Manual amendments

No.	Page	Description	Date
10	0, 1a, 2 - 5, 48, 52, 92, diagram 14	Fuel hoses TN500/10	Oktober 2016
11	1a, 2 - 6, 10, 13, 17, 21, 23, 24, 37, 38, 42-51, 69, 91, 93, diagrams 9, 12	Manual revision, TN500/11	July 2017

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0	Airworthiness limitations	5	July 2017
		6	July 2017
1.	**System description and adjustment data**		**issued**
1.1	Wing and tailplane setting data	7	Nov. 98
1.2	Elevator control and trim system	8	" "
	" "	9	" "
1.3	Rudder control	10	July 2017
1.4	Aileron and wing flaps control	11	Jan. 01
	" "	12	Nov. 98
	" "	13	July 2017
1.5	Airbrake control and wheel brake	14	Nov. 98
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	" "	16	Sept. 11
1.7	Tow hooks	17	July 2017
1.8	Water ballast system	18	Nov. 98
1.9	Massbalance and weights of control surfaces	19	Jan. 01
1.10	Fore and aft play of the wings	20	Nov. 98
1.11	Power plant	21	July 2017
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	" "	27	" "
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	" "	29	Nov. 98
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5	**Weight and balance**	86	Nov. 98
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Diagrams		issued
1	Elevator control , trim	April 90
2	Rudder control	" "
3	Controls in the fuselage (aileron, wing flaps and airbrakes)	" "
4	Controls in the wings (aileron, wing flaps and airbrakes)	" "
5	Tow releases	" "
6	Water ballast system	" "
7a	Landing gear, hydraulic wheel brake (wheels from ser. No. 52002 on and ser. No. 51833)	July 11
8	Systems for static and total pressure	April 90
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10	Steerable nose wheel	April 90
11	Powerplant	Sept. 98
12	Cooling system	July 2017
13b	Extension-retraction mechanism	June 03
14	Fuel system	October 2016
14a	Installation of the fuel filter	Sept. 98
15	Propellerbrake	" "
16	Engine door control	" "
17	Retaining cable	" "
18	Retaining cable	March 04

Enclosures		issued
Equipment list	(94)	Nov. 98
Checklist for checks and maintenance work	(95)	Nov. 98
5EP31 Installation Dräger oxygen system		08.10.90
5EP50 Installation ELT ACK		07.12.98
5E101 Wiring scheme issue I		25.06.03
5E102 Wiring plan DIN A 1 (in aircraft log) **or**		2.07.03
5E102 Wiring plan DIN A 1 **together with**		02.02.99
5E218 Amendment to the wiring plan 5E102		25.06.03
Instructions for inspection 500/20		July 1995
Questionnaire for TN 348/4		" "
Working instruction No. 1 for TN 348/4		Oct. 1994
Working instruction No. 2 for TN 348/4		" "
5V18 Tool for airbrake adjustment		14.10.94
Drawing W40		30.11.99
Drawing W51		20.11.96
Drawing W57		10.09.99
Drawing 8E210		22.05.97
Drawing 5M110		23.10.02
Enclosure 1 Instructions for transponder Installation		Jan. 06
Working instruction No. 1 for TN348/20 issue 3, headrest securing ropes		22.10.08

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**

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
   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.
   TN 500/10: When instructions 2 and 3 of this TN have been accomplished the life time of the flexible fuel lines is 10 years.

c) The **coolant hoses** have to be exchanged after 6 years.

Note: The **coolant** (type see section 1.11.2) has 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.

Instructions for continued airworthiness

j) **Flexible fuel bags in the wings (option)**
These have to be exchanged after 10 years.

Note: The **brake fluid of the wheel brake** has to be exchanged after 4 years (types see section1.6.4).
Note: 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.

0.4 **Service time, maintenance documents**
Follow the instructions of the respective manufacturer.

a) Operating Manual for Tow Releases
Series: E 85 Nose Tow Release
latest approved version

Operating Manual for Safety Tow Releases
Series: Europa G 88 Safety 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 types see section 6.1, 6.2 and 6.4.

d) Engine: Manual for ROTAX engine type 535 C latest approved version

e) Propeller: Technoflug Operation and maintenance manual No. P3 latest approved version

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0.5 **Power plant trouble shooting**
Please find a checklist in in the DG-00MB flight manual sect. 8.8.

1.3 **Rudder control**

1.3.1 **Rudder control circuit** - see diagram 2

1.3.2 **Rudder deflections and tolerances**

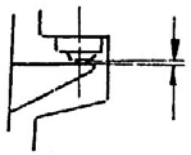
217-5 mm (± 30°) (8.54 - .2 inch) measured at 420 mm (16.5 inch) from the hinge axis.

1.3.3 **Rudder stops**

The rudder stops are located at the lower hinge of the rudder.

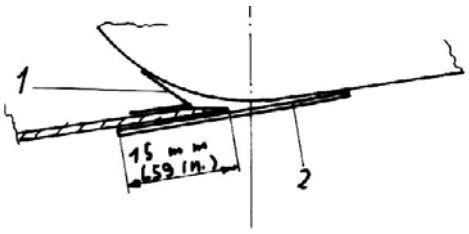
1.3.4 **Axial free play**

The maximum allowable free play at the upper hinge point is 1 mm (0.04 inch)



max 1 mm

axial free play



sealing the rudder

1.3.5 **Sealing the rudder**

The rudder is sealed on both sides. Inside the fin with a V sealing tape (3 M Scotch Flexodicht Band 2743 white) which is attached at the fin trailing edge. If damaged it should be replaced and sprayed with Teflon spray. On the outside a combi sealing (flexible sealing with turbulator zig-zag dents at its leading edge) is installed. Prior to installation of this sealing clean the glue area of the fin with Acetone.

Caution: Acetone may damage competition no's. or the colour scheme.

