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Forged Head, 1-1/8" (29 mm) Square

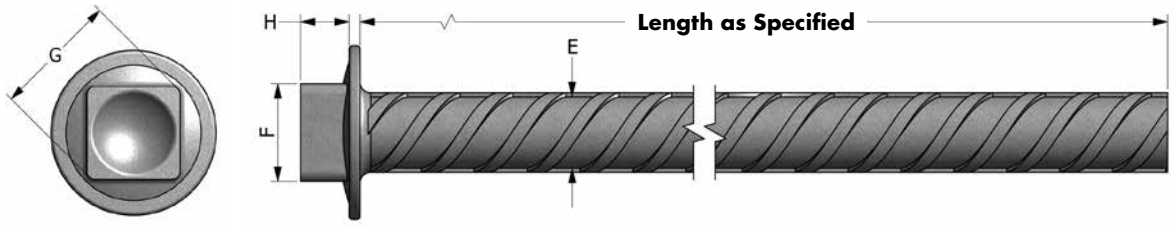
Installation

Dimensions — Rebar and J-BAR

	Bar Type	Bolt Size, in. (mm)			
		5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Body Diameter (E), Nominal, in. (mm)	Rebar J-BAR	0.625 (16) NA	0.750 (19) 0.680 (17)	0.875 (22) 0.804 (20)	1.000 (25) 0.914 (23)
Head Across Flats (F), in. (mm)	1.088–1.125 (27.64–28.58)				
Head Across Corners (G), in. (mm)	1.425–1.591 (36.20–40.41)				
Head Height (H), in. (mm)	0.476 (12.09)				

All dimensions in accordance with ASTM F432.

Rebar

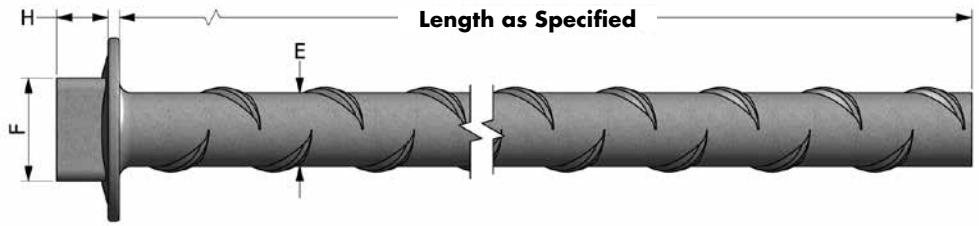


Technical Data — Rebar

Grade	Gr40	Gr60			Gr90
Bolt Size, in. (mm)	3/4 (19)	5/8 (16)	3/4 (19)	7/8 (22)	5/8 (16)
Yield Strength, min., lb (kN)	17,600 (78)	18,600 (83)	26,400 (117)	36,000 (160)	27,900 (124)
Tensile Strength, min., lb (kN)	30,800 (137)	27,900 (124)	39,600 (176)	54,000 (240)	37,200 (165)

All mechanical and physical properties in accordance with ASTM F432.

J-BAR®



Technical Data — J-BAR

Grade	Gr75		
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Yield Strength, min., lb (kN)	26,800 (119)	37,700 (165)	49,200 (219)
Tensile Strength, min., lb (kN)	36,125 (161)	49,900 (222)	65,600 (292)

All mechanical and physical properties in accordance with ASTM F432.

Tensioned Rebar Bolts

JENNMAR's tensioned rebar bolts have threaded ends and can be used as fully grouted or point anchored systems. Tensioned rebar systems offer simple beam building at an inexpensive price.

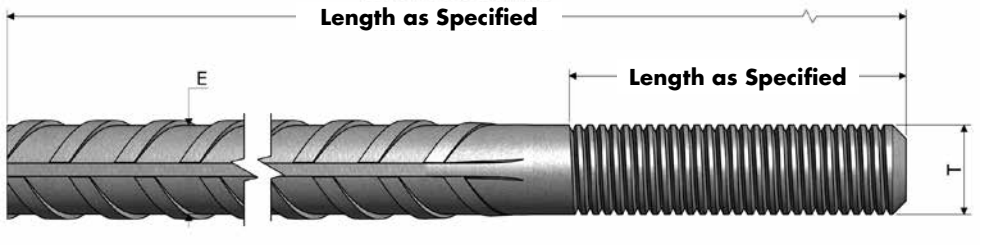
Installation

Dimensions — Rebar and J-BAR

		Bolt Size, in. (mm)			
	Bar Type	**5/8 (16)**	**3/4 (19)**	**7/8 (22)**	**1 (25)**
Body Diameter (E), Nominal, in. (mm)	Rebar J-BAR	0.625 (16) —	0.750 (19) 0.680 (17)	0.875 (22) 0.804 (20)	1.000 (25) 0.914 (23)
Thread Size (T), LH or RH		5/8 in. – 11 UNC	3/4 in. – 10 UNC	7/8 in. – 9 UNC	1 in. – 8 UNC

All dimensions and thread sizes in accordance with ASTM F432.

