


Am. No.	removed Pages	included Pages	Amendment Date	Approval (LBA)	Date of Approval	Date of inclusion	Signature
6	iii, iv, 2-4, 2-5, 3-6, 4-7, 7-5, ** 2-4a, 2-5a, 3-6a, 4-7a, 7-5a	iii-1, iii-2, iv, 2-4, 2-5, 3-6, 4-7, 7-5, ** 2-4a, 2-5a, 3-6a, 4-7a, 7-5a	25.05.2005				
7	iii-2, iv, 4-2, 4-3, 4-3a, 4-6, 4-6a, 4-9, 4-9a, 4-10, 7-1, 7-1a, 8-1	iii-2, iv, 4-2, 4-3, 4-3a, 4-6, 4-6a, 4-9, 4-9a, 4-10, 7-1, 7-1a, 8-1	10.01.2014		EASA 10048848 16 APR 2014		

** Only if alternative equipment is installed, insertation of alternative pages (please refer to sect. 0.2 „List of effective Pages“ or page ii for further information.)

0.2 List of Effective Pages

This record is valid only for the Serial No. specified on the title page.

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i			
ii		5	Mar. 20. 2003
iii-1		6	May. 25. 2005
iii-2		7	Jan. 10, 2014
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v			
1-0			
1-1		5	Mar. 20. 2003
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2-0	X	5	Mar. 20. 2003
2-1	X		
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2-3*	X		
2-3a*	X	5	Mar. 20. 2003
2-4*	X	6	May. 25. 2005
2-4a*	X	6	May. 25. 2005
2-5*	X	6	May. 25. 2005
2-5a*	X	6	May. 25. 2005
2-6	X	5	Mar. 20. 2003
2-7	X	5	Mar. 20. 2003
2-8*	X	5	Mar. 20. 2003
2-8a*	X	5	Mar. 20. 2003
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3-1	X		
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3-2a*	X	5	Mar. 20. 2003
3-3	X		
3-4	X	1	Aug. 10 1994
3-5*	X	1	Aug. 10 1994
3-5a*	X	5	Mar. 20. 2003
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3-6a*	X	6	May. 25. 2005
3-7*	X		
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4-0	X		
4-1	X		
4-2	X	7	Jan. 10, 2014
4-3*	X	7	Jan. 10, 2014
4-3a*	X	7	Jan. 10, 2014
4-4*	X		
4-4a*	X	5	Mar. 20. 2003
4-5*	X		
4-5a*	X	5	Mar. 20. 2003
4-6*	X	7	Jan. 10, 2014
4-6a*	X	7	Jan. 10, 2014
4-7*	X	6	May. 25. 2005
4-7a*	X	6	May. 25. 2005
4-8*	X		
4-8a*	X	5	Mar. 20. 2003
4-9*	X	7	Jan. 10, 2014
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4-10	X	7	Jan. 10, 2014
4-11	X		
5-0	X	5	Mar. 20. 2003
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5-4		5	Mar. 20. 2003
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5-5a*		5	Mar. 20. 2003
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7-1*		7	Jan. 10, 2014
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7-2a*		5	Mar. 20. 2003
7-3a*		5	Mar. 20. 2003
7-4*			
7-4a*		5	Mar. 20. 2003
7-5*		6	May. 25. 2005
7-5a*		6	May. 25. 2005
7-6*			
7-6a*		5	Mar. 20. 2003
7-7*		5	Mar. 20. 2003
7-7a*		5	Mar. 20. 2003
8-0			
8-1		7	Jan. 10, 2014
9-0			
9-1		5	Mar. 20. 2003
9-2		5	Mar. 20. 2003

* strike out not applicable pages! (installation of alternative equipment see page ii)

4.2.4 Fuselage

- Fit cowlings. Following this, engage the bowden cables for the cooling air intakes.

Note: Carry out daily inspection according to sect. 4.3.1 and 4.3.2 before fitting cowlings.