Warning: These sealings are not to be removed. If damaged or if the flexible sealings does not touch the rudder any more, the sealing have to be exchanged. Use only original material. These materials should be purchased from DG Flugzeugbau.

item	part.-no.	Amount	description
1	70000295	2x1.5 m (59in.)	V sealing tape
2	30003130	2x1.48m (58in.)	combi sealing 30/15

1.3.6 **Retaining spring for the pedal adjustment handle**

A rubber cord with 2 mm (0.08 in.) diameter which pulls the pedal adjustment cable tight is installed in the console below the instrument panel. If this rubber cord is defective the handle of the pedal adjustment cable won't be pulled to the front so that it may hook into the trim release lever at the control stick with pedals in a rear position.

then:
1. Adjust the control stick to neutral.
2. Adjust the wing flap handle to 0° flapsetting.
3. Adjust wing flaps and ailerons to zero.

Adjustment of the ailerons
Deflect aileron downwards. Then screw off the aileron control surface horn 5St53/2 (at the wing parting) by use of a 10 mm socket wrench.

Then loosen the counter nut at the rod end with a 10 mm open end wrench. Adjustment is made by rotating the complete drive.

Note: Secure the bolts again with a small amount of Loctite 243.

Adjustment of the wing flaps
Adjust at the rod ends of the pushrods 5ST56 which run from the mixer shaft 5St60 to the wing flaps operating shaft 5St54.

4. Adjust the aileron stops. (See sect. 1.4.3)
5. Check the flap deflections and adjust the stops if necessary. (See sect. 1.4.3)

1.4.6 Pilot force reducing rubber cord

The rubber cord in the wing flap control system reduces the pilot forces when moving the flap into the positive positions. The cord is located on the left hand side behind the front main bulkhead below the baggage compartment floor. The cord runs from a fork at the front main bulkhead around a pulley at the rear main bulkhead to the spring at pushrod 5St74. The length of the rubber cord when loose should be 700 mm (27.5 in.) If the cord is longer or worn it must be replaced. It must be replaced at least every 6 years.

1.7 Tow hooks

1.7.1 Tow release circuit see diagram 5

1.7.2 Adjustment

Check if both tow releases open fully. Adjustment at the bellcrank 5R32/1 in the rear cockpit.

1.7.3 **The ring muzzle** of the C.G. hook should not be bent or ground down and move easily. If the muzzle is damaged, the tow release has to be exchanged and repaired by the manufacturer (Tost).

1.7.4 Removing the tow hooks

C.G. tow hook

Remove the mounting bolts and the actuating lever. Don't remove the bolt which carries the actuating lever.
Move the tow hook some mm in an upward direction (use a piece of hard wood and a hammer). Then move it to the front and rotate it so far that the ring muzzle of the hook is located between the stands for the mounting bolts. Then pull the hook out upwards.

Nose tow hook

Remove the tow hook with the fittings 5R3/2 and 3.

1.7.5 Rubber cords

To keep the actuating cables tight there is a rubber cord at both of the cables in front of the bellcrank 5R32/1. Replace the rubber cords if worn.

1.7.6 For **further information** refer to the operating and maintenance instructions for the release mechanism (see sect. 0.4 of this maintenance manual).

1.11. **Power Plant**

1.11.1 **Arrangement** see diagram 11.
You will find a part list with the designations and the reference numbers for the powerplant parts at the end of this manual.

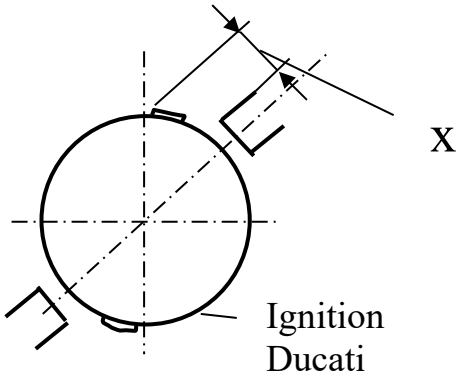
1.11.2 The **engine** is a SOLO 2625 02 with electronic dual ignition and liquid cooling. For further engine specifications refer to the engine manual, see sect. 0.4. of this manual. The cooling circuit is equipped with an electric waterpump. The pump operates with ignition on. If the glider electrics are switched off (master switch) with running engine, the pump will still receive electric power from the generator.
Coolant: Commercially available anti-freeze for car engines (recommended: BASF Glysantin G48 Protect Plus concentrate) and distilled water.
Mixing ration 1:1 (up to aprox. –40°C, -40°F)

Caution: If you don't operate the engine for periods longer than 2 months you must preserve your engine according to the instructions in the engine manual. The same applies for any overseas transportation.

1.11.3 **Exhaust Muffler:**
The muffler has been specially designed for the DG-500MB and is attached by four spring couplings in a movable frame, secured with Loctite 243.

1.11.4 **Propeller:**
KS-1G-160-R-110-( )-B
Attachment bolts: - six M 8 x 65 DIN 931 - 8.8,
head with a 2 mm (0.08 in.) dia. hole for lockwiring.

Propeller Positioning:
To assist in having the propeller stop in a vertical position during flight, the propeller should be positioned accordingly to the compression point of the engine. With the propeller in the position for retraction the magneto flywheel must be in the following position:
x= aprox. 20mm (.79in.) with the actuator which is mounted at the upper drive belt pulley directly above the centre of the proximity switch



View from the rear

Adjustment is made slipping the drive belt into the required position.

