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**AIRPLANE FLIGHT MANUAL  
FOR THE POWERED SAILPLANE  
HK 36 TS**

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Engine : Rotax 912 A3  
Model : HK 36 TS  
S/N : \_\_\_\_\_

Doc. No. : 3.01.06  
Date of Issue : January 1996

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Signature:    
Authority: \_\_\_\_\_  
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Stamp: \_\_\_\_\_

Original date of approval: 6. März. 1996

This powered sailplane is to be operated in compliance with the information and limitations contained herein.

Prior to operating the powered sailplane, the Pilot must take notice of all the information contained in this Airplane Flight Manual.

This powered sailplane manual is FAA approved for U.S. registered aircraft in accordance with the provisions of 14 CFR, Section 21.29, and is required by FAA Type Certificate Data Sheet No. G07CE.

## PREFACE

Congratulations on your choice of the HK 36 TS powered sailplane. Skilful operation of an airplane will ensure your safety and provide you with hours of enjoyment. Therefore, you should take the time to get familiar with your new HK 36 TS.

We ask you to read this manual thoroughly and to pay attention to the recommendations given in it. If you do, you can expect many hours of incident-free flight operation from your powered sailplane.

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0.1 RECORD OF REVISIONS

Any revision of the present manual, except current weighing data, must be recorded in the following table and in the 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.

If you have purchased a second hand HK 36 TS, please let us know your address so that we can supply you with the publications you need for safe operation of the powered sailplane.

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## 1. GENERAL

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## 1.1 INTRODUCTION

The powered sailplane Flight Manual has been prepared to provide pilots and instructors with information for the safe and efficient operation of the powered sailplane.

This manual includes the material required to be furnished to the pilot by JAR-22. It also contains supplementary data supplied by the powered sailplane manufacturer.

This Flight Manual conforms to the actual version of the customer's airplane. However, any optional equipment (COM, NAV, etc.) is not considered. For their operation, the operation manual of the respective manufacturer must be followed.

This must always be kept onboard the airplane.

## 1.2 CERTIFICATION BASIS

The HK 36 TS powered sailplane has been approved by Austro Control GmbH (ACG) in accordance with JAR-22 for sailplanes and powered sailplanes including amendments 22/90/1 and 22/91/1 (change 4), and the Type Certificate No. SF 3/82 has been issued.

Category of Airworthiness: Utility

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### 1.3 WARNINGS, CAUTIONS AND NOTES

The following definitions apply to warnings, cautions and notes used in the Flight Manual.

#### WARNING

Means that the non-observation of the corresponding procedure leads to an immediate or important degradation of the flight safety.

#### CAUTION

Means that the 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 on any special item not directly related to safety but which is important or unusual.

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1.4 EXPLANATIONS1.4.1 Abbreviations

ACG	Austro Control GmbH
CG	Center of gravity
CFRP	Carbon fiber reinforced plastic
GFRP	Glass fiber reinforced plastic
OAT	Outside Air Temperature
IAS	Indicated Airspeed (read on airspeed indicator without any correction of errors).
TAS	True Airspeed (IAS corrected by errors due to instrument, system, altitude and temperature)

1.4.2 Physical units

hPa	Hectopascal	SI-unit of pressure, 1 hPa = 100 N/m <sup>2</sup> = 1 mbar
inHg	inches mercury column	US-unit of pressure, 1 inHg = 33.86 hPa
psi	pounds per square inch	US-unit of pressure, 1 psi = 0.0689 bar
kts.	knots	1 kts. = 1.852 km/h
mph	miles per hour	1 mph = 1.609 km/h
RPM	revolutions per minute	

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1.4.3 Special terms

Pressure altitude	Altitude indicated by the altimeter when the subscale is adjusted to 1013.25 mbar (or 1013.25 hPa)
Service ceiling	Maximum altitude that can be reached with a climb rate of at least 0.5 m/s (approx. 100 ft./min.)
Take-off roll	Distance between the start of the take-off run and the lift-off point
Take-off distance	Distance between the start of the take-off run and the point above which the airplane is able to clear a 15 m (approx. 50 ft.) obstacle
Non-lifting parts	Fuselage, rudder, horizontal tail surfaces and useful load
Useful load	Crew, baggage and fuel

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1.5 DESCRIPTIVE DATA

The HK 36 TS is a two-seated powered sailplane in fiber-composite structure, designed in compliance with JAR-22; Category of Airworthiness: Utility.

It is a low wing airplane with T-tail, side-by-side seating configuration, tail wheel landing gear and Schempp-Hirth type air brakes in the wings' upper surface.

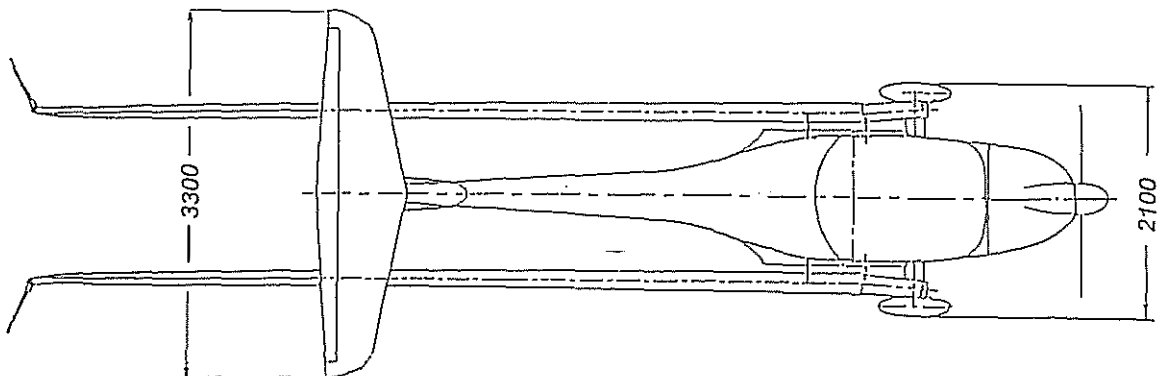
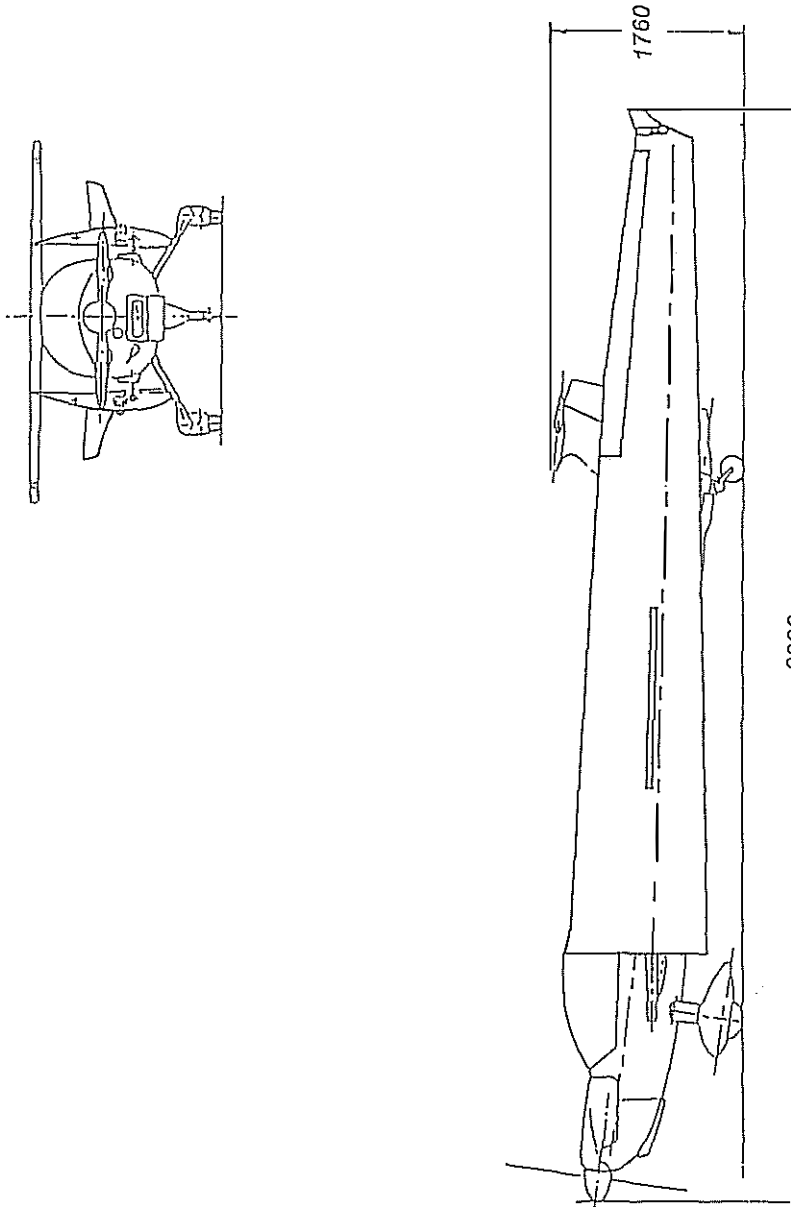
In order to enable a fast disassembly and a space-saving storage the airplane can be furnished with a wing folding mechanism.

The power plant is a Rotax R 912 A3 engine with an mt-propeller | MTV-21-A-C-F/CF175-05 hydro-mechanically variable pitch propeller.

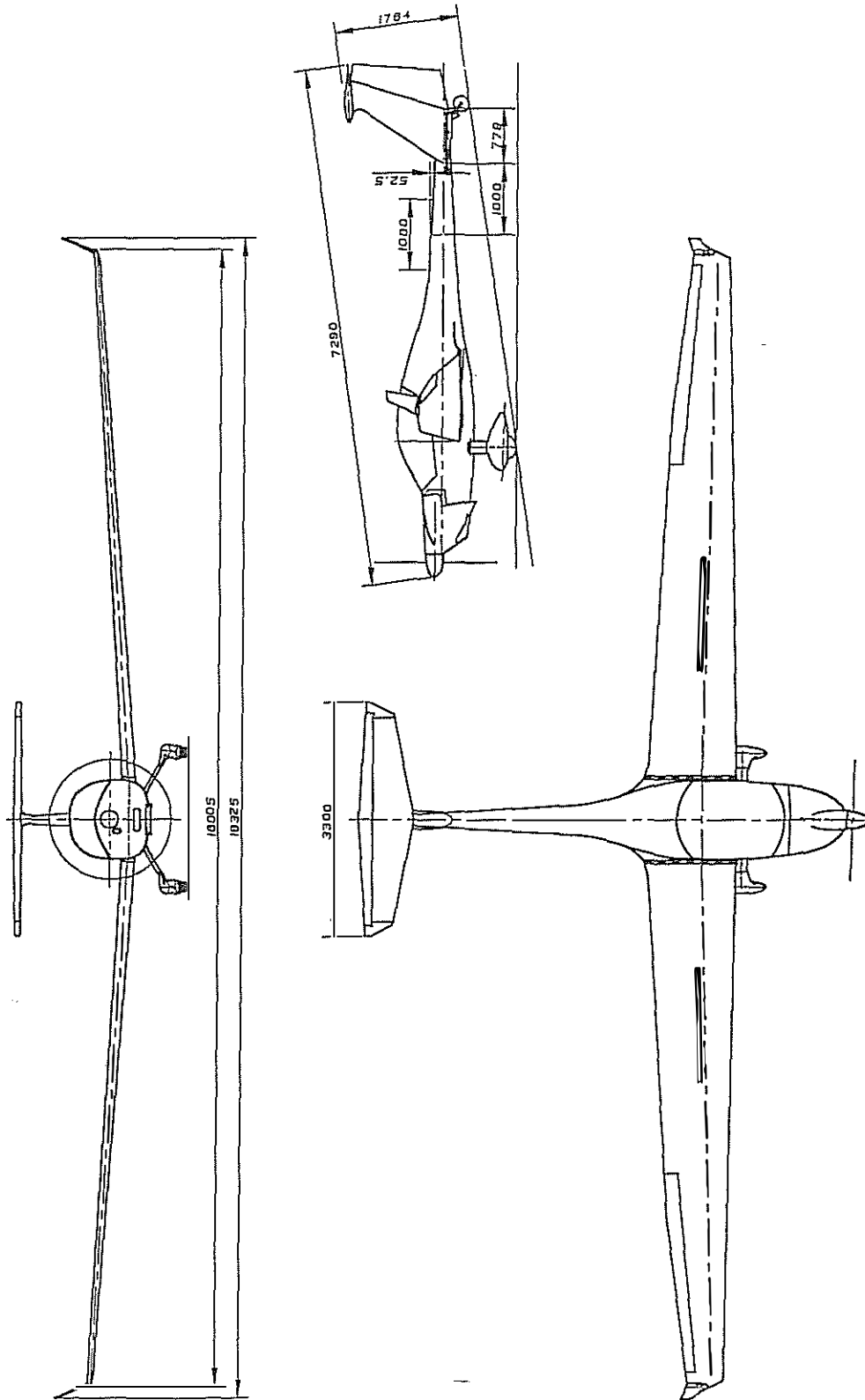
Span: with winglets	16.33 m	54 ft.
without winglets	16.01 m	53 ft.
Length:	7.28 m	24 ft.
Height:	1.78 m	70 in.
MAC:	1.004 m	39.5 in.
Wing area:	15.30 m <sup>2</sup>	165 sq.ft.
Max. wing loading:	50.30 kg/m <sup>2</sup>	10.30 lbs./sq.ft.
Aspect ratio:	17.11	
Airfoil:	Wortmann FX 63-137	

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1.6 THREE-VIEW DRAWINGS



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**2 . LIMITATIONS**

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## 2.1 INTRODUCTION

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

The limitations included in this section and in Section 9 have been approved by Austro Control GmbH (ACG).

