Earnest

How can we help you today?

Spotting Quality

Your guide to sourcing high quality fasteners.

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Getting what you pay for.

When sourcing plow bolts, or any fastener for that matter, it is easy to choose price over quality. However, the old saying of “you get what you pay for” summarizes the current conditions of the fastener industry today. Cheap parts are cheap for a reason. Inconsistent manufacturing processes, lack of attention to technical specifications or poor training of machinists results in substandard parts being made available at lower and lower price points. No matter the reason, poor manufacturing shows in ways you can and often in ways you cannot see. As some global areas of manufacturing still struggle to achieve consistent steel formulation, machining, and heat-treating practices, saving a few dollars on parts with questionable manufacturing processes provides a less than comforting feeling and can come at a cost to your reputation.

So, as you begin sourcing plow and carriage bolts for your blade attachment systems this winter season, keep that old adage in mind “you get what you pay for”. A penny saved today can come at the cost of the reputation you have earned.

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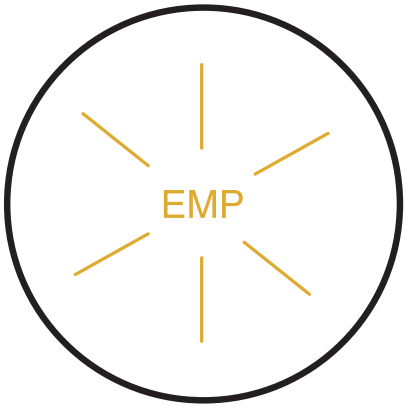
Head Marking.

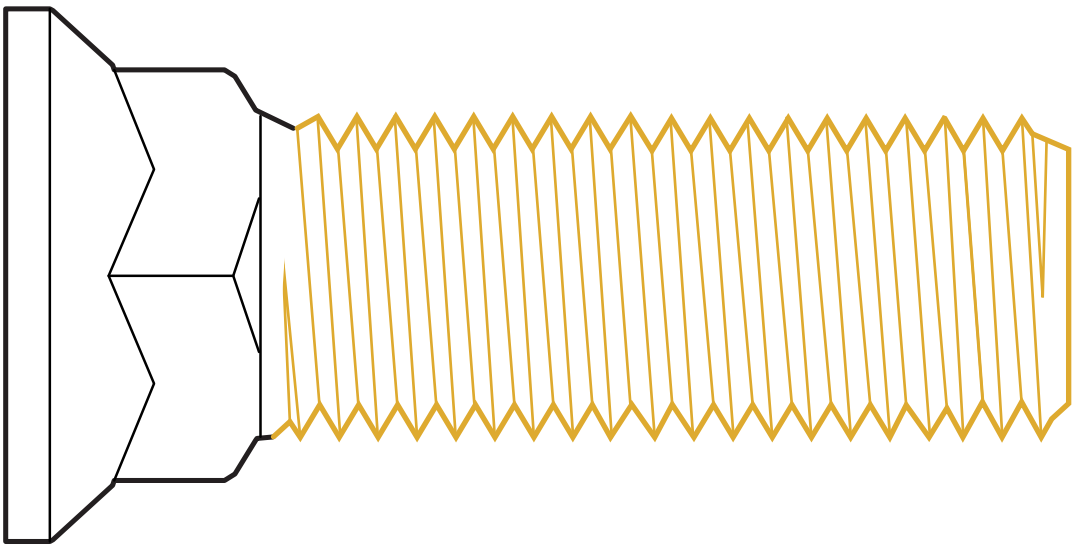
Head markings allow you to identify and trace a part back to a manufacturer. If the manufacturer isn't proud to put their mark on it, why would you want to sell it? Every high-quality part from Earnest has a head marking to allow for traceability in the event there is a product failure or quality issue. We only sell products from manufacturers whose product quality meets our strict guidelines and are proud to display our Earnest "E" head marking on the parts made to Earnest specifications.



There are numerous resources on-line that can help you identify a head marking or you can download the pdf of fastener head markings on file with the U.S. Patent office at www.uspto.gov/trademarks/law/FQA_Registry.pdf.