1.11.10 **Tightening torques and locking:**

a) All bolts on the engine which are not secured by selflocking nuts should be tightened according to the following:

M 10	-	40 N m (29 ft lb)
M 8	-	20 N m (15 ft lb)
M 6	-	12 N m (9 ft lb)

They should also be secured with Loctite 243. All locked and secured bolts are marked with red paint which also marks the respective component at that particular point. Whenever a bolt has to be tightened or taken off, the red paint should also be removed and only renewed after the bolt is once again securely attached with Loctite.

b) Cylinder head nuts	20 N m (15 ft lb)
CHT probe	15 N m (11 ft lb)
spark plugs	20 N m (15 ft lb)
propeller	20 N m (15 ft lb)
magneto flywheel	80 N m (58 ft lb)
lower drive belt pulley	100 N m (73 ft lb)

1.11.11 **Fire warning light**

The probe is located at the engine bay side wall opposite to the carburettors. There is a fuse 0.2 A for the „fire“ probe in the wiring near the engine master switch.
To check its function you may heat the probe up to 160° C. Use a fan heater with a thin terminal to heat the probe only. The red light „fire“ on the instrument panel must shine.

Warning: Don’t execute this test without measuring the temperature close to the probe. 160° C must not be exceeded.

Note: There is a self test function installed. When switching on the main switch the fire warning light must flash once.

1.12. Retraction - extension mechanism

1.12.1 **Layout** see diagram 13b

1.12.2 **The retraction-extension mechanism** (spindle drive) consists of a 12 V electrically driven sealed ball screw shaft type Stross BSA10 special version for DG-500MB.

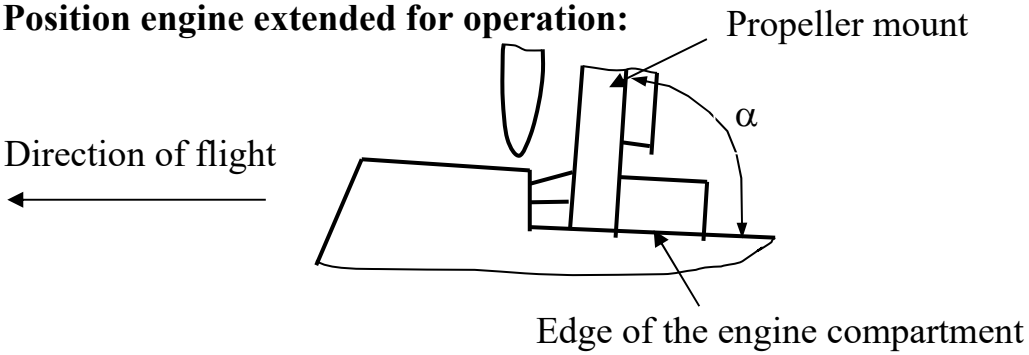
1.12.3 **Extension time of the spindledrive**
The time for extension is approx. 12-13 seconds. If the extension takes longer than 15 seconds the spindledrive must be replaced.
Measure at room temperature, with full batteries and via the ignition switch.

Note for 1.12.1 – 1.12.3: In ser. no. B16 and B17 a spindle drive Stross ATL10 RNC270 was installed during production. Installation see drawing 5M209 instead of diagram 13b. The extension time is about 17 seconds. If the extension takes longer than 20 seconds the spindledrive must be replaced. If this spindledrive must be replaced it should be replaced by a Stross BSA10, installation according to TN500/12

1.12.4 **Adjusting the powerplant retaining cable**
Extend the engine via the ignition switch until the extension will be switched off by the position switch.
without retaining cable shock absorber: It should be possible in this position to pull out the retaining cable approx. 25mm (1 in.) before it comes to its stop. If necessary adjust via the adjustment screw at the rear engine bay bulkhead. Secure the adjustment screw by fastening its lock nut.
with retaining cable shock absorber (from ser. no. 5E243B20 on and retrofit according to TN843/19): It should be possible in this position to pull out the retaining cable approx. 15mm (.6 in.) before it comes to its stop. If necessary adjust via the adjustment screw. Secure the adjustment screw by fastening its lock nut.

1.12.5 **Position switches**
Position engine retracted: via a switch actuated by the propellermount
Position engine extended: via a switch actuated by the muffler frame

1.12.6 **Adjustment of the powerplant positions**
Position engine extended for operation:



2. Inspections

2.1 Daily inspection

see flight manual DG-500MB

2.2 Regular inspections

A) **Annual inspection** (and 100hr inspection – only for USA)

- Execute all items of the daily inspection (see flight manual section 4.3). Check especially the headrest securing ropes in the rear cockpit according to "Working instruction No. 1 for TN348/20 issue 3" (attached to this manual) for correct assembly and for wear.
- Check the rudder cables for wear especially around the "S" tubes on the rudder pedals. Worn rudder cables should be replaced (see sect.4.2).
- Check the sealing of the rudder (see sect.1.3.5).
- Inspect all bolted connections and locking devices ie. locknuts, split pins etc.
- Check all metal parts for adequate greasing and rust prevention. (see sect. 3.3).
- Check the control surface deflections (see sect. 1.2 - 1.4).
- Check the free play in all control circuits (see sect. 1.2 - 1.6) and the fore and aft play of the wings (see sect. 1.10).
- Check the canopy emergency releases according to sect. 7.15 of the flight manual.
- Check the tension of the lines of the waterbag attachment (see sect. 4.1.).
- Check the rubber cords in the control system (see sect. 1.2.6, 1.4.6 and 1.7.5).
- Check the thickness of the wheel brake linings and the thickness of the wheel brake disc (see section 1.6.1.4).
- Check if the brake fluid has to be exchanged (see sect. 1.6.4).
- Check the airbrakes according to "Instructions for inspection 500/20" (at the end of this manual).
- Check the friction brake of the throttle control (see sect. 1.11.8).
  Check if the powerplant has been serviced according to section 3.5.1
- Check the torque of the propeller bolts see sect. 3.5.1 item 25 of this manual.
- Check the friction of the canopy operating handles see section 1.15.

- **Tow hooks**
  The operating and maintenance instructions for the release mechanisms, see sect. 0.4 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.

B) Special inspections

Tow hook

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

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

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. Ask the DG Flugzeugbau for the necessary inspection document.
When you request the inspection document, 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 document.

