BGA TECHNICAL COMMITTEE

TECHNICAL NEWSHEET 11/12/96

The Last For 1996

PART 1 Airworthiness "AGGRO" - Please add to the 1996 Pink pages.

1.1. HARNESSES. Anti-Slip springs should be fitted to any harnesses which change their adjustment under normal operating conditions. (KA21's etc). Available from London Sailplanes (and others?).

1.2. KESTREL 19. Rudder Pedals, when adjusted to the fully forward position, fouled a non-standard ballast weight. (Reported by Tim Macfadyen).

1.3. PUCHACZ - Airbrake Operating Lever Failure. Two cases reported. Sketch herewith. Sent to owners 29/10/96.

1.4. LAK - 12 Service at 500 HRS. Bulletin 012.5 has been issued for implementation at 500 hrs or 5 years.

1.5. AMERICAN CHAMPION (Bellanca). Series aeroplanes (Tugs). FAA A/D 96-18-02 requires action to eliminate structural failure of the wing assembly. (Operators should consult their CAA (M3) Approval Maintenance Organisation).

1.6. STEMME 10 S.L.M.G.'s. LBA A/D 96-300 (herewith) requires inspection for cracks in the rear horizontal stabiliser fitting.

1.7. STANDARD CIRRUS (Series). LBA A/D 75-051/4 (herewith) requires action on **BALL JOINTS** on airbrake actuating lever.

1.8. CAA Procedures - Unscheduled Work on Tugs & SLMG's. CAA Airworthiness Notice No. 12 (Appendix 53) herewith draws attention to the importance of proper record keeping in respect of unscheduled repair and maintenance operations. If the work is incomplete (NOT SIGNED OFF!) the aeroplane Must Not Fly. A sample Rectification Sheet is attached.

1.9. THE LAW AND MAINTENANCE. The attached reprint once again strongly emphasises the importance of PROPERLY KEPT RECORDS.

1.10 LAMS Light Aircraft Maintenance Schedule for Tugs and SLMG's. Proforma worksheets should be used to record compliance with the Schedule (sample enclosed),

1.11 LOG BOOKS. (Tugs, SLMG's & Gliders). In support of 1.9 above) Log Books should be promptly completed on completion of the work, to reflect the true airworthiness state of the aeroplane. This includes the RED & GREEN Pages of CAA Log Books.

2.0. GENERAL INFORMATION

2.1. ACCIDENT INVESTIGATION. Guidelines for BGA Inspectors, are attached hereto.

2.2. OLYMPIA 460 SERIES. The attached Note has been sent to owners.

2.3. INSPECTOR RENEWALS - Have you actioned? If not please send to the BGA a.s.a.p.

2.4. UNLEADED MOGAS APPROVAL for Limbach Engines (L1700 and L2000) in Scheibe SF25, SF28 and SF36 S.L.M.G's is contained in Scheibe Tech Note 653-36 (herewith).

HAPPY CHRISTMAS TO ALL OUR READERS, AND A HAPPY NEW YEAR FOR 1997.

Dick Stratton
Chief Technical Officer

PUCHACZ AIR-BRAKE FAILURE! TNS 11/12/96

TWO CASES REPORTED.

Mr R I Lloyd
5 Tile Fields
Hollingbourne
Maidstone
Kent
ME17 1TZ

Tel Home: (01622) 880282
Work: (01622) 688351

Mr D Stratten
BGA Technical Officer
British Gliding Association
Kimberly House
Vaughan Way
Leicester LE1 4SG

28 October 1996

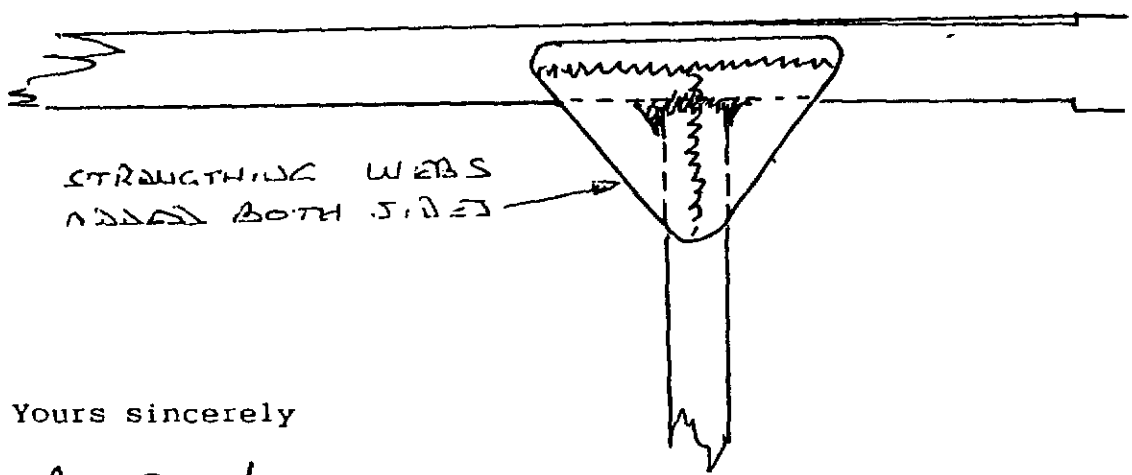
Dear Dick,

PUCHACZ - AIRBRAKE OPERATING LEVER FRACTURE

Routine examination of aircraft revealed lack of stiffness where operating lever is butt welded to torque tube (8 on attached drawing).

After removal of assembly, examination showed that fractures of the weld had occurred at both sides of leaver where it is welded to torque tube.

Weld repair carried out including addition of triangular steel webs welded on both sides of leaver and tube for added strength as indicated below.



