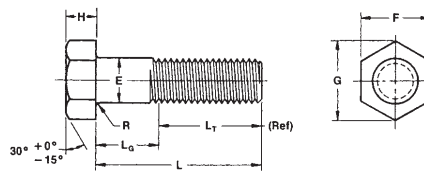


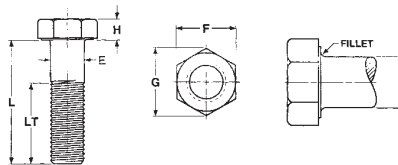


### Grade 2 Hex Head Bolts



Basic Diameter	E		F			G		H			R	
	Body Dia.		Width Across Flats			Width Across Corners		Height			Radius Of Fillet	
	Max.		Basic	Max.	Min.	Max.	Min.	Basic	Max.	Min.	Max	Min.
1/4	0.260		7/16	0.438	0.425	0.505	0.484	11/64	0.188	0.150	0.03	0.01
5/16	0.324		1/2	0.500	0.484	0.577	0.552	7/32	0.235	0.195	0.03	0.01
3/8	0.388		9/16	0.562	0.544	0.650	0.620	1/4	0.268	0.226	0.03	0.01
7/16	0.452		5/8	0.625	0.603	0.722	0.687	19/64	0.316	0.272	0.03	0.01
1/2	0.515		3/4	0.750	0.725	0.866	0.826	11/32	0.364	0.302	0.03	0.01
5/8	0.642		15/16	0.938	0.906	1.083	1.033	27/64	0.444	0.378	0.06	0.02
3/4	0.768		1-1/8	1.125	1.088	1.299	1.240	1/2	0.524	0.455	0.06	0.02
7/8	0.895		1-5/16	1.312	1.269	1.516	1.447	37/64	0.604	0.531	0.06	0.02
1	1.022		1-1/2	1.500	1.450	1.732	1.653	43/64	0.700	0.591	0.09	0.03
1-1/8	1.149		1-11/16	1.688	1.631	1.949	1.859	3/4	0.780	0.658	0.09	0.03
1-1/4	1.277		1-7/8	1.875	1.812	2.165	2.066	27/32	0.876	0.749	0.09	0.03
1-3/8	1.404		2-1/16	2.062	1.994	2.382	2.273	29/32	0.940	0.810	0.09	0.03
1-1/2	1.531		2-1/4	2.250	2.175	2.598	2.480	1	1.036	0.902	0.09	0.03
1-3/4	1.785		2-5/8	2.625	2.538	3.031	2.893	1-5/32	1.196	1.054	0.12	0.04
2	2.039		3	3.000	2.900	3.464	3.306	1-11/32	1.388	1.175	0.12	0.04
2-1/4	2.305		3-3/8	3.375	3.262	3.897	3.719	1-1/2	1.548	1.327	0.19	0.06
2-1/2	2.559		3-3/4	3.750	3.625	4.330	4.133	1-21/32	1.708	1.479	0.19	0.06
2-3/4	2.827		4-1/8	4.125	3.988	4.763	4.546	1-13/16	1.869	1.632	0.19	0.06
3	3.081		4-1/2	4.500	4.350	5.196	4.959	2	2.060	1.815	0.19	0.06
3-1/4	3.335		4-7/8	4.875	4.712	5.629	5.372	2-3/16	2.251	1.936	0.19	0.06
3-1/2	3.589		5-1/4	5.250	5.075	6.062	5.786	2-5/16	2.380	2.057	0.19	0.06
3-3/4	3.858		5-5/8	5.625	5.437	6.495	6.198	2-1/2	2.572	2.241	0.19	0.06
4	4.111		6	6.000	5.800	6.928	6.612	2-11/16	2.764	2.424	0.19	0.06

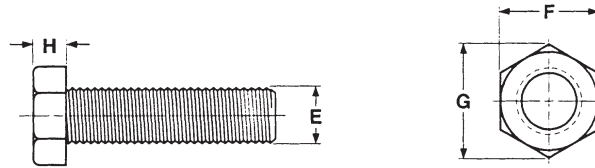
### Hex Head Cap Screws (Gr. 5 and 8)



