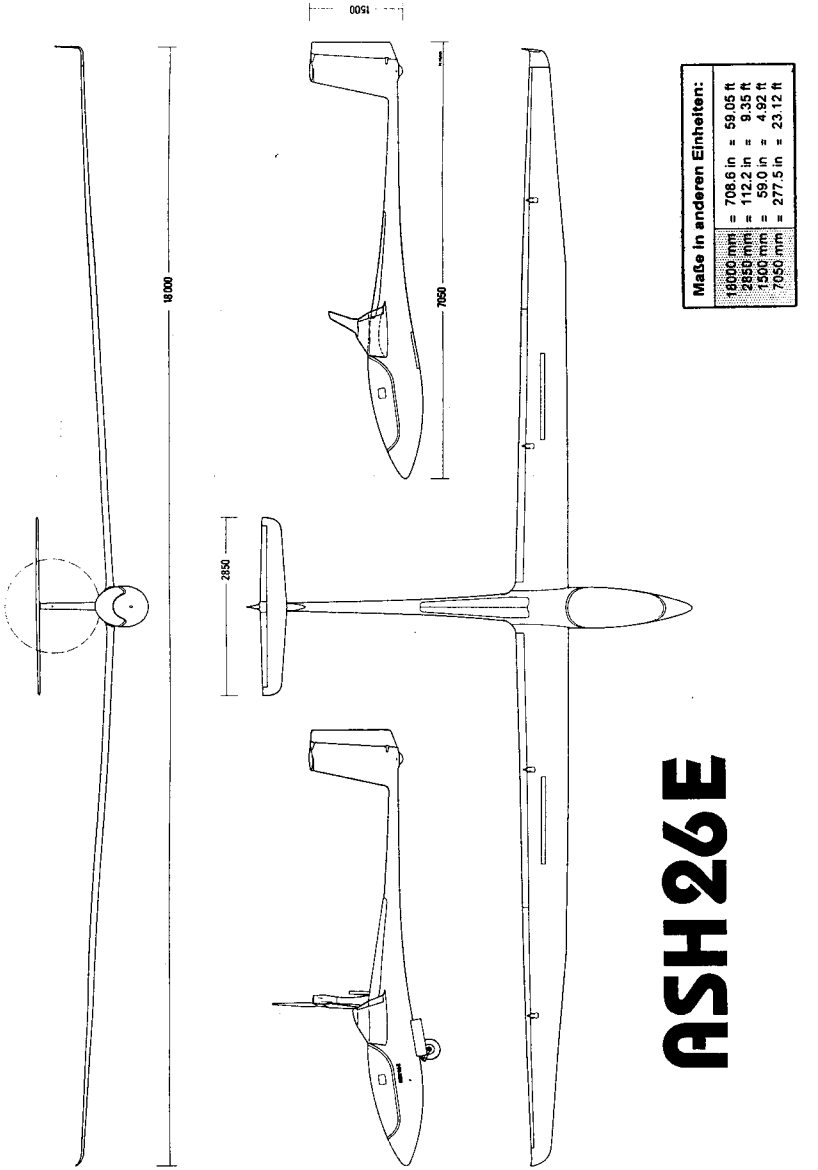
By the issue of the Technical Note 7 the use of winglets has been certified. A wing separation joint at 8.7 meter was incorporated in order to enable the fitting of these detachable winglets sitting on an approx. 30 cm short wing piece.
The previous short wing tip is available as another option and can also be fitted at this separation joint.

Technical Data:

Span	18.00 m	(59.06 ft)
Fuselage length	7.05 m	(23.13 ft)
Height (Fin and Tail Wheel)	1.50 m	(4.92 ft)
Max. all-up mass	525 kg	(1157.62 lb)
Wing chord:		
(mean aerodynamic)	0.688 m	(2.26 ft)
Wing area	11.68 m^2	(125.72 sqft)
Wing loading:		
- minimum	36 kg/m^2	(7.37 lb/sqft)
- maximum	45 kg m^2	(9.22 lb/sqft)

1.5 Three-View Drawing Fig.1.5-1



Maße in anderen Einheiten:		
18000 mm	= 708.6 in	= 59.05 ft
2850 mm	= 112.2 in	= 9.35 ft
1500 mm	= 59.0 in	= 4.92 ft
7050 mm	= 277.5 in	= 23.12 ft

SECTION 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 sailplane, 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 26 E can be rigged without use of rigging aids by three people, or by two people if a fuselage cradle and wing trestle are used.

