



**WSK "PZL-ŚWIDNIK" S.A.**  
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## **SAILPLANE FLIGHT MANUAL**

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General Inspectorate of Civil Aviation  
Civil Aircraft Airworthiness Authority

Stamp:

Original date of approval:

<b>This Flight Manual should be always kept on board of the sailplane</b>
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This sailplane is to be operated in compliance with information and limitations contained herein.

The original Polish version has been translated into English to the best of our knowledge and belief, but in case of any uncertainty the Polish original shall prevail.

The English translation has been made by Włodzimierz Sypek.



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## 0.1 RECORD OF REVISIONS

Any revision of the present Manual, except actual weighing data, must be recorded in the following table and in case of approved Sections endorsed by the responsible airworthiness authority.

The new or amended text in the revised page will be indicated by a black vertical line in the left hand margin, and the Revision No. and the date will be shown on the bottom left hand of the page.

Revision No.	Affected Section	Affected Pages	Date	Approval	Date	Date Inserted	Signature



## 0.2 LIST OF EFFECTIVE PAGES

Section	Page	Issue Date	Section	Page	Issue Date
0	(i)	18.11.2003	5	5.1	18.11.2003
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**SECTION 1**

**GENERAL**

- 1.1 INTRODUCTION**
- 1.2 CERTIFICATION BASIS**
- 1.3 WARNINGS, CAUTIONS, AND NOTES**
- 1.4 DESCRIPTIVE DATA**
- 1.5 THREE-VIEW DRAWING**
- 1.6 ABBREVIATIONS**



# **PW-6U**

## Sailplane Flight Manual

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### **1.1 INTRODUCTION**

This Sailplane Flight Manual has been prepared to provide pilots and instructors with information for the safe and efficient operation of the PW-6U sailplane.

This Manual includes the material required by Joint Airworthiness Requirements JAR-22 and supplemental information supplied by the sailplane manufacturer.

### **1.2 CERTIFICATION BASIS**

This type of sailplane has been approved by Civil Aircraft Airworthiness Board in accordance with Joint Airworthiness Requirements JAR-22 - Change 5 dated October 28, 1995.

The Type Certificate No. **BG-213** has been issued on September 11, 2000, Category of Airworthiness "U" (utility).

### **1.3 WARNINGS, CAUTIONS, NOTES**

#### **WARNING:**

**MEANS THAT NON-OBSERVATION OF THE CORRESPONDING PROCEDURE LEADS TO AN IMMEDIATE OR IMPORTANT DEGRADATION OF THE FLIGHT SAFETY.**

#### **CAUTION:**

**MEANS THAT NON-OBSERVATION OF THE CORRESPONDING PROCEDURE LEADS TO A MINOR OR TO A MORE OR LESS LONG TERM DEGRADATION OF THE FLIGHT SAFETY.**

#### **NOTE:**

**Draws the attention to any special item not directly related to safety, but which is important or unusual.**



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### 1.4 DESCRIPTIVE DATA

#### SAILPLANE DESCRIPTION

The PW-6U is a dual-seat sailplane with the cantilever mid wing and standard tailplane arrangement. The sailplane has the all epoxy-glass composite structure.

The wings are of trapezoid contour with bow-shaped ends. The wings are of mono-spar structure with sandwich shells.

The air brakes are panel-type extendable from the upper wing surface.

The fuselage shells are of monocoque structure, stiffened with frames.

The rudder is fabric-covered.

The front cockpit is equipped with rudder pedals adjustable in flight and the backrest adjustable on the ground. The canopy opens forwards.

The rear cockpit is provided with non-adjustable rudder pedals and the backrest adjustable on the ground. The canopy opens aftward.

The sailplane landing gear is not retractable and consists of the main wheel with shock absorber and drum brake, nose wheel and tail wheel.

The sailplane is provided with two takeoff hooks (the nose hook is used for aerotowing and the C.G. hook for winch-launching).

#### MAIN DATA

Wing span .....	<b>52.49 ft</b>
Length .....	<b>25.75 ft</b>
Height.....	<b>7.87 ft</b>
Wing area .....	<b>164.17 ft<sup>2</sup></b>
Aspect ratio .....	<b>16.8</b>
Wing loading .....	<b>7.4 lb/ft<sup>2</sup></b>
Mean standard chord.....	<b>3.32 ft</b>



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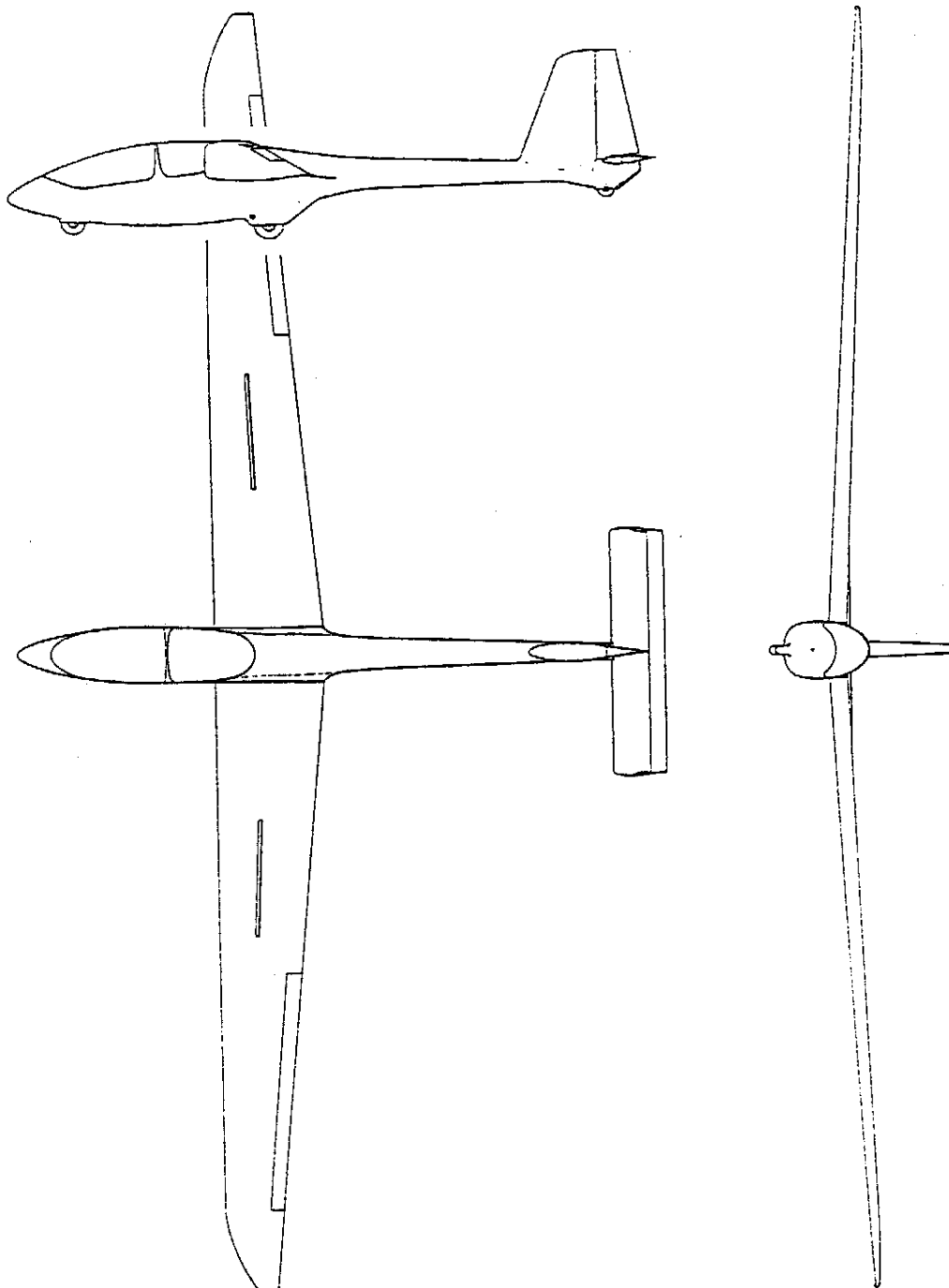
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### 1.5 THREE-VIEW DRAWING



PW-6U Sailplane  
Fig. 1-1





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### 1.6 ABBREVIATIONS

CAS - calibrated airspeed means the sailplane indicated speed calibrated for pressure port location (due to location of pressure ports on the sailplane) and instrument error. The calibrated airspeed is equal to the true airspeed in the international standard atmosphere at the sea level.

C.G. - center of gravity.

DaN - decaNewton.

h - hour.

IAS - indicated airspeed means the sailplane airspeed as shown on its pitot-static airspeed indicator, not calibrated for the pitot-static system and instrument error. In this Manual a zero instrument error is assumed.

m - meter.

kg - kilogram.

km - kilometer.

s - second.

$V_{S1}$  - means the stall airspeed or the minimum steady flight airspeed for a specific configuration.

kts – knots	1 knot (kt)	- 1.8532 km/h
ft - feet	1 foot (ft)	- 0.3048 m
lbs - pounds	1 pound (lb)	- 0.45359 kg
lbf - pound force	1 pound force	- 0.445 daN



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**SECTION 2**

**LIMITATIONS**

- 2.1 INTRODUCTION**
- 2.2 AIRSPEED**
- 2.3 AIRSPEED INDICATOR MARKINGS**
- 2.4 WEIGHT**
- 2.5 CENTER OF GRAVITY**
- 2.6 APPROVED MANEUVERS**
- 2.7 MANEUVERING LOAD FACTORS**
- 2.8 KINDS OF OPERATION**
- 2.9 MINIMUM EQUIPMENT**
- 2.10 AEROTOW AND WINCH-LAUNCHING**
- 2.11 OTHER LIMITATIONS**
- 2.12 LIMITATIONS PLACARDS**



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## Sailplane Flight Manual

### 2.1 INTRODUCTION

Section 2 includes operating limitations, airspeed indicator markings, and basic placards necessary for safe operation of the sailplane. The limitations included in this Section and in Section 9 have been approved by the Civil Aircraft Airworthiness Board.

