

Maintenance Manual DG-1000M

0 General

0.1 Manual amendments

No.	Page	Description	Date
1	0.0, 0.1, 0.3 ÷ 0.7, 0.9, 0.12 ÷ 0.14, 1.2, 1.5, 1.8 ÷ 1.12, 1.20, 1.24, 1.31, 1.33, 1.34, 2.1 ÷ 2.4, 2.6, 3.1 ÷ 3.7, 4.6 ÷ 4.8, 4.11, 4.12, 4.19 ÷ 4.24, 4.26, 4.27, 4.29, 4.30, 6.1, 6.4, 7.2, 8.1 ÷ 8.4, diagrams 2, 3, 7, 15, 16, 23, add drawing W59, 10E202 issue C (only with coolant pump Pierburg)	Manual revision Alternative for coolant pump TN1000/22	October 2012
2	0.1, 0.3, 0.6, 0.11, 0.13, 0.14, 1.3, 1.4, 1.10, 8.2, 8.3, 8.5	Manual revision TN1000/23	July 2014

Maintenance Manual DG-1000M

0.2 List of effective pages

Section	page	issued	replaced	replaced	replaced
0	0.0	October 2010			
	0.1	"	See list of amendments		
	0.2	"	See list of amendments		
	0.3	"	See list of amendments		
	0.4	"	See list of amendments		
	0.5	"	See list of amendments		
	0.6	"	See list of amendments		
	0.7	"	See list of amendments		
	0.8	"			
	0.9	"	October 2012		
	0.10	"			
	0.11	"	July 2014		
	0.12	"	October 2012		
	0.13	"	October 2012	July 2014	
	0.14	"	October 2012	July 2014	
	1.1	October 2010			
	1.2	"	October 2012		
	1.3	"	July 2014		
	1.4	"	July 2014		
	1.5	"	October 2012		
	1.6	"			
	1.7	"			
	1.8	"	October 2012		
	1.9	"	October 2012		
	1.10.	"	October 2012	July 2014	
	1.11	"	October 2012		
	1.12	"	October 2012		
	1.13	"			
	1.14	"			
	1.15	"			
	1.16	"			
	1.17	"			
	1.18	"			
	1.19	"			
	1.20	"	October 2012		
	1.21	"			
	1.22	"			
	1.23	"			

Maintenance Manual DG-1000M

List of effective pages (cont.)

Section	page	issued	replaced	replaced	replaced
7	7.1	October 2010			
	7.2	October 2012			
8	8.1	October 2010	October 2012		
	8.2	"	October 2012	July 2014	
	8.3	"	October 2012	July 2014	
	8.4	"	October 2012		
	8.5	July 2014			
9	9.1	October 2010			
	9.2	"			
	9.3	"			
	9.4	"			
	9.5	"			
	9.6	"			
Diagram		issued	replaced	replaced	replaced
1	October 10				
2	October 10	October 2012			
3	June 05	October 2012			
4	Nov. 01				
5	October 10				
6	October 10				
7	October 10	October 2012			
8	October 10				
9	October 10				
10	October 10				
11	October 10				
12	October 10				
13	October 10				
14	October 10				
15	October 10	October 2012			
16	October 10	October 2012			
17	October 10				
18	October 10				
19	October 10				
20	October 10				
21	October 10				
22	October 10				
23	October 10	October 2012			
24	October 10				
25	October 10				
26	October 10				
27	October 10				

Maintenance Manual DG-1000M

Section	content	page
4.11	DEI-NT settings	4.33
4.11.1	Calibration of the fuel display in the DEI-NT	4.33
4.11.2	Further DEI-NT settings	4.33
4.11.3	Download of flight log and service data.....	4.34
5	Weight and balance.....	5.1
6	Instrumentation and accessories list	6.1
6.1	Air speed indicator.....	6.1
6.2	Altimeter	6.1
6.3	Harness (seat).....	6.1
6.4	Compass	6.2
6.5	VHF transceiver	6.2
6.6	Variometer	6.3
6.7	Turn and bank indicator	6.3
6.8	Outside air temperature gauge	6.3
6.9	Engine instrumentation	6.3
6.10	Instruments which are not part of the minimum equipment:.....	6.4
6.10.1	Transponders:.....	6.4
6.10.2	ELT:	6.4
6.10.3	Other instruments and equipment (eg. variometers, gliding computers or flight data recorders):.....	6.4
7	List of special tools etc.	7.1
8	Partlist	8.1
8.1	Parts for the powerplant.....	8.1
8.1.1	Parts necessary for the 25 hours inspection.....	8.1
8.1.2	Spare parts.....	8.1
8.2	Control surface sealings and turbulators.....	8.4
8.3	Parts for landing gear	8.4
8.4	Other parts	8.5
9	Enclosures	9.1
9.1	Equipment list	9.1
9.2	Checklist for checks and maintenance work	9.2
9.3	Instruction for downloading log book and service data from the DEI-NT	9.3

0.4 Airworthiness limitations

0.4.1 Repairs

Repair damaged airframe parts prior to next flight. Follow the instructions of the DG-1000 repair manual. Repairs outside the scope of the DG-1000 repair manual and major repairs must be accomplished at an approved repair station or by an approved 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 the variant DG-1000M is 12000 flight hours. Therefore inspections according to section 2.4 of this manual have to be executed at 3000 h, 6000 h, 9000 h and every 1000 hours following thereafter.

0.4.3 Life time of equipment and components

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

- a) The following components of the power plant have to be replaced after 400 engine hours.
 1. All nuts and bolts on the engine, part no. 39001028
 2. The bearings in the upper drive belt pulley, part no. 59332050 and 59320320
- b) The **gasket for the drainer valve** has to be exchanged after 6 years, part no. 60504402.
- c) The **full tank sensor** has to be exchanged after 6 years, part no. 45001605.
- d) The **coolant hoses**, part no. 39001029 **and the coolant** (type see section 2.12.2) have to be exchanged after 6 years.
- e) All **flexible fuel lines** have to be exchanged after 6 years (part no. see section 8.1.2.3).
- f) The **drive belts** have to be exchanged after 100 engine hours, part no.60510831).
- g) The **spark plugs** have to be exchanged after 100 engine hours, part no.40050360.
- h) 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 6.3.
- i) 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.

Maintenance Manual DG-1000M

- j) The **brake fluid of the wheel brake** 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.

0.4.4 Service time, maintenance documents of equipment and components

Follow the instructions of the respective manufacturer.

- a) Tow releases:

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 6.3.
- c) Minimum instrumentation: instructions of the manufacturer, approved instruments see sections 6.1, 6.2 and 6.4.
- d) Engine: Manual for the engine SOLO Type 2625 02 I, latest approved version.
- e) Propeller: Operation- and Maintenance manual for fixed pitch propeller in Glass or Carbon reinforced Plastic type BM, latest approved version.

0.4.5 Power plant trouble shooting

Please find a checklist in AFM section 8.8.

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.*

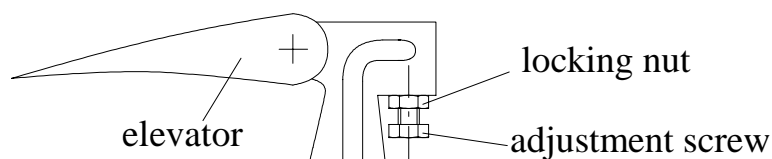
1.2.3 Elevator stops

The elevator stops are located at the rear control column and can be adjusted with a 10 mm open end wrench.

1.2.4 Elevator control circuit free play

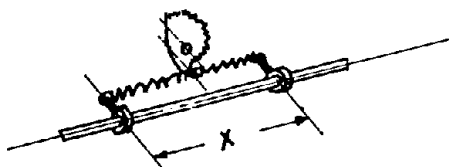
With the elevator held fixed in the zero position, the free play at the top of the control column can be ± 2 mm (± 0.08 in.). Within the automatic elevator connection there should be no free play noticeable in the zero position when the elevator is moved at its trailing edge.

Any free play can be reduced by screwing in the adjustment screw on the automatic connector funnel.



1.2.5 Trim

The trim mechanism should be adjusted so that with full forward (nose down) trim the control column is pulled by the trim springs into its maximum forward position with a force P of approx. 30 N (6.6 lbs.). The force P is to be measured with a spring balance at the upper end of the control stick. Read the force, when the stick just starts to move.



The tensioning of the trim mechanism springs is adjusted as shown in the sketch. $x = 340$ mm (13.4 in.)

The springs are located in the rear cockpit on the left hand side.

The correct adjustment should be verified in flight and corrected if necessary.

Trimming should be possible up to 200 – 220 km/h (108 - 119 kts.).

Note: If the DG-1000M can be trimmed up to higher speeds it is likely that the trim is not sufficient in circling flight.

1.2.6 Pilot force reducing rubber-cord

The rubber cord (part No. 30091131 dia. 6 mm white) produces an elevator stick force in push direction. If the trim efficiency of your glider in push direction is reduced, you have to inspect the rubber cord.

The rubber cord is located on the left hand side behind the main bulkhead below the baggage compartment floor. The rubber cord runs from bellcrank 5St19 to a fork beside the left hand front edge of the landing gear box.

The length of the rubber cord when loose should be 470 mm (18.5 in.). If the cord is longer or worn it must be replaced.

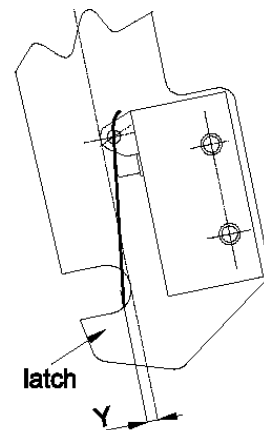
The cord must be replaced at least every 6 years.

4. Retract the landing gear a small amount, extend again and check if the lower green control light starts shining. If not, the arm was bent too far.
5. If the adjustment is correct, retract the landing gear and extend via the emergency system. Check if the lower green control light starts shining. If not, the arm was bent too far. After adjustment repeat the check according to item 2.

b) Limit switch landing gear retracted

The spindle drive must be shut off in the retracted position when the bolt at the left drag strut 10FW102 engages in the notch of the left latch on shaft 10FW109 and activates the limit switch which is mounted to the latch.

Check: Activate the limit switch. The distance Y shall be 2 - 3 mm (0.08 – 0.12 in.) when the switch is activated. If necessary adjust the switch by bending its arm.



c) Limit switch gas strut (emergency extension system)

This switch (position 12 in diagram 9) is mounted to the upper end of the gas-strut at bracket 10FW120. When resetting the gas strut the spindle drive must be stopped by the limit switch when the distance X in diagram 9 (from counter nut up to gas strut body) is 17 - 20 mm (0.67 – 0.8 in.). If necessary loosen the mounting screws and rotate the switch for adjustment.

d) Switch emergency extension system (optional with TN1000/19, standard from ser.no. 10-157 on)

This switch (position 20 in diagram 9) activates higher current for the spindle drive via the LG control unit to reset the gas-strut as long as one of the emergency extension handles is pulled. The switch is mounted to a bracket 10FW143 which is mounted to the bracket 10FW120 see item c). The switch is activated by the deblocking lever in the upper gas-strut end. In case the spindle drive doesn't have enough power to reset the gas-strut check the function of the switch. To accomplish this disconnect the 2 wires from the switch. With one of the emergency extension handles pulled the resistance between these 2 terminals must be zero. If necessary adjust the switch by bending its arm.

1.6.1.3 Free play

Free play between bell crank 10FW108 and shaft 10FW91 is not allowed. If there is any free play tighten the two bolts M8x45 inside the landing gear box with a 13 mm open-end wrench. If there is still some free play, the bolts should be removed and the holes drilled out and reamed to diameter 10 H7. M10 x 45 LN9037 bolts should then be installed.

Maintenance Manual DG-1000M

8.1.2.2 Parts for cooling system

60001201 Electric water pump Webasto U4810 modified (no longer available)

60001210 Coolant pump Pierburg modified (replacement for Webasto).

41072800 Elastic adapter-ring 10M280

Note: A voltage converter 10E211 (see section 8.1.2.4) must be installed to run the coolant pump Pierburg with sufficient power.

60504049 Radiator KTM VW 0425 or later type VW2192

39001019 Service kit cooling system hoses

Rubber mounts for radiator

60000275 2 pieces Rundlager Type B (upper mount)

60000262 1 piece Rundlager Type A (lower mount)

60000377 Copper sealing ring 10x14x0,8 DIN 7603 A for service port

8.1.2.3 Parts for fuel system

60507550 Drainer CAV 110 (1/8" NPT)

Warning: Replace the sealing ring of the drainer against partno. 60504402 prior to installation

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

60510516 Fuel pressure switch DRS 5 ES 0,5 – 5 bar seal FKM or

60510519 Fuel pressure switch Beck 901.51

60507577 Fuel pressure regulator Pierburg 7.21476.50.0

60507575 Fuel pump Pierburg with rubber sleeve 7.22156.60.0

60507562 Refuelling pump Facet 60106

60507576 Fuel filter Pierburg Nr. 4.00030.80.0 (in front of fuel pump)

60507568 Fuel filter MANN WK 613 (behind fuel pump)

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

60510833 Injection valve Bosch 0 280 155 868

60504407 O-Ring for Injection valve Bosch

60507802 Front fuel gauge: VDO 224-011-020-279X

60507800 Rear fuel gauge: VDO 224 082 005 088

60000527 Fuel cock KH 1072 T

60507607 Coupling for fuel filler hose KL-006-0-SL007

45001605 Full tank sensor

48000009 Fuel hose 7,5x13,5 mm DIN 73379-2A

48000092 Fuel hose Inner dia. 3,5 mm fabric braided 2122.0200 (for emergency system)

60507526 Fuel hose 15 x 23 mm fabric braided (at fuel pump)

30092051 Metal braiding inner dia. 8 mm

60000377 Copper sealing ring 10x14x0,8 DIN 7603 A for service port

Maintenance Manual DG-1000M

8.1.2.4 Parts for the electrical system

- 60510899 Main battery: Odyssey PC625 12V/17Ah
- 41076003 DEI-NT- DG-1000M
- 41076004 DEI-NT-DG-1000M second unit (rear cockpit)
- 41076005 Control unit-NT-DG-1000M
- 41076006 Engine control unit ECU Trijekt-Plus T101 Solo No. 23 00 886
- 41076007 Controller for emergency system Solo No. 23 00 896

- 41075210 Engine speed sensor (normal system+emergency system) Bosch 0261210147 assembled with wiring and plugs
- 60510836 Throttle valve sensor: Bosch 0 280 122 201
- 60510837 Probe for coolant temperature Bosch 0 281 002 209
- 60510669 Intake air sensor Epcos B57881S212F
- 41075204 Proximity switch ready assembled with wiring and plug
- 41075211 Voltage converter 10E211 for coolant pump Pierburg

- 60510834 Ignition coil Solo No. 23 00 883

- 60510832 Regulator Ducati 34407011
- 60504044 Voltage reducing module for generator/regulator
- 60510202 Condensor for generator/regulator 100.000 μ F/40V

- 60510464 Limit-switch engine retracted and engine extended 164-574, alternatively SI2010-B2T20YR30,5m
- 60510506 Manual extension-retraction switch MTG 106 G
- 60510465 Black cap for switch MTG206S
- 60510483 Switch for emergency engine control: APEM 5636 MA
- 60510466 Red cap for APEM 5636 MA

- 60510854 Key switch 3 Pos, 2 Pol KL09-1908KA (Master switch)
- 60510362 Switch STA 106 E (selector intern-extern)
- 60510372 Press-button DJET 07.17502.21 for starter
- 60510375 Press-button 12G2904 for refuelling pump

- 60510385 Circuit breaker ETA 2A
- 60510386 Circuit breaker ETA 3A
- 60510437 Fuse 01191017003 80 A for battery

- 60510796 Socket BSB 12 (in main bulkhead)
- 60510797 Plug BSK12 for socket BSB 12

8.4 Other parts

- 30091131 Rubber cord dia. 6 mm white
- 30091130 Rubber cord dia. 2 mm white
- 30091132 Rubber cord dia. 2 mm black