Nominal or Basic Product Diameter	E		F			G		H			R	LT		
	Body Diameter		Width Across Flats			Width Across Corners		Head Height				Radius of Fillet	Thread	Length
	Max.	Min.	Basic	Max	Min.	Max.	Min.	Basic	Max.	Min.	Min.		For Screw Lengths ≤ 6 In.	For Screw Lengths > 6 In.
1/4	0.2500	0.2500	0.2450	7/16	0.438	0.428	0.505	0.488	5/32	0.163	0.150	0.015	0.750	1.000
5/16	0.3125	0.3125	0.3065	1/2	0.500	0.489	0.577	0.557	13/64	0.211	0.195	0.015	0.875	1.125
3/8	0.3750	0.3750	0.3690	9/16	0.562	0.551	0.650	0.628	15/64	0.243	0.226	0.015	1.000	1.250
7/16	0.4375	0.4375	0.4305	5/8	0.625	0.612	0.722	0.698	9/32	0.291	0.272	0.015	1.125	1.375
1/2	0.5000	0.5000	0.4930	3/4	0.750	0.736	0.866	0.840	5/16	0.323	0.302	0.015	1.250	1.500
9/16	0.5625	0.5625	0.5545	13/16	0.812	0.798	0.938	0.910	23/64	0.371	0.348	0.020	1.375	1.625
5/8	0.6250	0.6250	0.6170	15/16	0.938	0.922	1.083	1.051	25/64	0.403	0.378	0.020	1.500	1.750
3/4	0.7500	0.7500	0.7410	1-1/8	1.125	1.100	1.299	1.254	15/32	0.483	0.455	0.020	1.750	2.000
7/8	0.8750	0.8750	0.8660	1-5/16	1.312	1.285	1.516	1.465	35/64	0.563	0.531	0.040	2.000	2.250
1	1.0000	1.0000	0.9900	1-1/2	1.500	1.469	1.732	1.675	39/64	0.627	0.591	0.060	2.250	2.500
1-1/8	1.1250	1.1250	1.1140	1-11/16	1.683	1.631	1.949	1.859	11/16	0.718	0.658	0.060	2.500	2.750
1-1/4	1.2500	1.2500	1.2390	1-7/8	1.875	1.812	2.165	2.066	25/32	0.813	0.749	0.060	2.750	3.000
1-3/8	1.3750	1.3750	1.3630	2-1/16	2.062	1.994	2.382	2.273	27/32	0.878	0.810	0.060	3.000	3.250
1-1/2	1.5000	1.5000	1.4880	2-1/4	2.250	2.175	2.598	2.480	15/16	0.974	0.902	0.060	3.250	3.500

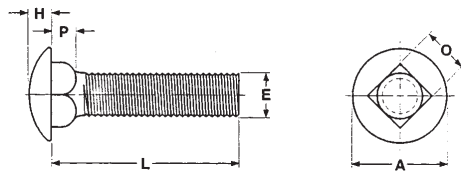


### Tap Bolts - (Available In Gr.2, Gr. 5 and 8)



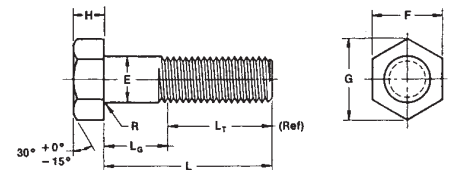
Nominal or Basic Product Diameter	E Body Diameter		F Width Across Flats			G Width Across Corners		H Head Height			
	Max.	Min.	Basic	Max	Min.	Max.	Min.	Basic	Max.	Min.	
1/4	0.2500	0.2500	0.2450	7/16	0.438	0.428	0.505	0.488	5/32	0.163	0.150
5/16	0.3125	0.3125	0.3065	1/2	0.500	0.489	0.577	0.557	13/64	0.211	0.195
3/8	0.3750	0.3750	0.3690	9/16	0.562	0.551	0.650	0.628	15/64	0.243	0.226
7/16	0.4375	0.4375	0.4305	5/8	0.625	0.612	0.722	0.698	9/32	0.291	0.272
1/2	0.5000	0.5000	0.4930	3/4	0.750	0.736	0.866	0.840	5/16	0.323	0.302
9/16	0.5625	0.5625	0.5545	13/16	0.812	0.798	0.938	0.910	23/64	0.371	0.348
5/8	0.6250	0.6250	0.6170	15/16	0.938	0.922	1.083	1.051	25/64	0.403	0.378
3/4	0.7500	0.7500	0.7410	1-1/8	1.125	1.100	1.299	1.254	15/32	0.483	0.455
7/8	0.8750	0.8750	0.8660	1-5/16	1.312	1.285	1.516	1.465	35/64	0.563	0.531
1	1.0000	1.0000	0.9900	1-1/2	1.500	1.469	1.732	1.675	39/64	0.627	0.591
1-1/8	1.1250	1.1250	1.1140	1-11/16	1.688	1.631	1.949	1.859	11/16	0.718	0.658
1-1/4	1.2500	1.2500	1.2390	1-7/8	1.875	1.812	2.165	2.066	25/32	0.813	0.749
1-3/8	1.3750	1.3750	1.3630	2-1/6	2.062	1.994	2.382	2.273	27/32	0.878	0.810
1-1/2	1.5000	1.5000	1.4880	2-1/4	2.250	2.175	2.598	2.480	15/16	0.974	0.902

