Red Line	280 (151)	Max. speed for all operations.
Yellow triangle	90 (49)	Approach speed at max. weight without water ballast

2.4 Masses (Weights)

Max. Permissible Take-Off Mass:
- with water ballast 750 kg (1654 lbs)

Max. Permissible Landing Mass: 750 kg (1654 lbs)

Max. mass of all non-lifting parts 390 kg (860 lbs)

Max. mass in the baggage compartment: 15 kg (33 lbs)

2.5 Center of Gravity

The limits of the C.G. range are as follows:

forward limit - 0.19m (0.62 ft) aft of BP
aft limit - 0.39m (1.28 ft) aft of BP

"BP" stands in this context for "Reference Datum" which is situated at the wing leading edge at the wing root rib.

An example of the C.G. position calculation can be found in Section 6 of the ASH 25 Maintenance Manual.

2.6 Approved Manoeuvres

This glider is approved for use in normal gliding operation (Airworthiness Category "Utility").

2.7 Manoeuvring Load Factors

Maximum permissible manoeuvring load factors:
- maximum positive load factor + 5.3
- maximum negative load factor - 2.65

at an air speed of: 185 kmh (100 kts)

For both types of launch, a weak link of 750 to 900 daN must be used in the launch cable or tow rope.
For Aerotow, the tow rope must be not less than 40 m (135 feet) in length.

2.12 Operating Limitations Placard

This placard is fixed in the front cockpit and contains the most important Mass (Weight) and Speed Limitations.

Segelflugzeugbau A. Schleicher GmbH & Co. Poppenhausen

Model: ASH 25 Serial-No.:

DATA and LOADING PLACARD

Empty Mass (Weight):	kg	lbs
Max. Mass (Weight):	750 kg	1654 lbs
Min. Front Seat Load Solo:	kg	lbs
Max. Front Seat Load:	kg	lbs
Max. Rear Seat Load:	kg	lbs
Max. Total Combined Seat Load:	kg	lbs

MAXIMUM PERMISSIBLE SPEEDS:

Winch Launch W/L:	130 km/h	70 kts
Aerotow A/T:	185 km/h	100 kts
Operating Landing Gear:	185 km/h	100 kts
Maneuvering Speed:	185 km/h	100 kts

Weak Link for A/T and W/L: 750 to 900 daN / 1685 to 2023 lbs

Tire Pressure Main Wheel:	3,4 bis 3,6 bar	(48 to 51 psi)
Tail Wheel:	2,4 bis 2,6 bar	(34 to 37 psi)

REDUCED MINIMUM COCKPIT LOAD
WITHOUT TRIM BALLAST IN THE FIN:
SEE FLIGHT MANUAL - PAGE 6.4 !

4.1 Introduction

This Section contains Check Lists for the daily inspection and pre-flight checks. It also describes normal operating procedures. Normal operation procedures associated with the glider, if equipped with various ancillary systems and equipment not included as standard equipment, are described in Section 9.

4.2 Rigging and Derigging

Rigging
The ASH 25 can be rigged without use of rigging aids by three people, or by two people if a fuselage cradle and wing trestle are used.

1. Clean and lubricate all pins, bushings and control connections.

2. Support fuselage and keep upright. If the wheel is lowered, check that the landing gear is securely locked down.

3. Set flap lever to Flap Position 1 or 2.

4. Insert left inner wing spar fork into fuselage and support its outer end with a trestle, if available.

   NOTE: The wing trestle must not obstruct the movement of the flap !

5. Insert right inner wing spar root and line up main rigging pin bushes. Insert and lock main pins. Only at this point - and not before - may the wing weight be relaxed.

If the aircraft is still supported in a fuselage cradle, it is recommended that the landing gear should be extended at this stage, and rigging completed with the aircraft standing on its wheel. Do not connect the control linkages in the fuselage yet, as this makes the rigging of the outer wings more difficult.

6. Screw the T-shaped rigging tool for fitting the outer wing into its seating. Unlock the left outer wing airbrake paddle by means of the tool provided.

7. Insert left outer wing into spar socket of inner wing and push in, leaving a gap of 5 to 10 cm = 2 to 4 in.

8. Connect flap control push rod (nearest the trailing edge) and secure.

9. Now push outer wing home, push main pin in to full extent against flight direction and turn clockwise to secure. Unscrew T-tool. The main pin is correctly fitted, if it is flush with the wing surface. When pushing wings home, ensure that the aileron and airbrake push rods do not foul ribs or fittings.

