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FLIGHTMANUAL

FOR THE

MOTORGLIDER

DG-808C

Type : DG-800A
Model : DG-808C

Data Sheet No.: EASA.A.067

Factory Serial No.: _____

Registration No.: _____

Date of Issue: June 2005

Pages as indicated by "EASA App." are approved by:

(Signature)

(Authority)

(Stamp)

Date of approval January 10. 2006

This motorglider is to be operated in compliance with information and limitations contained herein.

Warnings

All sailplanes, especially those with retractable powerplants, are very complex technical devices. If you don't use yours as it is intended and within the certified operating limitations or if you fail to carry out proper maintenance work, it may harm your health or place your life in danger.

Prior to flying the aircraft read all manuals carefully and regard especially all **warnings, caution** remarks and **notes** given in the manuals.

- Never take-off without executing a serious pre-flight inspection according to the flight manual!
- Never take-off with a motorglider without checking the max. engine RPM and the ignition circuits!
- Always respect the relevant safety altitudes!
- With a motorglider never rely completely on the engine extending and starting. Plan your flight path so that you are always able to carry out a safe outlanding if necessary. Be aware that with the engine extended but not running the rate of sink increases remarkably. This means that with a motorglider you have to decide earlier for an outlanding than with a pure sailplane.
- Selflaunch only if you are sure that with an engine failure during the initial climb there is the possibility to execute a safe outlanding or to return to the airfield.
- Respect the stall speeds and always fly with a safety margin above the stall speed according to the flight conditions, especially at low altitudes and in the mountains.
- Use only the types of fuel and oil for your motorglider as specified in the flight manual.
- Use only the battery chargers as specified in the flight manual.
- Don't execute yourself any work on the control system except for greasing.
- Repairs and maintenance work should only be accomplished by the manufacturer or at certified repair stations rated for this type of work. A list of stations which have experience with DG aircraft may be obtained from DG Flugzeugbau..
- Even if no annual inspections are required in your country, have your aircraft checked annually (see maintenance manual section 2).
- Please pay attention to our web-site www.dg-flugzeugbau.de. There you will find the latest technical notes and service information for your glider:
  http://www.dg-flugzeugbau.de/en/maintenance-service-aircraft/technical-notes
  The „DG Pilot Info" informs you immediately by e-mail about the publication of new technical notes and service information.
  If you don't receive this info service, please click on the DG website on "News, Newsletter" Subscription to receive this service free of charge.

0 Revisions

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 right hand margin, and the under lying document for the Revision and the date will be shown on the bottom of the page.

Rev. No.	Affected Pages/ section	Description	Issue Date	EASA Approval Date	Inserted Date Signature
1	0.3-0.5, 1.5, 1.6, 2.5, 2.9-2.11, 4.22, 5.3, 5.6, 5.7, 5.9, 5.10, 5.13, 6.6, 6.10, 7.10, 7.13-7.15	Manual revision TN 800/34	September 2007	9. October 2007	
2	0.1, 0.3 ÷ 0.5, 1.2, 1.5, 2.6, 2.8, 2.9, 3.4, 4.4 ÷ 4.6, 4.8, 4.9, 4.11, 4.15, 4.20, 4.24, 4.26, 4.27, 4.29, 5.14, 6.2, 6.4, 6.7, 6.10, 7.1, 7.2, 7.4, 7.9 ÷ 7.11, 7.15, 7.18, 7.20, 7.22, 7.23	Manual revision, Coolant pump Pierburg TN 800/41	May 2012	14. Sept. 2012	
3	0.1, 0.6, 9.4	TN DG-G-11 NOAH Improvements	May2015	7.07.2015	
4	0.0, 0.1, 0.3 – 0.5, 2.11, 4.9, 4.10, 4.12, 4.25, 4.29, 7.2, 7.23	Manual revision TN800/45	July 2017	10.08.2017	

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0.2 List of effective pages

Section		page	issued	replaced/	replaced/
0		0.0	June 2005	July 2017	
		0.1	see manual amendments		
		0.2	"		
		0.3	"		
		0.4	"		
		0.5	"		
		0.6	June 2005		
1		1.1	June 2005		
		1.2	"	May 2012	
		1.3	"		
		1.4	"		
		1.5	"	Sept 2007	May 2012
		1.6	"	Sept 2007	
2	App.	2.1	June 2005		
	"	2.2	"		
	"	2.3	"		
	"	2.4	"		
	"	2.5	"	Sept 2007	
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	"	2.8	"	May 2012	
	"	2.9	"	May 2012	
	"	2.10	"	Sept 2007	
	"	2.11	"	Sept 2007	July 2017
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	"	2.13	"		
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3	"	3.1	June 2005		
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	"	3.3	"		
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	"	3.5	"		
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	"	3.7	"		
4	"	4.1	June 2005		
	"	4.2	"		
	"	4.3	"		

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4	App.	4.4	June 2005	May 2012	
		4.5	"	May 2012	
		4.6	"	May 2012	
	"	4.7	"		
	"	4.8	"	May 2012	
	"	4.9	"	May 2012	July 2017
	"	4.10	"	July 2017	
	"	4.11	"	May 2012	
	"	4.12	"	July 2017	
	"	4.13	"		
	"	4.14	"		
	"	4.15	"	May 2012	
	"	4.16	"		
	"	4.17	"		
	"	4.18	"		
	"	4.19	"		
	"	4.20	"	May 2012	
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	"	4.22	"	Sept 2007	
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	"	4.27	"	May 2012	
	"	4.28	"		
		4.29		May 2012	July 2017
5	"	5.1	June 2005		
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	"	5.3	"	Sept 2007	
	"	5.4	"		
	"	5.5	"		
	"	5.6	"	Sept 2007	
	App.	5.7	"	Sept 2007	
		5.8	"		
		5.9	"	Sept 2007	
		5.10	"	Sept 2007	
		5.11	"		
		5.12	"		
		5.13	"	Sept 2007	
		5.14	"		

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6	6.1	June 2005		
	6.2	"	May 2012	
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	6.6	"	Sept 2007	
	6.7	"	May 2012	
	6.8	"		
	6.9	"		
	6.10	"	Sept 2007	May 2012
7	7.1	June 2005	May 2012	
	7.2	"	May 2012	July 2017
	7.3	"		
	7.4	"	May 2012	
	7.5	"		
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	7.8	"		
	7.9	"	May 2012	
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	7.20	"	May 2012	
	7.21	"		
	7.22	"	May 2012	
	7.23	"	May 2012	July 2017
8	8.1	June 2005		
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	8.4	"		
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	9.3	"		
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	9.5	"		

0.3 Table of contents

1 General

1.1 Introduction

The flight manual has been prepared to provide pilots and instructors with information for the safe and efficient operation of the DG-808C motorglider.

This manual includes the material required to be furnished to the pilot by JAR Part 22. It also contains supplemental data supplied by the glider manufacturer.

1.2 Certification basis

This motorglider type DG-800, variant DG-808C has been approved by the EASA in accordance with:

Airworthiness requirements:
JAR Part 22 „*Sailplanes and powered sailplanes*“, change 4, issued 27th June 1989.
and
Noise requirements: ICAO Appendix 16, Volume I, Part II, Chapter 10

The Type Certificate No. EASA.A.067 for the variant DG-808C has been issued on January 10. 2006.

Category of Airworthiness: "Utility"

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.

1.4 Descriptive data

The DG-808C is a singleseater high performance self-launching motorglider with retractable powerplant.

Technical details

- 2-piece wing or 4 piece wing with parting at y = 7.25 m (Option).
- Wing tips with Winglets for 15 m span (Option)
- Removable Winglets for 18 m span (Option)
- Automatic hook-ups for all controls.
- Comfortable seating and modern cockpit design, safety cockpit.
- Large canopy for very good inflight vision.
- Draught free canopy demist and adjustable direct ventilation.
- Sealed airbrake- and landing gear boxes.
- Retractable main wheel, spring mounted.
- Steerable tailwheel.
- All controls including the engine are operated with the left hand, which enables the right hand to remain on the control stick.

Powerplant and powerplant controls

- Retractable powerplant with liquid cooled Solo 2 625 01 two stroke engine and GFRP-Composite propeller Technoflug KS-1G-152-R-122-( )-B 1
- Electrical engine extension-retraction, operated automatically with the ignition switch or manually as back-up, electronic safety devices to avoid misoperation.
- Engine control instruments with digital LCD indication (Microprocessor technology) DEI-NT including stall warning, outside air thermometer, and landing gear warning.
- BBSA slipping-centrifugal clutch to reduce drive belt loads as an option.

Further details:

- Waterballast in the wings.
- Waterballast in the fin in an integral tank (only Version DG-808C Competition).
- Wing fuel tanks as an option.

Technical data

Wingspan		m (feet)	15 (49.2)	18 (59.1)
Wing surface		m² (ft²)	10.68 (115.0)	11.81 (127.1)
Aspect ratio		/	21.07	27.42
Mean aerodynamic chord MAC		m (ft)	0.734 (2.41)	0.700 (2.30)
Length		m (ft)	7.055 (23.15)	
Fuselage width		m (ft)	0.63 (2.07)	
Fuselage height		m (ft)	0.81 (2.66)	
Horizontal tail span		m (ft)	2.52 (8.27)	

Data for the version DG-808C Classic

Waterballast wings		kg (U.S.gal)	100 (26.4)	
Waterballast fin tank		kg (U.S.gal)	none	
Empty weight	approx.	kg (lbs.)	336 (741)	340 (750)
Wing loading with payload 80 kg (176 lbs.) approx.		kg/m² (lbs./ft²)	39 (7.97)	35.4 (7.29)
Max. weight		kg (lbs.)	525 (1157)	
Max. wing loading		kg/m² (lbs./ft²)	44.5 (9.11)	

Data for the version DG-808C Competition

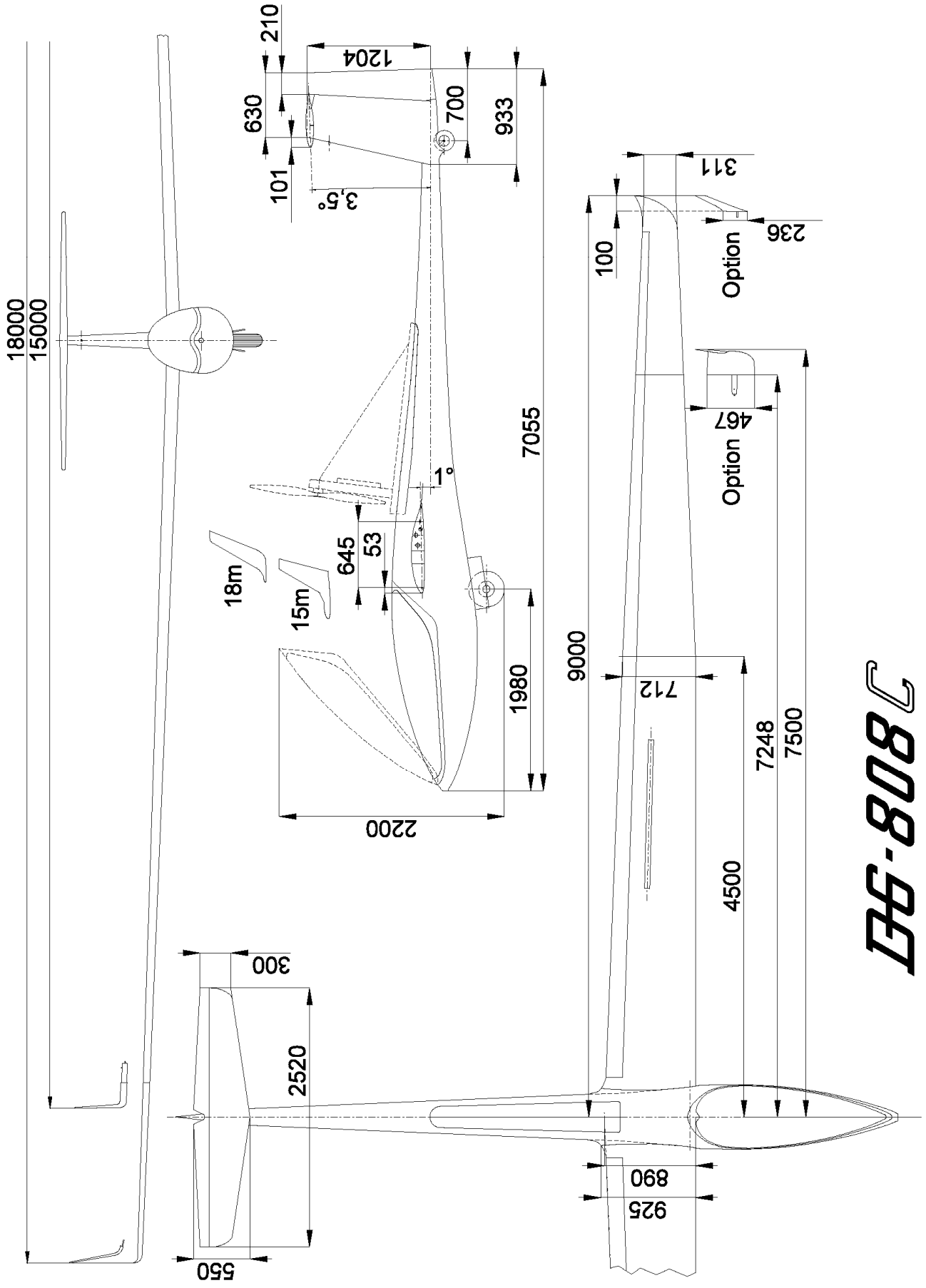
Waterballast wings		kg (U.S.gal)	120 (31.7) or	150 (39.6)
Waterballast fin tank		kg (U.S.gal)	max. 6.5 (1.72)	
Empty weight	approx.	kg (lbs.)	346 (762)	350 (772)
Wing loading with 80 kg (176 lbs.) payload approx.		kg/m² (lbs./ft²)	39.9 (8.16)	36.4 (7.46)
Max. weight		kg (lbs.)	540 (1190)	600 (1323)
Max. wing loading		kg/m² (lbs./ft²)	50.6 (10.35)	50.8 (10.47)

Powerplant

engine	Liquid cooled Solo 2 625 01 two stroke engine	
power	39 kW (53 hp)	
Reduction gear	1:3	
Propeller	Technoflug KS-1G-152-R-122-( )-B	GFRP-Composite
Propeller diameter	1.52 m (4.99 ft).	
Fuel tank capacity	fuselage tank	21 Liter (5.5 U.S.gal.)

Empty masses are with common instrumentation.
*Options will increase the empty mass accordingly!

1.5 Three view drawing (dimensions in mm)



2 Limitations

2.1 Introduction

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

The limitations included in this section have been approved by the EASA.

2.2 Airspeed

Airspeed limitations and their operational significance are shown below

	Speed	IAS km/h (kts.)	Remarks
VNE	Never exceed speed	270 (146)	Do not exceed this speed in any operation and do not use more than 1/3 of control deflection.
VPE	Max. speed with powerplant extended	190 (103)	Do not exceed this speed with the powerplant extended (engine idling)
VRA	Rough air speed	190 (103)	Do not exceed this speed except in smooth air and then only with caution. Rough air is in lee-wave rotors, thunderclouds, visible whirlwinds or over mountain crests etc.
VA	Manoeuvring speed	190 (103)	Do not make full or abrupt control movement above this speed, because under certain conditions the sailplane may be overstressed by full control movement.
VFE	Maximum flap extended speed L +5° up to +8°	 150 (81) 190 (103)	Do not exceed these speeds with the given flap setting
VW	Maximum winch-launching speed	150 (81)	Do not exceed this speed during winch- or auto-tow-launching
VT	Maximum aero-towing speed	190 (103)	Do not exceed this speed during aerotowing.
VLO	Maximum landing gear operating speed	190 (103)	Do not extend or retract the landing gear above this speed.
VPO	Max. speed to extend and re-tract the power-plant	100 (54)	Do not extend or retract the powerplant above this speed

Warning: At higher altitudes the true airspeed is higher than the indicated airspeed, so V_{NE} is reduced with altitude according to the table below (see also section 4.5.9).

Altitude in [m]	0-3000	4000	5000	6000	7000	8000
V_{NE} indicated km/h	270	256	243	230	217	205
Altitude in [ft]	0-10000	13000	16000	20000	23000	26000
V_{NE} indicated kts.	146	138	131	124	117	111

2.3 Airspeed Indicator Markings

Airspeed indicator markings and their colour code significance are shown below.

Marking	(IAS) value or range km/h (kts)	Significance
White Arc	88 -190 (47.5 - 103)	**Positive Flap Operating Range** (lower limit is maximum weight 1.1 VSO in landing configuration. Upper limit is maximum speed permissible with flaps extended positive + 8°, + 5°)
Green Arc	97 - 190 (52 - 103)	**Normal Operating Range** (Lower limit is maximum weight 1.1 VS1 at most forward c.g. with flaps neutral. Upper limit is rough air speed.)
Yellow Arc	190 - 270 (103 - 146)	Manoeuvres must be conducted with caution and only in smooth air.
Red Line	270 (146)	Maximum speed for all operations.
L	150 (81)	Max. speed for landing configuration L
Blue line	90 (49)	Speed of best climb Vy
Yellow Triangle	105 (57)	Approach speed at maximum weight without water ballast

2.4 Power plant

Engine manufacturer:	Solo Kleinmotoren Sindelfingen/Maichingen Germany		
Engine model:	Solo 2 625 01 2 cylinder liquid cooled two stroke engine with dual ignition		
Maximum power:	Take off:	39 kW	(53 hp)
	continuous:	39 kW	(53 hp)
Max. engine RPM:	6600 RPM		
Max. continious RPM:	6300 RPM		

Max. coolant temperature: 95°C (203°F)

Note: After engine stop and retraction the coolant temperature may exceed 95°C. This is acceptable.

Propeller:	Diameter 1.52 m (4.99 ft)
Manufacturer:	Technoflug, Schramberg, Germany
Model:	KS-1G-152-R-122-( )-B

2.5 Power plant instrument markings (on DEI-NT, DEI=digital engine indicator)

Power plant instrument markings and their significance are shown below:

Engine speed indicator:
In the centre of the DEI-NT display, indication digital with 4 digits, limitation data printed above display:

green	6300	max. continuous RPM
yellow	6300 – 6600	caution range
red	6600	max. RPM

Max. continuous RPM:
When exceeding this RPM a blinking "Hi" appears at the left hand side of the RPM.

Max. RPM:
When exceeding this RPM a full screen warning "Engine Speed" appears, when this warning has been confirmed (by pushing the selector knob at the right hand side of the display) the engine speed display is blinking whilst the engine speed is above max. RPM..

Coolant temperature indicator (CHT):
On right hand upper side of the DEI-NT display, digital indication with 3 digits, limitation data printed above display:
red 95°C
When exceeding this temperature a full screen warning "CHT overTemp" appears. When this warning has been confirmed (by pushing the selector knob at the right hand side of the display) the CHT display will keep blinking as long as the CHT is above the max. CHT.

Fuel quantity indicator:
On left hand upper side of the DEI-NT display, digital indication with 2 digits. Limitation data for the non useable amount of fuel printed above the display:
red 0.5 l
When a fuel quantity of approx. 4 Litres is reached a full screen warning "Low Fuel" appears, when this warning has been confirmed (by pushing the turning knob at the right hand side of the display) the fuel display is blinking.
When reaching the non usable amount of fuel "R" is displayed and blinking.

2.6 Fuel

Fuel capacity:
Fuselage tank:

total:	21 l	(5.55 US gal.)
Non useable amount of fuel:	0.5 l	(0.15 US gal.)
Useable amount of fuel:	20,5 l	(5.42 US gal)
Wing tank left (Option):	10 l	(2.64 US gal.)
Wing tank right (Option):	10 l	(2.64 US gal.)

Approved fuel grades:

Car super gasoline min. 95 octane (ROZ) (RON) leaded or unleaded
or: AVGAS 100 LL (only if super gasoline is not available)
or: mix 50% AVGAS 100 LL and 50% Car super gasoline unleaded min 92 ctane (ROZ) (RON)

mixed with self mixing Super quality two stroke oil - specification TSC 3 or API TC or JASO FC or higher quality. Mixing ratio 1:50.

Caution: Fuel with more than 5% Ethanol is not acceptable to be used for the DG-808C fuel system.

Note: The SOLO company recommends the following oil types: CASTROL Actevo 2T, or CASTROL Super Two Stroke.

2.7 Mass (weight)

Maximum take-off and landing mass with waterballast

Version DG-808C	Classic	Competiton
wingspan 15 m	525 kg (1157 lbs.)	540 kg (1190 lbs.)
wingspan 18 m	525 kg (1157 lb).	600 kg (1323 lbs.)

Maximum take-off and landing mass without waterballast:

Maximum take-off and landing mass = $W_{NLP} + W_{wings}$

W_{NLP} = Maximum mass of the non lifting parts (see below)

W_{wings} = actual mass of the wings

Maximum mass of the non lifting parts

Version DG-808C	Classic	Competiton
	338 kg (745 lbs.)	354 kg (780 lbs)

Maximum waterballast

Version DG-808C	Classic	Competiton
wingtanks	100 kg (220 lbs)	120 kg or 150 kg (265 lbs. or 330lbs.)
fintank	/	6,7 kg (14.8 lbs).

Caution: Ballast in the fin tank is part of the weight of the non lifting parts. The max. take-off mass must not be exceeded with this ballast.

Caution: It is recommended to dump the waterballast before landing on airfields. Always dump the ballast before an outlanding.

Maximum mass in baggage compartment: 15 kg (33 lbs)

Caution: Heavy pieces of baggage must be secured to the baggage compartment floor (screwing to the floor or with belts). The max. mass secured on one half of the floor (left and right of fuselage centre line) should not exceed 7,5kg (16.5 lbs.).

Warning: Follow the loading procedures (see section 6).

2.8 Centre of gravity

Centre of gravity range in flight is:
238mm (9.37 in.) up to 383mm (15.08 in.) behind datum.
Datum = wing leading edge at the root rib.
Horizontal reference line = aft fuselage centre line horizontal.

C.G. diagrams and loading chart see section 6.

2.9 Approved manoeuvres

This sailplane is certified for normal gliding in the "Utility" category.
Simple aerobatics are approved but only without waterballast and with engine retracted.
The following aerobatic manoeuvres are approved (see section 4.5.12):
Wingflap setting 0° for all manoevres.