### Carriage Bolts (Gr. 2 and 5, Gr. 8 Available)



Basic Bolt Diameter	E Body Diameter		A Head Diameter		H Head Height		O Square Width		P Square Depth		
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
	10	0.1900	0.199	0.182	0.469	0.438	0.114	0.094	0.199	0.185	0.125
1/4	0.2500	0.260	0.237	0.594	0.563	0.145	0.125	0.260	0.245	0.156	0.125
5/16	0.3125	0.324	0.298	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156
3/8	0.3750	0.388	0.360	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188
7/16	0.4375	0.452	0.421	0.969	0.907	0.239	0.219	0.452	0.431	0.250	0.219
1/2	0.5000	0.515	0.483	1.094	1.032	0.270	0.250	0.515	0.492	0.281	0.250
5/8	0.6250	0.642	0.605	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313
3/4	0.7500	0.768	0.729	1.594	1.469	0.406	0.375	0.768	0.741	0.406	0.375

### Super 9 Hex Head Cap Screws

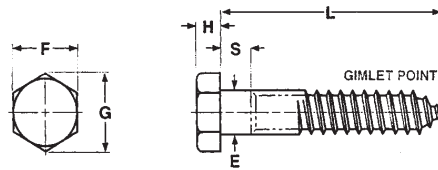


Basic Diameter	Tensile Strength lbs.	Proof Load lbs.	Clamp Load lbs.	*Torque ft./lbs.
1/4 - 20	5,720	4,770	3,550	11
1/4 - 28	6,550	5,460	4,050	12
5/16 - 18	9,430	7,860	5,850	22
5/16 - 24	10,440	8,700	6,500	25
3/8 - 16	13,950	11,620	9,700	40
3/8 - 24	15,800	13,170	9,850	45
7/16 - 14	19,130	15,940	11,950	65
7/16 - 20	21,360	17,800	13,350	70
1/2 - 13	25,540	21,280	15,950	95
1/2 - 20	28,780	23,980	17,950	110
9/16 - 12	32,760	27,300	20,450	140
9/16 - 18	36,540	30,450	22,800	160
5/8 - 11	40,680	33,900	25,400	195
5/8 - 18	46,080	38,400	28,800	225
3/4 - 10	60,120	50,100	37,550	350
3/4 - 16	67,140	55,950	41,950	390
7/8 - 9	83,160	69,300	51,950	565
7/8 - 14	91,620	76,350	57,250	625
1 - 8	109,080	90,900	68,150	850
1 - 14	122,220	99,450	74,550	930
1-1/8 - 7	137,340	114,450	85,800	1,200
1-1/8 - 12	154,080	128,400	96,300	1,350
1-1/4 - 7	174,420	145,350	109,000	1,700
1-1/4 - 12	193,140	160,950	120,700	1,850
1-1/2 - 6	252,900	210,750	158,050	2,950
1-1/2 - 12	284,580	237,150	177,850	3,330

CAUTION: LUBRICATED FASTENERS (PLATED OR OTHERWISE) ARE TO BE TORQUED AT A LOWER VALUE (LUB. COLUMN). OTHERWISE EXCESSIVE CLAMPOLOADS AND FAILURE DURING INSTALLATION WILL RESULT. USERS OF THIS CHART ASSUME FULL RESPONSIBILITY OF APPLICATION.

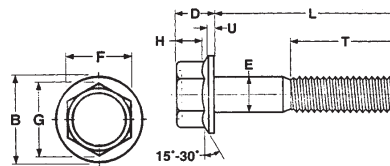


### Hex Head Lag Screw



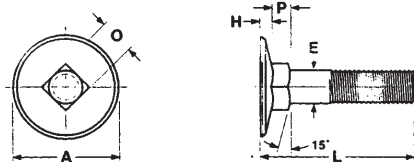
Basic Product Diameter	Threads Per Inch	E		F			G		H			S
		Body or Shoulder Diameter		Width Across Flats			Hex Lag Screws		Head Height			
		Max.	Min.	Basic	Max.	Min.	Max.	Min.	Max.	Min.	Min.	
1/4 0.2500	10	0.260	0.237	7/16	0.438	0.425	0.505	0.484	11/64	0.188	0.150	0.094
5/16 0.3125	9	0.324	0.298	1/2	0.500	0.484	0.577	0.552	7/32	0.235	0.195	0.125
3/8 0.3750	7	0.388	0.360	9/16	0.562	0.544	0.650	0.620	1/4	0.268	0.226	0.125
7/16 0.4375	7	0.452	0.421	5/8	0.625	0.603	0.722	0.687	19/64	0.316	0.272	0.156
1/2 0.5000	6	0.515	0.482	3/4	0.750	0.725	0.866	0.826	11/32	0.364	0.302	0.156
5/8 0.6250	5	0.642	0.605	15/16	0.938	0.906	1.083	1.033	27/64	0.444	0.378	0.312
3/4 0.7500	4-1/2	0.768	0.729	1-1/8	1.125	1.088	1.299	1.240	1/2	0.524	0.455	0.375

### Grade 8 Hex Flange Bolts



Nominal Size or Basic Major Dia. Of Thread	E		F			G		B	U	H		L <sub>T</sub>	
	Body Dia.		Width Across Flats			Width Across Corners		Flange Dia.	Flange Thickness	Head Height		Thread	Length
	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	L ≤ 6 In.	L > 6 In.
3/8 0.3750	0.3750	0.3690	9/16	0.5625	0.551	0.650	0.618	0.81	0.06	0.39	0.25	1.000	1.250
1/2 0.5000	0.5000	0.4930	3/4	0.7500	0.736	0.866	0.825	1.07	0.08	0.51	0.34	1.250	1.500
5/8 0.6250	0.6250	0.6170	15/16	0.9375	0.922	1.083	1.034	1.33	0.10	0.62	0.42	1.500	1.750
3/4 0.7500	0.7500	0.7410	1-1/8	1.1250	1.100	1.299	1.234	1.59	0.11	0.73	0.51	1.750	2.000

### Elevator Bolts



Nominal Size or Basic Bolt Diameter	E		A			H		O		P	
	Body Diameter		Head Diameter			Head Height		Square Width		Square Depth	
	Max.	Min.	Max. Edge Sharp	Min. Edge Sharp	Min. Edge Flat	Max.	Min.	Max.	Min.	Max.	Min.
1/4 0.2500	0.260	0.237	1.008	0.969	0.938	0.098	0.087	0.280	0.245	0.219	0.188
5/16 0.3125	0.324	0.298	1.227	1.188	1.157	0.114	0.094	0.342	0.307	0.250	0.219
3/8 0.3750	0.388	0.360	1.352	1.312	1.272	0.145	0.125	0.405	0.368	0.250	0.219

Evansville, IN  
Jasper, IN  
Vincennes, IN

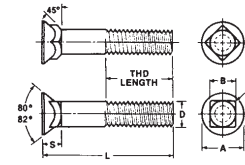
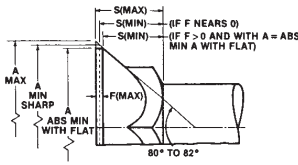
812-477-0077  
812-482-5105  
812-882-4090



Henderson, KY  
Owensboro, KY  
Mt. Vernon, IL

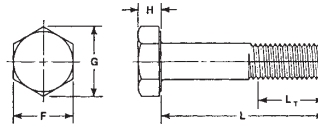
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### Plow Bolts (GR. 5 And 8)



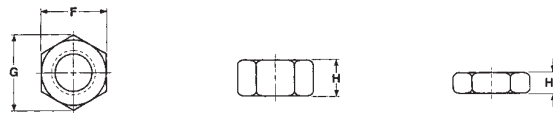
Basic Diameter	A Diameter of Head			F Feed Thickness	S Depth of Square and Head		B Width of Square		R Radius on Corners of Square
	Max.	Sharp	Flat Min.	Max	Max.	Min.	Max.	Basic Min.	Max.
	5/16	0.605	0.578	0.563	0.025	0.269	0.243	0.325	0.313
3/8	0.708	0.671	0.656	0.031	0.312	0.281	0.387	0.375	3/64
7/16	0.826	0.781	0.766	0.036	0.364	0.328	0.450	0.438	3/64
1/2	0.945	0.890	0.875	0.042	0.417	0.375	0.515	0.500	3/64
9/16	1.045	1.000	0.969	0.045	0.461	0.416	0.578	0.563	5/64
5/8	1.147	1.094	1.063	0.050	0.506	0.456	0.640	0.625	5/64
3/4	1.303	1.250	1.219	0.050	0.541	0.491	0.765	0.750	5/64
7/8	1.512	1.469	1.406	0.063	0.626	0.563	0.906	0.875	3/32
1	1.700	1.656	1.594	0.063	0.690	0.627	1.031	1.000	3/32

### A325 Domestic Structural Bolts



Basic Size	F Width Across Flats		G Width Across Corners		H Height		L <sub>T</sub> Thread Length
	Max.	Min.	Max.	Min.	Max.	Min.	Basic
	1/2 - 13	0.875	0.850	1.010	0.969	0.323	0.302
5/8 - 11	1.062	1.031	1.227	1.175	0.403	0.378	1.25
3/4 - 10	1.250	1.212	1.443	1.383	0.483	0.455	1.38
7/8 - 9	1.438	1.394	1.660	1.589	0.563	0.531	1.50
1 - 8	1.625	1.575	1.876	1.796	0.627	0.591	1.75
1-1/8 - 7	1.812	1.756	2.093	2.002	0.718	0.658	2.00
1-1/4 - 7	2.000	1.938	2.309	2.209	0.813	0.749	2.00
1-3/8 - 6	2.188	2.119	2.526	2.416	0.878	0.810	2.25
1-1/2 - 6	2.375	2.300	2.742	2.622	0.974	0.902	2.25

### Finished Hex Nuts (Gr. 2, 5 and 8) and Hex Jam Nuts



Nominal Or Basic Major Diagram Of Thread	F Width Across Flats			G Width Across Corners		H Thickness Hex Nuts & Reversible Lock Nuts			H1 Thickness Hex Jam Nuts			
	Basic	Max.	Min.	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	
	8	0.1640	11/32	0.344	0.332	0.397	0.378	-	0.203	0.187	-	-
10	0.1900	3/8	0.375	0.362	0.433	0.413	-	0.203	0.187	-	-	-
1/4	0.2500	7/16	0.438	0.428	0.505	0.488	7/32	0.226	0.212	5/32	0.164	0.150
5/16	0.3125	1/2	0.500	0.489	0.577	0.557	17/64	0.273	0.258	3/16	0.195	0.180
3/8	0.3750	9/16	0.562	0.551	0.650	0.628	21/64	0.337	0.320	7/32	0.227	0.210
7/16	0.4375	11/16	0.688	0.675	0.794	0.768	3/8	0.385	0.365	1/4	0.260	0.240
1/2	0.5000	3/4	0.750	0.736	0.866	0.840	7/16	0.448	0.427	5/16	0.323	0.302
9/16	0.5625	7/8	0.875	0.861	1.010	0.982	31/64	0.496	0.473	5/16	0.324	0.301
5/8	0.6250	15/16	0.938	0.922	1.083	1.051	35/64	0.559	0.535	3/8	0.387	0.363
3/4	0.7500	1-1/8	1.125	1.088	1.299	1.240	41/64	0.665	0.617	27/64	0.446	0.398
7/8	0.8750	1-5/16	1.312	1.269	1.516	1.447	3/4	0.776	0.724	31/64	0.510	0.458
1	1.0000	1-1/2	1.500	1.450	1.732	1.653	55/64	0.887	0.831	35/64	0.575	0.519
1 - 1/8	1.1250	1-11/16	1.688	1.631	1.949	1.859	31/32	0.999	0.939	39/64	0.639	0.579
1 - 1/4	1.2500	1-7/8	1.875	1.812	2.165	2.066	1-1/6	1.094	1.030	23/32	0.751	0.687
1 - 3/8	1.3750	2-1/16	2.062	1.994	2.382	2.273	1-11/64	1.206	1.138	25/32	0.815	0.747
1 - 1/2	1.5000	2-1/4	2.250	2.175	2.598	2.480	1-9/32	1.317	1.245	27/32	0.880	0.808
1 - 5/8	1.6250	2-7/16	2.438	2.356	2.815	2.686	1-25/64	1.429	1.353	29/32	0.945	0.869
1 - 3/4	1.7500	2-5/8	2.625	2.538	3.031	2.893	1-1/2	1.540	1.460	31/32	1.009	0.929
2	2.0000	3	3.000	2.900	3.464	3.306	1-23/32	1.763	1.675	1-3/32	1.138	1.050
2 - 1/4	2.2500	3-3/8	3.375	3.263	3.897	3.719	1-15/16	1.986	1.890	1-7/32	1.267	1.171
2 - 1/2	2.5000	3-3/4	3.750	3.625	4.330	4.133	2-5/32	2.209	2.105	1-11/32	1.396	1.292
2 - 3/4	2.7500	4-1/8	4.125	3.988	4.763	4.546	2-3/8	2.431	2.319	1-15/32	1.525	1.413
3	3.0000	4-1/2	4.500	4.350	5.196	4.959	2-19/32	2.654	2.534	1-19/32	1.654	1.534