0 General

0.1 Manual amendments

No.	Page	Description	Date
1	0.5, 0.6, 4.14-4.16 diagrams 7, 11, 12	Manual revision TN413/2	September 2003
2	0.6, diagrams 1 and 11	Manual revision TN413/3	May 2004
3	0.4, 0.6, 1.9, diagram 7	Landing gear / over centre lock in extended position TN413/7	Nov. 2004
4	0.4, 0.5, 0.11, 2.6, 6.2, 6.4, 7.1	Manual revision TN413/8	January 2005
5	0.4 - 0.6, 0.10, 1.9, 1.10, 4.7-4.9, diagrams 17, 18	landing gear positive locking device TN1000/13	February 2008
6	0.4, 0.6, 0.10, 1.14 diagram 6a	ÄM 1000-02 Fin ballast tank valve and handle	March 2008
7	0.4, 0.5, 0.6, 1.2, 2.6, 4.2, 6.2, diagrams 3, 9, 11, remove page 2.7	Manual revision TN1000/16	May 2008
8	0.4, 0.5, 0.6, 0.10, 4.8, 4.9, diagram 7a	ÄM1000-04 production version of the positive locking device	Oct. 2008
9	0.4, 0.6, 0.10, diagrams 20-22, drawings 10E3, 10E4, enclosure 1	Electrically operated main landing gear TN1000/14	November 2008
10	0.6 and 0.10, diagram 21, Encl. 1 pages 2, 2a and 8. drawing 10E4 issue E	Electrically operated landing gear, device to provide higher current for resetting the emergency extension gas strut TN1000/19	October 2010
11	0.2, 0.4 ÷ 0.12, 1.2, 1.5, 1.11, 1.14, 1.15, 1.18, 2.1, 2.4 ÷ 2.6, 3.3, 4.8, 5.1, 6.2, 6.4, diagr. 1, diagr. 9, encl. 1 pages 1, 2, 2a, 4, 8, 10E3, Z193, SI 67-09, remove 5EP50	Manual revision TN1000/18	February 2011

0.2 List of effective pages

Section	page	issued	replaced/	replaced/	replaced/
0	0.1	March 2002			
	0.2	see manual amendments			
	0.3	“			
	0.4	“			
	0.5	“			
	0.6	“			
	0.7	March 2002	Febr. 2011		
	0.8	“	Febr. 2011		
	0.9	“	Febr. 2011		
	0.10	“	Febr. 2008	March 2008	Oct. 2008
			Nov. 2008	Febr. 2011	
	0.11	“	January 2005	Febr. 2011	
	0.12	“	Febr. 2011		
	0.13	Febr. 2011			
1	1.1	March 2002			
	1.2	“	May 2008	Febr. 2011	
	1.3	“			
	1.4	“			
	1.5	“	Febr. 2011		
	1.6	“			
	1.7	“			
	1.8	“			
	1.9	“	Nov. 2004	Febr. 2008	
	1.10.	“	Febr. 2008		
	1.11	“	Febr. 2011		
	1.12	“			
	1.13	“			
	1.14	“	March 2008	Febr. 2011	
	1.15	“	Febr. 2011		
	1.16	“			
	1.17	“			
	1.18	Febr. 2011			
2	2.1	March 2002	Febr. 2011		
	2.2	“			
	2.3	“			
	2.4	“	Febr. 2011		
	2.5	“	Febr. 2011		
	2.6	“	January 2005	May 2008	Febr. 2011
	2.7	“	removed May 2008		

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Section	page	issued	replaced/	replaced/	replaced/
3	3.1	March 2002			
	3.2	“			
	3.3	“	Febr. 2011		
	3.4	“			
4	4.1	March 2002			
	4.2	“	May 2008		
	4.3	“			
	4.4	“			
	4.5	“			
	4.6	“			
	4.7	“	Febr. 2008		
	4.8	“	Febr. 2008	Oct. 2008	Febr. 2011
	4.9	“	Febr. 2008	Oct. 2008	
	4.10	March 2002			
	4.11	“			
	4.12	“			
	4.13	“			
	4.14	“	Sept. 2003		
	4.15	“	Sept. 2003		
	4.16	“	Sept. 2003		
	4.17	“			
5	5.1	March 2002			
	5.2	“			
6	6.1	March 2002			
	6.2	“	January 2005	May 2008	Febr. 2011
	6.3	“			
	6.4	January 2005	Febr. 2011		
7	7.1	March 2002	January 2005		
8	8.1	March 2002			
9	9.1	March 2002			

0,2 List of effective pages (continued)

diagram	issued	replaced/	replaced/	replaced/
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2	Nov. 2001			
3	Nov. 2001	May 2008		
4	Nov. 2001			
5	Nov. 2001			
6	Nov. 2001	March 2008	March 2008 Not valid for 10-101, and from 10-128 on	
	March 2008			
7	Nov. 2001	Sept. 2003	Nov. 2004	
7a	Oct. 2008			
8	Nov. 2001			
9	Nov. 2001	Jan. 2008	Febr. 2011	
10	Nov. 2001			
11	Nov. 2001	Sept. 2003	May 2004	May 2008
12	Nov. 2001	Sept. 2003		
17	Febr. 2008			
18	Febr. 2008			
20	Nov. 2008			
21	Nov. 2008	Oct. 2010		
22	Nov. 2008			
5EP34	25.01.90			
5V18	14.10.94			
10FW2	5.10.99			
10E3	28.11.2008	28.02.11		
10E4	20.10.08			
10E4	8.10.10			
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SI 67-07	5.11.2007			
Z193	4.11.2009			

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SI 67-07	Service Info ballast box in the fin foam rubber rings
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0.4 Airworthiness limitations

0.4.1 Repairs

Repair or replace damaged parts prior to next flight. Follow the instructions of the DG-1000 repair manual for repairs of the airframe. Repairs outside the scope of DG-1000 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 spare parts.
For all aircraft under EASA regulations the following applies: According to part 21, subpart M to accomplish major repairs an approved repair instruction is required, see also TN DG-G-01 “Approved repair methods according to EU Commission Regulation 1702/2003 part 21, subpart M”

0.4.2 Life time of the airframe

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

0.4.3 Life time of components

a) The **fabric straps of the safety harness** have to be exchanged after 12 years.
b) The **rubber cord** in the elevator control system see section 1.2.6 has to be replaced at least every 6 years.
c) **Other components**:
   All other components like tow hook, wheels, gas struts, control system parts, bolts, pins etc. have no life time limitation, but should be replaced when worn, damaged or disqualified by excessive corrosion.

