BRITISH GLIDING ASSOCIATION

TECHNICAL COMMITTEE

TECHNICAL NEWSHEET 1/2/89

PART 1 AIRWORTHINESS "AGGRO"

Happy New Year and herewith the 1989 BLUE PAGES, a "Compendium of Airworthiness Directives, Mandatory Modifications and Special Inspections" TO WHICH REFERENCE MUST BE MADE BEFORE SIGNING Item 53 of BGA Form 267 "General Purpose Glider Airworthiness Report". A new Page 22 gives airworthiness and modification advice.

1.1 KA7 Aileron Drive Pin, on the aileron, normally welded to the level, has been found to be fractured, and no longer secured. (Reported by Newark & Notts GC).

1.2 Grob G.103 Twin Astir Serial No's 3000 - 3291 and 3501 - 3729. T/Note TM 315-38 (extract herewith) requires inspection for fouling between aileron and airbrake controls in the centre section.

1.3 T.69D Vega Underside of tailplane, skin de-bonded. Sketch herewith is self explanatory

1.4 DG 300 - Undercarriage Powering Malfunction. "Key ring" type attachment of single bungee jammed between the tyre and the bulkhead. Modified to two bungee installation. (Reported by S.T. Turner, Southdown GC).

1.5 Extracts from General Aviation Safety Information Leaflets) (G.A.S.I.L.S.)

1) Curtis Fuel System water drains - malfunction
2) Chipmunk Flap Cable failure
3) Weight & Balance saga Xmas message!
4) Pawnee - snow on the wing
5) Pawnee -(glider tug) - exhaust failure
6) Aviation Fuel - airfield operator's responsibility to comply with Aritcle 82 of the Air Navigation Order
7) Scat (wire wound) flexible hose - swallowed by the engine!
8) Loss of performance on take-off - long grass!

1.6 Extracts from Air Accident Investigation Branch (AAIB)

1) Pawnee savaged by winch cable!
2) BRASOV IS-28M2A minor damage to landing gear support beam (yet again!!).
3) Robin DR 400/180
4) Janus CM

PART 2 GENERAL MATTERS

2.1 G.R.P. Laminators Courses. Marine Builders Training Trust. The 1989 course programme is attached herewith. Slingsby Aircraft also run 5 day courses mainly in support of the T.67 firefly. Contact Roger Bull 0751 32474.

2.2 Falke Spares, including RWG Propeller (new), gasket sets, hand starter cables, recoil springs, main and tailwheel tyres and tubes. Contact A.F. Cowley, Swan Cottage, The Paddock, Penally, Dyfed (West wales GC).

2.3 Control System ball races/bearings. French manufactured SKF bearings are available from commercial agencies. Each one should be inspected before application. (Reported by Humfrey Chamberlain, Rattlesden GC) (not to be used on Civil Registered Aircraft).

2.4 Procurement of Aircraft Spares Civil Registered Aircraft. The attached letter from CAA dated 13/12/88 is self explanatory.

2.5 Renewal of Motor Glider Certificates of Airworthiness

The Light Aircraft Maintenance Schedule (LAMS/GAP 411) page 5/1 allows the Annual Inspections to be anticipated by 62 days. Please submit your 3 year C of A renewals before the C of A expires.

Supplement to TNS/1/89 gives a precise Check list of how to proceed, & CAA Renewal charges (1989).

BGA PRICE LIST FOR 1989

1)	Glider C of A Renewal	£25.00
2)	BGA Inspector Renewal	£15.00
3)	BGA Technical Procedure Manual	£1.50 (incl p & p)
4)	G.R.P. Repair Manual (Slingsby)	£22.50 (incl p & p)
5)	AC43-13 Aircraft Inspection & Repair (Latest Issue)	£15.95 (incl p & p)
6)	Standard Repairs To Gliders	£4.50 (incl p & p)

7) CAA C of A renewal charges (SLMG's) £36.00 per 500kg (or part thereof) per year of validity (normally 3 years).

R.B. STRATTON.
CHIEF TECHNICAL OFFICER

irworthiness Division

EPORT AND RECOMMENDATION FOR RENEWAL OF ERTIFICATE OF AIRWORTHINESS BY AN RGANISATION APPROVED IN ACCORDANCE WITH CA[SECTION A, CHAPTER A8–15

OTE: Where an item is not applicable or appropriate the letters 'NA' should be entered.

DISTRIBUTION

White	–	CAA Area Office
Pink	–	CAA Area Office
Yellow	–	Aircraft Records
Blue	–	Approved Organisation

1 AIRCRAFT DETAILS

1.1 Registration: _____ Type: _____ Constructor's No: _____

1.2 C of A Category: PRIVATE

1.3 Engine Type(s) _____ Propeller Type(s) _____

2 REPORT

2.1 Total hours flown either since manufacture or since initial issue of UK C of A*: _____

2.2 Hours flown during each calendar year since C of A issue or last renewal:

19 _____ hr/19 _____ hr/19 _____ hr/19 _____ hr/Total _____ hr

2.3 Aircraft tested to Airworthiness Flight Test Schedule No: BCA 26T FT. Issue No: – Date of satisfactory Flight Test: _____

2. Radio equipment installed is in accordance with Form AD 917 dated: _____

2.5 Flight Manual/Pilots Operating Handbook/Owners Manual* is in accordance with Flight Manual checklist dated: _____

2.6 Date of Current Weight Schedule: _____

2.7 ~~Aircraft is approved for Glider Towing/Parachuting*~~

2.8 I confirm that all appropriate CAA requirements and Airworthiness Notices – Contents No: _____ have been complied with.

2.9 I confirm that compliance with the following, as appropriate, is recorded in the aircraft records:

(a) FAA Airworthiness Directive Vol 1 at Bi-weekly Listing No: N/A.

