

- 13) Air brake: check condition, free movement, alignment and locking.
- 14) Rear wing attachment pins pressed in and secured?
- 15) Check that static ports in the fuselage tail boom are unobstructed!
- 16) Check the condition of the Pitot tube and the Total Energy probe respectively! Are they firmly seated?
- 17) Rudder: check condition, free movement, and play!
Cable connections secured?
- 18) Check tailplane for correct assembly, and for correct engagement.
Elevator and actuator: condition, free movement, and play!
- 19) Check control linkages of elevator, aileron, rudder and air brakes for free movement and for force-fit. Hold controls firmly at full deflection while loads are applied to stick, pedals and air brakes lever respectively.

Only in flight operation with the rudder hand lever:

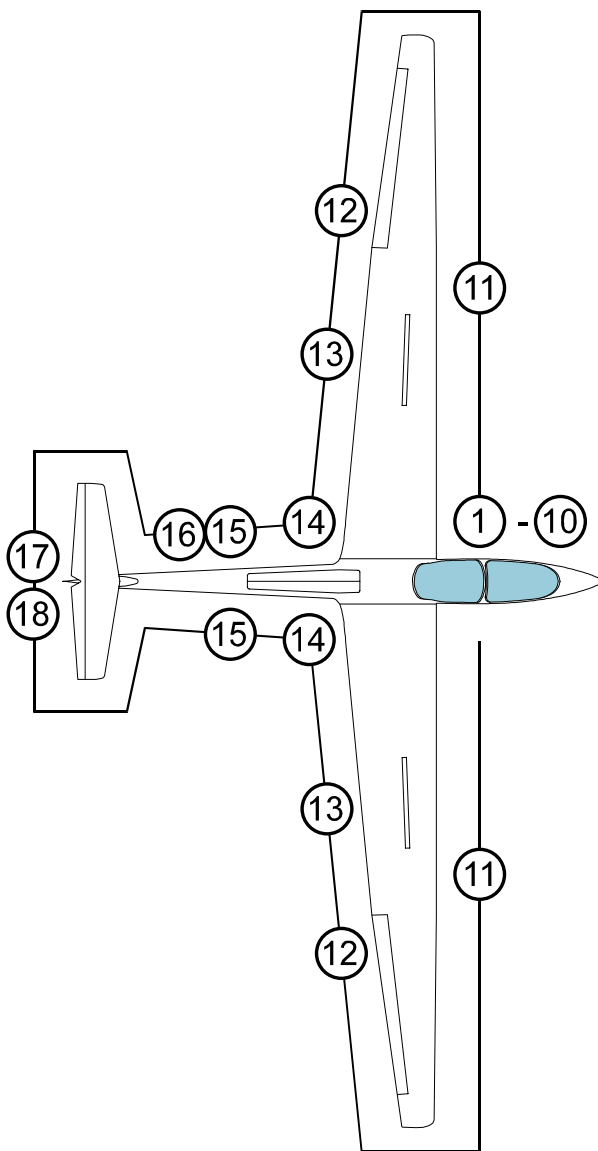
- Locking bolt screwed in at the airbrake handle and secured ?
- Rudder hand lever mounted and secured ?
- Are the rudder cables connected to the joint between both seats and secured resp. disconnected and attached to the anchor points?
(see section 9.C)
- Rudder hand levers may not have perceptible play !

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 ?
(see section 9.C)

After rough landings or excessive flight stress the whole aircraft must be checked with the wings and tail unit removed. If any damage is found, a technical inspector must be called in. On no account one must take off again before the damage has been repaired.

Fig. 4.3-1 **Tour around the aircraft** (see Daily Inspection 4.3)



Section 7

- 7. Description of the Powered Sailplane, its Systems and Equipment
 - 7.1 Introduction
 - 7.2 Flight Controls and Trim
 - 7.3 Air Brakes
 - 7.4 Landing Gear
 - 7.5 Cockpit, Canopies, Safety Harness and Instrument Panels
 - 7.6 Baggage Compartment
 - 7.7 Power-Plant
 - 7.8 Fuel and Oil Tank System
 - 7.9 Electrical System
 - 7.10 Pitot and Static Pressure System
 - 7.11 Miscellaneous Equipment (Removable Ballast, Oxygen, Emergency Location Transmitter)

7.1 Introduction

This Section contains a description of the powered sailplane, its systems and equipment with instructions for use. Details of various optional systems and equipment can furthermore be found in Section 9.

A detailed technical description and overall view drawings are contained in the Maintenance Manual.