Yours sincerely

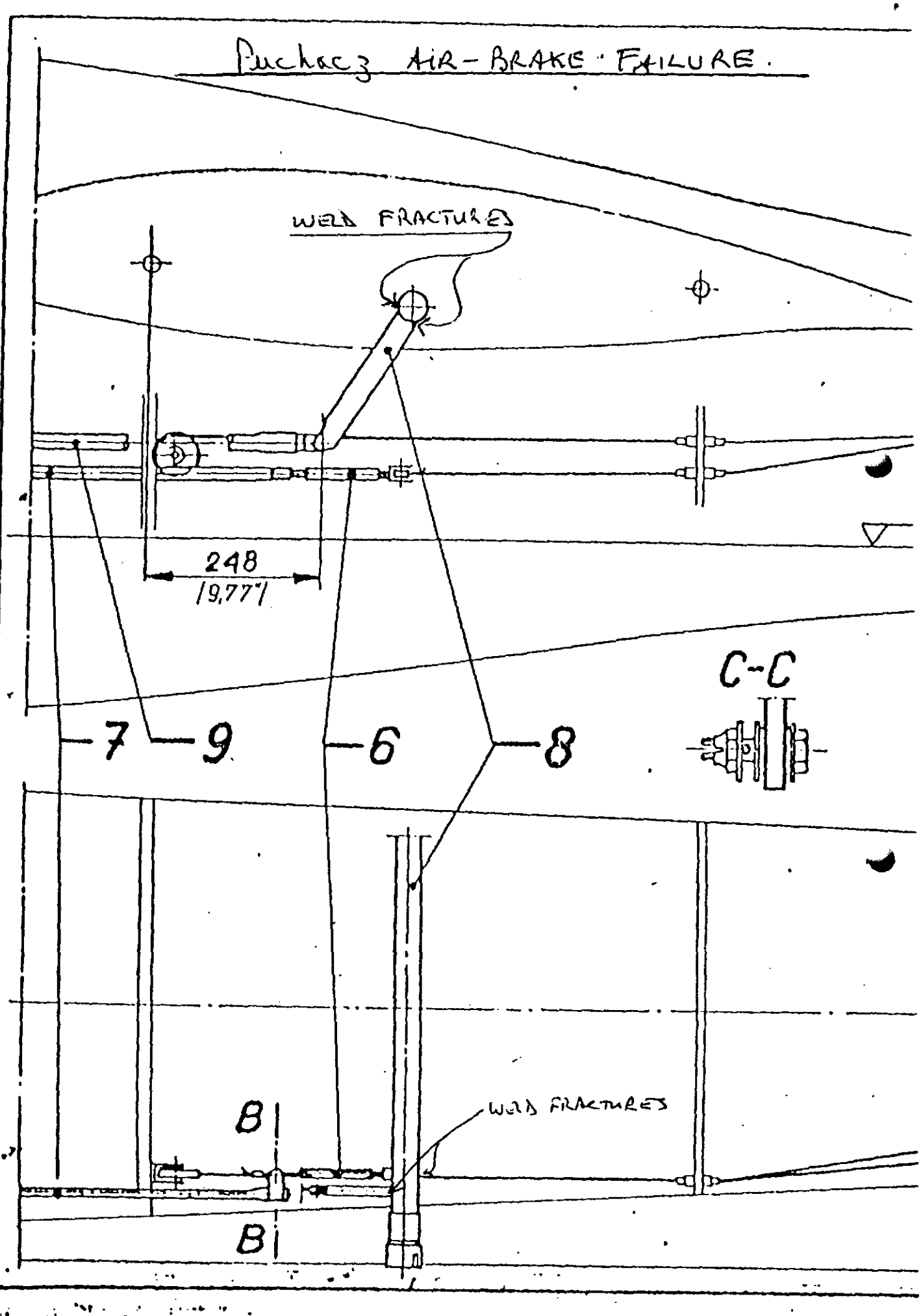
BOB LLOYD
11c 652/E

THIS REPAIR - STRONGLY RECOMMENDED.

29/10/96

To: CWNBAS 29/10/96

Puchacz AIR-BRAKE FAILURE.



Bulletin No. 012.5.Re.001A

SERVICE OF THE LAK-12 SAILPLANE AFTER 500 FLIGHT HOURS OR 5-YEAR OPERATION

1995

Joint - Stock Company

"Sportinė Aviacija"

Pociunai, Prienai, LT-4340,
Lithuanian Republic

Tel.: +370-49-51575

Fax: +370-49-53039

1996 10 14 No. 257

MR. R.STRATTON
C/O: THE BRITISH GLIDING ASSOCIATION,
KIMBERLEY HOUSE,
VAUGHAN WAY,
LEICESTER
LE1 4SE

DEAR MR. R.STRATTON,

FOR NEW MANUFACTURED LAK-12 (FROM WORKS NUMBER 6137) THERE IS NO OBLIGATORY OVERHAUL. AFTER EACH 500 FLIGHT HOURS OR AFTER EACH 5 YEARS OF OPERATION OWNERS OF THE GLIDERS LAK-12 MUST CARRY OUT BULLETIN NOR. 012. 5 REQ01A WHICH DOES NOT REQUIRE SPECIAL QUALIFICATIONS OR UNUSUAL EQUIPMENT.

YOURS SINCERELY,

RIMANTAS KORONKEVICIUS
DIRECTOR

SAFETY REGULATION GROUP

Aviation House
Gatwick Airport South
West Sussex
RH6 0YR
UNITED KINGDOM

Direct Dial +44(0)1293 573150
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CIVIL AVIATION AUTHORITY

Our ref 9/97/CtAw/182

21 October 1996

LBA AIRWORTHINESS DIRECTIVE 96-300
STEMME S10 AND S10-V MOTORGLIDERS
CRACKS IN REAR STABILIZER FITTING

The provisions of Article 9(7) of the Air Navigation Order (1995) as amended, are such that a Certificate of Airworthiness in respect of an aircraft registered in the United Kingdom will cease to be in force until any modification or inspection, being a modification or inspection required by the CAA is completed.

In accordance with Article 9(7) and Airworthiness Notice No. 36 the modification or inspection required by this Airworthiness Directive is mandatory for applicable aircraft on the UK Register.

IT IS RECOMMENDED THAT YOU FORWARD A COPY OF THIS AIRWORTHINESS DIRECTIVE TO THE ORGANISATION THAT MAINTAINS YOUR AIRCRAFT.

W R TROWELL
Aircraft Maintenance Approvals

Luftfahrt-Bundesamt
-AD-Department-

Airworthiness Directive

In case of any difficulty, reference should be made to the German original issue

96-300 Stemme

Effective Date: October 24, 1996

Affected powered sailplanes:
German Type Certificate No.: 846

Stemme
Stemme S10 and S10-V
- S/No's. model S10 : 10-03 up to and including 10-63
  S/No's. model S10-V : 14-002 up to and including 14-026 and transformed A/C 14-012M up to and including 14-063M

Subject:
Cracks in rear Horizontal Stabilizer Fitting.

Reason:
Cracks were detected in some S/No.'s of the Type in the rear fitting of the horizontal stabilizer (HS). It is believed that they were caused by internal residual stress after welding, superimposed by operational loads. Cracks developed after long periods of operation compounded by non-optimal component design.