(b) CAA Mandatory Modifications and Inspections Summary, Contents and checklist of pages at Issue } BCA dated LIST + TNS dated

(c) Foreign Airworthiness Directives Vol III, Contents and checklist of pages at Issue

(d) CAA Additional Directives, Contents and checklist of pages at Issue } ((~~latest issue~~) dated

2.10 The aircraft complies with Specification/Data Sheet/Fiche No:* – Revision/Issue/Edition No: –

Quote Variations:

3 CERTIFICATION

3.1 STAR INSPECTION †

completed on: _____

Certified by:

Category	*Name*	*AMEL No.*
BCA INSPECTOR.		

3.2 **Certified that** the appropriate requirements of BCAR, Section A Chapter A2–5 have been complied with and that the particulars contained herein are correct. It is recommended that Certificate of Airworthiness No: _____ be renewed for a period of 36 months, in the Private/~~Aerial Work/Transport*~~ Category

Signed: _____ Name: STRATTON.

Organisation: BCA.

Approval Ref. No.: ~~D47~~ 8378/73 Date: _____

The following documents are attached for CAA records: ~~Flight Test Schedule/Flight Manual Check List/Weight and Centre of Gravity Schedule*~~

BCA FORMS 267 | 267 A | 267 FT.

*Delete as necessary

†To be in addition to and coincidental with the annual check (CAIP BL/1–15)

AD 202L
010485

GASK 12/88

P

3. FUEL DRAINS

Aircraft : Piper PA28-161 Warrior
Date : 24th April 1988

APPLIES TO ALL CURTIS DRAINS

The aircraft had taken off uneventfully with all temperatures and pressures reading normally. At 150 ft, the engine RPM dropped to idle, but on lowering the nose engine power immediately returned. On every occasion that the nose was raised, the engine power ceased only to return again when the nose was lowered. The pilot was able to climb in this undulating fashion to 500 ft and carried out a low level circuit and landed back on the airfield. Upon examination, it was found that the strainer bowl fuel drain at the cowling had remained locked in the open position. Since there is no requirement to remove large quantities of fuel from this drain and therefore no need for them to remain locked open, the Flying Club concerned has modified them to prevent them remaining in the open position.

CAA Comment:
The CAA has recommended, on numerous occasions, the removal of the locking feature on the CURTIS fuel cock. CSE Service Bulletin 6/75 is reproduced below.

C.S.E. SERVICE BULLETIN 6/75 OCTOBER, 1975

SUBJECT: Fuel Filter Water Drain Valves.

MODELS AFFECTED: All Piper Single and Twin Engined Aircraft:

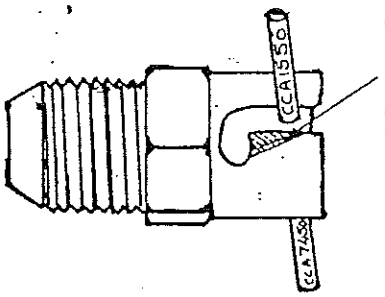
RECOMMENDED COMPLIANCE TIME: Within the next 50 hours of operation or at the next inspection whichever occurs first.

There have been a number of reports from the field of engine failure and loss of power shortly after take-off on the Cherokee range of aircraft. In addition, there have been cases of high fuel consumption reported on one engine of the twin engine range.

Investigations have proved that, in some cases, the problems have been due to the Curtis drain valve, on the bowl of the fuel filter, located between the fuel cock and the engine driven fuel pump, being inadvertantly locked in the open position after carrying out a water check during a pre-flight inspection.

In order to prevent a re-occurrence of the above problem, modify all Curtis drain valves, part number CCA 1550 (Piper P/N 492-022) and CCA 7450 (Piper P/N 492-100), located between the fuel cock and the engine, as indicated in the sketch below, taking care not to damage the spring in the process.

NOTE: It is not possible to dismantle the Curtis Valve in any way.



Carefully file off shaded area of slot sufficiently to prevent the valve locking in the OPEN POSITION. Vendor part number CCA 1550 (Piper P/N 492-022) and CCA 7450 (Piper P/N 492-100).

CHIEF SERVICE ENGINEER C.A.A. APPROVED

E5. FLAP CONTROL CABLE SNAPPED

GASK 12/88

CHIPMUNK FLAP CABLE.

Aircraft : DHC1 Chipmunk (Military operated)
Date : September 1988

Just before the aircraft was about to touch down, it yawed to the left and rolled hard to the right. The pilot applied full power and opposite aileron and rudder control. The right hand flap was seen to be fully retracted whereas the left hand flap was fully down. The flap lever was moved to the retracted position and the aircraft carried out an uneventful circuit and flapless landing.

Engineering examination showed that the right hand flap operating cable had snapped in the area of rotation around the pulley assembly. The cable was replaced and no

AAIB 12/88

TWS 1/2/89

No: 12/88 Ref: EW/G88/09/14 Category: 1c

Aircraft Type and Registration:	Brasov IS-28M2A Motor Glider, G-BMMX
No & Type of Engines:	1 Linbach SL 1700-EI piston engine
Year of Manufacture:	1981
Date and Time (UTC):	4 September 1988 at 1450 hrs
Location:	Winthorpe Airfield, Lincs
Type of Flight:	Training
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Minor damage to landing gear support beam and adjacent fuselage ribs
Commander's Licence:	Private Pilot's Licence
Commander's Age:	60 years
Commander's Total Flying Experience:	1667 hours (of which 3 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

Following a satisfactory approach, the student pilot selected too high a nose attitude on roundout. A heavy landing ensued. The instructor stated that the aircraft was passed as fit to fly by a British Gliding Association Inspector, and was subsequently flown to its base for repair.

AAIB 12/88
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B.G.A. TECHNICAL COMMITTEE

SUPPLEMENT TO TNS 1/2/89

C of A Renewals Self-Launching Motor Gliders, Ref: CAA Approval of the B.G.A. REF DAI/8378/73.

