BRITISH GLIDING ASSOCIATION

TECH. COMMITTEE. TNS 9/10/79

1.0. Airworthiness "Agro". Please add to 1979 yellow pages!

1.1. "Vega" - Slingsby Engineering Ltd. T.I. No 87 (Issued 2) effects T65A gliders after and including 1904. (T65A gliders up to 1903 are not affected).
Wing Tang Spigots to be replaced. (Ref. also item 1.4).

1.2. Bocian Trim Tabs. Bristol & Gloucestershire G.C. report complete failure of the drive at the tab allowing the tab freedom to induce high out of balance forces in the control system. (Tab had been extended in accordance with BGA Mod IE/1/75.

1.3. Bocian. Emergency AD-CZLC - 1890-79. Wing-to-fuselage main fittings. (Circulated to owners and attached herewith).

The BGA Technical Committee at their meeting on 10/10/79, declined to endorse the limitations imposed on Bocians which are more than 15 years old - subject to satisfactory inspection in accordance with this AD.

1.4. "Vega" - weight and speed restrictions. C.A.A. telegram restricts weight to 350 kg, Vne to 95 knots and winch/auto-tow to 70k, pending wing modifications. (T.I. awaited).

1.5. Astir 77 - Aileron jams in flight. Incorrect alignment of guide-blocks in the wing, and incorrect setting of ailerons, resulted in jamming. (Reported by RAFGSA).

1.6. PIK 20D - Elevator not connected. Attached letter from Accident Investigation Branch is self explanatory. (WHY NOT DISPLAY ON NOTICE BOARD)

1.7. SD3 - 15T (Swales Developments). Fuselage-to-wing attachment lugs found to be oval. Repair by fitting bushes. (Peter Philpot Blackpool G.C.).

1.8. Spillable Batteries. Lloyds Aviation Dept. urgently recommend that the self-distruction of all types of gliders by this means should be discouraged. Non-spill batteries are available, including types which can be vented overboard, making sure that vent pipes do not contaminate local areas.

1.9. LS-1-e-f-ef series. AD 79-109 (attached) concerns Elevator Flutter, and imposes speed limitation of 108 knots. (The U.K. Agents for this breed are:-

SPEED SOARING,
23 Roundhead Drive,
Thame,
Oxon. (Tel: Thame 4132)

Technical Bulletin 38/30/3 should be requested from this company.

2.0. General Matters.

2.1. Olympia Drawing Services. Norman Ellison will be abroad for 2 years - spares are still held by Slingsby Engineering Ltd.

2.2. Gliders - Permits-to-fly. Types not yet certificated by the BGA may only be flown from BGA sites after a permit-to-fly has been issued. A BGA Inspection Report Form 267 should be submitted, together with a Flight Manual, or other form of declaration of limitations.
D.I.Y. Builders must follow the guidelines contained in BGA Technical Procedure Manual, Section 17.
An Independent Inspection of Controls requires signature on Form 267, particularly in respect of D.I.Y. applications.

2.3. Blanik - Product Support. Peter Clifford Aviation have closed down their office at Kidlington, but will continue to operate from their office at White Waltham Aerodrome, Nr. Maidenhead, Berks.

3.0. Tugs/Motor Gliders.

3.1. Compression Checks, by hand-turning the engine backward (for safety) are 100% cost-effective in detecting the poor condition of the "HOT-END" of piston engines. Poor starting and poor performance are directly related to poor compressions. Tug accidents have been attributed to the failure to detect one (or more) poor compressions made instantly disastrous by valve-head failure!

Motor Glider varants of the V-W, when operated on AVGAS 100LL, may be expected to suffer from accelerated valve deterioration.
Frequent re-adjustment of the valve clearances may prolong valve life.
Re-conditioned cylinder-head assemblies should be held in stock, where high utilisations are required.

3.2. Tug Accidents

(1) PA-18-150 blown over operating in 20 - 30 knot winds with one fuel-tank empty! (Doncaster G.C.) (Repairs likely to be costly and prolonged).

(2) Auster 6A. Valve-head failure results in forced landing after take-off and write-off. (Buckminster G.C.)