Action:
Inspection for cracks and if necessary exchange of parts.

Compliance:
Inspection must be done before the next flight.
Parts substitution: immediately, if finding positive - ferry flight to the next approved service station permissible, if cracks length below 7 mm.

Technical publication of the manufacturer:
Stemme Service Bulletin No. A31-10-022, dated August 16, 1996 becomes herewith part of this AD and may be obtained from Messrs.

Stemme GmbH & Co. KG
Am Flugplatz

D-15344 Straubing
Federal Republic of Germany

Accomplishment and log book entry:
Action to be accomplished by an approved service station and to be checked and entered in the log by a licensed inspector.

* * *

TNS. 11/12/96

Luftfahrt-Bundesamt
-AD-Department-

Airworthiness Directive

In case of any difficulty, reference should be made to the German original issue

75-051/4 Schempp-Hirth

Effective Date: August 29, 1996

Affected sail- and powerd sailplanes:

German Type Certificate No.: 278
Standard Cirrus
Standard Cirrus B
Standard Cirrus CS 11-75L
Standard Cirrus G
- S/No's.: all (* also S/No.'s having at their end the suffix "G", which is marked, when the sailplane was manufactured by Grob)

German Type Certificate No.: 865
Standard Cirrus TOP
Standard Cirrus B TOP
- S/No's.: all (* also S/No.'s having at their end the suffix "G", which is marked, when the sailplane was manufactured by Grob)

Subject:
Ball joints on airbrake actuating lever inside the fuselage
- possibility of fatigue fractures
- Modification of the lever facing flank

Reason:
On several sail- and powered sailplanes with a greart number of flxing hours a fatigue fracture of a ball joint on the air brake drive lever in the fuselage occured.
The thread on ball joints from current production (by Messrs. L'Hotellier) is slightly shorter and starts only 2.5 mm (0.10 in.) below the collar. Connecting the swivel joints is no longer possible unless a minor alternation of the airbrake actuating lever is carried out.

Actions:
1) Exchange of ball joints
2) Adding some pages into the AFM
3) Modification of airbrake actuating lever into the fuselage

Compliance:
Action 1 & 2:
- at latest when reaching 500 hours time in service, if not already has been performed
- repeat this exchange after every 500 hours time in service
- Sailplanes and powered Sailplanes with more than 500 hours time in service during the next annual inspection, but not later than August 31, 1996.

Action 3:
On the next periodical exchange of the ball joints.

Technical publication of the manufacturer:
Schempp-Hirth Technical Note No. 278-23 dated January 1979 and it's supplentary issue dated March 26, 1993 which becomes herewith part of this AD and may be obtained from Messrs.

Schempp-Hirth Flugzeugbau GmbH
P.O. Box 14 43
D-73222 Kirchheim unter Teck
Federal Republic of Germany

Accomplishment and log book entry:
Action to be accomplished by an approved service station or the holder of the aircraft and to be checked and entered in the log by a licensed inspector.

Note:
This AD supersedes the LTA-Nr. 79-051/3, dated July 04, 1996.

* * *

AIRWORTHINESS NOTICE No. 12
APPENDIX No. 53

Issue 2

30 September 1996

PLANNING AND RECORDING OF NON-SCHEDULED MAINTENANCE TASKS

1 As a result of an enquiry into a serious incident where incorrect and incomplete documentation was cited as a contributory factor, the CAA wishes to remind all Operators, Certifying Engineers and JAR-145 Approved Maintenance Organisations of the need to prepare complete documentation prior to the work being accomplished which clearly and accurately defines the non-scheduled maintenance task(s) to be undertaken.

2 Non-scheduled maintenance tasks can arise from scheduled maintenance inspections or from defects recorded on operational aircraft. Non-scheduled maintenance tasks require a certificate of release to service be issued when all maintenance relating to the task(s) has been completed.

3 JAR 145.50(b), Certification of maintenance, specifies 'A certificate of release to service must contain basic details of the maintenance carried out.....' It therefore follows that the documents recording a non-scheduled maintenance task must contain sufficient detail to enable the Certifying Engineer to determine that it has been carried out to the standard which will enable him to issue a certificate of release to service.

4 Maintenance tasks on aircraft vary in complexity and task cards raised for scheduled maintenance reflect the level of complexity of the specific task. Control of these complex tasks by maintenance personnel at shop floor level is normally simplified by breaking each task down into a number of discrete steps with the provision for appropriately authorised staff to sign/stamp when each step is completed. It is equally important that non-scheduled maintenance tasks are similarly broken down into steps to provide a detailed record of maintenance which is to be carried out and certified on completion of each step or group of steps as they occur. Engineers are reminded of the need for a full and comprehensive hand-over of work outstanding at shift changes.

which the JAR maintenance organisation intends to work. The aircraft/ aircraft component design organisation standards and aircraft operator standards must be taken into account.'

4 The CAA consider that:

(a) the responsibilities defined in both CAA Airworthiness Notice No 3 and JAR-145 are fundamentally equivalent and require work to be carried out to specified maintenance instructions using recommended tooling and, when working in approved maintenance organisations, in accordance with established procedures.

(b) it is important to adhere to publications which provide instructions for continued airworthiness together with company procedures which lay down the standards for work carried out by Licensed Aircraft Maintenance Engineers, Authorised Certifying Staff and Approved Maintenance Organisations. The privileges of Licensed Aircraft Maintenance Engineers and Authorised Certifying Staff do not include authority to deviate from such instructions or procedures.

BGA Rectification Worksheet
and Certificate of Compliance

Tug Registration: ____________
Page No: ____________
Form BGA/T/1

I hereby certify that the Inspection/overhaul/repair/replacement/modification specified below, has been carried out in accordance with the requirements of BCAR Chapter A4-3.

NTRY NO	DATE	WORK REQUIRED	WORK COMPLETED	INSPECTOR	DATE

NOTE: SIGNIFICANT ENTRIES TO BE ENTERED IN LOG BOOKS
This document to be retained in accordance with ANO Article 55.

BGA Rectification Worksheet
and Certificate of Compliance

Tug Registration: ____________
Page No: ____________
Form BGA/T/1

I hereby certify that the Inspection/overhaul/repair/replacement/ modification specified below, has been carried out in accordance with the requirements of BCAR Chapter A4-3.

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This document to be retained in accordance with ANO Article 55.

