

Maintenance manual DG-1000S

No.	Page	Description	Date
15	0.3 ÷ 0.8, 0.10 ÷ 0.12, 1.3, 1.5, 1.11, 1.16, 1.18, 1.19, 2.1, 2.6, 3.1, 4.6, 4.10, 4.12, 4.13, 6.1, 7.1, diagrams: 2, 3, 9, Enclosure 1 pages: 5, 8	Manual revision TN 1000/24, New type 12V sockets and plugs	October 2014
16	0.3, 0.4, 1.11	TN1000/34 small nose wheel	October 2017
17	0.3 - 0.7, 0.10, 0.11, 0.12, 1.3, 1.12, 1.14, 2.6, 4.9, 4.11, 6.1, 6.3 Enclosure 1 pages 5-7, Diagrams 2, 5, 5a, 7, 7a, 11, 20, Drawings 10E13, 10R146	TM1000/41 Manual revision	December 2018
18	0.3, 0.6, diagram 11	TN1000/41 revision 1	May 2019
19	0.3 - 0.6, 2.1, 2.2, 4.9, 6.3, enclosure 1 page 7	TN1000/42 Canopy lock, rear locking rods Manual revision	July 2019

0.2 List of effective pages

Section	page	issued	replaced	replaced	replaced	replaced
0	0.1	March 2002				
	0.2	see manual	amendments			
	0.3		“			
	0.4		“			
	0.5		“			
	0.6		“			
	0.7	March 2002	Febr. 2011	Oct. 2014	Dec. 2018	
	0.8	“	Febr. 2011			
	0.9	“	Febr. 2011			
	0.10	“	Febr. 2008	March 2008	Oct. 2008	Nov. 2008
			Febr. 2011	March 2011	Oct. 2014	
	0.11	“	Jan. 2005	Febr. 2011	Oct. 2014	Dec. 2018
	0.12	“	Febr. 2011	Oct. 2014	Dec. 2018	
1	1.1	March 2002				
	1.2	“	May 2008	Febr. 2011		
	1.3	“	Oct. 2014	Dec. 2018		
	1.4	“				
	1.5	“	Febr. 2011	Oct. 2014		
	1.6	“				
	1.7	“				
	1.8	“				
	1.9	“	Nov. 2004	Febr. 2008		
	1.10.	“	Febr. 2008			
	1.11	“	Febr. 2011	Oct. 2014	Oct. 2017	
	1.12	“	Dec. 2018			
	1.13	“				
	1.14	“	March 2008	Febr. 2011	Dec. 2018	
	1.15	“	Febr. 2011			
	1.16	“	Oct. 2014			
	1.17	“				
	1.18	Febr. 2011	Oct. 2014			
	1.19	Oct. 2014				
2	2.1	March 2002	Febr. 2011	Oct. 2014	July 2019	
	2.2	“	July 2019			
	2.3	“				
	2.4	“	Febr. 2011			
	2.5	“	Febr. 2011			
	2.6	“	Jan. 2005	May 2008	Febr. 2011	Oct. 2014
			Dec. 2018			
	2.7	“	removed	May 2008		

0.2 List of effective pages (continued)

Section	page	issued	replaced	replaced	replaced	replaced
3	3.1	March 2002	Oct. 2014			
	3.2	“				
	3.3	“	Febr. 2011			
	3.4	“				
4	4.1	March 2002				
	4.2	“	May 2008			
	4.3	“				
	4.4	“				
	4.5	“				
	4.6	“	Oct. 2014			
	4.7	“	Febr. 2008			
	4.8	“	Febr. 2008	Oct. 2008	Febr. 2011	
	4.9	“	Febr. 2008	Oct. 2008	Dec. 2018	July 2019
	4.10	March 2002	Oct. 2014			
	4.11	“	Dec. 2018			
	4.12	“	Oct. 2014			
	4.13	“	Oct. 2014			
	4.14	“	Sept. 2003			
	4.15	“	Sept. 2003			
	4.16	“	Sept. 2003			
	4.17	“				
5	5.1	March 2002				
	5.2	“				
6	6.1	March 2002	Oct. 2014	Dec. 2018		
	6.2	“	Jan. 2005	May 2008	Febr. 2011	
	6.3	“	Dec. 2018	July 2019		
	6.4	Jan. 2005	Febr. 2011			
7	7.1	March 2002	Jan. 2005	Oct. 2014		
8	8.1	March 2002				
9	9.1	March 2002				

0.2 List of effective pages (continued)

diagram	issued	replaced	replaced	replaced	replaced
1	Nov. 2001	May 2004	Oct. 2010		
2	Nov. 2001	Oct. 2014	Dec. 2018		
3	Nov. 2001	May 2008	Oct. 2014		
4	Nov. 2001				
5	Nov. 2001	Dec. 2018			
5a	Dec. 2018				
6	Nov. 2001	March 2008	March 2008	Not valid for 10-101, and from 10-128 on	
6a	March 2008				
7	Nov. 2001	Sept. 2003	Nov. 2004	Dec. 2018	
7a	Oct. 2008	Dec. 2018			
8	Nov. 2001	July 2011			
9	Nov. 2001	Jan. 2008	Febr. 2011	July 2011	Oct. 2014
10	Nov. 2001				
11	Nov. 2001	Sept. 2003 May 2019	May 2004	May 2008	Dec. 2018
12	Nov. 2001	Sept. 2003			
17	Febr. 2008				
18	Febr. 2008				
20	Nov. 2008	Dec. 2018			
21	Nov. 2008	Oct. 2010			
22	Nov. 2008				
5EP34	25.01.1990				
5V18	14.10.1994				
10FW2	5.10.1999				
10E3	28.11.2008	28.02.2011			
10E4 issue A	28.10.2008				
10E4 issue E	8.10.2010				
10E13	12.12.2018				
Encl. 1	Nov. 2008	Page 2, 2a, 8 Oct. 2010 Page 7 July 2019	1, 2, 2a, 4 8, Febr. 2011	5, 8 Oct. 2014	5-7 Dec. 2018
Encl. 2	March 2011	June 2012			
10EP41	4.02.2011				
10E6	23.02.2011	23.02.2012			
SI 67-07	5.11.2007				
Z193	4.11.2009				
10R146	7.01.2019				

2 Inspections

2.1 Daily inspection

see flight manual section 4.3

2.2 Regular inspections

A After 200 flight hours and during the annual inspection

Check the rudder cables for wear especially around the “S” tubes on the rudder pedals. Worn rudder cables should be replaced (see section 4.2).
Check the seal of the rudder (see section 1.3.5).

B Annual inspection (and 100hr inspection – only for USA)

- Execute all items of the daily inspection see flight manual section 4.3.
- Inspect all bolted connections and locking devices ie. locknuts, split pins etc.
- Check all metal parts for adequate greasing and rust prevention. (see section 3.3).
- Check the control surface deflections (see sections 1.2 up to 1.4).
- Check the free play in all control circuits (see section 1.2 up to 1.6)
- Check the fore and aft play of the wings (see section 1.11).
- Check the canopy emergency releases according to section 7.14 of the flight manual.
- Check the rubber cords in the control system (see sections 1.2.6 and 1.7.5).
- Check the thickness of the wheel brake linings and of the brake disc (see section 1.6.4).
- Check if the brake fluid has to be exchanged (see section 1.6.4).
- Check the airbrakes according to section 4.4.
- Check the fin ballast tank system according to section 1.8.2.
- Check the fin ballast box according to section 1.9.
- Check the friction of the canopy opening handles (canopies removed from fuselage): A force of 10 – 20N (2.2 up to 4.4 lbs.) should be required at the end of the handle. If the force is too low tighten the hinge bolt of the handle accordingly.
- Check if the rear locking rods of front and rear canopy are screwed in tightly. To accomplish this close the locking mechanism with canopy open and try to rotate the locking rod clockwise using small pipe pliers and a piece of abrasive paper 240 grid around the rod to protect the rod from damage.

Caution: Don't rotate counter-clockwise, otherwise you may rotate the rod out of the thread and destroy the Loctite and lock nut securing.

If you are able to rotate the rod proceed with TN1000/42 instruction 3.

- **Tow hooks:** The operating and maintenance instructions for the release mechanisms, see sect. 0.5.3 of this maintenance manual have to be followed.
- **All-up weight and centre of gravity:** These should be checked at least every 4 years during the yearly inspection.

C Every 3 months

Check the tension of the lines of the waterbag attachment (see section 4.1).

D Special inspections

Tow hook:

After a wheel-up landing, the C.G. tow hook is to be cleaned and to be carefully checked for any damage.

After a landing where the fuselage nose has touched the ground, the nose tow hook is to be cleaned and to be checked for correct functioning.

C.G. weighing: After all work which may influence the C.G.

H Removal of the front upper fork 10FW13/1

- 1 Remove the main wheel see A.
- 2 Retract the landing gear.
Warning: The landing gear will retract by itself when unlocked by the force of the gas spring!
- 3 Disassemble the gas spring from the left side of the undercarriage box see 4.5.0.
- 4 Extend the landing gear again.
- 5 Remove the 2 bolts M6×26 LN9037 which connect the struts 10FW14/3 to the front upper fork 10FW13/1.
- 6 Remove the pushrod 10FW20 from the actuating lever 10FW15/1.
- 7 Remove the 2 bolts M6x35 LN9037 which connect the actuating lever 10FW15/1 to the shaft 10FW15/3. Shift lever 10FW15/1 in outboard direction and remove it.
- 8 **Up to ser. no. 10-132:** Remove the 3 bolts M6x35 LN9037 which connect the shaft 10FW15/3 (left) and 10FW15/2 (right) to the fork 10FW13/1.
From ser. no. 10-133 on: Remove the 2 bolts M6x35 LN9037 which connect the shaft 10FW15/3 (left hand side) to the fork 10FW13/1.
With TN1000/13 executed, standard from ser. no. 10-133 on: remove the locking catch. (lock for retracted position)
- 9 **Up to ser. no. 10-132:** Shift the shaft 10FW15/3 towards the left fuselage wall. Mark the shaft at the outside fuselage wall (e.g. by illuminating this area from the inside) and drill a dia. 18 mm hole through the fuselage wall. Insert a bolt with thread M8 into the shaft to pull out the shaft through the hole.
From ser. no. 10-133 on: Pull out the axle 10FW15/3 at the actuation lever.
Note: The axle 10FW15/3 has been shortened, so there it is no more necessary to drill a hole through the fuselage wall.
- 10 **Up to ser. no. 10-132:** Insert a bolt with thread M10 into the shaft 10FW15/2 to pull out the shaft (no hole in the fuselage shell needed).
From ser. no. 10-133 on: Remove the axle with cone clamping devices 10FW124 according to point G 7 (axle 10FW127)
- 11 Remove the fork 10FW13/1.

I Installation

- 1 Reverse the above procedures
- 2 Use new nuts LN9348 or DIN985-8 zn and a new split pin dia. 1.6x12 DIN94 zn. Install bolts in same directions and washers at same positions.
During reassembly secure the 2 bolts A with Loctite 243 or safety wire.
- 3 **From ser. no. 10-133 on:** Clean and lubricate (using oil) the axles 10FW124 and 10FW127 before reinstallation. Fasten the counter nut with a torque of 12 Nm (8.8 ft lb) for axle 10FW124 and 20 Nm (14.7 ft lb) for axle 10FW127.
Caution: Only in ser. no. 10-134 a thinner axle 10FW137 is installed at the right hand side of fork 10FW12/2. Fasten the counter nut of this axle only with a torque of 12 Nm (8.8 ft lb).

Note: It is sufficient to tape the holes drilled for removal of the axles. GFRP repair is not necessary.

Variometer

Manufacturer	Type	Certification No.
Winter	5 StVM5 (Durchm.58)	TS 10.230/14
	± 5 m/s Ident.No. 5451	
	±1000 ft/min Ident.No. 5452	
	± 10 kts Ident.No. 5453	
Winter	5 STV 5 (Durchm.80)	TS 10.230/13
	± 5 m/s Ident.No. 5251	
	±1000 ft/min Ident.No. 5252	
	± 10 kts Ident.No. 5253	

Turn and bank indicator

Manufacturer	Type	Certification No.
Apparatebau Gauting	WZ-402/31 12 V	10.241/8

Outside air temperature gauge

Manufacturer	Type	Certification No.
Störk	TF 00-059 K (-20 - + 40 °C)	/

Accelerometer

(for Category A Aerobatics)

Accelerometer capable of retaining max. and min. g-values with markings red radial lines at +7g and -5g.

Manufacturer	Type	Standard
Falcon Gauge	GM5 10-2	MIL-A-5885 C
AOA	BM 470-RL/L	MIL-A-5885 A

or other instruments designed for aircraft use according to MIL-A-5885 C (or later issues) standards may be installed.

- 6 Slip the drive unit on the linear guide to the front position.
- 7 Remove the 2 rear bolts M6x28 which mount the linear guide to the landing gear box.
- 8 Slide the drive unit on the linear guide to the rear position. Be careful not to slide the drive unit too far so that it may slide off the linear guide.
- 9 Remove the 2 front bolts M6x28 which mount the linear guide to the landing gear box.
- 10 Remove the drive unit from the fuselage.

I. Removal of the rear fork 10FW91

- 1 Remove the main wheel see A.
- 2 Disassemble the gas strut from the left side of the undercarriage box see section 4.5.0
- 3 Remove the 2 bolts M8×40 LN9037 which connect the drag struts to the rear fork 10FW91.
- 4 Remove the drag struts.
- 5 Remove the landing gear drive unit according to H.
- 6 Remove the bolts which connect the rear fork with the lever 10FW108.
- 7 **Up to ser.No. 10-267:** Remove the axle with cone clamping devices 10FW127. To remove the axle hold the screw head with a spanner and unfasten the counter nut with an open end spanner until the axle can be pulled out.
From ser. No. 10-268 on: Remove axle 10FW251/1. To remove the axle screw a bolt M10 into the axle from the outside, then remove the bolt M6x35 LN9037 which fixes the axle in the fork, pull out the axle at the M10 bolt.
- 8 Pull out the lever 10FW108.
- 9 Remove the rear fork.

J. Reinstallation

- 1 Reverse the above procedures.
 - 2 Use new lock nuts and a new split pin dia. 1.6x12 DIN94 zn. Install bolts in same directions and washers at same positions.. During reassembly of the brake assembly secure the 2 bolts A with Loctite 243 or safety wire.
 - 3 Clean and lubricate (using oil) the axles 10FW124 and 10FW127 before reinstallation. Fasten the counter nut with a torque of 12 Nm (8.8 ft lb) for axle 10FW124 and 20 Nm (14.7 ft lb) for axle 10FW127.
 - 4 Secure the bolt M10x 44 which mounts the gas strut to the extension of the landing gear box with Loctite 243.
- Note:** It is sufficient to tape the holes drilled for removal of the axles. GFRP repair is not necessary.