Rebar

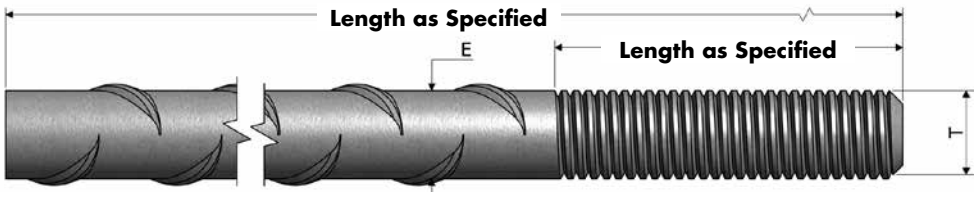


Technical Data — Rebar

Grade	**Gr60**				**Gr90**
Bolt Size, in. (mm)	**5/8 (16)**	**3/4 (19)**	**7/8 (22)**	**1 (25)**	**5/8 (16)**
Thread Yield Strength, min., lb (kN)	13,600 (60)	20,000 (89)	27,700 (123)	36,400 (162)	20,300 (90)
Thread Tensile Strength, min., lb (kN)	20,300 (90)	30,100 (134)	41,600 (185)	54,500 (242)	27,100 (121)

All mechanical and physical properties in accordance with ASTM F432.

J-BAR®



Technical Data — J-BAR

Grade	**Gr75**		
Bolt Size, in. (mm)	**3/4 (19)**	**7/8 (22)**	**1 (25)**
Thread Yield Strength, min., lb (kN)	26,800 (119)	37,000 (165)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	36,125 (161)	49,900 (222)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

Tensioned Rebar Bolts/TT Anti-Friction Washer

JENNMAR offers the following variations of tensioned rebar systems for specific mining applications:

- JENNMAR SUPER TWIST®
- Torque Tension Dome Nut
- TT Nut Technology

JENNMAR's SUPER TWIST® is the most efficient and cost effective torque tension system on the market. Simply reverse spin to mix the resin, and then torque the nut. The nut never leaves the bolt due to JENNMAR's specially designed crimped bar. This system provides uniform tensioning, consistent torque and high installed loads.

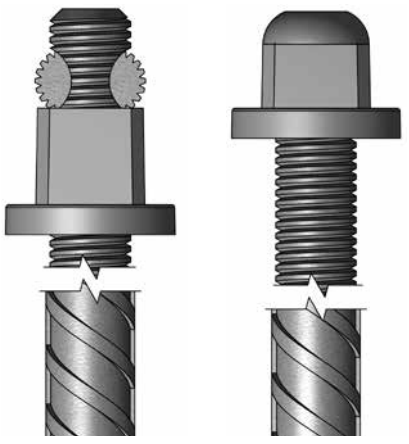
Other benefits include:

- Minimum amount of bolt protrusion
- Low residual torque

Torque Tension Dome Nut system provides the mining industry with a simple, inexpensive tensioned rebar system utilizing bottom threaded rebar. Resin mixing and torquing is in the same direction.

JENNMAR's TT Nut Technology can provide the following benefits over other conventional torque tension systems:

- No external delay mechanism (shear pin, plug, etc.)
- Special thread design in TT Nut provides uniform resin mixing and bolt tensioning
- Minimum amount of bolt protruding from roof
- System can be used fully grouted or point anchored bolts



Super Twist® **Dome Nut**

JENNMAR has developed the TT Anti-Friction Washer for various roof bolting applications to provide higher and more uniform tension and improve the beaming effect and roof stability. The TT Ant-Friction Washer consists of two zinc coated hardened steel washers joined together with an exclusive polymer. The zinc coating provides a smooth clean surface to apply the polymer which then allows for an optimum bond between washers. The zinc coating also enhances the lubricating effect and prevents corrosion. The combination of zinc coating and hot melt lubricant provides a much improved friction reducing medium.

Features

- Increase in tension/torque ratio
- Increase in install load
- Available in (2 in. O.D. × 1 in. I.D.) or (2-1/4 in. O.D. × 1-1/8 in. I.D.)

Advantages

- Improve beaming effect and roof stability
- Especially effective in weak, laminated strata
- Polymer acts as improved anti-friction agent
- Zinc coating minimizes washer corrosion
- Eliminates sparking during bolt rotation
- Zinc corrosion protection allows for outdoor or underground storage
- Not affected by exposure to sunlight or extreme temperatures

Combination Bolt System

System Overview

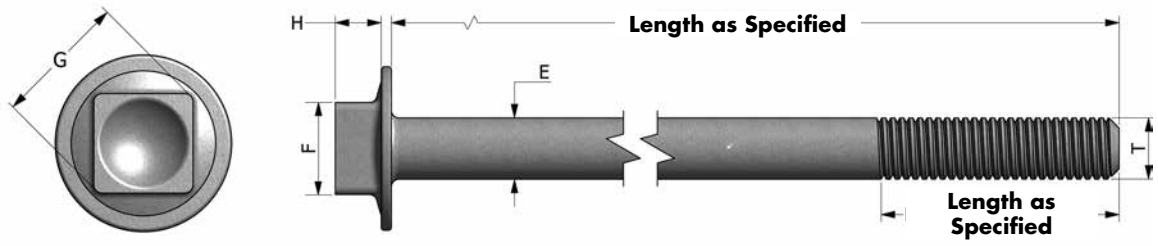
JENNMAR offers the industry's most proven combination bolt system in the mining industry. The Combination Bolt is a two-piece bolt. The upper piece, available in additional combinations, consists of JENNMAR's exclusive J-BAR® for better mixing, stronger threads, and greater anchorage capacity. The lower piece (a headed smooth bar) is connected to the top bolt by a coupler. The Combination Bolt provides ultimate tension in weak strata. The top portion (J-BAR) is encapsulated with resin, while the lower anchor is tensioned to the roof with our bearing plate.