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. Maintenance

3.1 General maintenance (see also flight manual).

Exterior surfaces of the fibre reinforced plastic parts

The surfaces are coated by a UP-gelcoat or by PU paint (Option). This gelcoat is protected by a hard wax coating which has been applied during production with a rotating disc ("Schwabbel" procedure). Do not remove the wax, because this would lead to shading, swelling and cracking of the surface. In general, the wax coat is very resistant. As soon as the wax coat is damaged or worn, a new coat has to be applied. If you store your aircraft often outside, this may be necessary every half year! "Schwabbel" procedure:
The best method is with an electric power buffer as we do in the factory. Also an electric drill may be used. Speed approximately 2000 RPM. Two packages of special cloth discs (Schwabbelscheiben) have to be installed. A block of hard wax has to be pressed against the rotating discs. By doing so, the wax becomes hot and is taken up by the cloth. The hard wax and the cloth discs should be purchased from the DG Flugzeugbau factory.

Wax	part no. 70000121
Cloth disc	part no. 70000600

You get the best effect when polishing 90° to the microscratches of the sanding process.
Note: Make sure that the surface does not get too hot, otherwise the finish will be damaged. Therefore move the polishing machine all the time, and do not stay on one spot.

Plexiglas canopy:

Small scratches on the exterior surfaces of the canopies can be removed by the "Schwabbel" procedure (see above). Lock the canopies to the fuselage!

Metal parts:

The pins and bushes for rigging the aircraft are not surface protected and must be covered with grease all the time (see sect. 3.3). The other metal parts, especially the control stick and all handles, should be preserved with metal polishes occasionally.

3.2 Maintenance of the airframe

The sailplane is service free except for the care of the surfaces (see sect. 3.1) and greasing and oiling of the control system and all pins (see sect. 3.3).

After a landing in a soft field, the undercarriage box and tow hook should be thoroughly cleaned.

3.3 Greasing and oiling

A The contact surfaces of the canopies to the fuselage are to be rubbed with colourless floor-polish (canopy and fuselage side) to reduce grating noise in flight. Polish at the beginning of the flight season and then every month.

B Once a year your DG-500MB should be carefully checked and all bearings, including control surface hinges, should be cleaned and greased if necessary. The various greasing points are as follows:

- Aileron drive connections at the inboard aileron.
- Airbrake drive connection - in airbrake box, also grease the brake paddle pivots.
- Remove the access panels on the left hand cockpit walls and grease all the pushrod guides, but not those with Teflon linings, note see below.
- Remove the baggage compartment floors and open the baggage compartment rear cover to grease all bearings.
- Open the access panels (2 in the front and 2 in the rear cockpit). In the rear cockpit you have to remove the height adjustable seat pan first. Grease all accessible bearings (ball bearings and rod ends with universal bearings)
- Remove the control column covers and grease all the bearings associated with the control columns.
- Grease the rudder pedal adjustment slide.
- Oil all hinge points on the undercarriage in the undercarriage box.
- Clean and grease all control surfaces hinges.
- Clean and grease the control hook ups for wing flaps, ailerons, airbrakes and elevator control.
- Clean and grease all pins and bushes of the wing and tailplane attachment.
- Grease the powerplant see sect. 3.5

Note: The greases we recommend are lithium based pressure-resistant anti-corrosion greases or lithium-soap greases (multi-purpose greases for rolling element bearings).

Note: The sliding guides of the following parts are made from Teflon and should not be greased:

Landing gear controlhandle 5FW39 on 5St68/2, Airbrake control handle 5St69 on 5St68/1 and wingflaps handle 5St72 on 5 St68/2.

If these parts have been greased inadvertently you have to disassemble the parts and to clean them completely with Acetone.

3.4 Damage of the airframe

Before every flight, especially after a longer period of non-use, an inspection should be carried out. Check for any small changes such as small holes, bubbles and uneven areas on any skin surfaces, as these signal that something may be wrong. With major damage, contact the DG Flugzeugbau factory immediately and send photographs and a damage report from a licensed inspector or from an appropriately rated mechanic. With this information, the correct repair procedures can then be determined.

Minor damage such as small cracks and holes in the skin surfaces can be repaired by a certified repair station.

Additional information, such as a listing of all materials used in your aircraft can be found in the repair manual.

Home repairs should not be attempted when:

- the main spars or the spar ends are damaged or major fittings on the wings, fuselage or tailplane are broken out or white patches are noted around them in the laminate.
- When areas are so badly damaged that component parts cannot be repaired without special jigs for proper positioning and alignment.
- Whenever it is necessary to cut into undamaged areas to execute repairs.

3.5 Servicing the engine

Note: If you don't operate the engine for periods longer than 2 months you must preserve your engine according to the instructions in the engine manual. The same applies for any overseas transportation.

3.5.1 25 hour inspection

The following checks and maintenance work should be done every 25 hours engine time. Items 1, 2, 3, 7, 8, 10, 13 and 25 should be executed at least 1 year after the last 25 hour inspection, preferably with the annual inspection. In your aircraft log you will find stickers on which you can enter the next maintenance dates. Fix these stickers in a visible place in the cockpit, preferably on the right side console. Checklists for this maintenance work are in the enclosures of this manual. Please complete the checklist when executing the inspection and file it in the aircraft log.

1. Remove the engine doors, general visual inspection.

2. Change spark plugs.
   Check if the spark plug connectors have a tight fit on the spark plugs after you have exchanged the spark plugs. If not, the connector must be replaced..

3. Exchange the fuel filter. Filter types see sect. 8. Paper filters should under **no** circumstances be used. Assembly see diagram 14a.

4. Measure fuel flow (see sect. 1.13.3). Therefore disconnect the hose at the lower end of the primer filter. Hold the hose into a measuring container. Switch on the electric fuel pump with the ignition switch. Determine the time for supplying 1 litre of fuel. For the measurement a minimum of 10 l of fuel should be in the fuselage tank. Note down the value, max. time is 90 seconds for 1 litre.