1) Introduction The CAA (Airworthiness Division) have indicated their intention to survey samples of civil registed aircraft administered by the B.G.A.(and also by the P.F.A., B.M.A.A. etc).

2) Since the location of some 100 such aircraft is so geographically wide-spread, and since clubs, and club members responsible for such aircraft, may not be available other than at weekends, some delays in completing such renewals is likely to arise.

3) To minimise the loss of use of such aircraft, full advantage should be taken of the facility to complete renewals 62 days prior to expiry (Ref LAMS (Blue Book) section 5 Note 2).

4) Having completed the C of A renewal work, the aircraft may continue to operate on the unexpired portion of the current C of A, whilst the C of A renewal submission and/or inspection is processed.

5) Preparation for the C of A Renewal (and/or CAA Inspection).

a) The Working conditions and facilities required to complete such work, must be to a commonsense acceptable standard.

b) Spare parts, whether in stock, or removed from aircraft must be properly identified and stored.

c) Such technical literature as may be essential to the proper maintenance of the aircraft, its engine, propeller, and equipment, must be available.

d) Technical Records such as worksheets, logbooks (Cap 389-Engine and CAP 399 Airframe), rectification worksheets, and LAMS Proforma maintenance schedules, must be available.

The Green Pages of the airframe & engine log books should be updated, for scheduled servicing.

The Red Pages should record the current status of Mandatory Modification and Inspections.

(Reference should be made to the B.G.A.'s Annual Compendium of Mandatory Modifications and Inspections, and to subsequent TNS, as well as to C.A.A.'s Airworthiness Notices).

6) The Light Aircraft Maintenance Schedule (Lams Blue Book Issue 2 as ammended), is the basis for all Scheduled Maintenance. The third Annual Inspection is referred to as the "STAR" Inspection, at which time the C of A is renewed. The LAMS should be read by all concerned with its implementation. A record of the work carried out to show compliance with LAMS can be made on B.G.A. LAMS Proforma (TNS 10/86). Rectification should be recorded on a separate Proforma.

7) Aircraft Documentation. The following original copies should be available ON SITE for inspection:

a) Certificate of Registration (CAA Form 71).
b) LAMS Proforma Record BGA LAMS 86.
c) Rectification Worksheets B.G.A. Form/TI.
d) Flight Manual or Operators Manual.
e) Weight & Balance Report.
f) LAMS)Blue Book) Issue 2 + amendments.
g) Certificate of Approval of Aircraft Radio Installation CAA Form 917 AD.
h) Log Books, complete with daily records of flying, scheduled maintenance, rectification, repairs and modifications.
j) Daily inspection record (Article 34 of the A.N.O.).

8) The following documentation has to be submitted to the B.G.A. Office prior to its despatch to CAA:-

a) B.G.A. Form 267 (airframe inspection report).
b) B.G.A. Form 267M (Engine inspection report).
c) B.G.A. Form 267FT (Flight Test Report).
d) Certificate of Airworthiness (CAA Form 958).
e) CAA Forms 202L (From CAA or BGA Office). (Sample copy attached herewith).
f) Cheque for CAA fee - (Ref CAA Airworthiness Notice No. 25 currently £36 per 500kg or part thereof per year of validity i.e. for a 550kg aircraft the fee Payable to the B.G.A. is £36 x 2 x 3years = £216.00 (effective 1/4/89)

9) Placards and markings on the aircraft should be renewed as required, to ensure that essential limitations are conveyed to the crew. Fuel markings and accuracy should be checked.

10) The OWNERS Name Plate, (in steel) should be displayed in the cockpit area, to comply with the ANO.

11) Radio Installation Approvals (simple communication systems)

a) There is an ICAO/LAMS requirement for the frequency of transmitters to be checked at 48 month intervals.
b) Proforma BGA/RAD/INST/86 can be used to simplify your application to the CAA, for the issue of a Radio Installation Approval (CAA Form AD971).

12) Airworthiness Guidelines

a) B.G.A.Technical Procedure Manual(Tugs and Gliding Related Powered Aircraft) price £1.50
b) CA 520 " light Aircarft Maintenance" £1.50 from CAA Offices, are useful guides to getting things right!

13) Present Your Aircraft For C of A Renewal free of corrosion, well protected paintwise, clean both inside and out, and properly documented.

R.B.Stratton
Chief Technical Officer
Feb 1989

MBTT
MARINE BUILDER'S TRAINING TRUST
HAZEL RD, WOOLSTON, SOUTHAMPTON SO2 7GB Tel: (0703) 446824
Reg. No. 1642305

COURSE PROGRAMME

GRP COURSE DATES AND CONDITIONS

COURSE	DATE
~~GRP HAND LAMINATING SKILLS COURSE **~~	~~9TH JANUARY 1989~~
~~ADVANCED FRP TECHNIQUES COURSE~~	~~30TH JANUARY 1989~~
GRP HAND LAMINATING SKILLS COURSE **	6TH FEBRUARY 1989
GRP HAND LAMINATING SKILLS COUSE **	20TH FEBRUARY 1989
GRP HAND LAMINATING SKILLS COURSE **	6TH MARCH 1989
BASIC AERO TECHNIQUES COURSE ** (A.T.I.T.A. Module 1)	13TH MARCH 1989
GRP HAND LAMINATING SKILLS COURSE **	24TH APRIL 1989
ADVANCED FRP TECHNIQUES COURSE	8TH MAY 1989
GRP HAND LAMINATING SKILLS COURSE **	15TH MAY 1989
ADVANCED FRP TECHNIQUES COURSE	12TH JUNE 1989
GRP HAND LAMINATING SKILLS COURSE **	19TH JUNE 1989

** INCLUDING CITY & GUILDS SKILL TEST

Whilst every effort will be made to run the courses shown, the Trust reserves the right to cancel any courses that do not attract sufficient bookings.