3.3. Engine Overhaul costs. The typical cost of overhauling 150/180 hp engines is now of-the-order-of £4,000! Are you making proper provisions for this kind of recurring expenditure?

3.4. Maintaining Tug Performance. The attached reprint from S & G (January 1977) may prove helpful.

3.5. Gypsy Major 10-1 and 10-2 engines. C.A.A. notice No. 35 (Issued 8) draws attention to mandatory modifications required by C.A.A. before "ON CONDITION" T.B.O.s become eligible.

3.6. Chipmunk Brakes. Van Dusen Aircraft Supplies have Cleveland Wheel and Brake Conversion Kits, approved by C.A.A. under A.A.N. 12150. Contact Van Dusen, Murdock Road, Bicester OX6 7RB. (Tel: Bicester 43381).

3.7. Compass Check Swings. These are an annual requirement- ref. LAMS Schedule 7, Para. 2.2. (d). Good quality hand-held marine compasses are available from yachting D.I.Y. shops. Ref. also to CAIP leaflets AL10-4/5.

3.8. Tug Tow Release Locations. The two fatal accidents in 1978 have still failed to impress on some club managements their obligations to provide the safest possible arrangements for their Tug Pilots! Please check all tugs for satisfactory compliance with the requirements, that releases should be readily accessible with upper body restraint harness tight, and under negative 'G' conditions. Ref. BCAR Section K4-10 and several BGA TNS in 1978!

A Citabria in Canada has inflicted serious permanent damage on the Tug Pilot and the Canadian Club concerned has consulted the BGA on our own modifications.

3.9. Tug - Flight Manual Review. (Multiple Tows, increased towing weights etc.). Final agreement has been reached with C.A.A. and Flight Manual amendments should become available early 1980.

3.10. Tug Maintenance Approval. The B.G.A. (T) Procedure Manual has been available since early August on application to the B.G.A. Office (Leicester 51051).

3.11. LAMS Schedules - Rectification Worksheets. It is not possible to operate a competent and systematic airworthiness system, without minimal/simple paperwork.

B.G.A. Proforma check lists for the LAMS 50hr/100hr/annual inspections were circulated with TNS/6/7/79 and are available from B.G.A. Office, and are applicable to Tugs and Motor Gliders.

SPECIAL PARISH NOTICE

POSSIBLE EXCOMMUNICATION?

B.G.A. Inspector Renewal Application Proforma is attached herewith, and an early response will be appreciated so that your name can be included in the 1980 List.

TWS 9/10/79.

DEPARTMENT OF TRADE
Accidents Investigation Branch
Kingsgate House 66-74 Victoria Street London SW1E 6SJ

Telephone Direct Line 01-212 5578
Switchboard 01-212 7676

Your reference

The Secretary
British Gliding Association
Kimberley House
Vaughan Way
Leicester

Our reference
EW/28/02

Date
30 August 1979

Attention BGA Safety Panel ELEVATOR NOT CONNECTED.

Dear Sir

ACCIDENT TO PIK 20D AT BOOKER AIRFIELD 19 AUGUST 1979

I attended the above accident on 19 August as AIB representative and was joined at the site by Mr Arthur W Doughty; BGA Safety Panel member and Mr Bert Page who is a member of the British Airways gliding club.

After taking witness statements and visiting the pilot in hospital, I left Booker airfield on 20 August with the understanding that the BGA has assumed responsibility for a report on the accident. I will be forwarding to Mr Doughty details of witnesses and photographs I have taken.

SUMMARY OF FLIGHT

The aircraft, a recently purchased Finnish glider was being aero-towed for its first flight of the day. After becoming airborne, the pilot appears to have lost control and released the tow cable at an estimated height of 150 feet. The tug completed a normal circuit but the glider dived steeply into the ground and was substantially damaged with the pilot substaining serious injuries.

Examination of the tail section flying controls indicated that the elevator attachment was disconnected at the vertical connecting rod with the safety pin hanging loose.

Yours sincerely

F E Pringle
Senior Inspector (Operations)
for Chief Inspector

cc Mr A W Doughty

Copy sent to [illegible]
[illegible] 1604
7NS 19/79

Airworthiness Directive

79-109 Rolladen Schneider

Date of issue:
July 4, 1979

Affected sailplane:
German Type Certificate No.262
Rolladen Schneider LS1-e, LS1-f, LS1-ef.

