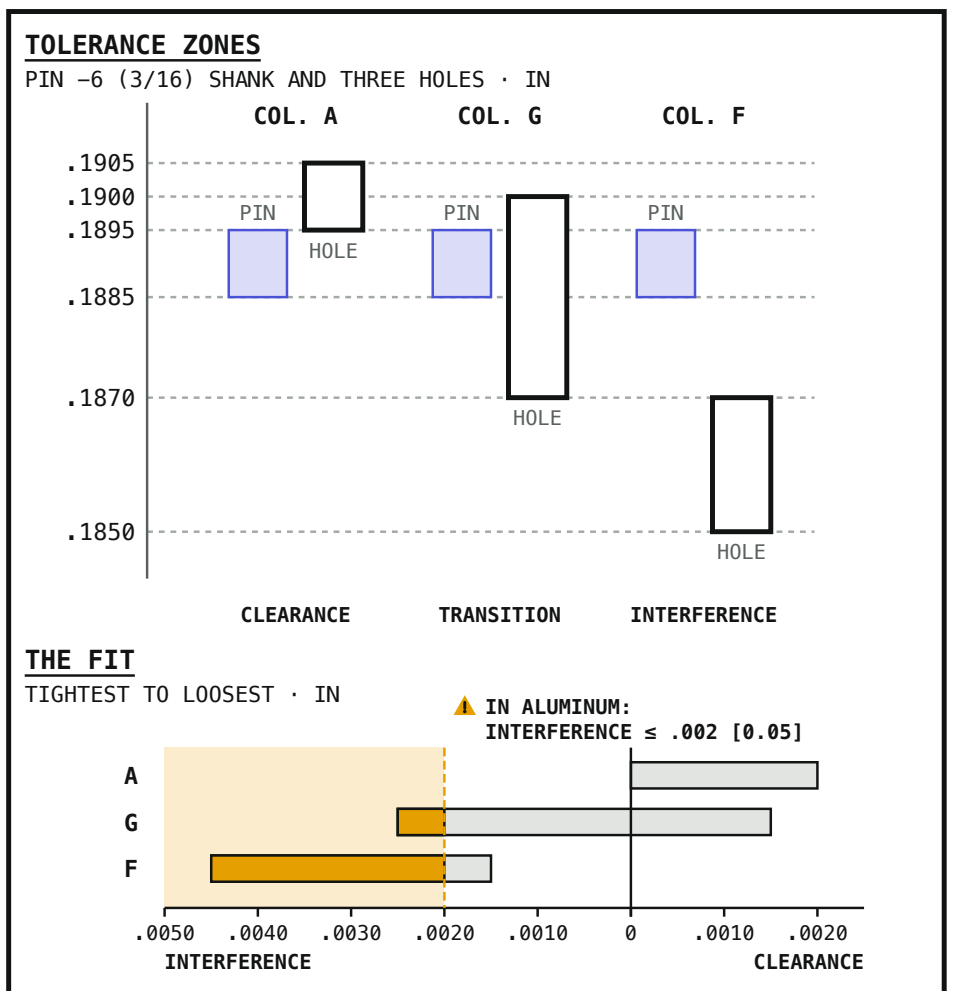
THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT

Fits and Clearances: Classes of Fit, Limits and Wear

Clearance · transition · interference · bolt holes · table of limits · checks

1 Identification



NAS618	HOLE ⌀	FIT, TIGHTEST TO LOOSEST	TYPE
COL. A	.1895–.1905 [4.814–4.838]	0 TO .0020 CLEARANCE [0 TO 0.051]	CLEARANCE
COL. G	.1870–.1900 [4.750–4.826]	.0025 INTERFERENCE TO .0015 CLEARANCE [0.064 TO 0.038]	TRANSITION
COL. F	.1850–.1870 [4.699–4.749]	.0015 TO .0045 INTERFERENCE [0.038 TO 0.114]	INTERFERENCE
PIN –6	.1885–.1895 [4.788–4.813]	SHANK, THE SAME PIN FOR ALL THREE: THE HOLE MAKES THE FIT	–

⚠ CHECK — COLUMNS G AND F GO PAST .002 AT THE WORST CASE: THE DRAWING OR THE SRM DECIDES WHICH HOLE (FAA-H-8083-31B P. 4–50).

