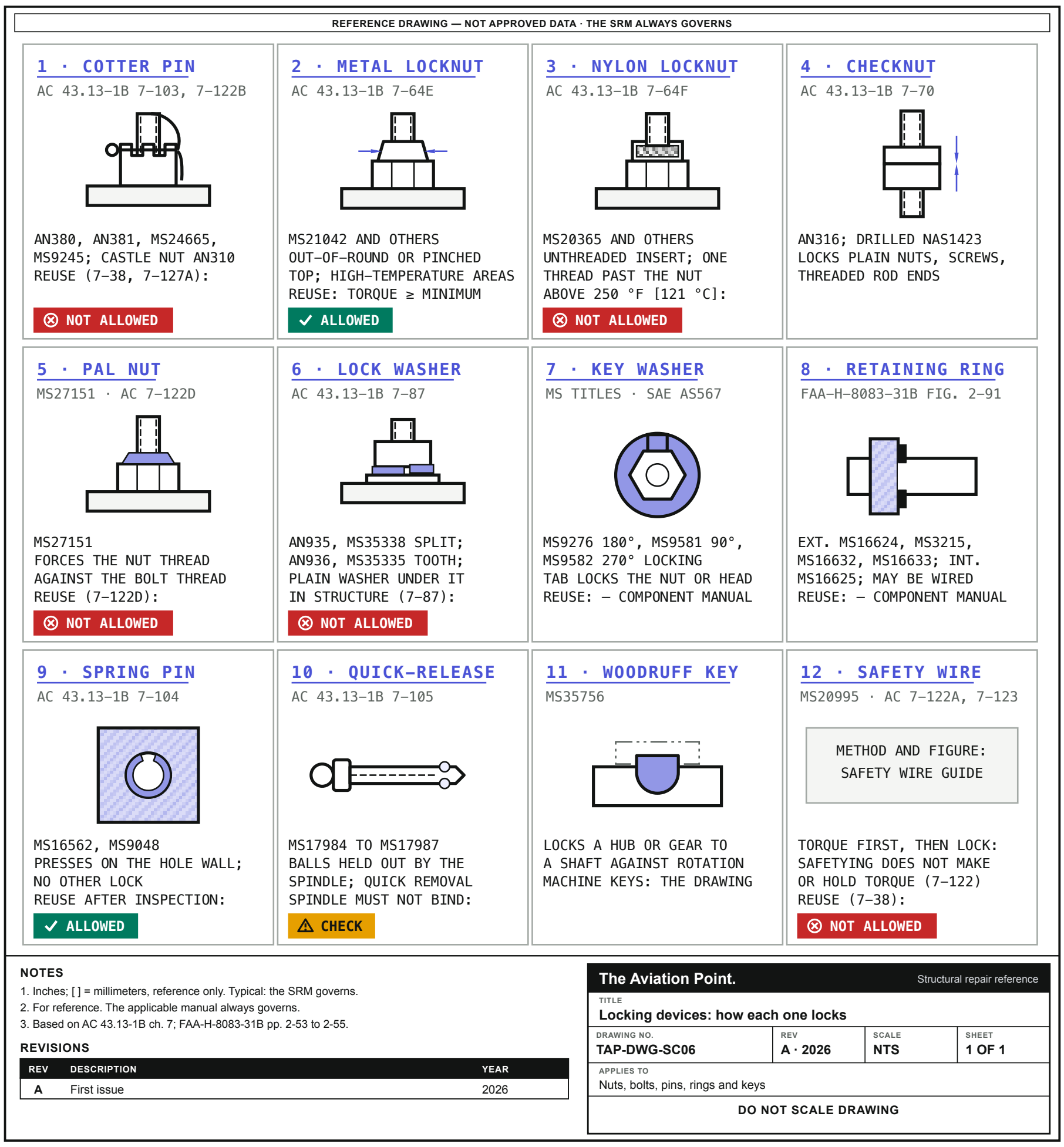
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# Locking Devices: Choosing, Fitting and Inspecting

How each device locks · reuse rules · inspection · fitting

## 1 Identification




Torque first, then the lock: safetying keeps a part from coming loose, it does not make or hold torque (AC 43.13-1B 7-122).

### The devices, by how they lock

| Device | Standards | Source |
|---|---|---|
| Safety wire (wire locking) | MS20995 | AC 43.13-1B 7-122a, 7-123; method: Safety wire |
| Cotter pin (cotter pin) | AN380, AN381, MS24665, MS9245 | 7-122b, 7-103 |
| Castle nut | AN310 | 7-66 |
| Castellated shear nut | AN320 | 7-67 |
| Self-locking nut, all-metal | MS21042 and others | 7-64e |
| Self-locking nut, fiber or nylon insert | MS20365 and others | 7-64f |
| Checknut (jam nut) | AN316; drilled jam nut NAS1423 | 7-70 |
| Pal nut | MS27151 | 7-122d; FAA-H-8083-31B p. 2-55 |
| Spring lock washer, tooth lock washer | AN935, MS35338; AN936, MS35335 | 7-87; FAA-H-8083-31B p. 2-55 |
| Key washer (tab washer) | MS9276 180°, MS9581 90°, MS9582 270° locking | Standard titles |
| Rod-end locking washer | NAS513 | NAS513 title |
| Locking plate | —: the drawing or IPC | —: the component manual sets fit and reuse |
| Spring pin | MS16562, MS9048 | 7-104 |
| Quick-release pin | MS17984 to MS17987 | 7-105 |
| Retaining ring (circlip, snap ring) | External MS16624, MS3215, MS16632, MS16633; internal MS16625 | Standard titles; FAA-H-8083-31B fig. 2-91; AC 7-122 |
| Key | MS35756 Key, Woodruff; machine keys: the drawing | MS35756 title |
| Turnlock (quick-release) fastener | Dzus, Camloc, Airloc: panel fasteners | T.O. 1-1A-1 ch. 3 and 5 |
| Turnbuckle locking clip | MS21256 | 7-183, 7-184 |



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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## 2 Allowable damage

### Reuse and replacement

| Device | Reuse | Replace when | Source |
|---|---|---|---|
| Cotter pin | NOT ALLOWED | Every removal | AC 43.13-1B 7-38, 7-103, 7-127a |
| Safety wire | NOT ALLOWED | Every removal | 7-38 |
| Pal or speed nut | NOT ALLOWED | Every removal | 7-122d |
| Self-locking nut | ALLOWED while it locks | Below the minimum prevailing torque of table 7-2 (values on Torquing) | 7-64f, 7-122c |
| Spring pin | ALLOWED after inspection | Pin or hole deformed | 7-104b |
| Quick-release pin | ALLOWED | Spindle binds: the balls may stay open and the pin fall out under vibration | 7-105 |
| Lock washer | — | —: the manual sets it; AC 43.13-1B gives no reuse rule | — |
| Key washer, locking plate | — | —: the component manual, or SAE AS567 in propulsion work | — |
| Retaining ring | — | —: the component manual and the ring standard | — |

### Inspection and acceptance

| Check | Reject | Source |
|---|---|---|
| Cotter pin size | Smaller pin; a used pin | FAA-H-8083-31B p. 2-55; AC 7-127a |
| Castellated nut slot | Torque past the maximum to reach a slot; change the plain washer instead | AC 7-40f, 7-86 |
| Self-locking nut | Fiber or nylon nut that does not reach the minimum: do not reuse | 7-64f |
| Self-locking nut position | On a part subject to rotation; where a loose part could be drawn into a turbine intake; on panels opened before or after each flight | 7-64a, c, d |
| Lock washer | In primary or secondary structure, or accessories where failure could damage the aircraft or hurt people; frequent removal, corrosion areas, airflow | 7-87 |
| Spring pin hole | Gap closed by misalignment, or excess insertion force | 7-104c |
| Quick-release pin | Spindle binding | 7-105 |
| Keyway, magnetic particle check | Keyways and thread roots can give nonrelevant indications: confirm before rejecting | 5-40b(2) |

## 3 Repair

1. Torque in range.
2. Line up the slot without passing the maximum.
3. Fit a new lock.
4. Inspect: one thread past, prongs or wire tight.

### Key points

- Torque first; safetying does not make or keep torque (AC 43.13-1B 7-122).
- Cotter pins, safety wire and pal nuts: never reused (7-38, 7-122d).
- No lock washers on structure (7-87).

**MAIN SOURCES** · FAA AC 43.13-1B CHG 1, Acceptable Methods, Techniques, and Practices: Aircraft Inspection and Repair · FAA-H-8083-31B, Aviation Maintenance Technician Handbook: Airframe · T.O. 1-1A-1 / NAVAIR 01-1A-1, General Manual for Structural Repair · MS33540 / NASM33540, Safety Wiring and Cotter Pinning, General Practices for · SAE AS567, General Practices for Use of Safety Wire, Key Washers, and Cotter Pins for Propulsion Systems · MS35756, Key, Woodruff; MS9276, MS9581, MS9582, Washer, Key; NAS513, Washer, Rod End, Locking · OSHA 29 CFR 1910.133, Eye and face protection

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