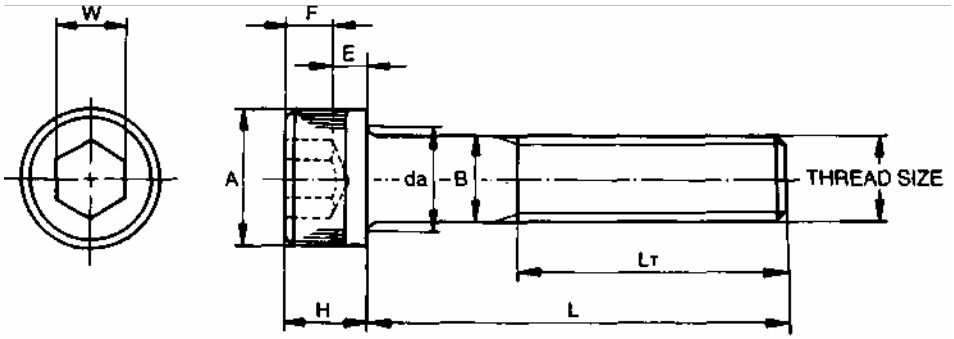
Socket Head Cap Screws

Inch Series - BA, BSW, BSF

Dimensions - Physical Properties - Tightening Torques



Notes :

1 The screws will generally conform to BS : 2470.
2. Threads will conform to Medium class of BS : 84 for BSW & BSF threads and to Normal class of *BS* : 84 for BA threads.
3. Material : "UNILOK" High Grade Alloy Steel.
4. Heat Treatment : HRc 38-44
5 For thread lengths LT, see page 14.
6 All dimensions are in inches.

Thread Size		0	2	3	4	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
Type		BA	BA	BA	BA	BSW	BSW BSF	BSW BSF	BSW BSF	BSW BSF	BSW BSF	BSW BSF	BSW BSF	BSW BSF	BSW BSF	BSW BSF
T.P.I.	BA	25.4	31.4	34.8	38.5											
	BSW					40	24	20	18	16	14	12	11	10	9	8
	BSF						32	26	22	20	18	16	14	12	11	10
A Max.		0.375	0.312	0.250	0.219	0.219	0.312	0.375	0.437	0.562	0.625	0.750	0.875	1.000	1.125	1.312
B. Max.		0.2362	0.1850	0.1614	0.1417	0.1250	0.1875	0.2500	0.3125	0.3750	0.4375	0.5000	0.6250	0.7500	0.8750	1.0000
E. Min.		0.080	0.063	0.055	0.048	0.053	0.065	0.095	0.119	0.143	0.166	0.190	0.238	0.285	0.333	0.380
F. Min.		0.133	0.089	0.075	0.066	0.066	0.089	0.120	0.151	9.182	0.213	0.245	0.307	0.370	0.432	0.495
H. Max.		0.236	0.187	0.161	0.142	0.125	0.187	0.250	0.312	0.375	0.437	0.500	0.625	0.750	0.875	1.000
da Max.		0.2642	0.2132	0.1854	0.1617	0.1450	0.2155	0.2780	0.3465	0.4150	0.4835	0.5520	0.6890	0.8280	0.9630	1.1000
W. Norn.		3/16	5/32	1/8	3/32	3/32	5/32	3/16	7/32	5/16	5/16	3/8	1/2	9/16	9/16	5/8

Physical Properties

Inclusive diameters	Upto 5/8	Above 5/8
Ultimate tensile strength, Min.	1, 90,000 lbf/in^2	1,80,000 lbf/in^2
Yield strength, 0.2% offset, Min.	1. 70,000 lbf/in^2	1,62,000 lbf/in^2
Shear strength. Min.	1,1 4,000 lbf/in^2	1 ,08,000 lbf/in^2
Elongation % on GL=5.65 VA", where A=cross sectional area	9% Min.	9% Min.