Manoeuvre	recommended km/h	entry speed IAS kts.
Spins	/	/
Inside Loop	180	97
Stall Turn	180	97
Lazy Eight	180	97
Chandelle	180	97

2.10 Manoeuvring load factors

The following load factors must not be exceeded:

	Speed	positive	negative
at manoeuvring speed	V_A	+5,3	-2,65
at max. speed	V_{NE}	+4,0	-1,5
with airbrakes extended	V_{NE}	+3,5	0
Wing-flaps landing setting	V_{FE}	+4,0	0

2.11 Flight crew

max. load in the seat 110 kg (242 lbs.)
min. load in the seat see placard in cockpit and weighing report page 6.5

With these loads, the C.G. range given under 6.8 will be kept in the limits if the empty weight C.G. is in its limits (see loading chart in section 6.8).

Caution:
With lower pilot weights lead ballast must be added to the seat.
Ballast put on the seat (lead ballast cushion) must be fastened at the safety belt anchor point.
Option: Provision for removable trim-ballast see sect 7.17.1.

Note: For Australia the lower limit for the min. load in the cockpit should not exceed 66 kg (146 lbs.). A provision for removable ballast (see section 7.17.1) is mandatory.

2.12 Kinds of operation

A) **All configurations**

Flights according to VFR (daylight)
Aerotow
Winch- and auto-launching

B) **In addition when flying without waterballast and with engine retracted**

1. Cloud flying (daylight): permitted when properly instrumented (see section 2.13 b).
2. Simple aerobatics (see section 4.5.12), Category „Utility“

Note: Cloud flying is not permitted in the USA, Canada and Australia.

2.13 Minimum equipment

As minimum equipment only the instruments and equipment specified in the equipment list (see maintenance manual) are permitted.
Note: The actual equipment list is filed in the enclosures of the maintenance manual.

a) Normal operation

Airspeed indicator: Range: 0-300 km/h (0-165kts.): Speed range markings see section 2.3
Altimeter: Range: 0 – min. 6.000 m (20.000 ft.),
Altimeter with fine range pointer, 1 turn max. 1000 m (3000 ft.)
Magnetic compass (compensated in the aircraft)
Four piece symmetrical safety harness
VHF – transceiver: (ready for operation) with noise absorbing earphones (not required for Canada)
Engine speed indicator, Fuel quantity indicator, Coolant temperature indicator, Engine elapsed time indicator (counts as long as the engine is running):
These 4 indicators are incorporated in the DEI-NT. Markings and display of the limitations see section 2.5
Outside air temperature gauge: with probe in the fuselage nose, also incorporated in the DEI-NT.
Rear view mirror
Fire warning light
Parachute: automatic or manual type or a hard back cushion approximately 8 cm (3 in.) thick.
Required placards, check lists and this flight manual

b) In addition for cloud flying : (Not permitted in Canada and Australia)

Variometer
Turn and bank indicator

Note: Experience has shown that the installed airspeed indicator system may be used for cloud flying.

2.14 Aerotow, winch and autotow launching

2.14.1 Weak links in towing cables

Version Classic and Version Competition up to TOW 525kg

Aerotow, winch and autotow launching
recommended: 6000 N ± 10% (1320 lbs. ± 10%)
max.: 6600 N (1455 lbs.)

Version Competition up to TOW 600kg

Aerotow and autotow launching
recommended: 6000 N ± 10% (1320 lbs. ± 10%)
max.: 6600 N (1455 lbs.)
Winch launching
recommended: 7500 N ± 10% (1654 lbs. ± 10%)
max.: 8250 N (1820 lbs.)

2.14.2 Towing cables

For aerotow:
Length 30-70 m (100 - 230 ft), material: hemp- or plastic fibres

2.14.3 Max. towing speeds

		maximum	maximum
Aerotow	V_T =	190 km/h	103 kts.
Winch- and autotow	V_W =	150 km/h	81 kts.

2.14.4 Tow Release

The C.G. tow release (installed in front of the main wheel) is suitable for winch-, auto launching and aerotow.
Caution: If an additional front hook is installed (below the instrument console) it is to be used only for aerotow.
Warning: Winch launching is not permitted at the front hook even in the case that no C.G. hook is installed.
Note: The front hook is mandatory for Australia.

2.15 Crosswinds

The demonstrated crosswind velocity is 15 km/h (8 kts.) according to the airworthiness requirements.

2.16 Tyre Pressure

Main wheel	3 bar	(44 psi)
Tail wheel	2,0 bar	(29 psi)

2.17 Waterballast

2.17.1 Wing ballast

Warning: Filling the water ballast is only allowed with a filling system which enables determination of the exact amount of ballast filled, e.g. water gauge or calibrated canisters. Only symmetrical loading is allowed.
After filling, balance the wings by dumping enough water from the heavy wing.
Flight with leaking watertanks is prohibited, as this may result in asymmetrical loading conditions.
Warning: Follow the loading chart (see section 6.8).
Don't try to fill more water into the tanks than the specified values.
The max. take-off weight must not be exceeded.

2.17.2 Fin tank

Warning: As it is dangerous to fly with empty wing tanks while ballast is remaining in the fin tank, **it is prohibited to fill water into the fin tank if there is any risk of icing**. The flight conditions must comply with the following table:
Warning: Follow the loading chart (see section 6.8).
Don't try to fill more water into the tanks than the specified values.
The max. take-off weight must not be exceeded.

min. ground temperature	°C	13,5	17	24	31	38
	°F	56	63	75	88	100
max. flight altitude	m	1500	2000	3000	4000	5000
	ft	5000	6500	10000	13000	16500

In addition the outside air temperature OAT gauge is to be monitored. The OAT should not be lower than 2°C (36°F)!

2.18 Wing fuel tanks (Option)

Max. capacity 10 l (2.64 U.S. gal.) per wing.
Don't park the rigged glider with filled wing fuel tanks for extended periods!

2.19 Limitations placards Version DG-808C Classic

DG Flugzeugbau GmbH

type: DG 808C Classic serial no: 8-
year of construction:

Maximum airspeeds	km/h	kts.
Winch launch	150	81
Aero-tow	190	103
Manoeuvering V_A	190	103
Rough air	190	103
Max. flap extended speed +8° +5°	190	103
Landing gear operating	190	103
Maximum speed V_{NE}	270	146
Max. flap extended speed L	150	81
Powerplant extended	190	103
Powerplant extension-retraction	100	54

Approved aerobatic manoeuvres (only without waterballast and with engine retracted)
pos. Loop, Stall Turn, Lazy Eight, Chandelle, Spin

Maximum mass:
525 kg (1157 lb.)

Loading chart
Cockpit load (parachute included)

maximum	110 kg	242 lbs
minimum	kg	lbs

With lower pilot weight necessary ballast must be added

Other cockpit placards see section 7

Gepäck max. 15 kg
baggage max. 33 lbs.

Preflight inspection
1. Lead ballast (for under weight pilot)?
2. Parachute worn properly ?
3. Safety harness buckled ?
4. Seat back and pedals adjusted ?
5. All controls and knobs in reach ?
6. Altimeter ?
7. Dive brakes cycled and locked ?
8. Wing flaps in take off position ?
9. Positive control check ? (One person at the control surfaces).
10. Trim ?
11. Canopy locked ?

Additional checks before self launching
12. Fuel level ?
13. Fuel Cock open?
14. Canopy open – propeller clear ?
15. After starting the engine – close canopy.
16. Check engine RPM.
17. Check both ignition circuits.

Sollbruchstelle max. 6600 N
rated load max. 1455 lbs.

Reifendruck 3 bar
Tyre pressure 44 psi

main wheel

Reifendruck 2 bar
Tyre pressure 29 psi

tail wheel

Altitude in [m]	0-3000	4000	5000	6000	7000	8000
V_{NE} IAS km/h	270	256	243	230	217	205
Altitude in [ft]	0-10000	13000	16000	20000	23000	26000
V_{NE} IAS kts.	146	138	131	124	117	111

2.20 Limitations placards Version DG-808CCompetition

DG Flugzeugbau GmbH

type: DG 808C Competition serial no: 8-
year of construction:

Maximum airspeeds	km/h	kts.
Winch launch	150	81
Aero-tow	190	103
Manoeuvering V_A	190	103
Rough air	190	103
Max. flap extended speed +8° +5°	190	103
Landing gear operating	190	103
Maximum speed V_{NE}	270	146
Max. flap extended speed L	150	81
Powerplant extended	190	103
Powerplant extension-retraction	100	54

Approved aerobatic manoeuvres (only without waterballast and with engine retracted)
pos. Loop, Stall Turn, Lazy Eight, Chandelle, Spin

Maximum mass:
18m wingspan 600 kg (1223 lb.)
15m wingspan 540 kg (1190 lb.)

Loading chart
Cockpit load (parachute included)

maximum	110 kg	242 lbs
minimum	kg	lbs

With lower pilot weight necessary ballast must be added

Other cockpit placards see section 7

Gepäck max. 15 kg
baggage max. 33 lbs.

Preflight inspection
1. Lead ballast (for under weight pilot)?
2. Fin ballast tank emptied or correct amount filled in?
3. Parachute worn properly ?
4. Safety harness buckled ?
5. Seat back and pedals adjusted ?
6. All controls and knobs in reach ?
7. Altimeter ?
8. Dive brakes cycled and locked ?
9. Wing flaps in take off position ?
10. Positive control check ? (One person at the control surfaces).
11. Trim ?
12. Canopy locked ?

Additional checks before self launching
13. Fuel level ?
14. Fuel Cock open?
15. Canopy open – propeller clear ?
16. After starting the engine – close canopy.
17. Check engine RPM.
18. Check both ignition circuits.

Sollbruchstelle max. 8250 N
rated load max. 1820 lbs.

Reifendruck 3 bar
Tyre pressure 44 psi

main wheel

Reifendruck 2 bar
Tyre pressure 29 psi

tail wheel

limits for use of the fin or fuselage waterballast tanks

minimum	°C	13.5	17	24	31	38
ground temperature	°F	56	63	75	88	100
maximum flight	m	1500	2000	3000	4000	5000
altitude above GND	ft.	5000	6500	10000	13000	16500

Altitude in [m]	0-3000	4000	5000	6000	7000	8000
V_{NE} IAS km/h	270	256	243	230	217	205
Altitude in [ft]	0-10000	13000	16000	20000	23000	26000
V_{NE} IAS kts.	146	138	131	124	117	111

2.21 Other limitations

2.21.1 Approach and landing

Landing with the engine extended and running is prohibited, except in an emergency.

Always land in the gliding configuration, engine retracted.

3 Emergency procedures

3.1 Introduction

Section 3 provides amplified procedures for coping with emergencies that may occur. Emergency situations can be minimized by proper pre-flight inspections and maintenance.
Caution: Canopy jettison and bailing out should be practised several times on the ground before flying the aircraft.

3.2 Canopy jettison

To bail out open the red canopy emergency release handle. The white canopy opening handle will be opened automatically. A hook at the rear canopy lock will be rotated underneath the fuselage part of the canopy frame. Because of the hook the canopy will rotate about this point to leave the fuselage in a fast and safe way. The canopy will be opened by a spring and blown away by the oncoming air. If necessary, you have to push the canopy upwards with both hands on the Plexiglas.

3.3 Bailing out

First jettison the canopy, then unlock the safety harness and bail out. The low walls of the cockpit allow for a quick push-off exit.

Warning: If bailing out with the engine running it is necessary to switch off the ignition and retract the engine with the manual switch even with the propeller still turning. The propeller will be stopped by the engine doors.
Don't try to stop the propeller vertical and to retract the engine using the normal method.

3.4 Stall recovery

By easing the stick forward and picking up a dropping wing with sufficient opposite rudder the glider can be recovered from the stall.
To recognize and prevent the stall, please refer to section 4.5.4.

3.5 Spin Recovery

Apply full opposite rudder against direction of the spin.
Then ease stick forward until the rotation ceases, at aft C.G. positions at which the glider spins with the nose up, it is necessary to apply full stick forward.
Centralise the controls and carefully pull out of the dive.
The ailerons should be kept neutral during recovery.

Caution: To prevent unintentional spinning do not stall the sailplane. Fly with enough speed reserve especially in gusty conditions and in the landing pattern. Intentional spins with waterballast are not permitted.

Height loss during recovery	without waterballast	with full waterballast
up to	m 150	m 220
up to	ft 500	ft 720
max. speed during recovery	km/h 190	
	kts. 103	

3.6 Spiral dive recovery

Apply rudder and aileron in opposite direction and carefully pull out of the dive. Spiral dive occurs only when spinning more than 2 turns with medium C.G. positions (see section 4.5.12).
To prevent spiral dives intentional spinning should only be executed at aft C.G. positions.
Recovery from unintentional spinning should be done immediately.

3.7 Recovery from unintentional cloud flying

Spins are not to be used to reduce altitude. In an emergency pull out the dive brakes fully before exceeding a speed of 200 km/h and fly with max. 200 km/h (108 kts.) until leaving the cloud.
At higher speeds up to V_{NE} pull out the dive brakes very carefully because of high aerodynamic and g-loads.

3.8 Engine failure

3.8.1 Power loss during take off

Push the control stick forwards immediately, watch the airspeed indicator!

Sufficient runway
- land normally straight ahead with engine extended
- flaps L
- airbrakes as desired

Insufficient runway
- decision based on position, terrain and height
- close fuel cock, switch off ignition and main switch
- engine extended reduces L/D to 15!

3.8.2 Power loss during flight

Push the control stick forward immediately, watch the airspeed indicator!
Check:
- fuel cock position?
- fuel quantity?

If no change, retract the engine or land with extended engine.

3.9 Fires

3.9.1 In engine on the ground

- close fuel cock and switch off ignition if the engine is still running
- keep engine extended
- switch off main switch (switch 25)
- use extinguisher, cloth or suitable external means

3.9.2 In engine in flight

- close fuel cock
- open throttle fully if engine is still running until engine stops
- if possible retract the engine to quench the fire
- land as soon as possible
- extinguish fire

3.9.3 In the fuselage

3.9.3.1 Front fuselage (electrical fire)

- switch off main switch (switch 25)
- close ventilation, open and side window
- land as soon as possible if the fire is not extinguished (circuits are effectively protected by circuit breakers)

3.9.3.2 Rear fuselage (engine)

- the red fire warning light will indicate a fire (temperature above 140°C, 284°F)
- close fuel cock
- open throttle fully if engine is still running until the engine stops
- if possible retract the engine to smother the fire
- if smoke prevents flying open ventilation
- land as soon as possible
- extinguish fire

3.10 Defective exhaust system

With a defective exhaust system inside the engine bay partial overheating of the engine bay walls is likely. First the fire resistant paint will swell and protect the structure for a few minutes. With longer operation the structure will be damaged. Therefore the engine has to be shut down as soon as possible, if an exhaust malfunction is suspected.
Malfunction in flight can be detected by a sudden change of engine sound. The engine will produce more noise with higher frequencies. This may happen for example after extension and starting of the engine in the rare case that the exhaust manifold and the muffler don't couple, e.g. if the cable which lifts the muffler is torn.
If such defect occurs in flight, climb only up to safety altitude, stop and retract the engine.

3.11 Loss of electrical power in flight

3.11.1 With the engine retracted:
Continue flying as a sailplane.

3.11.2 With the engine extended not running:
Look for a landing field to do a safe outlanding.

3.11.3 With the engine extended and running:
Don't stop the engine. Fly to the next airfield and land.
The fuel pump and the coolant pump will receive electric power directly from the generator to allow engine operation without battery power.
Avoid longer sinking flights with the engine idling as lubrication of the engine will be insufficient.
Therefore stop the engine for the landing or apply some throttle at least every 60 seconds to supply oil to the engine.
Landing with the engine extended see section 3.14.

3.12 Starting the engine with the starter not working:

In flight: Extend the engine by switching on the ignition, when engine is extended increase speed as quickly as possible to approx 175 km/h (95 kts.) until the engine starts. Then flare out with max. 2 g. From the beginning of the dive to the lowest point of the procedure you need appr.150 m (500 ft).
Therefore you should not start this procedure below 400 m (1320 ft) above ground.
Otherwise a safe outlanding is preferable.
On the ground: Handstarting the engine is not possible as you can't reach the necessary starting RPM. You may carry out an aerotow and start the engine (see above).
Warning*:* Jump-starting the engine directly at the starter motor is prohibited, this procedure may destroy the control unit.

3.13 Retraction or extension of the power plant with the normal mechanism not working

Extend or retract the power plant via the manual switch on the instrument panel.
This procedure is only to be followed in an emergency as all safety devices (e.g. against retraction of the engine while running) are by-passed.

3.14 Landing with the engine extended and stopped

Wing flap setting 8° or L
Landing with the engine extended and stopped is not a potential risk. However due to the high drag from the extended engine, the approach should be made not using airbrakes fully extended.
Fully extended airbrakes may result in a heavy and uncomfortable landing.
It is recommended to approach somewhat faster than usual.

3.15 Flight with asymmetric waterballast

If you suspect that the waterballast does not dump symmetrically you have to close the dump valves of the wingtanks immediately, to avoid greater asymmetry.
Asymmetry can be verified by the necessary aileron deflection in straight flight at low airspeeds.
When flying with asymmetric waterballast you have to increase the airspeed, especially in turns, so that you can avoid a stall at all costs.
Fly the landing pattern and touch down approx. 10 km/h (6 kts.) faster than usual and after touch down control carefully the bank angle to avoid the wing touching the ground too early.

3.16 Defective fin ballast control

If suddenly the operating force of the fin ballast control handle is uncommonly low (you don’t feel the force of the retaining spring) you must suspect that the valve will not be opened. In this case it is prohibited to dump the wing ballast to avoid an inadmissible aft C.G. position.
You must perform the landing with full ballast, try to avoid an outlanding.

3.17 Emergency wheel up landing

It is not recommended to execute a wheel up emergency landing, as the energy absorption capability of the fuselage is much smaller than that of the landing gear.
If the landing gear can't be extended touch down with small angle of attack.

3.18 Emergency ground loop

If there is the risk of overshooting the landing strip you have to decide at least 40 m (130 ft) before the end of the field to execute a controlled ground loop:

- If possible turn into the wind!
- At the same time try to lift the tail by pushing the stick forward.

3.19 Emergency landing on water

From the experience with emergency water landing we know that it is likely that the sailplane will dive into the water, cockpit first.
Therefore an emergency landing on water should be the last choice.
In the case of a water landing, however, extend the landing gear.

Recommended procedures :
On downwind leg of the landing pattern: Extend the landing gear, unlock the parachute harness (not the seat harness)
Touch down: With landing gear extended and airspeed as low as possible.
At point of touch-down: Use your left arm to protect your face against possible canopy fracture.
After touch down: Unfasten seat belt harnesses and undo parachute.
Leaving the cockpit under water: If the canopy has not fractured, opening the canopy may be possible only after the forward fuselage is almost completely filled with water.

4 Normal procedures

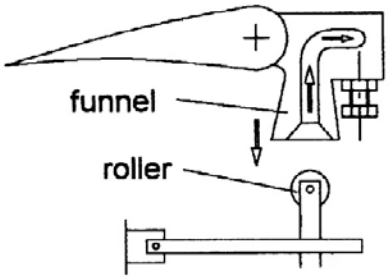
4.1 Introduction

This section provides checklists and amplification procedures for the conduct of normal operation. Normal procedures associated with optional systems can be found in section 9.

4.2 Rigging and derigging, filling the watertanks, refuelling

4.2.1 Rigging

1. Open the canopy.
2. Clean and lube the pins, bushings and the control connections.
3. Set the airbrake handle to the forward stop and control stick and wingflap handle to neutral.
   With a helper on the wingtip, push the right wing into place, then the left wing. All controls will hook up automatically. The flaperons should be held at neutral for rigging, airbrakes locked.
   Sight through the wing main pin bushings to determine alignment. Push the main pins in as far as possible. Turn the handles up to the fuselage wall, while pulling out the white securing knob, then release the knob back to its locked position.
4. Rigging of the stabilizer
   Set the trim **nose down.** Set the stabilizer on top of the vertical fin, so that the roller at the fuselage side push rod is inserted into the funnel at the elevator.
   Watch the procedure carefully.
   When the stabilizer is set down and laying on the fin, push it aft. The roller will slide forward in the funnel if you hold the elevator in the pertinent position.



   With a 13 mm wrench (supplied with your glider) tighten the front mounting bolt firmly (the brass securing sleeve will be pushed down by the wrench). Then rotate the bolt head a little back and forth so that the securing sleeve engages.
   The securing sleeve should move up so far that its upper surface is level with the upper surface of the bolt head.
   Check for correct elevator connection by looking through the Plexiglas window at the upper surface of the stabilizer.
5. Tape the gaps of the wing-fuselage junctions and the wing joints.
6. Execute a positive control check, one helper is needed to hold firmly the control surfaces.

4.2.2 Filling the water ballast tanks

Warning: Filling the water ballast is only allowed with a filling system which enables determination of the exact amount of ballast poured in, e.g. water gauge or calibrated canisters. Fill with clean water. Only symmetrical loading is allowed.
After filling, balance the wings by dumping enough water from the heavy wing,.
Flight with leaking watertanks is prohibited, as this may result in asymmetrical loading condition or the rear C.G. may be exceeded.
Warning: Follow the loading chart (see section 6.8).
Don't try to fill more water into the tanks than the specified values.
The max. take-off weight must not be exceeded.
Warning: Fill the hose from your water containers but never from a main pressure water supply. Filling the wing tanks with excessive pressure (more than 0.2 bar, 3 psi) will definitely burst the wing shell!
The same applies for the fin tank.

Filling the wing tanks

First open the fin tank and then open the right wing tank valve (top handle).
Place the right wing tip on the ground. Insert the hose into the water outlet on the lower surface of the wing. Fill with water. Close the valve.
Place the left wing tip on the ground and fill the left tank accordingly.
After filling the tanks, check to see if the wings are balanced. If one wing is heavier, dump enough water to balance the wings.
Finally press the Teflon-glass-fabric which shall close the dump holes against the wing-shell. There must always be a small amount of grease on the shell, to ensure that the covers stick to the shell.
Caution: If the tanks are to be filled up completely you must suck the air out of the tanks with the filling hose, as the tanks have no ventilation line.
In case a valve leaks slightly, you may try to pull out the PVC pushrod of the valve to stop the leak. If this cannot be done successfully refer to maintenance manual 1.8.1. and 4.1.

