BRITISH GLIDING ASSOCIATION

BGA TECHNICAL COMMITTEE

TECHNICAL NEWSSHEET TNS 7/8/90

PART 1 Airworthiness "AGGRO" - Gliders - Please add to the 1990 Yellow Pages.

1.1 Nimbus 3D (T). Fuel tank support structure (G.R.P. blocks) have become unglued and migrated into the aileron drive system. (Reported by RAFGSA Bicester)

1.2 Pegasus 101. Tailplane front attachment securing fastner ceases to be secured in the fin, allowing the threaded portion to undo in flight. (Reported by Louis Rotter, Midland G.C.).

1.3 Upper Body Restraint Harness. (Ref TNS 5/6/90, item 1.9) Piper Cub type harnesses have been found in a K13, in which application they may become undone. (Reported by Stratford-on-Avon G.C.).

1.4 BG 135 Air Brake Hinge Brackets. Secured by retaining screws which were not in safely. (Reported by Marc Morley, Portsmouth Naval G.C.).

1.5 OLY 463 - DRAG SPAR Fittings. Loose - probably due to shrinkage. Tested by application of loads at the wing tips. (Reported by Ken Blake).

1.6 OLY 2 - Elevator Mass Balance. Likewise no longer as secure as it needs to be, due to shrinkage. (Reported by Ken Blake).

1.7 K13. Failure of the TRIM TAB Root Rib. Separation in flight caused a degree of elevator flutter during a winch launch at Lasham. TNS 1/2/90 and Schleicher Tech/Note draw attention to give separation in this area.

1.8 L13 Blanik. Extension of Safe Fatigue Life. The Gliding Federation of Australia have sent BGA copies of their Airworthiness Directive 369 (Issue 1), which could be applied to Blaniks in the UK which are likely to exceed the U.K. limitations of 25,000 launches or 5225 hours. Eddy current inspection to AD 369 (option c), could extend the life to 6000 hrs.

1.9 Centrair 201B (Serial No's 201026 thru 201077). Failure of the air brake handle lower arm, due to cracking. Centrair SB 201-207 refers and FAA AB/90/13/11.

1.10 T65 Vega. Flap System. Failure of the universal joint (pre mod 16), in flight. (Reported by Michael Garrod). TNS 8/87 also refers.

1.11 DIMONA. Fin skin separation at top rudder hinge requires repeated inspection.

1.12 KA21's. Front Rudder Pedal Assembly found cracked

1.13 Control Deflections & Reversed Controls.
(1) SHK Yaw Control deflections not correctly rigged.
After Major Repair.

(2) After replacement of Rudder actuator (supplied undrilled). Rudder controls were found to be reversed only when the glider arrived at the launch point! What about duplicate inspections?

PART 2. Airworthiness "AGGRO" Powered Aeroplanes

2.1 Lycoming Cylinders - Cracking. Service Letter L228 (herewith), is self explanatory.

2.2 Piper PA25-235 (Pawnee). CAA Emergency AD 004-06-90 requires inspection of tailplane attachment structure. On the reverse, are the correct methods of adjusting the tailplane wires.

2.3 Fatal Accident Report RF5. A.A.I.B. Bulletin 6/90 refers - extract herewith.

2.4 Fatal Accident Report (Collision) Grob 109. A.A.I.B. Bulletin 7/90 (Herewith) refers.

PART 3 General Matters.

3.1 Disabled Persons - Manual Rudder Controls. Have been developed for :-
a) ASK6E - Westley Aircraft - Cranfield.
b) JANUS - RAFGSA - Bicester.
c) KA7/K13 - Trent Valley G.C. - Kirton Lindsey.

3.2 Electronic Weighing Equipment. Is available from Devon & Somerset Aviation, 15 Shutewater Close, Bishops Hill, Taunton, TA1 5EH. (0823 288200).

3.3 KA21's (ex Air Cadet "Vanguards"). Will be offered for sale shortly. Contact Mr Fenley (MOD) 071-921-7309

R.B. STRATTON
CHIEF TECHNICAL OFFICER

Civil Aviation Authority
Safety Regulation Group
Aviation House
South Area
Gatwick Airport
Gatwick
West Sussex RH6 0YR
Tel: Switchboard 0293 567171
Direct Dial 0293 573149
Telex: 878753 Fax: 0293 573999

004-06-90.

