## 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 4th, 2016 | |

## 0.2 List of effective pages

| Section | | page | issued | replaced | replaced | replaced | replaced |
|---|---|---|---|---|---|---|---|
| 0 | | 0.0 | July 2005 | | | | |
| | | 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 | " | | | | |

## 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 | | |
| | " | 4.10 | " | Febr. 2011 | | | |
| | " | 4.11 | " | | | | |
| | " | 4.12 | " | Oct. 2007 | | | |
| | " | 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 | " | | | | |

## 1.4 Descriptive data

The DG-1000T is a self-sustainer two-place high performance motorglider with retractable powerplant for training and cross country flying and in addition for aerobatic training.

The wings of the DG-1000T are made of carbon fibre reinforced plastics with a parting at y= 8,6m, there are four types of wing tips available with different spans:
A) Wing elongations with 20 m span with winglets
B) Wing tips with 18 m span without winglets
C) Wing tips with 18 m span with winglets
D) End plates with 17,2 m span

- Automatic hook-up s for all controls.
- Comfortable seating and modern cockpit design similar to the DG-single-seaters - safety cockpit.
- Large 2 piece canopy for very good in-flight vision.
- Draught free canopy demist and 1 adjustable swivel air vent for each pilot.
- Sealed airbrake and landing gear boxes.
- Controls in each cockpit.
- All controls are operated with the left hand, which enables the right hand to remain on the control stick.

The DG-1000T is available with 3 different versions of the undercarriage:
A) Very high spring mounted retractable main wheel with disc-brake, tail wheel.
B) High spring mounted retractable main wheel with disc-brake, tail wheel and nose wheel
C) Fixed spring mounted main wheel with disc-brake, tail wheel and nose wheel.
The main undercarriages versions B and C are interchangeable.

**Other characteristics:**
Waterballast in the wings and in the fin are optional with 18m span and standard with 20m span.

Standard: A ballast-box is installed in the fin. It can be used to compensate the mass of the rear pilot and as a trim-possibility for heavy pilots.
Max. ballast capacity: 12 kg.

Option: 2 ballast boxes in the front cockpit. The trim-weights used for the trim-ballast box in the fin also fit into these ballast boxes.

**Powerplant and powerplant controls**

- Retractable powerplant with air- cooled Solo 2350C two stroke engine and CFRP-Composite propeller DG-P001-1
- 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, landing gear warning and canopy warning.

