



DESCRIPTION

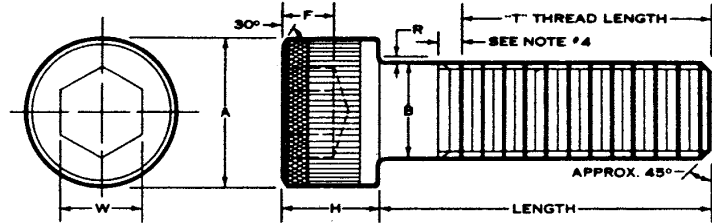
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Sockets & Pins

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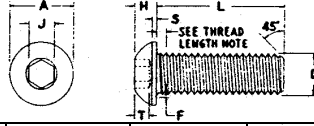
SOCKET HEAD CAP SCREWS



Size		A	B	F	H	R	T	W	X	Tap Drill Size		Body Drill Size
UNC	UNF									UNC	UNF	
---	#0-80 UNF-3A	.096 .091	.0600 .0568	.025	.0600 .057	.007	.500	.050	.006	--	1.25 mm	#51
#1-64 UNC-3A	#1-72 UNF-3A	.118 .112	.0730 .0695	.031	.0730 .070	.007	.625	.0625	.006	1.5 mm	1.5 mm	#46
#2-56 UNC-3A	#2-64 UNF-3A	.140 .134	.0860 .0822	.038	.086 .083	.008	.625	.0781	.006	#50	1.85 mm	3/32
#3-48 UNC-3A	#3-56 UNF-3A	.161 .154	.0990 .0949	.044	.099 .095	.008	.625	.0781	.006	#46	2.1 mm	#36
#4-40 UNC-3A	#4-48 UNF-3A	.183 .176	.1120 .1075	.051	.112 .108	.009	.750	.0937	.006	2.3 mm	#42	#31
#5-40 UNC-3A	#5-44 UNF-3A	.205 .198	.1250 .1202	.057	.125 .121	.010	.750	.0937	.006	#37	#37	9/64
#6-32 UNC-3A	#6-40 UNF-3A	.226 .218	.1380 .1329	.064	.138 .134	.010	.750	.1093	.006	#33	#32	#23
#8-32 UNC-3A	#8-36 UNF-3A	.270 .262	.1640 .1585	.077	.164 .159	.012	.875	.1406	.006	#29	3.5 mm	#15
#10-24 UNC-3A	#10-32 UNF-3A	.312 .303	.1900 .1840	.090	.190 .185	.014	.875	.1562	.006	#24	#20	#5
1/4-20 UNC-3A	1/4-28 UNF-3A	.375 .365	.2500 .2435	.120	.250 .244	.014	1.000	.1875	.006	#6	5.5 mm	17/64
5/16-18 UNC-3A	5/16-24 UNF-3A	.468 .457	.3125 .3053	.151	.312 .306	.017	1.125	.2500	.006	G	1	21/64
3/8-16 UNC-3A	3/8-24 UNF-3A	.562 .550	.3750 .3678	.182	.375 .368	.020	1.250	.3125	.008	O	8.6 mm	23/64
7/16-14 UNC-3A	7/16-20 UNF-3A	.656 .642	.4375 .4294	.213	.437 .430	.023	1.375	.3750	.009	9.4 mm	25/64	29/64
1/2-13 UNC-3A	1/2-20 UNF-3A	.750 .735	.5000 .4919	.245	.500 .492	.026	1.500	.3750	.010	27/64	11.5 mm	33/64
9/16-12 UNC-3A	9/16-18 UNF-3A	.843 .827	.5625 .5538	.265	.562 .554	.028	1.625	.4375	.011	31/64	1/2	37/64
5/8-11 UNC-3A	5/8-18 UNF-3A	.937 .921	.6250 .6163	.307	.625 .616	.032	1.750	.5000	.013	17/32	14.5 mm	41/64
3/4-10 UNC-3A	3/4-16 UNF-3A	1.125 1.107	.7500 .7406	.370	.750 .740	.039	2.000	.6250	.015	21.32	17.5 mm	49/64
7/8-9 UNC-3A	7/8-14 UNF-3A	1.312 1.293	.8750 .8647	.432	.875 .864	.044	2.250	.7500	.018	49/64	20.5 mm	57/64
1-8 UNC-3A	1-14 UNF-3A	1.500 1.479	1.0000 .9886	.495	1.000 .988	.050	2.500	.7500	.020	7/8	23.5 mm	1-1/64
1-1/8-7 UNC-2A	1-1/8-12 UNF-2A	1.687 1.665	1.1250 1.1086	.557	1.125 1.111	.055	2.812	.8750	.023	25 mm	1-3/64	1-5/32
1-1/4-7 UNC-2A	1-1/4-12 UNF-2A	1.875 1.852	1.2500 1.2336	.620	1.250 1.236	.060	3.125	.8750	.025	1-7/64	1-11/64	1-9/32
1-3/8-6 UNC-2A	1-3/8-12 UNF-2A	2.062 2.038	1.3750 1.3568	.682	1.375 1.360	.065	3.437	1.0000	.028	1-7/32	1-19/564	1-13/32
1-1/2-6 UNC-2A	1-1/2-12 UNF-2A	2.250 2.224	1.5000 1.4818	.745	1.500 1.485	.070	3.750	1.0000	.030	34 mm	36 mm	1-19/32
1-3/4-5 UNC-2A	1-3/4-12 UN-2A	2.625 2.597	1.7500 1.7295	.870	1.750 1.734	.080	4.375	1.2500	.035	1-35/64		1-25/32
2-4-1/2 UNC-2A	2-12 UN-2A	3.000 2.970	2.0000 1.9780	.995	2.000 1.983	.090	5.000	1.5000	.040	1-25/32		2-1/32
2-1/4-4-1/2 UNC-2A	2-1/4-12 UN-2A	3.375 3.344	2.2500 2.2280	1.120	2.250 2.232	.100	5.625	1.7500	.045	2-1/32		2-9/32
2-1/2-4 UNC-2A	2-1/2-12 UN-2A	3.750 3.717	2.5000 2.4762	1.245	2.500 2.481	.110	6.250	1.7500	.050	2-1/4		2-17/32
2-3/4-4 UNC-2A	2-3/4-12 UN-2A	4.125 4.090	2.7500 2.7262	1.370	2.750 2.730	.120	6.875	2.0000	.055	2-1/2		2-25/32
3-4 UNC-2A	3-12 UN-2A	4.500 4.464	3.0000 2.9762	1.495	3.000 2.979	.130	7.500	2.2500	.060	2-3/4		3-1/32
3-1/4-4 UNC-2A		4.875	3.2500	1.625	3.250	.140		2.2500				
3-1/2-4 UNC-2A		5.250	3.5000	1.750	3.500	.150		2.7500				
3-3/4-4 UNC-2A		5.625	3.7500	1.875	3.750	.160		2.7500				
4-4 UNC-2A		6.000	4.0000	2.000	4.000	.170		3.0000				

