Manual amendments

No.	Page	Description	Date	Signature
1	3, 4, 49, 65, 67, 68, 88, 89, 91, 99, diagr. 11	TN 843/2	Febr.92	
2	1-4, 6, 9, 11, 17, 19,37, 39, 40, 44, 46, 49-51, 66-69, 75, 81, 88, 91, 93, diagram 11, service-information 0-2/92	TN 843/5	Sept.92	
3	1-6, 24, 25, 26, 32, 37, 37a, 37b, 37c, 37d 38, 40, 42, 49, 50, 52, 59, 77, 85, 85a, 85b, 88, 89, 90, 92, diagram 6,8,13, drawing 5E1	TN 843/7	Febr.96	
4	1, 3, 4, 47, 59, 92, diagr.11	TN 843/8	March 97	
5	3, 52	TN 843/9	Oct. 97	
6	1, 2, 3, 11, 45, 63	TN 843/16	Jan. 01	
7	2-5, 9, 13, 38, 42, 43, 49, 59, 89, 89a, dia-gram 14	TN 843/28 manual revision	May 08	

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0	Airworthiness limitations	5	Febr.96	May 08
		6	" "	
1.	**System description and adjustment data**		**issued**	
1.1	Wing and tailgroup setting data	7	July 90	
1.2	Elevator control and trim system	8	" "	
		9	Sept.92	May 08
1.3	Rudder control	10	July 90	
1.4	Aileron and wing flaps control	11	Jan. 01	
		12	July 90	
		13	" "	May 08
1.5	Airbrake control and wheel brake	14	" "	
1.6	Undercarriage	15	" "	
		16		
1.7	Tow hooks	17	Sept.92	
1.8	Waterballast	18	July 90	
1.9	Massbalance of control surfaces	19	Sept.92	
1.10	Fore and aft play of the wings	20	July 90	
1.11	Power plant	21	" "	
		22	" "	
		23	" "	
1.12	Retraction-extension mechanism	24	Febr.96	
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		26	" "	
		27	July 90	
		28	" "	
		29	" "	
1.14	Electrical system	30	" "	
		31	" "	
		32	Febr.96	
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		35	" "	
		36	" "	
2.	**Inspections**			
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	Inspection program	37a	" "	
	Inspection after rigging	37b	" "	
		37c	" "	
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2.3	Inspection after a heavy landing	39	Sept.92	
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2.4	Inspection procedure for increase of service time	42	Febr.96	May 08
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3.	**Maintenance**			
3.1	General maintenance	44	Sept. 92	
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3.3	Greasing programme	45	" "	
3.4	Damage of the airframe	46	Sept. 92	
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4.	**Detailed instructions for assembly and servicing work**			
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		56	" "	
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4.6	Working instructions for heat-shrink tubing	59	Febr. 96	
4.7	Securing with Loctite 72 b	59	March 97	May 08
4.8	Instructions for securing the propeller bolts	60	July 90	
4.9	Filling and bleeding the cooling system	61	" "	
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4.10	Replacement of wing fuel tanks	63	Jan. 01	
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4.13	Ignition unit-trouble shooting	67	" "	
		68	" "	
		69	" "	
4.14	Instructions for the removal and refitting of magneto flywheel ass'y and exchange of starter gear	70	July 90	
		71	" "	
		72	" "	
4.15	Mounting and tensioning of the drive belt	73	" "	
		74	" "	
4.16	Replacing the bearings of the upper pulley 5M11	75	Sept. 92	
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	Content	Page	issued	replaced
4.18	Adjustment of the overcurrent switch in the EMCD	78	July 90	
4.19	Calibration of the fuel display in the DEI	79	" "	
		80	" "	
		81	Sept. 92	
4.20	Steerable nose wheel	82	July 90	
4.21	Replacement of engine retaining ables	83	" "	
	" " " " "	84	" "	
4.22	Power plant trouble shooting	85	Feb. 96	
	" " " "	85a	" "	
	" " " "	85b	" "	
5	Centre of gravity measurements-weighing	86	July 90	
		87	" "	
6.	Instruments and accessories list	88	Febr. 96	
		89	" "	May 08
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7.	List of special tools	90	" "	
8.	Partslist	91	Sept. 92	
		92	March 97	
		93	Sept. 92	

Diagrams		issued	replaced
1	Elevator control circuit, trim	April 90	
2	Rudder control circuit	" "	
3	Aileron, wing flap and spoiler control circuits, fuselage side	" "	
4	Aileron, wing flap and spoiler control circuits, wing side	" "	
5	Tow hooks	" "	
6	Waterballast system	Febr. 96	
7	Landing gear, hydraulic wheel brake	April 90	
8	Pitot static system	Febr. 96	
9	Placards	April 90	
10	Steerable nose wheel	" "	
11	Powerplant	March 97	
12	Powerplant	April 90	
13	Extension-retraction mechanism	Febr. 96	
14	Fuel system	April 90	

