v_{RA}	Rough air speed	184 (99)	Do not exceed this speed except in smooth air, and then only with caution. Examples of rough air are lee-wave rotor, thunderclouds etc.
v_A	Maneuvering speed	184 (99)	Do not make full or abrupt control movement above this speed, because under certain conditions the sailplane may be overstressed by full control movement.

V_{FE}	Max. Flap Extended Speed (if applicable give different flap setting)	**WK 1 = 270 km/h (= 146 kts)** **WK 2 = 270 km/h (=146 kts)** **WK W = 270 km/h (= 146 kts)** **WK 3 = 270 km/h (= 146 kts)** **WK 4 = 160 km/h (= 86 kts)** **WK L = 140 km/h (= 76 kts)** **WK = Flap**	Do not exceed these speeds with the given flap settings.
V_W	Max. winch launching speed	**130 km/h (70 kts)**	Do not exceed this speed during winch or autotow launching
V_T	Max. aerotowing speed	**150 km/h (81 kts)**	Do not exceed this speed during aerotow

Approved Octane Rating:	not less than 94 RON/ROZ (research o.r.)
Approved fuel grades:	**preferably AVGAS 100LL**

Fuel grades like Car Super, Euro-Super, and Super-plus are also permissible.
In the U.S. the "US 94 Octane Rating" complies with the minimum relative octane number required by the engine manufacturer.
The Maintenance Instruction "Fuel" as appendix to the Maintenance Manual must be regarded. For further data refer to the Engine Manual AE50R.

Engine oil: Preferably Silkolene Comp 2 Pre-mix.
However, Castrol Aviation A545 or Spectro Oils of America "Golden Spectro" can also be used.

2.13 Minimum Equipment

Minimum Equipment consists of:

- 1 x ASI indicating up to 300 km/h = 162 kts
- 1 x Altimeter
- 1 x 4-part seat harness (symmetrical)
- 1 x Magnetic Compass
- 1 x ILEC engine control unit
- 1 x rear view mirror
- 1 x parachute or back cushion

For flights beyond the environs of the airfield at which the flight originates an aircraft radio is mandatory (for Germany). In addition, headphones should be worn when the engine is running.
Approved equipment is listed in the Maintenance Manual in Section 12.1.

2.14 Aerotow, winch- and autotow-launching

The maximum launch speeds are:

for aerotow	150 km/h (80,9 kts)
for winch- and autotow-launch	130 km/h (70,1 kts)

For all launching methods a weak link of 675 to 825 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.

Tank System (fuel and oil)

a) Check that hose connections to the wing tanks are secure and tight.

b) Check visually fuselage tank through wheel well for damage due to impact from stones and for leaks.

c) Press drainer and release any condensation if present. Watch carefully that the drainer afterwards closes tightly again. The drainer is situated at the rear end of the left fuselage tank half.

d) Check fuel tank vent opening. This vent is fitted at the left-hand side of the fin above the tail wheel.

e) Check fuel contents for a safe take-off (min. 5 liters).

f) Check engine oil tank (between engine and exhaust silencer) for any signs of leakage. Level check! Sufficient oil usage ? (See also Section 7.10)
Always top up the oil tank to approx. 1 cm below the filler opening.

4.4 Pre-Flight Checks

The following Check List containing the most important points is affixed within easy view of the pilot.

Pre flight check

1. Horizontal tail bolt and assembly pins secured ?
2. Check control forces and freedom of control movements !
3. (Clearance of control surface gaps min. 1,5 mm as viewed from trailing edge) ?!
4. Automatic parachute static line connected ?
5. Check the C.G. !
6. Observe the mass and balance data !
7. Water tank outlets and ventilation openings free ?
8. Fuel contents checked ?
9. Wing fuel tanks (if installed) connected ?
10. Engine checked as per the manual?

Pre take-off check:

1. Fasten parachute ?
2. Fasten safety harness ?
3. Landing gear locked ?
4. Airbrakes locked ?
5. Trim set in take-off position ?
6. Flap set in take-off position ?
7. Altimeter correctly set ?
8. Tail dolly removed ?
9. Check the wind direction !
10. Close and lock the canopy !

(2) Starting the Engine

WARNING: A test run of the power-plant must <u>under no circumstances</u> be performed <u>without</u> the aircraft being completely rigged and safely chocked. Also a competent person must be securely strapped in the cockpit.

CAUTION: The local conditions for a safe take--off should be checked prior to take--off in accordance with the data given in Section 5 of this manual

Proceed in accordance with checklist.
If the engine fails to start, check it over as recommended in the Engine Manual.
It makes no sense to press the STARTER button for more than 5 seconds because the engine fires only if sufficient fuel has been primed. Therefore, after the 5 seconds first fuel should be primed again. If the engine still does not fire, this should be repeated again at 15 second intervals with increasing amounts of priming fuel.
If however, white smoke is observed to come out of the exhaust silencer already on the third trial and still no firing happened, then the engine is "over-flooded". You must not prime any more fuel. Instead move throttle to 1/3 towards "WIDE OPEN", shut the fuel valve, and press STARTER until engine fires. Then immediately re-open the fuel valve.

Check ignition circuits. The RPM must not drop by

more than 200 RPM.
Allow engine to warm through at 4000 RPM for 3 to 4 minutes on ground; the coolant temperature should then be around 60 °C (140 °F). This way it will be ensured that the engine will smoothly accelerate to max. RPM.
With temperatures below -10 °C (14 °F) the engine should not be started because there is the danger with a very cold engine that the lubricant oil is too thick and thus the oil feed into the engine could be interrupted.

(3) Self-Launch

For a safe self-launch maximum engine revolutions should come up to 5900 to 6300 rpm on the ground. With lower revolutions the pilot must face longer take-off distances than indicated in Section 5.2.3.

WARNING: If maximum revolutions on the ground are at 5600 rpm or below, the aircraft must not take off. First the carburettor adjustment must be checked and again a test run of the power-plant on the ground must be done.

Experienced pilots should start their take-off run at the negative flap setting 2. This flap setting affords excellent lateral control. At an indicated air speed of about 50 km/h = 27 kts the flap should be increased to Flap 4 (+23 °). For the remainder of the climb Flap 4 should be maintained.
For pilots without experience of flapped aircraft, we recommend setting Flap 4 both during take-off and throughout the climb.
For the acceleration run and actual lift-off, the following .....

