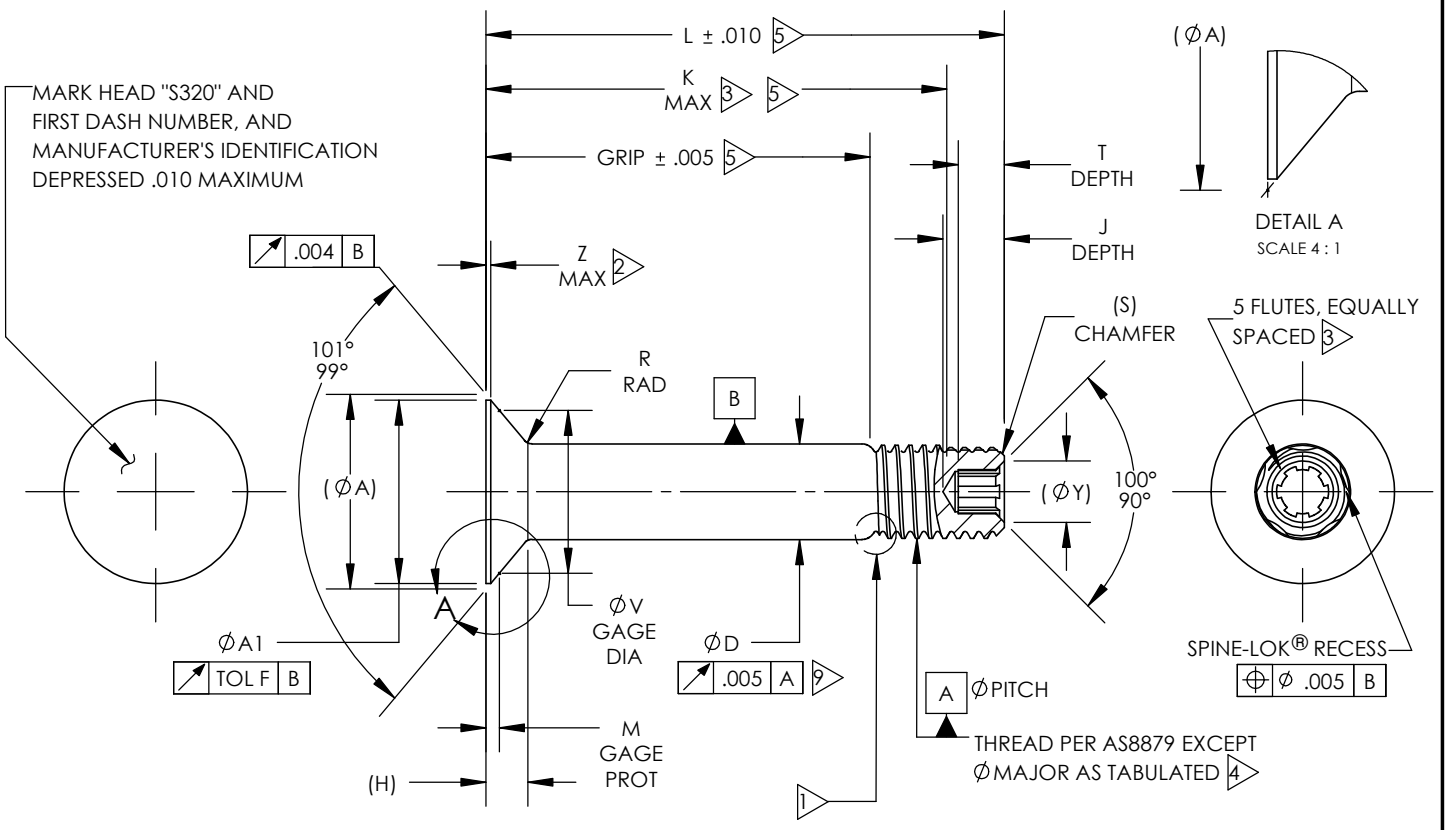

TABLE I - DIMENSIONS & MECHANICAL PROPERTIES

FIRST DASH NO.	ØNOM	THREAD (MODIFIED)		(ØA)	ØA1 MIN	ØD				F TOL	(H)	M GAGE PROT	R RAD	(S) CHAMFER	ØV GAGE
						BEFORE FINISH	AFTER FINISH								
		THREAD SIZE	ØMAJOR MOD			IVD ALUMINUM and ALUMINUM PIGMENTED COATING	ALL	IVD ALUMINUM and ALUMINUM PIGMENTED COATING	NONE						
						MIN	MAX	MIN	MIN						
5	5/32	.1640-32 UNJC-3A	.1595 .1565	.3304	.311	.1621	.1635	.1625	.1630	.004	.070	.0269 .0251	.025 .015	1/32" x 45°	.2671 .2669
6	3/16	.1900-32 UNJF-3A	.1840 .1810	.3813	.350	.1881	.1895	.1885	.1890	.005	.080	.0284 .0264	.030 .020	1/32" x 45°	.3145 .3143
8	1/4	.2500-28 UNJF-3A	.2440 .2410	.5066	.475	.2481	.2495	.2485	.2490	.006	.108	.0349 .0328	.030 .020	1/32" x 45°	.4243 .4241
10	5/16	.3125-24 UNJF-3A	.3060 .3020	.6335	.602	.3106	.3120	.3110	.3115	.007	.135	.0402 .0381	.040 .030	3/64" x 45°	.5387 .5385
12	3/8	.3750-24 UNJF-3A	.3680 .3640	.7604	.729	.3731	.3745	.3735	.3740	.008	.162	.0468 .0447	.040 .030	3/64" x 45°	.6500 .6498

DIMENSIONS AND TOLERANCE PER ASME Y14.5-2018.
DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED.
DIMENSIONS APPLY AFTER FINISH, AND BEFORE SOLID FILM LUBE AND CETYL ALCOHOL LUBE UNLESS OTHERWISE SPECIFIED.
SURFACE TEXTURE PER ASME B46.1. HEAD TO SHANK FILLET, THREAD FLANKS, THREAD ROOT, SHANK ("D" DIAMETER) AND BEARING SURFACE OF HEAD, 32 MICROINCHES RA. OTHER SURFACES, 125 MICROINCHES RA.

