ASK 23

Maintenance Manual
Repair Manual

ALEXANDER SCHLEICHER GMBH & CO., SEGELFLUGZEUGBAU
D-6416 POPPENHAUSEN/WASSERKUPPE

MAINTENANCE MANUAL

FOR THE GLIDER MODEL

ASK 23

Data Sheet No. 353

Edition February 1985

Individual details of the glider ASK 23:

Serial no. : .....

Registration letters: .....

Owner : .....

.....

.....

Manufacturer:
Alexander Schleicher GmbH & Co.
Segelflugzeugbau
D-6416 Poppenhausen
Federal Republic of Germany

The translation has been done by best knowledge and judgement. In any case the original text in German language is authoritative.

I. GENERAL INFORMATION

I.1 INDEX OF CORRECTION

Cur. No.	Page concd.	Designation or decription	Acknowledgemet, Date, Signature
01	10, 48	Text extended in the German version of the manual; not applicable fo the English translation	Sept. 5, 1985 Jumtow
02	16, 37, 38, 39	TN-No. 5: A: Improvement of the wheel brake / B: Modification to the control stick	
03	2a, 6, 37, 39, 45, 62, M.I. A&B	TN-No. 6: Amendment of the Maintenance Manual	
04	Annex	TN-No. 10: Inspection of the main bulkhead II (L/G bulkhead)	
05	Repair Manual	Amended issue July 1994	
06	Annex	TN-No. 11: Product improvment - new trim spring mod.	
07	2a, 49, 50, 62, Annex	TN-No. 12: Admentment of the Maintenance Manual, Inspection program to Extend Service Life	

All ASK 23 Manuals can be obtained from:
Alexander Schleicher GmbH & Co., Segelflugzeugbau
Huhnrain 1, D-36163 Poppenhausen/Wasserkuppe,
Phone +49-6658-890, FAX +49-6658-8940

Sheet 1 of 1	**ASK 23 / ASK 23 B** Technical Note No. 12	**Alexander Schleicher** GmbH & Co. Segelflugzeugbau D - 36163 Poppenhausen

Subject: A) Amendment of the Maintenance Manual.
B) Inspection Program To Increase The Service Life.

Serial number applicability: ASK 23 and ASK 23B, Data Sheet No.L-353. All serial numbers.

Compliance: A) Prior to the next annual C. of A. inspection, but before or on Dec. 31, 1997, at the latest.
B) Prior to reaching a total service life of 3000 flight hours respectively

Reason: The results of fatigue tests on fiber composite wings and wing spars have demonstrated that a service life of 12000 hours can be reached for these structural components. As the fatigue tests did not cover the entire (fiber composite) glider, the service life of 12000 hours can be granted only if the airworthiness of each individual glider (beyond the obligatory annual C. of A. inspections) is demonstrated in a special multi-step inspection program for the purpose of increasing the service life.

Action: The Maintenance Manual pages 1, 2a, 49, 50, and 62 must be exchanged for new pages with the same page no., but with the revision entry & date "TN 12 / 16.06.97". The Maintenance Instructions and other papers that are stated on the amended page 62, including this Technical Note itself, must be inserted into the Appendix of the Maintenance Manual, Section V.6.
The instructions and notes given in the amended manual pages must be regarded!
The accomplishment of the change to the Manual must be documented on the respective Page "Index of Corrections" in the Maintenance Manual.

Material & drawings: The manual pages, Maintenance Instructions, Technical Notes, AD-Notes, as well as the "Inspection Program To Increase The Service Life" can be obtained from Messrs. SCHLEICHER (Tel +49-6658-890 or Fax +49-6658-8940), or from the SCHLEICHER agency in your country. You always need to state the glider type and serial number.

Notes: The "Inspection To Increase The Service Life" must only be accomplished by the manufacturer or by a technical aviation service station holding an appropriate license; the accomplishment must be certified by a licensed aviation inspector in the glider logbook and in the glider inspection certificates.
The amendment to the Manual can be done by the operator of the glider himself.

Poppenhausen, June 16, 1997

Alexander Schleicher
GmbH & Co.

i.A. Lutz-W. Jumtow

(Lutz-W. Jumtow)

The German original of this Technical Note has been approved by the LBA under the date of 22. Juli 1997 (signature: FENDT).

The translation into English has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

Cur. No.	Page concd.	Designation or description	Acknowledgement, Date, Signature

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I.2. CONTENTS

I.3. SPECIFICATION

Wings

Wing section FX 61-168 and FX 60-126 at the wingtip.

Wingspan:	15,00 m	(49,21 ft)
Wing area:	12,90 m^2	(138,85 sqft)
Wing aspect ratio:	17,44	
Dihedral:	2,67° (top surface of spar)	
Sweep angle (t/3-line):	0°	

Fuselage

Fuselage length:	7,05 m	(23,13 ft)
Height at fin:	1,37 m	(4,50 ft)
Cockpit width:	0,65 m	(2,13 ft)
Cockpit height:	0,92 m	(3,02 ft)

Vertical tailplane

Height above top surface of fuselage:	1,05 m	(3,45 ft)
Area:	0,95 m^2	(10,23 sqft)
Section:	Wortmann FX 71-L-150/30	
Section thickness:	14 %	

Rudder

Rudder chord ratio:	32 %	
Area:	0,35 m^2	(3,77 sqft)

Horizontal tailplane

Span:	2,60 m	(8,53 ft)
Area:	1,38 m^2	(14,85 sqft)
Aspect ratio:	1,32	
Section:	Wortmann FX 71-L-150/30	
Section thickness:	15 %	

Elevator

Area:	0,41 m^2	(4,41 sqft)
Elevator chord ratio:	30 %	

Airbrakes

Length:	1,2 m	(3,94 ft)
Area (both):	0,31 m^2	(3,34 sqft)
Height:	0,15 m	(0,49 ft)

Masses

Empty mass:	approx.	240 kg	(529,2 lbs)
Useful load:	max.	140 kg	(308,7 lbs)
In the pilot seat:	max.	110 kg	(242,5 lbs)
Mass of non-lifting structural parts:	max.	253 kg	(557,9 lbs)
Max. flight mass:		380 kg	(837,9 lbs)
Wing loading:		24 ÷ 29,46 kg/m^2	(4,92 ÷ 6,03 lb/sqft)

II. DESCRIPTION OF SYSTEMS

II.1. THE ASK 23 GLIDER

Single-seat glider, higher midwing, with T-tailplane. The dive brakes feature resilient sealing bands, and extend from the top surface of the wings only.

II.1.1 Wings

Two-part wing with FRP-rigid foam-sandwich surface. The I-spar consists of fiberglass caps with FRP-hard foam webs. The wings are attached to the fuselage by means of a tongue and fork joint and two cylindrical main pins.

II.1.2 Fuselage

The fuselage is a fiberglass sandwich structure with honeycomb as layer of support.

II.1.3 Tail surfaces and control surfaces

The fixed portion (stabilizer) of the T-tailplane is a sandwich structure with Rohazell as supporting material. Elevator and rudder are a FRP shell construction with Rohazell as supporting material. The vertical fin is a sandwich structure like the fuselage.

II.2. CONTROL SYSTEMS

All control surfaces are actuated by means of pushrods, with the exception of the rudder. Some of the bellcranks and the short pushrods are of welded steel construction. The long pushrods are of aluminium tube, with connecting elements rivetted into them. The remaining bellcranks are machined from aluminium sheet material. All pushrods are supported in roller bearings or longitudinal ball-race guides. The aluminium pushrods are resistant to corrosion and are, therefore, not surface-treated.

II.2.1 Elevator control system

The control column is seated on a universal joint. A short pushrod runs from the front side of the column tube, driving a 180° dural bellcrank. From the long 180° crank a short pushrod runs the length of the right cockpit wall. A long aluminium pushrod which is linked to this short pushrod, runs to a 90° bellcrank in the fin.

From this bellcrank a vertical plastic pushrod runs via a parallelogram guide through the fin to the automatic connecting joint of the elevator.

The pushrod is made from plastic in order to shield the aerial from interferences.

II.2.2 Elevator trim system

The trim system uses a spring. The trim is actuated by a hand lever on the left cockpit wall. The friction is adjusted by means of a knurled head screw.

The wire spring (Ø 4,5 mm) is clamped into the elevator kinematik by means of a nylon bar.

II.2.3 Aileron control system

The aileron control linkage starts at the universal joint at the bottom end of the control column with a short pushrod driving a 90° dural bellcrank. From the outer end of this crank (long moment arm) a two-part pushrod at the right cockpit wall runs back to a 80° crank at the rear main bulkhead.
From this crank a pushrod leads diagonally to the differential crank. When the aircraft is rigged, the pushrods from the wings are connected to this differential crank by means of Hotellier-type ball-joints.
The aileron is actuated at its inner side. From there a short steel tube pushrod runs to a 90° dural crank which drives via a short steel and a long aluminium pushrod another reinforced steel tube pushrod. At this steel rod is the disconnect point with one Hotellier-type joint each.

II.2.4 Rudder control system

The rudder is operated by means of cables (Ø 3,2 mm = 0,126 in; LN 9374). The cables are anchored to a perforated plate which is attached on each side to a cross tube with U-type fitting at the pedal guide tube. This plate provides a means of correcting minor inaccuracies in cable length, and of setting the pedal rake angle.
From this perforated plate the control cables run through the "S"-shaped pedal guides, and from the top ends of the guides into nylon tubes which guide the cables into the fin. At that point the cables are attached directly to the lower rudder fitting by a pin locked with a split-pin.
The cables are held taut on the rudder pedals by means of springs.
The rudder limit stops are located on the lower rudder fitting in the fin.

II.2.5 Airbrake control system

From the operating grip on the left fuselage side two pushrods run to a rocker, a welded torque tube mechanism; pushrods (one each for the left and right airbrake) run from either side of this mechanism and drive a 90° bellcrank each which is pivotted on a plate at the subfloor at the wingroot level. The connecting heads for the l'Hôtellier-type connectors are located on these bellcranks. When the wings are fitted, the airbrake pushrods (aluminium tube) from the wings are connected at this point. These pushrods run via a steel pushrod to the toggle levers. The levers lock at one end-point and hold the airbrakes closed. From the toggle lever a rod operates the airbrake parallelogram which consists of two rockers, a linking rod and the airbrake itself.

II.3. LANDING GEAR

II.3.1 Main landing gear

The main landing gear consists of a fixed 5.00-5 wheel with a Tost internal expanding brake.
Tire pressure: 3,0 bar (42,66 psi).

Nose wheel:

The nose wheel is a fixed 260 x 85 wheel. Tire pressure: 2,0 bar (28,44 psi).

II.3.2 Tailskid / tailwheel

The aircraft is usually supplied with a tailskid of integral foam fitted with a metal rubbing plate.

Tailwheel:

As an option the skid can be replaced by a fixed tailwheel (210 x 65; tire pressure 2,5 bar = 35,6 psi) or by an integral-foam skid fitted with a polyamid roller.

II.3.3 Braking system

The mechanical internal expanding brake of the main landing gear is connected to the airbrake control system. When extending the airbrakes, the wheel brake is operated in the last third of the movement of the airbrakes.
From the airbrakes rocker lever in the fuselage a cable line runs via a bellcrank to the brake lever at the brake anchor plate.

II.4. COCKPIT AND EQUIPMENT

The Flight Manual describes the position of the controls and operating levers, and their effects (see Chapter IV.2. of this manual).
An illustration of the cockpit is given in the appendix (V.4.; Fig.5.4.1 on page 60).

Radio installation

The instrument panel is designed to accept a radio unit. Use the fitting and wires supplied with the radio set to install the unit. Radio equipment made by various manufacturers may be fitted (please refer to the "Equipment Inventory").
When considering the location of the instruments in the panel, bear in mind that the radio unit must be easily visible, and within reach of the hand. Nevertheless, the flight monitoring instruments have priority as far as good visibility is concerned.
The Becker radio set type 2008 can be fitted either horizontally or vertically.

The on-board loudspeaker can be fitted on the left side of the front main bulkhead.

The boom microphone is fitted on the right cockpit wall.

Baggage compartment

The compartment in front of both spar stubs in the fuselage is suitable in order to store the baggage.

As an option the installation of mountings for elastic cords, barograph, batteries, etc. is possible in this compartment. The mountings and supports are available from Alexander Schleicher GmbH & Co.

Safety harness

The aircraft is supplied with a four-point safety harness and an adjustable backrest.

Instrument panel

If the compass cannot be compensated in the instrument panel, it can be fitted above the control column on the canopy perspex.

Instruments which themselves weigh more than 1000 g (2,2 lbs), should be supported against the instrument panel or the canopy hinge with an additional strut, as well as be mounted to the panel with the four instrument screws.

We strongly recommend that you use only the FRP panels supplied by Schleicher (approx. 1,5 mm = 0,6 in thick), as stronger panels can lead to severe injuries in the case of a crash landing.

An equipment inventory showing tested and permissible instruments of the 'minimum equipment' is included in the Appendix (Chapter V.1.).

Oxygen installation

The oxygen bottle is fitted on the right next to the main landing gear. On the right side below the subfloor there is a provision for taking up the bottle. A hole is cut in the forward main bulkhead to allow the bottle to be fitted. This hole can be sealed with the corresponding cover after the oxygen system has been removed, to prevent foreign objects gaining access to the control system.

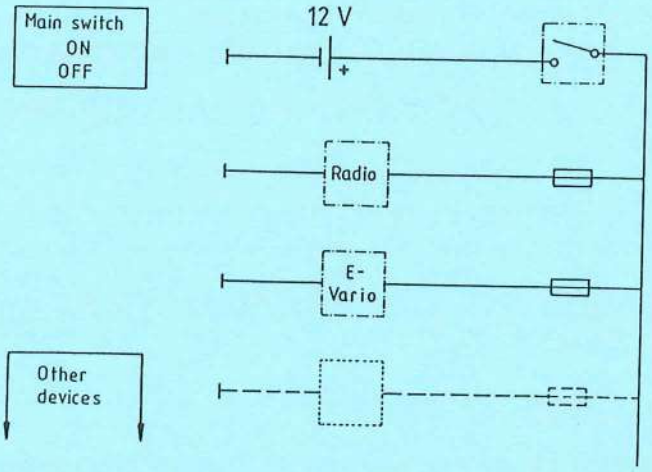
The oxygen bottle diameter must be between 100 and 103 mm (4 in). The cylindrical portion of the bottle must be at least 560 mm long (22,05 in) so that it is supported in its both fittings; this precludes the danger of the bottle jamming the control system. If the bottle is too short, it can be extended with tight-fitting tubes made from dural sheet 0,5 mm (0,02 in) thick.

Support fittings for the oxygen bottle are available from Schleicher.

Suitable attachment points for the individual parts of the oxygen system must be inquired from the manufacturer of the respective oxygen system.

II.5. ELECTRICAL SYSTEM

The wiring diagram provides details of the electrical system.



Fuse each unit according to manufacturer's data !

One battery is used as power supply.

Battery type: Dry-fit lead-acid accumulator or nickel-cadmium accu of about 5 Ah capacity.

"Each electrical unit must be provided with a device to protect it against excess current. No protective device may be used to protect more than one circuit which is of fundamental importance to flight safety". (JAR 22.1365).

II.6. PRIMARY AND SECONDARY STRUCTURES

The following components constitute the primary structures:

- Wing spars and root ribs;
- Wing skins;
- Tail boom from wing root area to fin;
- Fin and horizontal stabilizer;
- All fittings and control linkage components.

The following components are regarded as secondary structure:

- Tail surfaces and control surfaces;
- Fuselage in the cockpit region.

III. INSTRUCTIONS REGARDING MAINTENANCE AND MAINTENANCE PROCEDURES

III.1. GENERAL INFORMATION

The security and airworthiness of an aircraft depends to a great extent on the regular and thorough maintenance of all its components. Airworthiness of the ASK 23 can only be ensured, if the aircraft is maintained and operated in accordance with the manuals.

Maintenance work outside the prescribed intervals is for the most part restricted to cases of extreme operating conditions, as for example: extremes of climate, poor airfield conditions (outlandings), and poor storage conditions.

The instructions in the following chapter are applicable under normal circumstances.

III.1.1 Jacking points and ground transport

The aircraft has to be jacked up for the repeated bending frequency test, otherwise the suspension of the landing gear will falsify the results.

The jacking points for the bending oscillation tests are as follows:

1. Tailskid or tailwheel.
2. Fuselage front section on a trestle in the region of the control column bulkhead (behind the nose wheel), or instead by means of the fuselage dolly from the trailer.

Supports can be placed under the wings at the root rib position, and at about 2/3 of the wingspan. The supports should be cushioned or covered with foam rubber or similar material. When jacking up, take care to avoid the control surfaces. The fuselage is supported on suitable trestles in the cockpit region.

If the fuselage is to be stored inverted, a support should be placed under the canopy frame. Place a block of wood (about 15 cm in height; = 5,91 in) under the fin tip.

Take care not to damage the automatic elevator connection system !!

Before inverting the fuselage, remove the canopy and either fix the instrument binnacle in place, or fold it up as far as possible.

Ground transport

The wings can be carried by supporting them at the spar stubs, the root ribs and the wingtips.

III.2. DETERMINING THE CENTER OF GRAVITY

III.2.1 Notes on weighing and C.G.

The in flight C.G. position has a great influence on the flying characteristics of the aircraft, and for this reason it is vital to keep within the prescribed limits (see Chapter II.8. in the Flight Manual).
If the C.G. is too far aft, the aircraft's stalling behaviour and spinning characteristics deteriorate dangerously, and the sensitivity of the elevator control is increased.
If the C.G. is too far forward, performance deteriorates and flying at maximum lift is no longer possible, especially for steeply-banked circling flight.

After repairs, after the fitting of additional equipment, after painting etc., a check should be carried out to establish that the empty mass C.G. remains within the permissible limits.
Datum point and datum line for weighing are as stated in Chapter II.7. of the Flight Manual (Limits of C.G. Positions in Flight).

III.2.2 Empty mass C.G. position

A diagram showing the permissible empty mass C.G. position range (Fig.3.2-1) is given on Page 28 of this Manual.
If these empty mass C.G. limits are observed, then you can be certain that the in flight C.G. (flight mass C.G.) will remain within the permissible limits, provided that the correct loading plan is observed.

III.2.3 Weighing report

After repairs, painting or alterations to the equipment (e.g. installation of new instruments), then the C.G. must be checked. For this procedure the aircraft is to be balanced in the following empty mass configuration:

1. Flight instruments installed; canopy closed.
2. Seat backrest and seat cushion in place.
3. Logbook and Flight Manual in the cockpit.
4. Battery installed.
5. Without the removeable trim weights in the fuselage nose, if the aircraft is equipped with this optional item (see also Flight Manual, Chapter II.9.).

A weighing report must be prepared (e.g. DAeC form for German registered gliders) which must be included in the Logbook;
also the following data are to be entered in Chapter II.8. of the Flight Manual:

1. Date of weighing
2. Empty mass C.G. position
3. Empty mass
4. Minimum } payload in pilot's seat incl. parachute
5. Maximum }

It is often sufficient to calculate the empty mass C.G. position, e.g. when instruments are changed. To do this, the following effective moment arms (measured from the Datum Point = BP = "Bezugspunkt"; negative value = in front of BP):

a. Instruments in the instrument panel:

x_i = -1040 mm (-40,95 in) in front of BP

b. Oxygen bottle (4 l):

x_{O_2} = +170 mm (6,69 in) behind BP

c. Trim weights fitted behind the rudder pedals:

x_T = -1160 mm (45,67 in) in front of BP

d. Baggage compartment load in baggage compartment:

x_G = +170 mm (6,69 in) behind BP

Safe values for pilot moment arms are calculated as follows,

for a pilot weighing 70 kg (154,35 lbs) including parachute: x_P = -455 mm (17,91 in) in front of BP

for a pilot weighing 110 kg (242,5 lbs) including parachute: x_P = -570 mm (-22,44 in) in front of BP.

(for each 10 kg = 22,05 lbs increase in pilot mass, the value moves aft by 4,6 mm = 0,18 in).

III.2.4 Determining the in flight C.G. position X_S

If, as described above, the empty mass C.G. position tolerances and the loading plan are observed, it is ensured that the in flight C.G. position will remain within the permissible tolerances.
Nevertheless, the in flight C.G. position is an important factor in assessing flight characteristics and performance.

The in flight mass C.G. position is calculated as follows:

$$X_S = \frac{X_L \cdot m_L + X_P \cdot m_P + X_G \cdot m_G + X_{O_2} \cdot m_{O_2}}{m_L + m_P + m_G + m_{O_2}}$$

where:

X_L [mm] is the empty mass C.G. position;

m_L [kg] is the empty mass;

X_P [mm] is the pilot moment arm;

m_P [kg] is the pilot mass including parachute;

X_G [mm] is the C.G. position of the baggage in the baggage compartment (see page 24!);

m_G [kg] is the mass of the baggage in the baggage compartment;

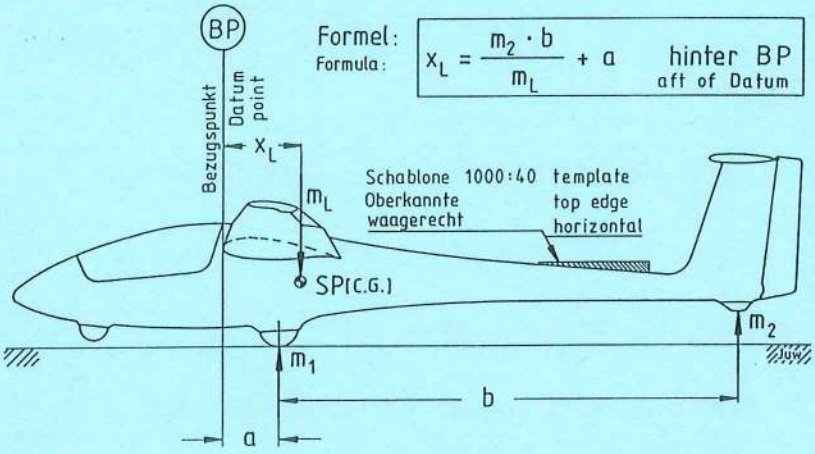
X_{O_2} [mm] is the C.G. position of the O_2 bottle in its standard location;

m_{O_2} [kg] is the mass of the O_2 bottle.

The permissible limits for the flight mass C.G. range extend from 285 mm to 455 mm (11,22 - 17,92 in) aft of the Datum Point "BP".

III.2.5 Example of calculating the C.G. position

1. Example of weighing to determine the empty mass C.G.:



Formel: / Formula:

$$X_L = \frac{m_2 \cdot b}{m_L} + a \qquad \text{hinter BP / aft of Datum}$$

m_L = 240 kg (529,2 lbs), found by weighing all components

m_2 = 10,9 kg (24,04 lbs)
b = 4126 mm (162,44 in)
a = 531 mm (20,91 in)

} Measured by weighing, with the aircraft in the correct attitude

$$X_L = \frac{10,9 \quad 4126}{240} + 531 = \underline{718 \text{ mm}} \text{ (28,27 in) aft of Datum Point "BP".}$$

2. Example of an alteration to the empty mass and to the empty mass C.G. position:

In an ASK 23 with weighing values m_L = 240 kg (529,2 lbs) and X_L = 718 mm (28,27 in), a pneumatic variometer = m_{i1} = 0,3 kg (0,66 lbs) is exchanged for an electric variometer = m_{i2} = 0,8 kg (1,76 lbs); the capa-

city flasks are not changed. In addition, an O_2 system is installed, m_{O_2} = 5,5 kg (12,13 lbs).

How do the figures alter for the ASK 23 ?
Before the alterations, the mass of the non-lifting structural parts is m_{ntr} = 113 kg (249,17 lbs); as the maximum permissible value for non-lifting structural parts is 253 kg (557,87 lbs), a load of maximum 110 kg (242,5 lbs) was permitted in the pilot's seat.
The alterations to the equipment raise the mass of the non-lifting structural parts by $m_{O_2} + m_{i2} - m_{i1}$ = 5,5 + 0,8 - 0,3 = 6,0 kg (13,23 lbs)

to: m_{ntr} = 119 kg (262,40 lbs).

The new maximum payload in the seat now amounts to: 253 - 119 = 134 kg (295,47 lbs).

So this means that the maximum load of 110 kg (242,5 lbs) in the pilot's seat is still permitted.

