

## FLIGHT MANUAL SF 25 C

Information only. The student will not be required to operate the engine, taxi, takeoff or landing.

### **Starting the engine:**

Parking brake: Set  
Engine cowl flap: Open  
Fuel valve: Open  
Fuel pump: On  
Choke: Pull (no choke if engine already warm)  
Propeller setting: Auto 24  
Throttle: Idle (if engine cold)  
Master switch: On  
Ignition switch: On (both)  
Propeller clear? Shout: "Clear prop!"  
Starter button: Press

Caution: Do not press the starter button for more than ten seconds. Before trying again allow 2 minutes for cooling off.

As soon as the engine starts release the starter button and set the throttle so that the engine runs at about 2,500 rpm. Check that the oil pressure rises within 10 seconds of starting and continue to monitor it. Do not increase engine revs until the oil pressure has settled down above 2 bar. Push the choke in fully.

Caution: As the propeller has a reduction gear it is important to adhere to the following procedures. To avoid a sudden load the throttle should be set to idle before starting the engine. Do not open the throttle more than 10% of its travel. For the same reason, after throttling back the engine, the engine revs should not be increased for about 3 seconds to allow the engine speed to stabilize. When testing magneto circuits, only one circuit should be switched on or off at any one time. Caution: Never operate the starter when the engine is still turning. Wait until the engine has stopped.

### **Warming up:**

Parking brake: set.  
Elevator: up.

During warming up: Monitor the engine instruments, let the engine run at 2,000 rpm for about 2 minutes, then continue warming up at 2,500 rpm until the oil temperature reaches 50°C. The time required will vary according to the air temperature.

Check fuel supply: brief running at maximum rpm min  $5,600 \pm 100$  rpm.

Caution: After running at maximum rpm the engine should be allowed to cool off somewhat to avoid vapor formation in the cylinder heads. The engine can also be warmed up whilst taxiing to the take-off point. The magneto check is carried out at 4,000 rpm. The maximum rpm drop for each circuit is 300 rpm. The maximum rpm difference between the two circuits must not exceed 120 rpm.

### **Taxiing**

The Falke can taxi unaided and is steered on the ground with the tailwheel which is linked to the rudder. Minimum turning circle about 15m. The wheel brake is effective and will always stop the motor glider quickly. The taxiing turning circle can be reduced by disconnecting the tailwheel steering and applying one brake. The tailwheel must be locked before take off.

### **Take off and climb.**

Pre-flight check list (see the placard in the cockpit), trim neutral, spoilers closed and locked, control column central (do not push the column forwards)

Climb power (5 minutes only) max 5,800 rpm, throttle fully open (available for take off and climb for up to five minutes)

Allow the speed to build up to 49 - 51 knots, then climb at not less than 51 knots.

After max. 5 minutes reduce to maximum continuous power; 4800 rpm and 22 in Hg manifold pressure.

Continue climbing to about 1,000ft, ensuring that the airfield remains within gliding range at all times.

To avoid excessive noise, the prop speed can be reduced by about 150 rpm as soon as a safe altitude is reached (175 - 250 ft).

The manifold pressure is not reduced but the prop speed can be reduced to 5,500 using the propeller speed knob. Check the rpm, oil pressure, oil temperature and cylinder head temperature. Check they are all in the permitted green arc. A faster climb speed is preferable as the engine is cooled better at higher flying speeds, especially during hot weather. Monitor the engine temperature especially closely during a long climb and in hot weather. If the engine temperature is approaching the limit, there are two options, and both reduce the rate of climb: fly faster or reduce engine power. The cowl flap must be fully open. During cruise the additional fuel pump can be switched off.

### **Landing.**

Before starting the approach, complete the following prop adjustments: turn speed control knob to 24.

Engine cowl flap: Open

Electric fuel pump: On.

The SF 25 C can be landed with the engine running or stopped. Approach speed: approx. 49 knots. Control the approach angle with the spoilers. The approach can also be corrected by side slipping, though this is rarely necessary as the spoilers are effective. With spoilers fully extended the rate of sink is about 3.7 m/sec at 49 knots.

When landing at minimum speed (about 38 knots) the Falke will touch down tailwheel first. The ground run can be reduced by careful use of the main wheel brakes. The wheel brake is operated by the last part of the travel of the spoiler lever. Caution: Never land with the spoilers fully extended at touchdown.

### **Stopping and starting the engine in flight.**

Before switching off the engine, allow it to run cooler at about 3,000 rpm for about 30 seconds, then close the throttle to idle, turn off sensitive electrical equipment and only then switch off the ignition. Speed for switching off engine in flight: 43 - 46 knots. Keep the airspeed low whilst the engine is stopping, to avoid prolonged run-on. After it has stopped the propeller can be turned to a horizontal parked position by blipping the starter motor. Switch off as many electrical consumers as possible.

Ignition: switch off

Throttle: Idle.

Propeller switch to Segel (Glide)

Ignition: Off.

Engine cowl flap: Close.

Before starting the engine in flight.

Engine cowl flap: Open

Ignition: On (BOTH).

Electric fuel pump: On (if fitted).

Sensitive electrical equipment (radio etc.): Off

*CAUTION! The electric variable pitch propeller requires about 1 minute to change from feathered glide setting to power pitch.*

Move propeller switch to Auto and wait for the green light to come on.