Filling the fin ballast tank

This tank must be filled after filling the wingtanks. Determine the amount (see section 6.8.5). Connect the transparent funnel equipped filling hose (supplied with the aircraft) via the hose connector to the hose which comes out of the left rear end of the fuselage.
The funnel can be suspended from the top of the rudder.

Fill with clean water using a graduated measuring vessel.
In addition you may check the content level by holding the filling hose against the scale on the fin.
After filling, push the fin tank dump handle in forward direction (the dump valve will be closed by a spring).
Then remove the filling hose with the hose connector.

4.2.3 Refuelling

4.2.3.1 General:

Preferably fuel is transferred from a can where the correct amount of oil is added and mixed prior to filling /see section 4.2.3.3a)). Refuelling is also possible via the tank filler opening on the fuselage exterior surface (see section 4.2.3.3b)).

4.2.3.2 Oil:

Use only super two stroke oil according to section 2.6.

4.2.3.3 Refuelling procedure

a) Refuelling via a permanently installed refuelling pump

Couple the fuel filler hose via a coupling to the fuselage side filler hose and switch on the main switch of the aircraft.
Start the pump by pressing the push button located in the fuselage main-bulkhead (behind the pilots left shoulder). As soon as the fuselage tank is full a built in device automatically switches off the pump. If you want to interrupt or to stop the filling procedure before the tank is full press the push button again. Starting the pumping again is only possible by pressing the push button again. This procedure will prevent the pump from running inadvertently.

Caution: If when pressing the push button the re-fuelling pump doesn't start running and the DEI fuel level indication changes immediately to 21 L, the tank full sensor is defective. In such a case refuel via the tank filler opening up to the sensor. Otherwise the fuel level gauge will display a higher fuel level than correct. Exchange the sensor as soon as possible.

b) Refuelling via the tank filler opening (on the fuselage exterior surface)

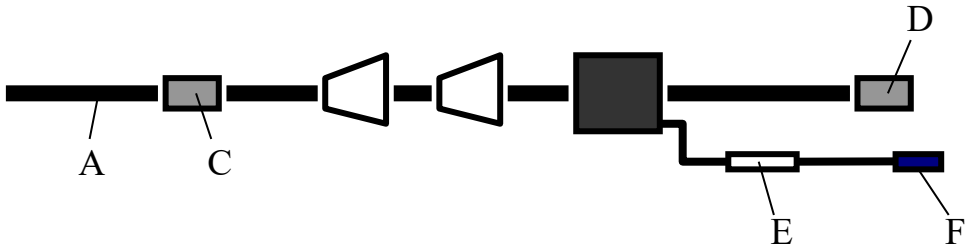
If you can't fill with premixed fuel, half fill the tank with fuel, then add the proper amount of oil and fill up completely.

Calibration: A sensor located at the lower end of the filler tube automatically cuts off the electric power for the pump system, as soon as the fuselage tank is filled and executes a calibration of the fuel gauge. The calibration will be confirmed by the DEI-NT by a beep with approx. 1 second duration.
If you don't use the pump (see a) for filling, the calibration may be done manually: Fill the tank so that the sensor (see above) is covered with fuel. Press the push button see a) (the refuelling pump will not start, as the tank is full).

The calibration will be confirmed by the DEI-NT by a beep with approx. 1 second duration.
At least each time you change the fuel type or quality you have to fill the tank completely to do a calibration to ensure a correct fuel quantity indication.

4.2.3.4 Wing fuel tanks (Option)

Filling can only be done by using the separate electric pump system Z 02/2.



Insert plug F into the 12V socket.
Close the wing tank valves in the fuselage. Attach the quick connector C of the pump system to the wing fuel tank, plug the hose A into the quick connector D and the other end into a canister. Switch on the pump for min. 1 minute to remove air and any remains of fuel from the tank.
Remove the quick connector C from the wing tank and plug hose A into quick connector C.
Place the wing tip of the tank to be filled on the ground.
Connect the quick connector D to the wing tank and fill the wing tank. Fill in max. 10l (2.64 US gal).
After filling the wing tank connect the fuselage connector to the wing connector.

Caution: Empty the wing fuel tanks prior to derigging.
Don't park the rigged glider with filled wing fuel tanks for extended periods!
Warning: Overfilling the tanks will damage the wing-shell due to the pressure of the refuelling pump.

4.2.3.5 Storage of the pump system (see 4.2.3.4)

To increase the lifetime of the pump it is better not to empty the pump, but to store the pump filled with fuel. Therefore remove hose A by disengaging the coupling . The couplings C + D are closing the fuel lines to the pump when disengaged.

4.2.3.6 Refuelling without a can

In case there is no can available for premixing the fuel and oil for filling the wing tanks, the fuselage tank can be used. Transfer approx. 5 litres (1.3 US gal.) of fuel into the fuselage tank, pour in the oil and fill the tank with fuel. Then fill the wing tanks (option) from the fuselage tank with the electric pump system Z02/2

4.2.4 Derigging

Derigging follows the reverse of rigging.
Waterballast must be dumped first.
Transfer the fuel from the wing tanks (Option) to the fuselage tank or empty the wing tanks using the electric pump system in reverse. Disconnect the connectors from the wing fuel tanks.
Lock the airbrakes.

4.2.5 Rigging and derigging the wing tip extensions (Option)

1. Insert the wing tip extensions into the wing.
   Press in the locking pin with your finger.
   Insert the wing tip until the flaperon connector starts to slide into the flaperon slot.
   Strike firmly with the palm of your hand on to the wing tip to lock in the wing tip extension.
2. Disassembling of the wing tip
   Use a 6 mm diameter pin (e.g. tool W36) for pressing in the locking pin on the wing's upper surface.
3. The rigging of the 15 m wingtips with winglets (Option) has to be done in the same manner as the wing tip extensions.

4.2.6 Rigging and derigging the 18 m winglets (Option)

To assemble the winglets pull off the wingtips and slot in the winglets. The winglets are secured to the wings by means of a quarter turn fastener. With a screw driver turn the fastener a 1/4 turn in clockwise direction until it engages.
Removal is the opposite of that described above.
To fly with wingtips instead of winglets, secure the wingtips to the wings by taping the gap.

4.3 Daily Inspection

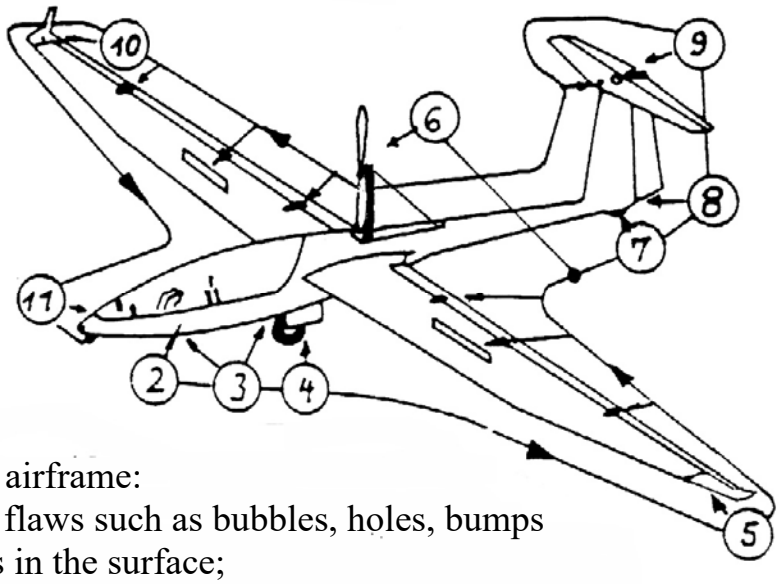
Please bear in mind the importance of the inspection after rigging the glider and respectively each day prior to the first take off. It is for your safety.

Caution: After a heavy landing or if your sailplane has been subjected to other high loads you must execute a complete inspection referring to maintenance manual section 2.3 prior to the next take off.
If you detect any damage, don't operate your aircraft before the damage is repaired. If the maintenance and repair manuals don't give adequate information, please contact the manufacturer.

A Inspection prior to rigging:

1. Wing roots and spar ends:-
   a) Check for cracks, delamination etc.;
   b) Check the bushes and their glued connections in root ribs and the spar ends for wear;
   c) Check the control hook-ups at the rootrib for wear and corrosion;
   d) Check the strings which hold the waterbags for sufficient tension (see maintenance manual section 4.1)
   e) Check the connections for the wing fuel tanks (Option)
   f) Check the watertank compartment for water leaks.
2. Fuselage at wing connection:-
   a) Check the lift pins for wear and corrosion;
   b) Check the control hook-ups including the water dump system for wear and corrosion.
3. Top of the vertical fin:-
   Check the mounting points of the horizontal tailplane and the elevator control hook-up for wear and corrosion
4. Horizontal tailplane:-
   Check the mounting points and the elevator control hook-up for wear and corrosion;
5. Rigging points for the outboard wing panels:-
   a) Check the bushes and their glued connections at the inner wing panels for wear and corrosion
   b) Check the lift pins and their glued connections at the insertable wing tips for wear and corrosion, and check the securing bolt for sufficient spring force.

B Inspection after rigging - Walk around the aircraft



1. All parts of the airframe:
   a) Check for flaws such as bubbles, holes, bumps and cracks in the surface;
   b) Check leading and trailing edges of the wings and control surfaces for cracks;
2. Cockpit area:-
   a) Check the canopy locking mechanism;
   b) Check the canopy emergency release for proper locking. Check the function of the canopy emergency release according to section 7.16 (not each day, but min. every 3 months);
   c) Check the main pin securing;
   d) Check all controls for wear and function, incl. positive control check. Check if the handle of the pedal adjustment cable will be pulled to the front so that it can't hook into the trim release lever at the control stick, even with pedals in a rear position;
   e) Check the tow release system for wear and function incl. cable release check;
   f) Check for foreign objects;
   g) Check the instrumentation for wear and function;
   h) Switch on the main switch, the fire warning light must flash once (self-test-function), check the engine controls;
   i) Check all fuses including the battery fuse;
   j) Check the extension-retraction mechanism by operating it in both directions. The extension time should not exceed 13 seconds!
   k) Check the fuel filter for dirt or sludge, the filter is located in the baggage compartment;
   l) Check the fuel level;
   m) Extend the engine halfway;
   n) **Option disc brake:** Check the brake fluid level (the reservoir is located in the rear left hand side of the baggage compartment;

3. C.G. Tow hook:-
   a) Check the ring muzzle of the C.G. hook for wear and function;
   b) Check both tow hooks (if installed) for cleanliness and corrosion;
4. Main landing gear:-
   a) Check the struts, the gear box, the gear doors and the tyre for wear; dirt in the struts can hinder the landing gear from locking over centre the next time!;
   b) Check the tyre pressure: main wheel: 3 bar (44 psi);
   c) Check wheel brake and cable for wear and function;
      Option disc brake: Check the condition of the wheel brake assy. and the brake hose.;
5. Left wing:-
   a) Check locking of the wing tip (option)
   b) Check the flaperon hinges for excessive free play;
   c) check flaperon drives for ecessive free play;
   d) Check airbrake and box and control rod for wear and free play. It must be possible to retract the airbrake, even if it is pressed backwards in direction of flight. If there is any water in the airbrake box this has to be removed;
6. Power plant checks:-
   Extend the powerplant via the manual switch (ignition off).
   a) check the connection of spindle drive and gas strut to engine and fuselage. To accomplish this extend the engine only so far, that you still can see the connection to the engine mount. Check especially for cracks in the spindle drive fork.
   b) **Option BBSA slipping-centrifugal clutch:** Check the propeller-stopper for wear and function, check especially the actuating spring.
   c) extend the powerplant completely;
   d) check all screwed connections and their securing;
   e) check function of throttle, and propeller brake;
   f) check ignition system incl. wires and the spark plug connectors for tight fit;
   g) check toothed belt for wear and correct tension, sudden loss of tension indicates damage of the engine assembly;
   h) check engine retaining cable and its connections in the engine compartment and at the engine;
   i) check fuel lines, electrical wires, bowden cables and structural parts for wear and kinks;
   j) check exhaust muffler, propeller mount, radiator, water pump and accessories for tight fit and any cracking. Check especially the cable which lifts the muffler during engine extension.
      To check the water pump, switch on the ignition.
      You should hear a buzz.
   k) apply strong pressure to the propellermount in forward, backward and sideward directions to check if the bolted connection between the engine block and the propeller mount or any thing else is loose or damaged. Check the rubber engine mounts too.

l) visual check of the propeller;
m) turn the propeller 1 revolution by hand and listen for abnormal sounds which may indicate engine damage;
n) drain condensed water from the fuel tank. The drainer is located in the main wheel box on the rear wall on the right hand side;
o) check the outlet of the fuel tank ventline for cleanliness, the outlet is located directly behind the landing gear box;
p) check the coolant level in the radiator by removing the radiator screw cap. Press down on cap for easier handling. The radiator must be filled up to approx. 25mm (1 in.) below its top;
q) Check the coolant hoses visually for leaks and any defects of the outer surface.

7. Tail wheel:-
   a) Check for wear, free play and excessive dirt in the wheel box. Remove excessive dirt prior to take off;
   b) Check tyre pressure: 2 bar -29 psi;
8. Rear end of the fuselage:-
   a) Check the lower rudder hinge and the connection of the rudder cables for wear, free play and correct securing;
   b) Check the bulkhead and fin trailing edge shear web for cracks and delamination;
   c) Only version Classic: Check the fin tank for correct amount of water filled in (see section 6.8.5. In case of doubt dump the fin tank.
9. Fin - horizontal tail:-
   a) Check the upper rudder hinge for wear and free play;
   b) Check the elevator for free play and correct control hook up, look through the Plexiglas window;
   c) Check the securing of the front mounting bolt;
   d) Check the horizontal tail for free play;
   e) Check the TE or Multiprobe for correct insertion and fix it with tape.
10. Right wing see item 5.
11. Fuselage nose:-
   a) Check the ports for the static pressure and the pitot pressure for cleanliness.
   b) If the sailplane was parked in rain, you have to empty the static ports by sucking out the water at the ports.

4.4 Pre-flight inspection

1. Lead ballast (for under weight pilot)?

2. Fin ballast tank emptied or correct amount filled in?
   (only with Version DG-808C Competition)

3. Parachute worn properly?

4. Safety harness buckled?

5. Seat back and pedals adjusted?

6. All controls and knobs in reach?

7. Altimeter?

8. Dive brakes cycled and locked?

9. Wing flaps in initial take-off position?

10. Positive control check? (One person at the control surfaces).

11. Trim?

12. Canopy locked?

Additional checks before self-launching

13. Fuel level?

14. Fuel cock open?

15. Canopy open - propeller clear?

16. After starting the engine - close canopy.

17. Check engine RPM

18. Check both ignition circuits.

4.5 Normal procedures and recommended speeds

4.5.1 Engine starting, taxiing procedures

4.5.1.1 Engine starting on the ground

a) Check if the fuel cock is open.
b) Master switch on.
c) Extend the powerplant:
there are two methods:
1. Extension via the manual switch which is located on the instrument panel. Hold the manual switch up until the extension procedure stops. The powerplant will be raised to its operating position. If you release the switch during the procedure the switch jumps back to the centre position and the extension stops.

Warning: When extending the engine via the ignition switch the starter motor may start cranking the engine in case the starter switch got stuck. Caution at the propeller.

2. Switch on the ignition switch in the DEI-NT(the toggle has to be pulled out for switching). The engine will be raised to it´s operating position automatically. Switch off the ignition, press the manual switch up to switch off the automatic system, otherwise the engine will be retracted automatically.

d) Turn the propeller min. 1 rotation by hand.
e) Switch on the ignition in the DEI-NT, the engine will be extended automatically to its operating position, unless it's already in this position. Listen if you can hear the electric fuel pump. If you don't hear the pump, it may be defective and you shouldn't try to start the engine.

Note: From the sound of the pump it can be determined if there is fuel in the pump or not.
Loud clicking: no fuel, soft clicking: pump filled with fuel.
If you suspect that there is no fuel in the pump, you should press the starter button no sooner than 30 seconds after the pump is filled, to ensure that there is enough fuel at the carburettor for starting the engine.

f) Check if the primer switch is in the automatic position.
g) Throttle in idle position.
h) Check that the propeller is clear.
i) Push the starter button until the engine runs.

Note: With a cold engine a syringe symbol must be shown on the centre display of the DEI-NT. As long as the symbol is shown, the primer injects fuel into the carburettor.

j) As soon as the engine fires move the throttle slowly forward until the engine runs smoothly. If the engine will not accelerate when increasing throttle you may press the starter button again to activate the primer again. The syringe symbol will be displayed again.

k) Adjust the engine RPM to approx. 3000 and check the ignition circuits (magnetos), but not before the engine runs smoothly. A max. drop of 300 RPM is permissible.

n) Check full engine RPM (wheel brake locked on, a helper should lift the fuselage nose), min. 5800 RPM.

o) To check the functioning of the second fuel pump press the **fuel pump test** button at full engine power for a minimum of 5 seconds to switch off the first pump. No RPM drop is allowed.

Warning: If after engine start the message "Starter Run" is displayed on the DEI-NT the starter motor didn't disengage and produces electric power, stop the engine immediately to prevent damage of the electrical system.

4.5.1.2 Starting problems

The engine is equipped with electric fuel injection (primer) instead of a choke valve. The automatic control of the primer enables engine starting with little risk of misoperation.

To check the correct functions of the primer the DEI-NT displays a syringe symbol as long as fuel is injected (primer valve open). With a cold engine fuel will also be injected after releasing the starter button. The duration of the injection is dependent on the coolant temperature. With coolant temperatures above 40°C (104°F) no fuel will be injected during engine start.

a) If you suspect that the engine is flooded, e.g. CHT just below 40°C (104°F) and primer working, you should switch off the primer and try to start the engine with full throttle. If the engine starts, wait until 3000 RPM are reached, then reduce throttle to keep approx. 3000 RPM.
If the engine is flooded excessively you may close in addition the fuel cock. As soon as the engine starts open the fuel cock again.

b) If with normal OAT (+5° C (41°F) up to +40°C (104°F)) the cold engine does not fire this may be a hint that the fuel filter is dirty and so the amount of fuel injected is reduced.
The filter has to be cleaned or replaced before take off.
Take-off with dirty fuel filter may result in RPM loss during take off!

c) Approx. ¼ hour after retraction of the hot engine vapour bubbles may start forming in the carburettor which makes engine start difficult. In most cases the engine will start but refuse to accept throttle and may stop again.
To avoid the engine stopping press the starter button again, if necessary several times. Each time you press the starter button the primer valve opens and injects some additional fuel to keep the engine running.

4.5.1.3 Taxiing

Taxiing without assistance can be done with the steerable tail wheel and one wingtip on the the ground.
Flapsetting 0°.
Avoid longer taxiing if possible to be kind to the airframe and to the powerplant.
Operate the airbrake handle (connected to wheel brake) with the left hand and the throttle with the right hand. Place trim fully noseup to get pressure on the tail wheel.
You can reduce the radius of turn by operating the wheel brake and applying more throttle so the rudder will help to turn the aircraft.

Caution: For taxiing always use engine speed such that the engine runs smoothly. This prevents vibration damage at the engine mount.
On concrete it may be necessary to apply a little wheel brake to reduce taxi speed.

4.5.2 Self launching, take-off and climb

4.5.2.1 Take-off distance

Prior to take-off check according to section 5.2.3 if the available runway length is sufficient.

It must be appreciated that a rising runway, wet or uneven surface, long grass, cross wind etc. will increase the take-off distance considerably.

Selflaunching should only be undertaken if in case of power loss or engine failure there are possibilities to clear obstacles or for a safe out-landing.
In case of doubt choose a safe tow launch.

4.5.2.2 Start roll and take off

Wing flaps + 8°, trim fully tail down.
The take-off roll may be executed with one wing on the ground.
With a crosswind if there is no wing runner the lee-wind wing should be on the ground. The drag of the wingtip wheel partly compensates the moment of the wind on the vertical tail. This technique reduces the tendency to turn the glider into the wind.
Gently apply full throttle, as soon as the aircraft rolls lift the wing by applying aileron.
Pull back stick during start roll until you have full control authority.
Then roll on the mainwheel until you reach take-off speed.

4.5.2.3 Climb

After take-off accelerate the DG-808C to Vy = 90 km/h (49 kts) and climb with this speed.
Retract the landing gear after reaching safety altitude.
Execute the whole climb with full throttle to ensure a smooth engine run.

4.5.3 Tow launch

Due to the towhook position being in the middle of the fuselage and the excellent effectiveness of the ailerons and rudder, the possibility of wing dropping or ground loops, even on a slowly accelerating aerotow is reduced. Take-off with strong crosswind is possible.

4.5.3.1 Aerotow

If only a C.G. release is installed, then the aerotow is to be executed with this release. Set trim to full nose down for aerotow.

Caution: If an additional tow release for aerotow is installed, only this release should be used for aerotow. Adjust the trim for aerotow to fully nose down position.

General: Set the wing flaps to +8°.
Hold the stick in the forward position.
Don't try to lift off before you reach an airspeed of 80 km/h (43 kts.) (without ballast).
On a rough airfield hold the control stick tight. The undercarriage can be retracted at safety height during the tow.

Note: With high take-off weight (more than 500kg, 1100lbs) it is recommended to set the wing flap lever to 0° for the initial take-off roll. As soon as adequate aileron control is achieved, move the flap lever to the +8° setting.

Normal towing speed is 120-130 km/h (65-70 kts.).
For a cross country tow the speed can be as high as 190 km/h (103 kts.), the flaps should be at a negative setting. (see section 4.5.2).

Warning: Aerotow with high take-off weight requires a powerful tow plane. Many tow planes are not certified to tow gliders with high take-off weights. Reduce the take-off weight if necessary!

4.5.3.2 Winch launch

Winch launch is only allowed using the C.G. tow hook!
Set the wing flaps to +8°.
Set the trim nose down for a winch launch. Use the normal winch launch procedure.
After reaching 60 m (200 ft) gradually pull back on the stick so that the glider will not pick up excessive speed.
After reaching release altitude pull the tow release knob.
The recommended winch launch airspeed is 110-120 km/h (60-65 kts.).

Caution: Do not fly at less than 90 km/h (49kts.) or not more than 150 km/h (81 kts.).

Warning: Winch launch with high take-off weight requires a powerful winch!

