

B.G.A. Technical Committee

T.N.S./8/9/77

Part 1. Airworthiness "Aggro" (gliders & motor gliders)

- 1.1. Standard Libelle. Axle failures. Several cases have been reported of shearing of the main wheel axle, adjacent to machined "steps". The subsequent damage to wheel assembly, undercarriage forks and doors will cost £140! Recommend NDT (Ardox) check of axles, or replacement by improved (D.I.Y.) product? (W. Meyer).
- 1.2. SF.25B (No's 4801 through to 4868) and SF.25C (4201 - 4255) LBA AD 77-217 (attached), requires inspection of the elevator support aft bearing pin. TM S-02-77 from Sportavia, refers.
- 1.3. Astir CS TM 102-7 (attached) requires the installation of 2 aileron supports, on ships 1001-1536. For details refer to Dave Paton, Chiltern Sailplanes, Wycombe Air Park, Marlow, Bucks. 10494-445854.
- 1.4. Standard Cirrus - Canopy lock pin sheared. The attached sketch shows a failure, resulting in canopy opening in-flight. (R. Parker - Dishforth).
- 1.5. Seat belt installations. D.I.Y. modifications should aim to improve crashworthiness and escapability. A recent case of exceptionally long bolts in harness attachments, and the removal of the load-spreading pads from the harness, would have resulted in substantial self-inflicted damages! (Eric Rolph).
- 1.6. I.S. 29D - Drain holes. There appear to be inadequate drains, anywhere in this machine, and accumulated water will generate corrosion. (Reported by Joe Podolski having sub-aqua'd one out of a gravel pit, undamaged except for instruments).
- 1.7. Pirat aileron backlash. Shrinkage of wood to which aileron drive is attached at the root end, will generate excessive play in the system (R. Parker - Dishforth).
- 1.8. K13 (Tost) wheel failures. "Overbraking" may be the cause of sheared bolts in Tost wheel assemblies. Independent 'caliper' brake control is preferable to interconnection with speed brake. (Len Morris - Swindon. Ref also T.N.S./7/77 and T.N.S./10/75).
- 1.9 BG 135 Series. Failure of aileron trailing-edge bonded joint results in loss of aileron torsional stiffness. Please inspect all ailerons for this failure, and repair by re-gluing and rivetting at about 2" pitch. (Reported by Ken Stewart).
- 1.10 PIK 20 Series. Safety Harness. AD 746/77 and service bulletin M15 require replacement of Auto LIV harness by PILOT - LEKO 1 type harness, because of difficulty in emergency evacuation.
- 1.11 IS 28B2. Foul between cable release system and rudder pedal adjustment fork, will make release mechanism stiff to operate. Modify as required, or lock rudder pedal adjustment to prevent the foul. (Report by J. A. Little).

Powered Aircraft "Aggro"

Part 1.0. Including extracts from General Aviation Safety Information (G.A.S.I. 8/77).

- 2.1. Electric Fuel Pump operation. The failure of diaphragm type engine driven pumps is not unknown. Therefore, in critical stages of flight, where such failures would be embarrassing, the electrical "back-up" pump should be selected, in accordance with relevant operating instructions, when flying below 1000ft a.g.l.
- 2.2. Diaphragm type fuel pump failures may be caused by:-
 - (a) deterioration and rupturing of the diaphragm*
 - (b) failure of the mechanical linkages

* Fuel leaks may be detected from the diaphragm pump, particularly when the back-up pump is in line.
- 2.3. Electrical fires in light aircraft. A PA-28-151 Cherokee Warrior was totally destroyed by fire, when a substitute car battery set fire to the battery box installation behind the rear seats. One passenger was injured during the evacuation!
- 2.4. Rollason D.62 Condor. Wing/fuselage attachment loose at the right rear bolted joint, and the joint was found to be fractured. The bolt in the joint was found to be thread-bound, contributing to the failure of the joint.
- 2.5. Rallye 150T and Rallye 150ST. MS 892A 150, MS 892E 150, MS 893A, MS 893E - FAA/AD/77/15/06 and Socata Service Bulletin 98/2 require visual inspection of engine mountings for cracks.
- 2.6. Gypsy 10 series engines. Crank case cracks. B.G.A. comment. Cracks are commonplace in the walls of 10/1 and 10/2 crank cases. Such external cracks may have been induced by cracks across the internal bulkheads within the engine, particularly through the oil scavenge drain holes. Generally speaking these cracks have proved to be non-catastrophic, and are evidenced by oil leakage. Experimental repair schemes have been tried, successfully, on the external cracks, but not, so far, on the cracked bulkheads, to which access is much more difficult.
- 2.7. Tost glider tow hooks. Tost hooks installed on tugs imported into the U.K. are acceptable to C.A.A. (Ref. E. Neidermeyer - C.A.A., Redhill, Surrey).
- 2.8. Fabric Testing (Tugs). The B.G.A. have written to the Chief Surveyor C.A.A., Redhill, drawing attention to the damage inflicted by destructive testing with the Sayboth tester, and the availability of the "Maule" tester, which

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is non-destructive. The Chief Surveyor has replied in a letter dated 27th July, 1977, Ref 9/90/Gen/B5, that the testing of fabric is "not a positive requirement to establish continued airworthiness". C.A.A. will also look into the Maule tester.

- 2.9: Repair of metal propellers (fixed pitch). Effectively, there are no facilities active in the U.K. for the repair of Fairey-Reed, and other metal propellers. Sooner or later this situation will have to be remedied by the emergence of a facility by some competent "cottage industry". Any suggestions?
- 2.10. Gypsy engine (Repair/overhaul). The following facilities are available:-
- (a) Norvic racing engines. Little Staughton, Beds. (Colmworth 700)
 - (b) Aero Bonner Shoreham Airport (07917-5764)
 - (c) Rollason's Ltd. Shoreham Airport (07917-62680)
 - (d) Hants & Sussex Aviation Ltd. Portsmouth Aerodrome (0705-62304).
- 2.11. Propellers. Wooden propellers may be available for certain engine installations in both U.S. and U.K. airframes to replace metal props, if the latter become extinct:-
- Hoffman propellers should be available from Personal Plane Services, Booker Airfield, Nr. Marlow, Bucks (Doug Bianchi) 0494-29432.
- Evra propellers from Rollasons, Shoreham Airport, (Frank Hounslow). Shoreham 62680.
- 2.12. Engine failure insurance. Because of the very high cost of engine repair/replacement, there may be some advantage in taking out insurance cover in respect of new or re-manufactured engines installed in tugs. Quotations should be obtainable from some aviation insurance brokers. (Mowbray Vale Thirsk 0845-23018).

Part III General. Tug accidents.

1. Introduction.

At least 6 tugs have been substantially damaged, (or written off) in the last 6 months.

AVERAGE = 1 PER MONTH

2. Causes.

All these accidents have been due to operational errors of judgement including the operation of aircraft with inoperative brakes etc!

3. Loss-of-Use.

Most will be out of action for several months, if in fact, repairers can be found!

4. Under Insurance.

Several will be "written off" because they are under-insured. (You can't have much of an accident these days for £2,000!).

5. Propellers.

Fairey-Reed propellers cannot be repaired by any organisation in the U.K. at the present time.

Alternative (wooden) propellers will have to be fitted, from Germany (Hoffman) or France (Evra) because there is no source of U.K. manufacture, and spares are becoming short and at exorbitant prices. (Ref T.N.S. 8/9/77).

6. Engines.

"Shock load" inspections will cost in excess of £1,000, and any defects discovered (other than those attributed to the accident), will be outside insurance cover, i.e. out of owner or Club's own pocket!!

7. Long Term.

There are no "cheap" tugs on the market. Typically second-hand PA18 Super Cubs are worth £10,000, and a good Chipmunk £7,500.

There is a shortage of tugs in the Clubs at the present time, and with the present accident rate, there is going to be an acute shortage.

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8. Conclusions.

- (1) Everyone should take drastic steps to improve the quality of their tug operations in order to avoid, avoidable accidents.
- (2) Review your Insurance cover.
- (3) Prepare contingency plans for the repair of your airframe, engine, and propeller.



R. B. Stratton
Chief Technical Officer

1/9/77

LATE NIGHT EXTRAS

Fairey-Reid Propeller Repairs / Overhauls.

Technical assistance and repair facilities may be available from Mr. Russell, E. Winn, Kilbratin Castle, Co. Cork. Telephone Bandon (023) 49601. Telex 8443.

Stamo - MS 1500. Repair / Overhaul.

The attached report by Ted Moslin contains very useful information.

Tost Hook Springs, and Weak Links manufactured out of L73, are available from: T. E. Macfadyen, 13, Southsea Road, Patchway, Bristol.

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STAMO MS - 1500.

Repair / Overhaul Information by Ted Moslin.

In reply to your letter concerning stamo MS 1500 motor spares, I do in fact carry a small stock of parts for this engine such as oil seals, thrust bearings, main and journal bearings, gaskets, valves etc. Pistons can be made to suit the cylinder for which it is required. Again I carry out the final machining myself.

