

Appendix C

Hand-operated rudder control (TN 3)

This appendix summarizes all information in the Flight Manual related to the hand-operated rudder control. The cross references to text passages in the existing Flight Manual are given in the text frames.

1 General

Pilots, who are handicapped or disabled with their legs, shall be enabled to do gliding. Therefore, a hand-operated rudder control is installed in the front cockpit of the ASK 21 B.

Instructors, who are handicapped or disabled with their legs, shall be enabled to give training flights. Therefore, in addition a hand-operated rudder control can be installed in the rear cockpit.

To avoid obstructing the rudder in case of reduced mobility of the legs and feet resting on the pedals, the cables coming from the corresponding pedals can be disconnected at the linear guiding in the rear seat. The disconnected cables have to be fixed on special anchor points on the fuselage wall (see section 7).

The airbrakes can be set to several, fixed positions, so that the left hand can be used again to control the rudder lever.

2 Operating Limitations and Data

There are no changes in this section

3 Emergency Procedures

There are no changes in this section

4 Normal Operating Procedures

Supplement to section 4.3 „Daily Inspection“, point 4)
on page 4.5

Only in flight operation with the rudder hand lever installed:

- The locking bolt at the airbrake handle must be screwed in and secured (see section 7).
- The rudder hand lever must be mounted and secured (see section 7).
- The rudder cables must be connected and secured in the linear guiding in the rear cockpit resp. disconnected and attached to the anchor points (see section 7).
- The rudder hand lever should ideally not have any notable play. See also section 3 of the Appendix 3 in the Maintenance Manual.

Flight operation without rudder hand lever installed:

- The rudder cables must be properly connected and secured in the linear guiding in the rear cockpit (see section 7).

5 Performance

There are no changes in this section

6 Mass (Weight) and Balance, C.G. Position

There are no changes in this section

7 Description of the Sailplane, its Systems and Equipment

Supplement to section 7.2 „Cockpit Controls“
on page 7.3

Hand-operated rudder control

There is an additional hand lever on the left wall of the front (optional in the rear cockpit also) actuating the rudder.

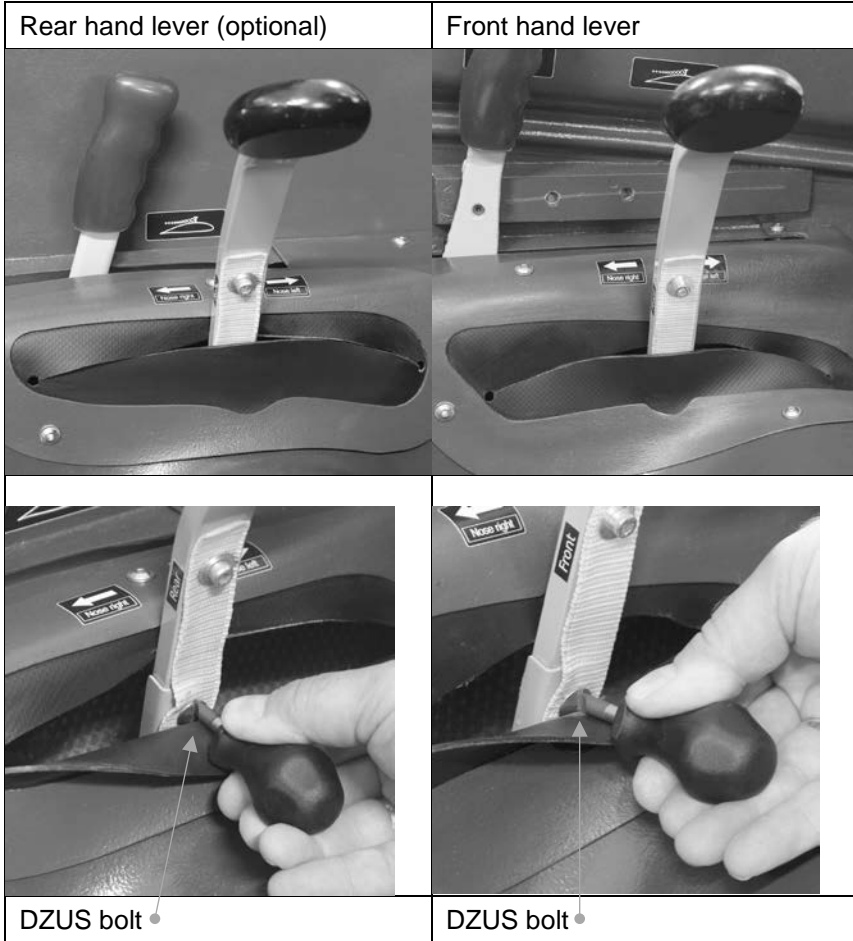
As this lever is connected directly to the left rudder pedals, the actuating direction is also the same:

Left rudder pedal **backwards**, hand lever **backwards**: right turn

Left rudder pedal **to the front**, hand lever **to the front**: left turn

Placards on the left cockpit wall point to the actuating direction:



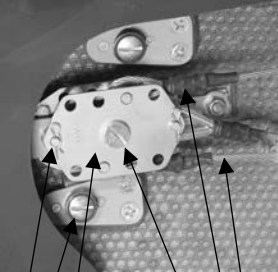

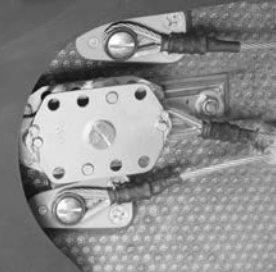


For the regular operation the hand levers - secured by DZUS bolts - are removable.

