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GLIDING FEDERATION OF AUSTRALIA

NATIONAL GLIDING SCHOOL

# MAINTENANCE NOTES - K-6

These notes are intended as a guide for the Inspector during a normal yearly examination for revalidation of the Certificate of Airworthiness on this type. The notes in no way replace previous or subsequent instructions from the G.F.A. or normal procedures required for this type.

## 1. General.

The K-6, previously known also as the Ka-6, is a single seat, high performance sailplane designed by Rudolf Kaiser. Variant include. K-6B, K-6BR, K-6C, K-6CR, K-6pe and K-6E, built by Alexander Schleicher.

The ES-Ka6 is a version of the K-6CR built under licence in Australia by Edmund Schneider Ltd. All versions of the K-6 are designed to the German requirements, BVS Category 2, and are non-aerobatic.

These notes do not cover the K-6E model which differs in detail from earlier versions.

### 1.1 Structure.

The airframe is of normal glued ply shell construction (Birch ply). The rear fuselage is a 1.5mm birch 3 ply shell. The wing torsion box is in 2.0mm diagonal 5 ply. German built K-6's have all timber sections from Baltic pine (Kiefer). Australian built ES-Ka6 retain the main spar only in Kiefer. The rest of the structure is built with spruce, using increased sections wherever necessary to maintain strength.

It should be noted that Kiefer is stronger and more dense (heavier) than spruce. Therefore, when making repairs to German (Schleicher) built K-6, spruce should not be used, except on lightly loaded parts, such as rib booms. Main structural members should be repaired only with the correct material.

### 1.2 Glue.

Schleicher built K-6 are assembled with resorcinol glue for ribs, spars and bulkheads etc., with a urea glue ("Kaurit") used for attaching the outer ply covering.

The Australian-built version retains resorcinol in the mainspar and dive brakes only, the rest of the structure is assembled with casein.

Identification:- Casein is pale cream to white in colour. Resorcinol is a dark reddish-brown, almost black. Kaurit, a single application urea, is a lighter brown with a pink tinge.

Repairs may be made with casein or resorcinol. Note that resorcinol is very sensitive to ambient temperature. The makers instructions should be carefully followed.

### 1.3 Finish.

The interior of the glider is protected with varnish. This coating may not be obvious but the surfaces must always be well sanded when making repairs.

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Schleicher built K-6 do not have the plywood surfaces fabric covered. Painting scheme was usually clear doped fabric (four coats); cellulose on to putty over plywood followed by several coats of grey cellulose undercoat with white or cream cellulose finish.

Australian ES-Ka6 have all outside surfaces fabric covered to protect the ply. Doping scheme is four coats of red pigmented tautening dope, with usually, a white cellulose (laquer) finish, in two or more coats. Some early ES-Ka6 were also doped silver.

Empty weight was about 190kg for German built KA6's as originally supplied and about 210 kg for Australian built ESKA6's.

Most Ka6 have been repainted in service, sometimes with enamel. Particular care is required during repainting to avoid unnecessary weight as the disposable load is not great and most K-6 tend to be tail heavy after repainting.

2. The following points may require particular attention. This does not mean that normal inspection procedures in other areas can be neglected.

3. Fuselage Group.

3.1 Fuselage.

Check near the wheelwell and the rear fuselage next to the stern post particularly for water damage. Also check carefully under the cockpit lining of ES-Ka6 for water damage, as moisture will tend to collect here if the aircraft has been in the rain. Check for blocked drain holes.

Note that there is a false keel of pine fairing the underside of the nose. This fairing is non-structural and provides protection to the nose structure from ground damage. The fairings may be repaired with "plastic wood" or any other suitable filler.

It may be found that the plywood next to the rear tailplane fittings has been damaged. Small corner gussets can be fitted here to reinforce the upper edge of the ply.

Test the attachment of the fin-post by loading the top of the fin by hand. (About 5 kg).

Check tailplane attachment fittings for fatigue (Details E. Schneider Ltd.). Check self aligning bearings for excessive wear. Fit new bearings when tailplane feels loose after attachment fittings have been checked for tightness.

3.2 Mainwheel.

This is 300 x 100 mm for Schleicher built K-6 and 4.95 x 3.5 inch for ES-Ka6. The latter is interchangeable with the ES52 and ES59 wheel. The wheel has a band brake, operated by a cable from the dive brake lever.

Remove the wheel and clean the band brake and inside the fibreglass wheel well. The wheel is mounted on sealed ball bearings which do not require lubrication, but the axle can be cleaned and regreased to prevent rusting.

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Check axle for straightness. Bent axles are difficult to remove and re-fit.