German Type Certificate No. 296
LS 2.

German Type Certificate No. 317
LS 3.

Subject:
Elevator drive.

Reason:
Possible flutter of the elevator.

Action and compliance:

1. Immediately upon receipt of this AD the maximum speed of the affected sailplanes must be limited to 200 km/h (108 kts). The actions of point 1a through 1c of the Technical Bulletin have to be accomplished before the next flight after the effective date of this AD.
2. After accomplishment of the actions of point 2 and 3 of the Technical Bulletin until December 31, 1979, at the latest, the restrictions specified under point 1 are no longer applicable.

Technical publication of the manufacturer:
Rolladen Schneider Technical Bulletin No.38/3013 of June 18, 1979, which becomes herewith part of this AD and may be obtained from Messrs. Rolladen Schneider Flugzeugbau GmbH, Mühlstr. 10, D-6073 Egelsbach.

Accomplishment and log book entry:
Action 1 of this AD to be accomplished by a skilled person and entered in the sailplane's log by a licensed inspector.
Action 2 of this AD to be accomplished by an approved service station and entered in the sailplane's log.

PRZEDSIEBIORSTWO DOSWIADCZALNO-PRODUKCYJNE SZYBOWNICTWA
"PZL BIELSKO"

B U L L E T I N No BE-016/79 "BOCIAN"

EMERGENCY

Ref: Special inspection of wing-to fuselage main fittings after each 50 flying hours

Obligatory for: All the gliders of SZD-9bis "Bocian" type

Elaborated in PDPS "PZL-Bielsko"
on July 17, 1979, by:

.....
Jerzy Stawowczyk, B.Sc.

Checked by:

.....
Wiesław Gębala, M.Sc.

Translated by:

.....
Wiesław Stafiej, D.Sc.

Accepted by:

.....
for Director of PDPS
PZL-Bielsko
Edward Margański, M.Sc.
Technical Director

Approved by: Ministry of Communication
Civil Aviation Administration
Civil Aircraft Inspection Board
on 23.VII.1979 .....
Signature

1.00 GROUNDS FOR AND THE WAY OF INTRODUCING THIS BULLETIN

In respect to the appearing in the glider operation the cracks on wing-to-fuselage main fittings the inspection of these fittings shall be performed according to the directions of this Bulletin, up to the time of establishing the explicit grounds of the above failure.

2.00 GLIDERS COVERED BY THIS BULLETIN

All the versions of SZD-9 bis "Bocian" type gliders.

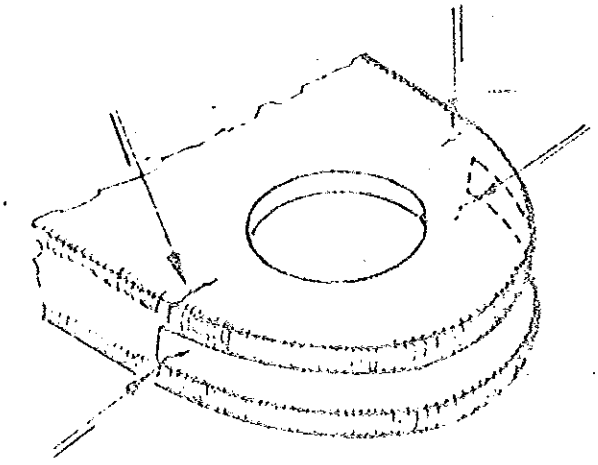
3.00 RANGE OF THE INSPECTION

3.10 To perform the inspection the wing should be derigged, the lacquer removed by means of nitro thinner or other lacquer solvent on all the inspected areas. Then the whole wing should be washed with hot water and dried. After the inspection the surfaces on which the lacquer has been removed should be protected against corrosion by means of applying an acid-free technical vaseline.