4.5.4 Free flight

Stalling characteristics (level and turning flight)
When stalled with flap setting neutral or negative the DG-808C will continue to fly level.
If the stick should be pulled further the DG-808C will drop the nose or one wing.
During the stall a large angle of attack will be reached.
At positive flap settings the DG-808C will stall over one wing.
When reaching the minimum speed, the angle of attack has to be increased remarkably before the DG-808C stalls, so that the stalled flight is easy to recognize.

With a little stick forward and opposite rudder the DG-808C can be recovered without much loss of height. Rain does not influence this behaviour noticeably. The loss of height is appr.30m (100ft) if recovered immediately.

Stall airspeeds see section 5.2.2.

Caution: Flights in conditions conducive to lightning strikes must be avoided.

Wing flap settings
Optimal settings depending on the wing loading see section 5.3.2.

High speed flying
Flap settings -5°, -10°, -14°
The parallelogram control stick reduces the possibility of pilot induced oscillations.
The DG-808C can be trimmed almost up to highest speeds.
Nevertheless don't release the stick at any time.
Do not exceed the max. airspeeds. (see section 2.2!)

Thermalling
Flap setting: +5°.
+8° for narrow thermals

Thanks to the long fuselage, the DG-808C is directionally very stable.
Uneven lift can be optimized because of the excellent roll rate.

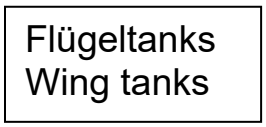
4.5.5 Cruise engine on and utilisation of the wing fuel tanks

4.5.5.1 General

The engine of the DG-808C is not designed for continuous cruise with the engine. Due to the high drag of the extended powerplant and as the propeller is designed for optimum take-off performance, cruise with higher speed is not efficient.
The optimum cruise is with the so called sawtooth technique. After climb with Vy retract the engine and glide with airspeed according to the Mc Cready theory, flying slowly in lift and faster in sinking air.
The medium cruise speed achieved by sawtooth technique is not much less than for level engine on cruise, but the range will be more than doubled.
Performance data see section 5.3.5.

4.5.5.2 Utilisation of the wing fuel tanks (Option)

The wing fuel tanks have no fuel level indication. Therfore it is best to empty the fuselage tank to approx.10 l (2.6 U.S.gal.) and then to transfer the fuel from one wingtank into the fuselage tank.
Should the fuselage tank become completely empty and the engine RPM's begin to drop, set the throttle immediately to idle and open one wing tank valve. After about 45 sec. there should be enough fuel in the main tank to apply full throttle again.
Another aid in determining fuel levels is the engine elapsed time indicator. as with normal flight fuel consumption of 20-22 l/h (5.3-5.8 U.S. gal.) and knowing how much fuel was in the aircraft at take off, the amount of fuel left can easily be calculated. The engine hour reading should therefore be noted before take-off or the trip-time-counter in the DEI-NT (see page 7.13) should be set to zero at take-off (Reset Trip Time Counter).
The operating switch and the indication light are installed in the instrument panel at a suitable location. The switch is locked in all positions (operation similar to the ignition switch).
Centre position= off, to the left= left tank, to the right= right tank.
In addition an amber LED flashes if a valve is open. By this the pilot will be reminded to close the valve to save electric power.
The valves are wired via the switch which switches off the electric refuelling pump when the fuselage tank is full. So the respective wing tank valve will be switched off with full fuselage tank, to avoid spillage of fuel.



4.5.6 Engine stop retraction and extension – start in flight and after landing

4.5.6.1 Stopping and retracting the engine in flight

1. Lift the rear view mirror so that you see the propeller.
2. Fly at 85-90 km/h (46-49 kts).
3. Bring the throttle back to idle. A cooling run of approx. ½ minute is recommended.
4. Switch off the ignition.
5. The engine will be slowed down by the electric propeller brake (option) or must be slowed down with the manual propeller brake.
6. As soon as the propeller stopped turning, the powerplant will be automatically retracted a little (intermediate position).
   To save altitude you may turn the propeller into the position for retraction (ignition switched off) by pressing the starter button.
   The starter motor receives only pulses of electric power to turn the propeller slowly. As soon as the propeller is in retraction position, the electric power is cut off.
   a) without BBSA slipping centrifugal clutch: As soon as the propeller is in the position for retraction the electrical propeller brake (Option) engages or you have to pull on the manual brake. The engine will retract by itself.
   b) with BBSA slipping centrifugal clutch: When the powerplant is retracted into the intermediate position the propeller stopper moves forward in the propeller circle. As soon as the propeller is in the position for retraction (close to the stopper) the engine will retract by itself.

Note: If turning the propeller with the starter motor doesn't work, you may turn the propeller by increasing the airspeed. Watch the procedure in the mirror!

Note: In case the automatic retraction is defective, the engine must be retracted via the manual extension-retraction switch.

Caution: With high temperatures (temperature on ground above 25°C/77°F) there is the risk of overheating the propeller after engine retraction. To avoid damage, extend the engine again via the manual switch (approx. 1 second) to open the engine doors, retract again after 5 minutes.

4.5.6.2 Extension and starting the engine in flight

1. With the engine extended but not running the rate of sink at 90 km/h (49 kts) increases to 2 m/sec. (395 ft/min.).
   Therefore restarting the engine should only be done over landable terrain and not below 400 m (1320 ft) above ground. But it is better to restart the engine at 200 m (660 ft) over a landable field rather than at 400 m (1320 ft) over a forest or unlandable scrub.
   Should a flight be conducted over a wide expanse of unlandable terrain, the engine should then be restarted at 1000 m (3300 ft) above ground level so that if the engine does not start, all the emergency starting procedures can be followed unhurriedly including retraction of the engine if necessary.
2. In a normal restarting situation the loss of altitude from starting the extension procedure until the engine is running is only about 20 m (70 ft).
3. Extension: Fly at 80-90 km/h (43-49 kts) with flaps set at 8°
   Check if the primer switch is in the. ”auto” position and if the fuel cock is open.
   Throttle on idle, switch on the ignition. The engine will extend by itself. You may press the starter button before the engine is extended completely. The starter motor will start the engine as soon as the powerplant is extended.
   When the engine fires, release the starter button and move the throttle slowly to full throttle.
   In case of starting problems see section 4.5.1.2.

Caution: With coolant temperatures above 45°C the engine may start but refuse to accept throttle. This may be due to formation of vapour bubbles in the carburettor .
In such a case allow the engine to run for 20 seconds at idle, press the starter button again, if necessary several times. Each time you press the starter button the primer valve opens and injects some additional fuel to keep the engine running. When the engine runs with constant RPM slowly increase throttle.

4.5.7 Approach and landing

Note: Always land in the gliding configuration, engine retracted, except in an emergency.

4.5.7.1 Normal landing

It is recommended to dump the waterballast before landing on airfields.
Dump the ballast before an outlanding in any case.
Abeam the landing point extend the landing gear and set the wing flap to 8° or L.
In calm weather approach with approx. 96 km/h (52 kts.) (ballast dumped!).
With strong wind fly faster!

The very effective Schempp-Hirth dive brakes make a short landing possible.

Slipping may be used as additional landing aid.
Caution: While side-slipping the rudder is held in its deflected position by the airflow. So it is recommended to practice slipping at a higher altitude.

The slip can be introduced at the recommended approach speed (see above).
To recover from the slip neutralize the aileron control first, this will reduce the force which sucks the rudder in its displaced position.
During the slip the airspeed indicator shows airspeed values which are too low, so the slip must be executed with regard to the position of the horizon.
No influence on the slipping characteristics when slipping with partially filled waterballast is noticeable.

Strong crosswind offers no problem.
Do not approach too slowly with fully extended airbrakes otherwise the aircraft may drop during flare out.
When flaring out keep the airbrake setting you were using, opening them further may drop the sailplane.
You can land the DG-808C on soft fields with the landing gear extended, as there is no tendency of nosing over, if the stick is pulled backwards.
During ground roll the wing flaps may be kept in the landing position.
Clean the landing gear and tow release after landing in a muddy field. Dirt in the front strut can keep the landing gear from locking over centre next time. Simply hosing with water is the best cleaning method.

4.5.7.2 Landing with the engine extended and stopped

See emergency procedures section 3.14.
Land with the engine extended only if the engine can't be retracted.

4.5.7.3 Landing with the landing gear retracted

Wheel-up landing is not recommended (see emergency procedures section 3.17).

After wheel-up landing check the fuselage belly and the tow hook for damage.

4.5.7.4 Landing with asymmetric waterballast

See emergency procedures section 3.15.

4.5.7.5 Extension and starting the engine after landing

The same procedures as in flight may be used after landing for taxying. Operate the ignition switch after touch down. On uneven runways extend the engine after stopping the aircraft to reduce wear of the extension-retraction unit.

4.5.7.6 Engine retraction on the ground

Caution: After ground test runs or after taxiing don't retract the engine immediately. Allow the engine to cool down several minutes.

For retraction turn the propeller by hand into position, don't use the starter motor.

The engine will be retracted automatically. To interrupt the retraction procedure proceed as follows:

Push the manual switch up or down to switch off the automatic system. Further retraction is via the manual switch or by switching the ignition on and off.

4.5.8 Flight with water ballast

4.5.8.1 Wing tanks

Recommended ballast for smooth thermals:

	rate of climb		ballast	
	m/s	fpm	litres	U.S. gallons
below	1	200	none	
	1 – 2	200 - 400	40	10
	2 - 4	400 - 800	100	26
more than	4	800	max. ballast	

Do not exceed the maximum gross weight when loading the water ballast. The maximum quantity of water allowed is dependent on the empty weight and the cockpit load (see section 6.8.8).

4.5.8.2 Fin water ballast tank

For optimal thermalling performance and handling water ballast in the fin tank should be used to compensate the forward movement of C.G. due to the mass of the wing water ballast. Please refer to section 6.8.9.

Warning: It is prohibited to use the fin tank in icing conditions (see section 2.17.2).

4.5.8.3 General:

If there is the risk of freezing, dump all water before you reach freezing altitude, latest at +2°C (36°F), or descend to lower altitudes. If the OAT decreases +2°C a warning message “WATER FREEZE” will be displayed on the DEI-NT.

Warning: If you suspect a tank is leaking, dump all water immediately.

4.5.8.4 Landing with waterballast

Water ballast raises the approach speed and the stress on the landing gear, so it is recommended to dump the waterballast before landing.

Dump the ballast before an outlanding in any case.

4.5.8.5 Filling the waterballast

See sections 4.2.2. After filling level the wings and check if the dump valves are tight. It is not permitted to fly with leaking water tanks as this may result in an asymmetric loading condition.

4.5.8.6 Dumping the waterballast

First open the fin tank, then open both wing ballast tanks together. Do not empty one wing tank after the other to avoid an asymmetric loading condition.
In flight the water drains at approx. 0.7 lt./sec. (1.5 lbs./sec).

Warning: If suddenly the operating force of the fin ballast control handle is unusually low (you don't feel the force of the retaining spring) you must suspect that the valve will not be opened. In this case it is prohibited to dump the wing ballast to avoid an inadmissible aft C.G. position.
You must perform the landing with full ballast, try to avoid an outlanding.

4.5.8.7 Valves leaking, servicing

Please refer to the maintenance manual section 1.8 and 4.1.

4.5.9 Flight at high altitude and at low temperatures

With temperatures below 0°C (32°F) for instance when wave flying or flying in winter, it is possible that the control circuits could become stiffer. Special care should be taken to ensure that there is no moisture on any section of the control circuits to minimize the possibility of freeze up. It could be advantageous to apply Vaseline along all the edges of the airbrake cover plates to minimize the possibility of freezing closed.

Operate the controls regularly to prevent ice build-up.
It is not allowed to carry waterballast.

Caution:

1. At temperatures below -20°C (-4°F) there is the risk of cracking the gelcoat.
2. Attention must be paid to the fact that at higher altitudes the true airspeed is greater than the indicated airspeed.
   The max. speed V_{NE} is reduced according to the following table:

Altitude in [m]	0-3000	4000	5000	6000	7000	8000
V_{NE} indicated km/h	270	256	243	230	217	205

Altitude in [ft]	0-10000	13000	16000	20000	23000	26000
V_{NE} indicated kts.	146	138	131	124	117	111

3. Dump the water ballast before you reach freezing altitude or descend to lower altitudes.
4. Do not fly below 0°C (32°F) when your glider is wet (e.g. after rain).
5. **With coolant pump type Pierburg (TN800/41):** The antifreeze in the coolant of the engine is mixes normally for a lowest OAT of -20°C. For high altitude flights where lower temperatures may be expected you have to change the mixture for -40°C, see MM section 1.11.2.

4.5.10 Flight in rain and thunderstorms

With light rain the stall speed and the sink rate increases slightly and the approach speed has to be increased.

Warning: Flights and especially winch launches in the vicinity of thunder storms should be avoided. Due to lightning discharge, carbon fibre structures may be destroyed.

With the engine running:
In normal rain, the rate of climb will be reduced by 1/3. The cross country cruising speed will also be reduced by approx. 10 km/h (5 kts).
Take-off in rain should only be done with a long enough airfield and attention given to safety. A take-off should not be attempted in heavy rain.

4.5.11 Cloud flying

Cloud flying is only permitted without waterballast and with the engine retracted.
Take care to fly smoothly and coordinated. It is prohibited to use a spin as a method to reduce altitude in cloud. In case of emergency, pull out the dive brakes fully before exceeding a speed of 200 km/h and dive with max. 200 km/h (108 kts.) to leave the cloud.

Warning: Flying in or near thunderstorm-clouds is prohibited.

Note: Cloud flying is not permitted in the USA, Canada and Australia.

4.5.12 Aerobatics

Permissible only without ballast in the wings and with engine retracted.

Execute only the approved manoeuvres. At the recommended entry airspeeds there is no need to pull up abruptly, unnecessarily stressing the aircraft.
The following manoeuvres are easy to execute.
Wing flap setting for all manoeuvres 0°.

Approved manoeuvres

1. Spins	/		
2. Inside Loop	Entry Speed	180 km/h	(97 kts.)
3. Stall turn	Entry Speed	180 km/h	(97 kts.)
4. Chandelle	Entry Speed	180 km/h	(97 kts.)
5. Lazy Eight	Entry Speed	180 km/h	(97 kts.)

Spins:

Caution: Continuous spinning is best at aft C.G. positions 330-383 mm (13.0 – 15.1 in) behind datum.
It is not necessary to extend the dive brakes during spin recovery. The DG-808C shows a large nose down pitch after leaving spin if you are spinning more than 2 turns. So you have to flare out correspondingly.
With **forward C.G. position** the DG-808C will not remain in a spin.
The DG-808C will recover after 1-2 turns (depending on C.G. position).
As the nose down pitch and the airspeed will be high with this C.G. position spinning should not be executed.
At medium C.G. position there is a tendency that the spin will turn into a spiral dive after 3 turns. Reaching this state you have to recover immediately. The spiral dive tendency can be avoided if you deflect the aileron into the direction of the spin when inducing the spin.

Inducing the spin: (Normal procedure)
Gradually bring the sailplane into a stall. When it starts to burble, pull the stick back completely and kick in full rudder in the spin direction.

Recovering from the spin:
Check ailerons neutral.
Apply full rudder opposite to direction of the spin.
Then ease stick forward until rotation ceases.
At aft C.G. positions at which the glider spins with the nose up, it is necessary to apply full stick forward.
Centralize the controls and carefully pull out of the dive.
Height loss during recovery is up to 150 m (490 ft), the max. speed is 190 km /h (103 kts.).

Stall-turn
To fly a stall-turn safely, please proceed as follows:

After reaching the entry speed pull back the stick quickly, but not abruptly. During the pull out, shortly before reaching the vertical flight path initiate rotation with the rudder. Push the rudder quickly, but not abruptly. Also, at the highest point of the turn, the glider should still have a positive airspeed above stalling speed.

Be careful not to exceed the airspeed for max. control surface deflection as indicated in section 2.2.

When reaching the vertical dive, flare out immediately to minimize speed increase and g-load.

Caution: A classical stall-turn with almost no airspeed at the highest point of the turn is very difficult to fly with a glider with larger wingspan, due to the high moment of inertia.
This effect is taken into account when using the above mentioned procedure.

Warning: If the rudder is pushed too late and the rotation is insufficient, it is possible that the glider tailslides (falls tailwards).
If this happens, it is important to hold all controls firmly, preferably at one of the stops, until the nose swings down. Then flare out immediately.

4.6 Flight with the engine removed from the aircraft

The DG-808C can be flown without the engine when the engine is sent for a major overhaul, or removed to decrease the aircraft empty weight for competition flying.

The following items must be executed: (see section 4.17 in the DG-808C maintenance manual).

1. Remove the powerplant.
   The engine extension-retraction mechanism and the exhaust system will remain in the fuselage.
2. Remove the 4 main batteries, insulate the battery connector cables.
   Install and connect a battery in the baggage compartment (see section 7.17.4).
3. Install a mass behind the tailwheel box according to drawings 8R86 and 8R87. The drawings and the necessary parts can be ordered from DG Flugzeugbau.

Warning: Installation of a heavier tailwheel as a compensation mass is prohibited for flutter reasons.

4. C.G. recalculation
   Carry out a C.G. calculation according to section 6.9 using the data of the following table. The inflight C.G. will be moved forward by approx. 0.0-0.020 m (0.0-0.8 in.) depending on the flightmass and empty mass C.G.

1 kg = 2.2046 lbs 0.305 m = 1 ft

	mass behind datum	C.G.	moment
mass reduction	kg	m	kg x m
engine with propeller	-46.4	1.120	-51.97
batteries in front	- 8.2	-1.291	+10.59
additional mass			
battery in baggage compartment	+ 2.9	+0.17	+ 0.49
mass at tail	+ 5	+4.580	+22.9
total difference	-46.7	+0.385	-17.99

5. Fix the limit switch “engine retracted” with a Ty-rap in the actuated position. Otherwise the DEI-NT will remain in the powered flight mode.
6. Tape the engine doors carefully with fabric tape.

Note: After switching on the main switch some failure messages will be displayed. Confirm each message by pressing the selector switch to eliminate the message.

5 Performance

5.1 Introduction

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

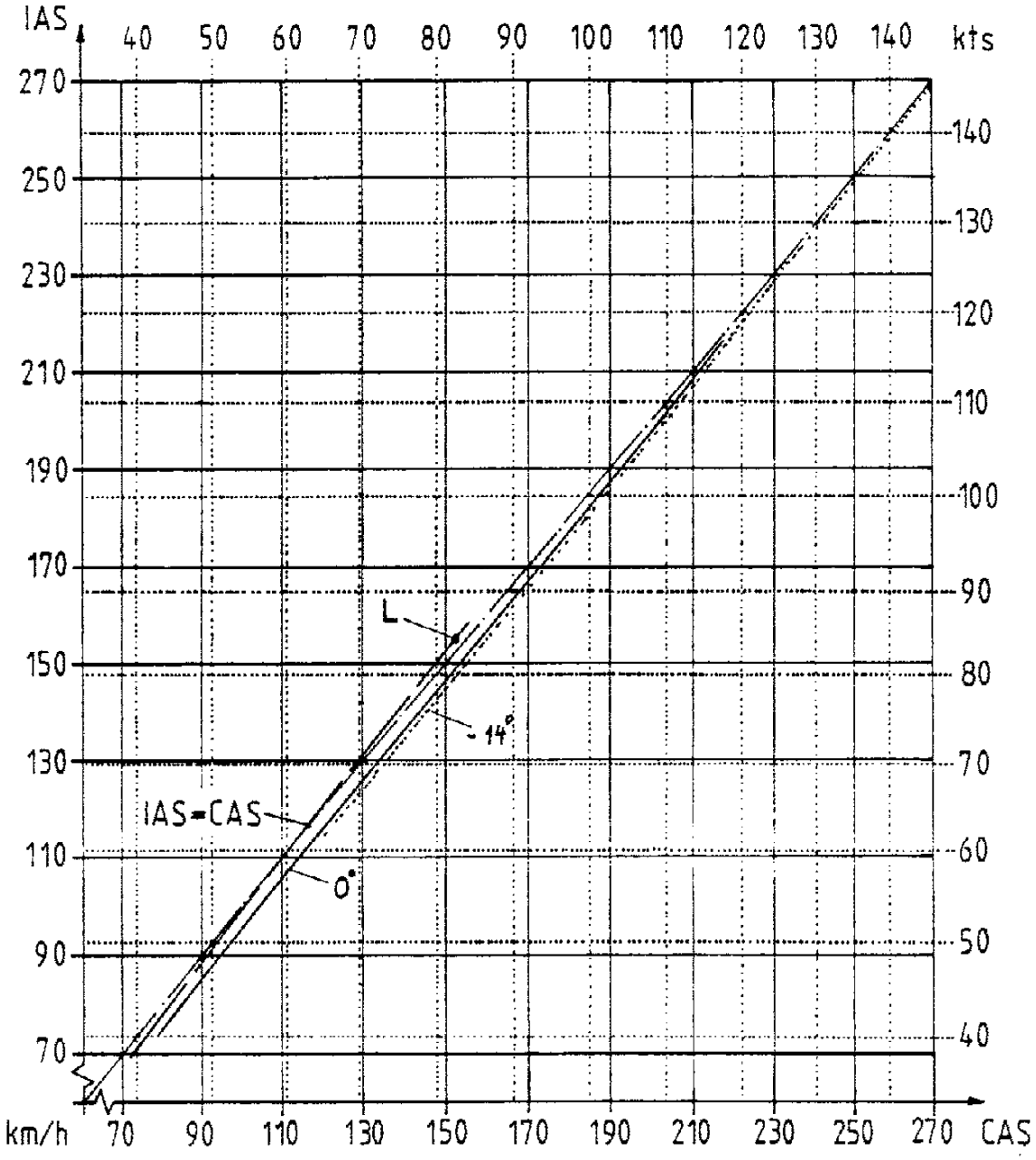
The data in the charts has been computed from actual flight tests with the sailplane in good and clean condition and using average piloting techniques.

5.2 Approved data

5.2.1 Airspeed indicator system calibration

IAS = indicated airspeed
CAS = calibrated airspeed

Indicated airspeed



calibrated airspeed

1 kts= 1 km/h / 1.852

Caution: The airspeed indicator is to be connected to the static ports and pitot probe in the fuselage nose.

