No.	Page	Description	Date
15	0.3 ÷ 0.8, 0.10 ÷ 0.12, 1.3, 1.5, 1.11, 1.16, 1.18, 1.19, 2.1, 2.6, 3.1, 4.6, 4.10, 4.12, 4.13, 6.1, 7.1, diagrams: 2, 3, 9, Enclosure 1 pages: 5, 8	Manual revision TN 1000/24, New type 12V sockets and plugs	October 2014

0.2 List of effective pages

Section	page	issued	replaced	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	Oct. 2014		
	0.8	“	Febr. 2011			
	0.9	“	Febr. 2011			
	0.10	“	Febr. 2008	March 2008	Oct. 2008	Nov. 2008
			Febr. 2011	March 2011	Oct. 2014	
	0.11	“	Jan. 2005	Febr. 2011	Oct. 2014	
	0.12	“	Febr. 2011	Oct. 2014		
1	1.1	March 2002				
	1.2	“	May 2008	Febr. 2011		
	1.3	“	Oct. 2014			
	1.4	“				
	1.5	“	Febr. 2011	Oct. 2014		
	1.6	“				
	1.7	“				
	1.8	“				
	1.9	“	Nov. 2004	Febr. 2008		
	1.10.	“	Febr. 2008			
	1.11	“	Febr. 2011	Oct. 2014		
	1.12	“				
	1.13	“				
	1.14	“	March 2008	Febr. 2011		
	1.15	“	Febr. 2011			
	1.16	“	Oct. 2014			
	1.17	“				
	1.18	Febr. 2011	Oct. 2014			
	1.19	Oct. 2014				
2	2.1	March 2002	Febr. 2011	Oct. 2014		
	2.2	“				
	2.3	“				
	2.4	“	Febr. 2011			
	2.5	“	Febr. 2011			
	2.6	“	Jan. 2005	May 2008	Febr. 2011	Oct. 2014
	2.7	“	removed May 2008			

0.2 List of effective pages (continued)

Section	page	issued	replaced	replaced	replaced	replaced
3	3.1	March 2002	Oct. 2014			
	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	“	Oct. 2014			
	4.7	“	Febr. 2008			
	4.8	“	Febr. 2008	Oct. 2008	Febr. 2011	
	4.9	“	Febr. 2008	Oct. 2008		
	4.10	March 2002	Oct. 2014			
	4.11	“				
	4.12	“	Oct. 2014			
	4.13	“	Oct. 2014			
	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	Oct. 2014			
	6.2	“	Jan. 2005	May 2008	Febr. 2011	
	6.3	“				
	6.4	Jan. 2005	Febr. 2011			
7	7.1	March 2002	Jan. 2005	Oct. 2014		
8	8.1	March 2002				
9	9.1	March 2002				

0.2 List of effective pages (continued)

diagram	issued	replaced	replaced	replaced	replaced
1	Nov. 2001	May 2004	Oct. 2010		
2	Nov. 2001	Oct. 2014			
3	Nov. 2001	May 2008	Oct. 2014		
4	Nov. 2001				
5	Nov. 2001				
6	Nov. 2001	March 2008	March 2008 Not valid for 10-101, and from 10-128 on		
6a	March 2008				
7	Nov. 2001	Sept. 2003	Nov. 2004		
7a	Oct. 2008				
8	Nov. 2001	July 2011			
9	Nov. 2001	Jan. 2008	Febr. 2011	July 2011	Oct. 2014
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	25.01.1990				
5V18	14.10.1994				
10FW2	5.10.1999				
10E3	28.11.2008	28.02.2011			
10E4 issue A	28.10.2008				
10E4 issue E	8.10.2010				
Encl. 1	Nov. 2008	Page 2, 2a, 8 Oct. 2010	1, 2, 2a, 4 8, Febr. 2011	5, 8 Oct. 2014	
Encl. 2	March 2011	June 2012			
10EP41	4.02.2011				
10E6	23.02.2011	23.02.2012			
SI 67-07	5.11.2007				
Z193	4.11.2009				

0.3 Content

diagrams

1	Elevator control, trim
2	Rudder control
3	Controls in the fuselage (Aileron and spoiler controls)
4	Controls in the wings (Aileron and spoiler controls)
5	Tow releases
6	Water ballast system
6a	Waterballast system 10-101, from 10-128 on
7	Landing gear, hydraulic wheel brake (Version without nose wheel) up to ser. No. 10-132
7a	Landing gear, hydraulic wheel brake (Version without nose wheel) from ser. No. 10-133 on
8	Landing gear, hydraulic wheel brake (Version with nose wheel)
9	Landing gear, non retractable
10	Systems for static and total pressure
11	Placards
12	Landing gear control (Version without nose wheel)
17	Landing gear positive locking device TN1000/13, no more valid from ser. No. 10-133 on
18	actuation unit LG locking device, differences to diagr. 12 for TN1000/13 and from ser. no. 10-133 on
20	Electrically operated main landing gear (in landing gear box)
21	Electrically operated main landing gear (outside landing gear box)
22	Placards electrically operated main landing gear
5EP34	Installation plan Dräger oxygen system
5V18	Tool for airbrake adjustment
10FW2	Spring leg (landing gear)
10E3	Wiring plan DG-1000S with electrically operated main landing gear
10E4	Wiring plan electrically operated main landing gear TN1000/14
10E4 issue E	Wiring plan electrically operated main landing gear TN1000/19
Encl. 1	Electrically operated main landing gear
Encl. 2	Special equipment for aerobatics
10EP41	Installation plan G-logger DG-GL
10E6	Wiring plan DG-1000S with smoke generator
SI 67-07	Service Info ballast box in the fin foam rubber rings
Z193	406 MHZ ELT antenna BD3 installation 2-seaters

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 German composite sailplanes and motorgliders was proofed for 12000 flight hours. The initial life time for the DG-1000S is 3000 flight hours and may be increased by inspections according to section 2.4 of this manual to 6000 h, 9000 h, 10000 h, 11000 h and 12000 h.

0.4.3 Life time of components

a) The **fabric straps of the safety harness** have to be exchanged according to the instructions of the respective manufacturer. If no limitations are given, exchange after 12 years, approved types see section 6.
b) The **rubber cord** in the elevator control system see section 1.2.6 has to be replaced at least every 6 years, part no. 30091131.
c) 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.

0.4.4 Service time, maintenance documents

Follow the instructions of the respective manufacturer:

a) Tow releases:
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.

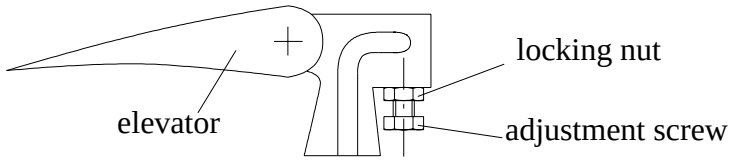
b) Safety harness: instructions of the manufacturer, latest approved version. Approved types see section 6.

c) Minimum instrumentation: instructions of the manufacturer, approved instruments see sections 6.

1.2.4 Elevator control circuit free play

With the elevator held fixed in the zero position, the free play at the top of the control column can be ± 2 mm (± 0.08 in.). Within the automatic elevator connection there should be no free play noticeable in the zero position when the elevator is moved at its trailing edge.

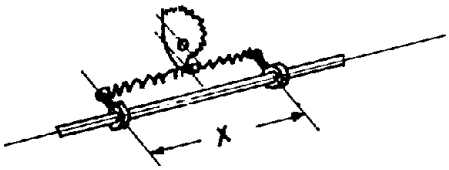
Any free play can be reduced by screwing in the adjustment screw on the automatic connector funnel.



1.2.5 Trim

The trim mechanism should be adjusted so that with full forward (nose down) trim the control column is pulled by the trim springs into it's maximum forward position with a force P of approx. 30 N (6.6 lbs.).
The force P is to be measured with a spring balance at the upper end of the control stick. Read the force, when the stick just starts to move.
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.



The correct adjustment should be verified in flight and corrected if necessary. Trimming should be possible up to 200 – 220 km/h (108 - 119 kts.).

Note: If the DG-1000S can be trimmed up to higher speeds it is likely that the trim is not sufficient in circling flight.

1.3 Rudder control

1.3.1 Rudder control circuit

see diagram 2

1.3.2 Rudder deflections and tolerances

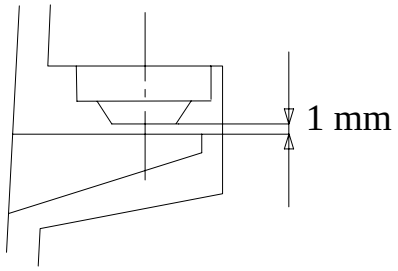
28° up to 29° which is 160 up to 165 mm (6.3 up to 6.5 in.) to both sides measured at 330 mm (13 in.) behind the hinge axis (lower rear end of the rudder).

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.

1.3.6 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.

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 .

c) The brake linings must be replaced if they are worn down to a thickness of 2.5 mm (0.098 in.). Removal of the brake calliper see section 4.5.1B or 4.5.2B..
Replacement set (2 linings, 6 rivets) Tost Nr. 075860.

d) The brake disc must be replaced if it is worn down to a thickness of 4.3 mm (0.17 in.).

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)

1.10 Massbalance and weights of control surfaces

After repairs or repainting the control surfaces weights and moments should not exceed the following limits:

Control Surface	Weight		Moment		Spring balance reading see instructions below	
	kg (lbs.)		kg×cm (lbs.×in.)		kg (lbs.)	
	min.	max.	min.	max.	min.	max.
Rudder (incl. massbalance)	3,5 (7,72)	5,2 (11,46)	-2,5 (-2,17)	+0,5 (0,434)	-0,25 (-0,55)	+0,05 (0,11)
Elevator (without pushrod)	2,25 (4,9)	3,0 (6,61)	9,0 (7,81)	12,0 (10,42)	0,53 (1,182)	0,71 (1,576)
Inboard ailerons light version	4,7 (10,36)	6,0 (13,23)	0 (0)	3,4 (2,95)	0 (0)	0,207 (0,457)
Inboard ailerons heavy version	5,7 (12,57)	7,0 (15,43)	0 (0)	2,5 (2,17)	0 (0)	0,152 (0,336)
Outboard ailerons (20m extension)	0,35 (0,77)	0,55 (1,2)	0,7 (0,61)	1,2 (1,04)	0,07 (0,157)	0,12 (0,27)

Negative moment means that the control surface is balanced more than 100%. In such case you have to apply a downward load at the measuring point.

Note: Before any changes to the massbalance weights are made, contact the DG Flugzeugbau factory.

Method for determining control surface moments

All control surfaces: Remove the control surface and hang it friction free on two hinge points.

It is important that ailerons and elevator are positioned upside up.

The inboard aileron must be hung at its first (root) and 5. hinge.

The elevator must be hung at hinges 2 and 5.

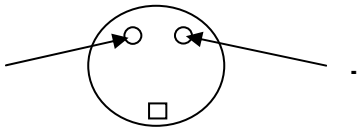
Control surface	measuring point	behind hinge axis	
		mm	in.
Rudder	lower edge	100	3,94
Elevator	centre, y= 70mm (2.76 in.)	168	6,61
Inboard aileron	aileron root	164	6,46
Outboard aileron (20m)	aileron root	98	3,86

1.12 Electrical system

1.12.1 12 V Socket

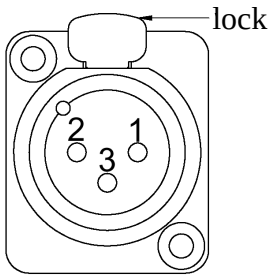
A socket is located in the rear cockpit (behind the pilots right shoulder). It is used for: battery charging and to provide power for external accessories

Connection of the socket terminals:
Type Preh
view from the cockpit



From ser. No. 10-120 on a BSB12 socket is installed.
Connection of the socket terminals: centre pin= + pole.

From ser. No. 10-225 on a Socket
XLR 3-pole NC3FD-LX-BAG is installed.
Connection of the socket terminals:
1= +
2= -
3= not used
view from the cockpit



Suitable plugs see parts list section 1.12.2.

1.12.2 Plugs

Wiring with plugs for additional batteries in baggage compartment and fin are standard equipment.

Plug types:

10002317 Preh plug for 12V sockets

From ser. No. 10-120 on:

60510797 Plug BSK12 (for socket BSB12)

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

From ser. No. 10-225 on:

60510881 Plug XLR 3-pole NC3MX-BAG (for socket XLR)

1.12.3 Batteries

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 and of the brake disc (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 (canopies removed from fuselage): 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.

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 DG Flugzeugbau for the necessary inspection document (Life Extension Program DG–1000, latest issue).
   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 section 8.

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
Adapter W67 (for mounting the cloth discs to a power buffer with thread M14)	Part-No. 80010026

You get the best effect when polishing 90° to the microscratches of the sanding process.

Caution: 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!

4.5 Removal and installation of the undercarriage (main wheel)

4.5.0 General

Warning: A gas strut is installed inside the landing gear box to compensate the mass of the landing gear. The landing gear may retract by itself when unlocked by the force of the gas strut, especially when the glider is not in the normal position. So when working on the landing gear make sure that inadvertent retraction of the landing gear is prevented.

Removal of the gas strut in the landing gear control system: Use a screw clamp to pre-stress the gas strut sufficiently so that the bolts can be removed.

4.5.1 Undercarriage (main wheel), Version without nose wheel

see diagram 7

A Removal of the main wheel

1 Remove axis 10FW11/7 together with the 2 parts 10FW11/2.
2 Remove the wheel axle 10FW11/6 and the bush 10FW11/4.
3 Move the wheel with the brake assembly to the right, so that the pin of part 10FW18 slides out of the fork 10FW11/1. Now remove the wheel with the brake assembly.

B Removal of the brake assembly from the main wheel

1. This is only necessary if the tyre is to be removed or if the brake linings are to be exchanged.
2. Remove the 2 bolts A from the brake assembly.
3. Take off brake assembly with holder 10FW18 and take away the loose part (back plate assy.) with the brake lining.
4. During reassembly secure the 2 bolts A with Loctite 243 or safety wire.

Caution: Don't operate the airbrake and thus the wheelbrake with brake assembly disassembled, as the piston and the brake-fluid will be pressed out of the brake assembly.

4.5.2 Undercarriage (main wheel), Version with nose wheel

see diagram 8

A Removal of the main wheel

1 Remove the bolt M 8 x 45 DIN 931-8.8 zn which secures the holder 5FW9 for the brake assembly to the front landing gear strut 5FW10.
2 Remove the axis 5F17/1 and the parts 5FW17/2.
3 Remove the wheel axis 5FW5 and the bush 5FW4/1.
4 Move the wheel with the brake assembly to the right, so that the pin of part 5FW9 slides out of 5FW10. Now remove the wheel with the brake assembly.

B Removal of the brake assembly from the main wheel

This is only necessary if the tyre is to be removed or if the brake linings are to be exchanged.

1 Remove the 2 upper bolts A from the brake assembly.
2 Take off brake assembly with holder 5 FW 9 and take away the loose part (back plate assy.) with the brake lining.
3 During reassembly secure the 2 bolts A with Loctite 243 or safety wire.

Caution: Don't operate the airbrake and thus the wheelbrake with brake assembly disassembled, as the piston and the brake-fluid will be pressed out of the brake assembly.

C Removal of the rear landing gear strut

1 Remove the baggage compartment floor and the rear cover of the baggage compartment.
2 Disassemble the wheel see A.
3 Retract the landing gear.
Warning: The landing gear will retract by itself when unlocked by the force of the gas spring!
4 Remove the short adjustable pushrod from the actuating lever 5FW8 see 4.5.0.
5 Disassemble the gas spring from the left side of the undercarriage box.
6 Extend the landing gear again.
7 Disassemble the 3 bolts M6 x 40 LN9037 which fix the parts 5FW7 and 5FW8 to the strut 5FW12. Work inside the landing gear box.
8 Pull out 5FW7 and 5FW8 (with the gas spring).
9 Take out the rear landing gear strut.

4.6 Filling and bleeding the hydraulic disc brake

Note: The master cylinder is mounted in an horizontal position. Due to the position of the reservoir filling and bleeding of the system is only possible from the lowest point which is the brake cylinder assembly at the wheel.

Necessary tools and material:

- open-end wrench 1/4" = 6.35 mm for the bleeder valve at the cylinder assy..
- 1 open-end wrench 11/16" = 18 mm.
- 2 Plastic syringes acid resistant, volume ca. 100 ml (6 cu.in.). Use this syringe for brake fluid only!
- 1 bleeder assy. Tost No. 075890.
- 1 m (3 ft.) transparent PVC hose inside diameter 8 mm (0.31 in.), fixed to syringe and bleeder assy. with hose clamps.
- Brake-fluid DOT 3, DOT 4 or SAEJ 1703.

1. **Preparations**

- Raise the fuselage, extend the landing gear
- Fix the left wheel door in the fully open position
- Set the airbrake control in the retracted position
- Remove the baggage compartment floor and rear cover, check that the actuating cable for the master cylinder is loose and that the piston rod of the master cylinder is at its stop (brake open).
- Remove the main wheel according to section 4..5.1A or 4.5.2A. Place the wheel so that the brake hose makes no bow above or below the horizontal. If necessary lift the fuselage even more.

2. **Filling**

Warning: Brake fluid is poisonous!
Protect your hands and clothes. Remove all spilled brake fluid. Clean all parts which had contact with brake fluid with alcohol, don't use fuel or solvents.

- Open the cover of the reservoir
- Fill the first syringe (with hose and bleeder assy.) with brake fluid, eliminate all air bubbles.
- Remove the protection cap from the bleeder valve, attach the bleeder assy. and fix it with the wrench 11/16".
- Open the bleeder valve at the cylinder assy., use the 1/4" wrench, fill in slowly the complete volume avoiding air bubbles.

- Fill the complete system up to 15 mm (0.6 in.) below the upper edge of the reservoir, avoid over filling.
- Close the bleeder valve at the brake calliper.
- Use the second syringe to remove all brake fluid from the reservoir.
- Fill the first syringe again, open the bleeder valve and fill in further brake-fluid. Look at the reservoir while filling to see if air bubbles are coming out of the line. Fill up to 15 mm (0.6 in.) below the upper edge of the reservoir.
- Close the bleeder valve, reinstall the membrane and the cap to the reservoir and remove the bleeder assy.
- Check brake pressure according to step 3..
- Reinstall the main wheel.

3. **Check brake pressure**

- extend the airbrakes, there must be a strong pressure when the wheel brake engages.
- check several times, the wheel brake must engage at the same point every time
- if this is not the case, you have to bleed the system again

4. **Check the hydraulic brake system for leaks**

- extend the airbrakes with high force and hold it in this position for 2 minutes.
- Then check the whole hydraulic system visually for leaks. If necessary tighten the screwed joints or replace the seals and bleed the system again.

Note: The adjustment of the length of the cable between the master cylinder and the airbrake control shaft restricts the max. airbrake extension height. The adjustment of this cable should be done with the glider rigged.

5. **Bleeding the hydraulic brake system**

- Remove the brake fluid from the reservoir using the syringe.
- Then repeat items 2 and 3 of this instruction.

6. **Exchanging brake fluid** (every 4 years)

- Perform preparations (see step 1.) of this instruction. It is not necessary to remove the main wheel.
- Fill the system with new brake fluid (see step 2.). To accomplish this remove all brake fluid from the reservoir first with the second syringe. Used brake fluid is darker than new brake fluid and can easily be identified. Watch the reservoir while filling to see when the new fluid streams into the reservoir. Repeat the filling process until only new fluid is in the system and no air bubbles can be detected.
- Perform steps 3. and 4. of this instruction.

6 Instrumentation and accessories list

Air speed indicator (0 - 300 km/h, 165 kts)

Manufacturer	Type	**Certification No.**
Winter	6 FMS 4(diam. 80mm)	TS 10.210/15
	0-300 km/h Ident.No. 6421453	
	0-160 kts Ident.No. 6423453	
Winter	7 FMS 4(diam. 58mm)	TS 10.210/19
	0-300 km/h Ident.No. 7421453	
	0-160 kts Ident.No. 7423453	

The airspeed indictor must have colour coded speed ranges marked as indicated in the flight manual section 2.3.

Altimeter

Manufacturer	Type	**Certification No.**
Winter	4 FGH 10 (diam. 80mm)	TS 10.220/46
	1.000-10.000m Ident.No.4110	
	1.000-20.000 ft Ident.No.4320	
Winter	4 FGH 20 (diam.58mm)	TS 10.220/47
	1.000-10.000m Ident.No.4220	
Winter	4 FGH 40 (diam.58mm)	TS 10.220/48
	1.000-20.000ft Ident.No.4550	

Or any other TSO C 10b specified and approved altimeter with fine range pointer 1 turn max. 1000 m, 3000 ft.

Harness (seat)

Manufacturer	Type	**Certification No.**
Gadringer	BAGU 5202 G	40.070/32
	SCHUGU 2700 G	40.071/05
	rubber coated adjuster bars	
Schroth	4-01-0.104	40.073/11

7 List of special tools etc.

A Special tool with 6 mm thread (W38/2) for the securing of the tailplane and for the locking pins of the rear wing suspension.

B Special tool W36 (or a suitable pin with 6mm diameter) for derigging of the outboard wings and for the cover plate of the ballast box in the fin.

C Tool for airbrake adjustment: 5V17 and rod according to drawing 5V18.

D Open-end wrenches

1/4" = 6,35 mm	SW 14
SW 7	SW 17
SW 8	11/16" = 18 mm
SW 9	SW 19
SW 10	SW 22
SW 13	

E Allen key wrench
3 mm, 4 mm, 5 mm, 6 mm, 7 mm, 8 mm, 10 mm and 12 mm

F Circlip pliers A (outside) for the range 8-14 mm for the tail wheel axis

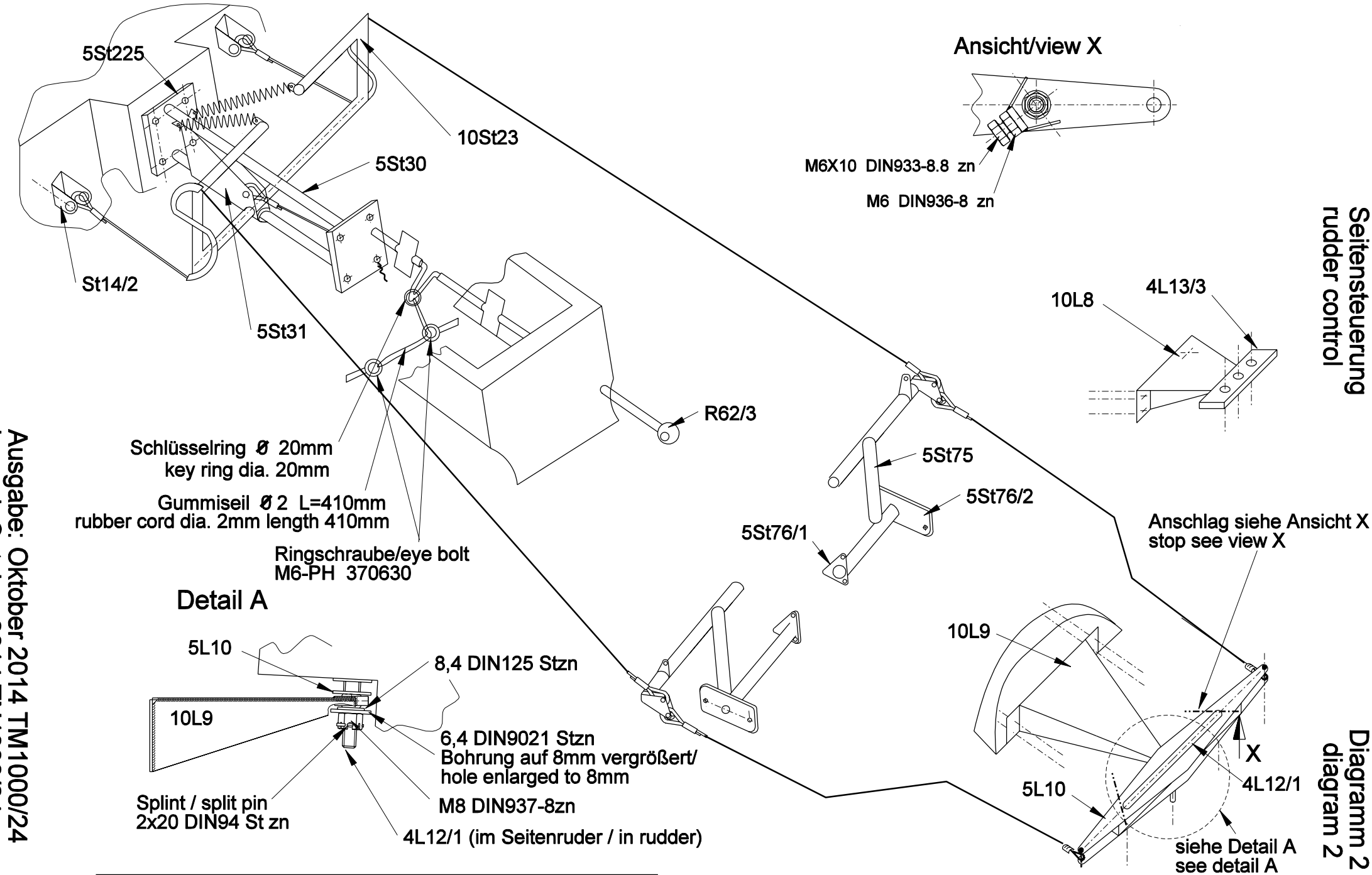
G Spring balance max. reading 50 N (11 lbs.) for determination of control surface moments (see section 1.10)

H Spring balance max. reading 100 N (22 lbs.) for determination of airbrake overcentre locking moments (see section 4.4.2

I Nicopress tool 64 – CGMP for cable connections

J For filling the wing ballast tanks: Hose with outside dia 25 mm (1 in.), 1 m (3.2 ft.) long.

K For filling the fin ballast tank: Z27/2 Funnel with clear PVC hose inner diameter 12 mm (.47 in.) 1.9 m (6 ft.) long and hose connector GS 12.