PIN, EDDIE BOLT® 2, 100° FLUSH TENSION HEAD, SPLINE-LOK® SOCKET RECESS, 95 KSI SHEAR MINIMUM, 6AL-4V TITANIUM

HOWMET AEROSPACE

HOWMET AEROSPACE PART STANDARD

HOWMET FASTENING SYSTEMS
CITY OF INDUSTRY OPERATIONS
135 N. UNRUH AVE., CITY OF INDUSTRY, CA 91744

ELS320

REV: **R**
REV DATE: 19-JUL-2023
SHEET 1 OF 6

DATA CLASSIFICATION: GENERAL | ECCN: EAR99 | CAGE CODE: 1RC86

TABLE I - DIMENSIONS & MECHANICAL PROPERTIES (CONTINUED)

FIRST DASH NO.	∅NOM	SPLINE-LOK®			Z MAX ▷2◁	DOUBLE SHEAR STRENGTH LBF MIN	TENSILE STRENGTH LBF MIN
		(∅Y)	T DEPTH MIN	J DEPTH MAX			
5	5/32	.100	.075	.140	.010	4,010	2,180
6	3/16	.120	.075	.140	.015	5,380	3,180
8	1/4	.160	.090	.160	.015	9,300	5,820
10	5/16	.189	.125	.210	.015	14,600	9,200
12	3/8	.242	.120	.205	.015	21,000	14,000

PROCUREMENT SPECIFICATION: EBS2202.
MATERIAL: 6AL-4V TITANIUM ALLOY PER AMS4928 OR AMS4967.
HEAT TREAT: 95,000 PSI SHEAR MINIMUM.
FINISH: NC = NO FINISH & CETYL LUBE PER AS87132.
NF = DRY FILM LUBE PER AS5272, TYPE I (HEAD & SHANK ONLY, OVERSPRAY PERMITTED) AND CETYL LUBE PER AS87132.
NN = NO FINISH AND NO LUBE.
JC = ALUMINUM PIGMENTED COATING PER PS103 ON HEAD AND SHANK ONLY. CETYL LUBE PER AS87132. ▷8◁
VC = IVD ALUMINUM COATING PER MIL-DTL-83448, TYPE II, CLASS 3 ON HEAD AND SHANK ONLY, AND CETYL LUBE PER AS87132 ▷8◁