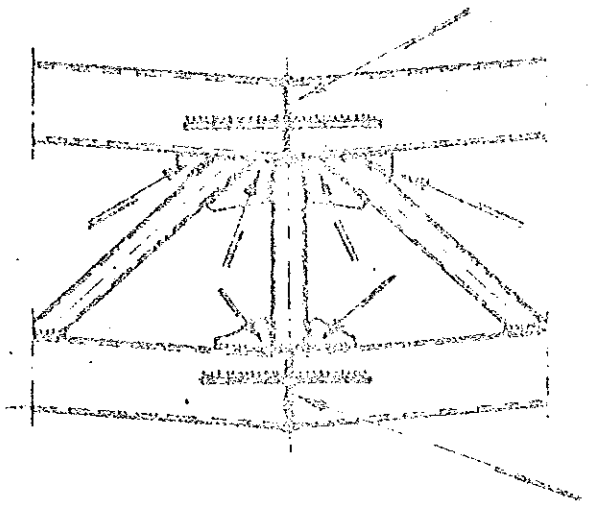
3.20 Inspection of fuselage framework

Check the condition of welding joints and fitting metal sheets using the magnifying glass of minimum 5 times augmentation and pay the special attention to the places shown on the sketches No 1 and 2. On the framework the front and upper surfaces shall be inspected.

Sketch No 1

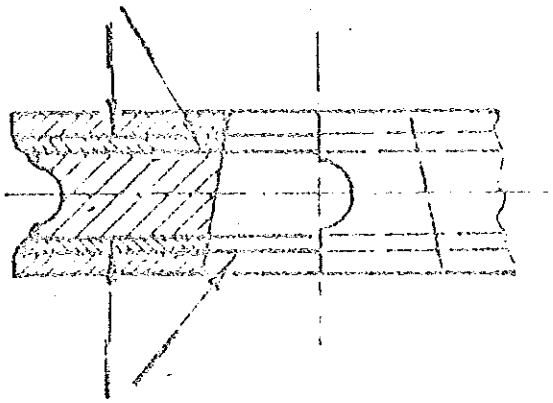


Sketch No 2



3.22. Check the splitting of the metal sheet set of the fitting. The maximum allowable splitting is 0.4 mm / see sketch No 3 /. The horizontal displacement of sheets is unacceptable

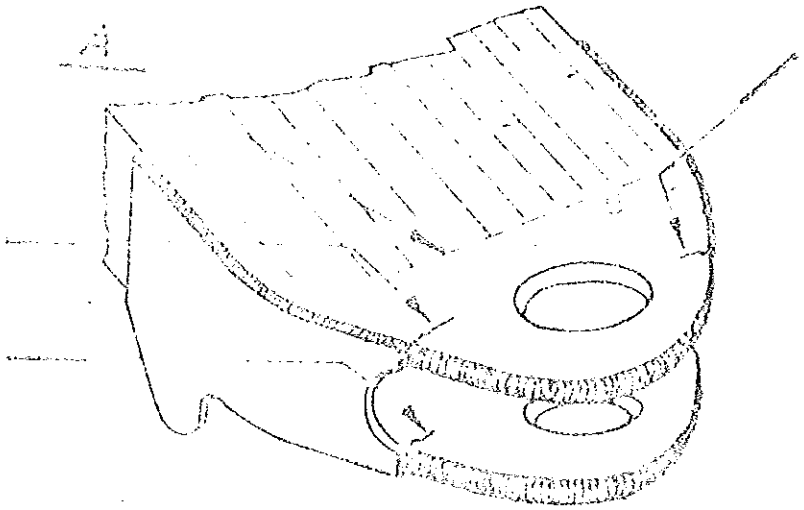
Sketch No 3



3.30 Inspection of wing main fittings

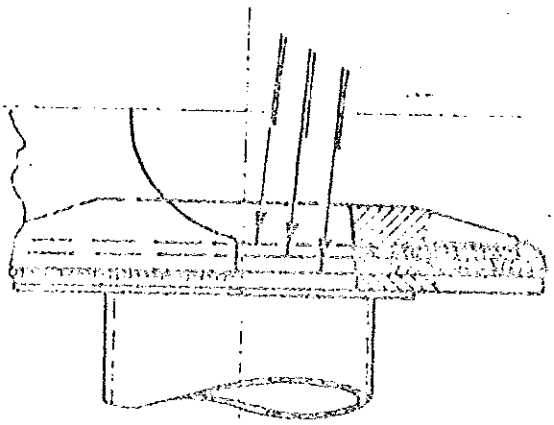
3.31 Check the condition of welding joints and fitting metal sheet using the magnifying glass of minimum 5 times augmentation and pay the special attention to the places shown on the sketch No 4.Check the absence of deformation /buckling/ of the surface aft of the line marked with arrow "A".

