

Flight manual DG-1000T

Warnings and hints

- All motor gliders 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!
- Always respect the relevant safety altitudes!
- 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 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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0.1 Record of revisions continued

Rev. No.	Affected Pages/ section	Description	Issue Date	EASA Approval Date	Inserted Date Signature
7	0.3, 0.6, 0.7, 9.1-9.12	Electrically operated main landing gear TN1000/14	Nov. 2008	28. January 2009	
8	0.6, 9.1, 9.2, 9.13	Special equipment for very small pilots TN1000/17	May 2010	20. July 2010	
9	0.2 – 0.6, 1.4, 2.6, 2.11, 2.12, 4.3, 4.5 - 4.7, 4.9, 4.10, 4.13, 4.14, 4.29, 6.3, 6.5, 6.6, 6.10, 6.11, 7.2, 7.9, 7.12, 7.18, 7.21, 7.23, 7.24, 9.7, 9.13	Manual revision TN1000/18	Febr. 2011	13.05.2011	
10	0.1 ÷ 0.6, 1.5, 2.9, 2.11, 4.6, 4.8, 4.22, 5.4, 6.4, 6.7, 7.15, 7.22, 7.24, 9.8	Manual revision TN1000/24, Fuel cock warning TNDG-G-09 added on page 7.15	October 2014	11.11.2014	
11	0.2, 0.4, 4.14	Propeller adapter with elastomeric damper element TN 1000/26	August 2015	9.11.2015	
12	0.2, 0.3, 0.4, 1.4, 1.5, 1.6, 2.8, 2.10, 2.15, 4.3, 4.6, 4.17, 4.25, 5.4, 5.5	TN 1000/25 18m winglets 17,2 m end plates	February 2016	July 4 th , 2016	
13	0.0, 0.2 – 0.5, 4.9, 4.12, 6.6, 7.2, 7.11	Manual revision TN1000/32	July 2017	10.08.2017	

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0.2 List of effective pages

Section	page	issued	replaced	replaced	replaced	replaced
0	0.0	July 2005	July 2017			
	0.1	see manual amendments				
	0.2		"			
	0.3		"			
	0.4		"			
	0.5		"			
	0.6		"			
	0.7	July 2005				
1	1.1	"				
	1.2	"				
	1.3	"				
	1.4	"	Febr. 2011	Febr. 2016		
	1.5	"	Jan. 2007	Oct. 2014	Febr. 2016	
	1.6	"	Jan. 2007	Febr. 2016		
2	App. 2.1	July 2005				
	" 2.2	"				
	" 2.3	"				
	" 2.4	"				
	" 2.5	"	Jan. 2007			
	" 2.6	"	Febr. 2011			
	" 2.7	"				
	" 2.8	"	Febr. 2016			
	" 2.9	"	Oct. 2014			
	" 2.10	"	Febr. 2016			
	" 2.11	"	Jan. 2007	May 2008	Febr. 2011	Oct. 2014
	" 2.12	"	Jan. 2007	Oct. 07	Febr. 2011	
	2.13					
	2.14		Jan. 2007			
	2.15		Jan. 2007	Febr. 2016		
3	" 3.1	July 2005				
	" 3.2	"				
	" 3.3	"	Jan. 2006			
	" 3.4	"				
	" 3.5	"				
	" 3.6	"				
	" 3.7	"				
	" 3.8	"				

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0.2 List of effective pages (cont.)

Section		page	issued	replaced	replaced	replaced	replaced
4	App.	4.1	July 2005				
	"	4.2	"				
	"	4.3	"	Febr. 2011	Febr. 2016		
	"	4.4	"				
	"	4.5	"	Febr. 2011			
	"	4.6	"	Oct. 07	Febr. 2011	Oct. 2014	Febr. 2016
	"	4.7	"	Febr. 2011			
	"	4.8	"	Oct. 2014			
	"	4.9	"	Febr. 2008	Febr. 2011	July 2017	
	"	4.10	"	Febr. 2011			
	"	4.11	"				
	"	4.12	"	Oct. 2007	July 2017		
	"	4.13	"	Jan. 2007	Oct. 07	Febr. 2011	
	"	4.14	"	Febr. 2011	August 15		
	"	4.15	"				
	"	4.16	"	Jan. 2007			
	"	4.17	"	Jan. 2007	Febr. 08	Febr. 2016	
	"	4.18	"	Jan. 2007			
	"	4.19	"				
	"	4.20	"				
	"	4.21	"	Jan. 07			
	"	4.22	"	Oct. 2014			
	"	4.23	"				
	"	4.24	"	Jan. 2007			
	"	4.25	"	Jan. 2007	Febr. 2016		
	"	4.26	"				
	"	4.27	"				
	"	4.28	"				
	"	4.29	"	Febr. 2011			
5	"	5.1	July 2005				
	"	5.2	"	Febr. 2011			
	"	5.3	"	Jan. 2007			
	"	5.4	"	Oct. 2014	Febr. 2016		
	App.	5.5	"	Jan. 2007	Febr. 2016		
		5.6	"	Jan. 2007			
		5.7	"	Jan. 2007			
		5.8	"	Jan. 2007			
		5.9	"				