**Technical data**

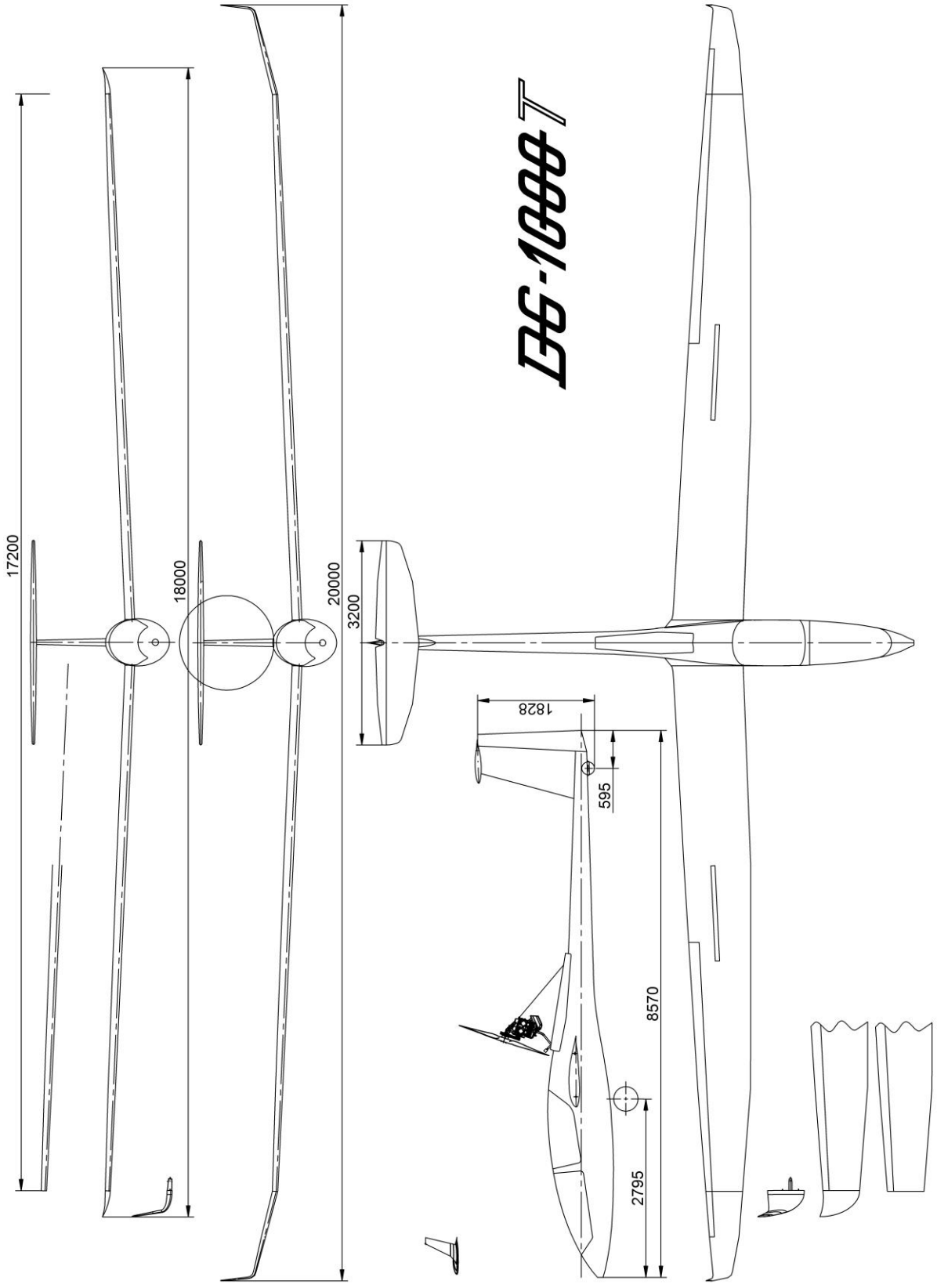
| | | | | |
|---|---|---|---|---|
| Span | m / ft | 17,2 | 18 / 59.1 | 20 / 65.62 |
| Wing area | m² / ft² | 16,3 | 16,72 / 180 | 17,53 / 189 |
| Aspect ratio | / | 18,15 | 19,38 | 22,82 |
| Length | m / ft | | 8,57 / 28.12 | |
| Fuselage height | m / ft | | 1,0 / 3.28 | |
| Fuselage width | m / ft | | 0,73 / 2.4 | |
| Span of the horiz. tailplane | m / ft | | 3,2 / 10.5 | |
| Waterballast Wings max. | kg (l) / US.gal | | 160 / 42.3 | |
| Waterballast fin max. | kg (l)/ US.gal | | 6,2 / 1.64 | |
| Trim ballast fin max. | kg / lbs | | 12 / 26.5 | |
| Empty mass with basic instruments* approx. | kg / lbs | 457 / 1007 | 461 / 1016 | 465 / 1025 |
| Wing loading (with one Pilot 80kg / 176 lbs) approx. | kg/m² / lbs/ft² | 32,9 / 6.75 | 32,4 / 6.64 | 31,1 / 6.37 |
| max. take-off mass (max. TOW) | kg / lbs | 750 / 1653 | 750 / 1653 | 750 / 1653 |
| max. wing loading | kg/m² / lbs/ft² | 46,0 / 9,4 | 44,9 / 9.2 | 42,8 / 8.77 |
| Aerobatics | | unlimited Category „A“ | unlimited Category „A“ | simple |
| max. TOW for aerobatics (cat. A) | kg / lbs | 630 / 1389 | 630 / 1389 | / |
| max. speed | km/h /kts | 270 / 146 | 270 / 146 | 270 / 146 |

**Powerplant** Solo 2350C two-cylinder-two-stroke-engine

| | | |
|---|---|---|
| power | KW / hp | 22 / 30 |
| Reduction gear | - | 1:2,3 |
| Fuel tank capacity | Liter / US.gal | 22 / 5.81 |
| Propeller | DG-P001-1 | CFRP-Composite |
| | m / ft | 1,48 / 4.86 |

*Options will increase the empty mass accordingly!