NOTE: Winglets must be attached only after the wing assembly is done.

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 right wing spar fork into fuselage and watch the alignment of the automatic control linkage connectors. Hold the wing such that the wing-side levers of the automatic connectors will be guided into the angular funnel-type connectors at the fuselage. Only then a further assembly is possible.
   Now support the outer wing end with a trestle, if available.

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

5. Insert left wing and watch again the alignment of the automatic control linkage connectors (see above point 4.). Then 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.

   Only at this stage the winglets - if available - are rigged.

   NOTE: The correct and secure engagement of the winglets or of the short wing tip respectively must be checked.

6. After cleaning and lightly lubricating the elevator studs and sockets, the tailplane is pushed on to the fin from the front. Each half-elevator must be guided into the elevator connectors. The elastic lip seal covering the elevator gap must be placed on top of the elevator control tongue. Now push the tailplane home until the hexagon socket head bolt at the leading edge will engage its thread. The bolt must be fully and firmly tightened; it is secured by means of a spring ball catch, whose ball must engage in the grooves on the side of the bolt head.

7. A considerable performance improvement can be achieved with little effort by taping all gaps between wing junctions with plastic self-adhesive tape (on the non moving parts only). The fin-tailplane junction should also be taped up. The canopy rim must not be taped over, so as not to impair bail-out.

It is recommended that areas to be taped up should be thoroughly waxed beforehand, so that the adhesive tape can afterwards be cleanly removed without lifting the paint finish.

8. If flexible fuel tanks are fitted in the wings, their fuel hoses should now (or, at the latest, after filling up) be connected to that from the fuselage tank. The end of this hose is located in the baggage compartment in front of the spar.

9. Now use the Check List (see the following para. 4.4) to carry out a pre-flight check. Under point 3. "Control surface clearances at trailing edge min. 1.5 mm = 1/16 in!" check that the wing control surfaces have that minimum clearance from each other and from the inboard and outboard wing cut-out edges. This clearance is necessary to ensure that these surfaces do not foul each other or the wing cut-out edges when deformed under load in flight.

De-rigging

To de-rig, proceed in the reverse order of rigging. We would add the following suggestions:

1. Drain all water ballast. Ensure that all the water has emptied out by putting down alternate wing tips several times. If fuel tanks are fitted in the wings, these must be emptied before transporting the aircraft.

2. If the tailplane is very firmly located in its rear seating, it will be more easily dismantled by two people alternately pushing it forwards by the tips.

NOTE: Winglets must be detached prior to de-rigging the wings.

3. Before de-rigging the wings from the fuselage, do not forget to disconnect the fuel hoses!

4.3 Daily Inspection

Before commencing flying operations, the aircraft must be thoroughly inspected and its controls checked; this also applies to aircraft kept in the hangar, as experience shows them to be vulnerable to hangar-packing damage and small animal.

a) Open canopy and check canopy jettison.

b) Main pins home and secured?

c) Check cockpit and control runs for loose objects or components.

d) Check condition and operation of tow release couplings! Release control operating freely? Do not forget release checks!

e) Check that the Pitot tube in the ventilation aperture of the fuselage nose is clean and unobstructed.

f) Check fuselage, especially underside, for damage.

g) Check inflation and condition of tires:
the values are given in the Data and Loading Placard which is affixed in the cockpit, and a copy of it is shown at the end of Section 2 of this manual.

h) Check both wing upper and under surface for damage.

i) Flaps including ailerons: check condition and free movement (clearances). Also the linkage fairings of control surfaces and wings must be checked for clearance.

j) Check correct assembly of winglets, or short wing tips respectively. Locking mechanism on wing underside securely engaged ?

k) Check that static ports in the fuselage tail boom are unobstructed.

l) Check that rudder, tailplane and elevator are correctly assembled, and for damage or excessive play.

m) Check proper condition of the turbulator tape at the horizontal tailplane.

n) Check the pressure ports in the fin: is the probe properly seated and tight??

o) The control connections of ailerons, elevator and air brakes can be verified only by checking the full, free and stress-free operation of all control linkages. Hold controls firmly at full deflection while loads are applied to control surfaces.

p) Airbrake paddles: check condition and positive connections. Do both sides have good over-center lock?

q) Check wheel brake for operation and leaks. With airbrake paddles fully extended the resilient brake pressure from the main brake (master) cylinder should be felt through the brake handle.