0.4.4 Service time, maintenance documents

Follow the instructions of the respective manufacturer:

a) Operating Manual for Safety Tow Releases
Series: Europa G 88 Safety Tow Release
latest approved version
Operating Manual for Tow Releases
Series: E 85 Nose Tow Release
latest approved version

b) Safety harness: instructions of the manufacturer latest approved version.

c) Minimum instrumentation: instructions of the manufacturer latest approved version.

1.2 Elevator control and trim system

1.2.1 Control system

see diagram 1

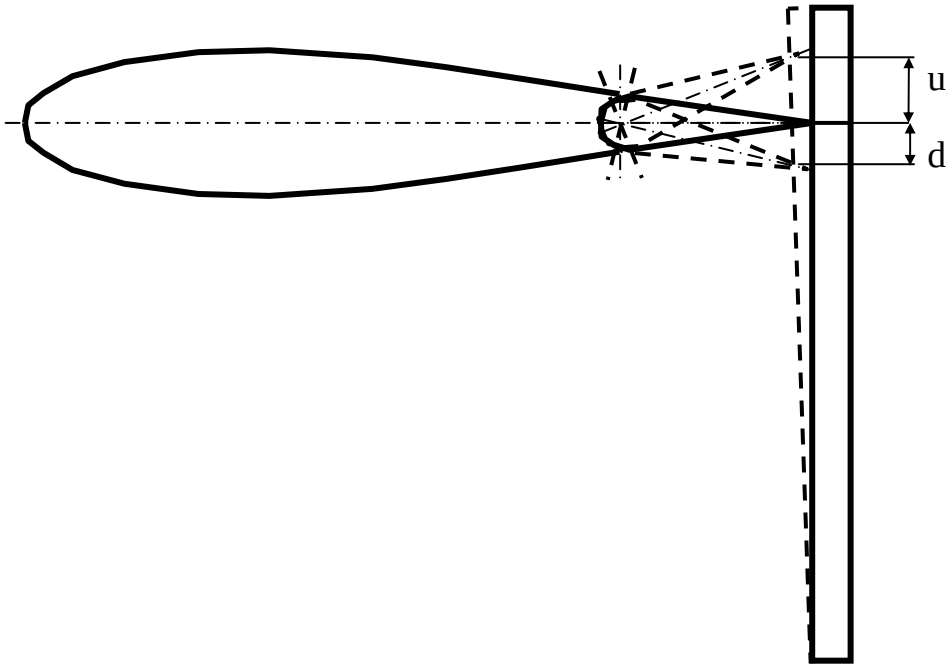
1.2.2 Elevator deflections and tolerances

up:	27°	u= 77 up to 79 mm	(3.03 up to 3.11)
down:	21°	d= 61 up to 63 mm	(2.40 up to 2.48)

measured at 168 mm (6.61 in.) from hinge axis which is directly at the edge of the cut out for the rudder

Measurement:

- Hold a measuring stick with one end on the floor, the stick must be vertical when touching the elevator trailing edge.
- Set the elevator to zero by using a pattern. A drawing for the zero-pattern 10V99 is available from DG Flugzeugbau.
- Mark the 0-point on the stick.
- Then measure the up and down deflections according to the sketch.



1.2.3 Elevator stops

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

1.3 Rudder control

1.3.1 Rudder control circuit

see diagram 2

1.3.2 Rudder deflections and tolerances

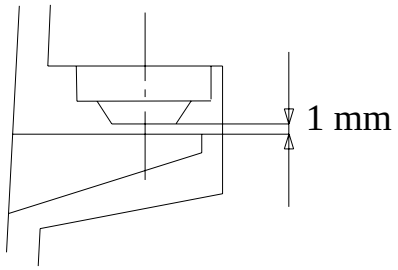
28° up to 29° which is 160 up to 165 mm (6.3 up to 6.5 in.) to both sides measured at 330 mm (13 in.) behind the hinge axis (lower rear end of the rudder).

1.3.3 Rudder stops

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

1.3.4 Axial space and free play

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



1.3.5 Sealing the rudder

The rudder is sealed on both sides. On the outside Mylar seals and inside the fin with V seal tapes.

These seals are not to be removed.

If damaged replace the seals according to section 4.7.4.

1.6.3 Main wheel (non retractable Version)

see diagram 9

1.6.4 Hydraulic brake system

a) Brake fluid approved specification DOT 3, DOT 4, SAEJ 1703.
The brake fluid must be exchanged at least every 4 years.

Warning: brake fluid is poisonous.

b) Adjustment: see section 1.5.2c)
If adjustment does not increase the braking effect as desired, the brake system is leaking or there is air in the brake system. Bleeding of the brake system see section 4.6 . The brake linings must be replaced if they are worn down to a thickness of 1.5 mm (0.06 in.). Replacement see section 4.5B.

Replacement set (2 linings, 6 rivets) Tost Nr. 075860.

1.6.5 Wheels, tyres, tyre pressures

Main wheel:

Tyre:	380 x 150 6 PR, diameter 380 mm (15 in.),
Wheel:	Tost 5” wheel with disc brake, width 134 mm, axle 30 mm
Tyre pressare:	2,5 bar (36 psi)

Tail wheel:

Tyre	200 x 50 6 PR, diameter 200 mm (7,87in.)
Wheel:	Plastic hub with ball bearings, part. No. S23
Tyre pressure	4 bar (58 psi)

Nose wheel (only version B) and C))**:**

Tyre:	260 x 85, diameter 260 mm (10,2 in)
Wheel:	Tost 4” wheel, width 85 mm, axle 20 mm
Tyre pressure:	2,5 bar (36 psi)

1.8.2 Fin tank

The fin ballast tank is constructed as integral tank.

a) Adjustment
   The release cable must be adjusted so that the cable just becomes loose when the handle is parallel to the fuselage wall.

b) Inspection
   According to sect. 2.2 a special inspection is to be carried out on the fin ballast tank system at each annual inspection.
   The dump time of the full fin tank should be timed and should not exceed 120 seconds.
   Check the calibration of the outside air temperature gauge (in the DEI-NT).
   Up to ser.no. 10-100 and ser.no. 10-102 to 10-127:
   Remove the tailwheel and the cover plate in the tailwheel box. Check the control cable and the lever of the valve carefully for wear. Check the control cable at the operating handle too. If the cable or the lever is worn, further use of the fin tank is prohibited. Please contact DG Flugzeugbau for a detailed repair instruction.
   Ser.no. 10-101, and from ser. no. 10-128 on:
   Check the control cable at the operating handle and at the dump valve (installed in the lower rudder mounting bracket). If the cable is worn, further use of the fin tank is prohibited.