Enclosures	issued	replaced
Equipment list	July 90	
5 EP 31 Installation Dräger oxygen system	08.10.90	
5 EP 30 Installation ELT	27.02.91	
5 E 1 Wiring scheme DIN A 2 (in aircraft log)	19.02.96	
5 E 2 Wiring plan DIN A 1 (in aircraft log)	08.03.90	
Checklists for the 25 hour service work	July 90	
Service-Information 0-2/92	March 92	

Instructions for continued airworthiness

0 Airworthiness limitations

0.1 Repairs:

Repair damaged wings, fuselage and tail surfaces prior to next flight. Repairs outside the scope of DG Flugzeugbau DG-500 M repair manual and major repairs must be accomplished at a certified repair station or a certified mechanic rated for composite aircraft structure work in accordance with DG Flugzeugbau repair methods.

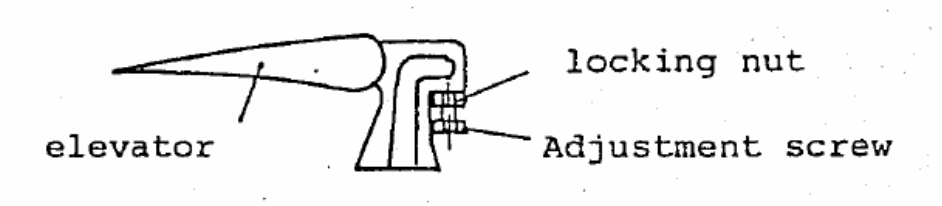
0.2 Life time of the airframe

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

0.3 Life time of components

a) The fabric straps of the safety harness have to be exchanged after 12 years.
b) 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.
c) The following **parts of the powerplant** have to be exchanged after 300 hours engine time
   1. all bolts and nuts of the powerplant
   2. the drive belt
   3. all relays (starter, extension-retraction)
   4. the propeller bearings
d) The **flexible fuel lines** including the plugged piece of hose at the pneumatic fuel pump have to be exchanged after 6 years.
e) The **hoses of the engine cooling system** have to be exchanged after 6 years.
f) The **spark plugs** have a life time of 25 engine hours.
g) **Flexible fuel bags in the wings** (option) These have to be exchanged after 10 years.
h) **Other components**
   All other components like propeller, tow hook, wheels, gas struts, control system parts, bolts, pins etc. have no life time limitation, but should be replaced when worn, damaged or disqualified by excessive corrosion.

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

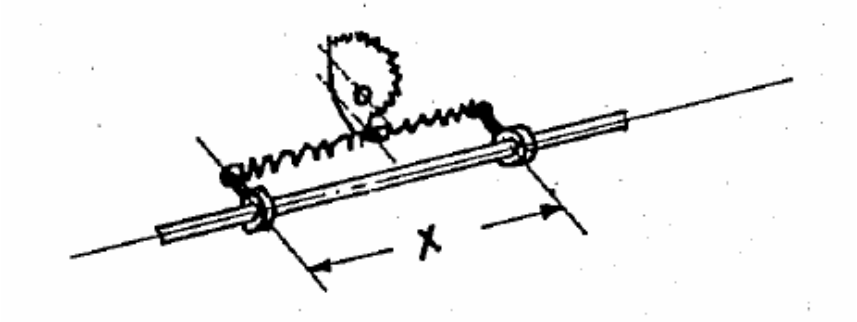


1.2.5 **Trim**

The trim mechanism should be adjusted so that with full forward (nose down) trim the control column is in the maximum forward position.

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

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



1.2.6 **Pilot force reducing rubbercord**

The rubber cord produces an elevator stick force in push direction. If the trim efficiency of your DG-500 in push direction is reduced, you have to inspect the rubber cord. The rubber cord is located on the left hand side behind the main bulkhead below the baggage compartment floor. The rubber cord runs from bellcrank 5St19 to a fork at the main bulkhead. The length of the rubber cord when loose should be 500 mm (19.7 in.).
If the cord is longer or worn it must be replaced. The cord must be replaced at least every 6 years.

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 5St3/2 (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 72 b (672) resp. Loctite 243.

Adjustment of the wing flaps
Adjust at the rod ends of the pushrods 5ST56 which run from the mixer shaft 5 St 60 to the wing flaps operating shaft 5St54.
4. Adjust the aileron stops. (See 1.4.3)
5. Check the flap deflections and adjust the stops if necessary. (See 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 main bulkhead below the baggage compartment floor. The cord runs from a fork at the 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.

C) **Every 3 months**
Check the tension of the lines of the waterbag attachment (see sect. 4.1.).