5.2.2 Stall speeds

Stall speeds wing span 15 m
The given speeds are the minimum achievable speeds during level flight in km/h and (kts.).

Airbrakes retracted

Flap setting	**mass** 340	370	400	440	480	525	540	**kg**
	750	**816**	**882**	**970**	**1058**	**1157**	**1190**	**lbs.**
L	64	67	70	73	76	80	81	km/h
	35	36	38	40	41	43	44	kts.
+8°	65	68	71	74	77	81	82	km/h
	35	37	38	40	42	44	44	kts.
0°	69	72	75	79	82	86	87	km/h
	37	39	41	43	45	47	47	kts.
-14°	74	78	81	85	88	93	94	km/h
	40	42	44	46	48	50	51	kts.

Airbrakes extended

Flap setting	**mass** 340	370	400	440	480	525	540	**kg**
	750	**816**	**882**	**970**	**1058**	**1157**	**1190**	**lbs.**
L	71	74	77	81	84	88	90	km/h
	38	40	42	44	46	48	48	kts.
+8°	71	74	77	81	84	88	90	km/h
	38	40	42	44	46	48	48	kts.
0°	74	78	81	85	88	93	94	km/h
	40	42	44	46	48	50	51	kts.
-14°	80	83	86	90	95	99	100	km/h
	43	45	47	49	51	53	54	kts.

The loss of height for stall recovery is approximately 30 m (100 ft) if recovered immediately.

Stall speeds wing span 18 m
The given speeds are the minimum achievable speeds during level flight in km/h and (kts.).

Airbrakes retracted

Flap setting	**mass**								
	340	**370**	**400**	**440**	**480**	**525**	**560**	**600**	**kg**
	750	**816**	**882**	**970**	**1058**	**1157**	**1235**	**1323**	**lbs.**
L	61	64	66	70	73	76	78	81	km/h
	33	34	36	38	39	41	42	44	kts.
+8°	62	65	67	70	74	77	80	82	km/h
	33	35	36	38	40	42	43	44	kts.
0°	66	69	72	75	78	82	85	88	km/h
	36	37	39	41	42	44	46	47	kts.
-14°	71	74	77	81	84	88	91	94	km/h
	38	40	41	43	45	48	49	51	kts.

Airbrakes extended

Flap setting	**mass**								
	340	**370**	**400**	**440**	**480**	**525**	**560**	**600**	**kg**
	750	**816**	**882**	**970**	**1058**	**1157**	**1235**	**1323**	**lbs.**
L	68	71	73	77	80	84	87	90	km/h
	37	38	40	42	43	45	47	48	kts.
+8°	68	71	73	77	80	84	87	90	km/h
	37	38	40	42	43	45	47	48	kts.
0°	71	74	77	81	84	88	91	94	km/h
	38	40	41	43	45	48	49	51	kts.
-14°	76	79	82	86	90	94	97	100	km/h
	41	43	44	46	49	51	52	54	kts.

The loss of height for stall recovery is approximately 30 m (100 ft) if recovered immediately.

5.2.3 Take-off performance

The data is valid for take-off from dry level hard surface, no wind and proper condition of engine, propeller and aircraft.
The take-off procedure is to be executed according to 4.5.2.

SR = take-off roll
S = take-off distance to 15 m (50 ft.) altitude
T = temperature on ground
H = pressure altitude, can be computed as follows:
H (m) = (1013 mb - QNH) • 100 / 11.7 + airfield elevation (m)

18m span		m = 440 kg		m = 525 kg		m= 600 kg	
H (m)	T(°C)	SR(m)	S(m)	SR(m)	S(m)	SR(m)	S(m)
0	0°	110	174	157	240	205	306
	15°	123	193	175	267	229	341
	30°	136	214	194	296	253	377
500	0°	124	196	177	270	231	345
	15°	138	218	197	301	258	384
	30°	153	241	218	333	285	425
1000	0°	140	221	200	305	261	389
	15°	156	246	222	339	291	433
	30°	173	272	246	376	322	480
1500	0°	159	250	226	344	295	440
	15°	176	278	251	383	328	490
	30°	195	308	278	424	363	542
2000	0°	179	282	255	389	333	497
	15°	200	314	284	433	371	553
	30°	221	348	314	480	411	613
15m span		m = 440 kg		m = 480 kg		m= 540 kg	
H (m)	T(°C)	SR(m)	S(m)	SR(m)	S(m)	SR(m)	S(m)
0	0°	116	183	138	214	175	266
	15°	129	203	154	238	195	296
	30°	143	225	170	264	215	327
500	0°	131	206	156	241	197	299
	15°	146	229	173	269	219	333
	30°	161	254	192	297	243	369
1000	0°	148	232	176	272	222	338
	15°	164	259	196	303	247	376
	30°	182	286	216	335	274	416
1500	0°	167	263	198	308	251	381
	15°	186	292	221	342	280	424
	30°	205	323	244	379	309	470
2000	0°	189	297	224	348	284	431
	15°	210	330	250	387	316	480
	30°	232	366	276	428	350	531

Dry level grass surface increase the take-off distance by 10% to 15%.

Warning: Wet soft grass surface may increase the take-off distance much more

Take-off performance, British, US

18 m span		m = 970 lbs.		m = 1160 lbs.		m = 1320 lbs.	
H (ft)	T (°F)	SR(ft)	S(ft)	SR(ft)	S(ft)	SR(ft)	S(ft)
0	32	362	570	518	790	671	1001
	59	403	635	577	880	747	1114
	86	446	703	638	973	827	1233
1640	32	408	643	584	890	756	1128
	59	454	715	650	991	841	1256
	86	503	792	719	1097	931	1390
3280	32	461	725	659	1005	853	1273
	59	513	807	733	1118	949	1416
	86	567	893	811	1237	1051	1568
4920	32	520	819	744	1135	964	1438
	59	579	912	828	1263	1072	1600
	86	641	1009	917	1398	1187	1771
6560	32	588	926	841	1283	1089	1625
	59	655	1031	936	1428	1212	1809
	86	725	1141	1036	1581	1342	2002
15 m span		m = 970 lbs.		m = 1060 lbs.		m = 1190 lbs.	
H (ft)	T (°F)	SR(ft)	S(ft)	SR(ft)	S(ft)	SR(ft)	S(ft)
0	32	381	600	455	705	573	871
	59	424	668	506	785	638	969
	86	469	739	560	868	706	1073
1640	32	429	676	513	794	646	981
	59	478	752	571	884	719	1092
	86	529	832	631	978	796	1209
3280	32	484	762	578	896	729	1107
	59	539	848	644	997	811	1232
	86	597	939	712	1104	898	1363
4920	32	547	861	653	1012	823	1250
	59	609	959	727	1127	916	1392
	86	674	1061	805	1247	1014	1540
6560	32	619	974	733	1144	932	1415
	59	688	1084	822	1274	1037	1574
	86	762	1200	910	1410	1148	1743

5.3 Additional Information

5.3.1 Demonstrated crosswind performance

The demonstrated crosswind velocity is 15 km/h (8 kts) according to the airworthiness requirements.

5.3.2 Gliding performance

(data evaluated by comparison flights)

Performance data with 15 m span (S = 10.68 m²)

Mass	kg	340	370	430	525	540
Wing loading	kg/m²	32	35	40	49	50.6
	lbs./ft²	6.6	7.2	8.2	10.0	10.4
min. sink rate	m/s	0.55	0.58	0.61	0.67	0.68
	ft/min	109	115	121	133	135
at V	km/h	79	83	86	98	99
	kts.	43	45	46	53	54
best glide ratio	/	44.6	45.0	45.4	46.2	46.3
at V	km/h	96	101	105	119	121
	kts.	52	55	57	64	65

Performance data with 18 m span (S=11.81 m²)

Mass	kg	350	410	470	525	600
Wing loading	kg/ m²	30	35	40	44.5	50.8
	lbs./ft²	6.1	7.2	8.2	9.1	10.47
min. sink rate	m/s	0.47	0.50	0.53	0.55	0.58
	ft/min	93	99	105	109	116
at V	km/h	75	81	88	93	100
	kts.	40	44	48	50	54
best glide ratio	/	49.4	50.1	50.7	51.2	51.8
at V	km/h	91	98	105	110	118
	kts.	49	53	57	59	64

With winglets at the 18m wingtips the max. L/D is increased by approx. 1.5 points.
The min. sink is reduced by approx. 0.03 m/s (6 ft/min.).

A variation in speed by ± 10 km/h (5 kts.) from the above will decrease the best glide angle by 0.5 glide points and increase the min. sink rate by 1 cm/sec. (2 ft/min).

For optimum performance, the aircraft should be flown with a C.G. towards the rear of the allowable range. This especially improves thermalling performance. However the aircraft will be more pitch sensitive.

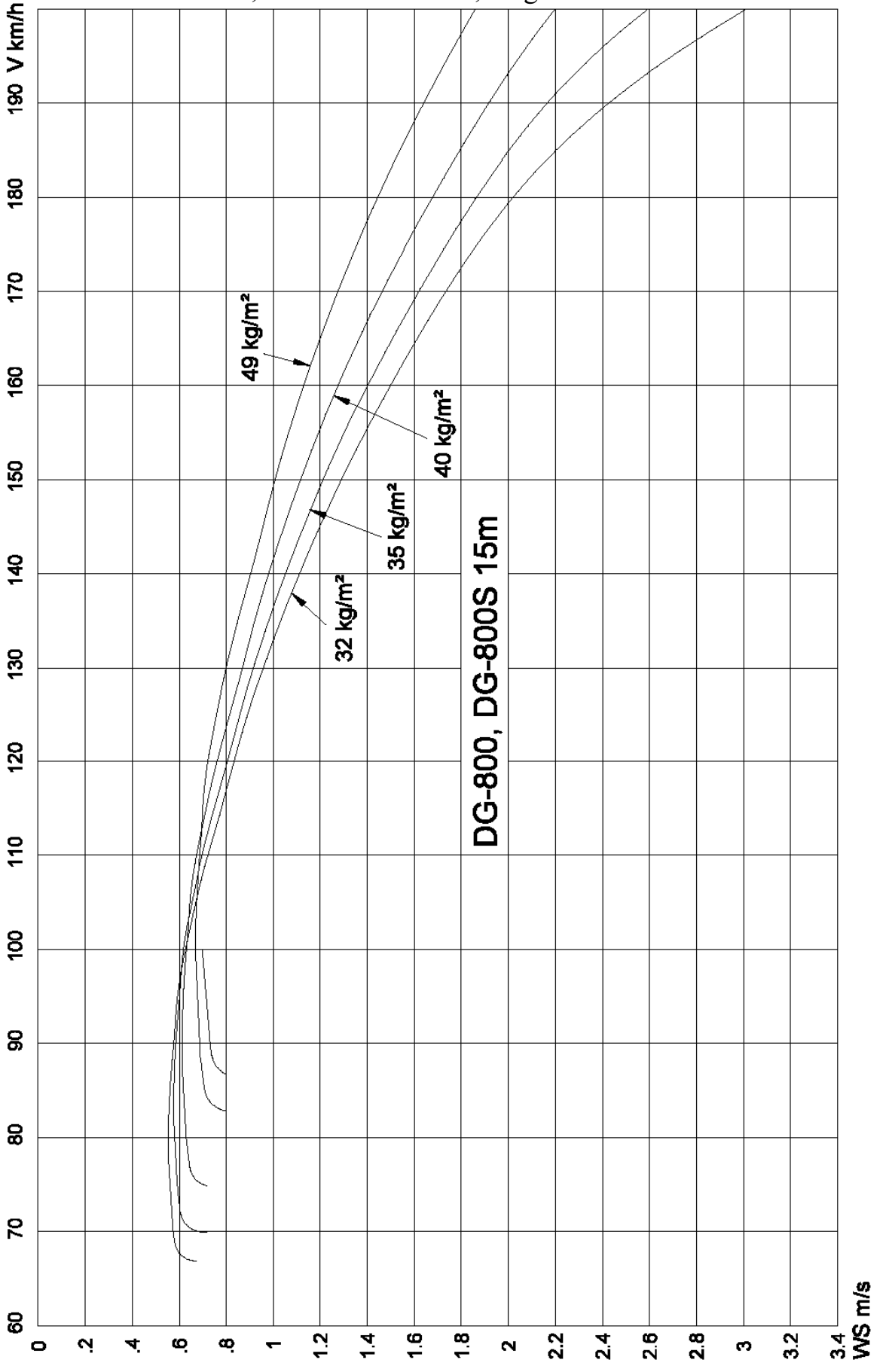
The wing fuselage joint, wing parting and the tailplane fin joint should be taped up and the aircraft thoroughly cleaned to obtain maximum performance.

The polars apply to a "clean" aircraft.
With dirty wings or flight in rain, the performance drops accordingly.

5.3.3 Flight polar

with 15 m wing span

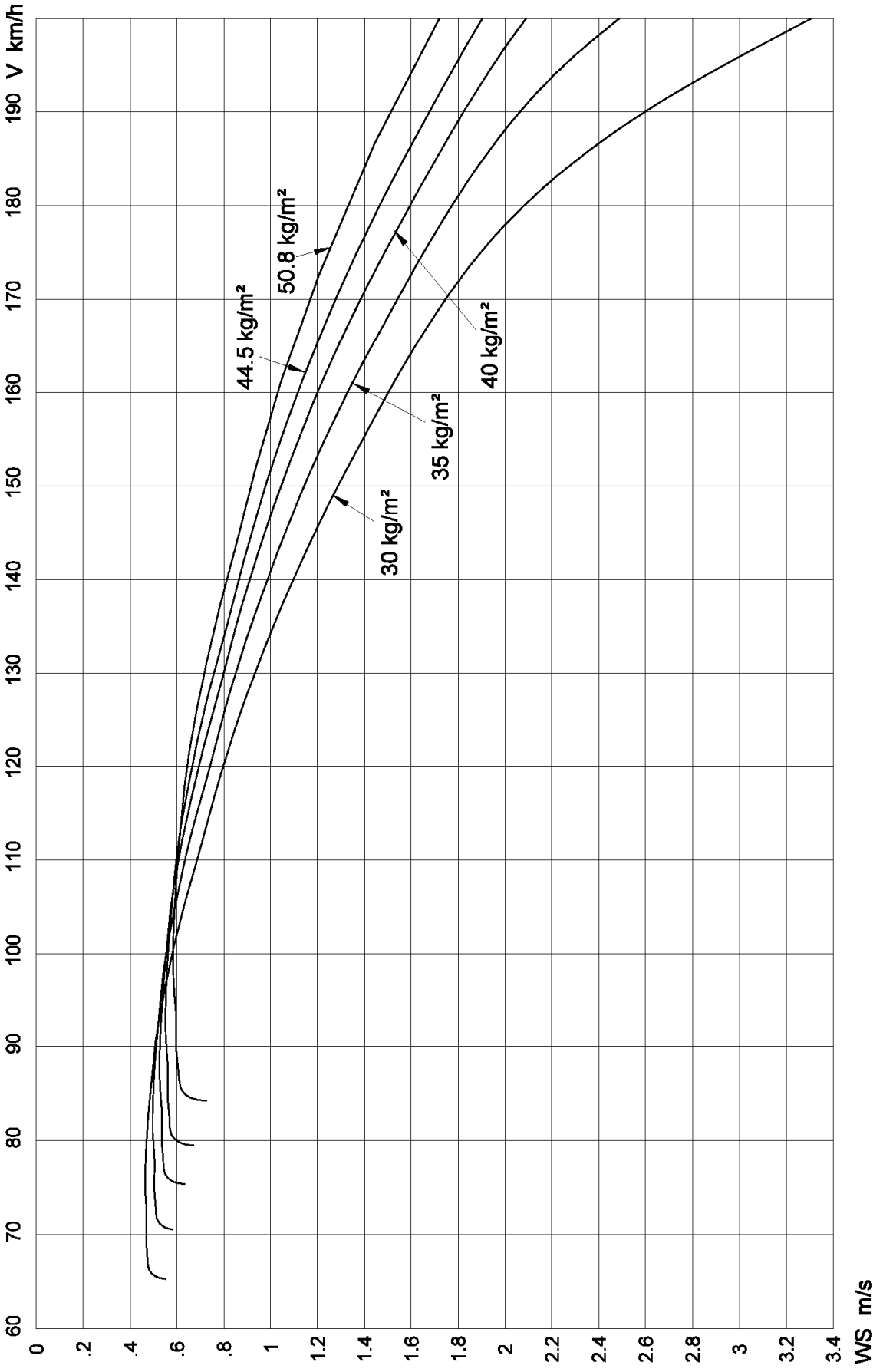
1 kts= 1 km/h / 1.852, 1 m/s= 197 ft/min., 1 kg/m²= 0.2048 lbs/ft²



Flight polar

with 18 m wing span

1 kts= 1 km/h / 1.852, 1 m/s= 197 ft/min., 1 kg/m²= 0.2048 lbs/ft²



5.3.4 Operating the wing flaps

The following flap settings should be used for optimum performance for the speed ranges and wing loadings specified:

Speeds in km/h
wing span 15 m

mass (kg)	**340**	**370**	**400**	**440**	**480**	**525**	**540**
+8°	up to 74	- 77	- 80	- 84	- 88	- 92	- 93
+5°	74- 83	77- 87	80- 90	84- 94	88- 99	92-103	93 - 104
0°	83- 92	87- 96	90-100	94-104	99-110	103-115	104 - 117
-5°	92- 125	96-130	100-135	104-141	110-149	115-155	117 - 157
-10°	125- 148	130-154	135-160	141-167	149-176	155-183	157 - 186
-14°	148-V_{NE}	154-V_{NE}	160-V_{NE}	167-V_{NE}	176-V_{NE}	183-V_{NE}	186 - V_{NE}

wing span 18 m

mass (kg)	**340**	**370**	**400**	**440**	**480**	**525**	**600**
+8°	up to 70	- 73	- 76	- 80	- 84	- 87	- 93
+5°	70- 79	73- 83	76- 86	80- 90	84- 94	87- 98	93 - 105
0°	79- 88	83- 92	86- 95	90-100	94-104	98-109	105 - 117
-5°	88- 119	92-124	95-129	100-135	104-141	109-147	117 - 157
-10°	119- 141	124-147	129-153	135-160	141-167	147-175	157 - 188
-14°	141-V_{NE}	147-VNE	153-V_{NE}	160-V_{NE}	167-V_{NE}	175-V_{NE}	188 - V_{NE}

To accelerate or flatten out, always use flaps and elevator simultaneously.

Set the flap earlier in its position for the speeds listed above because flattening out raises the wing loading and speeding up lowers it. The higher the g-loads, set the flaps earlier.

Flatten out with 1.5 g or speeding up with 0.5 g changes the optimal speed approximately 15 km/h (8 kts.) at low speeds and 30km/h (16 kts.) at high speeds.

Operating the wing flaps cont.

Speeds in kts.

wing span 15 m

mass (lbs.)	750	816	880	970	1060	1157	1190
+8°	up to 40	- 42	- 43	- 45	- 48	- 50	- 50
+5°	40- 45	42- 47	43- 49	45- 51	48- 53	50- 56	50- 56
0°	45- 50	47- 52	49- 54	51- 56	53- 59	56- 62	56- 63
-5°	50- 67	52- 70	54- 73	56- 76	59- 80	62- 84	63- 85
-10°	67- 80	70- 83	73- 86	76- 90	80- 95	84- 99	85- 100
-14°	80- V_{NE}	83- V_{NE}	86- V_{NE}	90- V_{NE}	95- V_{NE}	99- V_{NE}	100- V_{NE}

wing span 18 m

mass (lbs.)	750	816	880	970	1060	1157	1301
+8°	up to 38	- 39	- 41	- 43	- 45	- 47	- 50
+5°	38- 43	39- 45	41- 46	43- 49	45- 51	47- 53	50- 56
0°	43- 48	45- 50	46- 51	49- 54	51- 56	53- 59	56- 63
-5°	48- 64	50- 67	51- 70	54- 73	56- 76	59- 79	63- 85
-10°	64- 76	67- 79	70- 83	73- 86	76- 90	79- 94	85- 100
-14°	76- V_{NE}	79- V_{NE}	83- V_{NE}	86- V_{NE}	90- V_{NE}	94- V_{NE}	100- V_{NE}

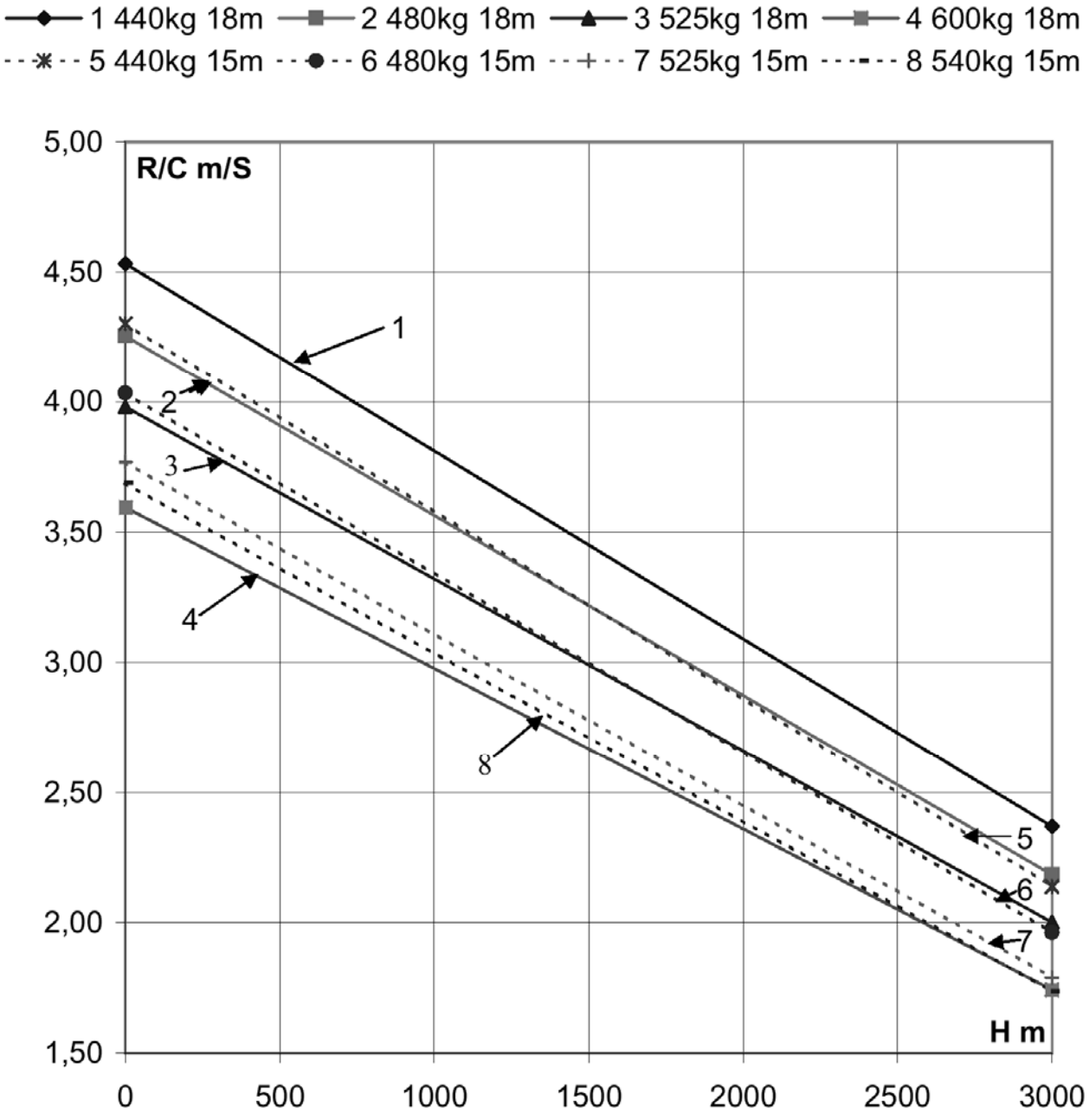
5.3.5 Performance under power

5.3.5.1 Rate of climb

Measured rates of climb for 15°C (59°F) at MSL.
15°C increase in temperature reduces the rate of climb by ca. 0.2 m/s (40 ft/min.).