Sketch No 4



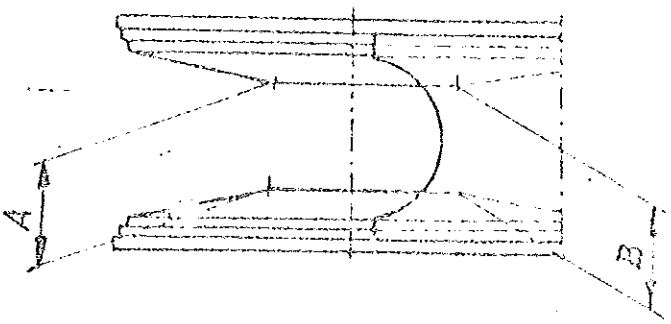
3.32 Check the splitting of metal sheet set of the fitting.The maximum allowable splitting is 0.4 mm /see sketch No 5/. The displacement of sheets is unacceptable.

Sketch No 5



3.33 Check the distance between the upper and lower fitting arms /see sketch No 6/. The allowable play of parallelism is 0.55 mm, checked in the places of dimensions "A" and "B".

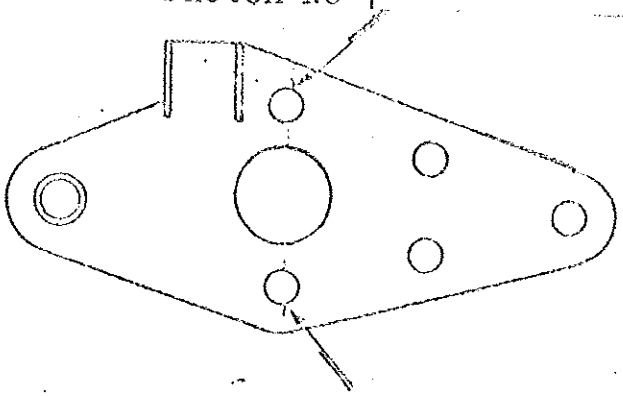
Sketch No 6



3.40 Inspection of the rear spar fitting

3.41 Through the inspection holes in the root rib check the condition of the rear spar fitting, good light provided. Pay the special attention to the absence of the cracks in places shown on sketch No 7. Access for checking of the fitting thorough the inspection hole made acc. to Bulletin No LE-07/75 "Bocian"

Sketch No 7



3.50. Inspection of the main conical bolts

3.51 Check the markings on the bolts /top, bottom, left and right side/. If no, mark on the bolts.

3.52 Disassemble the main conical bolt set.

3.53 Check the condition of contact surfaces. Check the bolt side surface against a light, using the linear gauge. The excessive clearance is not allowed.

3.54 Check the condition of the pins securing the bolts against rotation.

3.60 Inspection of conical bolts to fitting contact

3.61 Check the per cent of contact of conical bolt to wing fitting, and then to fuselage fitting /the bolts disassembled/. Pay attention to complete the proper bolt with the proper fitting. The contact area, checked by means of tracing ink, should be no less than 70%.

3.62 After performing the inspections acc. to items 3.20, 3.30 3.40, 3.50 and 3.61 assemble the bolt set and check the bolt-to-fitting surface contact on the wing rigged to fuselage. The minimum contact, measured by means of tracing ink, should be no less than 70% of area.

4.00 EVALUATION OF INSPECTION RESULTS

4.10 When during the inspection acc. to item 3.00 the crack of any fitting has been found, or acc. to item 3.23 the play of parallelism of fitting arms /dimensions "A" and "B"/, the flying shall be prohibited till this failure would be corrected in the way consulted with the producer of glider.

