DG Flugzeugbau GmbH
Postfach 4120 76625 Bruchsal
Tel. 07257/890

Technical Note
No. 323/10

Subject : Additional tow hook for aerotow

Effectivity : Sailplanes DG-200 all models only as an option

Accomplishment : non, optional

Reason : In addition to the C.G. tow hook a tow hook only for aerotow can be installed as an option. The installation place is below the instrument panel.
Postfactory installation is possible.

Instructions : 1. Installation of the nose tow hook Tost "E85" according to installation plan EFK, drawings R83 and R84.
For postfactory installation the installed control cable is to cut so that the cable leading to the C.G. hook can be used for the new installation. Cut the nylon tubes according to plan EFK. Remove the pulley and its cover under the instrument panel. Make a cutout in the left wall under the instrument console referring to drawing R84 for installation of the GFRP part R85. Grind away the upper and lower glued joints of the wall.

Assemble the bulkheads R81 and R82 provisionally to the tow hook. Place the assembly exactly in the middle of the fuselage and mark the position of the glued joints for the bulkheads and a cutout diameter 53 mm (2.1 in.) for the ring of the tow hook see drawing R83

Next you have to alter the position of the pitot and static pressure lines according to installation plan ED/l. The lines should come out of the GFRP wall min. 90 mm (3.5 in.) above the fuselage bottom. If not, you have to reposition them prior to the installation of the tow hook.

Mill a cutout 2 mm deep for the rubber cover see drawing R86 in the lower fuselage surface. The nylon line for the pitot pressure is to bend to the left by heating it. To prevent a wrinkle in the tube insert a dia. 3.2 mm (1/8 in.) control cable in the line prior to heating. The line should be bend so that there is no interfering with the tow hook. The plastic hose for the pitot pressure is to lengthen by 130 mm (5.1 in.).
The length of the static hoses are 140 mm (5.5 in.) left and 120 mm (4.7 in.) right, measured from the T-tube fitting.

To prevent from chafing at the tow hook the hoses are to be fixed with a plain loop cushioned clamp dia. 22 x 15, which is to be fixed at the left upper mounting bolt of the pedal adjustment device. The original bolt is to be exchanged against a bolt M6 x 30 DIN 912-8.8.
Roughen the glued joint areas at the bulkheads, the fuselage and the wall R85.
Assemble the tow hook with the lever R79/l and the bulkheads.
Mix the resin 50 g (1.76 ounces) MGS L285 and 19 g (0.67 ounces) hardener MGS L286. Brush all glued joint areas with the resin mixture. Thicken some of the resin mixture with cotton flocks and apply on the glued joint areas. Glue in the wall R85 and the bulkheads with the towhook. Fix the nylon tubes according to plan EFK with 2 layers of glasfibre fabric 92125.
Curing procedure: 12 h room temperature, 18 h 55°C (131°F)

Assemble the bellcrank R80 provisionally with the clevis rod ends and the adjustment screw R79/3 to the bulkhead and the towhook. Adjust R79/3 for a distance of 75 mm (2.96 in.) of the axes. Insert the control cables with thimbles and Nicopress sleeves according to plan EFK and mark the positions. Take out the bellcrank R80 and press the sleeves with a Nicopress tool groove M.

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Finally assemble the bell crank.
Adjust the adjustment screw R79/3 so that the cable leading to the C.G. tow release is just not tensioned. Lock the fork rod ends with the counter nuts. Glue in the rubber cover according to drawing R86 with Pattex contact adhesive or similar. Cover the joint with thin plastic tape.

2. Function test

Carry out a function test at the front release and at the C.G. release.
For testing use a rope with the original Tost double rings (marked LN6 5091 - Tost). Pull the rope parallel to the lower fuselage surface with min. 50 daN (110 lbs.) to the front.
Release from the cockpit Ensure for safe release with low pilot forces.

3. Manual pages

The following manual pages are to be exchanged against pages issued April 1998 marked TN 323/10. Follow the new instructions marked with a bar at the side of the pages.

