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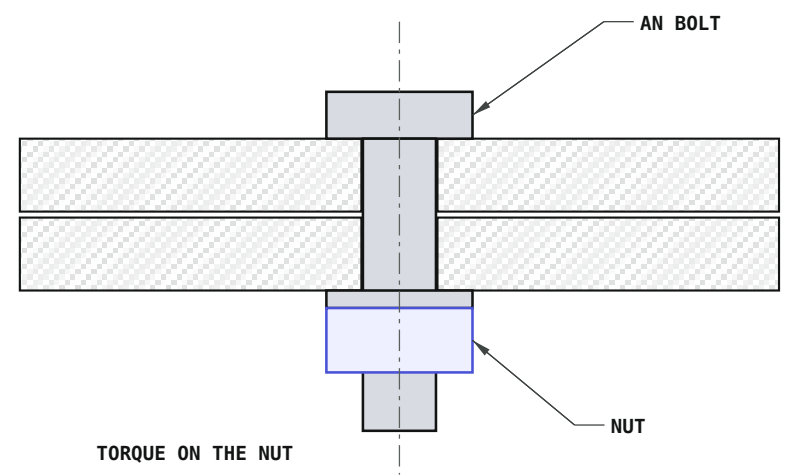
# AN Bolt & Nut Torque Chart

When the manufacturer gives no torque, AC 43.13-1B Table 7-1 does: from 12-15 in-lb on an 8-36 bolt up to 3,700–5,500 in-lb on a 1-14.

## 1 Identification

REFERENCE DRAWING — NOT APPROVED DATA · THE SRM ALWAYS GOVERNS

**SECTION**
BOLTED JOINT




**PARTS**

| PART | WHAT IT DOES |
|---|---|
| AN bolt | Shank size sets the torque |
| Nut | Tension or shear type: see Table 7-1 |
| Joint | Clamped by the torque |

**KEY DATA**

TABLE 7-1
When the manufacturer gives none: from 12–15 in-lb on an 8-36 bolt to 3,700–5,500 in-lb on a 1-14 (AC 43.13-1B).

NUTS
Tension nuts take more than shear nuts.

DRAG
Add the nut's friction drag to the value you set.

**NOTES**
1. Dimensions in inches. Do not scale: the SRM sets the values.
2. For reference. The applicable manual always governs.

**REVISIONS**

| REV | DESCRIPTION | YEAR |
|---|---|---|
| A | First issue | 2026 |

**The Aviation Point.** Structural repair reference

| TITLE | | | |
|---|---|---|---|
| AN bolt and nut | | | |
| DRAWING NO. TAP-DWG-096 | REV A · 2026 | SCALE NTS | SHEET 1 OF 1 |
| CODE TAP-D-AN-TORQUE | | | |

DO NOT SCALE DRAWING

### Fine thread series (in-lb)

| Thread size | Install: tension nut | Install: shear nut | Max: tension nut | Max: shear nut |
|---|---|---|---|---|
| 8-36 | 12-15 | 7-9 | 20 | 12 |
| 10-32 | 20-25 | 12-15 | 40 | 25 |
| 1/4-28 | 50-70 | 30-40 | 100 | 60 |
| 5/16-24 | 100-140 | 60-85 | 225 | 140 |
| 3/8-24 | 160-190 | 95-110 | 390 | 240 |
| 7/16-20 | 450-500 | 270-300 | 840 | 500 |
| 1/2-20 | 480-690 | 290-410 | 1100 | 660 |
| 9/16-18 | 800-1000 | 480-600 | 1600 | 960 |
| 5/8-18 | 1100-1300 | 600-780 | 2400 | 1400 |
| 3/4-16 | 2300-2500 | 1300-1500 | 5000 | 3000 |
| 7/8-14 | 2500-3000 | 1500-1800 | 7000 | 4200 |
| 1-14 | 3700-5500 | 2200-3300* | 10,000 | 6000 |
| 1-1/8-12 | 5000-7000 | 3000-4200* | 15,000 | 9000 |
| 1-1/4-12 | 9000-11,000 | 5400-6600* | 25,000 | 15,000 |

### Coarse thread series (in-lb)

| Thread size | Install: tension nut | Install: shear nut | Max: tension nut | Max: shear nut |
|---|---|---|---|---|
| 8-32 | 12-15 | 7-9 | 20 | 12 |
| 10-24 | 20-25 | 12-15 | 35 | 21 |
| 1/4-20 | 40-50 | 25-30 | 75 | 45 |
| 5/16-18 | 80-90 | 48-55 | 160 | 100 |
| 3/8-16 | 160-185 | 95-100 | 275 | 170 |
| 7/16-14 | 235-255 | 140-155 | 475 | 280 |
| 1/2-13 | 400-480 | 240-290 | 880 | 520 |
| 9/16-12 | 500-700 | 300-420 | 1100 | 650 |
| 5/8-11 | 700-900 | 420-540 | 1500 | 900 |
| 3/4-10 | 1150-1600 | 700-950 | 2500 | 1500 |
| 7/8-9 | 2200-3000 | 1300-1800 | 4600 | 2700 |



Educational reference only, not approved data. Always consult the applicable SRM, AMM, or AC 43.13-1B and your certifying authority.