### WARNING

All operation values must be kept within the limits stated herein during flight.

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2.2 AIRSPEED**NOTE**

The airspeeds shown below must be understood as IAS.

Airspeed limitations

Airspeed limitations and their operational significance are shown below:

	Speed	IAS km/h (kts/mpH)	Remarks
V <sub>NE</sub>	Never exceed speed	261 (141/162)	Do not exceed this speed in any operation and do not use more than 1/3 of control deflection. (Do not use more than 1/3 of the travel between position of the controls for unaccelerated flight and deflection to stop.)
V <sub>RA</sub>	Rough air speed	210 (113/130)	Do not exceed this speed except in smooth air, and then only with caution. Examples of rough air are lee-wave rotors, thunderclouds, etc.
V <sub>A</sub>	Maneuvering speed	176 (95/109)	Do not make full or abrupt control movements above this speed, because under certain conditions the powered sailplane may be overstressed by full control movement.
V <sub>ABf</sub>	Maximum admissible speed with air brakes fixed in half extended position	150 (81/93)	Above this speed the air brakes can be extended inadvertently over the half extended position by aerodynamic forces.

The warnings on the following pages must be complied with.

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**WARNING**

At speeds beyond the rough air speed the airplane may be overstressed by heavy gusts (lee-wave rotors, thunderclouds, whirlwinds and turbulence at close range to mountain ridges).

**WARNING**

For reasons of flutter safety, the never exceed speed ( $v_{NE}$ ) is limited at altitudes above 2000 meters (6500 ft.) (see sub-paragraph 4.5.7).

**WARNING**

The maneuvering speed stated on the previous page applies to the maximum T/O mass (max. T/O weight) of 770 kg / 1653 lbs. At lower flight masses, the following limits must be applied:

flight mass (gross weight)		$v_A$		
[kg]	[lbs.]	[km/h]	[kts.]	[mph]
700	1543	168	91	104
650	1433	162	87	101
600	1323	155	84	96

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**WARNING**

These speeds are not marked on the airspeed indicator. Simultaneous full deflection of elevator and rudder can overstress the airplane even at speeds below  $v_A$ .

Best rate of climb speed

$v_y = 105$  km/h (57 kts./65 mph)

At this airspeed the airplane climbs with the maximum possible rate of climb.

Best angle of climb speed

$v_x = 95$  km/h (51 kts./59 mph)

This airspeed is not marked on the airspeed indicator.

At this airspeed the airplane climbs with the maximum possible angle of climb.

Recommended lowest airspeed for approach

105 km/h (65 mph / 57 kts.)

**NOTE**

Conditions like strong headwind, danger of wind shears, turbulence, or wet wings require a higher approach speed

Stalling speeds

see paragraph 5.2.2

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2.3 AIRSPEED INDICATOR MARKINGS

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

Marking	(IAS) value or range km/h (kts./mph)	Significance
Green arc	86-210 (46-113/53-130)	Normal Operating Range Lower limit is max. mass (weight) 1.1 $v_{S1}$ at most forward c.g. with air brakes retracted. Upper limit is rough air speed.
Yellow arc	210-261 (113-141/130-162)	Maneuvers must be conducted with caution and only in smooth air.
Red line	261 (141/162)	Maximum speed for all operations.
Blue line	105 (57/65)	Best rate-of-climb speed $v_y$
Yellow triangle	105 (57/65)	Approach speed at max. flight mass (weight)

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2.4 POWER-PLANT

Engine Manufacturer: Bombardier Rotax  
 Engine Model: Rotax 912 A3

**NOTE**

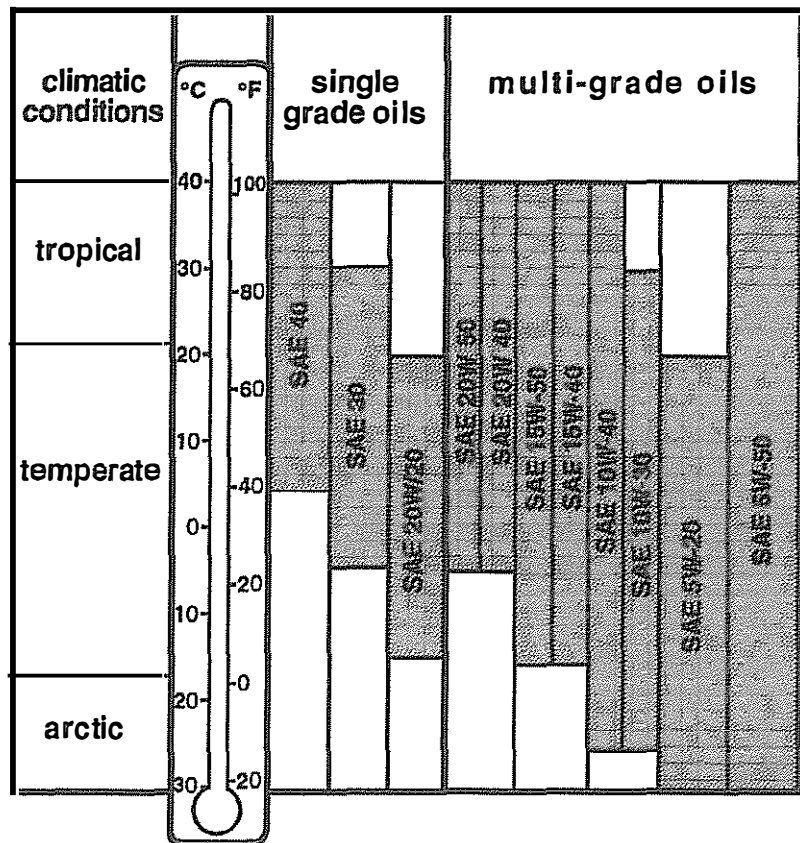
The engine drives the propeller through a speed-reducing gear with a gear ratio of 2.273:1.

The built-in tachometer indicates the propeller speed. Consequently, all speeds given in this manual are propeller speeds (in contrast to the engine manual).

Max. T/O power (5 minutes):	59.6 kW / 81 DIN hp.
Max. T/O RPM:	2550
Max. continuous power:	58 kW / 79 DIN hp.
Max. continuous RPM:	2420
Idle RPM:	650
Power check RPM:	2500 ± 50
Maximum Cylinder Head Temperature:	150° C (302° F)
Maximum Oil Temperature:	140° C (284° F)
Minimum Oil Temperature:	50° C (122° F)

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Minimum oil pressure: 1.5 bar (22 psi) at 1250 RPM  
 Maximum oil pressure: 5 bar (73 psi)  
 Max. oil pressure in case of cold-start (short-term): 7 bar (102 psi)  
 Oil grade: Automotive lubricants for Otto-engines with SAE ratings compatible with seasonal temperatures (see chart). The lubricant quality rating according to the API system must be "SF" or "SG".

**CAUTION**

Under no circumstances should Aviation Grade oil be used!

Oil quantity, minimum: 2.0 liters (2.1 US quarts)  
 maximum: 3.0 liters (3.2 US quarts)

Propeller manufacturer: mt-propeller, Straubing, Germany

Propeller model: Hydraulically variable pitch propeller  
 MTV-21-A-C-F/CF175-05

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2.5 POWER-PLANT INSTRUMENT MARKINGS

Power-plant instrument markings and their color-code signification are shown below:

Indicator	Red Line Minimum Limit	Green Arc Normal Operating Range	Yellow Arc Caution Range	Red Line Maximum Limit
RPM indicator	-	650-2420 RPM	2420-2550 RPM	2550 RPM
Oil temperature indicator	50° C	50-140° C	-	140° C
Cylinder head temperature indicator	-	-	-	150° C
Oil pressure indicator	1.5 bar	1.5 - 5 bar	5 - 7 bar	7 bar
Fuel quantity indicator	-	-	-	-

2.6 MASS (WEIGHT)

Maximum take-off mass (max. T/O weight):	770 kg	1698 lbs.
Maximum landing mass:	770 kg	1698 lbs.
Maximum mass of all non-lifting parts:		
Serial numbers below 36.517	590 kg	1301 lbs.
Serial number 36.517 and subsequent	610 kg	1345 lbs.
Maximum mass in baggage compartment:	12 kg	26 lbs.
Maximum useful load (including fuel):	see page 6-7	
Maximum seat payload, right seat:	110 kg	243 lbs.
Maximum seat payload, left seat:	110 kg	243 lbs.

**WARNING**

Any exceeding of the mass limits can lead to overstressing of the airplane and to a degradation of flying characteristics and flight performance.

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## 2.7 CENTER OF GRAVITY

The reference datum plane for the center of gravity (CG) specifications is tangent to the leading edge of the wing at the root rib. It is vertical when the fuselage tube lies horizontal. Procedures for a horizontal alignment and empty mass CG specifications can be found in the Maintenance Manual, Section 4.

The permissible flight CG range is:

Maximum forward CG : 318 mm (12.52 in.) aft of reference datum

Maximum rearward CG : 430 mm (16.93 in.) aft of reference datum

### WARNING

A flight CG which lies outside the permissible range deteriorates the controllability and stability of the airplane.

The procedure of checking the CG position is included in Section 6.

## 2.8 APPROVED MANEUVERS

This powered sailplane is certified in the Utility category.

### NOTE

Aerobatics and spinning are forbidden!

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## 2.9 MANEUVERING LOAD FACTORS

Table of maximum permissible load factors:

	$V_A$	$V_{NE}$
Positive:	5.30	4.00
Negative:	-2.65	-1.50

### WARNING

Any exceeding of the maximum permissible load factors may overstress the airplane.

## 2.10 FLIGHT CREW

Solo flights must be conducted from the left seat!

## 2.11 KINDS OF OPERATION

The HK 36 TS is certified for DAY-VFR operation. Night VFR operation - if permitted by the competent authority - requires additional equipment in accordance with national regulations.

IFR, flights in clouds, flights into known icing conditions and aerobatics are forbidden.

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## 2.12 FUEL

### Total fuel

Standard tank:        55 liters        14.5 US gal.  
Long range tank:     79 liters        20.9 US gal.

### Usable fuel

Standard tank:        54 liters        14.3 US gal.  
Long range tank:     77 liters        20.3 US gal.

### Approved fuel grades

- Aviation Grade 100 LL
- MOGAS, leaded, min. octane rating: 96 ROZ
- Automotive Super, min. octane rating: 95 ROZ, leaded or unleaded

## 2.13 AEROTOW, WINCH AND AUTOTOW LAUNCHING

The powered sailplane is designed for self-take-off only.

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## 2.14 OTHER LIMITATIONS

Limitations for soaring when using a battery with a capacity of 18 Amp-hours (Ah):

The capacity of the lead-accumulator is very much dependent on the temperature. Therefore, the length of a continuous soaring at low temperatures is restricted to:

4 hours at 0 °C (32 °F)  
2 hours at -10 °C (14 °F),

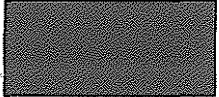
good maintenance condition and charge of the battery provided. Average intensity of current: 0.3 Amps.

There are no such limitations when a 30 Ah battery is installed.

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2.15 LIMITATION PLACARDS

The following placard is attached to the instrument panel, left side:

Maneuvering speed at maximum gross weight:	$v_A = 176 \text{ km/h}$
Minimum seat payload, full tank, no baggage	
Minimum seat payload, full tank, 12 kg baggage	
Maximum permissible useful load	

The following placard is attached to the canopy frame, left side (US registered S/N's only):

This airplane must be operated as a utility category airplane in compliance with the operating limitations as stated in the form of placards, markings, and manuals.	
<b>MAXIMUMS:</b>	MANEUVERING SPEED (IAS) 176 km/h (95 kts. / 109 mph)
	GROSS WEIGHT 770 kg (1698 lbs.)
	FLIGHT LOAD FACTOR +5.3/-2.65
No acrobatic maneuvers, including spin, approved. Altitude loss in a stall recovery: 20 m (65 ft.). Flight into known icing conditions prohibited. This airplane is certified for the following flight operations as of date of original airworthiness certificate: DAY-VFR.	

The following placard is attached to the canopy frame, left side (US and Canadian registered S/N's only):

Altitude		$v_{NE}$ (IAS)		
[m]	[ft.]	[km/h]	[Kts.]	[mph]
2000	6500	261	141	162
3000	9800	246	133	153
4000	13100	233	126	145
5000	16400	221	119	137
6000	19600	210	113	130

The following placard is attached to the center section of the instrument panel:

Use air brake fixture (hands off) only up to 150 km/h! A/B may extend beyond fixture at higher speeds.
---

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## 3. EMERGENCY PROCEDURES

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### 3.1 INTRODUCTION

Section 3 provides checklists and recommended procedures for coping with emergencies that may occur.