The principal purpose of this Section is to describe the controls in the cockpit, their layout and labels.

7.2 Flight Controls and Trim

(1) Aileron and Elevator

Both these controls are operated by means of the control columns fitted at both seats. Next to both sticks the trim release levers are fitted; the radio transmit button is mounted in addition on the front seat stick.

(2) Rudder

Removable rudder hand lever on the left cockpit sidewall below the airbrake lever. When mounting the lever, secure it with the attached DZUS-bolt

Optionally, the ruder pedals can be prepared for temporarily deactivation, see section 9.C.

The rudder pedals are adjustable to suit leg length.

(a) Front seat:

Pedal adjustment:
grey knob at right of stick



To move pedals aft:

Relax pressure on pedals and pull them back by the knob. Then release knob and apply pressure to pedals to lock in position.

To move pedals forward:

Pull knob and push pedals forward with your heels. Release knob and apply pressure shortly to pedals to lock in position.

(b) Rear seat:



Pedal adjustment:

grey ring in front
of rear stick

To move pedals aft:

Relax foot pressure on pedals, lift grey ring to disengage from detent hole and pull pedals backwards by the ring. Re-engage the catch in the nearest detent hole to secure.

To move pedals forward:

Lift the grey ring to unlock, push pedals forward with your heels and re-engage the catch in nearest detent hole.

(3) Trim

The trim release levers are at the left side of the two control sticks. A trim indicator is fitted at the left cockpit wall at either seat.

Trim nose heavy



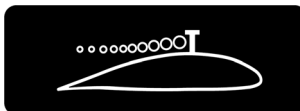
Trim tail heavy



7.3 Air Brakes

The air brakes are operated by either of the blue handles mounted at the left cockpit wall.

Pull the blue handle to extend the air brake paddles.



When the air brake handle is pulled back to its fullest extent, it will also actuate the hydraulic disc brake of the main wheel.



The air brakes extend on the upper wing surface only.

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.

Optionally, an additional wheel brake lever can be installed on the front stick (see section 9.D)

7.4 Landing Gear

The ASK 21 Mi uses a fixed, sprung main wheel, size 380 x 150.

The tail wheel size is 210 x 65, the nose wheel 4.00-4.

Optionally the ASK 21 Mi can be equipped with a steerable nose wheel, which is coupled with the rudder control circuit. In conjunction with the wing tip wheels which are also an available option, the ASK 21 Mi can roll on the ground on its own with the use of its power-plant.

Tire pressures:	main wheel	3.5 bar	(51 psi)
	tail wheel	2.5 bar	(36 psi)
	nose wheel	2.0 bar	(29 psi)

Section 9

9. Supplements

9.1 Introduction

9.2 List of inserted Supplements

Supplements Inserted

9.1 Introduction

This Section contains appropriate supplements necessary to safely and efficiently operate the aircraft when equipped with various optional systems and equipment, which do not come as standard.

The following optional equipment has already been described in Section 7.11 of this manual:

- Removable Trim Ballast as Compensation for Reduced Pilot Weight
- Oxygen System
- Emergency Location Transmitter

9.2 List of Inserted Supplements

Date of Insertion	Document No.	Number Pages	Title of the inserted supplement
1. Dez. 07	A	4	Spin ballast
1. Dez. 07	B	12	Operation with removed engine
1. Mar 09	C	4	Rudder-pedals deactivation (TN2)
1. Mar 09	D	2	Wheel brake lever on the stick

C Rudder-pedals deactivation (TN 2)

1 General

The rudder control with a hand lever enables pilots to fly the ASK 21 Mi, 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.

This is an optional addition to the rudder hand levers.

2 Limitations

No changes become necessary for Limitations

3 Emergency Procedures

No changes become necessary for Emergency Procedures.

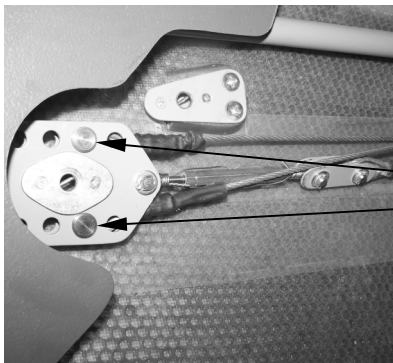
4 Normal Procedures

Cable connection of the left side is pictured:



Anchor point for disconnected cables of the pedals.

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

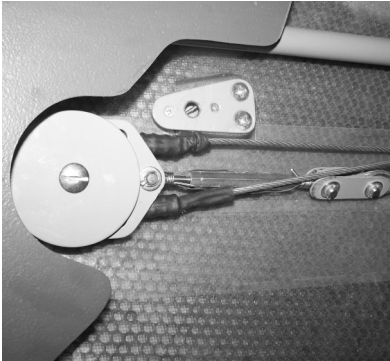


Perforated plate for cables of rudder pedals with de-mounted lock washer. The removable connection bolts are visible.

Caution: 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.

9.C.2 Rudder-pedals deactivation

Possible Variants:

**Front and rear pedals connected****Caution:**

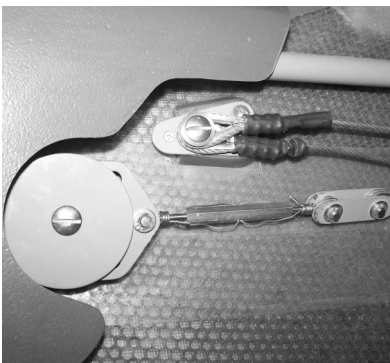
The lock washer must be mounted according to the rules to hold the connection bolts in their position.

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

**Rear pedals disconnected****Caution:**

The cables coming from the **rear** pedals have to be attached with screws left and right at the anchor points.

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

**Front and rear pedals disconnected**

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

To reconnect:

Front pedals on the upper row, rear pedals on the lower row of the perforated plate.

5 Performance

No changes become necessary for Performance

6 Weight and Balance

No changes become necessary for Weight and Balance

7 Maintenance

If there are no provisions for a removable rudder hand lever on the rear seat, the cables of the rear pedals have to be permanently attached to the perforated plate by means of a screw with flat head (instead of the removable connection bolts)

9.C.4 Rudder-pedals deactivation

D Wheel brake lever on the stick

1 General

On the control stick a brake lever can be installed acting upon the master cylinder of the hydraulic wheel brake via a Bowden cable. This lever simplifies taxiing or tightening the tow-rope. The wheel brake is still mainly operated through the airbrake control.

2 Limitations

No changes become necessary for Limitations

3 Emergency Procedures

No changes become necessary for Emergency Procedures.

4 Normal Procedures

To move the main cylinder piston far enough with such a small lever, necessarily requires much hand force. Therefore, this lever is only intended to

- assist during slow taxiing
- to hold the glider when the tow rope is tightened.

As before, the wheel brake is only reliably operated, by full extension of the airbrakes.

Check during preflight inspection, that with the brake lever the point of the master cylinder can be reached, at which the wheel brake starts to clamp.

5 Performance

No changes become necessary for Performance

6 Weight and Balance

No changes become necessary for Weight and Balance

7 Maintenance

The bowdencable must be adjusted such, that it does not hinder the piston of the master cylinder from moving out completely. Otherwise no brake fluid can replenish from the reservoir.

Take care that the bowden cable cover is not tightened, when the air-brake controls operate the wheel brake.

9.D.2 Wheel brake lever on the stick

2.2.4 Rudder Control System

The rudder is actuated by cables Ø 3.2 mm (DIN ISO 2020, version 1A or 1B). Both front and rear pedals are adjustable.

The rudder cables are running each from a fixed point through S-shaped pedal loops to a perforated plate in the area of the rear seat. Here the cables of the front and rear pedals are joined and from the perforated plate onwards the cables run through nylon tubes to the rudder actuating bell crank.

At the perforated 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 detent.

For the adjustment of the cables at the perforated plates the rear seat must be removed.

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

Only with TN-Nr. 02:

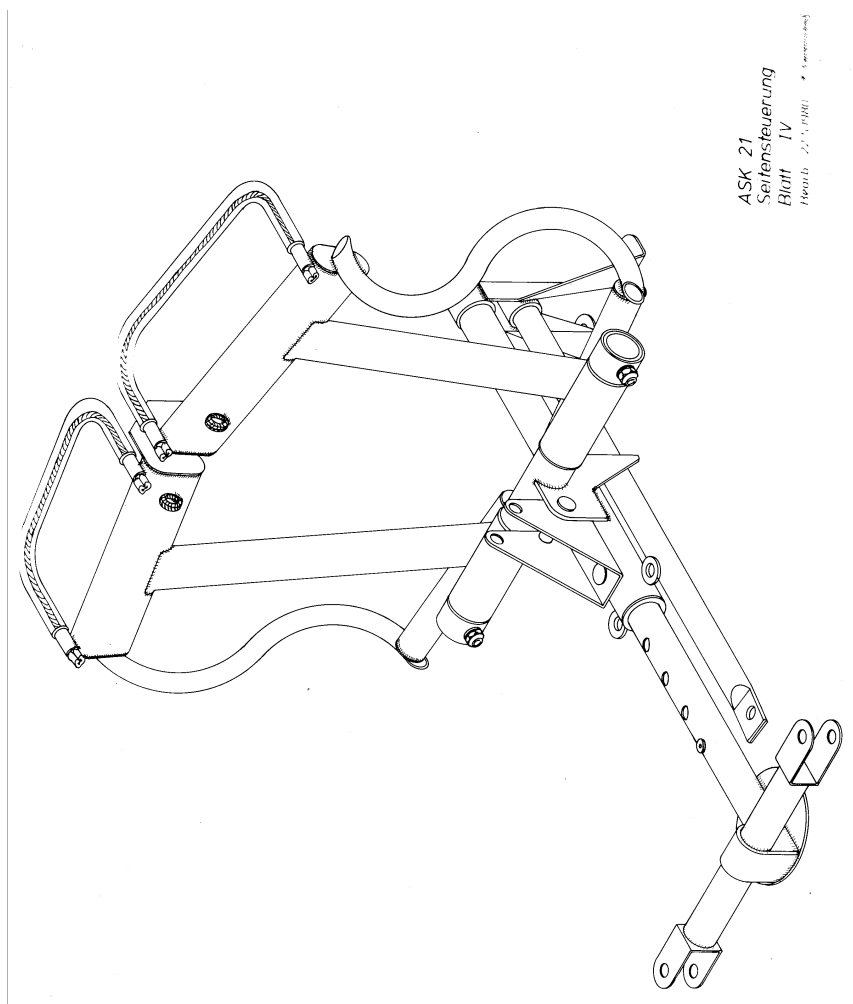
The front rudder hand lever is connected to the perforated plates with Ø 3.2 mm-cables. The cable to the right perforated plate is lead through two pulleys in the fuselage nose.

The (optional) rear rudder hand lever is stiffly connected to the left perforated plate.

The neutral position of the front rudder hand lever and the cable tension of the attached cables can be adjusted with turnbuckles. The cable tension shall be just big enough to eliminate play of the front rudder hand lever.

Optionally, the ruder pedals can be prepared for temporarily deactivation, see Flight Manual, section 9.C.

Fig. 2.2.4-1 Pedals in the front seat



2.2.5 Air Brakes Control System

The air brakes are actuated by push rods. A driving rod runs along the left cockpit wall, 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 underneath the arm – continues to a 90° duralumin bell crank and runs below the rear spar tunnel wall.

The back of the spar tunnel wall carries two rocker arms and the push rod which produces the counterclockwise travel of the actuating levers: By means of a L'HOTELLIER connector (M12.41) the push rods in the wing are connected to the actuating levers. They lead to the inner air brake lever, which on the other hand is connected to the outer air brake lever by an adjustable push rod so that synchronous movement is guaranteed.

