

# ASK 21 FLIGHT MANUAL

## Check List / 1

### Pre Flight Check

1. Main pins safetied ?
2. Rear wing attachment pins: is the safety lock visible above the pin ?
3. Horizontal tail unit pins safetied ? Is the spring retainer engaged ?
4. Elevator pushrod connected ?  
Safetied with a spring clip ?  
This is not applicable for gliders which use the automatic elevator connection !
5. Aileron pushrods connected ?  
Safetied with a spring clip ?  
Do not forget the sight control through the access hole cover !
6. Airbrake pushrods connected ?  
Safetied with a spring clip ?  
Do not forget the sight control through the access hole cover !
7. Check for foreign bodies !

### Attention !

With all HOTELLIER quick-release joints one must be able to touch the ball pivot by feeling through the slot in the ball socket. Check the proper engagement of the safety lock by pushing it on to close !

C H E C K   L I S T   /   2

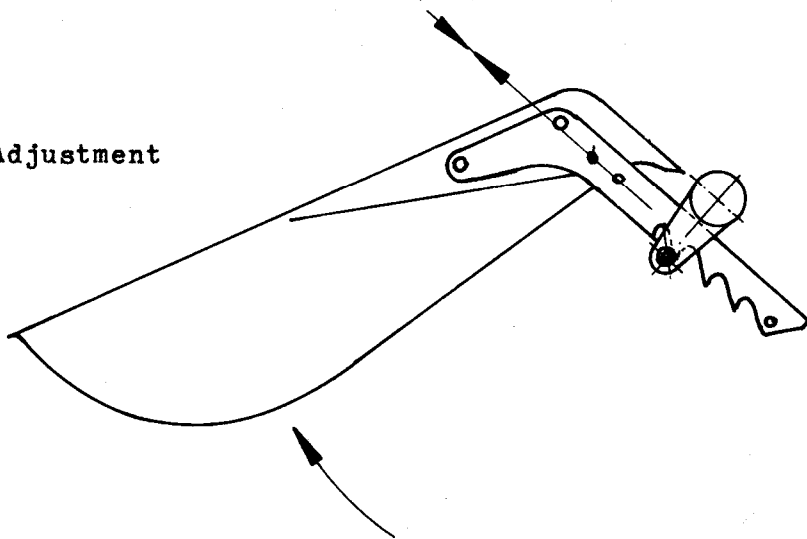
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Pre take off check

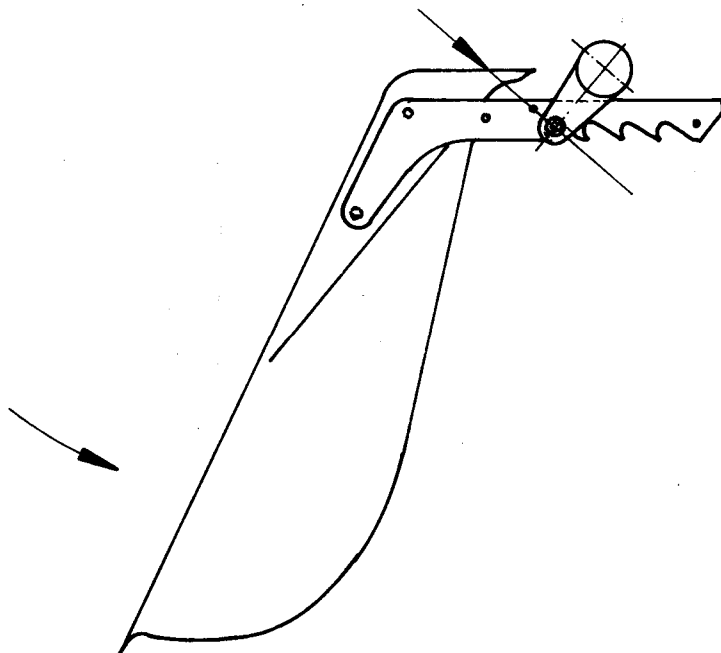
1. Parachute connected to harness ?
2. Safety harness fastened ?
3. Airbrakes locked ?
4. Trim lever adjusted to a middle position ?
5. Altimeter adjusted ?
6. Canopies closed and locked ?  
Rear canopy !!
7. For flight with only one occupant remove  
rear back rest !!
8. Put your toes under the toe-straps !!  
Do not flatten the straps !!  
Danger of jamming the pedals !!