5. Remove the carburettor cover and membrane, remove the needle valve, flush the carburettor by switching on the fuel pump. The fuel must spout out as a powerful stream. If a large amount of fuel leaks out of the carburettor when you remove the membrane this is a sign that:
   a) a dirt particle prevents the needle valve from closing completely.
   b) the main nozzle is clogged (dirty), so that the engine can't receive the full amount of fuel. In this case you have to disassemble the main nozzle and to clean its chamber, see sect. 1.13.7b) 2..

   Check the connection of the throttle cable for damage and wear.

6.a) Check the filter of the primer valve. The filter is installed in the hose connector between T-type connector and primer valve. Loosen the hose clamps and take out the connector with the filter. Flow fuel through the filter in reverse direction and check that as the fuel comes out of the filter any dirt is removed. Reinstall the filter.

b) Check the function of the primer valve and nozzles (engine must be cold). Switch the primer switch in auto position. Remove the air intake filters. Press the switch 47 to the left, switch on the DEI and then switch on the ignition. Now the DEI must show **P** on the centre display and fuel must be injected via the nozzles into the intake manifolds of both carburettors. Test only for 2-3 seconds, otherwise you may flood the engine. Check the hoses which connect the primer valve to the carburettors for any damage.

c) Leak test of the primer valve: When only the ignition is switched on (fuel pump running) no fuel must be injected by the primer.

7. Check all fuel lines for any wear, fissures, kinks, tight fit and leaks. For the check switch on the ignition to run the electric fuel pump to demonstrate operating fuel pressure.

8. Check the intake airfilters of the carburettors for excessive dirt and wear, wash with pure petroleum spirit and blow compressed air in reverse direction through the filters. Spray the outside with oil for filters with cotton fabric, reinstall the filters. We recommend exchange of the filters every 25 hours. Also new filters must be sprayed with filter oil.

8.a With the air intake silencer still removed check visually the screws of the throttle valve and of the choke valve (if existent) for tight fit.

9. Check all cables and associated levers and the propellerbrake (see sect. 1.11.8 and 1.11.9). Replace levers and pins of the brake in case of excessive free play. Replace cables when worn.

11. Clean engine and radiator

12. Check cooling system for leaks, refill coolant if necessary, check antifreeze. Check the radiator and its mounting. Check the coolant hoses.
To check the water pump, switch on the ignition. Your should hear a buzz.

12.a) Remove the exhaust manifold.

b) Check the cylinders and pistons via the exhaust ports for seizing marks, for carbon remains and for sticking piston rings. 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, check for combustion deposits and for cracks in the cylinder coating especially at the inlet and transfer ports. Use a torch and mirror for these checks. If seizing marks or cracks 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.

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).
15. Check the rubber engine mounts, especially for cracks. Therefore apply strong pressure to the propeller mount in forward, backward and sideways direction.
16. Check and grease the starter motor gear shaft (don't grease the starter motor gear) Check starter motor for tight mounting. There should be no excessive radial free play of the starter motor gear axle. With too much free play the starter must be exchanged.
17. Clean the starter ring gear and check for damage. Check if the starter ring gear was bent forwards by the starter motor. There should be approx. 1mm (.04 in.) clearance between starter ring gear and drive belt.
18. Remove the fairings which protect the drive belt. Check the drive belt for wear and tension (see sect. 1.11.5). If the drive belt shows signs of wear or if there are cracks/tears at the base of the belt teeth, the drive belt must be replaced. Check the 6 rollers which guide the drive belt for tight fit to their mounting brackets and for easy turning. If there is any significant friction in their bearings, the rollers have to be replaced. Check the roller mounts for proper attachment to the propellermount.
19. Clean the spindle drive. Operation test. The bare surface of the spindle drive piston must be greased slightly. If necessary apply some grease.
    Check the rubbermounts at the front and rear attachment of the spindle drive for wear. The fork at the rear attachment must rotate without twisting the rubbermount.
20. Oil all hinge points of the powerplant.
21. Check the time taken to extend the power plant. Batteries must be fully charged. If it takes longer than described under sect. 1.12.3 first check the wiring of the spindle drive for any damage. If no other reason for the slow extension can be detected the spindle drive has to be replaced.
22. Check the engine retaining cable for wear and kinks.
    Check thimble and bolt of the upper cable connection for wear.
    Check the adjustment of the retaining cable according to sect. 1.12.4. If necessary adjust the cable at the adjustment screw in the rear end of the engine bay.
23. Check the main bearings of the upper pulley for any free play.

24. Check the tension of the propeller bolts: remove the lockwire, loosen the propeller bolts and retorque them with a torque wrench, torque value see sect. 1.11.10. Secure again with lockwire.

25. Check the propeller blades for any damage.

26. Check all electric cables and connectors. Check the terminals especially of the starter positive and earth wire for cracks.
Note: The critical spots may be covered by heat shrink tubing.

27. Check the whole electrical system wiring, ensure all equipment is secure and all connections are OK. Check proper functioning of all systems and fuses/circuit breakers.

28. Re-install the engine doors. Check all the hinges on the engine compartment doors for proper fit and any cracks, tears etc. Check if hinge pins are secured properly.
Check the engine door rubber cord and its retaining cord for wear and function.

Ground test run:
Warning: Never run the engine without the wings assembled,

29. If needed adjust the idle RPM (see sect. 1.13.7).

30. Check the magnetos - at 3000 RPM, drop should not be more than 300 RPM.

31. Check max. engine RPM - 6300 RPM minimum.

32. Check EGT's (only with optional EGT probes) EGT should be adjusted according to the instructions see sect. 1.13.7, item 5.

33. With engine running at full power press the test button on the front instrument panel for 10 seconds to switch off the first fuel pump. The engine must run with the same speed with the fuel supplied by the second pump.

3.5.2 **Every 3 years**
Section no more effective.

3.5.3 **After 50 engine hours** exchange the drive belt.