The take-off performances given below are applicable to take-offs on hard and level grass runways and for the aircraft, propeller, and engine in good condition and for the following conditions :

Airfield elevation	0 msl	
Temperature	15 °C	59 °F
Air pressure	1013 hPa	29.92 in.merc.
Take-off mass (with water ballast)	525 kg	1158 lb
Speed to climb over 15 m (= 50 ft) obstacle (v_{IAS}):	100 km/h (54 kts)*	

* After safety altitude is reached, climb with v_Y = 95 km/h (51 kts).

	GRASS RUNWAY:	HARD RUNWAY:
Take-off roll	283 m 929 ft	177 m 581 ft
Take-off distance to 15 m (50 ft) height	446 m 1463 ft	340 m 1116 ft

The influence of air temperature and air pressure (airfield elevation) on take-off performance is given in the take-off charts. (See Section 5.2.3.1.)

CAUTION: - In rain (wet wings) or with frost or ice on the leading edges, the aerodynamic quality of the aircraft is drastically reduced.
Take-off is prohibited!
First wing and tailplane must be cleaned !

- A tailwind as well as an uphill runway increases the take-off distances considerably. The possibility of abandoning the take-off must be considered. See also Section 4.5.1(3).

5.2.3.1 Take-off Charts

CAUTION: For other runway surface conditions such as wet grass, soft ground, high grass, wet snow, water spots, etc., which are not given in these charts, it is recommended to use the additional distance factors or percentages given in the AIP (Airport) Manual Volume 1 !

For pilots inexperienced in self-launch the following observation may be helpful for estimating a safe self-launch:
The flight testing of the ASH 26 E demonstrated that take-off and climb characteristics during self-launch are slightly better than for an aerotow behind a powerful 132 kW tug aircraft (eg: Robin DR 400). If therefore a safe aerotow may be expected, there will neither be any problems for the self-launch.

The following charts give values for various airfield elevations and temperatures.

SECTION 7

7. Description of the Powered Sailplane, its Systems and Equipment.

7.1 Introduction

This Section contains a description of the powered sailplane, its systems and equipment with instructions for use. Details of various ancillary systems and equipment, not included as standard equipment, can furthermore be found in Section 9.

A detailed technical description with overall view drawings can be found in the Maintenance Manual, Section 2.

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

7.2 Airframe

The ASH 26 E wing is equipped with trailing edge flaps over the whole of its span. The inboard flap is defined as a **'camber changing flap'**. When landing flap setting is selected, this flap deflects downwards by some 38°. This flap is also actuated by the aileron control, however, it is deflecting less than the aileron.

The outer flap is called **'aileron'** as it is mainly actuated by the aileron control. In addition the aileron is also deflected in accordance with flap settings.
In landing flap setting, the aileron deflects upwards by about 6°. This helps to keep the ASH 26 E fully controllable during the landing run.

The wing is equipped with vortex generators on the lower surface for the purpose of boundary layer control. The air emitted

WARNING: The rotary engine uses a total loss oil lubrication. If no oil is refilled into the oil tank or if the oil supply gets interrupted, this will inevitably destroy the engine.

Avgas 100 LL or Car Super min.94 RON/ROZ	
Tankage:	
Fuselage	= 16 liters
if installed:	
wing fuel tank, right	= 15 liters
wing fuel tank, left	= 15 liters
non-usable	= 0.7 liters
CAUTION:	
check engine oil tank level!	

Engine Oil: ➨
Silkolene Comp 2 Pre-mix
Castrol Aviation A545 or
Spectro Oils of America
"Golden Spectro"
Top up with each refuelling!

Oil usage must be checked. The following values may be given as an indication (consumption is RPM sensitive):

a) 0.2 liters oil/h with an RPM of 6900.

b) or slightly more than 0.015 liters oil per liter fuel.

(1) Fuel Filling Systems

Filling of the fuel tanks in fuselage and wings must be carried out only either by means of the fuel refilling equipment available as optional extra or by means of a funnel with corresponding connecting hose and filter. The electric refueling equipment mainly comprises the fuel hose connectors, a fuel pump with electrical plug, a fuel filter and a hose which is inserted into a fuel container when filling-up. The electrical plug fits the socket mounted in the instrument panel for this purpose.

(2) Filling of Fuselage and Wing Fuel Tanks

The optional wing fuel tanks are connected to each other and to the fuselage tank by their filling hose couplings in the baggage compartment in front of the main spar. These couplings are fuel tight, even if they are disconnected one from the other with the tanks full.
To fill up, the adaptor of the tank to be filled is connected with the appropriate adaptor of the filling system **outside** the fuselage - the fuel hoses are long enough - and the electrical plug is inserted into the socket in the instrument panel.
For filling the fuel tank(s) it is recommended to use the electric refuelling system (optional extra). When all connections have been coupled up, the filling equipment is switched on by means of the plug switch.

CAUTION: Filling of fuel may only be carried out either by means of the optional electric refueling pump system or by means of a funnel. More powerful pumps could burst the wing shell in the course of filling the wing tanks!
The fuel filter in the filling hose must not be removed.
The fuel hoses from the tanks must be connected with the fuel filling system only **outside** the fuselage. This will prevent fuel dripping into the fuselage.

When filling the fuselage tank, monitor the fuel level indicator and switch off the electric filling system at the latest when 16 liters are indicated. When filling the fuselage tank via a funnel, the funnel must not be placed higher than the capacity reservoir mounted in the fuselage (see Fig.7.10-1). This will prevent the capacity reservoir from being filled inadvertently.

As the wing tanks are not equipped with a fuel gauge, it is advisable to fill from a container of a capacity approximately matching that of one wing tank, or on which the amount filled can be read off. As in the case of filling water ballast tanks, the respective wings are lowered in turn.
Fuselage and wing tank(s) **must not** be refilled **simultaneously.**

When fueling has been completed, the filling equipment is disconnected and the wing tanks are re-connected with the fuselage tank. Now verify in any case that the tank selector switch **[15]** at the ILEC control unit is re-set to position "**OFF**". If it remains in position "ON", fuel from the wing tank(s) would be fed into the fuselage tank and then overflow through the tank vent.

(3)Topping-Up of the Fuselage Tank in Flight

The engine is fed with fuel exclusively by the fuselage tank. The wing tanks merely serve to top up the fuselage tank. If, therefore, the fuselage tank is to be topped-up with fuel from the wing tanks in flight, the magnetic valve of the wing tanks must be opened at the ILEC control unit (switch **[15]** must be set to "ON" or "AUTO"; in position "AUTO" the yellow pilot light **[16]** is only illuminated if fuel contents in the fuselage tank is less than 4 liters).