4.3 Daily Inspection

Before commencing flight duties the responsible pilot has to carry out a visual inspection of the motorglider in the following order (switch off ignition and main switch before!):

4.3.1 Engine

- check oil contents (min: lower mark, maxi: upper mark), on flights in excess of 8 hours at least middle position;
- remove upper and both lateral portions of the cowling;
- refill oil, if necessary (please refer to the engine operating manual for the oil grade);
- visual inspection of the engine - inspect cooling air ducts for foreign bodies,
- Inspection of all fuel lines of engine and wing connection area for leakage. The check shall be performed with fuel pressure. For the test switch ON Master switch (with Ignition switch OFF, landing gear DOWN), electrical fuel pump (RH fuel tank) ON, Check with fuel cocks LH and RH tanks OPEN and CLOSED.
- refit lateral portions of the cowling;
- cooling air flaps: check for proper function by operating the Propeller dome (move forwards and backwards for several times);
- cooling air flap control: check for proper function by operating several times;
- fuel tank vent opening unobstructed (underside of outer wing connection);
- visual inspection of fuel contents through fuel cap;
- drain fuel system by pressing both drainers in the landing gear well: remove as much fuel as is necessary to make sure that possible dirt and water has been removed. For this both main cocks must be opened.
- drained fuel is to be collected in a vessel and examined for water and dirt.

Caution: For complete drainage of the tanks the aircraft must be kept level for a few hours before and during the drainage.

Check that drainers close properly again and do not leak. If they leak the reason could be dirt in the fuel.

Draining of fuel increases the danger of fire. Make sure before engine start up that immediate fire risk does not exist.

4.3.2 Wing connector area

- Wing pins secured (Fokker needles)
- controls connected and safety pins fitted for ailerons, flaps and air brakes
- controls free of obstructions
- fuel lines and electrics connected
- foreign body inspection
- re-fit upper cowling

4.3.3 Propeller / Propeller Dome

- Check engine master switch for proper functioning: Are engine electrics switched off (red generator light extinguished and voltmeter reading "0"), when propeller dome operation handle is unlocked in the forward position of dome (and vice versa)?
- Visual inspection of propeller. Check for loose connections and local damages;
- Propeller blades free of damage, protecting strip on leading edge in good condition?
- Propeller blades can be moved freely from inner stop to outer stop?

- Check pitch control mechanism for ease of movability by extending one blade up to approx. 90° and pull blade tip in flight direction (induce force into the outer third of blade and give a slight support to blade root hinge). Doing so, the blade suspension is subject to a torque around its longitudinal axis and the control mechanism is forced to move the complete working travel. It must return easily to the initial position when the blade tip is released.
- Check clearance in power transmission path of pitch control mechanism by pushing blade tip (in 90° position) slightly in and counter flight direction. There must be no remarkable rotation of the suspension forks before the control mechanism is set going. Check both blades one after the other.
- Extend blades successively into fully deployed position and check play of articulation needle bearing - in and counter flight direction, as well as in pitch direction (torsion around the longitudinal axis of the blade). A clearance of 4 mm in total at the blade tips is acceptable, in pitch direction the clearance must be nearly zero.
- Fold propeller. Push blade mounting at the hinge back and forward with moderate force. By doing so observe (a) the variable pitch bearing and (b) the bearing in the gear. There must be no significant clearance in either of these bearings.

Note: The described simple checks may be useful to detect sudden and rough changes. Since the gear-box is able to move as a whole due its flexible suspension (shockmounts), exact results cannot be expected with these methods. For further information please refer to the Maintenance Manual.

4.3.4 Landing gear

- Air pressure: main wheels [46.5 ±1.5 p.s.i. (3.2 ±0.1 bar)]^{1 s} [37.7 ±1.5 p.s.i. (2.6 ±0.1 bar)]^{1a}
tailwheel 36 ±3 p.s.i. (2.5 ±0.2 bar)
- Check tire slip marks and tread
- Both landing gear indicators "GREEN"?
- Examine elements for emergency landing gear release. Check attachment of spindles to radius struts. Locking plate attaching spring in correct position? Are cables drawn downward completely (min. 30mm overhang)? Are cable coverings unobstructed, able to move and not jammed or blocked?
- Examine position switches for foreign bodies and dirt. Position switch for gear deployed/locked is located on the radius strut and the one for gear retracted at the support plate on the forward frame strut.
- Brake fluid: Check quantity. Brake fluid reservoir is located in the landing-gear bay, cabin rear wall.

4.3.5 Wings

- Check aileron, flaps and air brakes for condition, unobstructed movement and play (axial and radial; limits see maintenance manual).
- Check inner-to-outboard wing connection - safety bolt must be flush with wing surface.

4.3.6 Empennage

- Check tail plane for proper rigging - front arresting bolt (colored red) must not protrude from leading edge of the vertical fin.
- Examine rudder and elevator for unobstructed movement and damage.