Seitensteuerung
rudder control

Diagramm 2
diagram 2

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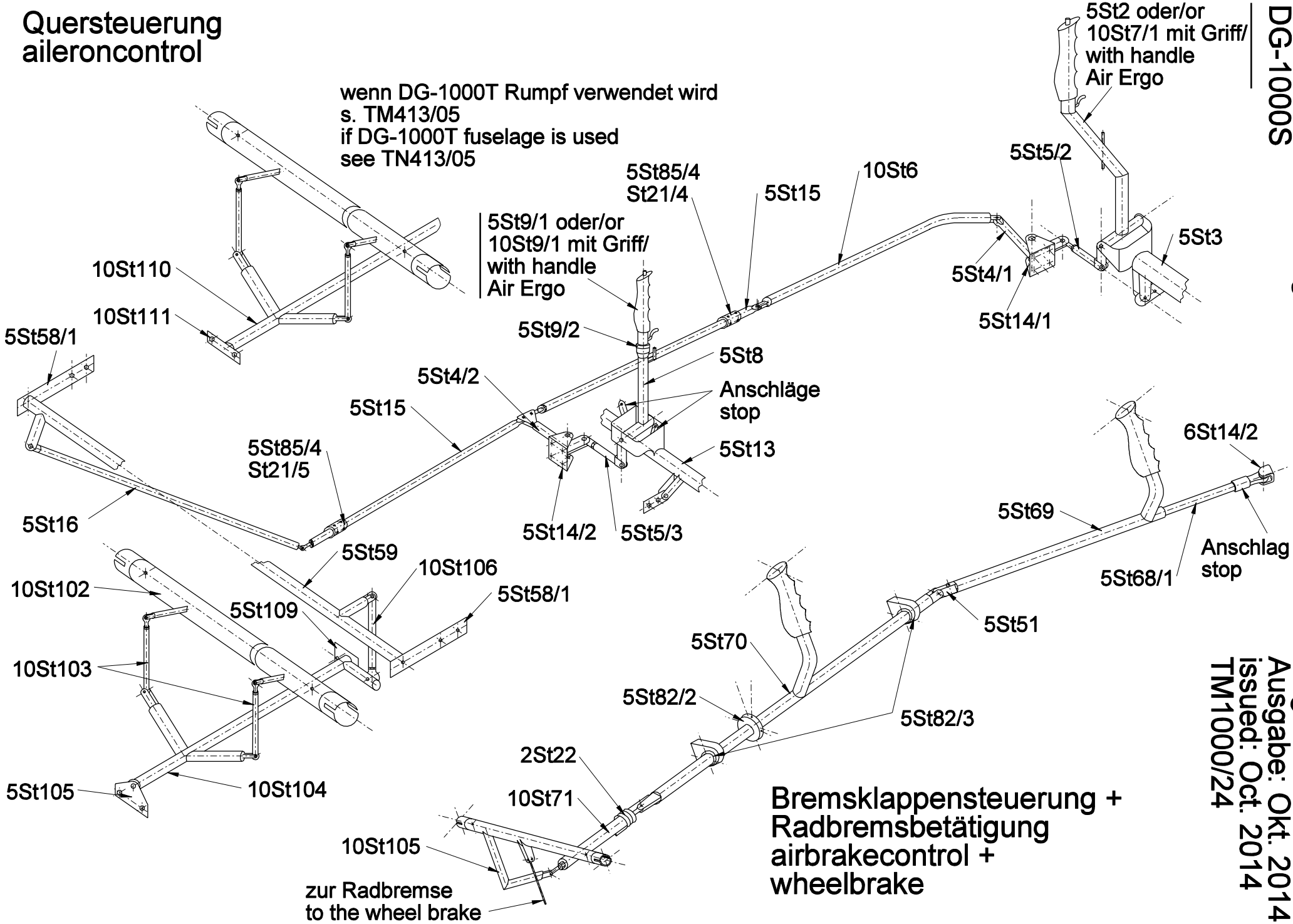
issued: October 2014 TN1000/24

