B.G.A. TECHNICAL COMMITTEE

TECHNICAL NEWSHEET

TNS 9/10/83

PART 1 AIRWORTHINESS 'AGGRO' (Please add to the 1983 Pink Pages)

1.1. FLUTTER - cable tensions Loss of friction in the control circuit of the ailerons of a Grunau, resulted in serious flutter. The very hot/dry weather will have caused significant changes in cable tensions in most wooden aeroplanes. Backlash in all circuits should be checked periodically.

1.2. T.21 SEDBERGH - cracks in bolt holes in front pylon at drag-spar attachment. H.Q. Air Cadets have reported cracks due to wood shrinkage.

1.3. ASK 21 Foul between controls below rear cockpit floor, and Bowden cable drive to elevator trim indicator. Additional clip may be required. (Reported by R.A.F.G.S.A. Bicester).

1.4. SZD-50-3 'PUCHACZ' Bulletin BK 10/50-3/83 introduces measures to eliminate the possibility of foreign objects fouling the control system below the front seat. (contact U.K. agents).

1.5. KA-6 Spar Failure in New Zealand The following factors contributed to an in-flight wing separation during an avoidance manoevre in N.Z.:-

a) An open crack in the end of the spar boom.

b) Deterioration of the wood strength properties due to iron staining of the spar boom.

c) In-built stresses in the spar boom as a result of poorly controlled manufacturing conditions.

d) Stresses in the spar boom due to swelling corrosion of bolts.

e) Poor wood quality

N.B. The New Zealand accident investigator's report concluded that "the parachute worked uneventfully"!

This type of structural deterioration may occur in any glider of similar construction.

1.6. OPEN CIRRUS speed brake rod failure Sketch kindly provided by Mark Darby attached herewith, explains the problem.

1.7. DART 17R - Aileron flutter at 95 knots resulted in 6" split in port aileron. Backlash of 5-6mm had to be reduced to eliminate the problem (Reported by Kent G.C.).

1.8. OPEN CIRRUS (V.T.C.) Rudder Cables jammed having escaped from the guards around the pulleys. The rudder pedal springs were very weak and the plastic conduit was loose and fouling the pulley. (Reported by Doncaster G.C.).

1.9. KESTREL 19 Flap Flutter The attached report and sketch by Chris Batty is self explanatory.

1.10. ASW 20L - Flap disconnected Wing mounted female connector had not engaged fully on the fuselage mounted ball, and became detached when landing-gear was retracted. (Reported by Tim Macfadyen).

1.11. HOFFMAN SERVICE BULLETIN No. E4A (herewith) requires action on all LIMBACH 2000 installations to check propeller blade root retention, to placard an avoid RPM, and to check calibrate tachometers.

1.12 SOCCATA RALLYE - Nose leg failure due to corrosion. Extract from GASIL 7/83 herewith, reports a fourth case of failure.

1.13 ALTIMETER FAILURES Aeronautical Information Circular 51/1983, attached reports failures which may apply equally to tugs or gliders.

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PART 2 GENERAL

2.1. CAN WOOD DRY OUT? The Vintage Gliding Club have kindly provided the text of a note by R.A.E. (attached).

2.2. G.R.P.COURSES The Marine Builders Training Trust, Hazel Road, Woolston, Southampton SO2 7GB (Southampton 446824) periodically put on courses for "AERO DIVISION G.R.P. EPOXIDE REPAIRS". Details of syllabus and costs may be obtained from Mr. Brent Strickland. (Initiated by Robin Dispain - Senior B.G.A. Inspector).

2.3. IMPORTED MOTOR GLIDERS (new or second-hand) - documentation The C.A.A. require copies of either Export C. of A. or current domestic C. of A., before certificates of airworthiness can be issued in the U.K.

R.B. STRATTON
CHIEF TECHNICAL OFFICER

22nd September, 1983

IMPORTANT NOTICE

B.G.A. Inspector Renewals are now due (slip enclosed) and Insurance Indemnity of £250,000 in respect of B.G.A. airworthiness activities is only available to paid-up B.G.A. Inspectors.