The C.G. position alters as follows:

$$X_{Lnew} = \frac{(m_L \cdot X_L)old + (m_{i2} - m_{i1}) \cdot X_i + m_{O_2} \cdot X_{O_2}}{m_{Lnew}}$$

$$m_{Lnew} = m_{Lold} + m_{i2} - m_{i1} + m_{O_2}$$

$$= 240 + 0,8 - 0,3 + 5,5 = 246 \text{ kg (542,43 lbs).}$$

$$X_{Lnew} = \frac{240 \cdot 718 - (0,8 - 0,3) \cdot 1040 + 5,5 \cdot 170}{246}$$

$$= 702,2 \quad \approx 702 \text{ mm (27,64 in).}$$

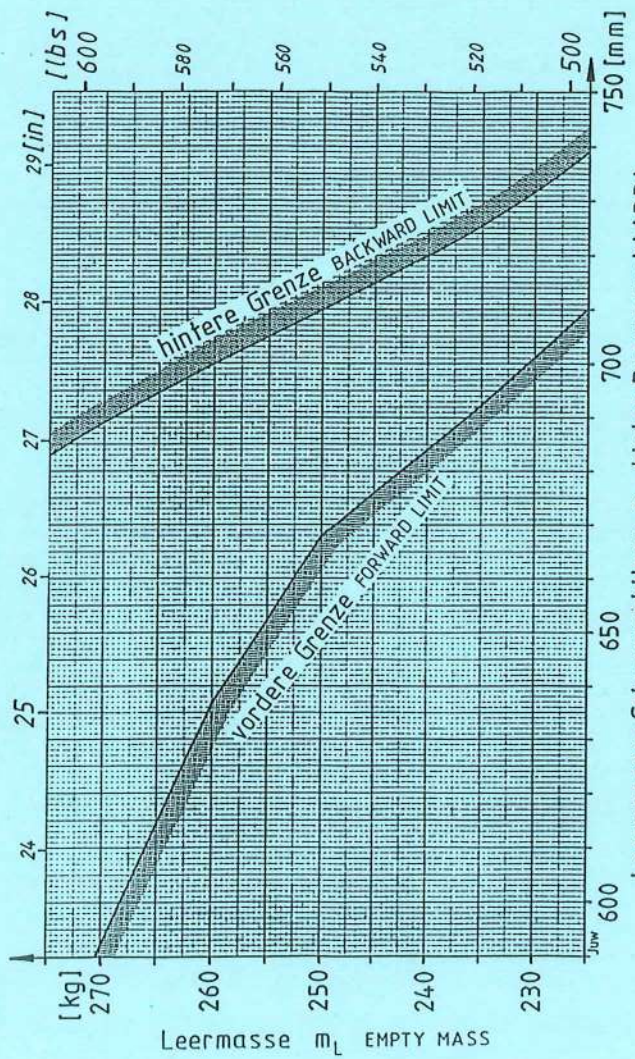


Fig. 3.2-1

DATE:	AUTHOR:	CORRECTION:	
01.02.85	Jumtow		

Reading off the graph 3.2-1, you will see that the empty mass C.G. position is within the permissible range. The new values must now be entered in Chapter II.8. of the Flight Manual to update the current state of the aircraft, by a person licensed to do this (e.g. building inspector of any licensed technical aviation station).

3. Example of calculating the flight mass C.G. position:

An ASK 23 with an empty mass of m_L = 246 kg (542,43 lbs) and an empty mass C.G. position of X_L = 702 mm 27,64 in), is to be flown by a pilot weighing 70 kg (154,35 lbs) including parachute. He takes 2 kg (4,41 lbs) of rations with him in the cockpit, plus 4 kg (8,82 lbs) of baggage (e.g. barograph, retaining straps, canopy cover, rainwear etc.) in the baggage compartment. The backrest is in its most forward setting of X_P = -570 mm (-22,44 in).

What will the in flight C.G. position be ?
In this case the cockpit payload will be: m_P = 70 kg (pilot + parachute) + 2 kg (rations) = 72 kg (158,76 lbs).

Following the formula given in Chapter III.2.4, the calculation runs as follows:

$$X_S = \frac{X_L \cdot m_L + X_P \cdot m_P + X_G \cdot m_G}{m_L + m_P + m_G}$$

$$X_S = \frac{702 \cdot 246 + (-570 \cdot 72) + 170 \cdot 4}{246 + 72 + 4}$$

$$= \underline{\underline{411 \text{ mm}}} \ (16{,}18 \text{ in}).$$

The in flight C.G. is now in the rear third of the permissible range, which is a very favorable position.

III.3. TABLE OF TIGHTENING TORQUES

The table below shows the maximum permissible tightening torques of screw fasteners for standard items.

Thread	daNm (mkp)	/ (ftlbs)
M4	0,18	1,3
M5	0,36	2,6
M6	0,64	4,6
M8	1,60	11,6
M10	3,20	23,1
M12	5,70	41,2
M14	9,20	66,5

III.4. RIGGING ANGLES AND CONTROL SURFACE DEFLECTIONS

Wing incidence angle
- Horizontal tailplane chord +2,0°
- Fuselage tail boom axis +2,0°

Horizontal tail-plane incidence angle
- Wing chord -2,0°
- Fuselage tailboom axis 0°

III.4.1 Maximum permissible control surface play

The maximum permissible play can also be measured at the measuring points (= MPE) at which the control surface deflections are measured. To do this, lock the controls in the cockpit so that they cannot move.

	MPE (mm / in)		Permissible play (mm / in)	
Rudder	330	12,99	5,0	0,20
Elevator	200	7,87	4,0	0,16
Aileron	225	8,86	4,0	0,16

DATE: 01.02.85 | AUTHOR: Jumtow | CORRECTION:

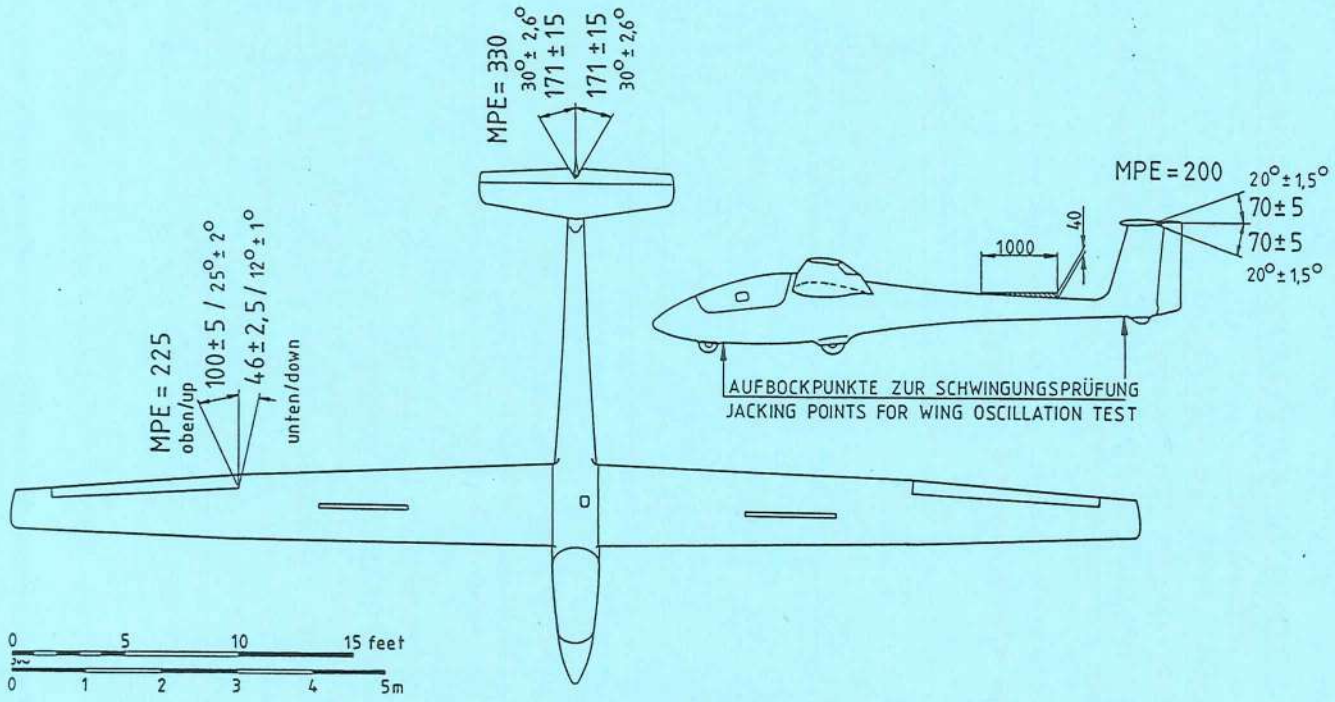


Fig. 3.4 - 1 Ruderausschläge
CONTROL SURFACE MOVEMENTS

DIMENSIONS IN m.m.
MPE (MESSPUNKTENTFERNUNG ZUR DREHACHSE) =
DISTANCE FROM MEASURING POINT TO PIVOT AXIS

III.5. CONTROL SURFACE MASSES AND TAILHEAVY MASS BALANCE MOMENTS

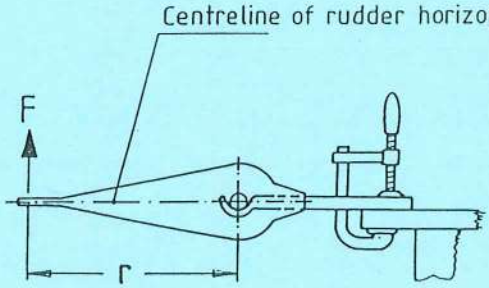
If control surfaces are repaired or repainted, it is essential to check that the mass and tailheavy moment remain within the permissible limits. If the limits are exceeded, contact SCHLEICHER direct.

The permissible control surface masses and tailheavy mass balance moments are stated below:

	Mass (kg)	Moment (daNcm)
Rudder	1,72 ÷ 2,18	12,45 ÷ 15,90
Elevator	2,64 ÷ 3,36	9,42 ÷ 11,98
Aileron	2,49 ÷ 3,17	13,62 ÷ 17,34

	Mass (lbs)	Moment (inlbs)
Rudder	3,79 ÷ 4,81	10,81 ÷ 13,80
Elevator	5,82 ÷ 7,41	8,18 ÷ 10,40
Aileron	5,49 ÷ 6,99	11,82 ÷ 15,05

When weighing these items, make sure that the pivots are as friction-free as possible. When removed from the aircraft, the longer control surfaces such as the ailerons may flex either forward or back, according to temperature, when viewed from the leading edge. This will falsify results considerably when examining the moments. The suspension points of these components must then be chosen in such a way that this influence is minimized. If a control surface, for example, flexes forwards, then it is best to choose suspension points far enough outboard to ensure that the spacing to the mass balance in the control surface leading edge is roughly compensated. (See also Figs. 3.5-1 and 3.5-2.)



$M = F \cdot r \; [N \cdot cm]$
[in.-lbs.]

Measurement of F using letter balance or spring balance

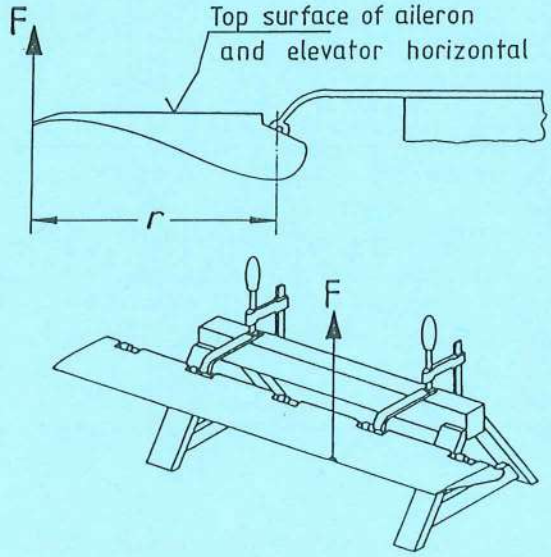
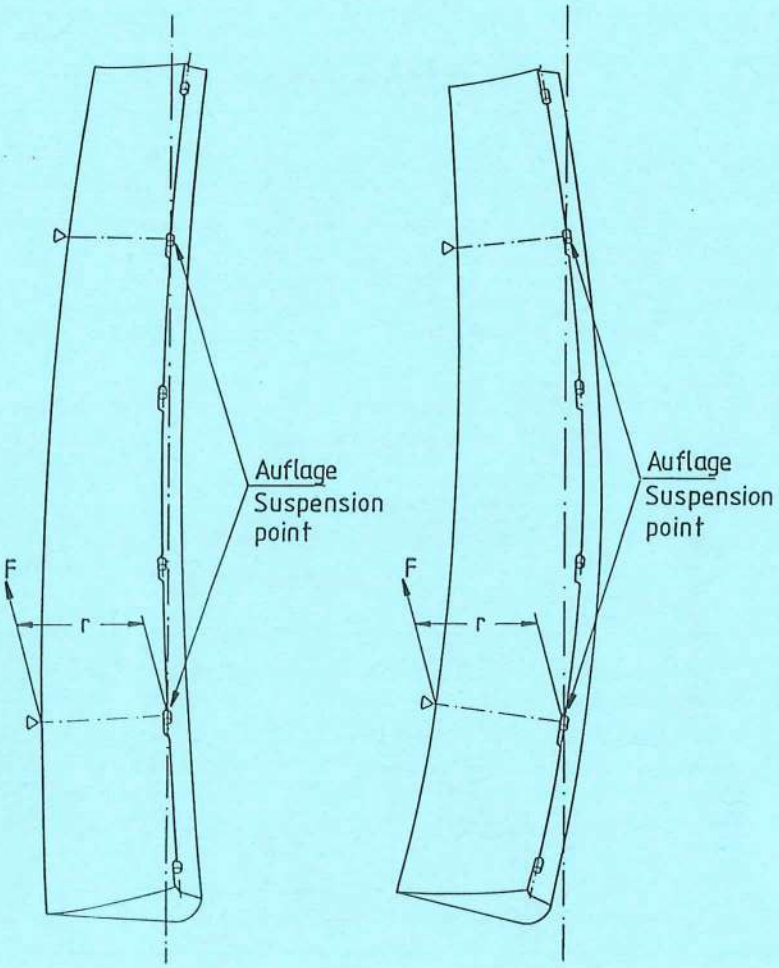


Fig. 3.5-1 Measurement of tailheavy mass-balance moments



By sighting along the pivot axes, determine which two bearings are suitable as support points (flexure shown greatly exaggerated in the sketch)

Fig. 3.5-2

DATE:	AUTHOR:	CORRECTION:	
01.02.85	Jumtow		

III.6. LANDING GEAR

III.6.1 Main landing gear

Maintenance of the main landing gear is limited to a visual check of tire and rim. If severely soiled, then the landing gear should immediately be cleaned.

III.6.2 Tailskid / tailwheel

The tailskid wear plate should be renewed by welding on extra steel plate material, or by replacing with a new one, before wear becomes severe. The tailskid plate must be removed for welding work, and the welding seams must be rounded off. (See Fig. 3.6-1).

Important: Do not leave grooves or humps on which a tow cable could catch !

The rubber tailskid is designed to tear away from the fuselage under severe sideloads. It can be glued back in place or repaired using contact glue (Pattex). It is important to apply adhesive tape over the glued joint between rubber and fuselage to prevent the rubber peeling off and long grass getting caught in the joint.

It is not permissible to fit a tailskid made of harder rubber compound.

If a tailwheel is fitted, then the tire and rim should be checked visually.

III.6.3 Tires

The tire pressure must be checked fairly often. If tire pressure is low, suspension movement may be excessive which can lead to damage.

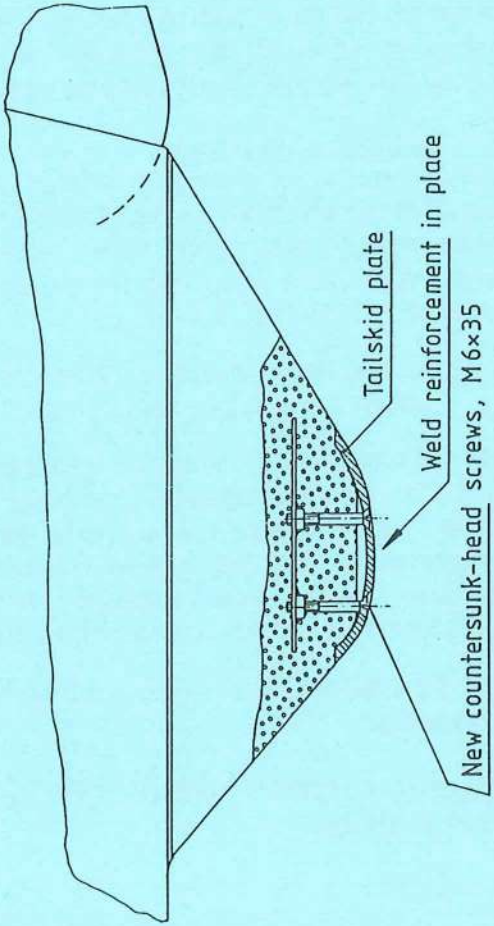

Tailskid plate
Weld reinforcement in place
New countersunk-head screws, M6×35

Fig. 3.6-1

When the contact surface of the tire is worn out, the tire must be replaced. The tire must be protected from all kinds of grease and oil, as these will attack and damage the rubber.

Sizes:

Main Wheel: Tire with Inner Tube 5.00-5; 6-ply rating.
Nose Wheel: Tire with Inner Tube 260 x 85.
Tail Wheel: Tire with Inner Tube 210 x 65.

Tire Pressures:

Main Wheel: 3.0 bar (= 42,66 psi)
Nose Wheel: 2.0 bar (= 28,44 psi)
Tail Wheel: 2.5 bar (= 35,60 psi): IF INSTALLED.

III.6.4 Wheel Braking System

If the action of the wheel brake is found to be poor or altogether ineffective, this may be due to the following causes:

a. Brake linings may be worn and needing re-adjusting.

b. When actuating the airbrakes, the airbrakes lever is pulled back to its stop at the seat pan reaer end without giving sufficient wheel brake action.

c. Brake linings may be completely worn and needing renewal.

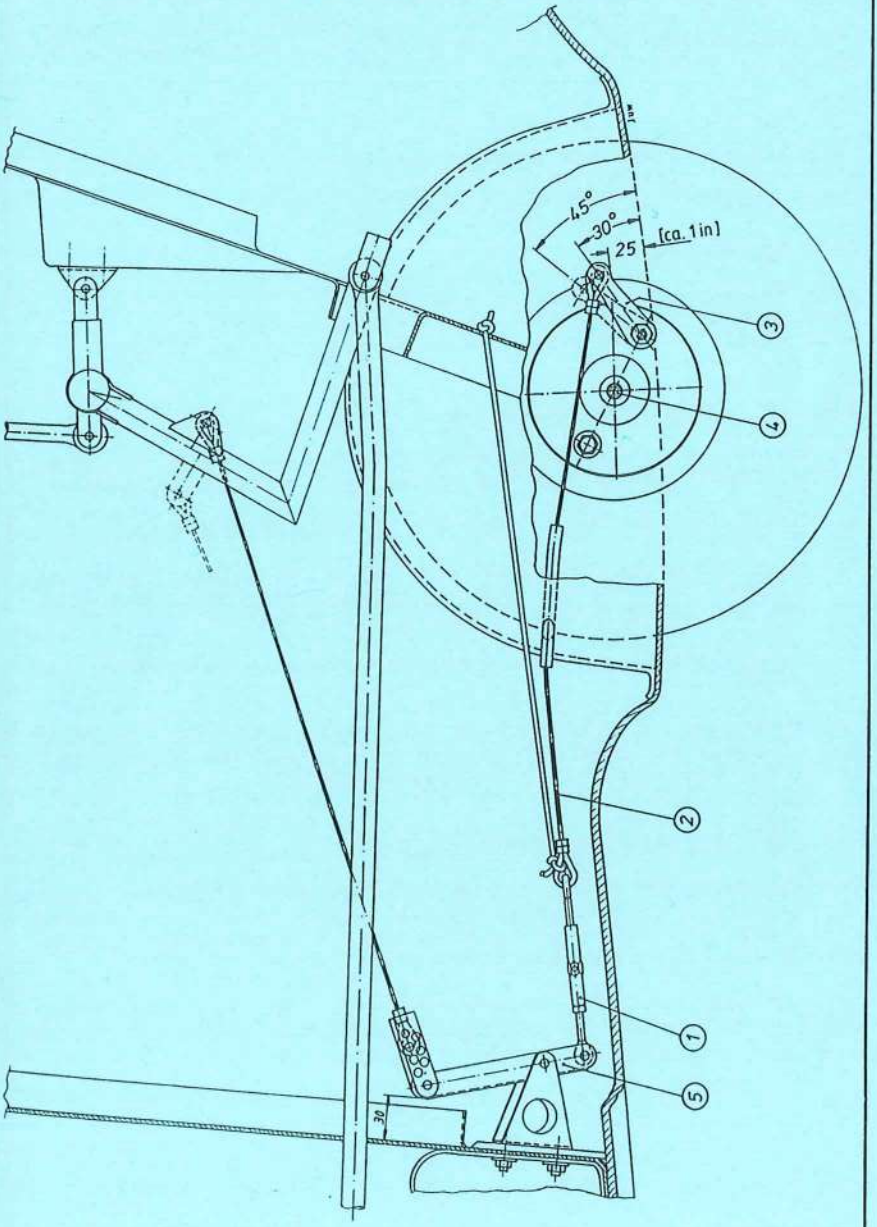
To re-adjust the wheel brake the cover of the main bulkhead and the seat pan must be removed. To renew the brake linings, the main wheel must be disassembled.

III.6.5 Re-adjusting the wheel brake

Before the wheel brake can be re-adjusted, the correct basic adjustment of the airbrake control system must be checked (see III.10). This must be done with the wheel brake disconnected from the airbrake control circuit.

By screwing in the adjustment bolt at the deflecting pulley ① , the brake cable line ② can be tightened up (see Fig. 3.6-2).

Fig. 3.6-2 RE-ADJUSTING THE WHEEL BRAKE



DATE:	AUTHOR:	CORRECTION:	
01.02.85	Jumtow		TN no. 5 dated Sept.6, 1988

The wheel brake must be adjusted such that : with the air-brake lever pulled full back there is still at least 2 cm travel left between airbrake lever and seatpan gate rear end. In this position the wheel brake must already be fully blocked and the brake crank ③ at the brake anchor plate must have an angle of about 45° towards the wheel box lower edge (see Fig.3.6-2).
The (unbraked) correct basic adjustment of the brake crank ③ towards the wheel box lower edge must be approx. 30°.

III.6.6 Replacing the brake linings

Remove the wheel axle -SW 17- ④. Then carefully pull the wheel out of the wheel box and undo the brake cable line ② from the brake crank ③. Now take the brake anchor plate out of the rim.
If the brake lining thickness is less than 1,5 mm at one point (0,06 in), the brake linings must be replaced.
Clean brake drum and brake anchor plate thoroughly from all brake dust.

Inside the brake no grease must be applied !!

When fitting the new brake linings take care that both release springs are suspended into the brake linings in the following way: the weaker release spring into the brake cam and the strong release spring into the anchor screw.
Now refit all parts in the reverse sequence and adjust the brake as described in Chapter III.6.5; observe also the "Technical Instructions for all TOST braked wheels" stating the prescribed torque moments.

Carry out a check of the brake for correct operation and effectiveness !!

III.7. LUBRICATING PLAN

Refer to Fig. 3.7-1 !

Ballraces:

The grooved ballraces used are grease-filled and encapsuled; further greasing is not required.
The 14 C 6 swivelling ball bearings in the pushrods and the dural bellcranks are pre-greased and fitted with felt seals; they also require no maintenance over a long period.
The same applies for the ballraces in the pushrod guides.

The canopy latches, especially the emergency jettisoning mechanism at the front, must be kept well greased.

Soiled tow releases are best cleaned with compressed air, a paintbrush, and by moving the mechanism; they can then be lubricated again with aerosol oil or similar.

Greases and oils based on MoS_2 are not suitable for bearings incorporating brass, bronze or copper parts; but they are very good for steel/steel bearings and roller bearings.

III.8. PRESSURE LINES AND CONNECTIONS FOR THE INSTRUMENTATION

Refer to Fig. 3.8-1 :

1. Altimeter
2. Airspeed indicator
3. Variometer
4. Total energy venturi tube
5. Static pressure vents on the fuselage for A.S.I.

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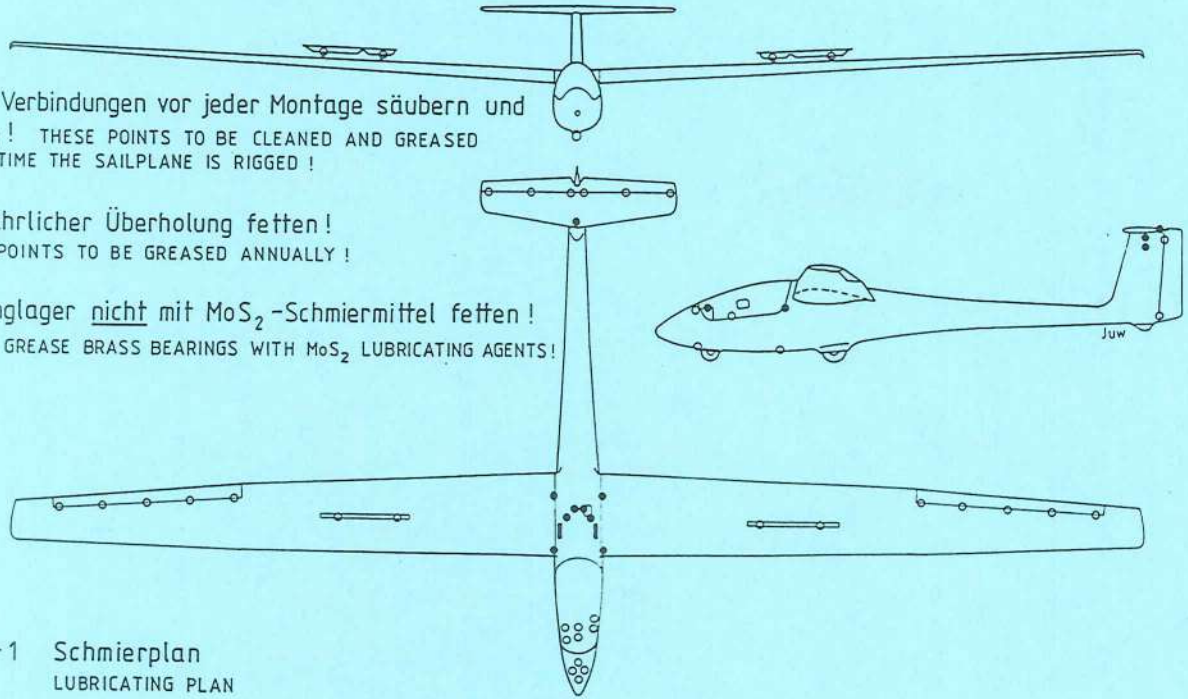


Diese Verbindungen vor jeder Montage säubern und fetten! THESE POINTS TO BE CLEANED AND GREASED EVERY TIME THE SAILPLANE IS RIGGED!