FEES

GRP HAND LAMINATING SKILLS COURSE (INCLUDING CITY & GUILDS TEST FEE)	£195.00 + VAT
ADVANCED FRP TECHNIQUES COURSE	£270.00 + VAT
BASIC AERO TECHNIQUES COURSE	£220.00 + VAT

CONDITIONS

50% of all fees will be charged for bookings cancelled less than two weeks before the course starts. No refund can be made in respect of cancellations received by the Trust after this period.

ACCOMMODATION

Ample accommodation is available in guest houses and hotels in and around Southampton. A list will be sent with the joining instructions.

NOVEMBER 1988

APPROVED TRAINING ORGANISATION

Civil Aviation Authority
Safety Regulation Group
Aviation House
South Area
Gatwick Airport
Gatwick
West Sussex RH6 0YR
Tel: Switchboard 0293 567171
Direct Dial 0293 57
Telex: 878753 Fax: 0293 573999

Maintenance Standards Department

13 December 1988

NOTICE TO ALL RECIPIENTS OF CAP 475

RE: PROCUREMENT OF AIRCRAFT SPARES AND EVIDENCE OF ACCEPTABLE ORIGIN

Recent experience makes it necessary to remind all concerned that CAA Airworthiness Notice No. 11 places the onus on the end user to be satisfied as to acceptable origin of spares and materials for aeronautical use.

When placing orders end users must take the greatest care in establishing confidence in suppliers, particularly when distributors and stockists are used.

CAA Approval and FAA Repair Station identifier references should be verified for authenticity when quoted on documents issued by suppliers by checking in the CAA List of Approved Organisations (CAP 475) or with the Maintenance Approvals Section at Gatwick. If a quoted CAA Approved Reference number is not found in CAP 475, check with the Maintenance Approvals Section (Tel Nos 0923 573151/573153) to see if an approval has recently been granted. In addition the scope of any Approval held should be verified as being appropriate to the product/service being sold. In cases of doubt, the supplier should be asked to obtain and forward copies of the Certificates and Schedules of Approval awarded by the appropriate regulatory authority to the companies who have issued the release documents. On product release documentation, Approval and Repair Station numbers should only be quoted by the organisations identified by the number used; any other use should be treated as worthy of further enquiry. Any apparently fraudulent or seriously discrepant documentation should be copied and forwarded to the CAA Safety Regulation Group.

It is essential that the UK and foreign regulatory bodies be given details of cases of ambiguous or misleading use of Approval identities, as they represent a potentially serious airworthiness hazard.

GROB	Service Bulletin TM 315-38	GROB TWIN ASTIR G 103 "TWIN II"

BGA TN5 11/2/89.

GROB G. 103

Subject: Inspection of the correct installation position of the fixing bolts of aileron- and air brake connector at the distributor.

Effectivity:

	s/n
TWIN ASTIR (incl. Trainer)	3000 - 3291
GROB G 103 "TWIN II" (incl. ACRO)	3501 - 3729

Accomplishment: For all serial numbers during the annual inspection.

Reason: An accident investigation revealed that the owner of a TWIN ASTIR - probably when performing a service bulletin - mounted the fixing bolts on the aileron connector downwards. The manufacturer specifies installation upwards.

The wrong mountig of the bolts can lead to a reciprocal interference of aileron- and air brake control.

As a precaution, an inspection of the installation position of the bolts on aileron and air brake connector is ordered. So as to prevent further wrong installations, this service bulletin includes the attachment of a warning placard on the aileron lever (103-4222) with the following wording:

> Achtung!
> *Caution!*
> Montagerichtung der Verbinderschrauben:
> *Mounting direction of connector bolts:*
> BK-Hebel von oben nach unten
> *Airbrake lever downwards*
> QR-Hebel von unten nach oben
> *Aileron lever upwards*

Instructions:

Instruction 1

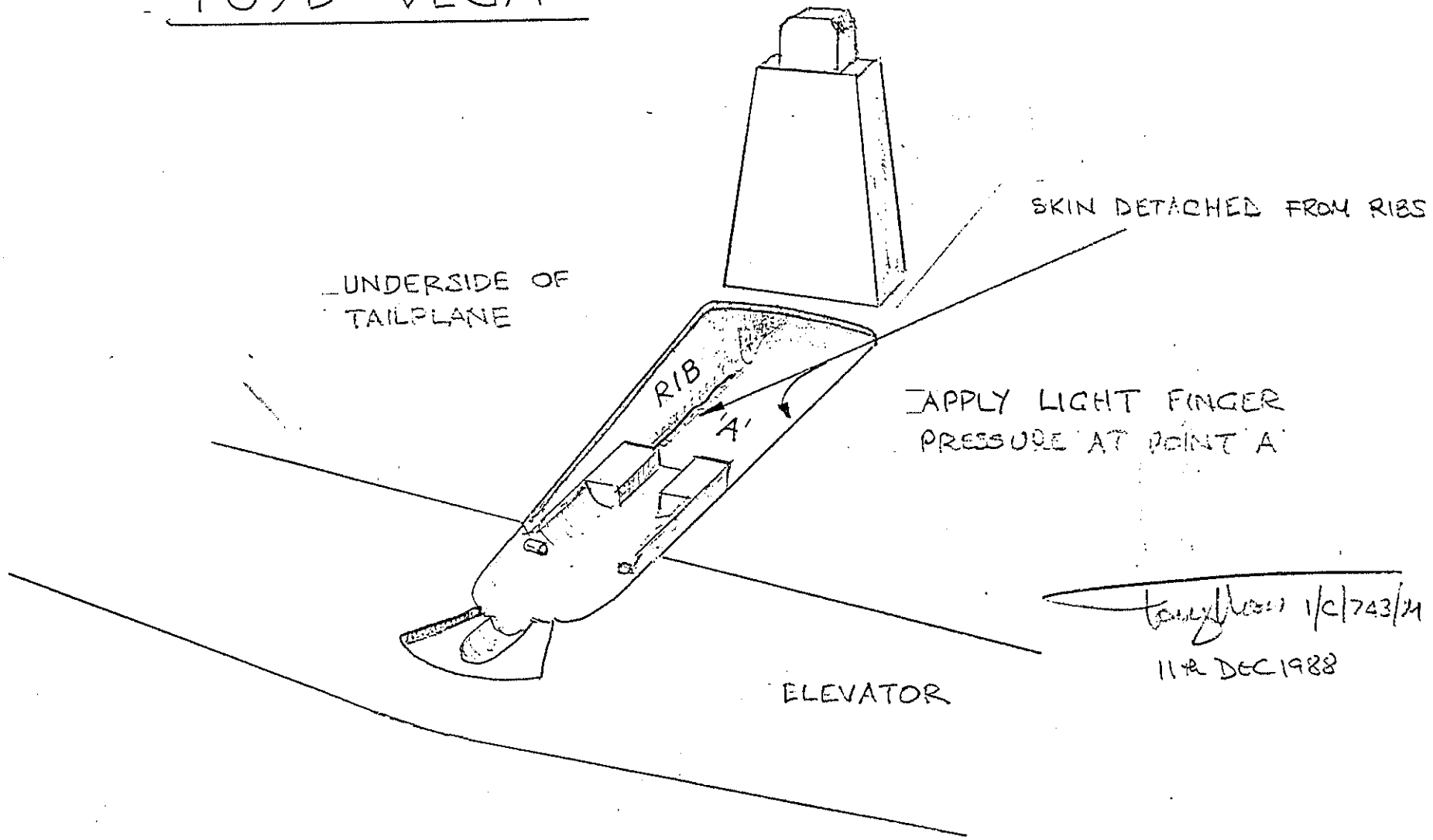
Checking of the correct mounting of the connector bolts (see fig. 1):