D) **Special inspections**
Tow hook
After a wheel-up landing, the C.G. tow hook mechanism is to be cleaned and carefully checked for any damage.

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

Propeller
In addition to the instructions given in the propeller manual you have to check the torque of the propeller bolts if you operate your aircraft in varying temperature and humidity conditions. Especially high ambient temperature and low humidity are likely to cause shrinkage of the wooden propeller and thus loss of torque (pre-tension) which may lead to failure of the propeller bolts. To check see sect. 3.5.1 item 33 of this manual.

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. + 5. step).

3. Ask the manufacturer 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 the manufacturer or 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 manufacturer's facilities, a copy of the records must be sent to the manufacturer for his evaluation and information

10. Check the rotary valve drive for wear see engine manual sect. 8.10 and section 4.11 of this manual.
11. Change gear oil of rotary valve drive. Use same Super two stroke oil as you use for the fuel.
    Note: The items 10 and 11 must be executed only every 50 hours engine time.
12. Check cooling system for leaks, refill cooling water if necessary, check antifreeze. Check the radiator and its mounting.
    Caution: The hose clamp which secures the cap of the cooling liquid reservoir must be mounted so that the screwed joint is in the front to prevent the engine retaining cables catching the screwed joint.
13. Check the cylinders and pistons via the exhaust ports for seizing marks, rings sticking and for carbon remains. Illuminate the combustion chamber and check for combustion deposits. Use torch and mirror for these checks. If seizing marks can be detected the engine shall not be used any more. Excessive combustion deposits have to be removed. If rings are sticking, the cylinders must be removed. Remove and clean rings and grooves. Exchange rings if necessary. Check and remove combustion deposits also from the inner sides of the pistons.
    Caution: Necessary repair work must be acomplished at a certified repair station rated for such engine work.
14. 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 has to be exchanged.
15. Clean the starter ring gear and check for cracks. If you find any cracks the ring gear must be exchanged. see sect. 4.14.
16. Check all engine bolts with a torque wrench see 1.11.10.
    Check especially the torque of the cylinder head nuts.
17. Clean engine and radiator
18. Check the exhaust pipe and muffler and their mounting for cracks.
19. Check all fuel lines including the plugged piece of hose at the pneumatic fuel pump for any wear, kinks, tight fit and leaks.
20. Oil all cables and associated levers and check for proper functioning. Replace cables when worn.

4.6 Working instructions for heat-shrink tubing

To insulate various parts of the electrical system heat-shrink tubing is used.

For repair and maintenance the heat-shrink tubing often has to be removed.

For removal use a sharp knife. To insulate again slip a new piece of heat-shrink tubing over the part which is to be insulated.

Use a hot air gun (min. 200°C, 390°F) to heat the tubing until it shrinks and gives a tight fit.

4.7 Securing with Loctite

All bolts on the engine except for the propellermounting bolts (lockwire) which are not secured with locking nuts have to be secured with Loctite 72 b (672). Loctite 243 may be used as an alternative.

If a bolt can't be unscrewed you must heat this section with a hot air gun to reduce the locking force of the Loctite.

Before reinstallation you have to clean the thread of the bolt and the inside thread from any remains of Loctite. For this procedure use Acetone. If necessary recut the inside thread.
Before you apply Loctite, the bolt and inside thread have to be degreased with spray cleaner Loctite 7063. Wipe off the bolt and clean the inside thread with compressed air. Repeat twice for inside threads.

Apply only a small amount of Loctite to the bolt thread. Too much Loctite may cause damage when you try to loosen the bolt again.

With blind holes the Loctite must be applied to the thread in the hole and not to the bolt.

All locked and secured bolts have to be marked with red securing paint which also marks the respective component at that particular point.

Remove the old red securing paint before reinstallation of the bolt.

Caution: Loctite must be used within 2 years of production date. The production date is printed on the bottom of the bottle.
96A means January 1996, 96B means February 1996 and so on.

6.5 VHF transceiver

Manufacturer	Type	**Certification No.**
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 600	LBA.O.10.911/106JTSO
	ATR 500	LBA.0.10.911/113JTSO
	ATR 833	EASA.210.0193

or other instruments certified for aircraft use according to TSO or JTSO or ETSO standards may be installed.

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

Note: FSG-40 S and AR 2008/25 radios can't be operated with the automatic Intercom unit which was specially designed for the DG-500M.

6.6 Variometer

Manufacturer	**Type**	**Certification No.**
Winter 5 St VM5 (dia.58 mm)		TS 10.230/14
	±5 m/sec Ident.No.5451	
	±1000 ft/min ident.No.5452	
	±10 knts 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 knts Ident.No.5253	

6.7 Turn and bank indicator

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

6.8 **Engine instrumentation**
(RPM, fuel, CHT, voltmeter)

Manufacturer	**Type**	
DG Flugzeugbau	DEI-MC 500	main instrument, front cockpit
	DEI-M 500 Z	in the rear cockpit

6.9 **Engine elapsed - time indicator**

Manufacturer	**Type**
Grässlin	EGZQ 52

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.