Violent applications of rudder or aileron would result in a spiral dive, spinning or side slipping, depending on C.G. position.

CAUTION: Height loss due to incipient spin from straight or circling flight depends largely on the all-up flight mass:
Height loss from straight flight after prompt recovery action

≈ 40 m = 132 ft !

Height loss from circling flight:

up to 150 m = 495 ft !

More specifically, the following would apply:

C.G.position	Flap	Rudder & Aileron Coordinated	Rudder & Aileron Crossed
rearmost	3 - 4	steady spin	steady spin
central	3 - 4	spin, leading to spiral dive	spin, leading to slipping turn
foremost	3 - 4	approx. half turn of spin, leading to spiral dive	slipping turn

See also Section 3.5 in this manual.

With winglets fitted the above specifications for spin behavior do not noticeably change.

Wing drop from circling flight is not noticeably more violent than from straight flight.
Height loss during one spin turn may come up to 150 m. For recovery from spinning up to 140 m will be required in the most unfavorable case.

4.5.5 Landing Approach

Make the decision to land in good time and, notwithstanding the high performance, select Flap 4 and lower the wheel at not less than 100 m = 300 ft above ground.
For the remainder of the circuit, maintain about 90 km/h [49 kts] (yellow triangle on ASI scale).
The aircraft should be trimmed to between 90 and 100 km/h [49 - 54 kts]. In turbulence, the approach speed should be appropriately increased.

CAUTION: Only when you are quite certain of being able to reach the boundary of the landing area in a straight approach should landing Flap L (+38°) be selected.

At air speeds above 100 km/h (54 kts) the control forces required to engage Flap L will noticeably increase. It is, therefore inadvisable to engage landing Flap L at more than 100 km/h. These high control forces are generated by the very positive camber of the flaps. These deflect downwards by 38°, whereas the outboard ailerons deflect to -6°. This marked wing wash-out greatly increases the natural sink of the aircraft, especially at air speeds between 120 and 130 km/h (65 and 70 kts).

By changing pitch attitude (forward or back stick pressure) the glide angle can be further varied to a large degree.

In addition, glide path control can, of course, be exercised in the normal way by means of the airbrakes.

8.4 Ground Handling / Road Transport

(1) Parking

The ASH 26 E is equipped with plastic sealing tape at all control surface gaps as serial standard. When parking the aircraft principally all control surfaces must be set to neutral !

In the open:
Parking of the aircraft in the open can be recommended only if forseeable weather conditions remain suitable. It should be seriously considered whether the secure picketing, covering, and cleaning of the aircraft before the next flight may not demand more effort than de-rigging and re-rigging would have done.
For tying-down the wings, cradles (perhaps from the trailer) should be used which ensure that the ailerons cannot be stressed by the picketing ropes.

NOTE: Parking in the open without protection against weather or light will reduce the life of the gelcoat surface finish. Even after only a few weeks without intensive care the polyester paint finish can become brittle and develop cracks.

CAUTION: The anti-freeze of the engine coolant liquid should be checked before the beginning of the cold season.
If there is no sufficient anti-freeze in the coolant, the engine will be destroyed by deep temperatures.

In the hangar:
If the aircraft is parked in the hangar for protracted periods, it is recommended to cover only the perspex canopy with a dust cover, as dust covers retain moisture in wet weather for long periods, which would impair the dimensional stability and even the strength of all fiber composite materials.
For this reason, protracted periods of parking with water ballast on board is also **inadmissible** !

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

When tying down the aircraft winglets must be detached and replaced by assembly rods (trailer accessory).

(2) Road Transport

Messrs. Alexander Schleicher GmbH & Co. can supply dimensioned drawings of the ASH 26 E which will provide all the measurements needed for building a closed trailer. We can also supply the names and addresses of reputable trailer manufacturers.

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

Reinforced points of the fuselage are the main wheel (but watch the suspension springing !) and tail wheel; also possibly the drag spar pins (make up support seatings from plastic material like Nylon!), and under the fuselage the area between landing gear cutout and the lap strap anchoring points.

SECTION 1

1.1 Introduction

This Maintenance Manual has been compiled because the safety and airworthiness of an aircraft depends to a large measure also on the careful maintenance of all its components. Its airworthiness can be assured only if the ASH 26 E is maintained and operated in the manner laid down in the Manuals.

1.2 Description of the Aircraft

Single-seater mid-wing powered sailplane with camber-changing flaps, T-tail unit, retractable landing gear and provision for water ballast. The dive brakes with spring loaded sealing caps extend on the top surface only. The fuselage boom accommodates a stationary engine.
For self-launch and powered flight only the propeller with the faired timing belt is extended.
The components of the ASH 26 E are made from hybrid composite laminate. This means that several fiber materials are used together. For the construction of the ASH 26 E besides the well known GRP (Glass fiber reinforced plastic) also SRP (Synthetic fiber reinforced plastic) and CRP (Carbon fiber reinforced plastic) are used.

1.2.1 Wings

The 2-part wing is of CRP hard foam sandwich construction. The I-section spar consists of carbon fiber caps with GRP-hard foam-web. The wings are assembled in the fuselage by means of a tongue-andfork joint and two cylindrical main pins.

Available as an option: 0.45 m high winglets with a wing separation joint at 8.7 meter.

1.2.2 Fuselage

The fuselage shell construction employs hybrid materials technology. The mixture of glass, carbon and aramid fibers provides a light, rigid structure.
The additional stiffening - partly two-skin-structure - provided in the cockpit area and the specially shaped cockpit rim further increase pilot safety in the case of an accident.

The fin is made up from GRP/SRP hard foam sandwich so as not to impede signal transmission from the VHF radio aerial.

1.2.3 Tail Unit, Control Surfaces, and Flaps

The stabilizer of the horizontal (stabilizer-plus-elevator) T-tail unit is of CFRP/hard foam sandwich construction. Control surfaces and flaps are of SRP-/hard foam sandwich construction.

1.2.4 Power-plant

The compact power-plant, a single rotor engine type Mid-West AE50R, is accommodated in the fuselage tail boom immediately behind the wing.
The engine and exhaust silencer of this new-technology power-plant are fitted stationary in the fuselage. Only the rigid two-bladed propeller of this self-launching powered sailplane is extended electrically. When the propeller is retracted the engine compartment is aerodynamically faired and covered by neatly fitting doors.
The power-plant has an extremely low noise and vibration level and the 37 kW engine provides excellent rates of climb even at maximum all-up weight.

1.3 Primary and Secondary Structures

Primary structures include:

- wing spars and root ribs
- wing shells
- fuselage tail boom from wing mounting area to fin
- fin and horizontal stabilizer
- all rigging fittings and control linkage parts
- engine mount bed and propeller support assy.

Secondary structures are:

- control surfaces and flaps
- fuselage in the cockpit area
- engine compartment doors.

1.4 Specifications

Wings

Span		18 m	(59.06 ft)
Wing area		11.68 m^2	(125.72 sqft)
Aspect Ratio		27.74	
Dihedral (control surface hinges)		3.0°	
Sweepback: (both inner wing tapers)		0.0°	
(outboard wing taper)		+3.0°	
Flap settings		-1°, 0°, +10°, +23°, + 38°	
Airfoil section:	Wing	DU 89-134/14 (13.4 % thickness)	
	Winglet, bottom	DU 98-125M1	
	Winglet, top	DU 98-100M1	
Winglet height (as of wing chord)		0.45 m	(1.48 ft)
Winglet area		0.0647 m^2	(0.70 sqft)
Winglet sweepback (leading edge)		30°	

- Remove the canopy; the instrument panel should be either fixed in place or hinged up to its fullest extent.
- It is essential to seal the vent hole in the lid of the brake fluid reservoir with adhesive tape!
- The elevator actuator must be protected by placing a suitable block underneath the front part of the fin.

Ground Transport

The wings may be supported at the spar stubs, root ribs and wing tips.

NOTE: Do not carry the wings by the protruding ends of control rods !
Do not carry the wings by the winglet, only either at the optional detachable short wing tip or at a suitable assembly rod (trailer accessory) !

2.12 Tow Release Couplings

The tow release coupling fitted at the C.G. is model TOST "Europa G 88" (Data Sheet No: 60.230/2). Model TOST "Europa G 72" or "Europa G 73" may be used as replacements.

The release coupling fitted for aero-tow use is of model TOST "Europa E 85" (Data Sheet No: 60.230/1). Tow release couplings of types TOST "Europa E 72" or "Europa E 75" may be fitted as replacements.

When replacing tow release couplings, care should be taken to use again bolts of strength grade 10.9 or 12.9 as well as nuts of strength grade M6-6 for re-fitting.

If replacement of a tow release coupling is required, replace also bolts and nuts.

2.13 Additional Equipment and Installations

For further equipment as for example ELT, barograph turnpoint cameras etc. airworthiness requirement JAR-22.597 is applicable.

According to this requirement at least the following load factors (accelerations) must be demonstrated (if necessary load tests must be performed with these loads) for fitting the above equipment parts.

forwards	9.0 g
backwards	2.5 g
upwards	6.7 g
downwards	10.0 g
sidewards	3.0 g

These load factors already include a safety factor of j = 1.5!

Exceeding this requirement, Schleicher recommends to fix subjects which may hurt the pilot during a severe crash, for a forward load factor of 25 g minimum. This is in order to adapt their fittings to the high cockpit strength of the ASH 26 E.

SECTION 6

6. Weighing Procedure and Determination of C.G. Position

6.1 Introduction

This Section describes the procedures for determining the empty mass and the empty mass moment of the powered sailplane. In addition, procedures for determining the Center of Gravity are provided.

A list of equipment fitted will be included in the most recent and currently valid aircraft inspection report.

As the C.G. position is of vital importance for safe flight, the limits laid down must on no account be exceeded.

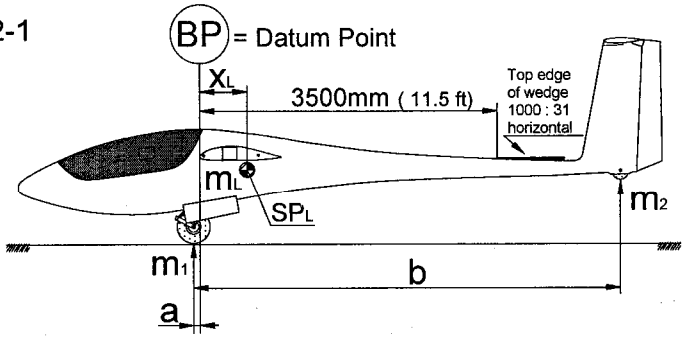
It is especially important after repairs, re-finishing and the fitting of additional equipment to ensure that the empty mass C.G. remains within permissible limits. If this cannot be proved by calculation, the aircraft must be re-weighed.

6.2 Weighing Procedure

The Datum (Reference) Point (German: BezugsPunkt = BP) for weighing and calculating the C.G. is the **wing leading edge** at the root rib.

For weighing the aircraft is supported so that the top edge of a wedge 1000 : 31 placed on the tail boom in front of the fin is horizontal (see Fig. 6.2-1). The weighing is best done on two scales .
If the aircraft is optionally equipped with both the winglet and the short wingtip, the latter is more critical with regard to the in flight C.G. position! The weighing with the winglet assembled is only done if the detachable short wingtip is not available.

Fig. 6.2-1



Formula:

$$x_L = \frac{m_2 * b}{m_L} - a \qquad \text{aft of datum (BP)}$$

$$m_L = m_1 + m_2$$

The aircraft must be prepared for weighing as follows:

1. Power-plant **retracted** and flaps in flap setting 3
2. Landing gear **extended** and - if supplied - with steerable tail wheel fitted
3. Flight instruments fitted and canopy closed
4. With seat backrest, and seat cushion or equivalent in place
5. Aircraft log book and Flight Manual in place
6. Without removable trim ballast (battery) in fin, if supplied
7. Without parachute
9. Without oxygen bottle, if supplied
10 Without barograph in the rear engine compartment
11. With the engine oil tank and cooling system completely refilled
12. Only unusable fuel residue in tank.
13. If optionally equipped with winglets and detachable short wingtip the weighing must be done in the configuration with the short wing tip.