Check adjustment and locking of brake operating cable with the wheel at 35psi. Check also position of dive brakes on re-rigging. (See 6.5)

3.3 Canopy.

Check the canopy locking mechanism for wear and for tightness of attachment screws. If screws are loose, replace with next oversize PK "self tapping" screws (not woodscrews). There have been many incidents of canopy's coming loose in flight.

3.4 Rear Skid.

As supplied Schleicher built K-6 have a multi-layer spring tailskid while ES-Ka6 have a single leaf design. Check the skid shoe for wear, and build up with weld metal or brazing bronze. The latter is preferred in Australia to reduce fire risk. Be most careful to ensure that the shoe has no projections that could possibly catch on wire. There have been many incidents, and a few bad accidents, caused by the tailskid shoe picking up a winch cable on takeoff. At least one club has removed the shoe altogether and the wearing surface is provided by the rear of the spring leaf, or by brazing metal added to it.

Check that the heads of bolts used to attach the spring are smoothed off by suitable wood or metal fairings.

4. Tail Group.

4.1 Fin and Rudder.

Strip rudder hinges to clean, lightly oil and re-assemble. Check rudder stops for damage due to overload. The rudder is locked by the lower hinge bolt. It is not necessary to fit a split-pin to the upper hinge pivot. Note well! The rudder nose fairing is structural.

4.2 Tailplane and Elevator.

Undo the centre (elevator horn) bolts and remove the elevator halves from each side. Check that the centre hinge pin is positively locked with a lock-pin through a drilled hole.

Inspect horizontal stabilizer according to Schleicher Inspection Note B40-10 issued Jan. '67 (Crack in welded seam, details E. Schneider Ltd.).

Inspect for water damage to rear of tailplane spar. This may be the result of storing the tailplane vertically in some trailers. Provide additional drain holes as required.

Check for water damage to elevator, particularly in the case of open trailers. (Tailplane stored with drain holes to top).

Note well! The elevator nose fairing is structural.

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## 5. Wings.

### 5.1 Fittings.

Clean and lightly oil all bell crank self aligning bearings. (Open type). It will pay to sew on felt "boots" to the bellcrank arms to exclude dust.

It will usually be found that the bellcrank mounting brackets (dive-brake and aileron) attached to the root rib will be slightly loose. Reasonable side travel, of the order of plus or minus 3mm is permitted.

In the case of aileron bellcrank brackets attached to the main spar no slop is allowed. If there are no access holes existing, proceed as follows:-

Cut a 16mm diameter hole in the ply directly above the bellcrank hinge bolt. Remove the locknut and drive out the hinge bolt, taking care not to lose the two packing washers each side of the hinge bearing. The two bracket mounting bolt can now be tightened, using a socket spanner and drive. If the bolts turn, then drill a 3mm hole on the far side of the spar. Using a piece of wire establish the position of the spar face and mark this in pencil on the skin. Drill two holes 10mm about 25mm apart, and cut between to provide access to bolt heads.

Note well! Avoid damage to wooden spar caused by over-tightened bolts.

On re-assembly, the hinge bolt should clamp on the hinge bearing inner without causing the bracket to foul on the bellcrank. Fit thicker spacing washers as necessary.

Note well! Bracket bolts on ES-Ka6 are $\frac{1}{4}$ BSF but all bellcrank bolts are metric (5mm). Also $\frac{1}{4}$ BSF stopnuts will fit on the threads, although they will seat on the plastic only, and are unsafe.

Cover access holes with fabric or plastic tape. This is a moderately stressed area, and it will not be necessary to reinforce access holes provided they are kept within dimensions stated.

### 5.2 Ailerons.

If aileron hinges or horns are loose, a similar procedure may be adopted as for 5.3. The aileron covering is 1mm birch 3 ply. Most aileron hinge positions have plywood access holes provided which are fabric covered.

### 5.3 Dive Brakes.

Check that the webs are not warped and that there is no danger of the brakes locking open by the webs catching on the rim of the dive brake box. Check the undersurface brakes while loading them towards the rear to simulate operating loads. With brakes locked closed, inspect surface to be flush with wings, while wings are being loaded at the tips to reproduce normal wing bending. Open brakes and correct with file and sanding block. Refinish with dope or wood primer followed by correct final coat.

After 3 years service, or as required, strip and clean the dive brake pivot bearings. Soak in oil and wipe dry before re-assembly. Access holes are provided in the wing.

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Check that Schleicher Ka6 modification 9 has been introduced to forked air brake push rod. (Details E. Schneider Ltd.).

6. Controls.

The controls consist of push rods for elevator, dive brakes and ailerons, with cables for rudder, wheel brake and release.

Adjustments should not be necessary except after some repairs.

Dusty conditions will greatly aggrevate cable wear. Cables should not be oiled or painted.

Inspect all push rod felt bearings at not more than three year intervals.

