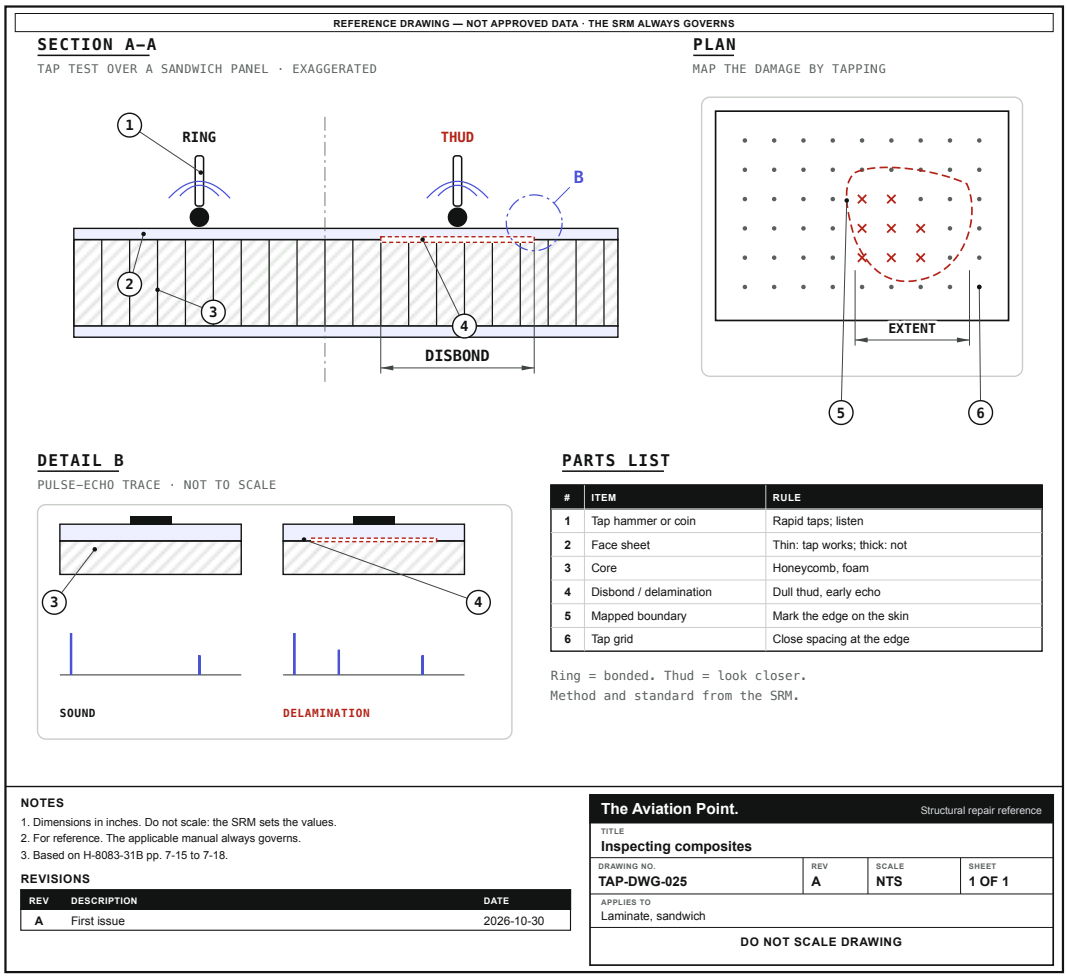
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Inspecting Composites: What Finds What

Which method finds what · tap rules · map before repair



Tap test, damage map, pulse-echo trace and parts list, after FAA-H-8083-31B pp. 7-15 to 7-18 and 7-38 to 7-39.

Which method finds what

Method	Finds	Misses or limits
Visual	Scorch, stains, dents, penetration, abrasion, chips, wrinkles, blisters, resin starvation, discolouration from heat or lightning. Primary in-service method; whitening shows delamination in semitransparent glass laminates	Internal delaminations, disbonds and matrix crazing; damage under paint or deep below the surface; nearly all damage in opaque carbon and aramid
Tap test (coin or light hammer)	Delamination and disbond: a clear ring is bonded, a dull thud is not. Good on thin skins, thin skin-to-stiffener bondlines and thin honeycomb facings	Not reliable on structures of more than four plies; poorer the deeper the flaw; does not find resin cracks or broken fibres. Needs a quiet place and a tapper who knows the part
Automated tap	As tap, with a solenoid and a force trace; any change from the sound region shows damage	Needs a calibration on a good area
Ultrasonic: pulse echo	Delaminations, cracks, porosity, water and disbonds in bonded components, from one side	Does not find disbonds between skin and honeycomb core
Ultrasonic: high-frequency bond tester	Delaminations and voids; flaws down to 0.5 in	Skin-to-core disbond and porosity
Ultrasonic: low-frequency bond tester	Delaminations, voids and skin-to-core disbonds	Cannot tell which side; nothing under 1.0 in
Thermography	Debonds, cracks, impact damage, panel thinning and water ingress, from differences in heat flow	Best on thin laminates and near-surface defects
Radiography (X-ray)	Crushed or blown core, water in cells, voids in foam adhesive, position of internal parts	Delaminations lying flat to the beam; impractical around aircraft for radiation safety
Moisture meter	Water in honeycomb, by the radio-frequency power it absorbs	Says nothing of delamination or disbond

Key points

- **Visual:** primary in-service; misses delaminations, disbonds and matrix crazing.
- **Tap:** clear ring = bonded; dull thud = look closer. Unreliable above four plies; quiet room; know the part.
- **Ultrasonic:** internal delaminations and voids; pulse echo does not find skin-to-core disbond.
- **Thermography:** thin laminates and near-surface flaws.

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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- **X-ray:** core damage and water; not for delaminations flat to the beam; not practical near aircraft.
- **Map first:** size and depth by NDI, marked on the skin.

SOURCES · FAA-H-8083-31B, AMT Handbook — Airframe, Volume 1, Chapter 7 · AC 43.13-1B, Change 1, Chapter 3, Fiberglass and Plastics

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