10. At this stage it will be of help to move the trestle outwards somewhat, perhaps near the position of the center flap actuator. This will reduce the loads both on wing and trestle.

11. The rigging of the right outer wing should also

5.2.2 Stall Speeds

Stall Speeds in km/h (kts) Indicated Air Speed :-

Flap Setting	All-Up Weight kg (lbs) 540 kg (1191 lbs)	630 kg (1389 lbs)	750 kg (1654 lbs)
Flap 1	76 (41)	83 (44,8)	90 (48,6)
Flap 2	75 (40,5)	81 (43,7)	88 (47,5)
Flap 3	72 (38,9)	78 (42,1)	85 (45,9)
Flap 4	66 (35,6)	71 (38,3)	78 (42,1)
Flap 5	65 (35,1)	70 (37,8)	76 (41)
Landing Flap	64 (34,5)	69 (37,2)	75 (40,5)
Landing Flap + Airbrake	67 (36,2)	72 (38,9)	78 (42,1)

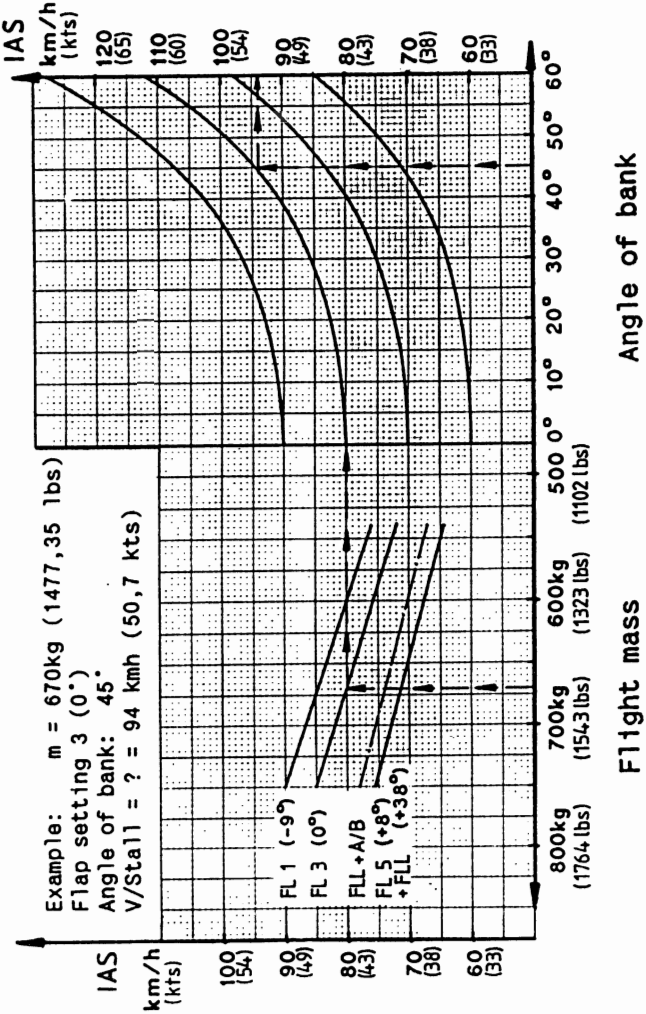
1. The speeds indicated are valid for the aerodynamically clean glider.

2. With C.G. aft, a stall warning in the form of horizontal tail buffeting will commence at about 5 % above stalling speed.

3. Extension of air brakes increases the stalling speed in straight flight by about 5 km/h = 2,7 kts.

4. Lowering the landing gear does not affect the stalling speed.

Stalling Speed Diagrams



SECTION 6

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

6.1 Introduction

6.2 Mass and Balance Form

6.1 Introduction

This Section lists the mass and balance range within which the ASH 25 may be safely flown.

Weighing procedure and calculation of permissible C.G. limits, and a list of equipment which must be included in the weighing, are shown in the Maintenance Manual, Section 6.

6.2 Mass and Balance Form

The Mass and Balance Form on Page 6.4 shows the maximum and minimum cockpit loads for both seats, and any additional load still permissible for the baggage compartment.
If the pilot mass is low, then correspondingly more baggage can be loaded, however, it must never exceed the maximum permissible limit.

These mass and balance data must be calculated in accordance with the currently valid weighing data. The data and diagrams needed for establishing these are to be found in the Maintenance Manual, Section 6.