3.5.4. **After 400 engine hours** the power plant must undergo a major overhaul. Apart from the items listed in section 3.4.1., 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 belt
4. Replace the bearings of the upper drive belt pulley.

3.5.5. **After 6 years**

1. Replace all rubber fuel lines and the gasket of the drainer valve.
   TN500/10: When instructions 2 and 3 of this TN have been accomplished the above mentioned fuel lines must not be exchanged after 3 years. But 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.

Note: The new fuel lines must be flushed thoroughly with fuel after assembly.

2. Replace all coolant hoses and the coolant.

3.5.6 **When required**

1. If the fuel tank is excessively dirty or when the fuel gauge gives false indications, a thorough flushing of the fuel tank is required (see sect. 1.13.6).
2. If the engine should run rough between idle and full throttle even after all the points in sect. 3.4.1. are OK, then it is possible that the membranes in the carburettors have hardened. They should then be replaced.
3. After sudden power loss at full throttle:

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

3.6 **Hydraulic wheel brake**
The brake fluid must be exchanged at least every 4 years see sec. 1.6.4.

4.15 Filling and bleeding the cooling system

Please refer to diagram 12

4.15.1 Filling and bleeding

a) The engine must be cold. Extend the powerplant.
Remove the screw cap of the radiator. Press down on cap for easier handling. Fill in coolant until the radiator is completely filled.
Coolant: Commercially available anti-freeze for car engines (recommended: BASF Glysantin G48 Protect Plus concentrate) and distilled water.
Mixing ration 1:1 (up to aprox. –40°C, -40°F)
you will need approx. 1.8 litre , 0.475 U.S.gal..

b) Switch on the ignition to run the coolant pump. Run for approx. 1 minute. Switch off the ignition. If necessary top up the radiator.

c) Close the radiator cap.

d) Run the engine to warm up, then run approx. ½ minute at full throttle. Stop the engine.

e) Allow the engine to cool down. Remove the radiator cap and check the coolant level. The coolant level should be approx. 2 cm (0.8 in.) below the top of the radiator. If necessary top up to this level.

f) Close the radiator cap again.

4.15.2 Removal of the coolant

a) Retract the engine until the engine doors just stay open.

b) Remove the straight aluminium hose connector from the coolant hose on top of the coolant pump and replace it by a T-connector TS 16 (supplied with the glider service set).

c) Install a hose with 16 mm (0.6 in.) inside diameter to the T-connector. Hold the hose into a container placed below the lowest point of the cooling system.

d) Extend the engine. After all liquid has run out of the system, switch on the ignition to run the coolant pump for a short time.

e) Replace the T-connector by the straight connector again.

8. Partlist

In this list you will find only parts of the powerplant and the electrical system. Please find the part no's of the control-system parts and of the metal fittings of the powerplant in the following diagrams.

8.1 Parts for the powerplant

a) necessary for the 25 hours inspection

40050360 Spark plugs S36 (Bosch W5AC electrode gap 0.5 mm) with screw cap fastened to the thread by crimping (4 pieces necessary)

Caution: Bosch delivers the W5AC spark plugs with removable caps. It is not allowed to use these spark plugs. Spark plugs S36 can be identified by a dot of red paint on the insulator.

60507570 Fuel filter Entrata IN straight CH27
60507569 Fuel filter Entrata IN 90° elbow CH28
60500150 Gaskets for exhaust manifold (2 pieces needed)
60500142 Airfilter
70002200 Oil for airfilters with cottonfabric K&N 99-05046

b) **Spare parts**

60510821 Spark plug connector Bosch 0356351032 1kΩ
60500127 Nut for spring coupling M 8 for exhaust muffler (Rotax 842330)
60500128 Spring for spring coupling M 8 (Rotax 239628)
60502500 Starter motor: DENSO 128 000-1671 12 V
or DENSO 12 000-1679 12 V
60500155 Gasket for coolant outlet
60504013 Drive belt Poly Chain GT 8 M 2520-45
59332050 Front bearing for upper pulley 32205B
59320320 Rear " " " " 320/32X
52200054 Securing washer 20 DIN 462 for upper pulley front bearing
30002028 Special grease for upper pulley bearings SKF LGMT3
39001026 Exchange kit nuts and bolts for 400 h overhaul
60000182 Gas strut for muffler frame E1 E1-76-040-130/150N
60507561 Electric fuel pump Facet 40106
60001200 Electric water pump Webasto U4810 modified
60504049 Radiator KTM VW 00425
60504045 Extension-retraction spindledrive type
Stross BSA 10 special version for DG-500MB
60504046 Voltage transformer for BSA 10
40872873 Brake pad for propellerbrake (glued to mounting bracket)
40050350 Screw nipple S35 (Attachment of the throttle cable to the carburettors, omitted from ser.no 5E213 on)
52130011 Securing washer DIN432 zn 13mm (powerplant main bearings)

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, alternatively SI2010-B2T20YR30,5m

