

Maintenance Manual DG-1000T

No.	Page	Description	Date
12	0.2 ÷ 0.9, 0.9a, 0.10 ÷ 0.12, 1.2, 1.5, 1.11, 1.14, 1.15, 1.27 ÷ 1.29, 1.33, 2.1, 2.4 ÷ 2.6, 3.3, 4.8, 5.1, 6.1, 6.2, 6.4, 8.3, 9.2, diagr. 1, 9, 11, encl. 4 pages 1, 2, 2a, 3, Z193, SI 67-07, remove 5EP50	Manual revision TN1000/18	February 2011
13	0.6, diagrams 8 and 9	Wheel brake TN1000/21	July 2011
14	0.2 ÷ 0.7, 0.10 ÷ 0.12, 1.3, 1.5, 1.11, 1.16, 1.29, 1.30, 2.1, 2.6, 3.1, 4.6, 4.10, 4.12, 4.13, 4.19, 4.20, 6.1, 7.1, 8.2, 8.3, diagrams: 2, 3, 9, Enclosure 4 pages: 4, 7	Manual revision TN 1000/24, New type 12V sockets and plugs, Changes due to TN 4603-14 of the Solo company (Exchange of the axle of the upper drive belt pulley on pages 4.19 and 4.20)	October 2014
15	0.2, 0.3 - 0.6, 0.9a, 0.11, 1.18, 3.5, 3.8, 4.20, 4.20a, 4.26, 4.28, 8.1 – 8.3 diagram 13, diagram 15, diagram 15a	Propeller adapter ring with elastomeric damper TN 1000/26 Alternative mechanical fuel pump TN 1000/28	August 2015
16	0.2 -0.6, 0.11, 0.12, 2.1, 2.2, 3.7, 6.3, 8.2, 8.3, diagram 2	Manual revision TN1000/32	July 2017
17	0.2, 0.3, 1.11	TN1000/34 small nose wheel	October 2017
18	0.2-0.7, 0.10 - 0.13, 2.6, 3.9, 6.1, 8.2, diagrams 15 and 15a, file working instruction No. 1 for TN 1000/38 at the end of the MM.	TN1000/38 PU fuel hoses, limitation of life-time, replacement by new types of fuel hoses	February 2018

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0	0.0	June 2005	January 2007			
	0.1	see manual amendments				
	0.2		"			
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	0.5		"			
	0.6		"			
	0.7	June 2005	January 2007 Febr. 2018	Febr. 2011	Oct. 2014	
	0.8	"	Febr. 2011			
	0.9	"	Febr. 2011			
	0.9a	Febr. 2011	August 2015			
	0.10			Febr. 2008	March 2008	Oct. 2008
				Nov. 2008	Febr. 2011	Oct. 2014
	0.11			Febr. 2011	Oct. 2014	August 2015
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0.12			January 2007	Febr. 2011	Oct. 2014	
			July 2017	Febr. 2018		
0.13		Febr. 2018				
1	1.1	June 2005	January 2007			
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	1.5	"	Febr. 2011	Oct. 2014		
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	1.7	"				
	1.8	"				
	1.9	"	Febr. 2008			
	1.10	"	Febr. 2008			
	1.11	"	Febr. 2011	Oct. 2014	Oct. 2017	
	1.12	"				
	1.13	"				
	1.14	"	March 2008	Febr. 2011		
	1.15	"	Febr. 2011			
	1.16	"	Oct. 2014			
	1.17	"				
	1.18	"	August 2015			
	1.19	"	March 2008			
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	1.21	"				
	1.22	"	October 2006			
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	1.29	"	Febr. 2011	Oct. 2014	
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	1.31	"	May 2008		
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2	2.1	June 2005	March 2008 July 2017	Febr. 2011	Oct. 2014
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	4.20a	August 2015			
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	4.27	"			
	4.28	"	January 2007	August 2015	
	4.29	"			
	4.30	"			
	4.31	"			
5	5.1	June 2005	Febr. 2011		
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6	6.1	June 2005	Febr. 2011	Oct. 2014	
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	6.4	"	Febr. 2011		
7	7.1	June 2005	Oct. 2014		
8	8.1	June 2005	January 2007	August 2015	
	8.2	"	Dec. 2006	January 2007	Oct. 2014
			August 2015	July 2017	Febr. 2018
	8.3	"	May 2008	Febr. 2011	Oct. 2014
			August 2015	July 2017	
	8.4	"	January 2007		
9	9.1	June 2005			
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2	Nov. 2001	Oct. 2014	July 2017	
3	June 2005	Oct. 2014		
4	Nov. 2001			
5	Nov. 2001	January 2007		
6	Nov. 2001	January 2007	March 2008	Not valid for 10-101, and from 10-128 on
6a	March 2008			
7	Nov. 2004			
7a	Oct. 2008			
8	Nov. 2001	January 2007	July 2011	
9	June 2005	January 2007 Oct. 2014	Febr. 2011	July 2011
10	May. 2005	January 2007		
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15	June 2005	January 2007	August 2015	Febr. 2018
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20	Nov. 2008			
21	Nov. 2008	Oct. 2010		
22	Nov. 2008			
5EP34	25.01.90			
5V18	14.10.94			
10FW2	05.10.99			
10E4 issue A	28.10.08			
10E4 issue E	8.10.10			
10E102	14.09.05	5.12.05	26.01.06	
10E103	24.06.05			
Encl. 1	June 2005			
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SI 67-07	5.11.2007			
Z193	4.11.2009			
Working instruction No. 1 for TN1000/38			Febr. 2018	

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diagrams

- 1 Elevator control, trim
- 2 Rudder control
- 3 Controls in the fuselage (Aileron and spoiler controls)
- 4 Controls in the wings (Aileron and spoiler controls)
- 5 Tow releases
- 6 Water ballast system
- 6a Waterballast system 10-101, from 10-128 on
- 7 Landing gear, hydraulic wheel brake (Version without nose wheel) up to ser. No. 10-132
- 7a Landing gear, hydraulic wheel brake (Version without nose wheel) from ser. No. 10-133 on
- 8 Landing gear, hydraulic wheel brake (Version with nose wheel)
- 9 Landing gear, non retractable
- 10 Systems for static and total pressure
- 11 Placards
- 12 Landing gear control (Version without nose wheel)
- 13 Powerplant
- 14 Extension/retraction mechanism
- 15 Fuel system
- 15a Fuel system with automatic fuel cock
- 16 Powerplant retaining cables
- 17 Landing gear positive locking device TN1000/13 no more valid from ser. No. 10-133 on
- 18 Actuation unit LG locking device, differences to diag. 12 for TN1000/13 and from ser. no. 10-133 on
- 19 Throttle handle in front and rear Cockpit TN1000/15
- 20 Electrically operated main landing gear (in landing gear box)
- 21 Electrically operated main landing gear (outside landing gear box)
- 22 Placards electrically operated main landing gear

- 5EP34 Installation plan Dräger oxygen system
- 5V18 Tool for airbrake adjustment
- 10FW2 Spring leg (landing gear)
- 10E4 Wiring plan electrically operated main landing gear TN1000/14
- 10E4 Wiring plan electrically operated main landing gear TN1000/19

- Issue E
- 10E102 Wiring plan DINA1 (in aircraft log)
- 10E103 Wiring scheme
- Encl. 1 Download instructions for flightlog and service data from the DEI-NT
- Encl. 2 Instructions for transponder installation
- Encl. 3 Throttle handle in front and rear Cockpit TN1000/15
- Encl. 4 Electrically operated main landing gear
- SI 67-07 Service Info ballast box in the fin foam rubber rings
- Z193 406 MHZ ELT antenna BD3 installation 2-seaters
- Working instruction No. 1 for TN1000/3

0.4 Airworthiness limitations

0.4.1 Repairs

Repair or replace damaged parts prior to next flight. Follow the instructions of the DG-1000 repair manual for repairs of the airframe. Repairs outside the scope of DG-1000 repair manual and major repairs must be accomplished at a certified repair station or by a certified mechanic rated for composite aircraft structure work in accordance with DG repair methods.

Use only genuine spare parts.

For all aircraft under EASA regulations the following applies: According to part 21, subpart M to accomplish major repairs an approved repair instruction is required, see also TN DG-G-01 “Approved repair methods according to EU Commission Regulation 1702/2003 part 21, subpart M”

0.4.2 Life time of the airframe

The maximum allowable operating time for German composite sailplanes and motorgliders was proofed for 12000 flight hours.

The initial life time for the DG-1000T is 3000 flight hours.

Extension of the life time to 12000 hours can only be achieved by implementing a comprehensive inspection program for the aircraft to be carried out in accordance with data that has been approved by an applicable aviation authority, see section 2.4 of this manual.

Only for USA

Note: The Airworthiness Limitations section is FAA approved and specifies maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulation unless an alternative program has been FAA approved.

0.5 Further service information

0.5.1 Life time of components

Use only genuine spare parts. For part. No.'s of all parts please refer to section 8.

Note: You will find detailed instructions for replacement of the life limited parts (if applicable) in section 4 of this manual.

After exchanging life limited parts change the "Summary of operating hours" for your motorglider by entering the replacement dates of the exchanged parts.

- a) All **nuts and bolts** (part No. 39001031) at the powerplant have to be exchanged after 200 h, together with the engine overhaul.
- b) The **drive belts** (part No. 60510829) at the powerplant have to be exchanged after 200 h, together with the engine overhaul.
- c) The **rubber mounts** (part No. 45002079 and 45002080) at the powerplant have to be exchanged after 200 h, together with the engine overhaul.
- d) All **fuel lines** and the gasket for the drainer valve (part No. 60504402) have to be exchanged after 6 years.

TN 1000/38: When instructions 3 of this TN have been accomplished the life time of the lines (part. No. 39001070) is 10 years. the life time of the FPM fuel lines (part. No. 30092047 and 30092048) between primer valve and carburetors is 6 years.

- e) The **spark plugs** have to be exchanged after 25 engine hours, part no.40050360.
- f) The **fabric straps of the safety harness** have to be exchanged according to the instructions of the respective manufacturer. If no limitations are given, exchange after 12 years, approved types see section 6.
- g) The **rubber cord** in the elevator control system see section 1.2.6 has to be replaced at least every 6 years, part no. 30091131.
- h) The **adapter ring** with elastic damping element 10M067 for the propeller (introduced with TN1000/26) has to be exchanged after 50 engine hours or 5 years, whichever comes first.
- i) The **eccentric axle** of the reduction gear (propeller axle) Solo part no. 2031211-V2 has to be replaced after 50 engine hours

0.5.2 Service times for other than life limited parts

The **brake fluid of the wheel brake (option)** has to be exchanged after 4 years (types see section 1.6.2).

Note: All **other components** like propeller, tow hook, wheels, gas struts, control system parts, bolts, pins etc. have no life time limitation, but should be replaced when worn, damaged or disqualified by excessive corrosion.

0.5.3 Service time, maintenance documents

Follow the instructions of the respective manufacturer:

- a) Operating Manual for Safety Tow Releases
Series: Europa G 88 Safety Tow Release
latest approved version
Operating Manual for Tow Releases
Series: E 85 Nose Tow Release
latest approved version
- b) Safety harness: instructions of the manufacturer latest approved version.
Approved types see section 6.
- c) Minimum instrumentation: instructions of the manufacturer, approved instruments see sections 6.
- d) Engine: Manual for the engine SOLO Type 2350 C, latest approved version.
- e) Operating- and Service Instructions for propeller DG-P001 latest approved version.

2.4 Inspection procedure for increase of service time

1. General

The results of fatigue tests of wingspar sections have demonstrated that the service time of GFRP/CFRP gliders and motorgliders may be limited to 12000 hours, if for each individual glider (in addition to the obligatory annual inspections) the airworthiness is demonstrated according to a special multi-step inspection program particularly with regard to the service life.

2. Dates

When the glider has reached a service time of 3000 hours, an inspection must be done in accordance with the inspection program mentioned under point 3. If the results of this inspection are positive or if any defects found have been duly repaired, the service time of the glider is extended by another 3000 hours to a total of 6000 hours (first step).

The above inspection program must be repeated when the glider has reached a service time of 6000 hours. If the results of this inspection are positive or if any defects found have been duly repaired, the service time of the glider is extended to 9000 hours (second step).

When the glider has reached a service time of 9000 h the above inspection program must be repeated. If the results of the inspection are still positive, or if any defects found have been duly repaired, the service time may be extended to a total of 10000 hours (third step).

Proceed analogous when reaching 10000 and 11000 hours (4. + 5. step).

3. DG Flugzeugbau will develop an inspection program to be executed at 3000 h, 6000 h, 9000h, and every 1000 hours thereafter up to the 12000 hour limit. This program will be approved by the aviation authorities and will be available for purchase from DG Flugzeugbau.

When you request the inspection program, the following data should be submitted: Model/Type, Registration, Serial Number and the operating hours at which the inspection will be performed. A charge will be made for the inspection program.

4. The inspection must only be done by a licensed repair station or inspector.
5. The results of the inspections have to be recorded in an inspection test report wherein comments are required for each inspection instruction. If the inspections are done outside the DG Flugzeugbau facilities, a copy of the records must be sent to DG Flugzeugbau for evaluation and information.

3.6.2 After 200 engine hours

After 200 engine hours the power plant must undergo a major overhaul.

Apart from the items listed in section 3.6.1., the following items also need to be done:

1. Remove the power plant and remove the engine from the powerplant. Ship the engine to the manufacturer or an aircraft engine maintenance workshop approved by the manufacturer and by the authorities.
2. Replace all the nuts and bolts on the engine
3. Replace the drive belts if they haven't been replaced during the overhaul.

3.6.3 After 6 years

1. Replace the gasket of the drainer valve every 6 years.
2. Replace the FPM fuel hoses between primer valve and carburettors every 6 years.
3. Replace all other fuel lines every 6 years.

TN1000/38: When instruction 3 of this TN has been accomplished these fuel lines must not be exchanged after 6 but after 10 years. To allow this after 6 years all fuel hoses are to be inspected visually thoroughly and completely for any damage especially fissures, kinks or leaks. For the check switch on the ignition to run the electric fuel pump to demonstrate operating fuel pressure.

Repeat this inspection every following year.

Caution: New fuel lines must be flushed thoroughly with fuel after assembly.

3.6.4 When required

1. If the engine should run rough between idle and full throttle even after all the points in sect. 3.6.1. are OK, then it is possible that the membranes in the carburettors have hardened. They should then be replaced.
2. After sudden power loss at full throttle: Check pistons and cylinders for seizing marks, therefore remove the exhaust muffler. Check the cylinders and pistons via the exhaust ports for seizing marks. Press against the piston rings with a suitable tool. The rings must be movable. Black remains on the outside of the pistons below the rings indicate sticking or damaged piston rings, this is not acceptable.

Illuminate the combustion chamber and check for combustion deposits. Use a torch and mirror for these checks.

If seizing marks are detected the engine must not be used. Excessive combustion deposits have to be removed.

With sticking piston rings the cylinders must be removed. Take out the piston rings and clean the grooves and the rings or replace the rings. Remove also any combustion deposits inside the pistons.

Caution: Necessary repair work including removal of combustion deposits must be accomplished at a certified repair station rated for such engine work.

6 Instrumentation and accessories list

Air speed indicator (0 - 300 km/h, 165 kts)

Manufacturer	Type	Certification No.
Winter	6 FMS 4(diam. 80mm)	TS 10.210/15
	0-300 km/h Ident.No. 6421514 0-160 kts Ident.No. 6423514	
Winter	7 FMS 4(diam. 58mm)	TS 10.210/19
	0-300 km/h Ident.No. 7421514 0-160 kts Ident.No. 7423514	

The airspeed indicator must have colour coded speed ranges marked as indicated in the flight manual section 2.3.

Altimeter

Manufacturer	Type	Certification No.
Winter	4 FGH 10 (diam. 80mm)	TS 10.220/46
	1.000-10.000m Ident.No.4110 1.000-20.000 ft Ident.No.4320	
Winter	4 FGH 20 (diam.58mm)	TS 10.220/47
	1.000-10.000m Ident.No.4220	
Winter	4 FGH 40 (diam.58mm)	TS 10.220/48
	1.000-20.000ft Ident.No.4550	

Or any other TSO C 10b specified and approved altimeter with fine range pointer 1 turn max. 1000 m, 3000 ft.

Harness (seat)

Manufacturer	Type	Certification No.
Gadringer	BAGU 5202 G	40.070/32
	SCHUGU 2700 G rubber coated adjuster bars	40.071/05
alternatively	BAGU 5202	40.070/32
	SCHUGU 2700 from manufacturing year 2000 on	40.071/05
Optional in addition	Crotch strap BOGU1303 8 mm hole	40.072/4
Schroth	4-01-0.104	40.073/11
Optional in addition	with crotch strap	

8.2 Parts for fuel system

60507550 Drainer CAV 110 (1/8" NPT)

Warning: Replace the seal ring of the drainer against part no. 60504402 prior to installation

60504402 Seal ring for drainer CAV 110 (for automotive fuel)

60507560 Electric fuel pump Facet 40105

60507558 Refuelling pump KAVAN 12 V up to ser. no. T28

60507562 Refuelling pump Facet 60106 from ser. no. T29 on

60500164 Mechanical fuel pump Bing 8080 (no more available)

60500257 Mechanical fuel pump Mikuni DF44-18 from ser. no. T57 on and as spare part (for installation follow TN1000/28)

60507571 MANN-fuel- filter 500009180 WK 31/2(10) for refuelling pump

41070521 Fuel distributor 10M52/1 with filter for primer valve and restriction for excess fuel line

60000527 Fuel cock KH 1072 T

60507609 Coupling for fuel filler hose KL-006-0 WR513

60503070 Primer-valve IWP069

45001576 Full tank sensor with wiring, plug and gasket 60507547

60507547 Gasket O-ring 10 x 2,5 80FPM610 for full tank sensor

39001070 Material kit for fuel lines (every 10 years)

30092048 Fuel hose 3x1,5 FPM black

30092047 Fuel hose 5x1,5 FPM black