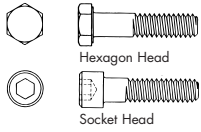


# ACKLANDS GRAINGER®

INDUSTRIAL • SAFETY • FASTENERS



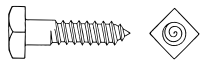
### CAP SCREWS

A cap screw is a screw having all surfaces machined or of an equivalent finish, closely controlled body diameter, and a flat chamfered point, with a wrench, slotted, recessed, or socket head of proportions and tolerances designed to assure full and proper loading when wrenching or driven into a tapped hole. Cap screws usually have hexagon, splined socket, or driven into a tapped hole. Cap screws usually have hexagon, splined socket, hexagon socket, button, flat, fillister, or round head styles as indicated.



### HEXAGON HEAD BOLT

A hexagon head bolt is a bolt having a hexagonal shaped external wrenching head. It is available in several dimensional series such as Finished Hexagon, Regular Hexagon, and Heavy Hexagon and within these series in various grades with regard to materials, tolerances, and threads.



### LAG BOLT

A lag bolt is a bolt having a square or hex head, a gimlet or cone point, and a thin sharp, coarse-pitch thread. It is designed for producing its own mating thread in wood or other resilient materials.



### ROUND HEAD SQUARE NECK CARRIAGE BOLT

A round head square neck carriage bolt has a square shoulder under the head. It is designed for use in wood.



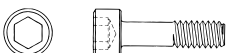
### ROUND COUNTERSUNK HEAD SQUARE NECK PLOW BOLT

A round countersunk head square neck plow bolt (No.3 Head) has a round countersunk head with an 80° head angle and a short square neck to prevent rotation.



### TAP BOLT

A tap bolt is a square or hexagon head machine bolt, threaded relatively close to the head.



### INTERNAL WRENCHING BOLT

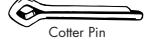
An internal wrenching bolt is a bolt having a large cylindrical head with flat top, flat bearing surface, and hexagon socket. The bolt is designed for use in high strength, high temperature applications such as steam turbines. A bolt designated as an Internal Wrenching Bolt is used in aircraft. It is similar in design to the one previously described except that the head is tapered.



Spring Pin



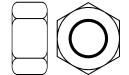
Dowel Pin



Cotter Pin

### PIN PRODUCTS

Various pin fasteners are used on machine assemblies where loading is primarily in shear. Semi-permanent pin products such as spring pins, cotter pins, and dowel pins, require the application of pressure for installation or removal.



### HEX NUT

A hex nut is a nut with a hexagonal shaped external wrenching body. They are available in four main dimensional series including regular, finished, semi-finished and heavy.



### WASHER

Washers are used primarily as a seat to distribute load in a fastener system. There are many styles of washers that are used to provide spring tension, span oversize holes, insulate, seal, lock a fastener, protect surfaces, or provide electrical connections.



### LOCK WASHER

Lock washers are frequently used under the head of a bolt or nut to help grip the fastener to the part's surface.



### RIVET

A rivet is a non-threaded fastener used to join several parts together. It has a head and shank made from a deformable material such as steel, aluminum, brass, copper or bronze.

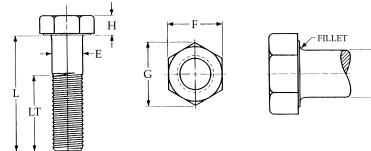


Wood Screw

Tapping Screw

### SELF-TAPPING SCREW

Self-tapping screws are designed to cut or form a mating thread in metal, plastic, and other materials without pre-tapped holes, permitting rapid installation.



### DIMENSIONAL INFORMATION HEX CAP SCREWS

Nominal Product Dia.	E	F		G		H		R		LT	Length for screw length-6"
		BASIC	MAX.	MIN.	BASIC	MIN.	BASIC	MIN.			
1/4	7/16	0.505	0.488	5/32	0.015	0.750	1.000				
5/16	1/2	0.577	0.557	13/64	0.015	0.875	1.125				
3/8	9/16	0.650	0.628	15/64	0.015	1.000	1.250				
7/16	5/8	0.722	0.698	9/32	0.015	1.125	1.375				
1/2	3/4	0.866	0.840	5/16	0.015	1.250	1.500				
9/16	13/16	0.938	0.910	23/64	0.020	1.375	1.625				
5/8	15/16	1.083	1.051	25/64	0.020	1.500	1.750				
3/4	1 1/16	1.299	1.254	13/32	0.020	1.750	2.000				
7/8	1 5/16	1.516	1.465	35/64	0.040	2.000	2.250				
1	1 1/2	1.732	1.675	39/64	0.060	2.250	2.500				
1 1/8	1 11/16	1.949	1.859	11/16	0.060	2.500	2.750				
1 1/4	1 7/8	2.165	2.066	25/32	0.060	2.750	3.000				
1 3/8	2 1/16	2.382	2.273	27/32	0.060	3.000	3.250				
1 1/2	2 1/4	2.598	2.480	15/16	0.060	3.250	3.500				