### 2.2 AIRSPEED

Airspeed limitations and their operational significance are shown below:

Speed		kts IAS	Remarks
V <sub>NE</sub>	Never exceed speed	141	Do not exceed this speed in any operation and do not use more than 1/3 of control deflection.
V <sub>RA</sub>	Rough air speed	89	Do not exceed this speed except in smooth air, and then only with caution. Examples of rough air are lee-wave rotor, thunderclouds, etc.
V <sub>A</sub>	Maneuvering speed	89	Do not make full or abrupt control movement above this speed, because under certain conditions the sailplane may be overstressed by full control movement.
V <sub>W</sub>	Maximum winch-launching speed	65	Do not exceed this speed during winch-launching.
V <sub>T</sub>	Maximum aerotowing speed	89 (CAS = 88)	Do not exceed this speed during aerotowing.



### 2.3 AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings and their color-code significance are shown below:

Marking	[kts] IAS value or range	Significance
Green arc	45-89	<i>Normal Operating Range.</i> (Lower limit is maximum weight 1.1 $V_{S1}$ at most forward C.G. Upper limit is rough air speed).
Yellow arc	89-141	Maneuvers must be conducted with caution and only in smooth air.
Red line	141	Maximum speed for all operations.
Yellow triangle	54	Approach speed at maximum weight.



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### 2.4 WEIGHT

Maximum takeoff weight.....	<b>1204</b>	<b>lbs</b>
Maximum fuselage and tailplane weight.....	<b>419</b>	<b>lbs</b>
Maximum payload .....	<b>441</b>	<b>lbs</b>
Minimum of pilot with parachute weight (solo flight) .....	<b>121</b>	<b>lbs</b>
Maximum of pilot with parachute weight.....	<b>242.5</b>	<b>lbs</b>
Maximum load in baggage compartment .....	<b>11</b>	<b>lbs</b>

### 2.5 CENTER OF GRAVITY

Center of Gravity range (for flight):

- Forward limit                      17% of Mean Standard Chord  
7.02 in from root chord leading edge
- Aft limit                              42% of Mean Standard Chord  
16.77 in from root chord leading edge

The methods how to determine the sailplane C.G. and empty sailplane C.G. are described in the MAINTENANCE MANUAL.

#### **WARNING:**

**THE SAILPLANE MAY BE OPERATED SAFELY ONLY WHEN LOADED AS DEFINED IN SECTION 6 OF THIS MANUAL.**

### 2.6 APPROVED MANEUVERS

This sailplane is certified in the Utility Category.

The following maneuvers are allowed:

- Chandelle (climbing),
- Loop,
- Stall turn,
- Spin,
- Spiral.
- Chandelle (dive out).

Techniques of the above aerobatic figures and recommended entry speeds are contained in Section 4 of this Manual.



## **2.7 MANEUVERING LOAD FACTORS**

Limit load factors are as follows:

- for the airspeed  $V_A=89$  kts                      +5.3 / -2.65
- for the airspeed  $V_{NE}=141$  kts                    +4.0 / -1.5

## **2.8 KINDS OF OPERATION**

- day flying,
- cloud flying
- aerobatic maneuvers (as per paragraph 2.6 of this Manual)

## **2.9 MINIMUM EQUIPMENT**

- 4-piece safety belt – 2 sets,
- Two airspeed indicators (marked as per paragraph 2.3 of this Manual),
- Two altimeters,
- Total energy variometer (in the forward cockpit),
- Two turn and bank indicators with a slip ball,
- Magnetic compass (in the forward cockpit),
- Communication transceiver,
- Power supply unit.

### **CAUTION:**

PARACHUTES ARE REQUIRED FOR ALL AEROBATIC MANEUVERS.

### **CAUTION:**

INSTRUMENTS AND OTHER EQUIPMENT MUST BE OF AN APPROVED TYPE



## **2.10 AEROTOW AND WINCH-LAUNCHING**

### **AEROTOW**

The aerotow hook (nose hook) is located in front of the nose wheel.

- Maximum aerotowing speed .....  $V_T = 89$  kts  
(CAS = 88 kts)
- Maximum force that breaks the cable or weak link ..... **2408 lbf**
- Minimum towing cable length..... **66 ft**

### **WARNING:**

**AEROTOWING WITH USE OF THE C.G. HOOK IS NOT ALLOWED.**

### **WINCH LAUNCHING**

The winch-launching hook (C.G. hook with automatic release) is located in front of the main wheel on the right hand side of the fuselage.

### **CAUTION:**

**WINCH LAUNCH WITH USE OF NOSE HOOK IS NOT ALLOWED.**

- Maximum winch-launching speed .....  $V_W = 65$  kts
- Maximum force that breaks the cable or weak link ..... **2408 lbf**

## **2.11 OTHER LIMITATIONS**

- 1) Flying in known icing conditions is not permitted.
- 2) Night flying is prohibited.
- 3) Aerobatic maneuvers in rough air are prohibited.



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#### 2.12 LIMITATIONS PLACARDS

Maximum winch-launching speed (IAS) .....  $V_W = 65$  kts  
Maximum aerotow speed (IAS) .....  $V_T = 89$  kts  
Maneuvering speed (IAS).....  $V_A = 89$  kts  
Allowed maneuvers: chandelle (climbing), loop, stall turn, spin, spiral,  
chandelle (dive out)

Empty sailplane weight .....max. **794 lbs**  
Takeoff weight.....**1204 lbs**  
Maximum cockpit load.....**441 lbs**  
Minimum pilot+parachute weight in solo flight ..... **121 lbs**  
Maximum pilot + parachute weight .....**242.5 lbs**  
Maximum force that breaks cable or weak link ..... **2408 lbf**

Baggage max. **11 lbs**

**THE MARKINGS AND PLACARDS INSTALLED IN THIS GLIDER CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS GLIDER IN THE UTILITY CATEGORY.**

**OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS GLIDER IN THIS CATEGORY ARE CONTAINED IN THE GLIDER FLIGHT AND MAINTENANCE MANUALS.**

$V_{NE}$ /kts/ IAS	Altitude /ft/
<b>141</b>	<b>0 – 9843</b>
<b>135</b>	<b>13123</b>
<b>132</b>	<b>16404</b>
<b>130</b>	<b>19685</b>
<b>127</b>	<b>22966</b>
<b>121</b>	<b>26247</b>
<b>119</b>	<b>29528</b>
<b>116</b>	<b>32808</b>

The other placards are shown in Section 7 (Fig. 7-5).

Location of the placards is described in the sailplane MAINTENANCE MANUAL.





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**SECTION 3**

**EMERGENCY PROCEDURES**

- 3.1 INTRODUCTION**
- 3.2 CANOPY JETTISON**
- 3.3 BAILING OUT**
- 3.4 STALL RECOVERY**
- 3.5 SPIN RECOVERY**
- 3.6 SPIRAL DIVE RECOVERY**



### **3.1 INTRODUCTION**

Section 3 provides checklist and amplified procedures for coping with emergencies that may occur.

### **3.2 CANOPY JETTISON**

#### **Forward canopy:**

- 1) Pull the canopy emergency jettison handle full.
- 2) Catch the handles of locks and push the canopy upwards.

#### **Rear canopy:**

- 1) Open the aft canopy locks.
- 2) Pull the canopy upwards.

### **3.3 BAILING OUT**

**This procedure applies to both cockpits.**

- 1) Jettison the canopy.
- 2) Unfasten the safety belts.
- 3) Bail out of the sailplane (if the sailplane rotates, bail out in the sense of rotation).
- 4) When the altitude is sufficient, open the parachute with delay, and when the altitude is below 656 ft, open the parachute immediately.

### **3.4 STALL RECOVERY**

Push the control stick forward and hold it until the normal flight attitude is regained for the sailplane.

### **3.5 SPIN RECOVERY**

PW-6U sailplane is approved for spin.

- 1) Check ailerons neutral.
- 2) Apply full rudder opposite to the direction of the spin.
- 3) Move the stick forward until the sailplane rotation ceases.
- 4) Return the rudder to the neutral position and recover the sailplane from the dive.

### **3.6 SPIRAL DIVE RECOVERY**

- 1) Cancel the bank with the coordinated aileron and rudder deflection.
- 2) Recover the sailplane from the dive.



## **SECTION 4**

### **NORMAL PROCEDURES**

- 4.1 INTRODUCTION**
- 4.2 RIGGING AND DE-RIGGING**
- 4.3 DAILY INSPECTION**
- 4.4 PREFLIGHT INSPECTION**
- 4.5 NORMAL PROCEDURES AND RECOMMENDED SPEEDS**
  - 4.5.1 BEFORE TAKEOFF
  - 4.5.2 TAKEOFF
  - 4.5.3 FLIGHT
  - 4.5.4 APPROACH
  - 4.5.5 LANDING
  - 4.5.6 FLIGHT IN RAIN
  - 4.5.7 AEROBATICS
- 4.6 POSTFLIGHT INSPECTION**



## **4.1 INTRODUCTION**

Section 4 provides checklist and amplified procedures for the conduct of normal operation/ Normal procedures associated with optional systems can be found in Section 9.

## **4.2 RIGGING AND DE-RIGGING**

- A) Rigging team: 3 persons (or 4 persons without the rigging jigs)
- B) Rigging jigs: fuselage support, wing tip support (approx 5 ft tall)
- C) Rigging procedure:
  - 1. Clean and lubricate all attachment fittings, bolts, and connectors of control linkages,
  - 2. Position the fuselage on the support (in case when the support is not available, 1 person should hold the fuselage), open the rear cockpit canopy, move the air brake handle aftwards, open the access door in the fuselage,
  - 3. Unlock and move forward the main bolts, and then move forward the rear bolts through the access hole,
  - 4. Install the right hand wing first. Insert the wing spar grip into the fuselage, match together the wing and fuselage fittings, insert the rear right hand bolt home, insert the main right hand bolt half a way (place the bolt between two signs meaning "½" position) and then insert the main left hand bolt also half a way (as above) - (see Fig. 4-2).

