LET, a. s. 686 04 KUNOVICE, CZECH REPUBLIC

SAILPLANE FLIGHT MANUAL

Serial Nos.eligible : 938101, and subsequend

Model : **L - 13 AC BLANIK**

Serial No. : **00 86 05**

Registration : **N374BA**

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Signature :

Authority : CAA Prague

Stamp :

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THIS FLIGHT MANUAL MUST BE CARRIED ABOARD THE SAILPLANE AT ALL TIMES WHEN IN OPERATION.

This Sailplane Flight Manual constitutes an FAA Approval Flight Manual for US Registreted asilplanes in accordance with FAR 21.29

0.1 RECORD OF REVISIONS

The Sailplane owner will be notified by the Czech Republic, Civil Aviation Authority approved Bulletins of any revision or amendment to this manual. The owner must replace the old pages with the new ones and enter the revisions into the Record of Revisions. The manufacturer must be informed of any change of owner or owner's address to keep the service and flight documents current

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Revised or amended parts of the text will be marked by vertical line in page margin, and the number of the revision and date of its issue will be shown at the bottom of the page.

Rev. No.	Section	Affected Pages	Date of Issuing Revised Pages	Number of Bulletin Covering Revision	Date of Bulletin Approval	Carried Out On, Signature
			This Flight Manual was authorized to date Mar 24/00			

Rev. No.	Section	Affected Pages	Date of Issuing Revised Pages	Number of Bulletin Covering Revision	Date of Bulletin Approval	Carried Out On, Signature

0.2 LIST OF EFFECTIVE PAGES

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0.3 TABLE OF CONTENTS

Section 1

General

Contents

1.1 INTRODUCTION

This Flight Manual contains the instructions, performance information and limitations for the L - 13 AC BLANIK Sailplane. Pilots are assumed to be familiar with basic theory of flying and therefore this Manual contains only instructions specific for the L - 13 AC BLANIK Sailplane

1.2 REGULATION BASIS

This sailplane has been approved by Civil Aviation Authority of the Czech Republic in accordance with BCAR-E, issue 1960 in Aerobatic Category of Airworthiness.

1.3 DEFINITIONS AND ABBREVIATIONS

WARNING: MEANS THAT NON-OBSERVATION OF THE CORRESPONDING PROCEDURE LEADS TO AN IMMEDIATE OR IMPORTANT DEGRADATION OF FLIGT SAFETY.

CAUTION: **Means that non-observation of the corresponding procedure leads to a minor or more or less long term degradation of flight safety.**

NOTE: Draws attention to any special item not directly related to safety but which is important or unusual.

km/h IAS . . . . indicated airspeed in kilometres per hour

KIAS . . . . . indicated airspeed in knots

FM . . . . . Flight Manual

QFE . . . . . atmospheric pressure at aerodrome level (altimeter reads 0)

QNH . . . . . setting of altimeter pressure scale to obtain sailplane altitude level

MAC . . . . . Mean Aerodynamic Chord

VFR . . . . . Visual Flight Rules

V_A . . . . . manoeuvring speed

V_{NE} . . . . . never exceed speed in smooth air

V_{RA} . . . . . rough air speed

V_T ..... maximum aerotowing speed

V_W ..... maximum winch-launching speed

V_{LO} ..... maximum landing gear operating speed

1.4 BASIC DATA

1.4.1 Brief Description

The L - 13 AC BLANIK is a two-seat cantilever high-wing monoplane of all-metal structure with fabric-covered control surfaces. Both flight compartments are covered by single-section canopy which may be emergency jettisoned in flight.
In both flight compartments are located all elements to control the sailplane including instrument panels with flight and navigation instruments. The sailplane is provided with hooks to enable winch and aerotow launching. Both flight comportments are vented by air bled from fuselage nose, and its supply may be controlled. There is a baggage compartment behind the rear flight compartment. Both flight compartments are upholstered. The wing including ailerons and air brakes is attached by six bolts to the fuselage. A vertical fin with rudder is attached to the rear fuselage. The horizontal tail is also attached to the end of fuselage. The elevator and ailerons are manual controls by control cables and push-pull rods. The rudder control is also manually operated by the feet, using control cables and rods.
The air brakes are controlled by levers. The elevator trim tab is also lever controlled. The sailplane is fitted with a main and tail-wheel type landing gear. The main landing gear is mechanically retractable with a hydropneumatic shock absorber and a wheel with mechanically actuated brake. The tail landing gear is a tail wheel with shock absorber.

Main landing gear retraction

To retract the main landing gear lift the handle on the right-hand side panel up and pull to the rear. Push the handle downwards to lock it in the retracted position.

Main landing gear extension

To extend the main landing gear, lift the handle and move it forward. Push the handle down to lock it in the extended position. The landing gear is in the locked position if the handle cannot be moved rearward.

1.4.2 Basic Dimensions

1. Main dimensions

Wing span . . . . . 46.59 ft (14.2 m)

Length . . . . . 27.56 ft (8.4 m)

Height . . . . . 6.86 ft (2.09 m)

2. Wing

Area . . . . . 187.72 sq.ft (17.44 m^2)

Aspect ratio 11.186

Dihedral . . . . . 3^o

Sweep angle . . . . . -5^o

Mean aerodynamic chord . . . . . 4.26 ft (1.298 m)

Geometric twist . . . . . -3^o

Ailerons

Area . . . . . 19.16 sq.ft (1.78 m^2)

Span . . . . . 9.13 ft (2.783 m)

Deflections: up . . . . . $34^o + 2^o$

down . . . . . $13^o + 2^o$

Air brakes

Area . . . . . 6.97 sq.ft (0.648 m^2)

Span . . . . . 4.61 ft (1.404 m)

3. Horizontal tail

Area (total) . . . . . 28.63 sq.ft (2.66 m^2)

Span . . . . . 11.32 ft (3.45 m)

Aspect ratio 4.3

Dihedral angle . . . . . 5^o

Elevator

Area . . . . . 10.76 sq.ft (1.0 m^2)

Deflection: up . . . . . $32^o + 2^o$

down . . . . . $27^o + 1^o$

Trim tab area . . . . . 1.25 sq.ft (0.116 m^2)

Trim tab deflection:up . . . . . $12^o + 1^o$

down . . . . . $35^o \pm 1^o$

4. **Vertical tail**

Area (total) . . . . . 16.15 sq.ft (1.5 m^2)

Height . . . . . 5.25 ft (1.6 m)

Aspect ratio 1.7

Rudder

Area . . . . . 8.50 sq.ft (0.79 m^2)

Deflection (both sides - perpendicular to axis of rotation) . . . . . $29^o + 1^o$

5. **Fuselage**

Fuselage width . . . . . 2.165 ft (0.66 m)

Fuselage height . . . . . 3.61 ft (1.10 m)

(cont.)