R/C = climb rate at Vy = 90 km/h (49 kts.) and with flap setting +8°
H = altitude above sea level

1 m/s= 197 ft/min., 1 m= 3.2809 ft, 1 kg= 2.2046 lbs



5.3.5.2 Cruising Flight

The cruising speed is 140-145 km/h (76-78 kts.) with maximum continuous power 6300 RPM.

5.3.5.3 Maximum operational altitude

The maximum operational altitude is more than 5000 m (16000 ft) MSL.
For continuous operation at higher altitudes, the main nozzle in the carburettor may be set to a smaller fuel flow in accordance with the engine manufacturer.

5.3.5.4 Maximum Range (without reserve)

Take-off mass 440 kg, 970 lbs. wingspan 18 m

1. At cruising speed
   with full fuselage tank (21 l, 5.5 US gal)= 195 km, 105 nm.
   This is 9.3 km/l; 19.1 nm/US gal.
2. With saw-tooth flight technique Mc Cready 0
   with full fuselage tank (21 l, 5.5 US gal)= max. 525 km; 283 nm.
   This is 25 km/l, 49 nm/US gal.
   These values can only be achieved with still air and exact speed control.
3. With saw-tooth flight technique Mc Cready 1
   with full fuselage tank (21 l, 5.5 US gal)= max. 440 km; 237 nm.
   This is 21 km/l, 43 nm/US gal.
   The values for saw-tooth technique are for beginning the climb at 600 m (1970 ft) MSL and a climb of 1000 m (3280 ft).

5.3.6 Noise data

Noise requirements: ICAO Annex 16, Volume I, Part II, Chapter X

Measured noise level:	61,0 dB(A) with 15m wingspan 540kg
	61,3 dB(A) with 18m wingspan 600kg
	57,1 dB(A) with 18m wingspan 525kg (Version Classic)
Noise limit:	70,0 dB(A) with 15m wingspan 540kg
	70,8 dB(A) with 18m wingspan 600kg
	70,0 dB(A) with 18m wingspan 525kg (Version Classic)

6 Mass (weight) and balance

6.1 Introduction

This section contains the payload range within which the sailplane may be safely operated.
A procedure for calculating the in-flight C.G. is also provided.
A comprehensive list of all equipment available for this sailplane is contained in the maintenance manual.

6.2 Weighing procedures

See maintenance manual DG-808C section 5.
Datum: Wing leading edge at the rootrib.
Reference line: aft fuselage centre line horizontal.
Execute the weighing with the powerplant retracted and all tanks emptied.

6.3 Weighing record

The result of each C.G. weighing is to be entered on page 6.5. If the min. cockpit load has changed this data is to be entered in the cockpit placard as well.
When altering the equipment, the new data can be gathered by a C.G. calculation (see section 6.9).
The actual equipment list is enclosed in the maintenance manual.

6.4 Basic empty mass and C.G.

Actual data see page 6.5. With the empty weight C.G. and the cockpit loads in the limits of the diagram on page 6.6, the in-flight C.G. limits will not be exceeded.

6.5 Mass of all non-lifting parts (WNLP)

Maximum mass of the non lifting parts is:

Version DG-808C	Classic	Competiton
wing span 15 m	338 kg (745 lbs.)	354 kg (780 lbs)

WNLP is to be determined as follows:
WNLP = WNLP empty + payload (pilots, parachute, baggage, waterballast in the fin, fuel etc.).
WNLP empty = Total empty weight incl. permanently installed equipment minus weight of the wings.
Note: The waterballast in the fin tank is part of the fuselage payload.

6.6 Max. mass (weight)

Maximum take-off and landing mass with waterballast

Version DG-808C	Classic	Competiton
wingspan 15 m	525 kg (1157 lbs.)	540 kg (1190 lbs.)
wingspan 18 m	525 kg (1157 lb).	600 kg (1323 lbs.)

Maximum take-off and landing mass without waterballast:

Maximum take-off and landing mass = $W_{NLP} + W_{wings}$

W_{NLP} = Maximum mass of the non lifting parts (see below)

W_{wings} = actual mass of the wings

6.7 Useful loads

Max. load **without** waterballast

= max. weight without waterballast - empty weight

Max. load **with** waterballast

= max. weight with waterballast - empty weight

The data is recorded on page 6.5.

6.8 Loading chart

6.8.1 Cockpit load

Cockpit load see table on page 6.5, weighing report.
With lower pilot weight necessary ballast must be added in the seat or in the optional ballast boxes (see below). Ballast put on the seat (lead ballast cushion) must be fastened at the connections of the safety belts.

6.8.2 Removable ballast for underweight pilots (Option)

see section 7.17.1.

6.8.3 Baggage

max. 15 kg (33lbs)
Heavy pieces of baggage must be secured to the baggage compartment floor (screwing to the floor or with belts). The max. mass secured on one half of the floor (left and right of fuselage centre line) should not exceed 7,5 kg (16.5 lbs.).
The added load in the fuselage must not exceed the max. payload without waterballast (W.B.) (see weighing report section 6.8.6).

6.8.4 Waterballast in the wing tanks

Maximum waterballast

Version DG-808C	Classic	Competiton
wingtanks	100 kg (220 lbs)	120 kg or 150 kg (265 lbs. or 330lbs.)

Warning: Filling the water ballast is only allowed with a filling system which enables determination of the exact amount of ballast filled, e.g. water gauge or calibrated canisters. Don't try to fill more water into the tanks than the specified values. It is only allowed to fly with symmetric wing ballast!

6.8.5 Fin ballast tank (only version DG-808C Competition)

Water ballast in the fin tank should be used to compensate the forward move of C.G. due to the water ballast in the wings.
The amount of ballast in this tank is dependent on the amount of water in the wing tanks and to be determined from the tables in section 6.8.9.

The total amount of ballast (wing and fin tank) is dependent on the empty mass and the fuselage load and can be determined from the tables in section 6.8.8

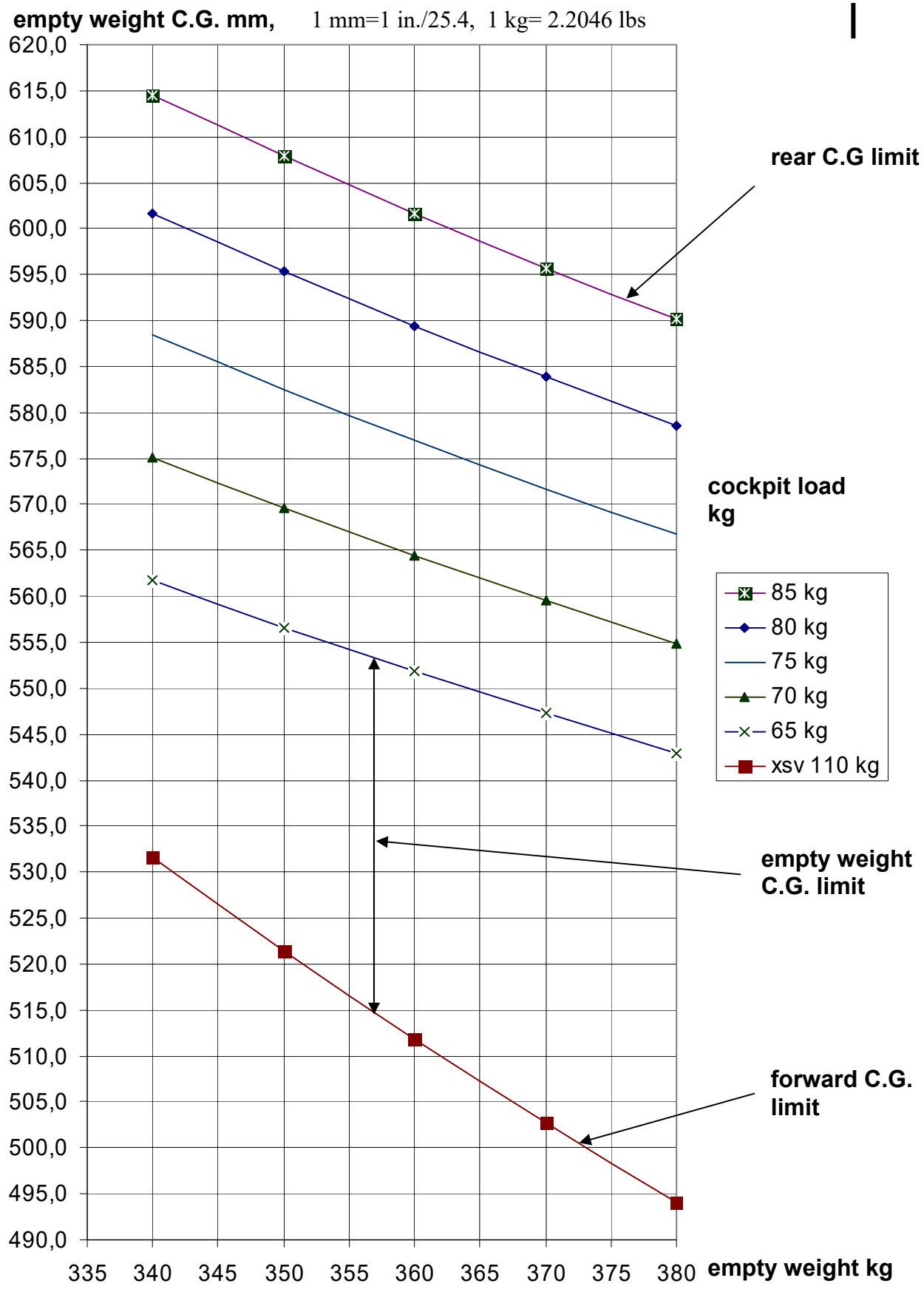
6.8.6 Weighing report (for section 6.3)

Distances in mm, masses in kg
25.4 mm = 1 inch
1 kg = 2.2046 lbs.

Date of weighing:	wing span						
Executed by:							
Date of equipment list:							
Empty mass	15						
	18						
Empty mass C.G.	15						
	18						
Max. mass without W.B.	15						
	18	/					
Max. load without W.B.	15						
	18						
Max. mass with W.B.	15						
	18						
Max. useful load with W.B.	15						
	18						
Min. cockpit load							
Max.cockpit load		110					
Inspector, signature, stamp							

6.8.7 Empty weight C.G. limits (for 6.4)

Engine installed, retracted



6.8.8 Ballast chart (total ballast)

To determine the max. allowable total waterballast (wing tanks + fin tank).

Fuselage load = pilot + baggage etc. but without waterballast.
All values in kg (l) 1 kg = 2.2046 lbs. 3.785 kg (l) = 1 US gal.

Version DG-808C Classic)

This table is for the max. TOW of 525 kg (15m and 18m wingspan)

empty mass	350	355	360	365	370	375	380	385	390
fuselage load									
70	105	100	95	90	85	80	75	70	65
75	100	95	90	85	80	75	70	65	60
80	95	90	85	80	75	70	65	60	55
85	90	85	80	75	70	65	60	55	50
90	85	80	75	70	65	60	55	50	45
95	80	75	70	65	60	55	50	45	40
100	75	70	65	60	55	50	45	40	35
105	70	65	60	55	50	45	40	35	30
110	65	60	55	50	45	40	35	30	25
115	60	55	50	45	40	35	30	25	20
120	55	50	45	40	35	30	25	20	15
125	50	45	40	35	30	25	20	15	10
130	45	40	35	30	25	20	15	10	5

Version DG-808C Competition)

This table is for the max. TOW of 540 kg (15m wingspan)

empty mass	350	355	360	365	370	375	380	385	390
fuselage load									
70	120	115	110	105	100	95	90	85	80
75	115	110	105	100	95	90	85	80	75
80	110	105	100	95	90	85	80	75	70
85	105	100	95	90	85	80	75	70	65
90	100	95	90	85	80	75	70	65	60
95	95	90	85	80	75	70	65	60	55
100	90	85	80	75	70	65	60	55	50
105	85	80	75	70	65	60	55	50	45
110	80	75	70	65	60	55	50	45	40
115	75	70	65	60	55	50	45	40	35
120	70	65	60	55	50	45	40	35	30
125	65	60	55	50	45	40	35	30	25
130	60	55	50	45	40	35	30	25	20

This table is for the max. TOW of 600 kg (18m wingspan)

empty mass	355	360	365	370	375	380	385	390	395
fuselage load									
70	175	170	165	160	155	150	145	140	135
75	170	165	160	155	150	145	140	135	130
80	165	160	155	150	145	140	135	130	125
85	160	155	150	145	140	135	130	125	120
90	155	150	145	140	135	130	125	120	115
95	150	145	140	135	130	125	120	115	110
100	145	140	135	130	125	120	115	110	105
105	140	135	130	125	120	115	110	105	100
110	135	130	125	120	115	110	105	100	95
115	130	125	120	115	110	105	100	95	90
120	125	120	115	110	105	100	95	90	85
125	120	115	110	105	100	95	90	85	80
130	115	110	105	100	95	90	85	80	75

6.8.9 Ballast chart for the fin ballast tank (only version DG-808C Competition)

To determine the max. allowable waterballast in the fin tank or in the fuselage tanks.
All values in kg (l)
1 kg = 2.2046 lbs.
3.785 kg (l) = 1 US gal.

wingtanks	fin-tank	total ballast
20	0,9	21
40	1,8	42
60	2,7	63
80	3,6	84
100	4,5	105
120	5,4	125
130	5,9	136
150	6,5	157

Note: The values for “total ballast“ must not exceed the total ballast determined from section 6.8.8.
Note: The fin waterballast determined from these charts compensates approx. 90 % of the C.G. shift due to the wing ballast, which will insure that in case of leaking wing tanks the rear in-flight C.G. is kept in the limits.

6.9 C.G. calculation

The actual C.G. can be determined as follows:
For each item, the moment mass x C.G. has to be determined and to be added up and divided by the total mass (see the following example).

1 kg = 2.2046 lbs. = .264 US gal. water 0.305 m = 1 ft

Item	mass [kg]	C.G. behind Datum [m]	Moment [m×kg]
Aircraft empty	360	0,56	201,6
Pilot	78	-0,55	-42,9
Waterballast in the wings	70	0,174	12,18
Water in the fin tank	4	4,55	18,2
Total:	**512**	**0,369**	**189,08**
		(X_S = Moment/Mass)	

The limits of the in-flight C.G 0,238m - 0,383m should not be exceeded!

The most important C.G. positions (behind datum):
Pilot: The C.G. position is dependent on the pilots shape, mass and thickness of the parachute. The pilot C.G. position can be determined by executing a weight and balance measurement with glider empty and equipped with the pilot etc. (see maintenance manual section 5).
Please note that the distance “a” has to be measured with both configurations, as it may change due to deflection of the landing gear.

The pilot C.G. can be determined by the following equation:

$$X_P = (X_{SF} * M_F - X_{SE} * M_E)/M_P$$

M_F = flight mass
X_{SF} = flight C.G
M_P = pilot mass
M_E = empty mass X_{SE} = empty C.G.

1 kg = 2.2046 lbs., 0.305 m = 1 ft

If the actual pilot C.G. is not known, you have to take the values from the following table:

Pilot mass [kg]	Pilot C.G. [m]	
	flight near the forward C.G.	Flight near the aft C.G.
110	-0,582	-0,533
105	-0,583	-0,535
100	-0,584	-0,537
95	-0,585	-0,539
90	-0,586	-0,541
85	-0,587	-0,543
80	-0,588	-0,546
75	-0,589	-0,548
70	-0,590	-0,550
65	-0,591	-0,552
60	-0,592	-0,554
55	-0,593	-0,556

Further C.G. positions:

Baggage and battery in baggage compartment	0,171 m
Instruments	-1,070 m
removable ballast (Option, see section 7.17.1a)	-1,743 m
Waterballast in the wings	0,174 m
Fin ballast tank (see section 6.8.5)	4,400 m
Tail wheel	4,510 m
Batteries in the cockpit, front position	-1,402 m
Batteries in the cockpit, rear position	-1,180 m
Powerplant (see section 4.6)	1.120 m
Fuel tank	0,335 m

C.G. Shift due to extension of the engine

XS2 = XS1 – 6.5/W

W = total mass (kg)
XS2 = C.G. position with engine extended (m)
XS1 = C.G. position with engine retracted (m)

7 Sailplane and systems description

7.1 Introduction

This section provides description and operating of the sailplane and its systems.

M.M. = Maintenance manual

Refer to section 9 "Supplements" for details of optional systems and equipment.

7.2 Airframe

The DG-808C is a single-seater high performance motorglider with 18 m wing span.
As an option wings can be equipped with a parting device at y = 7.25 m, and with winglets for flying with 15 m span.
Winglets for 18 m span are optional equipment.

Construction

Wings	CFRP-foam-sandwich-shell with CFRP-roving spar caps
Flaperons	CFRP-skin
Rudder	GFRP-foam sandwich-shell
Horizontal stabilizer	CFRP-AFRP hybrid skin
Elevator	GFRP-skin
Fuselage	CFRP-AFRP-hybrid skin

Canopy

Large single piece canopy, hinged at the nose, supported by a gas strut. Canopy transparency made from Plexiglas GS 241 clear or light green GS 2942 as option.

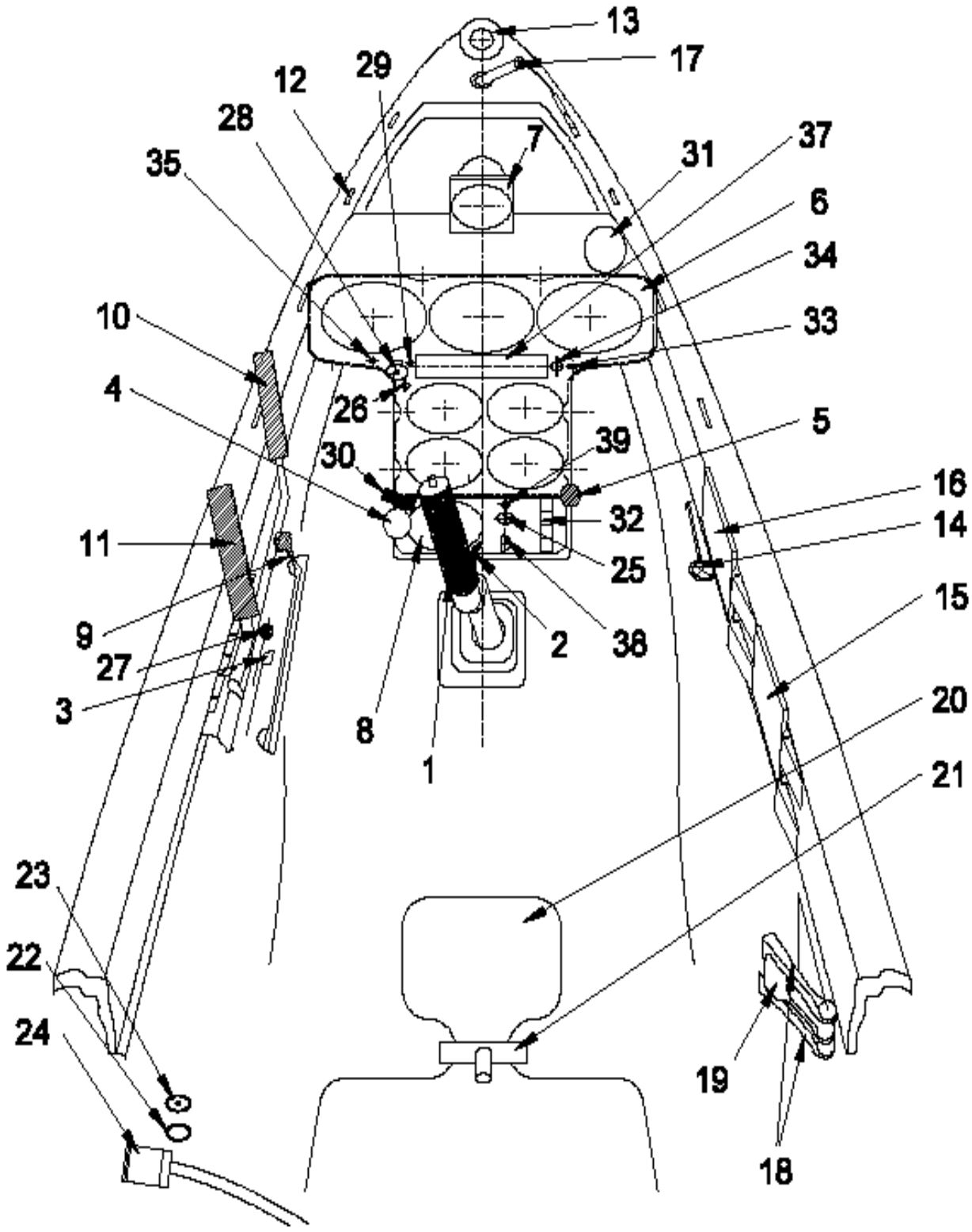
Tailplane

T-Tail with conventional stabilizer-elevator and spring trim.