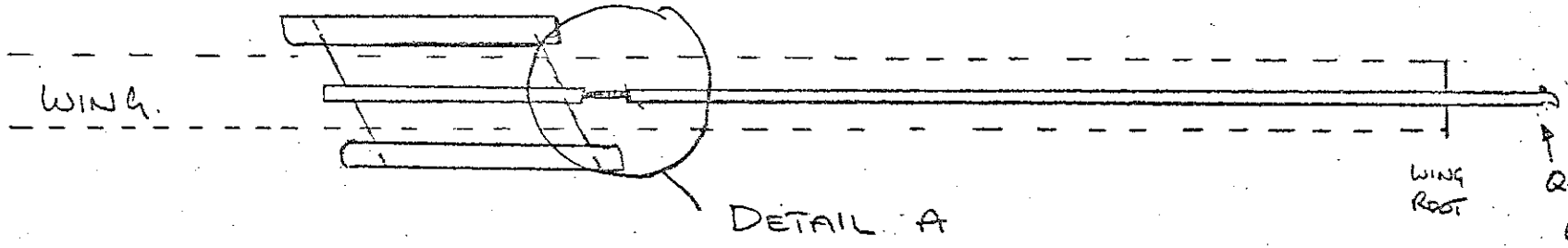
A prompt response is therefore worthwhile.

TNS 10/83

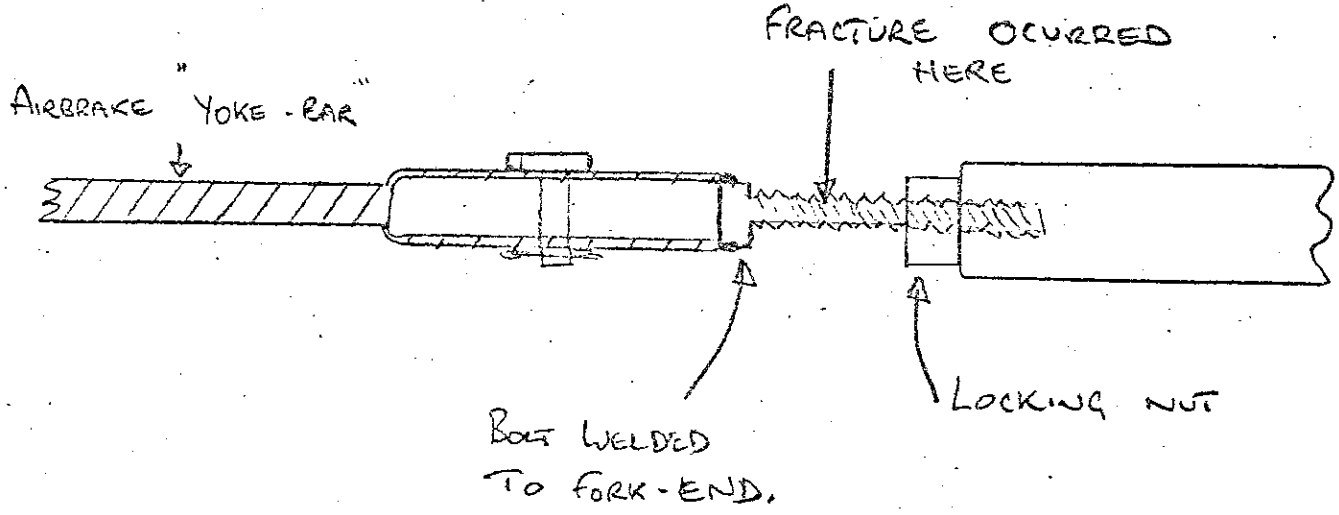
OPEN CIRRUS

AIRBRAKE

LOCATION OF FAULT : X-SECTION THROUGH STBD WING LOOKING AFT



DETAIL A



AIRBRAKE TORQUE-TUBE / FORK-END FAILURE. SCHEMP-HIRTH OPEN CIRRUS (MSN# 2

MARK DARBY (SUSSEX) 14/8/83.

AIRCRAFT - BGA 1716 KESTREL 19

EVENT - SEVERE FLAP FLUTTER AT 110KT ON 16/7/83

1. FINDINGS

After the event the g.r.p. moulding which provides the flap torque shaft bearing was found to be almost completely detached from the inside of the fuselage. The resulting flexibility provided enormous flap backlash. On dismantling the mechanism the double row self aligning bearing at the end of the L.H. torque tube was found to be disrupted as shown in sketch.