BACK REST ADJUSTMENT

Adjustment



Engaged



IV.2 Daily Inspections

- 1.a) Open canopy! Check that the main pins are properly secured.
  - b) Check the proper connection of the ailerons and airbrakes through the access hole on the left side above the wing. Are the quick-release connectors secured with spring clips ?
  - c) Check for foreign bodies !
  - d) Check the control circuits force and that all controls are free-moving. Apply full deflections and load the control circuits with fixed controls and airbrakes.  
Check the plastic tubes inside the S-shaped tubes of the rudder pedals for proper and tight fit.
  - e) Check tire pressure:  
Nose wheel 2,0 bar (28 psi)  
Main wheel 2,7 bar (38 psi)  
Tail wheel (If installed) 2,5 bar (35,6 psi).
  - f) The condition and function of the tow release mechanism is to be checked. Actuate the tow release: does it snap back freely ? Engage and disengage the ring pair. Check the automatic release of the C.G. towing hook with the ring pair which must release automatically backwards.
  - g) Check the wheel brake. Pull the airbrake lever; at the end of its travel an elastic resistance must be felt.
- 2.a) Check upper and lower wing surface for damages !
  - b) Aileron: its condition, free-movingness and play is to be checked ! Check also the pushrod connection.
  - c) Airbrake: its condition, fit and locking is to be checked.
- 3.) Check the fuselage for damages, in particular also the bottom side.
  - 4.) Check that the tailplane is properly assembled and secured. Check also the pushrod connection. Secured by spring clips ?

IV.10 APPROACH AND LANDING

The most favorable approach speed is about 90 km/h (49 kts). With turbulence it may be advisable to increase the approach speed slightly. Even steep approaches may be slowed down efficiently with the airbrakes. It is advisable to unlock the airbrakes at the beginning of the landing final approach.

Note : The airbrakes increase the stalling speed by about 3 km/h (1,6 knots).

Sideslipping is also suitable as an approach control.

With full rudder during sideslipping the rudder pressure decreases to zero; the rudder must be pushed back.

V. RIGGING AND DE-RIGGING

V.1 RIGGING

Rigging the ASK 21 can be carried out by four persons without mechanical assistance, and by three persons with the use of a fuselage stand or a wing support.

Prior to rigging, clean and grease all pins, bolts, bushings and control system connections !

1. Set up the fuselage and hold it horizontal.
2. Plug the spar fork of the left wing into the fuselage and - if available - place a wing support under the wing end.
3. Offer up the right wing and align the main pin fittings.
4. Press in the main pins and secure. **Never** insert the rear wing attachment pins prior to the main pins !
5. Press in the rear wing attachment pins; unscrew the T-tool and check whether the safety lock is engaged.
6. Connect and lock the aileron control linkages in the fuselage behind the spar tunnel. You must be able to touch the ball pivot by feeling through the slot in the socket. Also check the proper engagement of the safety lock by pushing it on to close ! Secure them with spring clips!
7. Connect and lock the airbrake control linkages in the fuselage behind the spar tunnel. Secure them with spring clips!

8. The tailplane is fitted onto the fin from the front. Now the Allan bolt at the leading edge is screwed in; this should be screwed in tightly until the spring-loaded safety pin snaps out over the screw head as far as the socket.
9. Connect the elevator and safety with a spring clip !

Note, if your glider uses an automatic elevator connection: after cleaning and lightly greasing the plug-in elevator connections, the tailplane is fitted onto the fin from the front; both elevator panels must be fitted into their connectors simultaneously. Then the tailplane is pushed back until the Allan bolt at the leading edge can be screwed in; this should be screwed in tightly until the spring-loaded safety pin snaps out over the screw head as far as the socket.

10. Carry out a pre-flight check referring to the Check List.
11. The control circuits must be subjected to an operational test.
12. Check condition and function of the wheel brake; check the tire pressure.  
See also Section IV.2 Daily Inspections.

## V.2 DE-RIGGING

De-rigging is carried out in the reverse sequence to that of rigging. It must be taken care that the rear wing attachment pins have to be removed prior to the main pins.

## V.3 PARKING

When parking the glider, the canopies have to be closed.

When an ASK 21 is parked on an airfield in the sunshine (this must also be observed during the waiting time until take-off when the pilots are already on board ) the canopies must not be left open for some time. Depending on the position of the sun and the intensity of the radiation, the burning-glass effect of the canopies can cause a slow fire in the area of the instrument panel or the headrest respectively.

Therefore, if you have to store the glider outside, it is absolutely necessary always to close the canopies and to cover them with a white cloth.

## V.4 ROAD TRANSPORT

The design of a glider trailer is another subject and cannot be discussed in all details here. Of course, a closed trailer is preferable. But also an open trailer may serve the purpose, the latter is generally simpler and lighter. It is important that all components are well fixed and have a large support surface.

Structural components survey drawing which can be used for the building of a trailer, can be obtained from ALEXANDER SCHLEICHER.



VII. CHECK LISTS

Pre Flight Check

1. Main pins safetied ?
2. Rear wing attachment pins: is the safety lock visible above the pin ?
3. Horizontal tail unit pins safetied ? Is the spring retainer engaged ?
4. Elevator pushrod connected ? Safetied with a spring clip ? This is not applicable for gliders which use the automatic elevator connection !
5. Aileron pushrods connected ? Safetied with a spring clip ? Do not forget the sight control through the access hole cover !
6. Airbrake pushrods connected ? Safetied with a spring clip ? Do not forget the sight control through the access hole cover !
7. Check for foreign objects !

Attention !

With all **HOTELLIER** quick-release joints one must be able to touch the ball pivot by feeling through the slot in the ball socket. Check the proper engagement of the safety lock by pushing it on to close !

Pre Take Off Check

1. Parachute connected to harness ?
2. Safety harness fastened ?
3. Airbrakes locked ?
4. Trim neutral ?
5. Altimeter correctly set ?
6. Canopies closed and locked ? Rear Canopy !!
7. For flights with only one occupant remove the rear back rest !!
8. Leave your toes under the pedal toe-straps ! Never flatten the straps ! Danger of jamming the pedals !

3. Special checks

After rough landings :

Check the landing gear suspension mount at the front main bulkhead !!  
Check the wheel fork for deformation; gear box !!  
Check the control shaft above the wheel for deformation !!  
Make sure that the rubber buffers have not come over the support discs !!  
Check spar tongue and fork for white areas !!  
Check the wing connections at the fuselage !!  
Check the cross tube at the front main bulkhead for compression deformations !!  
Determine wing bending oscillation frequency and compare with the value of the last inspection report. In case of differences by more than 5 % contact the Schleicher factory. (See survey drawing on page 29 of the Maintenance Manual for jack up points !).

After ground loops :

Inspect the fuselage tail cone at the transition to the fin and also the attachment of the horizontal tail unit to the fin !!  
Check wing connections at the fuselage !!  
Inspect horizontal shear web in the fuselage (between front and rear main bulkhead).

## VIII PERIODICAL INSPECTIONS

The following maintenance checks have to be carried out periodically, however, imperatively at the latest annually :-

1. Check the whole glider - outside and inside where accessible - for cracks, holes, dents and white spots in the fiberglass.

2. The attachment hinges and pins must be checked for corrosion, tool marks and play. If the front shear pins of the wing-fuselage junction show too much lateral play due to ground loopings, thin metal washers must be added on these pins. The spar pins must show some play, otherwise the wings possibly cannot be rigged at all with different temperatures. Besides here the bearing pressure is so low that there is no danger of wear-out.

On the other hand the rear pins of the wing-fuselage junction require more attention. In the case of play (backlash) at these pins they have to be replaced in time against oversize pins. The play (backlash) at these pins should be within the tolerances H7/g6.

Good preventive maintenance will increase considerably the service life of all pins and fittings. Always clean and relubricate the pins prior to every rigging. Do not misalign the pins !!