## 1.5 three view drawing (dimensions in mm)



## 2.8 Centre of gravity

Centre of gravity range in flight is
200mm (7.87 inch) up to 440mm (17.32 inch) 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 sect. 6.

## 2.9 Approved manoeuvres

**Category „Utility“:**

The glider is certified for normal gliding in the "Utility" category.
Simple aerobatics are approved but only without water ballast and with the weight of the rear pilot compensated by ballast in the ballast box in the fin see section 6.8.7.

The following aerobatic manoeuvres are approved with all spans:

| | |
|---|---|
| Spins | Chandelle |
| Inside loop | Turn |
| Lazy Eight | |

Recommended entry speeds see section 4.5.11.1.

**Category „Aerobatic“**

Span 17,2 m or 18 m without winglets and without water ballast, max. mass 630 kg (1389 lbs.) and with the required equipment see section 2.13 installed and with the weight of the rear pilot compensated by ballast in the ballast box in the fin see section 6.8.7.

In addition to the manoeuvres in category „Utility“ the following manoeuvres are approved:

| | |
|---|---|
| Inverted flight | half flick roll from normal to inverted flight with half loop |
| half loop and half roll | half flick roll from inverted to normal flight |
| half roll and half loop | |
| slow roll | |

Recommended entry speeds see section 4.5.11.2.

## 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**

1. Cloud flying (daylight): permitted when properly instrumented (see section 2.13).
2. Simple aerobatics see sect. 4.5.11.1. Category „Utility“
3. Aerobatics see section 4.5.11.2. Category „Aerobatic“ if the required equipment (see section 2.13 b) ) is installed, only with 17,2 m span or 18 m span without winglets, max. mass 630 kg (1389 lbs.).

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

## 2.21 Limitations placards

**DG Flugzeugbau GmbH**
Type: DG – 1000T Serial No.: 10- T
Year of construction:

| Maximum airspeeds | km/h | kts. |
|---|---|---|
| Winch launching | 150 | 81 |
| Aero-tow | 185 | 100 |
| Manoeuvring $V_A$ | 185 | 100 |
| Rough air | 185 | 100 |
| Maximum speed $V_{NE}$ | 270 | 146 |
| Powerplant extended | 185 | 100 |
| Powerplant extension-retraction | 100 | 54 |

Approved aerobatic manoeuvres, only without waterballast:
*Pos. Loop, Chandelle, Spin, Stall turn*
In addition Category A:
Only with 17,2 m or 18 m span without winglets, without water ballast, engine retracted or removed:
*Half loop and half roll, half roll and half loop, slow roll, inverted flight, half positive flick roll from normal flight with half loop, half negative flick roll from inverted flight*
Maximum mass:

| | | |
|---|---|---|
| Category A | 630 kg | 1389 lbs. |
| Category U | 750 kg | 1653 lbs. |
| Category U without waterballast | kg | lbs. |

**Loading chart**

| Cockpit load | front seat | | rear seat | | (Parachute |
|---|---|---|---|---|---|
| maximum | 110 kg | 242 lbs. | 90 kg | 198 lbs. | included) |
| or maximum | 105 kg | 231 lbs. | 105 kg | 231 lbs. | |
| minimum | kg | lbs. | / | / | without fin battery |
| minimum | kg | lbs. | / | / | With fin battery |

With lower pilot weight necessary ballast must be added.

**Cockpit Check**
1. Lead ballast (for under weight pilot)?
2. Parachute worn properly?
3. Safety harness buckled?
4. Front seat: pedals adjusted?
   Rear seat: seating height adjusted?
5. All controls and knobs in reach?
6. Altimeter?
7. Dive brakes cycled and locked?
8. Positive control check ? (One person at the control surfaces).
9. Fin ballast tank emptied or correct amount filled in?
10. Trim ballast box in the fin, correct amount filled in? Locking device completely engaged?
11. Battery in the fin? Loading chart regarded?
12. Trim?
13. Fuel level?
14. Fuel cock open?
15. Both canopies locked?
16. Runway free?