Bei jährlicher Überholung fetten!
THESE POINTS TO BE GREASED ANNUALLY!

Messinglager nicht mit MoS_2-Schmiermittel fetten!
DO NOT GREASE BRASS BEARINGS WITH MoS_2 LUBRICATING AGENTS!

Fig. 3.7.-1 Schmierplan
LUBRICATING PLAN

DATE: 01.02.85
AUTHOR: Jumtow
CORRECTION:

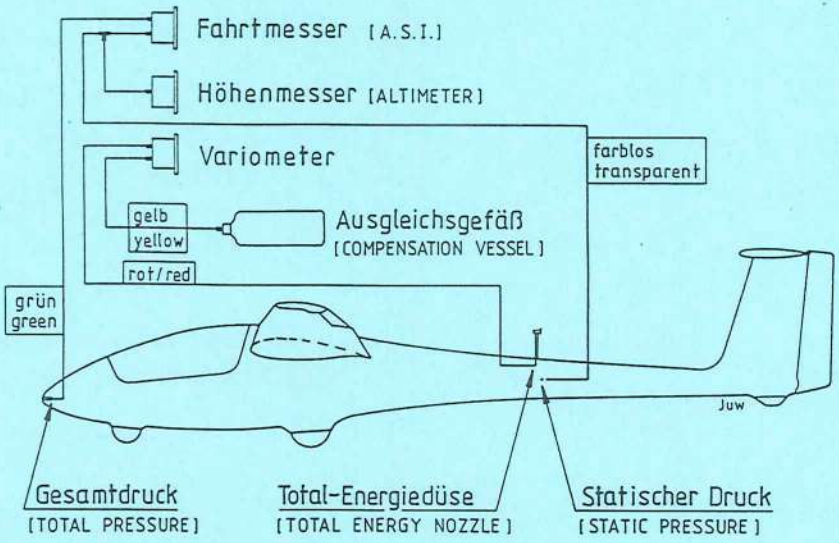


Fig. 3.8-1 Druckleitungen und Instrumenten-Anschlüsse
PRESSURE LINES AND INSTRUMENT CONNECTIONS

III.9. REMOVAL AND FITTING OF COMPONENTS

III.9.1 Fitting the wings and the tailplane

Refer to the ASK 23 Flight Manual !

III.9.2 Fitting and removing control surfaces

All control surfaces including the rudder are connected to the structure using dowel pins of Ø 6 mm = 0,24 in (6 m6 x 40; DIN 6325). At one end of these dowel pins there is a machined groove. The bearing is drilled through at one point and the pin is retained by a blind rivet fitted through this hole, with its bottom end projecting into the machined groove in the pin. The rivet heads can be struck off with a chisel; the rivet shank is then pressed through the hole into the groove in the pin, using a drift.
The dowel pins are pressed out of the bearing to one side, using a suitable drift or piece of steel rod.

If the control surface is to be removed entirely, first disconnect the pushrods.

With the dowel pins re-greased and fitted back into position to secure the control surface, retain the pins with pop rivets (supplier: Fa.Tucker, TAB DBS 320/200484).

III.9.3 Canopy and emergency jettisoning mechanism

The canopy has to be removed for certain procedures; for example, to gain access to the instruments. This is easily carried out by one or - better - two persons, by opening the canopy and pivotting to the left the red emergency jettison lever on top of the instrument panel cover.

The emergency jettison mechanism should be free-moving and easy to operate at all times, and should therefore be regularly greased and checked for correct operation.

To fit the canopy, the locking bolt of the emergency jettison mechanism must be inserted into the triangle plate of the canopy hinge and the red emergency jettison lever must be pivotted to the right up to its stop.

To prevent an inadvertant opening, there is a locking wire Ø 0,8 mm (0,03 in) to secure the emergency jettison lever. After the canopy has been refitted, the emergency jettison lever must be secured as shown in Fig. III.9.-1.

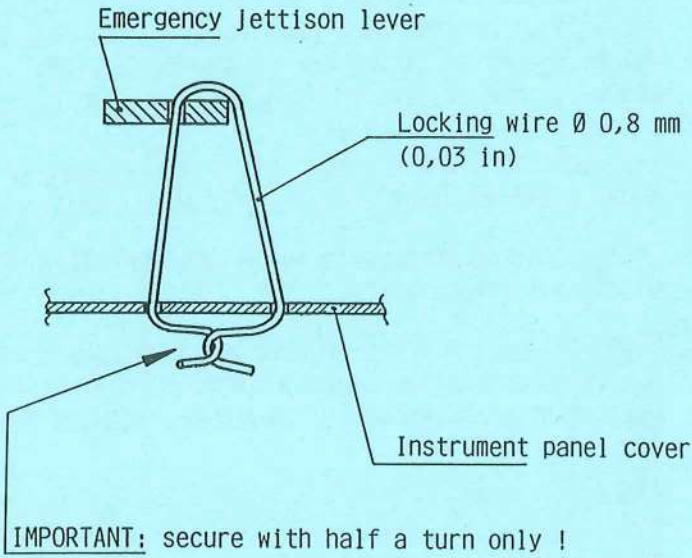


Fig. III.9-1

III.10. MAINTENANCE WORK ON THE WINGS, FUSELAGE AND AIRBRAKES

It is very important to check the locking of the airbrakes from time to time. Each airbrake has its own toggle in the wing. For this reason, you have to check that both airbrakes lock simultaneously and securely.
This is checked by connecting the brakes individually, and marking the point on the operating lever gate in the cockpit at which the linkage's dead center occurs. Both dead points should be within 5 mm (0,2 in) of each other, and in the locked state the individual airbrakes should still have 5 mm of free lever movement forwards in the gate.

The correct basic adjustment of the airbrake control system must be checked with the wheel brake disconnected from the airbrake control circuit. The airbrake lever in the cockpit is fully pulled back to its stop which is the seatpan gate rear end. Doing this the airbrake bellcrank I in the fuselage must not butt against the main bulkhead II (landing gear bulkhead) ! Now re-connect the wheel brake. Then the airbrakes are adjusted such that with the airbrake lever pulled full back and with the wheel brake fully blocked there is still a clearance of at least 10 mm between the wing upper side and the red airbrake panel lower edge!

The wing-fuselage transition should be inspected for play between the four sockets in the wings and the bolts on the fuselage as part of the annual inspection. Play at this point leads to disturbing click-click noises when the rudder is operated, and can result in unpleasant tail oscillations at high speeds.

This play is eliminated by fitting thin metal washers under one or more bolts. The bolts are slid out of the fuselage tubes by fitting a steel rod through the hole in the opposite bolt, and driving the bolt out from the inside with a hammer. It should be possible to drive the

bolt back into place, after fitting the metal washer, using only a 500 g (1 lb) hammer and a few blows. If it returns too easily, then knurl the seating area slightly until a tight fit is obtained again.

If the glider is operated from a sandy, dusty surface, then the TOST tow release should be cleaned at short intervals.

III.11. NOTES ON REPAIR WORK

Damage to wings, fuselage, tail surfaces and control linkages must be repaired before the next flight. Repair instructions and materials to be used are found in the SCHLEICHER Repair Manual for all ASW- and ASK-models (see Appendix, Chapter V.7.).

When major damage is done, we recommend that you contact the manufacturer who will then make available up--to-date notes on repairs and maintenance; these notes are constantly being revised and extended in the light of new experience. It has proved to be very helpful, if photographs and/or sketches are enclosed when damage is reported (e.g. drawing in the site of damage in copies of the Flight Manual drawings).

III.12. CARE OF THE AIRCRAFT

Damp is an enemy of all fiber-reinforcing materials; with prolonged contact, the water penetrates into the epoxy resin matrix, allowing the resin to swell, and partially opening up the tight polymerization of the plastic molecules. A combination of high temperature and high levels of damp is to be avoided especially !!

The best possible painted surface protection are still not capable of completely preventing the diffusion of the water vapour; they only slow down the effects. If penetrated

water cannot be removed with a sponge or leather, then the aircraft must be disassembled and the water dried out in as dry an area as possible; the room should not be too hot, however, and the component concerned should be turned over frequently.

After a sudden downpour of rain, or even after a long period of steady rain, you must expect water to have penetrated inside the aircraft; inspect the aircraft immediately !

Sunlight - especially the UV content of it - causes the white polyester gelcoat to become brittle, as also the Plexiglass canopy. Also the wax layer on the gelcoat oxidizes and turns yellow more rapidly if the aircraft is subjected to strong sunlight unnecessarily.

As the white polyester gelcoat has a relatively permanent wax protective layer, it can withstand repeated washing with cold water to which a cleaning agent has been added. The wax layer only needs to be renewed once a year in normal operation.
For care of the paintwork, do not use agents which contain silicone (recommended are e.g. 1 Z-Special Cleaner-D2, made by W.Sauer & Co. at 5060 Bensberg; or cleaning polish made by Lesonal).

Adhesive residues from adhesive tapes are removed with cleaning spirit (car petrol is poisonous !) or paint thinners. Re-apply wax to the cleaned areas.

Caution: The anti-collision paintwork as well as the ornamental paintwork are applied in nitro- or acrylic paint; hence no paint thinners must be allowed to contact these areas !
Even cleaning spirit should not be left on these surfaces for longer than necessary.

The acrylic glass canopy (Plexiglass or Perspex) should be cleaned only with either a specialized cleaning agent (e.g. Plexiklar), or with copious amounts of clean water. On no account use a dry cloth or similar to remove dust and clean the surface.

The safety harness must be constantly checked for tears, rough patches and wear respectively corrosion of the fittings and locks. The locks must also open properly and this needs to be checked occasionally - even under simulated load.

III.13. SPECIAL INSPECTION PROCEDURES

III.13.1 After hard landings

- Remove the seatpan and check bulkheads, towing hook attachments and also the fiberglass items for damage !
- Check the wheel attachments at the main landing gear and at the nose wheel !
- Check the spar forks and tongue for white areas !
- Check the wing connections at the fuselage !
- Check the cross tube at the forward main bulkhead !
- Measure the repeated wing bending frequency and compare with the value in the latest inspection report ! For any variation of more than 5 % contact SCHLEICHER direct. See Fig. 3.4-1 for jacking points.

III.13.2 After ground loops

- Check the fuselage/fin transition area, and the tailplane attachment on the fin !
- Check the wing/fuselage connections !
- Check the horizontal thrust wall in the fuselage (between forward and rear main bulkheads) !

III.13.3 Inspection Program to Extend Service Life

General

Fatigue tests on FRP wings and FRP wing spars have shown that a service life expectancy of 12000 hours can be reached for these components without problems. However, as this fatigue test program did not examine the entire aircraft made of FRP, this service life of 12000 hours can be granted only if the long-term airworthiness of each individual aircraft is demonstrated in a special multi-stage inspection program (over and above the mandatory annual C of A inspections) for the purpose of extending the service life.

Time Limits

1st Stage:
When the aircraft has reached a service life of 3000, 6000, and 9000 hours respectively, an inspection must be carried out in accordance with a particular inspection program laid down by Messrs. Schleicher, from whom a copy of this program must be obtained. If the results of this inspection are positive in each case, or if any defects discovered have been correctly repaired, the service life of the aircraft is extended after its 9000 hours inspection by another 1000 hours, i.e. to a total of 10000 hours.

2nd Stage:
When a service life of 10.000 flying hours has been reached the above inspection program must be repeated. If the results are positive, or any defects found have been satisfactorily repaired, the service life may be increased to a total of 11.000 flying hours. The same procedure applies again when the aircraft has reached 12000 hours, provided the results are again positive, or any defects discovered are satisfactorily repaired.
For a possible extension of service life beyond 12000 hours, detailed requirements will be established in due course.

Inspection Program

The currently valid inspection program must be obtained from Messrs.Schleicher.
The inspections may be carried out only by the manufacturer, or by an appropriately licensed aircraft repairer.
The results of the inspections must be listed in an inspection report in which each item must be annotated with a comprehensive comment, as laid down.
If the inspection is not carried out by the manufacturer, but by a licensed aircraft repairer, a copy of the filled in inspection report **must** be forwarded to Messrs. SCHLEICHER for the purpose of evaluation. Messrs. SCHLEICHER will issue an acknowledgement of receipt and send it back to the aircraft owner. Only then the inspector must certify the increase of the service life in the logbook and in the aircraft inspection records.

The need for annual Certificate of Airworthiness inspections and overhauls is not affected by this rule (for German registered aircraft § 27 (1) LuftGerPO* applies). *LuftGerPO = Aircraft Examination Rules

III.14 PERIODICAL INSPECTIONS

At regular intervals
- if the aircraft is in constant use, we recommend an interval of 100 hours - but in any case no later than during the annual inspection, the following checks must be carried out:

1. The entire aircraft must be examined for paintwork cracks, holes and buckles, which then must be made good.
2. A check for foreign bodies must be carried out in the entire aircraft; to do this, the seat pan and fairing of the main bulkhead must be removed.
3. Are all fittings in a satisfactory condition ? No play, cracks, scratches nor corrosion appeared?
4. Are all other metal parts free from corrosion?
   If necessary repaint; using a zinc chromate primer.

5. There must be no significant play in the fuselage/ wing or fuselage/tailplane connections; see also Chapter III.10.

6. The condition of all accessible bearings, fittings, joints and control cables in the control linkages is to be checked.

7. The controls including the airbrakes must be subjected to an operational test, and their control movements measured.

8. If any control is not free-moving over its entire range of movement, then the cause is to be established and eliminated.

9. The condition of the main landing gear,nose wheel and tailskid (foam skid with wear plate respectively pneumatic tailwheel) including tire and brake linings must be checked.

10. The pressure vents (pitot and static pressure ports) on the fuselage are to be checked for blockages and leaks.

11. Condition and function - if applicable, also maximum permissible operational time - of all instruments and VHF transceiver unit are to be checked !

12. An examination of the condition and function of the tow hook mechanisms is to be carried out. The operating cables must be free-moving and in the locked state of the towing hooks, the operating cables must still have play, i.e. they must not be under tension.

13. The canopy emergency jettison mechanism must be operated, and examined for corrosion and burrs etc. If necessary, correct faults and in all cases re-grease !

14. The wing bending frequency is to be measured and compared with the stated value in the latest inspection report. For this test the fuselage must be rigidly supported on two supports, in order to obtain comparable values; for the position of the supports see Fig. 3.4-1 !

15. Check that the equipment and instrumentation are in accordance with the Equipment Inventory !

16. After repairs or alterations to the equipment the empty mass and the C.G. position must be new established by calculation or weighing, and are to be recorded in a summary of masses.

IV. ACCESSORIES

IV.1. MANUALS

a) On-board logbook;

b) Flight Manual ASK 23, February 1985 edition;

c) Maintenance Manual ASK 23, February 1985 edition;

d) Glider service record book;

e) Notes on operation and maintenance for the safety towing hooks "Europa G 72" and "Europa G 73" and for the nose towing hooks "E 72" and "E 75", issue May 1975.

IV.2. TOOLS

Special Allen key for fitting the horizontal tailplane.

IV.3. GLIDER SERVICE RECORD BOOK

The glider service record book must include the following:

a) Detailed glider inspection report, Pages 1 and 2;
b) Test flight report;
c) Equipment inventory;
d) Inspection reports covering equipment and instruments;
e) Published technical notes and airworthiness directives;
f) Annual inspection records and reports;
g) Weight reports;
h) Maintenance Manual;
i) Repair instructions for the aircraft.

IV.4. DOCUMENTS TO BE CARRIED ON BOARD

a) Registration certificate;
b) Airworthiness certificate;
c) Valid glider original inspection report or annual re-inspection report;
d) Insurance certificate (third party liability insurance);
e) On-board logbook;
f) Flight Manual;
g) License certificate for aerial radio base.

V. APPENDIX

V.1. EQUIPMENT INVENTORY ISSUE FEBRUARY 1985

Minimum Equipment

V.1.1 Airspeed indicator

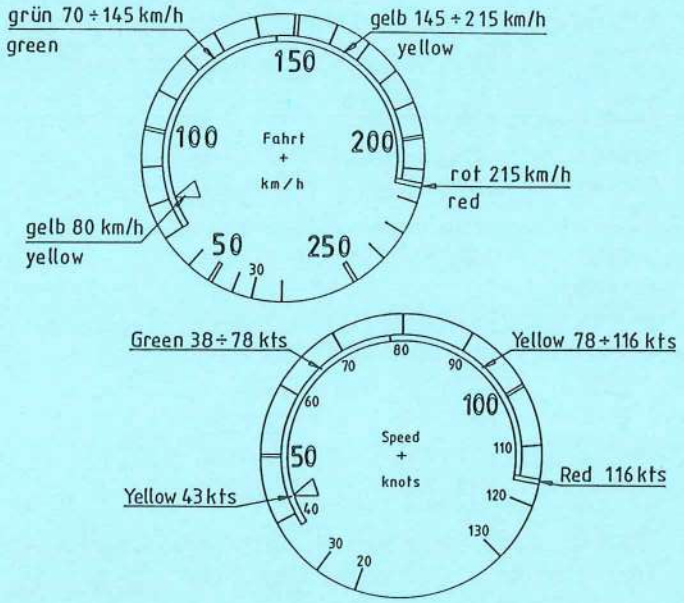
Manufacturer	Type	Code/Spec.No.	Measuring Range	Ref.No.
Winter	6 FMS 411	TS 10.210/15	0-250 km/h	AS/4/23

Manufacturer	Type	Code/Spec.No.	Measuring Range	Ref.No.
V.1.2 Altimeter				
Winter	4 HM 6	TS 10.220/44	0-6000 m	406
Winter	4 FGH 10	TS 10.220/46	0-10000m	411
PZL	W-12 S	-	-	-
V.1.3 Four-part safety harness				
Gadringer	BaGu 5201	40.070/32	-	-
	Schugu 2700	40.071/05	-	-
Supplementary Minimum Equipment For Cloud Flying				
V.1.4 Turn & bank indicator				
Apparatebau Gauting	WZ-402/31	10.241/8	-	-
V.1.5 Compass				
Ludolph	FK 5	10.401/1	-	-
Ludolph	FK 16	10.410/3	-	-
PZL	BS 1	-	-	-
PZL	B 13/KJ	-	-	-
V.1.6 Variometer				
Winter	5 STV	TS 10.230/13	± 5 m/s	5251
Winter	5 STVM	TS 10.230/14	± 5 m/s	5451
Winter	5 StVLM	TS 10.230/12	±10 m /s	5551

Manufacturer	Type	Code/Spec.No.	Measuring Range	Ref.No.
V.1.7 VHF transceiver				
Dittel	FSG 15/25	10.911/44	-	-
Dittel	FSG 16/25	10.911/44	-	-
Dittel	FSG 40 S	10.911/45	-	-
Becker	AR 2008/25	10.911/48	-	-
Avionic Dittel	ATR 720	10.911/70	-	-
Becker	AR 2009/25	10.911/48	-	-
Dittel	FSG 50	10.911/71	-	-
Dittel	FSG 60	10.911/72	-	-
Dittel	FSG 60 M	10.911/72	-	-
Becker	AR 3201	10.911/76	-	-

The Equipment Inventory is valid for F.R.Germany registered gliders. For other countries approved equivalent instruments may be used; in case of doubt contact your country's authorities.

V.2. AIRSPEED INDICATOR MARKINGS



V.3. DETAILS AND SUPPLIERS OF COMPONENTS REQUIRING REPLACEMENT

V.3.1 Landing gear components

Main wheel, tire with tube	:	5.00-5, 6-ply rating
Rim	:	TOST 5"-braked wheel, Standard 125/20
Anchor plate	:	SCHLEICHER (modified TOST-part)
Brake shoes with release springs	:	SCHLEICHER (modified TOST-part)
Nose wheel, tire with tube	:	260 x 85
Rim	:	TOST 4"-landing wheel 85/17
Tail wheel, tire with tube	:	210 x 65
Rim	:	TOST "Moritz"
Foam tailskid with wear plate	:	SCHLEICHER

Foam tailskid with
polyamid roller : SCHLEICHER

These parts are obtainable from SCHLEICHER direct.

V.3.2 Towing hooks

The towing hooks "Europa G 72" or "Europa G 73" respectively the nose towing hooks "E 72" or "E 75" are manufactured and serviced by:

TOST GmbH
Thalkirchner Str. 162
D - 8000 München 2.

V.4. NOTICE PLACARDS AND THEIR LOCATION

All the placards are illustrated and explained in the Flight Manual Chapters II.12. and IV.2. The running numbers indicate their location in the aircraft (see Fig. 5.4-1).

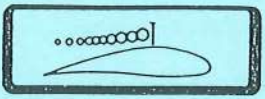
(1)

Alexander Schleicher GmbH & Co.
Segelflugzeugbau, D-6416 Poppenhausen
Model ASK 23 Serial-No. 23 xxx
DATA PLACARD and LOADING SCHEME

		lbs	kg
Empty weight			
Max. all up weight		838 lbs	380 kg
Max. cockpit payload		lbs	kg
Min. cockpit payload		lbs	kg
Max. speed for:			
winch launch		67,5 kts	125 km/h
aero tow		78,25 kts	145 km/h
maneuvering		78,25 kts	145 km/h
Weak link for winch launch		540 up to 660daN	
Weak link for aero tow		270 up to 330daN	
Tire pressure:	Main wheel	42,7 psi	3,0 bar
	Nose wheel	28,4 psi	2,0 bar
	Tail wheel	35,6 psi	2,5 bar

(2)

(6)



(3)

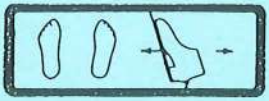
(7)

(4)

(8)

(5)

(9)



(5a)

(11)

(10)

Preflight Check

1. Control connections, mainpins and bolts safetied?
2. Control check forcewise and
3. for clearance between controls and structure (gaps min. 1,5 mm sideways)?
4. Parachute static line connected?
5. Check pressure ports and probes?
6. Regard loading scheme?

Prior to take-off:

1. Parachute connected to harness?
2. Safety harness fastened?
3. Airbrakes locked?
4. Trim lever adjusted in starting position?
5. Altimeter adjusted?
6. What is the wind direction now?
7. Close your canopy now and lock white levers!

(12)

Check weight and proper fixing of trim discs prior to start.

1 trim disc is equivalent to 1,74 kg [3,84 lbs] cockpit load!

Loading of baggage compartment
max. 15 kg [33 lb.]

This plate is located between the shoulder strap fittings on the cockpit back wall.

A. Schleicher
6416 Poppenhausen

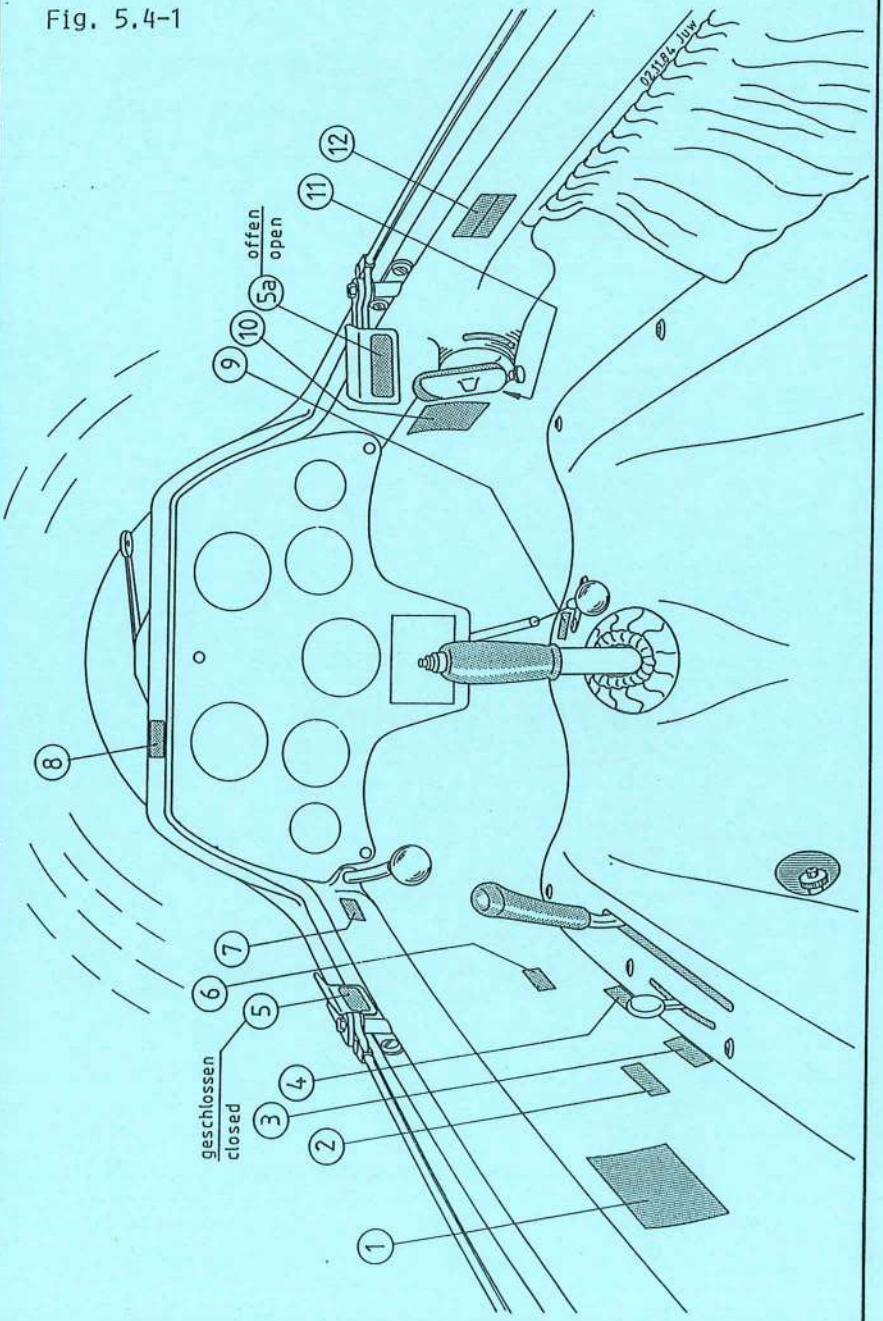
Muster : AS-K 23
Werk-Nr.: 23 xxx
Kennzeichen :
Made in West-Germany

Serial number and type placard: located on the main bulkhead on the right side behind the pilot.