### **CAUTION:**

INSERT THE BOLTS BY HAND ONLY, NO TOOL IS ALLOWED. IN CASE OF JAMMING (EXCESSIVE DRAG) ABORT THE RIGGING AND CHECK IF THE BOLTS AND FITTING ARE CLEAN.

- 5. Support the wing tip (in case when no support is available, 1 person should hold the wing),
- 6. Install the left hand wing: insert the wing spar grip into the fuselage, match together the wing and fuselage fittings, insert the rear bolt home, insert the main left hand bolt until it is locked with the latch and then insert the main right hand bolt in the same way,
- 7. Connect the control linkages of ailerons and air brakes (see Fig. 4-1),



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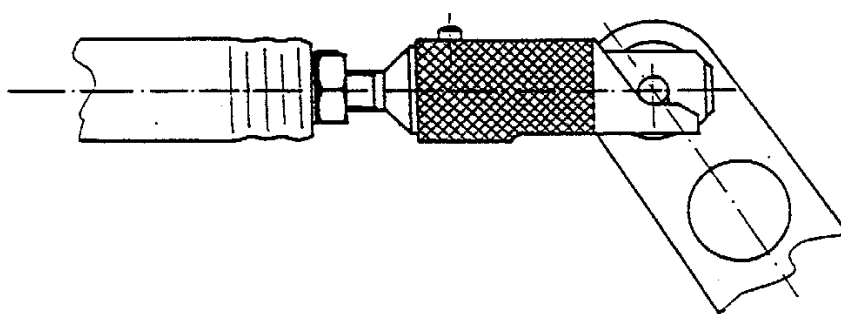
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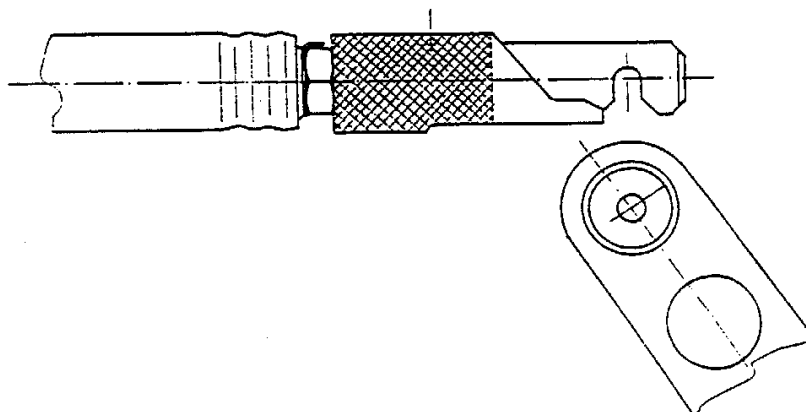
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8. Rigging of the tailplane: deflect the rudder to the stop, fit the tailplane to the fuselage (the stabilizer front pins must engage the fuselage installed fittings), insert the rear bolt and lock it. The elevator control circuit is connected automatically, (see Fig. 4-3),
9. Make sure the main bolts of the wings, the bolt of elevator, and connections of the control linkages are secured. Close the access door in the fuselage.

De-rigging is performed in the reversed sequence.



A) Joint Connected and Secured



B) Joint Disconnected

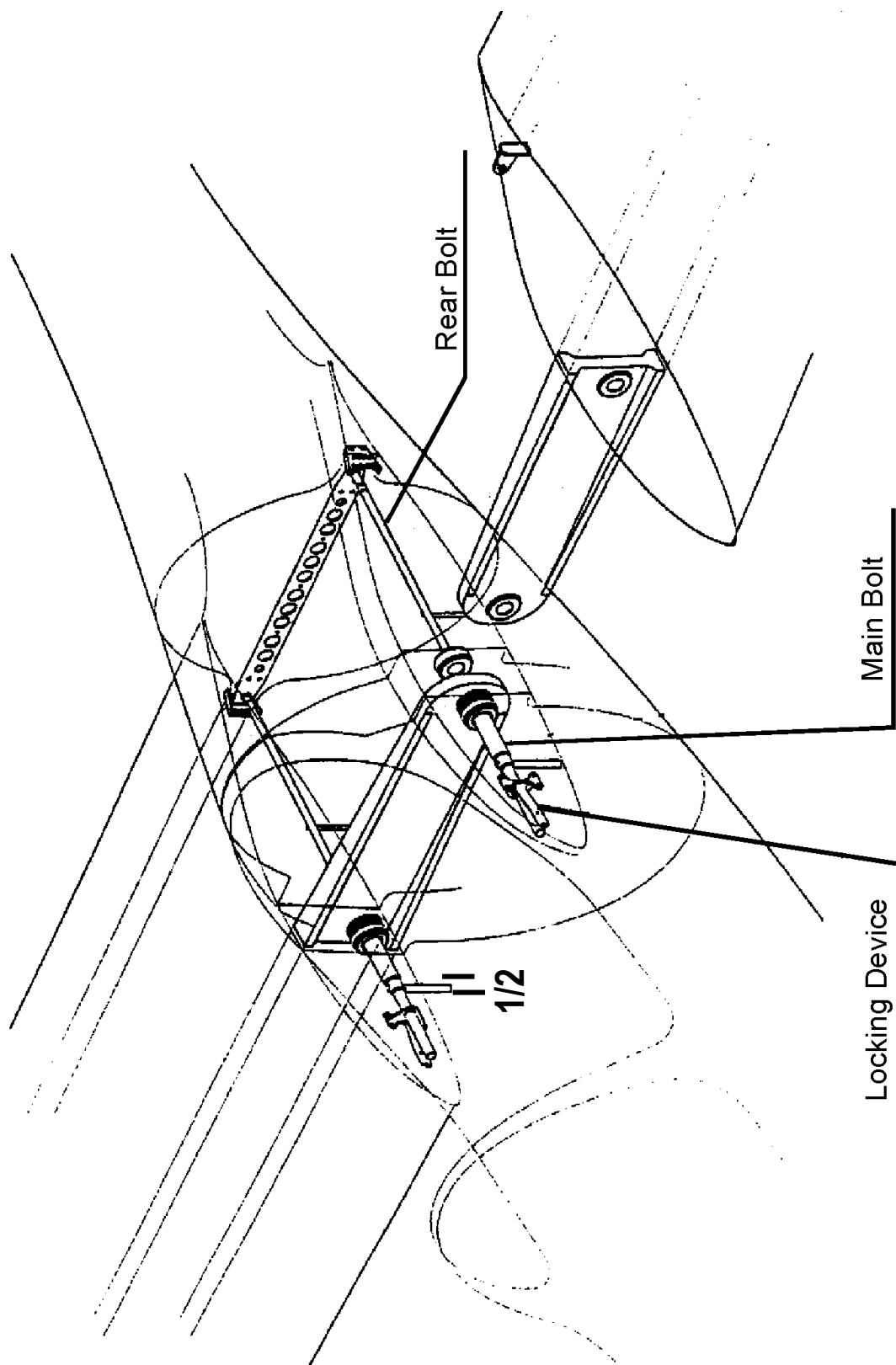
Connection of Control Linkages of Ailerons and Air Brakes with Quick-Disconnect Joints

Fig. 4-1



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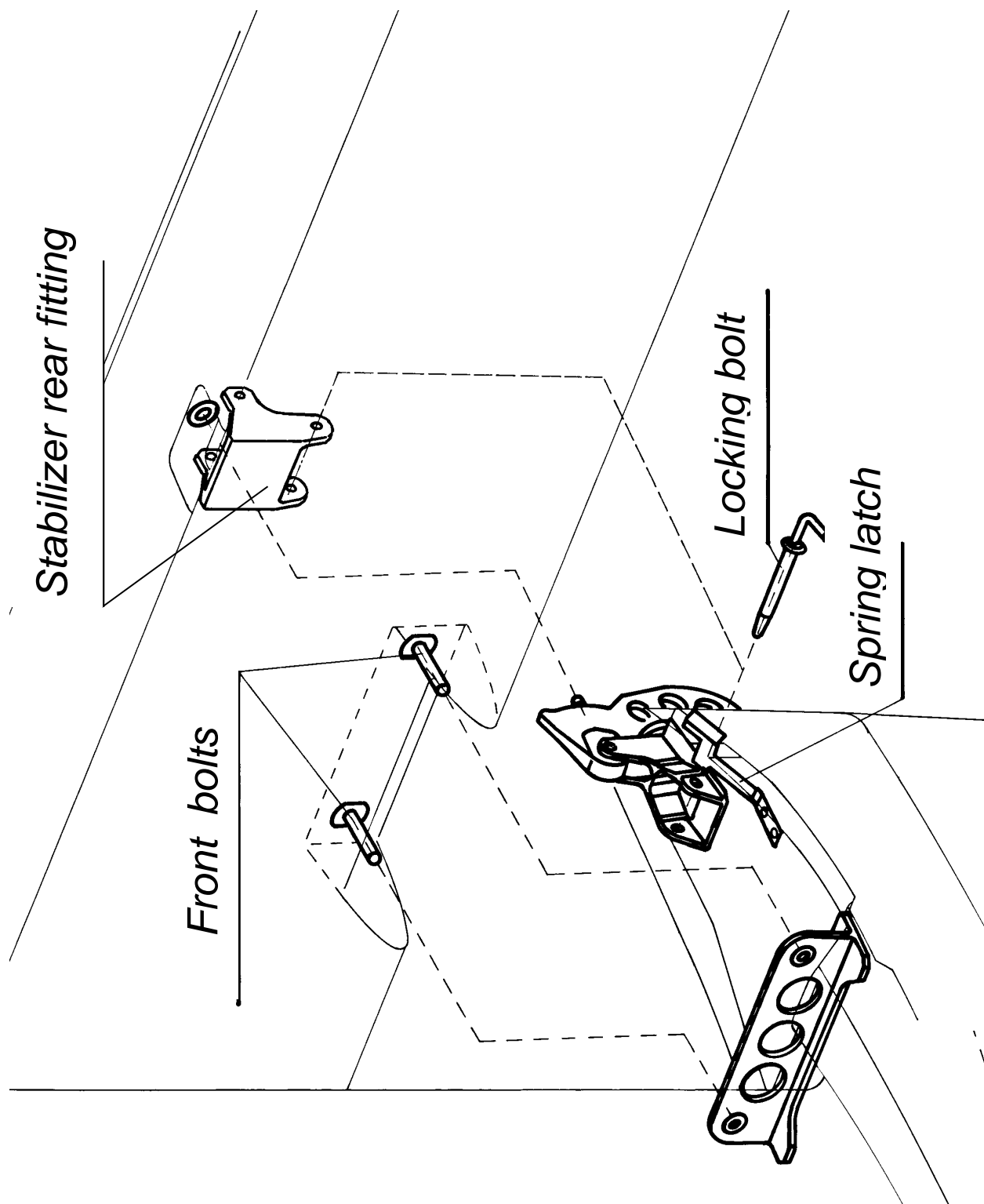