Flight manual	page	subject
	1	list of amendments
	11	tow hooks
	17	aerotow
	27	maintenance

Materials : 1 tow release Tost E 85 (special version for DG-single seaters)
with bush R79/2 and bolt M 6x 85 DIN 931-8.8 zn.
1 lever R79/1
1 adjustment screw R79/3
1 bellcrank R80
1 clevis rod end G 6 x 12 DIN 71752 left hand thread
1 clevis rod end G 6 x 24 DIN 71752
1 nut DIN 439-8 M6 left hand thread
1 nut DIN 439-8 M6
2 clevis pins 6 x 18/16,5 DIN 1434 zn
3 cotter pins 1,5 x 12
600 mm (24 in.) control cable dia. 3.2 mm (1/8 in.) LN 9374
1 bolt M6 x 30 LN 9037
2 bolts M6 x 60 DIN 912-8.8 zn
5 self locking nuts M6 DIN 985-8 zn
9 washers 6.4 DIN 125 St zn
3 Nicopress sleeves 28-3-M copper-zinc plated
2 thimbles 3 mm DIN 6899 A
1 plain loop type cushioned clamp dia. 22 x 1.5
1 rubber cover R86 (rubber from car wheel tube 2 mm (.08 in.) thick)
Glasfibre 92125 appr. 100 x 100 mm (4 x 4 in.)
Epoxy-resin MGS L285 50 g (1,76 ounces)
+ hardener MGS L286 19g (.67 ounces)
cotton flocks 100 g (3,53 ounces)
one of each tow hook bulkheads R81, R82
1 GFRP wall R85

Drawings: R83
R84
R86

Installation plans: EFK,
ED/1

Weight and balance : The weight increases by 0.9 kg (2 lbs.) at 1243 mm (48.9 in.) in front of datum.
For postfactory installation calculate the new empty weight C.G or carry out a new C.G. weighing.
Write a new C.G. weighing report.

Remarks : All instructions are to be executed by the manufacturer or by a licensed workshop and to be inspected and entered in the aircraft logs by a licensed inspector.

Bruchsal, date:
April 08. 1998

Author:
Dipl. Ing. Wilhelm Dirks

Wilhelm Dirks

LBA – approved:

The German original of this TN has been approved by the LBA under the date of 07. Mai 1998 and is signed by Mr. Fendt. The translation into English has been done by best knowledge and judgement.

Type certification inspector:
Dipl. Ing. Swen Lehner

Swen Lehner

Manual contents and amendments

No.	Page	Description	Date	Signat.
1	Manual p.22	Main pin securing	June 80	
2	Manual p.22 Maint.-m. p.18 diagr. 6	Automatic self connection for the elevator control	Sept. 80 Sept. 80 Sept. 80	
3	Manual. P.13, 14 Maint.-m. cover, p.6, 7, 18	Automatic trimm control and wheel brake control connected to the airbrake handle	Sept. 80 Sept. 80 Sept. 80	
4	Manual p.13a	Single piece canopy	Sept..80	
5	Maint.-m., diagr.7	Spring mounted landing gear	Sept. 80	
6	Manual p.22 Maint.-m. p.7	Waterballastsystem	Sept. 80 Sept. 80	
7	Manual p.3, 27, 28 Maint.-m. p.0, 7, 7a, 7b, 10, 13	Technichal Note No. 323/5	Febr. 85	
8	Flight-m. 12, 17/12, 12a, 13a Maint.-m. diagr. 3a	Marking of canopy emergency release and ventilation (TN 323/6)	June1986	
9	Maint.-m. 0, 7c	Airbrakes (TN 323/9)	Oct. 1996	
10	Flight-m. 11, 17, 27	Installation of an additional tow hook for aerotow (TN 323/10)	April 1998	

2.9 Tow Release

C.G. release: Special tow release SH 72
additionally as an option: Nose release E 85 installed below instrument console
only for aerotow

2.10 Weak Links

Winch launch and aero tow	5000 +- 300 N 500 +- 3o daN (kp) 1100 +- 66 lbs.

2.11 Tire Pressure

Mainwheel	3 bar (ATÜ) (42 PSI)
Tailwheel	2 bar (ATÜ) (28 PSI)

2.12 Crosswinds

The tested maximum crosswind component according to the Airworthiness requirements for take-off and landing is 16 km/h 9 kts 10 mph. Use flap setting L 1 for strong crosswind landing.

Manual contents and amendments

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6	Manual p.22 Maint.-m. p.7	Waterballastsystem	Sept. 80 Sept. 80	
7	Manual p.3, 27, 28 Maint.-m. p.0, 7,7a,7b,10,13	Technical Note No. 323/5	Febr. 85	
8	Flight-m. p.12, 17/12, 12a, 13a Maint.-m. diagr. 3a	Marking of canopy emergency release and ventilation (TN 323/6)	June 1986	
9	Maint.-m. p.0, 7c	Airbrakes (TN 323/9)	Oct. 1996	
10	Flight-m. 11, 17, 27	Installation of an additional tow hook for aerotow (TN 323/10)	April 1998	

4.3 Cockpit check:

1. Lead ballast (for under weight pilot)?
2. Parachute worn correctly?
3. Pilot seat belts and shoulder harness fastened?
4. Seat back and rudder pedals adjusted?
5. All controls and instruments in reach?
6. Altimeter?
7. Spoilers checked for operation and locked?
8. Flight controls tested? (One man at the controls)
9. Trim set?
10. Canopy properly closed and locked?

4.4 Take – off

The location of the tow hitch in the fuselage centre line, the very effective ailerons and rudder supply ample control to avoid dropping a wingtip and to master a strong crosswind on take off.

Aero-tow:

a) If only a C.G. release is installed, then the aerotow is to be executed with this release. Set trim full nose down.

b) If an additional tow release for aerotow is installed, only this release should be used for aerotow. Adjust the trim for aerotow so that the indicator is 2 cm (0.8 in.) behind the forward position.

c) General: Hold stick in resulting position and at 75-80km/h (38-43kts.) (44-50mph) ease stick back to lift off. On very rough surfaces keep a tight grip on the stick. After attaining safety altitude the landing gear can be retracted with a forceful operation of the gear handle. Normal tow speed is 100-120 km/h (54-65 kts.) (62-75mph). Cruising tow speed is 190 km/h (103 kts.) (118mph).
For starting the roll set the flaps on 0°, reaching the take off speed set +4° and keep them there for the remainder of the climb. When towing at higher speeds cross country the flaps may be set on 0° or to reduce drag on –8°.

Winch launch is only allowed at the C.G. release.

Manual contents and amendments

No.	Page	Description	Date	Signat.
1	Manual p.22	Main pin securing	June 80	
2	Manual p.22 Maint.-m. p.18 diagr. 6	Automatic self connection for the elevator control	Sept. 80 Sept. 80 Sept. 80	
3	Manual. P.13, 14 Maint.-m. cover, p.6, 7, 18	Automatic trimm control and wheel brake control connected to the airbrake handle	Sept. 80 Sept. 80 Sept. 80	
4	Manual p.13a	Single piece canopy	Sept..80	
5	Maint.-m., diagr.7	Spring mounted landing gear	Sept. 80	
6	Manual p.22 Maint.-m. p.7	Waterballast system	Sept. 80 Sept. 80	
7	Manual p.3, 27, 28 Maint.-m. p.0, 7,7a,7b,10,13	Technichal Note No. 323/5	Febr. 85	
8	Flight-m. p.12, 17/12, 12a, 13a Maint.-m. diagr. 3a	Marking of canopy emergency release and ventilation (TN 323/6)	June1986	
9	Maint.-m. p.0, 7c	Airbrakes (TN 323/9)	Oct. 1996	
10	Flight-m. 11, 17, 27	Installation of an additional tow hook for aerotow (TN 323/10)	April 1998	

Diagram 2 is a rate of sink polar. The competition pilot should set up the DG-2oo with the CG near the aft limit. This enhances thermalling performance, but be prepared for some pitch sensitivity.

Of course the wing fuselage gap and the stabilizer bolt should be taped. The sailplane must be clean to obtain the performance shown in diagram 2. Dirty surfaces and / or rain reduce flight performance.

6.2 Maintenance

Before every assembly all fittings should be cleaned and lubricated. Every 3 month all the bearings and hinges should be cleaned and greased, see the greasing program sect.7 of the maintenance manual. Also the emergency release of the single piece canopy should be greased and checked. At the annual inspection all displacements, weights, adjustments and general condition must be checked. See maintenance manual.

6.3 Repair

Minor damage may be repaired by a licensed airframe mechanic. Advises see DG-200 maintenance manual. Don't do any repairs without considering the maintenance manual!