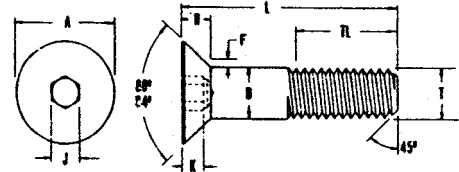


BUTTON HEAD SOCKET CAP SCREWS



Screw Size	Major Diameter		Head Diameter		Head Height		Head Side Height	Hexagon Socket Size	Key Engagement	Fillet		
	Nom	Min	Max	Min	Max	Min	Max	Ref	Nom	Min	Min	Max
#4	40 NC 48 NF	.1072 .1073	.1120	.201	.213	.051	.059	.015	1/16	.035	.005	.010
#6	32 NC 40 NF	.1362 .1332	.1380	.250	.262	.063	.073	.015	5/64	.044	.005	.010
#8	32 NC 36 NF	.1586 .1590	.1640	.298	.312	.077	.087	.015	3/32	.052	.010	.015
#10	24 NC 32 NF	.1834 .1846	.1900	.347	.361	.091	.101	.020	1/8	.070	.010	.015
1/4	20 UNC 28 UNF	.2419 .2435	.2500	.419	.437	.122	.132	.031	5/32	.087	.015	.020
5/16	18 UNC 24 UNF	.3038 .3053	.3125	.527	.547	.152	.166	.031	3/16	.105	.015	.020
3/8	16 UNC 24 UNF	.3656 .3678	.3750	.636	.656	.185	.199	.031	7/32	.122	.015	.020
1/2	13 UNC 20 UNF	.4891 .4919	.5000	.851	.875	.245	.265	.046	5/16	.175	.020	.030
5/8	11 UNC 18 UNF	.6129 .6163	.6250	.970	1.000	.311	.331	.062	3/8	.210	.020	.030

Thread Length Note: All standard lengths threaded to within two threads of head.

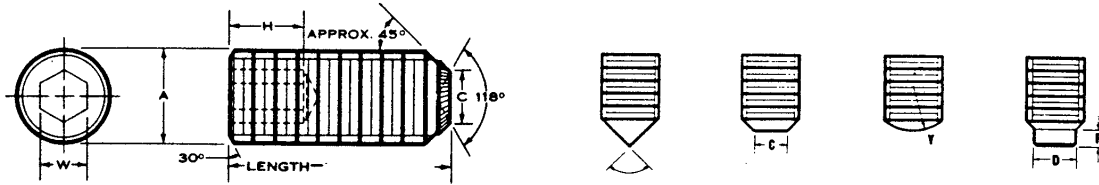


FLAT HEAD SOCKET CAP SCREWS

Thread Size T	Body Diameter D		Head Diameter		Head Height		Hexagon Socket Size	Key Engagement	Fillet	Basic Thread Length TL	
			A		H						
			Absolute Min (w/Flat)	Theoretical Sharp Max	Flushness Tolerance	Ref Max					J Nom
#4	40 NC 48 NF	.1075	.1120	.218	.255	.011	.083	1/16	.055	.011	0.750
#5	40 NC 44 NF	.1202	.1250	.240	.281	.012	.090	5/64	.061	.012	0.750
#6	32 NC 40 NF	.1329	.1380	.263	.307	.013	.097	5/64	.066	.014	0.750
#8	32 NC 36 NF	.1585	.1640	.311	.359	.014	.112	3/32	.076	.016	0.875
#10	24 NC 32 NF	.1840	.1900	.359	.411	.015	.127	1/8	.087	.019	0.875
1/4	20 UNC 28 UNF	.2435	.2500	.480	.531	.016	.161	5/32	.111	.025	1.000
5/16	18 UNC 24 UNF	.3053	.3125	.600	.656	.017	.198	3/16	.135	.031	1.125
3/8	16 UNC 24 UNF	.3678	.3750	.720	.781	.018	.234	7/32	.159	.037	1.250
7/16	14 UNC 20 UNF	.4294	.4375	.781	.844	.018	.234	1/4	.159	.044	1.375
1/2	13 UNC 20 UNF	.4919	.5000	.872	.937	.018	.251	5/16	.172	.050	1.500
5/8	11 UNC 18 UNF	.6163	.6250	1.112	1.188	.022	.324	3/8	.220	.050	1.750
3/4	10 UNC 16 UNF	.7406	.7500	1.355	1.438	.024	.396	3/8	.270	.050	2.000

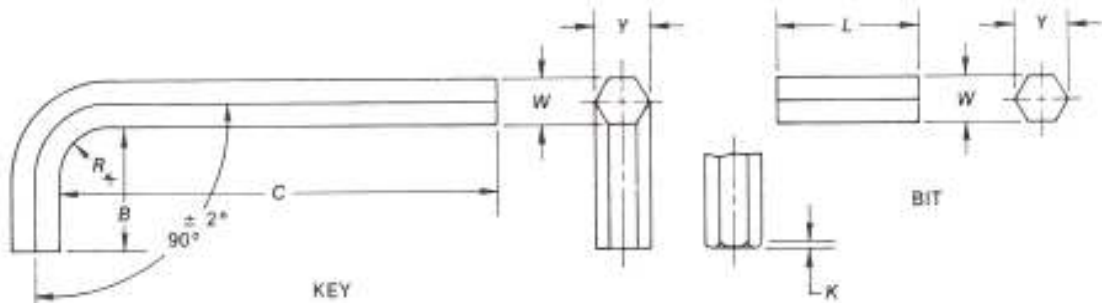


SOCKET SET SCREWS (ALL POINT TYPES)