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## Dry, lubricated and self-locking: which value

| Condition | What to use | Where it comes from |
|---|---|---|
| **Dry** (clean, oil-free cadmium-plated threads) | Table 7-1, install range and max, as printed above. | AC 43.13-1B Table 7-1 caution; par. 7-40b (clean, dry threads). |
| **Lubricated** (oil, anti-seize, dry film, $MoS_2$ nut coating) | **No value or factor is published in the AC.** Use the torque the manufacturer gives for that lubricant and finish; do not scale Table 7-1. | The AC lists molybdenum disulfide as a nut finish (par. 7-65d) but gives no torque for it. A published factor would need a source, so none is shown. |
| **Self-locking nut** (all-metal or fiber/nylon insert) | Table 7-1 value **plus** the drag torque measured with the nut running free (par. 7-40c). A reused nut must still show at least the Table 7-2 minimum prevailing torque, or it is replaced. | AC 43.13-1B par. 7-40c to 7-40g, 7-64f and Table 7-2 (p. 7-12). |

## Minimum prevailing torque, reused self-locking nuts (in-lb, N·m)

| Nominal size | Fine thread | Min. in-lb (N·m) | Coarse thread | Min. in-lb (N·m) |
|---|---|---|---|---|
| **7/16** | 7/16-20 | 8 (0.90) | 7/16-14 | 8 (0.90) |
| **1/2** | 1/2-20 | 10 (1.13) | 1/2-13 | 10 (1.13) |
| **9/16** | 9/16-18 | 13 (1.47) | 9/16-12 | 14 (1.58) |
| **5/8** | 5/8-18 | 18 (2.03) | 5/8-11 | 20 (2.26) |
| **3/4** | 3/4-16 | 27 (3.05) | 3/4-10 | 27 (3.05) |
| **7/8** | 7/8-14 | 40 (4.52) | 7/8-9 | 40 (4.52) |
| **1** | 1-14 | 55 (6.21) | 1-8 | 51 (5.76) |
| **1-1/8** | 1-1/8-12 | 73 (8.25) | 1-1/8-8 | 68 (7.68) |
| **1-1/4** | 1-1/4-12 | 94 (10.62) | 1-1/4-8 | 88 (9.94) |

## Where the sources agree, and where they do not

| Point | First source | Second source | Where they differ, and what governs |
|---|---|---|---|
| Calibration | AC 43.13-1B par. 7-40: calibrate at least once a year, or at once after abuse or a drop | ISO 6789-1 and -2: requirements and calibration method for hand torque tools | A shorter interval from the maker or the company program governs. |
| Value | AC 43.13-1B par. 7-40 and Table 7-1: default torque when the maker gives none | 14 CFR 43.13(a): methods in the current maintenance data of the maker | The aircraft's own data governs over Table 7-1. |
| Reused nuts | AC 43.13-1B par. 7-40: add the friction drag torque to the desired value | AC 43.13-1B Table 7-2: minimum prevailing torque of a reused self-locking nut | Both apply; a nut under the Table 7-2 minimum is replaced. |
| Adapter | AC 43.13-1B Fig. 7-2: indicated = actual x L / (L + E) | Check on the AC example: 135 x 10.0 / 11.5 = 117 lb-in | Agree with the figure. |

## 2 Allowable damage

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## 3 Repair

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## Key points

- **The aircraft's manual governs.** The AMM, SRM, engine manual or drawing torque overrides this table, including where it is lower.
- **Cadmium plating, oil-free threads.** The values come from that condition. Dry film lubricant, anti-seize, oil, stainless, titanium or aluminum threads change the friction. Use the manufacturer's value.
- **Not every fastener is on the table.** Hi-Lok, lockbolts, Cherry fasteners, studs, spark plugs, hose fittings, propeller and engine hardware have their own values.
- **Close-tolerance and special bolts** (AN173–AN186, NAS333–NAS340 and titanium NAS bolts) are interference fits. Do not substitute for them without the maker's or the FAA's instructions (par. 7-44).
- **Torque does not replace locking.** Safety wire, cotter pins and self-locking nuts keep the nut from turning. They do not hold torque (par. 7-122).

**MAIN SOURCES** · FAA AC 43.13-1B CHG 1, Chapter 7, Table 7-1 · FAA AC 43.13-1B CHG 1, Chapter 7, par. 7-37, 7-40, 7-44, 7-66, 7-67 and Figure 7-2 · FAA AC 43.13-1B CHG 1, Chapter 7, par. 7-64, 7-65 and Table 7-2 · FAA AC 43.13-1B CHG 1, Acceptable Methods, Techniques, and Practices: Aircraft Inspection and Repair · ISO 6789-1 and ISO 6789-2, Assembly tools for screws and nuts: hand torque tools · 14 CFR 43.13, Performance rules

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