Earnest

Earnest Technical Bulletin

All Metal Lock Nuts

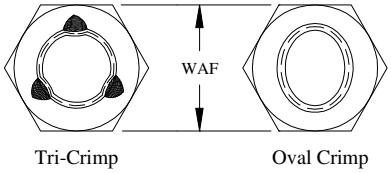
Stover® Style

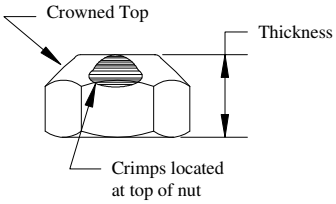
2/22/10

All Metal Hex Lock Nuts are designed to increase the resistance to rotation by developing a “prevailing torque” between the bolt (or stud) threads and the threads in the nut. This prevailing torque is developed by “crimping” the nut to create added friction between the threads of the nut and the threads of the bolt.

This design features a crowned top that is crimped to create the locking feature. This crowned top design is commonly called a “stover” style lock nut. The style of the locking crimp may be either oval shaped or triangular shaped (tri-crimp) depending on the size.

Both styles of crimps provide the same locking ability and resistance to loosening in high vibration applications.





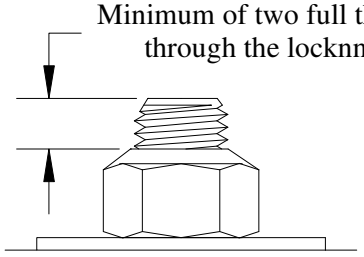
Size	Width Across Flats (nom)	Thickness Max	Thickness Min
1/4	7/16	.288	.212
5/16	1/2	.336	.258
3/8	9/16	.415	.320
7/16	11/16	.463	.365
1/ 2	3/4	.573	.427
9/16	7/8	.621	.473
5/8	15/16	.731	.535
3/4	1 1/8	.827	.617
7/8	1 5/16	.922	.724
1	1 1/2	1.018	.831

Earnest’s standard line of all metal lock nuts are made to the material properties and strength requirements are per the Industrial Fastener Institutes standard IFI 100/107 for Grade C which is designed to be used on fasteners up to a Grade 8 strength level.

Diameters	Proof Load Strength	Hardness
1/4 to 5/8	150,000 psi	Rc 24/32
3/4 to 1”	150,000 psi	Rc 26/34
over 1”	150,000 psi	Rc 26/36

The performance requirements (locking ability) are also per IFI 100/107 for prevailing torque nuts of Grade C. Other grades are available upon request.

Earnest standard line of lock nuts are coated with a zinc phosphate and oil coating that provides excellent resistance to galling and uniform torque tension performance. Other coatings are available upon request.



For proper installation of locknuts, two threads should extend past the top of the nut. The first one and one half threads on bolts and studs are typically chamfered and do not provide full thread engagement. To ensure maximum locking action the bolt or stud thread must extend at least two threads past the top of the nut.

Earnest Technical Bulletin 5/8/12

All Metal Lock Nuts-Collar Style

Sizes 1 1/8" to 2"

Earnest Machine Product's line of "All Metal Lock Nuts, Grade C – Collar Style" are manufactured to the dimensional and physical requirements of the Industrial Fastener Institutes (IFI) standard for "Prevailing Torque" style lock nuts (IFI Standard 100/107). This line is through hardened to a Grade C strength level, Grade C nuts are designed to be used with Grade 8 strength level fasteners (per SAE J429).

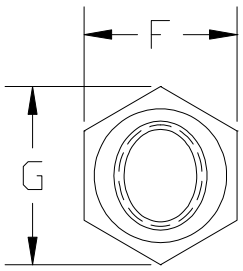
IFI 100/107 lists the dimensions and performance values for sizes up to 1 1/2", for sizes larger than 1 1/2" Earnest uses the same proportionality as IFI for sizes to 2".

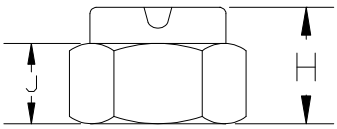
The prevailing torque is generated by the controlled crimp that has been applied to the collared section of the nut. The collar design of the nut and the controlled crimped area is designed to develop uniform holding power on the male thread, without creating excessive installation torque that can result in binding and galling of the threads during assembly. The uniform locking action provided by this collared design provides excellent resistance to loosening in high vibration applications.