2. SUGGESTED CAUSE

The L.H. flap drive bearing has received a substantial overload in the inwards direction to cause the outer ring to spring over the ball array. This load can only be reacted by the g.r.p. moulding carring the centre bearing in a direction which will "unpeel" it from the fuselage wall. It is suggested that the L.H. wing was entered to the fuselage with the flap in a different position to that of the cockpit lever. The flap drive spigot then abutted the slotted end of the torque tube instead of entering the slot. The resulting end load disrupted the bearing and dismounted the g.r.p. bearing housing.

3. CONCLUSION

In view of the detail design of the mechanism it is surprising that this has not occured on an aircraft previously. Other Kestrels have been seen to have the g.r.p. mounting partially peeled from the fuselage sidewall, indicating that they have been loaded during rigging, but their level of attachment has still been satisfactory. A fairly major re-design of the mechanism would be required to overcome this mode of failure. In view of the absence of other reported incidents, and the major but not catastrophic nature of the flutter, it is concluded that a design change is unnecessary.

4. RECOMMENDATION

1. That owners be alerted to the risk of damage during rigging.

2. That inspectors be made aware of the possibility that such damage could exist.

C J Batty

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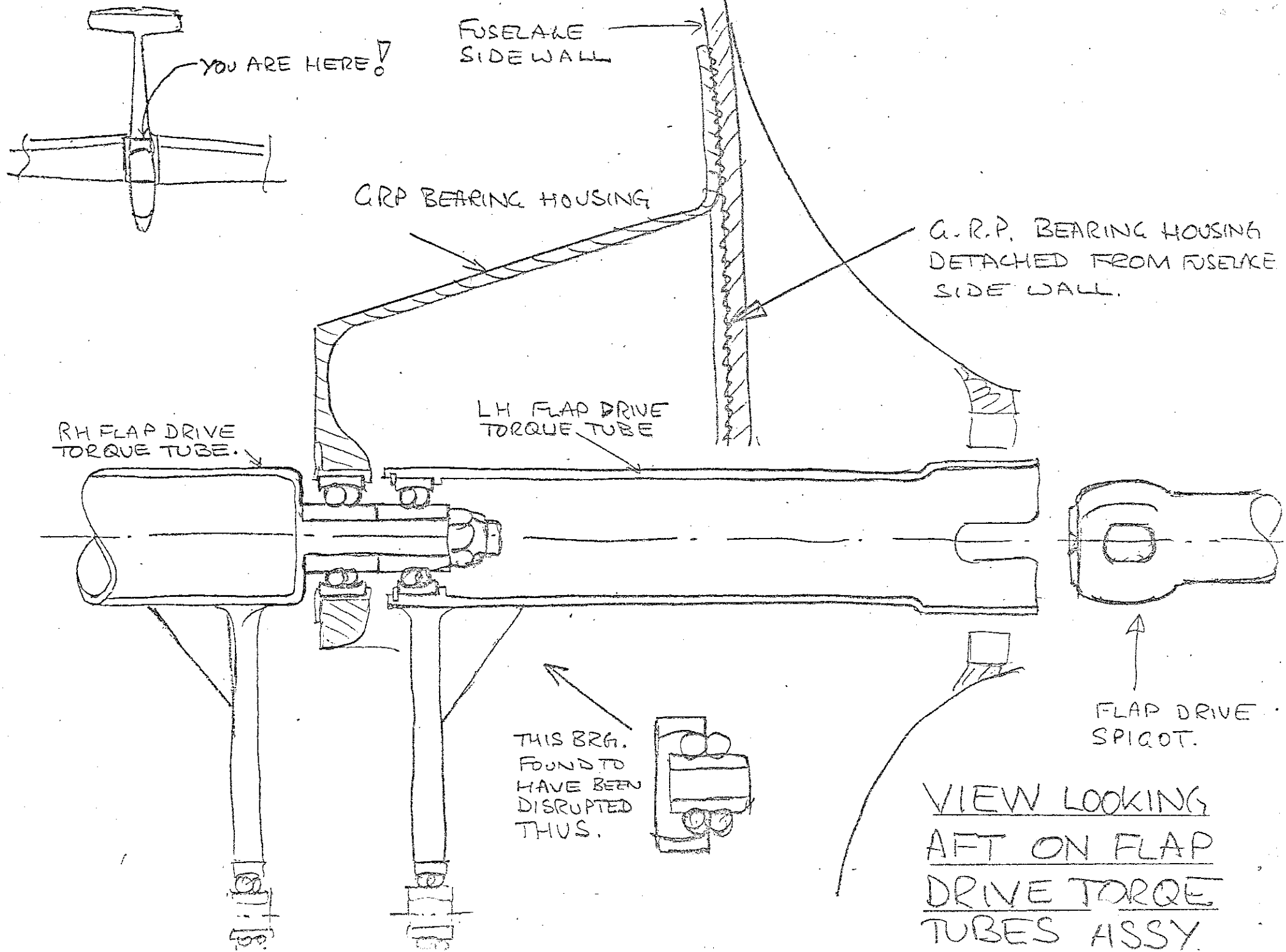
C. J. BATTY
1/A/098

