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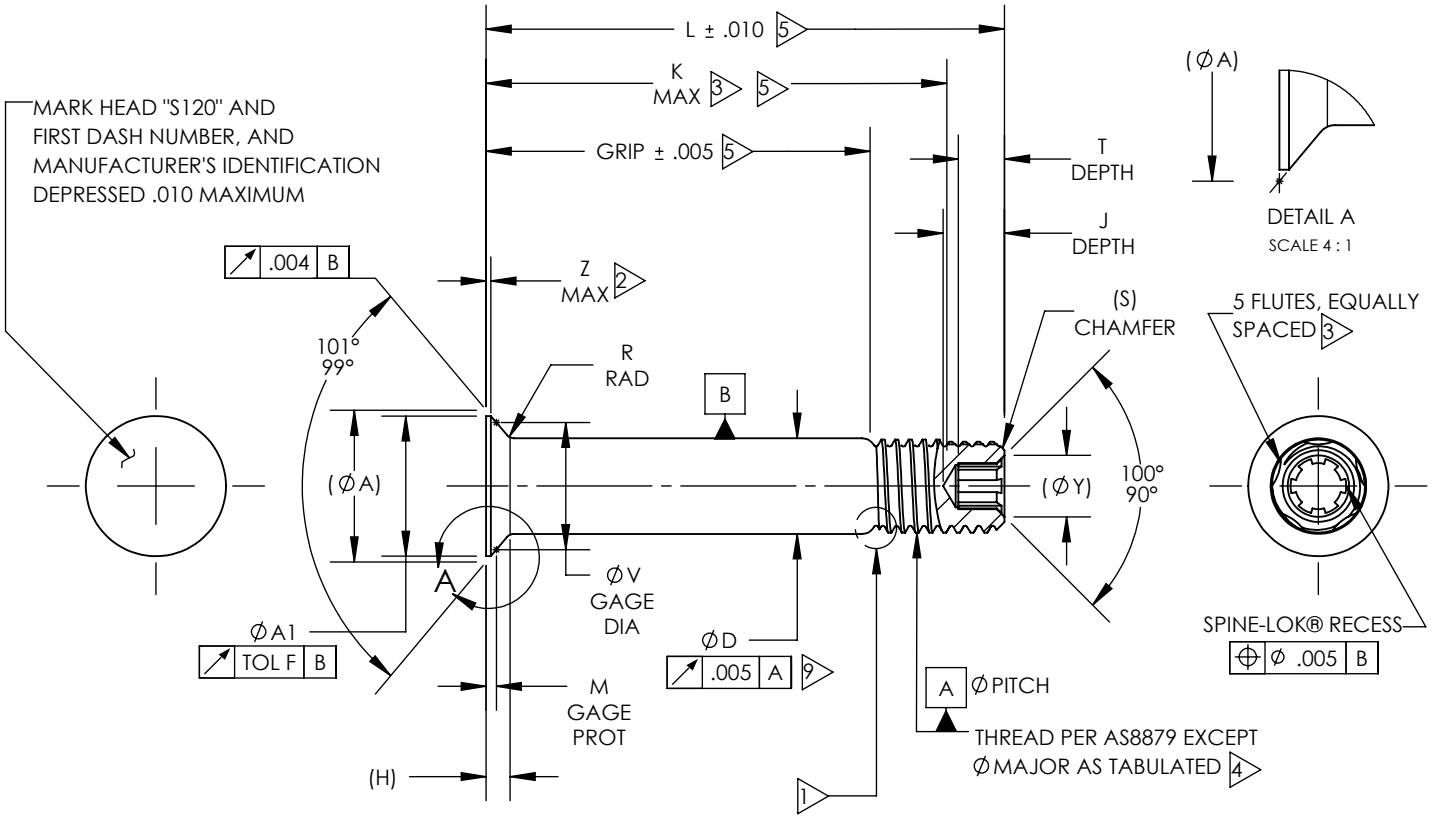