limits for use of the waterballast tank

| | | | | | | |
|---|---|---|---|---|---|---|
| minimum ground temperature | °C | 13.5 | 17 | 24 | 31 | 38 |
| | °F | 56 | 63 | 75 | 88 | 100 |
| maximum flight altitude above GND | m | 1500 | 2000 | 3000 | 4000 | 5000 |
| | 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 |

**Other cockpit placards see section 7**

**Gepäck max. 15 kg**
**baggage max. 33 lbs.**

**Sollbruchstelle 10000 N**
**rated load 2200 lbs.**

**Reifendruck 4 bar**
**Tyre pressure 58 psi**
**Tail wheel**

**Reifendruck 2,5 bar**
**Tyre pressure 36 psi**
**Main wheel**

**Reifendruck 2,5 bar**
**Tyre pressure 36 psi**
**Nose wheel** (if installed)

**Ballast box in the fin**
Min. load in the front seat
kg box empty

kg box filled

**At the control-light in the front instrument panel**

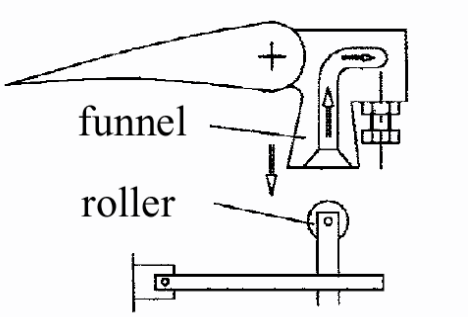
**Warning:**
Rigging of the horizontal tailplane is only permitted with nose down trim-setting!

**at the upper left hand side of the fin**

4. Rigging of the stabilizer
   Battery box in the fin: Check if the securing wire 10L35 (made from piano wire) is installed. If a battery is to be installed refer to section 4.2.5, connect the battery.
   **Cautiong:** Rigging of the horizontal tailplane is only permitted with **nose down** trim-setting. Therefore operate the trim release lever and push the control stick forward, then release the lever to engage the trim (don't operate the trim control knob, the trim should not be pushed to the most nose down position).

   Screw the tool W 38/2 into the securing plate (near the top of the left surface of the fin). Pull out the securing plate with the tool, move it downwards to engage in the rigging position. Set the stabilizer on, so that the roller at the fuselage side push rod is inserted into the funnel at the elevator.

   **Watch carefully the procedure!**

   When the stabilizer is set down and laying on the fin, push it aft. The roller will engage and slide forward in the funnel if you hold the elevator in the pertinent position.

   Release the securing device by pulling out with the tool and engage the securing device by lifting the tool. The securing plate must be flush with the surface of the fin. Screw out the tool.

   **Check for correct elevator connection by looking from the rear into the gap at the right hand side of the rudder.**

5. Rigging of the outboard wing panels (20m wing extensions or 18m or 17,2m wing tips): Insert the wing tip extensions into the wing. Press in the locking pin with your finger.
   Insert the wing tip until the aileron connector starts to slide onto the aileron. Strike firmly with the palm of your hand on to the wing tip to lock in the wing tip extension.

6. Tape the gaps of the wing-fuselage junctions and the wing joints.

7. Execute a positive control check, one helper to hold firmly the control surfaces is needed.

### 4.2.5 Installation of a battery in the fin

A battery in the fin may be installed optionally.
To accomplish the installation the locking bow (part 10L35 made from piano wire) must be removed. The locking bow prevents the installation of a battery and serves as indicator if a battery is installed, as its ends are visible from the outside.
After removing the battery reinstall the locking bow.
**Warning:** The fin battery raises the min. cockpit load see section 6.8.4.
Only the use of the factory supplied battery Z110 (mass 5.5 kg, 12.1 lbs.) is permitted. Don't put any other objects in the battery box.

### 4.2.6 Refuelling

Fuel is transferred via a permanently installed refuelling pump from a can where the correct amount of oil is added and mixed prior to filling.
Oil: Use only super two stroke oil according to section 2.6
Switch on the main switch of the aircraft and extend the engine.
Couple the fuel filler hose to the fuselage side coupling (in left hand front side of the engine compartment).
Start the pump by pressing the push button located next to the coupling. 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.
Starting the pumping again is possible by pressing the push button again.
**Warning:** Make sure to fill in clean fuel without any water.

