

CHAPTER 21

TOURING MOTOR GLIDERS

a) Definition of a Touring Motor Glider (TMG):

In terms of the SSSA Manual of Procedures (MOP) and JAR 22 a TMG is defined by the relationship:-
Maximum Take-Off Weight /Wing Span Squared must be less than 3. (If greater than 3 it falls into the Micro light or Ultra light category.)

At this stage the following types are recognised by the SSSA with other types being accepted at the discretion of the Technical Office Chairman. (*Fournier RF4 and RF5, Ximango, Dimona, Super Falke, Samba, Lambada, Vivat, Carat and Grob 109*).

b) Touring Motor Glider Licence:

A GPL has three possible ratings, namely:- ‘Aero tows’. ‘Winch’ and ‘Touring Motor Glider’. There are three different syllabuses for each rating. You must qualify for at least one rating to get a GPL. If you hold more than one rating, you can complete a renewal on aircraft/launch type applicable for any one of your ratings and the renewal is valid for other ratings that you may hold. (*see also www.ssa.org.za*)

It remains incumbent on all pilots to ensure that they are fully current on all the ATC and legal requirements to operate any aircraft in controlled airspace.

The CGC Flying Panel requires that a pilot flying the CGC Rotax Motor Glider pass written exam covering all aspects of the operation of such an aircraft.



A) CHECKLISTS FOR THE ROTAX FALKE SF25C ZS-GZF

DAILY INSPECTION

When undertaking the daily inspection it is essential to look out for:

Functionality, security, safe fastenings and locking thereof, as well as any discernable damage (cracks, deformation etc.).

Controls, bearings and control drives are to be checked for free movement and full deflection.

A: AIRFRAME INSPECTION

1. Main fittings: 2 rear wing/fuselage fittings (seating), seating and locking of main bolt inside fuselage
2. Connection and locking of ailerons inside fuselage
3. Connection of spoilers inside fuselage
4. Operation of rudder from cockpit – free operation.

5. Operation of spoilers from cockpit
6. Operation of brakes
7. Function of all instruments. Radio test transmission
8. Pitot: (dewatering valve is under inspection cover behind elevator; check after flying in rain)
9. Security of right stick
10. Tail wheel steering, rudder pedal adjustment in place
11. Control cables for kinks and wear. Check pulleys and guides

12. Condition and security of seat belts.
13. Check for foreign or loose objects.
14. Canopy, canopy locking and emergency eject knob, clear view panel
15. Inspection covers under wings for security
16. Aileron drives outside of wings
17. Aileron hinges, locking and inspect through transparent inspection panel

B: ENGINE INSPECTION (remove cowling)

1. General inspection for missing nuts, bolts and screws and locking devices
2. Air intake and ducting, security of spark plug cables and chafing.
3. Free movement, security and ability to secure in one position of :- throttle, choke, cabin heating, air vent, engine cooling flap.
4. Check oil level: (FIRST turn over propeller ANTICLOCKWISE a number of turns (direction of operation) until ‘gurgling’ sound is heard.
5. Oil level must be half way between max. and min. marks
6. Check coolant: must be between max. and min. marks.
7. Check oil, fuel and cooling systems for leaks and chafing.
8. Check fuel filter for impurities and water (located left side under panel)
9. Check engine mounting for security
10. Check exhaust for damage, security and leaks.
- 11 Check for foreign objects in engine compartment.
12. Check engine cowlings for cracks and fasteners for security
13. Check fuel tank level.
14. Check fuel tank vent on filler cap
15. Replace cowling and secure fasteners

C: PROPELLER INSPECTION

1. Check condition and security of spinner
2. Check propeller blades for cracks, nicks and condition of PU

D: PREFLIGHT INSPECTION

1. Undercarriage left:- *tyre, air, spats and leg*
2. Wing left:- *D-Box, spoiler, wing tip, aileron, trailing edge*
3. Fuselage rear left:- *petrol drain (visual check only), Fabric covering*
4. Elevator left:- *security, D-box, Elevator*
5. Fin/Rudder:- *security, D-box, Rudder Cables*
6. Tail Wheel:- *tyre, air*
7. Release hook: - *security, functionality*
8. Elevator right:- *elevator, trim, D-box*
9. Fuselage rear right:- *fabric covering*
10. Fuselage under right:- *fabric covering*
11. Wing right: - *as per wing left*

12. Undercarriage right:- *as per undercarriage left*
13. Fuselage front:- *fabric and fibreglass covering.*
14. Propeller:
15. Spinner
16. Canopy

E: OIL LEVEL INSPECTION (open small insp. cover)

1. Check coolant in overflow container - level must be between max. and min
2. Check oil level must be between max. and min
3. When engine is cold turn prop ANTI-CLOCKWISE (direction of operation) until oil is pumped from motor into tank (gurgling sound)