(LIABILITY) THE LAW AND MAINTENANCE

When Laurie Edwards first asked me to speak at this conference, I accepted because I thought I was going to have an afternoon out in Zurich. When he told me the subject upon which I was to speak was to be 'The Law and Maintenance', I thought he was offering me a chair at Zurich University, because you will readily appreciate that the subject is a vast one.

Airplanes themselves seem to start up, take off, fly and land in much the same sort of way whether the people around are speaking English, American (— a totally different language —), French, German, Dutch, or what have you. But the Law in each of those countries and many others around the world can take a peculiarly different view of the same set of circumstances. If the maintenance is OK, and the thing goes up and comes down, the Law is unlikely to be too troubled by how it did it. The probability is that if maintenance done in one country causes an accident or contributes to an accident in another country, someone is going to have to put a thinking-cap on and start looking into the whys and wherefores. For example, if you order your transportation in Spain and call for 'burro', you will get a donkey. Whereas if you order your transportation in Italy and call for 'burro', you will get butter — perhaps they will expect you to slide on it.

It is clearly impossible in the mercifully short space of time allotted to me this afternoon to cover either the Law or Maintenance and even less possible to cover the subject 'The Law and Maintenance'. So — where to begin? Clearly, we are not concerned other than peripherally with maintenance that does not give rise to a problem. What we *are* concerned with is Maintenance of one of two kinds that *does* give rise to a problem. The two kinds referred to are misfeasance and nonfeasance. That is to say, doing the job improperly or not doing it at all. These can both be classed under the heading of the word we all know and, I hope, respect — and that is 'Negligence'.

Well, it would be clearly inappropriate for me to attempt to cover the peculiarities of a hundred different legal systems, so I am going to talk briefly about what the word 'Negligence' means in the common English sense. Basically, to maintain an action for negligence, the Plaintiff has to prove three essential ingredients. One, he has to prove that the Defendant (that is to say, the maintenance shop, in the context in which we speak) owed him a duty of care.

Secondly, he has to prove that that duty was broken, and thirdly, he has to prove that damage resulted from the breach. These three ingredients are necessary whether the incident or accident we are dealing with is a minor traffic accident on the roads or a major aviation accident caused by faulty maintenance.

Let us have a look first at the duty of care. Clearly, if you are charged with the task of maintaining an airplane, then it follows that you accept or undertake to discharge a specific duty to do the job properly. But what we said earlier was that the duty has to be owed by the Defendant to the Plaintiff. So, how does one identify those persons to whom the duty is owed? Is the duty owed to the world at large; is it owed to the Captain only; is it owed to all the passengers; is it owed to all the people underneath an overflying aircraft, — in fact, the question is, how close do you have to *be* to the situation to say, "That maintenance outfit owed me a duty of care"? — Well, in the case of aircraft maintenance, of course, the number of people to whom the duty is owed is clearly a very wide one for reasons which we shall examine a little later on. But let me give you an example, albeit in a different field, as to where the Court found that a duty was *not* owed although a person had undoubtedly suffered as a result of the failure of someone else to take care.

There was a case many years ago where a prospective investor in a particular company obtained a copy of that company's accounts and was so delighted with the figures and prospects which those accounts disclosed that he purchased shares in the company. It turned out that the figures were wrong and that in the ordinary sense of the word, the accountants who had prepared them did not really exercise sufficient care when doing so, had not made all the necessary checks. The accounts were faulty and our friend lost all his money. So he sued the firm of accountants who had prepared the accounts. The Court said, in agreeing that he had indeed been the victim of a most unfortunate set of circumstances caused by the negligence of the accountants, that he was unable to claim because the accounts were not prepared for him. They were prepared for the company and indeed, for the existing share-holders. They were *not* meant to be a prospectus to the world at large, inviting them to subscribe to shares in the company. In essence, said the Court, these accountants did not owe *you*, the Plaintiff, a duty of care, and therefore your action fails.

Now, let us look at another case which is perhaps the basis upon which today one can start to decide whether a particular person is owed a duty or not. The case was an interesting one, if only by reason of its pure simplicity. It was a road traffic accident involving a bus and a car. Several people were injured. It is quite clear that those people had a right to damages because they were actually involved in the accident. But what about the pregnant woman who was walking along some fifty yards away, and as a result of the shock she received upon seeing the accident, had a miscarriage. She sued the bus company and the driver of the other car, saying "I do not really mind whose fault the accident was, but clearly one of you has been negligent. I have suffered as a result of it, therefore you owe me damages." The Defendants all said she was too remotely placed to be able to claim damages. She was, they said, not reasonably to have been foreseen. Basically, what happened was that the matter went to Appeal, and the very question that we are now considering, about to whom a duty of care is owed, was raised. It was explained to me in the following way. You draw a picture of the accident and all the people who are affected by it. You end up with a diagram showing the accident in the centre of the picture, and the various people in their relative positions around. And then all you have to do is to draw a circle around the accident. Anybody who comes within the circle has the right to damages. Anybody who comes outside the circle does not have the right to damages. What in fact the Court of Appeal said is, the whole question that has to be decided is very simple:

How large a circle do you draw? — And that is basically the question which we have to answer — How remote does the damage have to be before Plaintiff is excluded. Well, I'm sorry to tell you that it is my view that in the case of an airplane accident or incident caused by faulty maintenance, an awful lot of people would find themselves inside the circle.

The duty of care is, clearly, in the case of airplanes and their maintenance, according to most legal systems, a very strict one. And assuming that a Plaintiff can show that he was within the magic circle, his next job is to prove that the duty of care was in fact breached. And this is where we are going to digress slightly from the theory and deal with a practical aspect of the Law and Maintenance.

It is always a little unpalatable at these aviation conferences to talk about accidents, crashes, loss of limbs and life; but in a subject like this, one has to assume the worst — that somebody has fouled up on the maintenance and it has caused an accident. The first lesson is, of course, to get the maintenance right in the first place, and it is not my position to stand here and lecture you Gentlemen on *that*. Let us assume that the plane *has* gone down, and now the inquiry team is blaming it on faulty maintenance. Let us assume they have a crack at the pilot, who was killed, and for some reason or another they have been unable to pin the accident on him. And we all know what they say about that anyway — if the accident does not kill the pilot, the inquiry will.

Now they are looking for another scapegoat, — well, it *had* to be faulty maintenance, did it not. Something has been found in the wreckage, twisted, burned, maybe melted, which did not like the look of an investigator or vice versa; and basically, what the report said is, that if you had done it a different way, or had not done it at all, the accident would never have happened because this led to that, that led to something else which caused the airplane to fall out of the sky. You now have got a string of lawyers and plaintiffs around your neck, and what you are meant to do is to tell your lawyer that it was not really like that at all.