4.20 In case the bolt-to-fitting surface contact is lower than 70% of total area, the fitting shall be reamed and oversized bolts used acc. to directions of Service Manual. The bolt, if failed, shall be replaced by the new one. In these case also the checking of the bolt-to-fitting surface contact is necessary acc. to items 3.61 and 3.62

5.00 FINAL STATEMENTS

5.10 The gliders having completed below 500 ± 10 total flying hours shall be inspected in the nearest after 50 hours maintenance, acc. to the directions of this Bulletin. Operation of the gliders having completed more than 500± 10 total flying hours is prohibited, till the inspections acc. to the directions of this Bulletin are performed.

5.20 The inspection should be performed by the technicians having the high experience in ispecting or repairing the gliders, or by the aircraft mechanicians having the proper qulification and skill in servicing the aircrafts. The inspection shall be performed in collaboration with the National Authority.

5.30 Temporarily it is stated to:

5.31 Perform the inspection following the directions of this Bulletin after each 50± 5 flying hours.

5.32 On the gliders having completed the total flying hours above 500, performing of cloud and wave flying is prohibited.

5.33 * On the gliders being in operation more than 15 years, performing the cloud, wave and aerobatic flying is prohibited. It is allowed to demonstrate the several spinning turns by instructors or pilots having the full-aerobacy licence.

5.34 The mandatory works performed acc. to this Bulletin inscribe to the documents of the glider.

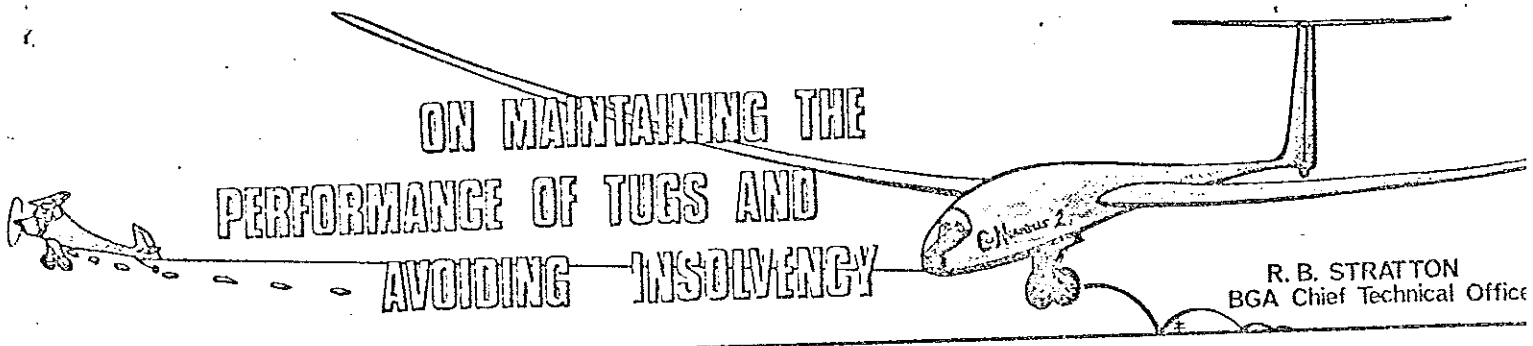
N O T E :

When rigging and derigging the wing to fuselage, pay specjal attention that the wing is not to much elevated or to much lowered. The careless rigging may cause the initial cracks of wing or fuse..age main fittings.

- THE END -

* THESE LIMITATIONS ARE NOT MADE MANDATORY BY THE B.C.A (Ref. Tech. Committee 10/10/79). Pol.

REPEAT TNS 9/10/79



ON MAINTAINING THE PERFORMANCE OF TUGS AND AVOIDING INSOLVENCY

R. B. STRATTON
BGA Chief Technical Office

From time to time beleaguered gliding club operators contact me about the performance problems of tugs and with one or other of my several hats on, I have become very familiar with the scatter that can occur.

Flight manual performance for American types is always optimistic, because it is based upon a calibrated engine, in an immaculate airframe, of below average weight, tested or corrected for dry conditions in Arizona! British Flight Manuals are factored to allow for normal scatter, arising from deterioration, and are, therefore, more reliable. The Flight Test Dept of the CAA are well aware of these discrepancies, and should be consulted where necessary, if you cannot account for your deviations from published figures.