Since it is impossible to foresee all kinds of emergencies and consider them in the Flight Manual, it is absolutely necessary for the pilot to know the airplane and to have knowledge and experience in solving problems that may occur.

### 3.2 CANOPY JETTISON

1. Strongly swing red canopy locks (left and right) 180° rearward
2. Place both hands above your head against canopy, push up and rearward

### 3.3 BAILING OUT

1. Jettison canopy
2. Release seat harness
3. Evacuate the airplane

#### NOTE

When using a manual parachute release, wait two seconds after exiting the airplane before activating parachute.

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### 3.4 STALL RECOVERY

#### 3.4.1 Behavior with power off

Under all loading conditions, air brakes applied or retracted, wings level flight or banked flight, the HK 36 TS goes through a horizontal stall. The ailerons keep their effectiveness even with maximum elevator deflection.

A partial loss of positive control in the stick and pedals, buffeting, and pitch angle of 20° to 30° occur during this condition.

#### NOTE

During the horizontal stall, IAS rises to approximately 85 km/h (46 kts. / 53 mph).

#### 3.4.2 Behavior with power on

See behavior with power off.

Only at 50 % to 100 % power, wings level flight, and maximum rearward center of gravity, the airplane may perform a stall dive over the left or right wing after entering the horizontal stall if the control stick is pulled even further.

#### 3.4.3 Recovery

The horizontal stall can be terminated immediately by relaxing the force on the elevator control.

#### NOTE

If the airplane performs a stall dive, immediately relax the force on the elevator control and pull out the airplane smoothly.

If the stick is pulled further, the airplane may start to spin.

Altitude loss resulting from stationary horizontal stall described above: approximately 10-20 m (33-65 ft.).

Altitude loss resulting from stall dive over a wing: approximately 40 m (130 ft.).

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### 3.5 SPIN RECOVERY

1. Apply full rudder opposite to spin direction, push stick forward, bring ailerons into the neutral position.
2. After spin movement has stopped, bring rudder to neutral position, pull airplane out smoothly.

### 3.6 SPIRAL DIVE RECOVERY

There is no tendency to a spiral dive.

The standard procedure for recovering from a spiral dive is:

1. Apply full rudder opposite to spiral dive rotation
2. Apply full aileron opposite to spiral dive rotation
3. Pull out the airplane smoothly

### 3.7 ENGINE FAILURE (carburetor icing)

#### 3.7.1 Engine failure during take-off

1. Fuel valve - check if OPEN
2. Electric fuel pump - check if ON
3. Propeller speed control - TAKE-OFF
4. Ignition switch - BOTH
5. Choke - OFF

#### **WARNING**

If the troubles cannot be eliminated immediately, and the engine refuses to deliver enough power, a straight-in landing must be performed under 80 m (260 ft.) of altitude.

Before touchdown: - Fuel valve - CLOSED  
 - Ignition - OFF  
 - Master switch - OFF

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3.7.2 Starting the engine with a discharged battery (during flight)

1. Electric consumers - OFF
2. Fuel valve - OPEN
3. Master switch - ON
4. Mode select switch - POWER FLIGHT
5. Choke - as required
6. Throttle control - IDLE
7. Ignition switch - BOTH
8. Airspeed - increase to 160 km/h to 180 km/h (100 mph - 112 mph or 86 kts. - 97 kts.)
9. Propeller speed control - slowly move from FEATHER to TAKE-OFF
10. Oil pressure - should be available within 10 seconds
11. Choke - re-adjust if required
12. RPM and throttle - as required to continue flight

**CAUTION**

Ensure adequate altitude reserve for engine warm-up after prolonged soaring periods.

13. Electric consumers - ON
14. Continue flight normally
15. Determine reason for battery discharge

**CAUTION**

The engine is started due to windmilling. Because of the high airspeed required for this process, an altitude loss of up to 300 m (1000 ft.) must be expected. The maximum admissible airspeeds must not be exceeded.

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3.7.3 Propeller stuck in feathered position**NOTE**

The propeller requires hydraulic pressure for pitch reduction. The hydraulic pressure is supplied through a pressure accumulator. When this accumulator is empty, the pressure must be built up by the oil pump of the engine. The engine is started with the propeller in feathered pitch and the throttle control in idle position.

1. Electric consumers - OFF
2. Fuel valve - OPEN
3. Master switch - ON
4. Mode select switch - POWER FLIGHT
5. Electric fuel pump - ON. Check whether the red warning light extinguishes after build-up of fuel pressure
6. Choke - as required
7. Throttle control - IDLE
8. Ignition switch - BOTH
9. Propeller speed control - TAKE-OFF
10. Ignition switch - turn clockwise to start engine until the propeller adopts the working position

**CAUTION**

It is possible to start the engine with the propeller in the feathered position, although this significantly increases engine wear.

11. Oil pressure - should be available within 10 seconds
12. Choke - re-adjust as required
13. RPM and throttle - as required to continue flight
14. Electric fuel pump - OFF
15. Electric consumers - ON
16. Continue flight normally
17. After the flight has ended, ascertain the reason for the loss of oil pressure and rectify the problem.

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3.7.4 Engine failure during cruise

1. Fuel valve - check if OPEN
2. Electric fuel pump - ON
3. Choke - check if OFF
4. Carburetor heat - ON at outside temperatures below 10° C (50° F)
5. Ignition - check if switch is in BOTH position
6. Fuel quantity - check

**NOTE**

If you cannot eliminate the troubles and the engine refuses to deliver enough power, proceed as follows:

1. Throttle control - IDLE
2. Ignition - OFF
3. Propeller - FEATHER
4. Fuel valve - CLOSED
5. Master switch - OFF
6. Adjust airspeed to speed of best glide ratio (105 km/h, 57 kts., 65 mph)
7. Look for a suitable landing field
8. Cowl flap - CLOSE

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3.7.5 Carburetor icing**NOTE**

Carburetor icing can be recognized by a drop in the engine speed and/or irregular running of the engine without a change in the throttle control position, the choke position, the propeller setting, the airspeed or the altitude

1. Carburetor heat - ON

**NOTE**

The engine output will slightly drop due to the intake air heating, and fuel consumption will slightly increase.

2. Carburetor heat - OFF as required

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3.8 FIRE3.8.1 Carburetor fire

1. Fuel valve - CLOSED
2. Throttle control - FULL
3. Cabin air - CLOSE
4. Cabin heat - OFF

3.8.2 Electrical fire

1. Master switch - OFF

3.9 OTHER EMERGENCIES3.9.1 Malfunction or failure of propeller speed control.

1. RPM - Keep in admissible range with throttle control
2. Airspeed - reduce

3.9.2 Icing.

1. Leave icing area
2. Continue to move controls to prohibit lockage from ice
3. If the canopy is iced over: open weather window, open cabin heating fully.

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3.9.3 Fuel pressure warning light illuminates.

1. Electrical fuel pump - ON
  - \* If the light extinguishes - land on nearest airfield and determine the reason for illumination
  - \* If the light does not extinguish: lack of fuel pressure may result in engine failure. See NOTE in 3.7.4 - Engine failure during cruise.

3.9.4 Emergency landing on water

Emergency landings on water should be performed only in extreme emergency situations. Due to trials with sailplanes it is assumed that the airplane will submerge immediately after touching the water and then surface again.

1. Parachute harness - open
2. Seat harness - tighten
3. Airspeed - normal approach
4. Touchdown - With minimum speed and air brakes retracted

**NOTE**

Conditions like strong headwind, danger of wind shears, turbulence, or wet wings require a higher approach speed.

**WARNING**

On touchdown protect your face with one arm!

5. Seat harness - release
6. Red canopy locks - swing 180° rearward, push canopy away
7. Evacuate airplane as fast as possible

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## 4. NORMAL PROCEDURES

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#### 4.1 INTRODUCTION

Section 4 provides checklists 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

##### 4.2.1 General

The wings are connected to the fuselage with three bolts each. The two main bolts are placed in the middle of the spar tunnel. They are accessible between the backrests and can be inserted from the front side. A spring loaded hook is placed over the bolt handles to secure the bolts.

The A- and B-bolts are fixed to the fuselage at the wing root. The A-bolt is placed in front of the spar tunnel, the B-bolt lies near the trailing edge. Self locking units are screwed onto the B-bolts, which are accessible through handholes on the wings' upper surface. Locking rings are integrated in the B-bolt locking units which therefore do not require any further safety device.

The horizontal stabilizer is attached to the vertical stabilizer by means of three bolts. The two bolts in the rear are fixed to the mount in the vertical stabilizer. The threaded bolt placed in front is provided with a hexagonal socket. When screwed in, it is automatically secured by means of a locking ring integrated into the horizontal stabilizer.

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4.2.2 Wing installation (wing folding mechanism not provided)

1. Clean all bolts and bushes and the B-bolt locking unit and apply a light coat of grease.

2. Lift one wing (two persons at the root rib, one at the wing tip) and insert spar stump into spar tunnel. Ensure the smooth insertion of the A- and B-bolts. Connect position and strobe lights (optional) when the gap between fuselage and wing is just wide enough to reach the wires.

3. Insert main bolt while moving the wing tip in small circles. The aileron and air brake control systems are automatically connected. Do not release the wing before the main bolt has been completely inserted.

The wide track of the landing gear allows the attached wing to support itself, no outside support is required.

4. Screw the B-bolt locking unit onto the B-bolt and tighten it by hand.

5. Install the other wing in a similar manner.

6. Tighten both B-bolt locking units with wrench (size 17 mm) applying moderate hand force (approximately 6 Nm/4.5 ft.lbs).

7. Secure main bolts with spring loaded hook.

8. Apply water resistant adhesive tape to the gap between fuselage and wing.

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4.2.3 Wing installation (wing folding mechanism provided)

1. Clean all bolts, bushes and the B-bolt locking unit and apply a light coat of grease, remove lid over B-bolt handhole.
2. Unhook one wing from its hanging mount, pull it rearward to the stop. A second person should stand between the wing and fuselage and relieve the load on the telescopic tube by lifting the wing at the spar stump.
3. Walk forward until the wing is 90° from line of flight; rotate the wing until the root ribs are parallel; keep wing in its correct position.
4. Introduce spar stump into spar tunnel while ensuring the smooth insertion of A- and B-bolts. Connect position and strobe lights (optional) when the gap between the fuselage and wing is just wide enough to reach the wires.
5. Insert main bolt. The aileron and air brake control systems are automatically connected. Do not release the wing before the main bolt has been completely inserted. The wide track of the landing gear allows the attached wing to support itself, no outside support is required.
6. Screw the B-bolt locking unit onto the B-bolt and tighten it by hand.
7. Install the other wing in a similar manner.
8. Tighten both B-bolt locking units with a wrench (size 17 mm) applying moderate hand force (approximately 6 Nm/4.5 lbs.ft.).
9. Secure main bolts with the spring loaded hook.
10. Apply water resistant adhesive tape to the gap between fuselage and wing.

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#### 4.2.4 Wing removal

To remove the wing reverse the procedure.

#### 4.2.5 Winglet installation

1. Clean the bolts and bushes if necessary.

### CAUTION

Do not lubricate the threaded bolts!

2. Install winglet with washers and self locking nuts.
3. Tighten self locking nuts with moderate hand force (appr. 6 Nm / 4.5 ft.lbs.)
4. Apply water resistant adhesive tape to the gap.

#### 4.2.6 Winglet removal

To remove the winglet reverse the procedure.

#### 4.2.7 Horizontal stabilizer installation

1. Clean all bushes and bolts and apply a slight coat of grease.
2. Move the trim knob to full NOSE DOWN position.
3. Remove the Pitot tube.
4. Position the horizontal stabilizer over the stabilizer mount; the elevator control rod must be connected by a second person.

### WARNING

The elevator control rod is not connected automatically!

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5. Slip the horizontal stabilizer onto the rearward bolts.
6. Screw in the fastening bolt to the stop with an 8 mm hexagon key applying moderate hand force (approximately 6 Nm / 4.5 ft.lbs).
7. Check the horizontal stabilizer for secure attachment, and inspect load transmission of elevator control system.
8. Install the Pitot tube.
9. Apply water resistant adhesive tape to the gap between the horizontal stabilizer and the vertical stabilizer.

#### 4.2.8 Horizontal stabilizer removal

To remove the horizontal stabilizer reverse the procedure.

#### 4.3 DAILY INSPECTION

##### WARNING

Master switch OFF, ignition OFF!

1. Fuel tank drain check: drain off about 1/8 liter (approx. 1/8 US quart) of fuel using a transparent drain cup (see paragraph 7.10). Inspect for dirt or water.

##### NOTE

In order to prevent the water deposited in the tank from dispersing, the airplane must not be agitated prior to the drain check.