3. Check all metal parts for corrosion and, if necessary, repaint them. As priming a zinc-chromate prime has to be used.

4. Check that there is no play in the fuselage/wing and fuselage/tailplane connections (see also above Point 2.).
5. The condition of all accessible bearings, fittings, joints, stops in the control linkages, and especially the control cables and towing hook cables, must be checked.  
The plastic tubes inside the S-shaped rudder pedals tubes must be checked for proper and tight fit !
6. The controls, including the airbrakes, must be subjected to an operational test, and their control deflections measured.
7. If any control is not free-moving over its entire range of movement, then the cause is to be established and eliminated.
8. The condition of the main landing gear and tailskid (foam skid with wear plate or pneumatic tailwheel respectively) including tire, brake linings, and rubber shock absorber must be checked. See also that there is sufficient brake fluid in the tank.
9. The towing hooks must be inspected according to the manufacturer's "operations and maintenance instructions".
10. The pressure openings (pitot and static pressure ports) on the fuselage, including their flexible lines, are to be checked for blockages and leaks.
11. Condition and function - if applicable, maximum permissible operational time - of all instruments, VHF-transceiver unit, and other equipment are to be checked !
12. The wing bending frequency is to be measured and compared with the stated value in the latest inspection report. For this test the fuselage must be rigidly supported on two supports, in order to obtain comparable values; for the position of the supports see the Survey Drawing on page 29.
13. Check that the equipment and instrumentation are in accordance with the Equipment Inventory.
14. After repairs or alterations to the equipment the new empty weight and the C.G. position are to be found by calculation or weighing, and are to be recorded in a summary of weights.

Checking and securing the L'HOTELLIER quick-release connectors in the control linkages

1. **Securing**

Past experience showed that the quick-release connectors in the airbrake, aileron and particularly in the elevator control linkages were incorrectly assembled or that their assembly was even completely forgotten (as of serial no. 21206 the aircraft was then supplied with an automatic elevator connection). A sticker (Fig.1) fixed to the fin and the access hole cover, serve to remind the pilot of the correct assembly. All quick-release connectors must be secured in addition by means of a spring clip (Fig.2). With the older type of connectors the check hole must be drilled to approx. 1,2 mm  $\phi$  for this purpose.

Fig. 1

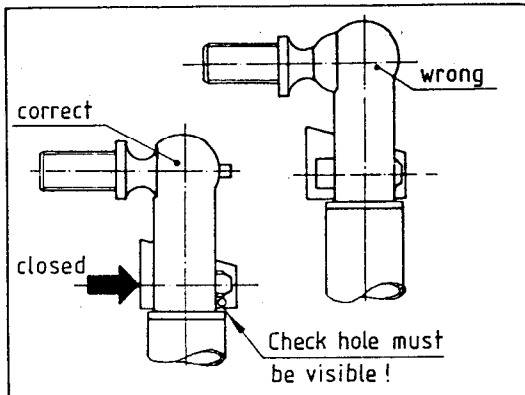
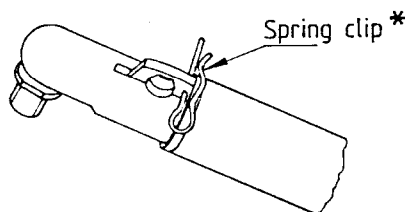


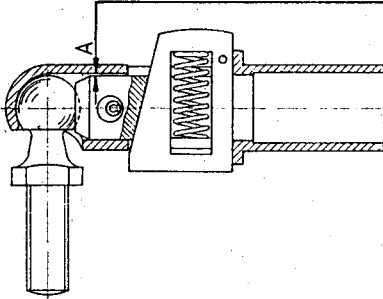
Fig. 2



\* Spring clip no.50030771 can be ordered from Alexander Schleicher or from the company A.Würth, P.O.Box 1261, D-7118 Künzelsau.  
 (This part is also identical with the FORD brake securing spring clip).

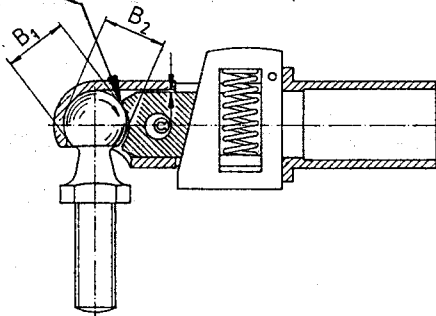
2. Inspection

As experience accumulated in Australia has shown, the condition of the L'HOTELLIER connectors must be checked on every annual inspection of the aircraft, especially when it has been operated frequently and from sandy airfields.

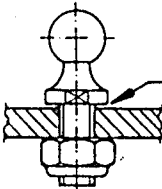


Clearance A must not exceed 0,15 mm (0,006 in); check this by using a wire of the above diameter!

Bad wedging effect causing wear of the ball.



The greatest and smallest diameters B to be found must not differ by more than 0,1 mm (0,004 in).



The tight seat of the ball ends inside the fittings must be checked as loose ball ends are likely to break under bending loads in the thread area.

Gap generated by an unscrewed and incorrectly refitted ball end or owing to overloading /wear out of the lever part.