Colours

Airframe:	white		
registration numbers:	grey	RAL 7001	(Pantone 444)
or	red	RAL 3020	(Pantone 485)
or	blue	RAL 5010	(Pantone 301)
or	blue	RAL 5012	(Pantone 307)
or	green	RAL 6001	(Pantone 349)
or	similar colours		

7.3 Cockpit, cockpit controls and placards



1) Control column - Parallelogram type

2) Release lever for the trim mechanism - green
   Operation see section 7.5 elevator control

3) Trim position indicator and trim preselection lever

4) Tow release knob - yellow 

5) Rudder pedal adjustment knob – black 

   By pulling on the knob, the locking pin will be disengaged and the rudder pedals can be pulled back towards the pilot or pushed forward away from the pilot.

6) Instrument panel
   After removing the side screws at the base 2 x M6 and after removing the screws attaching the cover to the panel 4 x M4, the cover can be removed towards the front. The panel remains in the aircraft.

7) Compass installation position

8) Radio installation position

9) Undercarriage retraction - extension handle - black

   back = retracted,
   front = extended,

   The undercarriage is locked in the extended position by an overcentre locking arrangement and an additional safety catch at the handle. The handle is to be turned toward the cockpit wall, so that the locking catch will engage.

10) Airbrake handle - blue

The wheel brake is operated at the end of the airbrake handle travel and the flaps will be moved from negative to neutral.

Parking brake combined with an airbrake securing device (Piggott-hook): Pull the airbrake handle back to actuate the wheelbrake and rotate the handle to the cockpit wall. A detent will engage in one of 4 notches to hold the system in this position.

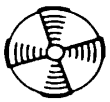
In case the airbrakes mistakenly haven't been locked, a detent engages in one of several notches to avoid inadvertent deployment of the airbrakes. To open and to close the airbrakes the operating handle must be rotated into the cockpit so far that the detent passes the notches.

11) Wing flap handle – black

12) Constantly open de-misting air vents

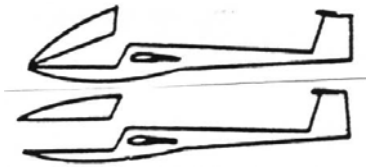
13) Main air vent

14) Main air vent operating knob
pushed to front = closed
pulled = open



15) Canopy opening handle - white
towards the nose = closed
into cockpit = open

16) Canopy emergency release handle - red
towards the nose = closed
into cockpit = open



17) Locking mechanism for the canopy emergency release towards the front – locked.

For 15, 16, 17 please also refer to section 7.12.

18) Water ballast dump handles - silver
upper handle = right wingtank
lower handle = left wingtank
forward = valve closed
into the cockpit = valve open.

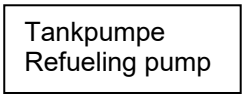
19) Fin waterballast dump lever
Rotate backward to dump. The wing waterballast can only be dumped after dumping the fin waterballast.

20) Head rest.
The head rest is integrated into the back rest to take up the rebound forces of the pilots head in the case of a crash landing.
Warning: If the DG-808C is to be flown without back rest, a separate headrest (Option) must be installed.

21) Back rest adjustment
Pull out the securing knob (located in the baggage compartment) to adjust the backrest support..

22) 12 V socket at the main bulkhead. Only live with main switch in first position for charging the batteries, with main switch in second position electric power will be supplied, charging is possible too.

23) Push button for refuelling pump



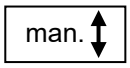
Press the push button to start the pumping.
As soon as the fuselage tank is full a built in device automatically switches off the pump. If you want to interrupt or to stop the filling procedure before the tank is full press again the push button.

24) Filler hose for the fuel tank with hose coupling. Refuelling see section 4.2.3.

25) Main switch (key switch)

Turn anticlockwise: off,
Turn clockwise first position: In this position the 12V socket is live for charging the battery-
Turn clockwise second position: on
With this main switch the complete electric power supply will be cut off. After taking out the main switch key the motorglider can't be operated.

26) Manual retraction – extension switch for the powerplant



Any operation of this switch switches off the automatic extension-retraction system. Operation of the ignition switch reactivates the automatic system.
up = extension down = retraction.
Hold the switch until the extension procedure stops.

Note: Extend the engine manually on the ground prior to take-off or for maintenance work.
Manual retraction only to be used in the air if the automatics don't work. Make sure that the propeller is vertical.

27) Fuel cock – red
to the front = open
to the rear = closed
Close the fuel cock only in an emergency (see chapter 3)

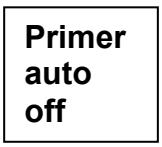
28) Throttle handle with integrated starter button
The starter button is only activated when the engine is extended and the ignition switch is in the "on" position.

With the engine running the starter motor will be blocked automatically.

Aligning the propeller for retraction with the starter button

If, after stopping, the propeller is not in the retraction position, it is possible to turn the propeller slowly with the starter motor into retraction position by pressing the starter button (ignition switched off). The starter motor speed is reduced by electronic means during this procedure. This procedure should not be used on the ground so as not to unnecessarily stress the starter motor.

29) **Primer switch**
up = automatic operation
down = off (no injection)
(see also set. 4.5.1.2)



30) Manual propeller-brake (grey) **Propeller-brake**

Optional automatic propeller brake:
After switching off the ignition the automatic brake will slow down the propeller speed. The braking procedure starts as soon as the engine speed is below 3.000 RPM. The braking is continuous until the propeller is stopped. Then the brake opens again and the propeller must be positioned vertical by the airstream or with the starter motor (ignition off see item 28). As soon as the propeller is in the correct position (control light 43 off) the brake engages and holds the propeller until the engine is retracted.

31) Rear view mirror to watch the propeller during aligning procedure

32) Circuit breakers

Circuit breaker for the electric variometer	2A
Circuit breaker for the radio	3A
Circuit breaker spare	3A
Circuit breaker spare	3A

Note: Further fuses are located in the control unit. Those are re-settable fuses.

33) **Fire warning light** red **Fire**
The probe for the warning light is located near the carburettors at the engine bay wall. In case of a fire the light will shine if a temperature of appr. 140° C (284° F) is exceeded.
Self-test-function:. When switching on the main switch, the fire warning light will flash once.

34) Change over switch from static pressure to total energy pressure for the variometer (Option).
up **stat** = Varimeters operating on static pressure= for powered flight
down **T E** = Variometers operating on total energy probe= soaring flight

35) Press button to test the second fuel pump with the engine running at full throttle.
Pressing this button, you are switching off the first pump.

fuel pump test

36) Wing fuel tanks with electromagnetic valves **(Option)**
The operating switch and the indication light are installed in the instrument panel at a suitable location. The switch is locked in all positions (operation similar to the ignition switch).
Centre position= off, to the left= left tank, to the right= right tank.
In addition an amber LED flashes if a valve is open. By this signal the pilot will be reminded to close the valve to save electric power.

37) DEI-NT with integrated ignition switch and ignition circuit test switch
Switching up the ignition switch (the toggle has to be pulled out for switching). raises the powerplant to its operating position automatically.
Switching off the ignition: As soon as the propeller stops turning, the powerplant will be automatically retracted a little (intermediate position).
You may turn the propeller into the position for retraction (ignition switched off) by pressing the starter button.

a) without BBSA slipping centrifugal clutch: As soon as the propeller is in the position for retraction the electrical propeller brake (Option) engages or you have to pull on the manual brake. The powerplant will retract by itself.
b) with BBSA slipping centrifugal clutch **(Option):** When the powerplant is retracted into the intermediate position the propeller stopper moves forward in the propeller circle. As soon as the propeller is in the position for retraction (close to the stopper) the engine will retract by itself.

Ignition circuit test switch:

Switch in centre	**I+II**	=	both ignition circuit activated
Switch to the left	**I**	=	1. ignition circuit activated
Switch to the right	**II**	=	2. ignition circuit activated

The switch is spring loaded such that it will always return to the centre position (**I + II**).

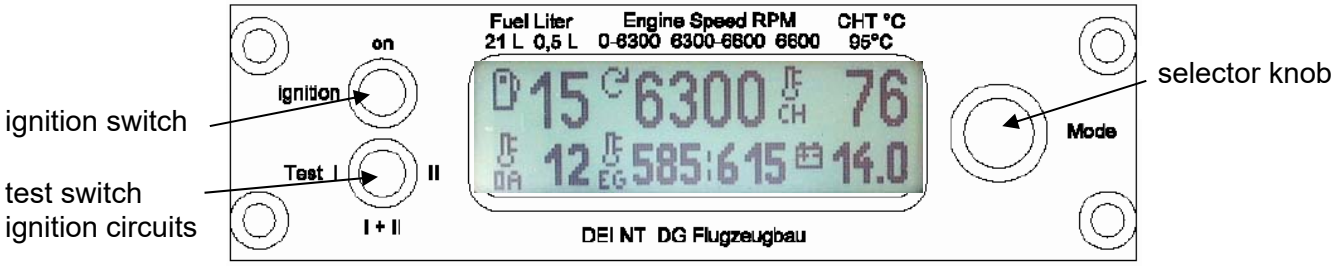
Description of the DEI-NT see section 7.4.

38) Socket for data download from the DEI-NT

39) Selector switch for additional battery (Option),
up = internal battery
centre position = off
down = additional battery
Preferably the gliding computers and loggers shall be connected to this switch.

intern off extern

7.4 DEI-NT Operation



After turning on the main switch the DEI-NT shows a screen with operating times. Then the screen changes to the gliding screen (powerplant retracted) or to the powered flight screen (powerplant not retracted).
You may change to other screens by pushing the selector knob (right hand side) until the DEI_NT beeps twice.
The following screens may be selected:
1. Gliding or powered flight (according to powerplant position),
2. Flight log, 3. Set up, 4. Operating times

Caution: In case of powerplant failures and if warnings are necessary full screen messages are displayed. All messages may be verified by a short push to the selector knob, the DEI-NT changes back to the normal screen.
With software versions below 1.5 the stall can't be verified), only increase of airspeed can eliminate the warning message.
3 short alarm-signals (horn or the optional stick vibrator) will draw the pilots attention to the message, except for the stall warning where the signal is uninterrupted as long as the flight speed is too slow.

Description of the screens:

7.4.1 Gliding and powered flight screens

Upper left: Fuel level: If the fuel level falls short of approx. 4 litres the message "Low Fuel" will be displayed, after verifying this message the fuel level display is blinking, when reaching the amount of non useable fuel (0,5 litres) "R" starts blinking.

Lower left: Outside air temperature OA(T): When the OAT falls below 2°C the message "Water Freeze" will be displayed, after verifying this message the OAT display starts blinking.

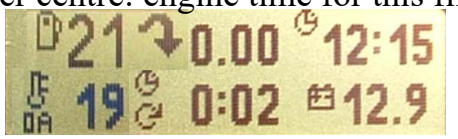
Lower right: Battery voltage: Below a voltage of 11V the message "Low battery" will be displayed, after verifying this message the voltage display starts blinking. Above a voltage of 14,7 V the message "Battery Overch." will be displayed, after verifying this message the voltage display starts blinking.

7.4.1. a) Gliding screen

Upper centre: Stall factor, see set up menu.

Upper right: Time, instead of the time the CHT, will be displayed as long as the CHT is above 50°C.

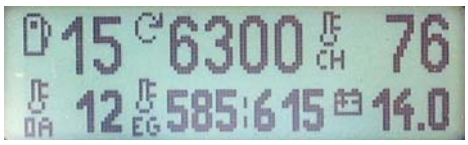
Lower centre: engine time for this flight

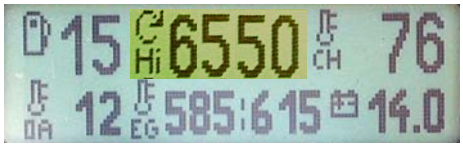


7.4.1. b) Powered flight screen

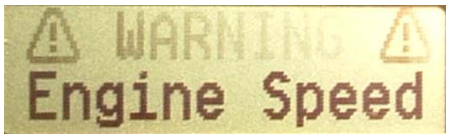
Centre:

c) With the engine running the engine RPM will be displayed in the upper half. When exceeding the max. continuous engine speed “Hi“ will be displayed and is blinking at the left hand side of the RPM display..



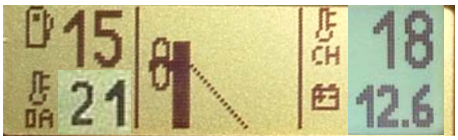


When exceeding the max. engine RPM the message "Engine Speed" will be displayed, the “Warning“ symbol is blinking, after verifying this message the RPM display is blinking.



In the lower half the values of the EGT sensors (Option) will be displayed instead of the engine time.

b) As long as the engine is not running symbols showing the position of the powerplant will be displayed. If the powerplant is moving, in addition an arrow will be displayed showing if the powerplant is being retracted or extended (not when moving the powerplant via the manual switch). As soon as the powerplant is completely retracted the screen changes to the gliding screen. . In case the propeller is not in the position for retraction a short propeller side view) will be displayed. In position for retraction a long propeller will be displayed.



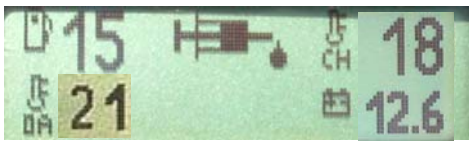
powerplant extended

propeller not in position for retraction propeller in position for retraction

powerplant in intermediate position (propeller stopper extended with optional BBSA clutch)

propeller not in position for retraction propeller in position for retraction

c) When starting the engine a syringe symbol will be displayed (primer switch on auto position) whilst the primer valve is open.



If the engine will not accelerate when increasing throttle you may press the starter button again to activate the primer again. The syringe symbol will be displayed again.

d) When moving the powerplant via the manual switch, a hand symbol will be displayed showing that the automatic extension-retraction function is deactivated. Operating the ignition switch will reactivate the automatic extension-retraction function. The hand will disappear.

Upper right: CH(T): Cylinder head temperature, above the max. approved CHT the message "CHT OverTemp " will be displayed, after verifying this message the CHT display is blinking.

Further messages (Failure messages and warning messages) see section 5.

7.4.2 Flight log

The following data will be displayed:
Date, take-off time, landing time, engine time of this flight.
With the selector knob you may choose a flight, by a short push to the selector knob further data for this flight will be displayed: flight duration, max. engine RPM, max. CHT, max. EGT (if sensors are installed).

7.4.3 Set up screen (menu)

On this screen 4 lines are displayed at a time, one of them is displayed negative and may be edited. Choose the line which is to be edited via the selector knob
Editing values: Push the selector knob,
the DEI-NT will beep once and the first value which may be edited will be displayed positive and may be altered via the selector knob. Push the selector knob to confirm this value and you get to the next value.

The following lines will be displayed:

RESET TRIP COUNTER: Push the selector knob, N (no) will be displayed, rotate the selector knob Y (yes) will be displayed, push the selector knob to reset the time to zero.

RESET MAINT. TIMER: Push the selector knob, N (no) will be displayed, rotate the selector knob Y (yes) will be displayed, push the selector knob to reset the time to the service-interval (25 hours).

FLIGHTLOG → PC: Push the selector knob, N (no) will be displayed, rotate the selector knob Y (yes) will be displayed, push the selector knob to start the download of the recorded data. The PC must be connected to the serial interface (socket close to the radio). You will download the flight log and service data (see section 7.4.6).

SET TIME: Set up time

SET DATE: Set up date

STARTER SPEED: % of the normal starter motor power to turn the propeller into the position for retraction (ignition switched off) – standard value 35%, adjustable between 0-49%.

PRIMER DOSE: % of the max. amount of fuel injected by the primer, max. 99% - standard value 99%.
(With 0°CHT. the adjusted amount of fuel will be injected. The amount of fuel will be reduced linearly to 0 at 40° CHT).

PRIMER DURATION: Post starting injection of the primer, max. 99% of the time programmed in the control unit (40 seconds), standard value 99%

STALL FACTOR: With this factor the start of the stall warning will be set (warning via a horn or via a vibrator at the control stick (Option)). Adjustment may be made by flying level (with flap setting +8°) and gently stalling the glider to determine the stalling speed, then fly approx. 5% faster, note the displayed stall factor (upper centre display) and change the factor in the set up menu to this value. You have to make the adjustment for one flight mass only. The sensors for the stall warning make a quasi angle of attack measurement and thus the stall warning will work in other operating conditions too (different wing loading, turning flight, airbrakes extended etc.).

CAUTION: If the stall factor is set to 0.89 the stall warning is switched off completely. This setting is only allowed to eliminate a permanent stall warning in case a sensor fails. Send the DEI for repair to the manufacturer as soon as possible. This feature is only available with software Version 1.5 and higher.

EMPTY TANK CALIB.(ration): Calibration of the fuel gauge with empty tank. Push the selector knob, N will be displayed, rotate the selector knob, Y will be displayed. Push the selector knob to execute the calibration.

FULL TANK CALIB.(ration): Calibration of the fuel gauge with full tank. Push the selector knob, N will be displayed, rotate the selector knob, Y will be displayed. Push the selector knob to execute the calibration.

SYSTEM SETUP ****: Only for service by the manufacturer.
PROP BRAKE: Activation of the electrical propeller brake (Option). Push the selector knob, N will be displayed, rotate the selector knob, Y will be displayed, the propeller brake is activated. Rotate the selector knob N will be displayed, the propeller brake is deactivated. Push the selector knob to save this adjustment.
Note: If no electrical propeller brake is installed this function must be deactivated, otherwise failure messages will be displayed.
FREEZE WARNING: Activation or deactivation of the warning message. Adjustment similar to Prop Brake. You may deactivate this warning in case no watertanks are installed. When deactivated the OAT screen will still blink at low temperatures.
JOINT WARNING OUTP: Activation or deactivation of the signals (horn or the optional stick vibrator) to draw the pilots attention to the messages. Adjustment similar to Prop Brake.
Note: The signal for the stall warning will not be deactivated.
PRIMERTESTMODE: When you activate this mode the starter motor will be deactivated to enable testing the primer function (see maintenance manual section 3.5.1 item 6.b)). Adjustment similar to Prop Brake.
SWITCH-OFF WARNING: Activation or deactivation of the reminder to switch off the main switch. Adjustment similar to Prop Brake (from software version 1.7 on).

7.4.4 Operating times

ENGINE TRIP: Trip counter for the engine time, reset in the Setup menu.
ENGINE TOTAL: Engine elapsed time counter, reset only by the manufacturer.
NEXT MAINTENAN.(ce) : The engine time until the next maintenance, reset in the Setup menu after completion of the 25 hour maintenance.
DEI Vx.x E-BOX Vx.x: Software versions of DEI-NT and control unit

Push the selector knob until the DEI-NT beeps twice to return to the flight screen.

7.4.5 Display of powerplant failures and warnings

In case of powerplant failures and if warnings are necessary full screen messages are displayed. All messages may be verified by a short push of the selector knob, the DEI-NT changes back to the normal screen.

Powerplant failures:

Upper line displays "Failure" and is blinking, 2. line displays:

- "Engine Info" = no data transfer between DEI-NT and control unit
- "Spindle Fuse" = the fuse for the spindle drive is blown → wait until it cools down and resets
- "RPM Pickup" = proximity switch defective → automatic extension-retraction will be switched off
- "Primer Valve" = Primer-valve defective
- "OAT Sensor" = Outside air temperature sensor defective
- "CHT Sensor" = Cylinder head temperature sensor defective
- "Fuel Sensor" = Condensator type probe in the tank (not the full tank sensor) defective
- "Generator" = Generator not charging
- "Water Pump" = coolant pump not working

Note: When installing a coolant pump type Pierburg 7.02058.50.0 this failure message must be deactivated in the DEI-NT (by the manufacturer).

- "Prop Brake" = Short circuit or interrupted connection to the motors for the propellerbrake (Option)
- "EGT Sensor" = EGT sensor (Option) defective

Warning messages:

Upper line displays "Warning " and is blinking, 2. line displays:

- "Spoiler" = airbrakes not locked, this warning is displayed only prior to and during take-off and will not be displayed when airbrakes are unlocked during the flight
- "Raise Gear" = Landing gear should be retracted, appears 4 minutes after take-off in case the landing gear is still extended
- "Landg. Gear " = Landing gear warning when airbrakes are unlocked and the landing gear is still retracted
- "Stall" = Stall warning appears simultaneously with the acoustically or tactile stall warning.
- "Low Battery" = Battery voltage permanently below 11 V
- "Battery Overch." = Battery voltage permanently above 14,7 V
- "CBox OvrTemp" = Starter motor control in control unit above temperature limit
- "CHT OverTemp" = CHT above max. certified value
- "Water Freeze" = OAT below +2°C
- "Low Fuel" = low fuel level

- "Engine Speed" = Engine RPM above max. certified value.
- "Main Switch" = Reminder to switch off the main switch (from software version 1.7 on).

- "Starter Run" = Starter motor didn't disengage and produces electric power, stop the engine as soon as safety altitude is reached to prevent damage of the electrical system, This message can't be deleted by pushing the selector knob.
- "EGT OverTemp" = EGT above max. certified value (only with optionally installed EGT sensors)

Explanation for failure messages
Spindle Fuse:
The re-settable fuse for the spindle drive may be blown in the following cases:
a) The propeller hub hooks during extension at the engine doors.
b) The limit switch in position engine extended or retracted is not operated.
As soon as the fuse is blown the Control Unit changes to manual extension-retraction mode and thus cuts off the electric power to the spindle drive and reports the failure to the DEI-NT.
After the cool-down time (approx. 10 sec.) the message disappears and the symbol for manual operation (hand) will be displayed on the screen.
You may reactivate the automatic operation by operating the ignition switch, even during the cool-down time.
Case a) Retract the powerplant again manually, then try to extend the engine again.
Case b) Retract the engine manually a little and then try to extend the powerplant manually up to its operating position.