WARNING: With the switch in position "**ON**" care should be taken to close the wing tanks again in good time in order to prevent the fuselage tank being overfilled, causing fuel to be lost by overflowing through the tank vent. Monitor fuel level indicator!

CAUTION: It is recommended to use the switch [15] only in setting "AUTO" because this makes it less likely that the fuselage tank will be overfilled. Anyhow, fuel level indicator must always be monitored !

(4) Draining Wing Fluel Tanks on the Ground

In order to drain the wing tanks on the ground, both flexible wing fuel tanks must be disconnected from the fuselage tank. Have a suitable container ready, and pull the hose with the appropriate connector off the fuel filling equipment. This hose is inserted into the container, and connected to the wing tank it is intended to drain.

7.11 Electrical System

Refer also to Fig.7.11-1 and 7.11-2 at the end of this Section.

(1) Soaring Flight Board Circuit

The electrical system is supplied by a 12V battery. A main switch {1} is installed in the power-plant control console which is turning on the board system. Each electrical applicance is protected by its own fuse.
There are different possible configurations to supply the electrical board system. Refer also to Fig.7.11-1.

An installation drawing cannot be provided by SCHLEICHER as too many different ELT's are on the market.

Since the whole of the air frame except for the fin and a small area above the baggage space contains CRP layers, and carbon fiber laminations screen the transmission radiation, the ELT aerial must be fitted in the baggage compartment at the top and must extend into the canopy area.
The instructions for the installation given by the ELT manufacturer must be regarded. The installation of an ELT must be approved by a licensed aviation inspector.

(6) Steerable Tailwheel

As an optional extra the ASH 26 E can be equipped alternatively with a steerable tail wheel instead of the conventional tail wheel and with removable wing tip wheels. This makes it possible to roll with the aircraft on the ground without the aid of a second person- eg: to the take-off point.

Prior to the assembly of the steerable tail wheel first the standard tail wheel including its box must be dismantled (loosen nut A/F 17, remove washer and axle bolt).
Now the connecting unit for the safety springs must be screwed onto the rudder in perfect alignment, with the retaining eyes pointing to the front. Then the white pressure plate of the steerable tail wheel assy is inserted into the support mounted at the front wall of the tail wheel housing and screwed on (two washers and two lock nuts M6). The bearing bushing of the steerable tail wheel assy must be aligned to fit the bore holes in the tail wheel housing so that the axle bolt can be re-fitted. Replace the washer //

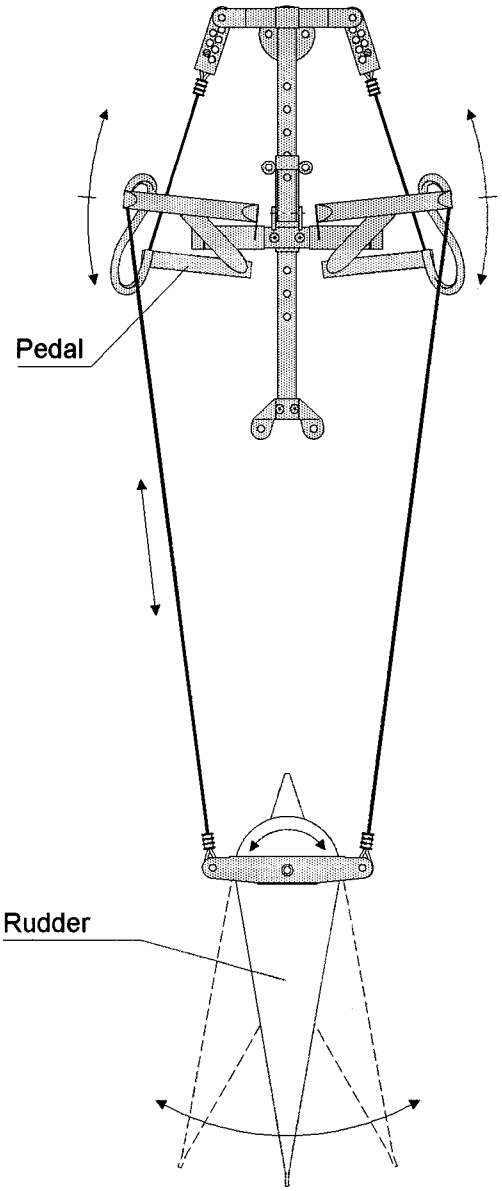
and tighten nut A/F 13. If the above procedure cannot be accomplished with the safety springs hooked in, they may be unhooked at the wheel fork of the steerable tail wheel.
Finally the fairing is attached and taped on.

The parts of the steerable tail wheel mod have the same mass as the standard tail wheel. Therefore, the C.G. remains unchanged.
If the steerable tail wheel is dismantled in order to fly again with the standard tail wheel, the connecting unit for the safety springs at the rudder must also be removed!

If rubber skids are fitted at the wing tips these must be removed (two hexagonal socket head screws A/F 5 respectively) and replaced by the wing tip wheels. Pay attention to the correct mounting (left and right wheels are different).

NOTE: The original screws only must be used otherwise damage to the wing skin cannot be excluded.

Fig. 2.2 - 6 Rudder Control System



2.3. Power-Plant

2.3.1 Description of the Components

Power-plant components are marked in the following paras by a number in brackets. The Figures 2.3-1 through 2.3-10 hereafter use the same numbering for these parts.

2.3.1.1 Power-Plant Design

The power-plant is mounted to the airframe at three rubber suspended points - marked **[1]** + **[2]** - by means of an engine mount bed. An electric spindle **[3]** which is integrated into the left side of the engine mount bed, serves to extend and retract the propeller assembly **[5]** via a toggle crank design **[4]**. This process is assisted by a gas strut which engages at the right side to the toggle crank design. When the propeller is extended the drive belt is tightened at the same time (reduction gear 1:3).

The power-plant consists of a single rotor, Wankeltype rotary engine, with liquid-cooled housing, forced air cooled rotor, alternator **[17]**, electric starter **[7]** and electronic dual spark battery ignition. The precise engine designation of the makers, Midwest Engines Ltd., is: **Mid-West AE50R**.

The engine is described in details in the Midwest engine manual.

The exhaust system **[8]**, too, is fitted stationary inside the fuselage.

When the propeller is retracted, the engine compartment is

partment is completely covered by neatly fitting doors.

2.3.1.2 Engine controls in the cockpit

The throttle and the propeller stop block are operated via Bowden cables by a pair of control levers in the engine control console which is fitted beneath the instrument panel. Also the PRIMER and STARTER buttons and the main switch are located at this engine control console (see also Flight Manual Section 7.9 for a complete description and illustration of this console).

