

Kind : Modification into ASW 20-L model.

Subject : Detachable wing tip.

Effectivity : All ASW 20s, optional.

Accomplishment : None; optional modification.

Reason : The ASW 20-L can be operated with two wing spans (15m and 16,59m). As the interest of the customers in the ASW 20-L model is great, some ASW 20s to begin with are ordered with the detachable wing tip of the 15m-version so that after approval of the 16,59m-version of the ASW 20-L no time-consuming modification of the wing is necessary.

Instructions :

1. According to the drawings

205.51.0021

205.51.0022

205.51.0024

205.51.0100

205.51.0101

205.51.0150

the parts for the modification of the wing are built.

According to drawing 205.51.S.1 the wing tip is cut off at the end of the aileron. The saw cut includes a 93° angle with the leading edge.

Now the shear web of the main spar is removed from the saw cut up to a position 155mm off inward and the spar beams are scarfed so that the FRP pot 205.51.0150 at which the fitting-205.51.0021 is already installed can be well fitted into the spar.

The foam of the wing sandwich is totally removed on both sides to a line 20mm behind the cut and from this position to a position 130mm behind the cut the foam is scarfed so that rib 205.51.0101 can be inserted with some play for glue and adjustment.

The glass layer of the inner sandwich skin is carefully sanded up to 160mm behind the cut and 1 layer 92145 (main glass in the flight direction, see drawing 205.51.S. 1) is laminated onto both upper and lower wing sandwich as inner skin. The new laminate is covered by tear-off cloth and then hardens. The above explained job results in laminating the 92145 glass layer on top of the spar beams.

As of serial number 20 136 all ASW 20 wings are built with the glass 92145 and the Corticell foam of the sandwich, too, is scarfed according to the above description; i.e. the glass layer is positioned between spar and wing sandwich.

On some ASW 20s with serial numbers earlier than 20 136 the inside preparations were already made, as the modification into the L-model was already optioned for these gliders.

The installation of the components is made in two steps.

First of all, all components are assembled. But glue mixture (Epikote/Epikure mixed with Aerosil) is applied only to the internal rib 205.51.0101 and to the FRP pot 205.51.0150. The root rib is not glued in. Only after the inspection of the inner glue joints and after the pine fillers are glued to the internal rib and to the FRP pot, the root rib is glued to the wing skins.

Self-locking nuts which are screwed to the FRP pot allow to remove the root rib from the FRP pot.

For the second glueing step the glue mixture (as above) is applied to the root rib. Then the FRP pot, too, is glued to the root rib in addition to the M6 - bolt and nut connection.

For both steps of the glueing job either the master jig for the 16,59m version or an original 16,59 m wing tip is required. This must be used in order to position the internal parts such that the wing tip is well in line with the wing.

2. The modification job for the wing tip (15m version) is much easier.

According to the drawings
205.51.0102 and
205.51.0026

the component parts for the wing tip are built.

First of all, surplus glue is removed inside the cut off wing tip and the internal glue areas round the root rib are carefully sanded. Now the aluminum fitting is inserted into the wing end and safetied. To the knurled end some very stiff glue mixture is applied from below and the FRP wing tip is fixed to the aluminum part.

After hardening the tip together with the aluminum fitting is carefully removed and the glue joint is carefully reinforced with glass laminate (approx. 2 layers 92140).

As a last step the wing tip root rib is glued to the tip and the pins P/N 205.51.0023 are glued into the rib.

Material :

See drawings.

Glue mixture (parts in weight) :

Epikote 162	100 parts
Epikure 113	38 parts
Aerosil	max. 15 parts

Weight and Balance :

Because of the modification the weight of the wings including the detachable 15m wing tip is increased by 0.7 kg. As the additional weight is within the in-flight C. of G. limits, the modification is not critical in this respect. However, because of the possible change of the loading limits a weight and balance is necessary.

Notes :

1. Because of the in part tricky glue job the modification according to this TN may only be done by the manufacturer or by a licensed repair station in cooperation with the manufacturer.
2. If the modification is done after the curing of the wing, then the wing tip must be cured for 12 hours above 55° C.
3. In order to avoid a weakening of the attachment of the wing tip by heat of sun radiation, only the detachable wing tip should be painted with anti-collision paint. This measure matters especially in regard of the provided operation of the 16,59m version.
4. The 15m version is operated according to the operation limits and the Flight Manual of the ASW 20.
5. The conditions of the operation of the ASW 20-L, the 16,59m span version, are settled in TN 8 b.

Drawings :

For this TN 8 a the following drawings were new made :

205.51.8.1
205.51.0021
205.51.0022
205.51.0024
205.51.0026

205.51.0100
205.51.0101
205.51.0102
205.51.0023
205.51.0150

Poppenhausen, November 30, 1978

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(Gerhard Waibel)

The German original of this TN is approved by LBA under the date of
December 13, 1978, and is signed by FRIES.

In any case of doubt the German text is authoritative.

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INSTALLING WINGLETS

Necessary Equipment List :

- Carpenter's square (3'X 2' works best)
- Plumbob
- "C" clamps
- Hax saw
- Measuring scales (for glue)
- Drill with wood bits
- Misc. normal tools

WORK BEGINS

- Remove 15M tips
- Plug large (alum.) spar into aircraft
- Plug forward and aft pins into aircraft
- Place plywood rib onto the spar and mark location to drill fwd and aft pins, (drill slightly oversize to allow for the glue)
- Prefit winglet and cut alum. spar to proper length
- Now glue the plywood rib onto all three fittings, while they are on the aircraft. Remove only when hard !!
- Reinstall 15M tips.
- To establish the correct span of the winglets, you must first place the wings on sawhorses of equal height at the root and tip. THIS IS VERY IMPORTANT !!!!
- Using a plumbob mark the floor with the plumbob located at the wing leading edge cut line
- Now move the plumbob aft ,to just fwd of the aileron, and mark the floor
- Connect these two points
- Now mark the floor , with the plumbob located at the outboard most point of the 15M tip
- Using a carpenter's square, lay a square on the first two points and measure the distance from this line and the tip mark (Should be around 3-3.5")
- Do the same for the other wing (Don't forget these numbers they are important to you)

- Without moving the wing, remove the 15M tips and install the pre-glued plywood ribs
- Without moving the wing, pre-fit the winglet using at least one "C" clamp to hold it in place
- Using the same numbers as before, hang the plumbob on the outside of the winglet tip, adjust the winglet tilt to arrive at the same numbers as the 15M tips
- If you are satisfied with the fit of the winglet, then remove and glue along the rib junction and add extra glue above and below the spar
- If the winglet / wing junction is not straight then remove and sand to fit, then glue
- Once the glueing has begun, double check all of the measurements. NOW IS NOT THE TIME TO MAKE A MISTAKE.
- Let dry hard before removing
- Contour with filler until you are happy and then paint!

ABOUT THE GLUE:

Scheufler Resin L-285
Hardner H-285

Pot life = 45-60 min

Mixing ratio = 100 parts resin to 38 parts hardner by weight

Post cure = 15 hrs at 50 C

Mix cotton flock to acheive a mixture which is not to wet

GOOD LUCK !!!!!

ANY QUESTIONS JUST CALL