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

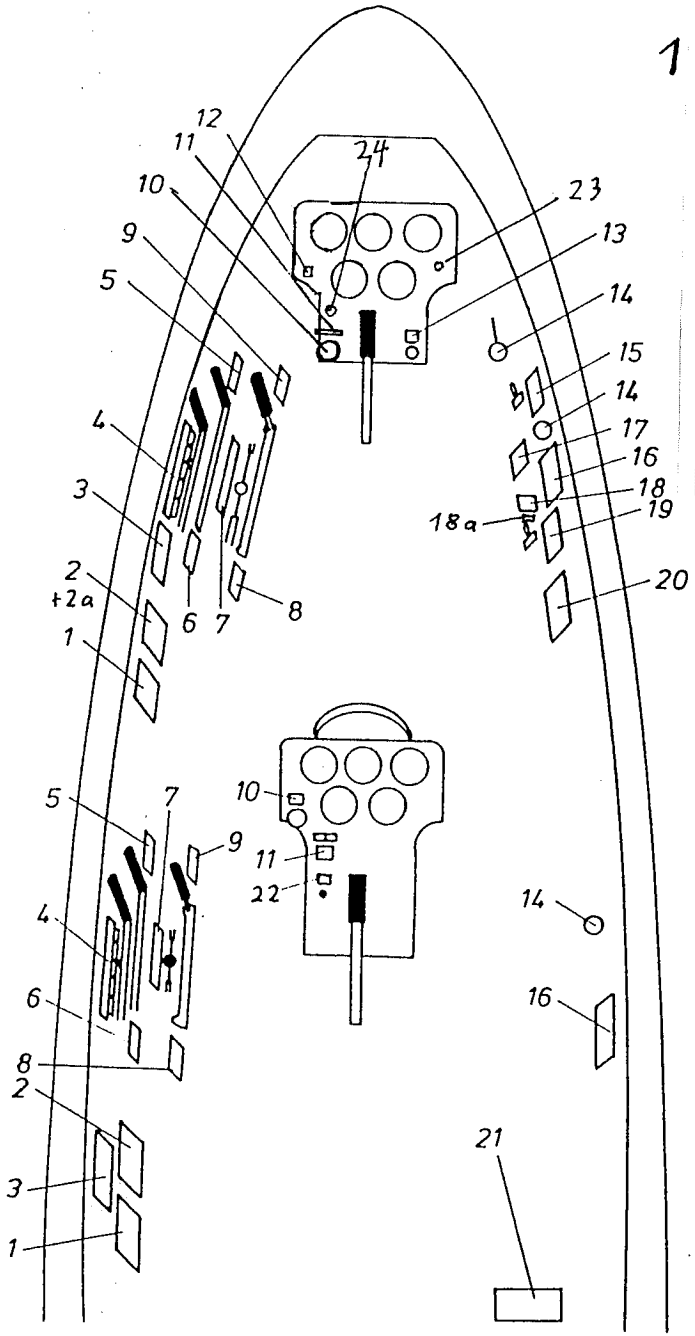
60510436 Fuse 535257 60 A for batteries
60510440 Fuse 250V 0.2A 5x20 m for fire warning light
60510419 Fuse 250V 2A 5x20 m for second fuel pump

60510550 Proximity switch
40576150 Proximity switch ready assembled with wiring and plug

60510796 Socket BSB 12 (in main bulkhead)

60510797 plug BSK12 for socket BSB 12

Placards DG-500MB



1

DG Flugzeugbau GmbH		
Type: DG – 500MB Serial no.: 5 E B Year of construction: 1999		
Maximum airspeeds:	km/h	kts
Winch launching	140	76
Aero-tow	197	106
Manoeuvering V_A	197	106
Rough air	197	106
Max. flap extended speed –10° –5°	197	106
Max. extended powerplant	197	106
Landing gear operation	197	106
Maximum speed V_{NE}	270	146
Max. flap extended speed L	150	81
Retraction and extension of the powerplant	100	54
Approved aerobatic manoeuvres (only without waterballast in the wings): Pos. Loop, Chandelle, Spin, Turn (only with 20m span)		
Maximum mass: 20 m wing span 815 kg (1797 lb.) 22 m wing span 825 kg (1819 lb.)		

Loading chart

Cockpit load	front seat		rear seat		(Parachute included)
maximum	110 kg	242 lb.	90 kg	198 lb.	
or maximum	105	231 lb	105 kg	231 lb.	
minimum					

With lower pilot weight necessary ballast must be added in the seat.

2

2a

Cockpit Check

1. Lead ballast (for under weight pilot)?
2. Parachute worn properly?
3. Safety harness buckled?
4. Front seat: pedals adjusted?
   Rear seat: seating height adjusted?
5. All controls and knobs in reach?
6. Altimeter?
7. Drive brakes cycled and locked?
8. Wing flaps in take off position?
9. Positive control check ? (One person at the control surfaces).
10. Fin ballast tank emptied or correct amount filled in?
11. Trim?
12. Canopy locked?

Additional checks before self launching

13. Fuel level
14. Canopy open – propeller clear?
15. After starting the engine – close canopy.
16. Check both ignition circuits.
17. Check engine RPM.

Altitude	m	0-2000	3000	4000	5000	6000
VNE	km/h	270	256	243	230	218
Altitude	ft.	0-6600	10000	13000	16000	20000
VNE	kts.	146	138	131	124	117

Type: DG-500 MB
W.Nr.:
FLUGZEUGBAU GMBH, BRUCHSAL

fire proof placard at front main bulkhead

Fire 23

Bauteil Nr.:

Part No's of airframe components at the front main bulkhead,
at the front ribs of the wings, flaps and ailerons,
at the rudder nose,
at the shear web of the horizontal stabilizer

fuel pump test 24

Above the LED's for the optional fin tank:

Fin ballast tank B
Minimum cockpit load

kg	kg
lbs	lbs
Tank empty	Tank filled

Benzin min. 95 Okt.
petrol min. 95 ROZ. **50:1** **Zweitaktöl**
two stroke oil **39 l** Near the tank filler opening

8 7 5 10

9 L +10 +5 0 –5 –10 4

6 16 3

Drainer On left landing gear door

Reifendruck 4 bar
Tyre pressure 58 psi

Right above the tailwheel

Reifendruck 2,5 bar
Tyre pressure 36 psi

Right above the nosewheel

Reifendruck 3 bar
Tyre pressure 44 psi

Sollbruchstelle 10000 N
rated load 2200 lbs.