Rolled Threads

Our plow and carriage bolts are roll threaded, meaning the threads are compressed into the steel to form the thread. This compression retains and enhances the strength of the bolt and creates a better defined root radius. The leading cause of fastener failures were the result of fatigue failures. The fully defined root radius makes a stronger thread and reduces the likelihood of thread fatigue failures.



Feed Thickness:

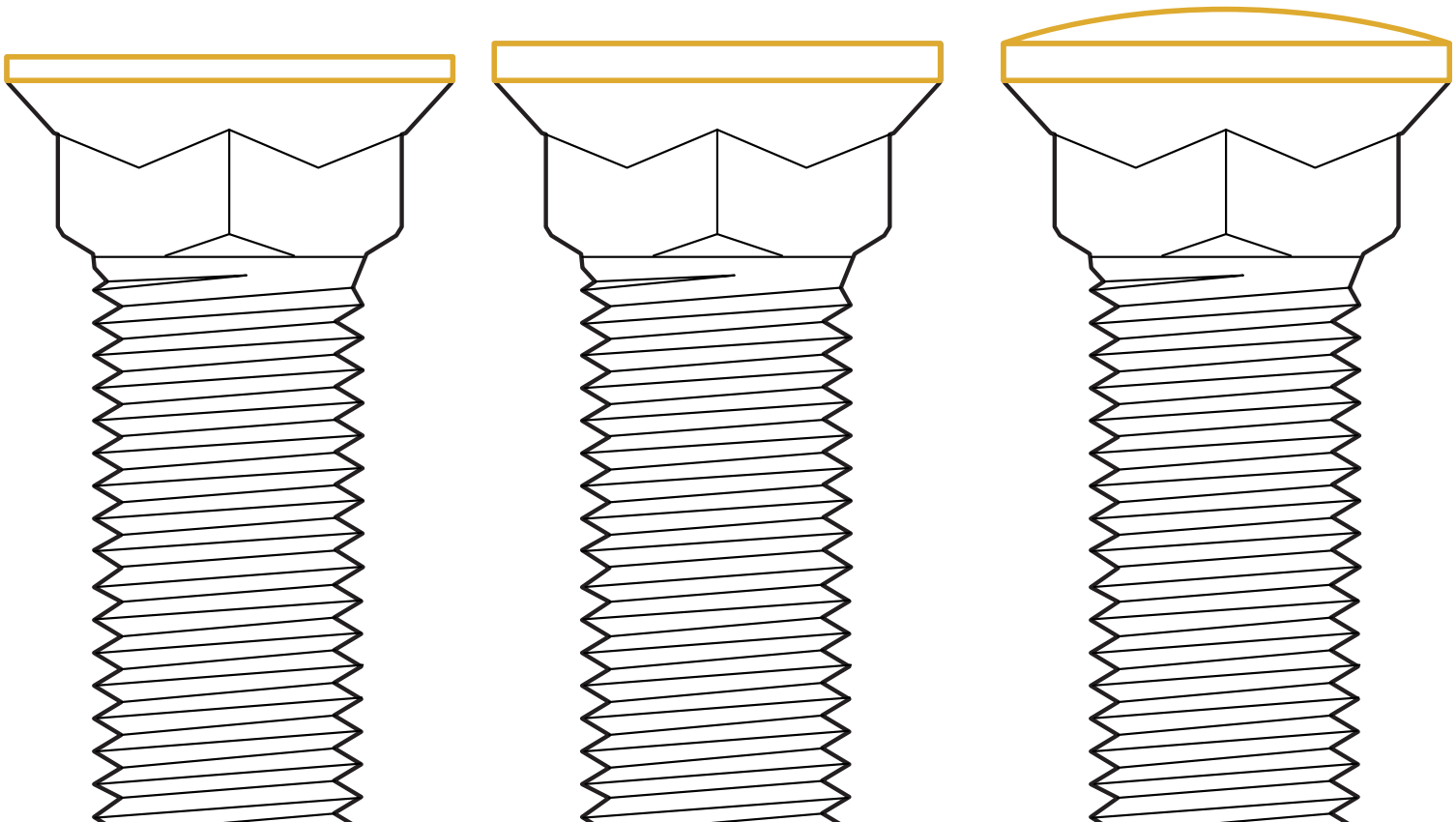
The feed area is the flat area that comprises the edge of the bolt head. As a bolt wears, the feed thickness diminishes. Think of it as the head slowly disappearing. With less head gripping the blade, the bolt assembly loosens, resulting in failure of the bolt and potential damage to the blade. Earnest's #3 Domed Head Plow Bolts are specifically designed with the maximum amount of feed area thickness to ensure maximum wear and longevity. Earnest's "domed" head plow bolts can be used in any application currently using standard flat head plow bolts.

