

## Maintenance manual DG-500MB

### Manual amendments

No.	Page	Description	Date	Signature
1	2, 3, 4, 34, 57, 63, 64, 93, drawing W57	Engine, powerplant drive belt tension, DEI- circuit breaker, manual revision TN 843/13	Oct. 1999	
2	2, 3, 4, 11, 19, 27, 45, 47, 48, 49, 51, 62, 71, 79, 91, wiring diagram 5E101, drawing W40	Greasing schedule, new attachment of the throttle cable from ser.no 5E213 on, manual revision TN 843/16	Jan. 2001	
3	2, 3, 4, 5, 23 - 28, 30 - 34, 36a, 37, 49 - 51, 54, 72, 73, 78, 79, 84, 91, 93, wiring schemes 5E101 issues G and H, 5E218	Engine control, manual extension and retraction control, carburettors, engine doors rubber cord, manual revision TN 843/17	March 2002	
4	2, 4, 24, 91, diagram 13b, wiring scheme 5E101 issue I, drawing 5E218	Extension-retraction unit, TN 843/18 issue 2	June 2003	
5	2, 3, 4, 24, 25, 47, 48, 50, 64, 65, 68, 73, 75, 76, diagram 18, drawing 5M110	Manual revision Powerplant: retaining cable mounting in fuselage TN 843/19	March 2004	
6	2, 3, 4, 5, 42, 49, 68, 89, 89a, 93, Enclosure 1	Manual revision TN 843/24	January 2006	

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	5E102 Wiring plan DIN A 1 (in aircraft log) <b>or</b>		2.07.03
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Instructions for continued airworthiness

### 0 **Airworthiness limitations**

#### 0.1 **Repairs:**

Repair or replace damaged parts prior to next flight. Follow the instructions of the DG-500MB repair manual. Repairs outside the scope of DG-500 MB 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 parts for all repairs.

#### 0.2 **Life time of the airframe**

The maximum allowable operating time for composite sailplanes is 12000 flight hours. Therefore inspections according to sect. 2.4 of this manual have to be executed at 3000 h, 6000 h, 9000 h and every 1000 hours following thereafter.

#### 0.3. **Life time of components**

- a) The following components of the power plant have to be replaced after 400 engine hours.
  1. All nuts and bolts on the engine
  2. The bearings of the upper drive belt pulley
- b) All flexible fuel lines and the gasket for the drainer valve have to be exchanged after 6 years.
- c) The **hoses of the cooling system** have to be exchanged after 6 years.
- d) The **drive belt** has to be exchanged after 50 engine hours.
- e) The 2 upper **rollers for the drive belt** have to be exchanged every 50 engine hours
- f) The **spark plugs** have to be exchanged after 25 engine hours.
- g) The **fabric straps of the safety harness** have to be exchanged after 12 years.
- h) The rubber cords in the elevator control system see sect. 1.2.6 and in the wing flap control system see sect. 1.4.6 have to be replaced at least every 6 years.
- i) **Other components**  
All other components like 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.
- j) **Flexible fuel bags in the wings (option)**  
These have to be exchanged after 10 years.

### 2.4 Inspection procedure for increase of service time

#### 1. General

The results of fatigue tests of wingspan 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. and 5. step).

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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.

- 12a. Check the cylinder base for indications of leaking and/or damaged gaskets. When gaskets are damaged or leaking they must be exchanged. To accomplish this the engine has to be removed from the propeller mount.  
**Caution:** The exchange of cylinder base gaskets must be accomplished at a certified repair station rated for such engine work.
13. Check the muffler for cracks and ensure mounting is secure. Check especially the cable which lifts the muffler during engine extension. Check the retaining cable for the muffler lifting cable incl. the rubber cord. Check the moving part at the front end of the muffler for any cracks. Check the exhaust manifold (already removed) for cracks. Reinstall the exhaust manifold, therefore remove any remains of the gaskets, install new gaskets. Check the function of the gas-spring at the muffler frame. Therefore retract the engine until the muffler pops downwards. The gas-spring must press the muffler frame securely to its lower stop. Check the length of the cable which lifts the muffler. To accomplish this extend the engine and press the muffler body in downward direction at its front end with a force of approx. 5 daN (11 lbs.). If the cable is too long or if the spring in the cable has been permanently stretched, the muffler will interfere with the exhaust manifold.  
Check the spring pressure at the coupling of exhaust manifold to muffler. To accomplish this, measure the distance between the brackets for the spring couplings at the muffler pipe and at the movable part of the muffler in disengaged and in operating position. Extend the powerplant to operating position via the ignition switch. As soon as the extension stops, lift the red cover of the manual extension switch and switch off the ignition. In operating position the distance should be approx. 1 mm (0.04 in.) smaller than when disengaged. If the difference should be less than 0.5 mm (0.02 in.) you have to adjust to 1mm using the nut on the eyebolt. By this procedure you will pull the muffler forwards in its frame.  
Note: With new manifold and/or new movable part the difference should be adjusted to 2 – 3 mm (0.04 – 0.12 in.) to allow breaking in of the parts.
14. Check all engine nuts and bolts with a torque wrench (see sect. 1.11.10).

### 4.14 Replacement of the engine retaining cable

Please refer to diagram 17 and diagram 18 with retaining cable shock absorber (standard from ser. no. 5E243B20 or retrofitted according to TN 843/19)

1. Extend the powerplant.
2. Remove the access panel from the rear engine bay floor.
3. Remove the engine retaining cable from the propeller mount. Let the cable retract slowly, otherwise the retraction bungee may jump from its pulley located inside the rear end of the fuselage. The bungee pulley is accessible via the access hole inside the tailwheel box.
4. Pull out the bungee via the access hole in the rear engine bay floor until you reach the terminal of the retaining cable.
5. Fix the bungee to the floor to prevent it from disappearing into the fuselage boom.
6. Cut off the retaining cable and pull it out. Don't damage the bungee! Don't loose the steel washer.
7. Attach the new cable with thimble and Nicopress sleeve to the bungee. Press the Nicopress sleeves. The end of the cable must be inside the second Nicopress sleeve. Fit the steel washer onto the cable and wrap the washer with the Nicopress sleeves twice with Tesaband 651.
8. Push the retaining cable via the adjustment screw through the rear engine bay bulkhead and pull it forwards. Don't forget to install the steel washer between Nicopress sleeve and bulkhead.
9. Let the bungee retract slowly into the aft fuselage
10. Install the retaining cable together with thimble and Nicopress sleeve to the propeller mount. Don't press the sleeve. Adjust the position of the powerplant according to section 1.12.4. Tighten the cable and press the Nicopress sleeve. Cut off the excess cable.
11. Check again the length of the retaining cable. See section 1.12.4. Adjustment is possible at the adjustment screw at the rear bulkhead.
12. Reinstall the access cover to the rear engine bay floor.

#### Material:

Steel cable diameter 3.2 mm (1/8 in.) type see sect. 4.2 approx. 2.3 m (91 in.) long

2 thimbles 3mm DIN 6899A

3 Nicopress sleeves 28-3-M

Tesaband 651 (self-adhesive textile tape)



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### 6.5 VHF transceiver

<b>Manufacturer</b>	<b>Type</b>	<b>Certification No.</b>
Dittel	FSG-40 S	10.911/45
	FSG-50	10.911/71
	FSG-60 M	10.911/72
	FSG-70,71 M	10.911/81
	FSG-90	10.911/98JTSO
	FSG-2T	LBA.0.10.911/103JTSO
Becker	AR 3201-(1)	10.911/76
	AR 2008/25 (A)	10.911/48
	AR 4201	JTSO-2C37 D, ED-23A
Filser	ATR 720 A	10.911/74
	ATR 720 C	10.911/83
	ATR 500	O.10.911/106JTSO
	ATR 600	LBA.0.10.911/113JTSO

**Note:** Only radios with diameter 58mm (2 ¼ in.) can be installed at the assigned place in the console below the instrument panel.

### 6.6 Variometer

<b>Manufacturer</b>	<b>Type</b>	<b>Certification No.</b>
Winter	5 St VM5 (dia.58 mm)	TS 10.230/14
	±5 m/sec Ident.No.5451	
	±1000 ft/min ident.No.5452	
	±10 kts Ident.No.5453	
Winter	5 StV5 (dia.80 mm)	TS 10.230/13
	±5 m/sec Ident.No.5251	
	±1000 ft/min Ident.No.5252	
	±10 kts Ident.No.5253	

### 6.7 Turn and bank indicator

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

### 6.8 Engine instrumentation

(RPM, fuel, CHT, voltmeter, engine elapsed - time indicator, EGT as an Option)

<b>Manufacturer</b>	<b>Type</b>	
DG Flugzeugbau	DEI-MC 500 B	main instrument, front cockpit
	DEI-M 500 ZB	in the rear cockpit

6.8 **Instruments which are not part of the minimum equipment:**

**Transponders:** Transponders certified for aircraft use according to TSO or JTSO or ETSO standards may be installed.

**Other instruments and equipment (eg. variometers, gliding computers or flight data recorders):**

Instruments and other equipment may be installed if they do not in themselves, or by their effect upon the sailplane, constitute a hazard to safe operation.

**Caution:** If additional instruments or equipment are to be installed after production of the glider, it must be assured that they will be installed in the places provided by the design. If installed in other places it must be assured that they are secured safely.

Electrical instruments and equipment must be connected via appropriately rated fuses, the power consumption of each single part should not exceed 3A.

After installation raise a new weight and balance report.

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### 8.2 Parts for the electrical system

60510891 Battery 6V, 10 or 12Ah equipped with screw - terminals  
40876070 DEI MC 500 B  
40876090 rear panel DEI MC 500 ZB  
40876030 Control unit 8E103 (including relays and regulator)

60510464 Limit-switch engine retracted and engine extended 164-574

#### **Ser.no B1 –B15 with instruction 5 from TN 843/17 not executed:**

60510476 Manual extension-retraction switch APR 20-647H  
60510475 Switch to switch over from normal to emergency extension-retraction APR 20-646H

#### **Ser.no B1 –B15 with instruction 5 from TN 843/17 executed, ser.no. B16 and on:**

60510482 Manual extension-retraction switch APEM 637 H/2  
60510483 Switch to switch over from normal to emergency extension-retraction APEM 5636 MA

60510476 Manual extension-retraction switch APR 20-647H  
60510475 Switch to switch over from normal to emergency extension-retraction APR 20-646H

60510813 Master switch Bosch 0341001001  
60510812 Key for master switch Bosch 0341001001  
60510478 Engine master switch 631 H-215A  
60510370 Press-button SECME 07 17801 21 for starter and for test of second fuel pump

60510391 Circuit breaker Klixon 7277-2-15A for spindledrive  
60510394 Circuit breaker Klixon 7277-2-5A for DEI  
60510385 Circuit breaker ETA 2A  
60510386 Circuit breaker ETA 3A  
60510388 Circuit breaker ETA 10A

60510436 Fuse 535257 60 A for batteries  
60510440 Fuse 250V 0.2A 5x20 m for fire warning light  
60510419 Fuse 250V 2A 5x20 m for second fuel pump

60510550 Proximity switch Insor IPCT 1212  
40576150 Proximity switch ready assembled with wiring and plug

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