



# Operational Safety Bulletin

No. 01/20

## Inspection of a Sailplane After Abnormal Flight Loads or Hard Landing

### Background

While landing during a recent flight review, the pilot under assessment flared too high and the instructor failed to take-over to prevent the sailplane stalling heavily onto the ground in a nose high attitude. The tailwheel struck first, followed by the mainwheel and nose-wheel. The force was sufficient to cause the fuselage forward of the mainwheel to also contact the ground. The instructor conducted an external inspection of the airframe and did not find any damage. The sailplane was then prepared for another flight by the same crew, but neither the pilot under assessment nor the instructor noticed the left aileron movement was restricted. The sailplane was then re-launched by aerotow, and during the ground roll the right wing dropped to the ground and the pilot under assessment took a while to get the wings level. At about 200ft AGL the flight crew identified they had no left aileron control. The instructor informed the tow pilot of their difficulties and requested they be towed into position to conduct a right-hand circuit to the operational runway. The landing was completed without further incident and a post-flight inspection revealed substantial internal damage including cracked and delaminated bulkheads, one of which was preventing the application of left aileron.

Unfortunately, incidents involving sailplanes that have been flown with undetected damage following a hard landing are not uncommon. The Airworthiness Department frequently receives reports from Inspectors who have discovered undetected hard landing damage while conducting an annual inspection.

### Introduction

Sailplanes are designed to withstand flight and landing loads within specified limits. If design limits are exceeded the structural integrity of the sailplane structure may be jeopardised and safety could be impaired. Any report or evidence on the sailplane which suggests that the design limits have been exceeded or equipment damaged should, therefore, be followed by a careful inspection appropriate to the nature of the occurrence and in accordance with the sailplane manufacturer's approved data.

The following advice is provided as guidance for special inspection requirements to certificate of registration holders, pilots and individuals involved in the maintenance of sailplanes. It is not possible to provide precise details of inspections to be adopted after every type of incident due to glider design differences and the varying nature of the stresses that may occur.

## Examination of the Sailplane

Where the sailplane manufacturer provides for special inspection requirements, those inspections must take priority over the guidance material in this bulletin. Should the manufacturer's inspection requirements be found to be deficient the following advice is provided to supplement the manufacturer's recommendations.

The inspection process must be to such a scope as to ensure that all defects, including sub-surface defects, or limitations in control functionality are detected. By virtue of their design, sailplanes differ in the manner in which an abnormal load may manifest itself. Wrinkling or distortion of fuselage or wing skins may well be an indication that structure deformation or failure has occurred, and a full investigation should be carried out. Any jamming, binding or limited travel of controls must be fully investigated. A wing frequency check should also be conducted in accordance with paragraph 3.3.4.1 of GFA publication [Basic Sailplane Engineering](#) (AIRW-M005).

Should the inspection process reveal that the sailplane has suffered major damage, the Maintenance Release must be endorsed that the sailplane is unairworthy (i.e. enter a Major Defect in Part 2). The Maintenance Release will then cease to be in force pursuant to paragraph 19.5.2 of MOSP 3 until the defect has been cleared by an appropriately authorised person.

## Hard or Overweight Landing and Abnormal Flight Load Inspection

If a sailplane has been flown through conditions of severe turbulence, or has been subjected to flight manoeuvres in excess of the manufacturer's recommended limits, or has suffered a hard or overweight (e.g. with water ballast) landing, including a ground-loop, the sailplane must be taken out of service and assessed for damage. The inspector must understand the loads which the sailplane is likely to have been subjected to so that the inspection can cover the likely damage points. A person holding an Annual Inspector or higher authority is authorised to perform the inspection and release the sailplane to service.

The inspections and actions recommended prior to further flight are detailed in Chapter 25 of the GFA publication 'Basic Sailplane Engineering'.

**Note:** *A hard landing occurs when a sailplane hits the ground with a greater vertical speed and force than in a normal landing. However, the forces involved may not always be apparent, so for most pilots if they have to question whether that previous landing was 'hard', it probably was! Any landing where tyres or wheels are deflated or damaged should raise this question.*



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