The identical hand levers are fitted tightly in their movable bottom parts. Lateral placards indicate the assignment rear and front:



Disconnecting the rudder pedals on the linear guidings in case of reduced mobility of the legs:

Cables of the rudder pedals connected on the linear guiding.	Cover of the linear guiding removed.	Cables of the rudder pedals disconnected and attached to the anchor points.
		
<ul style="list-style-type: none"> ● Cover ● Anchor point ● Cotter pin ● DZUS lock ● Cable rear pedal ● Cable front pedal 	<p>CAUTION <i>Watch out for loose parts such as bearing bushes and cotter pins!</i></p>	<p>Reinstall cover of the linear guide and secure it with the DZUS lock and two cotter pins.</p>

WARNING

When operating with removed rudder hand levers, the rudder cables have to be connected to the linear guides.

NOTE

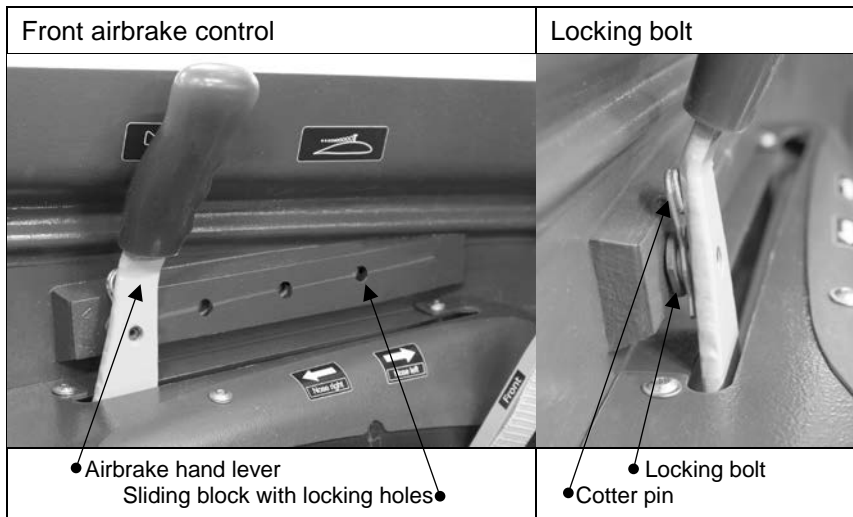
Depending on your needs, only the front or the rear pedals can be disconnected.

If the hand-operated rudder control is only installed in the front cockpit, then the lower anchor point only exists.

Supplement to section 7.3 „Airbrakes“
on page 7.3

The front airbrake hand lever can be engaged into the holes of a sliding block, so that the left hand can then be used again to control the rudder hand lever. The complete push rod is mounted rotatable, so that the air brake lever can be engaged from the rear cockpit also. The push rod includes a spring loaded joint, which secures the locking bolt of the airbrake lever in its engaged setting.

When operating with removed rudder hand levers, the locking bolt - secured by a cotter pin - can be unscrewed.



8 Aircraft Handling, Care and Maintenance

See Appendix A in the Maintenance Manual

Appendix A

Hand-operated rudder control (TN 3)

All information in the Maintenance Manual related to the hand-operated rudder control is summarized in this appendix. The cross references to the text passages in the existing Maintenance Manual are mentioned in the text frames.

1 Description and Specifications

There are no changes in this section

2 Description of Control Systems and Equipment

Supplement to section 2.2.4 „Rudder“ on page 2.4

Pilots who are handicapped or disabled with their legs shall be enabled to do gliding. Therefore, a hand-operated rudder control is installed in the front cockpit and optionally in the rear cockpit of the ASK 21 B also.

