5889	.6850	.7094
	<b>D<sub>1</sub></b>	Minor Dia, Max, Class 2B	.434	.457	.490	.515	.546	.578	.663	.696
		Minor Dia, Max, Class 3B	.4284	.4537	.4843	.5106	.5391	.5730	.6545	.6908
Minor Dia, Min, Classes 2B & 3B		.4170	.4460	.4720	.5020	.5270	.5650	.6420	.6820	
<b>TAPPED HOLE</b>	<b>FP</b>	Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia	.962	.800	1.062	.895	1.170	.958	1.350	1.125
		"      "      1.5 Dia	1.212	1.050	1.343	1.178	1.483	1.271	1.725	1.500
		"      "      2 Dia	1.462	1.300	1.624	1.457	1.795	1.583	2.100	1.875
		"      "      2.5 Dia	1.712	1.550	1.905	1.738	2.108	1.896	2.475	2.250
		"      "      3 Dia	1.962	1.800	2.186	2.019	2.420	2.208	2.850	2.625
	<b>FB</b>	Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia	.800	.700	.895	.784	.989	.847	1.150	1.000
		"      "      1.5 Dia	1.058	.950	1.176	1.065	1.301	1.160	1.525	1.375
		"      "      2 Dia	1.308	1.200	1.457	1.346	1.614	1.472	1.900	1.750
		"      "      2.5 Dia	1.558	1.450	1.738	1.627	1.926	1.785	2.275	2.125
		"      "      3 Dia	1.808	1.700	2.019	1.908	2.239	2.097	2.650	2.500
	<b>H</b>	Min Full Thread when Nominal Length = 1 Dia	.580	.550	.650	.620	.720	.680	.850	.810
		"      "      1.5 Dia	.830	.800	.930	.900	1.030	.990	1.230	1.190
		"      "      2 Dia	1.080	1.050	1.210	1.180	1.340	1.310	1.600	1.560
		"      "      2.5 Dia	1.330	1.300	1.490	1.460	1.650	1.620	1.980	1.940
		"      "      3 Dia	1.580	1.550	1.770	1.740	1.970	1.930	2.350	2.310
<b>V<sub>2</sub></b>	PD, Max, Class 2B	.5554	.5371	.6225	.6035	.6903	.6661	.8216	.7961	
	PD, Max, Class 3B	.5537	.5357	.6208	.6020	.6885	.6646	.8196	.7945	
	PD, Min, Classes 2B & 3B	.5499	.5325	.6167	.5986	.6841	.6611	.8149	.7906	
	Minor Dia, Max, Class 2B	.5335	.5223	.5986	.5872	.6641	.6497	.7926	.7776	
<b>V<sub>1</sub></b>	Minor Dia, Max, Class 3B	.5273	.5186	.5918	.5826	.6564	.6451	.7838	.7720	
	Minor Dia, Min, Classes 2B & 3B	.5166	.5108	.5806	.5745	.6447	.6370	.7716	.7635	
<b>V</b>	Major Dia, Max, Class 2B	.6165	.5768	.6887	.6476	.7625	.7102	.9010	.8457	
	Major Dia, Max, Class 3B	.6148	.5754	.6870	.6461	.7607	.7087	.8990	.8441	
	Major Dia, Min, Classes 2B & 3B	.5999	.5650	.6708	.6347	.7431	.6972	.8799	.8312	
<b>H</b>	Countersink, 120° Included Angle									
	Maximum	.620	.590	.690	.660	.760	.720	.900	.850	
	Minimum	.590	.560	.660	.630	.730	.690	.870	.820	
<b>THREAD PROJECTION</b>	<b>J</b>	Min. Tang Removed, when Insert Nominal Length = 1 Dia	.692	.625	.770	.701	.852	.764	1.000	.906
		"      "      1.5 Dia	.942	.875	1.052	.983	1.165	1.077	1.375	1.281
		"      "      2 Dia	1.192	1.125	1.333	1.264	1.477	1.389	1.750	1.656
		"      "      2.5 Dia	1.442	1.375	1.614	1.545	1.789	1.701	2.125	2.031
		"      "      3 Dia	1.692	1.625	1.896	1.827	2.102	2.014	2.500	2.406
	<b>K</b>	Max. Tang Not Removed, when Insert Nominal Length = 1 Dia	.461	.475	.521	.535	.580	.597	.700	.719
		"      "      1.5 Dia	.711	.725	.802	.816	.892	.910	1.075	1.094
		"      "      2 Dia	.961	.975	1.083	1.097	1.205	1.222	1.450	1.469
		"      "      2.5 Dia	1.211	1.225	1.365	1.379	1.517	1.535	1.825	1.844
	"      "      3 Dia	1.461	1.475	1.646	1.660	1.830	1.847	2.200	2.219	