1.1 The following mounting direction of the bolts is mandatory:
- on the airbrake lever downwards
- on the aileron lever upwards

1.2 Minimum distance

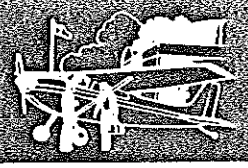
The boltheads must have a minimum distance of a = 5 mm to each other.

T69D VEGA



I/C 743/M
11th DEC 1988

ISSN 0309-667X



Civil Aviation Authority

General Aviation Safety Information Leaflet

Safety Promotion Section
Aviation House, South Area
Gatwick Airport, West Sussex, RH6 0YR
Telephone – (0293), Safety Prom 573225/6, Exchange 567171
Telex – 878753, Facsimile – (0293) 573999

CAA

12/88

16th December 1988

1. EDITORIAL

P/E

For many readers, this month's GASIL really is a bumper Christmas pack! Most recipients will receive the latest FACTAR, a questionnaire on Met. Services and a Guide to the CAA. In addition Flying Clubs will receive a Safety Orientated Calendar for 1989.

2. LONG GRASS PREVENTED TAKE OFF

P

Aircraft : Piper PA22 Tri-Pacer
Date : October 1988

The owner of the aircraft had recently acquired the 420 yard long farm field from which he was attempting take off. However, on the day in question, due to long grass which was also wet the aircraft failed to achieve flying speed. The aircraft struck a hedge and sustained severe damage to the fuselage.

CAA Comment:
Despite the advantages of a slight downslope and a gentle headwind, the presence of "long, wet grass" should have caused warning bells to ring loudly. The opposite is the back page of Safety Sense Leaflet No 7 (Aeroplane Performance).

FACTORS ARE CUMULATIVE AND MUST BE MULTIPLIED

CONDITION	TAKE-OFF		LANDING	
	INCREASE IN DISTANCE TO HEIGHT 50 FEET	FACTOR	INCREASE IN LANDING DISTANCE FROM 50 FEET	FACTOR
A 10% increase in aeroplane weight	20%	1.2	10%	1.1
An increase of 1,000ft in aerodrome altitude	10%	1.1	5%	1.05
An increase of 10 deg C in ambient temperature	10%	1.1	5%	1.05
Dry grass* – Short, 5" (13cm)	20%	1.2	20%	1.2
– Long, between 5" & 10" (13-25cm)	25%	1.25	30%	1.3
Wet grass* – Short	25%	1.25	30%	1.3
– Long	30%	1.3	40%	1.4
A 2% slope*	uphill 10%	1.1	downhill 10%	1.1
A tailwind component of 10% of lift-off speed	20%	1.2	20%	1.2
Soft ground or snow*	25% or more	1.25 +	25% or more	1.25 +
NOW USE ADDITIONAL SAFETY FACTORS (if data is unfactored)		**1.33**		1.43

Notes: * Effect on Ground Run/Roll will be greater.

Any deviation from normal operating techniques is likely to result in an increased distance.

The records used to compile this document include information reported to the CAA, information obtained from CAA investigations and deductions by CAA staff based on the available information. The authenticity of the contents or the absence of errors and omissions cannot be guaranteed.

In order to identify the broad subject matter each item is classified as follows:

P Operational items mostly of interest to pilots
E Airworthiness items mainly for engineers

Engineers Supplement

SEE ALSO P/E ITEMS IN MAIN GASIL GASIL 12/88

E1. TYRE BURST ON LANDING

Aircraft : Piper PA23 250 Aztec
Date : September 1988

After a normal approach, using full flap, a normal touchdown occurred. The left hand tyre burst and the aircraft slewed to the left, but remained on the runway. The engines were shut down and the crew and passengers vacated the aircraft.

The engineers found that the inner tube was trapped between the two wheel halves.

E2. LENGTH OF WIRE BETWEEN VALVE AND VALVE SEAT

SCAT HOSE!