4.3.7 Fuselage

- Examine for damage.
- Check statics on both sides of tail boom (and, if installed, at the left and right cockpit walls).
- Check pressure sender units of stall warning system on propeller dome below pitot-static probe.

4.3.8 Cockpit

- Canopy emergency release locked (arresting bolt on central canopy mounting in marked position?)
- Clean canopy with care. Examine cockpit for foreign bodies.

¹ (s) Standard, (a) with wide tire landing gear according to SB A31-10-009. The text which does not apply to the specific A/C is to be struck out.

- Unfold propeller blades one after the other und check the following:
 - 1) Push the propeller blade tip in and against the flight direction. This check can give information about a possible abrasion in the needle bearing of the blade suspension. A clearance of 0.16 in./4 mm on the blade tip is acceptable.
 - 2) Twist the propeller blade along the propeller blade longitudinal axis. The clearance must be nearly null.
- Fold the propeller. Push the propeller at the hinge of the blade mounting back and forward with moderate force. By doing so observe the bearing in the gear. There must be no significant clearance in either of these bearings.

Note: The described simple checks may be useful to detect sudden and rough changes. Since the gear-box is able to move as a whole due its flexible suspension (shockmounts), exact results cannot be expected with these methods. For further information please refer to the Maintenance Manual.

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Taxiing

- Observe taxiing area.
- Seating position as well as wing geometry do not allow the crew to observe the outer wing further than to the leading edge sweep-back. This blind spot must be considered absolutely during taxiing.
- When taxiing slowly, operate wheel brakes **carefully**.
- Depending on surface conditions and because of the large moment of inertia the function of the tailwheel steering is delayed.
- To avoid damaging the propeller, taxi on surface with loose stones and gravel with low revolutions.

4.5.2 Take-off and Climb

Checks before take off

- Full throttle check: attained engine rotational speed with PPC switch in TAKE-OFF position: 3000 ±100 rpm.
- Choke OFF
- Canopy LOCKED (LH, RH, rear)
- Trim NEUTRAL
- Fuel cocks **both** OPEN
- Electrical fuel pump ON
- Check engine control instruments
- PPC switch TAKE-OFF (Indicator GREEN)
- Cooling air flaps OPEN
- Flaps position +5°
- Air brakes LOCKED

Warning: If engine rotational speed under full throttle is below 2900 rpm, there is either an engine malfunction (if propeller pitch indicator shines GREEN) or propeller is **not** in take-off position (indicator extinguished). However there is a serious defect. **Do not take-off.**

Warning: It is urged with emphasis not to take-off during rain or with wet wings! (See also Section 4.5.8)

Caution: Always check open fuel cocks carefully. When fuel cocks are closed, the engine will run on for about 1 - 3 minutes. Closed fuel cocks may lead to a loss of engine power in the take-off phase.

Caution: Because of the design of the fuel system **both** fuel tanks must contain a fuel quantity sufficient for take-off.

Caution: Before taxiing from taxi-hold position to take off position, pay attention that the parking brake is deactivated (lever is in OFF position respectively parking brake unlocked). The parking brake shall not be used on the runway anymore.
To release the parking brake turn rotary handle to OFF position respectively unlock the brake lever, use brake lever simultaneously if required.

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position of the pitch control selector. If CRUISE position is selected, pitch variation begins with engine starting.

Caution: If starter fails during re-starting attempt, refer to emergency procedures, section 3.12.1.

Caution: After the engine has fired up, check cylinder head temperatures (max. 250°C) after a time with reference to the power setting. In case the opening of the cooling air flaps fails, there is the danger that the engine will overheat with subsequent failure.

4.5.5 Approach

The landing can be done either in gliding or in powered configuration. The following approach procedure applies for landing in powered configuration. Please ignore the engine related items (printed in italics) for landings in gliding configuration.

- *PPC switch position:* TAKE-OFF

Caution: *The change-over of propeller pitch can take up to 5 min, therefore the propeller pitch control has to be activated in time. If, in case of an overshooting, the propeller is not in take-off position, be aware of a considerably reduced rate of climb.*

- *Cooling air flaps* OPEN
- *Throttle* IDLING
- *Tanks* **both OPEN**

- The approach must be set up in such a manner that the runway can be reached without engine power.
- Lower the landing gear on the downwind leg (takes about 30 seconds) and wait for GREEN of the check lights. During lowering the two landing gear lights flash RED (first right one, then left one).

Warning: Before landing check parking brake lever to be in OFF position respectively brake lever to be unlocked. A landing with parking brake set results in uncontrollable braking and in worst case in a locking of the wheels.

