



THE GLIDING FEDERATION OF AUSTRALIA INC

C4/1-13 THE GATEWAY, BROADMEADOWS, VIC 3047
PHONE +61 (0) 3 9359 1613, FAX +61 (0) 3 9359 9865. ABN: 82 433 264 489

Airworthiness Alert 2021-3 **IS-28B2 Wing Rigging Failure**

Overview

An IS-28B2 sailplane had recently completed an annual inspection for the issue of a maintenance release and was performing a post maintenance evaluation flight. The glider was on aerotow flying just above the ground when a loud cracking noise was heard. The flight was terminated and a landing straight ahead was successfully carried out. After landing, the glider exhibited an exaggerated dihedral. On inspection, the connection between the lower wing spar attachment fittings had failed.



Investigation

The initial inspection suggested the upper tapered bolt had engaged correctly during rigging, but the lower tapered bolt had not engaged correctly. There were less than 14 mm of thread exposed on the bottom tapered bolt. A comparison with another IS-28B2 revealed that correctly engaged tapered bolts had approximately 25 mm of threads exposed on upper and lower threads when both tapered bolts were fully engaged.



Incorrect rigging - 13 mm thread exposed, collar not retained in slots, wear / contact surfaces visible on tapered bolt. Centre collar is above slot in guide plates

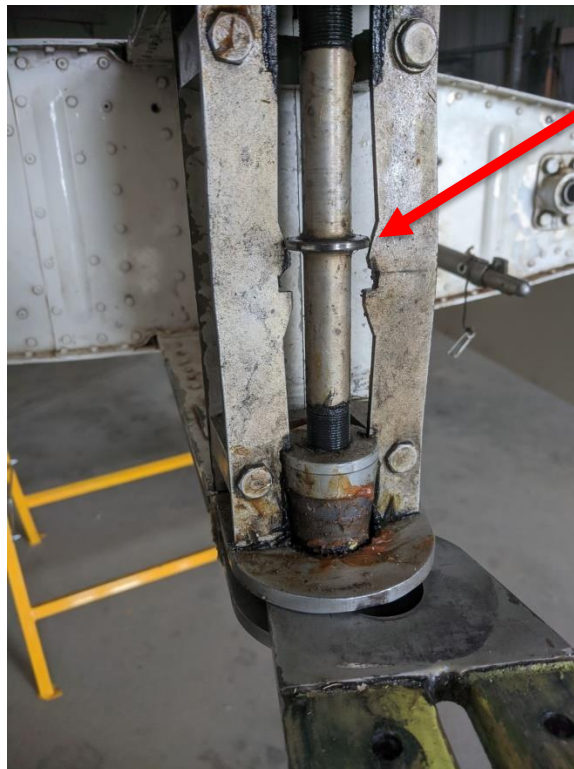


Correct rigging - aligned spar fittings and 25 mm thread, no wear / contact surfaces on tapered bolt exposed, collar housed in retainer.

After the preliminary inspection, the glider was derigged and it was able to recreate the sequence of events. During the initial rigging, the lower spar fittings were mis-aligned causing the lower tapered bolt to jam. An extension handle was being used on the T handle

rigging tool. The additional force provided by the extension caused the collar to force itself free of the retaining slots. It is likely the slots were quite worn prior to the event.

The upper tapered bolt was then free to extend into the upper fitting. The lower tapered bolt was still jammed and winding the T handle simply moved the collar and upper pin upwards.



