



CIRCULATION ALL OWNERS.

ACCIDENT REPORT AND SERVICE BULLETIN NUMBER - 23 - 13TH. AUGUST, 1987.

If you no longer own your Mainair aircraft please pass this bulletin on to the new owner and inform us accordingly.

(1) ACCIDENT - GEMINI FLASH 2A - POPHAM 8-8-87 - INTERIM REPORT ONLY TO PREVENT RUMOUR AND ILL FOUNDED SPECULATION.

A Pilot borrowed the aircraft for a test flight. He owned a Gemini Flash 2 and had ? * hours. A pilot on the ground witnessed him about ½ mile away at a height of around 700ft. He saw him execute a high bank turn in excess of 60° continued for 360° which was then reversed in a figure of 8 manoeuvre. As the aircraft banked steeply the opposite way, he saw the wings twisting violently and observed a failure of the wing tip. The aircraft descended in a steep spiral. The witness considered the turn manoeuvres were intentional.

The damage to the aircraft was extensive. The monopole had failed in bending rearwards but the internal safety wire had prevented seperation. The control frame base bar had multiple impact damage and had failed in bending. Both leading edges had failed in bending in a negative mode 4ft. from the tip. The front strut had failed in bending. Wood fibres were found impressed into the top of the wing keel fin bolt and the fin fabric was torn and marked. At this early stage it seems evident that the trike unit contacted the wing keel and a negative load failed the leading edges causing complete loss of control. * Pilot hours unknown at present.

REASONS.

Official investigations and a coroner's inquest will decide the cause of the accident and make recommendations accordingly. Our advise is a repeat of that offered before. Microlights are limited to bank angles not exceeding 60°. This is the limit and should not be used as a figure you should routinely achieve. All machinery has limitations and pilots I have seen frequently flying at the limits of their microlight flight envelope would not consider driving their car at its limits or operating any other equipment in a similar fashion.

Please operate your microlight within its flight envelope as placarded. Max bank angle 60° max pitch 30° no whip stalls, tail slides loops or aerobatic manoeuvres.
These are maximum limits. There is no reason to ever approach them during normal microlight flight.

SIMILAR ACCIDENTS.

Previous accidents show similarity with this accident. It is becoming obvious that high bank turns, particularly high banked reversing turns can lead to pilot control loss. The reasons are not yet proven beyond doubt but may include pilot control error, wake turbulence, trike inertia forces beyond the ability of the pilot to conteract or a host of other unknowns.

(2) WING CLEANING ALL TYPES.

An owner recently washed his Flash 2 wing and since it had been stored outside it was stained. He decided to add industrial bleach which brought the fabric up like new. A few weeks later when we checked the wing, degradation was so severe we could tear the fabric off the frame easily by hand. The sail was completely scrap. The aircraft had logged less then 40 hours. DO NOT USE ANY CHEMICALS OR SOLVENTS TO WASH YOUR MICROLIGHT. If you must clean it, use mild washing up liquid, lots of water, and remove EVERY trace of soap or detergent.

(3) WHEELS - ALL TRIKE UNITS.

The nylon wheel retainers and bearings on plastic centred wheels can wear and become damaged especially on runways or lots of cross wind operation. Keep them clean, well greased and inspect regularly.

(4) LOCK NUTS - ALL MICROLIGHTS.

The BMAA inspector network have instructions to ensure 1½ threads are visible through all nyloc nuts. Check your aircraft thoroughly before taking it for inspection.

(5) PRIMER BULBS - ALL TRIKES.

An operator reported that a 9 month old Gemini, stored for much of its life had suffered failure of the Primer Bulb which had perished and split. The reasons why are unknown. Check your Primer Bulb and fuel lines carefully and if they show signs of hardening or cracking we recommend replacement. A split fuel line or bulb may result in loss of your aircraft.

(6) RADIATORS - GEMINI TRIKES 462 ENGINES.

We have had reports of failure of the top rubber mounts, particularly the left hand one. There seems to be a variation in the rubber consistency or vibration level between aircraft. Keep a close watch on it and a plastic tie wrap will act as a back up in case of failure. Replacing the mount with the stiffer exhaust type may result in failure of the metal bracket which is soldered to the radiator. The 462 relies on its coolant entirely and loss will result in substantial engine damage. Maintain your cooling system carefully and regularly inspect for solder joint cracking particularly where the pipes are connected. Look for coolant staining, hose cracking and coolant fin damage.