7. FLIGHTLOG → PC:
The following data may be downloaded:
Date, take-off time, landing time, flight duration, engine time, max. engine RPM, max. CHT, max. EGT (if sensors are installed) of each flight.
The duration of the max. values of engine speed, CHT and EGT (if installed) have been over the limits.
Failure of the CAN interface (data transfer from DEI-NT to control unit).
Resets of the DEI-NT.
Coolant pump: short circuit or interrupted connection.
Over limit temperature of the control unit (hint for defects).
Electric propeller brake (if installed): driver failure.
Generator failure
All messages and their confirmation.

Download instruction can be found in the amendment to the maintenance manual.

7.5 Flight controls

Rudder control

See diagram 2 MM
Cable system with adjustable pedals.

Elevator control:

See diagram 1 M.M.
Parallelogram control column stick. The parallelogram system reduces the possibility of pilot induced oscillations.
All pushrods slide in maintenance free nylon ball guides.
Automatic control hook up system.

Trim:

Spring trimmer with release lever at the control stick and position indicator at the left cockpit wall.
To trim, you have to operate the release lever and bring the control stick and the wing flap handle to the appropriate position for the desired trim speed.
If this is not enough, you can in addition push forward the trim indicator (release lever operated).
It is possible to fly the DG-808C with the trim released. A rubber cord connects the wingflap control with the trim system (see maintenance manual section 1.2.5) and applies forward trim with negative flap settings.

Aileron and wingflap control

See diagram 3 and 4 MM.
The wings feature single piece flaperons which are driven at two places.
The mixing of aileron and flap deflections takes place in the fuselage. Pushrods slide in maintenance free nylon ball guides.
Automatic control hook up system.

7.6 Airbrakes

See diagram 3 and 4 MM.
Double storey Schempp-Hirth type airbrakes on the upper wing surface.
When operating the airbrakes the wingflaps will be moved from negative to neutral position.

The wheel brake is operated by the airbrake system.

Pushrods in the wings slide in maintenance free nylon ball guides. Automatic control hook up system.

7.7 Landing gear

see diagram 15 and 16 MM.

d) Main wheel:
retractable, assisted by a gas strut, spring mounted, fully sealed landing gear box, internal drum brake (disc brake optionally),
Tyre 5.00 - 5 4 PR or 6 PR, Diameter 362 mm (14.25 in)
Tyre pressure 3 bar (44 psi)

e) Tailwheel:
Tyre 200 x 50 2 PR, Diameter 200 mm (7.87 in)
Tyre pressure 2 bar (29 psi)
With plastic hub (brass hub not permitted)

7.8 Tow hooks

see diagram 5 MM.
"Safety release G 88" for winch- and aerotow installed near the C.G..
additional as option "nose release E 85" installed under the instrument console, only for aerotow.
Both hooks are operated by the same handle.
Warning: If no C.G. hook is installed, winch launching is not permitted with this glider.

7.9 Seats and safety harness

The seat is constructed as an integral inner shell. The backrest is adjustable by means of an aircushion (Adjustment see section 7.3 item 21). The backrest can be screwed to the seat shell at 3 different positions dependent on the thickness of the parachute.
The head rest is integrated in the back rest to take up the rebound forces of the pilots head in the case of a crash landing.
Warning: If the DG-808C is to be flown without back rest, a separate neckrest (Option) must be installed.
As safety harness only symmetric 4-point harnesses fixed at the given fixing points are allowed.

7.10 Baggage compartment

Max. load 15 kg (33 lbs.).
Heavy pieces of baggage must be secured to the baggage compartment floor.
The max. mass secured on one half of the floor (left and right of fuselage centre line) should not exceed 7.5 kg (16.5 lbs.).

7.11 Waterballast system

see diagram 5 MM.

a) The wingtanks are constructed as double wall bags with a capacity of 60 l (15.85 U.S.gal) or 87 l (23 U.S. gal) per wing. The 87 l tanks are separated in 2 chambers to reduce the pressure load in case of spinning and positive g-loads. The separation also improves the handling of the glider with the tanks filled partly. The dump valves are mounted in the wings and the controls are hooked up automatically when rigging the glider.

b) Fin ballast tank with 6.5 l (1.72 U.S.gal.) capacity. This tank is constructed as integral tank with a ventilation tube. Filling is via the dump valve. The dump valve is opened by a cable and closed by a steel spring. If you overfill the tank, the excess water drains via a hole in the rear fin shear web.

c) Control handles
The handle for the fintank (wide plate) is above the wingtank handles, so that the wingtanks can only be emptied after opening the fintank.

Warning: It is prohibited to change this system!
The handle for the fintank will stay in the open position by an overcentre device. The upper handle is for the right and the lower handle for the left wingtank.

7.12 Powerplant

7.12.1 Engine

Engine manufacturer:	Solo Kleinmotoren Sindelfingen/Maichingen Germany
Engine model:	SOLO 2 625 01 2 cylinder liquid cooled two stroke engine with dual ignition
Maximum power:	Take off: 39 kW (53 PS) continuous: 39 kW (53 PS)

7.12.2 Propeller

Diameter 1.52 m (4.99 ft)

Manufacturer:	Technoflug Schramberg, Germany
Model:	KS-1G-152-R-122-( )-B

7.12.3 Extension - retraction mechanism

Electric spindle drive assisted by a gas-strut.
The opening and closing of the engine bay doors is automatic.

7.13 Fuel system

7.13.1 Fuselage tank

21 l (5.55 US gal.) (useable amount of fuel)
A condensator type probe is installed in the tank to allow an indication which is almost independent from the pitch angle.
A switch located at the lower end of the tank filler cuts off the electric power for the electric refuelling pump as soon as the tank is full.

7.13.2 Fuel pump

Electric pump, controlled via the ignition switch, installed on the fuselage floor.
In line to the pump described above a second electric pump is installed. This pump receives it's electric power directly from the generator and operates only with engine running.

7.13.3 Wing tanks (Option)

Bags with approx. 10 l (2.6 US gal.) volume. without a ventilation line.

7.13.4 Coolant pump

Electric pump controlled via the ignition switch, installed at the fire wall in the front left edge of the engine bay.

Note for 7.13.2 and 7.13.4: The first fuel pump and the coolant pump receive their electric power from the batteries. In addition both fuel pumps and the coolant pump receive electric power directly from the engine generator. So with a failure of the electric system, the engine can still continue to run.

7.14 Electrical system

- Four separate batteries are provided, each rated at 6 V/12 Ah. The two sets are wired up in parallel to provide 12 V/24 Ah. The two 12 Volt sets are connected by fuses to prevent discharge of both sets due to a failure or electrical fault.
- Battery charging by a generator which is installed in the engine.
- Recharging the batteries with an automatic battery charger is possible via the 12 V socket in the main bulkhead. Therefore the master switch must be in the first "charging" position. Removing the batteries from the glider is not necessary.

Warning: Use only automatic chargers designed to charge sealed lead acid batteries. To charge the battery to its full capacity a charger with 14.4 V max. charging voltage is necessary (normal automatic chargers charge only up to 13.8 V). Such a charger is available from DG Flugzeugbau code no. Z 08.

- The DEI-NT (digital engine indicator) and its control unit control all automatic and safety functions. The DEI-NT displays the engine indications on digital displays. The control unit incorporates the master switch, the starter relay, extension- retraction relays, the regulator and fuses.
- All current - carrying wiring conforms to aeronautical specifications.

7.15 Pitot and static system

see diagram 6 M.M.
Pitot probe in fuselage nose, static ports a short distance behind fuselage nose.
The airspeed indicator is to be connected to these ports and probe.
Probe (PC) for the stall warning device below the fuselage nose.
Second set of static ports near the instrument panel for variometer or flight computer systems.
The altimeter is to be connected to one of these sets of static ports.
Additional holder for a TE-probe or a Multiprobe in the fin is to operate variometer and flight computer systems.
To preserve the sealings inside the holder, the end of the probe should be greased with e.g. Vaseline from time to time.

7.16 Canopy emergency release

For emergency release only the red handle at the canopy is to be operated. By this action the canopy opening lever will also be operated and a hook at the rear canopy lock will be rotated underneath the fuselage part of the canopy frame. Because of the hook, in case of emergency release, the canopy will rotate around this point and will leave the fuselage in a safe and fast way. A spring will open the canopy at the nose far enough to be blown away by the oncoming air.

Checking the emergency release on the ground:

Pull the emergency release knob, the canopy should spring open at the nose min. 6 cm (2.4 in.).

Reinstalling the canopy:

Pull the canopy hinge into the open position. Reinstall the emergency release spring. Two people are required to hold the canopy - one at the nose, the other at the rear. The emergency release locking mechanism should be in the open position. Place the canopy on the hinge and press down. Relocate the locking mechanism. Push the hook forwards at the rear canopy lock until it snaps in.

7.17 Miscellaneous equipment (Options)

7.17.1 Removable Ballast in the fuselage nose (Option)

Up to three lead ballast weights part No. Z11/1 up to Z11/3 each 2.25 kg (4.96 lbs.) can be fixed at the M6 inserts in front of the rudder pedals.
Each weight compensates a pilot mass of 5 kg (11 lbs.). The lead ballast weights are to be fixed with bolts M6 which must be min. 10 mm (.4 in.) and max. 35 mm (1.4 in.) longer than the thickness of the ballast weights.

7.17.2 Oxygen system

Oxygen bottle installation

Max. size of oxygen bottle is 4 l capacity with diameter 100 mm (3.94 in.). The bottle must be fixed at its neck with a bracket part No. Z14.

Installation of the oxygen equipment

To ensure a safe installation ask for an installation instruction.
For the installation of the Dräger Höhenatmer E 20088 you will find an installation plan 6EP27 in the maintenance manual.

7.17.3 ELT Emergency Locator Transmitter

To ensure a safe installation ask DG Flugzeugbau for an installation instruction.
For the ELT ACK you will find an installation plan 8EP38 in the maintenance manual.
Installation of 406 MHZ ELTs: The installation must be performed according to TN DG-G-08. Only the ELT types given in the TN may be installed.

Caution: Concerning 7.17.2 and 7.17.3
The installation has to be accomplished by the aircraft manufacturer or by an approved service station and to be inspected and entered in the aircraft log book by a licensed inspector.

7.17.4 Battery in baggage compartment with battery selector switch.

An additional battery Z73/4 (sealed lead acid) or Z73/3 (LiFePO) with holder Z72 or Z01/7 (sealed lead acid) or Z01/5 (LiFePO) with holder Z200 may be installed in the baggage compartment. In this case a battery selector switch must be installed in the instrument console.
Switch function:
up = internal battery
centre position = off
down = additional battery
Preferably the gliding computers and loggers shall be connected to this switch.
The battery fuse is installed at the battery, type G250V 5x20 4A fast.
Caution: It is not permissible to operate a LiFePO type battery in an electric circuit together with other batteries. If you want to install more than 1 battery a further selector switch to switch over from 1 battery to the other must be installed at a suitable place in the cockpit.

8 Sailplane handling, care and maintenance

8.1 Introduction

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

8.2 Inspection period, maintenance

The "Instructions for continued airworthiness" (maintenance manual) for the DG-808C have to be followed.
Before each rigging all the connecting pins and bushes should be cleaned and greased. This includes the control connectors.
Once a year all the bearings and hinges should be cleaned and greased.
Follow the greasing programme of the maintenance manual.
Each year the control surface displacements, adjustments and general condition must be checked. (See the maintenance manual).

8.3 Alterations or repairs

It is essential that the responsible airworthiness authority be contacted prior to any alterations on the aeroplane, to ensure that the airworthiness of the sailplane is not impaired.
It is prohibited to execute the alteration without the approval of the airworthiness authority.
The manufacturer will not be liable for the alteration or for damages resulting from changes in the characteristics of the aircraft due to alteration.
So it is strongly recommended to execute no alternatives which are not approved by the aircraft manufacturer.
External loads such as external camera installations are to be regarded as alterations!
Repair instructions can be found in the DG-800B repair manual (also applicable for the DG-808C).
No repairs should be carried out without referring to the manual.

8.4 Tie Down, Parking

Use textile ropes or straps to tie down the wing tips. The fuselage should be tied down just ahead of the fin.

Water ballast can be left in the wings for a few days only, but not when there is the possibility of freezing! On sunny days the cockpit should be closed and covered.

Note: Longer parking with exposure to sun and humidity will cause premature ageing of the external surfaces of your sailplane.

8.5 Transport

It is recommended to carry this valuable sailplane in a factory approved closed trailer.

Approved fitting points:

Inner wing panels:

- Wing spar as close to wing rootrib as possible or a rootrib wing cradle.
- A wing cradle at the taper change.

Horizontal tailplane and outboard wing panel:

- Cradles as desired

Fuselage:

- A felt lined fibreglass nose cap which does not extend over the canopy, secured to floor.
- Fuselage dolly in front of the undercarriage
- Tail wheel-well in trailer floor. Secure fuselage with a belt in front of the fin or hold it down with the trailer top (soft foam in top).

All aircraft structures should not be subject to any unusual loads. With high temperatures that can occur inside trailers, these loads in time can warp any fibre reinforced plastic sailplane.
The trailer should be well ventilated so as to prevent moisture build up which could result in bubbles forming in the gelcoat. A solar powered ventilator is recommended.

8.6 Towing on the ground

a) by towing from the tow hook using a rope with the standard double ring approved for the release
b) by using a tow bar which is fixed at the tail dolly and a wing tip wheel.

The tow bar and wing tip wheel may be ordered through the DG-Flugzeugbau factory.

8.7 Cleaning and Care

Exterior surfaces of the fibre-reinforced plastic parts

The surfaces are coated by a UP-gelcoat or Polyurethane paint (Option). This surface is protected by a hard wax coating which has been applied during production with a rotating disc ("Schwabbel" procedure). Do not remove the wax, because this would lead to shading, swelling and cracking of the surface. In general, the wax coat is very resistant. As soon as the wax coat is damaged or worn, a new coat has to be applied (see maintenance manual section 3.1). If you store your aircraft often outside, this may be necessary every half year!

Hints for care

- Wash the surface only with clean water using a sponge and chamois.
- The adhesive remains of tape may be removed with petroleum ether (pure petroleum spirit) which should be applied and removed immediately, otherwise this may lead to swelling of the gelcoat.
- More stubborn dirt which cannot be removed by washing may be cleaned off with silicone-free, wax containing car polishes (e.g. 1Z Extra, Meguiars in USA).
- Long-term dirt and shading can be removed by applying a new hard wax coat (see maintenance manual section 3.1).
- Never use alcohol, acetone, thinner etc.. Do not use detergents for washing!
- Protect the surface from intense sunlight.
- Protect the aircraft from water and moisture (see sections 8.4 and 8.5).
- Remove water that has entered and allow the aircraft to dry out.
- Never store your wet aircraft in a trailer.

Plexiglas canopy

- Use clean water and a chamois for cleaning.
- Stubborn dirt and small scratches can be removed by use of the "Schwabbel procedure" (see maintenance manual section 3.1).

Metal parts

- The pins and bushes for rigging the aircraft are not surface protected and must be covered with grease at all times.
- The other metal parts, especially the control stick and all handles should occasionally be preserved with metal polishes.

8.8 Power plant trouble shooting

1a) **Extension and retraction doesn't work**
DEI-NT or control unit or wiring defective.

1b) **Automatic retraction doesn't work**
The proximity switch at the upper drive belt pulley is defective.
In case of a short circuit in the switch the DEI-NT displays the failure message “RPM Pickup”.

1c) **Automatic propellerbrake doesn’t work**
Brake pad worn away too far, so that the lever of the brake motor reaches it’s stop. Adjust brake cable or install a new brake pad according to maintenance manual section 1.11.9.
Brake motor doesn’t work: Brake motor or proximity switch defective or DEI-NT or control unit or wiring defective.

2. **Engine starting problems**
Refer to flight manual section 4.5.1.2.

3. **Starter motor doesn't work**
Limit switch at the engine mount (see maintenance manual section 1.14.14) does not work, or DEI-NT or control unit or wiring or starter motor defective.
Emergency procedure see flight manual section 3.12.

4. **Engine doesn't reach ground test RPM**
   A. The most frequent reason is the carburettor needle valve not shutting off completely. Disassemble the needle valve referring to maintenance manual section 1.13.7 item 1. Switch on the ignition so that a jet of fuel comes out of the valve hole to clean the valve seat. Assemble the needle valve again. (The dirt particles may be so small that you won't see them).
   B. Dirt in the main nozzle see maintenance manual section1.13.7 item 2.
   C. Dirt in the fuel filter, replace or clean the filter,
   D. Throttle butterfly valve doesn't open fully. Lubricate the Bowden cable or replace it if bent.
   E. Faulty ignition see item 7.
   F. Fuel lines clogged or kinked. Check fuel flow rate (see maintenance manual section 1.13.3).
   G. If the engine can't be accelerated from idle to full throttle and cleaning the carburettors (see 4 A and B) doesn't help, you should exchange the carburettor membrane and the gaskets.
   H Air intake filter clogged, see MM section 3.5.1 item 8.

5. **Fuel leaks out of the carburettors** see 4 A

6. **Loss of electrical power** see flight manual section 3.11.

7. **Ignition problems**
   No spark:
   on 1 spark plug of one ignition circuit:
   Spark plug, ignition cable or electronic box defective.
   on both spark plugs of one ignition circuit:
   Too low starting RPM; weak battery;
   shorting cable or ignition switch having ground connection;
   electronic box defective: if after interchanging the boxes with the other ignition circuit the trouble appears on the other ignition circuit; if not, armature plate (in the engine) or cables may be defective.
   on any of the spark plugs:
   too low starting RPM.; weak battery;
   shorting cable or ignition switch having ground connection;
   cable defective;
   If after interchanging the boxes with the other ignition circuit one circuit will function again, one electronic box and the armature plate are defective.

8. **Engine becomes too hot**
   Carburettor fuel nozzles clogged
   Fuel lines clogged, Fuel filter dirty
   Cooling system defective, test of the coolant pump (see maintenance manual section 4.16.1).
   Spark plugs defective
   Ignition timing not correct

9. **Sudden power loss at full throttle**
   Check pistons and cylinders for seizing marks (see maintenance manual section 3.5.1 item 12).

10. **Coolant pump and 2. fuel pump running** with ignition switched off (master switch on). If this failure occurs, there is a short in the generator or generator circuit.

9 Supplements

9.1 Introduction

This section contains the appropriate supplements necessary to safely and efficiently operate the sailplane when equipped with various optional systems and equipment not provided with the standard sailplane.

9.2 List of inserted supplements

Date of insertion	Document No.	Title of the inserted supplement
June 2005	9.3, 9.4, 9.5	Emergency bail-out aid NOAH (Option)

9.3 Emergency bail-out aid NOAH

Section 1

Introduction

In the following text the changes to those sections of the flight manual which are affected by the installation of winglets at the 18m wingtips will be given

Brief description

NOAH is a system to facilitate the bail-out from the cockpit in an emergency.
NOAH is a supplementation to the parachute.
NOAH features an airbag similar to a car airbag. The gas which is necessary to inflate the bag is stored in a pressurised gas cylinder. The actuation is by mechanical means via a handle at the right hand side near the control stick.
To actuate NOAH the canopy must be opened or jettisoned first. The system is secured by a metal plate at the actuation unit which is blocked by a GFRP block at the canopy frame.

When the NOAH system is activated the seat harness buckle will be opened prior to the opening of the pressurised gas cylinder. The pilot will be lifted by the airbag so that he can roll himself out of the cockpit.
If NOAH is used together with an automatic parachute, the emergency bail out procedure will be more or less automatic after operation of the NOAH handle.

Note: The NOAH airbag is constructed with a designed porosity so that after filling the gas will stream out slowly. This is to prevent injuries to the pilot if the seat harness buckle is not opened.

Technical data:

Mass of all parts: approx. 4,5 kg
Generation of pressure: nitrogen approx. 200 bar
Filling time: approx. 2 seconds
Design range: pilot mass 110 kg up to 4 g

Section 3

Use of NOAH in case of an emergency bail out:

Note: We recommend strongly the use of an automatic parachute. Only with an automatic parachute will the bail out procedure be nearly automatic and precious time and altitude can be saved.

For the bail out jettison the canopy first, therefore pull the canopy emergency release and if necessary push the canopy upwards.

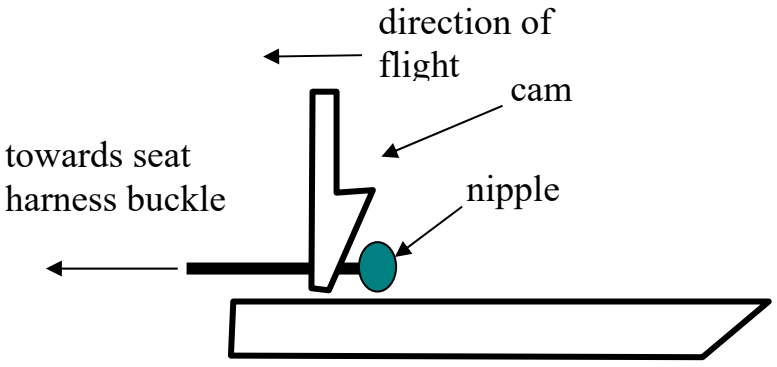
Then pull the NOAH handle (at the right hand side next to the control stick, marked black and yellow) **strongly and quickly** up to its stop.

Roll out of the cockpit to the right hand side if possible, as on the left hand side the airbrake handle may impede the procedure.

Caution: Don't operate the NOAH handle on the ground with open canopy as you may release NOAH and the pressurised gas cylinder must be filled again.

Section 4

a) Pre-flight inspection
Check the airbag, the high pressure hose and the operating cables for correct positioning and for any wear.
Check especially if the nipple of the cable which opens the seat harness buckle is positioned aft of the cam of the actuation unit (see sketch).



detail of the actuation unit
(at the right hand side cockpit wall in front of the main bulkhead)

In case a pressure gauge is installed at the NOAH cylinder (TN DG-G-11 performed): Read the pressure gauge (Underneath the Plexiglas cover at the front of the tube for the oxygen cylinder). If the pressure is lower than 180 bar, the cylinder should be refilled, otherwise you have to expect a too small assistance for bailing out.

b) For normal opening of the seat harness buckle rotate the buckle only in clockwise direction.

Section 7

The NOAH actuation handle is located at the right hand side abeam the control stick, it is marked black and yellow.
A sticker is wrapped around the actuation handle and the guiding tube for the actuation cable. The sticker serves as an additional means to guard against inadvertent operation.

Section 8

For inspections and maintenance please refer to the “manual for the emergency bail out-aid NOAH“.