Caution: In case of lacking indication after operating the landing gear switch check automatic circuit breaker (left hand of switch) and push button if necessary. If both indicator lights are not GREEN after up to 45 seconds, operate emergency let-down (refer 3.12.6).

Note: When the airbrakes are deployed, a horn can be heard and both check lights flash RED if the landing gear is not completely lowered.

- Flap position L (+16°)
- Approach speed 59 kts / 68 mph / 110 km/h.
- *Propeller pitch indicator* GREEN
- *If take-off pitch position is not indicated within an adequate time (i.e. up to 5 minutes) check propeller pitch position as follows:*

Airspeed: 59 kts / 110 km/h
Throttle: full power

If the engine revolution comes in the range 3200 ±100 rpm, TAKE-OFF position has been reached.

Warning: *If the rotational speed of the engine in the full-throttle check does not reach the defined value the propeller is not in TAKE-OFF position. In case of an overshooting, be aware of a considerably reduced rate of climb (refer to sect. 5.3.2). In this case it is recommended to do another circuit and to check the position of the propeller pitch control switch and circuit breaker.*

Warning: In rain increase approach speed by 10 %! (see section 4.5.8).

Caution: In turbulent conditions and strong wind approach with flap position +10° or +5° to achieve better effectiveness of the ailerons. Increase approach speed by 10%.

Caution: If starter fails during re-starting attempt, refer to emergency procedures, section 3.12.1.

Caution: After the engine has fired up, check cylinder head temperatures (max. 250°C) after a time with reference to the power setting. In case the opening of the cooling air flaps fails, there is the danger that the engine will overheat with subsequent failure.

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4.5.6 Landing

- Control angle of glide with airbrakes.
- Do not round out too low (high landing gear). Reduce airspeed in horizontal flight to the minimum flying speed, pull the stick and put down with main landing gear and tail wheel simultaneously.
- Hold stick pulled after ground contact. Leave airbrakes extended. Operate wheel brakes according to situation. Operate rudder with caution.

After reaching the parking position:

- Parking brake SET (turn lever to ON position and operate brake afterwards) respectively LOCK brake lever
- Avionics switch OFF
- Engine (for cooling down) IDLE for about 1 min.
- Ignition OFF
- Electrical fuel pump OFF
- Engine master switch OFF
- Master switch OFF
- When parking for longer periods on inclined ground use wheel chocks.

Caution: In case of an off-field landing the pilot may choice, with respect to the condition of the ground, either to land with deployed or with retracted landing gear. Landings on a smooth ground surface with a retracted landing gear have been performed without injuring the crew or damaging the motorglider (crew was fastened by seat-belts).

4.5.7 High Altitude Flight

Justification of flutter behavior of the type STEMME S10 has been performed at altitudes of 2000 m MSL (6500 ft) and above. Based on these tests the maximum airspeed V_{NE} has been established as indicated airspeed (IAS) between 0 and 6500 ft MSL with 146 kts (168 mph / 270 km/h; IAS = TAS at 6500 ft MSL).

In order to avoid exceeding of the maximum permissible **true airspeed** above 6500 ft MSL the maximum permissible **indicated airspeed** is reduced with increasing altitude. This is due to the installed airspeed indicator system, the reading of which depends on the pitot/static air pressure and thus also on the air density which decreases with increasing altitude. Based on the ICAO-Standard Atmosphere (ISA) reduction - deviating from the ASI marking - is established in the following steps:

from 6500 ft / 2.000 m MSL up to		V_{NE} (TAS) = 146 kts (168 mph / 270 km/h) corresponds to		
[ft MSL]	[m MSL]	[kts (IAS)]	[mph (IAS)]	[km/h (IAS)]
10.000	3.000	139	159	257
13.000	4.000	132	151	244
16.500	5.000	125	144	231
19.500	6.000	118	136	219
26.000	8.000	105	121	195
33.000	10.000	93	107	173
39.500	12.000	81	93	150

The above speed limits are to be kept with special attentiveness, since freedom of flutter for the type STEMME S10 can be guaranteed only up to these values.

7.1 Introduction

This section provides description and operation advice of the motorglider and its systems and equipment. Refer to section 9, Supplements, for details of optional systems and equipment.

7.2 Cockpit Controls

Each seat has a control stick and rudder pedals, and a brake and flap lever on the left hand side.