1.9 Ballast box in the fin

1.9.1 Inspection of the control light in the front instrument panel

Slide one weight after the other into the rails of the box. Check with each additional weight if the correct amount of blinks is displayed.
The heavy weights with 2,4 kg (5.3 lbs.) each must be installed in the lower 4 sections and the lighter weights with 1,2 kg (2.65 lbs.) each in the upper 2 sections. It doesn't matter in which sections the weights are installed, but it is not allowed to insert the light weights into the sections for the heavy weights.

The control light in the front instrument panel must start blinking after each transaction with the weights. By counting the amount of blinks check if the correct amount of ballast is displayed. For a heavy weight 2 blinks appear and 1 blink for a light weight, this means 10 blinks if the box is filled up completely. After a pause of 2-3 seconds the blinking must be repeated etc. The blinking can be stopped by pressing on the control light. Pressing again on the control light must reactivate the blinking feature.

1.9.2 Protection of the control light

There is a fuse holder in the positive wire to the control light (in the front instrument console near the light).
Fuse: 250V 5x20m 0,2A.

1.9.3 Inspection of the locking device of the ballast box cover plate

Check the locking device at the cover plate, the locking pin must be pressed by its spring towards its stop.
Insert the cover plate to close the compartment, it must be possible to push the locking pin with the tool up to its stop and the pin must stay in this position.

1.9.4 Inspection of the foam rubber rings

Check condition and correct gluing of the foam rubber rings 10L45/2 in the ballast box in the fin. Without these rings a correct indication is not possible. Replace damaged rings according to Service Info 67-07, attached to this MM.

1.12 Batteries

Wiring with plugs BSK12 (from ser. No. 10-120 on, before a Preh plug was installed) for additional batteries in baggage compartment and fin are standard equipment.

Caution plugs BSK12: The screws to fix the wires in the plugs must be tightened and secured with securing paint.

a) A battery Z110 (12 V, min. 12 Ah, mass 5.5 kg, 12.1 lbs.) must be installed in the battery box in the fin.

b) An additional battery Z01 12V/10Ah may be installed in the baggage compartment.
In this case a battery selector switch must be installed in the front instrument panel.

Caution: Use only automatic chargers suitable for sealed liquid acid batteries. To charge the batteries to their max. capacity a charger with a max. output voltage of 14.4 V is required (most chargers supply only 13.8 V). A suitable charger No. Z 08 is supplied by DG Flugzeugbau.

Note: Don't charge longer than for 1 week.

2 Inspections

2.1 Daily inspection

see flight manual section 4.3

2.2 Regular inspections

A After 200 flight hours and during the annual inspection

Check the rudder cables for wear especially around the S tubes on the rudder pedals. Worn rudder cables should be replaced (see section 4.2). Check the seal of the rudder (see section 1.3.5).

B Annual inspection (and 100hr inspection – only for USA)

- Execute all items of the daily inspection see flight manual section 4.3.
- Inspect all bolted connections and locking devices ie. locknuts, split pins etc.
- Check all metal parts for adequate greasing and rust prevention. (see section 3.3).
- Check the control surface deflections (see sections 1.2 up to 1.4).
- Check the free play in all control circuits (see section 1.2 up to 1.6)
- Check the fore and aft play of the wings (see section 1.11).
- Check the canopy emergency releases according to section 7.14 of the flight manual.
- Check the rubber cords in the control system (see sections 1.2.6 and 1.7.5.
- Check the thickness of the wheel brake linings (see section 1.6.4).
- Check if the brake fluid has to be exchanged (see section 1.6.4).
- Check the airbrakes according to section 4.4.
- Check the fin ballast tank system according to section 1.8.2.
- Check the fin ballast box according to section 1.9.
- Check the friction of the canopy opening handles: A force of 10 – 20N (2.2 up to 4.4 lbs.) should be required at the end of the handle. If the force is too low tighten the hinge bolt of the handle accordingly.
- **Tow hooks:** The operating and maintenance instructions for the release mechanisms, see sect. 0.4.4 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.

Fuselage - fin intersection:
Check for cracks. Remove gelcoat and any filler along the cracks. Apply pressure to the fin (push the fin towards the nose as well as applying torsion). Do the cracks penetrate the glass fibre structure?
Disassemble the rudder and check the glued connection of the fuselage end bulkhead and the fin trailing edge web.
To check the elevator control circuit and the bulkhead attachments in the fin area, the tailwheel and the cover plate in the wheel box should be removed.

Tailplane attachment:
Increased free play? Cracks in the fin top rib? Check the aluminium parts of the tailplane attachment if bent or loose, check the tailplane locking device.

Rudder mounts:
Increased free play? White areas in the glass fibre, bent rudder hinge pin supports?

Fuselage skin:
Outside: cracks, nicks, folds? Any separation of the skin from the core? Inside: white spots, zig zag white lines, cracks? Has any bulkhead become loose?

C.G. tow release:
Especially after a wheel up landing, check for dirt etc., check for proper functioning. Has the tow release housing become detached from the fuselage?

Seat back bulkhead:
Cracks? Shoulder strap attachment points?

Belly harness attachment points:
Check for cracking around the mountings in the seat. Check the safety harness assembly.

Controls:
Check for proper functioning and condition of all controls and adjustment mechanisms (i.e. rudder pedal adjustment, tow release, air brake, control column and trim etc.).

Instruments:
Proper functioning? Dirt in the static ports or in the pitot probe?

Undercarriage:
Check to insure if properly aligned. No bent forks? Proper extension and retraction? Any dirt in the forward fork pivot?
Any white areas or cracks in the wheel box? Remove the baggage area floor panels and inspect the wheel box from above. Undercarriage control circuit condition. Is there free play between actuating lever and upper fork?

Nose wheel (if applicable) and tail wheel:
Any cracks or white patches around the attachment?

Ballast box in the fin
Check especially after a ground loop if the rod which secures the ballast weights is bent and if the locking mechanism is still working properly.
Check also the GFRP parts of the box.

Horizontal tailplane-stabilizer:
Outer skins: Crushing, cracks, delaminations?
Mounting: Glued joint of the bushes, white areas around bushes, cracks in shear webs, cracks around locking plate?
Hinge mounts: checked?

Elevator:
Crushing, cracks, delaminations?
Hinge mounts checked? - Control surface horn bent or loose?

Do **all checks of the daily inspection** see flight manual section 4.3.

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.

3.3 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 glider 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 boots 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 ailerons, airbrakes and elevator control.
- Clean and grease all pins and bushes of the wing and tailplane attachment.
- Clean and grease the lower ball fitting of the gas strut at the front canopy (if installed).