21st July 1983



VIEW LOOKING AFT ON FLAP DRIVE TORQUE TUBES ASSY

PROPELLERWERK HOFFMANN ROSENHEIM

D-8200 Rosenheim 2 · Postfach 263 · Kuepferlingstraße 9 · Tel (08031) XXXXXX · Telex 05 25 811 HOCO D

32011

SERVICE BULLETIN NO. E 4 A 15.08.1983

The German Issue of this S. B. is LBA approved

This S. B. replaces S. B. No. E 4 dated July 15, 1983 which now is considered inactive.

Product affected:	HOFFMANN variable pitch propeller HO-V 62 R/L 160 T when installed with Limbach engine series L 2000.
Aircraft affected:	All powered gliders which are equipped with propeller/engine combination mentioned above.
Compliance:	See compliance and required action below.

BLADE ROOT RETENTION

Discussion:

A metal ferrule is attached to the blade body using lag screws. In flight, when using RPMs between 2950 and about 3250 stresses may arise in the lag screws exceeding the fatigue limit. Three incidents were revealed in which one each of five each lag screws per blade failed. Precautionary actions as listed below are necessary until a suitable solution has been developped.

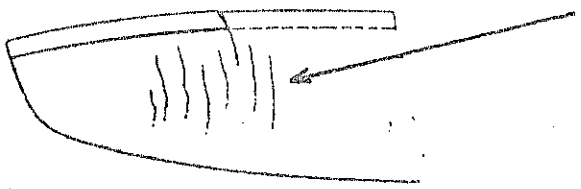
Compliance and required actions:

1) Immediately
   a) avoid RPM above 2900 in continous operation.
      Cruising with RPM above 2900 is not permitted.
      After take-off reduce RPM to 2900 as soon as safety of flight allows.
   b) Acrobatic manoeuvers using engine power are not permissible.
      Acrobatic manoeuvers with engine shut down are permissible.

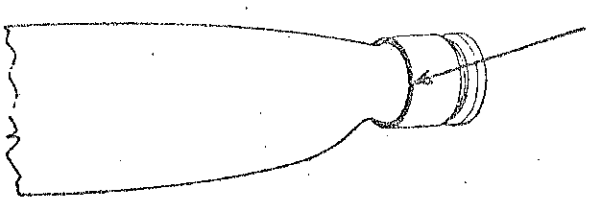
2) Within the next 10 service hours (engine running time)
   a) check RPM indicator.
      Apply correction marking.
      Example: "Reading 2830 is true 2900".
      Apply a decal close to the RPM indicator reading: "Avoid continous operation above 2900 RPM".
   b) Inspect propeller using the advises of owner's manual E 0107.72. To do this, the spinner dome must be removed. The inspection has to be carried out by a qualified person.

page -2- S. B. E 4 A

- If cracks in the lacquer are revealed with the directions across to the blade axis or if the metal leading edge is cracked, remove the propeller within the next 20 hours of service for special inspection in the factory.



- Inspect carefully all around the blade root the area between blade body and metal ferrule. Blades of newer construction are sealed in this area with Silicone rubber material. With such blades no cracks can be tolerated in the Silicone material or its connection to the metal ferrule (contrary to description in the manual). If a crack is revelaed in this area, the prop has to be removed from service for special inspection in the factory.



3) Within the next 20 service hours (engine running time) propellers with a static RPM of 2900 and above and which have been in service for more than 100 hours in this condition and propellers with more than 10 hours of aerobatic flight with engine power should be removed for special inspection in the factory.

4) Within the next 50 service hours (engine running time) propellers which have been used mainly for pilot training should be removed for special inspection in the factory.

5) Before accumulating 450 service hours (engine running time) since new
propeller overhaul is required.