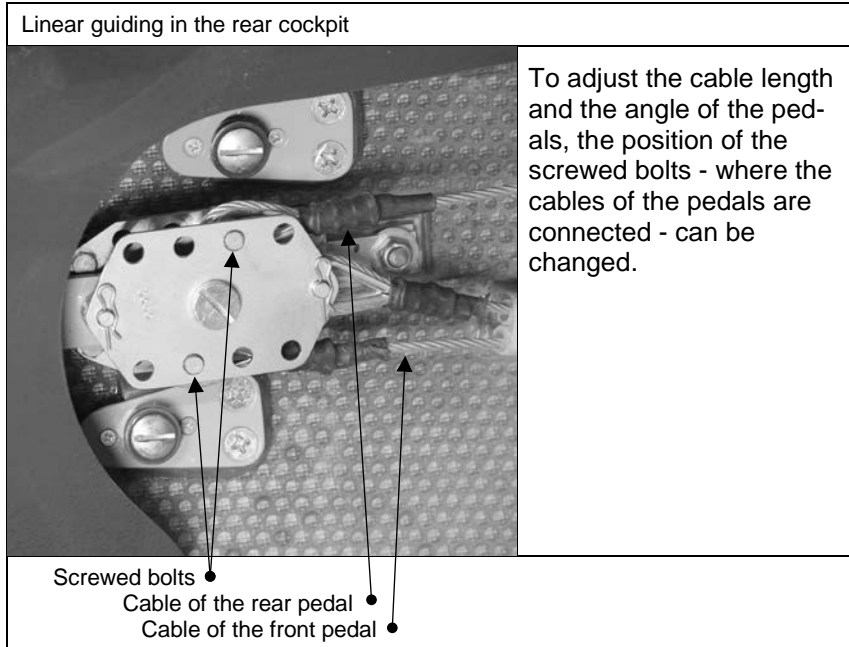
The front rudder hand lever is connected by means of cables Ø3.2 mm to the linear guidings on both sides of the rear cockpit. The cable to the right linear guiding is lead via two pulleys in the fuselage nose.

The (optional) rudder hand lever for the rear seat is stiffly connected to the left linear guiding by a coupling rod.

The cable tension can be adjusted with a turnbuckle on the front rudder hand lever. The rudder hand lever should ideally not have any notable play. See section 3 of this appendix, what play is still tolerable.

To avoid obstructing the rudder in case of reduced mobility of the legs and feet resting on the pedals, the cables coming from the particular pedals can be disconnected at the linear guiding in the rear seat. The disconnected cables have to be fixed on special anchor points on the fuselage wall (see appendix C, section 7 in the Flight Manual).

Small inaccuracies of the cable length and the angle of the pedals can be adjusted at the linear guiding:



Supplement to section 2.2.5 „Airbrake Control System“
on page 2.4

The front airbrake hand lever on the left cockpit wall can be engaged into the holes of a sliding block, so that the left hand can then be used again to control the rudder hand lever. The complete push rod is mounted rotatable, so that the air brake lever can be engaged from the rear cockpit also. The push rod includes a spring loaded joint, which secures the locking bolt of the airbrake lever in its engaged setting.

When operating with removed rudder hand levers, the locking bolt - secured by a cotter pin - can be unscrewed (see appendix C, section 7 in the Flight Manual).

3 Deflections of Control Surfaces and Flaps

Supplement to section 3.3 „Maximum Permissible Control Surface Play“ on page 3.5

When the rudder is fixed, negligible play can occur on the rudder hand lever:

	MPE *	tolerable play
Rudder hand lever	340 mm 13.4 inch (middle of the handle)	10 mm 0.4 inch

* MPE: **MessPunktEntfernung zur Drehachse** = Distance from measuring point to hinge axis

4 Airworthiness Limitations

There are no changes in this section

5 Control Surface Masses and Tail-heavy Moments

There are no changes in this section

6 Mass (Weight) and Balance

There are no changes in this section

7 Periodic Inspections and Service Life Limitations

Supplement to section 7.1 „Periodic Inspections of the Airframe“
on page 7.3 point 6

When inspecting the cables of the hand-operated rudder control, especially the area of the two pulleys in the fuselage nose and the cable connections at the levers and linear guidings should be checked.

Supplement to section 7.1 „Periodic Inspections of the Airframe“
on page 7.4 points 7 and 8

Check the hand-operated rudder control for operation, play (see section 3) and free movement.

At the linear guidings on the rear seat, especially the ball bearings have to be checked for operation and play. Remove possible dirt on the running surfaces.

8 Lubrication Scheme

Supplement to section 8 „Lubrication Scheme“
on page 8.2 point „Hinges with brass bushings“

Grease or oil the bearing of the rudder hand lever annually and also the bearings of the rear rudder hand lever and of the coupling rod.

9 Placards, Labels and Markings

The following placards are located on the left cockpit wall in front of and behind the rudder hand levers:



Front

indicates the front rudder hand lever,

Rear

indicates the (optional) rear rudder hand lever.



10 Repairs, Removal and Re-assembly of Components, Tightening Torques

There are no changes in this section

11 Modification of the Sailplane

There are no changes in this section

12 Appendix

Supplement to section 12.2 „Special Tools“ on page 12.5
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For assembly and disassembly the DZUS locks at the rudder hand levers, the linear guidings and the anchor points, an appropriate slotted screwdriver is supplied.