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82 CUSTODIANS: ARMY-- AV      NAVY-- AS AIR FORCE-- 89      DLA--		MILITARY SPECIFICATION SHEET TITLE INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR	SPECIFICATION SHEET NUMBER <b>MS33537E</b> SUPERSIDING MS33537D      27 JUNE 74 AMSC-- N/A      FSC- 8340
REVIEW: USER: PROJECT NUMBER: 6340-1888 DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.		Page 8 of 11	



Form Approved  
 OMB No. 0704-0188

TABLE IV (continued)

Nominal Insert Size		.8125		.875		1.000		1.0625	
		Threads Per Inch		16	9	16	8	12	(a) 14
In	Insert Nominal Length, 1 Dia	.812	.875	.875	1.000	1.000	1.000	1.062	1.062
	" " 1.5 Dia	1.219	1.312	1.312	1.500	1.500	1.500	1.594	1.594
	" " 2 Dia	1.625	1.750	1.750	2.000	2.000	2.000	2.125	2.125
	" " 2.5 Dia	2.031	2.188	2.188	2.500	2.500	2.500	2.656	2.656
	" " 3 Dia	2.438	2.625	2.625	3.000	3.000	3.000	3.188	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 <sub>2</sub>	FD, Max, Class 2B	.7782	.8110	.8356	.9276	.9535	.9609	1.0138
		FD, Max, Class 3B	.7766	.8089	.8339	.9254	.9516	.9590	1.0139
	D <sub>1</sub>	FD, Min, Classes 2B & 3B	.7719	.8028	.8286	.9188	.9439	.9536	1.0084
		Minor Dia, Max, Class 2B	.759	.778	.814	.890	.928	.939	.990
	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
" " = 1.5 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 <sub>2</sub>	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	1.0912	1.0542	1.0464	1.1167	
	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	
V <sub>1</sub>	Minor Dia, Min, Classes 2B & 3B	.8260	.8990	.8905	1.0271	1.0181	1.0155	1.0806	
	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	1.1093	1.0928	1.1708	
	H	Countersink, 120° Included Angle Maximum	.915	1.030	.990	1.170	1.130	1.110	1.190
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	1.579	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	<b>MS33537E</b>
AIR FORCE-88 DLA-	INSERT, SCREW THREAD, HELICAL COIL	SUPERSEDING
REVIEW: INTERNATIONAL INTEREST	INCH SERIES, COARSE AND FINE THREAD,	MS33537D 27 JUNE 74
USER: 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

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.

