

ASK 21 - Flight Manual

Check List / 1

Pre Flight Check

1. Main pins secured ?
2. Rear wing attachment pins: is the safety lock visible above the pin ?
3. Horizontal tail unit pins secured. Is the spring retainer engaged ?
4. Elevator pushrod connected ? Secured with a spring clip ?
This is not applicable for gliders which use the automatic elevator connection !
5. Aileron pushrods connected ? Secured with a spring clip ?
Do not forget the sight control through the access hole cover !
6. Airbrake pushrods connected ? Secured with a spring clip ?
Do not forget the sight control through the access hole cover !
7. TM 25 / TM 30:
Are the rudder cables connected to the joint between both seats and secured according to the rules resp. disconnected and attached to the anchor points ?
Is the plug-in rudder hand lever secured ?
Function of the rudder control in both seats checked ?
Cable tension of the rudder hand control system checked ?
8. Check for foreign bodies!

Attention !

With all L'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!

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IV. Normal Operation procedures

IV.1 Cockpit and operating levers

Front seat:

1. Stick
2. Trim; flat lever with **green** knob LH of stick.
3. Rudder pedal adjustment; **grey** knob at the console
4. Airbrakes with wheel brake; **blue** hand grip in the left lever arm rest
5. Release cable; **yellow** knob on the front left below the canopy frame.
6. Canopy emergency jettisoning; horizontal lever with **red** flat knob above the instrument panel cover. To the left = "Open".
7. Front canopy locking; **white** swivel levers forwards – parallel to the canopy frame.
8. Ventilation nozzle; on right cockpit wall below canopy frame; adjustable and closable.
9. Back rest; the back rest is adjustable by lifting it at the bottom upwards and forwards (see sketch). In normal flight attitudes the backrest cannot shift by itself. Very tall pilots may fly without the back rest.
10. Trim indicator; in the right arm rest behind the ventilation nozzle.
11. Detachable rudder hand lever at the left cockpit wall below the airbrake grip (not shown). Only applicable for mod. TN No. 25 and TN No. 30.

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Rear seat:

1. Stick
2. Trim; flat lever with **green** knob LH of stick.
3. Rudder pedal adjustment with circular grip in front of stick.
4. Airbrakes with wheel brake; **blue** lever in the left arm rest.
5. Release cable; **yellow** knob on left cockpit wall below the canopy frame
6. Rear canopy locking = Canopy **emergency** jettisoning;
Red swivel levers on left and right canopy frame.
To open canopy: pull **back** both levers.
To lock canopy: push both levers **forwards**, parallel to the canopy frame.
7. Ventilation nozzle; on right cockpit wall below the canopy frame; revolving and lockable.
8. Back rest; the back rest is adjustable by tilting it from the bottom upwards and forwards (see sketch); in normal flight attitudes the backrest cannot shift by itself.
Attention: At flights with one pilot the rear backrest must be fixed with the safety harness.

Very tall pilots may fly without the back rest.

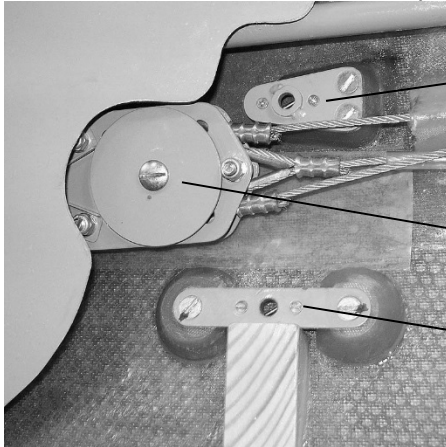
9. Trim indicator; in the right arm rest behind the ventilation nozzle.
10. Detachable rudder hand lever at the left cockpit wall below the airbrake grip (not shown). Only applicable for mod. TN No. 30.

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Connection of the rudder pedals:

The rudder control with a hand lever enables pilots to fly the ASK 21, even when their capability to move their legs is limited. In this case the feet resting on the pedals must not obstruct the rudder. Therefore, the cables coming from the particular pedals can be disconnected at the joint between the front and rear seat. The disconnected cables have to be fixed on special anchor points on the fuselage wall.