Typical Tightening Torque (Max.) and Induced Load

Thread Size	Stress Area	Tightening Torque	Induced Load
		Unplated *	
BA	in^2	lbfin	lbf
4	0.0110	32	1,100
3	0.0143	49	1,430
2	0.0192	71	1,920
0	0.0316	114	3,160

Notes:

1. The tightening torque calculated to induce 1,00,000 lbf/in^2 stress in screw threads.

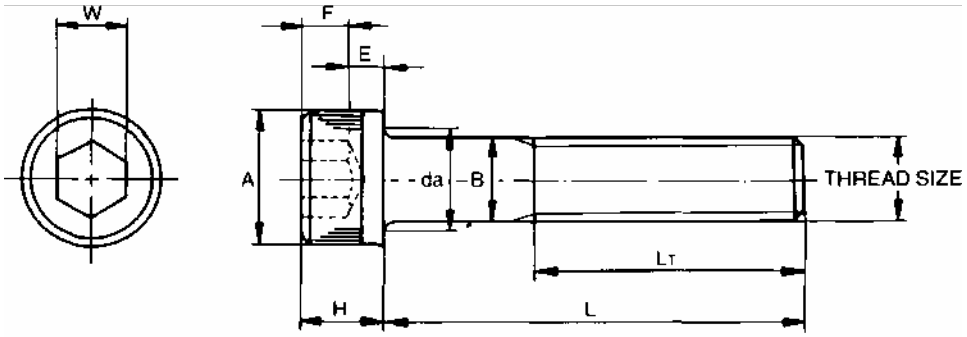
* Torque values listed are for plain screws. For Cadmium plated screws, multiply listed values by 0.75. For Zinc plated screws, multiply listed values by 1.40.

Thread Size	Stress Area	Tightening Torque	Induced Load	Thread Size	Stress Area	Tightening Torque	Induced Load
		Unplated *				Unplated *	
BSW	in^2	lbfIn	lbf	BSF	in^2	lbfin	lbf
1/8	0.0080	20	800				
3/16	0.0171	62	1,710	3/16	0.0195	24	1,948
1/4	0.0321	151	3,210	1/4	0.0357	167	3,570
5/16	0.0528	307	5,280	5/16	0.0567	319	5,670
3/8	0.0779	548	7,790	3/8	0.0840	560	8,400
7/16	0.1069	845	10,690	7/16	0.1158	880	11,580
1/2	0.1385	1,270	13,850	1/2	0.1521	1,303	15,210
5/8	0.2272	2,540	22,720	5/8	0.2432	2,595	24,320
3/4	0.3359	4,420	33,590	3/4	0.3525	4,540	35,250
7/8	0.4637	7,035	46,370	7/8	0.4874	7,323	48,740
1	0.6082	10,400	60,821	1	0.6419	10,976	64,190

Socket Head Cap Screws

Inch Series-UNC,UNF

Dimensions - Physical Properties - Tightening Torques



Notes :

1. The screws will generally conform to BS
2. Threads will conform to class 2A of BS : for UNC & UNF threads. 3. Material : "UNILOK" High Grade Alloy Steel.
4. Heat Treatment : HRc 38-44
5. For thread lengths Lr, see page 14
6. All dimensions are in inches

Thread Size		#8	#10	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
Type		UNC UNF	UNC UNF	UNC UNF	UNC UNF	UNC UNF	UNC UNF	UNC UNF	UNC UNF	UNC UNF	UNC UNF	UNC UNF
T.P.I.	UNC UNF	32 36	24 32	20 28	18 24	16 24	14 20	13 20	11« 18	10 16	9 14	8 12
A Max.		0.270	0.312	0.375	0.437	0.563	0.625	0.750	0.875	1.000	1.125	1.312
BMax.		0.1640	0.1900	0.2500	0.3125	0.3750	0.4375	0.5000	0.6250	0.7500	0.8750	1.000
EMin.		0.056	0.065	0.095	0.119	0.143	0.166	0.190	0.238	0.285	0.333	0.380
FMin.		0.077	0.090	0.120	0.151	0.182	0.213	0.245	0.307	0.370	0.432	0.495
H Max.		0.164	0.190	0.250	0.312	0.375	0.437	0.500	0.625	0.750	0.875	1.000
da Max.		0.188	0.218	0.278	0.347	0.415	0.484	0.552	0.689	0.828	0.963	1.100
WNom.		1/8	5/32	3/16	7/32	5/16	5/16	3/8	1/2	9/16	9/16	5/8

Physical Properties

Inclusive diameters	UptO 5/8	Above 5/8
Ultimate tensile strength Min.	1 ,90,000 lbf/in^2	1,80,000 lbf/in^2
Yield strength, 0.2% offset Min.	1 ,70,000 lbf/in^2	1,62,000 lbf/in^2
Shear strength Min.	1,1 4,000 lbf/in^2	1 ,08,000 lbf/in^2
Elongation % on GL = 5.65 VA" where A = cross sectional area	9% Min.	9% Min.

Typical Tightening Torque (Max.) and Induced Load

Thread Size	Stress Area	Tightening Torque Unplated *	Induced Load	hread Size	Stress Area	Tightening Torque Unplated *	Induced Load
UNC	in^2	lbfin	lbf	UNF	in^2	lbfin	lbf
#8	0.0142	49	1,420	#8	0.0149	50	1,490
#10	0.0179	64	1,790	#10	0.0203	76	2,030
1/4	0.0324	150	3,240	1/4	0.0368	170	3,680
5/16	0.0532	305	5,320	5/16	0.0587	325	5,870
3/8	0.0786	545	7,860	3/8	0.0886	570	8,860
7/16	0.1078	840	10,780	7/16	0.1198	900	11,980
1/2	0.1438	1,300	14,380	1/2	0.1612	1,370	16,120
5/8	0.2290	2,530	22,900	5/8	0.2580	2,660	28,500
3/4	0.3380	4,400	33,800	3/4	0.3750	4,800	37,500
7/8	0.4670	7,000	46,700	7/8	0.5130	7,600	51 ,300
1	0.6120	10,400	61,200	1	0.6670	11,000	66,700

Notes:

1. The tightening torque calculated to induce 1,00,000 lbf/in^2 stress in screw threads.

* Torque values listed are for plain screws. For Cadmium plated screws, multiply listed values by 0.75. For Zinc plated screws, multiply listed values by 1.40.

Socket Head Cap Screws

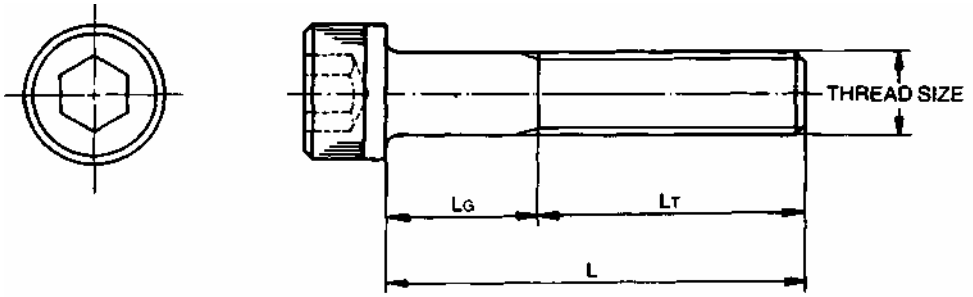
Inch Series

Unilok

Grip Length / Thread Length

Notes:

1. LG is the maximum grip length, and represents the minimum design grip length for the screw.
2. Tolerance on Grip Length will be +0-2.1/2 Pitch.
3. Tolerance on Thread Length will be +2.1/2 Pitch-0.
4. Thread length LT = L- LG.
5. All dimensions are in inches.



