Section 1

1 General

1.1 Introduction

This Flight Manual has been prepared to provide pilots and instructors with information for the safe and efficient operation of the AS 33 Es sailplane.

This Manual includes the material required to be furnished to the pilot by the certification specification CS-22. It also contains supplemental data useful for the pilot supplied by the sailplane manufacturer.

1.2 Type certification basis

This type of sustaining powered sailplane has been approved by the European Aviation Safety Agency (EASA) in accordance with CS-22, amendment 2, issued 5th March 2009.

Additionally the following requirement had to be complied with:

"Guidelines for the substantiation of the stress analysis for sailplanes and powered sailplanes made from glass and carbon fibre reinforced plastics", issued 1991.

Category of Airworthiness: Utility.

“Utility” refers to sailplanes and powered sailplanes used in normal gliding operation.

5.2 Control surface masses and tail-heavy moments

Date: Serial-No.: 33		Mass	permissible mass	Distance from hinge line	Trailing edge load	Moment	permissible moment	Remarks
Rudder			3.07 to 3.75 kg 6.77 to 8.26 lbs				1.42 to 5.65 daNcm 1.26 to 5.0 lbs inch	
Elevator (left and right with actuator)			1.23 to 1.83 kg 2.72 to 4.03 lbs				3.2 to 4.93 daNcm 2.8 to 4.36 lbs inch	
Flap left			2.56 to 3.41 kg 5.64 to 7.51 lbs				2.93 to 5.13 daNcm 2.59 to 4.54 lbs inch	
Flap right			2.56 to 3.41 kg 5.64 to 7.51 lbs				2.93 to 5.13 daNcm 2.59 to 4.54 lbs inch	
Aileron left	Inboard							
	15m outboard							
	18m outboard							
	Sum 15 m		2.1 to 2.73 kg 4.63 to 6.018 lbs				1.64 bis 2.43 daNcm 1.45 to 2.15 lbs inch	
	Sum 18 m		2.3 to 3.0 kg 5.107 to 6.61 lbs				1.71 to 2.99 daNcm 1.51 to 2.64 lbs inch	
Aileron right	Inboard							
	15m outboard							
	18m outboard							
	Sum 15 m		2.1 to 2.73 kg 4.63 to 6,018 lbs				1.64 bis 2.43 daNcm 1.45 to 2.15 lbs inch	
	Sum 18 m		2.3 to 3.0 kg 5.107 to 6.61 lbs				1.71 to 2.99 daNcm 1.51 to 2.64 lbs inch	
Weight flaps with fairings! **A negative moment stands for a nose-heavy control surface!**								

Remarks on the elevator

Normally the determination of the tail-heavy moment for the elevator should be performed measuring both elevator halves and the actuator together. In this case the value of the previous page apply!

In case of a repair it could be helpful to measure the single components of the elevator. In this case, the values shown in the right table apply.

Beyond this, the elevator control system in the vertical fin contributes a nose heavy moment. The push rod in the fin and the mass balance attached at its lower end (brass weight – each ~0.22 kg / 0.48 lbs) have a leverage of 86mm (3.38 inch). The total weight of this push rod including all attachment parts like screws, washers and nuts as well as with the two mass elements (AS P/N 330.48.0017) must be between 652 g (1.437 lbs) and 702 g (1.547 lbs).

Date: Serial-No: 33____	Mass	permissible mass	Distance from hinge line	Trailing edge load	Moment	permissible moment	Remarks
Elevator, left		0.6 to 0.82 g 1.3 to 1.8 lbs				0.85 to 1.15 daNcm 0.77 to 1.04 lbs inch	
Elevator, right		0.6 to 0.82 g 1.3 to 1.8 lbs				0.85 to 1.15 daNcm 0.77 to 1.04 lbs inch	
Elevator, actuator		0.26 bis 0.35 kg 0.57 to 0.77 lbs				1.28 bis 1.71 daNcm 1.16 to 1.51 lbs inch	

(Only relevant in case of repairs!)