

GFA AN 163
(ISSUE 1)

AIRWORTHINESS ADVICE NOTICE

TYPE AFFECTED: Scheibe SF-25 and Slingsby T-61 Falke series.

SUBJECT: Miscellaneous airworthiness information.

APPROVED MODIFICATIONS: Nil this issue.

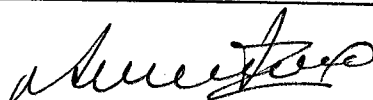
DEFECTS: Nil this issue.

MAINTENANCE TIPS: During the course of modifying a Slingsby example of the Falke powered sailplane, it was found necessary to replace several members in the steel-tube fuselage frame. The work was carried out by Southdown Engineering, Q'ld and the company's proprietor, CAR 35 engineer Dafydd Llewellyn, has provided the following analysis and recommendations as a result of carrying out the work and in particular as a result of his research to establish what materials were used in each model.

"Because the fuselages are basically made from hard-drawn mild steel tube (either BS T26 for the Slingsby-built examples or DIN 2391 grade ST 35 BK for Scheibe models), and because both these materials suffer a major loss of strength in the weld-heat-affected zones, it is probably unsafe to apply the local welded-sleeve repair techniques as given in FAA AC 43/13-1B Figure 4-35 in the central portions of the length of any tube, because these techniques assume only a minor drop in strength in the heat-affected zone. The severe loss in strength in the central portion of a tube may critically reduce its local buckling strength, leading to total column failure under critical compressive loading, so this could be a serious safety issue.

The techniques given in AC43.13-1 were written for either 4130 tube in the normalized condition, which hardly drops in yield strength at all when exposed to welding heat, or C1025 which is also used in the normalized condition and also hardly drops in yield strength with application of welding heat (strength after welding for both these materials is of the order of 90%). By contrast BS T26 is used in the hard-drawn condition and drops in yield strength from 54 KSI to 24 KSI (i.e. strength after welding is only 44%) and DIN 2391 grade ST 35 BK drops in yield strength from 46.5 KSI to 35

SIGNED:



SENIOR TECHNICAL OFFICER AIRWORTHINESS

For and on behalf of:

**THE GLIDING FEDERATION
OF AUSTRALIA**

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KSI in the weld-heat zone (i.e. strength after welding is 75%).

Therefore repairs to tubes in the frames using these hard-drawn materials should be made by replacing damaged tubes, not repairing them; it is suggested that welding should be confined to tube-splicing restricted to not more than 20% of the tube length at either end at, or immediately adjacent to, the clusters. Tube should be replaced with the nearest size of 4130 to Mil-T-6736 and the weld process should be GTAW (TiG) using ER70S2 filler rod".