

Flight manual DG-808C

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.

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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	
"		2.6	"	May 2012	
"		2.7	"		
"		2.8	"	May 2012	
"		2.9	"	May 2012	
"		2.10	"	Sept 2007	
"		2.11	"	Sept 2007	July 2017
"		2.12	"		
"		2.13	"		
"		2.14	"		
3		"	3.1	June 2005	
	"	3.2	"		
	"	3.3	"		
	"	3.4	"	May 2012	
	"	3.5	"		
	"	3.6	"		
	"	3.7	"		
4	"	4.1	June 2005		
	"	4.2	"		
	"	4.3	"		

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Section		Page	issued	replaced/	replaced/	
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	"			
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	"	4.19	"			
	"	4.20	"	May 2012		
	"	4.21	"			
	"	4.22	"	Sept 2007		
	"	4.23	"			
	"	4.24	"	May 2012		
	"	4.25	"	July 2017		
	"	4.26	"	May 2012		
	"	4.27	"	May 2012		
	"	4.28	"			
			4.29		May 2012	July 2017
	5	"	5.1	June 2005		
		"	5.2	"		
"		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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Section	Page	issued	replaced/	replaced/
6	6.1	June 2005		
	6.2	"	May 2012	
	6.3	"		
	6.4	"	May 2012	
	6.5	"		
	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	"		
	7.6	"		
	7.7	"		
	7.8	"		
	7.9	"	May 2012	
	7.10	"	Sept 2007	May 2012
	7.11	"	May 2012	July 2017
	7.12	"		
	7.13	"	Sept 2007	
	7.14	"	Sept. 2007	
	7.15	"	Sept 2007	May 2012
	7.16	"		
	7.17	"		
	7.18	"	May 2012	
	7.19	"		
	7.20	"	May 2012	
	7.21	"		
	7.22	"	May 2012	
	7.23	"	May 2012	July 2017
8	8.1	June 2005		
	8.2	"		
	8.3	"		
	8.4	"		
	8.5	"		
	8.6	"		
	8.7	"		

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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!

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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 excessive 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 propeller mount 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.

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- 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.

4.5 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 its 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.

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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 mixed 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.

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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	C.G.	moment
	behind datum		
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
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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.

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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

7.17 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.