Aircraft Maintenance
Standards Department

9/97/CtAw/171

Royal Air Force Gliding
and Soaring Association
Rafgsa Centre
Bicester Airfield
Bicester
Oxfordshire OX6 9AA

7 June 1990

CAA EMERGENCY AIRWORTHINESS DIRECTIVE 004-06-90
PIPER PA-25, PA-25-235 AND PA-25-260 AIRCRAFT
INSPECTION OF TAILPLANE ATTACHMENT FOR CRACKS

BACKGROUND

A report has been received of an in-flight failure of the tailplane attachment of a PA-25. Investigation revealed that the starboard forward fuselage-mounted attachment tube had suffered a fatigue failure at the point where the tube was welded to the fuselage structure. This Directive is issued to alert aircraft owners to the problem and to introduce a preliminary inspection. This Directive may be revised after a review of the findings from the inspection and when the problem has been discussed with Piper Aircraft Corporation and the FAA.

APPLICABILITY

Applicable to Piper PA-25, PA-25-235 and PA-25-260 aircraft.

COMPLIANCE

Compliance is required not later than 10 flying hours or 4 weeks whichever is the sooner from the effective date of this Directive which is 11 June 1990.

REQUIREMENT

Inspect the upper and lower bracing wires for correct rigging. Remove both halves of the tailplane and peel back the fabric patches which cover the forward transverse tailplane attachment tubes. Inspect these tubes for cracks using a dye penetrant or equivalent NDT inspection technique acceptable to the CAA. Pay particular attention to the areas adjacent to the welds. Report all findings of both inspections, whether defects are found or not, to the CAA Safety Data and Analysis Unit giving details of the total number of hours the part has accumulated in service.

Queries regarding this Directive should be referred to the Structures and Materials Department at the above address.

R J TEW
Aircraft Maintenance Approvals

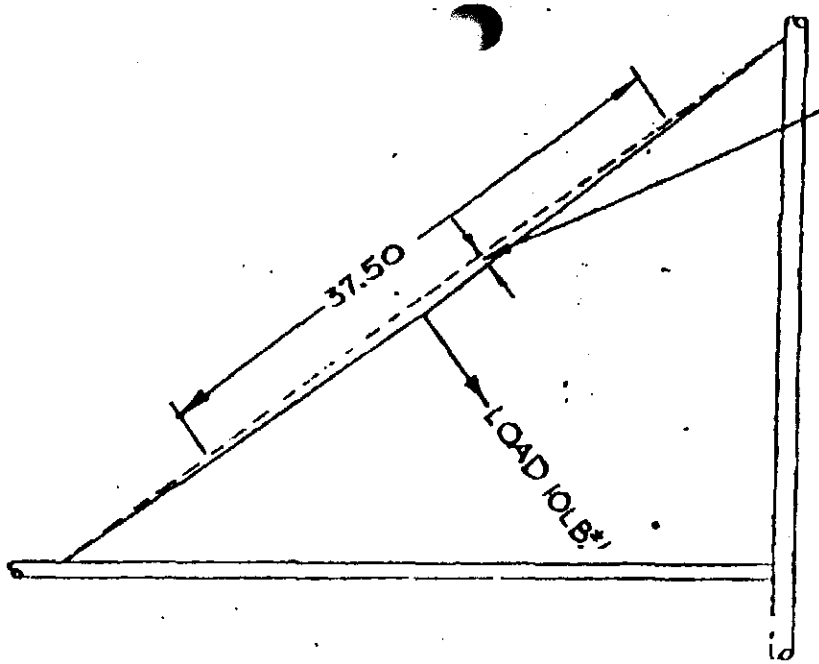
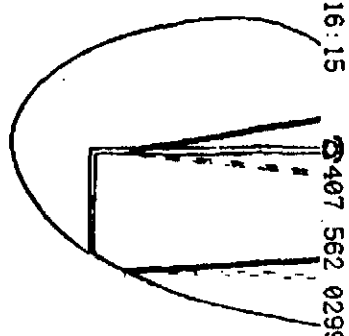