Screw Size		A		C	D	F	H	W	T	Tap Drill Size	
UNC	UNF	UNC	UNF							Min	Nom
---	#0-80 UNF-3A	---	.0600 .0568	.033 .027	.040 .037	.017 .013	.022	.028	.047	---	1.25 mm
#1-64 UNC-3A	#1-72 UNF-3A	.0730 .0692	.0730 .0695	.040 .033	.049 .045	.021 .017	.028	.035	.055	1.5 mm	1.5 mm
#2-56 UNC-3A	#2-64 UNF-3A	.0860 .0819	.0860 .0822	.047 .039	.057 .053	.024 .020	.028	.035	.062	#50	1.85 mm
#3-48 UNC-3A	#3-56 UNF-3A	.0990 .0945	.0990 .0949	.054 .045	.066 .062	.027 .023	.040	.050	.078	#46	2.1 mm
#4-40 UNC-3A	#4-48 UNF-3A	.1120 .1069	.1120 .1075	.061 .051	.075 .070	.030 .026	.040	.050	.084	2.3 mm	#42
#5-40 UNC-3A	#5-44 UNF-3A	.1250 .1199	.1250 .1202	.067 .057	.083 .078	.033 .027	.050	.0625	.093	#37	#37
#6-32 UNC-3A	#6-40 UNF-3A	.1380 .1320	.1380 .1329	.074 .064	.092 .087	.038 .032	.050	.0625	.109	#33	#32
#8-32 UNC-3A	#8-36 UNF-3A	.1640 .1580	.1640 .1585	.087 .076	.109 .103	.043 .037	.062	.0781	.125	#29	3.5 mm
#10-24 UNC-3A	#10-32 UNF-3A	.1900 .1828	.1900 .1840	.102 .088	.127 .120	.049 .041	.075	.0937	.141	#24	#20
1/4-20 UNC-3A	1/4-28 UNF-3A	.2500 .2419	.2500 .2435	.132 .118	.156 .149	.0665 .0585	.100	.125	.188	#6	5.5 mm
5/16-18 UNC-3A	5/16-24 UNF-3A	.3125 .3038	.3125 .3053	.172 .156	.203 .195	.082 .074	.125	.1562	.234	G	1
3/8-16 UNC-3A	3/8-24 UNF-3A	.3750 .3656	.3750 .3678	.212 .194	.250 .241	.0987 .0887	.150	.1875	.281	O	8.6 mm
7/16-14 UNC-3A	7/16-20 UNF-3A	.4375 .4272	.4375 .4294	.252 .232	.296 .287	.114 .104	.175	.2187	.328	9.4 mm	25/64
1/2-13 UNC-3A	1/2-20 UNF-3A	.5000 .4891	.5000 .4919	.291 .270	.343 .334	.130 .120	.200	.250	.375	27/64	11.5 mm
9/16-12 UNC-3A	9/16-18 UNF-3A	.5625 .5511	.5625 .5538	.332 .309	.390 .379	.1456 .1356	.200	.250	.422	31/64	1/2
5/8-11 UNC-3A	5/8-18 UNF-3A	.6250 .6129	.6250 .6163	.371 .347	.468 .456	.164 .148	.250	.3125	.468	17/32	14.5 mm
3/4-10 UNC-3A	3/4-16 UNF-3A	.7500 .7371	.7500 .7406	.450 .425	.562 .549	.1955 .1795	.300	.375	.562	21.32	17.5 mm
7/8-9 UNC-3A	7/8-14 UNF-3A	.8750 .8611	.8750 .8647	.530 .502	.656 .642	.2267 .2107	.400	.500	.656	49/64	20.5 mm
1-8 UNC-3A	1-14 UNF-3A	1.0000 .9850	1.0000 .9897	.609 .579	.750 .734	.260 .240	.450	.5625	.750	7/8	23.5 mm
1-1/8-7 UNC-2A	1-1/8-12 UNF-2A	1.1250 1.1086	1.1250 1.1136	.689 .655	.843 .826	.291 .271	.450	.5625	.844	25 mm	1-3/64
1-1/4-7 UNC-2A	1-1/4-12 UNF-2A	1.2500 1.2336	1.2500 1.2386	.767 .733	.937 .920	.3225 .3025	.500	.625	.938	1-7/64	1-11/64
1-3/8-6 UNC-3A	1-3/8-12 UNF-2A	1.3750 1.3568	1.3750 1.3636	.848 .808	1.031 1.011	.3537 .3337	.500	.625	1.032	1-7/32	1-19/564
1-1/2-6 UNC-3A	1-1/2-12 UNF-2A	1.5000 1.4818	1.5000 1.4886	.926 .886	1.125 1.105	.385 .365	.600	.750	1.125	34 mm	36 mm

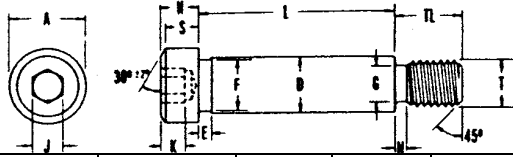
HEXAGON KEYS AND BITS



Nominal Key or Bit Size	W		Y		B		C				R	L	K	
	Hexagon Width Across Corners		Hexagon Width Across Corners		Length of Short Arm		Length of Long Arm				Radius of Bend	Length of Bit	Chamfer	
	Max	Min	Max	Min	Max	Min	Short Series		Long Series					
							Max	Min	Max	Min	Min	Max		
---	0.028	0.0280	0.0275	0.0314	0.0300	0.312	0.125	1.312	1.125	2.688	2.500	0.062	---	0.003
---	0.035	0.0350	0.0345	0.0939	0.0378	0.438	0.250	1.312	1.125	2.766	2.578	0.062	---	0.004
---	0.050	0.0500	0.0490	0.0560	0.0540	0.625	0.438	1.750	1.562	2.938	2.750	0.062	---	0.006
1/16	0.062	0.0625	0.0615	0.0701	0.0680	0.656	0.469	1.844	1.656	3.094	2.906	0.062	---	0.008
5/64	0.078	0.0781	0.0771	0.0880	0.0859	0.703	0.516	1.969	1.781	3.281	3.094	0.078	---	0.008
3/32	0.094	0.0937	0.0927	0.1058	0.1035	0.750	0.562	2.094	1.906	3.469	3.281	0.094	---	0.009
7/64	0.109	0.1094	0.1079	0.1238	0.1210	0.797	0.609	2.219	2.031	3.656	3.469	0.109	---	0.014
1/8	0.125	0.1250	0.1235	0.1418	0.1390	0.844	0.656	2.344	2.156	3.844	3.656	0.125	--	0.015
9/64	0.141	0.1406	0.1391	0.1593	0.1566	0.891	0.703	2.469	2.281	4.031	3.844	0.141	---	0.016
5/32	0.156	0.1562	0.1547	0.1774	0.1745	0.938	0.750	2.594	2.406	4.219	4.031	0.156	---	0.016
3/16	0.188	0.1875	0.1860	0.2135	0.2105	1.031	0.844	2.844	2.656	4.594	4.406	0.188	---	0.022
7/32	0.219	0.2187	0.2172	0.2490	0.2460	1.125	0.938	3.094	2.906	4.969	4.781	0.219	---	0.024
1/4	0.250	0.2500	0.2485	0.2845	0.2815	1.219	1.031	3.344	3.156	5.344	5.156	0.250	---	0.030
5/16	0.312	0.3125	0.3110	0.3570	0.3531	1.344	1.156	3.844	3.656	6.094	5.906	0.312	---	0.032
3/8	0.375	0.3750	0.3735	0.4285	0.4238	1.469	1.281	4.344	4.156	6.844	6.656	0.375	---	0.044
7/16	0.438	0.4375	0.4355	0.5005	0.4944	1.594	1.406	4.844	4.656	7.594	7.406	0.438	---	0.047
1/2	0.500	0.5000	0.4975	0.5715	0.5650	1.719	1.531	5.344	5.156	8.344	8.156	0.500	---	0.050
9/16	0.562	0.5625	0.5600	0.6420	0.6356	1.844	1.656	5.844	5.656	9.094	8.906	0.562	---	0.053
5/8	0.625	0.6250	0.6225	0.7146	0.7080	1.969	1.781	6.344	6.156	9.844	9.656	0.625	---	0.055
3/4	0.750	0.7500	0.7470	0.8580	0.8512	2.219	2.031	7.344	7.156	11.344	11.156	0.750	---	0.070
7/8	0.875	0.8750	0.8720	1.0020	0.9931	2.469	2.281	8.344	8.156	12.844	12.656	0.875	---	0.076
1	1.000	1.0000	0.9970	1.1470	1.1350	2.719	2.531	9.344	9.156	14.344	14.456	1.000	---	0.081
1-1/4	1.250	1.2500	1.2430	---	---	3.250	2.750	11.500	11.000	---	---	1.250	3.750	0.092
1-1/2	1.500	1.5000	1.4930	---	---	3.750	3.250	13.500	13.000	---	---	1.500	4.500	0.104
1-3/4	1.750	1.7500	1.7430	---	---	4.250	3.750	15.500	15.000	---	---	1.750	5.250	0.115
2	2.000	2.0000	1.9930	---	---	4.750	4.250	17.500	17.000	---	---	2.000	6.000	0.126
2-1/4	2.250	2.2500	2.2430	---	---	5.250	4.750	19.500	19.000	---	---	2.250	6.750	0.137
2-3/4	2.750	2.7500	2.7420	---	---	6.250	5.750	23.500	23.000	---	---	2.750	8.250	0.159
3	3.000	3.0000	2.9920	---	---	6.750	6.250	25.500	25.000	---	---	3.000	9.000	0.171