This Mass and Balance Form is valid only for the aircraft bearing the serial number (S.No.) shown on the title page of this manual.

If pilot mass in the front seat is less than the minimum stated in the Mass and Balance Form, this can be rectified by means of trim ballast plates fitted in front of the front seat. See also Section 7.11.

In order to ballast the ASH 25 for an optimum-performance C.G. range also with two up, the glider can be trimmed more tailheavy by fitting either a special battery or suitable trim ballast in the provided battery channel in the fin.
This, of course, will increase the possible minimum load in the front seat, if the glider is then being flown with only one pilot on board.
In such a case always this increased minimum cockpit load in the front seat must be entered in the DATA and LOADING PLACARD of the aircraft.
The lower permissible front seat load without trim ballast (battery) in the fin will be shown only on page 6.4 of this Flight Manual "Mass and Balance Form".

In the cockpit, an additional placard is to be affixed:

REDUCED MINIMUM COCKPIT LOAD
WITHOUT TRIM BALLAST IN THE FIN:
SEE FLIGHT MANUAL - PAGE 6.4 !

Refer also to Section 7.11 in this Flight Manual!

MASS AND BALANCE FORM

Date of Weighing	Empty mass (kg)	Empty mass C.G. mm aft of RP	Cockpit load front seat incl. chute one up (kg) min.	Cockpit load front seat incl. chute one up (kg) max.	Cockpit load rear seat incl. chutes max. with 110 kg (242 lbs) in the front seat	Load in baggage compart. (kg)	Inspector's stamp and signature

Maximum Permissible Loading with Water Ballast

Pilot mass + parachute + baggage	Empty Mass (kg)						
	470	480	490	500	510	520	530
70	180*	180*	180*	180*	170	160	150
80	180*	180*	180*	170	160	150	140
90	180*	180*	170	160	150	140	130
100	180	170	160	150	140	130	120
110	170	160	150	140	130	120	110
120	160	150	140	130	120	110	100
130	150	140	130	120	110	100	90
140	140	130	120	110	100	90	80
150	130	120	110	100	90	80	70
160	120	110	100	90	80	70	60
170	110	100	90	80	70	60	50
180	100	90	80	70	60	50	40

(See table in lbs overleaf!)

* Only if the aircraft has inboard water tanks

(which are an optional extra fitted only if expressly ordered), these 180 Liters are the maximum possible ballast load (180 kg = 397 lbs).

The outboard water tanks (fitted as standard equipment) have a combined capacity of 120 liters.

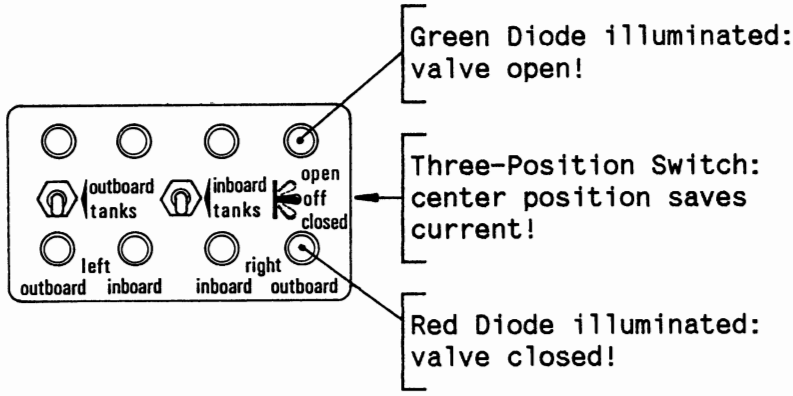
Pilot mass + parachute + baggage	Empty Mass (lbs)						
	1036	1058	1080	1103	1125	1147	1168
154	397*	397*	397*	397*	375	353	331
176	397*	397*	397*	375	353	331	309
198	397*	397*	375	353	331	309	287
221	397	375	353	331	309	287	265
243	375	353	331	309	287	265	243
265	353	331	309	287	265	243	221
287	331	309	287	265	243	221	198
309	309	287	265	243	221	198	176
331	287	265	243	221	198	176	154
353	265	243	221	198	176	154	132
375	243	221	198	176	154	132	110
397	221	198	176	154	132	110	88

* Refer to p.6.4!

7.8 Water Ballast System

The water ballast valves in the wings are operated electrically. A switch panel is fitted for this purpose in front of the front cockpit control stick.