At the right landing gear door

Bremsflüssigkeit
brake fluid
DOT 3 / DOT 4
min.

on brake fluid reservoir

main
off Haupt- on
schalter 17

auf Brandhahn zu
open fuel cock closed 19

Propeller-brake 11

auf Flügeltanks zu
open wingtanks closed 20

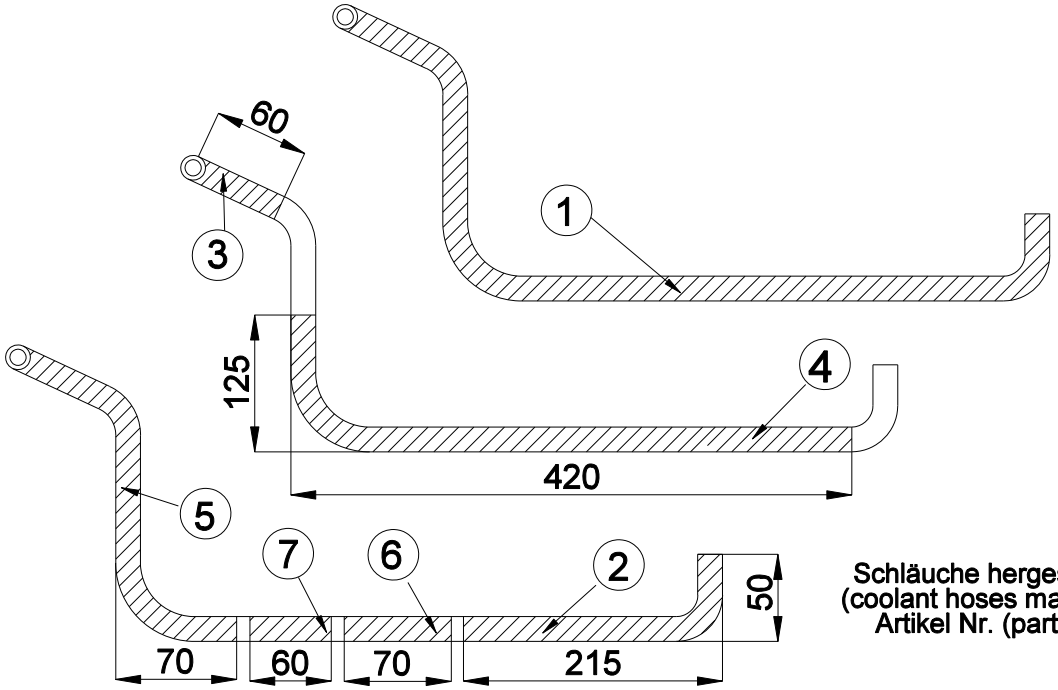
Gepäck max. 15 kg
baggage max. 33 lbs. 21

13 Primer auto off 12 14 15 Senden transmit 22 man 18 off Propeller-auto brake 18a

diagram 9
issued
July 2017

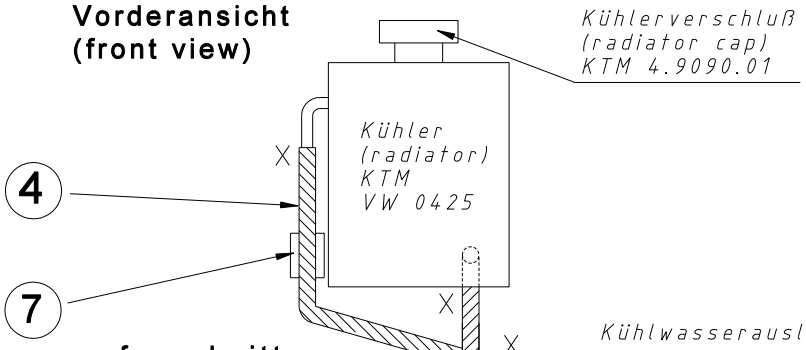
Kühlkreislauf DG-500MB
Cooling system

Diagramm 12
diagram 12



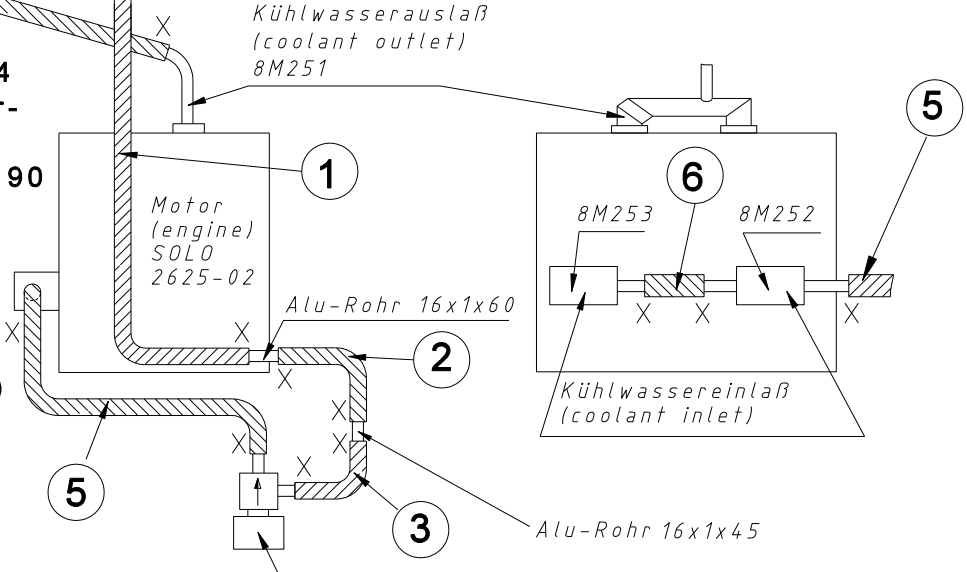
Schläuche hergestellt aus 3 Stück:
(coolant hoses made from 3 pieces:)
Artikel Nr. (part No.) 60504053

Vorderansicht
(front view)



Längs aufgeschnitten und über Schlauch Nr.4 geschoben als Scheuerschutz zum Propellerträger, mit Tyrap 4.8x190 befestigt.
(Cut langwise and slip over hose no.4 to prevent chafing at the propeller mount; fix with Tyrap 4.8x190)

Seitenansicht, nur Triebwerk
(side view, engine only)



x... Schlauchschelle 16-25
(hose clamp)

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