

3. Are all fittings in a satisfactory condition ? No play, cracks, scratches or corrosion appeared ?
4. Are all other metal parts free from corrosion ? If necessary, re-paint. Use 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 and tailskid (foamskid with wear plate respectively pneumatic tail-wheel) including tire and brake linings must be checked.
10. The pressure openings (pitot and static pressure ports) on the fuselage are to be checked for blockages and leaks.
11. Condition and function - if applicable, 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 release mechanism is to be carried out. The operating cables must be free-moving, and in the locked state of the towing hook, the operating cables must still have play, i.e. must not be under tension.

DATE:

June 2, 1983

AUTHOR:

Heide

CORRECTION:

13. The emergency canopy jettisoning system must be operated, and examined for corrosion and burrs etc. If necessary, correct faults and in all cases regrease!
14. The water bags and valves are to be checked for watertightness and correct operation (see III.13.4).
15. 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!
16. Check that the equipment and instrumentation are in accordance with the Equipment inventory.
17. After repairs or alterations to the equipment the new empty weight and the C.G. position are to be found by calculation or weighing, and are to be recorded in a summary of weights.
18. Prevention against flutter by checking the sealing of the wing control surface gaps and the blow turbulators.
  - a) Sealing with a plastic-treated fabric tape (TESA-BAND): the plastic coat on the fabric must not be damaged, discolored or even weather-worn. The tape must not tighten with full control surface deflections (negative).
  - b) Sealing with an elastic lip (steel or plastic respectively) :  
Check that there is a Teflon sealing tape underneath and that it is not damaged. Even with full control surface deflections (negative) a 100 % airtight fit of the steel (or plastic) lip must be guaranteed.
  - c) The blow turbulators must be checked for proper operation: blow with slight pressure, e.g. with a vacuum cleaner, (do not use compressed air!) into the Pitot tubes and feel at the blow holes that they are free; they can be cleaned with a thin steel wire,  $\varnothing$  0,5 mm (0,02 in).

#### IV. ACCESSORIES

##### IV.1. MANUALS

- a) On-board logbook;
- b) Flight Manual ASW 20 B, December 1983 edition;
- c) Maintenance Manual ASW 20 B, December 1983 edition;
- d) Glider's service record map;
- e) Notes on operation and maintenance for the safety towing hooks "Europa G 72" and "Europa G 73", May 1975 edition.

##### IV.2. TOOLS

Special Allen key for the assembly of the horizontal tailplane.

DATE:

June 2, 1983

AUTHOR:

Heide

CORRECTION: TN no.31 of 24.06.87

### V.8. MAINTENANCE INSTRUCTIONS

The following Maintenance Instructions have been written over the long period of service of the ASW 20 to meet the problems which have arisen. In dealing with the maintenance of the ASW 20 B, we can in many cases fall back on the experience gained with the ASW 20. Results of this experience have naturally been incorporated in the ASW 20 B as standard; e.g. Maintenance Instruction A no longer applies, as a very effective disc brake system has been fitted to the ASW 20 B. Similarly, the Tesamoll tape strips, the installation of which is covered in Maintenance Instruction B, are now fitted as standard; a check needs to be made from time to time that the strips still fit closely against the control surfaces; for this reason Maintenance Instruction B is now presented as the instructions for renewing the Tesamoll seal. It should be noted that the installation procedures in Maintenance Instruction H (tow release rake and wedge-shaped plywood blocks) have also been incorporated as standard in the ASW 20 B. Maintenance Instruction F concerns repair workshops abroad (Repair instructions for replacing a wing).

Maintenance Instruction B	dated 02.10.78
Maintenance Instruction C	dated 15.02.79
Maintenance Instruction D	dated 25.06.79
Maintenance Instruction E	dated 28.06.79
Maintenance Instruction F	dated 15.07.80
Maintenance Instruction G	dated 13.01.81
Maintenance Instruction H	dated 30.08.81
Maintenance Instruction I	dated 09.09.82
Maintenance Instruction J	dated 24.04.87

This series of Maintenance Instructions will be extended and supplemented as and when required.

Kind: Aerodynamic improvement.

Subject: Covering the control surfaces gap on the wing under and upper sides by an elastic lip seal.

Types affected: All ASW 20 model variants, as of serial no. 20001.

Compliance: None; optional.

Reason: Performance test measurements with an ASW 20 C have shown that a continuous transition from wing to camber-changing flap /aileron can save some considerable drag in high speed flight. It is important in this connexion that the sealing underneath this transition lip must be 100 % airtight. The problem of producing a continuous transition is solved by fixing an elastic lip seal to the wing, the curvature of which bridges over the gap between wing and control surfaces and which rests with its pre-tightened fit against the control surfaces.

Also the control surfaces gap on the wing under side must first be sealed by applying Teflon tape which at the same time serves to reduce the friction of the elastic lip on the flaps or ailerons.

The additional friction involved in the aileron control circuit is low and tolerable. Also the additional force involved for the flap actuation is low.

Action: 1. Covering the control surfaces gap on the wing under side:

1.1 The adhesive fabric tape (TESABAND) is removed from the wing under side control surfaces. Glue residues - also in the recess - must be completely removed by using synthetic resin thinner. To begin with and as an auxiliary measure, a 12 mm wide alignment tape ① (e.g. Tesafilm 104, 12 mm) is applied flush with the front edge of the recess (see Fig.1).

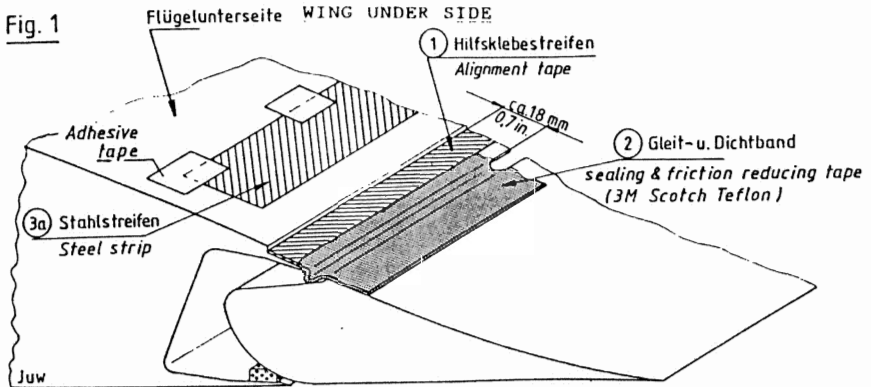
Note:

All glue areas must be completely clean, dry, and free from dust and grease !

The complete cleanness is best checked by applying a Tesafilm strip to the cleaned area, removing it again, and checking that no dust particles are sticking to the Tesafilm.

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Fig. 1



1.2 Now the sealing & friction reducing tape ② (3M SCOTCH Teflon tape, 30 mm wide) is applied - again flush - along the rear edge of the alignment tape ①. Please keep the drawn-off backing film of this sealing tape for later use with the steel strips.

1.3 When applying the above Teflon tape push the /flaps ailerons to the maximum negative setting to ensure that the tapes will not be under tension afterwards with normal negative control surface deflections and do not hinder such negative deflections!  
The sealing & friction-reducing tape ② must be strongly rubbed into contact.

1.4 If the steel tape ③a is used, it first must be thoroughly de-greased using acetone or Tri etc. Then position the strip - inverted - on the top in front of the recess where it must be held in place by several short tape strips. Using scissors the steel tape strip is easily cut into the five pieces as shown in Fig.2a.

Fig. 2a

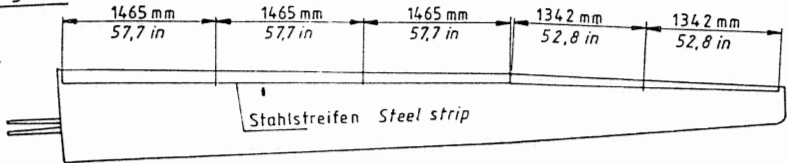
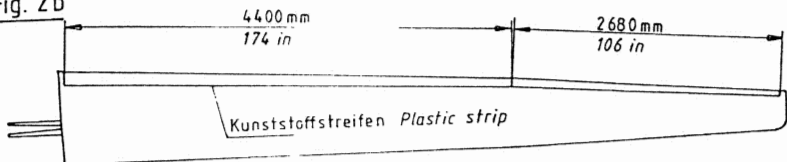


Fig. 2b



Zusammenhang: Zusammenhänge verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patentierung oder Gebrauchsmuster-Eintragung vorbehalten.

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Now the alignment tape ① which was applied at first as an auxiliary measure, is removed again; this is done step by step for each steel strip. In its place the Pattex Spezial glue is brushed on this area and also brushed on the entire width of the respective steel strip which is positioned in front of this area. The Pattex has to dry on for about 15 minutes.

For the following application of the steel strips it is best to put first the drawn-off backing film of the sealing & friction-reducing Teflon tape, which we kept for this purpose, onto the wing-side Pattex strip, otherwise it is impossible to align each steel strip with the necessary exactitude. It is an advantage to have the use of two pairs of hand for the glueing on of the steel strips; one person starting to remove the backing film at one end while the other person holds taut the steel strip at the other end to prevent it from rolling up. Then bit by bit the backing film is removed, the steel strip aligned and pressed into contact.