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 <sub>1</sub>	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	1.250	1.312
		" " = 1.5 Dia	1.580	1.625	1.719	1.768	1.812	1.906	1.938	2.000
		" " = 2 Dia	2.143	2.188	2.312	2.393	2.438	2.562	2.625	2.688
ASSEMBLED INSERT	D <sub>2</sub>	PD, Max, Class 2B	1.0416	1.0787	1.1409	1.1668	1.2039	1.2659	1.2771	1.3291
		PD, Max, Class 3B	1.0393	1.0768	1.1390	1.1644	1.2019	1.2640	1.2745	1.3270
		PD, Min, Classes 2B & 3B	1.0322	1.0709	1.1334	1.1572	1.1959	1.2584	1.2667	1.3209
ASSEMBLED INSERT	D <sub>1</sub>	Minor Dia, Max, Class 2B	.998	1.053	1.115	1.123	1.178	1.240	1.225	1.303
		Minor Dia, Max, Class 3B	.9875	1.0448	1.1073	1.1125	1.1698	1.2323	1.2146	1.2948
		Minor Dia, Min, Classes 2B & 3B	.9700	1.0350	1.0970	1.0950	1.1600	1.2220	1.1950	1.2850
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	2.375	1.875
		" " = 1.5 Dia	2.545	2.188	1.281	2.732	2.375	2.469	3.062	2.562
		" " = 2 Dia	3.107	2.750	2.875	3.357	3.000	3.125	3.750	3.250
		" " = 2.5 Dia	3.670	3.312	3.469	3.982	3.625	3.781	4.438	3.938
		" " = 3 Dia	4.232	3.875	4.062	4.607	4.250	4.438	5.125	4.625
	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	2.042	1.708
		" " = 1.5 Dia	2.259	2.021	2.115	2.446	2.208	2.302	2.729	2.396
		" " = 2 Dia	2.821	2.583	2.708	3.071	2.833	2.958	3.417	3.083
		" " = 2.5 Dia	3.384	3.146	3.302	3.696	3.458	3.615	4.104	3.771
		" " = 3 Dia	3.946	3.708	3.896	4.321	4.083	4.271	4.792	4.458
	H	Min Full Thread when Nominal Length = 1 Dia	1.270	1.210	1.270	1.390	1.330	1.400	1.540	1.460
		" " = 1.5 Dia	1.830	1.770	1.870	2.020	1.960	2.050	2.230	2.150
		" " = 2 Dia	2.390	2.330	2.460	2.640	2.580	2.710	2.920	2.831
		" " = 2.5 Dia	2.960	2.900	3.050	3.270	3.210	3.360	3.600	3.520
		" " = 3 Dia	3.520	3.460	3.650	3.890	3.830	4.020	4.290	4.210
V <sub>2</sub>	PD, Max, Class 2B	1.2262	1.1860	1.2482	1.3514	1.3112	1.3732	1.4926	1.4364	
	PD, Max, Class 3B	1.2239	1.1841	1.2463	1.3490	1.3092	1.3713	1.4900	1.4343	
	PD, Min, Classes 2B & 3B	1.2178	1.1792	1.2417	1.3428	1.3042	1.3667	1.4832	1.4292	
V <sub>1</sub>	Minor Dia, Max, Class 2B	1.1834	1.1611	1.2236	1.3084	1.2861	1.3486	1.4416	1.4111	
	Minor Dia, Max, Class 3B	1.1730	1.1531	1.2156	1.2980	1.2781	1.3406	1.4310	1.4031	
	Minor Dia, Min, Classes 2B & 3B	1.1559	1.1431	1.2056	1.2809	1.2681	1.3306	1.4110	1.3931	
V	Major Dia, Max, Class 2B	1.3396	1.2522	1.3144	1.4648	1.3774	1.4394	1.6248	1.5026	
	Major Dia, Max, Class 3B	1.3373	1.2503	1.3125	1.4624	1.3754	1.4375	1.6223	1.5005	
	Major Dia, Min, Classes 2B & 3B	1.3106	1.2333	1.2958	1.4356	1.3583	1.4208	1.5915	1.4833	
H	Countersink, 120° Included Angle	1.320	1.250	1.315	1.440	1.380	1.440	1.590	1.500	
	Maximum Minimum	1.290	1.220	1.285	1.410	1.350	1.410	1.560	1.470	
THREAD PROJECTION	J	Min, Tang Removed, when Insert Nominal Length = 1 Dia	1.482	1.333	1.396	1.607	1.458	1.520	1.792	1.583
		" " = 1.5 Dia	2.045	1.896	1.989	2.232	2.083	2.177	2.479	2.270
		" " = 2 Dia	2.607	2.458	2.583	2.857	2.708	2.833	3.167	2.958
		" " = 2.5 Dia	3.169	3.020	3.177	3.482	3.333	3.489	3.855	3.646
		" " = 3 Dia	3.732	3.583	3.770	4.107	3.958	4.146	4.542	4.333
THREAD PROJECTION	K	Max, Tang Not Removed, when Insert Nominal Length = 1 Dia	1.054	1.083	1.146	1.179	1.208	1.271	1.292	1.333
		" " = 1.5 Dia	1.616	1.646	1.740	1.804	1.833	1.927	1.979	2.021
		" " = 2 Dia	2.179	2.208	2.333	2.429	2.458	2.583	2.667	2.708
		" " = 2.5 Dia	2.741	2.771	2.927	3.054	3.083	3.239	3.354	3.396
		" " = 3 Dia	3.304	3.333	3.521	3.679	3.708	3.896	4.042	4.083