How do you go about it? — Well, I think I can tell you in confidence, at this time of the afternoon, that it is really terribly simple. The answer is *records*. Let me tell you, my friends, that without clear, concise, accurate, dated and signed records, you are in the proverbial out-house. We all remember Joe, or Bert, or Tom or Dick or Harry who did the job because he was told to do it, but he is no longer around. It may have been six months ago. Joe might be dead. We all remember that a supervisor looked at it after Joe had done it, because that is the way we always do things. But we do not remember which supervisor it was, because all our chaps are highly qualified anyway, and in any case we always deal with that bit of maintenance in the same way. We are very experienced and we never get it wrong.

And now we are stuck because the wretched prosecuting attorney is making life difficult. He wants to see the records. He wants to see where it was noted in the maintenance log. He is an absolute pain: he is asking all sorts of stupid little embarassing questions, like — "Where is the supervisor's signature? Where did the inspector sign it off?" — But, you say, we have work to do. We have no time to go around doing all this writing, we are busy with screw drivers and welding machines and riveting machines and all sorts of mechanical gadgets, and we have no time for that sort of nonsense. *You*, my friend, are a dream come true.

"Doubt that the stars have fire and that the sun doth move", as Prince Hamlet said to Ophelia, but do not doubt that without proper records, itemized, dated and signed, you are in trouble. You are about to go down in the history books. You will go down among such names as the Emperor Ferdinand, who said after the first performance of the 'Marriage of Figaro', — "Far too noisy, my dear Mozart, far too many notes". — You will go down with the Decca Recording Company who said, when turning down the Beatles in 1962, "We don't like their sound. Groups of guitars are on the way out." — You will go down with Dionysys Lardner, Professor of Natural Philosophy and Astronomy at London University, who stated, "Rail travel at high speed is not possible because passengers, unable to breathe, would die of asphixia." — And perhaps you would even go down in history alongside Simon Newcombe, who stated, eighteen months before the first flight of the Wright Brothers, "Flight by machines heavier than air is unpractical and insignificant, if not utterly impossible." — Whether you actually make it alongside them is unimportant. What is significant is that go down, you will.

This is not the forum for crying over spilt [illegible] or cataloguing unmercifully famous failures of the past. But almost more than in any other field, it is true in aviation that we learn from the mistakes of others. Let me tell you that one of the most drawn-out and expensive pieces of litigation in recent aviation history finally boiled down to the record books, I refer to the tragic loss of the DC-10 in Paris some years ago, when a modification had been ordered to the rear baggage door locking mechanism. The outcome of that case finally turned on the records — what work had been done, who had done it, who had supervised it, when it was done, etc. etc. Another DC-10 loss in Chicago, which I do not have to detail for you, also turned on the maintenance records — who had done what, how, where and why.

Basically, the duty of a maintenance shop is to do it by the book, and then to book it. If you do that, you cannot be held accountable. Yours is not to reason why, the F.A.A., the manufacturer and the operator are meant to have worked that out long before it gets to you. Do not be frightened to say that a plane must not fly. If you are asked to change the ti[illegible] and in doing so you find that the brakes are all shot to piece[illegible], it is clearly your obligation to notify the operator. If the operator says, don't do the brakes this time, we shall be back in a week, — document it. If necessary, hand him a letter with the plane stating what has happened, i.e.: 'Dear Sir, we have notified you that we cannot recommend operation of this aircraft with the brakes in their current state. You have notified us that you do not wish them to be fixed until next week. We must therefore point out that the operation of this aircraft in this state is your entire responsibility.' — I am assuming that there is no physical way that you can detain the plane or refuse to allow it to fly. That is not your job. Of course, I am dealing with a somewhat extreme example, because most operators will take the word of the maintenance man. But of course, there *are* cases where perhaps an expensive piece of equipment is shortly due for replacement. It is your view that it ought to be replaced sooner rather than later, but since it may, by the book, have a few more hours

left, the operator will choose to delay replacement, particularly in cases where the piece of equipment is duplicated anyway. But as you all know from experience, when one bit goes wrong, that is usually a signal for the other bit to go wrong at the same time. That is the way it always happens. I trust I have made the point.

What we are trying to do is to save *your* skins. I am assuming that your maintenance will be of a sufficiently high standard to save other people's skins. Records, documents, dates, details and signatures have proved to be your lifeblood. Don't neglect them, and *do it now*, not tomorrow or the next day; or next week when Joe gets back. If the job is done now, it cannot take that much longer to document it.

I am not going to dwell on the third item that I mentioned early on, that is the question of damage resulting from a breach, other than to say (in relation to what I have just said) that Courts today are consistently being called upon to apportion blame for an accident. Judges are very often without engineering skills or experience; and the nut or bolt that you left undone may be asked at a later date to bear a disproportionate contribution to the accident, when measured against the other factors. That is why I come back again to the question of records. If you tighten the bolt, say so. If you adjust something, say so. Pretend, as we lawyers do that you are going to be paid for everything you have done. It is the only pretence that keeps us in business. So, — itemize everything, get the job done, get it inspected, and then get it documented. After all, it was only a bolt, albeit a locking bolt,that brought down the DC-10 in Paris.

The other question which I would like to touch on is, how great a duty of care do you have to exercise? — What the Law says about this is that it has got to be reasonable. Is it not lovely how the answers are always so simple. That is all you have got to remember — you have to be reasonably careful. Well, what does 'reasonable' mean? — In English Law, clearly what is reasonable for one person is not reasonable for another. So, whose test of what is reasonable do we apply? — Well, we always say that it is the man travelling on top of an omnibus — the ordinary man in the street. Applied to this case, we are not expecting every engineer to be a great theorist or a University Professor. Clearly, he does have to have the skills to do the job. Let us go back to this question of brakes. Let us assume that in your considered opinion, the brakes are good enough for the plane to taxi out and to get to wherever it is going. But obviously, that is not good enough unless he happens to be going to a major maintenance centre where he is going to have his brakes fixed. Because the likelihood is that he is going to come back or he is going somewhere else before he comes back. So, what is reasonable? — You have to think ahead and notify him — that is, the operator — of what your considered views are. So if you do a tire change, and you reckon that the brakes are only going to be good for another ten landings, it is not a bad thing to advise the operator at the time. And again, it is something that ought to be documented. If a chap comes in for a tire change — (I am sorry to harp on this particular question of a tire change, but I want to keep it simple, not really for your sake, but for my sake) — if a chap comes for a tire change, it does not mean that you have to do a hundred-hour inspection on his engines or a three-thousand-landing inspection on his undercarriage. But it does mean that if something relevant comes to your attention, during the time you are changing the tires, such as seeing the brakes, then it is reasonable to expect that a reasonable engineer exercising reasonable judgement would notify the operator of the situation.And, bluntly put, if you do not, then somebody is going to point a finger at you later. Document it.