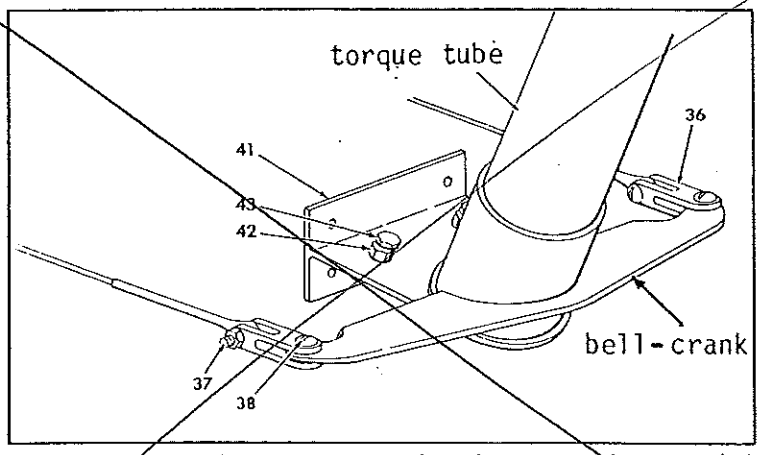
Aircraft : Piper PA28 Cherokee 140
Date : October 1988
Engine : Lycoming O-320 E2A

During the descent to the aircraft's normal operating base, the throttle was found to jam in one position but subsequently it freed. The aircraft landed safely and ground runs showed that the engine was running roughly and one cylinder was low on compression. Further engineering investigation showed that No 3 cylinder had no compression at all and when removed it was found that a length of wire was caught between the valve and the valve seat. This wire was found to be similar to the wire reinforcing used on Scat hose. It can only be assumed that a piece of wire from the forward Scat hose, which goes from the air filter to the carburettor, had come adrift. This had momentarily jammed the throttle and then worked its way along the induction to No 3 cylinder where it jammed the valve in the open position.

After lapping the valve in and replacing the Scat hose, engine runs proved satisfactory and the aircraft was returned to service.

E3. RUDDER TORQUE TUBE CRACKED

Aircraft : Gulfstream American GA7 Cougar
Date : September 1988



During inspection of the rudder torque tube in accordance with CAA AD 001-02-85 and the Gulfstream American Service Bulletin No ME-21, three longitudinal cracks were found in the torque tube beneath the bell crank. The 1979 aircraft has flown a total of 1150 hours.

The torque tube was removed and replaced.

CAA Comment:
A search of the CAA database shows no similar occurrences.

12. AVIATION FUEL AND UNLICENCED AERODROMES G-BASK 11/88 P

During a recent visit by a CAA Flight Ops Department Inspector to an unlicenced aerodrome, he observed that aviation fuel was being dispensed from a fuel bowser that can best be described as "a rusting hulk". The owner of the airfield admitted that the equipment had not been checked officially since a contract with a major oil company had terminated in 1981.

CAA comments:
Anybody who stores or dispenses fuel from any airstrip, be it licenced unlicenced or just a farm strip is obliged to comply with Article 82 of the Air Navigation Order. This Article, in simple terms, requires that the person who has management of any aviation fuel installation be satisfied that the installation stores and dispenses fuel so as not to render it unfit for use in aircraft and to ensure that the appropriate and correct grade is delivered to the installation and it is properly marked.

He is obliged to keep a written record of the grade and quantity of fuel delivered, particulars of any samples taken and particulars of the maintenance and cleaning of the installation.

Civil Aviation Authority's publication No. CAP434 - Aviation Fuel at Aerodromes, provides guidance to achieve the required standard.

Finally, pilots who have any doubt about the quality of the fuel which they are offered at an aerodrome should not unlift such supplies unless they are fully satisfied that the legal requirements concerning this fuel have been met.

13. **CAN YOU BELIEVE IT** P

Aircraft : Beech V35 Bonanza
Date : August 1987

Extracts from NTSB Report

The pilot had not flown for a considerable period of time and indeed his pilot licence had technically lapsed although he had accumulated some 400 hours total flying experience.

Shortly after takeoff, at a height estimated at 100 feet, the engine started mis-firing and rough running. Instead of landing ahead, astonishingly, he decided to turn back and succeeded in landing back on the runway.

He realised that the end of the runway was approaching fast and he would not stop before reaching the end of the runway so he decided to go around.!!!!!! During the climb out from this take off, the engine failed completely and the aircraft entered a spin and crashed. The pilot was seriously injured and his passenger was killed.

Subsequent investigation showed that the pilot had selected an empty tank, there being adequate fuel in **all** of the other aircraft fuel tanks.

CAA comments:
What a catalogue of disasters subsequently led to this tragic accident. The following are the most obvious lessons:

- Revise and memorise aircraft systems before even going to the airport,
- Check fuel levels during your pre-flight inspection,
- If you have not flown for a long time fly with an instructor,
- Pre-takeoff checks,
- Never turn back ..... and finally

It's better to be on the ground going to hit the fence at taxi-ing speed, this is better than hitting the ground at flying speed.

GASIL 11/88 P/E

2. EXHAUST MUFFLER FAILURE

PAWNEE.

Aircraft : Piper PA25 Pawnee 235
Date : October 1987

Extracts from New Zealand Air Accident Investigation.

At about 300 feet above ground level, on the 5th glider tow of the day, the pilot detected an unusual smell. Although the engine instruments indicated normal operation, the burning smell became stronger and the engine rpm decreased rapidly.

The glider was released and the pilot attempted to land the aircraft in a small paddock ahead of him. Realising that he could not stop the aircraft in the remaining distance the pilot "jumped" the aircraft over a low hedge. The aircraft clipped the top of the hedge causing it to nose down and yaw through 180°. It came to rest on its wheels in the next paddock.

When examined, a large hole approximately 150 sq.cms. in area, in the top of the engine exhaust muffler was discovered. A similar amount of light alloy heater shroud had disappeared. The escaping hot exhaust gases had played onto the rear of the engine, burning the insulation off the spark plug leads and heating the engine driven fuel pump probably caused vapour lock and the subsequent power loss.