Propellers which have already accumulated 450 hours time since new must be overhauled within the next 20 service hours.

6) Yearly
check RPM indicator one time per year.

Procedure:

During the special inspection and at overhaul the lag screws will be replaced by an improved version.

Exp.-
address:

telef. :

Return to:

HOFFMANN PROPELLER ROSENHEIM

Performance of Service Bulletin No. E 4 A

These questions shall help you to determine whether your propeller is affected and what you have to do. We recommend to give this sheet to the inspector who takes care for this one time inspection.

If one of these questions will be answered with yes, then please contact us in order that we can arrange a date for the performance.
T h i s s h e e t has to be in our hands when working on the prop!

The following mentioned points are in connection with our Service Bulletin E 4 A.

2) a) Has RPM indicator be checked? This is aboslutely necessary !

Correction marking applied as well as decal "Avoid ...above 2900 RPM"

....
date name

.....
signature of inspector

b) Inspecton of propeller blades
- cracks in the lacquer across to blade axis
  - ☐ yes: prop within 20 hrs into the factory
  - ☐ no : not affected
- cracks around blade root - metal ferrule
  - ☐ yes: prop to be removed from service
  - ☐ no : not affected

3) Prop has 2900 static RPM (RPM indicator checked) or higher.
Please indiacte. It has ..... RPM

- ☐ yes: see below
- ☐ no : not affected

  - Prop has been in service less than 100 hrs with 2900 RPM: has to be shipped to the factory before reaching 100 hrs.
  - Prop has been in service more than 100 hrs at 2900 RPM: has to be shipped within next 20 hrs into the factory.

- Prop has been used more than 10 hours in acrobatic flight
  - ☐ yes: within next 20 hours it has to be shipped to factory
  - ☐ no : not affected

4) Prop has been used mainly for pilot training
  - ☐ yes: ship into the factory within next 50 hours
  - ☐ no : not affected

5) All propellers which are not affected by point 2) to 4): overhaul time will be at 450 hours since new. We recommend to note this in your internal records.

date: ..... Signature: .....

PROPELLERWERK HOFFMANN ROSENHEIM

D-8200 Rosenheim 2 · Postfach 265 · Kueplerlingstraße 9 · Tel (08031) XXXXXX · Telex 05-25811 HOCO D

32011

Modified propellers are marked SB 4 on the outer collar of the ferrule on the chamber side of the blade. This marking is visible after removing the spinner dome. Such propellers have a TBO of 600 hours according to the conditions described in Service Bulletin No. E 1 E dated July 5, 1983 or a later approved issue.

Propellers affected by this S. B. which were shipped from the factory in condition new or repaired after July 15, 1983 are already equipped with improved lag screws as requested by this Service Bulletin. However, even for those propellers the compliance and required actions as listed under 1) a), 1) b), 2) a) and 6) have to be continued.

As soon as new results are available, this Service Bulletin will be revised.

HOFFMANN PROPELLER ROSENHEIM

LBA NR. I-EC 2, Nr. I-C 14

tr.
QEM
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dors

QB

General Aviation Safety Information

Safety Data and Analysis Unit
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Telephone Redhill 65966
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BGA TNS/10/83