Quite apart from anything else, properly kept records give an air of efficiency. They show that the maintenance shop manager cares. They show that the operation is properly conducted. It is a blank wall for a prosecuting attorney when he asks for records and they are produced pronto, because it is very difficult to argue with a statement made by a skilled engineer, the inspector and the supervisor who made a note on the day they did something as to what they did and what they saw and what they said. If the paper-work in the shop as a whole is a mess, if the sheet for that day on that airplane is the only sheet in the shop, it is going to raise suspicions as to when it was made up. But if the paper-work overall is properly kept and documented, it raises right away the probability that the maintenance shop cares. That takes the rug out from under those people accusing you.

Ladies and Gentlemen, thank you for your attention.

TUBS & SLMG's

	Item	Detail*	50	150	Annual
Structures	1	Inspect – external covering of fuselage, tail booms, mainplanes, nacelles, empennage, control surfaces, flaps and other high lift devices. Inspect – normal and emergency windows and doors, door hinges and door hinge attachment points. Check – satisfactory operation of latching and locking. Check – protective treatments; drain holes free from obstruction; access panels secure.	X	X	X
	2	Remove sufficient detachable panels, covers and/or fabric **(See Note page 3/5 paragraph 3)** to inspect – internal structure of fuselage, floors, bulkheads, tail booms, mainplanes, nacelles, empennage, control surfaces, flaps and other high lift devices, structural attachment joint assemblies; struts, bracing wires and their attachments; internal protective treatments; surface de-icer systems. Check – condition of static discharge wicks.		X	X
	3	Check – function of emergency exits by internal and external release methods. Inspect – condition of lightning strike bonding.			X
Landing Gear	4	Inspect – landing gear assemblies; shock-absorber struts or units for leaks and correct extension; brake system – brake linings, drums/discs; wheels and tyres. Check – tyre pressures; hydraulic brake system fluid level(s).	X	X	X
	5	Prior to raising aircraft carry out Item 4. With aircraft supported and weight off the wheels, Inspect – structural members and attachment fittings, including pivot points; shock absorbing devices; bungee rubbers; torque links; main, nose/tail wheels, including bearings, skids.		X	X

** Inspection required shown X*

	Item	Detail*	50	150	Annual
Landing Gear	5	Anti-skid devices, hoses and lines; hydraulic and electric actuators and jacks. Check – main and parking brake systems for correct operation. Carry out normal and emergency retraction and extension checks, including operation of locking devices, doors and operating linkage, indicators and warning devices. Check – hydraulic/pneumatic operating pressures.		X	X
Flying Controls	6	Check – flying controls for full and free movement in the correct sense; position indicators agree with surface movement.	X	X	X
	7	Inspect – hinges; brackets; push-pull rods; bellcranks; control horns; balance weights; cables; pulleys; chains; tubes; guides and fairleads; rollers; tracks and rails; screw jacks/rams, including auxiliary gearboxes or other power-operated systems. Check – turnbuckles/locking devices in safety. Inspect – flap asymmetric protection mechanisms.		X	X
	8	Check – all control cables for correct tension; control neutrals and travels. Record results.			X
Liquid, Air, Gas Systems	9	Inspect – hydraulic, pneumatic, vacuum and other fluid systems, as visible, for leaks and damage. Check – fluid levels in reservoirs; accumulator pressures; pitot/static vents clear; drains free from obstruction and pitot head correctly aligned.	X	X	X
	10	Check – tanks; powerpacks; valves; pipelines; hoses; actuators; filters; venturis. Check – systems for leaks with system pressures during engine ground run.		X	X
	11	Check – pitot/static systems for leaks. Continued on page 7/6			X

* Inspection required shown X

	Item	Detail*	50	150	Annual
Equipment and Environmental	12	Check – correct stowage of equipment, and validity of date on emergency equipment; seats, belts/harnesses for satisfactory condition, locking and release; fire extinguishers for leakage or discharge.	X	X	X
	13	(a) Check – cabin air system for correct operation. Inspect – heater for signs of overheating or contamination. Check – air conditioner for leaks and correct oil level. Inspect – ventilator blower; outflow valves; pressurization controller; bleed system; shut-off valves.		X	X
		(b) Carry out ground function pressurization check.			X
	14	Check – fire extinguisher(s) contents by pressure/weight.			X
Instrument Systems	15	Inspect – instruments for damage, and for legibility of markings and associated placards. Check – readings are consistent with ambient conditions; operation, as far as possible, on engine ground run; stall warning device operation.	X	X	X
	16	Inspect – instruments; panels; mounts; pipes; hoses; electrical wiring; gyro filters; flux detectors; instrument transmitters.		X	X
	17	Ensure – last compass swing will remain valid until next check (see Section 3, para 2.2(d)); instrument calibration periods will remain valid until next check (see Section 3, para 2.2(c)).	X	X	X
	18	Inspect – displays; instruments; controllers. Check – operation, as far as possible, on engine ground run, and perform manual override and disengagement checks.	X	X	X
Auto-pilot & Flight Director	19	Inspect – computers; amplifiers; power supplies; servo motors; connections to flying control systems; automatic trim systems; yaw dampers; manometric systems inter-connections.		X	X

* Inspection required shown X

	Item	*Detail**	*50*	*150*	*Annual*
Electrical Systems	20	Maintain battery. Inspect - battery stowage/compartment and vents/drains. Check - operation of all electrical circuits.	X	X	X
	21	Inspect - components; wiring; terminals; connectors. Check - correct type and rating of fuses and circuit breakers; correct spare fuses carried; flap asymmetric protection and all travel limit microswitches; lamps and lighting; fire circuits; brushes in starters and generators; drive belt tension and condition. Ensure voltage regulator load sharing is correct.		X	X
Radio	22	Inspect - aerials; insulators; controllers; instruments and displays; microphones and headsets. Check – placards and markings legible. Carry out VHF ground function test.	X	X	X
	23(a)	HF Communication – Test the function of the system.			X
	23(b)	ADF - Carry out ground function test using station(s) of known bearing to establish bearing accuracy. Check - audio on all bands.			X
	23(c)	ILS Localiser and Glide Slope - Carry out a check with a Field Test Set, including flag warnings of single tone failure. Check - centre-line accuracies, sense and course widths. Check - audio.			X
	23(d)	VOR - Carry out a check with a Field Test Set, including flag warnings, omni-radial resolving and radio-magnetic indicators accuracy at 90° intervals. Check - sense and course width. *Continued on page 7/8*			X