High humidity will have significant effects upon engine performance, as water vapour displaces air, and the charge density decreases with increased humidity. The secondary effect of reduced charge density is to create an over-rich mixture, to which must be added the further effect of slower burning and slightly reduced BMEP (Brake Mean Effective Pressure!). Overall, 5% of engine power may be lost due to high humidity. At 96°F (35°C) the water vapour content will be eight times greater than at 42°F (5°C), and 10% should be added to scheduled take-off distances in muggy conditions.

High induction air temperature (whether due to high ambient OAT, or to intake duct leaks and poor shutter sealing in the Carb-heater box), has a disastrous effect upon engine power, and a 1% loss for every 10°F rise above 59°F (+15°C), is a good rule of thumb assessment. Hot air further reduces the charge density, and richens the mixture.

Loss of Ram Air, whether due to contaminated air cleaner element, or to the selection of alternate air or hot air systems, can lose 15% in the worst case. (The loss of Ram Air alone is worth 3%. Adding hot air, and its side effects on mixture, brings the total loss to nearer 15%.)

Ignition and its effects on power. One magneto out is worth about 3%. Incorrect ignition timing either way will put the engine off-peak.

Fouled, or incorrectly gapped plugs subtract from the total, and fouled plug barrel connectors (or cigarettes) can reduce the HT voltage at the electrode gaps. Check carefully for cracks or signs of flash-over inside the porcelain of the connector. Check that the spring is making a positive contact, and there is no gap between the spring and the plug.

Clean inside the barrel and the cigarette end, and do not expose them to moisture, even from your fingers. The HT voltage of typical USA magnetos is much higher than the old UK types and the temptation to "flash-over" is that much greater too!

Induction leaks, either upstream or downstream of the carburettor, are bad news. The upstream leaks reduce the dynamic intake, and encourage the injection of hot air. Downstream leaks weaken the mixture!

Compression checks. Although there are both pressure gauge and air-flow-meter types of compression testers, there is no real substitute for hand turning the prop, and counting the "pots". Using a pressure test device coupled to a compressed air source, it is possible to check the source of the losses by listening to the crankcase-breather, the induction or the exhaust systems. "Soft-pots" are not good news powerwise, but the effect on static rpm is not always significant.

Blow-by the pistons into the crankcase, raises the oil temperature, the oil consumption and allows oil into the combustion chambers to foul the plugs, and to slightly lower the effective octane rating of the fuel. Blow-by causes maximum power loss at maximum power at take-off or in the climb, when the BMEP is also at maximum.

Propellers: All other things being equal (infrequently), the propeller may have greater impact upon performance than any other factor.

(a) **The correct** type of propeller is a matter of careful consideration. High static rpm (and high tip-speed), reduces propeller efficiency. Equally, coarse-pitch blades produce low rpm, low BHP, but higher efficiency. (The power required to drive a propeller varies as the cube of the rpm). Propeller science is anything but exact, and very fat rules of thumb have been applied since the theory was evolved in 1909! The environmental considerations of fuel economy and noise have activated the propeller and ducted-propeller designers to unbung their think-tanks and hopefully propulsion efficiencies will increase.

(b) **Fine-pitch** (high rpm) propellers do not have all the advantages in the glider towing business. High rpm means increased power, fuel consumption, heat and, sometimes, vibration levels. There may be a close relationship between high operating costs and high rpm. The balance between optimum climb performance and optimised engineering costs may be a fine one.

(c) **Propeller maintenance.** A dirty prop is bad news. One often sees leading edges and trailing faces caked with compressed grass and dead flies. (Motor gliders are particularly susceptible – if you have little performance to begin with, you don't have much to lose.) Propeller blades should be cleaned daily, and inspected in accordance with CAA Notice No. 55, for signs of damage which may lead to blade failure.

"Re-working" propellers may include cropping them

span-wise, as well as changing their camber, and reducing their chord, all within manufacturers limits! The static rpm of the engine/propeller combination seldom seems to change significantly, perhaps because co-incidentally, one compensates for the other, but there is evidence to show that the effect upon aircraft performance is more dramatic.

The only true test is an accurately performed flight test, where the weight, cg, ASI and engine parameters are carefully monitored, and the test conducted in dormant meteorological conditions by a consistent pilot.