Rigging Wings  
Fig. 4-2

Appr. 4.4



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Rigging Tailplane  
Fig. 4-3

Appr. 4.5



### 4.3 DAILY INSPECTION

**NOTE:**

**Before flight, make sure the airworthiness certificate is valid and the periodical inspection checklist is updated.**

It is recommended to perform the daily inspection and inspection after each rigging of the sailplane by following the below plan (see Fig. 4-4):

1. - Inspect the forward fuselage section for surface condition. Make sure the pressure ports are not blocked,
2. - Inspect the perspex surface and open both canopies,
  - Make sure that the wing securing bolts are inserted and locked,
  - In both cockpits inspect instruments and system connections,
  - Make sure the controls of elevator, rudder, and ailerons are operating correctly. Check them for maximum deflections, plays, and friction,
  - Make sure the air brakes are operating correctly. Check them for the maximum extended position and locking in the retracted position.
  - Check operation of the trimming device,
  - Make sure the nose aerotow and winch-launch hooks operate correctly,
  - Inspect the cockpits for loose items – remove,
  - Make sure the canopies open and close correctly,
  - Inspect safety belts, back rests and seat cushions,
3. - Check wheel tires for condition and pressure,
  - Make sure the wheels rotate freely,
  - Make sure the wheel brake and shock absorber are operating correctly,
4. - Inspect the upper and lower wing surface as well as the leading and trailing edges,
  - Check the ailerons for surface condition, plays, deflections, and friction,
  - Check the airbrakes for condition. Make sure they are play-free, extend and retract correctly, and their caps fit the wing contour,
5. - Make sure the control linkages are connected to the ailerons and air brakes,





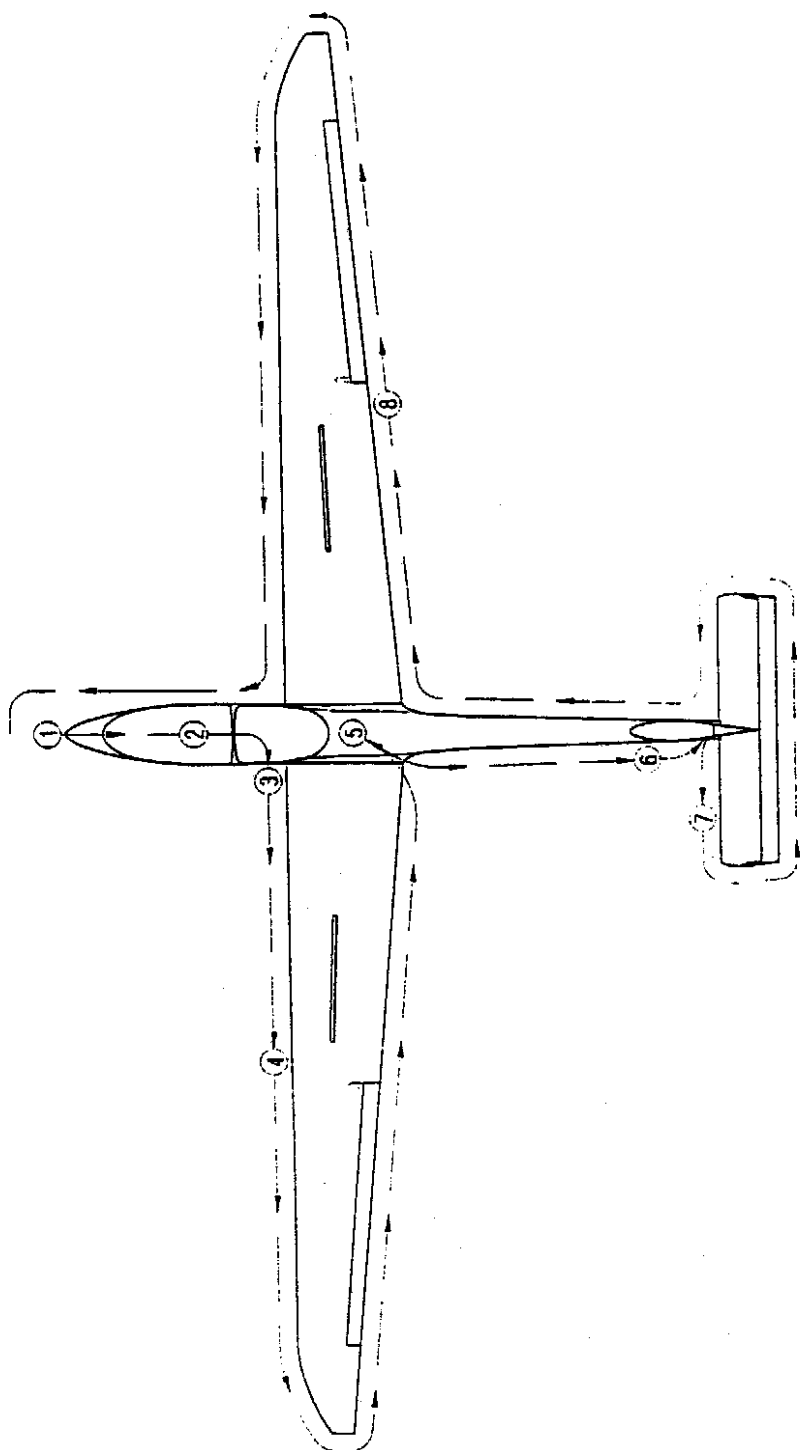
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Daily Inspection  
Fig. 4-4

Appr. 4.7



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6. - Inspect the rear fuselage section, particularly the bottom section,
  - Inspect the vertical stabilizer surface,
  - Inspect the rudder. Make sure that the fabric is free of defects and the upper hinge and cable connections are secure,
7. - Inspect the elevator for condition and security,
  - Check the elevator for deflections, plays and friction,
8. - Inspect the other wing as under step 4 above.

### **4.4 PREFLIGHT INSPECTION**

- Make sure the wing attachment bolts are inserted and locked properly,
- Make sure the tailplane is rigged and locked correctly,
- Open the access door and make sure the control linkages of ailerons and air brakes are connected and locked properly,
- Make sure the control surfaces and air brakes operate correctly, i.e. freely without jamming or excessive plays and make full deflections.
- Loading charts checked.

### **4.5 NORMAL PROCEDURES AND RECOMMENDED SPEEDS**

#### **4.5.1 BEFORE TAKEOFF**

(applicable to both cockpits)

- Inspect and put the parachute on,
- Adjust the backrest as required,
- Take place in the cockpit,
- Fasten and tighten the safety belts,
- Adjust the pedals (in the forward cockpit only),
- Move full movements of flight controls, pull the towing cable release handle, extend and retract the air brakes,
- Check the communication transceiver,
- Check the altimeter setting,
- Close the canopy.



#### 4.5.2 TAKEOFF

##### A) AEROTOWING

Before take-off set the trimming device handle to the position 1-2 for a light pilot and up to the position 5-6 for a heavy pilot.

Roll on the main wheel.

Piloting technique for the aerotow is typical.

The sailplane can be trimmed within the whole airspeed range in towed flight.

Flying under the towing airplane downwash is not recommended since the towing cable rubs the fuselage front part.

Recommended aerotowing airspeeds:

- while climbing 59 kts
- while flying cross-country 81 kts

##### B) WINCH-LAUNCHING

Before take-off set the trimming device handle to the position 1 for a light pilot and up to the position 5-6 for a heavy pilot.

Due to the C.G. hook location it is recommended to have the launching cable on the right-hand side of the sailplane.

If, however, the winch cable is clearly on the left-hand side of the sailplane, do not attempt to move the cable to the right.

During the ground run do not pull the control stick too much to avoid the tail wheel impact onto the ground. Roll on the main wheel.

While steep climbing, forces on the control stick are insignificant.

The best takeoff speed is within 49 - 54 kts.

#### RELEASE

The sailplane is equipped with the self-releasing hook.

There are two release techniques:

- 1) Before the intended hook release, ease the stick to lower the cable tension then pull the hook release handle in the cockpit,
- 2) Before the hook self-release, hold the stick in a position until the hook is self-released. After the self-release recover immediately the glide and make sure the cable is released by pulling the hook release handle.



#### 4.5.3 FLIGHT

##### CIRCLING

The circling airspeed, depending on the bank angle and sailplane weight, ranges from 43 - 51 kts.

The bank reversal 45°/45° requires 4.3 seconds.

##### SIDE SLIP

Perform the sideslip at the airspeed of 49 kts or higher. Up to the bank of approx. 20° the sailplane allows to retain the heading. When the bank is greater, the sailplane turns. The sideslip is performed in a typical way with the airbrakes retracted or extended. In the sideslip the airspeed indicator readings are not reliable. The sideslip characteristics in the landing configuration with the air brakes extended is as follows:

- Maneuver effectivity is typical,
- Side slip can be performed up to the airspeed of 70 kts IAS,
- Forces on the stick do not drop and are not reversed,
- Airspeed indicator reading is much lower than the actual airspeed.