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82	MILITARY SPECIFICATION SHEET	SPECIFICATION SHEET NUMBER
CUSTOMERS: ARMY-AV NAVY-AS	TITLE	<b>MS33537E</b>
AIR FORCE-99 DIA-	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: 6340-1988		
DISTRIBUTION STATEMENT	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	2.500	
	" " 1.5 Dia	2.250	2.250	2.438	2.812	3.375	3.750	
	" " 2 Dia	3.000	3.000	3.250	3.750	4.500	5.000	
	" " 2.5 Dia	3.750	3.750	4.062	4.688	5.625	6.250	
	" " 3 Dia	4.500	4.500	4.875	5.625	6.750	7.500	
ASSEMBLED INSERT	L Min Length of Insert when Nominal Length = 1 Dia " " = 1.5 Dia " " = 2 Dia " " = 2.5 Dia " " = 3 Dia	1.375	1.438	1.562	1.812	2.188	2.438	
		2.125	2.188	2.375	2.750	3.312	3.688	
		2.875	2.938	3.188	3.688	4.438	4.938	
		3.625	3.688	4.000	4.625	5.362	6.188	
		4.375	4.438	4.812	5.562	6.688	7.438	
	D <sub>2</sub>	PD, Max, Class 2B	1.4022	1.4542	1.5785	1.8287	2.2038	2.4540
		PD, Max, Class 3B	1.3996	1.4522	1.5766	1.8267	2.2018	2.4519
		PD, Min, Classes 2B & 3B	1.3917	1.4459	1.5709	1.8209	2.1959	2.4459
	D <sub>1</sub>	Minor Dia, Max, Class 2B	1.350	1.428	1.553	1.803	2.178	2.428
Minor Dia, Max, Class 3B		1.3396	1.4198	1.5448	1.7948	2.1698	2.4198	
Minor Dia, Min, Classes 2B & 3B		1.3200	1.4100	1.5350	1.7850	2.1600	2.4100	
TAPPED HOLE	FP Depth of Blind Hole for Plug Taps, Min when Nominal Length = 1 Dia " " = 1.5 Dia " " = 2 Dia " " = 2.5 Dia " " = 3 Dia	2.500	2.000	2.125	2.375	2.750	3.000	
		3.250	2.750	2.938	3.312	3.875	4.250	
		4.000	3.500	3.750	4.250	5.000	5.500	
		4.750	4.250	4.562	5.188	6.125	6.750	
		5.500	5.000	5.375	6.125	7.250	8.000	
	FB Depth of Blind Hole for Bottoming Taps, Min when Nominal Length = 1 Dia " " = 1.5 Dia " " = 2 Dia " " = 2.5 Dia " " = 3 Dia	2.167	1.833	1.958	2.208	2.583	2.833	
		2.917	2.583	2.771	3.146	3.708	4.083	
		3.667	3.333	3.583	4.083	4.833	5.333	
		4.417	4.083	4.396	5.021	5.958	6.583	
		5.167	4.833	5.208	5.958	7.083	7.833	
	H Min Full Thread when Nominal Length = 1 Dia " " = 1.5 Dia " " = 2 Dia " " = 2.5 Dia " " = 3 Dia	1.670	1.580	1.710	1.960	2.330	2.580	