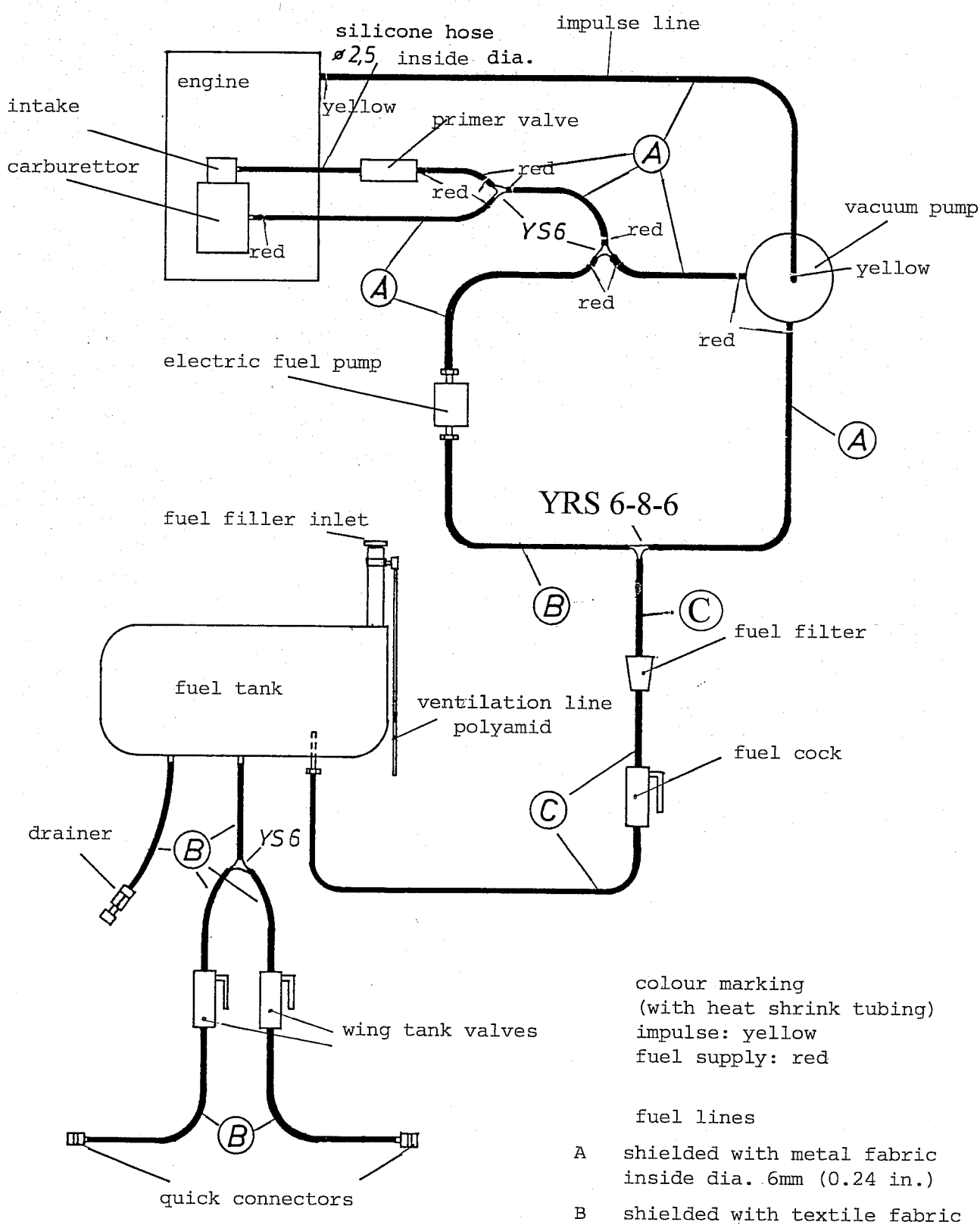
Other instruments and equipment (eg. variometers, gliding computers or flight data recorders):
Instruments and other equipment may be installed if they do not in themselves, or by their effect upon the sailplane, constitute a hazard to safe operation.

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.

diagram 14
Fuel system

issued: May 2008



colour marking
(with heat shrink tubing)
impulse: yellow
fuel supply: red

fuel lines

A shielded with metal fabric
inside dia. 6mm (0.24 in.)

B shielded with textile fabric
inside dia. 5.5mm (0.22 in.)

C shielded with textile fabric
inside dia. 7.5mm (0.3in.)