##### AIR BRAKE OPERATION

With the air brakes extended fully, the sailplane gliding ratio at the approach speed is 6.4. Diving at 45° with air brakes extended fully does not exceed the airspeed of 141 kts. Extending and retracting the air brakes do not cause the sailplane to pitch up or down. Operation of the air brakes is allowed within the whole airspeed range. The brakes can be retracted at the airspeed below 89 kts.

##### NOTE:

**When extending the air brake at the airspeed above 108 kts the negative vertical acceleration is significant. Therefore the air brake should be extended gently. The aircrew should have the safety belts fastened tightly.**



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#### 4.5.4 APPROACH

The recommended approach airspeed with the maximum gross weight without wind is 54 kts.

The approach glide slope should be adjusted by means of the air brakes.

#### 4.5.5 LANDING

The ground should be touched down with the main wheel. Avoid ground impact of the tail wheel. While on the ground, roll on the nose wheel – this facilitates keeping a desired heading and allows for efficient braking.

#### 4.5.6 FLIGHT IN RAIN

While flying in rain no abnormal control characteristics occur.

No significant increase of stalling speed is observed.

#### 4.5.7 AEROBATICS

Before attempting aerobatic maneuvers, trim the sailplane at the airspeed of approx. 70 kts. Make sure the air brakes are locked and no loose items are present in the cockpit.

The aerobatic maneuvers are performed in a typical way.

The recommended entry (recovery) speeds and obtainable g-loads are presented in the below table:

Figure	Airspeed (IAS) kts	G-load
Loop	102.5 to 108	3.5 g
Chandelle (climbing)	102.5 to 108	3.5 g
Stall turn	102.5 to 108	3.5 g
Spin	92 (recovery)	4.0 g
Spiral	65	3.5-4.0 g
Chandelle (dive out)	54 to 59	2.5-3.0 g



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#### SAILPLANE BEHAVIOR IN SPINNING

Aircrew	Light solo pilot 121-154 lbs	Heavy solo pilot 198-220 lbs	Two heavy pilots 397-441 lbs
Aileron deflection	any	any	Same as sense of spinning or neutral
Longitudinal oscillation	exist	not exist	not exist
Pitch angle	30-40 deg	50 deg	60-70 deg
Delay in recovery	Not more than 3/4 of rev.	Not more than 1/2 of rev.	Without delay up to 1/4 of rev.

The spin recovery is typical (refer to paragraph 3.5) however a light pilot flying solo should push the stick forward until the end stop and in case of heavy aircrew, pushing the stick to the neutral position should be enough to interrupt the autorotation.

#### 4.6 POST FLIGHT INSPECTION

- Switch off the electrical equipment,
- If necessary, drain water from the pitot and static pressure system (refer to the MAINTENANCE MANUAL),
- Clean the cockpits and the whole sailplane,
- Perform the daily inspection.



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**SECTION 5**

**PERFORMANCE**

**5.1 INTRODUCTION**

**5.2 APPROVED DATA**

5.2.1 AIRSPEED INDICATOR SYSTEM CALIBRATION

5.2.2 STALL SPEEDS (IAS)

**5.3 NON-APPROVED ADDITIONAL INFORMATION**

5.3.1 DEMONSTRATED CROSSWIND PERFORMANCE

5.3.2 FLIGHT POLAR



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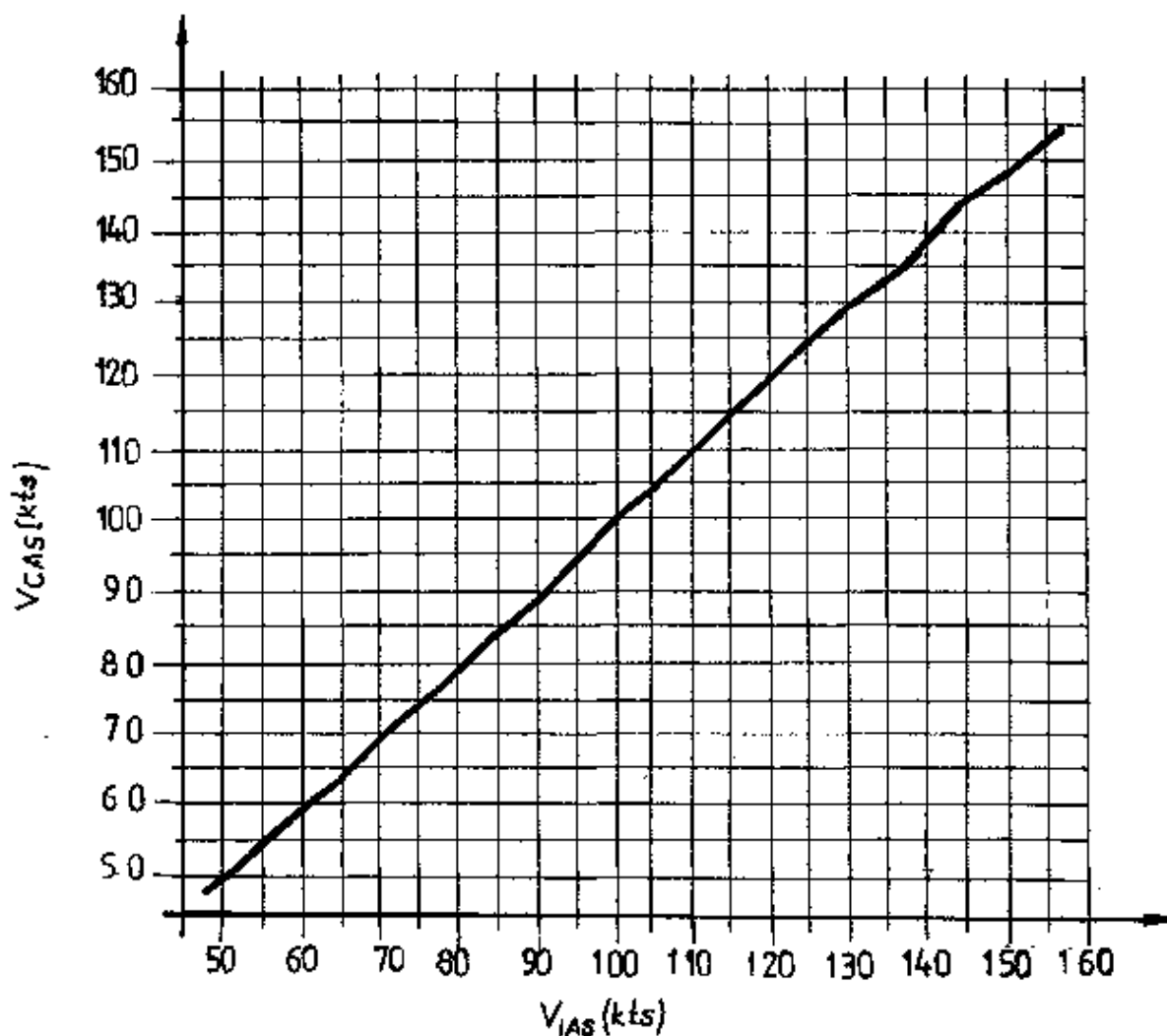
### 5.1 INTRODUCTION

Section 5 provides approved data for airspeed calibration, stall speeds and non-approved additional information.

The data presented in the charts has been computed from actual flight tests with the sailplane in good condition and using average piloting techniques.

### 5.2 APPROVED DATA

#### 5.2.1 AIRSPEED INDICATOR SYSTEM CALIBRATION



Airspeed Indicator System Calibration

Fig. 5-1





### 5.2.2 STALL SPEEDS (IAS)

#### SAILPLANE WITH HEAVY AIRCREW

The sailplane with heavy aircrew (above 397 lbs) and with the air brakes retracted stalls in straight flight by lowering the nose slightly (the minimum airspeed 41 kts). A clear warning that the sailplane is close to the stall effect appears approximately 1 to 2 kts before the stall. Flight with the air brakes extended can be maintained with the control stick pulled backward fully at the airspeed of 43 kts. While circling with roll up to 45° with the air brakes retracted (the minimum airspeed 43 kts) and extended (minimum airspeed 50 kts) the sailplane stalls by lowering the wing towards the turn. The straight flight is recovered by pushing the stick forward and deflecting the ailerons and rudder in the direction opposite to the turn.

#### SAILPLANE WITH MEDIUM OR LIGHT SOLO PILOT

The sailplane with a medium or lightweight solo pilot (121-198 lbs) stalls in straight flight gently and it is possible to maintain the lateral balance.

The stall warning is clear about 1 to 2 kts before the stall. Once stalled, the sailplane drops gently and symmetrically, and when the stick is pulled more, the sailplane does not tend to roll on the wing.

The stalling speed ranges from 36 to 37 kts with the air brakes retracted up to approximately 39 to 40 kts with the brakes extended.

The stall recovery is achieved by pushing the control stick forward.

When circling with the medium or lightweight pilot (121-198 lbs), once the critical speed is reached (the minimum airspeed 39 kts), the sailplane rolls towards the turn.

A slight push of the stick with the simultaneous deflection of the ailerons in the direction opposite to the turn recovers the normal flight without a tendency to enter the spin.

With the air brakes extended, the sailplane behavior in circling with roll up to 45° is similar to that with the brakes retracted (the minimum speed is 39-40 kts).