Advantages

- The ultimate tension resin system for all seam heights
- No need to bend for insertion
- Proven Shear Pin system with coupler
- System permits pre-bolting of overcasts for 50% savings
- With mine roof channel or mats savings can range from 25% to 140%
- Proven usage in longwall headgate and tailgate entries as supplemental or primary support
- Prevent roof sag and lateral roof movement

Installation

Forged Head, 1-1/8" (29 mm) Square



Dimensions

	Bar Type	Bolt Size, in. (mm)		
		3/4 (19)	7/8 (22)	1 (25)
Body Diameter (E), Nominal, in. (mm)	Smooth	0.680 (17)	0.797 (20)	0.906 (23)
Head Across Flats (F), in. (mm)		1.088–1.125 (27.64–28.58)		
Head Across Corners (G), in. (mm)		1.425–1.591 (36.20–40.41)		
Head Height (H), min., in. (mm)		0.476 (12.09)		
Thread Size (T), LH or RH, in.		3/4–10 UNC	7/8–9 UNC	1–8 UNC

All dimensions and thread sizes in accordance with ASTM F432.

continued

Forged Head, 1-1/8" (29 mm) Square continued

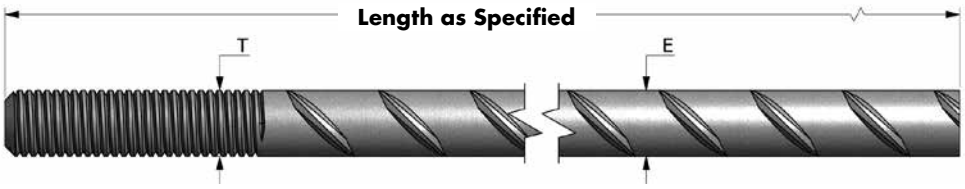
Smooth Bar

Technical Data — Smooth Bar

Grade	Gr75		
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	26,800 (119)	37,000 (165)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	36,125 (161)	49,900 (222)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

J-BAR®



Technical Data — J-BAR

Grade	Gr75		
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	26,800 (119)	37,000 (165)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	36,125 (161)	49,900 (222)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

INSTAL® Bolt Anchor System

JENNMAR's advanced line of INSTAL Bolt Anchor Systems is the industry's most efficient resin point anchor system, offering quick installation and superior anchorage capacity when compared to other resin point anchored products. They provide the support power and fast installation cycle of mechanical bolts with added anchorage capacity by utilizing resin. These bolts are furnished by JENNMAR's experienced sales technicians and engineers to fit your specific mine applications, and designed to your specific seam heights and strata conditions.

Benefits of Utilizing INSTAL Systems

- Prevents roof sag and lateral strata movement
- Consistently outperforms all other systems
- Cost efficient
- Designed specifically for longwall headgate and tailgate entries in low or high coal
- Provides increased holding power utilizing less resin (compression system only)
- Available for fully grouted installation

Installation

INSTAL Bolt Specifications

	Hole Diameter, in. (mm)	Bar Diameter, in. (mm)	Grades
INSTAL 1A HT	1-3/8 (35)	3/4, 7/8, 1 (19, 22, 25)	40, 60, 75
INSTAL II HT	1-3/8 (35)	3/4, 7/8, 1 (19, 22, 25)	40, 60, 75
INSTAL III HT	1-3/8 (35)	3/4, 7/8 (19, 22)	40, 60, 75
INSTAL 1A (with standard D8 4-prong shell)	1-3/8 (35)	5/8, 3/4 (16, 19)	60, 75
INSTAL II (with standard D8 4-prong shell)	1-3/8 (35)	5/8, 3/4, 7/8 (16, 19, 22)	40, 60, 75
INSTAL B HT (only INSTAL system for true 1 in. diameter hole)	1 (25)	5/8 (16)	60, 75, 90
INSTAL Compression Bolt System	1-3/8 (35)	5/8, 3/4, 7/8 (16, 19, 22)	40, 60, 75
INSTAL II or III (with J15 Expansion Shell)	1-1/2, 1-5/8 (38, 41)	1 (25)	60, 75

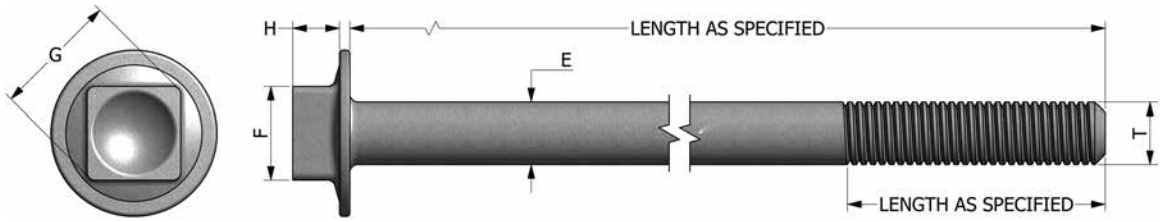
Forged Head, 1-1/8" (29 mm) Square

Dimensions

	Bar Type	Bolt Size, in. (mm)			
		5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Body Diameter (E), nominal, in. (mm)	Smooth Rebar J-BAR	0.563 (14) 0.625 (16) NA	0.680 (17) 0.750 (19) 0.680 (17)	0.797 (20) 0.875 (22) 0.804 (20)	0.906 (23) 1.000 (25) 0.914 (23)
Head Across Flats (F), in. (mm)		1.088–1.125 (27.64–28.58)			
Head Across Corners (G), in. (mm)		1.425–1.591 (36.20–40.41)			
Head Height (H), min., in. (mm)		0.476 (12.09)			
Thread Size (T), LH or RH, in.		5/8–11 UNC	3/4–10 UNC	7/8–9 UNC	1–8 UNC

All dimensions and thread sizes in accordance with ASTM F432.