The muffler had failed along the top production seam and the two halves had peeled outwards. The muffler damage was indicative of an internal explosion, although the pilot did not recall hearing an explosion.

The aircraft had completed its C of A renewal 40 hours previously and at that time the muffler had appeared sound. It has been installed in the aircraft 5 years previously and had been in operation for approximately 1000 hours.

CAA Comment:
A large number of Piper Pawnee aircraft are being used by gliding clubs in the United Kingdom, although no one has reported this problem to the CAA. Whilst Airworthiness Notice 40 addresses the problem of carbon monoxide contamination through leaking exhaust mufflers, the above incident emphasises the importance of proper inspection of these items.

(Any Powered Aircraft). P/E

3. CARBON MONOXIDE IN CABIN

Aircraft : Cessna 172N
Date : May 1988

Extracts from Australian Major Defects Summary

During the flight, the pilot reported having a headache, feeling nauseous and having affected vision. He initially suspected the cause of this to be paint fumes since the aircraft had recently been re-painted. However, subsequent medical evidence indicated that it was due to carbon monoxide poisoning.

Inspection of the aircraft revealed that the right hand steering link boot was torn and the left hand boot was holed which allowed exhaust gases into the cabin.

CAA comments:
Whilst the pre-flight inspection of these boots might be an unpleasant and messy task on occasions, the importance of so doing is apparent. It is important to remember that Carbon Monoxide is an insidious gas whose presence is only noticed after it has started affecting you.

No: 1/89 **Ref: EW/C1088** **Category: 1c**

Aircraft Type and Registration:	Robin DR400/180R, G-BHHR	
No & Type of Engines:	1 Avco Lycoming 0-360-A3A piston engine	
Year of Manufacture:	1973	
Date and Time (UTC):	21 October 1988 at about 1045 hrs	
Location:	Drumochter, Invernesshire, Scotland	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 2
Injuries:	Crew - 1 (fatal)	Passengers - 2 (fatal)
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	39 years	
Commander's Total Flying Experience:	420 hours (of which about 200 hours were on type)	
Information Source:	AAIB Field Investigation	

The aircraft was a Robin DR400-180R aircraft that was primarily used for glider towing. It was equipped with basic flight instruments which consisted of an airspeed indicator, altimeter, turn and slip, vertical speed indicator, and a small magnetic compass; it did not have a serviceable artificial horizon or a serviceable direction indicator. No radio aids to navigation were fitted however it did carry two VHF radios which were capable of transmitting and receiving the normal air-to-ground ATC VHF radio frequencies.

G-BHHR was owned and operated by the directors of a gliding club based at Bidford-on-Avon, and, since 17 September 1988, it had been operated from Feshiebridge aerodrome, near Aviemore, carrying out glider towing flights during a club excursion to the Scottish Highlands. No unservicabilities were recorded during the time that the aircraft was operated at Feshiebridge. On 21 October 1988 it was intended to ferry the aircraft from Feshiebridge back to Bidford-on-Avon, via Carlisle where a re-fueling stop was to be made. The planned route for the first sector was to fly under VFR following the main A9 road south towards Perth, and thereafter request VFR clearance through the Edinburgh and Glasgow Control Zones and thence to Carlisle. There were 3 persons on board a pilot and two passengers on board.

The pilot held a Private Pilot's Licence for aircraft in Group A and SLMGs, with a current medical certificate. He did not hold either an Instrument or IMC rating. His total flying experience was 420 hours of which about 200 hours were on the Robin DR400-180R. This flying (on type) was almost

exclusively concerned with glider towing and thus had invariably been carried out in Visual Meteorological Conditions. The passenger who occupied the aircraft's front right side seat was a qualified glider pilot who was well experienced in cross-country navigation. She had made the flight between Bidford-on-Avon and Feshiebridge on at least six previous occasions and was familiar with the intended route.

Prior to departure from Feshiebridge the aircraft's fuel tanks were filled to capacity with 4-star motor gasoline purchased from a local garage. The duty Air Traffic Control Officer at Carlisle Airport reported that at about 1000 hrs he received a telephone call from a female person advising that a Robin aircraft, registration G-BHHR, would be arriving at Carlisle for re-fuelling at about 1300 hrs and requesting details of the weather. The Carlisle weather actual at that time was reported as a surface wind of 120/08 knots, visibility 9000 metres in haze, 2 oktas cloud at 1500 feet, 5 oktas at 25000 feet, temperature +14 (C). There is no evidence that details of the flight were passed to any other ATC unit or that details of the en-route weather were requested. Had the details of the weather at Perth been asked for they would have been reported as a surface wind of 080/06 knots, visibility 100 metres in drizzle, sky obscured.

The aircraft took off from Feshiebridge at about 1025 hrs and was observed to climb away normally towards Kingussie and the A9 road, and thereafter to head south. Witnesses report that the weather at Feshiebridge was then fine, and the Aviemore 1050 hrs weather observation recorded a surface wind of 030/02 knots, nil weather, 1 okta cloud at 2500 feet, 6 oktas at 3200 feet. Thereafter it has not been possible to establish the precise flight path of the aircraft as it appears to have been flown at an height that was below any possible radar cover and also below that which would have allowed two-way radio contact with an ATC unit. However an eye-witness, who was travelling in a motor vehicle that was heading southbound on the A9, reported seeing the aircraft, which was also heading southbound, pass overhead the vehicle before it disappeared from sight in cloud. The same eye-witness reports seeing the same aircraft, but at a position a further 5 miles south down the A9 road, when it re-appeared from cloud in a steep nose down attitude from which it did not recover. The distance between the two sightings of the aircraft by the witness in the motor vehicle on the A9 was just over 9 kilometres and the vehicle was reported to be travelling at 55 miles per hour. The straight line distance between the points was 8.75 kilometres. The normal cruising speed of the Robin DR400-180R is 120 knots (139mph) and the stalling speed, flaps up is 52 knots (59mph). It therefore follows that, between the two sightings reported by the eye-witness, the aircraft must have completed at least one 360 degree orbit and that this must have been carried out in cloud.

