

Eye Bolt Installation Guide

Tip: Set your PDF viewer to "Actual size" before printing to maintain scale.

Step-by-Step Installation Procedure

1. Select Proper Tap Drill Size

Choose the correct tap drill size for your thread size. For UNC (coarse) threads, refer to standard tap drill charts. The tapped hole must be deep enough for required thread engagement PLUS 2-3 threads extra clearance.

2. Drill and Tap the Hole

- Drill pilot hole to correct depth (engagement + 2-3 threads)
- Use cutting fluid during tapping operation
- Tap hole perpendicular to mounting surface
- Clean all chips and debris thoroughly

3. Calculate Required Thread Engagement

- Steel base: $1.5 \times$ bolt diameter minimum
- Cast iron: $2.0 \times$ bolt diameter minimum
- Aluminum: $2.5 \times$ bolt diameter minimum
- Example: 3/4" bolt in steel requires 1.13" engagement

4. Apply Thread Lubricant (Optional)

- Use anti-seize compound on threads if specified
- Check if load rating assumes dry or lubricated installation
- Clean excess lubricant from shoulder seating area

5. Install Eye Bolt with Proper Wrench

- Insert steel bar through eye opening (proper diameter for snug fit)
- DO NOT strike the eye with a hammer
- Turn clockwise to thread into tapped hole
- Continue until shoulder is 1-2 turns from seating

6. Orient Eye Direction

- Stop when eye is approximately aligned with load direction
- For angular loads, eye must be in the plane of the pull
- Never back out more than 1/4 turn to achieve orientation

7. Seat Shoulder Completely

- Tighten until shoulder is firmly against mounting surface
- NO gap should be visible under shoulder
- Use torque wrench for critical applications (consult mfg specs)
- Verify proper orientation after final tightening

8. Final Inspection Before Use

- Verify full thread engagement achieved
- Confirm shoulder is completely seated with no gap
- Check proper eye orientation for load direction
- Inspect for any visible damage to eye or threads
- Verify correct eye bolt type for application

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Common Installation Errors to Avoid

Error	Consequence	Prevention
Insufficient thread engagement	Pullout failure, drastically reduced capacity	Calculate and verify minimum engagement depth
Shoulder not fully seated	Eliminates angular load capacity, potential failure	Tighten completely until no gap visible
Using washers under shoulder	Negates shoulder function, unsafe angular loading	Never use washers with shoulder eye bolts
Oversized tapped hole	Reduced thread engagement, lower capacity	Use correct tap drill size per charts
Cross-threading during install	Damaged threads, reduced strength	Start threads carefully by hand first
Over-tightening	Thread deformation, reduced capacity	Use proper torque per specifications
Wrong eye bolt type	Using screw eye bolt for angular loads	Match eye bolt type to load direction
Backing out for alignment	Loosens shoulder seat, unsafe	Never back out >1/4 turn; re-install if needed

UNC Thread Tap Drill Sizes for Eye Bolts

Thread Size	TPI	Tap Drill Size	Decimal	Min Depth for 1.5D
1/4"-20	20	#7	0.201"	0.56"
5/16"-18	18	F	0.257"	0.66"
3/8"-16	16	5/16"	0.3125"	0.75"
1/2"-13	13	27/64"	0.4219"	0.94"
5/8"-11	11	17/32"	0.5312"	1.13"
3/4"-10	10	21/32"	0.6562"	1.31"
7/8"-9	9	49/64"	0.7656"	1.50"
1"-8	8	7/8"	0.875"	1.69"

Note: Minimum depth shown is for steel base material. Add 2-3 threads clearance beyond engagement depth.

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