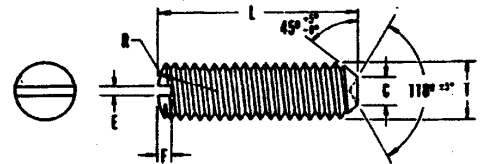


SOCKET HEAD SHOULDER SCREWS



GROUND ON BODY AND UNDERSIDE
OF HEAD—BLUE-BLACK RUST
RESISTANT FINISH

Shoulder Diameter			Head Diameter		Head Weight		Head Side Height	Thread Size	Thread Length	Thread Neck Width	Thread Neck Diam	Hexagon Socket Size	Key Engagement	Shoulder Neck Width	Shoulder Neck Diam
D			A		H		S	T	TL	N	G	J	K	E	F
Nom	Min	Max	Min	Max	Min	Max	Min	Nom		Max	Min	Nom	Min	Max	Min
1/4	.2460	.2480	.357	3/8	.182	3/16	.157	#10-24 NC	3/8	.062	.133	1/8	.094	.093	.236
5/16	.3085	.3105	.419	7/16	.213	7/32	.183	1/4-20 UNC	7/16	.075	.182	5/32	.117	.093	.298
3/8	.3710	.3730	.543	9/16	.244	1/4	.209	5/16-18 UNC	1/2	.083	.237	3/16	.141	.093	.361
1/2	.4960	.4980	.729	3/4	.306	5/16	.262	3/8-16 UNC	5/8	.093	.291	1/4	.188	.093	.486
5/8	.6210	.6230	.853	7/8	.368	3/8	.315	1/2-13 UNC	3/4	.115	.397	5/16	.234	.093	.603
3/4	.7460	.7480	.977	1	.492	1/2	.421	5/8-11 UNC	7/8	.136	.502	3/8	.281	.093	.728



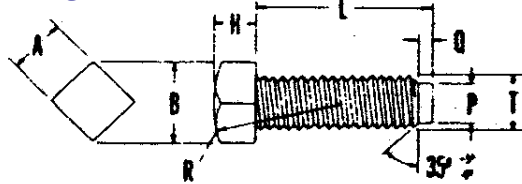
SLOTTED SET SCREWS

Threads to Class 2A Tolerance

Thread Size		Cup Diameter		Slot Width	Slot Depth	Radius	Thread Size		Cup Diameter		Slot Width	Slot Depth	Radius
T		C		E	F	R	T		C		E	F	R
Nom	Threads Per Inch	Min	Max	Nom	Nom	Nom	Nom	Threads Per Inch	Min	Max	Nom	Nom	Nom
#6	32 NC	.064	.074	.025	.035	.138	3/8	16 UNC	.194	.212	.064	.094	.375
#8	32 NC	.076	.087	.029	.041	.164	7/16	14 UNC	.232	.252	.072	.109	.438
#10	24 NC	.088	.102	.032	.048	.190	1/2	13 UNC	.270	.291	.081	.125	.500
#10	32 NF						5/8	11 UNC	.347	.371	.102	.156	.625
1/4	20 UNC	.118	.132	.045	.063	.250	3/4	10 UNC	.425	.450	.129	.188	.750
5/16	18 UNC	.156	.172	.051	.078	.313							

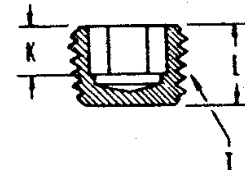


SQUARE HEAD SET SCREWS



Thread Size		Head Height			Width Across Flats			Width Across Corners	Radius	Cup Point Diameter			Lgth Half Cup Point
T		H			A			B	R	P			Q
Nom	Thrds / In.	Nom	Min	Max	Nom	Min	Max	Min	Nom	Nom	Min	Max	Nom
1/4	20 UNC	3/16	.178	.196	1/4	.241	.2500	.331	5/8	5/32	.149	.156	1/16
5/16	18 UNC	15/64	.224	.245	5/16	.302	.3125	.415	25/32	13/64	.195	.203	5/64
3/8	16 UNC	9/32	.270	.293	3/8	.362	.3750	.497	15/16	1/4	.241	.250	3/32
7/16	14 UNC	21/64	.315	.341	7/16	.423	.4375	.581	1-3/32	19/64	.287	.297	7/64
1/2	13 UNC	3/8	.361	.389	1/2	.484	.5000	.665	1-1/4	11/32	.334	.344	1/8
5/8	11 UNC	15/32	.452	.485	5/8	.606	.6250	.833	1-9/16	15/32	.456	.469	5/32
3/4	10 UNC	9/16	.544	.582	3/4	.729	.7500	1.001	1-7/8	9/16	.549	.563	3/16
7/8	9 UNC	21/32	.635	.678	7/8	.852	.8750	1.170	2-3/16	21/32	.656	.642	7/32
1	8 UNC	3/4	.729	.774	1	.974	1.0000	1.337	2-1/2	3/4	.750	.734	1/4

SOCKET PIPE PLUGS



Thread Size		Diam @ Large End	Length	Socket Width Across Flats		Thread Size		Diam @ Large End	Length	Socket Width Across Flats	
T		D	L	J		T		D	L	J	
Nom	Thrds / In.	Max	Nom	Min	Max	Nom	Thds / In.	Max	Nom	Min	Max
1/16	27 NPT	.3125	5/16	.1562	.1582	1/2	14 NPT	.8400	9/16	.3750	.3780
1/8	27 NPT	.4050	5/16	.1875	.1895	3/4	14 NPT	1.0500	5/8	.5625	.5655
1/4	18 NPT	.5400	7/16	.2500	.2520	1	11-1/2 NPT	1.3150	3/4	.6250	.6290
3/8	18 NPT	.6750	1/2	.3125	.3155	1-1/4	11-1/2 NPT	1.6600	13/16	.7500	.7540

Socket Depth (K). The depth of socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension.