S.No.23xxx

Component placard on each component.

Fig. 5.4-1



DATE :	AUTHOR :	CORRECTION :	
01.02.85	Jumtow		

V.5. APPARATUS WITH SERVICE LIFE LIMITS

Towing hooks

Calculated from the date of installation in the aircraft, the TOST nose towing hooks "E 72" or "E 75" have a service life of 4 years before inspection, while the TOST towing hooks "Europa G 72" or "Europa G 73" have a service life of 3 years before inspection, and/or -for all TOST towing hook types - a maximum of 2000 launches.

Instruments

The flight monitoring instruments do not normally have service life restrictions; as a general rule, abide by the respective manufacturer's instructions.

Oxygen installations

For permanent oxygen installations the relevant section of the detailed inspection certificate states the overhaul time limit. Over and beyond this, oxygen bottles must be re-inspected by a technical inspection institute every five years in accordance with pressure vessel regulations.

This procedure applies to F.R.Germany registered gliders; for other countries equivalent procedures have to be regarded.

V.6 Maintenance Instructions

Maintenance Instructions are written during the period of service of the ASK 23 to meet any problems which have arisen. This series of Maintenance Instructions will be extended and supplemented as and when required.

The general "Maintenance Instruction **ALL FRP GLIDER MODELS**", dated June 19, 1986 describes the removing of play between the sockets (= bushings) and bolts (= pins) of the wing-to-fuselage transition.

Maintenance Instruction **A** dated 11.12.85 describes "Adjusting the ailerons".

The general "Maintenance Instruction **PAINT CRACKS**" dated June 26, 1989, describes how to inspect, preserve, and repair the paint surface.

Repair Instruction **B** dated 17.01.90 describes the repair of Main Bulkhead II .

Instructions for the care of the gelcoat "UP Vorgelat T 30 / or T 35" respectively, issued by Martin G. Scheufler.

Maintenance Instruction DOC No. 10.01/Rev. E 03/94 (AD-No. 93.001/2) issued by L`HOTELLIER, France, concerning ball and swivel joints.

Sheet: 1 of 1	All FRP glider models Maintenance Instruction dated 19.06.86	*Alexander Schleicher* *Segelflugzeugbau* *6416 Poppenhausen*

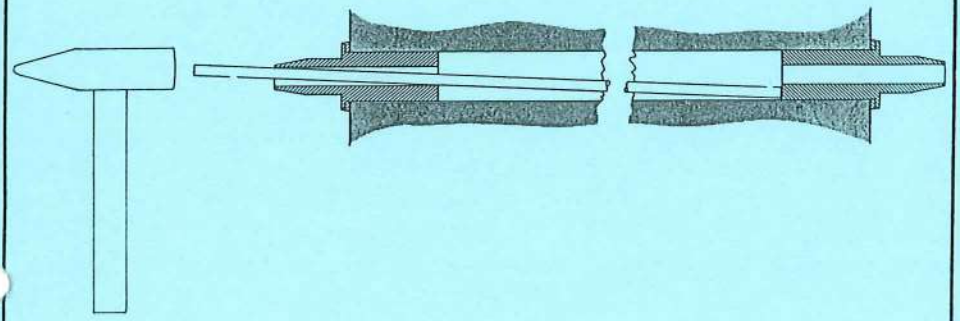
Removing play between the sockets and bolts of the wing-fuselage transition

1. Longitudinal play between the four sockets in the wings and the bolts on the fuselage (Note: for the ASK 21, only the socket/bolt connection front in the wing nose/fuselage transition) leads to disturbing click-click noises when the rudder is operated, and can result in unpleasant tail oscillations at high speeds.

2. The play is eliminated by fitting metal washers of Ø22,5/32-thickness according to the extent of the play. By testing, the play must be reduced such that the wings can be assembled still properly - this applies to a normal temperature of 20 °C. Depending on the extent of the play, the metal washers can be fitted under one or more bolts.

3. The bolts are slid out of the fuselage cross tubes by fitting a steel rod through the hole in the opposite bolt, and driving the bolt out from the inside with a hammer (see sketch below).

4. After fitting the metal washer(s), it should be possible to drive the bolt back in place, using only a 500 g (~ 1 lb) hammer and a few blows. If it returns too easily, then knurl the seating area slightly until a tight fit is obtained again.



Poppenhausen, June 19, 1986

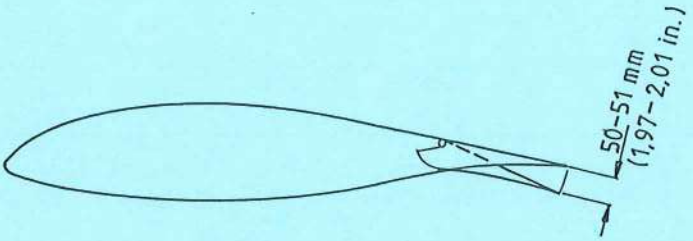
ALEXANDER SCHLEICHER
GmbH & Co.

L.-W. Jumtow

SHEET: 1 of 1	ASK 23 Maintenance Instruction -A-	*Alexander Schleicher* *Segelflugzeugbau* *6416 Poppenhausen*

ADJUSTING AILERONS

1. On the assembled glider the two aileron pushrods V (230.41.0011) are disconnected from the differential lever (230.41.0009); see Maintenance Manual pages 11 and 13.
2. With the glider in a level position the stick must be fixed in the center position and the differential lever must be level with the stick's top edge (gage above the front transverse tube). If necessary, adjust it at the uni-ball joint of the aileron pushrod III (230.41.0006) in the fuselage.
3. With the aileron pushrods V being disconnected, the ailerons are adjusted in such a way that they strike the limit stops when deflected downwards (positive) for 50 - 51 mm (1,97 - 2,01 in), and measured at the inner aileron end where it is actuated; see Fig. 1 hereafter. If necessary, adjust them at the uni-ball joint of the aileron pushrod VIII (230.41.0015) in the wing.



4. Now move the ailerons into zero position and fix them. Then it must be possible to connect the aileron pushrods V easily to the differential lever which has been fixed in its level position. If this is not possible, please adjust them at the uni-ball joint (230.41.0010) of the pushrod V accordingly.
5. Re-tighten and re-lock all joints and screws which possibly have been untied.
6. Check the permissible aileron deflections as stated on page 30 of the Maintenance Manual.
7. Check the aileron actuation for correct operation and effectiveness.

Poppenhausen, Dec.11, 1985

ALEXANDER SCHLEICHER
GmbH & Co.

L.-W. Jumtow.

Maintenance Instruction
PAINT CRACKS

Alexander Schleicher
GmbH & Co.
Segelflugzeugbau
D-6416 Poppenhausen

Subject: Paint cracks on fiber composite gliders.

Types affected: ASW 12, ASW 15, ASW 17, ASW 19, ASW 20, ASK 21, ASW 22, ASK 23, ASW 24, ASH 25; ALL variants and all serial no.s.

Compliance:

1. If deep cracks which go down to the fiber composite structure, are found on the glider, the glider must be presented each year to the manufacturer or any other licensed aviation station, who upon examination of the glider decides whether the glider can be continued in service for 1 year more or whether the repair must be done at once (see point "Action A.").
2. If hairline cracks which run only in the paint surface, are found on the glider, the glider shall be presented at the latest after three years annually to the manufacturer or any other licensed aviation station, who upon examination of the glider decides whether the glider can be continued in service for 1 year more or whether the repair must be done at once (see point "Action B."). The 3 years extension applies only on the condition that the maintenance and care of the aircraft is no longer neglected during this period of time and that the gliders are no longer stored outside;

Reason:

The Flight and Maintenance Manuals for SCHLEICHER-gliders contain insistent notes concerning the detrimental influence of moisture and sun radiation on the aerodynamic paint surface quality standard. Herewith we point out emphatically once again that every owner is obliged to observe the flight and maintenance or operations manuals of his glider in all points, and this refers also to the relevant notes on the care and maintenance of the glider.

If these notes are contravened, the result will be sooner or later - depending on the climate - damage to the paint surface quality.

Influence of the two factors
moisture and UV-radiation:

To begin with, generally an enlargement of the waviness of the finish develops - mainly on the wing and tail unit skins - caused by penetration of moisture. On the occasion of performance measurements (accomplished by P.Bickle, R.Johnson and the German DFVLR/Idaflieg) it has been demonstrated repeatedly that the larger waviness leads already to considerable performance loss which is all distinctly noticed in competitions. A competition

pilot will always be anxious to preserve or restore the performance of his glider to its full extent, but unfortunately owners of training and instruction gliders are generally of the opinion that they may accept such a performance loss with those gliders. This is regrettable in the view of the manufacturer because he makes all efforts to build and supply also these gliders with a clean aerodynamic surface. The valuable production time used to this end is then possibly uselessly provided.

Owing to the UV-radiation the gel coat of the paint surfaces grows brittle and shrinks; at the same time the UV-light destroys paint ingredients. So moisture (rain, dew) working in on long term will wash the decomposed paint ingredients out off the paint. The paint starts chalking and gets hairline cracks owing to the concurrence of embrittlement and shrinkage. Furthermore, these hairline cracks gather dirt which through its aggressive effect and its stronger heating-up from sun radiation further precipitates the degradation of the paint. Owing to this the intended protective effect for the fiber composite structure against moisture and UV-radiation is no longer granted.
Certainly a good care with hard wax can slow down the above process distinctly, but it cannot be stopped completely. For this reason a repainting of the aircraft will always become necessary at some point of time.

However, we point out explicitly that paint cracks - even deep cracks - do not represent damages to the aircraft structure if as of their first appearance immediate correct maintenance and care is given furthermore to the aircraft.
As all the outside skin of the aircraft is dimensioned for stiffness, there are no critical mechanical strength problems, even if some cracks have gone down into the fiber composite structure and have already attacked the resin matrix base.
The unknown ageing effects caused by the influence of moisture and UV on the unprotected fiber composite structure are more dangerous.

Those paint cracks as reported from customers in USA and Australia do not appear here in Europe or they develop so much more slowly that a paint crack repair has never yet been carried out here at our works. Accordingly we have no experience of our own with such repairs.
In this connexion we point out expressly that for the mentioned cases in the USA or Australia an absolute "zero" care of the gliders in question added to the "climate" factor; besides these gliders were exposed to the weather almost continuously and without any particular protection - very often day and night.

Maintenance Instruction
PAINT CRACKS

Alexander Schleicher
GmbH & Co.
Segelflugzeugbau
D-6416 Poppenhausen

Action:

To repair the paint cracks, these have to be removed generally by sanding them down to their ground. But in doing so, the fiber composite structure lieing under the gel coat should not be sanded on. Thus the sanding job is difficult and, therefore, relatively expensive.

A. If **deep cracks** are concerned which go down to or into the fiber composite structure (it is assumed that they result from large and rapid temperature changes as found e.g. with wave flights !), and if a repair is decided to be necessary, the paint material has to be sanded down to the fiber composite structure carefully and the area affected must be repaired.
In case that the resin matrix base of the fiber composite structure is already damaged, one should consider peeling off and replacing the damaged fiber composite layer. This work is possibly easier than the careful sanding job.

B. If **hairline cracks** are concerned which run only in the paint surface (and which presumably result from bad maintenance together with continuous UV-radiation - i.e. gliders left outside without any protection for a long period of time), we recommend to remove the paint material from all areas attacked by sanding on them down their end and to repaint these areas. The sooner this measure is taken, the less the work expenditure.

On the subject of rebuilding the paint system with materials available in the USA as well as on the subject of how to rebuild the profile (which is a must for high performance gliders which are to be flown in competitions) R.H.Johnson, Dallas Soaring Association, has written several articles published in SOARING magazine. We advise to consider in any case the repair experience accumulated in the USA.
For Europe we suggest to spray the sanded surfaces first with polyester fillers, to sand them again, and to respray them finally thinly with a white paint system on a Polyurethane basis which should be aircraft-approved.

Material & drawings:

See above point "Action".

Mass and C.G.:

It is necessary to redetermine the mass and C.G. data after repaintings.
After repainting of control surfaces and flaps special attention must be paid to their tailheavy balance

moments; these data are given in the respective Maintenance (or Operations) Manuals of the gliders.
If in the case of older glider models such data are not contained in the manuals, then the mass of the control surfaces and their tailheavy static balance moment must be determined prior to the paint job and must be re-adjusted after the repainting by ± 5 %.

Notes:

1. The action as per this Maintenance Instruction must only by accomplished by the manufacturer or by a technical aviation service station holding an appropriate license.
2. The present Maintenance Instruction PAINT CRACKS dated June 26, 1989, supersedes the previous Maintenance Instruction dated 15.07.87.

Poppenhausen, den 26.06.89

ALEXANDER SCHLEICHER
GmbH & Co.

Gerhard Waibel

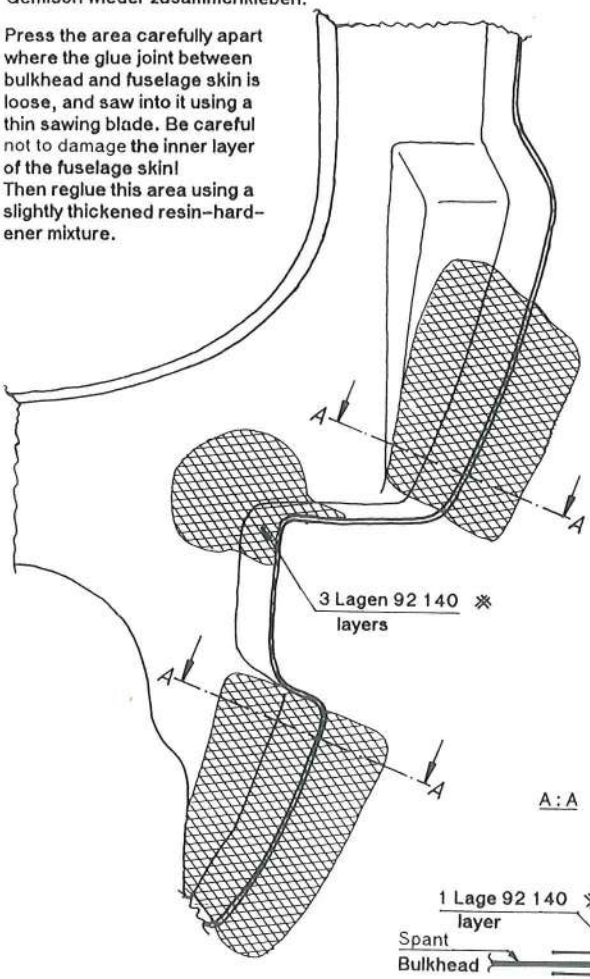
The translation into English has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

BLATT/SHEET 1 von/of 1	ASK 23 / 23 B Reparatur-Anleitung B Repair Instruction B Ausgabe/Issue 17.01.90	*Alexander Schleicher* *Segelflugzeugbau* *6416 Poppenhausen*

Gegenstand/Subject: Reparatur des Hauptspants II
Repair of main bulkhead II

Den Bereich der gelösten Klebung zwischen Spant und Rumpfschale vorsichtig auseinanderdrücken und mit einem dünnen Sägeblatt einsägen. Darauf achten, daß das Innengewebe der Rumpfschale nicht beschädigt wird! Dann mit leicht angedicktem Harz-Härter-Gemisch wieder zusammenkleben.

Press the area carefully apart where the glue joint between bulkhead and fuselage skin is loose, and saw into it using a thin sawing blade. Be careful not to damage the inner layer of the fuselage skin! Then reglue this area using a slightly thickened resin-hardener mixture.



Hinweise zur Pflege für UP Vorgelat T 30 / UP Vorgelat T 35

1. Geeignet sind die üblichen Lackpflegemittel mit oder ohne Siliconzusatz, und Wasser, das auch mit normalen Zusätzen üblicher Spülmittel versetzt sein kann. Nicht nur zum Entfernen von Fliegen, sondern auch von Fingerabdrücken, festgeklebtem Staub und Schmiermitteln eignen sich Teerentfernungsmittel auf Benzinbasis (aus Autopflegesets). Diese sollten aber nicht längere Zeit mit Lappen, Watte o.ä. auf die Flächen einwirken, da ein Anquellen mit anschließendem " Einfallen " möglich sein kann. Bei Reparaturen können siliconhaltige Pflegemittel Probleme beim Beilackieren hervorrufen. Deshalb empfehlen wir nach Möglichkeit die Verwendung siliconfreier Produkte.

2. Auch scharfe Lösungsmittel und Verdünnungen können nicht eingesetzt werden, da starkes Anquellen mit " Einfallen " möglich ist. Hierzu zählen besonders ester- und/oder ketonhaltige Verdünnungen, Aceton, Essigester und Lackverdünner aller Art. Alkohole, wie Spiritus oder Isopropanol (Isopropylalkohol) können vorsichtig, wie Benzine und andere aliphatische Kohlenwasserstoffe, zur Reinigung verwendet werden. Allerdings, wie gesagt, ohne starkes Reiben oder längere Einwirkzeit. Vor allem müssen chlorierte Kohlenwasserstoffe unbedingt vermieden werden, da hiermit in relativ kurzer Zeit die UP-Lackschicht total zerstört und abgelöst wird (z. B. Methylenchlorid, Trichloräthylen (Tri), Chloroform, Tetra (Chlorkohlenstoff), Trichloräthan, Per usw.).

3. Nicht geeignet ist eine Behandlung von Flugzeugen mit Lösemitteln, mit dem Ziel die ungünstige Aerodynamik von perlenförmigen Regentropfen bei Regenwetter dadurch auszuschließen. Dadurch wird die Schutzschicht völlig entfernt, somit kann die Errosion voll wirken, der UP-Lack ist schutzlos der Sonne, den UV-Strahlen und sonstigen Belastungen ausgesetzt. Die UP-Vorgelate werden dadurch zerstört.

4. Übliche Kunststoffmöbel-Polituren (z. B. Pronto), die auf eine Schichtbildung zur Verhinderung der elektrostatischen Aufladung durch Luft- und sonstige Reibung beruhen, sollten auf die Plexiglas (Acrylglas)-Hauben beschränkt bleiben, denn UP-Lacke mit EP-Laminate laden sich ungleich weniger auf, und der enstehende Film verbindet sich mit Poliermitteln zu einer fest haftenden Schmiere, die nur noch mit Lösemitteln entfernt werden kann.

5. Sind größere Überholungen notwendig wird die gesamte Oberfläche mit Nass-Schleifpapier überschliffen. Dabei sollte möglichst feines Schleifpapier verwendet werden. Grobe Schleifpapiere verursachen tiefe Schleifrillen die unter Umständen auslösend für Spannungsrisse sein können (Kerbwirkung). Vor dem Aufpolieren ist ein Naßschliff mit Schleifpapierkörnung 1000 oder besser -1400 erforderlich. Beim Aufpolieren mit Filzschwabbelscheibe und Polierwachs ist unbedingt darauf zu achten, daß örtliche Überhitzungen vermieden werden, da solche ein Ablösen der Vorgelatschicht vom Laminat bewirken. Bewährt haben sich Polierwachse der Firma Menzerna, 7500 Karlsruhe (z. B. Polierwachs No. 6). Werden andere Produkte eingesetzt sind ausreichende Eignungstests durchzuführen.

Achtung: Die Angaben in diesem Merkblatt beruhen auf unseren langjährigen Erfahrungen und entsprechen unserem derzeitigen Erkenntnisstand. Eine Haftung für Vollständigkeit und Richtigkeit der Angaben können wir jedoch nicht übernehmen.

Luftfahrt-Bundesamt

Lufttüchtigkeitsanweisung
LTA-Nr.: 1993-001/3
ersetzt: 93-001/2
Datum der Bekanntgabe: 09.04.1998

Muster: L'Hotellier L'Hotellier Schnellverschlüsse mit Verriegelungskeil	AD der ausländischen Behörde: - keine -
Geräte-Nr.: -keine-	Technische Mitteilungen des Herstellers: L'Hotellier Wartungsanweisung Ausgabe E aus 03/94'

Betroffenes Luftfahrtgerät:

L'Hotellier
L'Hotellier Schnellverschlüsse, mit Verriegelungskeil

- **Baureihen:** L'Hotellier Schnellverschlüsse mit Verriegelungskeil
  - wenn eingebaut in Segelflugzeuge, Motorseglern und Motorflugzeugen
- **Werk-Nrn.:** alle

Betrifft:

Gemeldete Störungen bei L'Hotellier Schnellverschlüssen haben das LBA veranlaßt, Untersuchungen über die Betriebssicherheit von L'Hotellier Schnellverschlüssen durchführen zu lassen.

Die Ergebnisse zeigen, daß sich die Reibefläche der Verriegelungskeile nach relativ wenigen Betätigungen einschleift und glättet. Wie bei den Versuchen demonstriert wurde, kann dann die Haftreibung unter ungünstigen Umständen auch unter normalen Betriebsbedingungen überwunden werden, d.h., daß sich die Verriegelungskeile öffnen!

Der o.g. Lufttüchtigkeitsmangel kann zur unbeabsichtigten Loslösung und Entkopplung von L'Hotellier Schnellverschlüssen und erheblichen Betriebsstörungen führen.

Die Flugsteuerung kann dadurch beeinträchtigt werden oder ist nicht mehr kontrolliert ausführbar und kann zu einem Unfall führen.

Grund für die Herausgabe der Zweitausgabe im April 1994 war die Revision der L'Hotellier Wartungsanweisung, in welcher das Maß der Rundheit des Kugelkopfes von max. 0,05 mm auf 0,1 mm hochgesetzt wurde.

Die Schnellverschlüsse sind mit einer Sicherungsnadel, einer Uerlingshülse oder Hülsen nach dem Uerlingsprinzip zu sichern.
Grund für die Herausgabe dieser LTA sind verschiedene Vorkomnisse mit Hülsen nach dem Uerlingsprinzip. Aus gegebenem Anlaß sind diese Hülsen auf Rißfreiheit und ausreichend Klemmkraft (Selbsthemmung) zu überprüfen und ggf. auszutauschen.

Maßnahmen:

Das Luftfahrt-Bundesamt weist ausdrücklich darauf hin, daß sich alle Luftfahrzeugführer mit den Besonderheiten der L'Hotellier Verschlüsse, insbesondere mit den verschiedenen Sicherungsmöglichkeiten und deren Handhabung, vertraut zu machen haben.

Die Schnellverschlüsse mit Verriegelungskeil müssen gesichert werden. Dazu sind folgende Maßnahmen durchzuführen:

1. Noch nicht vorhandene Sicherungsnadeln (z.B. L'H 140-31 von Hotellier) müssen nachgerüstet werden. In bestimmten Fällen kann es notwendig werden, daß die am Verriegelungskeil für die Sichtkontrolle vorgesehene Bohrung auf einen Durchmesser von 1,2 mm aufgebohrt werden muß, um das Einstecken der Sicherungsnadel zu gewährleisten (siehe Anlage, Teil I).

Die Verwendung einer Sicherungsnadel entfällt, wenn der L'Hotellier Schnellverschluß bereits über ein anderes anerkanntes Sicherungsverfahren (z.B. Hülsen nach dem Uerlingsprinzip, LS-Sicherungshülse, Schempp-Hirth Sicherungsfeder oder Wedekind-Sicherung) verfügt, bzw. ein solches neu eingebaut wird.
LBA-anerkannte Sichererungsverfahren: siehe Anlage Teil II.
Sowohl die Hülsen nach dem Uerlingsprinzip als auch die LS-Sicherungshülsen können nur bei geraden Verbindungen bzw. Übertragungswegen, nicht aber bei 90 Grad Anschlüssen verwendet werden.

Überprüfung der Hülsen nach dem Uerlingsprinzip
Diese Hülsen sind auf Rißfreiheit und ausreichende Klemmung (Selbsthemmung) zu überprüfen, ggf. sind die Hülsen auszutauschen (siehe Anlage Teil III).

Montagehinweis:
Die Hülsen müssen bei der Montage axial auf den L'Hotellier Schnellverschluß aufgeschoben werden, auf keinen Fall dürfen die Hülsen radial auf den L'Hotellier Verschluß aufgeklipst werden. Durch radiales Aufklipsen (zu weites Aufbiegen der Hülse) kann es zu Überbeanspruchungen mit Rißbildung oder Brüchen kommen. Dadurch kann die Hülse ihre Funktion nicht mehr wahrnehmen.

Jährliche Überprüfung der Hülsen
Die Hülsen müssen mindestens einmal pro Jahr auf Rißfreiheit und genügend Klemmkraft (Selbsthemmung) hin überprüft werden. Die ursprüngliche Spezifikation der Uerlingshülsen geht von einem 2-jährigen Austausch aus. Abweichungen hiervon sind den Technischen Mitteilungen der Hersteller zu entnehmen.

2. Flughandbuch
a) Abschnitt "Aufrüsten"
Die Empfehlung in verschiedenen Flughandbüchern: der Verriegelungskeil der L'Hotellier Verschlüsse "sollte gesichert werden ..." in dieser oder ähnlicher Form ist zu streichen und durch den Satz zu ersetzen:

"Der L'Hotellier Verschluß muß gesichert werden"

b) Sollte es in älteren Flughandbüchern keine Angaben zu L'Hotellier Schnellverschlüssen geben, so ist der Teil IV (siehe Anlage) in das Flughandbuch Abschnitt "Aufrüsten" aufzunehmen, wenn die Sicherung durch eine Sicherungsnadel erfolgt bzw. erfolgen soll. Die Eintragung ist ggf. auf einer neuen Seite vorzunehmen.

c) Sofern Hülsen nach dem Uerlingsprinzip als zusätzliche Sicherungsmaßnahmen für die L'Hotellier Verschlüsse verwendet werden, ist der Teil III der Anlage in das Flughandbuch einzuarbeiten.

Diese Eintragungen im Flughandbuch können handschriftlich oder als Kopie unter Angabe der LTA-Nr. 1993-001/3 im Flughandbuch erfolgen.
Eine Eintragung in das Verzeichnis der gültigen Seiten hat unter Angabe der Lufttüchtigkeitsanweisung Nr. 1993-001/3 zu erfolgen.

3) Wartungshandbuch
Die anliegende Wartungsanweisung (L'Hotellier, Ausgabe E 03/94) wird hiermit Bestandteil der Betriebsanweisungen und ist, sofern von den einzelnen Segel-, Motorsegler- und Motorflugzeug-Herstellern noch nicht geschehen, in das Wartungshandbuch des Luftfahrzeuges aufzunehmen.

4) Eine Überprüfung aller L'Hotellier Verschlüsse entsprechend obiger Wartungsanweisung ist durchzuführen. Verschlüsse bei denen die zulässigen Abweichungen überschritten sind, sind auszutauschen.

Hinweis:
Schon veröffentlichte musterspezifische Technische Mitteilungen der Hersteller bzw. der Musterbetreuer über L'Hotellier Schnellverschlüsse werden Bestandteil dieser LTA.

Bezugsquellen für den Sicherungsstecker:
- L'Hotellier Sicherungsstecker, Bestell-Nr.: L'H 140-31
- Sicherungssplint Durchmesser 1,2 mm, Ford Teile-Nr.: 1473 931 (weltweit)
- die Hersteller bzw. Musterbetreuer der betroffenen Segelflugzeuge, Motorsegler bzw. Motorflugzeuge

Anerkannte Hülsen nach dem Uerlingsprinzip sind:
- Uerlingshülse (Spezifikation Nr. SE 001/78)
- Hülse nach dem Uerlingsprinzip gemäß Technischer Mitteilung der Fa. Rolladen-Schneider Nr. 56/3049
- Hülse nach dem Uerlingsprinzip gemäß Service Information der Fa. DG-Flugzeugbau No. 0-4/92

Fristen:
Sichern der L'Hotellier Verschlüsse:

- an Segelflugzeugen und Motorseglern bis spätestens 30.04.1994
- an Motorflugzeugen bis spätestens 15.05.1998

Überprüfung der Hülsen nach dem Uerlingsprinzip an allen Luftfahrzeugen: Bei der nächsten Jahresinspektion, spätestens jedoch bis zum 15.05.1998 und danach mindestens einmal im Jahr.

Durch die vorgenannten Mängel ist die Lufttüchtigkeit des Luftfahrtgerätes derart beeinträchtigt, daß es nach Ablauf der genannten Fristen nur in Betrieb genommen werden darf, wenn die angeordneten Maßnahmen ordnungsgemäß durchgeführt worden sind. Im Interesse der Sicherheit des Luftverkehrs, das in diesem Fall das Interesse des Adressaten am Aufschub der angeordneten Maßnahmen überwiegt, ist es erforderlich die sofortige Vollziehung dieser LTA anzuordnen.

Rechtsbehelfsbelehrung:
Gegen diese Verfügung kann innerhalb eines Monats nach Bekanntgabe Widerspruch eingelegt werden. Der Widerspruch ist schriftlich oder zur Niederschrift beim Luftfahrt-Bundesamt, Lilienthalplatz 6, 38108 Braunschweig einzulegen.

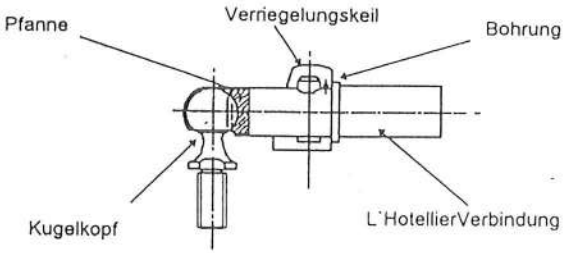
...

Anlage zur Lufttüchtigkeitsanweisung Nr. 1993-001/3
L´Hotellier-Schnellverschluß, Verriegelungskeil

Teil I

L´Hotellier Schnellverschlüsse mit Verriegelungskeil

Noch nicht vorhandene Sicherungsnadeln (z.B. L`H 140-31 von Hotellier) müssen nachgerüstet werden. In bestimmten Fällen kann es notwendig werden, daß die am Verriegelungskeil für die Sichtkontrolle vorgesehene Bohrung auf einen Durchmesser von 1,2 mm aufgebohrt werden muß, um das Einstecken der Sicherungsnadel zu gewährleisten.



Warnung !
Nicht gesicherte Schnellverschlüsse können sich im Betrieb selbsttätig öffnen !!

Teil II

LBA-anerkannte Sicherungsverfahren

Das LBA hat folgende Sicherungsverfahren zur Sicherung von L'Hotellier Schnellverschlüsse anerkannt:
Uerlingshülse bzw. Hülsen nach dem Uerlingsprinzip (siehe Teil III), Sicherungsnadel (Abb. 2 und 2a), LS-Sicherungshülse (Abb. 3), Schempp-Hirth-Sicherungsfeder (Abb. 4) und Wedekind-Sicherung (Abb. 5).

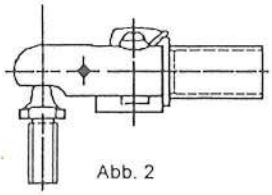


Abb. 2

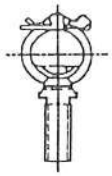


Abb. 2a

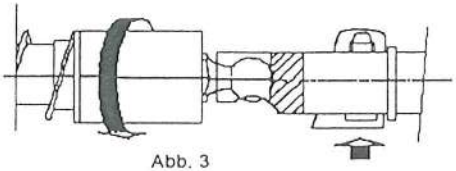


Abb. 3

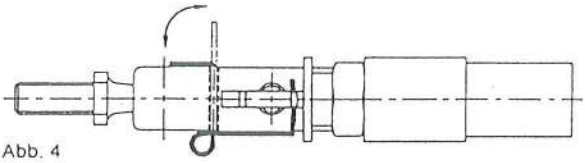
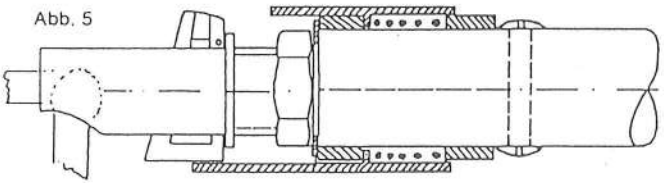


Abb. 4

Abb. 5

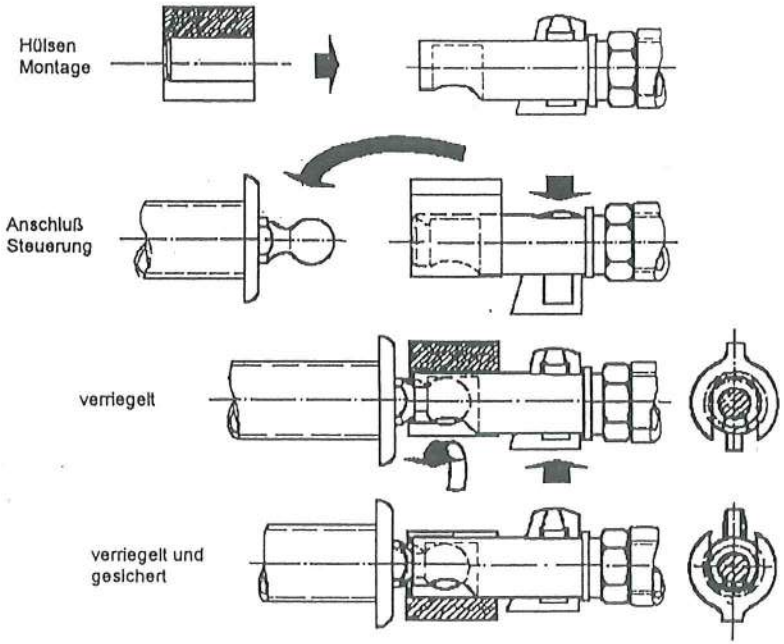


Teil III

Montagehinweis zu Hülsen nach dem Uerlingsprinzip

Die Hülsen müssen bei der Montage axial auf den L´Hotellier Schnellverschluß aufgeschoben werden.

Auf keinen Fall dürfen die Hülsen radial auf den L´Hotellier Schnellverschluß aufgeklipst werden. Durch radiales Aufklipsen (zu weites Aufbiegen der Hülse) oder sonstige Überdehnungen kann es zu Überbeanspruchungen mit Rißbildung oder Brüchen kommen. Dadurch kann die Hülse ihre Funktion nicht mehr wahrnehmen.



Teil IV

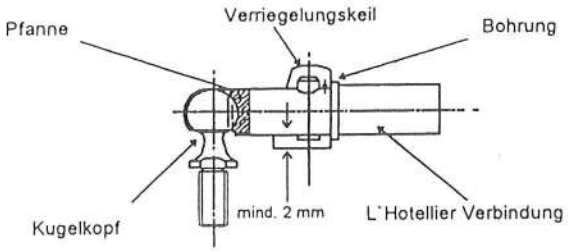
L'Hotellier Schnellverschlüsse

Mit der Funktion der Schnellverschlüsse muß sich jeder schon vor der Montage vertraut machen.

Jeder Schnellverschluß wird mit gedrücktem Sicherungskeil vollständig über die Kugel an der Stoßstange geschoben. Beim Verriegeln geht der Sicherungskeil etwas zurück, so daß bei richtiger Verbindung die Bohrung auf der Schmalseite des Sicherungskeils sichtbar wird.

In diese Bohrung muß die Sicherungsnadel eingesteckt und damit der Schnellverschluß gesichert werden.

Achtung!
Durch nochmaliges Belasten der Steuerverbindung ist das vollständige Einkuppeln der Kugel zu überprüfen !



Warnung !
Nicht gesicherte Schnellverschlüsse können sich im Betrieb selbsttätig öffnen !

INSTRUCTIONS FOR THE MAINTENANCE
L'HOTELLIER BALL AND SWIVEL JOINTS

HISTORIQUE DU DOCUMENT

REV.	DATE	OBJET DE LA MISE A JOUR	RED.	QUAL.	RESP.
A	11/85	Creation of document	BE	MJD	JMB
B	02/86	Representation of 1 swivel	BE	MJD	JMB
C	01/89	Adjunction of Fig.1 and Fig.2	BE	MJD	JMB
D	07/92	Updating of function of CR147	BE	MJD	JMB
E	03/94	Updating following DEI229-EM	BE	MJD	JMB

LISTE DES DESTINATAIRES

B.E. B.C. Q.C. B.C. Q.C. C.B.	OR. +1 EX. 1 EX. 1 EX.	PRODUCTION	1 EX.

COMPOSITION DU DOCUMENT

PAGE	IND.	PAGE	IND.	PAGE	IND.	PAGE	IND.	PAGE	IND.
TIT	E	SOM	E	1	E	2	E		

SUMMARY

Louis L'HOTELLIER S.A.
93, avenue Charles De Gaulle - 92270 BOIS COLOMBES
Tél.(1)42.42.13.94 Télex 611153F LHOTAIR Télécopie (1)47.60.07.07

1 - PREVENTIVE AND SAFETY MAINTENANCE INSTRUCTIONS

The rotation of the swivel around the ball must be done with resisting strengh, due to minimum frictions. Consequently it is mandatory to lubricate the swivel/ball assy. This lubrification must be done after cleaning and before assembly, with a non cold coagulating grease.

Eg : ESSO purpose (general use) :
Spray containing oils enriched with silicone (recommended for assemblies exposed to sand or other abrasive materials).

It is mandatory to verify, after each assembly, the correct location of the ball in the swivel. To do so, a location hole is drilled in the locker. When the assembly is good, the hole must be visible and must enable to insert the pin "B" réf. L'H 140-31, or other devices, linked to the locker only.

2 - PERIODICAL CHECK

During the annual visit or no later than every 500 flight hours, it is necessary to verify balls and swivels as follows :

2.1. FREE MOVEMENT OF THE BALL INTO THE HOUSING

- Check that the ball move free of friction point.
- Check the angular displacement.
- Check that there is no crack at the base of the ball

2.2. BALL SPHERICITY MEASUREMENT (See fig. 2)

The variation between several measures of the ball diameter must not exceed 0,1 mm.
This check aim is to detect an abnormal ball wear.

2.3. BALL THREAD CHECK

No thread damage is acceptable. During reassembly the collar must be perfectly set on its base. It is mandatory to fix the ball in position with an adequate locking device.

2.4. SWIVEL VISUAL CHECK

No deformation or penning in ball location or in the locking device seat is acceptable.

2.5. MEASUREMENT OF THE LOCKER LOWER PART PROJECTION AFTER ASSEMBLY OF THE SWIVEL ON THE BALL (see fig. 1)

This projection must be higher than 2 mm.
The aim of this requirement is to verify the efficiency of the automatic take up clearance

2.6. CHECK OF THE LINK BETWEEN DRIVE ROD AND SWIVEL

In the case of an adjustable swivel, verify that the link between swivel and drive rod is tight and properly secured by an adequate locking device.

2.7. SHIVEL ASSY OPERATION CHECK

Seat or locker : no clamping, due to oxydation or other reason, is acceptable.

If after these verifications, one of the above check is out of tolerance, it is mandatory to replace both ball and swivel.
nevertheless it is recommended to replace this assembly every 10 years or every 3000 flight hours.

IMPORTANT NOTE

Any defection parts may be returned to Ets Louis L'HOTELLIER for technical investigation.

FIG. 1

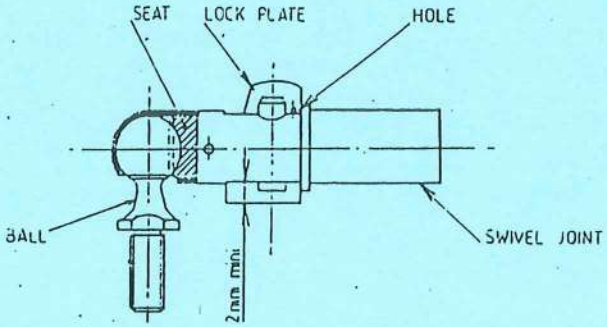
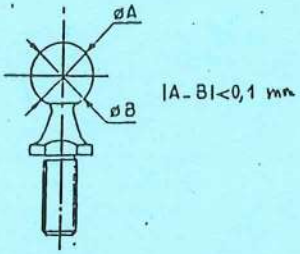


FIG. 2



SHEET: 1 of 1	ASK 23 /ASK 23B Technical Note No.10	Alexander Schleicher GmbH & Co Segelflugzeugbau D - 6416 Poppenhausen

Subject: Inspection of the main bulkhead II (landing gear bulkhead) for damages.

Serial number applicability: ASK 23 and ASK 23B, Data Sheet No.353, all serial no.s.

Compliance: Prior to or on the next Annual C. of A. inspection, but at the latest by March 31, 1994.

Reason: As it has been stated already in the Technical Note no.6 (dated Oct.17, 1990), worn out or badly adjusted or not-in-time readjusted wheel brakes may result in damages to the main bulkhead II (landing gear bulkhead) if when operating the airbrakes the airbrake control bellcrank I hits the bulkhead (damaging it and peeling it off the fuselage shell). This case also was noticed as a result of extremely rough landings. Therefore, the Repair Instruction 'B' (dated Oct.17, 1990) was issued for the ASK 23 and ASK 23 B.

Action: Remove the cover off the main bulkhead and the seatpan. Inspect the main bulkhead II (landing gear bulkhead) for damages and peeling off the fuselage shell. If such damages are found, proceed and repair in accordance with Repair Instruction 'B'.
This Technical Note must be inserted in the Maintenance Manual in the Appendix behind the Maintenance Instructions, Section V.6. The accomplishment of this TN and the insertion of the TN copy into the manual must be documented in the 'Index of Corrections' (p.1 + 2 of the manual).

Notes: The repair works as per this TN can be done by a competent person. The accomplishment of this mod must be certified by a licensed aviation inspector in the glider's inspection documents, the log-book, and in the Flight Manual.

Poppenhausen, September 14, 1993

ALEXANDER SCHLEICHER
GmbH & Co.

i.A. Gudrun Waibel
(G. Waibel)

The German original of this Technical Note has been approved by the LBA under the date of Sept.17, 1993 (signature: SCHMALJOHANN). The translation into Englisch has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

SHEET: 1 of 2	ASK 23 /ASK 23B Technical Note No.11	Alexander Schleicher GmbH & Co Segelflugzeugbau XXXXX D-6416 Poppenhausen

//new zip code: D-36163

Subject: Product improvement - new trim spring mod.

Serial number applicability: ASK 23 and ASK 23B, Data Sheet No.353, optional for all serial no.s. 23001 thru 23143. Incorporated standard in series production as of serial no. 23144.

Compliance: None; optional mod.

Action: Remove the seat pan and disassemble the existing trim springs including their mounting.
Then install new trim springs (P/N 99.000.7829) with their mounting, version II (P/N 230.49.0104). The trim spring adjusting dimension of 275 mm must be checked (see drawing). It must be guaranteed that the new trim springs have clearance with full actuation of trim release lever and full elevator deflection!
After installation of the new trim springs it must be checked that the trim is in its center position when the elevator is neutral.
This Technical Note must be inserted into the Maintenance Manual, Appendix behind the Maintenance Instructions, Section V.6. The accomplishment of this TN and the insertion of the TN copy into the manual must be documented in the 'Index of Corrections' (p.1+2 of the manual).

Material & Drawings: The required parts for the accomplishment of this TN can be obtained from Alexander Schleicher GmbH & Co., Tel +49(0)6658-890 or -8929, FAX +49(0)6658-8940. The serial number of the glider must be stated.

Mass and C.G.: It is not necessary to redetermine the empty mass and C.G. data.

Notes: The mod under this TN can be done by the manufacturer, or by a licensed aviation service station, or by a competent person. The accomplishment of this mod must be inspected and certified by a licensed aviation inspector in the glider's inspection documents, the log-book, and in the Flight & Maintenance Manual.
In compliance with JAR 22.161 (b)(2)(iii) flight testing minutes have been recorded as additional substantiation for this TN.

Poppenhausen, October 9, 1996

ALEXANDER SCHLEICHER GmbH & Co.

i.A. (Lutz-W.Jumtow)

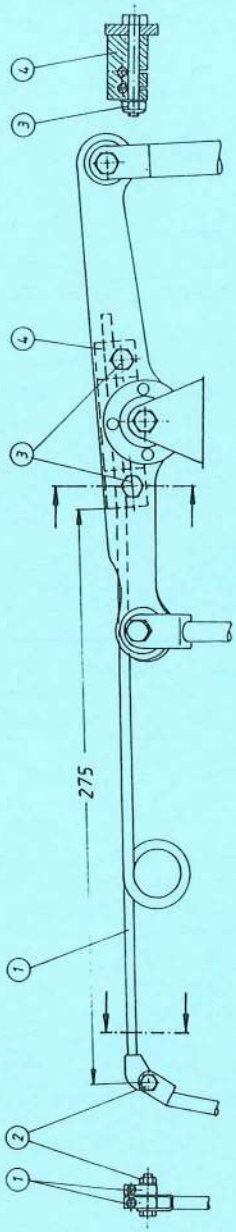
The German original of this Technical Note has been approved by the LBA under the date of Oct.15, 1996 (signature: WALTER). The translation into Englisch has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

ASK 23 /ASK 23B
Technical Note
No.11

Alexander Schleicher
GmbH & Co
Segelflugzeugbau
XXXXX
D-36163 Poppenhausen

//new zip code: D-36163

Installation drawing:



No	Designation	pc.
(1)	Trim spring (99 000 7829)	2
(2)	Screw M5 x 25, DIN 931-8.8	1
	Lock nut NM5, DIN 985-6	1
	Washer 5,3 DIN 125 - St	1
(3)	Screw M6 x 45, DIN 931-8.8	2
	Lock nut NM6, DIN 985-6	2
	Washer 6,4, DIN 125-St	2
(4)	Mounting for trim spring, version II, P/N 230.49.0104	1

Sheet 1 of 1	**ASK 23 / ASK 23 B** Technical Note No. 12	**Alexander Schleicher** GmbH & Co. Segelflugzeugbau D - 36163 Poppenhausen

Subject: A) Amendment of the Maintenance Manual.
B) Inspection Program To Increase The Service Life.

Serial number applicability: ASK 23 and ASK 23B, Data Sheet No.L-353. All serial numbers.

Compliance: A) Prior to the next annual C. of A. inspection, but before or on Dec. 31, 1997, at the latest.
B) Prior to reaching a total service life of 3000 flight hours respectively

Reason: The results of fatigue tests on fiber composite wings and wing spars have demonstrated that a service life of 12000 hours can be reached for these structural components. As the fatigue tests did not cover the entire (fiber composite) glider, the service life of 12000 hours can be granted only if the airworthiness of each individual glider (beyond the obligatory annual C. of A. inspections) is demonstrated in a special multi-step inspection program for the purpose of increasing the service life.

Action: The Maintenance Manual pages 1, 2a, 49, 50, and 62 must be exchanged for new pages with the same page no., but with the revision entry & date "TN 12 / 16.06.97". The Maintenance Instructions and other papers that are stated on the amended page 62, including this Technical Note itself, must be inserted into the Appendix of the Maintenance Manual, Section V.6.
The instructions and notes given in the amended manual pages must be regarded!
The accomplishment of the change to the Manual must be documented on the respective Page "Index of Corrections" in the Maintenance Manual.

Material & drawings: The manual pages, Maintenance Instructions, Technical Notes, AD-Notes, as well as the "Inspection Program To Increase The Service Life" can be obtained from Messrs. SCHLEICHER (Tel +49-6658-890 or Fax +49-6658-8940), or from the SCHLEICHER agency in your country. You always need to state the glider type and serial number.

Notes: The "Inspection To Increase The Service Life" must only be accomplished by the manufacturer or by a technical aviation service station holding an appropriate license; the accomplishment must be certified by a licensed aviation inspector in the glider logbook and in the glider inspection certificates.
The amendment to the Manual can be done by the operator of the glider himself.

Poppenhausen, June 16, 1997

Alexander Schleicher
GmbH & Co.

i.A. Lutz-W. Jumlow

(Lutz-W. Jumlow)

The German original of this Technical Note has been approved by the LBA under the date of 22. Juli 1997 (signature: FENDT).

The translation into English has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

ALEXANDER SCHLEICHER GMBH & CO., SEGELFLUGZEUGBAU
D-36161 POPPENHAUSEN/WASSERKUPPE

Tel. 06658-890 FAX 06658-8940

REPAIR MANUAL

REPAIR MANUAL

Issue February 1983

Amended and corrected	:	January 1994
Amended	:	July 1994
Amended	:	July 1998
Amended	:	April 1999

Published by the author ALEXANDER SCHLEICHER with the assistance of Martin Heide.
Translation into English has been done by best knowledge and judgement. In any case of doubt the original text in German language is controlling.

2. General Directions

Any material to be used for a repair must be suitable for the intended repair purpose, must fullfill the acceptance requirements of the competent Civil or Military Acceptance Authority, and must be stored according to the makers' prescriptions.
To ensure that these conditions are met, it is advisable to obtain a stock of fiber cloth, resin and hardener, as well as the manufacturer's main layer scheme drawings, already before the beginning of competitions and to store the materials (even the cloth) in airtight packs at about 20 °C. It is also advisable to make yourself familiar with the literature relevant to the subject on fiber composite repair methods.

We recommend -

in German: "Vorläufige Richtlinien für die Reparatur von GFK-Teilen (i.e. Provisional Guidelines for the Repair of GRP Components"); may be obtained from: DLR, Lilienthalplatz 7, 38108 BRAUNSCHWEIG.

or in English: MIL-HDBK-23 Part 1; may be obtained from: Government Printing Office, Washington 25 D.C., USA.

Abrupt change in thickness of laminate should be avoided in order to prevent stress concentration areas, and wherever possible the areas cut out should be oval and circular instead of rectangular. The transition between repair and undamaged area should be as gradual and smooth as possible.
The scarf or taper angles for fiber composite materials should be between 1 : 50 and to 1 : 100. Thin laminate layers cannot be scarfed; here the joints must overlap. In case of bi-directional cloth (equal number of fibers in warp and weft) the overlap lengths should be about 10 mm per 100 g/m^2 of cloth weight. With predominantly uni-directional cloth (reinforced warp) the overlap lengths of the warp should be ≈ 20 mm per 100 g/m^2. The weft fibers need not overlap. For exact values see diagram "Overlap Lengths".

Fiber composite materials are susceptible to water. Therefore, wet sanding of repaired areas must be avoided. For the same reason it is also important that all repaired areas be preserved by paint finish after the inspection - wherever necessary by a licensed inspector.

3. Repair Methods & Classification

The methods described hereafter apply only to smaller repairs. Major repairs must only be carried out by the manufacturer of the relevant part, or by an appropriately licensed aviation repair station; major repairs also require a new release inspection. Many references given hereafter apply to the repair of sandwich areas because they are particularly tricky for repair due to their structure. These described methods are analogously applicable to any simple fiber composite skin repair.

Repair Classification

Sometimes it may be necessary to do a temporary repair while the permanent repair over a larger area will then be carried out later by the manufacturer. Such provisional repairs are usually done mostly only superficially and are not the subject of these repair instructions.

Repairs are divided into the following classes, according to the extent to which the damage affects the airworthiness of the entire aircraft.

CLASS 1: Large area destructions requiring partial replacement of the component or a repair over a large area, i.e. damage to highly stressed components which impair the airworthiness, must only be repaired by the manufacturer of the relevant component, or by an appropriately licensed aviation repair station.

CLASS 2: Holes and fractures which e.g. run through a sandwich structure destroying both laminate skins, but only over a smaller area.

CLASS 3: Small holes and fractures in the outer skin which have not resulted in any internal damage, neither to the core material (foam, Balsa, tubus) nor to the inner laminate skin.

CLASS 4: Abrasions, scratches and grooves which do not involve a fracture or break.

4. Repair materials and useful aids

For all repairs it is important to know the number of layers, the cloth weight per m^2, and the fiber direction of the laminated cloth. This information is detailed in the layer scheme drawing of the component in question or can be inquired of the manufacturer. In an emergency, it is possible to establish the composition of a laminate by burning out the resin (gas welding torch) on a broken piece from the area needing repair.

The glass cloth used must be treated with Volan A finish, or I-550, and be stored in dry conditions. If in doubt, the glass cloth should be dried briefly with a fan heater before being used.
For GRP repair work the resin mixture to be used should be 100 parts (by weight) of Epikote 162 and 38 parts by weight of Laromin C 260 (Epikure 113).
Clean containers and thorough mixing (approx. 2 min.) are a basic pre-requisite to success. The pot life of a 100 g resin mixture is about 25 min. at 23 °C. When the mixture has gelled, i.e. has become noticeably more viscous, it must no longer be used, as it cannot wet out the cloth sufficiently any more. We point out distinctly that the original strength of a component cannot be achieved without final heat treatment (curing for 12 hours at 60 °C).
But temperatures above 80 °C must be avoided.

5. Preparing the parts for repair

Wherever possible all damaged components should be removed from the aircraft prior to their repair. They should then be cleaned with soap-suds and thoroughly dried. Now use a solvent (tri-chlor-ethylene, carbon tetra-chloride) to remove any wax and grease residues from the repair area. Finally the area is sanded using glass paper of grade 60 to 80. The surrounding areas are covered with stout paper or plastic foil to protect them from being soiled by resin drops.

6. Repair Classes

Class 4 Repair

Surface abrasions, scratches and grooves (provided the fiber glass laminate has not been damaged) usually ony require a new protective coat. Polyester paint is ideal for this (mixture of 100 parts UP gelcoat, white 03-69469, with 3 parts hardener 07-20500). To fill dee+er grooves, the paint can be allowed to gel slightly (about 30 min.). If the reinforcement layers have been damaged, the areas must be cleaned and, if necessary, smoothed down lightly with glass paper. Then one layer of fine glass cloth is applied over the area and covered with plastic foil. When the resin has hardened, use filler and re-paint.

Class 3 Repair

The damaged outer laminate skin is cut out over a sufficiently large area in rounded shapes. Be careful to remove any detached laminate layers from the core material. Then the edges of the damaged outer skin must be sanded down to a very flat taper. The laminate layers which become visible like contour lines, provide a good guide for the evenness of the taper. If the supporting core material has also been damaged, it must be removed, where necessary, right down to the inner laminate. Please note that the core material is repaired using Balsa wood of the specific weight 0.15 - 0.19 kg/dm^3. Scarf ratio is 1 : 5 in the direction of the fiber.

No scarf is made at right angles to the fiber direction. The foam core material - Conticell or Rohacell - is not scarfed (see Fig. 3a and 3b).
The cloth for the new outer laminate skin is now cut to size; where the largest cut piece should just cover the entire sanded area and the smallest cut piece should be the size of the removed core material area. All remaining layers should be graded in equal steps between these two extreme sizes.
A suitable technique is: a suitably larger piece of cloth is laid on a plastic foil and impregnated with resin, using a paint brush or a rubber smoother, then it is covered with a second plastic foil and all air bubbles and excess resin is squeezed out. Together with these foils the laminates are then cut to size.
Now first the new core material piece is impregnated and inserted in its place. Then the laminates are laid in, starting with the largest cut piece. To do this the bottom foil is torn off, the laminate inserted, and then the upper foil is peeled off, etc. All further repair steps are similar to those described under Class 4. For unsupported skin laminates proceed analogously. Perhaps it needs in this case first a piece of foam to be glued to the bottom surface to prevent the wet cloth laminate from sagging down (Fig.1.).

Class 2 Repairs

Damage which has penetrated both laminate skins, can be repaired as follows: all damaged areas in the skins and in the core material are cut out; the skins here again being cut in either oval or round shape. GRP laminate skins are sanded to a very flat taper (1 :50 up to 1 : 100) and the Balsa wood is scarfed in along the fiber direction (1 : 5). When the new core material has been inserted, the laminates are glued in as described under Class 3 repairs. First on one side only, and then after the first skin has cured completely, the laminate on the other side is glued on (Fig.2).

If there is no or only very difficult access to the inner skin of the sandwich, the repair area should be prepared as shown in Fig.3. Because the inner skins of the sandwiches (wing; tailplane) are very thin throughout, they cannot be scarfed, but only overlapped. However, this fact simplifies the repair somewhat as the lower laminate skin need not be scarfed.

The cloth layers of the upper laminate skin are prepared as described for Class 3 repairs. The lower skin layers are laminated onto the underside of the core material and then allowed to gel for 2 to 3 hours at 20 to 23 °C. Now fresh resin-hardener mixture is applied to the glue joints and the core piece with the lower laminate skin already glued on, is inserted and glued into place under light pressure. The upper laminate skin can then be repaired as described for Class 3 repairs.

If there is the risk (especially in the case of larger holes) that this thin, unsupported inner laminate skin will be displaced when the core material is glued in place, then it should be supported from the inside by some foam pieces beforehand. Styro-foam used with Uhu-por glue has proved useful here. If the inside area is inaccessible, the foam pieces can remain in these repaired areas permanently.

Class 1 Repairs

Such repairs should be reserved to the manufacturer or to an appropriately licensed aviation repair station. In any case the manufacturer and the competent Civil Aviation Authority must be contacted.

7. Summing up,

the following points are particulary important for successful repairs:

1. A bright, warm (20 °C), and dry room (50 % relative humidity).
2. Grease-free, cleanly sanded glue surfaces (watch hand sweat!).

3. Use of original materials; resin and hardener must not be older than 2 years.
4. Glass cloth treated with Volan A finish or I 550 finish, stored in dry condition. Observing pot life and curing time. A well mixed resin/hardener mixture (crystallized hardener can be regenerated by warming it up to 30 °C).

8. New Materials Carbon & Aramid

There are now in addition to the so far used standard glass fibers the late-technology carbon and aramid fibers (aramid is also known as Kevlar or PRD) which have alredy been used for main components in the series construction of the ASW 22. In composite with a resin system these materials are known as CFRP (Carbon Fiber Reinforced Plastics) and SFRP (S standing for the aramid fiber including Synthetic Fiber).

Components in various SCHLEICHER sailplanes are built from these new fibers, e.g. -

- Wing spar flanges	Carbon fiber rovings (ASW 22).
- Wing shells	CFRP-Conticell sandwich (ASW22)
- Fuselage tail boom	CFRP fabric strips (ASW 22)
- Control surfaces & flaps	SFRP and SFRP-Rohacell-sandwich (ASW 20 B/C and ASW 22)

The general repair instructions given here before for GRP fibers, are also applicable to the above new materials. Any differences for repairs with carbon and kevlar fibers are described hereafter.

Special Notes

Resin

When repairing CFRP and SFRP components it must be observed that these fibers require a different type of resin-hardener system than GRP repairs. In order to get the maximum use of the strength of carbon and kevlar fibers at higher temperatures, an epoxy resin must be used which provides still sufficient strength at 54 °C temperature.

For this reason the usual Epikote 162 cannot be used. SCHLEICHER uses for these components the resin L 160 with hardener 163 (100 parts resin : 28 parts hardener). The components must be cured at least 15 hours at above 55 °C.

Carbon fibers

Broken CFRP parts splinter badly so that there is increased risk of injury; gloves should always be worn when working on such fractures. A major disadvantage for such repairs is that the delaminations do not show distinctly by visible white areas - as in the case of glass repairs. To detect the extent of the damage, therefore, the areas surrounding a damaged region must be examined with the greatest care for hardly visible cracks, e.g. by loading or pressing them.
Even when only the paint appears to be damaged, you will find sometimes damage in a CFRP laminate where a GRP laminate would have been still undamaged underneath.

Basically cloth or rovings from carbon fibers can be worked up in the same way as glass fibers. If you have to repair laminates where the carbon fibers run into one direction only while glass fibers run in the other direction (e.g. Interglas 02902), such layers are treated as uni-directional or warp-reinforced layers and the glass need not be scarfed.
Overlap lengths of the different cloth weaves or rovings (mats) are given in the diagram. Note that the scarf length must only be half as long as the overlaps.

When wetting them with resin you will notice that the wetting through of the cloth is not visible. The solution here is to weigh the cut carbon piece which is to be used for the repair, and to work on it with the corresponding calculated resin-hardener amount. For a

CFRP laminate applied by hand the correct proportion of fiber weight is about 35 %; this means that the proportion of the resin used must be 65 % (exception: this does not apply to roving spars).

Aramid fibers

You will come across the first difficulty in working with Aramid right at the point when attempting to cut the cloth. This material can only be cleanly cut when using really sharp cutting tools (serrated cutters).
When sanding it, you will quickly realize that it is virtually impossible to obtain a sanded surface free from fiber fluff. It helps to rub it down wet with wet-and-dry paper. Of course. the sanded area must at once be dried thoroughly, using a fan heater, before further work is continued.

As the Kevlar fiber absorbs moisture, by which it will be deteriorated, it must be stored always in dry conditions or at least dried out before use.
Kevlar must be protected from UV light, both in its unprocessed and processed condition. A Kevlar repair area therefore must immediately be painted, using a paint with a UV-filter. The UP paints (former designation was PE paint) used by SCHLEICHER do contain this UV protection (titanium dioxide as white pigment).

Thin Kevlar skins as e.g. in the control surfaces and flaps of the ASW 22 cannot be scarfed and should be repaired by simple overlap. The resulting disalignment in height is corrected with filler and smoothed down. In view of aerodynamics this has no longer any influence for flaps or ailerons.

When repairing mass-balanced control surfaces their tailheavy moment must be checked in any case after the repair is done.

It may be useful to determine the tailheavy moment already prior to the repair. Thus it is possible to estimate whether it will at all be feasible to stay within the limits after a repair.
In case of large damage to these parts a replacement by new parts makes more sense anyhow.
Overlap lengths are given in the relevant diagram for Aramid. Scarf lengths are half as long as overlap lengths.

Dressings

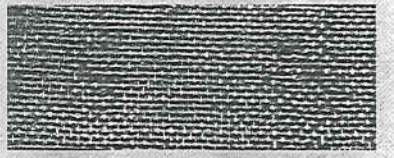
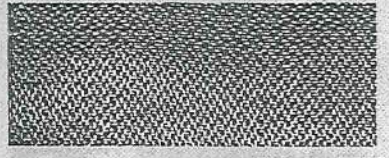
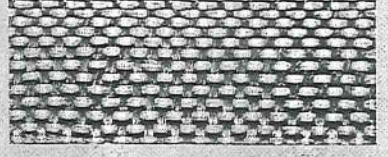
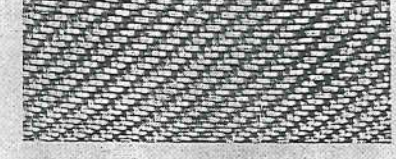
Carbon and Aramid fibers are treated with a dressing to make it possible to weave cloths from the fibers. For carbon fiber cloths this dressing also provides for better working qualities. It is an Epoxy resin which is used as dressing for carbon fiber.
The Aramid fibers are even dressed with a substance (poly vinyl alcohol) which is also used as a release agent. For this reason it is absolutely essential to wash out the Aramid cloth very thoroughly (dressing residue < 0.05 %).

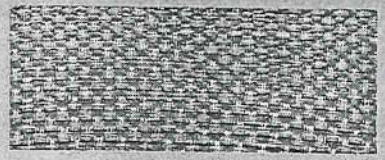
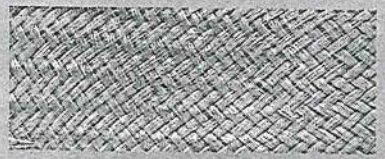
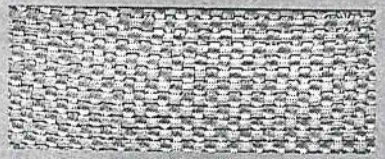
WARNING: Only such Aramid cloth qualities must be used where the manufacturer states explicitly that the dressing has been washed out.

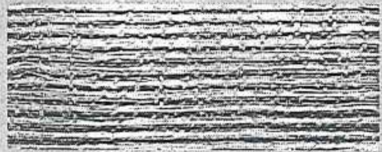
Latest service life fatigue tests with carbon laminates have demonstrated that the type of Epoxy resin used as dressing must match the resin with which the laminate has been made.
Therefore, it is important to use only the original materials stated.

9. Tables and Diagrams

6 Tables, 3 Figures, 3 Diagrams.

Muster / sample	weight g/m²	Gewebe - Bezeichnung (code) f. Glasfasern (glassfibre)		
		Interglas	LN 9169	remarks
	63	90070	8.4505.6	1610* * US-Spezifikation
	106	91110	8.4545.6	
	163	92100		
	163	92110	8.4548.6	

Muster / sample	weight g/m²	Gewebe - Bezeichnung (code) f. Glasfasern (glassfibre)		
		Interglas	LN 9169	remarks
	280	92115		1510* * US-Spezifikation
	280	92125	8.4551.6	
	395	92130		
	395	92140	8.4554.6	

Muster / sample	weight g/m^2	Gewebe - Bezeichnung (code) f. Glasfasern (glassfibre) Interglas	LN 9169	remarks
	220	92145	8.4520.6	
	430	92146	8.4525.6	

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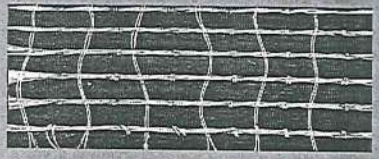
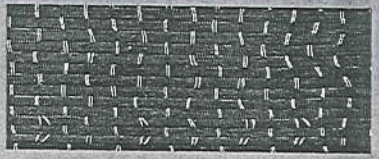
Muster / sample	weight g/m^2	Gewebe - Bezeichnung (code) f. Kohlefasern (carbonfibre)		
		producer	LN	remarks
	125	Rigilor AXT 125 / Carbotex CX 12		DEUTSCHE CARBONE AG / AEROTEX GMBH
	250	Rigilor AXT 250 / Carbotex CX 25		DEUTSCHE CARBONE AG / AEROTEX GMBH
	293	Sigratex KDU - 1001		SIGRI ELEKTRO-GRAPHIT GMBH
	293	Sigratex KDU - 1009		SIGRI ELEKTRO-GRAPHIT GMBH

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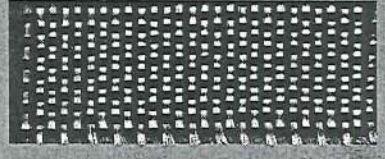
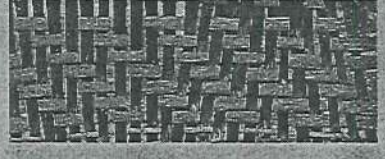
Muster / sample	weight g/m²	Gewebe - Bezeichnung (code) f. Kohlefasern (carbonfibre) producer	LN	remarks
	318	Sigratex KDU - 1012		SIGRI ELEKTRO-GRAPHIT GMBH
	190	02902		INTERGLAS
	200	03040		INTERGLAS
	245	03056		INTERGLAS

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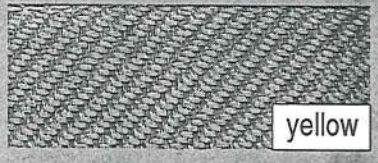
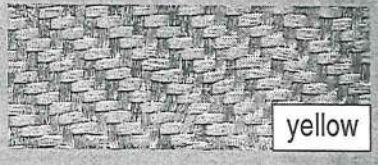
Muster / sample	weight g/m^2	Gewebe - Bezeichnung (code) f. Aramid-Fasern (-fibre)		
		Interglas	DIN 65 427	remarks
	63	98605	5.2230.3	120* * Mil-y 83370 A
	120	98608	5.2231.3	
	170	98612	5.2234.3	
	225	98631	5.2235.3	

Fig.1 REPARATUR DER KLASSE 3 / REPAIR CLASS 3

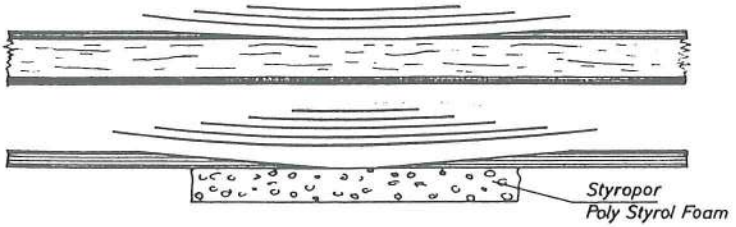


Fig.2 REPARATUR DER KLASSE 2/ REPAIR CLASS 2
(Innenseite zugänglich)/ (inside skin accessible)

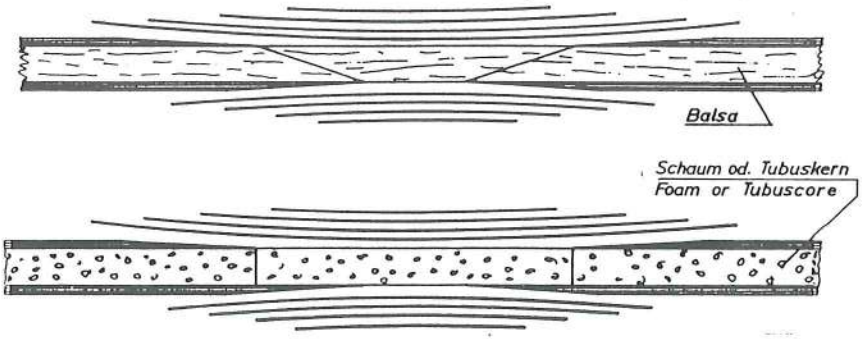


Fig.3a REPARATUR DER KLASSE 2 / REPAIR CLASS 2
(Innenseite unzugänglich)/ (inside skin inaccessible)

Vorbereitung der Reparaturstelle /Preparing the repair area

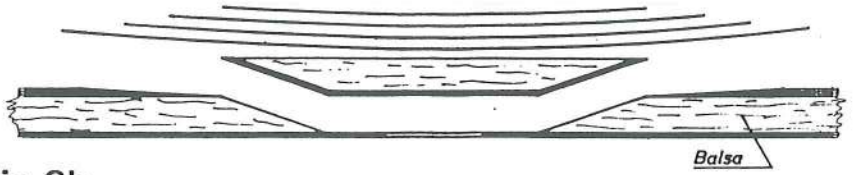
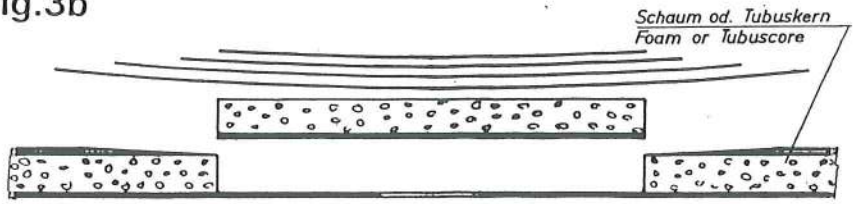
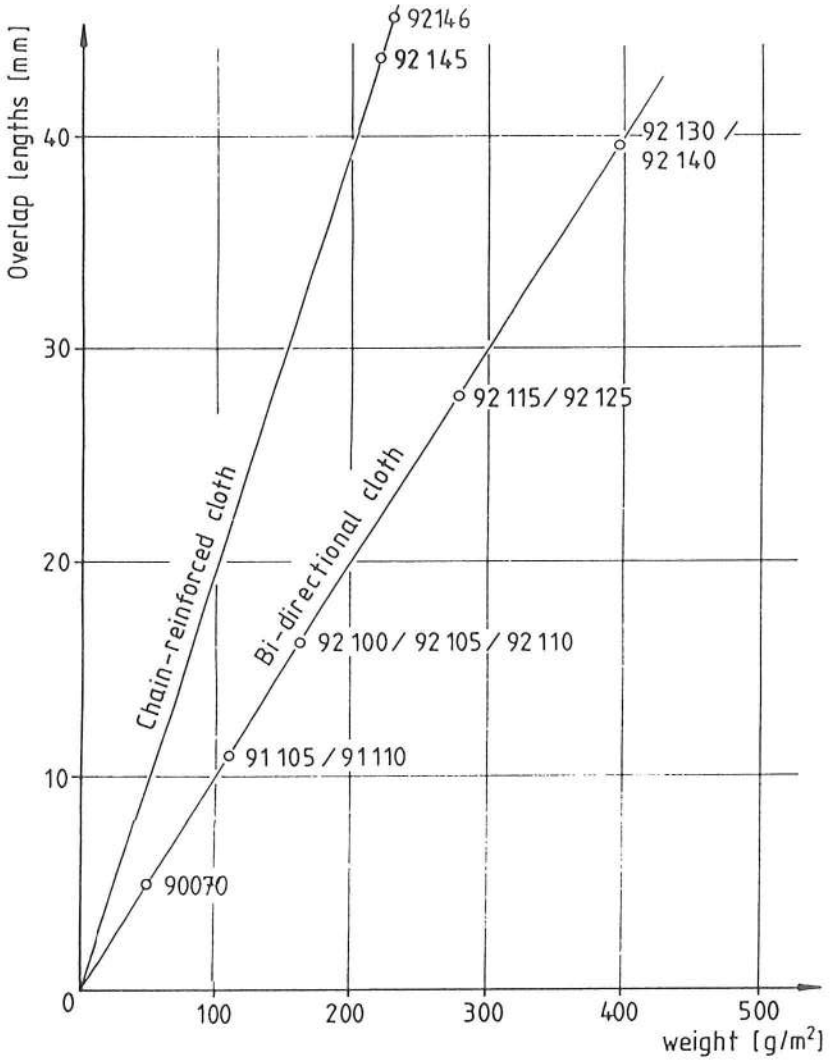


Fig.3b



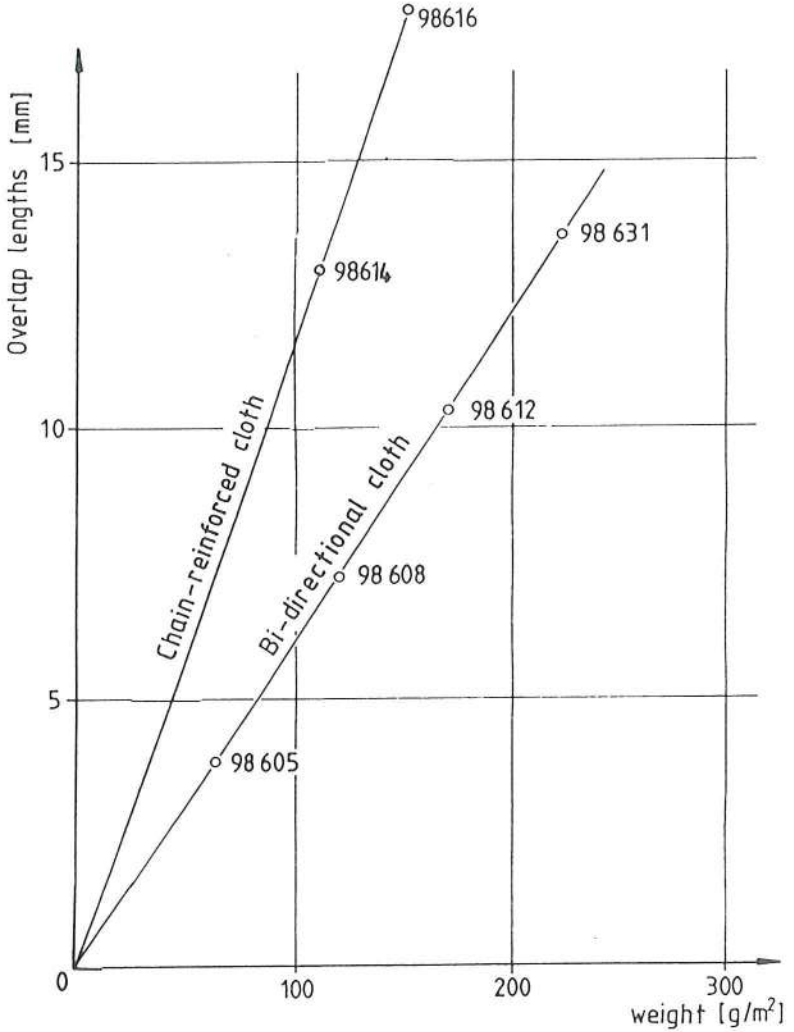
The taper of all scarf joints is shown greatly exaggerated.

