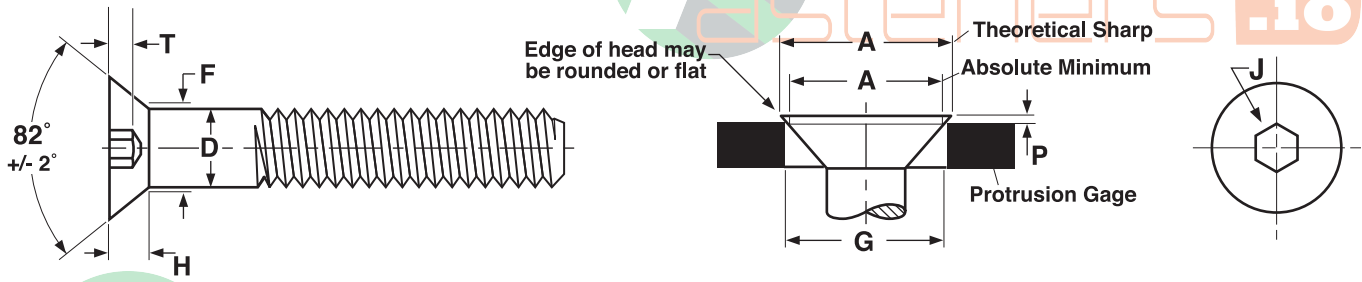


# SOCKETS

## FLAT HEAD CAP SCREWS

Alloy Steel

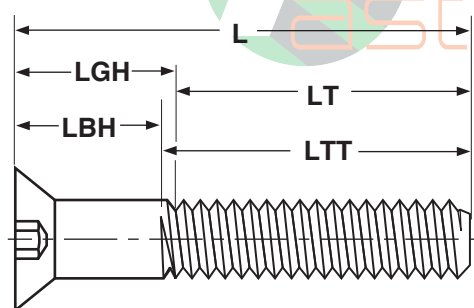


SOCKET FLAT HEAD CAP SCREWS - ALLOY STEEL														ASME B18.3-2012, Blue Devil®			
Nominal Size	D Body Diameter		A Head Diameter		H Head Height	G Protrusion Gage Diameter		P Protrusion		J Hex Socket Size	T Key Engagement	F Fillet Transition Diam.	Tensile Strength, Lbs.	Single Shear Strength of Body	Recommended Seating Torques, in./lbs.		
	Max	Min	Theoretical Sharp Max	Abs. Min	Ref	Max	Min	Max	Min	Nom	Min	Max	Min	lbs., Min	Coarse Thread	Fine Thread	
	4	0.1120	0.1075	0.255	0.218	0.083	0.172	0.171	0.057	0.036	1/16	0.055	0.136	880	950	8.	8.
5	0.1250	0.1202	0.281	0.240	0.090	0.196	0.195	0.059	0.037	5/64	0.061	0.153	1150	1,150	12.	13.	
6	0.1380	0.1329	0.307	0.263	0.097	0.220	0.219	0.060	0.037	5/64	0.066	0.168	1320	1,400	15.	17.	
8	0.1640	0.1585	0.359	0.311	0.112	0.267	0.266	0.063	0.039	3/32	0.076	0.194	2030	2,000	30.	31.	
10	0.1900	0.1840	0.411	0.359	0.127	0.313	0.312	0.066	0.041	1/8	0.087	0.220	2540	2,700	40.	45.	
1/4	0.2500	0.2435	0.531	0.480	0.161	0.424	0.423	0.072	0.043	5/32	0.111	0.280	4610	4,700	100.	110.	
5/16	0.3125	0.3053	0.656	0.600	0.198	0.539	0.538	0.078	0.047	3/16	0.135	0.343	7600	7,360	200.	220.	
3/8	0.3750	0.3678	0.781	0.720	0.234	0.653	0.652	0.088	0.050	7/32	0.159	0.405	11,200	10,600	350.	400.	
7/16	0.4375	0.4294	0.844	0.781	0.234	0.690	0.689	0.104	0.063	1/4	0.159	0.468	15,400	14,400	560.	625.	
1/2	0.5000	0.4919	0.938	0.872	0.251	0.739	0.738	0.131	0.087	5/16	0.172	0.530	20,600	18,850	850.	1,000.	
5/8	0.6250	0.6163	1.188	1.112	0.324	0.962	0.961	0.146	0.096	3/8	0.220	0.655	30,500	29,450	1,700.	1,900.	
3/4	0.7500	0.7406	1.438	1.355	0.396	1.186	1.185	0.170	0.105	1/2	0.220	0.780	45,100	42,400	3,000	3,200.	

