



Suggested Starting Torque Values

ASTM A193 Grade B7 - UNC

| Bolt Size (in) | TPI | Proof Load (lbs) | Clamp Load (lbs) | Tightening Torque (ft lbs) | | |
|----------------|-------|------------------|------------------|----------------------------|--------|--------|
| | | | | Galv+Waxed | Galv | Plain |
| 1/4 | 20 | 3,350 | 2,513 | 5 | 13 | 10 |
| 5/16 | 18 | 5,500 | 4,125 | 11 | 27 | 21 |
| 3/8 | 16 | 8,150 | 6,113 | 19 | 48 | 38 |
| 7/16 | 14 | 11,150 | 8,363 | 30 | 76 | 61 |
| 1/2 | 13 | 14,900 | 11,175 | 47 | 116 | 93 |
| 9/16 | 12 | 19,100 | 14,325 | 67 | 168 | 134 |
| 5/8 | 11 | 23,750 | 17,813 | 93 | 232 | 186 |
| 3/4 | 10 | 35,050 | 26,288 | 164 | 411 | 329 |
| 7/8 | 9 | 48,500 | 36,375 | 265 | 663 | 530 |
| 1 | 8 | 63,650 | 47,738 | 398 | 995 | 796 |
| 1-1/8 | 7 | 80,100 | 60,075 | 463 | 1,408 | 1,125 |
| 1-1/4 | 7 | 101,750 | 76,313 | 795 | 1,987 | 1,590 |
| 1-3/8 | 6 | 121,300 | 90,975 | 1,042 | 2,606 | 2,085 |
| 1-1/2 | 6 | 147,550 | 110,663 | 1,383 | 3,458 | 2,767 |
| 1-3/4 | 5 | 199,500 | 149,625 | 2,182 | 5,455 | 4,364 |
| 2 | 4-1/2 | 262,500 | 196,875 | 3,281 | 8,203 | 6,563 |
| 2-1/4 | 4-1/2 | 341,250 | 255,938 | 4,799 | 11,997 | 9,598 |
| 2-1/2 | 4 | 420,000 | 315,000 | 6,563 | 16,406 | 13,125 |
| 2-3/4 | 4 | 468,500 | 351,263 | 8,050 | 20,124 | 16,100 |
| 3 | 4 | 567,150 | 425,363 | 10,634 | 26,585 | 21,268 |
| 3-1/4 | 4 | 674,500 | 505,875 | 13,701 | 34,252 | 27,402 |
| 3-1/2 | 4 | 791,350 | 593,513 | 17,311 | 43,277 | 34,622 |
| 3-3/4 | 4 | 917,700 | 688,275 | 21,509 | 53,771 | 43,017 |
| 4 | 4 | 1,052,600 | 789,450 | 26,315 | 65,788 | 52,630 |
| 1-1/8 | 8 | 82,934 | 62,201 | 583 | 1,458 | 1,166 |
| 1-1/4 | 8 | 105,006 | 78,754 | 820 | 2,051 | 1,641 |
| 1-3/8 | 8 | 129,492 | 97,119 | 1,113 | 2,782 | 2,226 |
| 1-1/2 | 8 | 156,687 | 117,515 | 1,469 | 3,672 | 2,938 |
| 1-3/4 | 8 | 218,400 | 163,800 | — | — | 4,778 |
| 2 | 8 | 290,850 | 218,138 | — | — | 7,271 |
| 2-1/4 | 8 | 373,801 | 280,351 | — | — | 10,513 |
| 2-1/2 | 8 | 466,200 | 349,650 | — | — | 14,569 |
| 2-3/4 | 8 | 515,851 | 386,888 | — | — | 17,732 |
| 3 | 8 | 618,451 | 463,838 | — | — | 23,192 |
| 3-1/4 | 8 | 730,550 | 547,913 | — | — | 29,679 |
| 3-1/2 | 8 | 851,201 | 638,401 | — | — | 37,240 |
| 3-3/4 | 8 | 982,300 | 736,725 | — | — | 46,045 |
| 4 | 8 | 1,121,950 | 841,463 | — | — | 56,098 |

These torque calculations are estimates and are only offered as a guide. Because there are many variables that affect the torque-tension relationship, the only way to determine the correct torque is through experimentation under actual joint and assembly conditions.

Providing solutions to your sourcing needs