Water Ballast Switch Panel



The LEDs of the inboard tanks will, of course, flash only if ballast tanks have been fitted in the inboard wings. These tanks are not standard equipment and are fitted only if expressly ordered.

The above drawing of the switch panel illustrates the two 3-position switches, one for both the outboard tanks (= valves of the outboard wing tanks) and one for both the inboard tanks (= valves of the tanks in the inner wings).
By combining the switch connection of each left and right outer or inner tank, an inadvertent opening of only one valve, resulting in a one-sided ballast load, becomes impossible.

In addition, the electric switch circuit will allow the opening of the outboard tank valves only after the inboard tank valves are open.
The LEDs (top green = valves open; or bottom red = valves closed) are confirmation signals monitoring the state of the valve via limit switch actuators. If the cockpit switch for the outboard tanks is inadvertently set to 'open' first, the diodes will show red as the valves will not open. If then the inboard tank switch is set to the 'up' position, all the valves will open simultaneously and all upper LEDs will show green.

In order to save current, the switches should be re-set to their center position after operating the valves. This will switch off the LEDs.

7.9 Electrical System

The electrical system is supplied by a 12V battery. As an optional extra one additional battery can be ordered. In that case a main switch is fitted into the front instrument panel which is changing over between the two batteries or switching them both off.
Each electrical appliance is protected by its own fuse. Also in the cables leading to the batteries a fuse is fitted close to each battery.
The water ballast system uses current at 6V which allows the valves to be operated even with a flat battery. The 6V current is induced by an integrated circuit (IC) from the battery voltage.

7.10 Pitot and Static Pressure System

Pitot pressure is obtained from a Prandtl-tube mounted in the fin. Ensure that this Prandtl tube is fully pushed home in its seating in the fin. The inner end of the probe should from time to time be lightly lubricated with Vaseline or a similar lubricant, in order to save the O-ring gaskets from wear.

At the same time, the Prandtl tube provides accurate static pressure which can be used for electrically compensated variometer systems.

Static pressure for the ASI is obtained from the static ports at either side of the fuselage tail boom.

7.11 Miscellaneous Equipment

Removable Trim Ballast

If required, the ASH 25 can be fitted with seatings for lead trim ballast plates which can be bolted into place in front of the front seat (fitted only if expressly ordered). If the glider is equipped with a nose aero tow release coupling (also an optional extra), these trim ballast plates are bolted into place sideways at the tow release fitting.

In this location, a 1 kg (2.2 lbs) lead trim plate has the effect of a pilot weight of 1.3 kg (2.8 lbs).

Thus, a pilot weighing 6.5 kg (14 lbs) less than the minimum front cockpit load must use 5 kg = 11.02 lbs of trim weights.

Trim Ballast (Battery) In The Fin

If trim ballast (battery) is fitted in the fin, the minimum cockpit load in the front seat (for solo flights) is increased to more than 70 kg (154.4 lbs) (incl. parachute). In such a case this increased minimum cockpit load value in the front seat must be entered in the DATA and LOADING PLACARD which is fitted in the cockpit. The lower permissible front seat load without trim ballast (battery) in the fin will be shown only on page 6.4, Mass and Balance Form, of this Flight Manual.

For further details of minimum cockpit load see page 2.10 of this manual.

The foam buffer rod fitted over the battery secures it from above. This plastic foam rod must not be forgotten when changing or replacing batteries. You should also ensure that there is adequate plastic foam seating under the battery to protect it from hard knocks.

Oxygen

The two rear seatings for oxygen bottles are fitted as standard equipment.

The two front bottle fixing brackets are fitted only if expressly ordered.
When installing oxygen bottles, ensure that these bottle fixing brackets fit properly and securely.

NOTE: Fitting of oxygen equipment changes the empty-mass C.G. position!

When parking, carefully remove any remainders of provisions (chocolate, sweets &c), as experience shows this would attract small animals which could cause damage in and to the aircraft.

(2) Road Transport

Messrs. Alexander Schleicher GmbH can supply drawings for a closed trailer as well as the names and addressed of reputable trailer manufacturers.

Above all, it is important to ensure that the wings are supported in properly shaped and fitted wing trestles, or at the very least, that the spar ends are securely supported as closely as possible to the root ribs.

