

To install a canopy guiding device which accomplishes the same task as the so called „Rögerhaken“ on a „**Swift S-1**“ glider the following materials are necessary:

- 1 ea. p/n **S1 R1** (available from Güntert + Kohlmetz GmbH)
- 1 ea. p/n **R93/1, R93/2, R93/3** und **R93/4** (available from Güntert + Kohlmetz GmbH)
- bolt M5x25 DIN 7991-8.8
- lock nut (with polyamide insert) M5 DIN 985-8zn
- approx. 100g epoxy resin/hardener (Scheufler L285/H286)
- approx. 100g cotton flocks
- Loctite 243
- coarse sandpaper (grain size 60)
- vice
- brush
- stirrer
- mixing bowl

All work should be undertaken on the derigged glider. The main pins must be removed.

The interior of the fuselage is to be covered with plastic foil or paper so that dust from sanding, paint or resin can not contaminate it.



**Fig. 1: Confirmation of proper fit of part S1 R1**

Prior to glueing the part **S1 R1** into the fuselage its proper fit must be confirmed. To do so place it symmetrically in the upper canopy frame as shown in Fig. 1. Push it to the front as far as possible and temporarily fixate it there e.g. by an assistant who reaches through the spar-fork opening in the fuselage.



**Fig. 2: Preparation**

Close the canopy and check if the canopy-side canopy frame engages in part **S1 R1** without touching it or pressing on it. Lock the canopy.

If part **S1 R1** is touched by the canopy frame add spacers between fuselage wall and part until the the canopy frame does not touch it.

Now outline the position of the part inside the fuselage (e.g. with a pencil).

Remove any paint (if present) from the inside of the outline and sand the whole area thoroughly (grain size 60).

The area of the surface of part **S1 R1**, which will be glued to the fuselage, must also be thoroughly sanded (blue framed area in Fig. 2).

Fill the pre-drilled hole  $\varnothing 5\text{mm}$ , which will be used to bolt part **R93/2** to the fuselage later, with plasticine, so it is not blocked by glue.

If the sanded surfaces are touched prior to glueing, they have to be degreased (e.g. with acetone).

Resin and hardener have to be mixed in the correct mixing ratio:

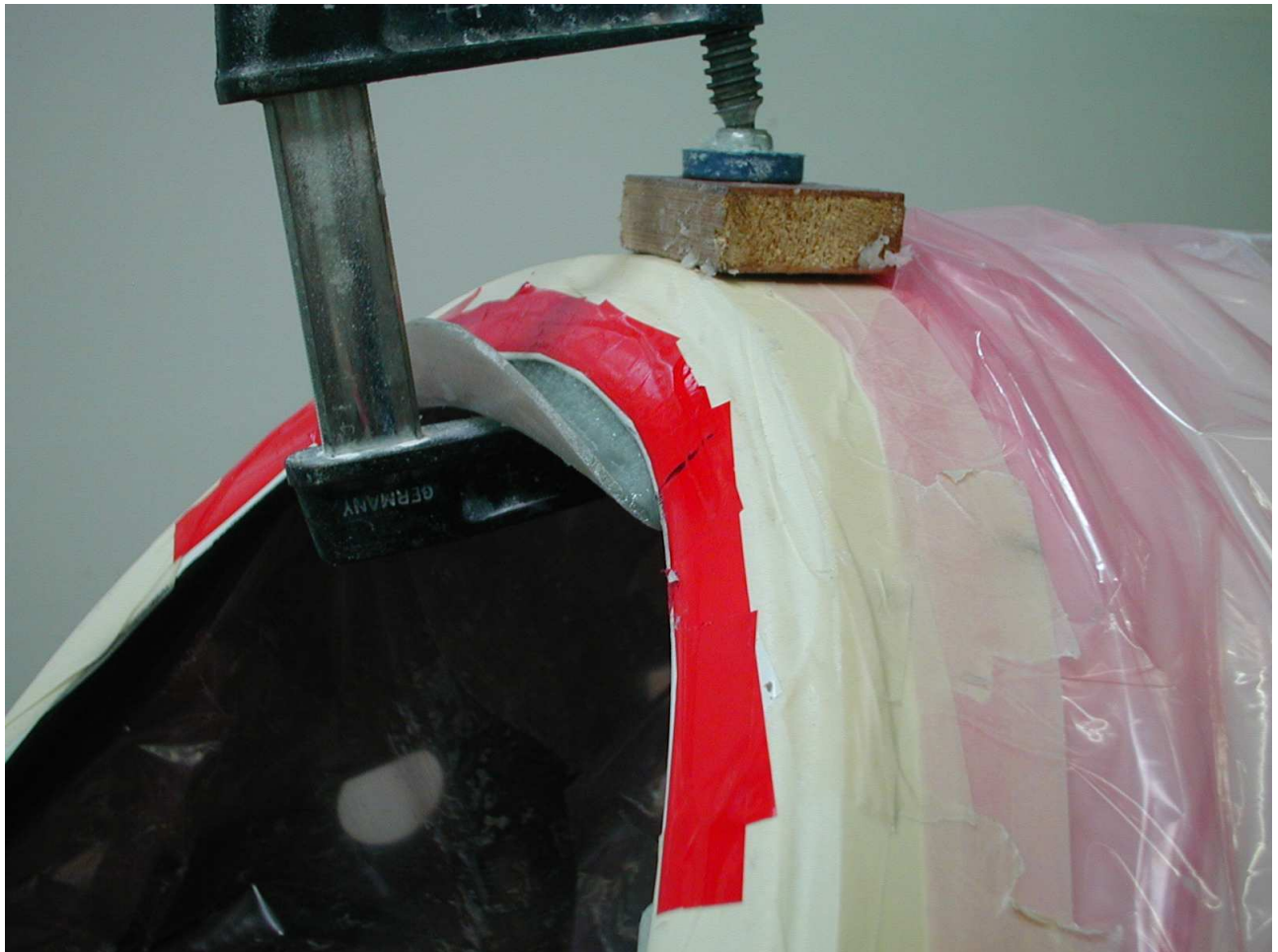
When measuring **mass (weight)**:  
When measuring **volume**:

100 parts resin - 38 to 40 parts hardener  
100 parts resin - 47 to 50 parts hardener

Stir the mixture until it is free of streaks. Brush the sanded surfaces inside the fuselage and of part **S1 R1** thinly with the resin/hardener mixture. The remaining resin/hardener mixture must be thickened with cottonflocks until a viscous adhesive is produced which hardly runs off the stirrer.

Apply the glue to the rear area of part **S1 R1** approx. 2-3mm thick (see blue framed area in Fig. 2) and glue the component to the upper fuselage.

When the part is positioned correctly wall it can be fixed with a vice (underlay a piece of soft wood or hard foam if necessary) for curing. Take care not to move the part when tightening the vice!



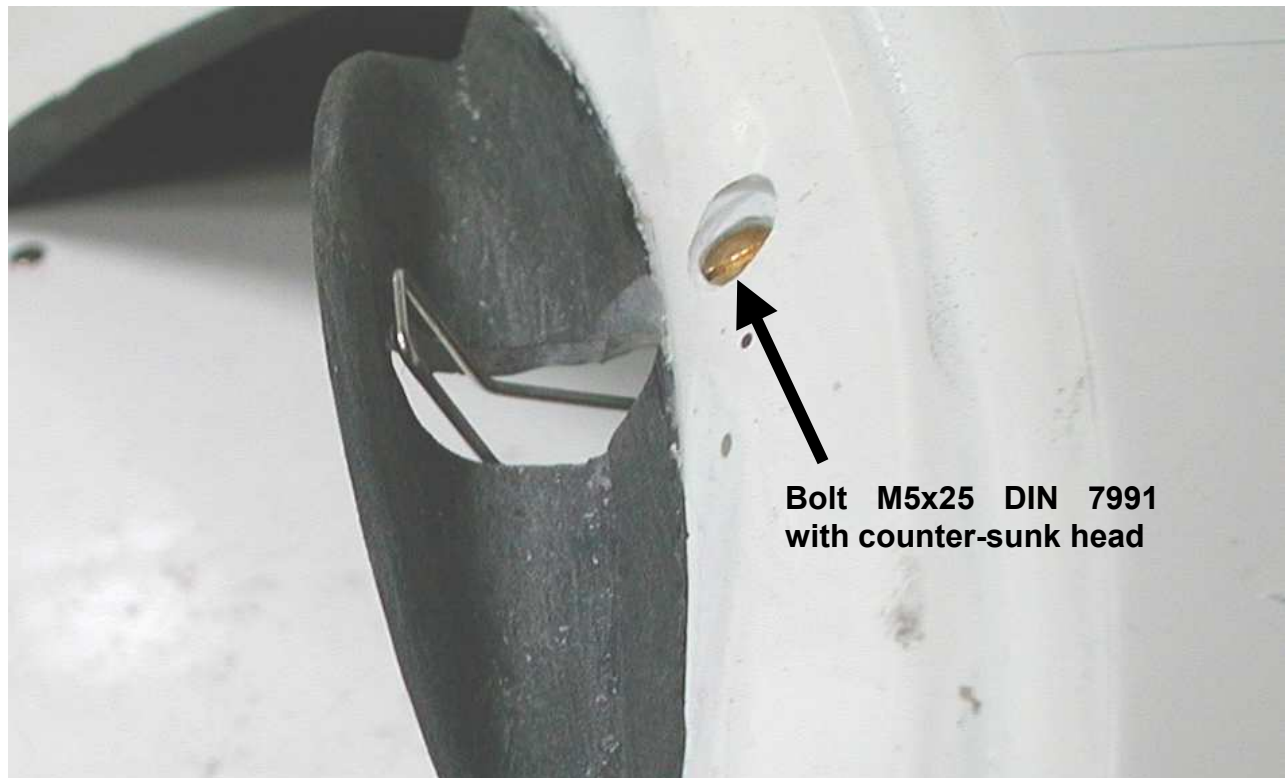
**Fig. 3: Glueing**

Adhesive which oozes out when tightening the vice can be removed with a spatula. Check if the gap between part and fuselage is filled with glue all around so there is no hole. Do not tighten the vice so much that the fuselage wall will be deformed.

After hardening of the resin the vice can be removed.

The pre-drilled hole  $\varnothing 5\text{mm}$  in part **S1 R1** can now be used as a template for the hole which must be drilled through the fuselage-side canopy frame. To do so, drill through the hole from the baggage compartment to the outside. Countersink the outside opening of the

hole in the canopy frame so the head of the bolt M5 x25 DIN 7991 is completely counter-sunk (see Fig. 4). Due to the angle of the bore hole the head will not be flush with the canopy frame.



**Fig. 4: Completed installation (side view)**

Bolt together aluminium-block **R93/2** and spring **R93/3** with the canopy frame on a trial basis. Depending upon the thickness of the fuselage-side canopy frame and the depth of the countersink, the bolt M5x25 sticks out differently far inward from the block (see Fig. 5).

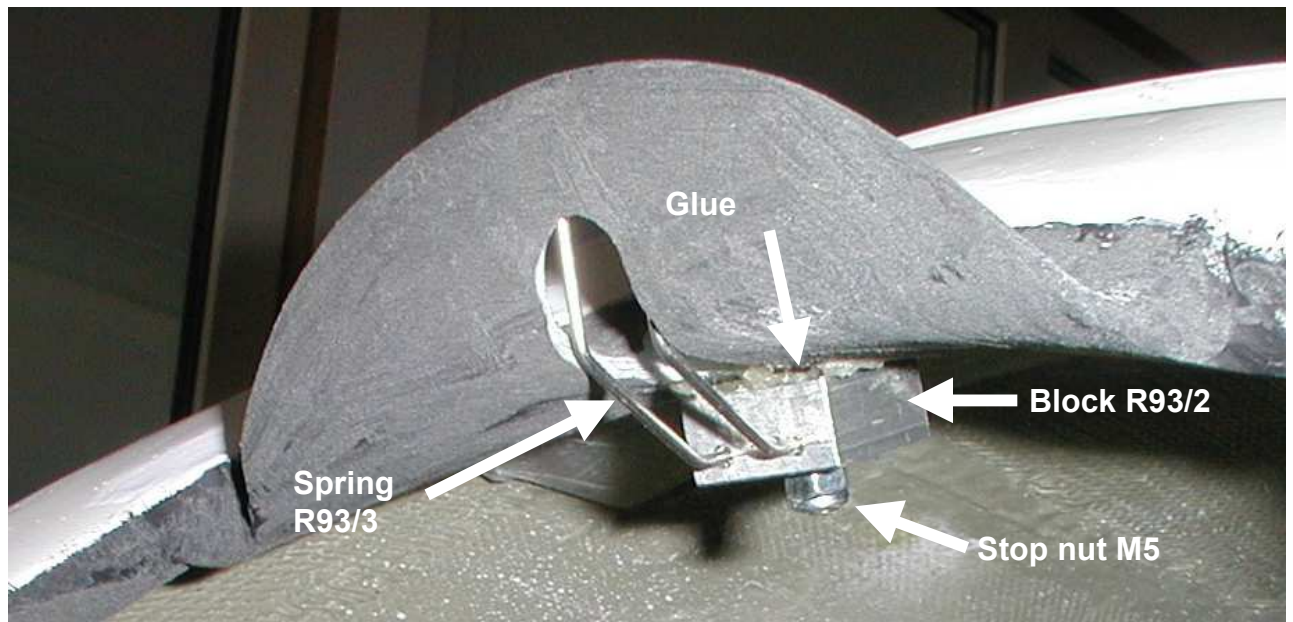
If there are not enough threads visible out of **R93/2** to fasten the locknut M5 DIN985 use either a longer bolt (e.g. M5x30 DIN 7991-8.8) or use a drop of Loctite 243 on the thread of the bolt to secure the bolt on final assembly.

Part **S1 R1** has a prepared cutout as shown in Fig. 6. Normally it shouldn't be necessary to enlarge the cutout. However it is necessary to check if spring **R93/3** has enough clearance to **S1 R1** on both sides, so the spring can be bent open enough when spike **R93/1** engages in the spring.

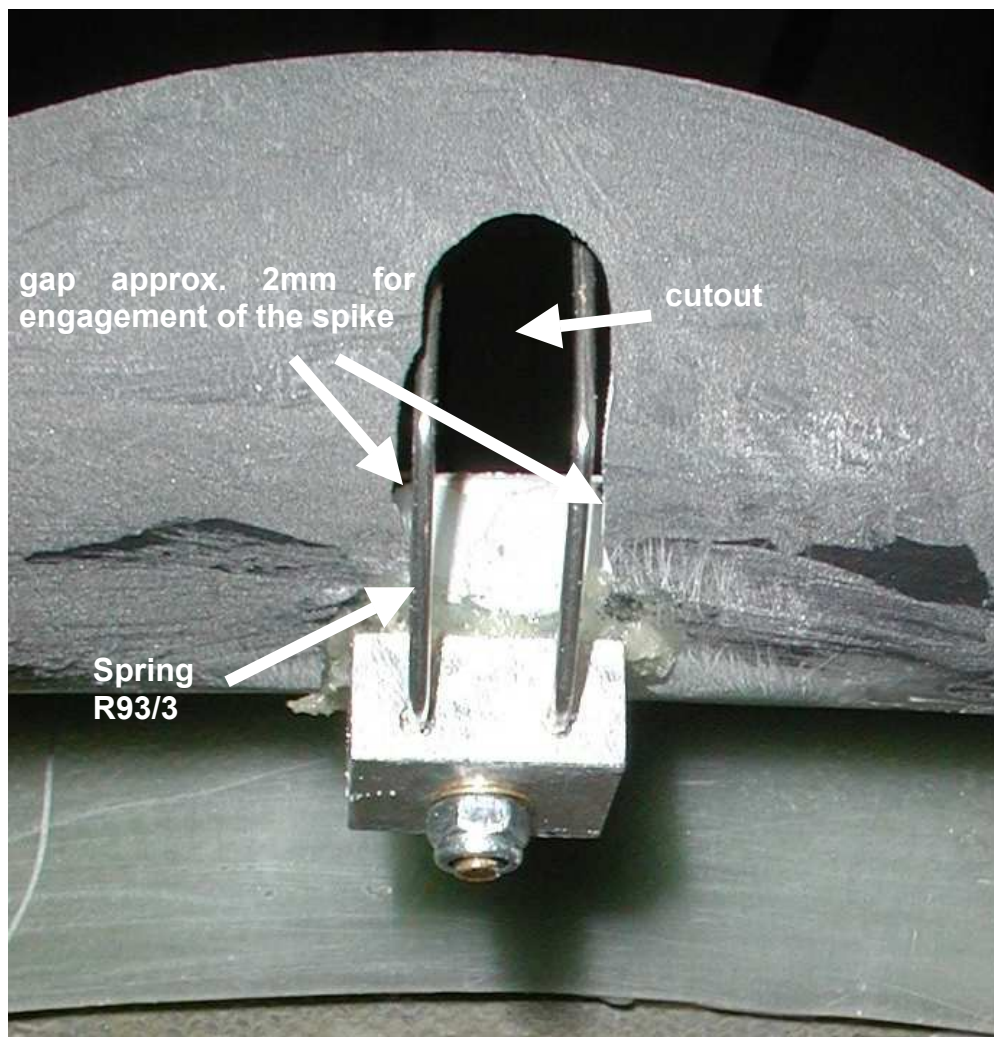
The cutout must not be enlarged to a degree which allows spike **R93/1** to fit left or right of the spring.

Now bolt part **R93/2** with spring **R93/3** to the canopy frame. To do so sand the upper surface of **R93/2** and cover it with resin thickened with cottonflocks. This will make sure **R93/2** is seated solidly on **S1 R1**.

Apply **R93/2** and tighten it with the bolt M5 through the canopy frame. Surplus glue can be wiped off with a spatula. Allow to cure.



**Fig. 5: Completed installation (shown from below)**



**Fig. 6: Completed installation (front view)**

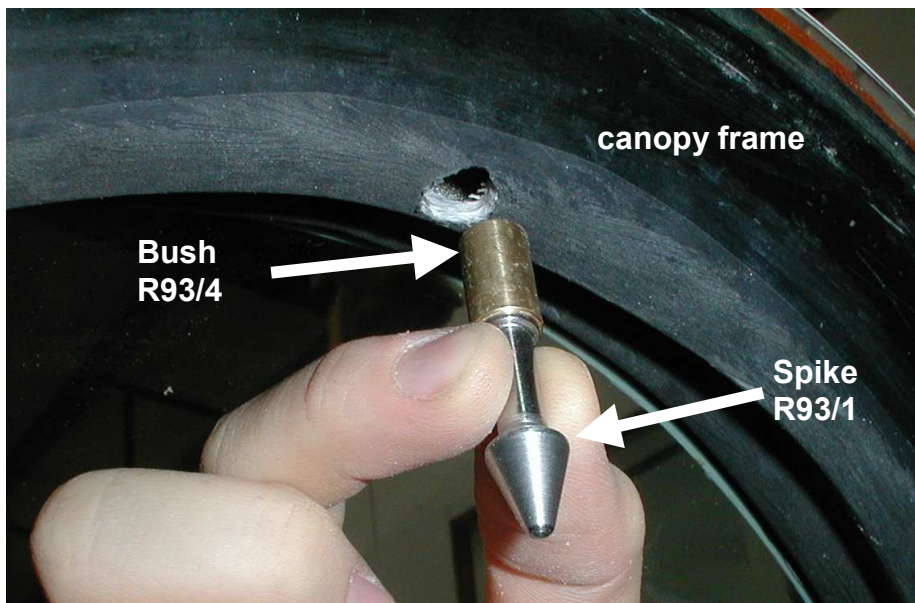
Now spike **R93/1** with bush **R93/4** can be fitted to the canopy-side frame.

Sit in the cockpit, close and lock the canopy, drill a hole in the canopy frame in the center of the spring **R93/3** with 9mm diameter and 15mm deep. Be careful not to drill too deep! The hole should be drilled vertical or a bit from aft below to front up.

Screw spike **R93/1** in bush **R93/4**. Fill the hole with resin/hardener thickened with cotton flocks, push the bush into the hole. The bolt should be vertical (or point a little bit rearwards) and in the center of the spring **R93/3**. Allow to cure at room temperature.

The canopy frame is hollow, so be sure to use enough thickened resin to create a proper seat for the bush.

The canopy should be locked and the spike engaged during hardening. The spike can be fixed with adhesive tape in correct position.



**Fig. 7: Hole in the canopy frame**

After curing check first if the canopy can be closed normally. If this is the case pull the canopy emergency release and try to rotate the canopy around the newly installed canopy guide in the back. It's advisable to do this with two people.

