



GFA AD-617
(ISSUE 1)

GFA AIRWORTHINESS DIRECTIVE

TYPE AFFECTED: DUO DISCUS S/N: 1 up to & including 164.

SUBJECT: Possible faulty bonding of Upper spar cap to Spar web.

BACKGROUND: The bonding problem was initially thought to be restricted to aircraft S/N 165 to 389, as previously described in AD-593. However a faulty bond has been found in an aircraft from the range of S/N 1 thru 164, therefore inspection is now required for all aircraft in that S/N block as well.

DOCUMENTATION: The LBA has issued AD 2004-084 and Schempp-Hirth has issued Technical Note 396-9, which forms part of this AD.

ACTION REQUIRED: Carry out inspection & if necessary repairs in accordance with TN396-9. Report findings in writing to the GFA Airworthiness Department.

WEIGHT AND BALANCE: Not Affected

IMPLEMENTATION: Before further flight.

COMPLIANCE: The requirements of this GFA Airworthiness Directive are mandatory. This Directive is issued pursuant to the Rules and Regulations of the Gliding Federation of Australia.

SIGNED:

CHIEF TECHNICAL OFFICER AIRWORTHINESS



For and on behalf of:

® THE GLIDING FEDERATION
OF AUSTRALIA

SUBJECT: Wing,
bonding of spar cap to spar web

AFFECTED: **Sailplane Duo Discus** (TC-No.: 396)
S/Nos: 1 through 164

URGENCY: At the latest on **April 30, 2004**

REASON: An inspection of the bonding of spar cap to spar web for the S/No 165 through 389 was performed according the Technical Note No 396-8 issue July 31, 2003.
This new Technical Note No. 396-9 takes in account the fact that defects in the bonding of a spar cap to spar web in the outer wing part was identified on a serial number which belongs to the range of serial numbers 1 through 164 so far not affected.
For safety reasons the bonding of these serial numbers will be checked too.

ACTIONS:

1. The bonding between the upper spar cap and the spar web are to be checked according to the instructions in the appendix of this Technical Note.
2. Defects in the spar cap and spar web bonding are to be repaired according to the instructions in the appendix of this Technical Note.
3. After completion of the check or respective repair the ailerons are to be re-installed, if the ailerons were removed, and the aileron deflections are to be checked, if the control rods were adjusted.
4. For information the report of the inspection should be sent to:
Schempp-Hirth
Flugzeugbau GmbH.
Postfach 1443
73222 Kirchheim/Teck
Germany

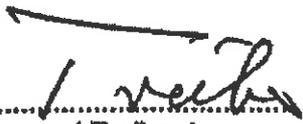
MATERIAL: See repair instructions in the appendix of this Technical Note.

WEIGHT: Alteration negligible

C/G POSITION: Alteration negligible

REMARK: The actions must be accomplished by a certified repair station and entered in the log book.

Kirchheim/Teck, 30.01.2004

Issued: 
(Treiber)

LBA-approved:

The German original has been approved by the LBA under the date of... **03 FEB 2004** and is signed of by Mr. *Blume*

The translation into English has been done by best knowledge and judgement.

EASA approved on:

... **Feb. 4th, 2004**
under Approval No.:
2004-935
.....

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Working Instructions for inspection of the spar cap and spar web

1. Recommended devices for the inspection

- Video camera (colour) with approx. Ø 15 mm (0.59 in) through 25 mm (0.98 in) with additional light and adequate cable extension with monitor.
- Endoscope (very long) preferable with 90 degree direction.

2. Inspection openings for checking the bonding between spar cap and spar web

- a) Cut the inspection opening in the outer root rib, see page 5.
- b) Remove the inspection opening in the lower surface at the aileron drive (if necessary for the inspection).

3. Inspection:

The bonding on the rear side of the spar cap and spar web on the upper wing surface has to be checked, see cross section on page 5.

It is required that the gap between GRFP-spar web and CFRP-spar cap is completely filled with bonding material.

This can be detected through:

- excessive bonding resin at the rear upper edge of the spar cap to the spar web connection.