PART CODE & EXAMPLE: ELS320 NN 8 -8

- ELS320 — BASIC PART NUMBER
- NN — FINISH: NO FINISH AND NO LUBE.
- 8 — 8/32" OR 1/4" NOMINAL DIAMETER (1/32" INCREMENTS)
- -8 — 8/16" OR 1/2 " MAXIMUM GRIP LENGTH (1/16" INCREMENTS)

GENERAL NOTES:

▷1◁ BLENDED RADIUS TRANSITION PERMITS USE IN INTERFERENCE FIT APPLICATION.

▷2◁ CURVED OR FLAT EDGE MANUFACTURER'S OPTION.

▷3◁ FLUTE LOCATION ("K" DIMENSION) AND GEOMETRY ARE INSPECTED PER SPECIFICATION E106.

▷4◁ THREADS MUST ACCEPT AN AS8879 "GO" RING GAGE TO ASSURE FREE RUNNING NUT CAPABILITY. AS8879 LIMITS DO NOT APPLY TO THE THREADS IN THE FLUTED PORTION OF THE THREAD. THE ∅MINOR AND ∅PITCH MAY BE UP TO .004 BELOW AS8879 MINIMUM VALUES AND ∅MAJOR MAY BE UP TO .002 BELOW SHEET 1 VALUES FOR A DISTANCE EQUAL TO THE FLUTE LENGTH PLUS 1.5P MAX.

▷5◁ SEE TABLE III.

6. PINS MUST BE PACKAGED OR REPACKAGED IN CLEAR SEALED BAGS. EACH BAG MUST BE MARKED WITH PURCHASER'S AND MANUFACTURER'S COMPLETE PART NUMBER, MANUFACTURER'S LOT NUMBER, MANUFACTURER'S OR DISTRIBUTOR'S NAME, AND THE PACK DATE.

7. PARTS WITH A MANUFACTURE DATE ON OR AFTER APRIL 7, 2011, MUST HAVE THE SPINE-LOK ®RECESS PETALS REMOVED IN ACCORDANCE WITH EBS2202. THE REQUIREMENTS OF EBS2202 ARE NOT APPLICABLE TO PARTS WITH A MANUFACTURE DATE PRIOR TO APRIL 7, 2011; THESE PARTS ARE ACCEPTABLE FOR USE UNTIL INVENTORIES ARE DEPLETED.

▷8◁ ALUMINUM COATING / IVD ALUMINUM COATING TO BE APPLIED ON HEAD AND SHANK ONLY. PARTIAL COATING IS ALLOWED IN THE THREAD RUNOUT AREA FOR A MAXIMUM DISTANCE OF .030 FROM THE END OF THE GRIP.

▷9◁ RUNOUT MEASURED WHEN HELD ON THE ∅PITCH OF THE COMPLETE THREADS NEAREST THE SHANK AND CHECKED ON ∅D WITHIN ONE DIAMETER OF THE THREAD RUNOUT.