### 4.2.7 Derigging

Derigging follows the reverse of rigging.
Waterballast must be dumped first.
Lock the airbrakes.
For disassembling the securing pins of the wings the tool W 38/2 must be screwed into the thread completely.
The brass part of the tool will then disengage the securing of this bolt.
It is recommended to leave the securing pin in the right wing while you derig the left wing.

Derigging of the outboard wing panels (20m wing extensions or 18 m or 17,2 m wing tips):
Use a 6 mm diameter pin (e.g. tool W36) for pressing in the locking pin on the wing's upper surface. Pull out the wing tip or the wing extension.

### 4.5.5 Approach and landing

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

#### 4.5.5.1 Normal landing

It is recommended to dump the waterballast before landing even on airfields. Dump the ballast before an outlanding in any case.

Abeam the landing point extend the landing gear. In calm weather approach with approx. 100 km/h (54 kts.) (ballast dumped!). With strong wind and / or waterballast 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.
If flown in 18m span with winglets, the glider tends to turn, even with full opposite rudder. Therefor sideslip is not a suitable way to make a steeper approach on final.

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 motorglider!

You can land the DG-1000T on soft fields with the landing gear extended, as there is no tendency of nosing over. During touch down pull the stick completely to avoid the fuselage nose touching the ground.

After landing in a muddy field clean the landing gear and tow releases.
Dirt in the front strut can keep the landing gear from locking over centre next time.
**With TN1000/13 executed, standard from ser. no. 10-133 on:**
Dirt in the landing gear positive locking device (notch and latch at the landing gear struts).may keep the latch from engaging in the notch next time.
Simply hosing with water is the best cleaning method (don’t use a high pressure cleaner)..

### 4.5.11.2 Category A, Aerobatic

Only approved with 17,2m span or 18m span without winglets, power plant retracted or removed and without water ballast, max. mass 630 kg (1389 lbs.) and with the weight of the rear pilot compensated by ballast in the ballast box in the fin see section 6.8.7 and with the required equipment installed see section 2.13.
Execute only the approved manoeuvres.
Don't execute aerobatics below the safety altitude required by national law.

**Approved manoeuvres** (Category A, Aerobatic):
All manoeuvres approved for category U, Utility and additionally:

| **Approved manoeuvres** | **recommended airspeed** | **g-load** |
|---|---|---|
| Inverted flight | 120 - 200 km/h (65-108 kts.) | -1 |
| **Approved manoeuvres** | **entry speeds** | **g-loads** |
| half loop and half roll | 220 km/h (119 kts.) | +5.0 |
| half roll and half loop | 180 – 200 km/h (97-108 kts.) | +4.5 |
| slow roll | 180 - 200 km/h (97-108 kts.) | +/-1.5 |
| half positive flick roll from normal to inverted flight with half pos. loop | 120 - 140 km/h (65 - 76 kts.) | +4.0 |
| half negative flick roll from inverted to normal flight | 130 – 150 km/h (70 - 81 kts.) | -3.5 |

Combinations of the approved manoeuvres

**Caution:** the DG-1000T is equipped with a powerful longitudinal trimming device. In addition the mass balance weight of the elevator is incorporated in the elevator control system. Due to these facts the elevator control forces during inverted flight change considerably with trim position.
It is strongly recommended to trim the glider to approx. 140 km/h (76 kts.) in horizontal flight prior to executing aerobatics, especially prior to inverted flight.

### 5.2.2 Stall speeds

The given speeds are the minimum achievable speeds during level flight in km/h and (kts.).

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Airbrakes retracted 20m span** | | | | | | | |
| mass kg | 470 | 500 | 550 | 600 | 650 | 700 | 750 |
| mass lbs. | 1036 | 1102 | 1213 | 1323 | 1433 | 1543 | 1653 |
| W/S kg/m² | 26,8 | 28,5 | 31,4 | 34,2 | 37,1 | 39,9 | 42,8 |
| W/S lbs./ft.² | 5.5 | 5.84 | 6.43 | 7.01 | 7.59 | 8.18 | 8.76 |
| V km/h | 62,9 | 64,9 | 68,0 | 71,1 | 74,0 | 76,8 | 79,5 |
| V kts. | 34 | 35 | 36.7 | 38.4 | 40 | 41.5 | 42.9 |
| **Airbrakes retracted 18m span** | | | | | | | |
| W/S kg/m² | 28,1 | 29,9 | 32,9 | 35,9 | 38,9 | 41,9 | 44,9 |
| W/S lbs./ft.² | 5.76 | 6.12 | 6.43 | 7.35 | 7.96 | 8.57 | 9.18 |
| V km/h | 64,4 | 66,4 | 69,7 | 72,8 | 75,8 | 78,6 | 81,4 |
| V kts. | 34.8 | 35.9 | 37.6 | 39.3 | 40.9 | 42.4 | 44 |
| **Airbrakes retracted 18m span with winglets** | | | | | | | |
| V km/h | 62.2 | 64.1 | 67.3 | 70.2 | 73.1 | 75.9 | 78.5 |
| V kts. | 33.6 | 34.6 | 36.3 | 37.9 | 39.5 | 41.0 | 42.4 |
| **Airbrakes retracted 17,2m span** | | | | | | | |
| W/S kg/m² | 28.8 | 30.7 | 33.7 | 36.8 | 39.9 | 42.9 | 46.0 |
| W/S lbs./ft.² | 5.91 | 6.28 | 6.91 | 7.54 | 8.17 | 8.80 | 9.42 |
| V km/h | 65.2 | 67.2 | 70.5 | 73.6 | 76.6 | 79.5 | 82.3 |
| V kts. | 35.2 | 36.3 | 38.1 | 39.7 | 41.4 | 42.9 | 44.4 |
| **Airbrakes extended 20m span** | | | | | | | |
| mass kg | 470 | 500 | 550 | 600 | 650 | 700 | 750 |
| V km/h | 67,4 | 69,5 | 72,9 | 76,2 | 79,3 | 82,3 | 85,1 |
| V kts. | 36,4 | 37,5 | 39,4 | 41,1 | 42,8 | 44,4 | 46,0 |
| **Airbrakes extended 18m span** | | | | | | | |
| V km/h | 69,0 | 71,2 | 74,7 | 78,0 | 81,2 | 84,2 | 87,2 |
| V kts. | 37,3 | 38,4 | 40,3 | 42,1 | 43,8 | 45,5 | 47,1 |
| **Airbrakes extended 18m span with winglets** | | | | | | | |
| V km/h | 67.5 | 69.6 | 73.0 | 76.3 | 79.4 | 82.4 | 85.3 |
| V kts. | 36.5 | 37.6 | 39.4 | 41.2 | 42.9 | 44.5 | 46.1 |
| **Airbrakes extended 17,2m span** | | | | | | | |
| V km/h | 69.8 | 71.9 | 75.5 | 78.8 | 82.0 | 85.1 | 88.1 |
| V kts. | 37.7 | 38.8 | 40.7 | 42.6 | 44.3 | 46.0 | 47.6 |

The loss of height for stall recovery is approximately 50 m (160 ft) if recovered immediately.

## 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

1 kts= 1 km/h / 1.852, 1 m/s= 197 ft/min.= 1.94 kts, 1 kg/m²= 0.2048 lbs/ft²

Performance data with **20 m** span (S = 17,53 m²)

| | | | | |
|---|---|---|---|---|
| wing loading | kg/m² | 28 | 35 | 42 |
| minimum sink | m/s | 0,51 | 0,56 | 0,62 |
| at | V [km/h] | 79 | 88 | 98 |
| best glide ratio | / | 45,9 | 46,3 | 46,6 |
| at | V [km/h] | 93 | 104 | 120 |

Performance data with **18 m** span (S = 16,72 m²)

| | | | | |
|---|---|---|---|---|
| wing loading | kg/m² | 30 | 36 | 45 |
| minimum sink | m/s | 0,60 | 0,65 | 0,72 |
| at | V [km/h] | 84 | 90 | 100 |
| best glide ratio | / | 41,5 | 41,7 | 42 |
| at | V [km/h] | 100 | 110 | 123 |

With winglets on the 18 m wing tips (optional) the best glide ratio is increased by 0.5 points.

With **17,2 m** span (S = 16,30 m²) the best glide ratio decreases by 1.5 glide points, compared to 18 m span without winglets.

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).
The polar curves can be seen on the next page.

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.