B) FLYING THE ROTAX FALKE

a) PREFLIGHT CHECKS

1. Check under luggage shelf - main bolt, aileron and spoiler connections, cables
2. Time sheet: fill in tacho reading and time (of day)
3. Straps tight
4. Canopy locked
5. Rudder movement free
6. Spoilers and brakes
7. No loose or foreign objects
8. Fuel valve open
9. Park brake on
10. Strobe light off
11. GPS off
12. Avionics off
13. Fuses check
14. Master switch on
15. Fuel level sufficient

b) STARTING ENGINE

(The application of Choke during operation B4 above will prime the engine and assist starting)

1. Park Brake on
2. Cooling flap open
3. Elevator stick back

ENGINE COLD

5. Choke on (if ambient temp. below 5°C)
6. Throttle closed.

ENGINE HOT

7. Choke off
8. Throttle 5mm open only
9. Propeller area free (Shout PROP CLEAR!)
10. Magnetos: both on
11. Starter: press
12. Oil pressure after 10 seconds in green segment

WARM UP

13. Warm up revs: 2500 rpm
14. Choke off

15. Oil temperature >50°

c) BEFORE TAXYING

1. Strobe on
2. Avionics on
3. Speaker/intercom switch selected
4. Frequency selected and Radio Check.
5. Volume adjusted
6. Altimeter set on QNH
7. VOR set
8. Oil temperature in green
9. Cylinder head temp in green
10. Park brake on
11. Taxi Clearance: radio call

d) TAXI-ING TO HOLDING POINT

1. Park Brake released
2. Elevator up (or down in tail wind)
3. Throttle set as required
4. Turning – use rudder pedals only. *(Don't use differential heel brakes as the tail wheel is now non-castoring to accommodate the release mechanism.)*

e) RUN UP - ON HARDSTAND* ONLY

**Hardstand must be checked, before run up for stones*

1. Magnetos check
2. Revs 4 000rpm
3. Magneto 1: drop 115-300rpm
4. Both: 4 000rpm
5. Magneto 2: drop 115-300rpm
6. Both: 4 000rpm
7. Full power check > 5 000rpm

f) TAKE OFF

1. Look out and listen for approaching aircraft
2. Make radio call entering runway
3. Transponder on 2000
4. VOR RWY direction
5. Trim set for take off
6. Park brake off. *(The fact that it may be possible to taxi with the park brake on does not mean it is off!!)*
7. Throttle - full power.
8. Stick slightly forward as speed builds up.
9. Rudder to maintain direction.
10. Aileron to keep wings level.
11. Lift off at approx 75 km/h

g) CLIMB

1. Best climb minimum 95 km/h

h) FLIGHT ABOVE 300FT AGL

2. Throttle back to 4,800 rpm
3. Oil temperature in green
4. Oil pressure in green
5. Cylinder head temp in green
6. Cooling flap as required

i) CRUISE

1. Performance settings and consumption:- (capacity > 56.4litres)

• 75% power	4 800rpm	150 km/h	15 litres / h
• 65% power	4500 rpm	135 km/h	12 litres / h
• 55% power	4 200 rpm	120 km/h	9 litres / h

j) REGULAR AIRBORNE CHECKS

1. Height, direction, revs, temps, pressures, radio, fuel, alternative airfields and emergency landing fields.

k) APPROACH and LANDING

2. Cooling flap open
3. Throttle set as required
4. Approach speed min 110 km/h
5. Allow for wind speed & direction
6. Trim set
7. Spoilers set as required
8. Landing three point
9. Brakes (BE CAREFUL) as required
10. Elevator up
11. Taxi slowly

l) TO SWITCH OFF ENGINE IN FLIGHT

1. Speed < 90 km/h
2. Cool engine for 30sec @ 3,000rpm
3. Throttle closed
4. Strobe off
5. GPS off
6. Avionics off
7. Magnetos off
8. Avionics on
9. Best gliding @ 95 km/h
10. Min. sink @ 87 km/h

m) RE-START ENGINE IN FLIGHT

1. Avionics off
2. Master switch on
3. Strobe on.
4. Choke - ONLY on if temp <5°
5. Throttle closed
6. Cooling flap 'open' if it was closed for gliding
7. Magnetos both On
8. Starter press
- 9 Oil pressure after 10 sec in green sector
10. Throttle as required
11. Choke off

- 12 Avionics on
- 13 Speaker/Intercom selected
- 14 Frequency selected
- 15 Volume as required

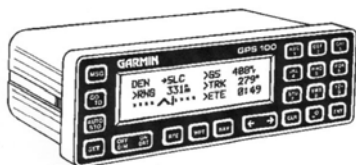
n) RE-FUELING

1. Position aircraft the last few metres BY HAND
2. Park brake: on
3. Attach pump earth lead to exhaust
4. Use Mogas (unleaded 95 octane). AVGAS ONLY IN EMERGENCY.
5. Use funnel with chamois
6. Do not overfill
7. Re-fit petrol cap