Diagram: overlap length for glass fiber



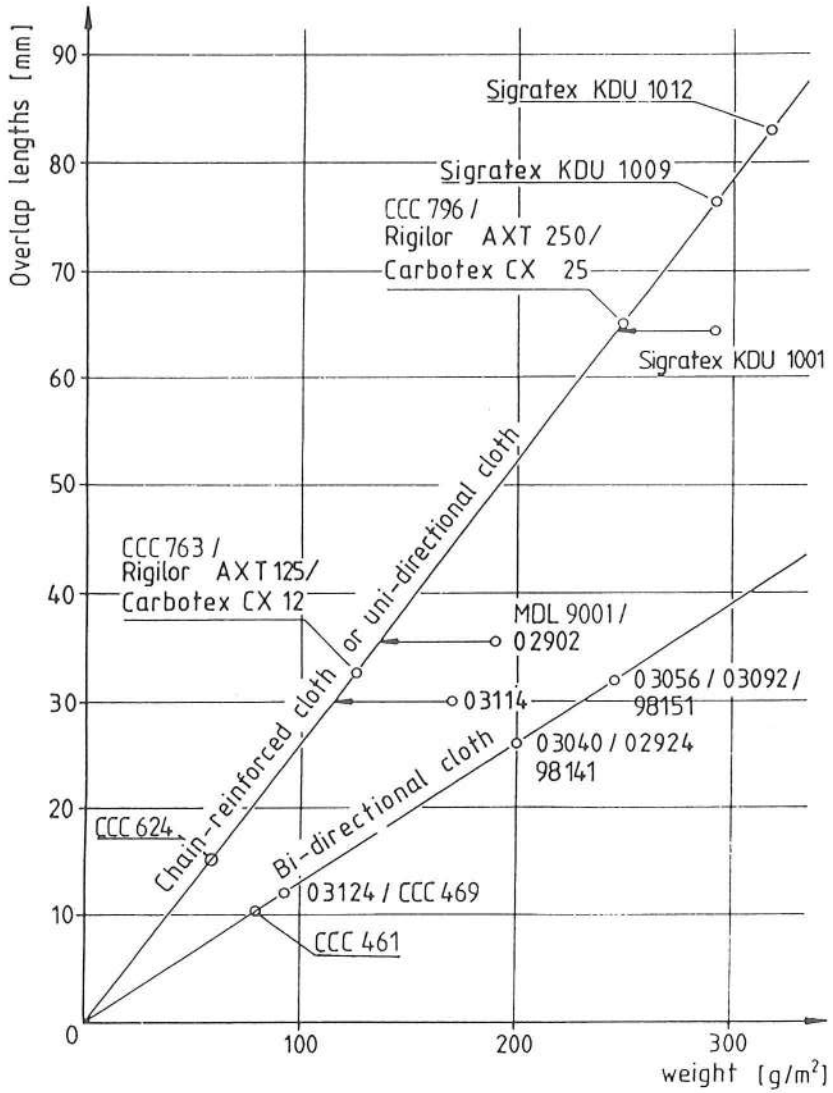
Scarf lengths are half as long as overlaps.

Diagram: overlap length for Aramid fiber



Scarf lengths are half as long as overlaps.

Diagram: overlap length for Carbon fiber



Scarf lengths are half as long as overlaps.

Materials used and supply reference: As per: 14.01.94

Any of the materials hereafter may be obtained by Messrs.ALEXANDER SCHLEICHER.

		formerly:	
Resin	Glycidäther 162	Epikote 162	Araldit LY 1525 BD
Hardener	Epikure 113	Laromin C 260	HY 2954
Manufacturer:		Manufacturer:	
Deutsche Shell Chemie GmbH		Ciba-Geigy AG	
Kölner Straße 6			
65760 Eschborn		Frankfurt/Main	

Resin	L 285	L 160
Hardener	H 285/286/287	H 163

Manufacturer: Martin G. Scheufler
Am Ostkai 21/22
70327 Stuttgart-Obertürkheim

Glass fiber cloth from E-Glass with Finish Volan-A or I 550	Carbon and Kevlar cloth
Manufacturer: CS-INTERGLAS AG Benzstraße 14 89155 Erbach	C. Cramer GmbH & Co. KG Weberstr. 21 48619 Heek-Nienborg

CARBON FIBER MATS

Carbotex CST 125, CST 250 / Rigilor AXT 125, AXT 250 with dressing for Epoxy resins.
To be supplied: from Messrs.ALEXANDER SCHLEICHER.

ROVINGS,

E-Glass: EC 9-756 K 43 (68) Manufacturer:
Vetrotex Deutschland GmbH
Bicherouxstraße 61
52134 Herzogenrath

Carbon fiber: KC 20 SDY LN 29 964 and CF-fabric strips (KDU)
Manufacturer: Sigri GmbH
Werner-von-Siemens-Straße 18
86405 Meitingen

FOAM MATERIALS

As per: 14.01.94

PVC hard foam 5.1360.2 according to DIN 29 898

	formerly:
Divinycell H 60	Conticell 60
Manufacturer:	Manufacturer:
Divinycell International GmbH	Continental AG
Max-von-Laue-Str. 7	
30966 Hemmingen	Hannover

PMI hard foam 5.1460.2 according to DIN 29 898 (Rohacell A71)
Manufacturer: Röhm GmbH
Chemische Fabrik
Kirschenallee 45
64293 Darmstadt

RESIN FILLERS:

Aerosil — Manufacturer: A+E Fischer
Postfach 13 02 45
65090 Wiesbaden

Cotton flocks, Type FB 1/035 (formerly Type FL 1f)
Manufacturer: Schwarzwälder Textilwerke
Postfach 4
77771 Schenkenzell

Micro balloon, white — Manufacturer: OMYA GmbH
Postfach 51 08 40
50944 Köln 51

PAINT

	formerly:
UP-gelcoat T 35 white	UP-gelcoat white 03-69 469
UP-hardener SF 2 / SF 10	UP-hardener No. 07-20 500
Thinner SF	Thinner No. 06-10 170
Manufacturer:	Manufacturer:
Martin G. Scheufler	AKZO Coatings GmbH
Am Ostkai 21/22	
70327 Stuttgart-Obertürkheim	Stuttgart

SHEET: 1 of 2	REPAIR INSTRUCTION for all Fiber Composite Aircraft Annex to the Repair Manual	Alexander Schleicher GmbH & Co. Segelflugzeugbau D-6416 Poppenhausen

new Post Code: D-36163

Subject: Repairs on fiber composite construction aircraft for which the original resin systems are no longer available in the market.

Serial number applicability: All serial no.s of SCHLEICHER aircraft made from fiber composite materials.

Reason: The first fiber composite aircraft types have been built almost 30 years ago and it becomes more and more difficult to obtain the original resin systems.
This repair instruction states which resin types can be used for which aircraft types on repairs.

Action: The following aircraft types made from glass fibers -

ASW 12 (all model variants and serial numbers)
ASW 15 (all model variants and serial numbers)
ASW 17 (all model variants and serial numbers; except for such fuselage built as per TN no.4, i.e. with carbon fiber)
ASW 19 (all model variants and serial numbers)
ASW 20 (all model variants and serial numbers; except for the control surfaces & flaps of ASW 20 B, BL and ASW 20 C, CL variants)
ASK 21 (all model variants and serial numbers)
ASK 23 (all model variants and serial numbers)

have been or are still built with the resin systems:
Epoxin 162 with hardener Laromin C260, subsequently renamed as:
Epikote 162 with hardener Epikure 113, subsequently renamed as:
Glycidether 162 with hardener Epikure 113.

In case that these original materials are no longer available, the following resin system can be used for the repair :
Scheufler L 285 with hardeners H 285 (rapid), or H 286 (medium) or H 287 (slow).

Primary structure components which have been built with the Scheufler resin system L 285, CANNOT be repaired with Epikote 162 / Epikure 113!

The carbon fiber reinforced ASW 17 fuselages as per TN no.4a were built with the resin system: Bakelite L 20 & hardener SL.

The ASW 22 (all model variants and serial numbers) was built with the resin system: CIBA XB 3052A & hardener XB 3052B; subsequently renamed as: LY 5053 & hardener HY 5052;
and with Scheufler resin L 160 and hardener H 161, H 162, H 162B or H 163, which was replaced after 1985 by the Scheufler resin L 285 with hardeners H 285, H 286 or H 287.

Alexander Schleicher
GmbH & Co.
Segelflugzeugbau
XXXXX D-6416 Poppenhausen

new Post Code: D-36163

The same resin systems as on the ASW 22 were also used for the control surfaces & flaps of ASW 20 B, BL and ASW 20 C, CL variants.

The aircraft types ASW 24, ASH 25 and ASH 26 E (all model variants and serial numbers respectively) were built only with the resin system: Scheufler L 285 with hardeners H 285, H 286 or H 287 - except for such heat-resistant engine parts which require explicitly other material.

For all before-mentioned aircraft types repairs can be done using either the original resin systems or Scheufler L 285 with hardeners H 285, H 286 or H 287 (depending on the desired pot life and curing conditions).

Any repair using Scheufler resin L 285 requires a post curing for about 12 hours at 58 - 62°C!

Notes:

Fuel Tanks:
ASK 14 and ASK 16 fuel tanks were built using the resin system: Epikote 162/Laromin C260.

Since the use of low-grade-benzole fuels (MOGAS-Eurosuper and Super Plus) these tanks have become blind and soft.

The fuel tanks for ASW 22 M, ASW 22 BE, ASW 24 E, ASH 25 E, and ASH 26 E, as well as new built tanks for ASK 14 and ASK 16 were built with: Bakelite L 20 & hardener H 91.

They must be repaired only with said Bakelite L 20 & H 91.

Poppenhausen, July 4, 1994

ALEXANDER SCHLEICHER
GmbH & Co.

Gerhard Waibel

The translation into English has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

Sheet 1 of 1	REPAIR INSTRUCTION CARBON FIBER CLOTH FOR ALL FIBER COMPOSITE AIRCRAFT Annex to the Repair Manual	**Alexander Schleicher** GmbH & Co. Segelflugzeugbau D - 36163 Poppenhausen

Subject: Repair and production of fiber composite aircraft for which the types of fabrics or roving layers as stated in the layer scheme drawings are no longer used.

Applicability: All AS aircraft, sailplanes and powered sailplanes, made from fiber composite reinforced plastics (FRP).

Reason: The designations of fabrics or roving layers have changed in the course of the years or are no longer in use and /or have been replaced by other types. This repair instruction states which types of fabrics or roving layers may be used as substitute.

Action: The materials Carbotex CX 12 or CST 125 (fabric weight 125 g/m², C-fiber percentage 120 g/m²) and Carbotex CX 25 or CST 250 (fabric weight 250 g/m², C-fiber percentage 240 g/m²) are no longer used.
For repair and production of FRP aircraft or FRP structural components the following substitute fabrics or layer styles may be used and the layer scheme drawings amended correspondingly.

Substitute for Carbotex CX 12 and CST 125, respectively:

Designation	Fabric weight	C-fiber percentage	Supplier	
ITG 98320 (03 340)	132 g/m²	121 g/m²	Interglas	
MDL 9001	140 g/m²	120 g/m²	Sigri	
CCC - Style 763	140 g/m²	120 g/m²	Kramer	X)

Substitute for Carbotex CX 25 and CST 250, respectively:

Designation	Fabric weight	C- fiber percentage	Supplier	
Sigratex KDU - 1001 (75 mm wide)	293 g/m²	248.4 g/m²	Sigri	
Sigratex KDU - 1009 (75 mm wide)	293 g/m²	282.4 g/m²	Sigri	X)
Sigratex KDU - 1012 (150 mm wide)	319 g/m²	300.4 g/m²	Sigri	X)
2 layers ITG 98320	132 g/m²	121 g/m²	Interglas	
2 layers CCC - Style 763	140 g/m²	120 g/m²	Kramer	
CCC - Style 796	280 g/m²	247 g/m²	Kramer	X)

X) Currently available ex stock from SCHLEICHER!

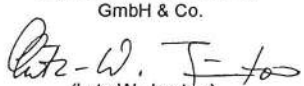
This Repair Instruction must be inserted as Annex into the Repair Manual !

Notes: All fabric or roving layer materials can be ordered from

Alexander Schleicher GmbH & Co.
PO Box 60
D-36161 Poppenhausen
Tel +49 6658 890 or Fax +49 6658 8940

Poppenhausen, July 7, 1998

Alexander Schleicher
GmbH & Co.

By order 
(Lutz-W. Jumtow)

Sheet 1 of 1	**Technical Note No. 01-99** for all aircraft types of Glass Fiber & Fiber Composite Construction	**Alexander Schleicher** GmbH & Co. Segelflugzeugbau D - 36163 Poppenhausen

Subject: New resin system for laminating glass, carbon, and Aramid fiber cloth

Applicability: All AS aircraft - sailplane and powered sailplane types - for which resin laminating systems are used.

Compliance: None.

Reason: The resin manufacturer Martin G. Scheufler has developed a laminating resin L 335 with the hardeners H 335, H 335 - 340 and H 340 which can be used instead of the resin system Epikote 162 with hardeners Epikure 113 or Laromin C 260 respectively. Production of the resin system Epikote / Epikure will be discontinued.

This laminating resin system is qualified by the tests as prescribed by the Luftfahrt-Bundesamt (LBA) in the Guidelines for Resin Fiber Composite Structures (German: RHV) and has been certified by the LBA for the aviation industry.

Action: For all fiber composite components which were built using the resin system Epikote 162 with hardeners Epikure 113 or Laromin C 260 respectively, now the laminating resin L 335 with the hardeners H 335, H 335 - 340 and H 340 can be used when the components are new built or repaired.

Spars **must not** be repaired nor new built with the laminating resin L 335 and the hardeners H 335, H 335 - 340 and H 340. In case of doubt it is required to contact the company Alexander Schleicher.

Components which have been repaired or new built with the resin L 335 must be cured for 15 h at a temperature of 55 - 60 C°.

This TN must be inserted as annex into the AS Repair Manual.

Notes: The resin system L 335 can be obtained from :

Alexander Schleicher GmbH & Co.
P.O. Box 60
D-36161 Poppenhausen/Wasserkuppe
Tel 06658 - 890 or Fax 06658 - 8940 or email AS-sailplanes@Fulda.net

Poppenhausen, March 12, 1999

Alexander Schleicher
GmbH & Co.

by order Lutz-W. Jumtow

(Lutz-W. Jumtow)

The German original of this Technical Note has been approved by the LBA under the date of March 16, 1999, (signature: JUNG). The translation into English has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

Sheet 1 of 1	**Technical Note No. 02-99** for all aircraft types of Glass Fiber & Fiber Composite Construction	Alexander Schleicher GmbH & Co. Segelflugzeugbau D - 36163 Poppenhausen

Subject: New finish for glass fiber cloth

Applicability: All AS aircraft - sailplane and powered sailplane types - which use glass fiber cloth for their construction.

Compliance: None.

Reason: CS-INTERGLAS AG, the manufacturer of glass fibers, has developed a new finish for Polyester resin (UP), Vinyl ester resin (VE), Epoxy resin (EP), and Polyamid systems (PA); this new finish replaces the previous finish types.

The new finish FK 800 made on the basis of Amino-Silan, offers the following advantages:
- lower Chloride values
- faster wetting of the cloth
- improved adhesion between cloth and resin system
- Chrome contents 0%
- excellent mechanical properties.

This finish is qualified by the tests as prescribed by the Luftfahrt-Bundesamt (LBA) in the Guidelines for Resin Fiber Composite Structures (German: RHV) and has been certified by the LBA for the aviation industry.

Action: Glass fiber cloth with the new finish FK 800 can be used for all fiber composite components, either for new built parts or for repairs, instead of the previously used glass cloth types.

This TN must be inserted as annex into the AS Repair Manual.

Poppenhausen, March 15, 1999

Alexander Schleicher
GmbH & Co.

by order Lutz-W. Jumtow

(Lutz-W. Jumtow)

The German original of this Technical Note has been approved by the LBA under the date of April 6, 1999, (signature: JUNG). The translation into English has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

Sheet 1 of 1	**Technical Note No. 03-99** for all aircraft of the production series ASH, ASK & ASW	**Alexander Schleicher** GmbH & Co. Segelflugzeugbau D - 36163 Poppenhausen

Subject: New material specifications for copper-zinc alloys (formerly brass).

Applicability: All AS aircraft - sailplane and powered sailplane types - currently in production as well as manufacture of spare parts for those formerly in production.

Compliance: None.

Reason: DIN 17 660 and 17 661 standards contain partly changed specifications, material abridged signs or numbers respectively, for copper-zinc alloys (formerly brass). The brass as originally stated in the drawings is no longer available in economical quantities.

Action: This TN supersedes the material specifications for copper-zinc alloys (formerly brass) on the respective existing drawings and must be inserted as annex into the AS Repair Manual.

Material: Instead of the brass material specifications which were so far stated in the drawings now the following material abridged signs and numbers can be used as substitute:

Material Abridged Sign	Material Number	Tensile Strength N/mm²	DIN
Cu Zn39 Pb2, hard F43 H120 (Ms 58)	2.0380.26	min. 430	17 660 / 17 670
Cu Zn39 Pb3, hard F43 H120 (Ms 58)	2.0401.26	min. 430	17 660 / 17 661
Cu Zn40 Pb2, hard F44 H125 (Ms 58)	2.0402.26	min. 440	17 660 / 17 661
Cu Zn37, hard F44 H140 (Ms 63)	2.0321.30	min. 440	17 660 / 17 661
Cu Zn37, hard F54 H170 (Ms 63)	2.0321.32	min. 540	17 660 / 17 661
Cu Zn37, hard F61 H200 (Ms 63)	2.0321.34	min. 610	17 660 / 17 661
Cu Zn40 Al2 *) (So MS 58 Al2)	WL 2.0564.0+8	min. 550	17 661

*) To be used as first choice, where possible!
Former abridged sign in brackets! (Ms = brass)

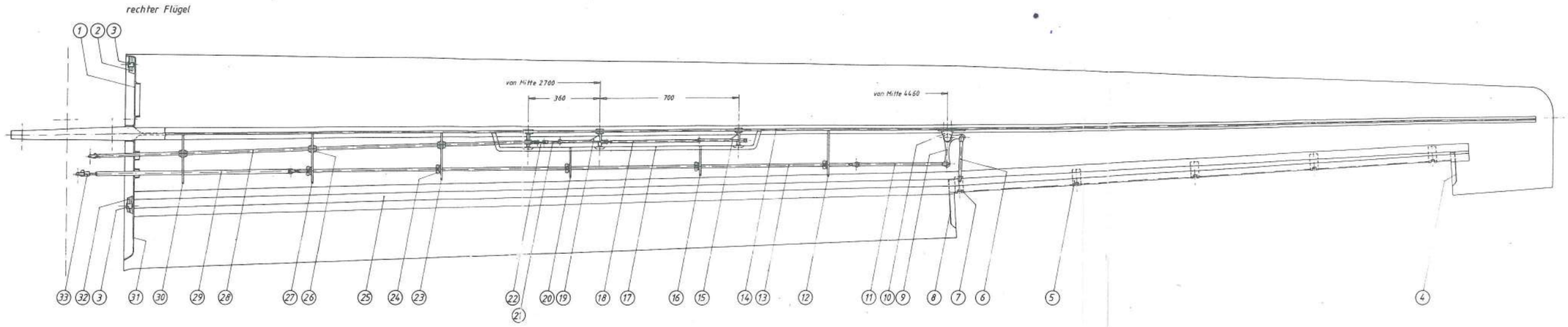
Drawings: The brass material specifications which were so far stated in the drawings are herewith replaced by the material abridged signs and numbers respectively in this TN. The respective drawings need not be changed.

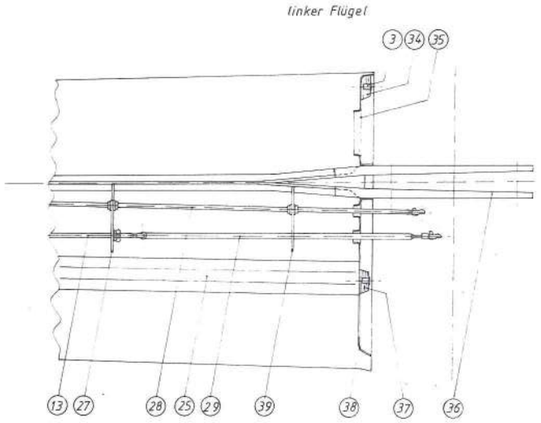
Poppenhausen, March 26, 1999

Alexander Schleicher
GmbH & Co.

by order
(Lutz-W. Jumtow)

The German original of this Technical Note has been approved by the LBA under the date of April 6, 1999, (signature: JUNG). The translation into English has been done by best knowledge and judgement; in any case of doubt the German original is controlling.

