



1. All Light Aircraft

The inspection and assessment of hail damage is required prior to the next flight to ensure that the damage is within manufacturers damage limits and specifications.

2. Purpose

To provide guidance to LAMEs, aircraft owners and aircraft operators on the correct process to follow post hail damage to aircraft.

3. Background

Following several recent severe storms, questions were raised by light aircraft owners on how to appropriately assess hail damage. Given that most light aircraft manufacturers do not provide wide-spread fatigue or impact damage assessment within the aircraft maintenance manual, some guidance is provided within this Airworthiness Bulletin.

Any hail damage needs to be assessed by a suitably qualified person and that assessment must be in accordance with approved data. Where that data does not exist or is ambiguous, the data needs to be identified, added to, or interpreted by a suitably approved person (CASR 21.M). Damage can then be assessed as per the approved data (or repaired as necessary), noting that CASR 21.007 can be used to approve the damage/serviceability for continued operation.

There are two main considerations when assessing hail damage:

- 1) **Effect on aerodynamics:** particularly flow separation, overall handling and also asymmetric stall (for example severely dented left or right wing), and
- 2) **Effect on structure:** essentially a dent reduces the stiffness in the local area and can in some cases impact sub-structure. As a general rule, any damage that affects the substructure is no longer considered negligible.

As a guide Cessna has quoted a six inch limitation rule which highlights that any damage within six inches from each other the skin must be evaluated by Cessna engineering. However, this rule does not apply to flight control surfaces which must be evaluated on a case by case basis.



4. Recommendations

Have an appropriately qualified CASR 21.M person inspect the aircraft to assess the damage paying particular attention to primary and secondary structures, the depth and quantity of damage. This information will assist either the aircraft manufacturer or the authorised aeronautical engineer to quantify the extent of the damage and the repair actions required to be taken.

Generally, if the damage is:

- less than 1" in diameter and less than 0.020" deep, and
- free of cracking (determined via either visual, eddy current or dye penetrant methods), and
- free of sharp edges, and
- does not impact on surrounding structure, then

the damage may be considered negligible and assessed to remain in situ for at least a temporary period, depending on proximity to other damage which may adversely affect the overall outcome.

Recommended process

- 1) Record of damage – this can be in the form of a 'damage map' depicting location and depth of damage. This can be time consuming, but removes any doubt of future damage issues. Alternatively physically marking the aircraft and taking photos may be acceptable (see Figure 1).
- 2) Have a qualified LAME undertake an assessment of the severity of the record of damage against approved data (such as the applicable Maintenance or Structural Repair Manual).
- 3) If the assessment of damage is within limits of the approved data for continued operation, the LAME may endorse the Maintenance Release for a temporary period, referencing the data or assessment via CASR 21.007.
- 4) If the damage is outside of the limits of the approved data, the damage will need to be repaired. A CASR 21.M assessment of the damage will be required before any further flight without repair work being carried out can be considered.
- 5) Following the expiry of the temporary period, permanently repair in accordance with SRM or approved data.

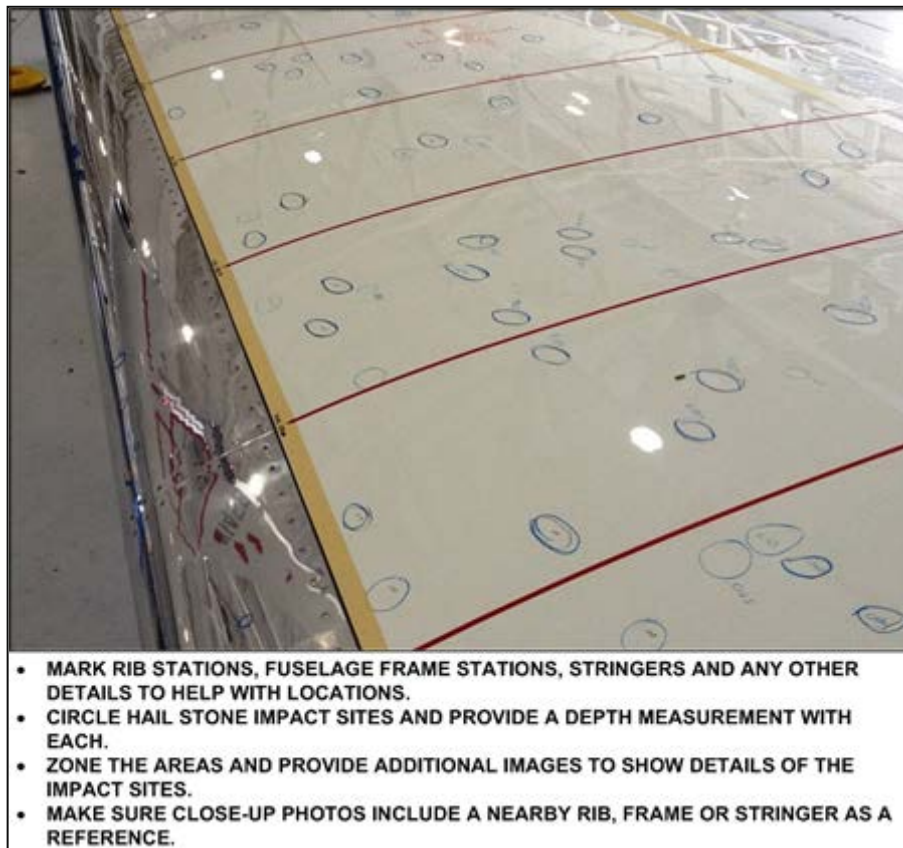


Figure 1

Cessna Hail Assessment Guidance

5. References

FAA AC43.13-1B/2A Aircraft Inspection, Repair & Alterations

CASA AC21-28 Permissible unserviceabilities – unrepaired defects (CASR.21.007)

Cessna Hail Damage Assessment ATA: 51-50 All models

Piper service letter 1095



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Assessment of Hail Damage

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6. Enquiries

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