## THREAD IDENTIFICATION CHART

Nom. Dia.	AMERICAN		Decimal Nom. Inch	Pitch in mm Dia.	METRIC	
	Threads per Inch	UNC UNF			Coarse	Fine
0		80	0.0600			
			0.0629	1.60	0.35	0.2
			0.0669	1.70	0.35	0.2, 0.25
			0.0709	1.80	0.35	0.2
1	64	72	0.0730			
			0.0787	2.00	0.40	0.25, 0.35
			0.0860			
			0.0866			
			0.0906			
			0.0984	2.50	0.45	0.4
			0.0990			
3	48	56	0.1024	2.60	0.45	0.25
			0.1120			
4	40	48	0.1181	3.00	0.50	0.35, 0.6
			0.1250			
5	40	44	0.1380	3.50	0.60	0.35, 0.5
6	32	40	0.1575	4.00	0.70	0.5
			0.1640			
8	32	36	0.1772			
			0.1900			
			0.1969	5.00	0.80	0.75, 0.70, 0.50
			0.2160			
			0.2362	6.00	1.00	0.5, 0.75
1/4	20	28	0.2500			
			0.2756	7.00	1.00	0.5, 0.75
			0.3125			
5/16	18	24	0.3150	8.00	1.25	0.5, 0.75, 1.0
			0.3543	9.00	1.25	0.75, 1.0
			0.3750			
3/8	16	24	0.3937	10.00	1.50	0.75, 1.0, 1.25
			0.4331	11.00	1.50	
			0.4375			
7/16	14	20	0.4724	12.00	1.75	1.0, 1.25, 1.50
			0.5000			
1/2	13	20	0.5512	14.00	2.00	1.0, 1.25, 1.50
			0.5625			
9/16	12	18	0.6250			
5/8	11	18	0.6299	16.00	2.00	1, 1.5
			0.7087	18.00	2.50	1, 1.5, 2
			0.7500			
3/4	10	16	0.7874	20.00	2.50	1, 1.5, 2
			0.8661	22.00	2.50	1, 1.5, 2
			0.8750			
7/8	9	14	0.9449	24.00	3.00	1, 1.5, 2
			1.0000			
			1.0236			
			1.0630	27.00	3.00	1, 1.5, 2
1 1/8	7	12	1.1250			
			1.1811	30.00	3.50	1, 1.5, 2, 3
1 1/4	7	12	1.2500			
			1.2598			
			1.2992	33.00	3.50	1.5, 2, 3
			1.3750			
1 3/8	6	12	1.3780			
			1.4173	36.00	4.00	1.5, 2, 3
			1.4961			
1 1/2	6	12	1.5000			
			1.5354	39.00	4.00	1.5, 2, 3
			1.5748			
			1.6535	42.00	4.50	1.5, 2, 3, 4

\* 1" - 14TPI (UNS) Standard - used on all stock (12 TPI Special Order Only)

Abstract of SAE J429 1985

### Mechanical & Material Requirements for Grades 2, 5 & 8 Hex Head Cap Screws

Grade Designation	Products	Nominal Size Dia., In.	Full Size Bolts, Screws Studs, Sems			Machine Test Specimens of Bolts, Screws and Studs			Surface Hardness Rockwell 30N Min. Max.	Core Hardness Rockwell Min. Max.		Grade Identification Marking I
			Proof Load (Stress)	Tensile Strength (Stress)	Yield Strength (Stress)	Tensile Strength (Stress)	Elongation	Reduction of Area Min. %		B80	B100	
2	Bolts, Screws, Studs	1/4 thru 3/4	55,000	74,000	57,000	74,000	18	35	-	B80	B100	None
5	Bolts, Screws, Studs	Over 3/4 to 1 1/2	33,000	60,000	36,000	60,000	18	35	-	B70	B100	None
8	Bolts, Screws, Studs	Over 1/4 to 1 1/2	85,000	120,000	92,000	120,000	14	35	54	C23	C34	None
	Bolts, Screws, Studs	Over 1/4 to 1 1/2	74,000	105,000	81,000	105,000	14	35	50	C19	C30	None
	Bolts, Screws, Studs	Over 1/4 to 1 1/2	120,000	150,000	130,000	150,000	12	35	58.6	C33	C39	None