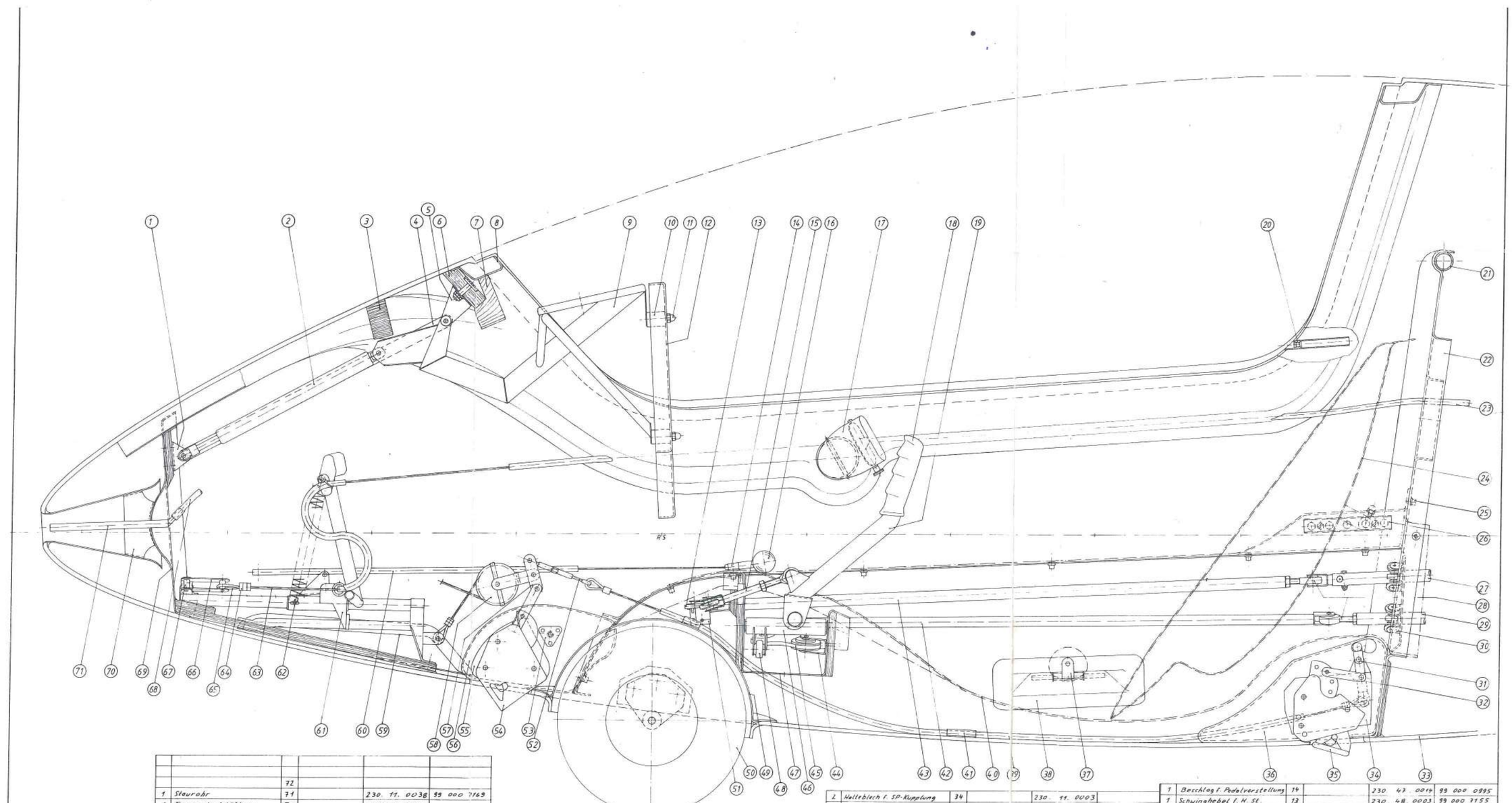




St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung
1	Rippe 1, li.	39		230.51.0106	
1	Wurzelrippe hinten li.	38		230.51.0152	
1	Klotz f. Querkraftauge, hinten li.	37		230.11.0102	
1	Holm kompl. li.	36		230.51.1001	
1	Wurzelrippe vorne li.	35		230.51.0151	
1	Klotz f. Querkraftauge, vorne li.	34		230.51.0102	
2	Gelenkkopf M10x1, verstellbar	33		230.41.0010	99.000.2350
1	Klotz f. Querkraftauge, hinten re.	32		230.52.0102	
1	Wurzelrippe hinten, re.	31		230.52.0152	
2	Rippe 1, re.	30		230.52.0106	
2	Stoßstange V f. QR-St.	29		230.41.0011	
2	Stoßstange III f. BK-St.	28		230.43.0014	
2	Rippe 2	27		230.51/52.0107	
6	Filzführung	26		230.11.0112/13	
2	Hilfsholm (Z-Steg)	25		230.51/52.0156	
10	Stoßstangenführung	24		230.51.0006	99.000.2090
2	Rippe 3	23		230.51/52.0108	
2	Kniehebel f. BK	22		230.43.0016	99.000.3441
2	Stoßstange IV f. BK-St.	21		230.43.0017	
2	Rippe 4	20		230.51/52.0109	
2	Hebel f. BK, innen	19		230.43/44.0001	
2	Verbindungsstange f. BK-Hebel	18		230.43.0005	
2	Klappenkasten	17		230.51/52.0153	
2	Rippe 5	16		230.51/52.0110	
2	Hebel f. BK, außen	15		230.43/44.0002	
1	Holm kompl. re	14		230.52.1001	
2	Stoßstange VI f. QR-St	13		230.41.0012	
2	Rippe 6	12		230.51/52.0111	
2	Stoßstange VII f. QR-St	11		230.41.0013	99.000.7168
2	Lagerbock f. QR-St	10		230.51.0005	99.000.4165
2	Umlenkhebel III f. QR-St	9		230.41.0014	99.000.8085
2	innere QR-Rippe	8		230.51/52.0154	
2	Festlager Ø6 f. QR	7		230.51.0157	99.010.4621
2	Stoßstange VIII f. QR-St	6		230.41.0015	
8	Loslager Ø6 f. QR	5		230.51.0158	99.010.4622
2	äußere QR Rippe	4		230.51/52.0155	
4	Querkraftauge	3		230.51.0004	99.332.0082
1	Klotz f. Querkraftauge, vorne re	2		230.52.0102	
1	Wurzelrippe vorne re	1		230.52.0151	
St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung

	Datum	Name	Typ	Benennung	Maßst.
Bearb.	09.05.84	Juw	ASK 23	Flügel-Übersicht	1:10
Gepru					
Norm					
A. Schleicher Segelflugzeugbau 6416 Poppenhausen			Zeichnungsnummer	L-353	Blatt
			230.51/52. S 3		Bl.
Zust.	Änderung	Datum	Na.	Urspr.	Ers. f.	Ers. d.

Datum: DATE: 01.02.85	Bearbeiter: AUTHOR: Jumtow	Änderung: CORRECTION:



St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung
		72			
1	Staurohr	71		230. 11. 0038	99 000 7169
1	Trompete f. Lüftung	70		230. 11. 0152	
1	Spant f. Lüftung	69		230. 11. 0153	
1	Instrumentenschlauch, grün	68	PVC - weich	Ø8 x 1,5 - 1000	
4	Buchse f. Seil-Ausgleichsblech	67		230. 47. 0015	99 103 0009
4	Seil-Ausgleichsblech	66		230. 47. 0008	99 000 7172
2	Kausche 3,5	65		DIN L 69	
2	Seilklemme Nico-press	64		28-3-M Ø 3,2	
2	Flugzeugseil Ø3,2 x 7700	63		LN 9374	
2	Zugfeder f. Pedale	62		230. 47. 0011	
1	Fußsteuer, kompl.	61		230. 47. 1001	
1	Pedal-Verstellrohr	60		230. 47. 0009	99 000 22 77
2	Hacken auflage	59		230. 11. 0154	
1	Umlenkrolle, hinten-Kuppl.-zug	58		230. 11. 0004	99 000 8905
2	Lasche f. Kupplungszug	57		230. 11. 0024	99. 000 4131
2	Steg f. FS-Kupplung	56		230. 11. 0155	
2	Halteblech f. FS-Kupplung	55		230. 11. 0013	99 000 2801
1	FS-Bugkupplung	54		"E 72 oder E75"	Tost
2	Halterung f. Trimmgewichte	53		230. 49. 0001/8	
1	Spannschloß A 4	52		DIN L 85	

St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung
1	Halterung f. Trimm Feder	51		230. 49. 0103	99 010 2478
1	Bugrad 260 x 65	50		Nabe 4" B5/17	Tost
1	Bugradkasten, kompl.	49		230. 11. 1003	
1	Stoßstange I f. QR-St.	48		230. 41. 0003	99 000 8073
1	Steuerkasten	47		230. 11. 0157	
1	Kardengelenk II	46		230. 41. 3001	99 000 3439
1	Umlenkhebel I f. QR-St.	45		230. 41. 0004	99 000 8067
2	Lagerbock f. QR-Umlenkhebel I	44		230. 11. 0042	
1	Stoßstange II f. H.-St.	43		230. 48. 0004	
1	Stoßstange II f. QR-St.	42		230. 41. 0005	
2	Schlauchschelle III 14Ø B	41		230. 11. 0177	99 010 8207
1	Sitzwanne	40		230. 11. 0146	
1	Tecalonrohr 80 Ø8 x 1 - 1000	39		DIN 73383-PA 11h	
2	Halterung f. Bauchgurtbeschlag	38		230. 11. 0176	
2	Bauchgurtbeschlag	37		230. 11. 0011	99 000 1030
2	Steg f. SP-Kupplung	36		230. 11. 0159	
1	SP-Schleppkupplung	35		Europa "G72 und G73"	Tost

St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung
2	Halteblech f. SP-Kupplung	34		230. 11. 0003	
1	Rumpfschale	33		230. 11. 0175	
2	Antriebsblech f. SP-Kupplung	32		230. 11. 0018	99 000 8070
1	Umlenkhebel f. SP-Kupplung	31		230. 11. 0017	99 000 8100
2	Stoßlagenführung	30		230. 11. 0012	99. 000 2090
1	Stoßstange III f. QR-St.	29		230.41. 0006	
3	Gelenkkopf M8x40	28		36580 SKF	
1	Stoßstange III f. H. St.	27		230. 48 0005	
2	Raste f. Sitzlehne	26		230. 11. 0029	99 000 5146
	Blindnietmutter M5x7 - 11,5 F	25	AL-Leg		Gesipa
1	Ruckenlehne	24		230. 11. 0167	
2	Tecalonrohr 80 Ø8x1 - 6500	23		DIN 73383-PA 11h	
1	Hauptspant I vorne	22		230. 11. 0160	
2	Querkraftrohr	21		230. 11. 0008	
1	Buchse f. Verriegelungsbolzen	20		230. 11. 0010	99 333 0005
1	Steuerknüppel	19		230. 48. 0001	99 000 7145
1	Griff f. Steuerknüppel	18		230. 48 0101	schwarz
1	Lüftungseinsatz, kompl.	17		230. 11. 1002	99 010 4130
1	Kugelgriff f. Pedalverstellung	16		230. 47. 0101	grau
1	Stoßstange I f. H. St.	15		230. 48. 0002	99 000 7500

St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung
1	Beschlag f. Pedalverstellung	14		230. 47. 0014	99 000 0995
1	Schwinghebel f. H. St.	13		230. 48. 0003	99 000 7155
1	Instrumentenbrett	12		230. 11. 0161	
3	Hutmutter M6	11		DIN 1587 - MS	
3	SH-Puffer 20 x 25 A	10		Gew. Biz. M6 x 19	Fa. ARGU
1	Haubengelenk II	9		230. 12. 0001	99 006 2658
1	Haubenrahmen, rumpfseitig	8		230. 11. 0158	
1	Anschlag II f. Haubengelenk	7		230. 11. 0103	
1	Verstärkung f. Lagerbock	6		230. 11. 0104	
1	Lagerbock f. Haubengelenk	5		230. 11. 0005	
2	Zugband f. Gasdruckfeder	4		230. 11. 0050	99 000 3791
1	Anschlag I f. Haubengelenk	3		230. 11. 0102	
1	Gasdruckfeder	2			700 N
2	Winkel f. Gasdruckfeder	1		230. 11. 0028	

St.	Bemerkung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung

Zust.	Änderung	Datum	No	Ursprung

	Datum	Name
Bearb.	26.10.84	Jumtow
Gepru.		
Norm.		

A. Schleicher Segelflugzeugbau 6418 Poppenhausen

Typ: ASK 23

Benennung: Rumpf-Vorderteil rechts

Maßst.: 1: 2,5

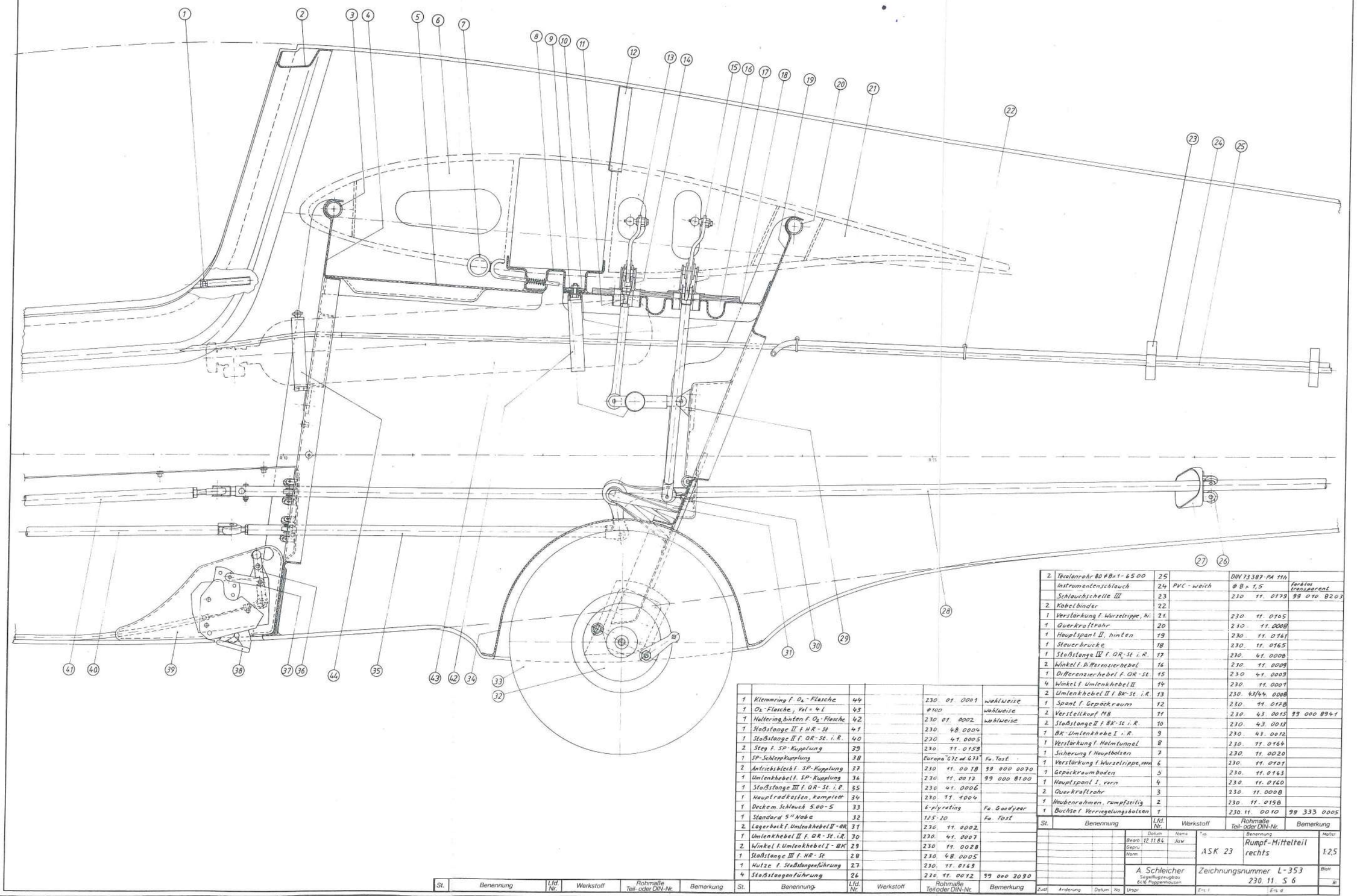
Zeichnungsnummer L-353 230. 11. S 4

Blatt: Bl.

Ers. f.:

Ers. d.:

Datum: DATE: 01.02.85	Bearbeiter: AUTHOR: Jumtow	Änderung: CORRECTION:



St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung
1	Klemmring f. O_2-Flasche	44		230. 01. 0001	wahlweise
1	O_2-Flasche, Vol = 4 l	43		Ø100	wahlweise
1	Halterung hinten f. O_2-Flasche	42		230. 01. 0002	wahlweise
1	Stoßstange II f. HR-St	41		230. 48. 0004	
1	Stoßstange II f. QR-St. i.R.	40		230. 41. 0005	
2	Steg f. SP-Kupplung	39		230. 11. 0159	
1	SP-Schleppkupplung	38		Europa G72 od G73	Fa. Tost
2	Anrickblech f. SP-Kupplung	37		230. 11. 0018	99 000 0070
1	Umlenkhebel f. SP-Kupplung	36		230. 11. 0013	99 000 8100
1	Stoßstange III f. QR-St. i.R.	35		230. 41. 0006	
1	Hauptradkasten, komplett	34		230. 11. 1004	
1	Deckem. Schlauch 5.00-5	33		6-ply rating	Fa. Goodyear
1	Standard 5" Nabe	32		125-20	Fa. Tost
2	Lagerbock f. Umlenkhebel II - QR	31		230. 11. 0002	
1	Umlenkhebel II f. QR-St. i.R.	30		230. 41. 0007	
2	Winkel f. Umlenkhebel I - BK	29		230. 11. 0028	
1	Stoßstange III f. HR-St	28		230. 48. 0005	
1	Hülze f. Stoßstangenführung	27		230. 11. 0163	
4	Stoßstangenführung	26		230. 11. 0012	99 000 2090
2	Tecalenrohr 80 Ø B x 1 - 6500	25		DIN 73387-PA 11h	
	Instrumentenschlauch	24	PVC - Weich	Ø B x 1,5	farblos transparent
	Schlauchschelle III	23		230. 11. 0179	99 010 8203
2	Kabelbinder	22			
1	Verstärkung f. Wurzelrippe, hi.	21		230. 11. 0165	
1	Querkraftrohr	20		230. 11. 0008	
1	Hauptspant II, hinten	19		230. 11. 0161	
1	Steuerbrücke	18		230. 11. 0165	
1	Stoßstange IV f. QR-St i.R.	17		230. 41. 0008	
2	Winkel f. Differenzierhebel	16		230. 11. 0009	
1	Differenzierhebel f. QR-St.	15		230 41. 0003	
4	Winkel f. Umlenkhebel II	14		230. 11. 0007	
2	Umlenkhebel II f. BK-St. i.R.	13		230. 43/44. 0008	
1	Spant f. Gepäckraum	12		230. 11. 0118	
2	Verstellkopf M8	11		230. 43. 0015	99 000 8941
2	Stoßstange II f. BK-St i.R.	10		230. 43. 0013	
1	BK-Umlenkhebel I i.R.	9		230. 43. 0012	
1	Verstärkung f. Helmtunnel	8		230. 11. 0164	
1	Sicherung f. Hauptbolzen	7		230. 11. 0020	
1	Verstärkung f. Wurzelrippe, vorn	6		230. 11. 0101	
1	Gepäckraumboden	5		230. 11. 0163	
1	Hauptspant I, vorn	4		230. 11. 0160	
2	Querkraftrohr	3		230. 11. 0008	
1	Haubenrahmen, rumpfseitig	2		230. 11. 0158	
1	Buchse f. Verriegelungsbolzen	1		230. 11. 0010	99 333 0005

St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung

Zust.	Änderung	Datum	Ng.
	Urspl.		

Datum: 12.11.84 Name: Juw

Gepru

Norm

A. Schleicher Segelflugzeugbau 6416 Poppenhausen

Fab. ASK 23

Benennung: Rumpf-Mittelteil rechts

Maßst. 1:2,5

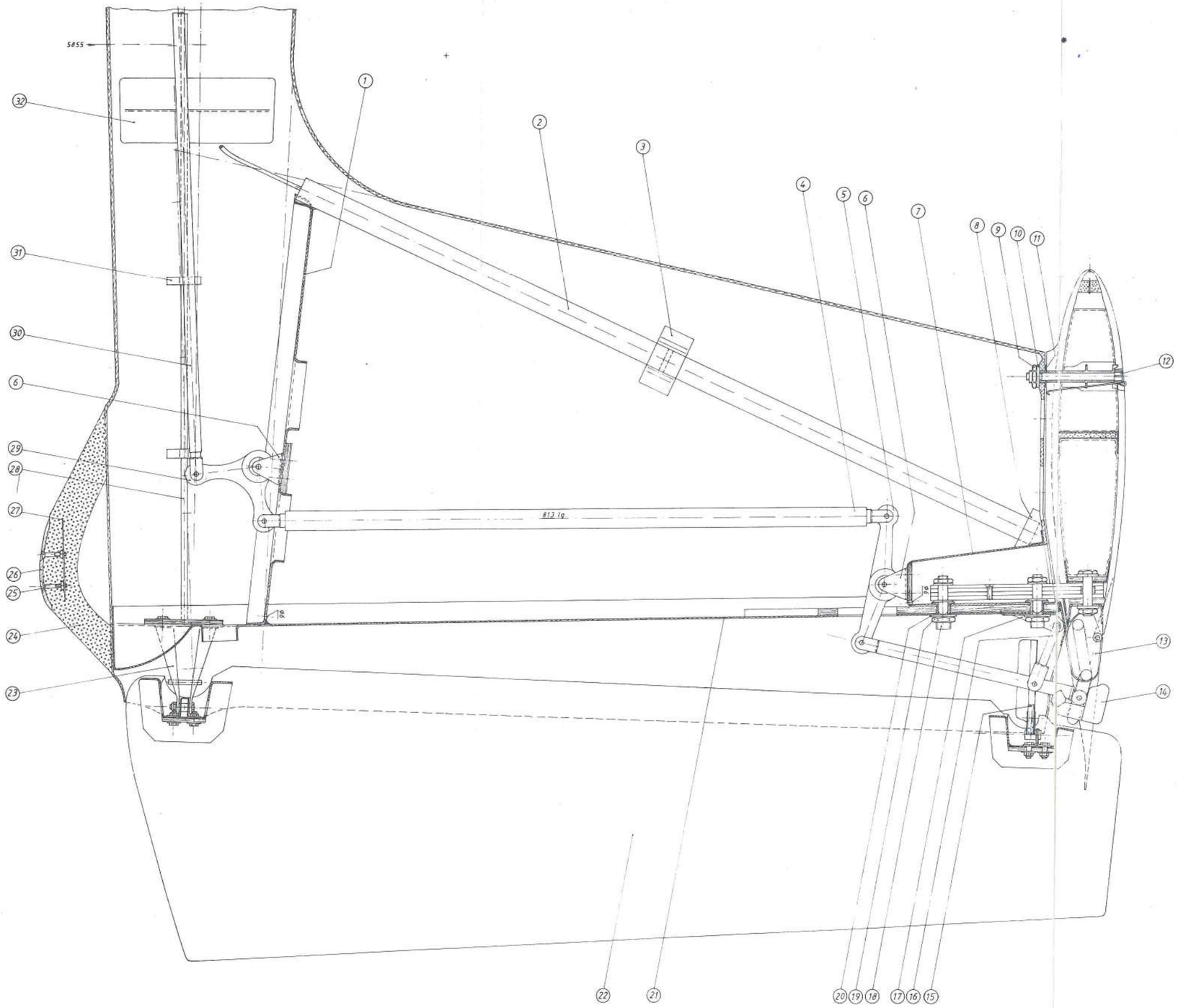
Zeichnungsnummer L-353 230. 11. S 6

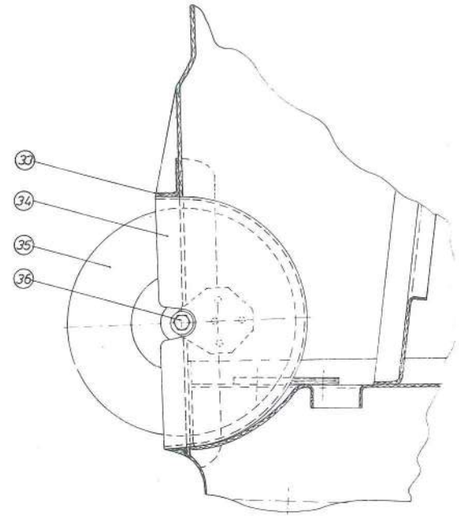
Blatt

Ers. f.

Ers. d.

Datum: DATE:	Bearbeiter: AUTHOR:	Änderung: CORRECTION:
01.02.85	Jumtow	





St.	Benennung	Lfd. Nr.	Werkstoff	Rohmaße Teil- oder DIN-Nr.	Bemerkung
1	Radachse M8 x 100 x 88	36			
1	Rad 210 x 65, kompl. m. Felge	35			
1	Radkasten	34			99.010.5470
	Glasgewebe	33	3 Lagen 92140 ☆		
1 Paar	Spant - Rumpf - SFL - Übergang	32		230.11.0130	
4	Schlauchschelle I	31		230.11.0132	99 010 8201
1	Stoßstange III f. H-St.	30		230.48.0005	
1	Umlenkhebel I f. H-St.	29		230.48.0006	99 000 8080
2	Tecalan-Rohr - BO DIN 73387 - PA 11	28		ϕ 8 x 1 - 7000	
1	Ankerplatte	27		230.25.0002	99 000 7450
1	Sporn - Löffel	26		230.29.0001	99 000 7640
2	Senkkopfschraube M6 x 35	25		DIN 963 - 06	
1	Sporn, kompl.	24	Integralschaum	230.29.1001	99 010 8173
1	Lagerbock f. SR, unten	23		230.32.0003	
1	Seitenruder, kompl.	22		230.38.1001	
1	Holm f. SFL.	21		230.37.0151	
2	Scheibe ϕ 18/34 - 2	20			
2	Sechskantmutter M18 x 1,5	19		DIN 439 - 06	
2	Bundbuchse f. T-Beschlag	18		230.37.0001	
1	Lagerbock f. Parallelschwinge	17		230.32.0004	
1	Parallelschwinge	16		230.48.0010	99 000 4940
1	Lager f. SR, oben	15		230.37.0002	
1	Antriebsstange f. HR	14		230.48.0009	
1	Hohenruder, kompl.	13		230.35.1001	
1	Nasenbolzen	12		230.33.0002	
1	Bundbuchse f. Nasenbolzen	11		230.32.0006	99 332 0094
1	Scheibe 16	10		DIN 126 - St	
1	Sechskantmutter M16 x 1,5	9		DIN 439 - 06	
	Glasseidenband 3595 L/40	8		1 Lage	
1	Kasten f. T-Beschlag	7		230.37.0153	
2	Lagerbock, schräg	6		230.37.0005	99 000 4130
1	Umlenkhebel II f. H-St.	5		230.48.0008	99 000 8066
1	Stoßstange IV f. H-St.	4		230.48.0007	
1	Halter f. Antenne	3		230.32.0154	
1	UKW-Sperrtopf-Antenne	2			Fa. Dittel
1	Rippe f. SF	1		230.37.0152	

	Datum	Name	Typ	Benennung	Maßst.
Bearb.	23.09.84	Jumtow	ASK 23	Seitenleitwerk Zusammenbau	1:2,5
Gepru					
Norm					

A. Schleicher Segelflugzeugbau 6416 Poppenhausen

Zeichnungsnummer L-353 230.37/38 S 2 Blatt Bl

Zust. | Änderung | Datum | Na | Ursp. | Ers. f. | Ers. d.

Datum: DATE:	Bearbeiter: AUTHOR:	Änderung: CORRECTION:
01.02.85	Jumtow	