		2.420	2.330	2.520	2.900	3.460	3.830	
		3.170	3.080	3.330	3.830	4.580	5.080	
		3.920	3.830	4.150	4.770	5.710	6.330	
		4.670	4.580	4.960	5.710	6.830	7.580	
	V <sub>2</sub>	PD, Max, Class 2B	1.6177	1.5615	1.6858	1.9360	2.3111	2.5613
		PD, Max, Class 3B	1.6151	1.5595	1.6839	1.9340	2.3091	2.5592
		PD, Min, Classes 2B & 3B	1.6082	1.5542	1.6792	1.9292	2.3042	2.5542
		Minor Dia, Max, Class 2B	1.5666	1.5361	1.6611	1.9111	2.2861	2.5361
		Minor Dia, Max, Class 3B	1.5560	1.5281	1.6531	1.9031	2.2781	2.5281
	V <sub>1</sub>	Minor Dia, Min, Classes 2B & 3B	1.5360	1.5181	1.6431	1.8931	2.2681	2.5181
Major Dia, Max, Class 2B		1.7500	1.6277	1.7520	2.0022	2.3773	2.6275	
Major Dia, Max, Class 3B		1.7474	1.6257	1.7501	2.0002	2.3753	2.6254	
V	Major Dia, Min, Classes 2B & 3B	1.7165	1.6083	1.7333	1.9833	2.3583	2.6083	
	M Countersink, 120° Included Angle Maximum Minimum	1.720 1.690	1.630 1.600	1.750 1.720	2.000 1.970	2.380 2.350	2.630 2.600	
THREAD PROJECTION	J Min, Tang Removed, when Insert Nominal Length = 1 Dia " " = 1.5 Dia " " = 2 Dia " " = 2.5 Dia " " = 3 Dia	1.917	1.708	1.833	2.083	2.458	2.708	
		2.667	2.458	2.646	3.020	3.583	3.958	
		3.417	3.208	3.458	3.958	4.708	5.208	
		4.167	3.958	4.270	4.896	5.833	6.438	
		4.917	4.708	5.083	5.833	6.958	7.708	
	K Max, Tang Removed, when Insert Nominal Length = 1 Dia " " = 1.5 Dia " " = 2 Dia " " = 2.5 Dia " " = 3 Dia	1.417	1.458	1.583	1.833	2.209	2.458	
		2.167	2.208	2.396	2.771	3.333	3.708	
		2.917	2.958	3.209	3.708	4.459	4.958	
		3.667	3.708	4.021	4.646	5.583	6.208	
		4.417	4.458	4.833	5.583	6.709	7.458	

INCH-POUND

PREPARING ACTIVITY: AIR FORCE-82	MILITARY SPECIFICATION SHEET	SPECIFICATION SHEET NUMBER
CUSTODIANS: ARMY-AV NAVY-AS	TITLE	<b>MS33537E</b>
AIR FORCE-89 DIA-	INSERT, SCREW THREAD, HELICAL COIL, INCH SERIES, COARSE AND FINE THREAD, STANDARD ASSEMBLY DIMENSIONS FOR	SUPERSADING MS33537D 27 JUNE 74
REVIEW: USER: PROJECT NUMBER 5340-1986	INTERNATIONAL INTEREST	AMSC- N/A FSC- 6340
DISTRIBUTION STATEMENT	A Approved for public release; distribution is unlimited.	Page 11 of 11

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