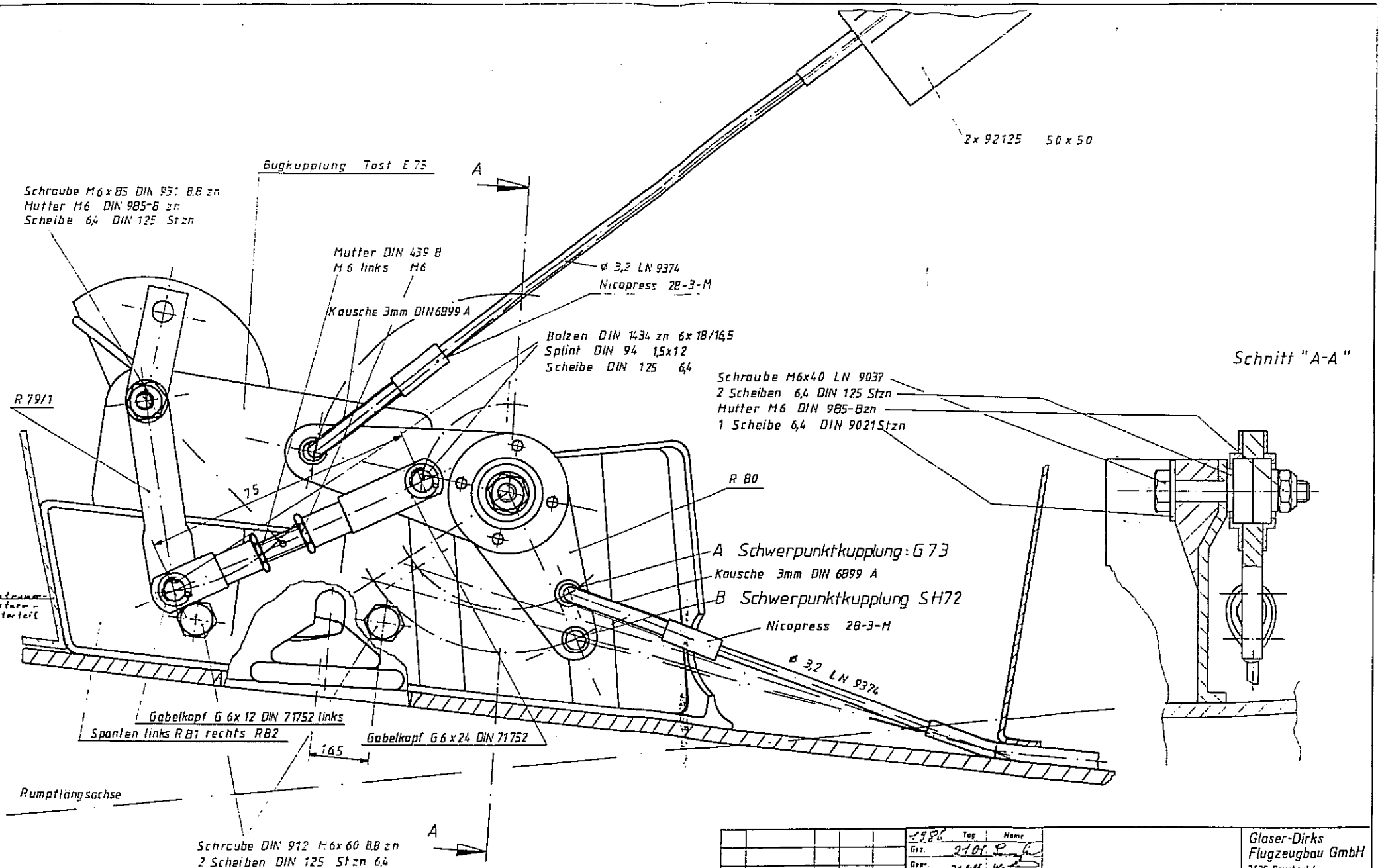
6.4 Tow release

C.G. release: To be serviced as detailed in "SH 72" and "S 72" manuals, issued Nov.1977, LBA-approved.

and if installed:
Operating Manual for Tow Releases
Series: E 85 Nose Tow Release
Date of Issue: March 1989

6.5 Maximum total service time and concerning inspections

see maintenance manual section 6.



	Tag	Name
Gez.	21.01.	
Gepr.	24.1.86	
Norm		

Maßstab 1:1

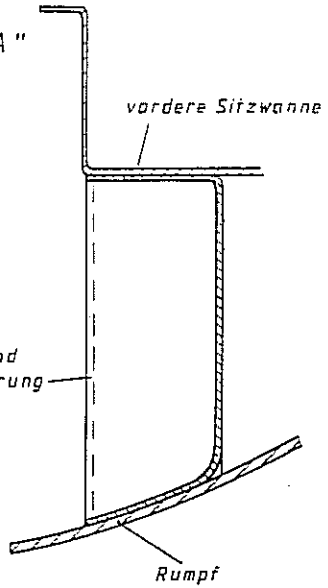
Maße ohne Toleranzangabe nach

Übersicht Schleppkupplungseinbau E 75

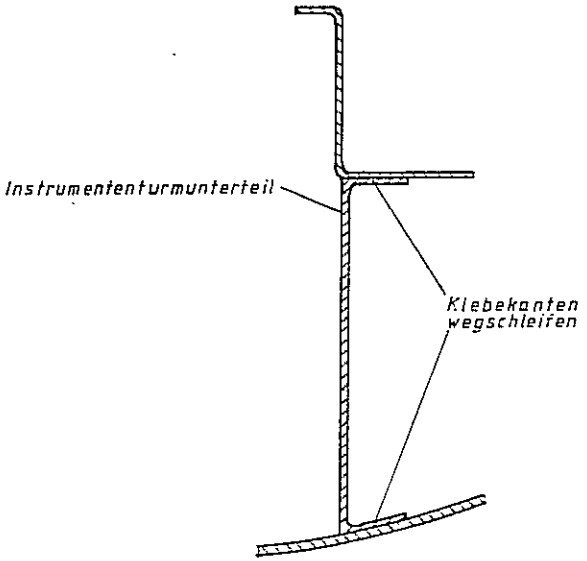
Glaser-Dirks Flugzeugbau GmbH
7520 Bruchsal 4
Im Schollengarten 19-20

R 83

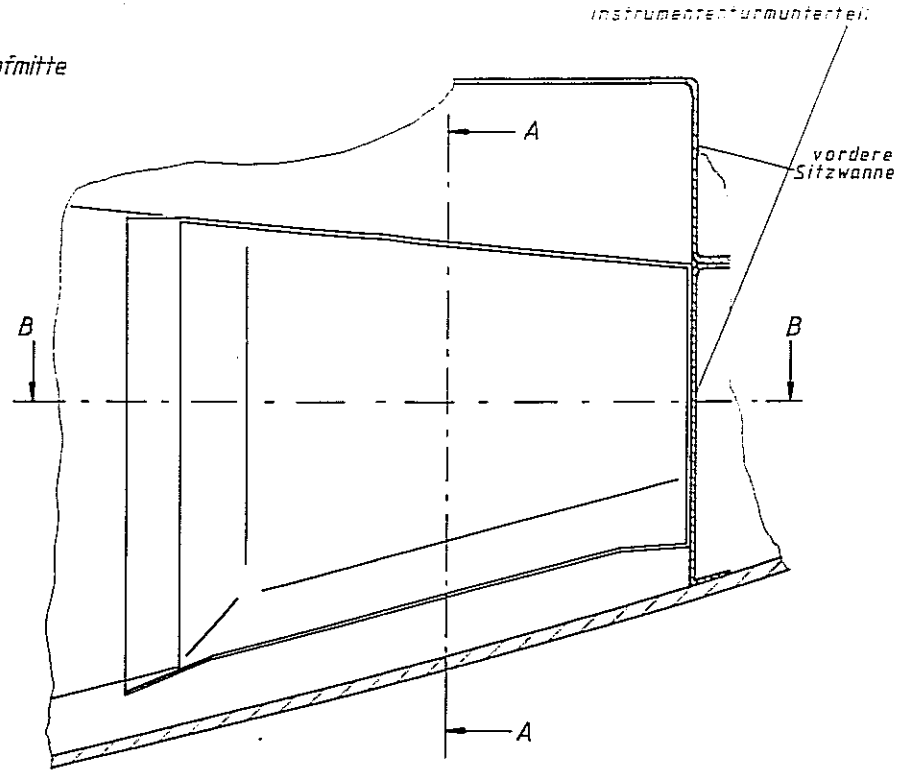
Schnitt "A-A"
von vorn



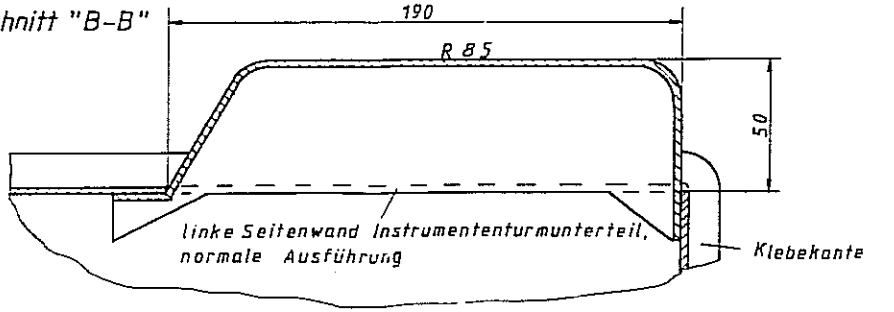
Schnitt "A-A" vor dem Einbau der GfK-Wand



Schnitt Rumpfmitte

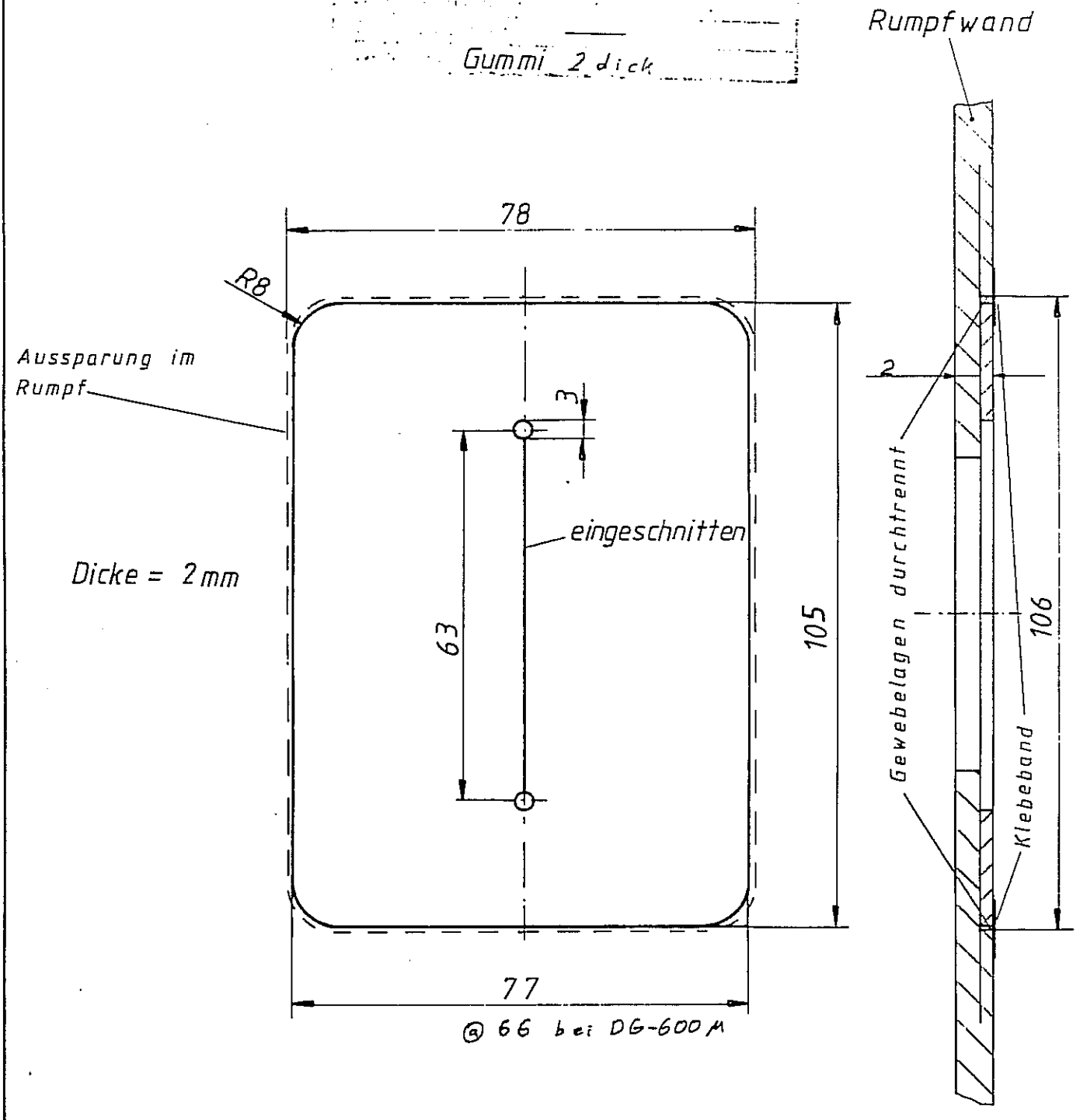


Schnitt "B-B"



1585	Tag	Name	Glaser-Dirks Flugzeugbau GmbH
Gez	24.10	Staun	7520 Bruchsal 4
Gepr.	28.10.	W. Dirks	Im Schollengarten 19-20
Norm			
Maßstab 1:2	Einbauzeichnung GfK-Wand		DG R 84
Maße ohne Toleranzang. nach			

Gummi 2 dick



a	66 statt 77 bei DG-600M	/	25.10.84	W. Dirks
Ausg.	Änderung	ÄM	Tag	Name

	Tag	Name
1384		
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Gepr.	"	W. Dirks
Norm.		