The power-plant as well as the propeller extension and retraction are controlled by the ILEC-Power-Plant Control Unit (see also Flight Manual Section 7.9 for a complete description and illustration of this control unit).

2.3.1.3 Propeller Gear and Timing Belt

The timing belt uses a special type of gear contour and must only be replaced for the original SCHLEICHER part; the same applies to the four belt pulleys.

If the timing belt flutters at idle speed RPM of 2900 ±100 RPM, the belt tension must be increased.
For this purpose and with the propeller extended, the propeller head fairing [32] is removed and the four lateral set screws [33] are undone for each side (loosen only, do not remove). Now the lock nuts of the 3 tighteners [34] are loosened (they are located in the connecting piece between the two belt guides).

Turning in the 3 tighteners evenly will move the propeller head parallely upwards.
If the tighteners are adjusted unevenly, propeller head pitch will change and the timing belt will run up on one side.
The lateral set screws are then re-tightened and the three tighteners secured. Check the belt running in accordance with the instructions below.

CAUTION: If the timing belt runs up at the upper belt pulley, the wear of the parts will be increased and this may lead to failure of the belt drive.
Whenever the belt tension has been adjusted, also the correct belt running must be checked.

Adjusting the belt running:
If the axles of the two main belt pulleys are not exactly parallel, the belt will run up at one side of the pulleys and will be subject to increased wear. The correct belt running is adjusted by adjusting the pitch of the upper pulley by means of the 3 tighteners (see above). The belt will always run up to the side of the lower belt tension, i.e. "downhill".

If the belt is running up at the front edge of the pulley,
the front tighteners are turned in (clockwise).

If the belt is running up at the rear edge of the pulley,
the rear tightener is turned in (clockwise).

- **Fuel system:**
Two electric fuel pumps provide the fuel supply; they are fitted in the fuselage in front of the fire bulkhead.
The fuel pressure at the carburettor inlet must meet the required tolerance; these values are given in the engine manual.

In order to be able to adjust the pump pressure independent of the pumps either a pressure reducer [48] or a throttle bypass line [49] is installed (see Fig.2.4-1).
The pumps are switched on at the same time when the ignition is ON (at the ILEC control unit).
The proper function of the fuel pumps can be checked when turning out either FUSE 1 or FUSE 2 of the pumps during an engine ground run. The RPM power of the engine should not alter by this action. If power loss is distinctly noticed, the corresponding pump must be replaced.

The electrically actuated primer valve [12] takes the fuel from the pressure side of the fuel system and injects it into the carburettor [13]. The primer works only if the fuel pumps work properly when the ignition is ON.

If problems with the carburettor mixture are experienced, you should consider also to check the primer valve for leaks. For this purpose the primer line [47] is disconnected from the carburettor (see Fig.2.3-9) and extended by a hose. With the ignition on (fuel pumps' running must be heard) it can be verified whether this valve is completely tight when NOT pressing the primer button in the cockpit.

In a second step it can also be tested if fuel flow through the valve is sufficient when pressing the Primer button.
If the primer valve is no longer completely tight, replace.

2.3.1.5 Ignition

The ignition system is described in Section 2.4 of the Engine Manual. The ignition wiring diagram is contained in the wiring diagram Fig.2.8-3.
In this aircraft the components are installed as follows:

Ignition Circuit 1: Ignition trigger at the starter gear rim (flywheel), right top.
Left ignition box in front of the fire bulkhead.
Front HT coil
Front spark plug.

Ignition Circuit 2: Ignition trigger at the starter gear rim (flywheel), left bottom.
Right ignition box in front of the fire bulkhead.
Rear HT coil.
Rear spark plug.

If the ignition circuit test switch at the ILEC (see Flight Manual Section 7.9) is hold in setting 1, the circuit 2 is switched off and the engine is running only on the first circuit. Holding the switch in setting 2 will test the second circuit.

2.3.1.6 Cooling Systems

Liquid cooling system:
The largest part of the heat is rejected via the liquid cooling system, the radiator [14] of which is pivoted into the air stream when the propeller is extended. The system is filled with a

2.3.1.9 Adjustment of the Carburettor

The carburettor is adjusted as described in the engine manual Appendix 1.

Fig.2.3-9 shows the following details:

[44] Low-speed screw at carburettor
[45] High-speed screw at carburettor
[46] Idle stop
[47] Connector for primer line

For setting the carburettor it is essential to watch that coolant temperature must be above 54 °C.
Idle revolution rate shall be 2900 RPM ± 100 RPM. To achieve this, the idle stop screw at the idle stop [46] is adjusted.

If during adjustment work the carburettor needle throttle response differs distinctly from the values given in the engine manual, check also the fuel pressure at the carburettor inlet. The permissible pressure values are given in the engine manual, Appendix 1.
If the problem cannot be solved by the correct fuel pressure, the opening and closing pressure of the carburettor diaphragm valve as well as the condition of the valve itself should be checked by an appropriately licensed person.

Opening pressure = 0.72 to 0.78 bar
(= 10.44 to 11.31 psi)
Closing pressure not below 0.45 bar (6.53 psi),
measured at the dry carburettor.

2.3.2 Propeller Type and Mounting

The approved propeller types are detailed in the Flight Manual of the ASH 26 E in Section 2.4

Fitting and dismantling the propeller is done in accordance with the instructions given in the operations and maintenance manual of the propeller.
The propeller bolts must be secured by stop nuts. Once loosened, always renew these nuts.

2.3.3 Temporary Storage of the Power-Plant

If the aircraft is not operated for a protracted period, observe the storage instructions under Section 4 of the engine manual.

Storage up to 30 days:
No special treatment is necessary for this period.

Storage over 30 up to 90 days:
Proceed as detailed in Section 4.6 through 4.10 in the engine manual. The following exceptions / deviations apply:

- The engine is not dismantled.

- The air intake filter **[20]** is removed and the throttle is moved to Wide Open Setting. Connect an oil can to a thin silicone tube which is inserted into the ram pipe **[21]** as far as on a length of 520 mm. Then 2 cc engine oil are injected directly into the engine through this tube.

Now proceed as prescribed under points 4.8(d) thru (j) in the engine manual, injecting the oil - as described before - through the carburettor.

- The air intake filter **[20]** is not re-assembled, the air intake is sealed by a plastic foil and rubber band. The same sealing is done at the ram pipe end of the exhaust.
- When the propeller has been retracted, verify the timing belt for even loops in its fold-area. Where necessary, support the belt loop by a hard foam rubber or similar material at the inside of the loop.