For a longer lasting bolt, choose the Earnest Domed Head plow bolt. This bolt has a rounded head that is thicker than the standard "flat" head plow bolt. This additional steel on the head provides more wear capability. Domed Head Plow Bolts meet CAT standards and are available in Grade 8 and Grade E9-170m. are available in Grade 8 and Grade E9-170m.

Inconsistent manufactured feed thickness.

Earnest #3 Flat Head Plow Bolt

Earnest #3 Domed Head Plow Bolt



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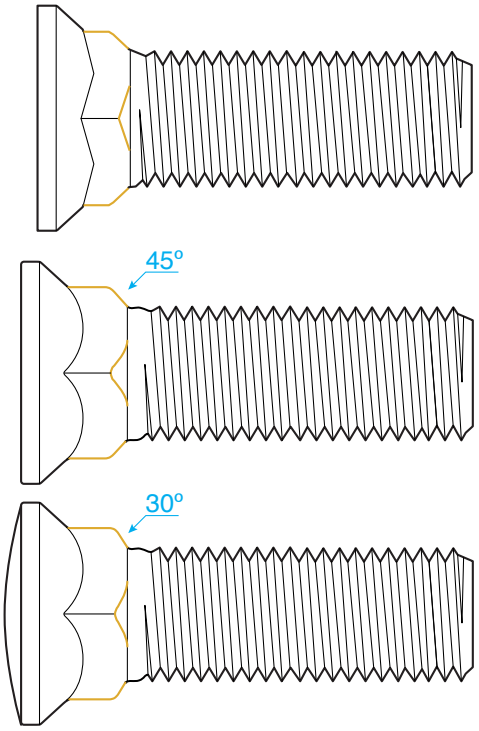
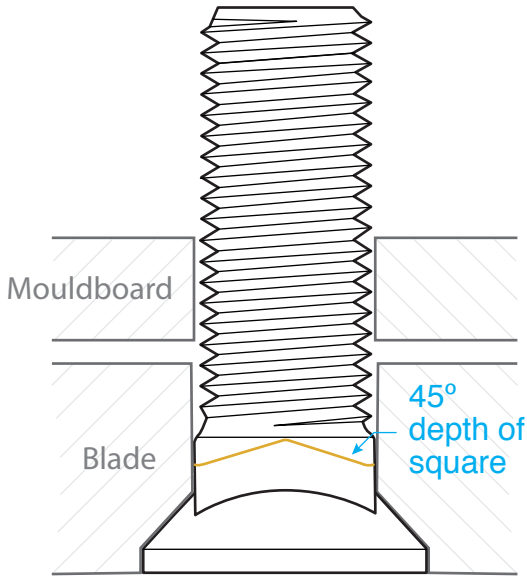
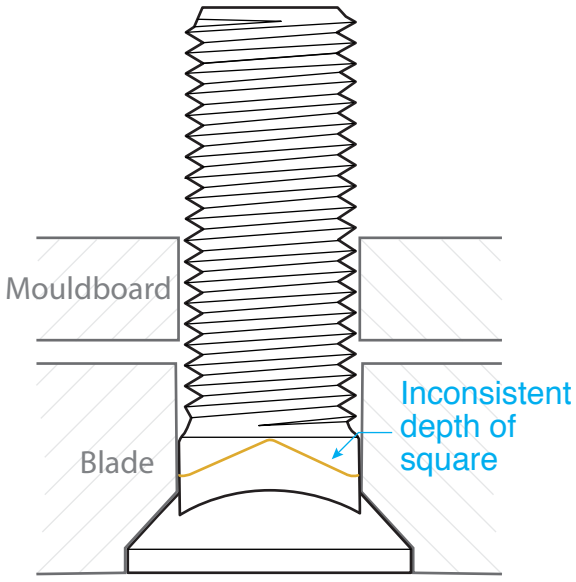
Square Depth:

The square of a plow or carriage bolt is the square part of the bolt directly under the head. This part fits into the square opening of the blade and through the mold or plow board, then is secured with a washer and nut to join the two parts together.

The square holds the bolt in place while the nut is being tightened. A more pronounced square helps when the depth of the hole stamped in the blade is irregular or inconsistent. The industry standard for plow bolts permits the corners of the square to at 45°. Inconsistent manufacturing practices of a plow bolt can result in varying thicknesses of this area, causing the bolt to slip or spin out of the hole, resulting in part failure, blade damage, or worse, damage to the board.







Inconsistent manufacturing practices of a plow bolt can result in varying thicknesses of this area, causing the bolt to slip or spin out of the hole, resulting in part failure, blade damage, or worse, damage to the board. Earnest plow bolts are designed with 30° depth of square, creating a more pronounced depth of square which in turn hold better when tightened.

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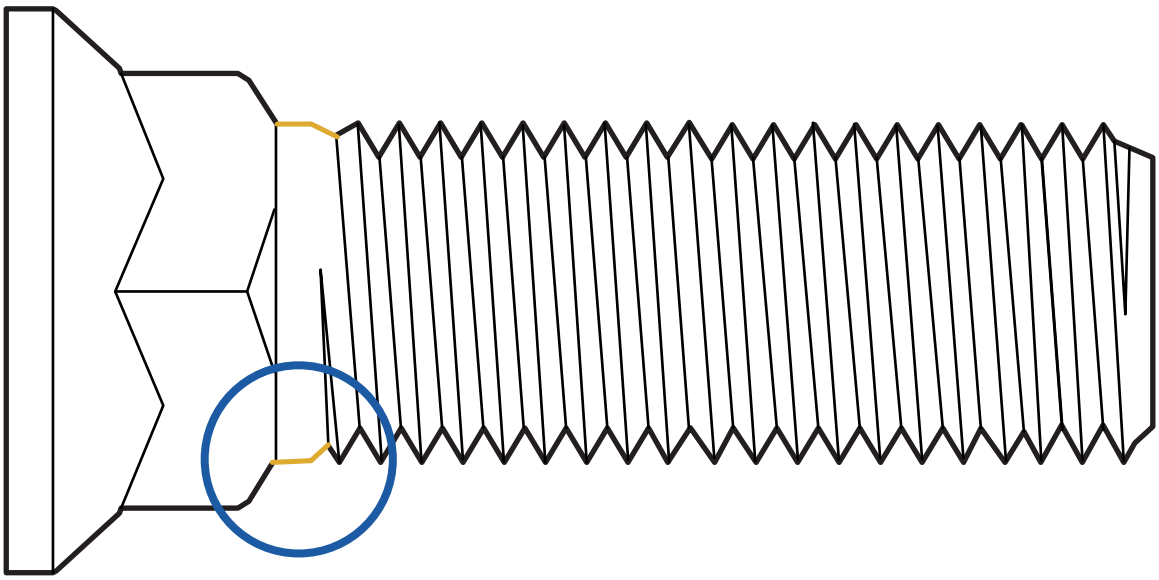
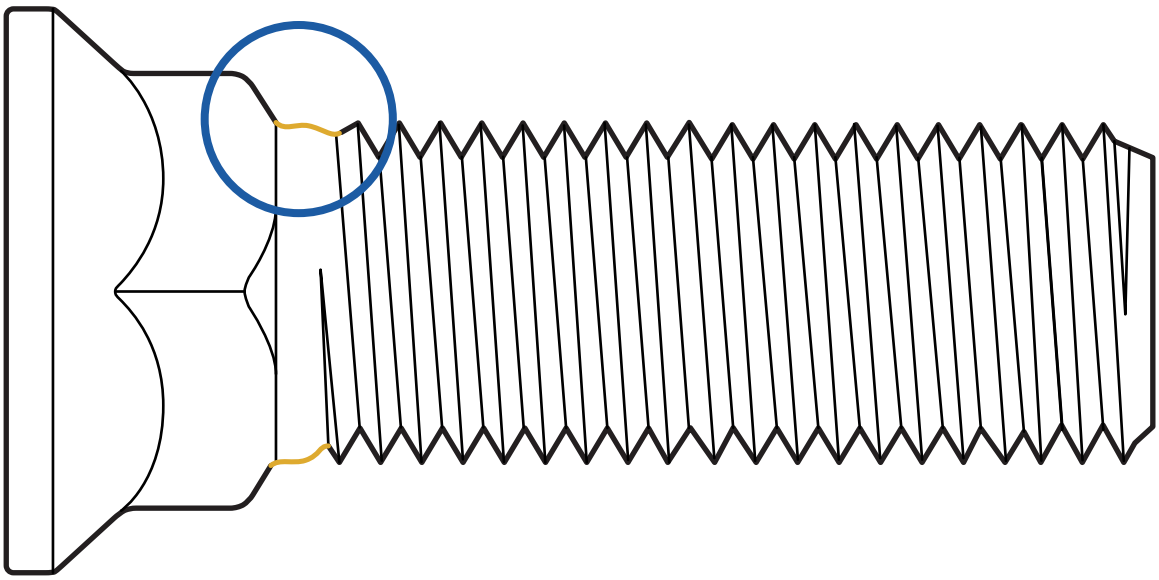