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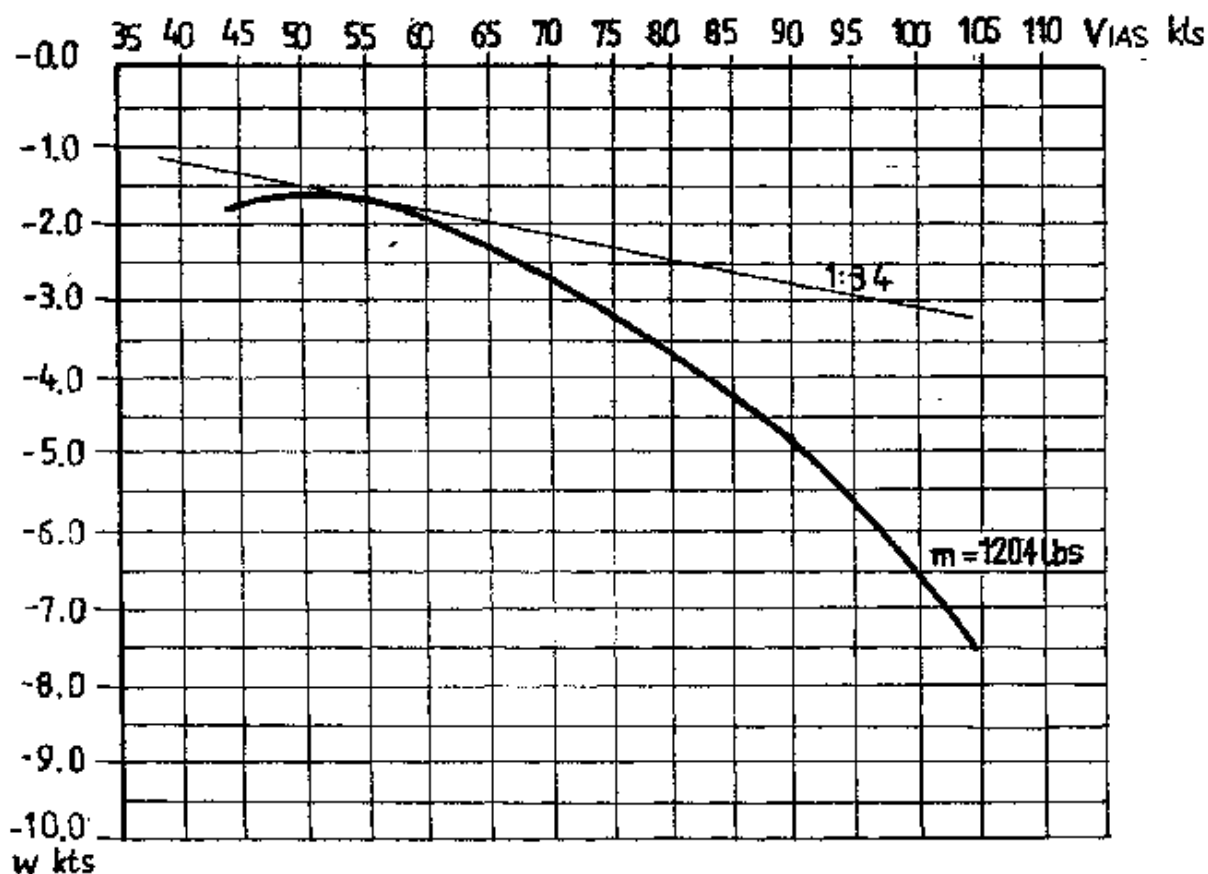
### 5.3 NON-APPROVED ADDITIONAL INFORMATION

#### 5.3.1 DEMONSTRATED CROSSWIND PERFORMANCE

The demonstrated crosswind component at aerotow take-off, winch-launch, and landing is 12 kts.

During roll on and run in on two wheels, the sailplane is practically non-sensitive to the crosswind.

#### 5.3.2 FLIGHT POLAR



Flight Polar  
Fig. 5-2

Airspeeds (for gross weight 1204 lbs) are as follows:

- Least descent speed = 51 kts
- Maximum glide ratio speed = 56 kts



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**SECTION 6**

**WEIGHT AND BALANCE**

**6.1 INTRODUCTION**

**6.2 ALLOWABLE PAYLOAD RANGE AND WEIGHT AND  
BALANCE RECORD**



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### **6.1 INTRODUCTION**

This section describes the payload range within which the sailplane can be operated safely.

For the sailplane weight check and C.G. calculation procedure as well as determination of empty sailplane weight and C.G. limits refer to the sailplane MAINTENANCE MANUAL.

A comprehensive list of the equipment available and that which was installed during the sailplane weight check is contained in the sailplane MAINTENANCE MANUAL.

### **6.2 ALLOWABLE PAYLOAD RANGE AND WEIGHT AND BALANCE RECORD**

#### **ALLOWABLE PAYLOAD RANGE**

Maximum cockpit load (aircrew+parachutes+baggage) .....	<b>441 lbs</b>
Minimum pilot's weight incl. Parachute (solo flight) .....	<b>121 lbs</b>
Maximum pilot's weight incl. parachute.....	<b>242.5 lbs</b>

[illegible]

6.3



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**SECTION 7**

**SAILPLANE AND SYSTEMS DESCRIPTION**

- 7.1 INTRODUCTION**
- 7.2 COCKPITS INSTALLED EQUIPMENT**
- 7.3 BAGGAGE COMPARTMENT**
- 7.4 PLACARDS**



## 7.1 INTRODUCTION

This Section provides description and operation of equipment installed in the cockpit. For the detailed information on optional equipment refer to Section 9 of this Manual.

For the detailed description of the sailplane and its systems refer to the sailplane MAINTENANCE MANUAL.

## 7.2 COCKPITS INSTALLED EQUIPMENT

Legend to Fig. 7-1 and 7-2 (the forward and rear cockpit):

- 1) Instrument panel (see also Fig. 7-3 and 7-4)
- 2) Towing cable release handle (yellow) – to release the cable, pull the handle,
- 3) Pedals adjustment handle (**only for the front canopy**) (brown – on the instrument panel console) - to adjust the pedals do the following:
  - Pull the handle to unlock the pedals,
  - Adjust a desired position by pulling or pushing the pedals with your feet,
  - Release the handle,
  - Make sure the pedals are locked in position by pushing the pedals with your feet.
- 4) Canopy jettison handle (red) – to jettison the canopy, pull the handle (**only for the front canopy**),
- 5) Air brake handle (blue) – operate the airbrakes as follows:
  - To extend the air brakes – pull the handle aftward,
  - To retract the air brakes – push the handle forward,
  - To lock the airbrake in the retracted position – push the handle forward until a clearly noticeable click can be felt,
  - To unlock the air brakes – pull the handle aftwards until a clearly noticeable click can be felt,
- 6) Wheel brake handle – to brake the wheel press the wheel brake handle against the air brake handle,



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- 7) Trimming device ball-grip (green) – to trim the sailplane do as follows:
  - Unlock the trimming device by pulling the ball-grip down,
  - Set the ball-grip in one of eleven positions (forward – increase the airspeed, aftward – decrease the airspeed),
  - Lock the device by locating the ball-grip in a desired cutout,
  - Make sure the trimming device is locked by moving the ball-grip forward and backward,
- 8) Ventilation hand-grip (**only for the front canopy**) – pull the hand-grip to open the air intake,
- 9) Canopy latch grips (red and white) – to operate the latch:
  - Forwards – the canopy is opened,
  - Backwards until the latch is locked – the canopy is closed,
- 10) Safety belts,
- 11) Back rest – adjust the back rest position as follows:
  - Locate the upper fittings of the back rest (forward seat) in one of three holes made in the fuselage transverse beam, or locate the grooves in the upper fitting of the back rest (rear seat) in tubes protruding from the pyramid and insert the lower fitting of the back rest in one of the three holes made in the seat cup (both seats).
- 12) Seat cushion,
- 13) Sanitary door,
- 14) Communication transceiver transmit button,
- 15) Microphone.
- 16) Rear canopy locks hand-grips (red and white) and, at the same time, **canopy jettison handles** – operation of locks:
  - forwards – canopy opened,
  - backwards till perceptible lock – canopy locked,
  - for the emergency jettison, move the hand-grips forwards and, when holding them, push the canopy upwards (**only for the rear canopy**).

### 7.3 BAGGAGE COMPARTMENT

The baggage compartment is located behind the pilot's seat in the rear cockpit on the left-hand side.

The baggage compartment is designed to carry a barograph or other items. The maximum baggage weight is 11 lbs.