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

Caution: 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

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

F Removal of the front fork 10FW10/1

1 Remove the baggage compartment floor and the rear cover of the baggage compartment.
2 Remove the main wheel see A.
3 Remove the lower fork 10FW11/1 see C.
4 Remove the spring legs see D.
5 Remove the struts see E.
6 Remove the nut M12 from the left hand side of the axle 10FW10/2. Shift the axle towards the fuselage wall. Mark the head of the axis at the outside fuselage wall (e.g. by illuminating this area from the inside) and drill a dia. 24 mm hole through the fuselage wall. Insert a bolt with thread M12 into the head of the axle (from ser. no. 10-7 on) to pull out the axle through the hole.
7 Remove the front fork 10FW10/1.

G Removal of the rear fork 10FW12/2

1 Remove the main wheel see A.
2 Retract the landing gear.
Warning: The landing gear will retract by itself when unlocked by the force of the gas spring!
3 Disassemble the gas spring from the left side of the undercarriage box see 4.5.0.
4 Extend the landing gear again.
5 Remove the 2 bolts M8×40 LN9037 which connect the struts to the rear fork 10FW12/2.
With TN1000/13 executed, standard from ser. no. 10-133 on: bolt M8x40 LN9037 on the right hand side and bolt M8x42 LN9037 on the left hand side.
6 Remove the 2 bolts M6×24 LN9037 which connect the struts to the rear fork 10FW12/2, don't change the length of the struts and don't mix up right and left strut.
7 **Up to ser. no. 10-132:** Remove the nut M12 from the left hand side of the axle 10FW12/1. Shift the axle towards the fuselage wall. Mark the head of the axle at the outside fuselage wall (e.g. by illuminating this area from the inside) and drill a dia. 24 mm hole (ser. no. 10-1 up to 10-6) resp. dia. 20mm (from ser,no. 10-7 on) through the fuselage wall. Insert a bolt with thread M8 into the head of the axle (from ser. no. 10-7 on) to pull out the axle through the hole.
From ser. no. 10-133 on: Remove both axles with cone clamping devices 10FW127. To remove an axle hold the screw head with a spanner and unfasten the counter nut with an open end spanner until the axle can be pulled out.
8 Remove the fork 10FW12/2.

5 Weight and balance

1. Assemble the glider completely with gear down.
2. Empty fin ballast box and water ballast tanks.
3. Place scales under the tailwheel and if suitable scales are available under the main wheel.
4. The fuselage must be levelled so that the top of the aft fuselage boom has a tail-down slope of 1000 : 33.
5. Read weight of tail wheel: W2, be certain the wings are level and hold so that no load is applied. Read W1 if suitable scales are available, otherwise see note below.
6. Measure the distance between perpendiculars through points a and b. (See figure, next page).

Caution: The distances a and b may change with different masses due to deflection of the landing gear.

Note: The total mass M may be determined by weighing and adding W1 and W2 or by weighing and adding the masses of all components.

Using the empty mass and the values determined above, calculate the C.G. as follows:

C.G. empty: X_{SL}: $X_{SL} = W_{2L} \bullet b/M_L + a$

M_L = empty mass = $W_{1L}+W_{2L}$
W_{2L} = load on tailwheel (empty)

The empty weight includes all accessories but excludes pilots and parachutes. Remove loose objects and any removable trim ballast from the cockpit.

C.G. in flight: X_{SF}: $X_{SF} = W_{2F} \bullet b/M_F + a$

M_F = flight mass = $W_{1F}+W_{2F}$
W_{2F} = load on tailwheel (flight mass)

The flight mass includes empty weight items plus pilot, parachute, trim ballast and all items needed in flight (barograph, camera, cushions, etc.). In addition, the rudder pedals and seating position should be adjusted as in flight.

Note for gliders with nose wheel: When weighing with 2 pilots the load W_2 will be negative. This means that you need a spring balance to determine W_2. Therefore push a pin through the hollow tail wheel axis.

Compass

Manufacturer	Type	**Certification No.**
PZL	B - 13	FD 19/77
Ludolph	FK 16	10.410/3
Airpath	C 2300	
Hamilton	H I 400	TSO C 7c Type1
	46 MFK 1	(only as additional equipment.)

The compass should be compensated in the A/C. A deviation table must be installed if deviation is more than 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
	AR 6201	EASA.210.1249
Filser/Funkwerk	ATR 720 A	10.911/74
	ATR 720 C	10.911/83
	ATR 600	LBA.0.10.911/106JTSO
	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.

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.
Installation of transponder and transponder antenna must be accomplished according to technical note DG-G-02.
After installation, a functional test and inspection must be performed by a licensed inspector.

ELT:
The ELT is or must be installed according to the ELT manufacturers instructions.
The designated place is the baggage compartment on the floor.
Installation of ELT antenna must be accomplished according to drawing Z193 (attached to the MM).
After installation, a functional test and inspection must be performed by a licensed inspector.
The ELT must be switched off during road transport.

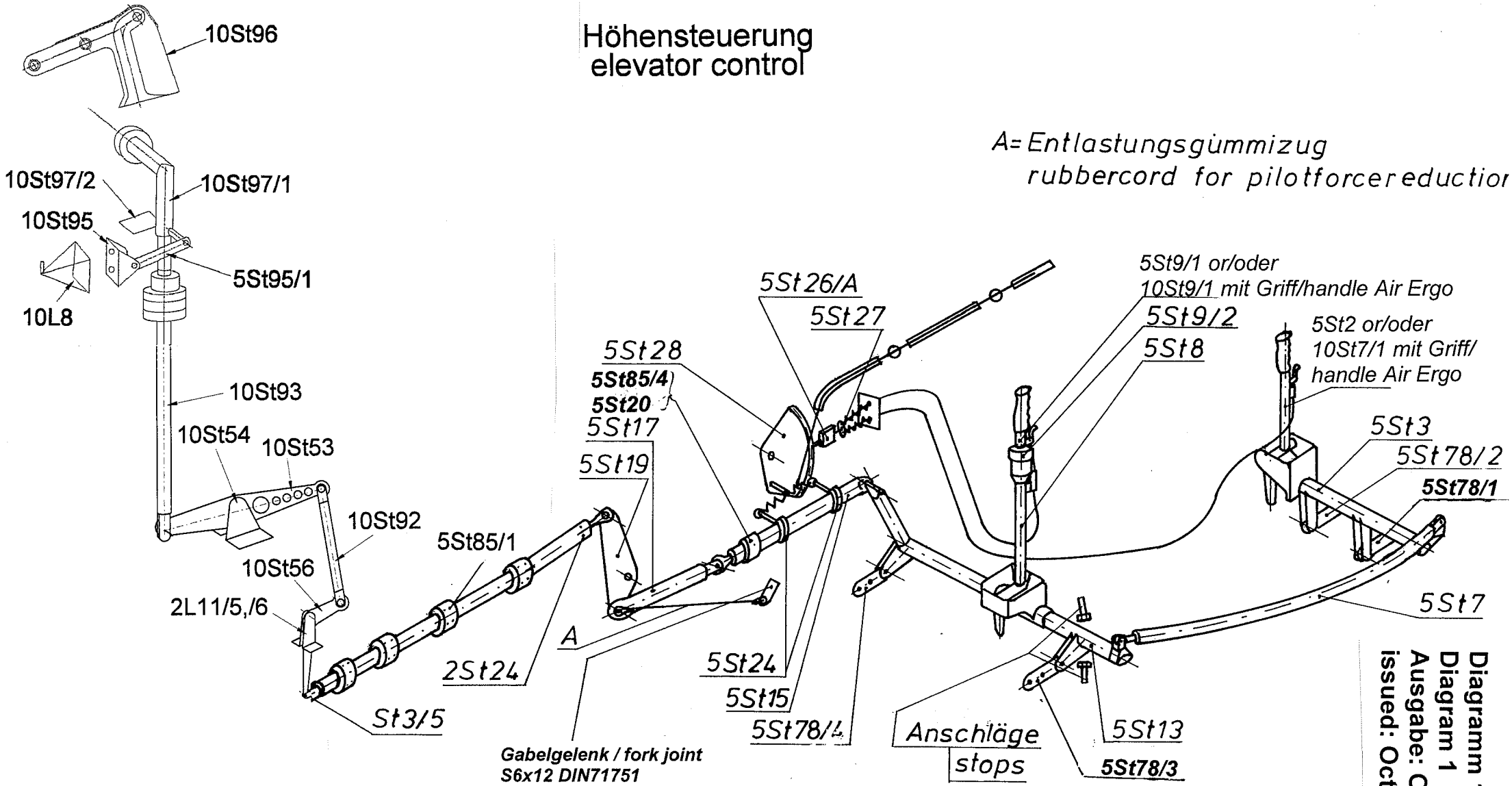
Other instruments and equipment (eg. variometers, gliding computers or flight data recorders):
Instruments and other equipment may be installed if they do not in themselves, or by their effect upon the sailplane, constitute a hazard to safe operation.

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 a appropriately rated fuses, the power consumption of each single part should not exceed 3A.

After installation raise a new weight and balance report.

Warning: If equipment is mounted on the canopies special care must be taken that canopy jettison is not impaired. To accomplish this any wire must be equipped with a plug in the vertical part. All plugs must be able to disconnect with low force, max. 10 N (2 lbs.). The wires must be long enough for the canopies to be opened completely before the wires are tight.
Equipment shall only be mounted at the fastening threads in the canopy frame provided by the design.
Max. mass of the equipment per canopy: 1 kg (2 lbs.).

Höhensteuerung
elevator control



A= Entlastungsgümmizug
rubbercord for pilotforcereductior

Gabelgelenk / fork joint
S6x12 DIN71751
(mit Schnappfederbolzen / with spring clip pin)

Diagramm 1
Diagram 1
Ausgabe: Okt. 2010
issued: October 2010

Festes Fahrwerk, hydraulische Radbremse
fixed landing gear, hydraulic wheelbrake

Diagramm 9
diagram 9

Ausgabe Februar 2011
issued February 2011

in Datei 10 FW50

6.4 DIN125 St zn
M6 DIN985-8 zn

M6x36 LN9037

Druckfeder, C DIN17223,
d=12,Dm=64,Lo=215,if=10,ig=11,5
compression spring

X

5FW12

5FW4/4

5FW7

Ansicht X
View X

Ansicht Y
View Y

FW4/3

5FW6

FW4/3

10.5 DIN125 St zn

8.4 DIN125 St zn

M8 DIN985-8 zn

10.5 DIN125 St zn

Fahrwerkskasten
landing gear box

Y

TCL Bremszange Typ 30-9
brake assy

Z

5FW10

10FW51

Reifen 380x150
tyre

5FW9

5FW4/1

5FW11

5FW15

5FW17/2

5FW 17/1

M6 DIN985-8zn

6.4 DIN125 St zn

5FW5

5FW 10

5FW17/2

5FW9

Ansicht Z
View Z

M8 DIN985-8 zn

8.4 DIN125 St zn

M8x45 DIN931-8.8 zn

All dimensions in mm, 25.4 mm= 1 in.

Electrically operated main landing gear

Part designations see MM diagrams 20 und 21

In the following text the changes to those sections of the maintenance manual which are effected by the installation of the electrically operated main landing gear will be given.

Section 1.6 Undercarriage

new subsection

1.6.5 Electrically operated main landing gear

This subsection replaces MM subsection 1.6.1.

1.6.5.1 Landing gear control circuit
See diagrams 20 (in LG box) and 21

With this version there are no handles and control rods for manual operation of the landing gear like Version A.
In the normal operating mode the landing gear will be retracted and extended by an electrical spindle drive.
A control unit which is installed in the rear instrument tower controls all electrical functions and the control lights.
A landing gear warning device is integrated into the system.

The landing gear will be locked in the extended position by over centre locking of the drag struts and held in this position by the spindle drive.

The landing gear will be locked in the retracted position by 2 bolts at the drag struts which engage into 2 latches at shaft 10FW102.
Unlocking is actuated by a cam mounted to the spindle drive, which rotates the shaft 10FW109 via a bell crank and a push rod to release the bolts (see diagram 20).

Emergency operation: The landing gear may be extended manually. The handles are located at the left hand fuselage wall, one in each cockpit at the positions of the handles for the manually operated landing gears.
Pulling on one of the 2 red emergency extension handles will open the valve of a lockable gas strut. The gas strut will push the spindle drive forward on a linear guide to extend and lock the landing gear.

1.6.5.2 Adjustment / limit switches

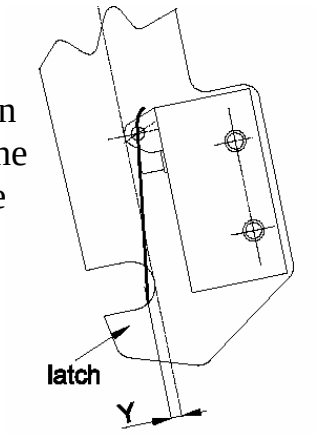
With the electrically operated landing gear only the limit switches have to be adjusted

a) Limit switch landing gear extended

1. Extend the landing gear electrically and check if the drag struts 10FW102 and the struts of the rear fork 10FW91 touch each other at their joint hinge point.
2. Apply a force of 100 N (2 lbs.) to the hinge point perpendicular to the centre line of the struts in upward direction. The system should be so stiff that you can move the hinge point no more than 2 mm (0.08 in.) out of line.
3. If it is possible to move the hinge point more than 2 mm, the limit switch must be adjusted. To accomplish this you have to bend the arm of the switch accordingly. The limit switch is mounted on the landing gear box and is activated by the lever 10FW108.
4. Retract the landing gear a small amount, extend again and check if the lower green control light starts shining. If not, the arm was bent too faar.
5. If the adjustment is correct, retract the landing gear and extend via the emergency system. Check if the lower green control light starts shining. If not, the arm was bent too faar. After adjustment repeat the check according to item 2.