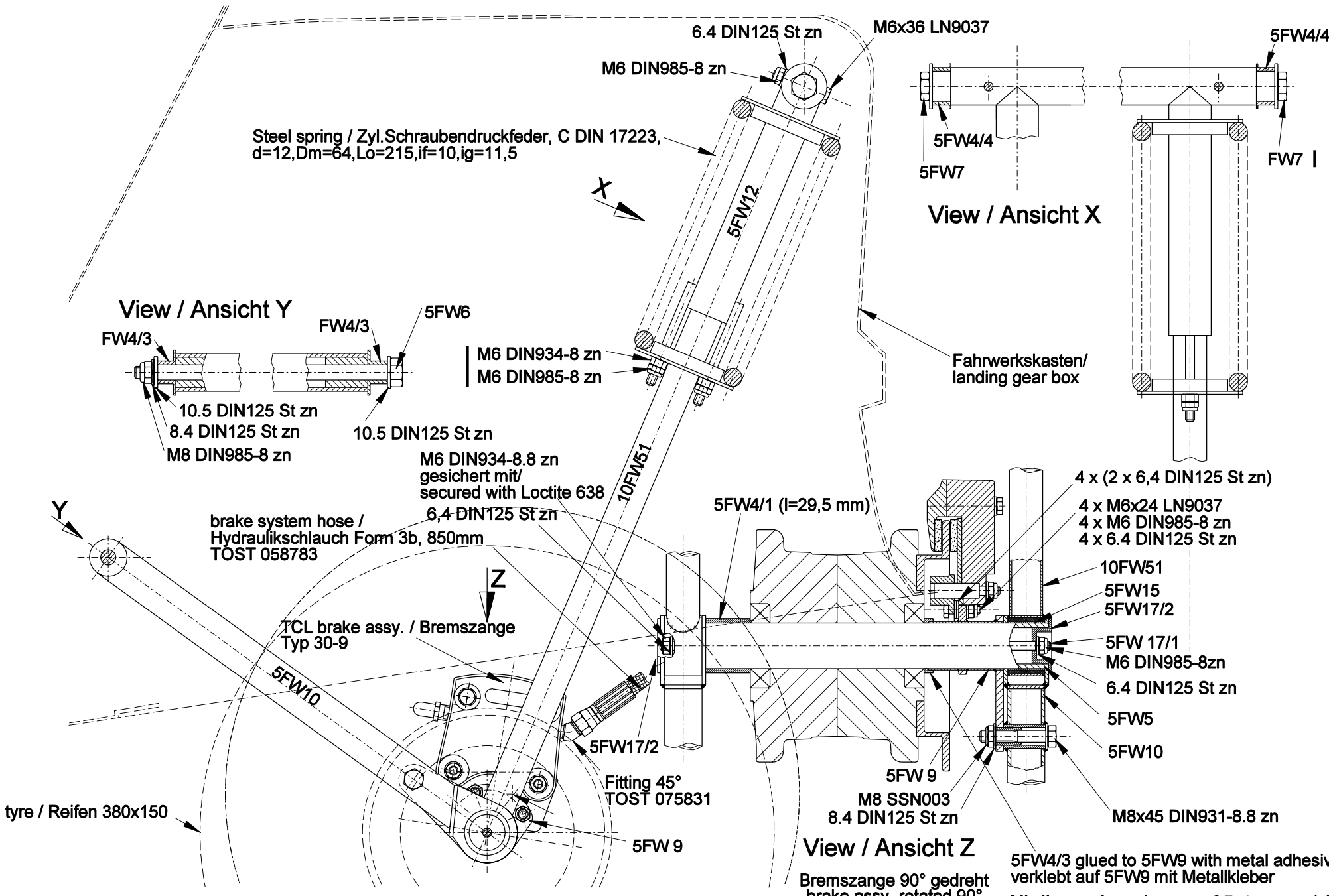
Quersteuerung
aileroncontrol



Bremsklappensteuerung + Radbremsbetätigung
airbrakecontrol + wheelbrake

Steuerung im Rumpf
controls in the fuselage
DG-1000S

Diagramm 3
diagramm 3
Ausgabe: Okt. 2014
issued: Oct. 2014
TM1000/24



All dimensions in mm, 25,4 mm= 1 in.

Festes Fahrwerk, hydraulische Radbremse
fixed landing gear, hydraulic wheelbrake

Diagramm 9
diagram 9

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issued October 2014 TN1000/24

Section 3 Maintenance

3.3 Greasing and oiling

Subsection amended

- Electrically operated landing gear: Clean and grease the slotted hole at the attachment of the spindle drive to the bell crank 10FW106 (see diagram 21).

Caution: The linear guide on which the spindle drive is moving during emergency extension of the landing gear is made from plastic and should not be greased .
If these parts have been greased inadvertently you have to disassemble the parts and to clean them completely with Acetone.

Section 4 Detailed instructions for assembly and servicing work

4.5 Removal and installation of the undercarriage (main wheel)

New Subsection

4.5.3 Electrically operated main landing gear

see diagrams 20 and 21

A-D Removal of the main wheel of the brake assembly from the main wheel of the lower landing gear fork 10FW11/1 and removal of the spring legs 10FW2 see section 4.5.1 A-D

E. Removal of the drag struts 10FW102 (left) 10FW102/2 (right)

1 Remove the main wheel see see section 4.5.1 A.
2 Disassemble the gas strut from the left side of the landing gear box see section 4.5.0
3 Remove the 2 bolts M8 LN9037 which connect the struts to fork 10FW10/1. Mark the bolts. Don’t interchange the bolts during reassembly!
4 Remove the 2 bolts M8×40 LN9037 which connect the struts to the rear fork 10FW91.
5 Remove the struts.

F. Removal of the front fork 10Fw10/1

see section 4.5.1 F

G. Removal of the shaft10FW109 (with the latches for locking the LG in retracted position)

1 Remove the baggage compartment floor and the rear cover of the baggage compartment.
2 Disconnect the wiring from the limit switch (mounted to the left latch of the shaft).
3 Remove the push rod 10FW121 between bell crank 10FW130 and lever 10FW89.

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)
60510506 Extension-retraction switch MTG 106 G (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)**