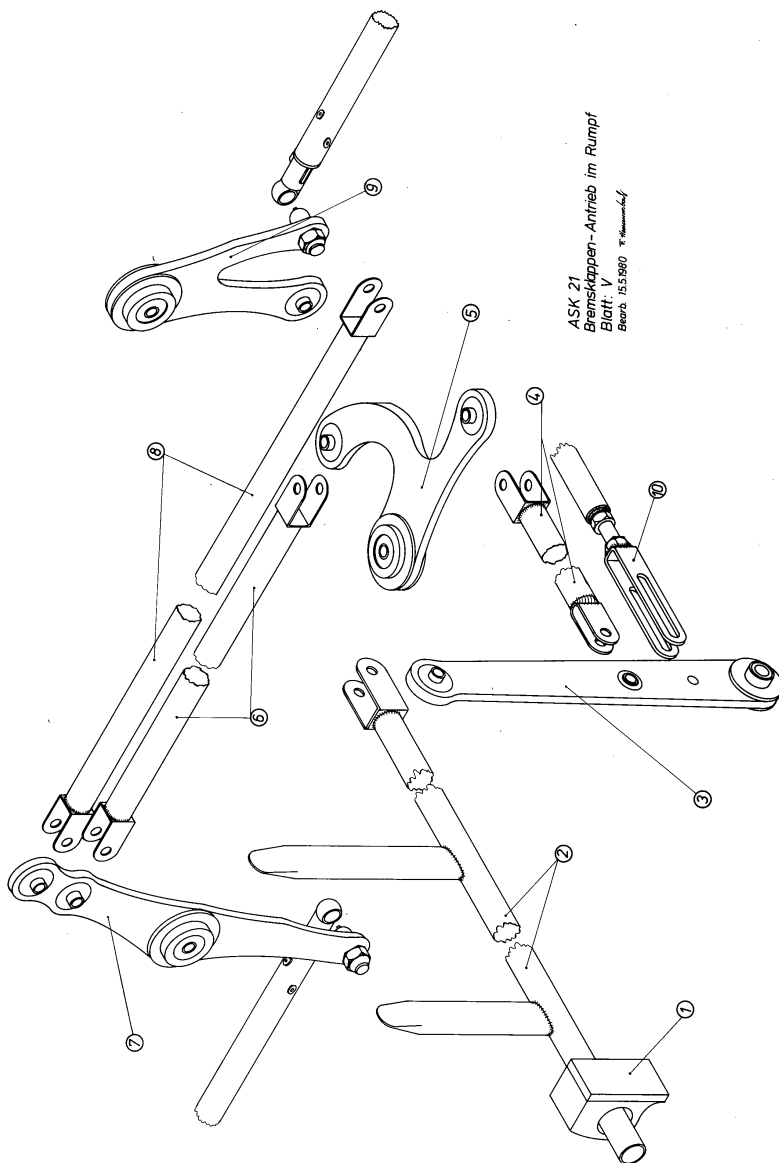
The stop of the air brake control circuit is the wheel brake cylinder.

Only with TN-Nr. 02:

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.

Optionally, an additional wheel brake lever can be installed on the front stick (see Flight Manual, section 9.D)

Fig. 2.2.5-1 Air brake control circuit in the fuselage



Changing Brake Linings

Remove the wheel fairing. You will find the wheel brake cylinder at the left-hand side of the wheel fork. At the rear end of the cylinder there are two 1/4" screws secured with locking wire. Remove the locking wire and fully undo both screws.

You can now remove the inner brake shoe with its back plate, and the wheel brake cylinder can be pulled off the brake torque plate.

The brake hose line must be left attached throughout, as otherwise the system will have to be bled.

You can now remove the outer brake shoe with its back plate.

While the brake is dismantled, the brake lever (air brakes) must NOT be operated!

The linings must be renewed before they have been worn down as far as the rivets (minimum residual lining thickness 2.54 mm = 0.10 in!) as otherwise, the brake disc will be damaged and the braking effectiveness unacceptably reduced. To rivet the new linings in place it is best to use a riveting tool designed for the purpose. Alternatively, however, a hammer, center punch, and round punch of not less than 6 mm (0.24 in) at the tip may be used.

Now replace brake shoes, tighten the two 1/4" screws and secure them again with locking wire. Re-assemble the wheel fairing.

Brake linings and rivets to suit can be obtained from Messrs. Schleicher. Orders must specify brake linings suitable for the Cleveland 30-9 brake assy.

2.4 Radio Installation

There is space provided in the front instrument panel for fitting a radio. The fitting components and cable harness supplied by the radio manufacturer should be used.

When planning its location in the instrument panel, remember that the radio must be plainly visible and within easy reach.

However, priority must be given to the flight control instruments concerning clear visibility.

The loudspeaker is fitted below the rear instrument panel cover, on the left side. The boom microphone is fitted on the right cockpit wall. The VHF antenna is located at the rear web in the fin.

2.5 Electrical System

Details of the electrical installation for the avionics are shown in the circuit diagram (Fig. 2.5-1). The electrical system for the power-plant is shown in Fig. 2.11-10 (at the end of Section 2 where the other illustrations relative to the power-plant are given).

Note: *Overload protection must be provided for each electrical equipment. No protective device may protect more than one circuit essential to flight safety.*

Types of Batteries

Power must be provided by maintenance-free lead batteries, dry-gel system. Batteries which are strongly degassing or which are not tilt resistant (e.g. acid batteries) are **not** permissible!

For the engine two batteries of the following type are used (or similar):

- 1x Panasonic PBL12/12 12V and 12Ah
- 2x Panasonic LC-R0612P PG1 6V and 12Ah

It is essential, that all batteries have the same capacitance (Ah).

The two 6V batteries have to be connected in series. They then correspond to one of the 12V batteries in the wiring diagrams Fig.2.5-1 and 2.11-10