Turn the speed setting knob to about 21 (912A) or 20 (912S) which equates to about 4800 rpm. Move the throttle control lever to about 10% power.

Operate the starter. If the engine is cold, throttle on idle, pull choke fully out.

Caution: Check that the engine does not overspeed on start up.

After starting the engine, use only limited power during warm up. Flying speed should be at least 44 - 49 knots. Do not use full power until the engine temperatures are in the green arc. *The height loss during restarting is usually about 500 - 600 ft.*

Warning: If there are variations in rpm or uncontrolled pitch changes when using the AUTO setting: Immediately trip the prop pitch circuit breaker.

### **Flying with the engine stopped.**

The Falke flies well at 44-52 knots, with a sink rate of about 1.2 m/s in straight and level flight. When the engine is off, close the cowl flap to reduce drag. The engine cowl flap must be opened again before restarting the engine.

As the SF 25 C is a low wing aircraft, the airflow around the wing/fuselage transition becomes turbulent if the aircraft is not flown accurately or if it is flown slowly (less than 44 knots) - the result is reduced performance. When flying the aircraft as a glider, and especially in turns, always ensure that you are flying as coordinated as possible.

### **Slow flying and stall characteristics.**

The stall speed (at max weight) is the same whether the engine is running or not: it is about 38 knots (when flown single seat about 35 knots). At this speed the airflow begins to break away at the wing roots, but the ailerons and rudder are still fully effective. With a forward CG the SF 25 C reacts to further reduction in airspeed by stalling. With rearward CG positions it is possible to continue flying in calm air in a semi-stalled state with the stick hard back and with ailerons and rudder still fully effective. In both cases, simply releasing the back pressure on the stick will restore the normal flying attitude. In rough air the SF 25 C will drop a wing on stalling. If you approach the stall with the engine running fast and continue to bring the stick back, the pitot tube on the fin will be in the propeller slipstream and give a spurious reading suggesting a higher airspeed than is actually the case. In this condition the ASI will oscillate violently between about 27 and 54 knots, so the stalled condition is still easy to recognize.

When stalled with a 30° angle of bank the SF 25 C drops the outer wing fairly gently, such that normal flying can be resumed as the wings come level. Stall characteristics are identical whether the engine is running or stopped.

### **Spins.**

With CG in forward and mid positions it is very difficult to make the SF 25 C spin. Even without any action on the part of the pilot, other than releasing the back pressure on the stick, the stall becomes a spiral dive. Recovery from the spiral dive presents no problems. It is not recommended that the spoilers be used to recover.

Even with rearward CG positions a fully developed spin is not possible. It is possible, however, to make it spin by bringing the stick back gradually and then crossing the controls: it will recover of its own accord from the spin after a maximum of 5 rotations, even if the controls continue to be held crossed. The SF 25 C will then yaw and it is easy to restore the normal flying attitude. If the SF 25 C pilot moves the stick in the direction of the spin, it will develop into a spiral dive from which the pilot should recover as quickly as possible to avoid excessive airspeed. Normal recovery inputs will result in recovery after half a rotation. Gently recover from the resulting dive without delay. At this stage it is recommended that the spoilers be extended to avoid excessive airspeed. The Falke is not approved for aerobatics or intentional spins.

### **Wet wings – warning.**

The SF 25 C uses a modern glider wing section so it is sensitive to rain on the wings. The airflow over the wings is disturbed by the rain drops, which reduces the lift available. With dry wings the minimum speed is 38 knots, but with wet wings it is about 44 - 46 knots. The stall characteristics are also affected. With dry wings, the SF 25 C is good-natured in a stall, but with wet wings it can drop a wing. When flying in rain, always fly at speeds greater than 46 knots. When taking off with wet wings, never lift off at less than 46 knots. Climb and approach at about 57 knots. Avoid steep turns and other high g force maneuvers. Any snow or ice on the wings must always be removed before take-off. Don't forget to clean off the tailplane too.

### **Cold weather flying and risk of carburetor icing.**

At all times of the year and especially during the cooler seasons it is important to monitor that the engine oil temperature never drops below 70° C. Intermediate settings on the cowl flap are effective in controlling the cooling air reaching the engine. Always ensure that the maximum cylinder head temperature never exceeds 135°C.

### **Emergency canopy release.**

Pull the top canopy knob forwards and turn anti-clockwise, pull the front emergency release knob and push the canopy to the right. The emergency release knob is colored red.

### **Crosswind.**

The Falke has been flight-tested for take-offs and landings in crosswinds up to 13 knots.

### **Off field landings.**

Flight testing of the SF 25 C included proving its capability to land on unprepared soft ground by landing in a potato field along the furrows. This should be taken into account in addition to other factors such as size, slope, surface, wind, length of landing run, clear approach, etc. The procedure for landing on soft ground is the same as for a normal landing on a runway.



1. Cowl Flaps
2. Rudder pedal adjustment
3. GPS Com and Transponder
4. Circuit breakers
5. Engine Instruments
6. Master, Ignition and Starter switches
7. Choke
8. Cabin heat
9. Cabin vent.
10. Throttle
11. Glider release
12. Trim Lever
13. Tail wheel lock
14. Fuel shutoff valve
15. Propeller control switches