Smooth Bar

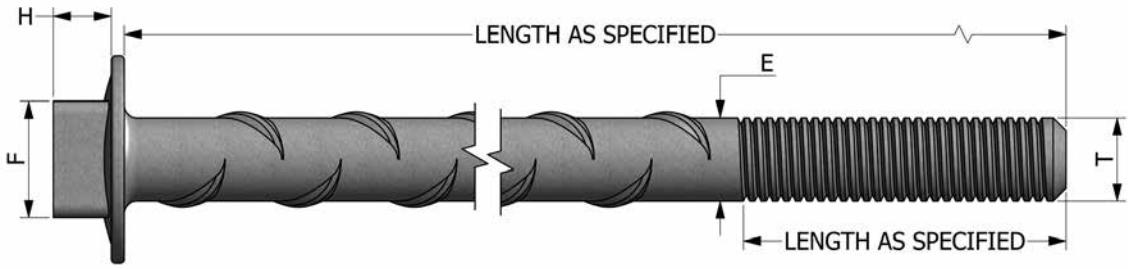


Technical Data — Smooth Bar

Grade	Gr55	Gr75			
Bolt Size, in. (mm)	5/8 (16)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	12,400 (55)	17,000 (76)	26,800 (119)	37,000 (165)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	19,200 (85)	22,600 (101)	36,125 (161)	49,900 (222)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

J-BAR®



Technical Data — J-BAR

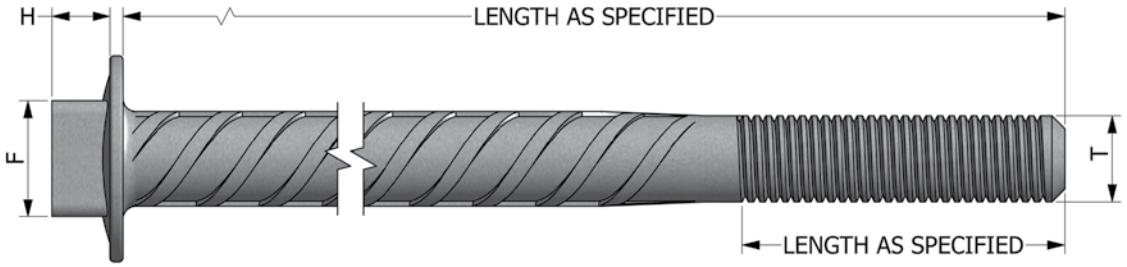
Grade	Gr75		
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	26,800 (119)	37,000 (165)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	36,125 (161)	49,900 (222)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

continued

Forged Head, 1-1/8" (29 mm) Square continued

Rebar

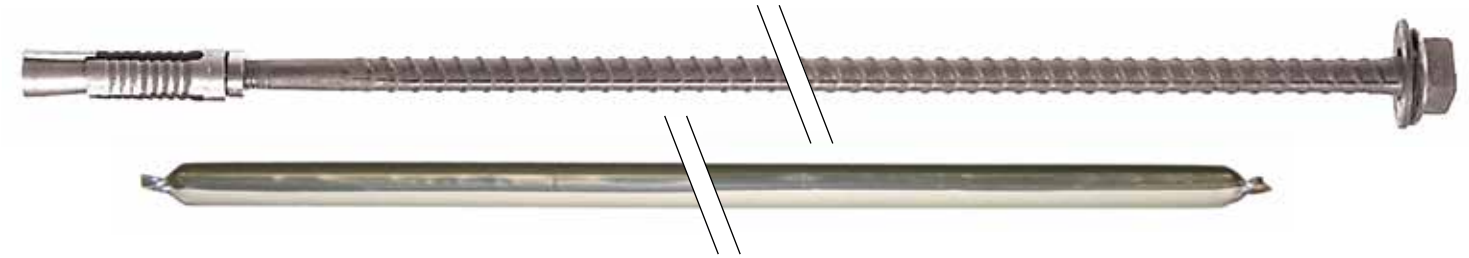


Technical Data — Rebar

Grade	Gr60				Gr90
Bolt Size, in. (mm)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)	5/8 (16)
Thread Yield Strength, min., lb (kN)	13,600 (60)	20,000 (89)	27,700 (123)	36,400 (162)	20,300 (90)
Thread Tensile Strength, min., lb (kN)	20,300 (90)	30,100 (134)	41,600 (185)	54,500 (242)	27,100 (121)

All mechanical and physical properties in accordance with ASTM F432.

Fully-Grouted INSTAL® Bolt Anchor System



The Fully-Grouted INSTAL® Bolt is the ideal high tension bolt due to the resin that locks bolt tension within the system, while significantly slowing down the weathering process around the bolt hole. The Fully-Grouted INSTAL Bolt combines the benefits of fully-grouted and tensioned bolts, providing the best of both worlds.

The fully-grouted, high-tension bolt is a 7/8", 6 ft. special grade 75 rebar that is tensioned to nearly 20,000 lb via a mechanical shell before the fully grouted resin column cures. A 60 × 1-1/4" J-LOK INSTAL resin cartridge is used to fully grout the 7/8" bolt in a 1-3/8" hole. Wider and deeper grooves on the shell plug facilitate the initial resin flow around the shell and reduce insertion pressure. Underground observations and laboratory tests indicate that the flow around the shell plug allows the resin to be mixed effectively. Since the shell and hole have an annulus thickness of less than 0.0625", glove fingering is not possible.

Advantages

Fully-Grouted INSTAL bolts have improved performance due to superior anchorage and stiffness that develops as a result of a full length resin anchor.