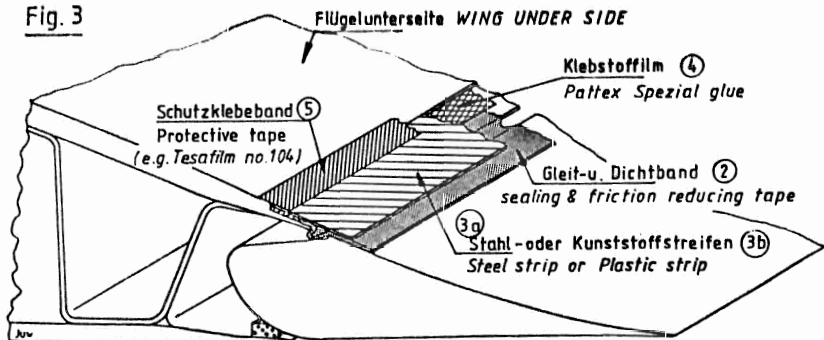
- 1.5 If the application of the self-adhesive plastic tape ③b (MYLAR) is chosen, the auxiliary alignment tape ① can be removed at once entirely. Then the backing film is removed off the plastic strip and the latter then fixed - flush - onto the recess in the wing, along the whole span length (see Fig.3).

The steel strip or the plastic strip respectively being applied, a soft wood block (e.g. balsa) or a hard rubber roller is used and the strip(s) - in the glue areas - pressed strongly into contact.

- 1.6 Then the butt joints of the five steel strips and the ends of the plastic strip respectively are also covered with the sealing and friction-reducing Scotch Teflon tape ②.

- 1.7 At last the wing control surfaces are moved into their maximum negative setting and are kept in this position for 24 hours; during this period the glue or self-adhesive film respectively will cure and reach its ultimate adhesion force.

Fig. 3



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1.8 At last a protective tape (5) is still applied over the butt joint of plastic/steel lip and wing; the tape to be used for this purpose should be as thin as possible and moisture-resistant; e.g. Tesafilm no.104, white, 25 mm wide is suitable (see Fig.3). This tape is applied for safety reasons and prevents a peeling-off of the lip seal from the front that could possibly lead to dangerous flight characteristics.

2. Covering the control surfaces gap on the wing upper side:

2.1 To enable the application of an elastic lip seal to the wing upper side, at first a recess (as shown in Fig.4) must be milled in by carefully excising the paint coat up to the outer FRP-layer ( $\approx 0,5$  mm depth).

2.2 The recess area must be carefully cleaned (see note under point 1.1), then the backing film is removed off the self-adhesive MYLAR plastic strip (6) and the strip with its self-adhesive film then glued flush - onto the recess in the wing, along the whole flap / aileron span length, (see Fig.4).

Then a soft wood block (e.g. balsa) or a hard rubber roller is used to press the strip strongly into contact in the glue areas.

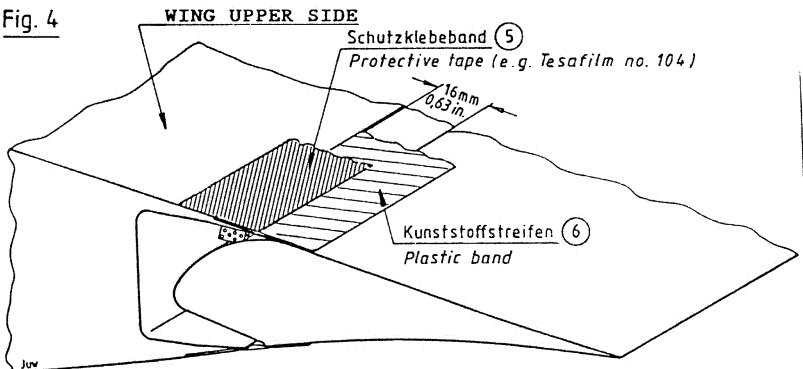
2.3 The butt joints and the ends of the plastic strip (6) are covered with the sealing and friction-reducing Scotch Teflon tape (2) .

2.4 Finally the protective tape (5) (Tesafilm no.104, white, 25 mm wide) is applied over the butt joint of plastic lip and wing; This tape is applied for safety reasons and prevents a peeling-off of the lip seal from the front that could possibly lead to dangerous flight characteristics.

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Fig. 4



Notes:

1. It is strongly recommended to check the elastic lip at the flaps and ailerons for 100 % airtight fit.
2. Also check the elastic lip at the wing for safe and tight bonding.
3. The material required for this optional mod can be ordered from SCHLEICHERS or from the SCHLEICHER-representative in your country.

Material:

For Wing		
<u>under side</u>	<u>upper side</u>	
15 m	-	Tesafilm no.104, 12 mm
15 m	15 m	Tesafilm no.104, 25 mm
15 m	-	3M Scotch Teflon tape, 30 mm
2 tubes	-	Pattex Spezial glue (for steel tape only)
9 m	-	Steel tape, 33 mm, pre-curved by 5 mm
5,4 m	-	Steel tape, 33 mm, pre-curved by 8 mm
9 m	-	Mylar tape, 37,5 mm, pre-curved by 6 mm
5,4 m	-	Mylar tape, 37,5 mm, pre-curved by 9 mm
-	15 m	Mylar tape, 21,5 mm, pre-curved by 4 mm

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

Poppenhausen, April 24, 1987

ALEXANDER SCHLEICHER  
GmbH & Co.

*Lutz-W. Junnow*  
L.W. Junnow.

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