An aftercast of the weather conditions prevailing in the Scottish Highlands at the time of the accident, prepared by the Meteorological Office at Bracknell, records that a south-south-easterly airflow was predominant and that the air was very moist up to 5000 feet amsl. Several observations were recorded in the Highlands mainly north of the accident site and all showed between 3 to 6 oktas of cloud with a base no lower than 2000 feet amsl. These relatively high bases would have been due to the general SW-NE orientation of the Grampians providing shelter from the moist south-easterly flow, which would have shed the bulk of its moisture on the south-east side of the mountains. The most recent observation immediately to the south-east of the accident site was at Tummel Bridge (546 feet amsl) which recorded light drizzle, with a cloud base of 8 oktas at 1000 feet agl, visibility of 3200 metres, and a surface wind of 6 knots from the south-east. At the same time the weather at Leuchars on the coast was reported as 8 oktas of cloud at 100 feet agl. The gradient wind would have caused the moist low level air to feed up Glen Garry as far as the 'bend' in the A9 road close to Drumochter. The actual weather conditions at the accident site, recorded by the flight crew of a Royal Air Force Search and Rescue helicopter, were 8 oktas cloud at 200 feet agl, visibility 2 kilometres, drizzle, with a surface wind from the south-east at 12 knots.

The aircraft had crashed into a peat covered slope whilst on a southerly heading and with a flight path angle of 35 degrees below the horizontal. The accident site was 1500 feet amsl. The force of the impact had been taken by the engine which had penetrated 3 feet into the peat to the rocks beneath, leaving the wing leading edges apparently undamaged by the impact. The fuselage had then hinged downwards from the engine bulkhead burying the main landing gear legs vertically in the peat to the

tops of the wheels. The aircraft had caught fire and, being primarily constructed of wood, had burnt out almost completely. Both propeller blades had broken away from the hub in rearwards bending, and examination of their leading edges showed no signs of the propeller having been under power at impact. The flying controls runs were checked and found to be intact.

The engine and flight instruments were taken to the AAIB facility at Farnborough for more detailed examination. Strip examination of the engine showed that it had been mechanically serviceable at impact. The fuel pump and magnetos were also checked and found to be serviceable. The carburettor air inlet system was too badly damaged by the impact to determine whether hot air had been selected. The flight instruments had been subjected to an intense fire which had caused considerable damage and prevented any useful information being obtained from them. An entry in the maintenance log dated 15 September 1988 recorded that the drive from the engine to the vacuum pump had broken and that no spares were available; this was confirmed by inspection. The entry further stated that the vacuum driven flight instruments had been marked as inoperative, these included the artificial horizon and the directional gyro.

The use of motor gasoline (mogas) in aircraft is covered by Airworthiness Notice No 98, issued by the Civil Aviation Authority, which also draws attention to the greater probability of carburettor icing when using mogas. This aircraft was not cleared to use mogas, however a 40 gallon drum was identified by the owner as containing 4-star fuel bought from a garage and used to fuel the aircraft. A Ministry of Defence Quality Assurance laboratory analysis of a fuel sample obtained from the 40 gallon drum showed that:

a. It complied fully with BS 4040 - 4-star leaded petrol (intermediate grade) for motor vehicles.

b. It did not comply with Airworthiness Notice No 98 Schedule 2 requirements in terms of constituents and additives.

BS 4040 allows the addition of significant quantities of propane and butane to both the summer and winter grades of fuel to increase the volatility and hence the ease of starting. An increase in volatility, measured by its Reid Vapour Pressure (RVP), also increases the fuel's susceptibility to both carburettor icing and vapour locking. The increase in carburettor icing with RVP is caused by increased evaporative cooling of all induction system surfaces that are wet with fuel. This particular fuel sample had twice the RVP of the Avgas 100LL specification, but the winter grade fuel to BS 4040 may have a maximum RVP of over 3 times that of 100LL. In addition, BS 4040 has a higher quantity of other low boiling point material than does Avgas (it has a lighter front end), which will further increase the tendency to carburettor icing,

The AAIB, in conjunction with the Directorate of Quality Assurance Technical Support, intend to publish comparative data for induction icing for Avgas 100LL and the range of fuel covered by BS 4040.

No: 1/89 **Ref: EW/G88/10/17** **Category: 1c**

Aircraft Type and Registration:	SHEMPP-HIRTH Janus CM, G-LIME
No & Type of Engines:	1 Rotax 535A piston engine
Year of Manufacture:	1986
Date and Time (UTC):	26 October 1988 at 1510 hrs
Location:	Aboyne Airport, Aberdeenshire
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Substantial - Beyond economic repair. Break-up of fuselage, right wing severed.
Commander's Licence:	Private Pilot's Licence
Commander's Age:	20 years
Commander's Total Flying Experience:	600 hours (of which 100 hours were on gliders with 10 hours on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot and an AAIB telephone enquiry

The aircraft was essentially a sailplane with a retractable engine mounted behind the cockpit canopy. The aircraft was returning to the airfield with the engine retracted. The pilot realized that he could not reach the airfield in the aircraft's "clean" configuration due to strong lee wave activity, and extended the engine. After 3 attempts to start the engine the pilot became preoccupied with avoiding power cables and the engine retraction procedure was initiated but not completed. The aircraft narrowly missed the cables and carried out a forced landing in a public car park north of the airfield.

The right wing struck a parked car slewing the aircraft 90° to the right and nosing it in to a row of parked cars. This then turned the aircraft right through another 90° causing the tail to collide with a car reversing out of the row. The aircraft was effectively destroyed, but the occupants suffered only minor bruising. Eight cars were struck causing damage of varying severity.

The weather was fine with wind 240°M at 5-10 kt, good visibility, and temperature +6°C.