Storage over 90 days:

The same treatment as described before is done and in addition the following:

- The fuselage tank must be emptied through the drainer and the engine should use up completely any fuel remaining in the lines and in the carburettor.
  Do NOT close the tank vent in the fin!
  On this occasion test the drainer for leaks and where necessary screw it out and clean.
- The outside of the engine needs no special protection as described in the engine manual under 4.9(d) on the condition that the engine compartment doors are airtight sealed by tape, in dry air.
  In regions with very humid climate in addition dry salt - as sold for caravan need may be put into the barograph support box in the engine compartment.

Returning to service from storage

Proceed in accordance with Section 4.10 in the engine manual. The following actions must be done in addition or differently from what is described in the engine manual.

- Open manually the engine compartment doors and check the belt loops in the fold-area for kinks. This is advised as a precaution, as no experience is so far available with storage time longer than 6 months.
- Air intake and exhaust are re-opened and the air intake filter re-assembled. If the engine has been stored for more than six months, than the engine inside requires oiling as described under para "Storage over 30 up to 90 days".
- The spark plugs which were left screwed in, need not be removed, if the engine starts after a few tries.
- Carry out a full engine ground run according to the instructions in Section 6 in the engine manual and record the results in the form contained in the engine manual.

2.3.4 Dismantling and Re-Assembling the Power-Plant

The following paras describe how to dismantle and re-fit the power-plant. This may become necessary for maintenance, repair or weight reduction or compliance with competition rules. The only component groups left in the fuselage are the fuel system, and all cockpit engine controls.

14. Carefully turn the engine to the right side so that first the starter will be pivoting out of the fuselage and only then the fan channel is pivoted outwards.

15. The foremost point of the engine unit remained still next to the fire bulkhead in front of the fuselage side mount. Now the engine unit is carefully pulled backwards until the front engine support mount is free. Are all connections undone ? Then take out the engine unit completely.

16. **WARNING:** When operating the sailplane with the power-plant removed, the instructions under Para. 2.3.5 "Operation with Power-Plant Removed" must be strictly adhered to! In addition also the engine batteries must be removed!

17. If it is intended to have the engine unit removed for a longer time, the storage instructions as per the engine manual now must be accomplished.

<u>Refitting Power-Plant</u>

Refitting the power-plant is done in reverse sequence as the dismantling. Prior to refitting it is advisable to do any maintenance works which are more easily done with the engine removed; likewise it is recommended to inspect all components thoroughly.

1. Prior to reinstalling the engine the three engine support bearings in the fuselage must be inspected. Particular attention must be paid to

the condition of all threads.
Clean the engine compartment and, if applicable, repair damages to the fire protection paint and the aluminum shields.
If the engine has been transported or inverted, the pump of the total loss oil supply **must** be bled before re-installing the engine.
For this purpose refer to the Maintenance Instruction "Venting the oil pump" in the Annex to this manual.

2. The propeller should be in the same position as described under point 9. for removing the engine.

3. Attach the engine to the lifting device such that the front engine support mount may be inserted first into the fuselage, between the suspension points and the fire bulkhead.

4. Carefully lower the engine unit and turn it to the right so that first the fan channel goes into the engine bay.
Watch that no cables nor leads are damaged.

5. Before the front engine support mount is lifted onto the dowel pin of the front suspension point, any shims as described under point 8. for removing the engine, must be refitted. Use new stop nuts for the front mounting connection.

6. Connect the 25-pin connector block **[23]** in the engine compartment and extend the propeller completely.

7. The rear engine mounting bolt **[29]** must be threaded into the thread of the rear engine support mount by carefully moving the engine unit. After having tightened the bolt secure it with locking wire.

   Locking wire (see Fig.2.3-10):
   The locking wire can fulfill its proper function only if the wire meets the screw head at the shallowest possible angle in order to prevent the screw from undoing itself (see direction of arrow in Fig.2.3-10). In the illustrated case, a locking wire connected to hole 1 or 2 would be ineffective!
   Always use fresh locking wire.

8. Connect Bowden cables and plug connectors. Do not forget to secure the starter cable with the lock plate.

9. Check fuel lines for contamination. After having connected them, test them for leaks and secure with wire.

10. Re-assemble engine bay doors and safety them.

11. Refit the elastic tensioning cords for the doors.

12. Carry out a thorough inspection of the engine unit and a full engine ground run prior to the next flight.

WARNING: In order to re-establish the correct C.G. position after having refitted the power-plant, the engine batteries must be reinstalled in the battery compartment beneath the control stick (see also Section 2.3.6) !

2.3.5 Operation with Power-Plant Removed

If the ASH 26 E is to be operated with the power-plant removed, the following points should be observed:

1. All control cables, leads and hoses must be immobilized by means of cable ties or adhesive tape!

2. For reasons of C.G. limits the engine batteries in the battery compartment beneath the control stick must be removed (here either one or two maintenance-free dry-gel batteries with 18 Ah may have been installed).

3. For the avionics power supply a standard maintenance-free dry-gel battery of approx. 7 Ah must be installed in a suitable battery support (see also Section 2.13 in this manual).

4. The barograph - if installed - may remain in the respective box in the engine compartment.

5. In order to keep the C.G. within permissible limits when flying without the power-plant, a C.G. re-calculation or better re-weighing must be done.
   Masses and moment arms of power-plant and ..//

batteries are stated in Section 6.8.

6. The powered sailplane with the power-plant removed can be operated under the in flight C.G. limits of the sailplane.
   Front in flight C.G. = **0.25 m aft of Datum** (=0,82 ft)
   Rear in flight C.G. = **0.39 m aft of Datum** (=1.28 ft)

2.4 Fuel System

2.4.1 Description of the Fuel System

The ASH 26 E is fitted with a **two-piece Fuselage Tank** as standard equipment. It is located in the area of the landing gear at the left and right fuselage wall. The fuel supply hose for the power-plant leads first of all from the underside of the tank to the **fuel filter** (when replacing the filter it is imperative to ensure that no paper filter is used. See also Section 7.2.1). From the fuel filter a hose is leading to the fuel valve (Fire Cock). This valve is operated via a rod linkage by a sliding knob in the left-hand arm rest of the seat. From this valve the fuel hose continues to the two fuel pumps (which are parallely switched on) in front of the fire bulkhead. From here the fuel hose is running via the fire bulkhead to the carburettor. Fuel pressure is adjusted either by a by-pass line with throttle or by a pressure reducer.
The **drain valve** is fitted direct at the left tank underside. This allows any condensation which may have accumulated in the bottom of the tank to be drained off.
The tank is **vented** by a fuel hose fitted at the

upper front of the tank, which continues via a capacity reservoir (expansion space) to a Tecalan tube. This Tecalan tube ends in a fitting mounted at the left-hand side of the fin above the tail wheel. From there, a small hole gives access to the outside.

The **Fuel Gauge** consists of a feeler in the left fuselage tank which measures the fuel level and activates an indicator at the ILEC control unit. Additionally both fuselage tanks feature transparent areas to allow the contents to be checked on the ground and also a check of the condition of the tank.

The **Filler Hose** is likewise fitted to the front of the tank. It leads through the baggage compartment floor into the baggage compartment. A sealing connector is fitted to the end of this hose, to which the external fuel filling system can be coupled-up.

The **external Fuel Filling Equipment** is used for filling the tanks. It consists mainly of a fuel pump, a fuel filter and a sealing hose connector (if wing tanks are fitted, there will be two opposing sealing hose connectors). The hose from the filter of the filling equipment is inserted into a fuel canister, and the sealing hose connector coupled up to the filler hose of the fuel tank. The electrical socket for the fuel pump is located in the instrument panel.
After every filling operation, the suction tube must be sealed so that no contamination may penetrate into the inside of the tube.

In addition, the ASH 26 E can be equipped with **Wing Fuel Tanks** in the form of plastic bags. One tank of 15 liters capacity can be accommodated in the .../

leading edge of each inboard wing.
In the baggage compartment, the fuel hoses of both wing tanks are coupled-up to the fuselage tank by means of quick-release connectors.
A solenoid valve operated from the cockpit controls fuel flow into and out of the tanks. From this valve a fuel hose runs to the fuselage tank.

For filling the wing tanks, the external filling equipment is also coupled up to these same quick-release connectors. At the outer end of the plastic bags the venting hose is connected to a pressure relief valve. This venting hose is ducted downwards out of the wing at the end rib.
It is also possible to equip the ASH 26 E with only one wing tank (asymmetrically).

2.4.2 Dismantling and Re-fitting of the Wing Fuel Tanks

The following paras describe how to remove and re-fit the wing fuel tanks. This may become necessary to facilitate maintenance, repairs or the fitting of water ballast tanks in the inboard wings.
The relevant installation drawing is included under Fig.2.4-2 in the rear part of this Section.

Dismantling the Wing Fuel Tanks:

- Refer to Fig.2.4-2.

- Remove the guide plate at the wing root rib, undoing the ground connection of the fuel tank.

  IF WATER BALLAST IS INSTALLED:
  Pull the actuating rod out of the water ballast valve (see Fig.2.6-2).

- Pull the vent hose off the elbow at the root rib and untie fixing cords.
  NOTE: Tie the end of the long cord back to the root rib so that it cannot inadvertantly be pulled out of the wing.

- Cut the cable ties which are holding the hose (at the root rib).

  IF WATER BALLAST IS INSTALLED:
  On the lower wing skin, remove the safety screws of the valve retaining screws; the latter are then undone by means of a caliper face spanner - e.g: Gedore No.44/7". (When re-fitting, do not forget to replace the Teflon sealing tape which becomes visible on removal).

- Now pull fuel tank out through the root rib by means of the fixing cord (slightly folding the tank in the process).

SECTION 4

4. Information on Service Life Limitations and Operating Hours

4.1 Inspection Program to Extend Service Life

Introduction

Fatigue tests on CFRP wings and CFRP wing spars have shown that a service life expectancy of 12000 hours may be achieved for these components without problems. However, as this test program did not examine an entire aircraft made of CFRP and GRP, this service life span of 12000 hours can be achieved only if the long-term airworthiness of each aircraft is demonstrated in a special multi-stage inspection program (over and above the mandatory annual C of A inspections).

Time Limits

1st Stage:
When the aircraft has reached a service life of 3000, 6000, and 9000 hours respectively an inspection must be carried out in accordance with a particular inspection program laid down by Messrs. Schleicher, from whom a copy of this program must be obtained. If the results of this inspection are positive, or if any defects discovered have been correctly repaired, the service life of the aircraft is increased after its 9000 hours inspection by another 1000 hours, i.e. to a total of 10000 hours.

2nd Stage:

When a service life of 10000 flying hours has been reached the above inspection program must be repeated. If the results

are positive, or any defects found have been satisfactorily repaired, the service life may be increased to a total of 11000 flying hours. The same procedure applies again when the aircraft has reached 12000 hours, provided the results are again positive, or any defects discovered are satisfactorily repaired.

For a possible extension of service life beyond 12000 hours, detailed requirements will be established in due course.

Inspection Program

The appropriate inspection program must be obtained from Messrs.Schleicher.

The inspections may be carried out only by the manufacturer, or by an appropriately licensed aircraft repairer.
The results of the inspections must be listed in an inspection report in which each item must be annotated with a comprehensive comment, as laid down.
If the inspection is not carried out by the manufacturer, but by a licensed aircraft repairer, a copy of the filled in inspection report **must** be forwarded to Messrs. SCHLEICHER for the purpose of evaluation!
After receipt and examination of this report Messrs. SCHLEICHER will issue an acknowledgement of receipt and send it back to the aircraft owner. Only then the inspector must certify the increase of the service life in the logbook and in the aircraft inspection records.

The need for annual Certificate of Airworthiness inspections and overhauls is not affected by this rule (for German registered aircraft § 27 (1) LuftGerPO* applies).

*LuftGerPO = Aircraft Examination Rules

4.2 Special Servicing Procedures and Equipment Subject to Service Life Limitations

Special Servicing Procedures

At regular intervals of five years, the EPDM (Du Pont Ethylene-Propylene-Rubber) sealing rings of the water ballast valves must be checked, and replaced if required.

At regular intervals of six years the brake line hose of the hydraulic wheel brake must be replaced. Should this hose be found to be in good condition, it need not be replaced, on condition that its condition is checked at least every 100 flying hours.

Equipment subject to Service Life Limitations

Tow Release Couplings

The TOST tow release couplings, fitted as standard equipment have a limited service life and must be returned for inspection and servicing at regular time intervals. Their service life begins when they are fitted in the aircraft.
Specifications of service life will be found in the TOST operating manuals for the tow release couplings.

Instruments

The flight monitoring instruments are not normally subject to service life limitations. As a general rule, the makers' instructions should be complied with.

Safety harness

The safety harness has a maximum service life of 12 years as of the date of manufacture which is entered in the corresponding "JAA Form One" (airworthiness release tag). As a general rule, the makers' instructions should be complied with.