TABLE I - DIMENSIONS & MECHANICAL PROPERTIES

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								
						ALUM COAT	ALL	ALUM COAT	NONE						
		THREAD SIZE	ØMAJOR MOD			MIN	MAX	MIN	MIN						
5	5/32	.1640-32 UNJC-3A	.1595 .1565	.2612	.237	.1621	.1635	.1625	.1630	.004	.040	.0177 .0163	.025 .015	1/32" x 45°	.2195 .2193
6	3/16	.1900-32 UNJF-3A	.1840 .1810	.3016	.266	.1881	.1895	.1885	.1890	.005	.046	.0244 .0224	.030 .020	1/32" x 45°	.2441 .2439
8	1/4	.2500-28 UNJF-3A	.2440 .2410	.3948	.359	.2481	.2495	.2485	.2490	.006	.060	.0269 .0248	.030 .020	1/32" x 45°	.3314 .3312
10	5/16	.3125-24 UNJF-3A	.3060 .3020	.4739	.438	.3106	.3120	.3110	.3115	.007	.067	.0294 .0273	.040 .030	3/64" x 45°	.4047 .4045
12	3/8	.3750-24 UNJF-3A	.3680 .3640	.5604	.524	.3731	.3745	.3735	.3740	.008	.077	.0318 .0297	.040 .030	3/64" x 45°	.4854 .4852

DIMENSIONS AND TOLERANCE PER ASME Y14.5-2018.
DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED.
DIMENSIONS APPLY AFTER FINISH AND SOLID FILM LUBRICATION 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 SHEAR HEAD, SPLINE-LOK® SOCKET RECESS, 95 KSI SHEAR MINIMUM, 6AL-4V TITANIUM

HOWMET AEROSPACE	**HOWMET AEROSPACE PART STANDARD**	**ELS120**
	HOWMET FASTENING SYSTEMS CITY OF INDUSTRY OPERATIONS 135 N. UNRUH AVE., CITY OF INDUSTRY, CA 91744	REV: **M** REV DATE: 30-SEP-2020 SHEET 1 OF 6
DATA CLASSIFICATION: GENERAL	ECCN: EAR99	CAGE CODE: 1RC86

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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	1,500
6	3/16	.120	.075	.140	.015	5,380	2,000
8	1/4	.160	.090	.160	.015	9,300	3,700
10	5/16	.189	.125	.210	.015	14,600	5,500
12	3/8	.242	.120	.205	.015	21,000	7,200

PROCUREMENT SPECIFICATION: EBS2202.

MATERIAL: 6AL-4V TITANIUM ALLOY PER AMS4928 OR AMS4967.

HEAT TREAT: 95,000 PSI SHEAR MINIMUM.

FINISH:
NC = NO FINISH AND CETYL ALCOHOL LUBE PER AS87132.
NF = DRY FILM LUBE PER AS5272, TYPE I (HEAD & SHANK ONLY, OVERSPRAY PERMITTED) AND CETYL ALCOHOL LUBE PER AS87132.
NN = NO FINISH AND NO LUBE
JC = ALUMINUM COAT PER PS103 ON HEAD AND SHANK ONLY. CETYL ALCOHOL LUBE PER AS87132. 6

PART CODE & EXAMPLE: ELS120 NN 8 -8

- -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.
- ELS120: BASIC PART NUMBER

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. ALUMINUM COAT TO BE APPLIED TO HEAD AND SHANK ONLY. OVERSPRAY ALLOWED IN THE THREAD RUNOUT AREA FOR A MAXIMUM DISTANCE OF .030 FROM THE END OF THE GRIP.
7. PINS MUST BE PACKAGED OR REPACKAGED IN CLEAR SEALED BAGS. EACH BAG MUST CONTAIN A MAX OF 100 PINS FOR 5 AND 6 DIAMETERS, 50 PINS PER BAG FOR 8 AND 10 DIAMETERS, AND 25 PINS PER BAG FOR 12 DIAMETER. 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.
8. 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.
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.