The Aviation Point.	TITLE FITS ON ONE PIN, NAS618	DWG NO. TAP-SYL-B04	REV A
SCALE NTS	UNITS IN [MM]	PROJ.	SHEET 1/1 · MATERIAL –
TOLERANCES PER NAS618	SOURCE NAS618 · FAA-H-8083-31B	STATUS TYPICAL, NOT APPROVED	

The pin did not change: the hole made the fit.

Fits on bolt and fastener holes

Fit	What is published
AN bolt in a normal hole	First lettered drill above the nominal bolt diameter: fastener hole drill
Light-drive fit (reamed)	AN hex bolts in reamed holes, NAS close-tolerance bolts and AN clevis bolts: not the letter drill. A light-drive fit is an interference of 0.0006 in (0.015 mm) for a 5/8 in bolt
Bolts in a longeron repair	Bolt holes drilled for a light-drive fit
Hi-Lok and Hi-Tigue	Interference in aluminum, not over 0.002 in (0.05 mm); clearance in steel, titanium and composite
Solid rivets	Hole just over the shank; the driven rivet fills it: rivet drill sizes
Worn or oversize holes	Next size, reaming and bushings: fastener hole damage

2 Allowable damage

Bow, twist and wear: what is published

Part	Published rule	Limit
Crankshaft	Replace if bent beyond the maker's permissible service limit. Worn journals reground to the maker's instructions; fillet radii never reduced; nitrided shafts re-nitrided where the maker says so	— (maker's table of limits)
Crankshaft flange before tear-down	Inspected for twisting, cracks or other deformation; the shaft turned slowly in 90° steps under a dial indicator to check its concentricity	— (maker)
Accessory drive couplings	Twisted splines, misalignment and run-out	— (maker)
Connecting rods	Cracks and straightness	— (maker)
Gears and damper pins	Cracked, broken or brinelled teeth; nicks or brinelling on damper pins and liners	— (maker)
Engine mount	Bent, cracked or buckled tubes; flex mounts for looseness, distortion or wear	— (maker)
Fastener holes	Square to the seat face; wall finish; tool marks at 45° or less to the hole axis unsatisfactory; heat discoloration to engineering	±3° · 125 µin (3.2 µm) drilled · 63 µin (1.6 µm) reamed

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

THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT

Standard methods for checking shafts, bores and holes

Check	Method
Shaft diameter	Outside micrometer, read to 0.001 in (0.0001 in with the vernier); several places along and round the shaft show taper and out-of-round
Bore or bushing	Telescoping or small-hole gauge set in the bore, then measured with the micrometer; inside micrometer for larger bores
Run-out and concentricity	Dial indicator on the shaft while it is turned slowly; read the total movement
Gap between parts	Thickness (feeler) gauge, e.g. 0.005 in (0.13 mm) under a blind rivet head
Bearings	Play, roughness and rejection: the bearing or component maker's data
Holes	Calibrated precision measuring equipment for diameter, location, edge distance, roundness and taper; a surface finish gauge for the wall
The instrument	Calibrated to its maker's instructions with gauge blocks, gauge pins or ring gauges

3 Repair

1. Limits from the drawing or the table of limits.
2. Clean; parts and gauge at one temperature.
3. Zero the instrument.
4. Hole and shaft: two directions, several places.
5. Hole – shaft against the limits.
6. Out of limits: the maker's repair. Record.

Key points

- **Fit = hole – shaft** at the extremes: + clearance, – interference.
- **Light-drive fit:** 0.0006 in interference for a 5/8 in bolt (AC 43.13-1B 7-39).
- **Hi-Lok in aluminum:** interference not over 0.002 in (H-31B p. 4-50).
- **Wear limits:** the maker's table of limits; none generic.

MAIN SOURCES · FAA AC 43.13-1B CHG 1 · FAA-H-8083-31B, Aviation Maintenance Technician Handbook: Airframe · FAA-H-8083-30B, Aviation Maintenance Technician Handbook: General · TO 1-1A-1, General Aircraft Structural Repair · NAS618 · ANSI B4.1-1967, Preferred Limits and Fits for Cylindrical Parts · ISO 286-1, Geometrical product specifications: ISO code system for tolerances on linear sizes, Part 1 · ISO 1, Geometrical product specifications: Standard reference temperature · ATA iSpec 2200 · 14 CFR 43.9 · Regulation No 1321/2014, Annex III, Appendix I, as amended by Regulation 2023/989 · FAA-S-ACS-1, Aviation Mechanic General, Airframe, and Powerplant Airman Certification Standards

SCAN · OPEN THIS GUIDE
theaviationpoint.com/standard-practices/fits-and-clearances/

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

THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT