

**Flight manual DG-500MB**

**0.1 Record of revisions**

Any revision of the present manual, except actual weighing data, must be recorded in the following table and in case of approved sections endorsed by the responsible airworthiness authority.

The new or amended text in the revised page will be indicated by a black vertical line in the right hand margin, and the Revision No. and the date will be shown on the bottom left hand of the page.

Rev. No.	Affected Pages/ section	Description	Issue Date	LBA Approval Date	Inserted Date Signature
1	0.5, 7.8	DEI circuit breaker, manual revision TN 843/13	Oct. 1999	03.11.99	
2	0.3, 4.8	Greasing schedule, manual revision TN 843/16	Jan. 2001	07.02.01	
3	0.3, 0.4, 0.5, 3.3, 3.4, 4.3, 4.5, 4.8, 4.12, 4.13, 4.14, 4.18, 4.21, 4.22, 5.5, 7.6, 7.7, 7.8, 7.12, 8.7	Engine control, manual extension and retraction control, manual revision TN 843/17	July 2002	31.07.02	

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TN 843/17

0.1

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**0.2 List of effective pages**

Section	page	issued	replaced/	replaced/	replaced/	replaced/
0		0.0	July 1999			
		0.1	-	Oct. 99	Jan. 01	July 02
		0.2	Nov. 98			
		0.3	July 1999	Jan. 01	July 02	
		0.4	Nov. 98		July 02	
		0.5	"		July 02	
		0.6	"			
1		1.1	"			
		1.2	July 1999			
		1.3	Nov. 98			
		1.4	"			
		1.5	"			
		1.6	"			
		1.7	"			
2	App..	2.1	"			
	"	2.2	"			
	"	2.3	"			
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3	"	3.1	"			
	"	3.2	"			
	"	3.3	"	July 02		
	"	3.4	"	July 02		
	"	3.5	"			
	"	3.6	"			
	"	3.7	"			
4	"	4.1	"			
	"	4.2	"			
	"	4.3	"	July 02		
	"	4.4	"			
	"	4.5	"	July 02		
	"	4.6	"			
	"	4.7	"			
	"	4.8	"	Jan.01	July 02	
	App.	4.9	"			

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0.3

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**0.2 List of effective pages (cont.)**

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4	App.	4.10	Nov. 98		
	"	4.11	"		
	"	4.12	"	July 02	
	"	4.13	"	July 02	
	"	4.14	"	July 02	
	"	4.15	"		
	"	4.16	"		
	"	4.17	"		
	"	4.18	"	July 02	
	"	4.19	"		
	"	4.20	"		
	"	4.21	"	July 02	
	"	4.22	"	July 02	
	"	4.23	"		
	"	4.24	"		
	"	4.25	"		
	"	4.26	"		
"	4.27	"			
5	"	5.1	Nov. 98		
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	"	5.3	"		
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	"	5.8	"		
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	"	5.11	"		
	"	5.12	"		
6		6.1	"		
		6.2	"		
		6.3	"		
		6.4	"		
		6.5	"		
		6.6	"		
		6.7	"		
		6.8	"		
		6.9	"		
		6.10	"		

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**0.2 List of effective pages (cont.)**

Section		page	issued	replaced	replaced
7		7.1	Nov. 98		
		7.2	"		
		7.3	"		
		7.4	"		
		7.5	"		
		7.6	"	July 02	
		7.7	"	July 02	
		7.8	"	Oct. 99	July 02
		7.9	"		
		7.10	"		
		7.11	"		
		7.12	"		July 02
		7.13	"		
		7.14	"		
		7.15	"		
		7.16	"		
		7.17	"		
		7.18	"		
		7.19	"		
8		8.1	"		
		8.2	"		
		8.3	"		
		8.4	"		
		8.5	"		
		8.6	"		
		8.7	"	July 02	
9		9.1	"		

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3.5 ff.

**Caution:** To prevent unintentional spinning do not stall the sailplane. Fly with enough speed reserve especially in gusty conditions and in the landing pattern.

Intended spins with waterballast are not permitted.

Height loss during recovery up to. 150 m (160-490 ft)  
max. speed during recovery 200 km/h (108 kts.)

### 3.6 Spiral dive recovery

Apply rudder and aileron in opposite direction and carefully pull out of the dive.

Spiral dive occurs only when spinning more than 3 turns with medium C.G. positions, see sect. 4.5.12.

To prevent spiral dives intentional spinning should only be executed at aft C.G. positions.

Recovery from unintentional spinning should be done immediately.

### 3.7 Recovery from unintentional cloud flying

Spins are not to be used to loose altitude. In an emergency, pull out the dive brakes fully before exceeding a speed of 200 km/h and fly with max. 200 km/h (108 kts.) until leaving the cloud.

At higher speeds up to VNE, pull out the dive brakes very carefully because of high aerodynamic and g-loads.

### 3.8 Engine failure

#### 3.8.1 Power loss during take off

Push the control stick forwards immediately, watch the airspeed indicator!

Sufficient runway

- land normally straight ahead with engine extended
- flaps L
- airbrakes as desired

Insufficient runway

- decision based on position, terrain and height
- close fuel cock, switch off ignition and main switch (switch no.25, see sect. 7.3)
- engine extended reduces L/D to 15!

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### 3.8.2 Power loss during flight

Push the control stick forward immediately, watch the airspeed indicator!

Check

- fuel cock position?
- fuel quantity?

If no change, retract the engine or land with extended engine.

### 3.9 Fires

#### 3.9.1 In engine on the ground

- close fuel cock and switch off ignition if the engine is still running
- keep engine extended
- switch off main switch (switch 25)
- use extinguisher, cloth or suitable external means

#### 3.9.2 In engine in flight

- close fuel cock
- open throttle fully if engine is still running until engine stops
- if possible retract the engine to quench the fire
- switch off engine master switch (switch 37)
- land as soon as possible
- extinguish fire

#### 3.9.3 In the fuselage

##### 3.9.3.1 Front fuselage (electrical fire)

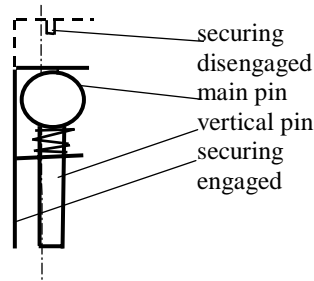
- switch off main switch (switch 25)
- close ventilation, open swivel air vents and side window
- land as soon as possible if the fire is not extinguished (circuits are effectively protected by circuit breakers)

##### 3.9.3.2 Rear fuselage (engine)

- the red fire warning light will indicate a fire (temperature above 140°C, 284°F)
- close fuel cock
- open throttle fully if engine is still running until the engine stops
- if possible retract the engine to smother the fire
- switch off engine master switch (switch 37)
- if smoke prevents flying open ventilation
- land as soon as possible
- extinguish fire

4.2.1 ff.

The sheet metal plate of the securing device must be flush with the vertical pin of the main pin



Rig the left outboard panel accordingly.

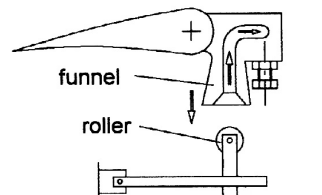
5. Rigging of the stabilizer

Set the trim **nose down**.

Screw the tool W 38/2 into the securing plate (near the top of the left surface of the fin). Pull out the securing 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 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.

6. Tape the gaps of the wing-fuselage junction and at the wing joint.

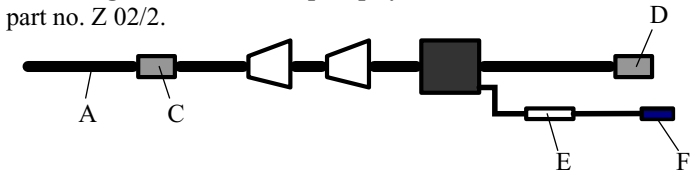
7. Positive control check.

4.2.4 **Refuelling**

4.2.4.1 Preferably fuel is transferred from a can where the correct amount of oil is added and mixed prior to filling, see 4.2.4.3a). Refuelling is possible also via the tank filler opening on the fuselage exterior surface, see 4.2.4.3c).

4.2.4.2 **Oil:** Use only super two stroke oil, specification TS C3 respectively API TC or better quality. The SOLO company recommends CASTROL Super TT two-stroke oil.

4.2.4.3 a) **Refuelling with the electric pump system**  
part no. Z 02/2.



Insert plug F in the socket which is fixed at the filler hose in the aircraft and switch on the main switch of the aircraft and the engine master switch.

Couple hose A to the pump system and hold it into your fuel canister. Couple the pump system via coupling D to the fuselage side filler hose (in baggage compartment). Switch on the pump via switch E.

b) **Refuelling via a permanently installed pump (Option)**

Couple the fuel filler hose via a coupling (like D see above) to the fuselage side filler hose and hold it into your fuel canister. Switch on the pump via a switch located in the fuselage main-bulkhead (behind the pilots right shoulder).

**Note for a) and b):** A built in device automatically switches off the current to this socket as soon as the fuselage tank is full. In case of automatic switch off the fuel tank will be filled completely only in the nose down attitude of the fuselage (the nose wheel must contact the ground).

c) **Refuelling via the tank filler opening on the fuselage exterior surface**

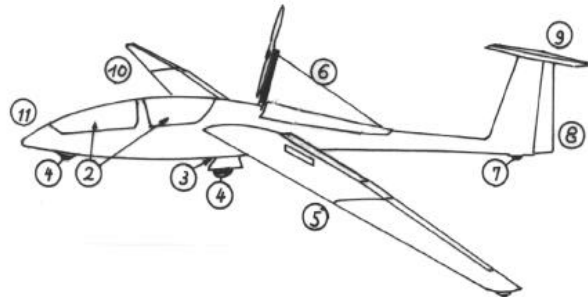
If you can't fill with premixed fuel, half fill the tank with fuel, then add the proper amount of oil and fill up completely.

4.2.4.4 **Storage of the pump system (see a)**

To increase the lifetime of the pump it is better not to empty the pump, but to store the pump filled with fuel. Therefore remove hose A by disengaging the coupling. The couplings C + D are closing the fuel lines to the pump when disengaged.

**B Inspection after rigging**

**Walk around the aircraft**



1. All parts of the airframe
  - a) check for flaws such as bubbles, holes, bumps and cracks in the surface
  - b) check leading and trailing edges of the wings and control surfaces for cracks
2. Cockpit area
  - a) check the canopy locking mechanism
  - b) check the canopy emergency release see sect. 7.15 (not each day, but min. every 3 month)
  - c) check the main pin securing  
check the securing ropes of the headrest in the rear cockpit for wear and function
  - d) check all controls for wear and function, incl. positive control check
  - e) check the tow release system for wear and function incl. cable release check
  - f) check for foreign objects
  - g) check the instrumentation and radio for wear and function
  - h) check the brake fluid level
  - i) check if the fin tank is empty
  - j) check the fuel filter for dirt and sludge
  - k) switch on main switch. The fire warning light must flash once (self-test-function). Check the engine controls
  - l) check all fuses including the battery fuse
  - m) check the extension-retraction mechanism by operating it in both directions. The extension time should not exceed 15 seconds!  
**Note:** If the mechanism can't be operated with the ignition switch or with the manual switch, check the circuit breaker.
  - n) extend the engine with the manual switch

**4.5 Normal procedures and recommended speeds**

**4.5.1 Engine starting, taxiing procedures**

**4.5.1.1 Engine starting on the ground**

- a) Check if the fuel cock is open.
- b) Master switch on.
- c) Switch engine master switch to **on**.
- d) Extend the engine with one of the two following methods:
  1. Switch on the ignition in the front cockpit (the toggle has to be pulled out for switching). The engine will be raised to it's operating position automatically. Lift the cover of the manual extension-retraction switch. Switch off the ignition, rotate the propeller out of the vertical position, put down the red cover again.  
**Note:** When extending the engine via the ignition it is arranged so that the engine rubber mounts will have the correct tension. If the engine is extended too far this may result in a higher vibration level with engine running.
  2. **Ser.no B1-B15 with instruction 5 from TN 843/17 not executed:**  
Extend the engine via the manual switch which is located on the right hand side console: Lift the red cover and press the switch to the front. Extend the engine only so far that you can rotate the propeller. Do not fully extend. The green control light **engine extended** should not be on. If the green light is on, retract the engine a little, until the light comes off. Turn the propeller out of the vertical position. Put down the red cover again.  
**Ser.no B1-B15 with instruction 5 from TN 843/17 executed, all ser.no from B16 and on:**  
Extend the engine via the manual switch which is located on the right hand side console: Lift the red cover and press the switch to the front. Hold the switch until the extension procedure stops. Put down the red cover again.  
**Note:** If the red cover remains in the up position the automatic extension-retraction via the ignition switch is in-operative.  
**Note:** If you cannot extend the engine, check the circuit breaker first. Otherwise see sect. 8 trouble shooting.
- e) Turn the propeller min. 1 rotation by hand.
- f) Switch on the ignition in the DEI, the engine will be extended automatically to its operating position.  
Listen if you can hear the electric fuel pump. If you don't hear the pump, it may be defective and you shouldn't try to start the engine.

f) cont: **Note:** From the sound of the pump it can be determined, if there is fuel in the pump or not.

Loud clicking: no fuel, soft clicking: pump filled with fuel.

If you suspect that there is no fuel in the pump, you should press the starter button no sooner than 30 seconds after the pump is filled, to ensure that there is enough fuel at the carburettor for starting the engine.

g) Check if the control light **engine extended** is on.

h) Check if the primer switch is in the automatic position.

i) Throttle in idle position.

j) Check that the propeller is clear.

k) Push the starter button until the engine runs.

**Note:** With a cold engine **P** must be shown on the center display of the DEI. As long as **P** is shown, the primer injects fuel into the carburettors.

l) As soon as the engine fires move the throttle slowly forward until the engine runs smoothly.

m) Adjust the engine RPM to approx. 3000 and check the ignition circuits (magnetos), but not before the engine runs smoothly.

n) Check full engine RPM (wheel brake on), min. 6300 RPM.

o) To check the functioning of the second fuel pump press the **fuel pump test** button at full engine power for a minimum of 5 seconds to switch off the first pump. No RPM drop is allowed.

#### 4.5.1.2 Starting problems

The engine is equipped with electric fuel injection (primer) instead of a choke valve. The automatic control of the primer enables engine starting with little risk of misoperation.

To inspect the correct functions of the primer the DEI displays **P** as long as fuel is injected (primer valve open). With a cold engine fuel will also be injected after releasing the starter button. The duration of the injection is dependent on the coolant temperature. With coolant temperatures above 38°C (100°F) no fuel will be injected during engine start.

a) If you suspect that the engine is flooded, e.g. CHT just below 38°C (100°F) and primer working, you should switch off the primer and try to start the engine with full throttle. If the engine starts, wait until 3000 RPM are reached, then reduce throttle to keep approx. 3000 RPM.

If the engine is flooded excessively you may close in addition the fuel cock. As soon as the engine starts open the fuel cock again.

b) If with normal CHT (+5° (41°F) up to +38°C (100°F)) the engine does not fire this may be a hint that the fuel filter is dirty and so the amount of fuel injected is reduced.

The filter has to be cleaned or replaced before take off.

Take off with dirty fuel filter may result in RPM loss during take off!

If you suspect that the primer doesn't inject fuel although the CHT is within the normal range and the fuel filter is clean the primer should be checked according to the maintenance manual sect. 3.5.1.6.

c) Approx. ¼ hour after retraction of the hot engine vapour bubbles may start forming in the carburettor which makes engine start difficult. In most cases the engine will start but refuse to accept throttle and may stop again.

To avoid the engine stopping press the starter button again, if necessary several times. Each time you press the starter button the primer valve opens and injects some additional fuel to keep the engine running.

d) If the glider on the ground is exposed to the sun with the engine extended for a longer period of time vapour bubbles may start forming in the carburettor which makes engine start difficult. Protect the carburettors from strong solar radiation resp. cool them down again before starting the engine. Regard the starting procedure for hot engine see sect. 4.5.1.2 c) above

#### 4.5.1.3 Taxiing

Taxiing without assistance can be done with the steerable nose wheel (Option) and one wingtip on the ground. Flapsetting +10°. Operate the airbrake handle (connected to wheel brake) with the left hand and the throttle with the right hand. Place trim fully nosedown to get pressure on the nose wheel.

You can reduce the radius of turn by operating the wheel brake and applying more throttle so the rudder will help to turn the aircraft.

**Caution:** For taxiing always use engine speed so that the engine runs smoothly. This prevents vibration damage at the engine mount. On concrete it may be necessary to apply a little wheel brake to reduce taxi speed.

#### 4.5.4 Free flight

##### **Stalling characteristics** (level and turning flight)

When stalled the DG-500MB will continue to fly level with high sink rate and buffeting. If the stick is pulled further the DG-500MB will drop the nose or drop one wing. During the stall a large angle of attack will be reached.

At forward C.G. positions the DG-500MB can be flown in stall without wing or nose dropping. When reaching the minimum speed, the angle of attack has to be increased significantly, before the DG-500MB stalls, so that the stalled flight is easy to recognize.

With stick forward and opposite rudder if required the DG-500MB can be recovered without much loss of height. Rain does not influence this behaviour noticeably. The loss of height is ca. 30 m (100 ft).

Stall airspeeds see sect. 5.2.2.

**Caution:** Flight in conditions conducive to lightning strikes must be avoided.

##### **Wing flap settings**

Optimal settings depending on the wing loading see sect. 5.3.4.

##### **High speed flying**

Flap settings 0°, -5°, -10°. Do not exceed the max. airspeeds. (see sect. 2.2 !)

##### **Thermalling**

Flap setting: +5°.

+10° only for narrow thermals.

#### 4.5.6.2 Extension and starting the engine in flight

1. With the engine extended but not running the rate of sink at 90 km/h (49 kts) increases to 1.5 m/sec. (300 ft/min.). This is a glide angle of 15! Therefore restarting the engine should only be done over landable terrain and not below 500 m (1650 ft) above ground. But it is better to restart the engine at 200 m (660 ft) over a landable field rather than at 500 m (1650 ft) over a forest or unlandable scrub. Should a flight be conducted over a wide expanse of unlandable terrain, the engine should then be restarted at 1000 m (3300 ft) above ground level so that if the engine does not start, all the emergency starting procedures can be followed in peace including retraction of the engine if necessary.
2. In a normal restarting situation the loss of altitude from starting the extension procedure until the engine is running is only about 20 m (70 ft).
3. Extension: Fly at 90 km/h (49 kts) with flaps set at 10°. Main-switch on, engine master switch on. Check if the red handle of the manual extension-retraction switch on the right side console of the front cockpit is switched to the down position. Check if the primer switch is in the "automatic" position. Switch on the ignition and press the starter button. The engine will extend by itself and the starter motor will start the engine as soon as the powerplant is extended. When the engine fires slowly increase throttle.  
In case of starting problems see sect.4.5.1.2.

##### **Caution:**

With coolant temperatures above 45°C the engine may start but refuse to accept throttle. This may be due to formation of vapour bubbles in the carburettor .

In such case allow the engine to run for 20 seconds at idle, press the starter button again, if necessary several times. Each time you press the starter button the primer valve opens and injects some additional fuel to keep the engine running. When the engine runs with constant RPM slowly increase throttle.

**Note:** To activate the automatic extension it is necessary to switch the engine master switch "on" prior to switching on the ignition. Otherwise the automatic system will not be activated (safety interconnection). Both ignition switches must be in the "on" position.

4.5.7 Approach and landing

4.5.7.1 With the engine retracted

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 and set the wing flap to landing setting (+10° for normal landing, L for short landing). In calm weather approach with approx. 105 km/h (57 kts) (ballast dumped!). With strong wind fly faster! The very effective Schempp-Hirth dive brakes make a short landing possible. So a slip is not necessary as a landing technique.

**Caution:** In a sideslip with full rudder deflection there is a rudder control force reversal and the angle of yaw becomes very large. It is recommended to limit the rudder deflection to about 75% of the full movement. When recovering from the sideslip by neutralizing the ailerons the rudder returns by itself to neutral too. Pilots should investigate the full sideslip at height before using sideslipping on an approach.

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 sailplane.

You can land the DG-500MB on soft fields with the landing gear extended, as there is no tendency of nosing over.

During ground roll the wing flaps may be kept in the landing position.

Clean the landing gear and tow release after landing in an muddy field. Dirt in the front strut can keep the landing gear from locking over center next time. Simply hosing with water is the best cleaning method.

4.5.7.2 Landing with the engine extended and running

Landings with the engine extended should be avoided. Follow the instructions in sect. 4.5.7.1 except that no side slipping should be done. If longer sinking flights with the engine idling are necessary it is recommended to apply some throttle at least every 60 seconds to ensure enough engine lubrication.

5.2.3 Take off performance

The data is valid for take off from dry level hard surface, no wind and proper condition of engine, propeller and aircraft. The take off procedure is to be executed according to 4.5.2.

SR = take off roll

S = take off distance to 15 m (50 ft.) altitude

T = temperature on ground

H = pressure altitude, can be computed as follows:

$H(m) = (1013 \text{ mb} - QNH) \times 100 / 11.7 + \text{airfield elevation (m)}$

20m span		m = 680 kg		m = 750 kg		m = 815 kg	
H (m)	T (°C)	SR(m)	S(m)	SR(m)	S(m)	SR(m)	S(m)
0	0°	155	275	189	327	223	380
	15°	173	306	210	364	248	423
	30°	191	338	232	403	275	468
500	0°	175	310	213	369	251	428
	15°	195	344	237	410	279	476
	30°	215	381	262	454	309	527
1000	0°	197	349	240	416	283	483
	15°	219	389	267	463	315	537
	30°	243	430	295	512	349	595
1500	0°	223	394	271	470	320	545
	15°	248	439	302	523	356	607
	30°	274	486	334	579	394	672
22m span		m = 680 kg		m = 750 kg		m = 825 kg	
H (m)	T (°C)	SR(m)	S(m)	SR(m)	S(m)	SR(m)	S(m)
0	0°	152	269	185	321	224	381
	15°	169	300	206	357	249	424
	30°	187	332	228	395	276	469
500	0°	171	304	209	362	252	429
	15°	191	338	232	402	281	477
	30°	211	374	257	445	311	528
1000	0°	193	342	235	408	285	484
	15°	215	381	262	454	317	538
	30°	238	422	290	502	351	596
1500	0°	218	387	266	461	322	547
	15°	243	431	296	513	358	608
	30°	269	477	327	568	396	673

Dry level grass surface increase the take off distance by 10% to 15%.

**Warning:** Wet soft grass surface may increase the take off distance much more



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- 19) Water ballast dump handles (Option) - silver

upper handle - right hand water bag  
 lower handle - left hand water bag  
 forward - valve closed  
 into the cockpit - valve open



- 20) Adjustment strap for the rear seat shell (to be operated on the ground)

- 21) Push to talk button (Option)

Senden  
transmit

- 22) 12 V socket for charging the batteries and to operate external fuel-pumps. Only live with main switch on.

- 22/1) External power supply socket (Option) to assist the gliders electrical system during engine start. Jump start cable (part no. Z69) is necessary.

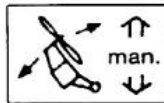
- 23) Outside-air temperature gauge (required with fin tank).

- 24) Indication lights for the fin ballast tank (Option)  
 With empty tank the light is on near the placarded value of the min. cockpit load for empty tank. With ballast in the tank (partly or completely filled) the other light is on near the value for the min. cockpit load with the tank filled completely. There is no indication for intermediate values.

- 25) Main switch - red  
 to the front = off, to the rear = on  
 With this main switch the complete electric power supply will be cut off mechanically. After taking out the main switch key the DG-500MB can't be operated.

main  
off Haupt- on  
schalter

- 26) Manual retraction – extension switch for the powerplant  
 By lifting the red cover plate you switch the system from automatic to manual operation and give access to the manual retraction extension switch.  
 to the front = extension, to the rear = retraction



**Note:** Extend the engine manually on the ground prior to take off or for maintenance work.

**Ser.no B1-B15 with instruction 5 from TN 843/17 not executed:** Extend the engine only so far that you can rotate the propeller. Do not fully extend. The green control light **engine extended** should not be on. If the green light is on, retract the engine a little, until the light turns off, see also 4.5.1.1d).

**Ser.no B1-B15 with instruction 5 from TN 843/17 executed, all ser.no. from B16 and up:** Extend the engine via the manual switch which is located on the right side console: Lift the red cover and press the switch to the front.  
 Hold the switch until the extension procedure stops. Put down the red cover again.

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- 26) cont: Manual retraction only to be used in the air if the automatics don't work.  
 Make sure, that the propeller is vertical (red control light 45 off!).

- 27) Switch for the electric propeller-brake  
 To the front = off  
 To the rear = automatic function

off Propeller-  
auto brake

The red cover plate of the manual extension-retraction switch (26) holds the switch for the propeller brake in the „auto“ position.

### Automatic brake

After switching off the ignition the automatic brake will slow down the propeller speed. The braking procedure starts as soon as the engine speed is below 3.000 RPM. The braking is continuous until the propeller is stopped. Then the brake opens again and the propeller must be positioned vertical by the airstream or with the starter motor (ignition off see item 30). As soon as the propeller is in the correct position (control-light 45off) the brake engages and holds the propeller until the engine is retracted.

- 28) Fuel cock - red

to the front = open  
 to the rear = closed

auf Brandhahn zu  
open fuelcock closed

Close the fuel cock only in an emergency (see chapter 3)

- 29) Operating knobs for the wing fuel tanks (Option) - black

to the front = open  
 to the rear = closed  
 upper knob = right tank  
 lower knob = left tank

auf Flügeltanks zu  
open wingtanks closed

- 30) Throttle handle with integrated starter button  
 The starter button is only activated when the engine is extended and both ignition switches are in the "on" position.

Throttle

⊙ Starter

With the engine running the starter motor will be blocked automatically.

### Aligning the propeller for retraction with the starter button

If after stopping the propeller is not in the retraction position, it is possible to turn the propeller slowly with the starter motor into retraction position by pressing the starter button (ignition switched off). The starter motor speed is reduced by electronic means during this procedure. This procedure should not be used on the ground so as not to unnecessarily stress the starter motor.

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- 31) Primer switch **Primer**  
 up = automatic operation **auto**  
 down = off (no injection) **off**  
 (see also sect. 4.5.1.2)
- 32) Propellerbrake manual (grey) **Propeller-  
brake**
- 33) Rear view mirror to watch the propeller during aligning procedure
- 34) Fuses
- |                |                    |   |  |   |
|----------------|--------------------|---|--|---|
|                |                    |   |  | a) Circuit breaker 10 A for the generator, the control unit and the proximity switch                              |
|                | <b>Gen.</b>        | a |  | b) Circuit breaker 2 A for the electric variometer  |
|                |                    |   |  | c) Circuit breaker 3 A for the radio  |
| b <b>Vario</b> | <b>Radio</b>       | c |  | d) Circuit breaker 3 A spare for turn and bank indicator or horizon   |
| d <b>Gyros</b> | <b>Socket</b>      | e |  | e) Circuit breaker 4 A for the 12 V socket  |
| f <b>DEI</b>   | <b>engine ext.</b> | g |  | f) Circuit breaker 5 A for the DEI, the fuel-pump and the coolant-pump (when operated by the power supply system) |
|                |                    |   |  | g) Circuit breaker 15A for the engine extension - retraction motor  |
- 35) Fire warning light (red) **Fire**  
 The probe for the warning light is located near the carburettors at the engine bay wall. In case of a fire the light will shine if a temperature of approx. 140° C (284° F) is exceeded.  
 A self-test-function is installed: When switching on the master switch, the fire warning light will flash once.
- 36) Change over switch from static pressure to total energy pressure for the variometer (Option).
- |      |              |   |  |  |
|------|--------------|---|--|--|
| up   | <b>stat.</b> | = |  | Vario operating on static pressure for engine running flight |
| down | <b>T E</b>   | = |  | Vario operating on total energy probe soaring flight         |
- 37) Engine master switch
- |      |              |   |  |  |
|------|--------------|---|--|--|
| up   | - <b>on</b>  | = |  | the total electrical system is on line                                     |
| down | - <b>off</b> | = |  | only soaring flight instrumentation, radio and 12 V socket No. 22 on line. |

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- 48) Exhaust gas temperature EGT indication (Option).  
 Switch No. 47 to the left: EGT in °C is displayed on the centre display for the front cylinder and on the right hand display for the rear cylinder. **E** will be displayed on the left hand display. **E 550 545**  
**v h**  
 If the EGT of one or of both cylinders exceeds 700° C (1292° F) all 3 displays, 49, 52 and 53, start blinking and the EGT will be displayed, e.g. **E 710 705**  
 Below 200°C **E --- ---** will be displayed if probes are connected and working. Otherwise nothing will be displayed.
- 49) Display for the fuel level in the fuselage tank in litres. With option EGT see also 48.  
**Fuel liter** The amount displayed is the total amount in the tank less 1 l (0.26 U.S.gal.) unusable amount.  
 If the displayed fuel level is lower than 5 l (1.32 U.S.gal.) an L (low) is displayed in front of the liter number as a warning.  
 When reaching the non usable amount of fuel LL will be displayed and the display starts blinking.  
**Note:** With a fuel level of less than 5 l (1.32 U.S.gal.) the fuel indication is no longer independent on the pitch attitude of the aircraft. If you fly with low pitch attitude less fuel than real will be displayed.  
 With more than 5 l (1.32 U.S.gal.) fuel the indication is nearly independent of pitch altitude due to the second fuel level probe.
- 50) Short time counter **trip**
- 51) Press the upper button (50): The centre display (52) will show the counted engine hours and the right display (53) will show the counted engine minutes.  
 Press the upper (50) and the lower button (51) simultaneously to set the counted engine time to zero.
- 51) Engine elapsed time indicator **total**  
 Press the lower button to display the total engine time. Display see (50). The engine elapsed time indicator is connected to the generator and operates only when the engine is running and when the generator circuit breaker (34a) is in.  
**Note:** If the DEI is to be replaced, you have to report the actual elapsed engine time to the manufacturer to enable them to adjust the engine time indicator of the replacement DEI to this value.  
 After replacement you have to execute a fuel gauge calibration according to sect. 4.22 maintenance manual.

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- F. Fuel lines clogged or kinked. Check fuel flow rate  
see maintenance manual sect. 1.13.3.
- G. If the engine can't be accelerated from idle to full throttle and cleaning  
the carburettors (see 4 A and B) doesn't help, you should exchange the  
carburettor membrane and the gaskets.
- H. Clogged air intake filter, see MM sect. 3.5.1 item 8.

### 5. Fuel leaks out of the carburettors

see 4 A

### 6. Loss of electrical power

see flight manual sect. 3.11.

### 7. Ignition problems

No spark:

- **on one spark plug of one ignition circuit:**  
Spark plug, ignition cable or electronic box defective.
- **on both spark plugs of one ignition circuit:**  
Too low starting RPM; weak battery;  
shorting cable or ignition switch having ground connection;  
electronic box defective: if after interchanging the boxes with the other  
ignition circuit the trouble appears on the other ignition circuit; if not,  
armature plate (in the engine) or cables may be defective.
- **on none of the spark plugs:**  
too low starting RPM: weak battery;  
shorting cable or ignition switch having ground connection;  
cable defective;  
If after interchanging the boxes with the other ignition circuit one circuit  
will function again, one electronic box and the armature plate are  
defective.

### 8. Engine becomes too hot

Carburettor fuel nozzles clogged

Fuel lines clogged

Fuel filter dirty

Cooling system defective

(Test of the coolant pump see DG Service Info 49-02)

Spark plugs defective

Ignition timing not correct

### 9. Disturbance of rear DEI indicators

This suggests that strong electromagnetic interference acts on the data  
transmission lines. Check the ignition system.

### 10. Sudden power loss at full throttle

Check pistons and cylinders for seizing marks, see maintenance manual sect.  
3.5.1 item 12b