

Guidance on Skids and Wheels on Sailplanes and Powered Sailplanes

AIRW-D026



INTRODUCTION

Most gliders are supplied with wingtip skids although some have wingtip wheels (eg DG 1000 and self-launching gliders). Most wingtip skids are attached by bonding although some are bolted (eg Astir). With many non-grassed runways in Australia, skids often wear down and need replacing.

Many older gliders have tail skids although more modern gliders have tail wheels. These tail skids are bonded to the fuselage and occasionally need replacing.

Replacement of worn skids is not addressed in Basic Sailplane Engineering and is not normally addressed in glider maintenance manuals.

CURRENT PRACTICE FOR FIXING REPLACEMENT SKIDS

With no guidance in place, replacement skids have been attached with:

- double sided tape (which allows skids to be pulled off by hand)
- contact adhesive (sometimes inappropriate for the material being bonded – eg rubber)
- Sikaflex (or similar PU bonding material) which provides a strong durable bond when applied correctly.

Poorly attached skids have detached while scraping on the ground during take-off or landing, resulted in damage to the glider wing and/or ailerons.

SCOPE

This guidance addresses the installation of wingtip skids, wingtip wheels and tail skids on sailplanes and powered sailplanes which were designed with skids.

It excludes wingtip skid or wheel installation on gliders or powered sailplanes which were not designed with skids or wheels. In this case an Engineering Order is required.

Replacement of wingtip skids with wingtip wheels is included in the scope of this document where they are of small form factor and relatively light (up to 250 grams each). For simplicity in this document, they are all referred to as skids.

Such installations would be expected to have low or negligible effect at the sailplane mass, centre of gravity, structural strength and drag and would thus be expected to have no appreciable effect on sailplane systems, handling or performance.

Risks to the sailplane and its occupants as well as third party risks (including potential skid detachment) posed by the installation need to be managed and mitigated by careful installation that will be assessed by the Annual Inspector for acceptability and documented accordingly.

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GUIDANCE ON INSTALLATION ASSESSMENT AND APPROVAL BY AN ANNUAL INSPECTOR

The skid (or wheel) installation will need to be assessed by an Annual Inspector before the first flight with the skid in situ on a sailplane. Guidance on acceptable installation practices and the assessment process to be followed are provided in the Installation Checklist below.

The decision to permit the skid installation resides with the Annual Inspector. The Annual Inspector should not feel pressured to approve the installation for the pilot and if uncomfortable or unsure about the installation should reject or refer to another Annual Inspector for approval or ask for guidance from the regional RTOA.

The Annual Inspector should consider any on-going airworthiness requirements such as daily inspections or annual re-application of the load testing.

The Annual Inspector may request a flight test in some cases to verify the installation, eg check under controlled conditions for flutter or influence (buzz) on the controls.

GENERAL INSTALLATION REQUIREMENTS AND GUIDELINES

The installation must be inspected by an Annual Inspector who will review the skid installation against the points below and complete and sign the sections below to confirm that the installation is satisfactory.

Step	General installation requirements and guidelines checklist	Tick or n/a
1.	Skids shall be attached to the airframe in the same region as the original skids.	
2.	Attachment shall be with suitable bonding agent such as Sikaflex. Check suitability of the bonding agent for the materials to be bonded. High strength double sided tape or flexible adhesive may be used.	
3.	Skids shall be weighed prior to installation. For tail skids, a new weight and balance report and placards will be required if the new skid is more than 50g heavier than the original skid. This may be by calculation by a weight and balance rated inspector.	
4.	Preparation for bonding shall include: <ul style="list-style-type: none">• sanding both surfaces to be bonded• removal of loose paint within the bond area• the use of temporary guide blocks and/or marking to ensure correct positioning during bonding• degreasing both surfaces prior to bonding with degreasing solvent, eg Septone Wax and Grease Remover which removes waxes and silicones• wearing of “rubber” gloves during degreasing and bonding to avoid contamination of the bond surface• Any additional preparation recommended by the skid manufacturer.	
5.	Further to the above, the structural integrity of the sailplane must not be compromised due to sanding or cutting the FRP structure or by drilling of new or enlarged holes.	

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6.	<p>Push/Pull test requirement: Following curing of the bonding agent, the integrity of the installation with regard to detachment during flight shall be checked by applying the following loads (separately):</p> <ul style="list-style-type: none"> • a downward load of 9g to the skid, at about the centre of gravity of the skid. For a skid weighing 250g, the downward load will be 2.25kg. • a rearwards load of 2kg. 	
7.	The installation shall be recorded in the aircraft log book. The recording shall include the weight and bonding agent.	

Additional comments and limitations related to the checklist above	
Checklist number	Comments

Instructions for Continuing Airworthiness, eg annual checks or re-attachment
<ol style="list-style-type: none"> 1. Check installations are secure at every Daily Inspection 2. Annually repeat the Test 6 above 3. Re-attach by repeating the above with the same or stronger adhesive and recording in Logbook.

Annual Inspector Sign-Off	
All sections of the form completed	
Attached installation sketch and a list of parts	
Location of installation	
Name (PRINT)	
Annual Inspector's GFA Number	
Date	
Signature	