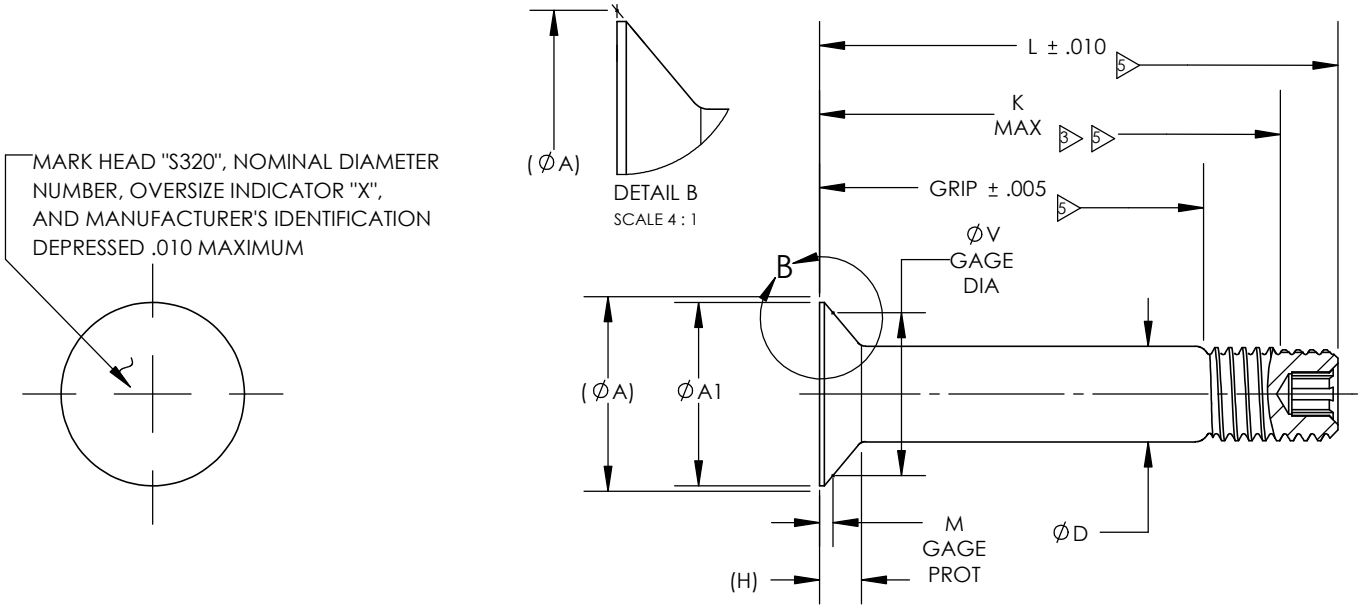

TABLE II (.0156 OVERSIZE) - DIMENSIONS & MECHANICAL PROPERTIES

DASH NUMBER	ØD				(H)	DOUBLE SHEAR STRENGTH LBF MIN
	BEFORE FINISH	AFTER FINISH				
	IVD ALUMINUM and ALUMINUM PIGMENTED COATING	ALL	IVD ALUMINUM and ALUMINUM PIGMENTED COATING	NONE		
	MIN	MAX	MIN	MIN		
5-( )X	NO .0156 OVERSIZE AVAILABLE					
6-( )X	.2012	.2026	.2016	.2021	.075	6,130
8-( )X	.2637	.2651	.2641	.2646	.102	10,490
10-( )X	.3262	.3276	.3266	.3271	.129	16,000
12-( )X	.3887	.3901	.3891	.3896	.156	22,700

GENERAL NOTES (CONTINUED):

10. FOR DIMENSIONS NOT SHOWN, SEE SHEETS 1 AND 2.

11. FOR MATERIAL, FINISH AND LUBE INFORMATION, SEE SHEETS 1 AND 2.

PART CODE & EXAMPLE: ELS320 NN 8 -8 X

- .0156 OVERSIZE
- 8/16" OR 1/2 " MAXIMUM GRIP LENGTH (1/16" INCREMENTS)
- 8/32" OR 1/4" NOMINAL DIAMETER (1/32" INCREMENTS)
- FINISH: NO FINISH AND NO LUBE.
- BASIC PART NUMBER