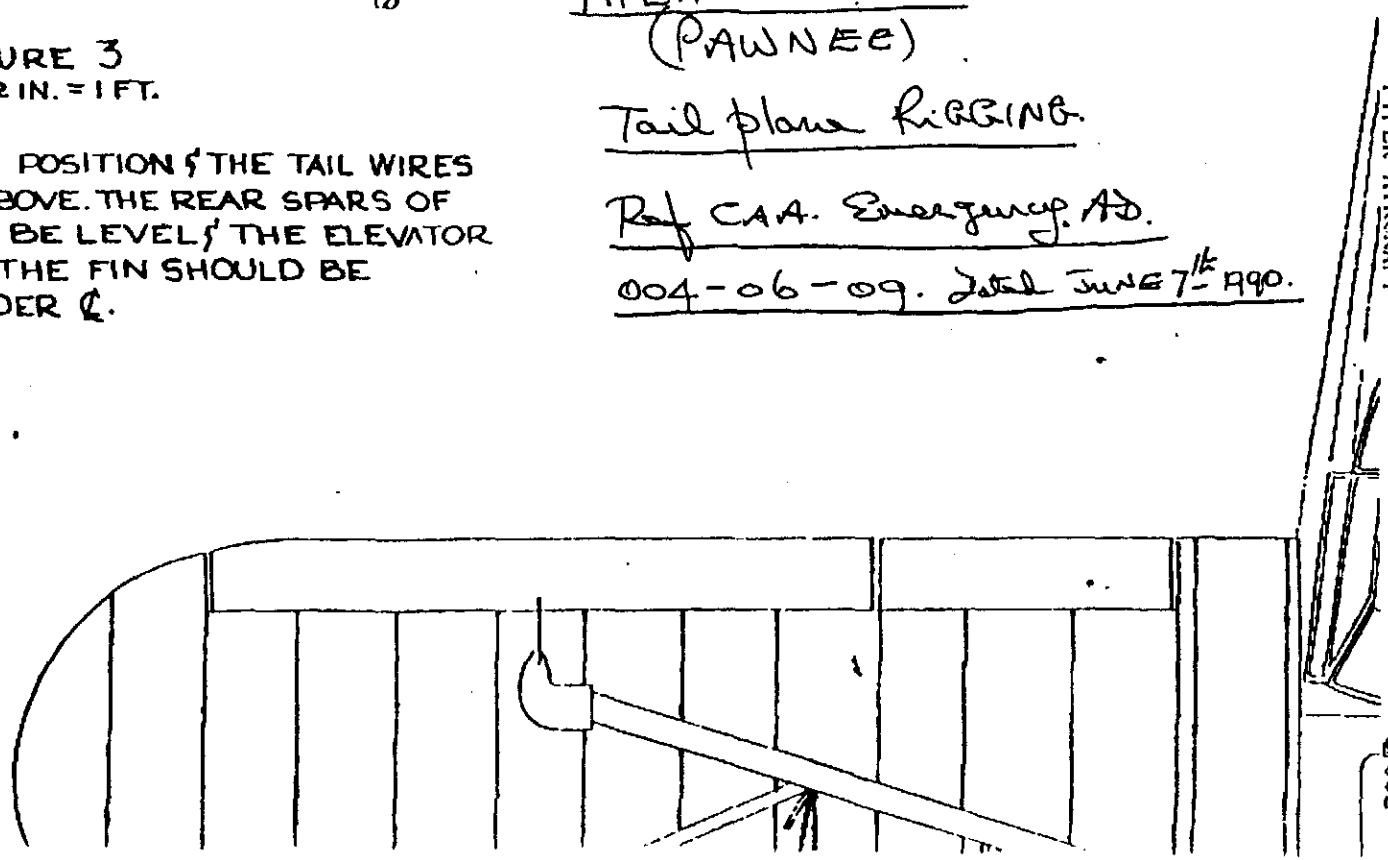
FIGURE 3
1½ IN. = 1 FT.

ADJUST TO OBTAIN .437 ± .06 DEFLECTION WITH LOAD APPLIED AS NOTED.

WITH AIRPLANE IN LEVEL POSITION & THE TAIL WIRES ADJUSTED AS NOTED ABOVE. THE REAR SPARS OF THE STABILIZER SHALL BE LEVEL & THE ELEVATOR HINGE LINE STRAIGHT. THE FIN SHOULD BE VERTICAL AT THE RUDDER ℄.



PIPER PA25-235
(PAWNEE)
Tail plane RIGGING.
Ref CAA. Emergency AD.
004-06-09. Dated JUNE 7th 1990.



PA25-235

TEXTRON Lycoming

Williamsport Plant
Textron Lycoming/Subsidiary of Textron Inc.
652 Oliver Street
Williamsport, PA 17701 U.S.A.

SERVICE LETTER

Service Letter No. L228
April 16, 1990

SUBJECT: Cracking of Cylinder-Head Exhaust Port

MODELS AFFECTED: All field-reconditioned, parallel-valve cylinder heads.

TIME OF COMPLIANCE: At next inspection or overhaul.

Field inspections have revealed that the cylinder-head exhaust port area on some parallel-valve cylinders reconditioned in the field may be prone to cracking. The cracking is confined to the left side of the exhaust port, next to the spark plug hole (see Figure 1).

Because the cracking may be of such a fine configuration, it can be difficult to detect visually. Therefore, a dye penetrant must be used for inspection purposes. After the dye penetrant has been applied to the left side of the exhaust port, the root areas of the fins next to the spark plug hole can then be inspected for dye seepage.

Textron Lycoming advises replacement of the cylinder-head/barrel assembly, if cracking is evident.