Cable connection of the left side is pictured:



Anchor point for disconnected cable of the front pedal.

Connection plate for cables of rudder pedals with lock washer for connection bolts.

Anchor point for disconnected cable of the rear pedal.

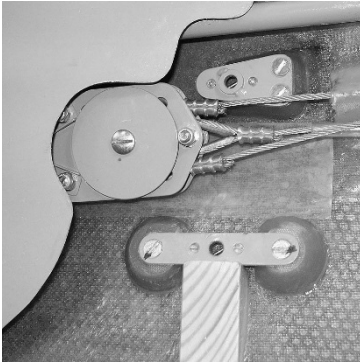


Connection plate for cables of rudder pedals with demounted lock washer. The removable connection bolts are visible.

Attention: The position of the connection bolts in the row of holes must be marked, to avoid a change of the total cable length when reconnecting, which would result in a change of the pedal position. The holes not needed will already be closed ex works.

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Possible Variants:

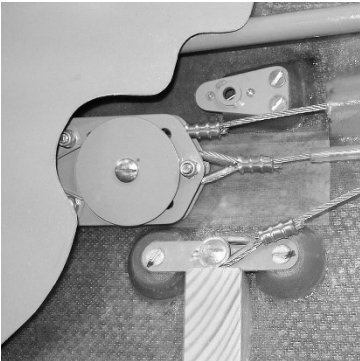


Front and rear pedals connected

Attention:

The lock washer must be mounted according to the rules to hold the connection bolts in their position.

The screws of the anchor points for the disconnected cables must be removed!

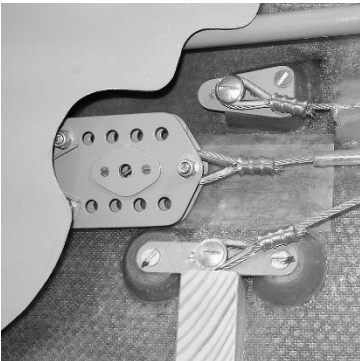


Rear pedals disconnected

Attention:

The towing ropes of the **rear** pedals have to be attached with screws left and right at the **lower** anchor points.

Likewise also only the **front** pedals can be disconnected and have to be fixed on the **upper** anchor points.

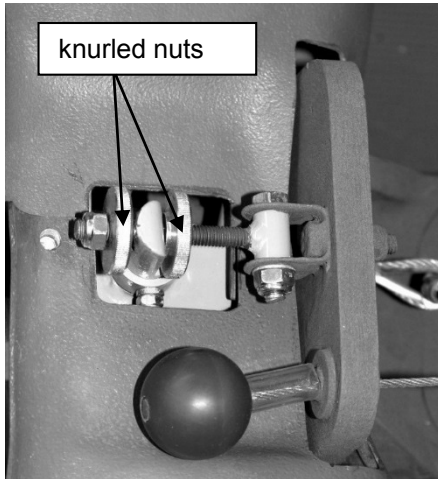


Front and rear pedals disconnected

In this situation, the rudder can in both pilot seats only be controlled with a hand lever.

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Checking and Adjusting of the Cable Tension:

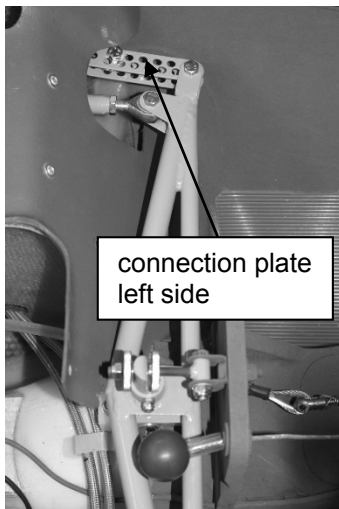


The adjusting screw for the cable tension of the rudder hand control system is located in the front of the control column and besides of the pedal adjustment. This is for the **fine adjustment** of the cable tension during the Pre Flight Check.

Shifting in the direction of flight results in a higher cable tension, shifting against a lower. After the adjustment both knurled nuts have to lock the part between again.

The cable tension is high enough, if the hand lever has no noticeable play with blocked rudder. The cable tension is too high, if the rudder does not move freely.