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2. Ensure completeness of the onboard documents and ensure that the operation time that is left before the next scheduled inspection (100, 200 or 600 hrs.) allows for the intended flight.
3. Inspect left fuselage skin for damage or cracks.
4. Inspection of vertical stabilizer:
  - Check skin for damage or cracks.
  - Check rudder for improper or insecure mounting.
  - Check for excessive play.
  - Check rudder control system for improper connection and interference.
  - Remove Pitot tube cover.
  - Check Pitot tube for improper mounting and blockage of bores.
5. Inspection of horizontal stabilizer:
  - Check horizontal stabilizer and tips for improper mounting, insecure attachment, and inspect skin for damage and cracks.
  - Check elevator for improper mounting, play, damage and cracks.
  - Check elevator control system for improper connection, lack of load transmission and interference.
6. Inspection of tail wheel assembly:
  - Check for damage.
  - Ensure correct inflation (3.1 bar / 45 psi).
7. Check right fuselage skin for damage and cracks.
8. Inspection of right wing:
  - Check wing, aileron and winglet for improper or insecure mounting, excessive play, damage and cracks.
  - Check aileron control system for improper connection, lack of load transmission and interference.
  - Check air brakes for incomplete retraction; ensure flushness with the wing surface.

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## 9. Inspection of right main landing gear:

- Check landing gear strut for damage and cracks.
- Check wheel fairing for damage and looseness.
- Check tire and brake for damage.
- Ensure correct inflation (2.1 bar / 30 psi).

## 10. Inspection of propeller:

- Check propeller blades for damage, cracks and excessive play.
- Check spinner for damage and insecure mounting.

## 11. Oil and coolant check:

- Check oil level.
- Ensure coolant level in equalizing reservoir is more than 1/3.
- Check engine compartment for obvious defects.
- Check coolers for obstruction.

## 12. Inspection of left main landing gear:

- Check landing gear strut for damage and cracks.
- Check wheel fairing for damage and looseness.
- Check tire and brake for damage.
- Ensure correct inflation (2.1 bar / 30 psi).

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## 13. Inspection of left wing:

- Check wing, aileron and winglet for improper or insecure mounting, excessive play, damage and cracks.
- Check aileron control system for improper connection, lack of load transmission and interference.
- Check air brakes for incomplete retraction; ensure flushness with the wing surface.

## 14. Check in the cabin:

- Check if loading is admissible (refer to Section 6).

**NOTE**

Ensure observation of loading restrictions by changing and/or rearranging the useful load.

- Master switch - ON
- Mode select switch - POWER FLIGHT
- All circuit breakers - ON
- Fuel quantity - check using fuel quantity indicator and log book entries; refuel if necessary

**NOTE**

Usable fuel and approved fuel grades see page 2-12.

- Master switch - OFF
- Check for foreign bodies and loose equipment
- Canopy - check for dirt and damage
- Cowl flap - check for improper operation
- Ensure that main bolts are secured

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15. Check of propeller feathered pitch position
- Rudder pedals . . . . . adjust
  - Canopy . . . . . lock
  - Fuel valve . . . . . OPEN
  - Parking brake . . . . . set
  - Electrical consumers . . . . . OFF
  - Master switch . . . . . ON
  - Mode select switch . . . . . POWER FLIGHT
  - Propeller speed control . . . . . TAKE-OFF
  - Cowl flap . . . . . OPEN
  - Electrical fuel pump . . . . . ON, verify red warning light  
extinguishes after build up of fuel  
pressure
  - Throttle control . . . . . IDLE
  - Choke . . . . . ON in case of cold start

**WARNING**

People must stay clear of the propeller danger zone!

- Ignition switch . . . . . press and turn clockwise  
to start engine
- Propeller speed . . . . . adjust to approximately 1000 RPM
- Oil pressure . . . . . must reach green range within  
10 seconds

**CAUTION**

If oil pressure is too low, turn off engine immediately!

**NOTE**

When the powered sailplane is parked for long periods, or the hydraulic pressure accumulator is emptied for any other reason, a loss of oil pressure may occur after oil pressure build up in the area of the oil pressure sensor. The reason for this is the filling process of the accumulator. The oil pressure indicator may drop to zero for a maximum of 15 seconds.

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- Choke . . . . . push forward as required
- Electrical fuel pump . . OFF
- At increased idle speed (approximately 1000 RPM), switch ignition OFF and simultaneously move the propeller speed control over the cam to the FEATHER position.

**NOTE**

If the propeller speed control is not operated simultaneously with the ignition switch, the propeller will remain in TAKE-OFF position. Propeller feathering is only possible at RPMs above 500 (see sub-paragraph 7.9.5, Propeller Speed Control).

- Propeller speed control . TAKE-OFF

**NOTE**

If the propeller remains in the feathered pitch position, the according emergency procedure (see sub-paragraph 3.7.3, Propeller Stuck in Feathered Position) must be applied.

- Master switch . . . . . OFF
- Mode select switch . . . SOARING

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4.4 PREFLIGHT INSPECTION

The following checklist with the most important items is placed where it is well visible for either pilot:

START CHECK	
1.	Mass & Balance checked
2.	Main bolts secured
3.	Fuel valve OPEN
4.	Fuel quantity checked
5.	Canopy locked
6.	Seat harness on and secure
7.	Propeller check
8.	Magneto check
9.	Carburetor heat OFF
10.	Controls free
11.	Trim checked
12.	Parking brake released
13.	Air brakes locked

4.5 NORMAL PROCEDURES AND RECOMMENDED SPEEDS4.5.1 Launch/engine starting, run up & taxiing procedures

- |     |                             |  |
|-----|-----------------------------|--|
| 1.  | Rudder pedals . . . . .     | adjust   |
| 2.  | Seat harnesses . . . . .    | fasten   |
| 3.  | Canopy . . . . .            | lock   |
| 4.  | Fuel valve . . . . .        | OPEN   |
| 5.  | Controls . . . . .          | free   |
| 6.  | Parking brake . . . . .     | set  |
| 7.  | Air brakes . . . . .        | verify proper operation; lock  |
| 8.  | Electrical consumers . . .  | OFF  |
| 9.  | Master switch . . . . .     | ON   |
| 10. | Mode select switch . . . .  | POWER FLIGHT   |
| 11. | Propeller speed control . . | TAKE-OFF   |
| 12. | Fuel quantity . . . . .     | check  |
| 13. | Cowl flap . . . . .         | OPEN   |
| 14. | Electric fuel pump . . . .  | ON; verify red light extinguishes<br>after build up of fuel pressure |
| 15. | Throttle control . . . . .  | IDLE   |

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16. Choke . . . . . ON in case of cold start

**WARNING**

People must stay clear of the propeller danger zone!

17. Ignition switch . . . . . press and turn clockwise  
to start engine

18. Propeller speed . . . . . adjust to approx. 1000 RPM

19. Oil pressure . . . . . must reach green range within  
10 seconds

**CAUTION**

If oil pressure is too low, turn off engine immediately!

**NOTE**

When the powered sailplane is parked for long periods, or the hydraulic pressure accumulator is emptied for any reason, a loss of oil pressure may occur after oil pressure build up in the area of the oil pressure sensor. The reason for this is the filling process of the accumulator. The oil pressure indicator may drop to zero for a maximum of 15 seconds.

20. Choke . . . . . push forward as required

**WARNING**

If the engine is warm, the activated choke will considerably cut the engine output!

21. Electrical consumers . . . ON as required

22. Altimeter . . . . . adjust

23. Oil temperature . . . . . check

**CAUTION**

Before loading the engine, allow the oil temperature to rise to 50° C (122° F) with the cowl flap open at 1000 to 1500 RPM (taxiing is allowable).

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- 24. Choke . . . . . OFF
- 25. Check ignition circuits at 1700 RPM, drop should be between 50 and 150 RPM. The difference between circuits 1 and 2 should not exceed 50 RPM.

**CAUTION**

If RPM drop is too high at low outside temperatures, repeat check with the carburetor heat ON.

- 26. Check carburetor heat at 2000 RPM, drop: 20 RPM
- 27. Propeller check - adjust 2000 RPM with throttle control. Select CRUISE position with propeller speed control (pull back until resistance distinctly increases), wait until speed drops to approx. 1800 RPM. Then reset to TAKE-OFF position. Repeat at least three times.

**CAUTION**

Without repeating the procedure it is not ensured that the pitch change mechanism is operative.

- 28. Check speed at full throttle (ignition switch - BOTH):  
2500 ± 50 RPM
- 29. Check power plant instruments - all must stay within the green range

4.5.2 Take-off and climb

- 1. Cowl flap . . . . . OPEN
- 2. Electric fuel pump . . . . . ON
- 3. Propeller speed control . . TAKE-OFF
- 4. Throttle . . . . . FULL (2500 ± 50 RPM)
- 5. Start take-off run with control stick slightly pressed forward, keep direction with rudder.
- 6. Lift tail wheel; airplane will lift off by itself at approximately 90 km/h (49 kts. / 56 mph).

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7. Perform climb with at least 95 km/h (51 kts. / 59 mph); monitor oil pressure, oil temperature and cylinder head temperature which all must stay within the green range.
8. At a height of 100 m (330 ft.) above ground level: Electrical fuel pump OFF. If the fuel system is intact, the red warning lamp must not illuminate, since the engine-driven pump maintains the fuel pressure.

For best angle of climb adjust airspeed to 95 km/h (51 kts. / 59 mph), for best rate of climb to 105 km/h (57 kts. / 65 mph). Figures apply to maximum T/O mass (max. gross weight).

#### 4.5.3 Flight (including inflight engine stop/start procedures)

#### NOTE

Economic power settings can be found in paragraph 5.3.7.

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Inflight engine stop

1. Throttle control . . . . . IDLE
2. Electrical consumers . . . . . OFF

**WARNING**

Engine start can become impossible:

- After prolonged soaring with several electric consumers switched on (mis-operation of mode select switch)
- In extreme cold (see page 2-13)
- If the battery is in a poorly maintained condition or barely charged

3. Ignition . . . . . OFF
4. Propeller . . . . . FEATHER
5. Mode select switch . . . . . SOARING

**CAUTION**

The propeller rotates after ignition shut-off due to windmilling. Feathering will occur with the propeller rotating.

6. Cowl flap . . . . . CLOSE

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Inflight engine start

1. Electrical consumers . . . . OFF
2. Master switch . . . . . ON
3. Mode select switch . . . . POWER FLIGHT
4. Propeller speed control . . TAKE-OFF
5. Cowl flap . . . . . OPEN
6. Choke . . . . . ON in case of cold start
7. Electric fuel pump . . . . ON
8. Throttle control . . . . . IDLE
9. Ignition switch . . . . . BOTH, start engine
10. Oil pressure . . . . . check

**NOTE**

The hydraulic pressure accumulator is not full after the propeller pitch change. After pressure build-up, there might be a loss of pressure in the area of the oil pressure sensor. The reason for this is the filling process of the pressure accumulator. The oil pressure indicator may drop to zero for a maximum of 15 seconds.

11. Choke . . . . . OFF if necessary
12. Electrical consumers . . . ON as required
13. Oil temperature . . . . . check
14. Propeller check - adjust 2000 RPM with throttle control. Select CRUISE position with propeller speed control (pull back until resistance distinctly increases), wait until speed drops to approx. 1800 RPM. Then reset to TAKE-OFF position. Repeat at least three times.

**CAUTION**

Without repeating the procedure it is not ensured that the pitch change mechanism is operative.

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Sideslips

The speed range in which sideslips can be performed depends on the strength of the pilot, because significant rudder control forces are required at higher airspeeds. Usually the upper limit is approximately 150 km/h (81 kts. / 93 mph).

A control force reversal can appear when the rudder is fully deflected and the ailerons are deflected opposite to the rudder. To recover, either release the aileron control or apply approximately 30 N (7 lbs.) to the pedal to overcome the control force reversal.

4.5.4 Approach

1. Throttle . . . . . reduce as required
2. Carburetor heat . . . . . ON if required
3. Trim . . . . . adjust as required
4. Air brakes . . . . . apply as required

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4.5.5 LandingPower-on landing

1. Propeller speed control . . TAKE-OFF
2. Electric fuel pump . . . . ON
3. Throttle . . . . . reduce
4. Carburetor heat . . . . . ON
5. Cowl flap . . . . . OPEN
6. Trim . . . . . adjust as required
7. Air brakes . . . . . apply as required

**NOTE**

The air brake lever catches when the air brakes are extended half way. With slightly increased force, this position can be overtraveled in either direction. With the air brakes locked in half extended position it is possible to control the glide path with the throttle control. The maximum airspeed for air brakes fixed in the half extended position  $v_{ABf}$  must not be exceeded.

8. Sideslip . . . . . possible but not necessary
9. Approach speed . . . . . 105 km/h (57 kts. / 65 mph)  
during final approach

**NOTE**

Conditions such as strong headwind, danger of wind shear, turbulence or wet wings require a higher approach speed.

10. Touchdown . . . . . in three point position

**CAUTION**

In case of airplanes *without toe-brakes*, avoid touch-down with the air brake lever pulled to the stop, since the wheel brakes are coupled with the air brake system and a lock-up of the wheels may result.