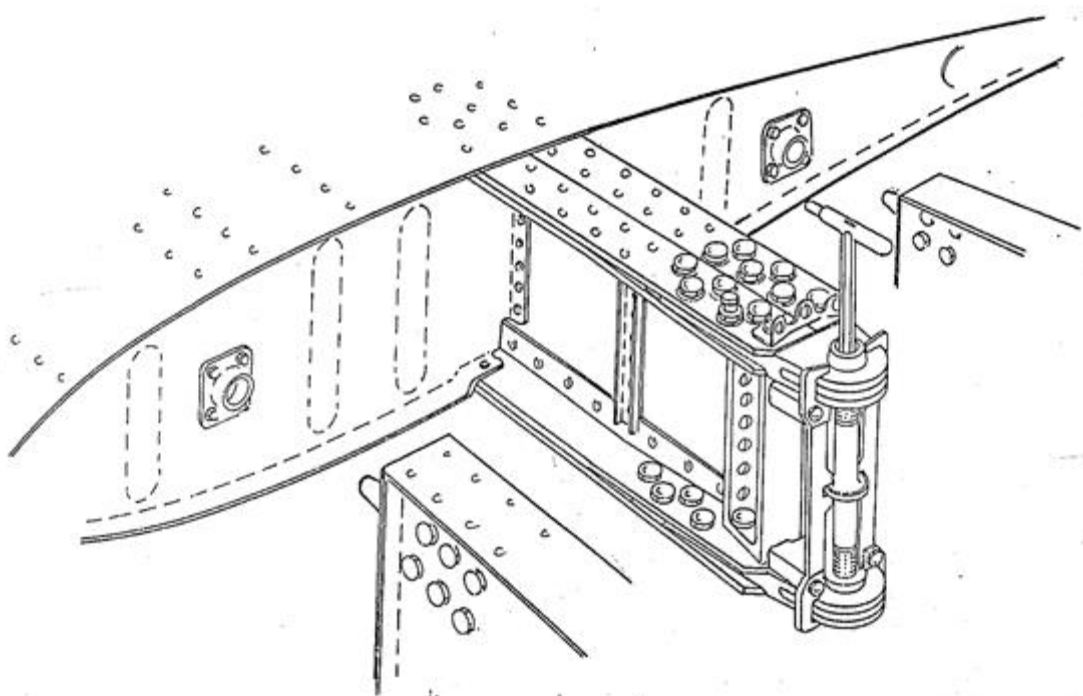
**Collar free of slots.
Retaining plates deformed.**

Recreation of event. The lower spar tongue is jamming the lower tapered bolt with wear / contact surfaces exposed, the collar is 10-15mm above the slots and the collar retaining slots are worn and rounded. The upper tapered bolt is fully engaged.

The following are extracts from the IS-28B2 Flight Manual.

6.2.1.1. Wing mounting

The fuselage-wing junction consists of four cylindrical guiding bolts located on fuselage and of two central, tapered, undismountable bolts, located on the right wing (see fig.6-1) which are actuated simultaneously by a special wrench.



The wings can be mounted no matter the order. The wings are brought in turn to the horizontal position, by three person (one of them at wing tip), then they are set to the junction and pushed on extremities in order to couple them.

To ease the approach, use the approach device (part no. 29.D2.12.01.019) shown in fig. 6-2 and delivered together with the glider.

By twisting the junction wrench, bring the tapered bolts to correct position.

CAUTION !

Do not use extensions during junction tightening. The two persons at wing extremities shall move the extremities up and down to ease the junction assembling.

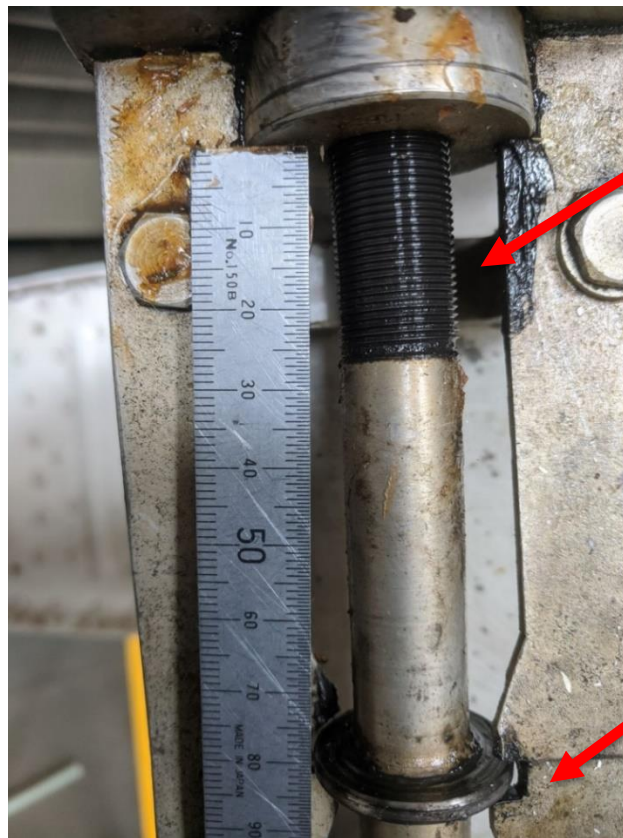
Recommendation / Action

The GFA recommends the following when rigging an IS-28B2:

Prior to rigging, the slot in the guide plates for the collar should be inspected for undue wear.

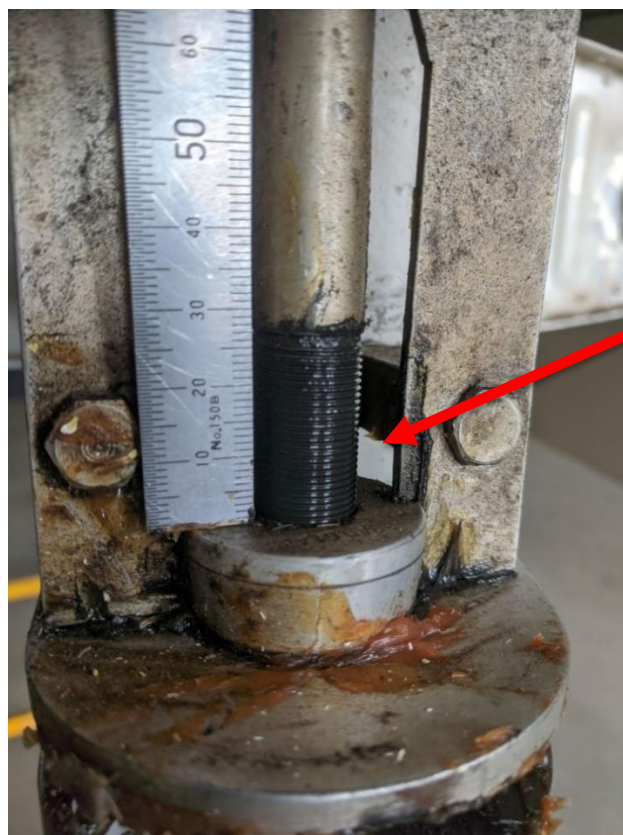
Prior to rigging, the tapered bolt assembly must be inspected and confirmed to be in good condition, fully functional and serviceable. Worn bolt assemblies must be replaced.

After rigging, the collar should be inspected to ensure it is still in the retaining slots.



Approx 25 mm thread showing

Collar in slot

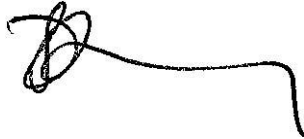


Approx 25 mm thread showing

The tapered bolts and collar should be visually inspected after rigging (including using a torch and mirror) to ensure upper and lower tapered bolts are fully engaged and collar is retained in its slot. Check the exposed threads are roughly equal on the upper and lower surface and approximately 25 mm of thread is exposed. Wear / contact surfaces on both tapered bolts should not be visible.

Reporting

Notify the GFA in the usual manner if you have information relating to any similar or related occurrence.

A handwritten signature in black ink, consisting of a stylized 'D' followed by a horizontal line that curves downwards at the end.

Dennis Stacey
GFA CTO
02/11/2021