b) Limit switch landing gear retracted

The spindle drive must be shut off in the retracted position when the bolt at the left drag strut 10FW102 engages in the notch of the left latch on shaft 10FW109 and activates the limit switch which is mounted to the latch.
Check: Activate the limit switch. The distance Y shall be 2 - 3 mm (0.08 – 0.12 in.) when the switch activates.
If necessary adjust the switch by bending its arm.



c) Limit switch gas strut (emergency extension system)

This switch (position 12 in diagram 21) is mounted to the upper end of the gas-strut at bracket 10FW120. When resetting the gas strut the spindle drive must be stopped by the limit switch when the distance X in diagram 21 (from counter nut up to gas strut body) is 17 - 20 mm (0.67 – 0.8 in.). If necessary loosen the mounting screws and rotate the switch for adjustment.

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

This switch (position 20 in diagram 21) activates higher current for the spindle drive via the LG control unit to reset the gas-strut as long as one of the emergency extension handles is pulled. The switch is mounted to a bracket 10FW143 which is mounted to the bracket 10FW120 see item c). The switch is activated by the deblocking lever in the upper gas-strut end. In case the spindle drive doesn't have enough power to reset the gas-strut check the function of the switch. To accomplish this disconnect the 2 wires from the switch. With one of the emergency extension handles pulled the resistance between these 2 terminals must be zero. If necessary adjust the switch by bending it's arm.

1.16.5.3 Free play

Free play between bell crank 10FW108 and shaft 10FW91 is not allowed.
If there is any free play tighten the two bolts M6x40 inside the landing gear box with a 10 mm open-end wrench. If there is still some free play, the bolts should be removed and the holes drilled out and reamed to diameter 8 H7. M 8 x 40 LN 9037 bolts should then be installed.

Landing gear warning:
A landing gear warning device is integrated into the system. Warning is by a buzzer
Switches:

1. A magnet at the airbrake control rod 5St69 activates a solenoid operated switch mounted at the fuselage wall in the front cockpit.
2. Limit switch landing gear extended.

Part extension and retraction for inspection and servicing
The retraction may be stopped by switching the toggle switch down,
The extension may be stopped by switching the toggle switch up and pressing simultaneously the press button.
Only the centre (red) LED will shine.
For any service work switch off the main switch!
With the normal procedures you may retract or extend the landing gear again.

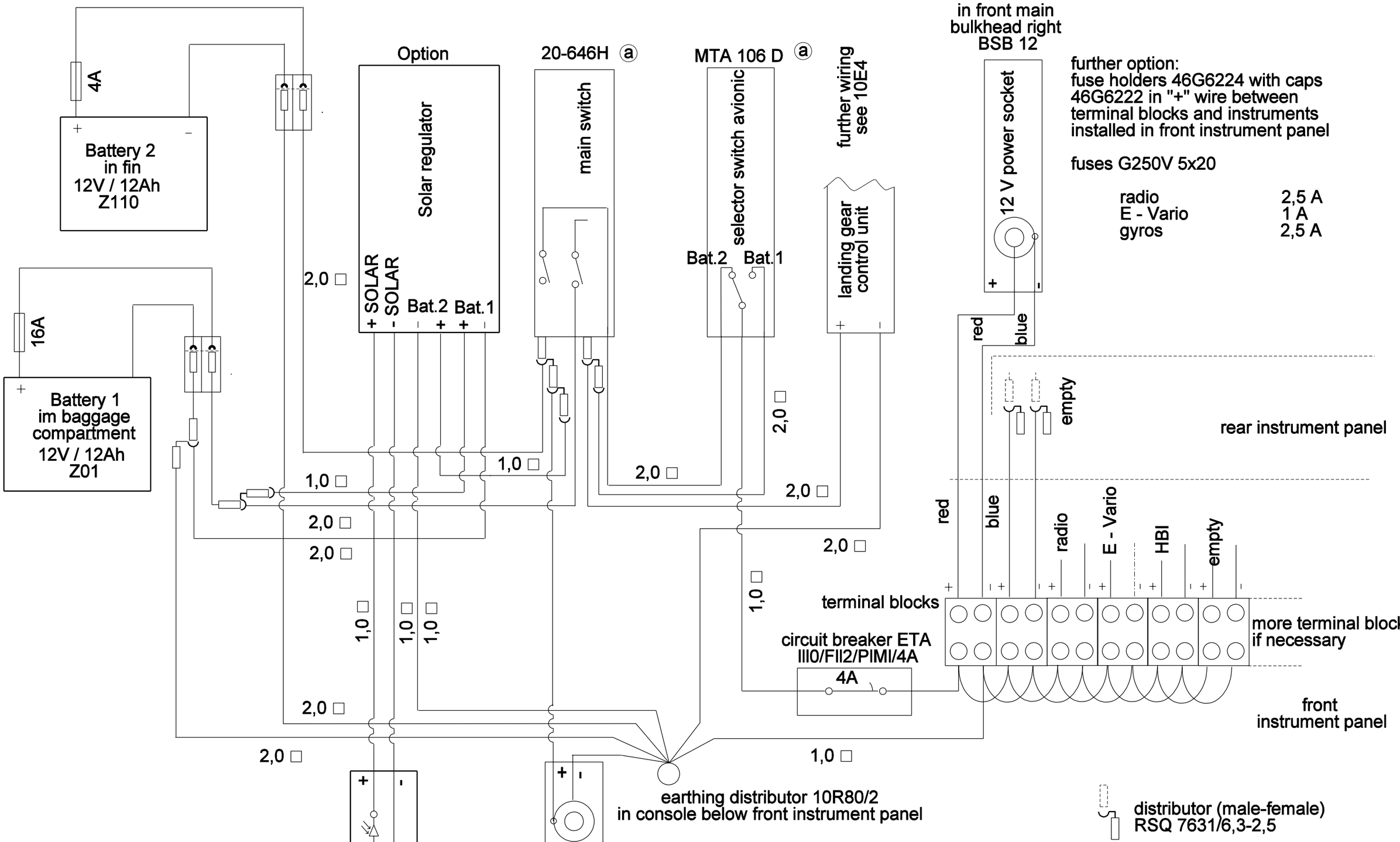
Section 8 Partlist

new Subsection

8.5 Parts for the electrically operated landing gear

60000168 Lockable gas strut K0V2P-3-200-647-001/460N
41041400 Spindle drive completely assembled
60510463 Limit switch 164-(LG retracted)
60510464 Limit switch 164-574 (LG extended)
41040008 Limit switch XGG2-88-S20Z1 (gas strut)
60510484 Extension-retraction switch MTG 206 S (LG up, down)
60510375 Press button 12G2904 with cap 12G2910 black (LG up)