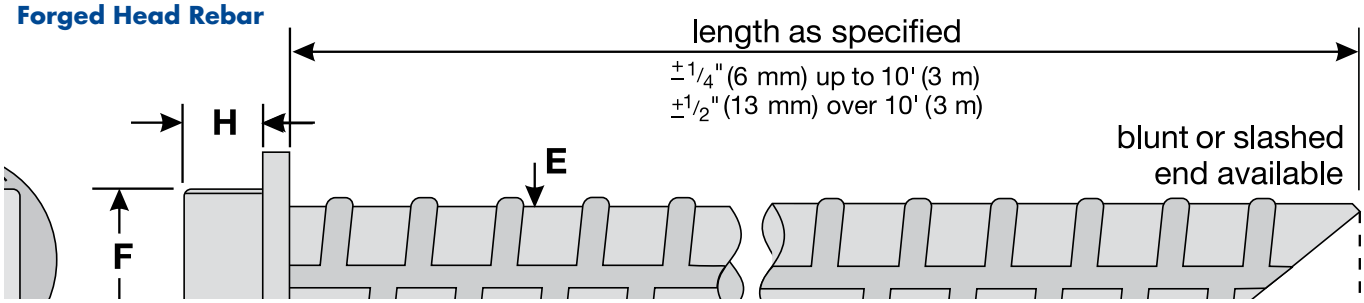
Significant resistance to rock movement is developed both axially and laterally because of the superior stiffness of the fully-grouted INSTAL bolts.

If roof separation or horizontal shearing forces occur, bolt loads that are developed are quickly transferred back to the rock, and roof separation and shearing are resisted.

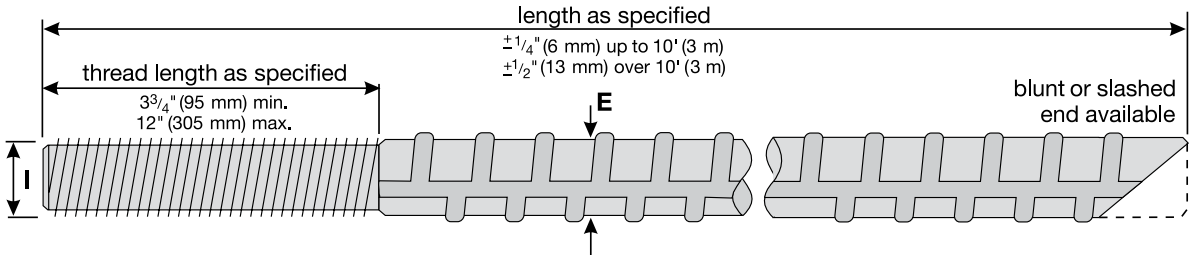
Rebar Rock Bolts (Forged Head & Threaded)

#5 (15 m), #6 (20 m), #7 (22 m) and #8 (25 m)

Forged Head Rebar



Threaded Rebar



Dimensions

	#5 (15 m)	#6 (20 m)	#7 (22 m)	#8 (25 m)
Nominal Bar Size E, in. (mm)	0.625 (16)	0.750 (19.5)	0.875 (22.2)	1.0 (25.2)
Head Across Flats F, in. (mm)	1.088 to 1.125 (27.64 to 28.58)			
Head Across Corners G, in. (mm)	1.425 to 1.591 (36.19 to 40.41)			
Head Height, min. H, in. (mm)	0.40 (10.2)			
Thread Size (LH or RH) I. in.	5/8–11 UNC	3/4–10 UNC	7/8–9 UNC	1–8 UNC

Technical Data — Forged Head — Grade 60

	#5 (15 m)	#6 (20 m)	#7 (22 m)	#8 (25 m)
Yield Strength, min., lbs (kN)	18,600 (80)	26,400 (120)	36,100 (155)	47,100 (200)
Tensile Strength, min., lbs (kN)	27,600 (121)	39,600 (180)	54,100 (232)	70,600 (300)
Elongation in 8" (200 mm)	9% minimum			

Technical Data — Threaded — Grade 60

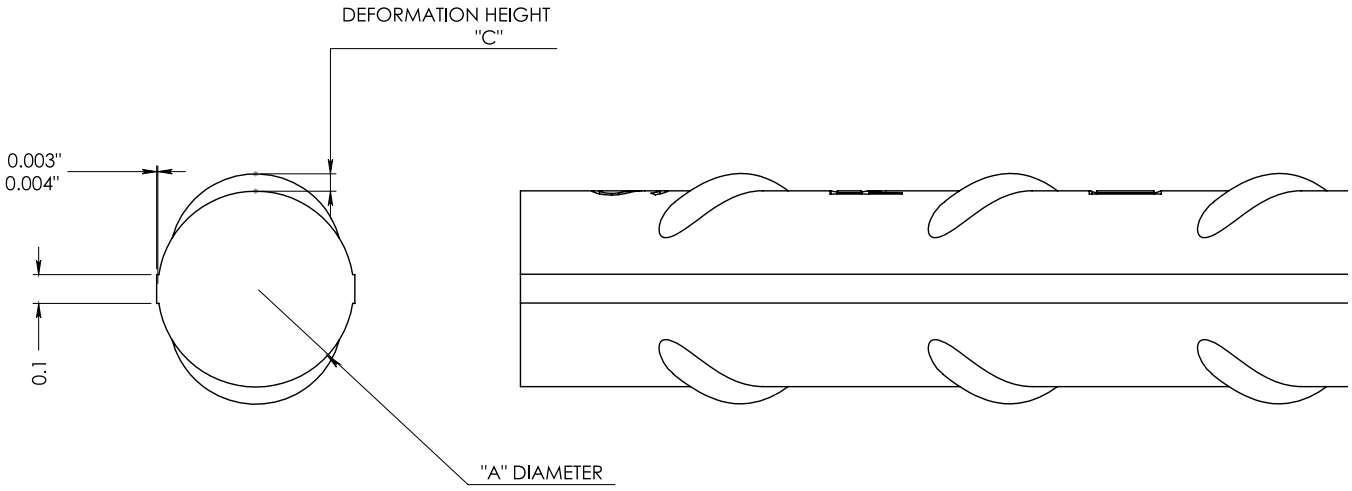
	5/8" – 11 UNC	3/4" – 10 UNC	7/8" – 9 UNC	1" – 8 UNC
Yield Strength, min., lbs (kN)	13,600 (60.5)	20,000 (89)	27,700 (123.2)	36,400 (161.9)
Tensile Strength, min., lbs (kN)	20,300 (90.3)	30,100 (133.9)	41,600 (185)	54,500 (242.4)
Elongation in 8" (200 mm)	9% minimum			