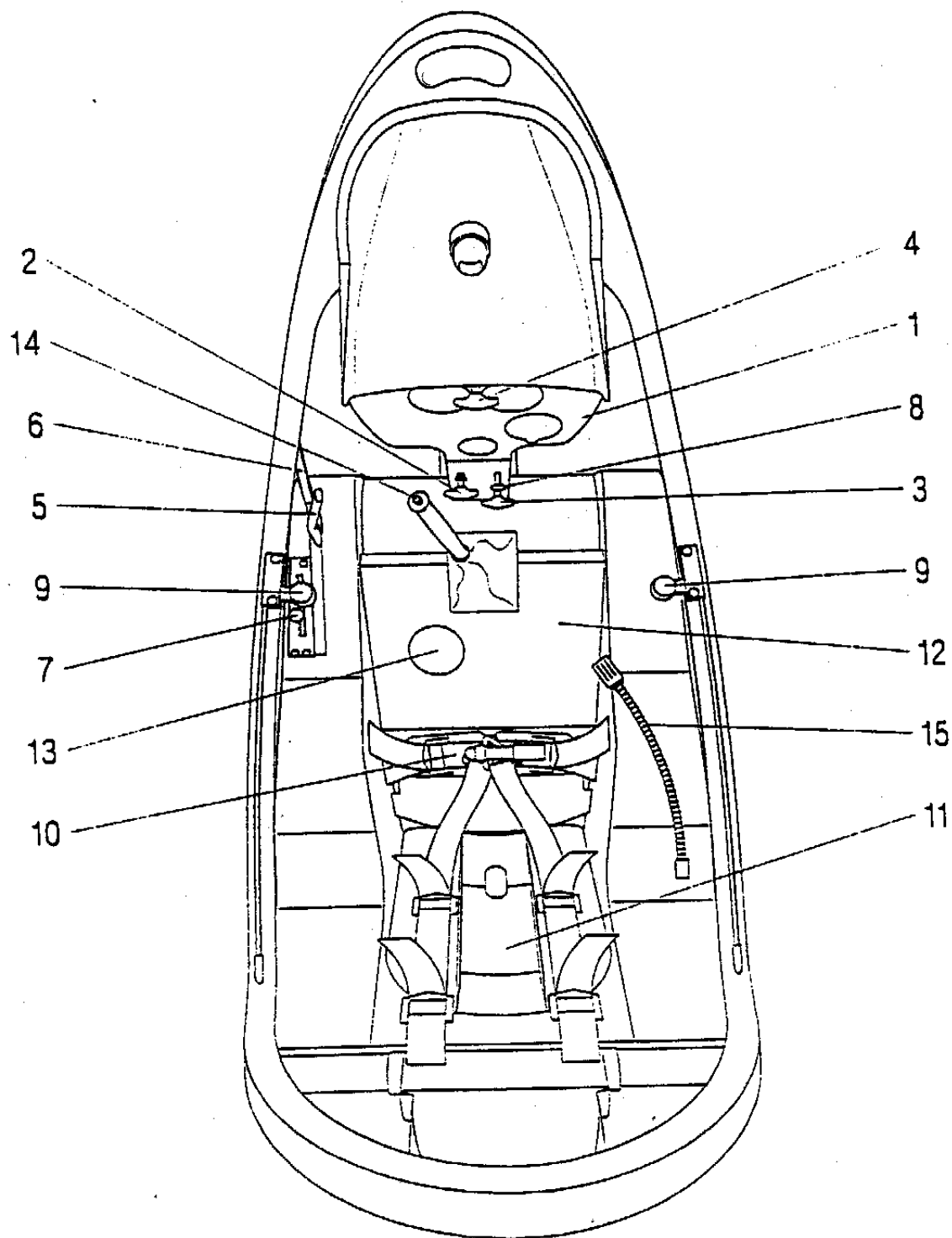
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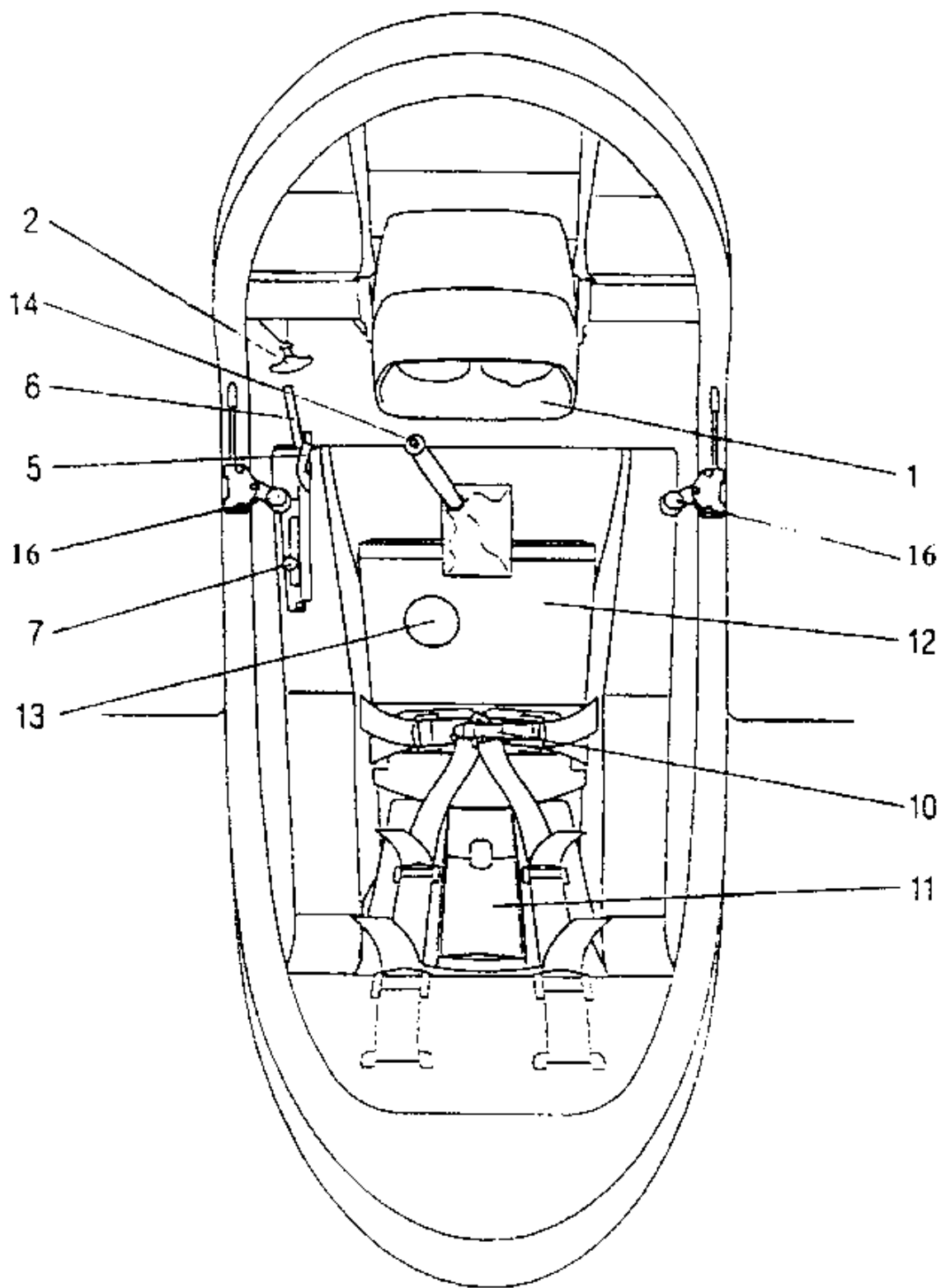


Forward Cockpit Equipment  
Fig. 7-1



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Rear Cockpit Equipment  
Fig. 7-2



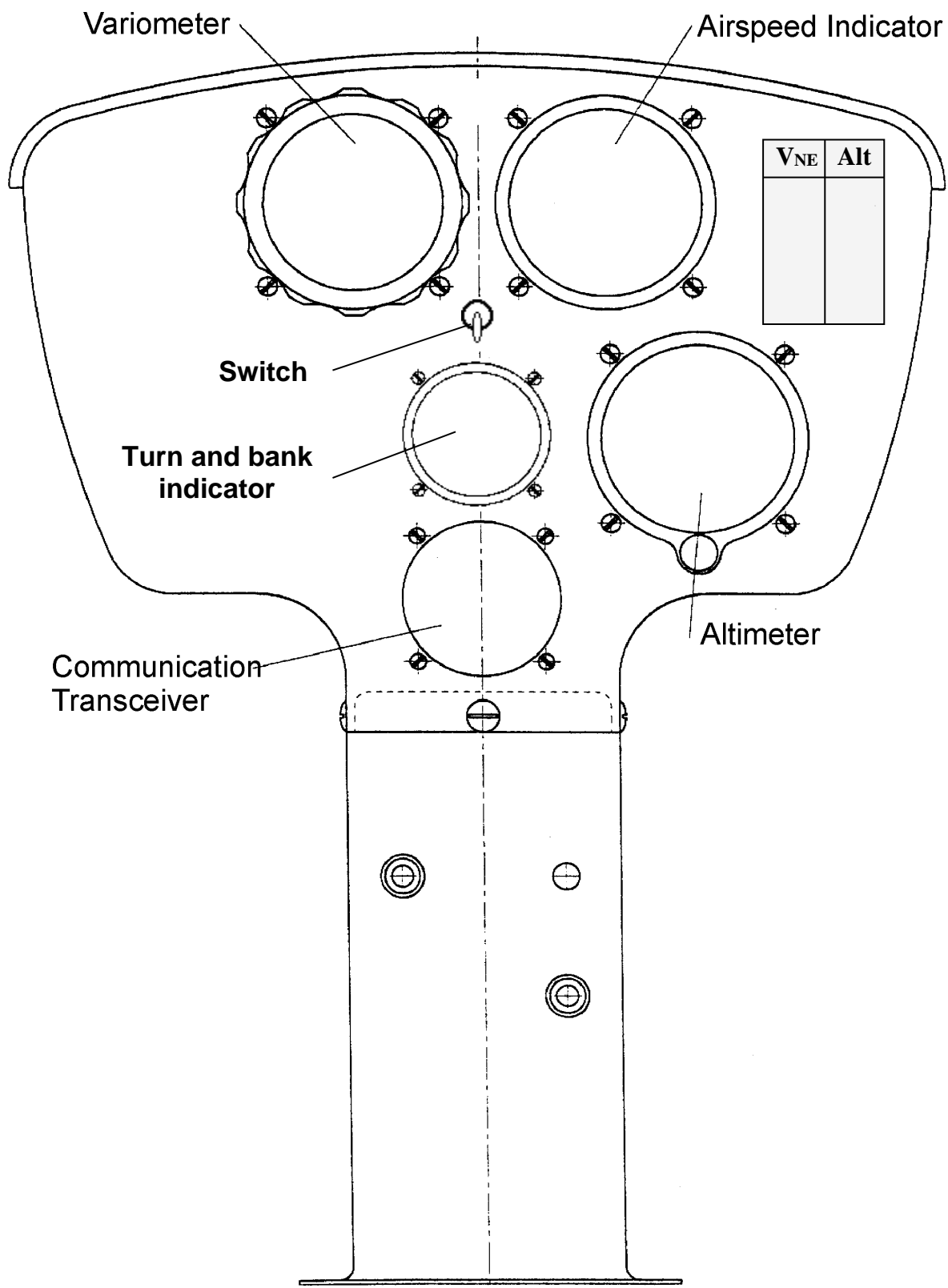
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Instrument Panel in Forward Cockpit  
Fig. 7.3