Canopy lock: One operating lever on left and one on right side of the canopy frame, as well as one at rear top (whose function is the retention of the canopy for the first phase of the emergency canopy release).

Emergency canopy jettison: in addition to the side locking levers there is a pull handle (red T-grip) in the control segment of the instrument panel (center face lower portion).

The brake for the main landing gear brake is operated with the hand lever fitted to the LH control stick. Separate lever/rotary handle for parking brake valve on the floor panel console in front of the LH control stick respectively lock LH brake lever with a pin to set parking brake. The same system for the RH stick is available as an option.

The tail wheel is steered by the rudder pedals.

Trim, throttle and choke lever, and the PPC (Propeller Pitch Control) switch are placed on a console between the seats.

The fuel cocks are fitted next to each other on a console between the seat backs.

The operating elements for retraction and deployment of the propeller are combined in the lower middle area (foot) of the instrument panel:

- handle to open, lock and close the propeller dome,
- handle to brake the propeller after switching off the engine (T-grip),
- handle to position the propeller so that it fits under the propeller dome (T-grip).

The handle for cooling air flap operation (to reduce engine cooling in cruise condition, 3 settings are available) can be found on the left of the propeller position handle.

Ventilation:

- Cabin: ventilation nozzle in the lower middle area (foot) of the instrument panel.
- Canopy: knob in the control segment of the instrument panel.

7.3 Instrumentation

The instrument panel is divided into three faces:

- in the left face the flight control instruments are fitted: ASI with indicating range of minimum 27 kts (31 mph / 50 km/h) up to 162 kts (206 mph / 300 km/h), altimeter, magnetic compass and supplemental and optional equipment.
- the center face is used for radio and navigational instrumentation and for further optional equipment.
- in the right face the instruments for engine monitoring and on-board electrical system are fitted.

7.4 Air-Brakes

Double paddle Schempp-Hirth air brakes are fitted on the upper surface of the inner wing.

The over-center-lock for the operating mechanism is found in the fuselage center section.

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Emergency canopy jettison: in addition to the side locking levers there is a pull handle (red T-grip) in the control segment of the instrument panel (center face lower portion).

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This section deals with manufacturer's recommended procedures for proper ground handling and servicing of the powered sailplane. It also identifies certain inspection and maintenance requirements which must be followed if the motorglider is to retain that new-plane performance and dependability. It is wise to follow a planned schedule of lubrication and preventive maintenance based on climatic and flying conditions encountered.

8.2 Powered Sailplane Inspection Periods

Airframe: (refer to maintenance manual STEMME S10-V) shortest interval: 50h

Engine: (refer to engine maintenance manual) shortest interval: 50h

Drivetrain System: (refer to maintenance manual STEMME S10-V) shortest interval: 50h

Propeller: (refer to maintenance manual STEMME S10-V) shortest interval: 50h

In any case for the frequency and the extent of inspection the regulations of FAR pt. 91 and 43 are to be observed. Therefore an annual or 100 h inspection (dependent on whether the aircraft is used for hire or flight instruction) is mandatory, the AI even if the described operation periods are not reached within one year.

Note the prescribed inspection after the first 25 h of operation (refer to maintenance manual STEMME S10-V for the extent of inspection).

8.3 Alterations or Repairs to the Powered Sailplane

Details of who is authorized to perform alteration and repair works on the powered sailplane and information on the limits between minor and major repairs can be found in the FAR pt. 43. These regulations are to be respected with first priority. It is essential that the responsible FAA office be contacted **prior to** any alterations on the powered sailplane to ensure that the airworthiness of the aircraft is not compromised.

For standard maintenance and minor repairs please refer to the Maintenance Manual, Doc. No. A40-10-122. Do contact the manufacturer concerning major repairs.

8.4 Ground Handling / Road Transport

- Parking: SET parking brake (turn lever to ON position and operate brake afterwards) respectively LOCK pin at brake lever with brake activated (on LH stick, optionally also RH).
Pay attention to the wings being levelled when fuel tanks are full; otherwise there is some leakage through the tank vents.
- Tie down: screw eyelet into the thread on the bottom surface of the inner wing ends and tie down vertically.
- Pushing backwards: guide on fin and only push on **inner** wing.
- Road transport: see manual for trailer.

8.5 Cleaning and Care

It is suggested not to leave the aircraft outside unnecessarily, since even after a few short weeks the polyester paint can get brittle and crack due to the UV radiation.

The surface and other parts require regular servicing. Detailed suggestions are found in the maintenance manual.