**Inspection Required shown X*

	Item	Detail*	50	150	Annual
Ignition	36	Inspect – magnetos; harnesses; spark plugs; switches; starting vibrators; contact breakers. Check – magneto internal timing and timing to engine. Assess condition of plug leads and HT harnesses. Check – magneto cam lubrication and ventilators; turbine ignitors and ignition units.		X	X
Exhaust	37	Inspect – exhaust manifolds and mufflers for leaks, damage and security.	X	X	X
	38	Remove cabin heat exchanger shrouds and inspect for signs of exhaust gas leakage. Inspect – turbo-charger (especially for cracks in turbine housing, compressor damage and freedom of rotation). Check – wastegate for correct operation. Inspect – turbo-charger control system, pipelines and hoses.		X	X
	39	Carry out pressure test of cabin heat exchanger.			X
Lubrication	40	Inspect and Check – filters; screens; magnetic plugs. Change oil (but see Section 3, para 2.2).	X	X	X
	41	Inspect – tanks; sumps; coolers; hoses; pipelines; vents. Lubricate engine and controls as required by manufacturer.		X	X

Inspection required shown X

	Item	Detail*	50	150	Annual
General	42	Ensure that:- (a) All tools, rags or other loose articles are removed from the aircraft. (b) All mandatory requirements (modifications, inspections and other directives) have been complied with. (c) All manufacturer's recommendations have been evaluated in accordance with Section 3 para 2 and any applicable requirements identified detailed in Sections 10 and 11 including the deletion of redundant requirements. (d) All applicable requirements entered in Sections 10 and 11 have been complied with. (e) All mandatory placards are legible, correctly positioned and worded. (f) The log books have been correctly filled in and are up to date.	X	X	X
	43	Carry out engine ground run and check, as far as possible, all systems and services for correct operation. Check – power-plant installation for leaks following run. Ensure all cowlings, access panels and doors are secure.	X	X	X
	44	Carry out Items 10 and 11 of the Check A when applicable to the type of aeroplane.	X	X	X

Inspection Required shown X

	Item	Detail*	50	150	Annual
Radio	23(e)	Marker - Carry out a check with a Field Test Set, including 3-tone operational check. Check - High/Low sensitivity.			X
	23(f)	DME - Carry out a check with a Field Test Set, including range accuracy.			X
	23(g)	ATC Transponder - Carry out a check with a Field Test Set. Check - frequency tolerance and side-lobe suppression. Check - Mode 'C'.			X
	23(h)	Airborne Search/Weather Radar - Test the function of all modes.			X
	23(i)	Area Navigation - Establish accuracy of waypoint distance and bearing.			X
	23(j)	Audio - Check 'Emergency' operation.			X
	24	Verify by reference to Section 8 that all required maintenance activities have been complied with (see also Section 3, para 2.2(f)).	X	X	X
	25	Inspect - cables and terminals; cooling systems; moisture trap areas.		X	X
Lub	26	Lubricate aircraft in accordance with manufacturer's recommendations.	X	X	X
Propeller	27	Inspect - blades for damage. Check - accumulator/dome pressure.	X	X	X
	28	Inspect - spinner; backplate; constant speed unit (governor); accumulators; de-icing boots; slip rings/brushes; fluid systems; control systems. Check - pitch change mechanism for backlash; propeller hub for condition. Lubricate and check for oil leaks.		X	X

**Inspection Required shown X*

	Item	Detail*	50	150	Annual
Engine Installation	29	Engine controls – Check for full and free movement of throttle, mixture and propeller controls over correct range.	X	X	X
	30	Check for evidence of leaks, overheating or other unsatisfactory operation.	X	X	X
	31	Inspect – crankcase; accessory housings; cylinder assemblies; valve operating mechanism; accessory drive belts; accessories; engine shock mounts; mount frames; bulkheads, firewalls and sealing; cooling baffles; cowlings; items in engine bay for mutual interference; compressor, turbine and gear housings; breathers and vents. Carry out compression check and record results and methods used.		X	X
Air Induction	32	Inspect – air filter/intake for condition and cleanliness; induction system and first stage compressor impeller for damage.	X	X	X
	33	Check – security of induction system components; correct operation of carburettor heat; alternative air bypass doors; flame traps; control systems; drains.		X	X
Fuel	34	Inspect – filters for cleanliness. Drain samples from all drain points and check for water, foreign matter and correct colour. Check – tank vents unobstructed.	X	X	X
	35	Inspect – tanks; selector valves; pumps; pipelines; hoses; carburettors; injector systems; throttle, mixture and fuel selector controls; turbine fuel control units; nozzles. *Continued on page 7/10*		X	X

**Inspection required shown X*

ADVICE FOR INSPECTORS - Accident Investigation

Whilst the likelihood of your becoming involved in the inspection of the wreckage after a crash is minimal you should, nevertheless, be prepared for such an eventuality.

Your most likely role is to establish that, where possible, that there was nothing wrong with the rigging or control connections of the glider prior to impact. Putting this another way, the aim is to be sure that all the damage is consistent with the impact.

Nothing should be taken for granted and the approach should be systematic. Check all the rigging pins for correct location and locking as appropriate. Check through the main flying controls, elevator, ailerons and rudder, with particular attention paid to connections and locking. Disruption of the cockpit area may make the task difficult but, generally, not impossible.

Ancillary controls, particularly airbrakes and trim, may be equally important. Asymmetric airbrake and the failure of the trimmer, especially of the sprung-loaded type, can be contributory, even casual to an accident.

Throughout the inspection it is advisable to make careful notes of what you have checked and all observations along the way. It is quite easy , in the stressful situation of a fatal accident to overlook something, so a check list is essential. (See below).

The circumstances in which you may find yourself called upon to carry out such an inspection is when the accident investigator, either from the AAIB or BGA, cannot get to the scene for some time and there is pressure from the police to move the wreckage, for example if a road or public right of way is obstructed.