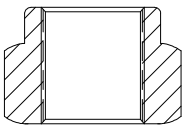
Earnest offers these Lock Nuts plated with an electroplated zinc and clear chromate and have a wax added to provide uniform torque tension performance along with corrosion protection (other platings are available upon request).

Physical Properties of Grade C Nuts

Material	Medium Carbon Steel
Proof Load Strength	150,000 psi min
Rockwell Hardness	Rc 26/36







Cross Sectional View

Size	Width Across Flats		Total Thickness		Hex Height		Proof Load (lbs)	Prevailing Torque (ft-lb)	
	F		H		J			1st Install	5th Removal
	Max	Min	Max	Min	Max	Min	Min	Max	Min
1 1/8 – 7	1.687	1.631	1.176	.939	.657	.636	115,000	100	70
1 1/8 – 12	1.687	1.631	1.176	.939	.657	.636	128,000	100	70
1 1/4 – 7	1.875	1.812	1.272	1.030	.719	.698	145,000	110	80
1 1/4 – 12	1.875	1.812	1.272	1.030	.719	.698	161,000	110	80
1 3/8 – 6	2.062	1.994	1.399	1.138	.793	.771	173,000	135	100
1 3/8 – 12	2.062	1.994	1.399	1.138	.793	.771	197,000	135	100
1 1/2 – 6	2.250	2.175	1.526	1.245	.865	.843	211,000	150	120
1 1/2 – 12	2.250	2.175	1.526	1.245	.865	.843	237,000	150	120
1 3/4 – 5	2.625	2.538	1.540	1.460	1.012	.989	285,000	175	130
1 3/4 – 12	2.625	2.538	1.540	1.460	1.012	.989	382,800	175	130
2 – 4 1/2	3.000	2.900	1.763	1.675	1.158	1.134	374,700	200	140
2 – 12	3.000	2.900	1.763	1.675	1.158	1.134	433,700	200	140

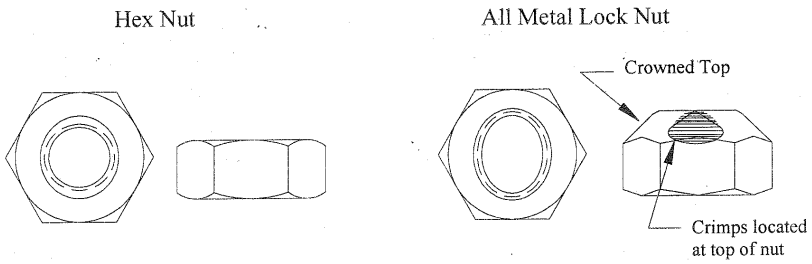
Earnest

Earnest Technical Bulletin

Strength Levels

Hex Nuts vs Hex Lock Nuts

4/19/00



Hex Nuts are typically manufactured to the material and strength requirements of the Society of Automotive Engineers standard SAE J995. This SAE specification recognizes three strength levels of nuts - Grade 2, Grade 5 and Grade 8. The strength levels of these nuts are designed to be compatible with the corresponding grades of the cap screws.

Locknuts are typically manufactured to Industrial Fastener Institute (IFI) 100/107 specifications. In order to differentiate between a free spinning nut and a nut that has prevailing torque (a wrench is required to run the nut up the threads of the cap screw) the IFI designated their nuts Grade A, Grade B and Grade C. These locknut grades are designed to be used on the same grades of cap screws as the free spinning nuts.

Locknut	Hex Nut	Maximum Grade of Cap Screw to be used with
Grade A	Grade 2	Grade 2
Grade B	Grade 5	Grade 5
Grade C	Grade 8	Grade 8

Lock Nuts can be manufactured ins several ways .

1. A cone is added to the top of the nut and the threads in this area are distorted - this style is commonly called a "stover" style (shown above).
2. A reduced collar area is added to the top of the nut and this collar area is crimped. - this style is most common for diameters of 1" and larger
3. The side of the nut is punched to distort the threads.
4. The top bearing surface of the nut is punched to distort the threads.
5. A nylon ring is added to the top of the nut.
6. A nylon patch is applied to the threads.

No matter what method is used to create the prevailing torque, the grade of nut must be compatible with the grade of the cap screw.