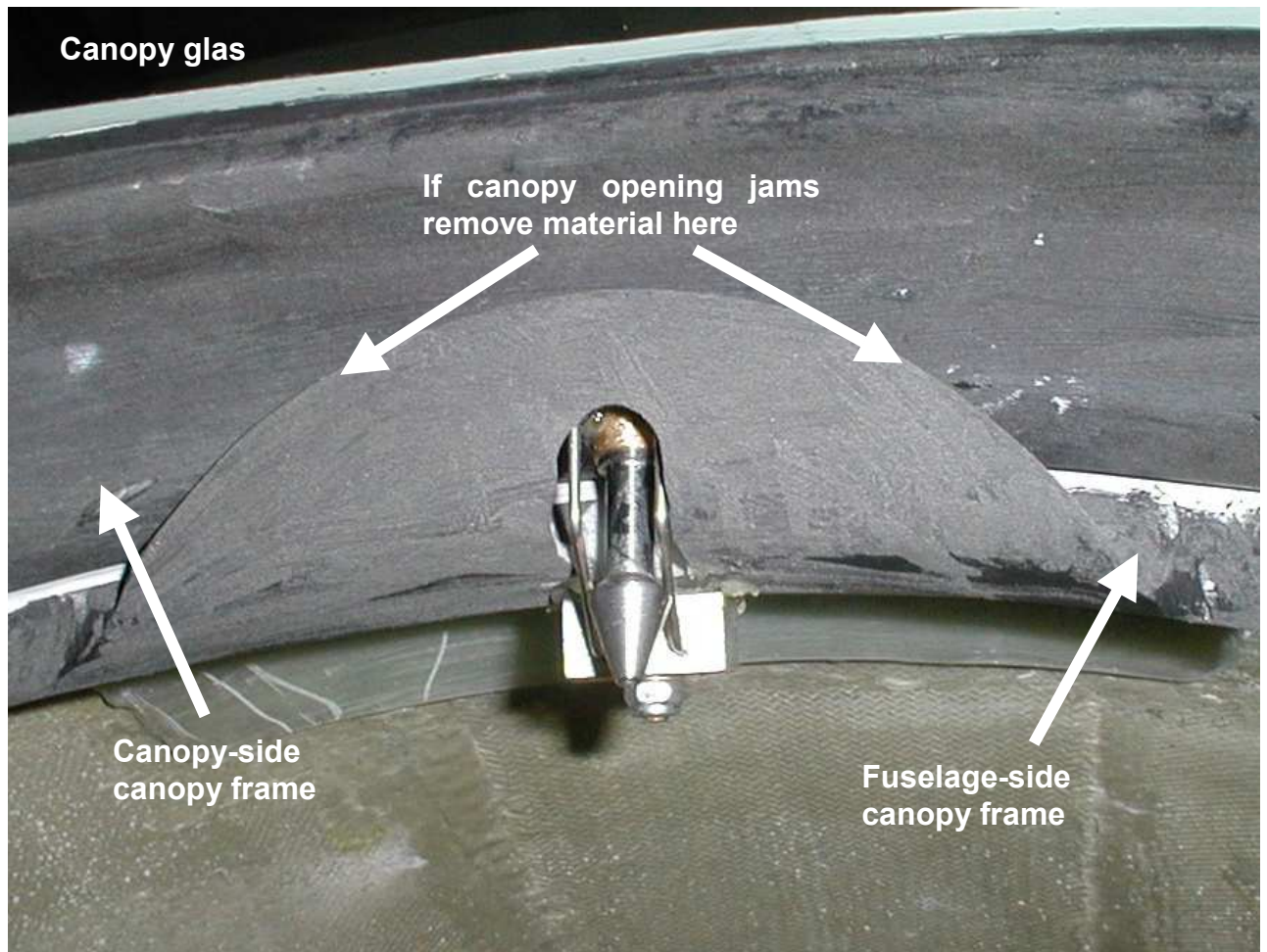
When doing so the spike must slide forward in the spring until it reaches the front end of the spring. Don't continue with the opening of the canopy - otherwise it is possible to lever the spike out of the canopy!

If the canopy jams in part **S1 R1** prior to the spike reaching the front end of the spring, it would be necessary to remove some material at the left and right front side of part **S1 R1** until the jamming is eliminated. (see Fig. 8)

Screw spike **R93/1** out of bush **R93/4**, put a drop of Loctite 243 on the thread and screw the spike back in.

If the correct function is confirmed the remaining glue gap between fuselage wall and part **S1 R1** can be sanded all around so that no sharp edges remain. If desired the area in the

baggage compartment can be painted again, the area of the part which sticks out of the fuselage to the front should be painted e.g. with Nextel to protect the GFRP.



**Fig. 8: Canopy guide with closed canopy**