1.4 Three-View Drawing

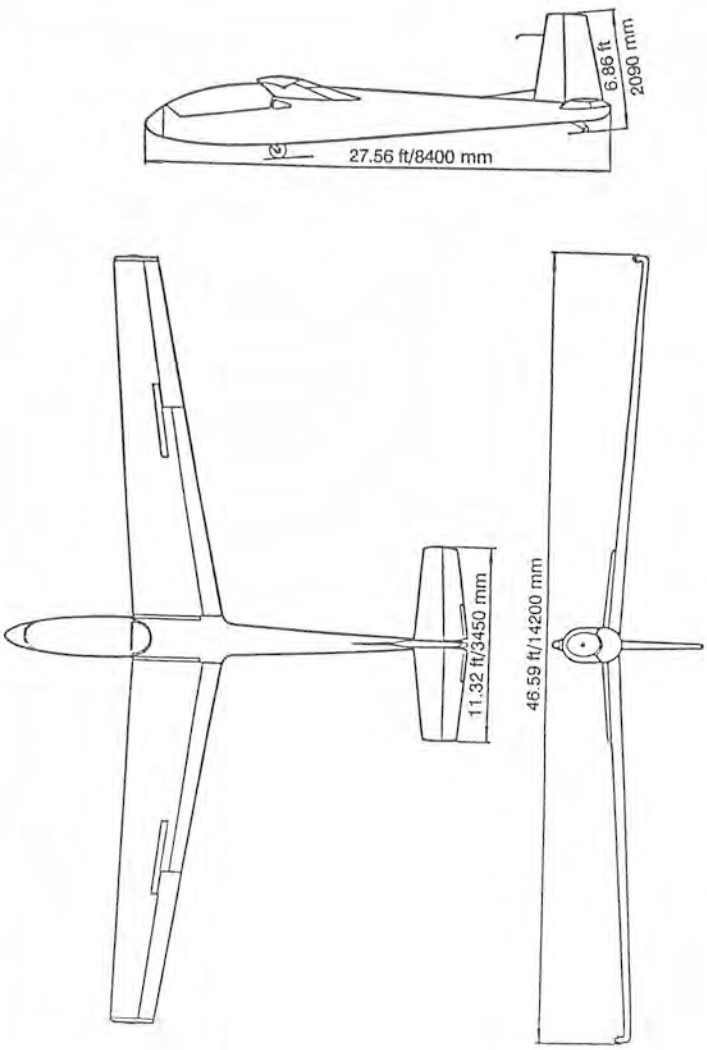


Fig. 1-1

Section 2

Limitations

Contents

2.1 INTRODUCTION

Section 2 includes operating limitations and basic placards necessary for safe operation of the sailplane, its standard systems and standard equipment.

2.2 AIRSPEED LIMITS

Speed		KIAS (km/h IAS)	Remarks
V_{NE}	Never exceed speed in smooth air	124 (230)	This speed must not be exceeded and control deflection must not be more than 1/3
V_{RA}	Rough air speed	86 (160)	This speed must not be exceeded in severe turbulence
V_A	Manoeuvring speed	86 (160)	No full or abrupt control deflections may be made above this speed because the sailplane structure might be overstressed
V_W	Maximum winch- launching speed	65 (120)	This speed must not be exceeded during winch-towing or motor-vehicle towing
V_T	Maximum aerotowing speed	76 (140)	This speed must not be exceeded during aerotowing
V_{LO}	Maximum landing gear operating speed	124 (230)	Do not extend or retract the landing gear above this speed

(cont.)

V_{NE} limits above 8,200 ft (2,500 m) of pressure altitude are as follows:

Pressure altitude ft	8,200	10,000	13,000	16,500	20,000	23,000	26,000	30,000
V_{NE} KIAS	124	120	113	105	98	92	85	79

Pressure altitude m	2,500	3,000	4,000	5,000	6,000	7,000	8,000	9,000
V_{NE} km/h IAS	230	223	209	195	182	170	158	147

2.3 AIRSPEED INDICATOR MARKINGS

Marking	KIAS (km/h IAS)	Significance
Green arc	40 - 86 (72 - 160)	Normal Operating Range (lower limit is maximum weight 1.1 V_{S1} at most forward c.g. position, upper limit is rough air speed).
Yellow arc	86 - 124 (160 - 230)	Speed range in smooth air.
Red line	124 (230)	Maximum permissible speed for all operations
Yellow triangle	49 (90)	Approach speed at maximum (flight) weight

2.4 Not used

2.5 Not used

2.6 WEIGHT AND CENTRE OF GRAVITY POSITION

Maximum take-off weight:

- with two occupants ..... 1100 lb (500 kg)

Empty weight of the sailplane with standard equipment ..... 672 lb ± 2% (305 kg ± 2%)

and the corresponding centre of gravity position:

1) from fuselage nose ..... $x_T = 120.866 \pm 0.51$ in (3,070 ± 13 mm), i.e. 65.5 ± 1% MAC

2) from reference plane (starting point of the wing rib No. 1) .. $x_T = 27.323 \pm 0.51$ in (694 ± 13 mm), i.e. 65.5 ± 1% MAC

Pilot's weight (including parachute):

- minimum pilot's weight (solo) ..... 154 lb (70 kg)
- maximum pilot's weight (solo) ..... 250 lb (113 kg)

Maximum useful load ..... 430 lb (195 kg)

Weight of non-lifting parts:

- maximum weight of non-lifting parts ... 783 lb (355 kg)

WARNING: IT IS NECESSARY TO USE SEAT WITH BALLAST OF 33 LB (15 KG) IN THE FRONT COCKPIT WHEN FLOWN BY A PILOT WEIGHING FROM MIN. 121 LB (55 KG) TO 154 LB (70 KG).