7/83

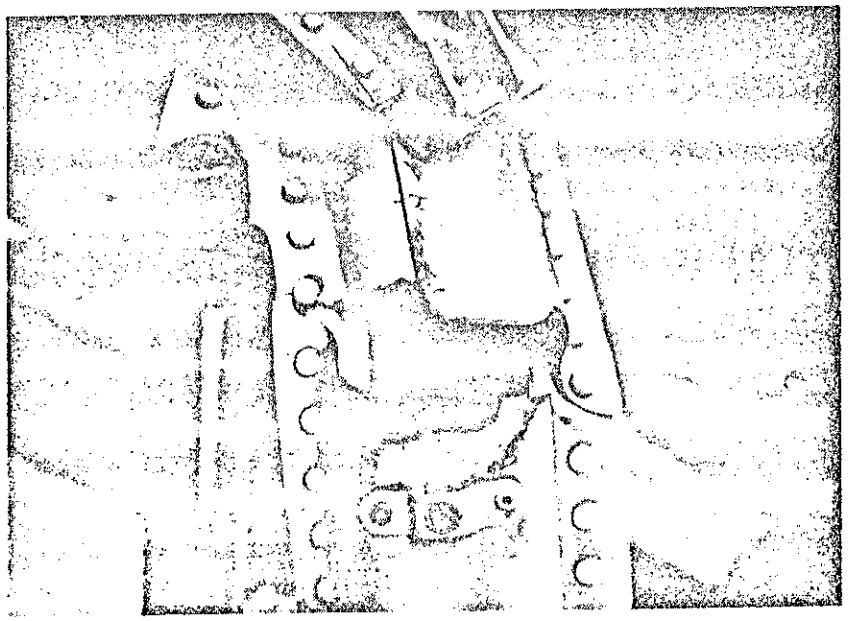
22 July 1983

E

1. NOSEWHEEL STRUT BROKE DUE TO CORROSION

Aircraft : Socata Rallye 894A
Date : May 1983

The aircraft was being taxied for an ADF aerial loop swing as part of the Annual Check. Without warning, the nose gear strut (Part No. 8042-0-108) fractured and folded sideways to the left and the propeller struck the ground stopping the engine. It appeared that the strut had been cracked for some considerable time through 75% of the cross section. The aircraft had flown 1394 hours since manufacture in 1969.



Forward →

Left-hand view on strut

CAA Comment:
This is the fourth case in seven years of this type of failure (see GASILS 1/77 p.3 and 5/77 p.1). The only real safeguard is to carry out periodic external visual inspections for signs of cracking or of internal corrosion. Socata Rallye Service (Letter) No 48 dated November 1966 recommends inspection of the nose landing gear before 5000 landings (or 500 hours for an aircraft used for glider towing where landings are not counted) and thereafter every 200 landings (or 25 hours for towing aircraft). Socata Service (Letter) No.65 introduces reinforcement for the nose gear on production aircraft. The CAA is considering making Socata Service No.48 mandatory.

In order to identify the broad subject matter each item is classified as follows:
Operational items mostly of interest to pilots
Airworthiness items mainly for engineers
Items which involve both operational and airworthiness interests

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P/E

Civil Aviation Authority

AERONAUTICAL INFORMATION CIRCULAR
UNITED KINGDOM

Aeronautical Information Service (AIS 2c)
Tolcarne Drive, Pinner, Middlesex HA5 2DU
Phone: 01-866 8781 Ext 259
Ext 257 (Distribution)

51/1983
(Pink 44)
7 September

File ref: 9/60 Airworthiness Division

ALTIMETERS IN GENERAL AVIATION AIRCRAFT

1 An incident occurred in flight in which the altimeter pressure setting scale became detached from the altimeter pointer when the pilot was attempting to set up the appropriate QNH. This resulted in a large indicated altimeter error.

2 Subsequent investigation revealed that satisfactory operation of the altimeter depends on the barometric adjustment control knob being attached to the spindle so that no fore or aft play exists between the knob and the instrument bezel. If such play exists, forward pressure on the knob may disengage the barometric adjustment scale from the altimeter pointer.

3 A number of altimeters of US manufacture are understood to be prone to this particular defect.

Included amongst these are the following:-
Aero Mechanism 8040, 8141, 8142 Series; Kollsmann Alticoder II; Narco AR 800 Series; and Bendix 3252013 Series Dial Pointer Type.

4 The Federal Aviation Agency is aware of this defect and is considering remedial action. In the meantime operators are advised to check that the barometric adjustment control knob is secure on the spindle and that the correct distance, as stated in the Manufacturer Overhaul Manual, exists between knob and bezel.

5 It is strongly advised that before flight the following checks are made:-

(a) that rotation of the barometric adjustment control knob results in a movement of both the pressure setting scale and the altimeter pointers and that forward pressure on the knob during rotation does not disengage the barometric adjustment scale from the altimeter pointers,

(b) that when QNH is set the altimeter reading agrees with the aerodrome elevation or that when QFE is set that the altimeter reads zero.

6 This AIC replaces information previously published in AIC 57/1978 (Lapsed).

This Circular is issued for information, guidance and necessary action.

Technical Note

CAN WOOD DRY OUT?

Experiments at RAE Farnborough have shown that only one bad thing can ever happen to wood that can lead to its destruction, other than by fire or impact. That is the breakdown of its cellulose structure due to rapid, severe, change of its moisture content. The taking on, and losing, of moisture rapidly, and in great quantities, due to violent humidity changes in air, is the only thing that can cause wood to lose structural integrity.

