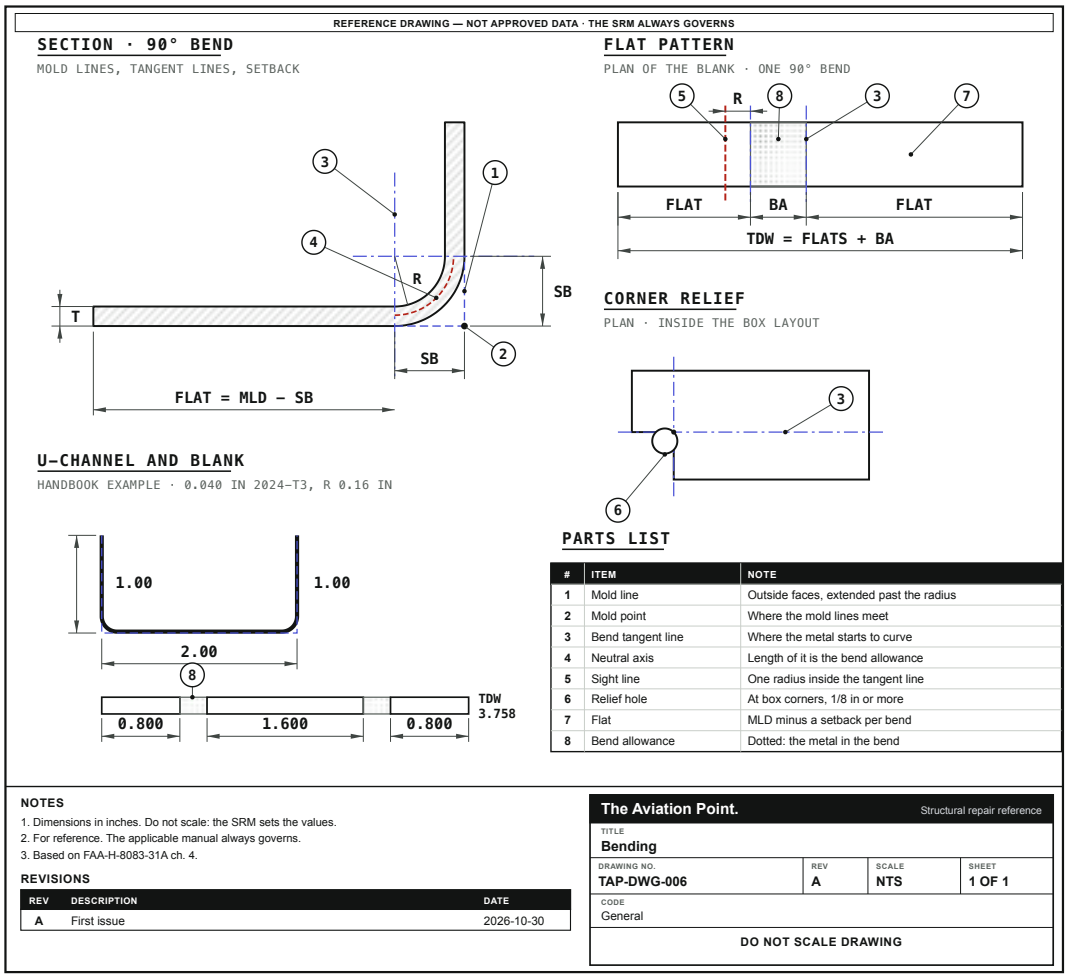
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Bending Sheet Metal: From Mold Lines to a Flat Blank

Mold lines · setback · bend allowance · flat pattern · sight line · relief hole



After FAA-H-8083-31A Vol. 1 pp. 4-59 to 4-73 (Figs. 4-120, 4-123, 4-131, 4-145).

The words and the formulas

Term	What it is	Formula
Mold line dimension (MLD)	Size of the part to the intersection of the mold lines, as if the corner had no radius	From the drawing
Bend radius (R)	Measured to the *inside* surface of the metal	From the drawing or Table 4-6
Setback (SB)	How far the brake jaws sit back from the mold line; also the distance from mold line to bend tangent line	SB = K (R + T)
K	One for 90 degrees; for any other bend, the tangent of half the bend angle	K = tan (angle / 2)
Flat	The straight part not in the bend	Flat = MLD − SB
Bend allowance (BA)	Length of the neutral axis through the bend, any bend 1 to 180 degrees	BA = (0.01743 R + 0.0078 T) × N
Total developed width (TDW)	The blank: flats plus bend allowances. It must be less than the sum of the MLDs	TDW = flats + BA × bends
Bend angle	Angle turned from flat, not the angle between the legs	180° − angle between flanges

If it goes wrong

You see	Look first at
Blank longer than the sum of the MLDs	The arithmetic: TDW must come out smaller, because the metal follows the radius (p. 4-67)
Crack across the outside of the bend	Radius below the minimum for the alloy and temper (p. 4-61, AC par. 4-55)
Corner tears or buckles in a box	Missing or undersized relief hole (pp. 4-72, 4-73)
Bend angle differs along the brake	Nose gap and clamp pressure; compare the test strips (pp. 4-71, 4-72)
A flat the wrong length	A bend not counted at both ends of a flat; the middle flat of a channel loses two setbacks (p. 4-64)

Key points

- **Radius first**, to the inside of the bend, from the drawing or the SRM. Too tight cracks the outside.

Step by step

1. Choose the radius; check the alloy and temper.
2. Work out SB, the flats, BA and the TDW.

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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- **SB = K (R + T)**, K = 1 at 90°. **Flat = MLD – SB**; a flat with a bend at each end loses two.
- **BA = (0.01743 R + 0.0078 T) × N.** TDW must come out under the sum of the MLDs.
- **Relief holes** at box corners, at least 1/8 in, touching the intersection of the inside tangent lines.

3. Deburr; lay out; sight line one radius inside the tangent line.
4. Set clamp pressure and nose gap; bend two test strips.
5. Bend; check the angle and the flat against the drawing.

SOURCES · FAA-H-8083-31A, AMT Handbook: Airframe, Volume 1, Chapter 4 · FAA AC 43.13-1B CHG 1, Chapter 4, par. 4-55 and 4-56

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