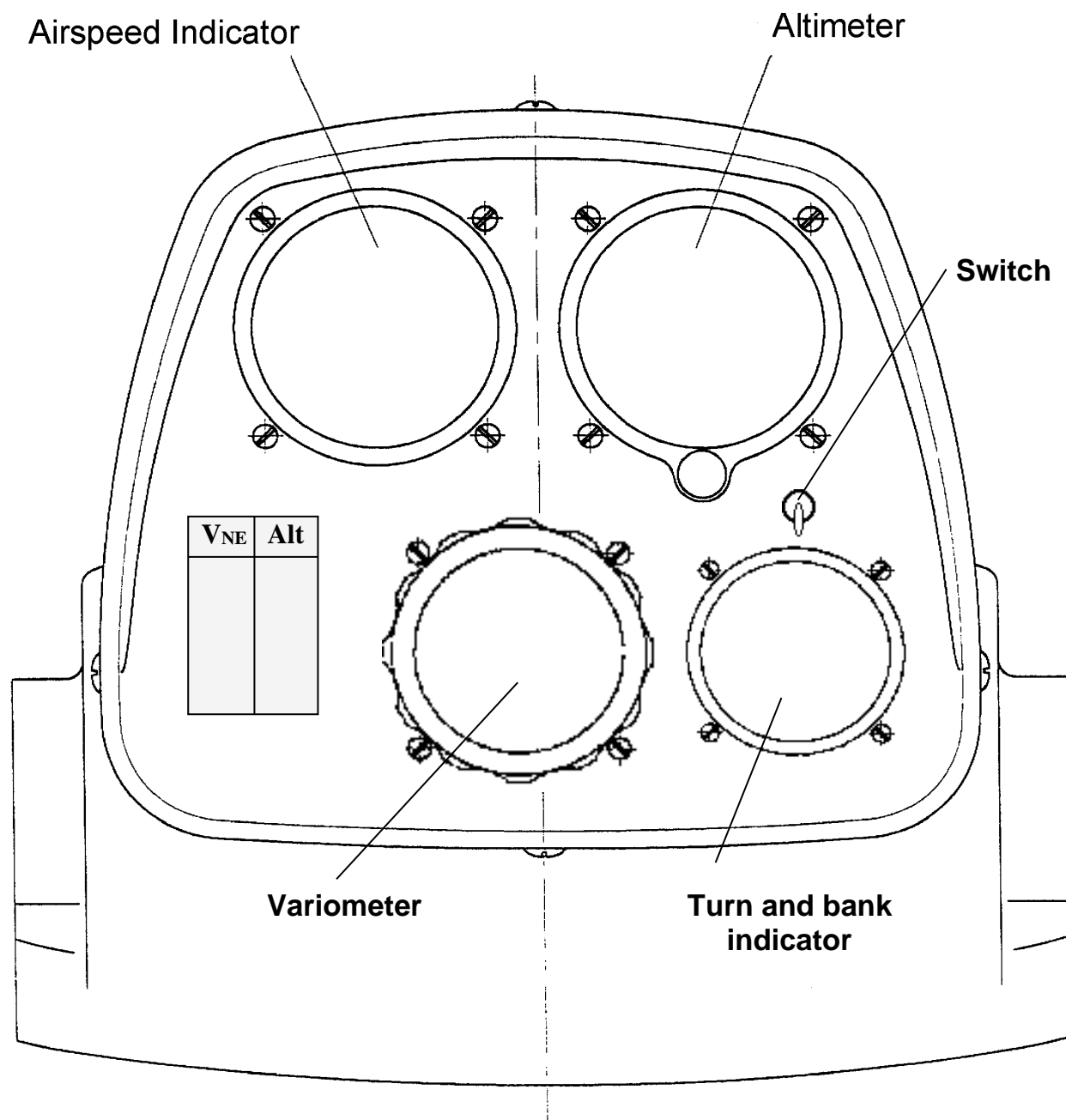
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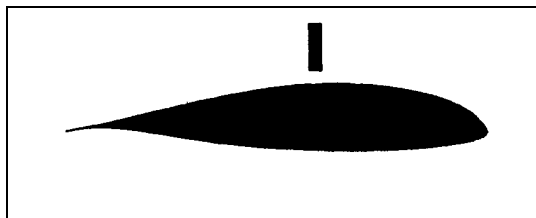
Instrument Panel in Rear Cockpit  
Fig. 7.4



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## 7.4 PLACARDS

Operating limitation placards are described in Section 2 of this Manual. For rigging and de-rigging placards and their locations refer to the sailplane MAINTENANCE MANUAL.



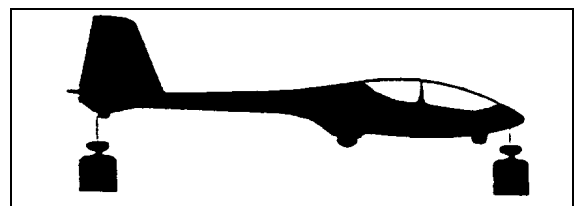
Air Brake



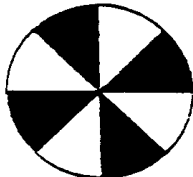
Wheel Brake



Back Rest Adjustment



Trimming Device



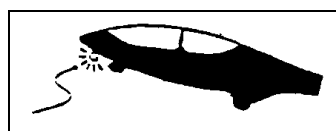
Ventilation

11 • 9 • 7 • 5 • 3 • 1

Trimming Device Positions



Open Forward Canopy



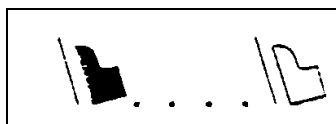
Cable Release



Open Rear Canopy



Forward Canopy Jettison



Pedals Adjustment



Rear Canopy Jettison

Cockpit Placards

Fig. 7-5



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**SECTION 8**

**SAILPLANE HANDLING, CARE AND  
MAINTENANCE**

- 8.1 INTRODUCTION**
- 8.2 SAILPLANE INSPECTION INTERVALS**
- 8.3 SAILPLANE ALTERATIONS OR REPAIRS**
- 8.4 GROUND HANDLING/ROAD TRANSPORT**
- 8.5 CLEANING, CARE, AND STORAGE**



## **8.1 INTRODUCTION**

This Section contains manufacturer's recommended procedures for proper ground handling of the sailplane. It also identifies certain inspection and maintenance requirements, which must be followed to retain the new-plane performance and condition.

## **8.2 SAILPLANE INSPECTION INTERVAL**

For periods and scopes of the sailplane inspection and maintenance refer to the MAINTENANCE MANUAL Document No. PW-6U/IOT/I/03 US M.

## **8.3 SAILPLANE ALTERATIONS OR REPAIRS**

Prior to any alteration or modification, it is necessary to consult with a relevant Airworthiness Authority to ensure that the airworthiness of the sailplane is not harmed.

For repairs, refer to the sailplane MAINTENANCE MANUAL, Document No. PW-6U/IOT/I/03 US M.

## **8.4 GROUND HANDLING/ROAD TRANSPORT**

### **TOWING**

The sailplane can be towed by the nose hook with any vehicle or other similar mechanical device at the maximum speed 3.7 mph and by observing standard towing practices.

While towing the sailplane, both canopies should be closed and the control stick should be fastened with safety belts.

### **NOTE:**

**Pushing the sailplane on the wing tips, tailplane tips or the control surfaces is prohibited.**



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#### **PARKING OUTDOOR**

While parking the sailplane canopies should be closed and protected with a cover.

#### **NOTE:**

**Do not leave the sailplane unattended if not moored.**

#### **MOORING**

- Position the sailplane so that the wind blows is from the backside direction,
- Put down the wing against the wind,
- Tie down the wing tip, nose hook and rear fuselage,
- Immobilize the control stick by means of the safety belts.

#### **ROAD TRANSPORT**

To prepare the sailplane for road transport, do the following:

- Make sure the sailplane is complete,
- Remove loose items from the cockpits.,
- Immobilize the control stick by means of safety belts,
- Latch the canopies and close the windows,
- Put the cover on the canopies,
- Secure the control system ends protruding out of the wings to prevent damage,
- Immobilize the ailerons and rudder with retainers,
- Secure the sailplane components on the trailer in a way to prevent damage (see the storage section but the tailplane can be located horizontally).

#### **NOTE:**

**When the opened trailer is used protect the sailplane with covers.**





## **8.5 CLEANING, CARE, AND STORAGE**

### **CLEANING**

The sailplane should be washed with water and commonly used detergents using a sponge or a soft cloth. After washing, make sure the draining holes are clean and, if necessary, dry the interior of the structure (this is particularly true for the air brake boxes). For washing the fabric components, use special cleaning agents and follow recommendations of their manufacturers. Vacuum clean the cockpit regularly.

### **NOTE:**

**Do not use the organic solvents (gasoline, nitro, etc.) to clean the canopy perspex.**

### **STORAGE**

The sailplane should be stored in a dry and ventilated room. In case of long-term storage it is necessary to protect the fittings against corrosion (e.g. with grease).

While storing the sailplane in de-rigged condition, position the sailplane components in the following way to prevent permanent deformations:

- Wings - leading edge downward, supported on the spar root (near the root rib) and leading edge near the trapezoid section end with a soft, fitted stand,
- Fuselage - on wheels. It is also possible to support the fuselage near the cockpit with a soft, fitted stand.
- Tailplane - leading edge downwards; both tips supported on the soft, fitted stands.

### **NOTE:**

**After storing the sailplane outdoor it is necessary to check for water inside the structure, then dry, clean and ventilate the whole sailplane.**



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**SECTION 9**

**SUPPLEMENTS**

**9.1 INTRODUCTION**

**9.2 LIST OF VALID SUPPLEMENTS**



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## **9.1 INTRODUCTION**

This Section contains appropriate supplements necessary for the safe and efficient operation of the sailplane when equipped with various optional systems and equipment not provided with the standard sailplane.

## **9.2 LIST OF INCORPORATED SUPPLEMENTS**

Date of Incorporation	Document No.	Title of Incorporated Supplement