

mainair sports

SERVICE BULLETIN NO 41

1ST DECEMBER 1993

SUBJECT : BANK ANGLE LIMITATIONS - FLASH 2 ALPHA AND MERCURY.

Refer to Service Bulletin No.33.

COMPLIANCE : New limitations effective from receipt of this bulletin, subject to new limitation placards being fitted to the Aircraft, and amended pages being installed in the Aircraft manual.

PURPOSE

As a result of a number of incidents in the period between 1985 to 1989 involving loss of control, (possibly due to deliberate or inadvertent excursions outside the permitted bank angles), Mainair voluntarily initiated a restriction in the permitted bank angle of all Flash Series wings, to 45 degrees. This restriction was accepted by the CAA, who issued an Airworthiness Directive to reflect this restriction.

Mainair Sports, with the agreement of the Civil Aviation Authority, have carried out a flight test programme on the Flash 2 Alpha to demonstrate that the aeroplane complies with the requirements of BCAR Section S Paper S855 which amends BCAR Section S to require additional investigation of the handling qualities of Flexwing aeroplanes in respect of turn reversals, high angles of bank, and combined lateral-directional oscillations.

As a result of this flight test programme, the CAA have agreed that the 60 degree bank angle limitation on the Flash 2 Alpha and the Mainair Mercury (which uses the same Alpha wing), may be reinstated. Accordingly, the action below must be taken.

ACTION

Within 3 months of the date of issue of this Bulletin :

- 1.) Replace the red main placard on the keel, and the placard on the port wing ` A ` frame upright with the new placards.
- 2.) Remove the existing pages 5 and 13A from the Flash 2 Alpha manual (pages 5 and 12 in the Mercury manual) and replace them with the enclosed pages.



Roger Pattrick
CHIEF DESIGNER

2.

Subject: Ear bracket at end of drag link.

Applicability: Gemini Flash 2 Alpha

Details: Following a recent inspection of a Gemini Flash 2 Alpha, it was found that a small crack had occurred in the ear bracket at the front of the drag link. The crack emanated forwards from the bolt hole, where it fastened onto the keel. The Aircraft in question has carried out approximately 300 hours and has recently been competing in the National competitions, which has subjected the Aircraft to some rather heavy spot landings, whilst qualifying for the World Championships in Spain.

Aircraft built after 17th March 1989 should have a new style ear bracket fitted, which should help to reduce the problem.

Owners are therefore advised to check this bracket as part of their normal pre-flight check.

Replacement brackets can be purchased from Mainair Sports.

Subject: New style hand throttle - cable routing.

Applicability: Gemini Flash 2 Alpha and Mercury Aircraft.

Details: It has been found that people have removed the cable tie which fastens the hand throttle cable to the drag link. This is there for a purpose, and should not be removed, as there is a risk of it catching on the rear seat steering [if fitted].

Therefore, ensure that the hand throttle cable is fastened onto the drag link sufficiently to prevent the cable moving, but also be sure not to over-tighten the cable tie and thus restrict movement at the inner cable.

Subject: Bronze sintered fuel filter.

Applicability: All Aircraft.

Details: It has been noted that when inspecting the in-line fuel filter, the element has been damaged when re-fitting.

The correct way to fit the element is to position the filter vertically, so that the element fits into the recess, and then to tighten the aluminium casing.

Replacement elements are available from Mainair Sports.

Roger Pattrick



Chief Designer

SPECIFICATIONS

Max total all-up weight	- 344 kgs Flash & Flash 2 - 370kg Flash 2A.
Max occupant weight	- 180 kgs
Max load factor	- 4G P. 2G N. with 1.5 safety factor
Load composition	- 1 or 2 occupants
Min all-up weight	- 234 kgs
Fuel capacity	- 4.75 gallons (5.6 kg) - or 9.5 galls with extra tank
Stall at min load (Height Loss)	- 22 knots (25MPH) (80')
Stall at max load (Height Loss)	- 24 knots (28MPH) (90')
Stall height loss at 30° bank	- 80 ft
Max nose down at stall	- 8°
Cruise speed	- 43 knots (49MPH)
Never-exceed speed (VNE)	- 77 knots (89MPH)
Min approach speed - engine at idle	- 36 knots (42MPH)
Best rate-of-climb speed	- 36 knots (42MPH)
Landing run at max load - clear 15 M obstacle	- 230M
Take-off run at max load- clear 15 M obstacle	- 181M
Climb rate fully laden	- 150M/min (500 fpm)
Climb rate min load	- 300M/min (1000 fpm)
Max wind operating conditions	- 18 knots (21 MPH)
Max cross wind conditions	- 8 knots at 90° (10 MPH)
Power off rate of descent	- 167M/min approx
Power off ground distance covered	- 1315M/min (7.84 : 1)