Notes: USA — manufactured to ASTM F432 and ASTM A615 specifications; bolts MSHA approved
Canada — manufactured to ASTM F432, CSA M430 and CSA G30.18M specifications
Grade 40 & 75 available where applicable. Notched rebar optional for bending.

MGSD Bar

The new hybrid size bar to allow easier insertion through resin and better resin mixing.

Size (in.)	Grade	Yield min.	Yield max.	Tensile min.	Tensile max.	Elongation	"A" Diameter (in.)	"A" Aim (in.)	"C" Nominal (in.)	"C" Deviation (in.)
3/4	75	75,000	87,000	100,000	131,000	8 % min.	0.680	0.680–0.686	0.060	0.038 min. 0.068 max.
7/8	75	75,000	87,000	100,000	131,000	8 % min.	0.796	0.796–0.808	0.054	0.038 min. 0.068 max.



Rebar Rock Bolts

Nuts

Domenuts

- For 3/4" thread A.F. = 1-1/8" square
- For 7/8" thread A.F. = 1-1/8" square
- For 1" thread A.F. = 1-5/8" hex

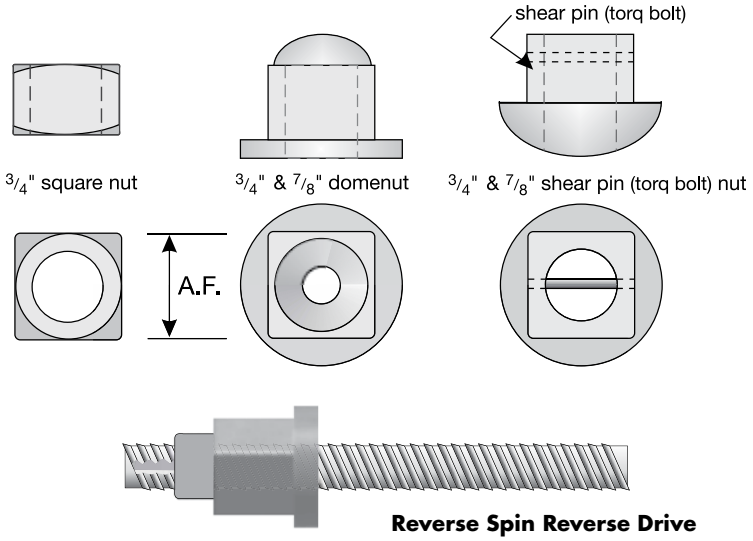
Plain Nuts — used with pinched thread

- For 3/4" thread A.F. = 1-1/8" square
- For 7/8" thread A.F. = 1-1/8" square with flange
- For 1" thread A.F. = 1-5/8" hex

Torq Bolts — system available

- for 3/4" and 7/8" thread A.F. = 1-1/8" square

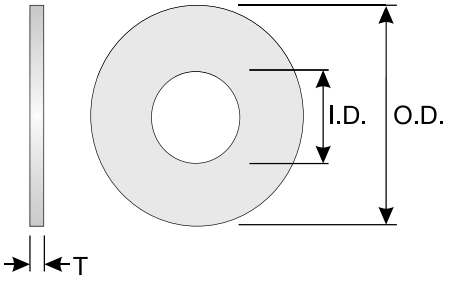
Resin Mixing System "crimped thread"



Reverse Spin Reverse Drive

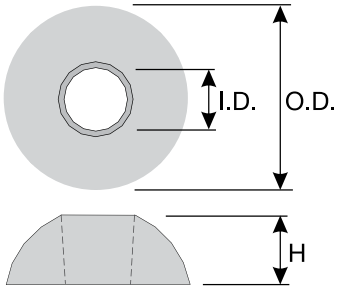
Hardened Round Washers

- To ASTM F436 specifications
- For 3/4" thread:
  - I.D. = 13/16", O.D. = 1-15/32", T = 0.122" to 0.177"
- For 7/8" thread:
  - I.D. = 15/16", O.D. = 1-3/4", T = 0.136" to 0.177"
- For 1" thread:
  - I.D. = 1-1/8", O.D. = 2", T = 0.136" to 0.177"



Spherical Seat (Compensation) Washers

- Ductile iron ASTM A536 Gr. 65-45-12
- For 3/4" thread:
  - I.D. = 13/16", O.D. = 2", H = 13/16" (model TSW-4)
  - I.D. = 15/16", O.D. = 2", H = 1/2" (model TSW)
- For 7/8" & 1" thread:
  - I.D. = 1-1/16", O.D. = 2", H = 1/2" (model TSW-1)



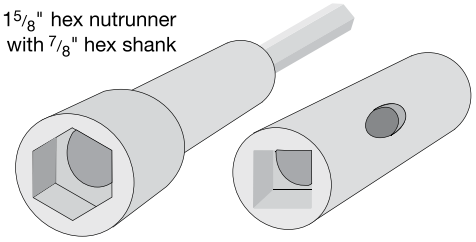
Installation Tools — for Stopers/Jacklegs