Oxygen System

Oxygen systems and oxygen supply must comply with JAR 22.1441 and 22.1449 !
For oxygen systems fitted, the relevant TBO is stated in the appertaining "airworthiness release tag" issued by the makers. Over and beyond this, the oxygen bottles must be re-inspected by a technical inspection institute every five years in accordance with pressure vessel regulations.

Water bags

"Smiley" water bags have a preliminary service life of 6 years. Prior to the expiry of this time limit the customer should contact Messrs. SCHLEICHER and check whether it is possible to increase this service life by means of a special inspection program.

Power-Plant

Service life limits and maintenance intervals for the Mid-West AE50R power-plant are specified in the engine manual "P 002", in its currently valid edition. Any inspection and maintenance work in view of the increase of service life must be performed and certified by the manufacturers, or by a licensed aircraft repair and maintenance establishment who has been authorized by the manufacturers and by the relevant civil aviation authority.

Propeller

The service life limitation of the TECHNOFLUG propeller is specified in the currently valid edition of the "Operation and Maintenance Manual no.P3", issued by TECHNOFLUG.

Fuel Lines

Fuel lines from Elastomers have a limited service life. According to German NOTAM (NFL II-39/76 and NFL II-96/78): "Permissible service limits are laid down generally in the Aviation Standard LN 9088 and in the respective U.S. publications." The fuel lines used as standard in the ASH 26 E have a maximum service life of five years.

Flexible Wing Fuel Tanks

The flexible fuel tanks are subject to a service life limitation. The service life is specified in the currently valid edition of the "Installation, Test & Inspection Instructions for flexible fuel tanks HFK T-LF.

CFRP Exhaust Fairing

Because of the extreme heat influence the CFRP exhaust fairing is subject to a service life limitation of 150 operating hours. Upon this time limit the fairing must be replaced by a fairing version with further improved heat resistance. This version is available from Schleicher as of November 1999.

THIS PAGE IS ONLY APPLICABLE TO U.S. REGISTERED AIRCRAFT!

4.3 Airworthiness Limitations

This Section covering Airworthiness Limitations is FAA-approved for U.S. registered aircraft.

THIS PAGE IS ONLY APPLICABLE TO U.S. REGISTERED AIRCRAFT!

Log of Revisions

Rev. No.	Page(s) affected	Description	LBA approved / Signature	Date of Revision

- Check the propeller shaft for radial play at the bearing seating (i.e. by applying radial load onto the shaft).
- Oil the sliding fit of the front propeller bearing. This is done by applying oil onto the propeller shaft in front of the bearing when the propeller is in a position "almost fully retracted".

Every 50 hours:

- Inspect the engine in accordance with the engine manual. The Maintenance Schedule contained in the engine manual covers also some points referring to a gearbox; but these are not applicable to this aircraft.
- Check drive belt for wear of cogs and of the belt sides.
- Check belt pulley for wear of teeth and condition of the hard coating of the aluminum pulleys. Minor wear is permissible.
- Do an engine ground run and watch the exhaust noise emission.

Every 100 hours:

- Inspect the engine in accordance with the engine manual.
- Inspect the belt pulley bearings for play in the ball bearings.

Every 150 hours:

- Inspect the engine in accordance with the engine manual.
- Replace the CFRP exhaust fairing (see 4.2.).

- Disassemble the exhaust silencer and then remove its CFRP fairing so that the exhaust silencer can be visually inspected for damages. Check the condition of the heat damming material in the CFRP fairing; if necessary replace.

- Check the elastic rubber coupling between crank shaft and lower drive pulley for cracks and replace where necessary.

After one year:

- Inspect the engine in accordance with the engine manual.
- Check coolant level and its anti-freeze contents.
- Remove residuals caused by oil, exhaust gases and fuel from power-plant and engine compartment wherever access is possible with the power-plant installed.

After three years:

- Inspection and maintenance works as prescribed in the engine manual.

After five years:

- Replace all rubber fuel hose lines.

b.) <u>Once-Only Maintenance Tasks</u>

After 1 hour and every time the propeller has been reinstalled respectively after 1 hour:

- Check and re-tighten the six mounting bolts of the propeller (observe the prescribed torque settings given in Section 5.3!).

33 Minimum cockpit load as per Data and Loading Placard with two batteries in front of control stick box
_____ kg (____lbs)

This placard is affixed at the right cockpit wall if applicable

34 **Fire**

35 Engine Master Switch

36 ← Fuel shut-off → shut valve open

37 L LANDUNG nur im Endteil LANDING for final only | THERMIK THERMALLING 4 | 3 | 2 | SCHNELLFLUG FAST 1

38 Reduced minimum cockpit load with power-plant dismantled see flight manual - Page 6.4

This placard is affixed next to the Data and Loading Placard (19)

39

Engine-Oil:
Silkolene Comp 2 Pre-mix
Castrol Aviation A545 od.
Spectro Oils of America
"Golden Spectro"

Top up with each refuelling !

Refill engine oil only with funnel !
Never fill the oil tank up to the rim !
Oil pollution in the engine compartment may lead to fire !

40

These placards are affixed at the ram pipe next to the engine oil tank.

Check List

ASH 26 E
Power-Plant Checklist
Issue: 31.01.95

Checklist, extending propeller and starting engine

- Fuel valve: OPEN
- Main switch: ON
- Power-plant main switch: ON (ILEC responding)
- Switch "Extend Propeller" engaged upwards
- Green LED "Propeller extended" on ?
- Propeller stop disengaged ?
- Ignition: ON
- Check fuel pump (must be heard)!

Cold and warm start on the ground

- Nobody/nothing within the arc of the propeller ?
- Set Throttle to "IDLE"
- Push PRIMER button for 2 to 3 seconds
- Push STARTER button max. 5 seconds
- If engine does not fire, press PRIMER and then STARTER again at 15 second intervals with increasing amounts of priming fuel.
- Check ignition circuits
- Allow engine to warm through at 4000 RPM for 3 to 4 minutes

Revolution Rates (RPM) and Speeds

Best climb at vY = 95 km/h = 51 kts (blue line).
Cruising speed 130 to 140 km/h (70 to 76 kts) at 6900 rpm.
Maximum continuous revs: 6900 rpm.

Cold and warm start in flight

- Air speed 90 to 110 km/h (49 to 60 kts)
- Move throttle to "IDLE"
- Push PRIMER button for 2 to 3 seconds
- Push STARTER button max. 5 seconds
- If engine does not fire, press PRIMER and then STARTER again at 15 second intervals with increasing amounts of priming fuel.
- If possible, allow engine to warm through
- Reduce airspeed and move throttle to Wide Open Throttle (WOT). (Watch rate of revolutions!)