<u>ENGINE OPTIONS</u>	Rotax 503 & Rotax 503 TPI	Rotax 462	Rotax 503-2V TPI	Rotax 582 TPI	Rotax 582 TPI
Reduction type	2.58:1	2.58:1	2.58:1	3.00:1	3.47:1
Dry weight	147kg	149kg	151kg	157kg	157kg
Fuel Mix	50:1	50:1	50:1	50:1	50:1
Rec.max engine temp EGT	1,500 degF	1,500 degF	1,500 degF	1,500 degF	1,500 degF
Rec.max engine temp CHT	425 degF	425 degF	425 degF	425 degF	425 degF
Rec.max engine speed	6,800 rpm	6,800 rpm	6,800 rpm	6400 rpm	6400 rpm
Propeller	62x40RT. 62x3-blade at 107deg at 12" stn. WD 62x3-blade at 113deg at 12" stn.	62x44RT. 62x46. 62x3-blade at 107deg at 12" stn. Wd 62x3-Blade at 12" stn.	62x40RT. 62x3-blade at 110deg at 12" stn. WD 62x3-blade at 112deg to 114deg at 12" stn.	WD 62x4-blade at 119deg at 12" stn.	WD 62x4-blade at 125deg at 12" stn.

Note: Recommended max engine temperatures and speeds can be exceeded for very short periods without immediate damage. However, you are strongly recommended not to exceed the limitations at any time. Engine speed (RPM), cylinder head temperature and exhaust gas temperature gauges are all available to enable accurate monitoring. If the aircraft is operated in accordance with the above specifications under ISA + 15°C max and the fuel air mix is correctly adjusted, the limits recommended will not be exceeded. Beware of high temperature days and long periods of stationery running.

PERMITTED MANOEUVRES.

Pitch angle - nose up/down not to exceed 30°. ALL AEROBATIC MANOEUVRES ARE PROHIBITED.
including: Whipstalls, Wingovers, Tailslides, Loops, Rolls and Spins. Angle of bank not to exceed 60°

GENERAL SPECIFICATIONS

Airframe	- multi sleeved 2 1/8"- 2"- 1 3/4" x 17 SWG
	- Drawn seamless HT - 30 - TF Anodised.
Aluminium fittings	- NSB sheet & H30 machined components
Bolts & Nuts	- Airframe bolts AN Series 3/16, 1/4, 5/16, & 3/8.
Rigging	- 7 x 7 x 4mm Stainless steel, 3 & 2 1/2mm coated 7x7 stainless steel.

Dimensions

Span	- 10.55 MTS
Height - Kingpost to Trike connection	- 1370 MM
Height - Base bar to Trike connection	- 1500 MM
Overall height	- 2870 MM
Length - nose to tip of keel	- 3300 MM
Rigged weight of wing	- 48 kg
Standard de-rigged length (wing)	- 6000 MM
Short packed de-rigged length (Wing)	- 4500 MM

Wing stressed to + 4 - 2 with 1.5 safety factor at all up weight of 370 kg (+6-3)

Dimensions - fully-assembled Flash Wing/Gemini Trike

Height - floor to kingpost top	- 3.83 Mts
Width - batten tip to tip	- 10.6 Mts
Length - wing tip rear to cockpit nose	- 3.46 Mts

reversed IE entering a steep say left hand 360° turn from a steep right hand one. At the cross over between the two turns the trike unit is accelerated and can induce a far higher bank angle than that required or anticipated by the pilot.

INVERTED FLEXWINGS DO NOT FLY. THE TRIKE UNIT WILL FALL INTO THE SAIL AND SEVERE STRUCTURAL DAMAGE WILL RESULT.

High Speed Stall

The stall speed increases as the load increases. A manoeuvre which induces " g " loadings (60° bank turn = 2g) will also increase the stall speed. If the Flash is flown in a steep bank turn and the bar is pushed out, it will lose airspeed and may enter a stall at a surprisingly high speed. During special flight tests by company test pilots a high speed stall was induced at a speed in excess of 75 MPH. A high speed stall entered during a steep turn will cause the aircraft to tighten its turn and may result in a vertical or near vertical dive.

WARNING

DO NOT EXCEED THE LIMITATIONS - 60° BANK ANGLE 30° PITCH - NON AEROBATIC

POSITIVE LOADING MUST BE SUSTAINED AT ALL TIMES

WAKE TURBULENCE

As an aircraft flies it leaves behind it severely disturbed air. Avoid flying, taking off or landing closely behind another aircraft, and be particularly careful of flying into your own wake turbulence. It is very easy to fly into your own wake during 360° turns and the effect can be quite violent. Microlights have been rolled as much as 90° turns by flying into their own wake. If you already happen to be in a bank, the potential results are self evident. Wake turbulence is greatest at high G loadings, during turns or slow flight.

Ground Handling - Sloping fields.

The Aircraft is very stable, but be aware that the wing high above your head can affect the stability, particularly on sloping ground.