Maßstab 1:1

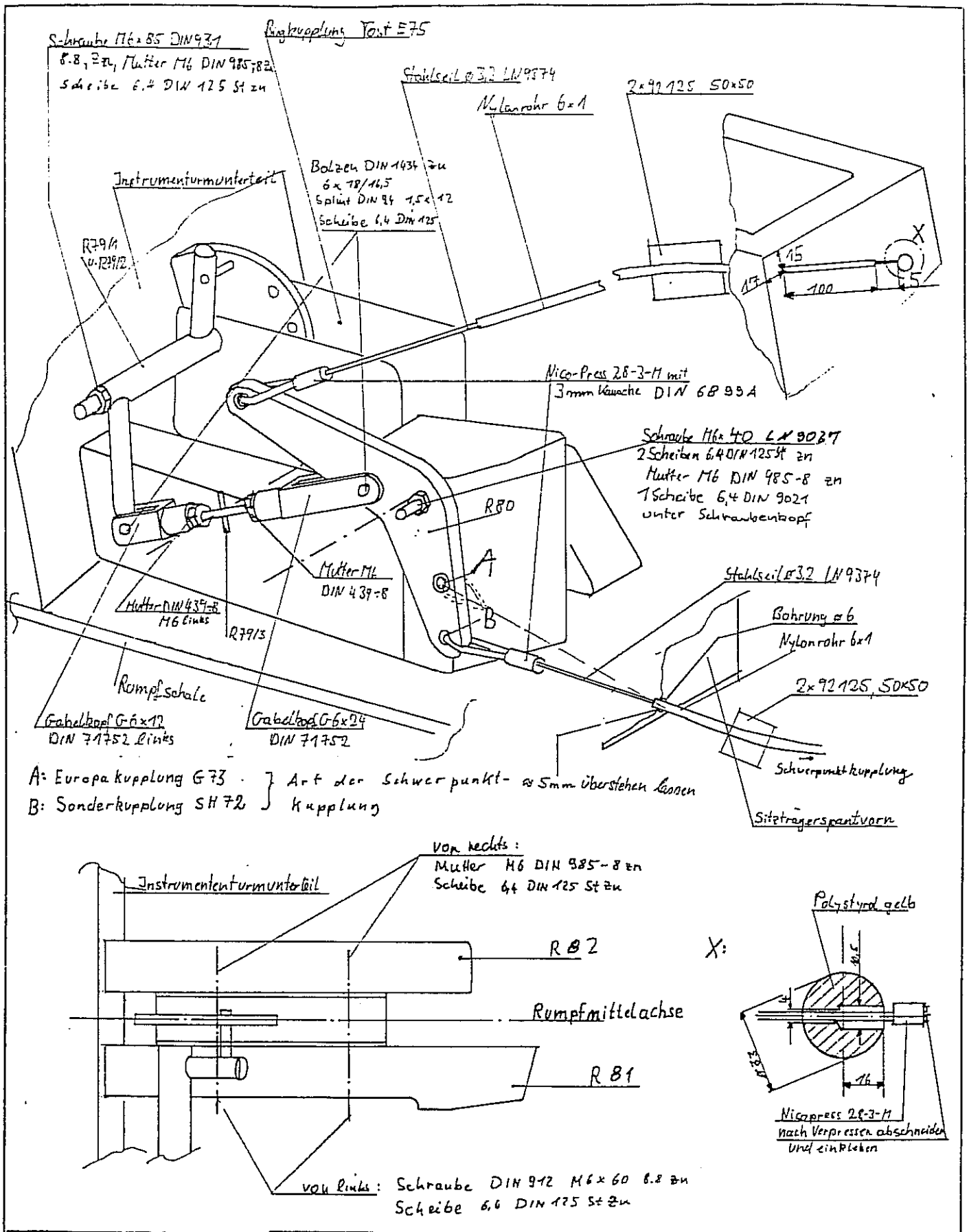
Maße ohne Toleranzang. nach:

Abdeckung für Ringmaul der Flugzeugschlepp-kupplung

Glaser-Dirks Flugzeugbau GmbH
7520 Bruchsal 4
Im Schollengarten 19-20

DG

R86



Ausg.	Änderung	AM	Tag	Name

1984	Tag	Name
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Gepr.	23.10.85	W. Dirks
Norm.		

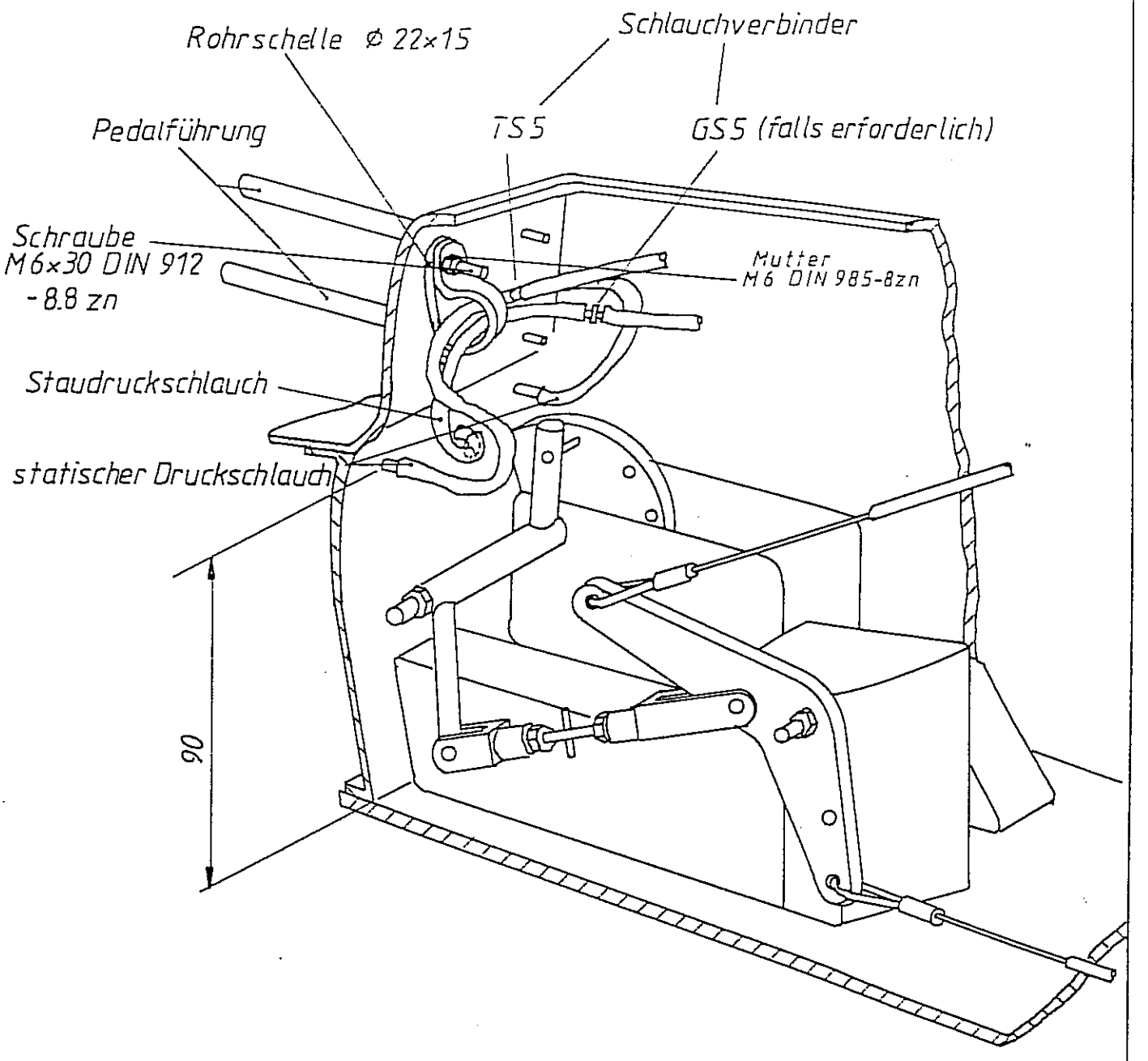
Maßstab: /

Maße ohne Toleranz-ang. nach: /

Einbauplan Zusätzliche Schleppkupplung für den Flugzeugschlepp

Glaser-Dirks Flugzeugbau GmbH
7520 Bruchsal 4
Im Schollengarten 19-20

EFK



Ausg.	Änderung	ÄM	Tag	Name

1995	Tag	Name
Gez.	24.10.	Staunus
Gepr.	28.10.	W. Dirks
Norm.		

Maßstab /

Maße ohne Toleranz-ang. nach /

Einbauplan Schläuche für statischen und Staudruck bei Einbau einer Bugkupplung

Glaser-Dirks
Flugzeugbau GmbH
7520 Bruchsal 4
Im Schollengarten 19-20

GG

Einbauplan
ED/1

Übersicht über Lufttüchtigkeitsanweisungen und Technische Mitteilungen

Muster: DG-200			Kennblatt- Nr.: 323	Werk-Nr.:	D-
LBA-LTA-Nr. Augabe-Datum	ausl. LTA- Nr. Ausgabe-Datum	TM-Nr. Ausgabe-Datum	betrifft Baureihen und Werknummern	Gegenstand	Termin
97-011 30.01.97		323/9 04.11.96	alle all	Flugsteurung: Bremsklappenlenksäule im Rumpf Bremsklappen im Flügel Controls: Airbrake torque tube in the fuselage Airbrakes in the wings	Maßnalume 1,2,5 vor dem nächsten Flug Maßnahme 3 bei Bedarf vor dem nächsten Flug Maßnahme 4 bis 31.03.97 Instruction 1,2,5 before the next flight Instruction 3 if necessary before the next flight Instr. 4 until 31.03.97
/		323/10 8.04.98	alle all	Einbau einer zusätzlichen Schleppkupplung für den Flugzeugschlepp Additional tow hook for aerotow	wahlweise on request