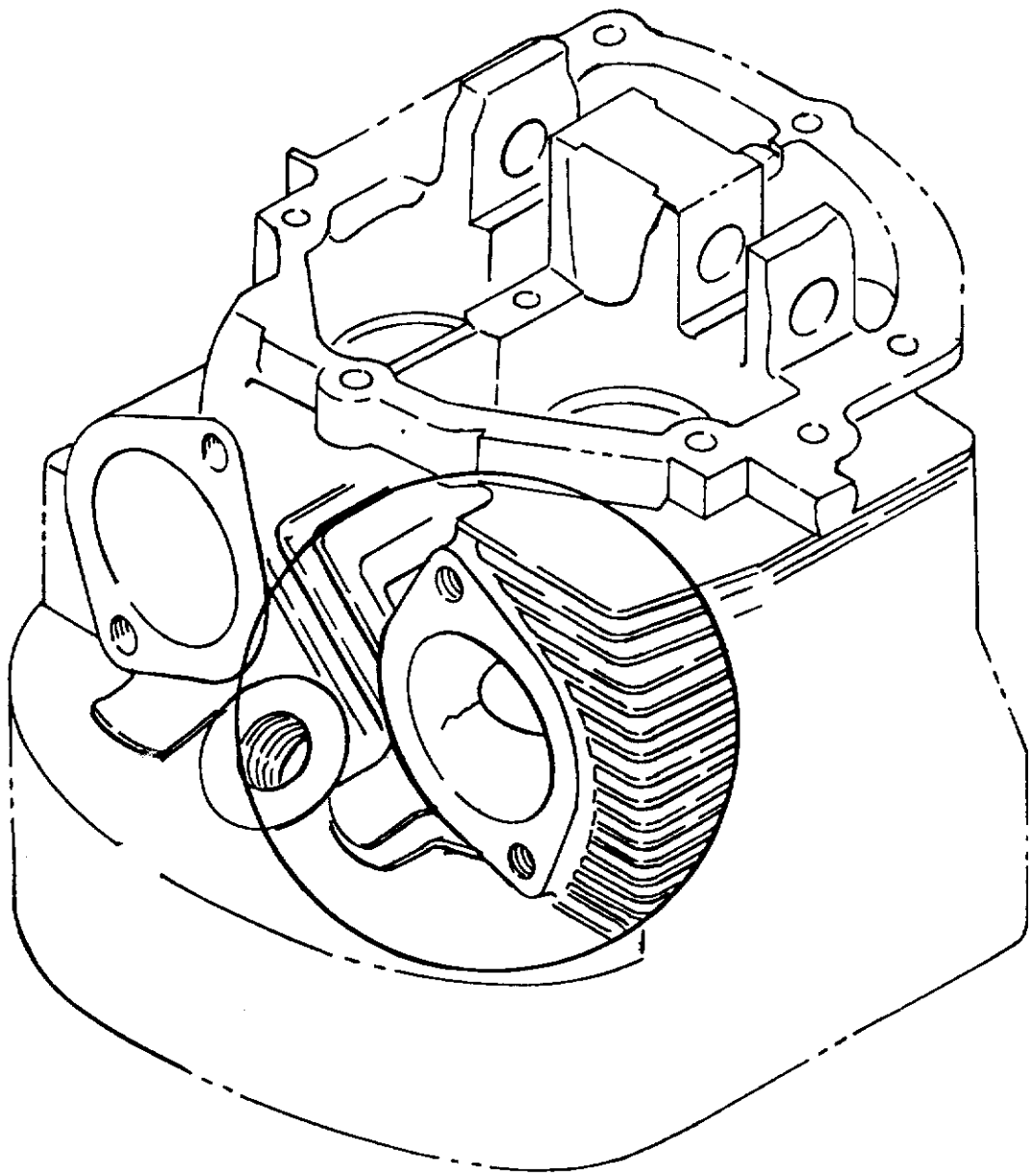


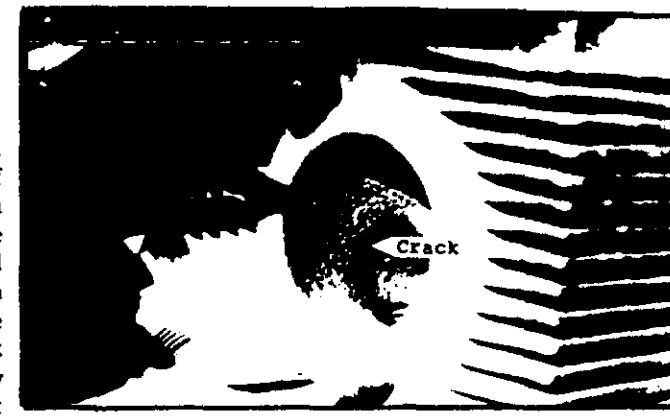
Figure 1. View of Exhaust-Port Area Prone to Cracking

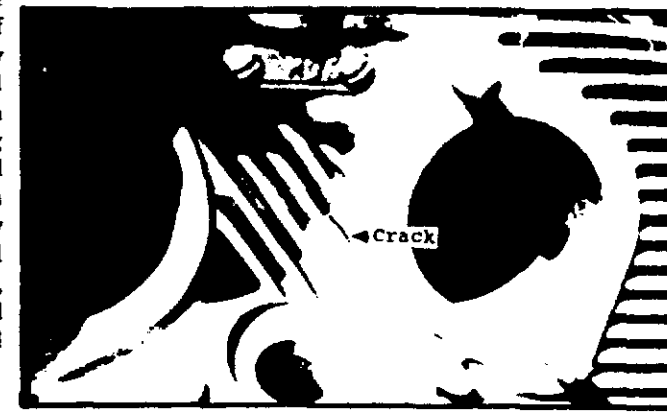
CYLINDER FAILURES.

E43 Lycoming O-320, O-360, O-540 and IO-540 engines. - A lengthy item on cracked cylinder heads is reprinted in full.