Over the years, grossly inaccurate or modestly dishonest climb performance testing has led to scatter of a devastating magnitude, such that subsequent C of A renewal tests are wildly adrift from previous records. Inevitably there is hassle with the CAA! In my opinion, it is better to declare the performance as measured and not to embellish the results in order to avoid the hassle. Hopefully, where public transport operation is not involved, CAA will trade-off honesty for hassle!

Airframes. Overweight and slovenly airframes suffer as much from reduced performance as do human beings. Battered leading edges (so often seen on ex-Army Auster 6s -- Terrier to you), gaps in cowlings and fairings, dirt, flies, mud and cow dung, are excellent consumers of fuel, power and performance. Evidence to this effect came my way dramatically having completed C of A performance climbs on 18 or more Chipmunks. The mean average was about 750ft/min corrected to ISA (+ 15°C). One, however, performed at 840ft/min for apparently the same weight and power. (Static rpm). This one was ex-Queen's Flight, now G-BCGC at Culdrose, which was obviously a very clean airframe, in the total mechanical engineering sense.

So if you want a check list by which to attempt to recover some lost performance you are strongly recommended to *"do"* the following:

(a) Check the intake filter, ducting, and hot/cold shutter systems. Clean or replace the filter regularly – shake-out the greenfly daily. Wash out the flame-traps on Gypsy-engined jugs, which may have become covered with oil and flies.

(b) Check that the mixture settings are correct for the particular engine. A rise of rpm should occur when the mixture is cleaned. Jets erode with fuel flow, and at fuel flows of 7 gallon/hr, a main jet will pass 14000 gallons in 2000hrs! It may not have been flow checked at the last overhaul, or it may have been accepted on top limit. It is only a small hole!

(c) Check for correct ignition timing, and ignition performance. Damaged HT leads and fouled plug-end connectors drain off energy. Contact springs should make good contact in the barrel of the plug.

(d) Check plugs for fouling. Clean and gap as required, and look for signs of incorrect mixture or over oiling on the hot end of the plug.

(e) Check for low compressions, and signs of blow-by. Monitor the oil consumption. If in doubt, test with a pressure tester coupled to an air supply, and listen for the leaks. Accurate diagnosis will pay for the test equipment, if you cannot borrow one from the local garage! Top-overhaul and re-ring as necessary to restore performance.

(f) Clean propellers, all over, for optimum performance. Look before you leap into a change of propeller in favour of high rpm, high-tip speed variants with reduced efficiency. Wooden propellers, well and accurately made in USA or Germany (or by your local cottage industry at home) are better vibration wise, do less damage when you bang into something and may not have diminished performance. (Tests with a Hoffman on a Chipmunk, proved this point!)

(g) Clean airframes must be kept clean in both the domestic and mechanical engineering senses and surplus weight in terms of bodies, fuel and "bric-a-brac" should be off-loaded.

(h) Carry out your climb performance tests at accurately known weights and speeds, without slip, and in dormant conditions. Correct them for deviations from ISA (15°C) at the rate of 4ft/min for every 1°C. Add the correction if the temperature is higher and *vice-versa.*

Dont's to avoid both financial and mechanical engineering bankruptcy: Do not waste time in the air or on the ground. Do not aerotow T-21s or other dragsters. (Modernise your glider fleet to match your tug capability). Never use tugs where winching, autotowing, or bungey launching, would be more cost effective. Do not neglect your tug fleet. Do not attempt short-field take-offs on a muggy day!

13. ENGINE PROBLEM

EXTRACT. CAST/9/79

Aircraft : Gulfstream American AA5 Traveler
Date : July 1979
Engine : Lycoming O-320

INTAKE FILTER BLOCKED!!

Just after take-off when at about 100 ft, the engine rpm reduced to about 1950. An emergency return was requested. A following aircraft reported black smoke from the exhaust and advised leaning the mixture. Having done this the pilot was able to complete a circuit at about 200 ft and land on another runway.

A ground run produced 2350 rpm for about 25 seconds, when the rpm started to drop; use of the electric pump cause a further fall in rpm and black smoke.

CAA Comment:
It was found that the air intake was completely blocked by matted grass, sand and oil. After the intake had been cleaned and the plugs serviced the engine operated normally.