Such air humidity changes are only likely to be encountered in some tropical countries and in desert areas, between night and day. The wood will become brittle, should its cellulose structure deteriorate, but, in no cases has structural failure been due to the wood drying out. In all cases, actual failures were due to the wood being subjected to forces for which it was never intended.

To preserve the integrity of a wood's cellulose, it is necessary to keep its moisture content as stable as possible. This can be done by sealing the wood, by covering every part of the internal structure with varnish. External wooden surfaces are usually sealed with dope, fabric and paint. As pre-1945 gliders usually had their interior wood varnished, the moisture content will usually have been kept fairly stable. However, there are some parts of the world that have such severe humidity changes that even varnish will not have been able to protect the wood from continually taking on and losing moisture content. Also old gliders may have had some unsealed wood put in to them during repairs.

The craftsmen of old knew what they were doing when they heavily varnished the interiors, and often the exteriors, of boats, aeroplanes and gliders. Often, an oil-based, glossy white paint is used to seal the internal wooden structures of aeroplanes now. One guesses that the paint should be white in order not to absorb heat (to keep the wood cool), and shiny, to allow water to run off it. One can imagine that shiny paint might be heavier than varnish but, that it would seal the wood very well.

Nevertheless, the VGC wishes to offer the following opinion.

As it is impossible to absolutely guarantee that all parts of wooden structures have not become brittle due to violent changes of moisture content during the very long lives of our aircraft, we can not take responsibility for structural failures due to vintage gliders being overstressed while being flown too fast.

There are many among us who say that our aircraft should not receive Certificates of Airworthiness unless their structural integrity is as it was when they were new. Placarded speeds in cockpits often bear this out. (117 knots max. calm air speed for a Kranich 2). We would agree that the above is an ideal but we have no idea whether it should be totally accepted as our gliders have lived very long lives. We therefore urge our pilots to err on the side of caution for their own good, and for the good of our whole movement.

DO NOT RISK OVERSTRESSING YOUR AIRCRAFT. VINTAGE GLIDERS HAVE BETRAYED NO-ONE YET. DO NOT BETRAY THEM.

P.T.O.

WOODS USED ON FRENCH VINTAGE GLIDERS

This is a question that has recently come to the fore, and we will do our best to answer it. However, we, as always, say that we can be wrong and expect to be corrected.

On the AVIA 40 P's of 1935, it is clear that mahogony plywood was used for covering all stressed parts that were not covered with fabric. This plywood, related to the Gaboon plywood used on Slingsby gliders since 1953, remains true and there is little sagging between the structural members beneath it. However, it will not go round bends of small radii, such as wing and tailplane leading edges without splitting. This necessitates a shaped leading edge member to which the upper and lower surface plywood is glued, the shaped member then becoming the leading edge stringer. Mahogony plywood (Contre-plaque d'acajou) is also used to cover the AVIA's fuselage, which is not rounded, but gently curved to edges. It is also known that the Castel 242's fuselage and also that of the Castel C.25S of 1941 and 1942 are both covered with this plywood. We suspect that the Castels 301S and 310P are also covered with it. These were designed and flown first in 1941 and 2 and are slab-sided. However, we cannot believe that the Caudron C.800, also of 1942, could have had its fuselage covered with this wood, as it is circular. Also it would have been almost impossible to use it on its elliptical wings.

Both Grunau Babies and (Nord 1300's) and Meises (Nord 2000's) were built in France shortly after the war. Almost certainly, a birch plywood would have been used on their wings, as it had been in Germany. So, evidently, a birch plywood was available in France. However, after the accident, to a Nord 1300 during our International Rally at La Montagne Noire, it was established that its structure had been built of spruce, rather than pine, as German Grunau Babies were. We wonder whether the Nord 2000 (Meise) had also been built of spruce, substituted for the original Baltic pine, as was done on both types, when they were built in England after the war. This might account for the N.1300 and N.2000 being a little heavier than their German counterparts, and for the fact that all N.1300's in France can only be winch launched from their nose hooks. These are aerotowing hooks. They have no other. A spruce member, when substituting a pine member in England, must be 25% greater in cross-section. However, aircraft quality spruce must have a density of not less than 24 lbs/cu. ft. It is, in fact, often considerably heavier. It is not difficult to see how weight can be put on when converting a pine structure to spruce.