Forged Head Rebar Driver (Dollie)

- 1-1/8" square driver
- Available with 7/8" hex socket or 3-1/4" long hex shank

Threaded Rebar Nutrunners

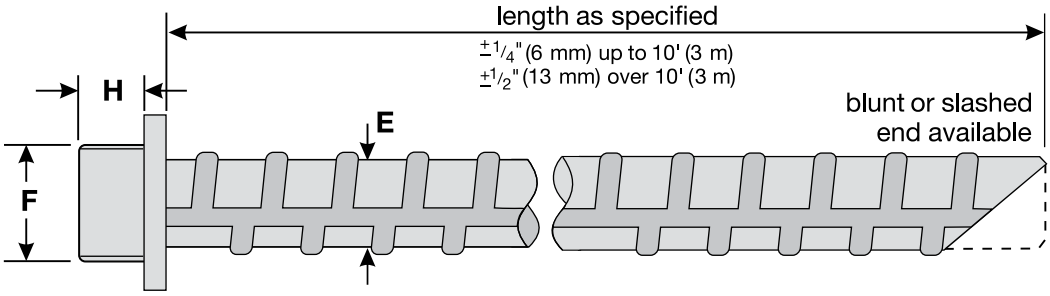
- 1-1/8" square nutrunner (for 3/4" & 7/8" bolts)
- 1-5/8" hex nutrunner (for 1" bolts)
- Available with 7/8" hex socket or 3-1/4" long hex shank



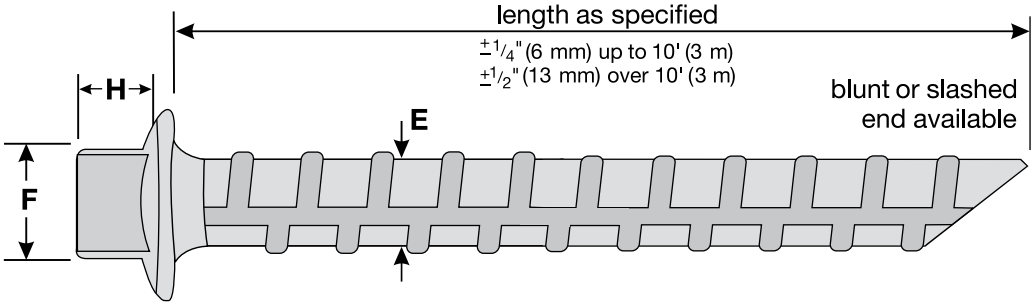
1 1/8" square nutrunner with 7/8" hex socket and optional ejector hole for domenut "caps"

Rope thread and T-thread drivers and nutrunners available on request

#7 (22 m)



Regular head for comparison



D-Dome™ head for comparison

Dimensions and Regulatory Requirements

- See Rebar Rockbolts page for size and regulatory requirement characteristics of D-Dome™ Rebar Rockbolts

Technical Data

- The D-Dome™ Rebar Rockbolts produces up to a 60% increase in head strength versus ASTM F432.95 requirements

Side View Comparison

Traditional headed rebar bolt loaded to 32,000 lbs

D-Dome™ headed rebar bolt loaded to 54,000 lbs

- The D-Dome™ headed rebar bolt offers increased security against roof loading
- Please contact a local sales representative for a sample product and to arrange for a trial

JENN-TENSION

JENNMAR offers the JENN-TENSION roof bolt re-tensioning system for a quick and economical alternative to replacement of loose roof plates. The JENN-TENSION system fits up to #7 rebar. JENN-TENSION is capable of re-tensioning roof plates with a minimum 1 in. gap between the plate and roof.

Each JENN-TENSION unit consists of the following items:

- Spherical Washer
- Threaded Spacer (0.5 or 1.0")
- Nut
- Extra Spacers

Installation is simple!

1. Clean loose material from the roof to ensure that the plate will fit firmly against the roof.
2. Slide the spherical washer on to the bolt with the slot opening away from you.
3. Select the proper size of threaded spacer (1/2 or 1 in.) dependent upon the gap between the plate and roof. Slide the threaded spacer on to the bolt with the slot facing towards you. If using a spherical washer, make sure that the tab on the washer is in the slot of the threaded spacer.
4. Add blank spacers until the plate is as close to the roof as possible.
5. Slide the nut over the head/washer of the bolt and up to the threaded spacer.
6. Tighten the nut by hand until the plate comes in contact with the roof. Limit rotation of spherical washer by placing a screwdriver in slot of spherical washer.
7. Use channel locks or a wrench to tighten the nut until the plate is firmly against the roof.

Technical Data — JENN-TENSION

Description	Material	Nominal Dimensions	
		in.	mm
Spherical Washer	Cast Ductile Iron	3 dia × 1-1/4 H	76 dia × 32 H
JENN-TENSION Nut		3-1/2 Hex w/ 2-1/4 × 8 UNC Thread	89 Hex w/ 57 × 8 UNC Thread
Threaded Spacer, 1/2 in. (13 mm)		1/2 H w/ 2-1/2 × 8 UNC Thread	13 H w/ 57 × 8 UNC Thread
Threaded Spacer, 1 in. (25 mm)		1 H w/ 2-1/4 × 8 UNC Thread	25 H w/ 57 × 8 UNC Thread
Spacer, 1/2 in. (13 mm)		2 dia × 1/2 H	51 dia × 13 H
Spacer, 1 in. (25 mm)		2 dia × 1 H	51 dia × 25 H
Spacer, 2 in. (51 mm)		2 dia × 2 H	51 dia × 51 H

Bendable Bolts

JENNMAR's Bendable Bolts are available where bending is necessary to permit installation of bars that are longer than the mine opening height. These bendable bolts can be furnished with or without an altered or notched section at a designated location at which the bar will bend.