NOTE: Installation of the front seat ballast is described in Section 7, paragraph 7.2 of this Flight Manual.

2.7 CENTRE OF GRAVITY

Permissible centre of gravity range

- front limit ..... 23% MAC 99.134 in(2,518 mm), i.e. from fuselage nose
- rear limit ..... 38% MAC 106.811in(2,713 mm) i.e. from fuselage nose

2.8 APPROVED MANOEUVRES

Manoeuvre	Dual	Solo	Entry airspeed IAS (KIAS)
Loop	yes	yes	Section 4.3.6, item 1.
Stall turn	yes	yes	Section 4.3.6, item 2.
Half loop and half roll	yes	yes	Section 4.3.6, item 3.
Half roll and half loop	yes	yes	Section 4.3.6, item 4.
Lazy eight	yes	yes	Section 4.3.6, item 5.
Inverted flight	yes	yes	Section 4.3.6, item 6.
Slow roll	yes	yes	Section 4.3.6, item 7.
Spin	yes	yes	Section 4.3.6, item 8.
Chandelle (climbing)	yes	yes	Section 4.3.6, item 9.
Steep turn	yes	yes	Section 4.3.6, item 10.
Flick roll	yes	yes	Section 4.3.6, item 11.
Flick half roll and half loop	yes	yes	Section 4.3.6, item 12.

2.9 MANOEUVRING LOAD FACTORS

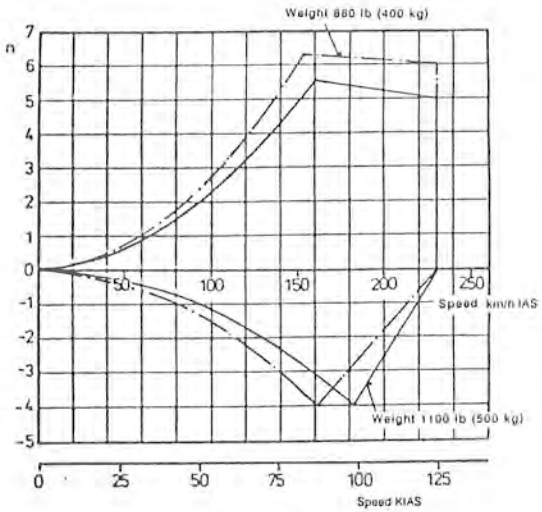


Fig. 2 - 1

2.10 FLIGHT CREW

The flight crew may consist of one or two pilots. If the sailplane is to be flown solo, the pilot must sit in the front seat and his weight (including parachute) must be at least 154 lb (70 kg). If the pilot's weight is less than 154 lb (70 kg), it is necessary to use the cushion with 33 lb (15 kg) ballast in front cockpit. The rear seat must be secured aft using the safety belt and shoulder harnesses.

2.11 KINDS OF OPERATION

The sailplane is certified in aerobatic category to allow approved aerobatic manoeuvres (see para. 2.6). Only day VFR flights and cloud flights are permitted. Intentional flights in icing conditions are prohibited

CAUTION: **It is necessary to record the aerobatic manoeuvres of the sailplane into the sailplane log book so as to be able to find out total flight time of aerobatics from date of sailplane manufacture.**

2.12 MINIMUM EQUIPMENT

Instruments and additional equipment added to the minimum equipment must be approved.

A. Flights according to VFR conditions

2 Airspeed indicators with colour-markings according to item 2.3

2 Altimeters

2 Turn and bank indicators

2 Magnetic compasses

2 Accelerometer

2 Five-point safety harnesses

2 Manual parachutes

B. Cloud flying

Added to minimum equipment as per para A

1 VHF transceiver

2.13 AEROTOW AND WINCH LAUNCHING

Aerotow

- the maximum cable strength or cable safety device to aerotow the sailplane is 1,400 lb (6,230 N).

- minimum cable length for aerotowing is 100 ft.

Winch-launching

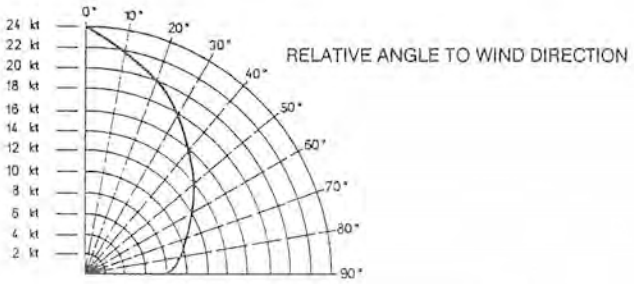
- the maximum cable strength for winch-launching of the sailplane is 1,400 lb (6,230 N).

2.14 OTHER LIMITATIONS

Maximum demonstrated crosswind component

- maximum demonstrated crosswind component for safe approach, landing and aerotow launching is 16 kt.

Determination of maximum wind speed at winch-launching:



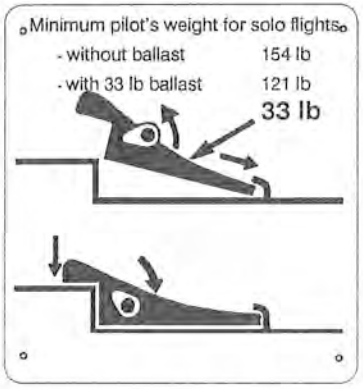
Wind angle relative to connecting line: Take-off - Winch

Fig. 2 - 2

2.15 LIMITATIONS PLACARDS

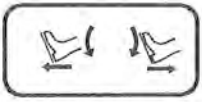
Operating limitations are emphasized on limitation placards both in front and rear cockpit. For location of the placards see Section 7, pages 7-4 and 7-5. Values given on the placards must comply with the installed instrument (e.g. airspeed indicator).

a) front cockpit




Seat back


Air vent


Pedal adjustment

b) both front and rear cockpits


Air brakes extended


Air brakes retracted

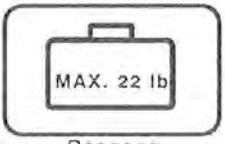

Canopy lift off


Canopy jettison


Landing gear retracted


Landing gear extended

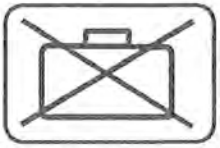

Wheel brake



Baggage (rear seat only)

Trim


Release


No baggage (rear seat only)

MAX. GROSS WEIGHT	1100 lb
EMPTY WEIGHT (STANDARD)	672 lb
APPROVED MANOEUVRES:	
LOOP	STALL TURN
HALF LOOP AND HALF ROLL	LAZY EIGHT
HALF ROLL AND HALF LOOP	CHANDELLE (CLIMBING)
INVERTED FLIGHT	SLOW ROLL
STEEP TURN	SPIN
FLICK ROLL	
FLICK HALF ROLL AND HALF LOOP	

SOLO FLIGHT FROM FRONT SEAT ONLY

MAX. ALOWABLE SPEED VS ALTITUDE

PRESSURE ALTITUDE	(FT) UP TO	8,200	10,000	13,000	16,500	20,000	23,000	26,000	30,000
VNE	(KIAS)	124	120	113	105	98	92	85	79

or

MAX. ALOWABLE SPEED VS ALTITUDE

PRESSURE ALTITUDE	(m) UP TO	2,500	3,000	4,000	5,000	6,000	7,000	8,000	9,000
VNE	(km/h) IAS	230	223	209	195	182	170	158	147

MAX. WINCH - LAUNCHING SPEED:	65 KIAS
MAX. AERO - TOWING SPEED:	76 KIAS
MAX. MANOEUVRING SPEED:	86 KIAS

MAX. WINCH - LAUNCHING SPEED:	120 km/h
MAX. AERO - TOWING SPEED:	140 km/h
MAX. MANOEUVRING SPEED:	160 km/h

c) exterior markings

Near the static pressure sensor.

STAT

SECTION 3

Emergency Procedures

Contents

3.1 INTRODUCTION

Section 3 provides procedures for handling emergency situations.

3.2 CANOPY JETTISON

Pilot (front or rear)

1. Canopy jettison lever (the red lever on the right upper cockpit frame, Fig. 3-1, pos. 1) : rotate the lever 180° in the direction of the arrow shown below the lever

   Note: Turning the lever (front or rear) 180° (upwards and forward) pulls the hinge pins on the right and left side of the cockpit. The canopy strap is also released.

2. If the canopy does not jettison: hold the emergency jettison lever in its end position and at the same time push the canopy upward, using the other hand.

3.2 BAILING OUT

Release the safety harnesses and stow them. Grasp cockpit rails, pull your legs under you, as much as possible and bail out over the side. If possible, exit below the sailplane wing.

CANOPY JETTISON DURING FLIGHT:

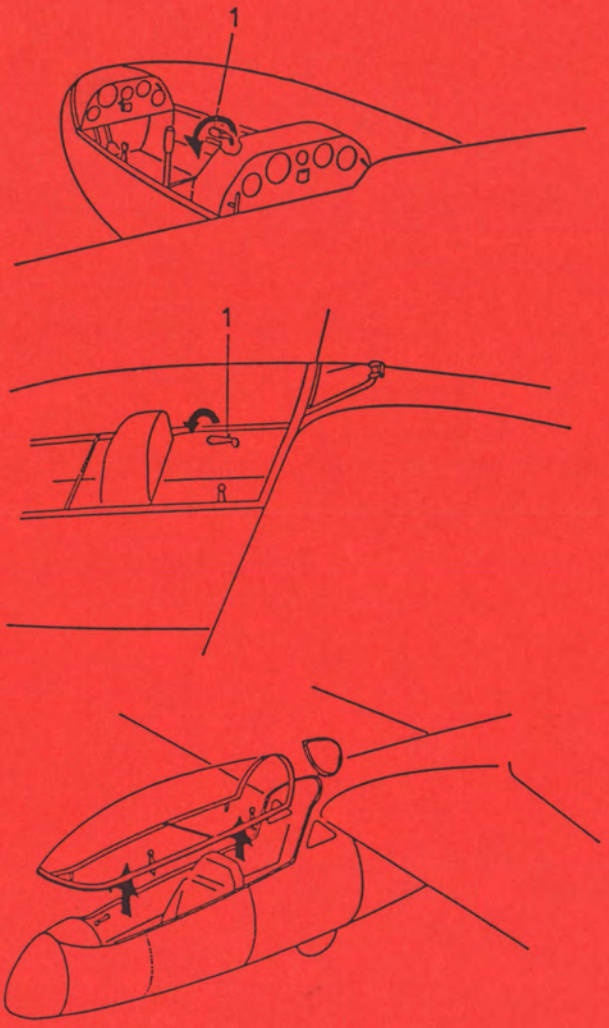


Fig. 3 - 1

3.4 STALLS

Pre-stall warning first is a gentle buffeting in the control stick (elevator), followed by a gentle nose down pitching at stall. Stall recovery at a high speed is the same. If the sailplane wing stalls, the control stick must be gently eased forward up tp pushing forward. If wings are not level, correct with simultaneous application of opposite rudder.
Elevator and rudder control must be energetic to prevent an inadvertent entry into a spin.
Stall recovery from turn is to be done by an energetic forward movement of the control stick and at the same time by applying the rudder against the stalling wing (in case the sailplane stalls to the right, we apply left rudder and vice versa). If we apply the control surfaces in time and energetically, the sailplane will stop slightly below the horizon which is enough to adjust speed to let it continue its controlled gliding. If it is not corrected, the sailplane may enter a spin.

3.5 SPIN

A spin usually results from a disproportional application of rudder at stall.

Standard procedure to recover from a spin is:

1. Prior to spin recovery, neutralize the ailerons.

2. Apply opposite rudder (i.e. against the direction of rotation).

3. Short pause.

4. Ease the control column forward until the rotation ceases.

5. Centralize rudder and recover from the dive.

3.6 SPIRAL

The spiral mode is noted by speed increasing rapidly.

The rapid airspeed increase is the difference between the spin and the spiral.

Spiral dive recovery: timely control the bank and sideslip by co-ordinated movement of the rudder and aileron and recover from the dive.

Section 4

Normal Procedures

CONTENTS

4.1 INTRODUCTION

Section 4 provides procedures for performing normal operations.

4.2 FIELD SAILPLANE ASSEMBLY AND DISASSEMBLY

Prior to removing wings, tilt upwards hotizontal tail (see item 4.2.3).

4.2.1 Wing removal

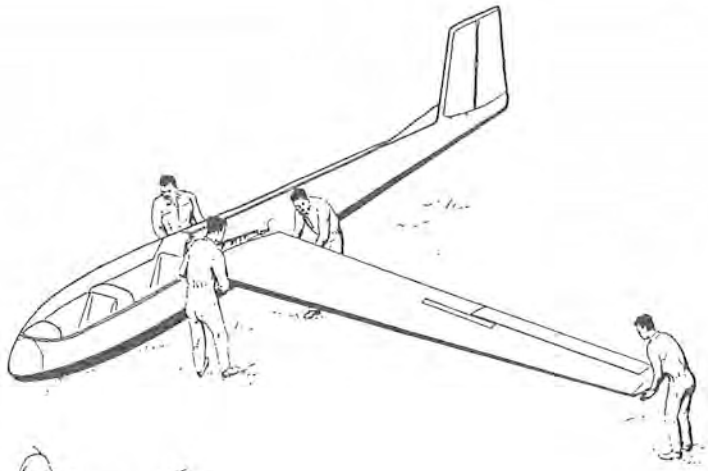
Four people are needed for wing removal.The first one holds the fuselage, the second one holds the wing tip and the third and fourth one hold the wing root (see Fig. 4-1). Level the sailplane in horizontal position.

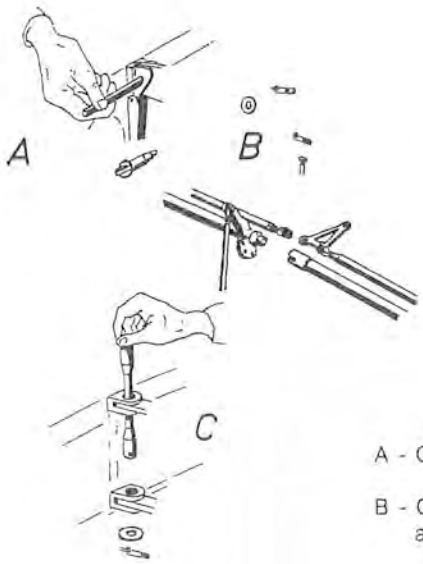
Remove the fairings between the fuselage and the wing. Remove electrical ground straps on aileron control tie rods. Discouple the aileron control tie rods by unlocking safety pins and removing pins on rocker levers pivoted in consoles on outside ribs (from the fuselage side). Remove lock pins from the front hinge pins and wing main pins and knock out the front pin.

Gently move the wing up and down when installing or removing the pins. Pull the wing from the fuselage by a slow and careful movement and place it perpendicularly with the leading edge pointing downwards on a special handling equipment.

4.2.2 Wing installation

The wing installation is the opposite procedure. For easier installation of the centre hinge pins use the centering pin (see Fig. 4-1, detailed view A) before inserting the pins. When sliping wing hinges on fuselage hinges make sure that the globular joint of the air brakes control (see Fig. 8-1, detailed view B) is set in a position to fit into the control drivers in the wing. When assembling, first slide in the wing main hinge pin and only then the wing front hinge pin.





A - Centering the front hinge

B - Control joint between the wing and the fuselage

C - Wing main hinges with the main pin

Fig. 4-1

4.2.3 Instructions for folding the horizontal tail unit control surfaces into the vertical position

The horizontal tail unit control surfaces can be folded upwards for sailplane transportation. (see Fig. 4-2, det.B)
Fold the fuselage tail portion upwards first. During this, the rudder is to be deflected to one side.
Unlock and take out the middle securing pin (see Fig.4-2, item 5) which secures the position of both tail unit control horizontal surfaces. The hinged portion of the fuselage tail can be set back, the rudder set in its neutral position and horizontal tail unit control surfaces folded upwards. When folding these surfaces, care should be taken to not damage the hinged part of the fuselage end. This can be prevented by proper deflection of both halves of the elevator.
When folding the tail unit control surfaces upwards, the elevator control countershaft takes place automatically (see Fig.4-2, item 4).
The tail unit surfaces shall be secured in their folded vertical position by a horizontal tail unit surface securing strut or both surfaces may be secured by a securing strap (see Fig.4-2, item 9). The latter shall be inserted into the cut out in the fuselage in front of the bulkhead 15 and secured in the middle by means of the pin, which can be removed from the hole in bulkhead No. 15 (see Fig.4-2, det. B). The pin shall be secured with a safety pin. Extended parts of the tailplane spars shall be inserted into the clevises on both ends of the strut and secured with pins. The latter shall be locked with safety pins.
To avoid damage to the elevator during sailplane transit, both rudder and elevator shall be secured by means of strap (textile) bound over them.

4.2.4 Returning the horizontal tail unit surfaces back to their normal (i.e. flight) position

See Fig. 4-2)
Three poeple are needed for this procedure.
Two men to hold the tail unit surfaces in the vertical position, the third - having folded the fuselage tail portion upwards - unlocks and removes 3 pins (Fig.4-2, item 5, 7, 8) and then the strut.
After removing out the securing strut or securing strap both halves of horizontal tail unit surfaces shall be slowly folded down. Meanwhile, the mechanic working close to the fuselage, holds the elevator control countershaft so that it fits with its channels in the carriers on both halves of the elevator. When folding both halves down, it is necessary to keep the elevator in such a position that its extended ribs do not contact the hinged part of the fuselage tail. As soon as the countershaft channels are meshed with the carriers on the elevator and tail unit control surfaces are in their normal position, the securing pin shall be inserted into the bushing on the bulkhead No. 15.

The pin should be secured with a safety. The hinged portion of fuselage tail should be returned to its normal position and secured with two screws.

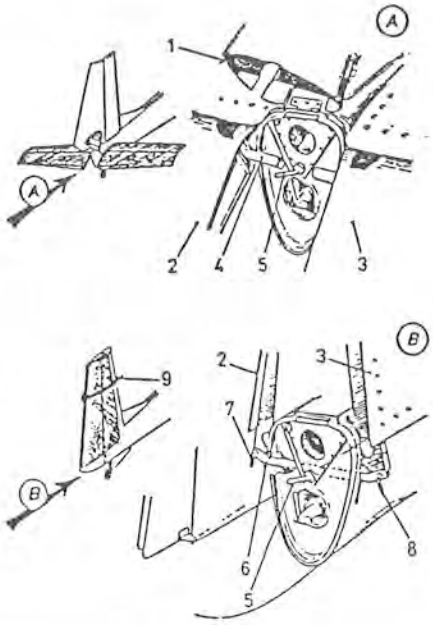


Fig. 4-2

(1)Hinged fuselage tail portion, (2)Left half of elevator, (3)Right half elevator, (4)Elevator control countershaft, (5)Securing pin, (6)Securing strut, (7) and (8)Strut securing pin, (9)Securing strap

WARNING: ENSURE THE CORRECT POSITION OF THE ELEVATOR CONTROL COUNTERSHAFT AFTER TILTING THE ELEVATOR INTO THE NORMAL FLIGHT POSITION: RED MARKED PART OF THE DRIVING MUST BE ON ITS LEFT SIDE IN THE BACK VIEW IN FLIGHT DIRECTION.

4.3 DAILY INSPECTION

After each flight day

- inspect the fuselage surfaces
- check the operation of the control mechanism of the towing equipment
- inspect the canopy glass and side windows
- inspect the wing surfaces and the movable parts of the wing
- inspect tail surfaces and the deflection of the control surfaces
- inspect controls for proper operation and security
- check the pressure in tire
- inspect the bay of the main landing gear and the tail wheel unit, check operation of the brakes and the shock absorber
- inspect the attachments of the instrument panels and inspect the instruments for damage
- inspect ventilation system
- inspect attachment of the first aid kit
- inspect battery bay
- check the voltage of airborne battery and charge the battery if necessary
- inspect the moisture trap

For more details see Maintenance Manual item 2.2.2 Operational Maintenance

4.4 PREFLIGHT INSPECTION

Before getting into the sailplane, the pilot must check the whole sailplane for proper condition in accordance with the inspection checklist. Perform the inspection in a systematic manner so no items are omitted.
Perform the inspection as shown in Fig. 4-3.

Sequence of the Walkaround Inspection of the Sailplane:

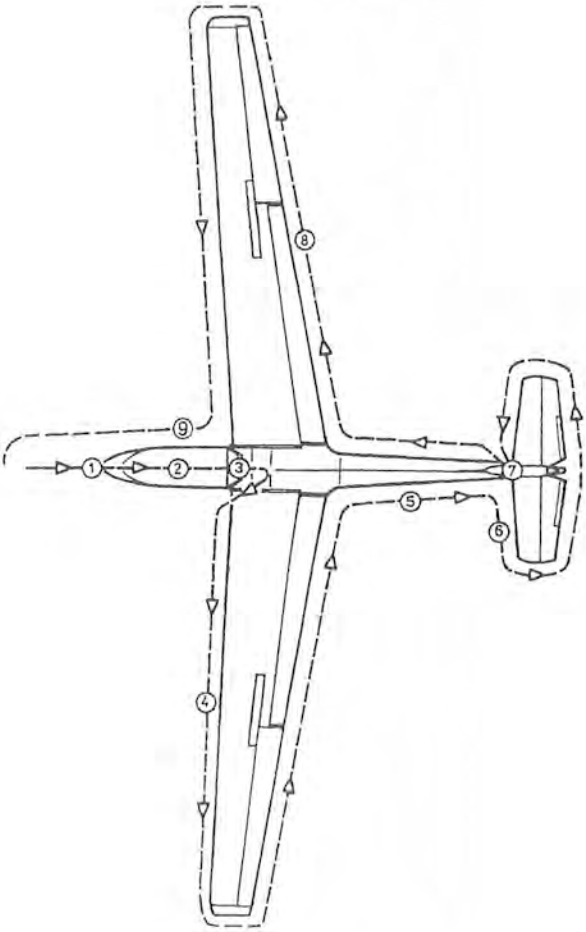


Fig. 4-3

4.4.1 PREFLIGHT INSPECTION CHECKLIST

Route item No.	Subject	Check/activity
1	Front fuselage section	
	Fuselage skin	no damage, deformation, loosened rivets
	Static-pressure sensors	no dirt, no clogging
	Cockpit canopy surface	no damage, no dirt
	Pitot tube	no damage, no clogging
2	Cockpit interior	
	Instruments	no damage
	Altimeters	correct QNH (QFE) setting
	Transceiver (if installed)	proper operation
	Nose ventilation	no clogging, proper function
	Safety harnesses	no damage
	Control system, trimmimg, air brakes	proper function
3	Landing gear wheels	
	Tire	no damage, correct inflation: - main landing gear 36.26 psi (250 kPa)

(cont.)

Route item No.	Subject	Check/activity
4	Left wing	
	Wing - fuelage connection	no damage to pins (main and front hinges), pins locking, wing- fuselage control connection
	Wing skin including leading edge	no damage, no deformations, loosened rivets
	Aileron surface	no damage to fabric cover, no damage to trailing edge
	Aileron	easy movement
	Airbrake locking in hinges	no damage to locking in hinges and control tie rods
5	Rear fuselage section	
	Fuselage surface	no damage, no deformations, loosened rivets
	Inspection cover	proper attachment of control elements, connections securing

(cont.)

Route item No.	Subject	Check/activity
6	Empennage	
	Empennage surface	no damage, no deformations and loosened rivets
	Probe of compensator of vertical speed indicator	removed cap, no damage
	Elevators	easy movement
	Locking of rear pin of horizontal tail	non-damaged condition of locking wire securing the rear pin of the horizontal tail unit
	Rudder	easy movement
7	Tail landing gear	
	Landing gear attachment	no damage of attachment
8	Right wing	see item 4 - left wing
9	Front fuselage section	
	Pins for canopy opening	proper position in relation to hinges

4.4.2 Before Take-Off Checklist

Front seat

Before entering the front cockpit, adjust the front seat back rest to a position allowing safe control of the sailplane when the safety harness is fully adjusted.

Rudder control

The position of the rudder pedals should be adjusted with fully adjusted the safety harness so that both left and right rudder pedals can be moved full travel. The rudder pedals in the front cockpit can be adjusted by use of a crank. In the rear cockpit the pedal adjustment should be done on the ground only. Three pedal positions are possible. The pedals are secured with locking pins.

Control column

Check the control column for free movement left and right, and fore and aft.

Instruments

Set the altimeters to QNH value (to read field altitude). The altimeters set to zero will indicate pressure at aerodrome level (QFE). Check all instruments and note that the vertical speed indicates zero.

Safety harnesses

Fasten the safety harnesses.

Cockpit canopy

Close and lock.

Trim

Set the elevator trim tab position to "0".

Air brakes

Check for easy movement and confirm their retraction.

Tow rope release

Check for proper function of the tow rope release and connect the tow rope. Ground-service personnel shall pull it to check its proper fastening.

4.5 NORMAL OPERATIONS AND RECOMMENDED SPEEDS

4.5.1 Not used

4.5.2 TAKE-OFF AND CLIMB

1. Aerotow launching

The take-off technique by aerotow is entirely conventional and does not require any special pilot skills. The elevator and rudder efficiency is high enough during the initial stages of the take-off run to prevent any directional or roll oscillations. With the elevator trim tab control set between "0" and "nose heavy" position hold the control stick in neutral position - on the landing gear wheel; then, while gently pulling the control stick, the sailplane will unstick. At a height of about 3 ft (1 m), hold a level attitude until the tow plane starts to climb. During cross wind take-offs, unstick the sailplane at a higher speed. The tow rope is to be attached to the front hook only.

NOTE: Before take-off at an airport where dirt may get into the cockpit close the ventilators. The ventilators can be opened during the climb. For take-offs close to $0^{o}C$ and high humidity fully open all ventilators to prevent condensation.

2. Winch-launching

CAUTION: **Use either side hooks, or lower hook (depending which hook is installed).**

The flying technique is the same as with other models of sailplanes. The trim tab control lever should be set in "zero" position. The recommended speed range is between 43 - 54 KIAS (80 - 100 km/h IAS). When performing the traffic pattern after winch launch or aerobatics, do not retract the landing gear.

(cont.)

3. Aerotow

a)Climb

When safe height is reached retract the landing gear (unlock the handle and pull it to the rear) and lock it. Trim the sailplane for the climb speed. The recommended tow speed is 59 - 70 KIAS (110 - 130 km/h IAS).
Aerotowing procedures are not different than normal techniques.

b)Level flight

Can be performed up to speed V_T = 76 KIAS (140 km/h IAS).

c)Descending

When descending on aerotow, observe the approved limitations of this sailplane. As necessary, apply air brakes or side slip to increase the vertical descent rate.

4.5.3 FLIGHT

1. Turns and circling

Since the sailplane is very manoeuvreable and controllable, its behaviour is very good in turns with bank angles up to 60°.

2. Side slipping

The technique for the side slipping is entirely conventional. Moving the control stick to the left, we are performing left side slip; to maintain straight descent, apply almost full right rudder. The angle of bank of the sailplane will be between 10° - 20°. The side slip as a means of increased rate of descent is effective only with simultaneous application of air brakes. The steady speed can be maintained by maintaining constant pitch angle. When performing slip manoeuvre, the airspeed readings are unreliable.

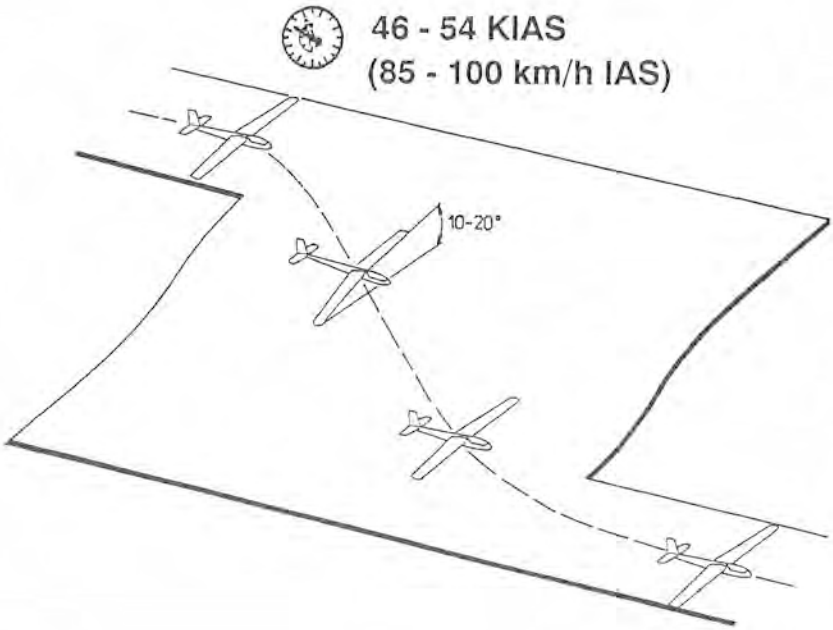


Fig. 4-4

3. Intentional stalls

Slow and continuous pulling aft on the control stick causes the sailplane to stall. Ailerons and rudder should be used to control bank. Prior to stall, pre-stall buffet warning will be noted approximatelly 5 % higher than stall. At stall, the nose pitch down below the horizon. To recovery from the stall move the control stick forward.

CAUTION: **Before stalling, spinning and performing aerobatics the following important procedures must be completed:**

Trim:	"0" position
Air brakes:	retracted and secured
Cockpit canopy:	locked and secured
Ventilation:	shut

Uncommended banking at stall must be corrected by releasing aft stick pressure and even pushing of the control stick forward with simultaneous application of opposite rudder.

4. Use of air brakes

The air brakes are to be used to avoid exceeding the V_{NE} speed, i.e.:

a) at stall into an abnormal position, e.g. during aerobatics

b) when disoriented during cloud flying

It is recommended to use the air brakes as a means for speed decrease in any case when the sailplane starts to increase its speed excessively and the pilot is uncertain of his orientation and how to manage the situation. Use of air brakes will enhance the safety and will make flying easier. The control lever should be held firmly during air brake extension, especially at high speeds.

4.5.4 APPROACH

The following approach speeds are recommended for approach-to-land:

Descent	Air brakes	Approach speed
Normal	retracted	40 - 46 KIAS (75 - 85 km/h IAS)
	extended	43 - 49 KIAS (80 - 90 km/h IAS)
Steeper	extended	49 - 59 KIAS (90 - 110 km/h IAS)

When using higher approach speeds, anticipate a longer landing distance.

4.5.5 LANDING

Landing on the airport

The landing manoeuvre is entirely conventional. The recommended attitude for landing should allow the main gear wheel to touchdown before the tail wheel contacts the ground (to reduce shock to the tail wheel from uneven ground). Do not flare prematurely in order to prevent the sailplane from dropping from a higher height on the tail wheel.

Off-field landing

The pilot must make a decision on the landing gear position.
It is recommended to land with the landing gear retracted, if landing off-field on a soft ground. In this case, extend the landing gear on the ground prior to next take-off. The landing gear can be extended only when manually lifted. If need be, the take-off may be accomplished with retracted and secured landing gear.

4.5.6 FLIGHT WITH WATER BALLAST

This sailplane does not have provisions for water ballast

4.5.7 HIGH ALTITUDE FLIGHT

For the high altitude flight:

- monitor the never exceed speed V_{NE} as a function of the altitude (see Section 2, item 2.2)
- an approved oxygen equipment must be installed

4.5.8 FLIGHT IN RAIN

Flight in rain has little effect on the pilot's view.
Excessive moisture from pitot static system can be drained from the moisture trap.
There are no rain induced airspeed errors.

4.5.9 AEROBATICS

The sailplane is able to perform the approved aerobatic manoeuvres provided limitations contained in Section 2.2, 2.6 and 2.7 are observed.

Instructions for performing the listed aerobatic manoeuvres are given on the following pages.

WARNING: DURING AN UNINTENDED TAIL SLIDE HOLD THE CONTROL STICK AFT AND THE AILERONS AND RUDER FIRMLY IN NEUTRAL POSITION (USE BOTH HANDS).

1. Loop

Enter a moderate dive with slight forward movement of the control stick to gain the entry speed of 86 KIAS (160 km/h IAS) when flying solo, and a speed of 97 KIAS (180 km/h IAS) when flying dual.
Raise the nose of the sailplane by slight backward movement of the control stick taking care to comply with "g-load" limits. After reaching the position "nose up", the control force drops slightly due to speed decrease. However, maintain the backward stick movement, but do not use more than about 60% of the control stick full deflection in the inverted position. Also the load factor must drop in the upper part of the loop arc. After passing the inverted position the speed will increase and the control stick must be eased slightly so the flight path remains smooth. When beginning the loop, pay attention to precise directional control to avoid loop "diverting".

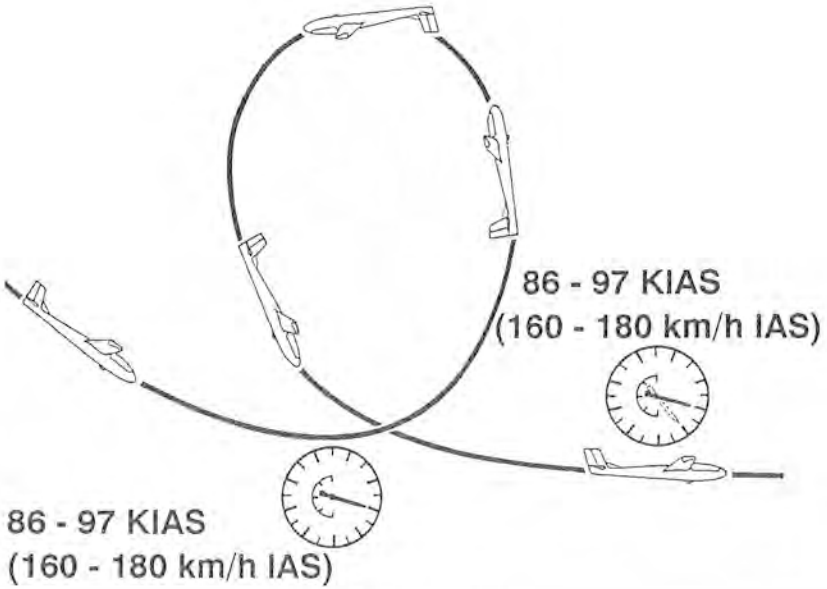


Fig.4 - 5