TYPICAL PHYSICAL PROPERTIES OF SOCKETS

Product	Ultimate Tensile Strength P.S.I.		Yield Point P.S.I.		Min % Elong. in 2"	Min Reduction In Area %	Hardness Rockwell "C"
	Min	Max	Min	Max			
Socket Head Cap Screws (Alloy)	160,000	185,000	135,000	160,000	10	38	36-40
Socket Set Screws (Alloy)	245,000	275,000	225,000	255,000	8	25	45-53
Socket Shoulder Screws	160,000	185,000	135,000	160,000	10	38	36-40
Socket Pipe Plugs	160,000	185,000	135,000	160,000	10	38	36-40
Sq. Hd Cup Pt Set Screws	245,000	275,000	225,000	255,000	8	25	48-52
Hexagon Keys	---	---	---	---	---	---	50-54
Dowel Pins	250,000	275,000	225,000	250,000	10	---	60-64 Surface 50-54 Core



SET SCREW POINT TERMINOLOGY



Flat Point: One of the least expensive pointing operations applied at the time of heading. This operation provides an end chamfer starting with a diameter smaller than the root diameter of the thread. The minimum reduction of the point is approximately 10% below the maximum minor diameter with an included angle of 40° to 50°.



Dog Point: A straight pointed section reduced in diameter slightly below the root diameter of the thread, usually extending in length about two-thirds the diameter of the thread. Recommended for ease in starting, to ensure against stripping fine threaded products, and to increase efficiency along production lines.



Rolled Point: An efficient method of producing pointed long studs or long screws with an end chamfer similar to the Flat Point. The last thread and a half is slightly cupped by the thread rolover operation.



Pinch Point (Rounded): An inexpensive method of applying a 60° lead-in point having a slightly rounded contour but with pinch-off marks on its surface. Used for aligning several sheets or assembling several parts requiring pilot action.



Nail Point (Pinched): Usually supplied with an approximate 45° included angle having a sharp point and slightly squared surface. Used for impinging or locking against wood or other soft material. Other degrees of included angle and sharpness are available.



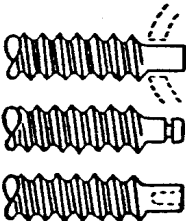
Cupped Point: A special cup section supplied on the end of the threaded member having a depression in the end to reduce the area in contact with the surface which increases its holding and locking power under pressure.



Round Point: A dome-like rounded surface applied to the end of a threaded member in order to offer pressure without disfigurement. Used for adjusting members where friction without cutting action is desired.



Cone Point: A precision cut-pointing operation to provide any required included angle. Offers a smooth surface, accurate length, and a sharp point that can be produced to any desired contour to fit your particular requirements.

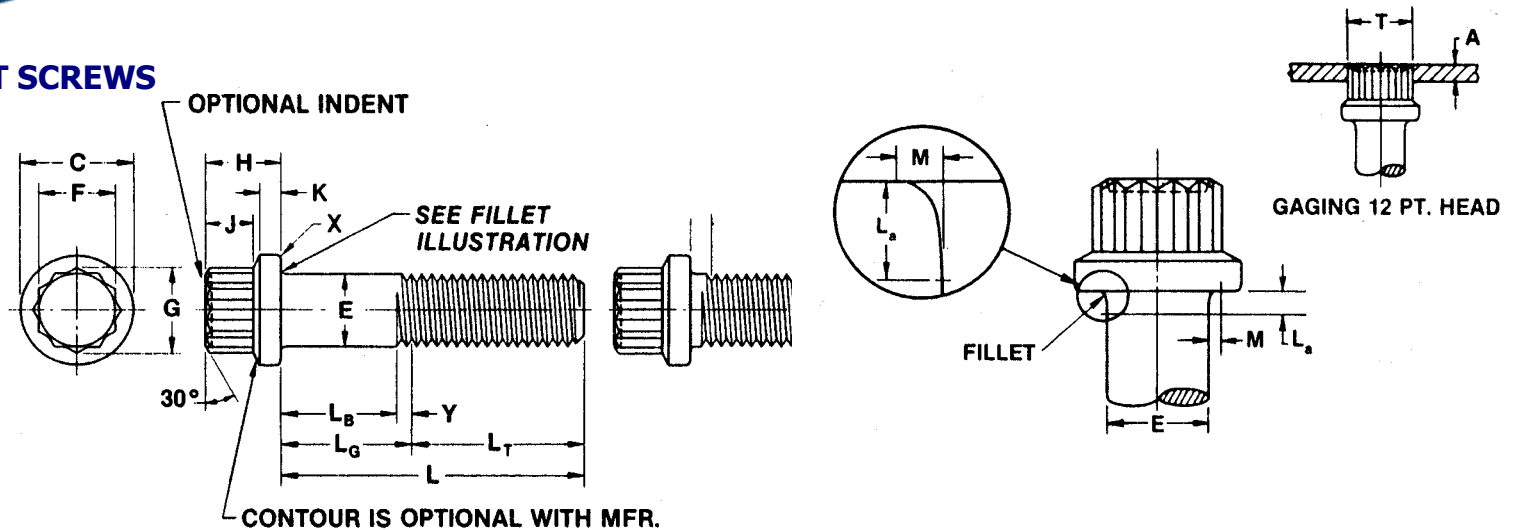


Cut Points: We illustrate a variety of tenon ends that can be supplied in the form of straight cut points wherein the diameter of the tenon end is substantially below the root diameter of the thread and a square abutment surface is required. As illustrated, this style of point offers excellent bearing surface when assembled into prepared washers or other assemblies requiring free turning pressure surfaces, as in clamps, etc.

Cut points can also be grooved for special locking rings, cupped for ease in riveting operating, or machined to other contours to meet your specific requirements.



