

MANDATORY BULLETIN

MB No: L 13/078a

Concerning: Technical Manual of the L13 Sailplane, 4th Edition - February 1977

Reason: Determination of allowable plays in deflections of elevator trim tab and method of their measuring and inspection in operation.

To be carried out at the latest by: On receiving this Bulletin

To be carried by: Maintenance Manual Holder

Costs to be covered by: No cost arise

Necessary material to be supplied by: Revised pages are enclosed

Bulletin becomes effective: Since the date receiving

Manhours required: 0

Total number of pages: Title page and 4 enclosures (pages 4, 12, 108/3, 108/3a 108/3b)

manufacturer

Engineering data contained in this Bulletin are CAI APPROVED.

FOREWORD

The scope of this manual is to inform all those who operate and maintain the Blanik L-13 sailplane. It is intended to supplement the general instructions for use, maintenance and operation of this sailplane.

The manual contents consists of:

- Part I - Technical description
- Part II - Instructions for operation

PART I - TECHNICAL DESCRIPTION

This part contains general specifications, including dimensions, weights, performances and technical descriptions of the sailplane outfit and equipment. This part is intended to provide general information on this airplane.

PART II - INSTRUCTIONS FOR OPERATION

This contains all necessary hints for the attending personnel, further instructions for repairing damaged parts which are not subjected to too much stress, and instructions on remedying all minor defects, which can be carried out within the normal attendance work of the sailplane.

The user will be acquainted with any additional information or changes in this manual contents due to alteration of the sailplane design, or necessary supplements of information concerning the sailplane attendance. This shall be done by means of Bulletins. It is the user's duty to effect the respective alterations in the manual contents as soon as he receives the Bulletin containing such alterations and to make a note about it in the Survey of the issued Bulletins on Page 2.

It should be remembered, for the sake of completeness, that in this manual contents are included all Bulletins issued before January 1, 1963. The Bulletins mentioned above are as follows:

- Service Bulletins - L 13/001, L 13/006, L 13/010, L 13/014, L 13/046,
- Information Bulletins - L 13/015-B, L 13/027, L 13/043.

SURVEY OF BULLETINS INFLUENCING THIS MANUAL CONTENTS.

(In the column "Class of bulletin" insert the letter "I" — in the case of an Information Bulletin, whereas the letter "S" applies to a Service Bulletin, whereas the letter "M" applies to a Mandatory Bulletin).

No.	No. of bulletin	Class of bulletin	Alteration effected in the following Clauses	Alteration carried out by
1	L13/059	M	Part II, Chapter II., Clause 3. Periodical inspections, lubrications and checkings are abolished and substituted by new Clause 3. It concerns 108-113 pages.	
2	L13/078a	M	Part I, Chapter I, section 2b Part II, Chapter II, section 3, item 3.2 Controls. Changed parts of revised pages No. 4, 12, 108/3, 108/3a, 108/3b are identified with vertical line Date on page 108/3 was changed to Mar 25/97. New page 108/3a, 108/3b with date Mar 25/97.	

CHAPTER I.

SAILPLANE SPECIFICATION

1. GENERAL

a) Machine type	Blanik L-13
Category: In single-seat configuration, it complies with British Civil Airworthiness Requirements, Section E (Gliders, 2nd Issue, 18th May 1960, Aerobatic Category.	
In two-seats configuration, it complies with BCAR, Section E, 2nd Issue, 1960, Cloud-flying Category, with a limitation of the n_1 load factor to +4.0 and the n_2 load factor to -2.0.	
Minimum crew:	1 pilot
b) Fuselage	
Maximum height	1.14 m
Maximum width	0.62 m
Length	8.4 m
c) Wing	
Wing area	19.15 sq.m
Aileron area	2.31 sq.m
Flap area	3.95 sq.m
Divebrake (air-brake) area	0.648 sq.m
Wing span	16.2 m
Wing chord in the fuselage axis	1.665 m
Wing chord at tips	0.710 m
Aspect ratio	13.7
Aerofoil section at wing root	NACA 63 ₂ A - 615
Aerofoil section at wing tip	NACA 63 ₂ A - 612
Mean aerodynamic chord	1.253 m
Rigging angle at wing tip	1°
Rigging angle at wing root	4°
Resulting wing twist	- 3°
Dihedral angle	3°
Angle of wing sweep	- 5°
d) Tail unit surfaces	
d1) Horizontal	
Total area	2.659 sq.m
Tailplane area	1.543 sq.m
Elevator area	1.00 sq.m
Elevator trim tab area	0.116 sq.m
Span	3.45 m
Aspect ratio	4.40
Rigging angle	- 3°
Dihedral angle	5°
d2) Vertical	
Total area	1.608 sq.m
Fin area	0.704 sq.m
Rudder area	0.904 sq.m
Height	1.64 m
Aspect ratio	1.45

e) Landing gear

e1) Undercarriage	Mechanically retractable with oleopneumatic shock-absorber and mechanical brake.
Undercarriage shock-absorber	L-13.501-17
Shock-absorber fluid	AMG-10 (or Aero Shell Fluid 4)
Air pressure (when in unloaded condition)	33 ± 1 kg/sq.cm
Undercarriage wheel	HP 4741-Z
Tyre and air tube	350 X 135
Pressure in air tube	2.6 kg/sq.cm
e2) Tail skid	
Shock-absorber	Rubber 70° Sh

f) Operation materials

Lubricants	Lubricant grease SP-2 (in acc. with CSN 65 6917) or CIATIM-201 (in acc. with GOST 6267-52) or RPM Aviation Grease No. 2
----------------------	---

g) Weights

Weight of an empty glider, including standard outfit, without coating	292.0 kg
Maximum permissible weight when airborne	500.0 kg
Wing loading, maximum	26.1 kg/sq.m

2. PERMISSIBLE ALLOWANCES - PLAY (TOLERANCE) - ADJUSTMENT OF CONTROL SURFACES

a) Measuring of the sailplane - levelling

The positions of the sailplane fuselage, wings and tail unit to one another shall be checked by measuring the respective levelling points. The coordinates of the levelling points and their permissible allowances are given in the levelling drawing (see Figs. 1, 2, 3)

b) Plays (tolerance) in controls

Permissible play in elevator control - measured on the control stick handle	2 mm
Permissible play in control of flaps - measured on the control stick handle	2 mm
Permissible play in rudder control - measured on rudder pedals	3 mm

Admissible clearance in control of elevator trim tab -
- measured on the tab trailing edge in vertical plane at zero position of the elevator and the tab +1 mm

c) Rigging of control surfaces

c1) Elevator	
upwards deflection	$32^\circ + 2^\circ$
downwards deflection	$25^\circ \pm 1^\circ$
c2) Rudder	
Deflection to either side	$30^\circ \pm 1^\circ$

Tail unit

No damage or deformation to the covering sheets is allowed. The covering fabric on rudder and elevator must not be worn out or torn. The rivets must not be loose. The rudder, elevator and trimtab motion must be easy, no play, however, being allowed. The hinge pins must be secured properly.

The rudder and elevator deflections are to be measured /see Part I of this Manual, Chapter 1-2/. Check whether or not the tailplane is not located in the fuselage with too much clearance. The permissible clearance of the tail plane location in the fuselage is not more than ± 2 mm /measured on the extreme outside arch of the tail plane/. More clearance than allowed may be due to wear of ball joints in the tailplane hinges of the fuselage /See Fig. 17, item 17/. It must be remedied by replacing these ball joints.

Controls

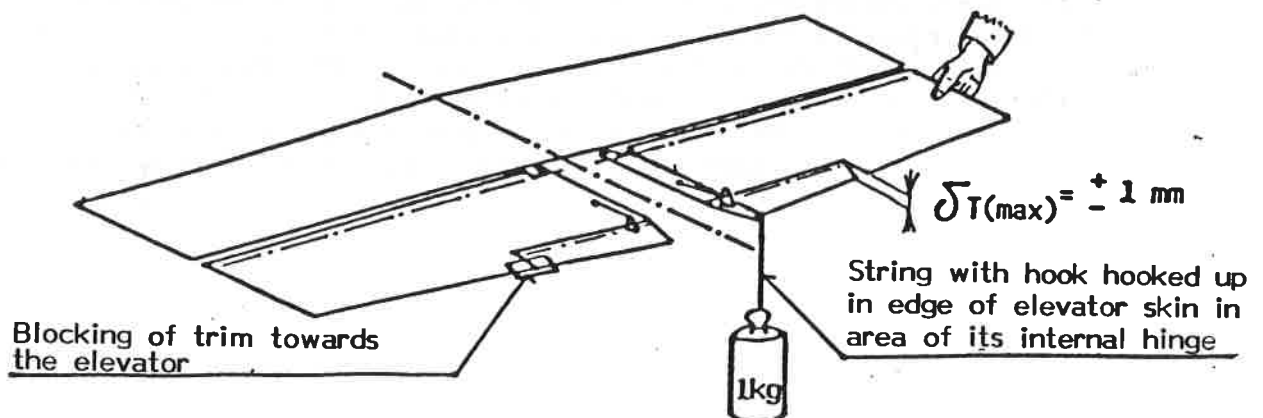
When the controls /control stick and rudder pedals/ are in a normal /i.e. central/ position, then the rudder, elevator and ailerons must be in their undeflected positions, too.

No, so called, lost motion of controls must occur /See Part I of this Manual, Chapter 1-2/.

Measure the clearance in control of the elevator trim tabs at zero position of the elevator and the tabs by the following procedure:

- block in suitable way one of the tabs on the trailing edge towards the elevator (e.g. two metal sheet strips connected by a bolt)
- load the other tab with a moment which will simulate a weight of 1 kg and which is hung-up through the string on the tab trailing edge in the area of control levers (see Scheme No. 1)
- a clearance is understood as a vertical distance between the trailing edge of the tab and the elevator (δ_T [mm])
- a clearance which is in upward direction will be evaluated only subjectively by comparison with a clearance measured in downward direction
- use the same procedure also for the other tab

Scheme No. 1: Measuring of clearances in rotation of elevator trim TAB



If the measured clearances δ_T exceed the admissible value ± 1 mm they must be fully eliminated by tightening the control strings (possibly cables) through tightening sleeves of bowdens on fuselage frame No. 14 (for gliders up to 17th series even with use of string tighteners at rear control lever of trim tabs in pilot's cockpit). Adjust the bowden tighteners in even way so that the difference in tab deflections does not occur. If the bowden tighteners travel is not sufficient for total clearance elimination it is necessary to

screw in the tighteners to the stop (so that the largest possible travel remains for following adjustment of clearances), to change the strings or cables in the bowdens, to attach them to surfaces and readjust them.

To ensure sufficient irreversibility (self-locking ability) of the trim tab control system it is necessary to tighten each of their control levers in the cockpit with tightening moment of 2 Nm.

Push rods must be neither bent nor otherwise deformed. Fairleads and control cables must not be damaged. The control push-rods of the flaps and divebrakes must not be damaged and must be easy to move, without of any play, in the guides. The carrier pin on the countershaft in the fuselage must not be jammed and the carrier channel /See Fig. 23, det. B/ must not be open. Damaged parts are to be replaced and the securings of all pins are to be checked.

Check the condition of the bonded junctions on inner push rods draw. No. L 13. 411-12 of flap control /See Fig. 23, item 15/. An eye is bonded to one end of this push-rod whilst a threaded tube for attachment of clevis is bonded to the other end.

How to procede during the check

The check is effected by two men. One of them holds the flap control handle in the "ON" position, whilst the other one holds the flap by its leading and trailing edges /at that point where is the rib/ and by exerting force in the directions of the flap extension and retraction, will check whether the flap control push rods are not loosened /in bonded joints/.

The check is carried out on the left as well as on the right flap. If any defect at the bonded joints is ascertained, then it is necessary to replace the defective part and report it to the manufacturer.

Landing gear

Check the pressure in the tyre air tube. This pressure can be checked by means of the normal pressure gauge which is used for motocars. The tyre air tube pressure should be 0.23MPa /2.6 kg per sq. cm/. Check the spring mounting of the undercarriage shock absorber. If the shock absorber is pumped properly and the sailplane is loaded fully, the piston rod /tube/ will project to a length of 13 - 3 mm out of the cylinder /See Fig. 79, dimension figure x/. The check can be effected without removing the leather cover of the piston rod. The measurement is taken after the shock absorber has been depressed several times in order to eliminate the influence of the shock absorber inner friction.

Intentionally left blank

For maintenance and defects of the shock absorber - see Cl. 4 of this Chapter. The operation of undercarriage control mechanism is to be tested on an elevated sailplane.

The brake lining must not be oil soaked and worn too much. The undercarriage wheel must not be damaged, its turning must be smooth. No play is allowed. For maintenance of the wheel and brake - see Cl. 5 of this Chapter.

The suspension /hinge/ pins and control mechanism pins must not be jammed. The stop on the suspension forging must not be bent.

Inspect the tail skid - to see if it is not damaged.

The undercarriage and surrounding area to be cleaned; worn parts replaced.

Outfit

Clean the cushions and upholstery. Inspect the first-aid kit contents and replenish, if necessary. Check the side-wall release hooks control mechanism and the front tow hook. Worn out parts are to be replaced. Once a year check the emergency jettisoning of the cockpit hood. Proceed in the following way:

1. Rotate through 180° in the direction marked by the arrow the emergency release lever installed on the right hand side of the cockpit hood towards the front. In the first segment of the travel of the release lever, the resistance due to cutting of the 0.5 mm locking wire fitted with a seal and an aluminium shear pin of 2.0 mm dia is to be overcome.
2. Holding the release lever at the end of its travel, force the right hand side of the cockpit hood upwards. To avoid damage of the hood, it is necessary that an assistant should support the hood from right outside before releasing it from the hinges.
3. After removal of the hood inspect all working parts for corrosion. Corrosion, if defected is to be removed with emery paper. In any case remove old grease, clean and lubricate.
4. Holding the release lever in its forward position, reassemble the cockpit hood by inserting the pins into the hinges. To end assembly seal the lever with locking wire and insert new aluminium shear pin.

Instruments and electrical outfit

Disconnect the Pitot and static pressure tubing from the instruments. Blow the tubing out by means of compressed air. After having blown the tubing out, effect the respective connections.

Check all units on instrument board and make certain that the glass of each is tight and in good condition and that no other damage has occurred to them.

Test all units without dismounting them from the instrument board. Specifications of all instruments are listed in Part I, Chapter VIII of this Manual.

In the turn-and-bank indicator LUN 1211.1 remove the carbon dust from the collector /see Cl. 8 of this Chapter/.

Carry out the compensation of the pilot compass /see Cl. 7 of this Chapter/.

If the converter PAG - 1FP is incorporated in the sailplane, the condition of the carbon brushes and commutator is to be checked in accordance with Part I, Chapter VIII.10 of this Manual.