As you may know, the cylinders are of Porsche manufacture and the pistons are made by Mahl. Each piston is machined to suit its cylinder and is not to be obtained separately. The engine itself consists of a 30hp Volkswagen crankcase machined to take a 1500cc early Porsche crankshaft, also it is opened up to suit the much larger bore cylinders. A modified camshaft is fitted and the rear of the crankcase is machined to take a thrust bearing housing which carries also the rear main bearing oil seal. This housing of course also carries the single Bendix magneto. The cylinder heads are standard Volkswagen but are bored out to take the Porsche cylinder spigot. The heads, by the way, are machined to suit only the cylinders which are fitted to the engine at the time of manufacture and thus cannot be interchanged.

As far as re-building this engine goes, I would strongly advise the bottom half to be left alone. The main reason for this advice is as follows. Once the crankcase has been split, the main bearing housings must be checked for ovality, and my experience on the past 15-20 engines has been to find that these bearing housings have gone out of round. The remedy is of course to line bore. But then the next problem is bearings to suit. These bearings can be obtained in Germany but always require further machining to make them fit. You will find every move you make on the bottom half of this engine will result in a big problem which can only be overcome by a machine shop back-up and a sound knowledge of engine building and design. If you possess both, then go ahead and take it all to pieces but please be warned, it is a very specialised unit.

The top half is quite simple except the piston rings which are quite non-standard. If you do manage to track some down, be careful that the chord is correct. If you do require a set, let me know as I am at this moment getting ten sets made up. The valve seats are standard at 45° but care must be taken to ensure the valve seat width does not go beyond .045" for the inlet and .055" for the exhaust. The valves are standard Volkswagen as are the springs and collets. The valve guides however are not standard and cannot be replaced without the correct gear. If you do wish to replace these, the material is PAN 'B' A. B.

STAMO MS - 1500 CONTINUED

The old guides must be pressed out, the guide apertures then jig-bored concentric to the valve seat, new guides made with an interference of .006" - .007", the head must then be heated slowly to 300° C. The valve guide must then be super cooled in liquid nitrogen to at least 70° below freezing and then of course must be pressed into position.

Again, if you require this service I will do it for you. But be warned, the price for a new head is £110.00. Anyway folks, that's the outline for the Stamo 1500. A good lightweight motor, a real hard worker but it can be a real headache once it is in bits.

TED MOSLIN.
April Cottage.

TNS/8/9/77

of the aileron deflection by supports on dismantled plane

model ASTIR CS, Work no. 1001 to 1536

1977

burdening of the control push rods in case of improper
during the transportation on ground (erection of the plane
on aileron) a support must be built in on each aileron.

Supply will be delivered
supports 102-0107.03 (Anschlagsbügel)
M 6 x 26 LN 9037 (Schrauben)
4 LN 9025 (Scheiben)
hexagonal nuts M 6 LN 9348 (Mutter)
key SW 10

dismantled plane:

Inserting of the screw which connects the joint pole head (Ge-
nigenkopf) on the rear of the last lateral push rod (Quer-
roßstange) with the impulse mounting. Now the push rod
is pushed slightly inwards.

The aileron support is to be guided into the cut of the aileron
so that the two straps of the aileron support are lying
in the cut of the impulse mounting.
(picture No. 2 and 3 and sketch)

When the support is inserted, the push rod can again be pulled
into the drills of the joint pole head, impulse mounting and aileron
so that they are straightened and the delivered longer screw (L =
26 mm) can be threaded through. Fit up the disc and the new
hexagonal nut. The narrow adjustment is the reason, that we send
the special fork key SW 10.

Important

When the assembly on the dismantled plane, control if the aileron
deflection is upwards in the measure (Maßbereich) 110 – 130 mm.
Adjust the hole until the deflection is reached. (picture 4)

Important

It must be checked on the erected plane, that the aileron deflec-
tion is in the tolerances as indicated in the controlreport. The
deflection must be in elevator-zero position. (picture 5 and 6)

Reference

The carrying out of the regulations 1 – 5 has to be certified
in the book by an examiner, Class III.

Proposed Indoctrination Course in
Glass Re-enforced Plastics (G.R.P.)

Vickers-Slingsby, Kirby Moorside, Yorkshire, may be able to provide the facilities for the above course at a cost of £50 per candidate, exclusive of accommodation, meals, travelling etc.

The objects of the course would be an introduction to damage detection, constructional and repair techniques, and minor repairs.

The course would be arranged from Saturday a.m. to Sunday p.m. during a weekend in the New Year.

Please reply on this proforma indicating your interest in attending such a course, in (say) March/April 1978.

G.R.P. Course 1978

Name _____

Address _____

_____ Tel. No. _____

B.G.A. Inspector No _____ Signature _____

Date _____

Comments/Recommendations for the course; preferred dates etc.

Please return to:-

Chief Technical Officer B.G.A., Kimberley House, Vaughan Way,
Leicester, Leics.