Tolerance on Length	Nominal Screw Size	Nominal Screw Length		
		Up to 1 in., Incl.	Over 1 in. to 2-1/2 in., Incl.	Over 2-1/2 in. to 6 in., Incl.
	0 thru 3/8, Inclusive	-0.03	-0.04	-0.06
	7/16 thru 3/4, Inclusive	-0.03	-0.06	-0.08

<b>Description</b>	Similar in design to a socket button head cap screw but with an 82° countersunk flat head.
<b>Applications/ Advantages</b>	Used when a flush mounting, high strength screw is required. Commonly used in tools and dies where moving parts pass over the fastened area.
<b>Material</b>	Screws shall be made from an alloy steel which conforms to the following chemical composition requirements (per product analysis)-- <b>Carbon:</b> 0.28 to 0.50%; <b>Phosphorus:</b> 0.040% maximum; <b>Sulfur:</b> 0.045% maximum. Also, one or more of the following elements shall be present in sufficient quantity to meet the performance requirements listed below: chromium, nickel, molybdenum or vanadium.
<b>Heat Treatment</b>	Screws shall be heat treated by oil quenching from above the transformation temperature and then tempered at a temperature not lower than 650°F.
<b>Hardness</b>	<i>Thru 1/2" diam.:</i> Rockwell C 39 - 44; <i>Over 1/2" diam.:</i> Rockwell C 37 - 44
<b>Tensile Strength</b>	<i>Thru 1/2" diam.:</i> 145,000 psi. minimum; <i>Over 1/2" diam.:</i> 135,000 psi. minimum
<b>Yield Strength</b>	153,000 psi. minimum (over 1/2" diam.)
<b>Elongation</b>	8% minimum (applies to machined specimens over 1/2" diam., of length at least 4D where D equals the nominal diameter of the screw)"
<b>Reduction of Area</b>	35% minimum (applies to machined specimens over 1/2" diam.)
<b>Finish</b>	Screws are supplied plain.

**Body & Grip Lengths** **FLAT HEAD CAP SCREWS**



For screws of nominal lengths longer than those for which  $L_{GH}$  and  $L_{BH}$  values tabulated in this table and for screws over 1 inch in diameter, the maximum grip gaging length  $L_{GH}$  and the minimum body length  $L_{BH}$  of the screws shall be determined as follows:

$$L_{GH} = L - L_T$$

$$L_{BH} = L - L_{TT}$$

where  $L$  = nominal length,  $L_T$  = minimum thread length, and  $L_{TT}$  = maximum total thread length.

<b>BODY AND GRIP LENGTHS OF FLAT HEAD SOCKET CAP SCREWS</b>												ASME B18.3-2012	
Nominal Size	4		5		6		8		10		1/4		
$L_T$ MIN.	.750		.750		.750		.875		.875		1.000		
$L_{TT}$ MAX	0.99		1.00		1.05		1.19		1.27		1.50		
Nominal Length	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	
1.25	0.50	0.38	0.50	0.38	0.50	0.34	0.38	0.22					
1.50	0.50	0.38	0.50	0.38	0.50	0.34	0.38	0.22	0.62	0.42			
1.75	1.00	0.88	1.00	0.88	1.00	0.84	0.88	0.72	0.62	0.42	0.75	0.50	
2.00	1.00	0.88	1.00	0.88	1.00	0.84	0.88	0.72	1.12	0.92	0.75	0.50	
2.50					1.50	1.34	1.38	1.22	1.62	1.42	1.25	1.00	
3.00							1.88	1.72	2.12	1.92	1.75	1.50	
3.50									2.62	2.42	2.25	2.00	

Nominal Size	5/16		3/8		7/16		1/2		5/8		3/4	
$L_T$ MIN.	1.125		1.250		1.375		1.500		1.750		2.000	
$L_{TT}$ MAX	1.71		1.94		2.17		2.38		2.82		3.25	
Nominal Length	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$	$L_{GH}$	$L_{BH}$
2.00	0.88	0.60										
2.25	0.88	0.60	1.00	0.69								
2.50	1.38	1.10	1.00	0.69	1.12	0.77	1.00	0.62				
3.00	1.88	1.60	1.50	1.19	1.62	1.27	1.00	0.62				
3.50	2.38	2.10	2.00	1.69	2.12	1.77	1.75	1.36	1.50	1.04	1.50	1.00
4.00	2.88	2.60	2.50	2.19	2.62	2.27	2.50	2.12	2.25	1.80	1.50	1.00
4.50	3.38	3.10	3.00	2.69	3.12	2.77	2.50	2.12	2.25	1.80	2.50	2.00
5.00	3.88	3.60	3.50	3.19	3.62	3.27	3.25	2.86	3.00	2.54	2.50	2.00
5.50	4.38	4.10	4.00	3.69	4.12	3.77	4.00	3.62	3.75	3.30	3.50	3.00
6.00	4.88	4.60	4.50	4.19	4.62	4.27	4.00	3.62	3.75	3.30	3.50	3.00