Fillet Radius:

Look for parts that have a well-defined fillet radius — the transition area below the square into the body of the bolt. A well defined fillet radius would be one that does not have sharp pronounced transitions (See illustration below). An angular or sharp transition actually promotes stress concentrations which lead to micro fractures that grow into major fractures and failures. Fluctuations in the machining of this critical stress area can result in “head popping,” where the head of the part literally pops off of the bolt.

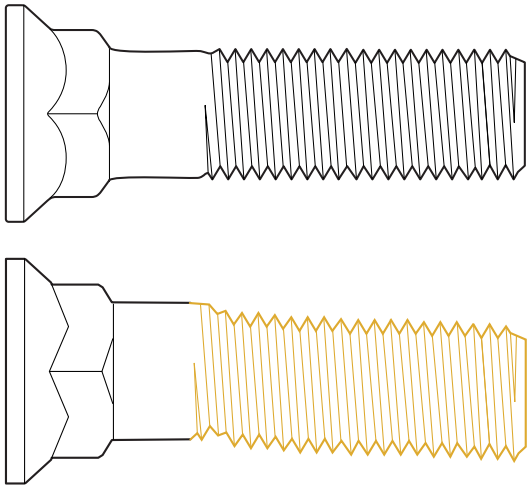


Concentricity of Threads:

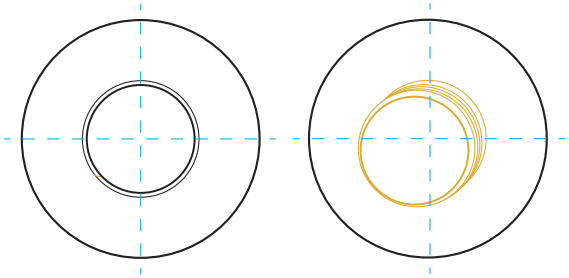
Thread concentricity is the alignment and straightness of the bolt body and threads to the center point of the head. Inconsistent manufacturing of parts can result in deviations of thread concentricity, leading to binding during installation and part failure. When you tighten a bolt, you are creating a “tensile stress” that results in the desired clamp load. Tensile stress can only be achieved when the components of the assembly and more specifically the bolt head, body and threads are in complete alignment.