(7) BOX MOUNTS - 462 ENGINES.

Cracking has been discovered in the box mounts where they fit to the seat channel. There does not seem to be consistency between models and the mounts and tensions are identical between the 503 and the 462. We presume the greater torque of the 462 may be over-stressing the component and we suggest careful monitoring. Propeller balance plays a large part in air frame component life and these cracks are high frequency fatigue cracks greatly affected by engine vibration.

(8) ROTAX GEARBOXES.

Many of the irritating part failures such as the previous two are directly related to vibration and many aircraft have not had the gearbox drive shims rechecked for tension. The final gear drive locates in an open socket and is held with significant disc spring tension. These springs weaken with age and use and hence a higher level of propeller vibration results. The remedy is to have the gearbox factory overhauled as special tools are needed.

(9) FUEL PUMP - ROBIN ENGINES.

An operator reported failure of the fuel pump diaphragm after 75 hours. The diaphragm had split and resulted in power loss and poor running. The operator said that oil leakage from the exhaust manifold and flooding of the engine led him to check the pump, although this was not initially suspected as the prime cause of the engine misfiring. The engine failure resulted in a forced landing and subsequent substantial damage.

(10) CAPACITOR - ROTAX ENGINES.

A Rotax 447 engine was suffering from power loss and RPM drop. The cause was found to be a Capacitor which was loose in its spring holder.

(11) ALL WINGS - LEECH LINES.

A dealer reported that the leech lines on an older Flash wing had stretched and tightened with age, consequently extending. He recommends that all the wings should be checked and re-trimmed. Any wing suffering from this effect should be noticed at the annual BMAA flight check and adjusted accordingly.

(12) ALL WINGS - TENSION ELASTIC.

Shock cord elastic is used to retract the cross tube tension cord and it has been pointed out to us that rubber perishes with age and condition. Check this shock cord frequently, especially on wings which are hangered rigged. If the shock cord fails it is likely to do so during rigging, but if the wing is left rigged, the failure may happen in flight allowing the cord to fall rearward perhaps catching in the propeller with catastrophic consequences.

(13) ALL WINGS.

A repeat notice - The side wires on the wings are "lifer" and require replacement at 250 hours. Failed strands were found in a wing which had logged 320 hours. Check yours and if near or over the 250 mark, replace them.

(14) AXLE TIE WIRES - GEMINI AND SCORCHER.

An axle tie wire was found to have wire strand failure but the bolts holding it were tightened completely removing all movement of the roll terminal ends. There should be movement of these terminals which means the bolts should not be tightened up solid.

(15) FUEL TANK CAPS.

We received a report of the plastic rim detaching from a locking fuel cap. We think it was caused by rotating the outside rim rather than the key locking or by lifting the tanks with the cap. Please avoid both

(16) PROPELLER BALANCE - ALL TRIKES.

We continue to find out of balance propellers on overhauls and inspections. Wood absorbs moisture at varying rates and the propeller needs constant attention to ensure it remains in balance. An out of balance propeller causes all kinds of fatigue problems from simple engine cowling cracking to electrical wire termination failure, gearbox seal and toothbelt failure and major airframe fatigue. Please look after your propeller and maintain it in good order.

(17) ROTAX COIL.

Our company 30 hour 462 Gemini was found to have a loose coil winding which if left may have resulted in ignition failure. It was simple to shim lock it in place but this is typical of the kind of small faults frequently not attended to. Reliability of your aircraft is a direct function of constant maintenance.

(18) 3 BLADE PROPELLERS.

We are experiencing huge problems in clearing the 3 blade propeller with the CAA. Despite having passed noise tests on the 503 and 462 GF2A, having passed a rigorous strength test and logging over 90 hours of flight testing we have further work to do. Hopefully it should be through within the next few weeks and we recommend it for all suitable models. Its quieter, more economical and gives far less vibration than a 2 blade propeller.

(19) MAINTENANCE

Workshop repair and part exchanges are revealing to us just how poorly the average owner is maintaining his aeroplane. Microlights need constant attention. It starts with cleaning off mud, oil and grease so you can reveal potential problems. A rebuild after an avoidable crash caused by a mis-judged out landing caused by a simple failure can set you back £2,000. Don't let it happen to you. Check, recheck, repair and check again. It takes but a few hours a week to maintain your machine in pristine and safe condition.