

Subject :

Inspection of aileron weight and aileron c.g. and inspection of play (backlash) in aileron and flap control circuits to avoid flutter risk.

Effectivity :

Glider model ASW 20, s/n 20 001 thru 20077 and 20 086.

Accomplishment :

All affected gliders are limited instantly to max indicated airspeed of 200 km/h (108 knots). After corrective measures (see below) have been carried out, the speed limit can be abandoned.

Reason :

With some gliders of the early production stages of the ASW 20 two kinds of oscillations of the aileron/flap controls have been observed.

1. With some ASW 20s being operated in the U.S.A. and in Australia high frequency oscillations (buzz of the control rods of 30-40 cycles per second) have been observed at speed of 110-120 knots IAS. In all cases the oscillations could be cured after the play - mostly of the flap controls - was reduced to the limits given in the Flight and Operations Manual.
2. With some few ASW 20s a low frequency oscillation (about 5 Hz = 5 cycles per second) of the aileron control circuit has been observed. Contrary to the above high frequency the stick is moving noticeably. It appears that the high frequency oscillation triggers the low frequency one. It could be demonstrated recently that the low frequency oscillation could be eliminated by exchange of the ailerons against lighter ones without any further modification to the glider.

Instructions :

- 1.a/With the stick blocked in a nearly neutral position and the flap handle in position 1 ( $-11^{\circ}$ ) each aileron has to be loaded near the actuator in order to check the play in the aileron control circuit. The difference between elastic deformation and play (backlash) is important. Play or backlash is only the small part of the movement observed between the clack-clack noise. If the play is greater than the tolerances given in the Manuals (ASW 20 see page 46; ASW 20 L see page 50), it has to be reduced, e.g. by exchange of spheric links, etc.

- 1.b/ The flaps now have to be checked for play in the same manner as described above for the ailerons and additionally must be loaded upwards and downwards simultaneously. In both checks the tolerances of play given in the Manuals must not be exceeded.
2. The wing to fuselage connection must be checked for tangential play and if need be the play must be eliminated by use of washers according to the procedure given in the Manuals (ASW 20 see page 39 ASW 20 L see page 43).
3. The ailerons must be disconnected from the wing and must be weighed and balanced.  
For this purpose first remove the tape on the lower wing surface. Now drill off the Pop-rivets (2,5mm in diameter) which safety the hinge pins. Perhaps the center of the rivets has to be marked by a cone prior to drilling. In any case some care must be taken that the FRP of the hinges is hurt as little as possible.  
The controls have to be removed from the aileron and there are two ways to do so :
  - a/ If new hollow tubular rivets including tools are available, the tubular rivet is drilled off.
  - b/ If procedure a/ is impossible, the fairing of the aileron actuator is split off carefully and the whole metal fittings are unscrewed from the ailerons.

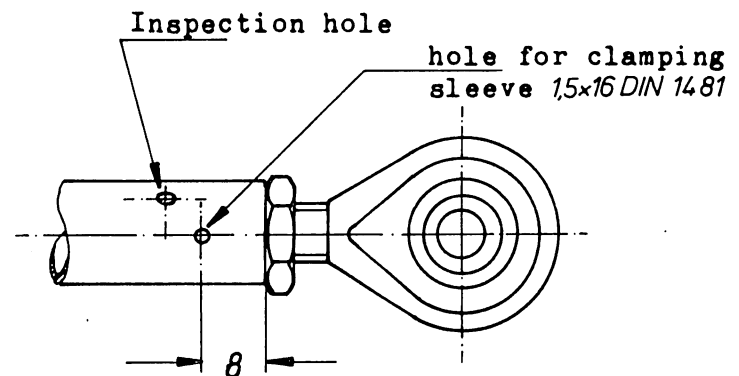
The weight of each aileron is determined (don't forget the fairing which is split off) and compared to the tolerances given in the Manuals. If according to procedure b/ the metal fittings were removed, 0.07 kg must be added to the determined weight.

Diverging from the sketch in the Manuals the c.g. of the ailerons is balanced according to the sketch on sheet 5 of this Technical Note. The weight of the aileron (if fittings have been removed, without their 0.07 kg) as determined multiplied by the distance from the c.g. to the hingeline is the tailheavy moment of the aileron. If the actuator fitting was removed, 0.15cmkg must be added. This total moment must not be greater than tolerated by the Manuals.

The measuring method given herein is somewhat more accurate than the one given in the Manuals and also somewhat to the safe side, as the upper surface of the ailerons is not level during balancing.

If freeplay (backlash), weights and moments are within tolerances, the glider can be reassembled. When taping the aileron hinge line, please regard that the aileron is deflected fully upwards to its stops and that the tape is still not tight, as it may shrink in moist climate !

4. Please check if the lever at the mixer is at the end of the track when the flap handle is locked in position 1 ( $-11^{\circ}$ ).  
If the handle can be pushed past the hole of position 1, one of the spheric ball joints of the flap pushrod, which is found on the left cockpit wall, must be turned in to shorten the pushrod. This must be done until the flap handle can just be locked in position 1 as the end of the track in the mixer is now touched.  
After adjustment both spheric ball joints must be safetied by 1,5mm clamping sleeves against being turned out (in addition to the nuts).