FLANGE 12-POINT SCREWS

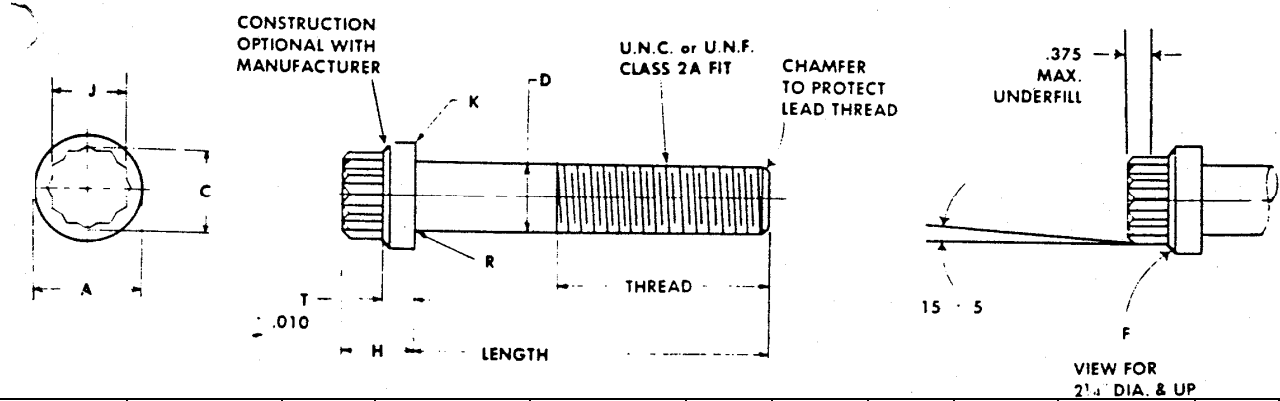


Nominal Size or Basic	E	C		F		G	H	J	K	Runout of Bearing Surface FIM	M		L _a	Bearing Surface Junctionure Radius	X	A		T		L _T	Y	
		Body Diam Min (Max Equal to Nom Size)	Flange Diameter		Width Across Flats		Width Across Corners	Head Height	Wrenching Height		Flange Thickness	Max			Min	Max	Min	Max	Min	Max	Min	Basic
1/4	0.2500	0.2435	0.375	0.365	0.252	0.244	0.278	0.260	0.15	0.058	0.007	0.014	0.009	0.087	0.007	0.020	0.0525	0.0522	0.2783	0.2780	1.000	0.25
5/16	0.3125	0.3053	0.469	0.457	0.315	0.306	0.348	0.312	0.18	0.074	0.008	0.017	0.012	0.087	0.009	0.020	0.0600	0.0597	0.3483	0.3480	1.125	0.28
3/8	0.3750	0.3678	0.562	0.550	0.377	0.368	0.420	0.375	0.21	0.095	0.010	0.020	0.015	0.087	0.012	0.020	0.0711	0.0708	0.4203	0.4200	1.250	0.31
7/16	0.4375	0.4294	0.656	0.642	0.438	0.429	0.489	0.438	0.26	0.109	0.011	0.023	0.018	0.087	0.014	0.030	0.0840	0.0837	0.4893	0.4890	0.375	0.36
1/2	0.5000	0.4919	0.750	0.735	0.502	0.493	0.562	0.500	0.29	0.129	0.013	0.026	0.020	0.087	0.016	0.030	0.0948	0.0945	0.5623	0.5620	1.500	0.38
9/16	0.5625	0.5538	0.844	0.828	0.564	0.555	0.633	0.563	0.33	0.145	0.015	0.029	0.022	0.157	0.018	0.030	0.1071	0.1068	0.6333	0.6330	1.625	0.42
5/8	0.6250	0.6163	0.938	0.921	0.627	0.618	0.705	0.625	0.36	0.166	0.016	0.032	0.024	0.157	0.021	0.040	0.1179	0.1176	0.7053	0.7050	1.750	0.46
3/4	0.7500	0.7406	1.125	1.107	0.752	0.743	0.847	0.750	0.44	0.200	0.020	0.039	0.030	0.157	0.025	0.040	0.1416	0.1413	0.8473	0.8470	2.000	0.50
7/8	0.8750	0.8647	1.312	1.293	0.877	0.866	0.987	0.875	0.51	0.234	0.023	0.044	0.034	0.227	0.031	0.040	0.1656	0.1653	0.9873	0.9870	2.250	0.56
1	1.0000	0.9886	1.500	1.479	1.003	0.991	1.130	1.000	0.60	0.268	0.026	0.050	0.040	0.332	0.034	0.040	0.1893	0.1890	1.1303	1.1300	2.500	0.62
1-1/8	1.1250	1.1086	1.688	1.665	1.128	1.115	1.271	1.125	0.66	0.310	0.029	0.055	0.045	0.332	0.039	0.050	0.2109	0.2106	1.2713	1.2710	2.750	0.71
1-1/4	1.2500	1.2336	1.875	1.852	1.253	1.240	1.414	1.250	0.73	0.350	0.033	0.060	0.050	0.332	0.044	0.050	0.2331	0.2328	1.4143	1.4140	3.000	0.71
1-3/8	1.3750	1.3568	2.062	2.038	1.378	1.365	1.556	1.375	0.80	0.392	0.036	0.065	0.055	0.332	0.048	0.050	0.2544	0.2541	1.5563	1.5560	3.250	0.83
1-1/2	1.5000	1.4818	2.250	2.224	1.503	1.489	1.697	1.500	0.87	0.433	0.039	0.070	0.060	0.332	0.052	0.050	0.2763	0.2760	1.6973	0.6970	3.500	0.83

Material – Alloy Steel (Typically AISI 8640, but can be made from other alloys as well.
Length and thread length specifications are in accordance with ANSI B18.3.



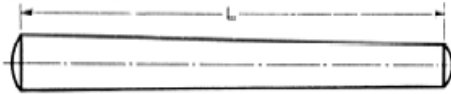
LARGE DIAMETER FLANGE 12-POINT SCREWS



Size	D		A		C	H		J		K	T	F	Socket Wrench Size	R		Thrs per Inch	Pitch Diameter
	Diameter of Body		Diameter of Collar		Across Corn.	Height of Head		Across Flats		Break Edge	Hght of Collar	Rad Top of Collar		Radius			
	Max	Min	Max	Min	Min	Max	Min	Max	Min	Max				Max	Min		
1-1/8	1.125	1.109	1.684	1.665	1.276	1.125	1.111	1.128	1.117	.015	7/16	--	1-1/8	.055	.045	7 12	1.0300- 1.0228 1.0691- 1.0631
1-1/4	1.250	1.234	1.871	1.852	1.418	1.250	1.236	1.254	1.241	.015	31/64	--	1-1/4	0.60	0.50	7 12	1.1550- 1.1476 1.1941- 1.1879
1-3/8	1.375	1.357	2.058	2.038	1.561	1.375	1.360	1.379	1.366	.015	17/32	--	1-3/8	.060	.055	6 12	1.2643- 1.2563 1.3190- 1.3127
1-1/2	1.500	1.482	2.245	2.224	1.705	1.500	1.485	1.505	1.491	.015	19/32	--	1-1/2	.070	.060	6 12	1.3893- 1.3812 1.4440- 1.4376
1-3/4	1.750	1.730	2.620	2.597	1.985	1.750	1.734	1.755	1.740	.015	3/4	--	1-3/4	.080	.070	5 8	1.6174- 1.6085 1.6665- 1.6590
2	2.000	1.980	2.995	2.970	2.268	2.000	1.983	2.005	1.990	0.15	7/8	--	2	.090	.075	4-1/2 8	1.8528- 1.8433 1.9165- 1.9087
2-1/4	2.250	2.227	3.375	3.344	2.480	2.250	2.232	2.255	2.200	.030	1	<u>.100</u> .060	2-1/4	.125	.100	4-1/2 8	2.1028- 2.0931 2.1664- 2.1584
2-1/2	2.500	2.477	3.750	3.717	2.760	2.500	2.481	2.505	2.455	.030	1-7/64	<u>.100</u> .060	2-1/2	.150	.110	4 8	2.3345- 2.3241 2.4164- 2.4082
2-3/4	2.750	2.727	4.125	4.090	3.040	2.750	2.730	2.755	2.700	.030	1-7/32	<u>.150</u> .090	2-3/4	.150	.110	4 8	2.5844- 2.5739 2.6663- 2.6580
3	3.000	2.977	4.500	4.464	3.320	3.000	2.979	3.005	2.950	.030	1-11/32	<u>.150</u> .090	3	.190	.150	4 8	2.8344- 2.8237 2.9162- 2.9077