Check that all control knobs and levers are colour coded to conform to international (O.S.T.I.V.) and local (G.F.A.) standards.

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|---|---|---|
| i.e. | Release | Yellow |
| | Canopy | Red |
| | Air Brakes | Blue |
| | Trimmer | Green |

6.1 Elevator Circuit.

The control column pivot and slave lever pivot on German built K-6 is a universal joint with ball bearing pivots. On the ES-Ka6 this item is a ball joint mounted between bearing plates.

If, in the latter case, slop becomes 'excessive' remove the control column pivot. This is held down by four bolts, the heads of which are accessible through holes in the false keel of the nose. Note! These holes are sometimes covered over during minor repairs to the false keel. Strip the ball pivot edge from the ball and fit a new shim plate to take up the play. Clean and relubricate with grease before re-assembly.

Inspect automatic elevator connection according to Schleicher Inspection Note not numbered, dated 4/7/62. (Details E. Schneider Ltd.)

6.2 Aileron Circuit.

Both ailerons should be neutral with the control column in the centre position. Ailerons will move up with rearward movement of the control column. See also under 5.1 "Wing Fittings".

6.3 Rudder Circuit.

Examine cable at forward end of fibre tube and at exit to rear fuselage. It can be assumed that the cable in between will be in a similar, or better, condition. Inspect rudder pedals for foulding on to side stringers in forward position. It may be necessary to chisel off some area of stringer to clear. Inspect pedal mounting brackets for cracks, particularly the brackets attaching wooden boards to the pedal frames. Failures have occurred.

To replace rudder cables, mark the pedal position on side of cockpit. Cut the cable at the stern and butt weld the new cable to this. Draw through the new cable to the nose and re-swage. If using cable which hasnot be pretensioned remember to allow for the stretch of the cable in service.

6.4 Trim Circuit.

Inspect coil spring of German built K-6 for cracks. Check correct trim friction ES-Ka6 and for failure of 3/16 Whitworth screw securing trim operating rod. It is recommended that, in the event of damage, the knob be drilled and tapped for a $\frac{1}{4}$ inch screw. Remove trim push rod and replace screw which may be welded or brazed. In this case only non-aircraft welding may be used as a non critical application.

6.5 Dive-brake Circuit.

See also under 5.1 and 5.3. On rigging after C of A, check for correct opening of brakes.

6.6 Release.

As supplied, the Schleicher K-6 will have been fitted with a Tost belly release with finger type back release. (No cage). This must be replaced by an approved "cage type" release to comply with both Australian (G.F.A.) standards and the present German standards. A Tost "Kombi E" belly release will fit the same mounting holes and is of an approved "cage type" design. Alternatively an "Ottfur type" release may be fitted. (Ottley Motors, Davies). Check that this modification is correctly entered up in the log book (Department of Civil Aviation, C.A. Form 9).

Check release cable for wear and corrosion (particularly under operating knob or strap). Remove releases and clean, inspect for wear to hook profile and pivots, check over centre action, correct spring tension. On re-assembly check friction of circuit. 'No-load' operating force should not exceed 7kg.

Check under load with standard rings.

7. Instruments.

A.S.I. calibration should be checked each year. Altimeter at regular intervals. Check that units used on the A.S.I. correspond with those on the placard. (Knots).

8. Weight Limitations.

8.1 The aircraft should be re-weighed if (a) any heavy equipment is installed; (b) it is repainted or (c) repaired following major damage.

Weighing must be carried out with a wedge, 1000 mm x 122 mm on the fuselage top, (apex towards wing) levelled. The longitudinal reference is the wing leading edge. Note! The leading edge is straight.

The maximum permitted flying weight is 300 kg with the provision that the maximum weight of the fuselage plus tailplane does not exceed 190kg. The maximum disposable load is therefore 300 kg minus the actual (measured) empty weight.

To be within limits, the centre of gravity of the loaded aircraft must be within 175 mm and 350 mm aft of wing root leading edge.

All measurements and calculations should be recorded in the log book and a copy sent to the Regional Technical Officer, Airworthiness, so that G.F.A. records may be kept up to date.

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(NOTE: C of A Inspectors are invited to call on G.F.A. Technical Officers for advice on the above procedure).

8.3 Placards.

The cockpit must be placarded with the minimum pilot weight, maximum disposable load and all flight limitations. Maximum towing cable strength of 450 kg aerotow, 650 kg winch/autotow is to be visibly marked on aircraft.

9. Documentation.

Both the log-book (C.A. Form 9) and the C of A Inspection Sheet (G.F.A. Form 2) must be completed with details of all work done, modifications and weight changes.

Normal procedure then will be to forward the Form 2 to the Regional Technical Officer, Airworthiness for the State.

10. Further Information.

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# Schleicher Ka 6 CR „Rhönsegler" Übersicht

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