If the inspection shows that freeplay (backlash) cannot be reduced to tolerances or that weight and/or tailheavy moments of the ailerons are exceeded and cannot be adjusted by simple methods as e.g. sanding the gelcoat surface a little (mainly the lower surface which is not exposed to sun radiation) or trimming the trailing edge of the aileron (max 3-5mm) or removing the rear fairing of the aileron actuator, a Speed Limitation to max 200 km/h (108 knots) IAS is necessary for the glider in question. A red radial speed mark must be put to the airspeed indicator at 200 km/h (108 knots).

It is necessary to contact the manufacturer immediately in order to develop corrective measures to restore unrestricted airworthiness for the glider.  
For reassembly of the glider see chapter 3.

Material :

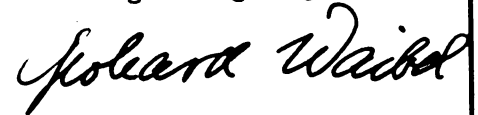
For replacement of parts only use original materials (e.g. spheric ball joints, nuts, etc.).

Notes :

For elimination of freeplay (backlash) ASW 20 owners may ask the manufacturer for the latest Maintenance Instruction D for the ASW 20 which is updated according to the results of current inspections.

Poppenhausen, February 17, 1981

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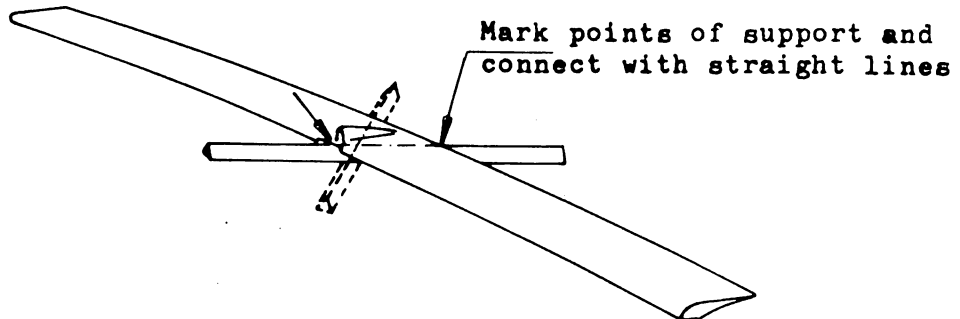


Gerhard Waibel.

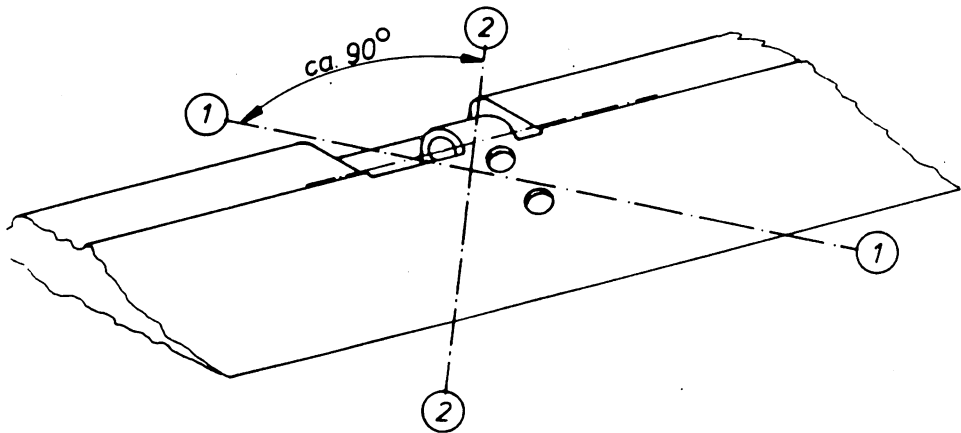
The German original of this TN is approved by the LBA under the date of March 3, 1981, and is signed by SCHMALJOHANN.

In any case the original text in German language is authoritative.

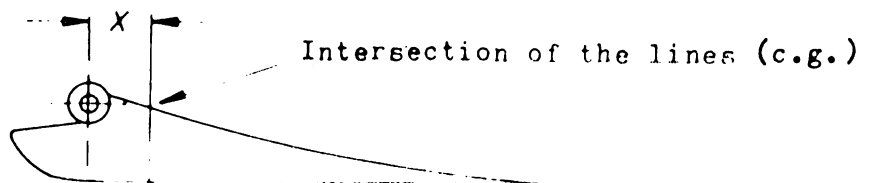
Determination of tailheavy moment of controls by balancing  
on a cutting edge done twice (triangular strip)



The connecting lines of the points of support ① - ① and ② - ② intersect in the c.g.



X = Distance from the c.g. to the center of the hingeline.



Weight (kg) · X (cm) = Moment (cmkg)