60510387 Circuit breaker ETA 4A
60510360 Toggle switch MTA 106 D (selector switch Avionic)
60510476 Toggle switch 20-647 H (main switch)
10180012 Battery Z01/2 (12V/12 Ah) with fuse 60510459
60510459 Fuse G 250V 5x20 / 16 A
60510865 Switch 1006.1511 **(optional with TN1000/19, standard from ser.no. 10-157 on)**



further option:
fuse holders 46G6224 with caps
46G6222 in "+" wire between
terminal blocks and instruments
installed in front instrument panel

fuses G250V 5x20

radio	2,5 A
E - Vario	1 A
gyros	2,5 A

- wiring 2,0□ AWG 14
- wiring 1,0□ AWG 16
  wiring not specified in the drawing is AWG 16
  all wires marked with heat shrink tubing red "+"
  black "-", if not specified otherwise

Toleranzen nach Arbeitsanweisung BA 1
Schweißen nach Arbeitsanweisung SA 1

Ausg.	Änderung	ÄM	Tag	Name
a	switch designation		28.02.11	W.Dirks

	Tag	Name
Gez.	28.11.08	Fromm
Gepr.		
Norm.		

Maßstab :

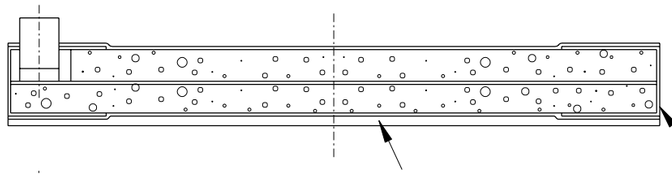
Maße ohne Toleranz-ang. nach:

wiring plan DG-1000S with electr. oper. LG

DG
Flugzeugbau GmbH
76646 Bruchsal 4
Im Schollengarten 20

10E3

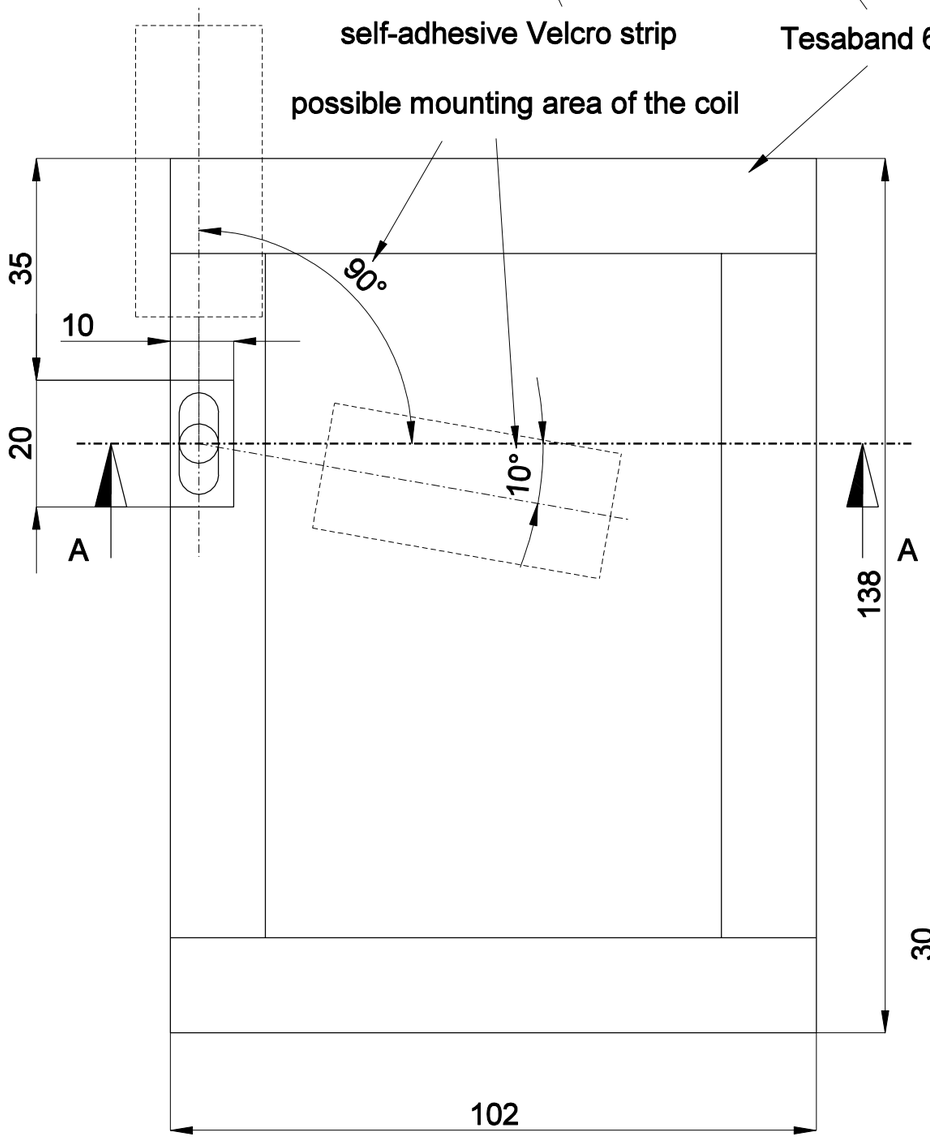
cross section A-A



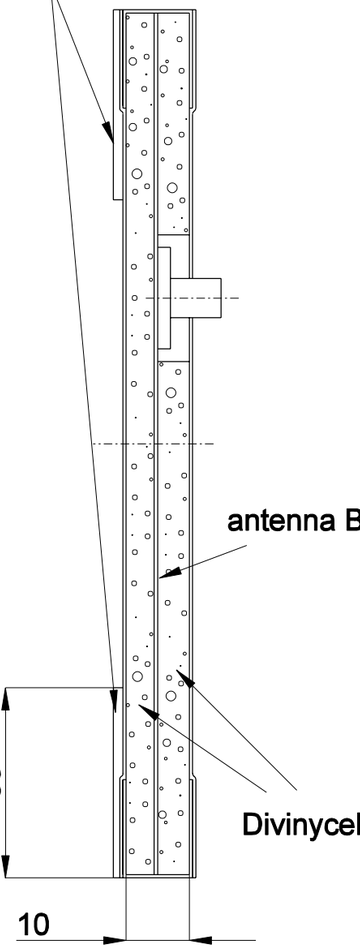
self-adhesive Velcro strip

Tesaband 651

possible mounting area of the coil

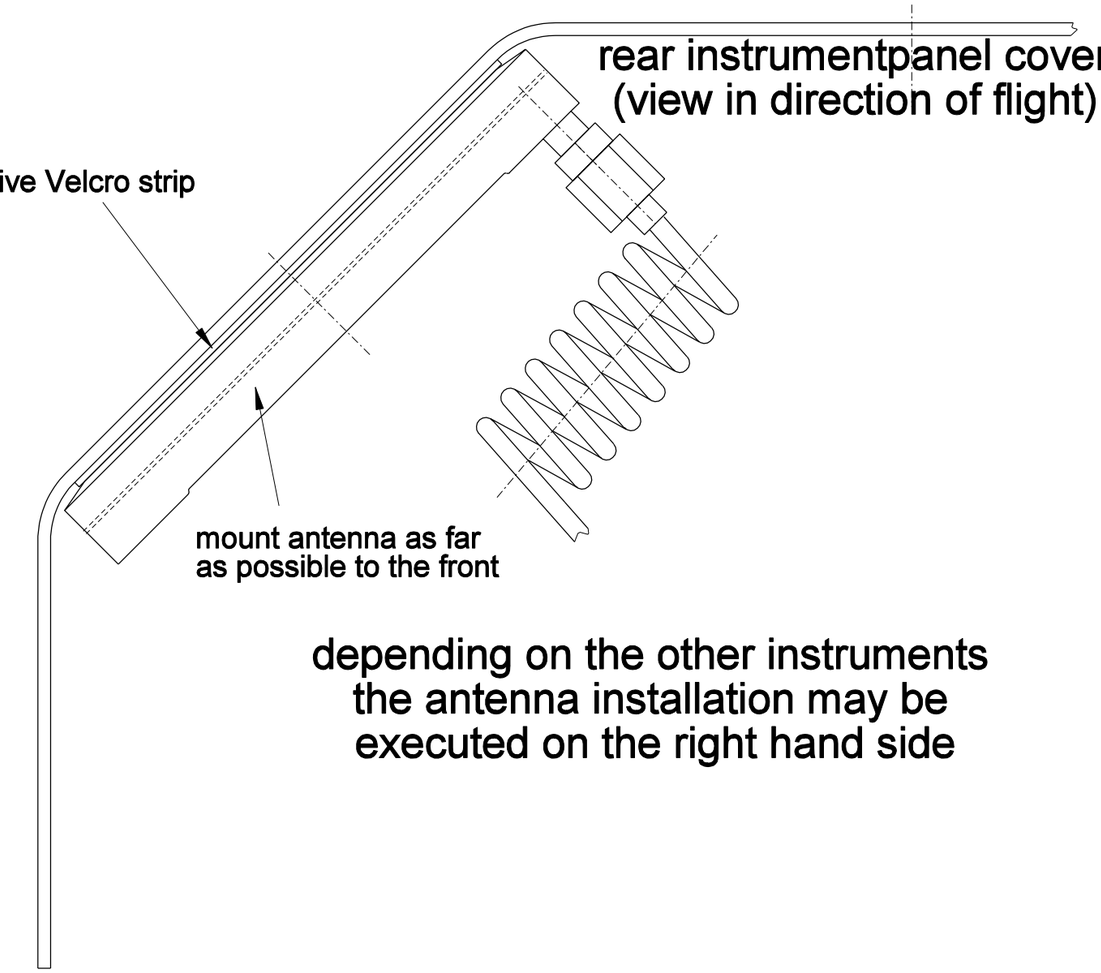


self-adhesive Velcro strip



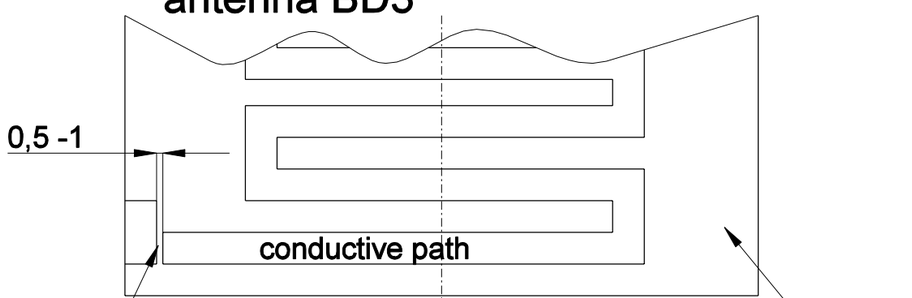
Divinycell H60 5 mm thick 102 mm x 136 mm

rear instrumentpanel cover
(view in direction of flight)



depending on the other instruments
the antenna installation may be
executed on the right hand side

modification of the
antenna BD3



Toleranzen nach Arbeitsanweisung BA 1				
Schweißen nach Arbeitsanweisung SA 1				
Ausg.	Änderung	ÄM	Tag	Name

	Tag	Name
Gez.	04.11.09	C. Stein.
Gepr.		
Norm.		

Maßstab 1:1 :

Maße ohne Toleranz-ang. nach:

406 MHZ ELT
antenna BD3
installation 2-seaters

DG Flugzeugbau GmbH
76646 Bruchsal
Otto-Lilienthal-Weg 2

Z193

Subject : Ballast box in the fin, foam rubber rings

Affected : DG-1000S, DG-1000T, DG-1000M all ser.no.'s

Urgency : prior to next flight and upon changing the trim ballast in the ballast box

Reason : In a DG-1000T a foam rubber ring glued to the mounting plate of the optical sensors for checking the trim ballast has detached. This caused an indication error of the control lamp in the front instrument panel.

Instructions :
1. Check condition and correct gluing of the foam rubber rings 10L45/2 (in older factory serial numbers felt strips and/or rings) in the ballast box in the fin.
2. Remove detached and damaged rings and replace them by new rings according to drawing on page 2. If felt strips are installed, replace them if damaged by foam rings.
   Remove adhesive remains before bonding the new rings.
3. Check the foam rubber rings according to point 1 when changing the trim ballast.

Material :
- order no. 41020452 Foam rubber rings 10L45/2
- order no. 30002009 Instant adhesive (Cyanoacrylate)
  Type Pattex Blitz

Weight and balance : influence negligible

Remarks : The instructions may be executed by the owner himself.

Bruchsal, date:
05.11.2007

Author:
H. Könen

This service info has been approved by EASA date 23. April 2008 with technical note DG-G-04.
Approval No. EASA.A.C.09568.

Assembly drawing for foam rubber rings 10L45/2:

