

## ALTERNATIVE PAGES FOR THE FLIGHT MANUAL

### STEMME S10-VT

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amendment 6 dated 02.11.01, amendment 8 dated 10.01.2014

#### Arrangement of alternative pages for alternative equipment

modified page	Ammend.-Ind.	print page	affected
2-2a	6	1	airspeed indicator
2-3a	3, 5	2	60ltr-tank
2-10a	6	3	wide tyre
4-4a	2,4	4	wide tyre
4-16a	0	5	additional batterie
2-3a, 4-7a ... 4-10a, 4-18a ... 4-21a, 7-1a, 7-5a, 8-2a	8	7...17	Hydromechanical Brake system (former design, not for retrofitting)

## 2.4 Propulsion System and Fluids

### 2.4.1 Engine, Propeller, Fuel

<b>Engine</b>		
Manufacturer	BRP-Powertrain GmbH & Co. KG Gunskirchen, Austria	
Engine modification	STEMME AG Strausberg, Germany	
Engine / Model	ROTAX 914 F2/S1	
Max. T/O RPM for 5 minutes	5800 RPM	
Max. cont. RPM	5500 RPM	
Idle RPM	1400 ... 1600 RPM	
T/O power (ISA)	113,2 hp / 84,5 kW at 5800 RPM, 1300 hPa (38,4 in HG)	
Max. cont. power (ISA)	98,4 hp / 73,4 kW at 5500 RPM, 1150 hPa (34,0 in HG)	
Altitude band for const. power: MCP (max. cont. power):	T/O power:	up to max. 8000 ft / 2450 m MSL up to max. 16000 ft / 4500 m MSL
Max. cylinder head temperature:	135°C / 275°F	
Oil temperature	maximum: minimum:	130°C / 266°F 50°C / 122°F
Temperatures for engine start-up	maximum: minimum:	50°C / 122°F -25°C / -13°F
Oil pressure	minimum: maximum pressure: Normal:	22 psi / 1,5 bar 101,5 psi / 7,0 bar (peak press. for cold eng. start) 22-72,5 psi / 1,5 - 5,0 bar
Fuel pressure	maximum: minimum: normal:	Airboxpressure + 5,08 psi / + 0,35 bar Airboxpressure + 2,18 psi / + 0,15 bar Airboxpressure + 3,63 psi / 0,25 bar
<b>Propeller</b>		
Propeller-manufacturer	STEMME AG Strausberg, Germany	
Propeller-type	11 AP-V	
Data sheet-No.	32.100/3	
<b>Fuel System</b>		
Maximum volume	2x15.8 US gal. / 2x13.2 imp.gal / 2x60 l (±5%) in wing tanks	
Max available fuel quantity	30.81 US gal / 25.74 imp.gal / 117 l (±5%)	
Unusable fuel	0,79 US gal / 0,66 imp. gal. / 3 l	

## 4.5 Normal Operating Procedures and Recommended Airspeeds

### 4.5.1 Engine Start, Warm-up and Taxi Procedures

#### 4.5.1.1 Engine start

- Parking brake SET
- All switches OFF
- Engine back-up switch OFF (guarded position)
- TCU-isolation switch OFF (guarded position)
- Landing gear lever DOWN
- Master switch ON, (normal voltage indication, green gear lights ON)
- Propeller-dome handle OPEN and LOCKED, (TCU performs self-test, main fuel pump cycles, engine instruments are activated, red battery charge control lamp ON)

**CAUTION:** When the TCU is energised (master switch ON and propeller-dome OPEN and LOCKED), the TCU-warning and -caution lamps are automatically activated for about 1-2 seconds, then they extinguish again. If this is not observed, the TCU may have a malfunction.

- Cowling flaps fully OPEN
- Fire-warning TEST by pressing indicator (notice acoustic and optical warning)
- Propeller switch T/O position, check green position lamp ON
- Fuel-cock OPEN in vertical position
- Fuel selector switch BOTH tanks
- Auxiliary fuel pumps ON, green status lamp ON
- With cold engine - Choke ON

**NOTE:** If the engine is warm, do not use choke.

- Throttle IDLE (max 10%)
- Propeller area FREE of persons and obstacles
- Starter START (for a minimum of three seconds)
- As soon as the engine fires up, release starter key to disconnect the starter motor. If the engine does not fire after 10 seconds of starter operation, stop and wait for at least 2 minutes for starter to cool-down, then try again.

**CAUTION:** An automatic electronic device adds the ignition with a time delay of three seconds after the starter is actuated, which means that the starter must always be operated for at least three seconds. The time delay allows the propeller blades to be fully deployed before the engine starts, and consequently reduces the loads for the propeller blades and their corresponding stops. In case that the propeller blades are not fully unfolded after two seconds, the engine start-up should be aborted before the ignition comes on. In case of repeated problems to unfold the propeller blades in time, make sure that the spring load of the propeller blades is correct, and that the blades can be easily moved and folded (→ aircraft maintenance manual).

**CAUTION:** If the engine fires before the expected time delay of three seconds is over, i.e. in case of a malfunctioning electronic device, the following checks must be performed before the intended flight in accordance with the aircraft maintenance manual: → AMM section 5.3.13 item 5 for the retarder module, and → AMM section 5.3.15 items 3 through 5 for the propeller.

**CAUTION:** During a cold engine start-up, the power lever should be fully pulled back into position "power idle". In case of a warm engine start-up, it is possible to open the throttle slightly (add up to 10% power) to improve the engine start-up behaviour.

- Engine RPM SET approx. 2000 RPM
- Oil pressure GREEN arc after 10 seconds

**NOTE:** Minimum oil pressure 22 psi / 1,5 bar; with cold engine at low RPM, up to 102 psi / 7 bar are normal.

**WARNING:** If the minimum oil pressure is not indicated within 10 seconds, stop engine immediately!

- Generator switch                    ON (red battery charge control lamp OFF)
- Auxiliary fuel pumps                OFF (green status lamp OFF)
- Warnings and Cautions              CHECK all OFF
- COM, NAV, gyros                    ON
- Choke                                    OFF with increasing engine temperature (1-2 minutes should be sufficient)

**4.5.1.2 Engine warm-up**

- Cooling-air flaps                    CLOSE as required (position 1-5) for engine warm-up

**NOTE:** Only with cold OAT is it recommended to close cooling-air flaps; they should be opened at the latest when oil temperature attains 50°C / 122°F or CHT 10 0°C / 212°F /.

- wheel brakes                        LOCKED
- Throttle                              2500 RPM (after about 2 minutes 2000 RPM)
- Oil pressure                         GREEN ARC
- Engine temperatures                WAIT for green range

**CAUTION:** To avoid engine damage, engine has to be warmed-up until minimum temperatures attained, before engine power is increased and RPM selected above values for the warm-up period.

**CAUTION:** To avoid engine and systems (in engine bay) overheat, extended ground runs with high power should not be performed, because sufficient cooling for extended high power settings is only achieved in flight.

**NOTE:** In case that the fuel line of only one wing tank is properly connected, while the other is still disconnected, this might not be recognised before the disconnected tank is selected. The proper function of the fuel system can already be checked during the warm-up or during taxiing by selecting the left and the right wing tanks separately (at least 2 minutes for each tank).

**4.5.1.3 Taxiing**

- Cowl flaps                            FULLY OPEN
- Brakes                                 RELEASE
- Directional control                 with RUDDER
- Taxi area                              OBSERVE
- Throttle                                AS REQUIRED
- Brakes                                 AS REQUIRED

**CAUTION:** Seating position as well as wing span do not allow the crew to observe the outer wing outside of the leading edge sweep-back. This must always be considered during taxiing.

**CAUTION:** When taxiing slowly, operate wheel brakes with caution.

**CAUTION:** Depending on surface conditions and because of the large moment of inertia the function of the tailwheel steering is delayed.

**CAUTION:** To avoid damaging the propeller, taxi on surfaces with loose stones and gravel using low propeller RPM.

#### 4.5.2 Take-off and Climb

**WARNING:** It is highly advised against T/O with wet wing or during rain (see section 4.5.7)!

##### 4.5.2.1 Checks before take off

In run-up area:

- Parking brake SET
- Choke OFF (pushed in)
- Elevator PULL to stop and hold
- Engine indications CHECK green ranges
- Throttle FULL POWER (115%), for high field elevation see remarks below
- Engine RPM CHECK 5200 + 60 RPM per 1000 ft elevation<sup>1)</sup> ± 200 RPM tolerance

<sup>1)</sup> 5200 + 200 RPM per 1000 m, respectively

**CAUTION:** Because of the manually controlled two-position propeller in combination with the turbocharged engine, a significant increase of RPM with altitude at constant power-setting has to be considered (about 60 RPM per 1000 ft / 200 RPM per 1000 m). This rule-of-thumb is valid for ISA. **If actual temperature differs noticeably from ISA, at high field elevations > 6600 ft / 2000 m and if uncertain, refer to diagrams for 115% and 110% power settings in section 5.2.3.1.**

**WARNING:** At very high field elevations take care not to exceed max T/O RPM of 5800 RPM. Therefore it is recommended to **set 100%** (throttle on soft stop) for engine run-up on airfields **above about 6600 ft / 2000 m**. The RPM observed may not differ more than +/-200 RPM from the value, taken from second diagram in section 5.2.3.1, valid for 100% power setting.

**CAUTION:** The a/c should be **directed into the wind** for run-up and magneto-check to have a good airflow in the cowl flap area. In crosswind or tailwind conditions there is a inadequate cooling and engine temperatures can steadily increase.

**CAUTION:** Run-ups with high power settings should be reduced to a minimum. The S10-VT cooling system is designed for airborne operation, not for extended ground-runs with T/O or max continuous power setting.

- Magneto check SET 4150 RPM (mag switch position BOTH)
- Separate magnetos CHECK RPM drop of rotational speed < 300 RPM  
difference between  $M_1$  and  $M_2$  < 120 RPM

**NOTE:** For correct magneto check wait until RPM with both magnetos is stabilized. Select left magneto and wait until RPM is stabilized before reading indicator. Select both and wait for stabilized RPM. Select right magneto and again let RPM stabilize before reading indicator.

**WARNING:** If RPM's during run-up or magneto check differ more than the limits given, T/O is not allowed, malfunction of engine or propeller must be expected.

- Canopy LOCKED (LH, RH, rear)
- Flap position CHECK +5°
- Air-brakes IN and LOCKED
- Cowl flaps OPEN
- Trim for climb speed  $V_y$  NEUTRAL, depending on load, slightly nose-up
- Warnings and cautions CHECK OFF
- Landing gear lever EXTEND (both green lamps ON)
- Engine instruments CHECK GREEN range
- Propeller position T/O (green lamp ON)
- Fuel quantity CHECK (sufficient fuel in **both** tanks)

**WARNING:** There must be **sufficient fuel in both tanks** for take-off. Do not perform a take-off when there is fuel in only one tank.

- Fuel-cock OPEN

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

- Fuel selector switch BOTH tanks
- Auxiliary fuel pumps ON (green lamp ON)
- Ignition switch BOTH
- Decide on **T/O procedure** due to conditions and **check field length** available and required.

Because the S10-VT has no constant speed propeller control and only the T/O-position of the propeller is to be used for takeoff, the power of the turbocharged engine, which is independent of density over a wide range, results in an increase of RPM vs. altitude at constant indicated speeds. To avoid engine overspeeds in T/O without active control of the power lever by the pilot, **three T/O-procedures** have been established for special pressure altitude ranges, which avoid engine overspeeding up to a safety altitude of about 500 ft / 150 m AGL while climbing with  $v_y = 62$  kts / 115 km/h IAS.

The Decision on the T/O-procedure can be made with the **RPM observed while checking engine at 115% full power:**

static RPM at 115%	T/O procedure	Power setting for T/O
< 5500	No. 1	115% power setting
5500 - 5600	No. 2	100% power setting
> 5600 RPM	No. 3	T/O with reduced power for static 5400 RPM

#### **4.5.3.5 Flying in strong turbulence**

When encountering areas with strong turbulence or crossing strong thermals airspeed must be reduced to below  $V_{RA} = 97$  kts / 180 km/h.

#### **4.5.3.6 Cold weather operation**

Before operating the a/c in cold areas, an inspection is recommended. Specially cooling fluid and lubrication fluid must be checked (refer to section 2.4.2 "Fluids").

#### **Engine starting at low OAT:**

- Start engine with throttle IDLE (max 10%) and with choke ON (open throttle renders starting carb ineffective!)
- Be aware, no spark below crankshaft speed of 220 RPM!
- as performance of electric starter is greatly reduced when hot and the battery capacity is low at cold temperatures, limit starting to periods not much longer than 10 seconds. With a well charged battery, adding a second battery will not improve cold starts.

**CAUTION:** If water is in the fuel system, it will descend to the lowest areas of the fuel system and freeze at low temperatures. This can block fuel pipes, filters and orifices. Therefore it is highly important to drain the fuel system properly to remove contained water specially when low OAT must be expected. Refer to section 4.3 "Daily Inspection".

**WARNING:** If OAT is extremely low, i.e. at high altitudes or in cold areas, battery capacity might be too low to turn the engine with more than 220 RPM for ignition. Successful engine restart might only be possible at higher temperatures and lower altitudes. This must be taken into account for flight and route planning.

#### **4.5.4 Approach**

Landing can be done either in gliding or in powered configuration.

a) *Approach in powered-configuration*

- PPC switch position TAKE-OFF

**CAUTION:** The change-over of propeller-blade pitch can take up to 5 minutes, therefore PPC has to be activated in time. If, in case of a go-around, the propeller is not in T/O position, be aware of a considerably reduced rate of climb.

Landing pattern should be arranged so, that landing could be performed with idle power. On downwind:

- Fuel cock OPEN
- Cowl flaps FULLY OPEN
- Wing flaps +5°
- Fuel selector switch BOTH tanks
- Auxiliary fuel pumps ON (green lamp ON)
- Throttle REDUCE as required
- Airspeed 59 kts / 110 km/h (yellow triangle on airspeed indicator scale)
- Landing gear selector DOWN (extension time about 30 seconds)
- Landing gear indicator CHECK 2 GREEN lamps

**CAUTION:** During gear extension the two landing gear lights flash RED (right first, then left). In case of lacking indication after selecting landing gear switch down, check CB (left side of switch) and push if necessary. If both indicator lights are not on and green after max 45 seconds, operate emergency gear extension (refer to 3.9.4.19).

**NOTE:** If airbrake handle is unlocked prior to gear-down indication, gear warning horn will sound and both gear warning lamps will flash RED until the landing gear is down and locked.

On final approach:

- Wing flaps L (+16°)
- Throttle IDLE
- Approach speed 59 kts / 110 km/h (yellow triangle on airspeed indicator scale)
- Propeller pitch indicator GREEN for T/O position
- Airbrakes AS REQUIRED

**NOTE:** It is recommended to arrange the approach so, that touch-down area can be reached with engine in idle. In this case flight path corrections are only done by applying airbrakes.

**CAUTION:** If propeller T/O-position is not indicated within an adequate time (max 5 minutes) by green lamp, propeller pitch position can be checked as follows:

- Airspeed 110 km/h / 59 kts
- Throttle FULL POWER but max 5500 RPM
- If 5400 RPM or more are attained, T/O blade-position most probably is reached.

**WARNING:** If propeller blades are not in T/O position, a considerably reduced rate of climb rate must be expected. In this case it is recommended to perform another pattern and to check PPC switch position and CB.

**WARNING:** If the a/c is wet and in rain increase approach speed by 10 %! (refer to section 4.5.7).

**CAUTION:** If strong turbulence or strong wind are encountered, select flap position +10° or +5° to achieve better effectiveness of lateral control. Increase approach speed by 10%.



**b) Approach in glider-configuration**

Landing pattern must be arranged so, that landing area can be reached in a safe flight path.

- Wing flaps +5°
- Airspeed 59 kts / 110 km/h (yellow triangle on airspeed indicator scale)
- Landing gear switch DOWN (extension time is about 30 seconds)
- Landing gear indicator both GREEN for down and locked

**CAUTION:** During gear extension the two landing gear lights flash RED (right first, then left). In case of lacking indication after selecting landing gear switch down, check CB (left side of switch) and push if necessary. If both indicator lights are not on and green after max 45 seconds, operate emergency gear extension (refer to 3.9.4.19).

**NOTE:** If airbrake handle is unlocked prior to gear-down indication, gear warning horn will sound and both gear warning lamps will flash RED until the landing gear is down and locked.

On final approach:

- Wing flaps L (+16°)
- Approach speed 59 kts / 110 km/h (yellow triangle on airspeed indicator scale)
- Airbrakes AS REQUIRED

**NOTE:** With airbrakes fully extended, propeller dome closed and 59 kts / 110 km/h glide ratio is about 1:7

**WARNING:** If raining increase approach speed by 10%! (refer to section 4.5.7 "Flight in Rain").

**CAUTION:** If strong turbulence or strong wind are encountered, select flap position +10° or +5° to achieve better effectiveness of lateral control. Increase approach speed by 10%.

#### 4.5.5 Landing, Taxi and parking

##### 4.5.5.1 Landing

On short final:

- Airbrakes AS REQUIRED
- Attitude maintain WINGS LEVEL
- Directional control stay on centre-line
- Elevator APPLY for touch-down in three-point attitude

**CAUTION:** Do not flare too low (high landing gear)! Close to the ground maintain wings level and use rudder only for directional control. Reduce speed to the minimum until touch-down with main landing gear and tail wheel simultaneously in three-point attitude.

Roll out after touch-down:

- Airbrakes FULLY EXTENDED and HOLD
- Elevator HOLD on aft stop
- Wheel brakes AS REQUIRED with caution

**CAUTION:** During roll out apply rudder cautiously, sensitivity is increased because pedals actuate rudder and tailwheel.

**CAUTION:** Off-field landing: It is the pilot's decision on whether to land with landing gear up or down; decision depends on surface and status of selected area. Several landings wheels-up were performed on dry, solid, level and flat ground without any harm to the crew or damage to the a/c (crew had seat belts well fastened and tightened).

**4.5.5.2 Taxi and ground operation:**

If a/c was landed in glider-configuration, engine may be restarted to taxi to parking position:

- Fuel-cock OPEN
- propeller-dome OPEN and LOCK
- Cowl-flaps FULLY OPEN
- Fuel selector switch BOTH tanks
- Auxiliary fuel pumps ON
- Choke ON for cold engine
- Throttle IDLE (max 10%)
- Ignition START
- Oil pressure GREEN
- Auxiliary fuel pumps OFF

**4.5.5.3 Parking and Shut-down**

On park position:

- Parking brake SET and LOCK
- Throttle SET about 2200 RPM
- Cowl-flaps FULLY OPEN
- Engine cool-down WAIT for CHT and oil temperature < 100°C / 212°F

**CAUTION:** Engine cool-down: Shut-off the engine after engine temperatures are below 100°C / 212°F (CHT and OIL temperature), but maximum after 5 minutes; for cool-down set 2000 - 2500 RPM and open cooling air flaps fully. Normally, the engine is cooled-down during approach and taxi.

**CAUTION:** During cool-down run the a/c should be **directed into the wind** to have a good airflow in the cowl-flap area. In crosswind or tailwind conditions cooling is inadequate and engine temperatures can steadily increase. If at high OAT's or poor wind conditions the engine temperatures do not decrease to below 100°C / 212°F the engine may be s hut-down after 5 minutes cool-down run.

**WARNING:** If the engine is operated under load during shut-down, a sudden engine-stop may result in overheating and damaging turbocharger.

**CAUTION:** If the engine is shut-down without a sufficient cool-down period prior to shut-down, this can result in local overheat of the engine and cooling fluid can overflow.

- COM and NAV OFF
- Generator switch OFF
- Ignition OFF
- Fuel-cock CLOSE
- If parking area is not even WHEEL CHOCKS as required
- Cooling of engine bay WAIT for 10 minutes
- Propeller-dome CLOSE
- Airbrakes UNLOCK (in case of need)

**CAUTION:** Propeller-dome and with it cooling air flaps should be closed about 10 minutes after engine shut-down to avoid heat accumulation and local overheat.

## 7.1 Introduction

This section provides description and operation advice of the powered glider and its systems and equipment. Section 9 includes flight manual supplements, if required, related to non-standard systems and equipment. For more information about components and systems see maintenance manual.

## 7.2 Cockpit Controls

### a) Cockpit controls at the airframe

Following overview includes the controls at the airframe.

1.	Control Stick	Middle in front of each seat.
2.	Rudder Pedals	For each seat and adjustable. The pedals also steer the tail wheel, which is coupled to the rudder via spring device.
3.	Airbrake Lever	For each seat LH side. Blue lever at LH cockpit side and on the centre console between seats.
4.	Flap Lever	For each seat LH side. Black lever at LH cockpit side and on the centre console. Indication of settings (-10, -5, 0, +5, +10, L) in centre console. Unlocking is by moving lever to the right against a spring force which locks the flap positions.
5.	Pedal Adjustment Handle	In front of each seat. Unlocking is by pulling the handle.
6.	Canopy Locks	Two white handles with red coloured ring, one on left and one on right side of the canopy frame, to open and lock the canopy, and one white handle at rear top, which keeps hold of the rear canopy at the first moment of emergency canopy jettison ("Röger-Hook").
7.	Brake Lever	Lever on LH control stick, on RH stick optional. The brake lever can be locked with a pin for parking.
8.	Trim Lever	One green lever on centre console between seats. To trim push down (unlock) and shift lever forward or aft. Locking is by a spring device.
9.	Throttle Lever	One black lever on centre console with two forward stops (for max. continuous and max. T/O-power). It is coupled with a spring acting forward in direction FULL POWER. Its position is fixed by friction discs, which can be adjusted with a milled-nut on LH side of the centre console.
10.	Choke Lever	Black lever on centre console, RH side of the throttle lever. It is coupled with a spring acting rearward in direction CHOKE OFF. Its position is fixed by friction discs, which can be adjusted with a milled-nut on RH side of the centre console.
11.	Propeller Pitch Control	Switch on centre console. The forward position is the TAKE-OFF position. A green light next to the switch indicates, if propeller pitch (not switch) is in T/O-position.
12.	Fuel Cock	Red handle on the rear console between the seat back rests. Turning the handle into it's horizontal position (fuel cock CLOSED) cuts off the fuel supply for the engine.

**CAUTION:** Throttle positions for 115% and 100% can be selected by feeling. The first stop is the 100% throttle position. To select 115% the throttle lever must be moved through a throttle gate to the left and then pushed to the next stop.

## 7.4 Landing Gear

The landing gear (L/G) consists of a tail wheel and two retractable main landing gear legs, hinged at the centre fuselage frame with the hinge axis in flight direction and locked in the extended position by means of an over-centre locking strut ("elbow lever") for each leg. The wheel is mounted on a trailing arm that is supported against the leg's frame by a pre-loaded elastomeric spring for shock absorption purposes.

Retracting of the L/G legs and doors is managed by an electrically driven linear actuator for each leg that is built up around a high precision ball screw. Each of the linear actuators is hinged with the top end at the fuselage frame; the bottom end is coupled to the respective elbow strut by means of a locking mechanism which can be released for an emergency let-down by pulling a T-handle in the cockpit (one for each of the legs) and via a bowden cable. In case of an emergency let-down the two legs have to be released in succession (order is proposed, wrong order not critical), they then come out by gravitational force. Secure locking in the extended position is achieved by a spring that forces the elbow lever into its over-centre position.

The actuators are controlled by stop switches, the switches for EXTENDED being integrated in the elbow struts and detecting the over-centre position, those for RETRACTED mounted at the fuselage frame and detecting the top position of each L/G leg. All these switches are in duplicate, the second one giving the signal for the indication and warning system, which is processed by a TTL-logic and displayed by focused green and red LED's on the right face of the instrument panel (ref. to the Flight Manual).

Both LG doors are actuated by the landing gear legs. The RH landing gear door is coupled directly to the RH landing gear leg via a spring device. The LH door is controlled by a cable mechanism. During retraction, the LH landing gear leg starts closing the LH door by means of a cable so far as to allow retraction of the RH landing gear leg. The RH landing gear leg effects complete closing of the door via the cable during the last portion of its retracting. Opening of the LH door is by a spring loaded roller strut, which rolls on the LH door. It pushes the door to the outside against the cable to keep the door from waving, and is blocked with the landing gear retracted, thus locking the door. In closed position the doors are additionally locked at the rear by means of magnets.

The tail wheel is without springing and guided in a trailing fork that is pivoted at its bottom in a thin section ball bearing, and at its top in a combined radial/axial sleeve bearing. The journal is constructed so that a certain friction damping is produced at the axial sleeve surfaces when loaded in axial direction in order to avoid tail wheel flutter whilst taxiing. For steering on the ground the tail wheel fork is coupled with the rudder by means of two pre-tensioned tensile springs.

The disk brakes on the main L/G wheels are operated hydraulically. The main cylinder for both the left and right wheel is located in the wheel well at the front wall, connection to the hand operating lever on the left stick is realized by a bowden cable, adjustable at the main cylinder. The hand lever can be locked in the operated position for use as a parking brake. A second lever on the right stick, NOR-type coupled to the system, is available as an option. Plumbing from the main cylinder to the wheel cylinders is realized by a short metal tube, T-type distributor and metal-shielded brake hoses.

## 7.5 Seats and Seat Belts

The seats are recessed into the bottom fuselage secondary structure (integrated seating) and have multiple adjustable back rests made of GFP.

Each seat is equipped with 4-point seatbelts and a central harness. The lap straps are supported at the sides of each seat. The shoulder harness is fastened to a tube behind each back rest.

Certified seat belts are indicated in the maintenance manual, section 9.1.

## 8.4 Ground Handling / Road Transport

### a) *Towing / Pushing*

Due to the big wing span, it is recommended to have a person for checking clearance of wing tips.

If the S10-VT is towed by car, only use properly fixed and suitable towing equipment, move slowly and do not make tight turns to reduce loads on tail wheel and aircraft structure. If the S10-VT is towed by rope, it is recommended to fix it on both landing gear struts and to have someone prepared to decelerate and stop the a/c.

- Pushing backwards: Directional control at rudder and push only at inner wing.

### b) *Storing:*

The S10-VT should only be stored in well ventilated rooms. A closed, weatherproof trailer or container must be provided with sufficient ventilation ports or facilities. Take care for stress-free support of the a/c and components.

### c) *Parking*

If the a/c is not derigged for a year, connection bolts, nuts and elements at fuselage, wing and empennage have to be properly protected for corrosion. Dust covers should be commonplace for high quality surfaces and materials like at the S10-VT. When parked outside, the a/c should be securely tightened to ground or sufficient ballast.

- Tightening: Insert eye-bolts in inlets under the ends of the inner wing.
- Parking: Set parking brake with lockpin at brake handle on control stick.
- Hangaring: Unlock airbrakes (for relieving the airbrake push rods); unlock parking brake and fix the powered glider with wheel brake blocks (when parking will last longer proceed like with hangaring).

**CAUTION:** Wings should be level for parking; otherwise there may be some leakage through tank vents.

### d) *Preparation for Transportation on Road*

Especially the one-piece inner wing must be carefully supported in a trailer because of its high weight. If the inner wing is transported upright, supported on nose, at least three wide supporting areas well adapted to wing section shape are recommended. Fuel from wing tanks must be drained for transportation on road and filled into approved fuel containers (refer to relevant regulations). The best way to empty wing tanks is with an optional device (available from STEMME) for the quick release coupling.

If the fuselage is transported with wheels retracted, it must be supported in a wide-area, well shaped supports below cockpit rear frame and also close to the tail wheel.

It is recommended to transport the horizontal tail surface in well shaped supports.

All supports should be covered by soft material (i.e. carpet) to protect the high quality a/c surfaces and components.

- Road transport: see manual for trailer.