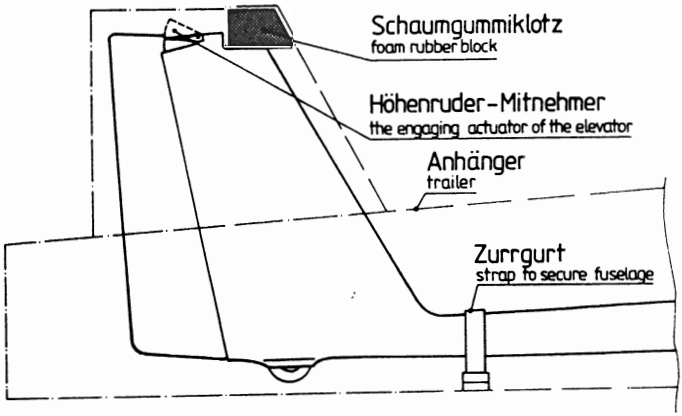
Re-inforced points of the fuselage are the main wheel (but remember the suspension springing!), and tail wheel; also possibly the drag spar pins (make up support seatings from plastic material like Nylon!), and the area under the canopy arch.

For an aircraft of this quality and value, an open trailer, even with tarpaulin, cannot be recommended. Only a closed trailer of plastic or metal construction, or with heavy tarpaulin cover, may be considered suitable, which in any case should have light coloured surfaces and be well ventilated also while stationary so as to avoid high internal temperatures or humidity.

Road transport with water ballast on board is not admissible!

CAUTION: When transported in a glider trailer, care must be taken that the elevator engaging actuator of the glider (on top of the fin) is not being restricted in its required free movement by any foam blocks inside the trailer.

If for example such a foam rubber block is restricting the free moving of the elevator engaging actuator, with rather long road transports this may lead to a fatigue crack on this part. (See also the Drawing in Section 7 of the Maintenance Manual).
This cause must immediately be removed.
The drawing below shows how to cut and locate a foam rubber block. We think it is also useful to have a strap anchored in the trailer floor in order to secure the tail boom in front of the fuselage- fin-transition. In any case be sure that the elevator engaging actuator is free moving. Even with the stick full back, full upwards deflection of the elevator engaging actuator must be possible.



8.5 Cleaning and General Care

Contrary to the false assumption that plastic materials are impervious to moisture and ultra-violet light we would state emphatically that even modern gliders need care and maintenance.

Moisture

In the long run, moisture will also damage fiber re-inforced laminates, as it will penetrate into the expoxy resin base and cause it to swell, which will partially burst the tight interweaving of the plastic molecules.
In particular, a combination of high temperature and high humidity must be avoided! (As eg: poorly ventilated trailer becoming damp inside, which is then heated by the sun).

Neither the best quality of paint protection on the surfaces, nor the plastic or rubber skins of the water ballast tanks can fundamentally prevent water vapour diffusion; they can only retard the process. If water has entered the airframe and cannot be removed by means of sponge or chamois leather, the aircraft should be de-rigged and dried out, while periodically turning the affected part, in a room which should be as dry as possible, but not too hot.

Sunlight

- especially its UV component - embrittles the white polyester gelcoat and also the perspex canopy. The wax layer on the gelcoat will also oxydize and discolour more quickly if the aircraft is unnecessarily exposed to strong sunlight. There is no paint finish on the market as yet which is suitable for plastic gliders, and would approximate the life-span of the plastic structure of the airframe.

As the white polyester gelcoat is protected by a fairly durable wax layer, it will tolerate being washed down from time to time with cold water, with a little cleaning medium added. In normal use, the wax layer need only be renewed annually with a rotary mop. In moderate European conditions it will suffice if on two occasions a paint preservative is used in addition. In areas subject to long and stronger sun exposure this should be done more often.

For the care of the paint finish, only silicone-free agents should be used (eg: 1 Z-Special Cleaner-D 2 by Messrs. W.Sauer & Co., D-5060 BENSBERG, or Cleaner Polish by Lesonal).

Traces of Adhesive from Self Adhesive Tapes
are best removed by means of benzene (petrol is toxic!) or paint thinners.
After cleaning, renew the wax coating.

NOTE: The signal and decorative markings are built up from nitric or acrylic paint; therefore no thinners must be used and even benzene should not be allowed to act on them for prolonged periods.

The Acrylic Canopy (Plexiglass or Perspex) should only be cleaned by means of a special cleaner (eg: Plexiklar) or with lots of clean water. On no account should a dry cloth be used for dusting or cleaning.

The Seat Straps should be regularly inspected for tears, compressed folds or wear, and corrosion of metal parts and buckles. The reliable operation of the release action - even under simulated load - should be tested occasionally.