If the adjusting screw allows no correct adjustment of the cable tension, the system has to be maintained. It has to be adjusted and inspected as follows:



- Remove the front fairings covering the swing lever.
- Adjust the cable tension by readjusting the cable mounting points on connection plates left and right on the swing lever.
- Check freedom from play and free movement.

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IV.2 Daily Checks

- 1 a) Open canopy! Check that the main pins are properly secured by the lock catches.
- 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 2.5 bar (35.6 psi) (if installed).
- 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 re-release of the C.G. towing hook with the ring pair which must re-lease automatically backwards.
- g) Check the wheel brake. Pull the air brake lever; at the end of its travel and elastic resistance must be felt.
- h) Check cable tension of the rudder hand control system (see page 19.1a).

Only in flight operation with the rudder hand lever:

- Locking bolt screwed in at the airbrake handle and secured ?
- Rudder hand lever mounted and secured ?
- Are the rudder cables connected to the joint between both seats and secured resp. disconnected and attached to the anchor points ? (only TN 30)

Only in flight operation without rudder hand lever:

- Are the rudder cables connected to the joint between both seats and secured according to the rules ? (only TN 30)

- 2 a) Check upper & lower wing surface for damages !
- b) Aileron: condition, freedom of movement, and play is to be checked ! Check also the push rod connection.
- c) Airbrake: check condition, adjustment and good locking.
- 3) Check the whole fuselage for damages, in particular the bottom side.
- 4) Check that the tailplane is properly assembled and secured. Check also the pushrod connection. Secured by spring clips ?

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Rudder Control System

The rudder is actuated by Ø 3.2 mm LN 9374 cables. Both front and rear pedals are adjustable.

The rudder cables are running from a fixed point through S-type pedal loops to a perforated adjusting plate the cables run through nylon tubes to the rudder actuating bell crank.

At the adjusting plate minor inaccuracies of cable length may be adjusted and also the pedal rake angle. The cables are held taut by springs at the pedals; at the rear pedals this spring serves simultaneously for holding down the adjusting stop.

For the adjustment of the cables at the adjusting plate the rear seat must be removed.

The rudder stops are located at the back of the rudder.
The rudder bell crank strikes the stop at the bearing bracket.

Only for the mod TN-No. 25 and TN-No. 30:

A pushrod connects the front rudder hand lever on the left cockpit wall to a swing lever in front of the stick. At both sides of this swing lever cables lead backward to the connection plates. The latter also offer some adjustment possibilities.

The cable tension has to be checked / adjusted during the maintenance. For the correct adjustment of the cable tension see Flight Manual page 19.1a.

Only TN-No. 30:

The rear rudder hand lever is directly attached to the connection plate of the left side. The cables coming from the front and rear pedals are also fastened to these connection plates. If necessary, the cables from the rudder pedals can be disconnected at this point (see Flight Manual pages 19b and 19c).

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Airbrakes

The airbrakes are actuated by push rods. On the left cockpit wall runs a connecting rod with a hand grip each for the front and rear cockpit. In the front cockpit the rod is running in a nylon guide.

In the rear cockpit it is supported by a duralumin rocker arm. From this arm another push rod – placed under the arm – continues to a 90° duralumin bell crank and runs below the rear spar tunnel wall.

The back of the spar tunnel wall features two rocker arms and the push rod which produces the counterclockwise travel of the actuating levers: By means of a HOTELLIER joint (M12.41) the push rods in the wing are connected to the actuating levers. They run through three ball bearing guides and lead to the airbrake toggle joint lever.

A short push rod leads to the inner airbrake lever which on the other hand is connected to the outer airbrake lever by a push rod so that synchronous movement is guaranteed.

Stop of the airbrake control: Brake cylinder.

Only for the mod TN-No. 30 dated 22.01.07:

A locking bolt can be screwed into the front air brake lever (secured by means of a spring clip) and can engage into holes at the left cockpit wall. So the airbrakes can be set to several, fixed positions from both the front and rear seat. The left hand can then be used again to control the rudder lever. The push rod includes a spring loaded joint, that secures the airbrake lever in its engaged setting.