6.3 Weighing Report

The weighing results must be stated in a weighing report which includes a list of equipment fitted at the time, and which must be filed in the aircraft service record map.

6.4 Empty Mass and Empty Mass Moment

The empty mass diagram refers to a characteristic wing mass of 152 kg (335.16 lb). Therefore, the lower limit line cannot be taken as a reference for the determination of the mass of the non-lifting parts. The useful load of the aircraft can only be calculated using the mass of the non-lifting parts found by weighing and the actual particular wing mass.

According to JAR 22.29 the following configuration of the powered sailplane defines the empty mass, the whole powered sailplane including:

- any fixed ballast
- any fixed equipment
- unusable fuel
- maximum amount of cooling liquid and engine oil
- hydraulic fluid of the brake system

but excluding:

- pilot and parachute
- other readily removable items of load (eg:fuel, barograph, cameras, food supply, special seat cushion, and water ballast in the wing).

The empty mass determined during the last weighing is entered in the **"Mass and Balance Form"**, see Section 6.2 of the **Flight Manual.**

8. If any control linkage does not move freely over the whole range of its movement, investigate and remedy the cause.

9. The condition of the main landing gear and tail wheel including tires and brake linings must be checked.

10. Examine the pitot and static ports at the fuselage for blockages and leaks.

11. Check condition and proper functioning - and, if appropriate, approved service life limit / TBO - of all instruments, and VHF transceiver.

12. The condition and proper functioning of the tow release couplings should be checked. The release actuating cables must have free movement and some play when the tow release coupling is closed and locked, so that they are not under any tension.

13. The canopy jettison release must be operated and examined for corrosion and burrs etc., if necessary, rectified and in any case freshly lubricated !

14. The proper functioning of the canopy jettison backup pin & spring should be checked. Neither the detent pin nor the bow spring must be greased because otherwise the pin disengages too early in the emergency jettison case.

15. The water ballast bags and valves must be checked for leaks and proper operation (see Section 2.6).

16. Compare equipment and instrumentation with that shown in the aircraft's equipment list.

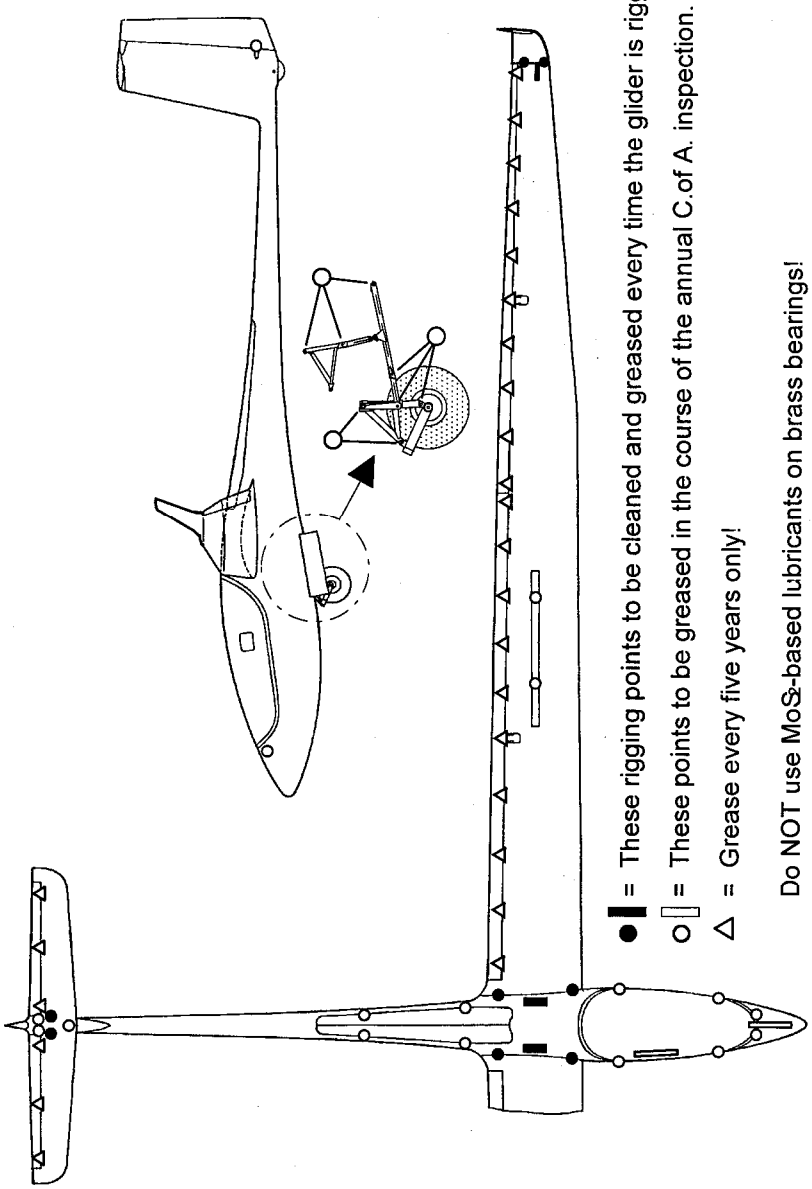
17. After repairs or changes in equipment fitted, the empty mass and C.G. position should be redetermined by calculation or weighing, and recorded in the Mass and Balance Form.