11. Wheel brakes . . . . . apply as required (by operating toe-brakes or by pulling the air brake lever, depending on brake system)
12. Electric fuel pump . . . . . OFF

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Balked landing with the engine running

1. Air brakes . . . . . retract
2. Throttle . . . . . FULL

**WARNING**

When approaching with the air brakes fixed in the half extended position, one hand on the control stick and the other on the throttle control, FIRST select full throttle, then retract the air brakes.

**NOTE**

Climbing is possible with the air brakes fixed in the half extended position.

3. Perform climb with at least 95 km/h (51 kts./59 mph). Monitor oil pressure, oil temperature, and cylinder head temperature. These must stay within the green range.
4. At a height of 100 m (330 ft.) above ground level: Electrical fuel pump OFF. If the fuel system is intact, the red warning lamp must not illuminate, since the engine-driven pump maintains the fuel pressure.

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Power-off landing**NOTE**

If the propeller is feathered, the approach must have enough altitude to ensure the landing field is reached, since starting the engine takes too much time during final approach.

1. Trim . . . . . adjust as required
2. Air brakes . . . . . apply as required
3. Approach speed . . . . . 105 km/h (57 kts. / 65 mph)  
during final approach

**NOTE**

Conditions such as strong headwind, danger of wind shear, turbulence or wet wings require a higher approach speed.

4. Touchdown . . . . . in three point position

**CAUTION**

In case of airplanes *without toe-brakes*, avoid touch-down with the air brake lever pulled to the stop, since the wheel brakes are coupled with the air brake system and a lock-up of the wheels may result.

5. Wheel brakes . . . . . apply as required (by operating toe  
brakes or by pulling the air brake  
lever, depending on brake system)

4.5.6 (omitted)

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4.5.7 High altitude flight

Above 2000 meters (6500 ft.) of altitude the following limitations to the never exceed speed  $v_{NE}$  must be observed:

Pressure altitude meters (feet)	$v_{NE}$ km/h (kts./mph.)
0 to 2000 ( 0 to 6500)	261 (141 / 162)
2000 to 3000 ( 6500 to 9800)	246 (133 / 153)
3000 to 4000 ( 9800 to 13100)	233 (126 / 145)
4000 to 5000 (13100 to 16400)	221 (119 / 137)
5000 to 6000 (16400 to 19600)	210 (113 / 130)

4.5.8 Flight in rain**NOTE**

Flight performance deteriorates in rain. The impact on the flying characteristics is minor. Flight in rain should be avoided because of the reduced visibility.

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4.5.9 Aerobatics**NOTE**

Aerobatics and spinning are forbidden.

4.5.10 Engine shut-down

1. Propeller speed control . . TAKE-OFF
2. Throttle . . . . . IDLE
3. Parking brake . . . . . set
4. Electric fuel pump . . . . OFF
5. Electrical consumers . . . OFF
6. Ignition . . . . . OFF

**NOTE**

In case of post-ignition in hot weather conditions and when using MOGAS fuel, switch on ignition again, pull choke, cut off ignition after 3 seconds.

7. Master switch . . . . . OFF
8. Mode select switch . . . . SOARING
9. Air brakes . . . . . lock

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#### 4.5.11 Parking

When parking for a short time, the airplane should be oriented in headwind direction with the parking brake set and the air brakes fixed in the extended position.

In case of longer unattended parking or in unpredictable wind conditions, the airplane should be moored or stored in a hangar.

#### CAUTION

Avoid outdoor parking for long periods of time!

#### NOTE

The powered sailplane should not be parked with the propeller in the feathered pitch position. With an empty oil pressure accumulator, the propeller cannot assume the take-off position. Starting the engine with the propeller in feathered pitch is possible, but significantly increases engine wear.

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## 5. PERFORMANCE

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## 5.1 INTRODUCTION

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

The data in the charts has been computed from actual flight tests with the powered sailplane and engine in good condition, wheel fairings installed and using average piloting techniques.

The specified airspeeds must be understood as IAS. The performance data has been evaluated applying the normal procedures described in Section 4.

### NOTE

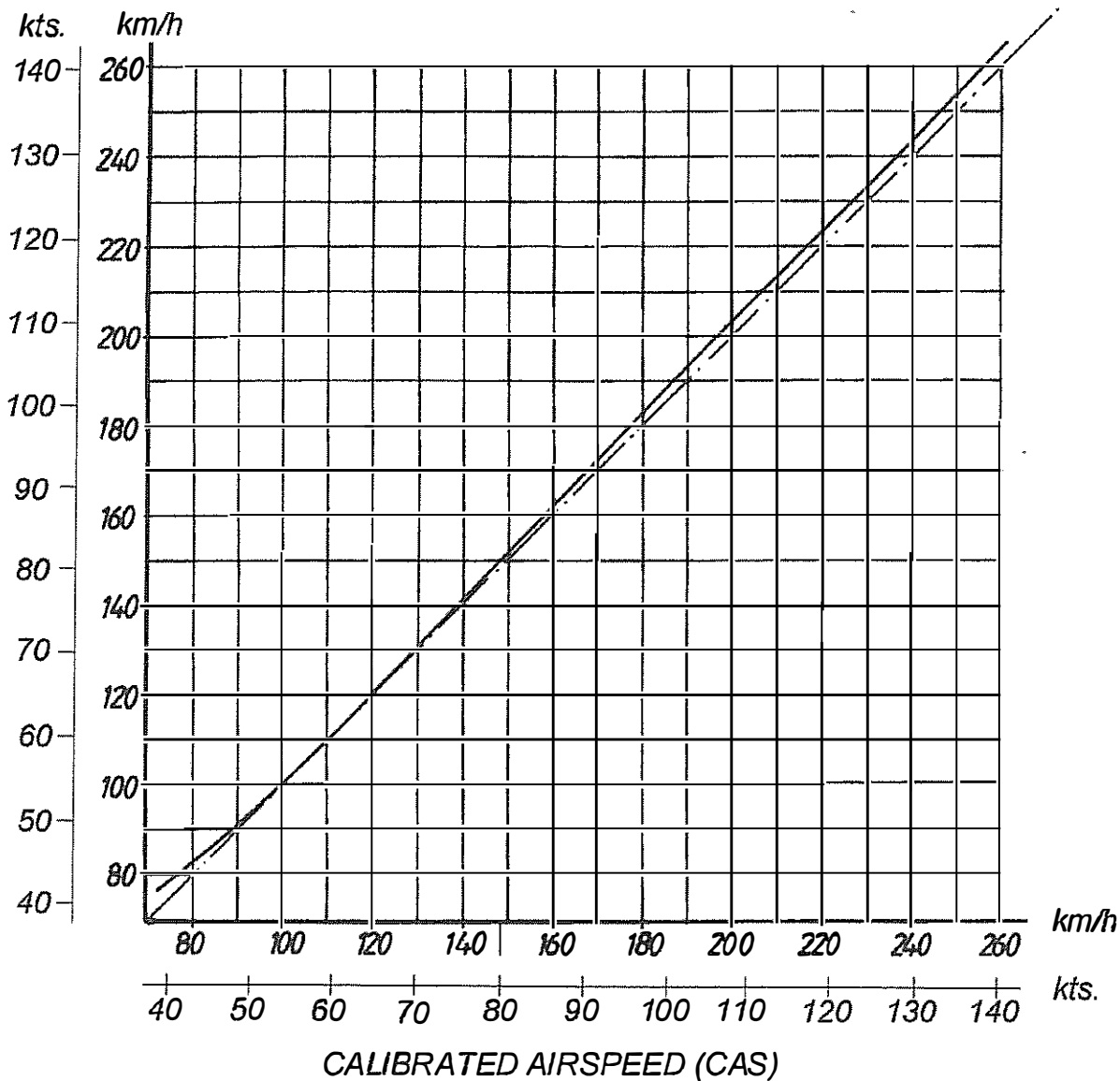
A poor maintenance condition of the airplane and unfavorable external circumstances (high temperature, rain) can considerably deteriorate the specified performance values.

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5.2 APPROVED DATA

5.2.1 Airspeed indicator system calibration

INDICATED AIRSPEED (IAS)



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5.2.2 Stall speeds

Stall speeds at different bank angles in **km/h**:

Air Brakes	Bank angle			
	0°	30°	45°	60°
retracted	$v_{S0} = 78$	84	93	110
extended	$v_{S1} = 81$	87	96	115

Stall speeds at different bank angles in **kts.**:

Air Brakes	Bank angle			
	0°	30°	45°	60°
retracted	$v_{S0} = 42$	45	50	60
extended	$v_{S1} = 44$	47	52	62

Stall speeds at different bank angles in **mph**:

Air Brakes	Bank angle			
	0°	30°	45°	60°
retracted	$v_{S0} = 48$	52	58	69
extended	$v_{S1} = 50$	54	60	71

**NOTE**

Conditions like turbulence, wet wings, or high load factors increase the stall speeds.

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5.2.3 Take-off performance

- Conditions:
- Outside air temperature: 15° C (59° F)
  - Atmospheric pressure: 1013 hPa (1013 mbar)
  - Calm
  - Full throttle
  - Maximum flight mass (max. gross weight)
  - Propeller setting: TAKE-OFF
  - Lift-off speed approx. 90 km/h (49 kts. / 56 mph)
  - Speed during climb approx. 95 km/h (51 kts. / 59 mph)
  - Level runway, asphalt surface

Take-off roll:

161 m (528 ft.)

Take-off distance to clear a 15 m (50 ft.) obstacle:

306 m (1004 ft.)

**NOTE**

For take-off distances under circumstances different from those described above refer to the charts in paragraph 5.3.3.

**NOTE**

Poor maintenance condition of the airplane, deviation from the procedures prescribed in this manual and unfavorable outward circumstances (high temperature, rain, unfavorable wind influence, and in particular high grass) can considerably extend the take-off distance.

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5.3 ADDITIONAL INFORMATION5.3.1 Demonstrated crosswind performance

Take-off: 30 km/h (16 kts. / 19 mph)

Landing: 30 km/h (16 kts. / 19 mph)

5.3.2 Glide performance and flight polar

Condition: maximum flight mass (max. gross weight)

Minimum rate of descent:

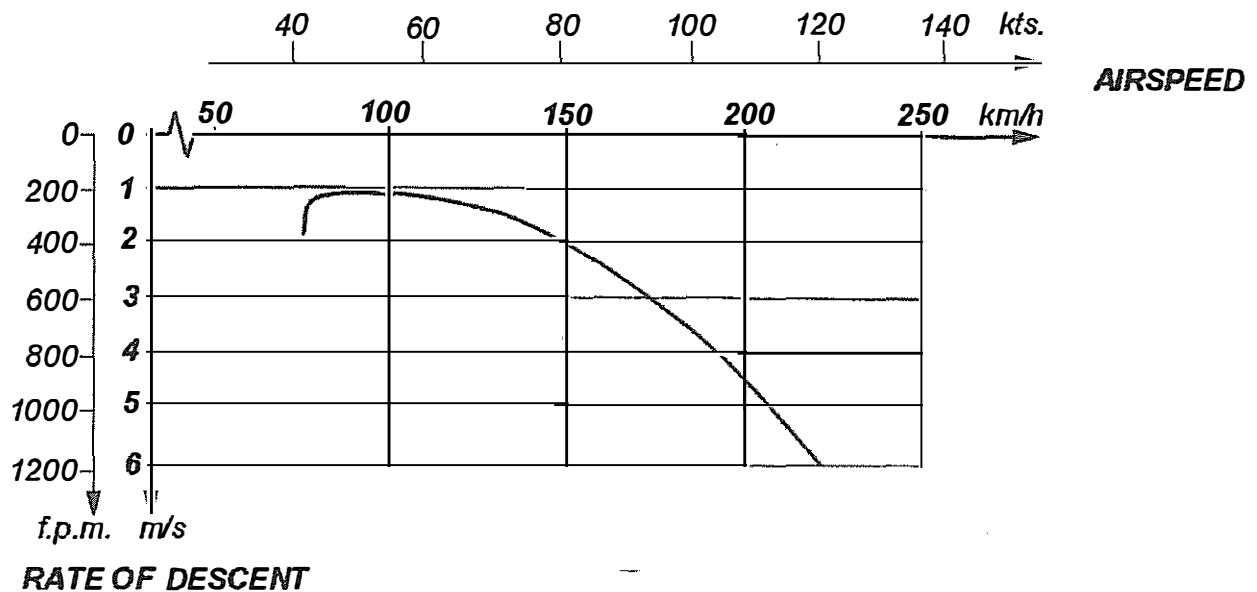
1.14 m/s (224 ft./min) at 95 km/h (51 kts. / 59 mph)

Maximum lift drag ratio:

28 at 105 km/h (57 kts. / 65 mph)

Flight polar:

Condition: propeller feathered



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5.3.3 Take-off charts

- Conditions:
- Full throttle
  - Maximum flight mass (max. gross weight)
  - Propeller setting: TAKE-OFF
  - Lift-off speed approx. 90 km/h (49 kts. / 56 mph)
  - Speed during climb approx. 95 km/h (51 kts. / 59 mph)
  - Level runway, asphalt surface

s1 = Take-off roll

s2 = Take-off distance to clear a 15 m (50 ft.) obstacle

Headwind-component [kts.]	OAT [°C]	Pressure altitude above mean sea level [m] / Atmospheric pressure [hPa] = [mbar]							
		0/1013		400/966		800/921		1200/877	
		s1 [m]	s2 [m]	s1 [m]	s2 [m]	s1 [m]	s2 [m]	s1 [m]	s2 [m]
0	0	142	275	160	302	179	335	201	371
	15	161	306	182	338	204	375	229	417
	30	182	340	205	377	230	419	260	466
5	0	114	232	128	256	144	285	162	317
	15	130	258	147	288	165	320	187	357
	30	147	290	166	323	189	359	213	401
10	0	88	194	100	214	113	239	129	267
	15	101	217	115	243	131	270	150	301
	30	116	243	132	272	150	303	172	340
15	0	65	157	75	175	86	197	99	221
	15	77	177	87	199	101	223	115	251
	30	88	200	101	225	116	253	134	285

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Headwind- component [kts.]	OAT [°F]	Pressure altitude above mean sea level [ft.]/ Atmospheric pressure [hPa] = [mbar]							
		0/1013		1310/966		2620/921		3940/877	
		s1 [ft.]	s2 [ft.]	s1 [ft.]	s2 [ft.]	s1 [ft.]	s2 [ft.]	s1 [ft.]	s2 [ft.]
0	32	466	902	525	991	587	1099	659	1217
	59	528	1004	597	1109	669	1230	751	1368
	86	597	1115	673	1237	755	1375	853	1529
5	32	374	761	420	840	472	935	531	1040
	59	427	846	482	945	541	1050	614	1171
	86	482	951	545	1060	620	1178	699	1316
10	32	289	636	328	702	371	784	423	876
	59	331	712	377	797	430	886	492	988
	86	381	797	433	892	492	994	564	1115
15	32	213	515	246	574	282	646	325	725
	59	253	581	285	653	331	732	377	823
	86	289	656	331	738	381	830	440	935

**WARNING**

A grass surface will extend the take-off distances by at least 20 %, depending on the characteristics of the ground (softness, grass height).

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5.3.4 Noise data

The evaluation of noise emission was carried out according to the Noise Regulations of ICAO, Annex 16, Chapter 10.

Noise emission: 61.4 dB(A).

5.3.5 Climb performance

Maximum rate of climb:

Conditions:

- Sea level
- Full throttle
- Max. flight mass (max. gross weight)
- $v = v_Y = 105 \text{ km/h}$  (57 kts. / 65 mph)
- Propeller speed: 2420 RPM

max. rate of climb = 4.1 m/s (807 ft./min)

5.3.6 Service ceiling

Service ceiling is above 5000 m (16400 ft.)

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5.3.7 Fuel consumption, cruising speed,  
maximum flight duration, range**NOTE**

The specifications for maximum flight duration and range apply to a full tank and do not include any reserve. The range specifications apply to flight in still air with a well-maintained and correctly adjusted airplane.

Conditions: - Propeller speed: 2200 RPM  
- Pressure altitude: 1500 meters (4900 ft.)

manifold pressure in. Hg	fuel consumption		cruising speed			maximum duration h:min	range			fuel tank version
	l/h	US gal. per hr.	km/h	kts.	mph		km	naut. miles	stat. miles	
23	15	4.0	170	92	106	3:36	612	330	380	55 1
						5:08	873	471	542	79 1
22	13	3.4	160	86	99	4:09	665	359	413	55 1
						5:55	948	512	589	79 1

**NOTE**

It is generally recommended for a fast cruise, that the propeller speed is set at 2400 RPM and that the manifold pressure is at least 0.7 inHg under the maximum obtainable. This reduces the fuel consumption considerably whilst hardly affecting the cruising speed.

For an economical cruise it is recommended that the RPM is set between 2300 and 2200 and manifold pressure 1 to 2 inHg under the maximum obtainable.

In order to keep engine wear at a minimum, permanent revolutions under 1900 RPM are not recommended.

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## 6. MASS (WEIGHT) AND BALANCE /

## EQUIPMENT LIST

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6.4 BASIC EMPTY MASS AND MOMENT . . . . .	6-4
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## 6.1 INTRODUCTION

This section describes the range of loading in which the HK 36 TS can be operated safely.

Descriptions of the weighing procedure, the computation of the admissible CG range, and a list of the equipment that must be present in the airplane during the weighing process are included in the Maintenance Manual, Section 4.

### WARNING

Exceeding the maximum mass (maximum gross weight) can overstress the airplane!

Falling short of the minimum seat payload (payload on both seats together) leads to a deterioration of controllability and stability.

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## 6.2 WEIGHING PROCEDURES

The weighing procedures are described in the Maintenance Manual, paragraph 4.2. The purpose of weighing the airplane is to evaluate the empty mass (empty weight) and the CG lever arm (i.e. CG position). It may be carried out by authorized personnel only.

## 6.3 WEIGHING REPORT

The Weighing Report shows the current empty mass (empty weight) and the corresponding CG position. The Weighing Report is preserved in the Aircraft Maintenance Log.

### NOTE

After equipment changes, repairs, repainting, etc. the airplane must be reweighed in compliance with the Maintenance Manual by an authorized person, and the new empty mass (empty weight) CG position must be computed. The results must be entered in the Mass and Balance Form, and the new limits must be drawn on a new Mass and Balance Diagram.

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6.4 BASIC EMPTY MASS AND MOMENT

The empty mass (empty weight) CG limitations are defined in the Maintenance Manual, Section 4.

These limitations guarantee that solo-pilots with a mass (weight) of at least 70 kg (154 lbs.) will not overstep the maximum rearward CG when flying with a full tank and no baggage.

The CG will not exceed the maximum forward position if 220 kg (485 lbs.) seat payload and 10 kg (22 lbs.) of fuel for a half hour flight are aboard.

6.5 MASS OF ALL NON-LIFTING PARTS

Maximum mass (weight) of all non-lifting parts:

- |  |   |   |                    |
|--|---|---|--------------------|
|  | - | Serial numbers below 36.517 . . . . .   | 590 kg (1301 lbs.) |
|  | - | Serial number 36.517 and subsequent . . | 610 kg (1345 lbs.) |

A list of all non-lifting parts is included in the Maintenance Manual, paragraph 4.6.

**NOTE**

Due to the design of the HK 36 TS, the mass (weight) of all non-lifting parts will not be exceeded unless the maximum flight mass (max. gross weight) of 770 kg / 1698 lbs. is overstepped.

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6.6 MASS (WEIGHT) AND BALANCE FORM

The Mass and Balance Form on page 6-6 shows the following values:

- current empty mass
- current empty mass CG position
- current maximum useful load including parachute, seat cushions, fuel, baggage
- minimum seat payload for solo flights with full tank and no baggage
- minimum seat payload for solo flights with full tank and maximum baggage mass

Furthermore, the Mass and Balance Form is a record of all weighings carried out.

The Mass and Balance Form must be updated by an authorized person in compliance with the currently effective Weighing Report. The corresponding instructions can be found in the Maintenance Manual, paragraph 4.7.

In addition to the Mass and Balance Form, a new Mass and Balance Diagram is filled out upon each weighing. The corresponding instructions are given in the Maintenance Manual, paragraph 4.8.

**NOTE**

Weighing is done in accordance with the Equipment Inventory which includes the winglets. Airplane operation without winglets is permissible. The influence on the empty mass (weight) and the corresponding moment is negligible.

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6.7 USEFUL LOADS6.7.1 Maximum useful load

The useful load includes the masses (weights) of the crew, baggage, and fuel. The maximum permissible useful load is shown in the Mass and Balance Form, in the Mass and Balance Diagram, and on the placard on the instrument panel.

**NOTE**

The total crew mass comprises of the mass of the passengers and parachutes.

6.7.2 Seat payloadMinimum seat payload

The Mass and Balance Form and the placard in the cockpit (left hand section of instrument panel) show the following data:

- Minimum seat payload for solo flights with a full tank and no baggage;
- Minimum seat payload for solo flights with a full tank and maximum baggage mass (12 kg / 26 lbs.).

The minimum seat payload is never less than 55 kg (121 lbs.).

**NOTE**

Pilots with a mass (a weight) between 55 kg (121 lbs.) and the minimum seat payload shown on the placard in the cockpit must install a trim weight in case of solo flights.

Trim weights

If the minimum seat payload exceeds 55 kg, a trim weight fixture must be installed on the center console 400 mm (15<sup>3</sup>/<sub>4</sub>" ) behind the firewall. A seat payload deficit should be equalized using the following chart:

seat payload deficit [kg (lbs.)]	5 (11)	10 (22)	15 (33)
mass of trim weight [kg (lbs.)]	1.7 (3.75)	3.4 (7.5)	5.1 (11.25)

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Maximum seat payload

The useful load on one seat must not exceed 110 kg (243 lbs.).

Lever arm of seat payload

A lever arm of 143 mm (5.63 in.) aft of reference datum is assumed for all CG computations.

6.7.3 Useful load in baggage compartment

The maximum useful load in the baggage compartment is 12 kg (26 lbs.). For the preparation of the Mass and Balance Diagram, the lever arm of the baggage was assumed to be equal to the lever arm of the fuel tank (i.e. 727 mm or 28.62 in. for the standard tank, 824 mm or 32.44 in. for the long range tank).

**NOTE**

When taking baggage aboard, do not exceed the maximum permissible useful load.

6.7.4 Fuel load

The fuel capacity is given in paragraph 2.12.

**NOTE**

When refueling, make sure not to exceed the maximum permissible useful load.

Lever arm of the fuel tank

A lever arm of 727 mm / 28.62 in. (standard tank) or 824 mm / 32.44 in. (long range tank) aft of reference datum is assumed for all CG computations.

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6.8 MASS / C.G. ENVELOPES

The Mass and Balance Diagram is a supplement to the Mass and Balance Form. It gives the pilot the information whether a loading is permissible, taking maximum permissible useful load and minimum seat payload into account. It shows the permissible mass (weight) of fuel and baggage for a given seat payload.

The diagram applies to one specific airplane. It is based on the data provided by the Mass and Balance Form and has to be redrawn by an authorized person upon each weighing, using the broken subsidiary lines.

The corresponding instructions are laid down in the Maintenance Manual.

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Use of the diagram

The forbidden combinations of seat payload and total mass (weight) of fuel and baggage are represented by the hatching.

Beside the diagram there is a scale for the conversion of the fuel quantity in liters or US gallons to the fuel mass (weight) in kilograms or pounds. The following sample problems show how to use the Mass and Balance Diagram.

## Example A:

- Pilot: 70 kg/154 lbs., copilot: 82 kg/181 lbs.;  
total: 152 kg/335 lbs.

- Long range tank: full (60 kg/132 lbs.), no baggage

The corresponding point in the diagram does not touch any boundary, hence the loading is permissible.

## Example B:

- Pilot: 65 kg/143 lbs., solo-flight

- Long range tank: full (60 kg/132 lbs.), baggage: 12 kg/26 lbs.;  
total: 72 kg/159 lbs.

The loading oversteps the maximum rearward CG position. The pilot must remove 15 kg/33 lbs. (20 liters/5.3 US gal.) of fuel.

## Example C:

- Pilot, 92 kg/203 lbs., copilot: 105 kg/231 lbs.;  
total: 197 kg/434 lbs.

- Standard tank

In case they do not take any baggage aboard, they may take off with 27 kg/60 lbs. (36 l/9.5 US gal.) of fuel.