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0.2 List of effective pages (cont.)

Section	Page	issued	replaced	replaced	replaced	replaced
6	6.1	July 2005				
	6.2	"				
	6.3	"	Febr. 2011			
	6.4	"	Oct. 2014			
	6.5	"	Febr. 2011			
	6.6	"	Febr. 2011	July 2017		
	6.7	"	Oct. 2014			
	6.8	"	Jan. 2007			
	6.9	"				
	6.10	"	Febr. 2011			
	6.11	"	Febr. 2011			
7	7.1	July 2005				
	7.2	"	Febr. 2011	July 2017		
	7.3	"				
	7.4	"				
	7.5	"	Febr. 2008			
	7.6	"				
	7.7	"				
	7.8	"				
	7.9	"	March 2008	Febr. 2011		
	7.10	"				
	7.11	"	July 2017			
	7.12	"	Febr. 2011			
	7.13	"				
	7.14	"	Oct. .2006	Oct. 2007		
	7.15	"	Oct. 2006	Oct. 0007	Oct. 2014	
	7.16	"	Oct. 2007			
	7.17	"	Oct. 2007			
	7.18	"	Febr. 2011			
	7.19	"				
	7.20	"				
	7.21	"	Febr. 2011			
	7.22	"	Oct. 2014			
	7.23	"				
	7.24	"	May 2008	Febr. 2011	Oct. 2014	

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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 for cleanliness and corrosion;
4. Main landing gear and nose wheel (if fitted):-
 - 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!;
With TN1000/13 executed, standard from ser. no. 10-133 on:
Check all parts of the landing gear positive locking device (notch and latch at the landing gear struts) for dirt. Check the Bowden cable for damage.
 - b) check the tyre pressure;
main wheel: 2.5 bar - 36 psi
nose wheel: 2.5 bar - 36 psi
 - c) check wheel brake and hose for wear and function;
5. Left wing:-
 - a) check locking of the outboard wing;
 - b) check the aileron for excessive free play;
 - c) 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;
 - d) check the locking of the rear wing attachment pin.
6. Powerplant and brake fluid level (Extend the powerplant via the manual switch, ignition off):-
 - a) all screwed connections and their securing
 - b) function of throttle, and propeller brake
 - c) ignition system incl. wires and the spark plug connectors for tight fit
 - d) Check drive belt for wear and correct tension, sudden loss of tension indicates damage of the engine assembly
 - e) engine retaining cable and its connections in the engine compartment and at the engine
 - f) fuel lines, electrical wires, bowden cables and structural parts for wear and kinks.
 - g) exhaust muffler, propeller mount, cooling air guides, mechanical fuel pump and accessories for tight fit and any cracking.
 - h) 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 also.
 - i) visual check of the propeller
 - j) turn the propeller 1 revolution by hand and listen for abnormal sounds which may indicate engine damage
 - l) 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.

4.5 Normal procedures and recommended speeds

4.5.1 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.

4.5.1.1 Aerotow

- a) Aerotow is permitted only using the nose tow release. Set trim to neutral for aerotow.
- b) Version with nose wheel: Pull the stick until the nose wheel lifts off from the ground. Then control the aeroplane so that nose wheel and tail wheel don't touch the ground.

Version without nose wheel: Keep the elevator in neutral 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.

Normal towing speed is 120-130 km/h (65 - 70 kts.).

For a cross country tow the speed can be as high as 185 km/h (98 kts.).

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!

Note: Aerotowing behind slow tow planes eg. Ultralight planes or touring motorgliders:

The take-off distance may be remarkably reduced if the DG-1000T is towed with the engine extended and running at full power.

Recommended towing speed is 100km/h (54 kts.).

Starting the engine on the ground: extend the powerplant via the manual extension-retraction switch, start the engine in the same manner as described in section 4.5.4.1.