Notched Bendable Bolts

Notched Bendable Bolts are available as single or double notched with notch location and bolt length designated by the customer. Bolts are available in the following sizes/grades:

- #6 & #7 rebar, grades 40 & 60

Fully grouted non-tensioned bendable bolts shall have reached a load of 23,000 lbf before breaking. Tensioned bendable bolts shall exceed the minimum yield loads in accordance with ASTM Specification A615 or F432, or both, for the grade and diameter of bolt used, plus 6000 lbf.

Non-Notched Bendable Bolts

Non-Notched Bendable Bolts are available in the following sizes and grades:

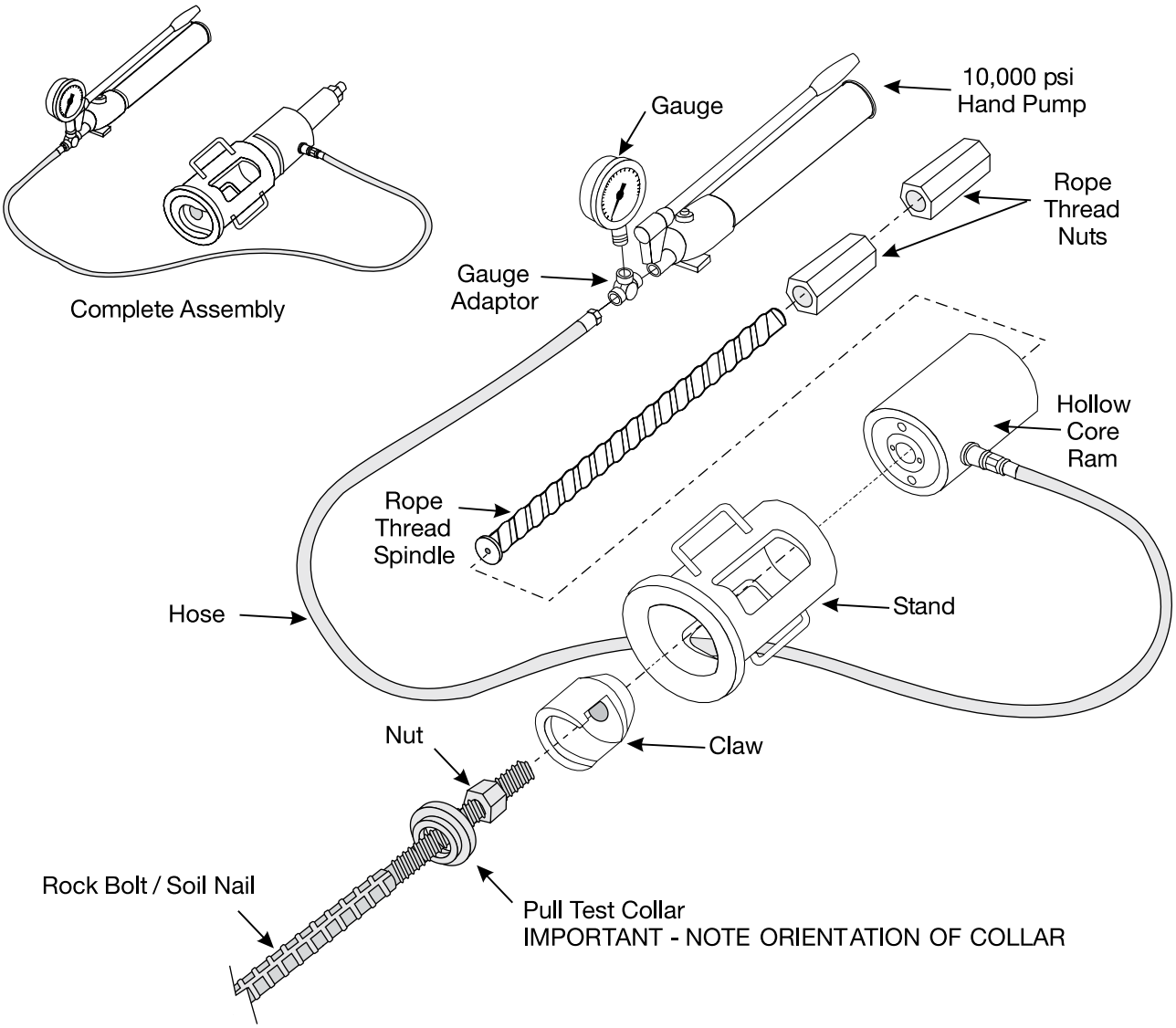
Technical Data — Non-Notched Bendable Bolts

Grade	Gr40	Gr60
Bolt Size, in. (mm)	3/4 (19)	5/8 (16)
Yield Strength, min., lb (kN)	17,600 (78)	18,600 (83)
Tensile Strength, min., lb (kN)	30,800 (137)	27,900 (124)
Elongation, min., in 8 in. (203 mm)	12%	9%

All mechanical and physical properties in accordance with ASTM F432.

Tension Jack/Pull Test Kit

30 Ton Capacity



General Information

The pull test kit consists of two assemblies:

- A mechanical assembly which includes a claw, stand, nut & spindle
- A hydraulic assembly which includes a hollow core ram, hand pump, gauge & hose
- The gauge measures pressure, which is easily converted into tons of load
- Suitable for testing virtually all types of rock bolts and soil nails
- When testing Split Set™, Swellex™ or forged head bolts, the pull collar must be put onto the bolt BEFORE installation of the bolt
- 30 ton units available for sale or rent
- Comes complete with wooden crate
- Pull test collars available upon request