## Example D:

- Pilot: 57 kg/126 lbs., no copilot

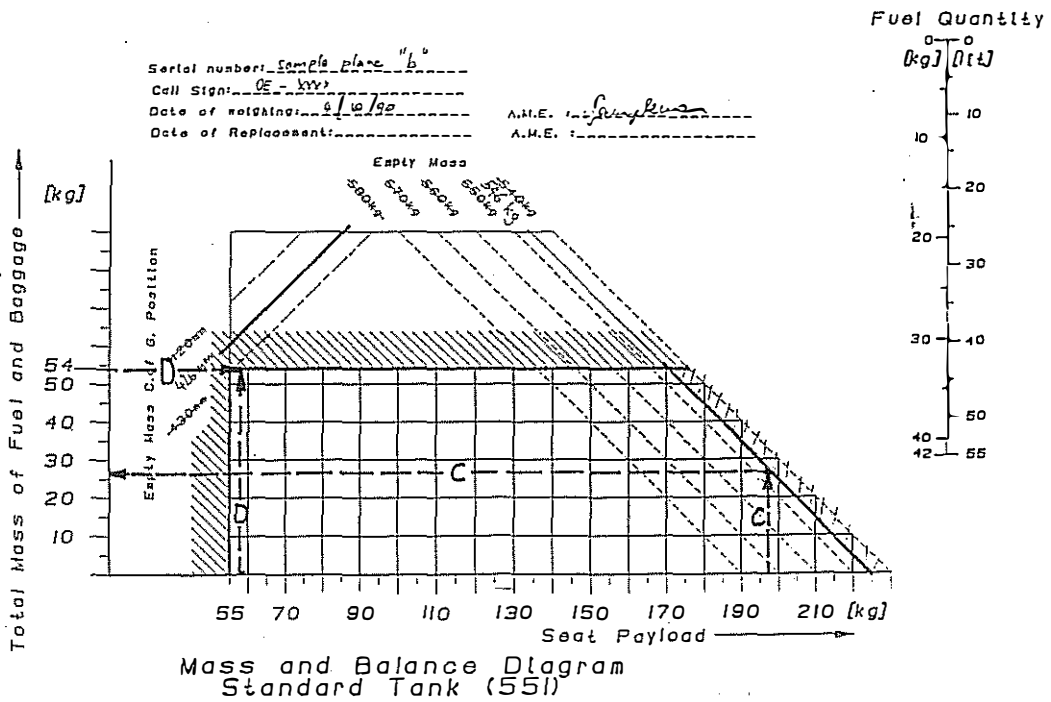
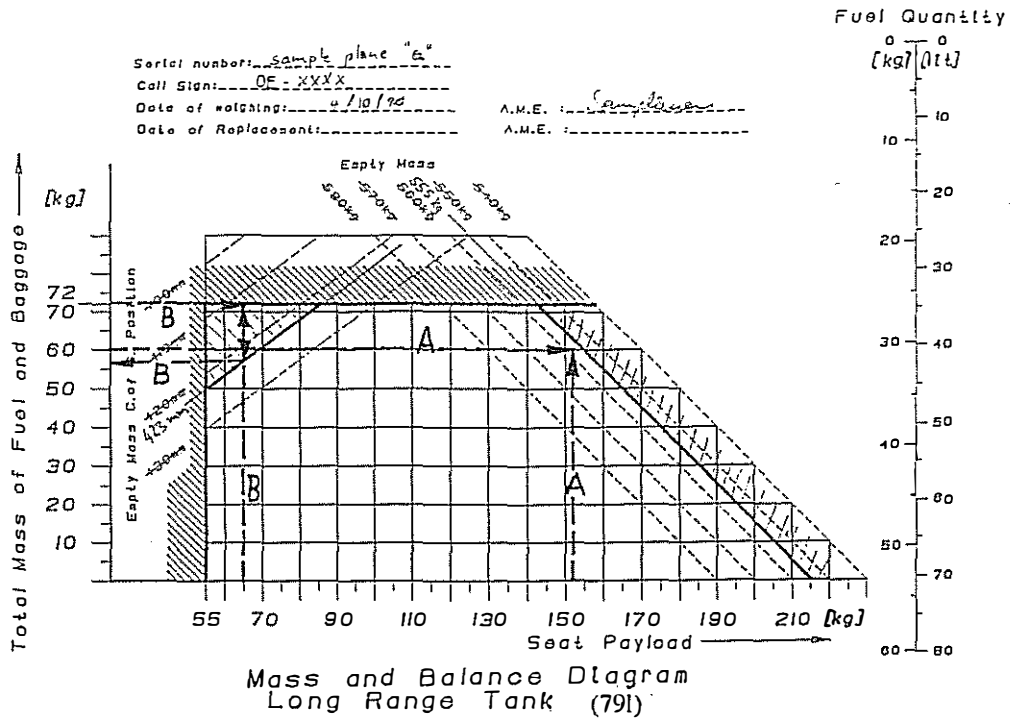
- Standard tank: full (42 kg/93 lbs.), baggage: 12 kg/26 lbs.;  
total: 54 kg/119 lbs.

Since the maximum rearward CG position is not effective in sample airplane "b", the pilot may exploit the maximum mass (weight) of fuel plus baggage, which amounts to 54 kg/119 lbs.

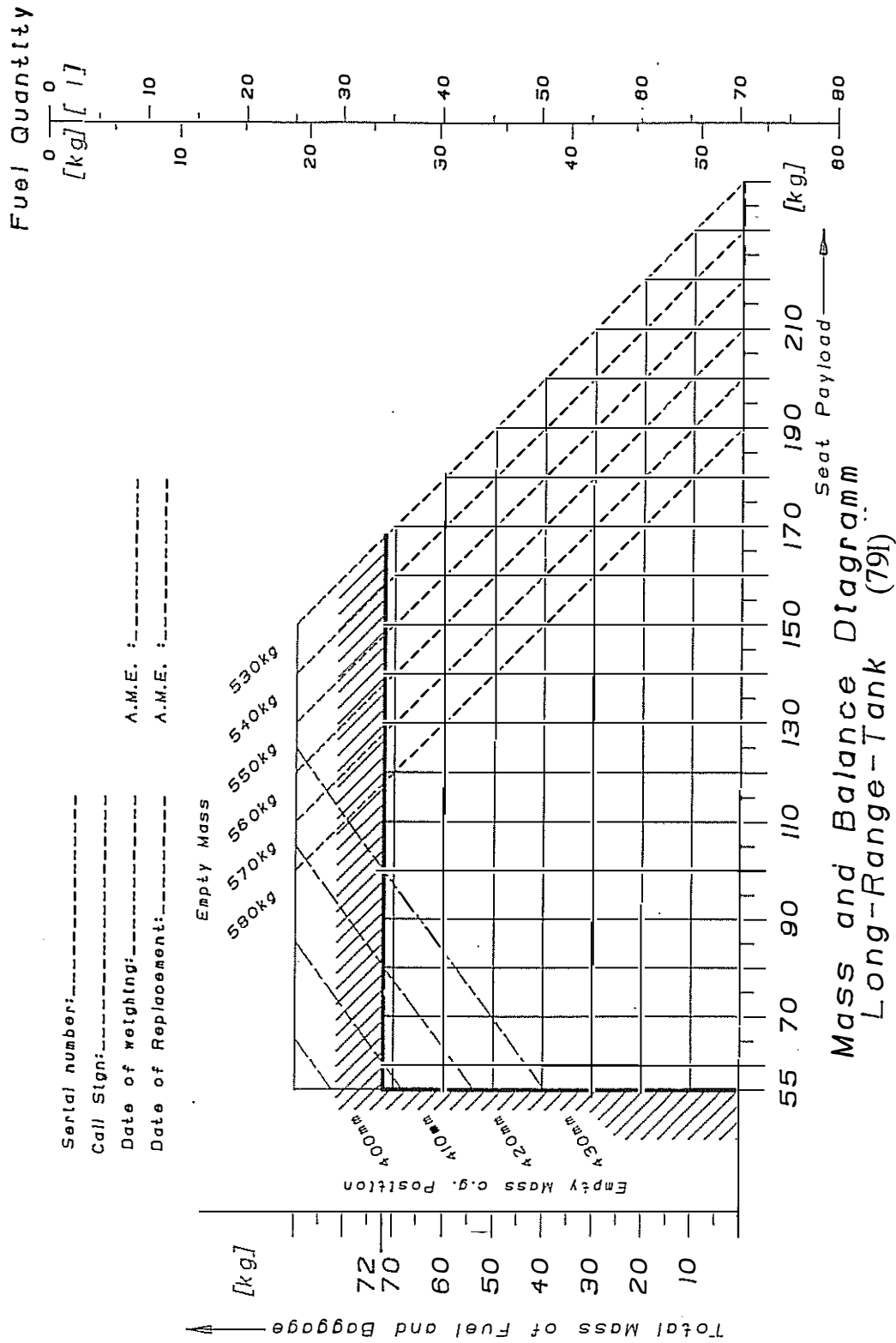
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Mass/center of gravity envelopes.

EXAMPLES



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6.9 EQUIPMENT LISTMinimum equipment (VFR)

- 1 Altimeter
- 1 Airspeed indicator
- 1 Magnetic compass
- 1 RPM indicator
- 1 Running time meter
- 1 Manifold pressure indicator
- 1 Oil pressure indicator
- 1 Oil temperature indicator
- 1 Cylinder head temperature indicator
- 1 Fuel quantity indicator
- 1 Ammeter
- 1 Deviation table
- 1 Fuel pressure warning lamp

Additional equipment

A list of the currently installed equipment is provided in the Equipment Inventory which is preserved in the Aircraft Maintenance Log.

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## 7. POWERED SAILPLANE AND SYSTEMS

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## 7.1 INTRODUCTION

This section provides description and operation of the powered sailplane and its systems. Refer to Section 9, Supplements, for details of optional systems and equipment.

## 7.2 AIRFRAME

### 7.2.1 Wings

The GFRP wings are manufactured in half-shell sandwich construction. The ailerons are made of CFRP and are attached to the wing by means of five hinges, also made of CFRP. Schempp-Hirth type air brakes are provided in the wings' upper surface. They may be extended at all speeds up to  $v_{NE}$ . The air brakes have oil dampers but must be locked. This is performed by pushing the lever to the forward stop overcoming the resistance occurring after the air brake is retracted. The air brake lever catches when the air brakes are extended half way.

The wings are connected to the fuselage with three bolts each.

The winglets are manufactured from CFRP and are attached to the wings with 2 threaded bolts each.

### NOTE

Airplane operation is also permissible without winglets. The flight characteristics and performance are not significantly affected.

### 7.2.2 Fuselage

The GFRP fuselage is manufactured in half-shell sandwich construction. A fire-resistant fabric is sandwiched between a stainless steel barrier and the firewall. The main bulkhead is made of CFRP/GFRP. The instrument panel is made of GFRP. The maximum permissible mass (weight) of the instrument panel including the instruments installed is 17 kg (37.5 lbs.).

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### 7.2.3 Tail plane

Rudder, elevator and horizontal stabilizer are manufactured in half-shell sandwich construction. The folded-top antenna for the COM equipment and the Pitot tube mount are placed in the vertical stabilizer. The horizontal tail surfaces are attached with two bolts and a fastening screw.

## 7.3 FLIGHT CONTROLS

### 7.3.1 Primary controls

Ailerons and elevator are driven by push-rods, the rudder is driven through control cables. Elevator control forces can be compensated by means of a spring trim system.

The aileron and air brake control systems are automatically connected when the wing is installed. However, the strobe and position lights (optional equipment) must be connected. The elevator control system must be connected by hand.

### 7.3.2 Elevator trim system

The green colored trim knob is located in the center console behind the throttle quadrant. To trim the airplane unlock the knob by pulling up, then move it to the desired position. The knob is spring-loaded and catches when it is released.

Knob forward = NOSE DOWN

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### 7.3.3 Rudder pedal adjust

#### NOTE

The rudder pedals must be adjusted on the ground!

The pedals are unlocked by pulling the black T-grip in front of the control stick.

Move forward: Push pedals forward with your heels while pulling the grip. Release the grip, let the pedals catch perceptibly.

Move rearward: Pull pedals rearward with the grip. Release the grip, use your feet to push the pedals forward until they catch.

### 7.4 AIR BRAKE SYSTEM

There is a blue air brake lever on either side panel. By pulling the lever rearward the air brakes are unlocked and extended.

The air brake lever catches when the air brakes are extended half way. This position can be over-travelled in either direction with slightly increased force.

By pushing the lever forward the air brakes are retracted. To lock the air brakes the lever must be pushed to the forward stop overcoming the resistance occurring after the air brake is retracted.

#### WARNING

The maximum admissible speed with the air brakes fixed in the half extended position  $v_{ABf}$  must not be exceeded.

The extension of the air brakes produces a nose down moment which is more intense at higher airspeeds.

At  $v_{NE}$ , the air brakes must be extended slowly in order to avoid too high negative acceleration.

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## 7.5 LANDING GEAR SYSTEM

### 7.5.1 General

The landing gear consists of a resilient main landing gear with disk brakes and a tail wheel which is steerable and also resilient. The two 15 inch wheels of the main landing gear are mounted to a GFRP strut with steel mounts. Optional fairings reduce drag. The 9-inch tail wheel can be deflected 45° to either side with the rudder pedals. For ground handling, a deflection of 60° can be acquired by shoving sideward.

### 7.5.2 Wheel brake

| There are two versions of the wheel braking system.

| *Wheel braking system with toe  
brakes:*

| The main wheels are equipped  
with hydraulically actuated disk  
brakes which are individually  
operated through toe pedals.

| *Wheel braking system without toe  
brakes:*

| The main wheels are equipped  
with hydraulically actuated disk  
brakes. The wheel brake system  
is coupled to the air brake  
lever. It is activated in the  
last quarter of the lever  
travel.

### 7.5.3 Parking brake

The draw-button is located on the center console behind the trim knob. The parking brake is released when the button is in the inserted position.

| To set the parking brake, draw the button to the stop and actuate the wheel brakes a few times.

| To release the parking brake actuate the wheel brakes again in order to relieve the shut-off valve, and simultaneously push the button in.

## CAUTION

| Pushing the button in without actuating the wheel brakes leads to an overstress of the operating circuit. Excessive wear may result.

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## 7.6 SEATS AND SAFETY HARNESES

The seat shells are removable in order to permit maintenance and inspection of the control system parts beneath. Jackets on the control sticks and on the air brake levers prevent foreign bodies from falling into the area of the control gear.

The seats are furnished with removable cushions. Parachutes with manual release can be used instead of the cushions. There is no fixture for the release cord of parachutes with automatic release. Therefore, these parachutes cannot be used.