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.

To ensure good communication with the tow pilot the use of a headset is recommended at least for the pilot in command.

Warnings:

1. Due to the shorter take-off distance the aerotow with engine extended and running is safer than with engine retracted. Nevertheless this take-off procedure is only permitted if the conditions are such that a tow with engine retracted will also be safe.
2. If the engine of the DG-1000T fails the tow must be terminated by releasing the towing cable, this procedure is applicable as long as the aircraft are still on the ground.

6.8.7 Ballast box in the fin

a) Compensation of the C.G. shift due to the rear pilot:

The ballast box can accommodate max. 4 weights of 2,4 kg mass (heavy weight) and 2 weights of 1,2 kg mass (light weight), so the max. mass is 12 kg.

The number of weights can be determined by the following table:

Mass of rear pilot		Number of trim weights	Number of blinks of the lamp in the front instrument panel see section 4.2.4
kg	lbs.		
55	121	2 heavy + 1 light	5
65	143	3 heavy	6
75	165	3 heavy + 1 light	7
85	187	4 heavy	8
95	209	4 heavy + 1 light	9
105	231	4 heavy + 2 light	10

Warning: When flying solo the ballast box must be emptied, except see b)! Otherwise you will fly with a dangerous C.G. position.

If the ballast box is filled up, the min. cockpit load in the front seat is raised by 35 kg (77 lbs.).

The resulting value (min. cockpit load in front seat from weighing without ballast + 35 kg) must be entered in the table on page 6.7 as value XX and also on the placard at the indication lights for the fin tank on the front instrument panel.

When using the trim weights make sure not to exceed the max. weight of 750kg (1653 lbs.) Category „U” or 630kg (1389 lbs.) Category „A“.

b) Trim-possibility for heavy pilots:

The ballast box may be used for this purpose too.

One trim weight of 1.2 kg raises the min. load in the front seat by 3.5 kg (7.7 lbs.).

One trim weight of 2.4 kg raises the min. load in the front seat by 7 kg (15.4 lbs.).

Example for combination of a) and b)

(1 kg= 2.2046 lbs):

Min. cockpit load of the glider:	70 kg	permissible amount of trim weights
Mass of the front pilot:	84 kg	2 x 2.4 kg
Mass of the rear pilot:	65 kg	3 x 2.4 kg or 2 x 2,4 kg and 2 x 1,2 kg
Total amount of trim ballast:		12 kg

This means that the ballast box can be filled completely for this example. Higher pilot masses can't be compensated.

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7.1 Introduction

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

M.M. = Maintenance manual

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

7.2 Airframe

The DG-1000T is a two-place high performance motorglider, either with 18 m span or with 20 m span and permanently installed winglets

Construction

Wings	CFRP-foam-sandwich-shell with CFRP-roving spar caps
Ailerons	CFRP-foam-sandwich-shell
Rudder	GFRP-foam sandwich-shell
Horizontal stabilizer	GFRP-foam sandwich-shell with CFRP-roving spar caps
Elevator	GFRP-shell
Fuselage	GFRP-shell, fuselage boom sandwich-shell with Tubus core

Canopy

Two canopies hinged at the right hand fuselage side. Canopy transparencies made from Plexiglas GS 241 or optionally green GS Green 2942.

Tailplane

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

Colour

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

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7.4.1. a) Gliding screen

Upper centre: Stall factor, see set up menu.

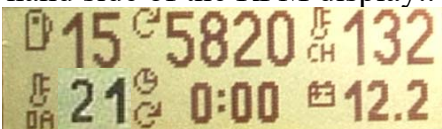
Upper right: Time, instead of the time CHT will be displayed as long as the CHT is above 50°C.



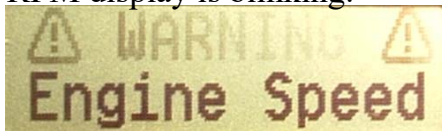
7.4.1. b) Powered flight screen

Upper centre:

- a) With the engine running the engine RPM will be displayed. 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.



- 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 be 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.

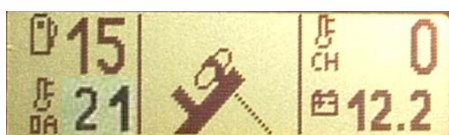


powerplant extended
propeller in position for retraction

propeller not in position for retraction



powerplant in position for stopping the propeller



powerplant in position propeller stopper extended

propeller not in position for retraction

propeller in position for retraction