TABLE III - FOR STANDARD & 1/64" (.0156) OVERSIZE PINS

SECOND DASH NO.	STRUCTURAL THICKNESS		GRIP ± .005	∅5		∅6		∅8		∅10		∅12	
	MIN	MAX		K MAX	L ± .010	K MAX	L ± .010	K MAX	L ± .010	K MAX	L ± .010	K MAX	L ± .010
1	.000	.062	.062	----	----	----	----	----	----	----	----	----	----
2	.063	.125	.125	----	----	----	----	----	----	----	----	----	----
3	.126	.188	.188	.333	.472	.358	.492	.389	.538	----	----	----	----
4	.189	.250	.250	.395	.535	.420	.555	.451	.600	.544	.695	----	----
5	.251	.312	.312	.457	.598	.482	.618	.513	.662	.606	.758	.646	.797
6	.313	.375	.375	.520	.660	.545	.680	.576	.725	.669	.820	.709	.860
7	.376	.438	.438	.583	.722	.608	.742	.639	.788	.732	.882	.772	.923
8	.439	.500	.500	.645	.785	.670	.805	.701	.850	.794	.945	.834	.985
9	.501	.562	.562	.707	.848	.732	.868	.763	.912	.856	1.008	.896	1.047
10	.563	.625	.625	.770	.910	.795	.930	.826	.975	.919	1.070	.959	1.110
11	.626	.688	.688	.833	.972	.858	.992	.889	1.038	.982	1.132	1.022	1.173
12	.689	.750	.750	.895	1.035	.920	1.055	.951	1.100	1.044	1.195	1.084	1.235
13	.751	.812	.812	.957	1.098	.982	1.118	1.013	1.162	1.106	1.258	1.146	1.297
14	.813	.875	.875	1.020	1.160	1.045	1.180	1.076	1.225	1.169	1.320	1.209	1.360
15	.876	.938	.938	1.083	1.222	1.108	1.242	1.139	1.288	1.232	1.382	1.272	1.423
16	.939	1.000	1.000	1.145	1.285	1.170	1.305	1.201	1.350	1.294	1.445	1.334	1.485
17	1.001	1.062	1.062	1.207	1.348	1.232	1.368	1.263	1.412	1.356	1.508	1.396	1.547
18	1.063	1.125	1.125	1.270	1.410	1.295	1.430	1.326	1.475	1.419	1.570	1.459	1.610
19	1.126	1.188	1.188	1.333	1.472	1.358	1.492	1.389	1.538	1.482	1.632	1.522	1.673
20	1.189	1.250	1.250	1.395	1.535	1.420	1.555	1.451	1.600	1.544	1.695	1.584	1.735
21	1.251	1.312	1.312	1.457	1.598	1.482	1.618	1.513	1.662	1.606	1.758	1.646	1.797
22	1.313	1.375	1.375	1.520	1.660	1.545	1.680	1.576	1.725	1.669	1.820	1.709	1.860
23	1.376	1.438	1.438	1.583	1.722	1.608	1.742	1.639	1.788	1.732	1.882	1.772	1.923
24	1.439	1.500	1.500	1.645	1.785	1.670	1.805	1.701	1.850	1.794	1.945	1.834	1.985
25	1.501	1.562	1.562	1.707	1.848	1.732	1.868	1.763	1.912	1.856	2.008	1.896	2.047
26	1.563	1.625	1.625	1.770	1.910	1.795	1.930	1.826	1.975	1.919	2.070	1.959	2.110
27	1.626	1.688	1.688	1.833	1.972	1.858	1.992	1.889	2.038	1.982	2.132	2.022	2.173
28	1.689	1.750	1.750	1.895	2.035	1.920	2.055	1.951	2.100	2.044	2.195	2.084	2.235
29	1.751	1.812	1.812	1.957	2.098	1.982	2.118	2.013	2.162	2.106	2.258	2.146	2.297
30	1.813	1.875	1.875	2.020	2.160	2.045	2.180	2.076	2.225	2.169	2.320	2.209	2.360
31	1.876	1.938	1.938	2.083	2.222	2.108	2.242	2.139	2.288	2.232	2.382	2.272	2.423
32	1.939	2.000	2.000	2.145	2.285	2.170	2.305	2.201	2.350	2.294	2.445	2.334	2.485

DASH NUMBER INDICATES MAX GRIP LENGTH IN .0625 INCREMENTS; LONGER LENGTHS MAY BE SPECIFIED BY USE OF WHOLE DASH NUMBERS ONLY.

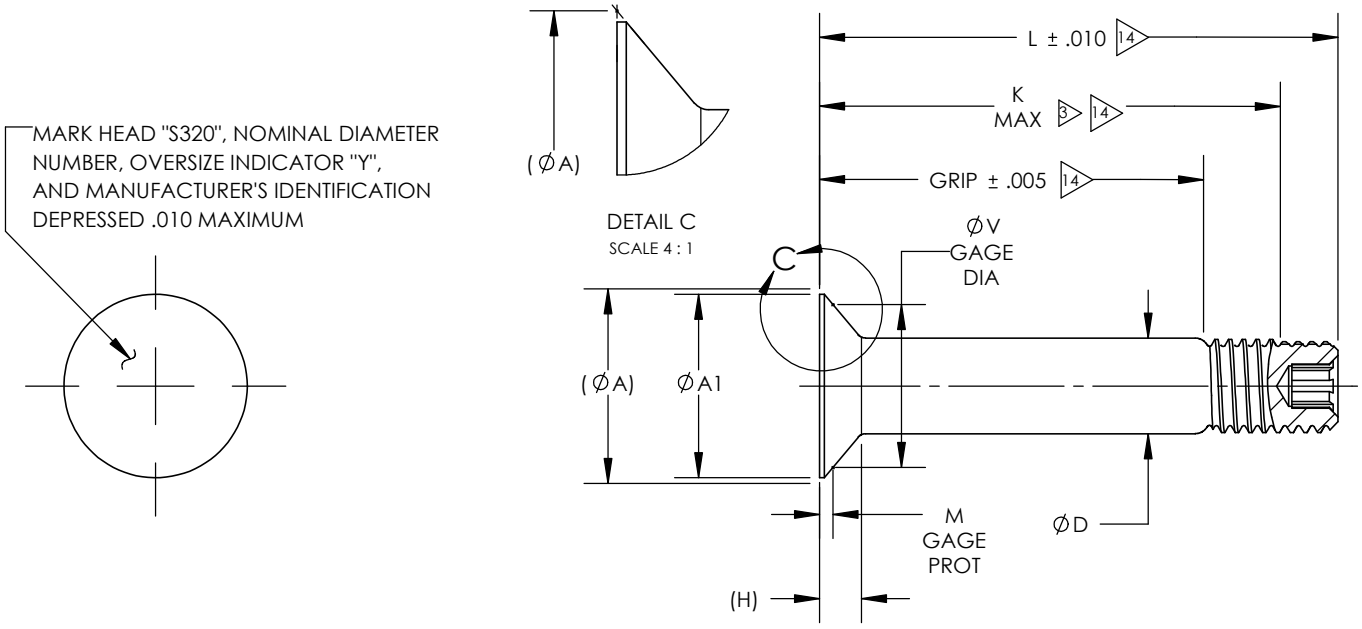

TABLE IV (.0312 OVERSIZE) - DIMENSIONS & MECHANICAL PROPERTIES

DASH NUMBER	ØD				(H)	DOUBLE SHEAR STRENGTH LBF MIN
	BEFORE FINISH	AFTER FINISH				
	IVD ALUMINUM and ALUMINUM PIGMENTED COATING	ALL	IVD ALUMINUM and ALUMINUM PIGMENTED COATING	NONE		
	MIN	MAX	MIN	MIN		
6-( )Y	.2168	.2182	.2172	.2177	.069	7,100
8-( )Y	.2793	.2807	.2797	.2802	.095	11,800
10-( )Y	.3418	.3432	.3422	.3427	.122	17,600
12-( )Y	.4043	.4057	.4047	.4052	.149	24,600
5-( )Y	USE STANDARD DIAMETER ELS320NN6-( )					

GENERAL NOTES (CONTINUED):

12. FOR DIMENSIONS NOT SHOWN, SEE SHEETS 1 AND 2.

13. FOR MATERIAL, FINISH AND LUBE INFORMATION, SEE SHEETS 1 AND 2.

14 SEE TABLE V.

PART CODE & EXAMPLE: ELS320 NN 8 -8 Y

- Y — .0312 OVERSIZE
- -8 — 8/16" OR 1/2 " MAXIMUM GRIP LENGTH (1/16" INCREMENTS)
- 8 — 8/32" OR 1/4" NOMINAL DIAMETER (1/32" INCREMENTS)
- NN — FINISH: NO FINISH AND NO LUBE.
- ELS320 — BASIC PART NUMBER

TABLE V - FOR 1/32" (.0312) OVERSIZE PINS

SECOND DASH NO.	STRUCTURAL THICKNESS		GRIP ± .005	∅6		∅8		∅10		∅12	
	MIN	MAX		K MAX	L ± .010	K MAX	L ± .010	K MAX	L ± .010	K MAX	L ± .010
1	.000	.062	.062	----	----	----	----	----	----	----	----
2	.063	.125	.125	----	----	----	----	----	----	----	----
3	.126	.188	.188	.378	.512	----	----	----	----	----	----
4	.189	.250	.250	.440	.575	.486	.635	.579	.740	----	----
5	.251	.312	.312	.502	.638	.548	.697	.641	.803	.691	.842
6	.313	.375	.375	.565	.700	.611	.760	.704	.865	.754	.905
7	.376	.438	.438	.628	.762	.674	.823	.767	.927	.817	.968
8	.439	.500	.500	.690	.825	.736	.885	.829	.990	.879	1.030
9	.501	.562	.562	.752	.888	.798	.947	.891	1.053	.941	1.092
10	.563	.625	.625	.815	.950	.861	1.010	.954	1.115	1.004	1.155
11	.626	.688	.688	.878	1.012	.924	1.073	1.017	1.177	1.067	1.218
12	.689	.750	.750	.940	1.075	.986	1.135	1.079	1.240	1.129	1.280
13	.751	.812	.812	1.002	1.138	1.048	1.197	1.141	1.303	1.191	1.342
14	.813	.875	.875	1.065	1.200	1.111	1.260	1.204	1.365	1.254	1.405
15	.876	.938	.938	1.128	1.262	1.174	1.323	1.267	1.427	1.317	1.468
16	.939	1.000	1.000	1.190	1.325	1.236	1.385	1.329	1.490	1.379	1.530
17	1.001	1.062	1.062	1.252	1.388	1.298	1.447	1.391	1.553	1.441	1.592
18	1.063	1.125	1.125	1.315	1.450	1.361	1.510	1.454	1.615	1.504	1.655
19	1.126	1.188	1.188	1.378	1.512	1.424	1.573	1.517	1.677	1.567	1.718
20	1.189	1.250	1.250	1.440	1.575	1.486	1.635	1.579	1.740	1.629	1.780
21	1.251	1.312	1.312	1.502	1.638	1.548	1.697	1.641	1.803	1.691	1.842
22	1.313	1.375	1.375	1.565	1.700	1.611	1.760	1.704	1.865	1.754	1.905
23	1.376	1.438	1.438	1.628	1.762	1.674	1.823	1.767	1.927	1.817	1.968
24	1.439	1.500	1.500	1.690	1.825	1.736	1.885	1.829	1.990	1.879	2.030
25	1.501	1.562	1.562	1.752	1.888	1.798	1.947	1.891	2.053	1.941	2.092
26	1.563	1.625	1.625	1.815	1.950	1.861	2.010	1.954	2.115	2.004	2.155
27	1.626	1.688	1.688	1.878	2.012	1.924	2.073	2.017	2.177	2.067	2.218
28	1.689	1.750	1.750	1.940	2.075	1.986	2.135	2.079	2.240	2.129	2.280
29	1.751	1.812	1.812	2.002	2.138	2.048	2.197	2.141	2.303	2.191	2.342
30	1.813	1.875	1.875	2.065	2.200	2.111	2.260	2.204	2.365	2.254	2.405
31	1.876	1.938	1.938	2.128	2.262	2.174	2.323	2.267	2.427	2.317	2.468
32	1.939	2.000	2.000	2.190	2.325	2.236	2.385	2.329	2.490	2.379	2.530

DASH NUMBER INDICATES MAX GRIP LENGTH IN .0625 INCREMENTS; LONGER LENGTHS MAY BE SPECIFIED BY USE OF WHOLE DASH NUMBERS ONLY.