TAPER PINS



Dimensions of Taper Pins

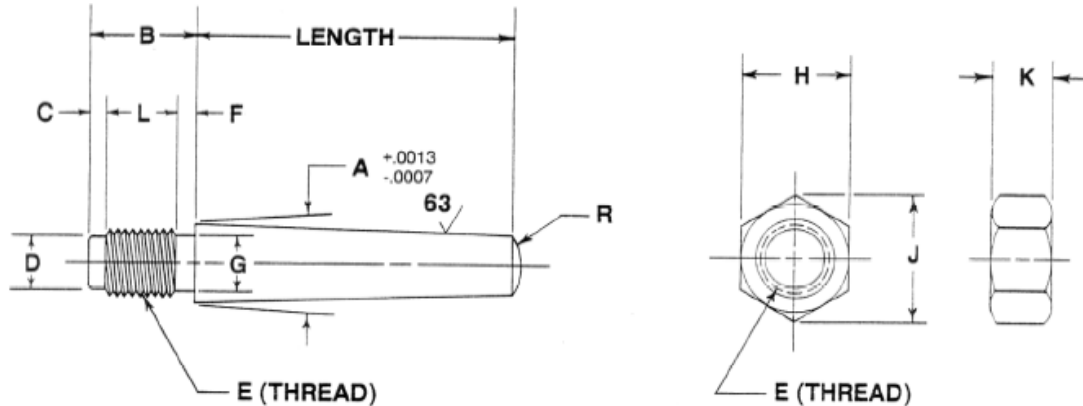
Number	7/0	6/0	5/0	4/0	3/0	2/0	0	1	2	3	4	5	6	7	8	9	10
Size (Large End)	0.0625	0.0780	0.0940	0.1090	0.1250	0.1410	0.1560	0.1720	0.1930	0.2190	0.2500	0.2890	0.3410	0.4090	0.4920	0.5910	0.7060
Length, L																	
0.375	X	X															
0.500	X	X	X	X	X	X	X										
0.625	X	X	X	X	X	X	X	X									
0.750		X	X	X	X	X	X	X	X	X							
0.875					X	X	X	X	X	X							
1.000			X	X	X	X	X	X	X	X	X	X					
1.250						X	X	X	X	X	X	X	X				
1.500							X	X	X	X	X	X	X				
1.750								X	X	X	X	X	X				
2.000									X	X	X	X	X	X			
2.250									X	X	X	X	X	X	X		
2.500									X	X	X	X	X	X	X	X	
2.750										X	X	X	X	X	X	X	X
3.000											X	X	X	X	X	X	X
3.250												X	X	X	X	X	X
3.500													X	X	X	X	X
3.750													X	X	X	X	X
4.000													X	X	X	X	X
4.250														X	X	X	X
4.500															X	X	X
4.750																X	X
5.000																	X
5.250																	
5.500																	
5.750																	
6.000																	

All dimensions are given in inches. Standard reamers are available for pins given above the line.
 Pins Nos. 11 (size 0.8600), 12 (size 1.032), 13 (size 1.241), and 14 (1.523) are special sizes—hence their lengths are special.
 To find small diameter of pin, multiply the length by 0.02083 and subtract the result from the large diameter.

TYPES	COMMERCIAL TYPE	PRECISION TYPE
Sizes	7/0 to 14	7/0 to 10
Tolerance on Diameter	(+0.0013, - 0.0007)	(+0.0013, - 0.0007)
Taper	1/4 In. per Ft.	1/4 In. per Ft.
Length Tolerance	(± 0.030)	(± 0.030)
Concavity Tolerance	None	0.0005 up to 1 in. long 0.001 1 1/16 to 2 in. long 0.002 2 1/16 and longer



THREADED TAPER PINS



NOTE: Tolerances unless otherwise specified:
 Taper 1/4" per foot or 0.02083" per inch.
 Fractions ± .010 Decimals ± .005

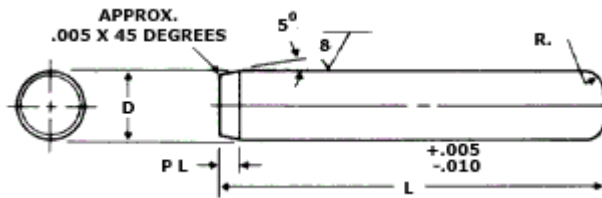
Finished Hex Nut
 SAE Fine Thread
 (Except #0 & #1 Sizes)

NUMBER OF TAPER PIN	LARGE END DIA.	THREAD END LENGTH	NOSE LENGTH	NOSE DIA.	UNF FINE THREAD	NECK WIDTH	NECK DIA.	REF. THREAD LENGTH	APPROX. END RADIUS	HEX ACROSS FLATS	HEX ACROSS CORNERS	HEX NUT THICK.
	A	B	C	D	E	F	G	L	R	H	J	K
0	.154	7/32	1/16	3/32	6-32 NC	—	—	5/32	5/32	5/16	11/32	7/64
1	.170	1/4	1/16	7/64	8-32 NC	1/16	.118	1/8	3/16	11/32	3/8	1/8
2	.191	1/4	1/16	9/64	10-32	1/16	.144	1/8	7/32	3/8	27/64	1/8
3	.217	1/4	1/16	9/64	10-32	1/16	.144	1/8	7/32	3/8	27/64	1/8
4	.248	13/32	5/64	3/16	1/4-28	3/32	.198	15/64	9/32	7/16	31/64	7/32
5	.287	13/32	5/64	3/16	1/4-28	3/32	.198	15/64	9/32	7/16	31/64	7/32
6	.339	15/32	5/64	15/64	5/16-24	3/32	.253	19/64	11/32	1/2	9/16	17/64
7	.407	9/16	5/64	19/64	3/8-24	3/32	.315	25/64	13/32	9/16	5/8	21/64
8	.490	11/16	7/64	11/32	7/16-20	1/8	.368	29/64	1/2	11/16	49/64	3/8
9	.589	3/4	7/64	13/32	1/2-20	1/8	.430	33/64	9/16	3/4	27/32	7/16
10	.704	15/16	7/64	17/32	5/8-18	1/8	.547	45/64	11/16	15/16	1 1/16	35/64
11	.858	1 1/8	1/8	41/64	3/4-16	5/32	.663	27/32	7/8	1 1/8	1 1/4	41/64
12	1.030	1 9/32	9/64	3/4	7/8-14	3/16	.777	61/64	1 1/4	1 5/16	1 29/64	3/4
13	1.239	1 9/32	9/64	3/4	7/8-14	3/16	.777	61/64	1 1/4	1 5/16	1 29/64	3/4
14	1.521	1 7/16	3/16	1	1 1/8-12	3/16	1.000	1 1/16	1 1/2	1 11/16	1 55/64	31/32