Each seat is provided with a four-part harness. To fasten the harness, the end pieces must be inserted into the lock. To open the harness, turn the twist handle on the lock.

## 7.7 BAGGAGE COMPARTMENT

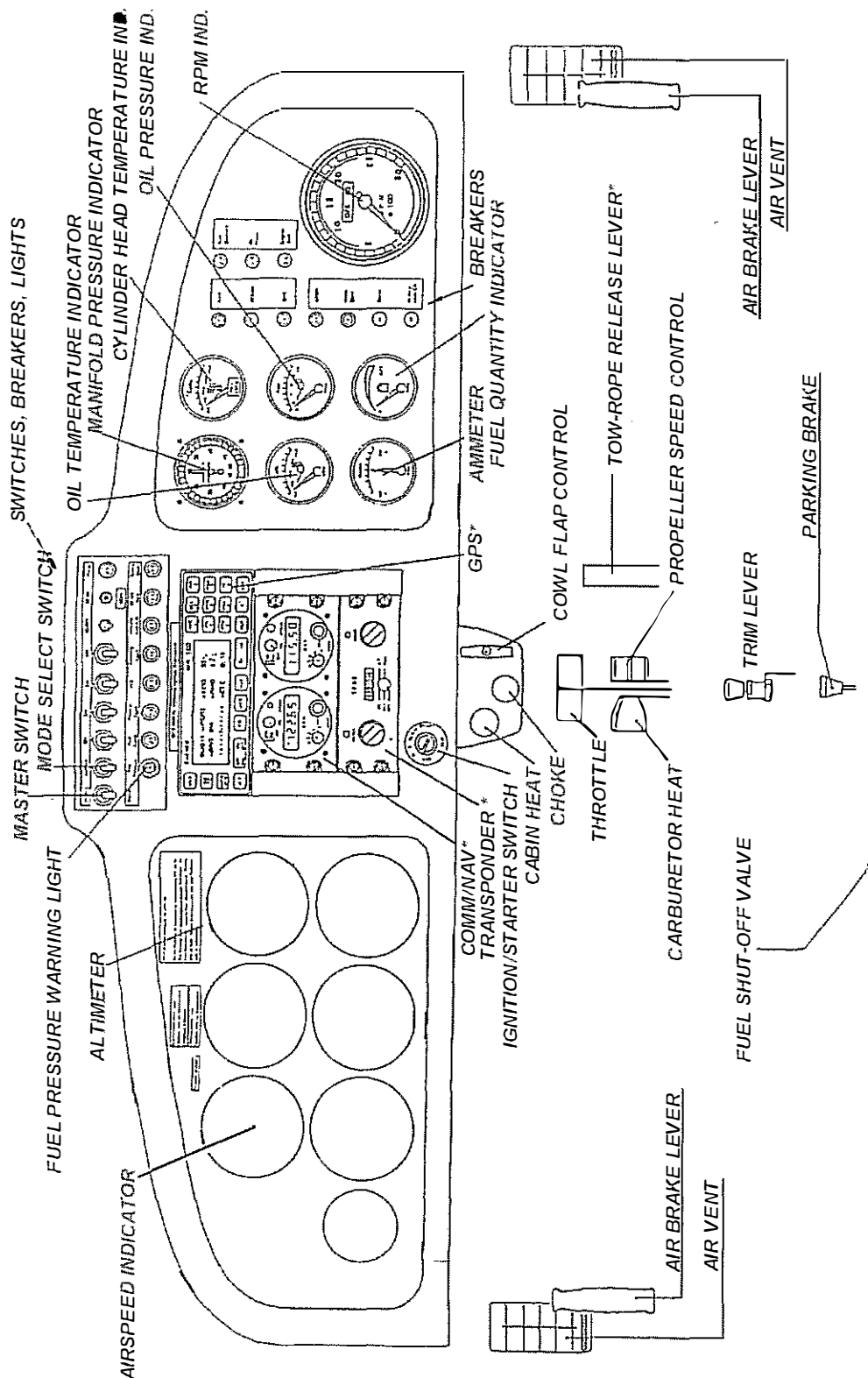
The baggage compartment is located behind the backrest above the fuel tank. Baggage pieces should be distributed evenly over the compartment. For safety reasons, the baggage pieces must be tied down.

### CAUTION

Before loading the baggage compartment, pay attention to the maximum useful load or, in case of solo flights, the minimum seat payload. Refer to the Mass and Balance Form and/or the Mass and Balance Diagram.

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7.8 COCKPIT



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### 7.8.1 Mode select switch

When the mode select switch is in SOARING position only the COM equipment is provided with battery power. All other electrical consumers are switched off.

### 7.8.2 Instruments

The flight instruments are installed in the left hand section of the instrument panel. The power-plant instruments are installed in the right hand section.

### 7.8.3 Cabin heat and cabin air

The draw-button for the cabin heat is located on the center console under the instrument panel. Pull the button to turn the cabin heat on.

The cabin can be aerated through the swivelling nozzles on the side panels. The two sliding/knockout windows in the canopy can be opened for additional aerating.

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#### 7.8.4 Canopy

##### Canopy lock

To close the canopy, pull shut with the black grips located on the front of the canopy frame. The canopy is locked by pushing forward the two red levers attached to the frame on either side. To open the canopy reverse the sequence.

### CAUTION

Before starting the engine, close and lock the canopy!

##### Canopy jettison

By strongly swinging the red levers 180° rearward, the canopy is disconnected from the brackets. Then the pilot must place both hands above his head against the canopy and push it away in upward direction.

#### 7.9 POWER-PLANT

##### 7.9.1 Engine

Liquid-cooled 4 cylinder four stroke engine Rotax 912 A3. Crankshaft speeds in parentheses.

Displacement: 1.211 liters

Max. output power (5 min): 59.6 kW (81 DIN-hp.) at 2550 RPM (5800 RPM)

Continuous output power: 58 kW (79 DIN-hp.) at 2420 RPM (5500 RPM)

For further specifications refer to the Operator's Manual for the engine.

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The ignition switch is operated with a key. To switch on the ignition turn the key clockwise until it catches. The starter is engaged by simultaneously pushing the button and turning the key clockwise to the stop.

### 7.9.2 Power plant controls

Throttle control, propeller speed control, and carburetor heat are combined in a unit on the center console.

Throttle control: Large round lever  
Lever full forward = FULL THROTTLE

Carburetor heat: Small rectangular lever  
Lever full rearward = CARBURETOR HEAT ON  
The carburetor heat is normally OFF (lever fully forward)

Propeller speed control: Black star shaped lever  
Lever fully forward = MAX. RPM  
Lever back to restriction = MIN. CRUISING RPM  
Lever fully rearward = SOARING POSITION

The choke button is installed in the center console under the instrument panel.

Choke button pulled = CHOKE ACTIVATED

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### 7.9.3 Cowl flap

For the operation of the manual cowl flap there is a T-grip on the center console next to the cabin heat button. To arrest the T-grip turn it 90° clockwise.

T-grip pulled = COWL FLAP CLOSED

The cowl flap is closed during soaring in order to reduce drag. At outside temperatures below 0 °C (32 °F), partial closing of the cowl flap avoids continuous operation with an oil temperature below 80 °C (176 °F).

#### NOTE

Continuous operation with oil temperatures below 80 °C (176 °F) may lead to increased accumulation of condensation, which can be recognized by white foam in the oil tank.

#### CAUTION

Leave the cowl flap at least half open when the engine is running in order to avoid overheating. Pay special attention to the engine temperatures.

### 7.9.4 Propeller & Governor

Hydraulically controlled constant speed propeller with feathered pitch, mt-propeller MTV-21-A-C-F/CF175-05.

| Governor: Woodward A-210790 or McCauley DCFU290D17B/T1.

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### 7.9.5 Propeller speed control

#### **NOTE**

The propeller speed control works differently from the usual systems in so far as hydraulic pressure is needed to reduce the blade pitch.

Small pitch is achieved by applying hydraulic pressure supplied by the governor. A spring moves the propeller to the feathered pitch position.

Propeller adjustment is done through the propeller speed control installed into the center console next to the throttle control. Pulling the control back to the point where the resistance increases causes an RPM reduction. The governor keeps the selected RPM constant, independent of airspeed and throttle position. If the engine power selected with the throttle control is not sufficient to maintain the selected RPM, the propeller blades will move to the lowest possible pitch (maximum RPM at this power setting).

If the propeller speed control is moved full rearward over the resistance (feathered pitch position) and if the propeller speed exceeds 500 RPM, the blades will move into the feathered pitch position. At too low RPM's, claws controlled by centrifugal force extend and keep the blades in low pitch position. Thus it is impossible to feather the propeller at engine standstill. During flight the propeller keeps rotating due to windmilling, even with the ignition switched off. The propeller stops rotating only when it is feathered. Therefore a propeller brake is not required.

The propeller governor is flanged to the engine. It is driven directly by the engine. The propeller control circuit is part of the engine oil circuit.

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In case of defects in the oil system, the propeller is supplied with oil by the pressure accumulator and thus stays operative for at least two minutes without oil being supplied by the engine. As soon as the oil pressure in the pressure accumulator is used up, the propeller blades will move into the feathered pitch position.

### CAUTION

The propeller speed control must not be moved over the resistance to the feathered pitch position as long as the engine is running!

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## 7.10 FUEL SYSTEM

### 7.10.1 General

The aluminum tank is located behind the backrest beneath the baggage compartment. The standard version holds 54 liters (14.3 US gal.), the long range version 77 liters (20.3 US gal.) of usable fuel. At its lowest spot, the tank is connected to the drain on the bottom side of the fuselage.

The fuel passes through a finger filter before it reaches the electric fuel pump with integrated filter, from there it goes to the fuel shut-off valve, the engine-driven fuel pump and finally to the float chambers of the two carburetors.

### 7.10.2 Fuel shut-off valve

The fuel shut-off valve is located on the left side of the center console near the pilot's feet.

Tap in flight direction = valve OPEN.

### 7.10.3 Tank drain

To drain the tank sump, activate the spring loaded drain by pushing the brass tube in with a drain cup. The brass tube protrudes approx. 30 mm (1.2 in.) from the fuselage contour and is located on the left hand side of the fuselage bottom, approximately at the same station as the fuel filler.

### 7.10.4 Fuel quantity indicator.

The fuel quantity indicator is adjusted for flight attitude. A slightly low indication is therefore possible on the ground.

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### 7.11 ELECTRICAL SYSTEM

The master switch is a toggle type. The mode select switch is situated to the right of the master switch.

#### CAUTION

Starting the engine is only possible if the mode select switch is in POWER FLIGHT position.

In SOARING position, all current consumers except for the COM equipment and the electric vertical speed indicator (optional) are currentless.

The NAV and COM equipment is located in the center section of the instrument panel. The transmit button for the radio is integrated into the control stick. A backrest-mounted connection set for two headsets is optional.

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### 7.12 PITOT AND STATIC SYSTEM

Static pressure, total head and the pressure for the compensation of the vertical speed indicator are measured by means of a Pitot tube which is mounted to the vertical stabilizer. The tube is removable. A safe connection of the lines is established automatically when the Pitot tube is inserted to the stop in the mount.

The lowest spot of the Pitot and static lines is bridged by means of bypass lines. Water that might have entered the system can accumulate there. Removal of water must be done during scheduled inspections (refer to Maintenance Manual).

### 7.13 MISCELLANEOUS EQUIPMENT

For the operation of additional avionics, refer to the manuals of the respective manufacturers.

### 7.14 PLACARDS / INSCRIPTIONS

The limitation placards are presented in paragraph 2.15. A list of all placards and inscriptions is included in the Maintenance Manual.

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## 8. POWERED SAILPLANE HANDLING, CARE AND MAINTENANCE

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## 8.1 INTRODUCTION

This section contains manufacturer's recommended procedures for proper ground handling and servicing of the powered sailplane. It also identifies certain inspection and maintenance requirements which must be followed if the powered sailplane is to retain that new-plane performance and dependability. It is wise to adhere to the lubrication schedule and perform preventive maintenance based on climatic and flying conditions encountered.

## 8.2 POWERED SAILPLANE INSPECTION PERIODS

Inspections are scheduled every 100, 200 and 600 hours. The respective inspection checklists are prescribed in the Maintenance Manual, paragraph 3.1.

## 8.3 POWERED SAILPLANE ALTERATIONS OR REPAIRS

Alterations or repairs of the powered sailplane may only be carried out as prescribed in the Maintenance Manual and only by authorized personnel.

## 8.4 GROUND HANDLING / ROAD TRANSPORT

For ground handling a draw tongue which is hooked to the tail wheel should be used. Road transport using a trailer is described in the Maintenance Manual, paragraph 1.2.

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### 8.5 CLEANING AND CARE

It is recommendable to remove insects with water and sponge after the day's flying is ended.

### CAUTION

Extreme dirt accumulation deteriorates  
flight performance!

Refer to the Maintenance Manual, paragraph 1.4, for further care measures.

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## 9. SUPPLEMENTS

At this time the following supplements are available:

Supplement 1

Use as a Tow Plane

Supplement 2

Differential Braking System

Supplement 3

Electrical Power Outlet for Additional Equipment

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