Lycoming Models O-320, O-360, O-540, and IO-540

Cracked Cylinder Heads



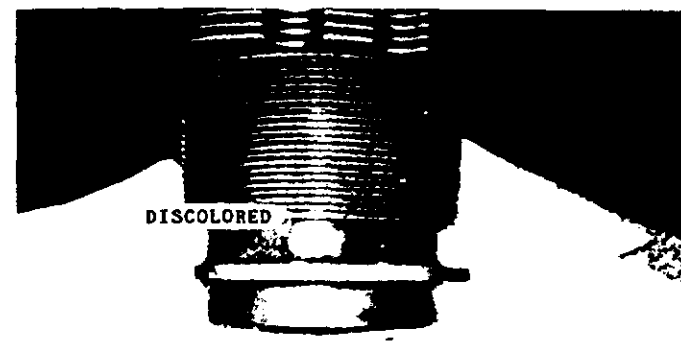


Several reports have been received of cracked cylinder heads. These cracks are located in the exhaust port area with most of them extending from the exhaust valve seat or guide, then down the port showing externally between cooling fins. These cracks often do not show up during routine 100-hour/annual inspections, and will not be detected by normal compression check methods. One submitter states that the only sure way he has found to detect these cracks is to remove the exhaust stack and, while shining a bright flashlight up the exhaust port, spray contact cleaner into the port. If a crack is present, a fine wet line will appear, which is the contact cleaner in the crack. He has found that other cleaners do not detect the crack. Many of these cylinders have been overhauled at least once to as many as four times and most have been operated with 100 LL fuel and multi-viscosity oil. In the field, cylinder overhaul can include chroming and also rebarrelling. During the rebarrelling process the traceability of individual heads, hence true total time on those heads is lost. Therefore, it could well be that a cracked cylinder head with, for example, 360 hours SMOH, may in fact have 4000 total hours on it. It certainly behooves all repair stations or other persons performing cylinder repair, rebuilding, or engine overhauls to perform an adequate and effective NDT inspection, not limited to any one type, on all cylinder heads, including the areas inside the exhaust ports.

E44 TCM engines. - The following long item on piston failures is reprinted in full.

Teledyne Continental Models I)-470C, E-185-9, IO-520D, TSIO-520CE, TSIO-520N

Piston Failure



There have been several reports of engines which were utilizing the TCM steel insert piston experiencing failure. The piston/cylinder failure is sometimes preceded by cylinder discoloration and paint burning off the base of the cylinder in a triangular shape toward the cylinder head. Impending failure is sometimes accompanied by a tapping sound similar to that of a collapsed lifter, high oil temperature, and high cylinder head temperature. Upon disassembly after failure, severe piston scuffing below the third ring, (possibly indicating insufficient clearance) is often evident. Part times since new range from 1.5 hours to 40 hours.

NOTE: This article appeared in Alerts 134, September 1989. Another report has been received telling of this problem occurring with Superior Air Parts as well as TCM steel insert pistons and that it is affecting the TCM engine family from the C-90 to the TSIO-520.

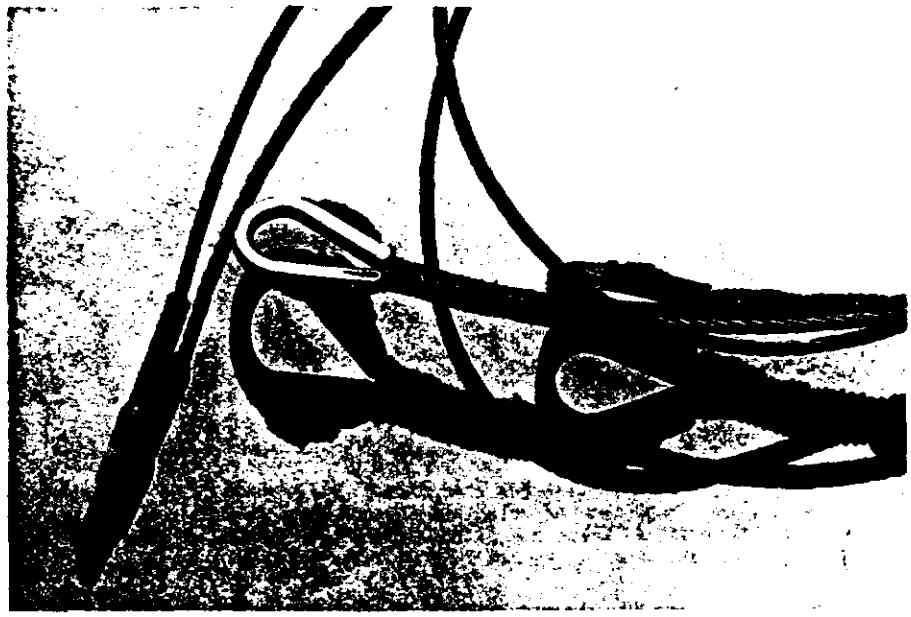
END

E5. ACCEPTANCE OF AIRCRAFT COMPONENTS

Aircraft Type : DHC1 Chipmunk
Date : March 1990

The aircraft was presented to an M3 organisation for its annual inspection. The aircraft owners supplied a replacement flap cable and a tail wheel bolt with a Certificate of Conformity.