An important consideration is if you yourself carried out the last CofA inspection. If this is the case then it is in your best interest not to do the inspection of the wreckage after the crash yourself, for obvious reasons.

Note

BGA Inspectors may wish to use the Glider Inspection Report (FORM 267) as a guide on which to record your findings.

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British Gliding Association

12th November 1996

OLY 460 SERIES SPAR CORROSION PROBLEM

This note is to appraise owners of OLY 460 series gliders of action currently being taken by the BGA Technical Committee to resolve the recent grounding of the type by the CAA, this being the organisation which originally approved the type and will be responsible for lifting the grounding notice.

The Technical Committee has tasked a sub-committee to discuss and agree with the CAA a course of action to inspect, repair and reinstate affected gliders to flying condition where appropriate, in the light of a detailed review of the technical type records currently being undertaken.

As a first step, the extent of corrosion existing among ONLY 460 variants must be determined in accordance with a detailed inspection procedure which will be issued shortly. By way of the intrusive nature of the inspection process required, repair centres/senior inspectors to be used will be identified by the Chief Technical Officer, at convenient locations around the country. Observations are to be returned to him within a period not exceeding 2 months from the issue of the inspection directive.

(NB: It is emphasised that if you open the structure yourself by removing the plywood from upper and lower spar surfaces, that you do not touch or remove any signs of corrosion from the spar booms themselves. The first assessment of the condition is important and any interference may require an even more invasive investigation to be necessary).

Following a review of both the inspection data and the structural design records, repair schemes will be discussed and hopefully agreed with the CAA which take into account the existence or otherwise of spar corrosion, the age of the type and any strengthening options which are considered viable and appropriate.

The Technical Committee would like to point out that this unfortunate episode has well illustrated the importance of ensuring that gliders are properly stored in appropriate dry trailer conditions, with correct attention paid to the maintenance of protective treatments particularly where dissimilar materials are used in critical structural locations.

Mike Woollard
BGA Technical Committee Chairman

	Technische Mitteilung 653 - 66 **770 - 19** **819 - 3** *(Service- Bulletin 653 - 66, 770 -19, 819 - 3)*	**SF 25, SF 28, SF 36** **Blatt: 1** *Page 1* **von 2** *of 2*

Gegenstand: Zugelassene Kraftstoffsorten für Triebwerke L 1700, L 2000, der Firma LIMBACH Flugmotorenbau GmbH&CO.KG.

(Subject: — *Certificated sorts of fuel for engines L1700, L2000, of LIMBACH Flugmotorenbau GmbH&Co.KG)*

Betroffen: Motorsegler der Firma SCHEIBE Flugzeugbau mit Triebwerken der Firma LIMBACH Flugmotorenbau:
SF 25 alle Baureihen, alle Werknummern,Gerätekennblatt 653
SF 28 alle Baureihen, alle Werknummern, Gerätekennblatt 770
SF 36 A alle Werknummern, Gerätekennblatt 819

(Affected: — *Motorglider from SCHEIBE Flugzeugbau GmbH with engines of LIMBACH Flugmotorenbau:*
SF 25,all versions, all serialnumbers, German-Type-Certification Data-Sheet 653
SF 28,all versions, all serialnumbers, German-Type-Certification Data-Sheet 770
SF 36 A, all serialnumbers, German-Type-Certification Data-Sheet 819)

Dringlichkeit: **Keine**
(Urgency: None.)

Vorgang: Ab Herbst 1996 steht für den Betrieb mit Motorseglern kein verbleiter Superkraftstoff wie bisher mehr zur Verfügung.

(Reason: — From autumn 1996 there is no leaded fuel available to operate motorgliders.)

Maßnahmen: Nach Durchführung der in den
TM 653 - 28 (neueste Ausgabe) der Fa. SCHEIBE FlugzeugbauGmbH

und
TM 53 in Verbindung mit **TM 42,TM44** und **TM 50 (jeweils neuste Ausgabe)**
der Firma LIMBACH Flugmotorenbau GmbH&Co.KG
festgelegten Maßnahmen ist die Verwendung von

BLEIFREIEN KRAFTSTOFFEN mit einer **MINDESTOKTANZAHL** von **ROZ 96**
ZULÄSSIG.
In den zum Motorsegler gehörenden gültigen und aktuellen Flug- und Betriebshandbüchern sind außer AVGAS 100LL alle anderen Kraftstoffsorten zu streichen. Anstelle der gestrichenen Kraftstoffsorten ist der handschriftliche Eintrag

KRAFTSTOFFE mit einer **MINDESTOKTANZAHL** von **ROZ 96**
vorzunehmen. Das Kraftstoffsorten- und Mengenschild am Kraftstoffeinfüllstutzen ist entsprech zu ändern oder neu vom Zellenhersteller zu beziehen.

(Actions: — After carrying- through of the actions out of
TM 653 - 28 (latest revision) from SCHEIBE Flugzeugbau GmbH

and
TM 53 in union with TM 42, TM 44 and TM 50 (each in the last revision)
from LIMBACH Flugmotorenbau GmbH&Co.KG

— *the operation of the above motorgliders is CERTIFICATED WITH*

— *UNLEADED FUEL with a MINIMUM OCTANE-RATING of ROZ 96.*
All entrys beside AVGAS 100 LL for the useable fuel are to delete in the flight- and operation-manuals of the motorgliders. Instead of the deleted fuelsorts a handmade entry is to do in the fl and operation-manuals as follows.
FUEL with a MINIMUM OCTANE-RATING of ROZ 96
The placard at the fuelfillercap is to modify like the above text or to renew.)

Deutscher Text
Anerkannt durch
Luftfahrt-Bundesa

07. Nov. 19

Hinweise und Anmerkungen: Die oben beschriebenen Maßnahmen können vom Halter durchgeführt werden. Der ordnungsgemäße Nachtrag im Flug- und Betriebshandbuch ist bei der nächsten Jahresnachprüfung vom Prüfer Kl. 3 im Bordbuch (Betriebsaufzeichnungen) zu bescheinigen.

(Remarks: The above actions are to be carried out by the owner of the motorglider. At next annual- inspection the licensed inspector has to do a log- book entry.)

SCHEIBE FLUGZEUGBAU GMBH

Musterprüfleitstelle

Dachau, den 18.10.1996

(Haferkorn)

Deutscher Text
Anerkannt durch
Luftfahrt-Bundesamt 07. Nov. 1996

i.A. Jung

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