Showcase photos on page 6 and 7 indicate the following:

- a complete bonding with excessive bonding resin
- a defective bonding – insufficient bonding resin

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4. Inspection procedure:

The bonding of the upper spar cap to the spar web has to be checked visual **from the root rib over the whole length of the wing until the outer end of the aileron** through the inspection opening, see item 2.

If an area can not be clearly identified (lighting conditions insufficient) additional inspection openings may be required:

These additional inspection openings should be cut according the information in the appendix of the Technical Note No.396-8/890-3 issue July 31, 2003 section 2, which is published on our internet side www.schempp-hirth.com.

Remark:

- a) The inspection opening in the outer root rib (outboard) can stay open.
- b) In case of doubts during the check regarding the safety of the bonding contact the holder of the design SCHEMPP-HIRTH GmbH.

5. Defects in the bonding of the spar cap to spar web connection:

If defects were noticed the gap depth and length should be identified with a pointer with markings for the depth (wire diameter approx. 0,7 mm and/or a thin metal sheet thickness approx. 0,3 mm).

When identifying the area of the gap, always investigate the extension of the void in span wise direction.

Some photos on page 6 and 7 show examples of defects in the bonding.

When repairing these defects this method of identifying the dimension of the defects should be maintained to detect the whole area.

In the case of defects in the outer wing part, first openings in the rear web (supporting the aileron) should be cut for further examination and possibly also repair. If required, openings may be cut in the lower wing surface behind or in front of the spar.

Defects have to be repaired according the instructions on page 3 and 4.

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Repair instructions for the spar cap/spar web connection

A cross section of the wing with spar is shown on page 5.

To repair the spar cap/spar web connection in the outer wing part it is possibly sufficient to cut an opening in the rear web (supporting the aileron). If the repair is not possible on this way, respectively in the case of a repair in the inner part of the wing, a sufficient opening in the lower surface has to be cut so that the repair can be done.

Take care that the opening has a distance of more than 20 mm to the spar cap.
Also inspection openings forward the spar can be necessary.

I. Deficiency in the bonding of less than 15 mm from the edge of the web and less than 40 mm in length

1. Roughen the surface in the gap of spar cap and spar web.
2. Around the affected area roughen the surface of spar web and the wing shell.
3. Fill the gap with resin (thickened with cotton flocks)
4. Additional apply a layer of glasfibre 92125 under 45 degrees over the affected area. This layer should exceed the border of this area at least 20 mm covering over the edge of the spar cap and spar web.

II. Deficiency in the bonding of more than 15 mm from the edge of the web or exceeding 40 mm in length or within the flange of the spar web

1. In the area of the deficiency sand the spar web away and scarf the edge of the web flange.
2. After roughening of the spar cap and the surrounding spar web apply the following layers 92125 under 45 degrees over the area to be repaired:

wing station	numbers of layers 92125 under 45 degrees
from root rib inboard until 1100 mm (43.3 in)	6 layers for each side
from 1100 mm (43 in) root rib inboard until 3000 mm (118 in)	4 layers for each side
from 3000 mm (118 in) root rib inboard until root rib outboard	3 layers for each side

Remark: The minimum scarf length for one layer 92125 is at least 10 mm.

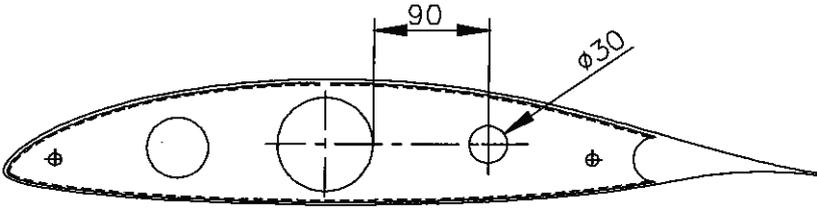
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III. General instructions to the repair of the spar cap/spar web connection and the repair of the repair openings in the wing shell

The repair of the spar cap/spar web connection and the repair of the repair openings in the wing shell must be done according following additional instructions:

- a) Repair instructions in the appendix of the Maintenance Manuals:
 - Repair Instructions Duo Discus, issue January 1994
- b) Repair instructions for sailplanes and powered sailplanes constructed from fibre reinforced plastic (FRP), issue September 1991

inspection opening in the outer
root rib



wing section in the
airbrake area