Threaded Taper Pins are used whenever a taper pin has to be removed from the driven side!
 Threaded Taper are .002" smaller on the large end diameter than Standard Taper Pins to allow the Threaded Taper Pin to be inserted approx. 3/32" deeper into the taper-reamed hole. The large end of the Threaded Taper Pin is recessed below the surface which allows the nut to bear on the surface when tightened to pull the pin out. Threaded Taper Pins are used when it is inconvenient or impractical to remove a Standard Taper Pin by striking the small end. Diameters of Threaded Taper Pins allow them to be used interchangeably with Plain Taper Pins.



DOWEL PINS



NOMINAL SIZE	DIAMETER D				PL (1)	R
	STANDARD PIN		OVERSIZE PIN		POINT LENGTH (REF)	TOP RADIUS BASIC
	MAX	MIN.	MAX	MIN.	MAX	MIN.
1/8	0.1253	0.1251	0.1261	0.1259	0.045	0.031
3/16	0.1878	0.1876	0.1886	0.1884	0.060	0.046
1/4	0.2503	0.2501	0.2511	0.2509	0.070	0.062
5/16	0.3128	0.3126	0.3136	0.3134	0.070	0.062
3/8	0.3753	0.3751	0.3761	0.3759	0.080	0.078
7/16	0.4378	0.4376	0.4386	0.4384	0.090	0.093
1/2	0.5003	0.5001	0.5011	0.5009	0.090	0.125
5/8	0.6253	0.6251	0.6261	0.6259	0.090	0.125
3/4	0.7503	0.7501	0.7511	0.7509	0.120	0.125
7/8	0.8753	0.8751	.8761	0.8759	0.120	0.125
1	1.0003	1.0001	1.0011	1.0009	0.120	0.125

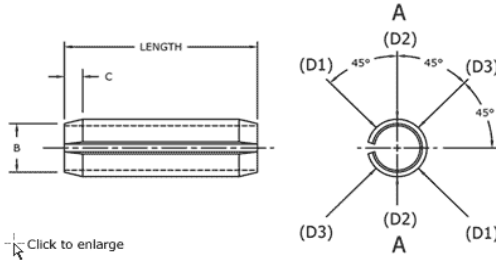
**Hardened and ground alloy steel, surface hardness 60 RC+
Core hardness 58-60 RC
ANSI B18.8.2**

**Diameter tolerances +.0000, -.0002
Length Tolerances +/- .010**

Also available in 303 Stainless



ROLLPINS



Dia (A)

Length

		1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2	5/8	3/4	
3/16	.187	0.1	0.2	.26												
1/4	.250	0.2	0.2	0.3	.60											
5/16	.312	0.2	0.3	0.4	.75											
3/8	.375	0.2	0.3	0.5	.89											
7/16	.437	0.3	0.4	0.6	1.0	1.5										
1/2	.500	0.3	0.5	0.7	1.1	1.7	2.5	3.5	4.5							
9/16	.562	0.3	0.5	0.8	1.3	1.9	2.9	4.0	5.0							
5/8	.625	0.4	0.6	0.8	1.5	2.1	3.2	4.5	5.3		13.0					
11/16	.687	0.4	0.6	0.9	1.6	2.4	3.5	4.7	5.9							
3/4	.750	0.5	0.7	1.0	1.8	2.6	3.8	5.3	6.3	9.9	15.0					
13/16	.812	0.5	0.7	1.1	1.9	2.8	4.1	5.8	6.9	11.0						
7/8	.875	0.5	0.8	1.2	2.1	3.0	4.5	6.2	7.4	12.0	18.0					
15/16	.937	0.6	0.9	1.3	2.2	3.2	4.8	6.7	8.0	12.5						
1	1.000	0.6	0.9	1.4	2.4	3.4	5.1	7.0	8.5	13.0	20.0	24.0		26.0		
1 1/8	1.125		1.0	1.5	2.7	3.8	5.7	7.9	9.5	14.0	23.0					
1 1/4	1.250		1.2	1.7	3.0	4.3	6.4	8.8	11.0	16.0	24.0	30.0	41.0	33.0		
1 3/8	1.375		1.4	1.8	3.3	4.7	7.0	9.7	12.0	18.0						
1 1/2	1.500		1.4	2.0	3.6	5.1	7.6	11.0	13.0	19.0	29.0	36.0	49.0	38.0	58.0	
1 5/8	1.625				3.9	5.5	8.3	12.0	14.0	21.0						
1 3/4	1.750				4.2	6.0	8.9	12.5	15.0	22.0	34.0	42.0	57.0	48.0		
1 7/8	1.875				4.5	6.4	9.6	13.0	16.0	24.0				49.0		
2	2.000				4.7	6.8	10.0	14.0	17.0	25.0	38.0	48.0	65.0	50.0	76.0	
2 1/4	2.250					7.8	12.0	16.0	19.0	29.0	43.0	54.0	73.0	59.0	86.0	
2 1/2	2.500					8.6	13.0	18.0	21.0	32.0	48.0	60.0	81.0	64.0	96.0	
2 3/4	2.750							19.0	23.0	35.0	53.0	66.0	89.0	72.0	105.0	
3	3.000							21.0	25.0	38.0	58.0	72.0	97.0	76.0	116.0	
3 1/4	3.250								28.0	41.0	62.0	77.0	105.0	85.0	124.0	
3 1/2	3.500								31.0	44.0	67.0	83.0	114.0	88.0	134.0	
3 3/4	3.750									48.0	72.0	89.0	122.0	97.0	103.0	
4	4.000									51.0	77.0	95.0	130.0	102.0	154.0	



Cotter Pins

Cotter Pin Size Range

Diameter (inch)	Lengths (inch)
1/32 and 3/64	1/4 thru 1-1/2
1/16	1/4 thru 3
3/32 and 5/64	1/2 thru 4
1/8 and 7/64	1/2 thru 4
5/32 and 9/64	3/4 thru 4
3/16	3/4 thru 4
1/4 and 7/32	1 thru 6
5/16	1 thru 6
3/8	1-1/2 thru 18
1/2 and 7/16	2 thru 22
5/8	3 thru 22
3/4	3 thru 22
7/8	to order
1	to order
1-1/4	to order

