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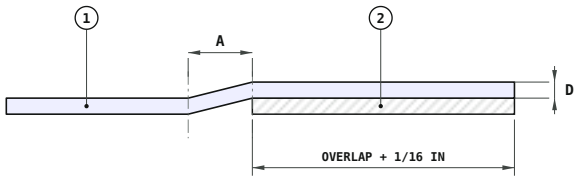
Joggles, Relief Holes and Lightening Holes

Joggle · relief hole · lightening hole

REFERENCE DRAWING — NOT APPROVED DATA · THE SRM ALWAYS GOVERNS

SECTION A

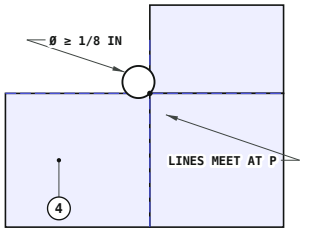
JOGGLE · SIDE VIEW, EXAGGERATED



D = THICKNESS OF THE PART CLEARED · A = DRAWING, ELSE 4 × D

DETAIL B

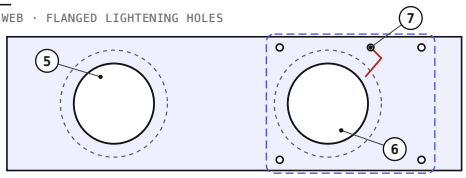
RELIEF HOLE · FLAT BLANK, ONE CORNER



HOLE TOUCHES P; 1/32 TO 1/16 IN BEHIND THE LINES

PLAN

RIB WEB · FLANGED LIGHTENING HOLES



FLANGE WIDTH AND HOLE SIZE: DESIGN SPECIFICATION

DETAIL C

ALLOWANCE A BY PART FORM

FLAT SHEET: 4 × D

90° ANGLE: A LITTLE MORE

EXTRUSION: UP TO 12 × T

THE DRAWING GOVERNS EVERY TIME

PARTS LIST

#	PART	RULE	SOURCE
1	Joggled part	Offset so it laps over the mating part and the surface stays smooth	H-8083-31A p. 4-81
2	Mating part	Its thickness sets the joggle depth; add 1/16 in to the length	p. 4-81
3	Allowance A	Between the two bends: drawing first, then 4 × depth on flat sheet	p. 4-81
4	Relief hole	At crossing inside tangent lines; 1/8 in minimum to 0.064 in sheet	pp. 4-72, 4-73
5	Lightening hole	Only where authorised; flange stiffens the web	pp. 4-82, 4-83
6	Repair plate	Same material and thickness; edge 2D, pitch 4D to 6D	p. 4-99
7	Crack stop-drill	Remove the damage or stop-drill the crack end	p. 4-99

NOTES

1. Dimensions in inches. Do not scale: the SRM sets the values.
2. For reference. The applicable manual always governs.
3. Based on FAA-H-8083-31A ch. 4.

REVISIONS

REV	DESCRIPTION	DATE
A	First issue	2026-10-30

The Aviation Point. — Structural repair reference

TITLE			
Joggles and relief holes			
DRAWING NO.	REV	SCALE	SHEET
TAP-DWG-034	A	NTS	1 OF 1
APPLIES TO			
Sheet metal forming			

DO NOT SCALE DRAWING

After FAA-H-8083-31A pp. 4-72 to 4-74, 4-81 to 4-83 and 4-99, Figs. 4-145, 4-146, 4-163 and 4-165.

Key points

- **Joggle depth** = thickness of the part cleared; length + 1/16 in.
- **Allowance** from the drawing; else 4 × depth on flat sheet.
- **Relief hole** at crossing bends, 1/8 in minimum to 0.064 in; touches the tangent crossing.
- **Lightening holes** only where authorised; flange sized by design.
- **Cracked flange:** stop-drill, same-material plate, edge 2D, pitch 4D to 6D.

Step by step

1. Read depth and allowance from the drawing.
2. Mark the bend lines; bend 20 to 30 degrees, turn, bend to height.
3. Check clearance on the mating part.
4. Drill relief holes before folding a box.
5. Deburr and protect the edges.

SOURCES · FAA-H-8083-31A, AMT Handbook — Airframe, Volume 1, Chapter 4

SCAN · OPEN THIS GUIDE
theaviationpoint.com/sheet-metal/joggles/

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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