Thread Size			Basic Thread Length	Nominal Length 'L'																				
				3/4	7/8	1	1 ¼	1 ½	1 ¾	2	1 ¼	2 ½	2 ¾	3	3 ¼	3	3 ¾	4	4 ¼	4 ½	4 ¾	5		
BA	BSW BSF	UNC UNF		Grip Length 'LG'																				
	1/8		0.750			0.250	0.250	0.750	0.750	1.250	1.250	1.750												
4			0.750				0.500	0.500	1.000	1.000	1.500	1.500	2.000											
3&2	3/16	#8, #10	0.875				0.375	0.375	0.875	0.875	1.375	1.375	1.875	1.875	2.375									
0	1/4	1/4	1.000					0.500	0.500	1.000	1.000	1.500	1.500	2.000	2.000	2.500	2.500	3.000	3.000	3.500	3.500	4.000		
	5/16	5/16	1.125						0.625	0.625	1.125	1.125	1.625	1.625	2.125	2.125	2.625	2.625	3.125	3.125	3.625	3.625		
	3/8	3/8	1.250						0.500	0.500	1.000	1.000	1.500	1.500	2.000	2.000	2.500	2.500	3.000	3.000	3.500	3.500		
	7/16	7/16	1.375							0.625	0.625	1.125	1.125	1.625	1.625	2.125	2.125	2.625	2.625	3.125	3.125	3.625		
	1/2	1/2	1.500		Sizes to the left of the heavy lines will be threaded to head.						0.750	0.750	0.750	1.500	1.500	1.500	2.250	2.250	2.250	3.000	3.000	3.000		
	5/8	5/8	1.750									0.750	0.750	0.750	1.500	1.500	1.500	2.250	2.250	2.250	3.000	3.000		
	3/4	3/4	2.000											1.000	1.000	1.000	1.000	2.000	2.000	2.000	2.000	3.000		
	7/8	7/8	2.250												1.000	1.000	1.000	1.000	2.000	2.000	2.000	2.000		
	1	1	2.500													1.000	1.000	1.000	1.000	2.000	2.000	2.000		

Thread Size			Basic Length	Nominal Length 'L'																	
				5 ¼	5 ½	5 ¾	6	6 ¼	6 ½	6 ¾	7	7 ¼	7 ½	7 ¾	8	8 ½	9	9 ½	10	11	
BA	BSW BSF	UNC UNF		Grip Length 'LG'																	
	1/8																				
4																					
3 & 2	3/16	#8, #10																			
0	1/4	1/4																			
	5/16	5/16	1.125	4.125	4.125	4.625	4.625	5,125													
	3/8	3/8	1.250	4.000	4.000	4.500	4.500	5.000	5.000	5.500	5.500	6.000	6.000								
	7/16	7/16	1.375	3.625	4.125	4.125	4.625	4.625	5.125	5.125	5.625	5.625	6.125	6.125	6.625	7.125	7.625				
	1/2	1/2	1.500	3.750	3.750	3.750	4.500	4.500	4.500	5.250	5.250	5.250	6.000	6.000	6.000	7.000	7.000	8.000	8.000		
	5/8	5/8	1.750	3.000	3.750	3.750	3.750	4.500	4.500	4.500	5.250	5.250	5.250	6.000	6.000	6.750	6.750	7.750	7.750	9.250	
	3/4	3/4	2.000	3.000	3.000	3.000	4.000	4.000	4.000	4.000	5.000	5.000	5.000	5.000	6.000	6.000	7.000	7.000	8.000	9.000	
	7/8	7/8	2.250	3.000	3.000	3.000	3.000	4.000	4.000	4.000	4.000	5.000	5.000	5.000	5.000	6.000	6.000	7.000	7.000	8.000	
	1	1	2.500	2.000	3.000	3.000	3.000	3.000	4.000	4.000	4.000	4.000	5.000	5.000	5.000	6.000	6.000	7.000	7.000	8.000	