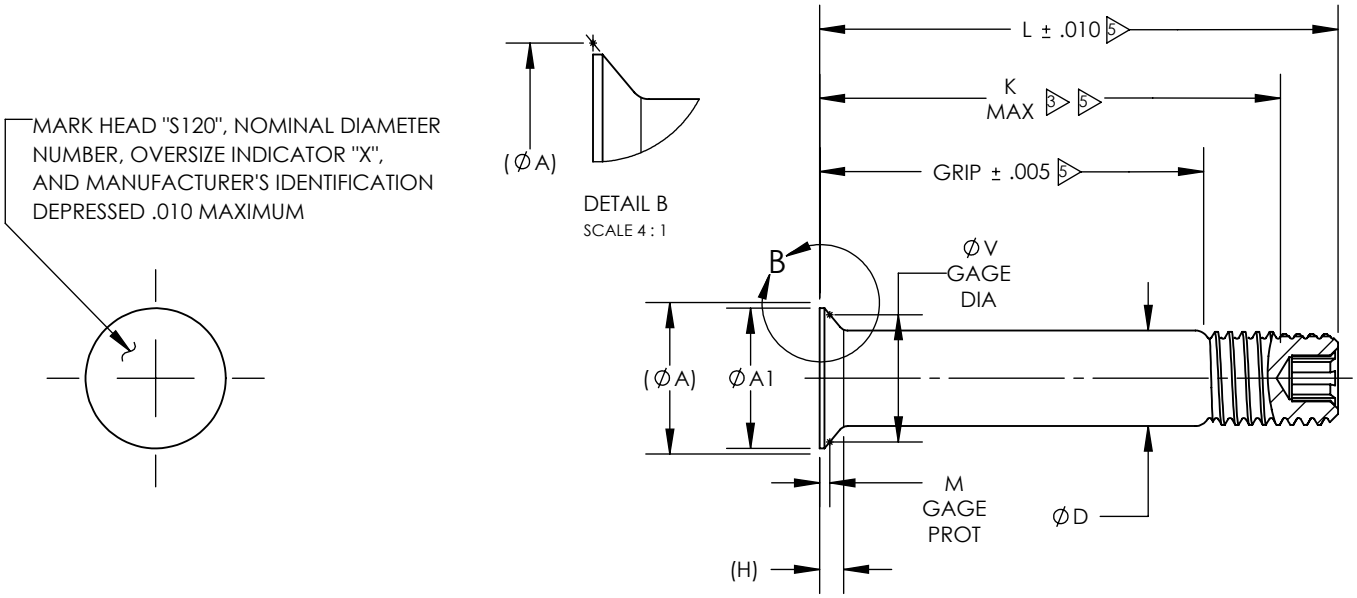

TABLE II (.0156 OVERSIZE) - DIMENSIONS & MECHANICAL PROPERTIES

DASH NUMBER	(∅A)	∅A1 MIN	∅D				(H)	M GAGE PROT	∅V GAGE	DOUBLE SHEAR STRENGTH LBF MIN
			BEFORE FINISH	AFTER FINISH						
			ALUM COAT	ALL	ALUM COAT	NONE				
			MIN	MAX	MIN	MIN				
5-( )X	NO .0156 OVERSIZE AVAILABLE									
6-( )X	.3146	.283	.2012	.2026	.2016	.2021	.046	.0299 .0274	.2440 .2438	6,130
8-( )X	.4104	.379	.2637	.2651	.2641	.2646	.060	.0335 .0309	.3314 .3312	10,490
10-( )X	.4895	.458	.3262	.3276	.3266	.3271	.066	.0359 .0333	.4047 .4045	16,000
12-( )X	.5749	.544	.3887	.3901	.3891	.3896	.076	.0379 .0353	.4854 .4852	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: ELS120 NN 8 -8 X

- X — .0156 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.
- ELS120 — BASIC PART NUMBER

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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	.270	.410	----	----	----	----	----	----	----	----
3	.126	.188	.188	.333	.472	.358	.492	.389	.538	.482	.632	.522	.673
4	.189	.250	.250	.395	.535	.420	.555	.451	.600	.544	.695	.584	.735
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.