When the engineer tried to fit the flap cable he found that the thimble and the string binding made it too large to fit through the locating hole in the wing ribs. In addition, when it was attempted to tighten up the turn buckle, he found that the threads were of a different type and that the threaded section was of such poor metal that it sheared as soon as any pressure was applied.



The tail wheel bolt was found to be slightly too large: when the cadmium plating was removed it was found that this was a previously used bolt which had been recadmium plated.

CAA Comments:
The attention of all concerned and particularly licensed engineers who will finally be end-users of aircraft spares, is drawn to Airworthiness Notice 17 entitled "Acceptance of Aircraft Components for aircraft with a Certificate of Airworthiness".

The problem of bogus Aircraft spares is Worldwide and there are known cases of serious injuries caused by crashes where bogus parts were used. Do not let this happen to you - vigilance when acquiring spares spares is essential.

No: 6/90 **Ref: EW/C1152** **Category: 1c**

Aircraft Type and Registration:	Sportavia-Putzer Fournier RF5, G-AYAI	
No & Type of Engines:	1 Sportavia-Limbach SL 1700-E piston engine	
Year of Manufacture:	1970	
Date and Time (UTC):	18 March 1990 at 1535 hrs	
Location:	Near Rattlesden Airfield, Suffolk	
Type of Flight:	Private (pleasure)	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Fatal)	Passengers - 1 (Serious)
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	57 years	
Commander's Total Flying Experience:	285 hours (of which 9 were on type)	
Information Source:	AAIB Field Investigation	

At about 1530 hrs the aircraft took-off, from runway 24 at Rattlesden Airfield, for a flight to Tibenham Airfield. The weather was fine and the surface wind southerly at about 12 kt. Several members of the local gliding club saw the take-off and noted that the climb attitude appeared to be steeper than normal. The passenger, who occupied the rear seat, recalled that the airspeed indicator read about 80 mph shortly after take-off and he also noticed the steep climb attitude. At about 400 feet agl, as the aircraft crossed the upwind end of the runway, it entered a left turn. Almost immediately the passenger felt a marked vibration. He noted that the airspeed had reduced to about 50 mph and the aircraft was in a high nose attitude. The pilot lowered the nose and reduced the angle of bank slightly. The vibration ceased and the speed increased to about 80 mph, accompanied by a height loss of about 200 feet. The pilot again raised the nose, the vibration started and the aircraft continued to descend in a steepening left turn until it struck the ground left wingtip first.

On-site examination indicated that the aircraft had impacted with almost 90° of left bank and in a nose down attitude of about 45°. The speed at impact was moderate and the aircraft was complete, with the undercarriage locked down, the spoilers in and the engine running. The cowl flaps were probably open.

In the subsequent detailed examination of the wreckage at AAIB Farnborough, it was established that the flying controls had all been serviceable and that the wing outer plane rigging pins has been engaged (the FR5 has folding outer wing panels). No defect which would have contributed to the accident was positively identified from the wreckage. Stall warning was provided by a vane switch, in the leading edge of the wing, which, when made, completed the circuit to a red warning light in the front cockpit. When the switch was tested it could be heard to click at about mid travel but no electrical continuity occurred until it was at the limit of its upward travel and contacting the top of the slot. The area around switch was damaged and it was not possible to determine how it would have operated prior to impact. The co-owner, who had noticed that it did not operate on the ground, believed it was fitted with some kind of interlock, however, study of the electrical circuit diagram showed this not to be the case.

The forward and rear airspeed indicators were attached to a common source to which air pressure was applied. The forward indicator registered about 15 mph higher than the rear, however, as the former had been severely disrupted by the impact it was not possible to say whether this discrepancy had existed prior to the crash.