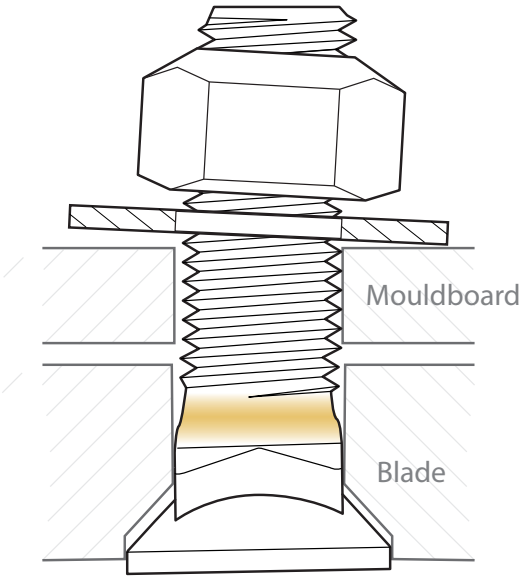
A bolt that is out of concentric alignment will feel as if it is tightening, but is instead actually bending the bolt into the hole. This creates what is called “bending stress” and is obviously not a desired installation procedure.

Earnest only works with manufacturers that take quality as serious as we do. All of our plow bolt threads are rolled to increase thread concentricity.



Looking down the threads at a concentirc bolt (left) and and non-concentric alignment (right)





A bolt that is out of concentric alignment will feel as if it is tightening, but is instead actually bending the bolt into the hole. This creates what is called “bending stress” illustrated in yellow above. This bending stress leads to fatigue failure of the fasteneing system.

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Alloy Steel:

Alloy steel is a blanket statement that simply indicates some type of alloy was added to the standard steel mix of carbon, manganese and iron. What alloys were added play a critical role in the toughness, strength and wear resistance of a fastener.

Earnest plow bolts are made with varying levels of chrome, moly or nickel, creating a bolt that is harder, stronger and resist wear and corrosion better than carbon steel. Earnest only sources Grade 8 and E9-170m plow bolts from manufacturing regions that have mastered the process of creating high-grade alloy steel. Our engineering team translates Manufacturing Test Reports (MTR's) to ensure the steel mix and process meets industry standards and ours as well.

Standard steel mix

6	26	25
C	**Fe**	**Mn**
Carbon	**Iron**	**Manganese**
12.011	55.847	54.938

+

Added Alloys

24	28	42
Cr	**Ni**	**Mo**
Chromium	**Nickel**	**Molybdenum**
51.9961	58.693	95.94
Increased corrosion resistance	Increased toughness and ductility	Increased hardness

Certifications:

Earnest engineers and sourcing specialists review certifications to confirm steel quality and heat-treating standards are being met. Every part you order should have corresponding certification documents — if they're not in the box, they should at the least be made available to you. Quality is everything, and we are not afraid to prove it. We make sure our certs (or MTRs) are accurate, legible, and show you the build specification of the part you order. No questions about it. Our cert library stems back 20 years and is made available at anytime you need it, free of charge through our website, earnestmachine.com or by contacting a member of our sales staff.

Earnest only works with manufacturers that take quality as serious as we do and proves it through detailed Manufacturing Testing Reports on every lot we sell.

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Uniform Heat Treating:

Heat treating is the process of exposing a part to extreme heat, in turn adding strength to the finished product when it cools. Making sure parts are heat treated to industry specifications, correct temperatures and cooling stages can be a challenge for some manufacturers. Attention to heating and cooling times, heat treating process and quality standards can directly effect the strength and quality of the end product.

Earnest machine uses a quench and temper process where the bolts are heated to 1400° then quenched in an oil bath then tempered to 800°. The trick here is to get the bolt back to room temperature as quickly as possible after the first heat treatment. If you do not get the bolt heated to the right temperature or cooled in the correct amount of time the result will be a bolt that is too brittle or too soft.

What's most important is the quality plan put in place at the manufacturer for testing heat treating. Earnest Machine insist that every lot of product produced is tested to the inspection level requirements of ASTM B18.18.

Working with manufacturers that have heat treating quality processes in place is critical to the end product.