18. Check all control surface and flap gaps for correct sealing. It is important that the proper sealing of the gap under the elastic fairing strip is ensured by the Teflon tape. This is especially important at the lower wing surface and the top surface of the tailplane. Air flow through the flap or control surface gap can initiate flutter! Further details on this point are given in the Appendix of this manual, in Maintenance Instruction A.

19. The elastic fairing strip at the upper and lower wing surface gaps and at the horizontal tailplane top surface must have a good, lightly tensioned seating on the surfaces of controls and flaps. Raised strip edges impair performance. Further details on this point are given in the Appendix of this manual, in Maintenance Instruction A.

20. The zig-zag tape at the horizontal tail top & bottom surface must be checked for proper condition. Further details on this point are given in the Appendix of this manual, in Maintenance Instruction A.

Fig. 8.0-1 Lubrication Chart



12.2 Special Tools

a) Socket wrench for hexagon socket head screws, 6 DIN 911-12.9 (Allen Key), and

b) Rigging plate AS P/N 99.000.4657 (both for rigging the tailplane).

c) Filling nozzle AS P/N 99.336.0022, and

d) Stopper plug AS P/N 99.000.8861 (both for filling the water bags)

e) Unlocking tool for winglet and detachable short wing tip.

Special tool not supplied:

f) Caliper Face Spanner - e.g: Gedore No.44/7" (for water ballast valve assembly).

12.3 Supply Sources for Special Tools

The special tools b) thru d) can only be obtained through Messrs. Alexander Schleicher.

The Allen key a) and the caliper face spanner f) are available from all good tool shops, but can also be obtained through Messrs. Alexander Schleicher.

The unlocking tool e) for example may also be made from a screwdriver which is cut obtuse.

12.4 List of Maintenance Documents for Fitted Equipment

- Currently valid edition of the Engine Manual AE50R Report No.(P)002.

- Currently valid edition of the Operating and Maintenance Manual No.P3 for the propeller, supplied by Messrs.TECHNOFLUG, issued Sept.16, 1991.

- Operating Manual for Tow Release Coupling Series **"Europa G 88"** Safety Tow Release, issue February 1989, LBA approved.
  or:
- Operating Manual for the Tow Release Coupling, Series: Safety Tow Release **"Europa G 72"** and Safety Tow Release **"Europa G 73"**, issue January 1989, LBA approved.

- Operating Manual for Tow Release Coupling Series Nose Tow Release Hook **"E 85"**, issue March 1989, LBA approved.
  or:
- Operating Manual for Tow Release Coupling Series Nose Tow Release Hook **"E 72"** and **"E 75"**, issue March 1989, LBA approved.

- WHEEL and BRAKE ASSEMBLIES CATALOGUE, Component Maintenance Manual, Appendix A, Fits and Clearances -
  A-1. Brake Lining Wear Limits
  A-2. Brake Disc Minimum Thickness
  by: Parker Hannifin Corporation, Avon, OH, USA.

- Installation, Test & Inspection Instructions for flexible fuel tanks HFK T-LF Drawing No.12/89, by Messrs. HEIMANN, in the currently valid edition.