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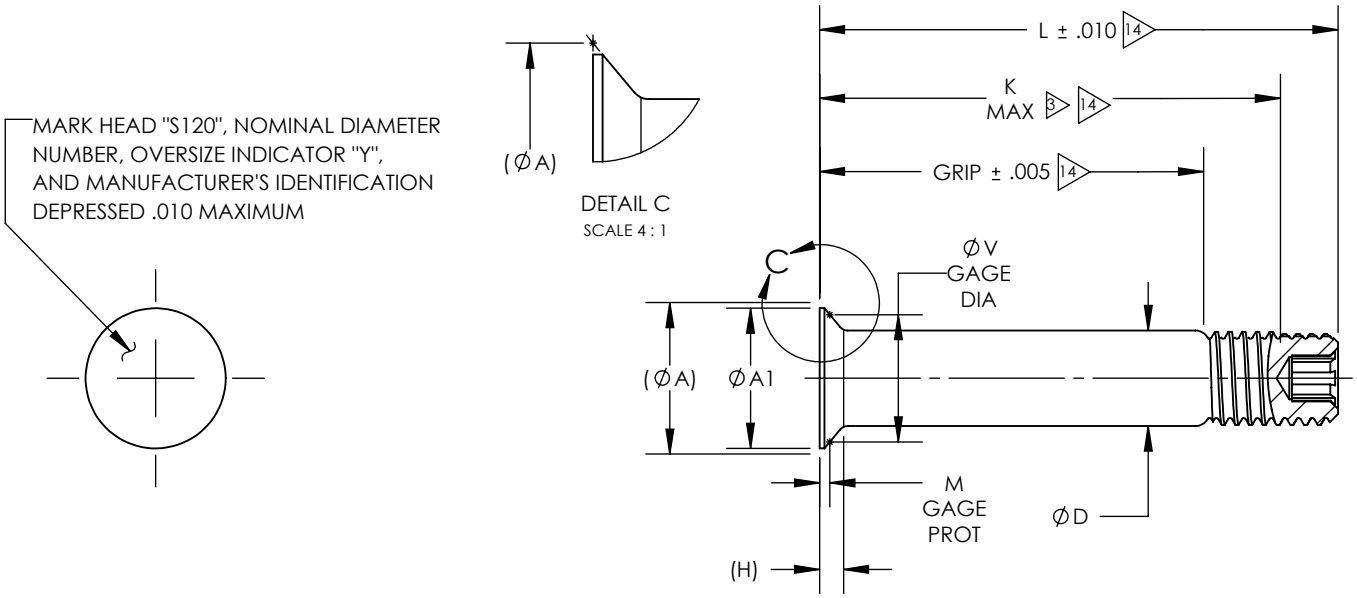

TABLE IV (.0312 OVERSIZE) - DIMENSIONS & MECHANICAL PROPERTIES

DASH NUMBER	(∅A)	∅A1 MIN	∅D				(H)	M GAGE PROT	∅V GAGE	DOUBLE SHEAR STRENGTH LBF MIN
			BEFORE FINISH	AFTER FINISH						
			ALUM COAT	ALL	ALUM COAT	NONE				
			MIN	MAX	MIN	MIN				
5-( )Y	USE STANDARD DIAMETER ELS120NN6-( )									
6-( )Y	.3303	.299	.2168	.2182	.2172	.2177	.046	.0268 .0243	.2671 .2669	7,100
8-( )Y	.4260	.395	.2793	.2807	.2797	.2802	.060	.0401 .0374	.3314 .3312	11,800
10-( )Y	.5051	.474	.3418	.3432	.3422	.3427	.066	.0310 .0284	.4320 .4318	17,600
12-( )Y	.5916	.560	.4043	.4057	.4047	.4052	.076	.0450 .0422	.4854 .4852	24,600

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: ELS120 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.
- ELS120 — BASIC PART NUMBER

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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	.424	.573	.517	.677	.567	.718
4	.189	.250	.250	.440	.575	.486	.635	.579	.740	.629	.780
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.

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