Checklist stopping engine and retracting propeller

- Air Speed: 90-100 km/h (49-54 kts)
- Throttle: IDLE (bottom position)
  Wait until low RPM have stabilized.
- Ignition: OFF
- Let engine revs. die down.
- Engage propeller stop lever (bottom position)
  When engaging the stop the propeller must not stand direct above the stop block.
- Wait until propeller runs against the propeller stop block.
- Check vertical position of the propeller by means of the mirror.
- Hold down switch "RETRACT" and let propeller retract only so far that its tip can no longer be seen in the rear view mirror. Then after about 2 min. press again "RETRACT" until the ILEC LED "Propeller retracted" lights.
- Fuel valve: SHUT
- Switch off Power-Plant Main Switch by pushing the red lever next to it.

When repairing plexiglass canopies you must regard the prescriptions of the manufacturer of the acrylic glass or the instructions given in FAA Advisory Circular AC 43.13-1A (Aircraft Inspection and Repair), Section 9 (copy of which may be obtained from the LBA or FAA).

Additional Minimum Equipment for Cloud Flying:

Maker	Model	Data Sheet / Spec.no.	Measuring Range	Ref.No.
Compass				
Airpath	C 2300	-	-	-
Bohli	46-MFK-1	-	-	-
Ludolph	FK 5	10.410/1	-	-
Ludolph	FK 16	10.410/3	-	-
Ludolph	FK 16/83B	10.410/7	-	-
Ludolph	FK 16/83S	10.410/7	-	-
Ludolph	FK16/83SB	10.410/7	-	-
PZL	BS 1	-	-	-
PZL	B 13/KJ	-	-	-

According to JAR 22.1327 the magnetic direction indicator (compass) must be installed so that it is compensated in level flight to ± 10°, and to ± 15° when the radio is in use. A deviation table (in not more than 30° increments) must be placarded near the instrument, if the compass cannot be adjusted more exact than ±5° (JAR 22.1547).

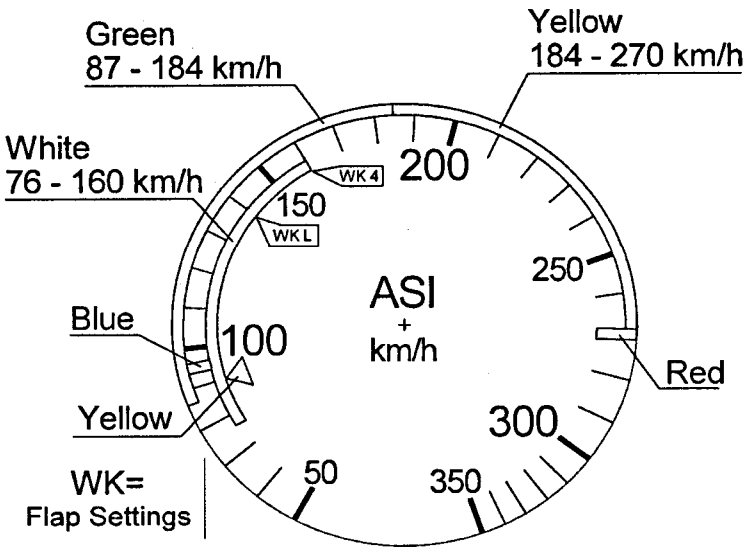
Variometer				
Winter	5 StV 5	TS 10.230/13	± 5 m/s	5251
Winter	5 StVM 5	TS 10.230/14	± 5 m/s	5451
Winter	5 StVLM10	TS 10.230/12	±10 m/s	5561
Winter	5 StVL 10	TS 10.230/11	±10 m/s	5361

Maker	Model	Data Sheet/ Spec. No.	Measur- ing Range	Ref.No.
VHF Transceiver				
Avionic Dittel	ATR 720 A	10.911/70	-	-
	ATR 720 B	10.911/80	-	-
	ATR 720 C	10.911/80	-	-
Becker	AR 2008/25	10.911/48	-	-
	AR 2009/25	10.911/48	-	-
	AR 3201	10.911/76	-	-
	AR 3201-1	10.911/76	-	-
	AR 3201-3	10.911/76	-	-
	NAV 3301	10.911/78	-	-
	AR 4201	10.911/87	-	-
Dittel	FSG 15/25	10.911/44	-	-
	FSG 16/25	10.911/44	-	-
	FSG 40 A	10.911/45	-	-
	FSG 40 S	10.911/45	-	-
	FSG 50	10.911/71	-	-
	FSG 60	10.911/72	-	-
	FSGH 60 M	10.911/72	-	-
	FSG 70	10.911/81	-	-
	FSG 71 M	10.911/81	-	-
VHF Navigation Systems for VOR				
Becker	NR 3301-1	10.922/78	with IN 3300-4	
	NR 3301-2	10.922/78	with IN 3300-4	
	NR 3301-3	10.922/79	-	
Transponder				
Becker	ATC 2000-2R	10-930/36	-	-
Encoding Altimeter				
IEI	E 9001	10.221/05	-	-

ELT see **Section 2.13** of this manual and also Flight Manual **Section 7.13 (5).**

12.5 Air Speed Indicator Markings

When markings are on the cover glass of the instrument, there must be means to maintain the correct alignment of the glass cover with the face of the dial (JAR 22.1543 a).
Each arc and line must be wide enough and located to be clearly visible to the pilot and not mask any portion of the dial (JAR 22.1543 b).



12.6 Maintenance Instructions

The following Maintenance Instructions are established from time to time as required, in accordance with experience accumulated in operating the ASH 26 E. The Maintenance Manual is to be supplemented by inserting any new Maintenance Instruction which may have been issued for the ASH 26 E.

The general **Maintenance Instruction "PAINT CRACKS"** dated June 26, 1989, describes how to inspect, preserve, and repair the paint surface, respectively.

The **Maintenance Instruction A** for the ASH 26 E (dated July 31, 1995) describes how to replace the elastic plastic sealing strips at the control surface and flap gaps, as well as how to apply or replace the turbulators at the horizontal and vertical tailplanes.

The **Maintenance Instruction "Venting the oil pump"** dated March 25, 1997 describes the how to vent the oil pump at the power-plant.

The **Maintenance Instruction "Fuel"** dated Aug. 19, 1999, describes the use of motor vehicle fuel types.