Analysis of samples of fuel taken from the tanks and the carburettor showed contamination in both cases. The contamination of the tank fuel was believed to have occurred post accident, and that of the carburettor fuel to have been a consequence of the impact.

The post mortem examination of the pilot did not reveal any pre-existing medical condition which could have contributed to the accident.

The British Gliding Association has indentified a problem which can exist when pilots, whose experience is mainly on Group A aircraft, fly motor gliders. The latter have relatively low power and there may be a tendency to climb too steeply after take-off with a consequent loss of airspeed.

A.S.I System Error?

No: 7/90 Ref: EW/C1158 Category: 1c

Aircraft Type and Registration:	(a) Grob G109, G-BKNJ (b) Robin HR 100/210, G-BFWW
No & Type of Engines:	(a) 1 Limbach L2000-EB1A (b) 1 Continental IO-360-D piston engines
Year of Manufacture:	(a) 1983 (b) 1974
Date and Time (UTC):	3 May 1990 at 1132 hrs
Location:	Wolford Heath, Warwickshire
Type of Flight:	(a) Private (b) Private
Persons on Board:	Crew (a) 2 (b) 1 Passengers (a) None (b) One
Injuries:	Crew (a) 2 (fatal) (b) 1 (minor) Passengers (a) N/A (b) 1 (minor)
Nature of Damage:	(a) Aircraft destroyed (b) Collision damage to propeller spinner, propeller blade, cockpit canopy, fin and rudder. Extensive landing damage to wings and wheels.
Commander's Licence	(a) and (b) Private Pilot's Licence
Commander's Age:	(a) 58 years (b) 66 years
Commander's Total Flying Experience:	(a) 5650 hours (of which 3000 were on type) (b) 886 hours (of which 3 were on type)
Information Source:	AAIB Field Investigation

The accident was a mid-air collision between the Grob motor glider, annotated "(a)" above, and the Robin aircraft annotated "(b)".

The Grob, based at Enstone airfield, had been operating in 'practice area Charlie' to the north of the western end of the Upper Heyford Mandatory Radio Area (UHMRA) and was returning to Enstone. At 1129 hrs, the pilot gave his position to Upper Heyford radar as 2 nm northwest of Moreton-in-Marsh at 3,300 feet and, about 1 minute later, 1 nm north of Moreton-in-Marsh, steering 120° for Enstone. This is confirmed by a radar recording provided by the London Air Traffic Control Centre (LATCC). He was identified by Heyford radar information service and told that he had "Traffic (at) right, one o'clock, six miles, northwest bound...", which he acknowledged with "Golf November Juliet, looking". The traffic quoted was the Robin, which was actually "northeast bound". This was Heyford radar's last communication with the aircraft. There was no cloud at this time but the visibility was restricted by haze, probably to less than 6 km.

Meteorological information

The initial weather information concerning the forecast landing conditions at Glasgow, that the commander reportedly obtained from the Meteorological Service at Amsterdam (Schipol), indicated generally cloudy conditions with the forecast:-

> Valid 0400/1300 hrs - Surface wind 220/12 kts, visibility in excess of 10 km, cloud 2 oktas cumulus 1800 ft and 5 oktas strato-cumulus 3000 feet, temporarily visibility 7000 metres, cloud 5 oktas cumulus 1200 feet. Probability 20% between 0400/0700 hrs visibility 5000 metres, showers of rain or snow, cloud 5 oktas at 800 feet.

An aftercast provided by the Meteorological Office, Bracknell has reported that, at the time of the accident, the synoptic situation was a cold front lying from Malin Head to Islay to Fraserburgh. Visibility was generally 15 kilometers in continuous light rain, reducing considerably in sleet and snow on high ground. Cloud: patches of Stratus base 800 feet, Broken Strato-cumulus base 2000 feet merging with Overcast Layers base 3000 feet tops to 10000 feet. The Zero Degree Isotherm was 2000 feet. The aftercast concludes with the remark that moderate accumulations of ice may well have been picked up with prolonged flight in strato-cumulus near the frontal zone on approach to Glasgow. Prior to descent towards Glasgow the aircraft had cruised for about 2 1/2 hours at FL 85, where the air temperature would have been generally around minus 14 degrees Celsius.