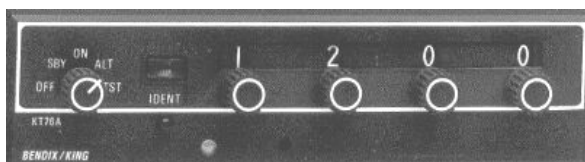
o) PARKING

1. Only park in designated areas.
2. Throttle **closed**.
3. Park brake **on**
4. Strobe **off**.
5. GPS **off**.
6. Avionics **off**.
7. Magnetos **off** and key removed.
8. Master switch **off** and key removed.
9. Fuel cock **off**.
10. Fill in timesheet. Tacho , Times and Charges.
11. Close and lock canopy.
12. Close clear vision panel.
13. Turn aircraft into wind or hangar it.

C) THE GPS and TRANSPONDER.



The Rotax Motor Falke is fitted with a **Garmin 100AVD GPS** (The Owner’s Manual is available on the Internet at :- http://www.garmin.com/manual/GPS100AVD_ownermanual.pdf).



The transponder is a **Bendix/King KT76A** <http://www.bendixking.com>

D) FLIGHT CHECK MNEMONICS (As recommended by SSSA)

a) Pre-Flight Checks: “Take More Pills For Good Health In England”

T	Test Controls Throttle Trim	Checked free and easy Friction nut not too tight. Set for Take off.
M	Mixture Master Switch	Choke Closed Switch On
P	Pressure Temperature	Oil in the Green CHT > min, Oil Temp rising
F	Fuel	Selection and content Transfer pump off
G	Gill	Cowl flap open.
H	Hatches	Closed and locked.
I	Instruments Radio	Checked and set. Checked and on.
E	Electrics Engine Revs. Eventualities	All electrical devices powered Minimum static rpm checked What if?

b) Pre - Landing Checks “BUMPFHLL”

B	Brakes and Airbrakes	Tested and closed
U	Undercarriage	Down and Locked
M	Mags, Ignition Master	On
P	Pressure(oil)	Oil pressure
F	Fuel	Content and Selection
H	Harnesses	Tighten
L	Lookout	
L	Landing area	

j) Pre -Manoeuvre checks “HASLL”

H	Height	Sufficient for Manoeuvre.
A	Airframe	Config. Flaps, airbrakes, engine
S	Security	Straps tight , no loose objects
L	Location	Airspace, terrain below
L	Lookout	Other traffic, Inspection turns

E) CLUB REQUIREMENTS FOR SOLO FLYING, CARRYING PAXES and INSTRUCTING IN THE ROTAX

a) Flying as a Student (dual or solo):

- Paid up CGC and SSSA membership, either permanent or daily.
- TMG Training log book complete with SSSA Training Card which acts as a Student Licence.
- Flying only under jurisdiction of qualified club instructor.

b) Flying as a GPL holding pilot (solo or with a GPL holding co-pilot.)

- Paid up membership as above.
- Holder of current SSSA GPL with T M G rating.
- Current medical, as indicated on your GPL ratings card.

c) On non-scheduled flying days.

- The CFI, Deputy CFI or Chairman must be informed prior to flying the Rotax.

d) Flying with passengers.

- As above for GPL Licensed pilot.
- Air Experience Instructors Rating.
- Air Experience Pupils must be paid up members of CGC and SSSA.

e) Instruction:

- As above for GPL Licensed pilots.
- SSSA Instructor's Assistant or Full Instructor's Brevet with Touring Motor Glider endorsement.
- Pupils paid up members as above.

F) TUGGING WITH THE ROTAX

SSSA Minimum criteria for tugging with a TMG Tug plane are as follows:

- GPL with TMG rating.
- 100 hours or 100 launches on type or similar.
- Completion of the tug-pilot training as specified in the section "SSSA AEROTOWING GUIDELINES" of the SSSA Manual of Procedures.

Note: Only tug Pilots specifically authorised by the CGC Flying Panel are permitted to tug in the CGC's Rotax Motor Falke.

G) TOURING

When preparing for a touring flight attention should be given the following;

- What is the macro picture with the weather, is it pre-frontal and you can expect the conditions to pick up.
- What is the weather at your destination
- Weather report *en route*
- Flight Plan submission, (*See Flight Plans below*).

- Route marked on aeronautical maps
- Radio frequencies to be used *en route*
- Air Space boundaries and Reporting points.
- Flight Levels w.r.t. to the Semi-circular Rule and topography.
- Fuel quantities and fuel-burn calculation.
- Alternate airfield co-ords and contact phone numbers. (*consult the Airfield Book of SA*)
- Water to drink and food if necessary.
- Tell someone what route are you planning to fly in the event of S&R.

a) Flight Plans: (see also "The Pilot's Radio Handbook" Dietland Lempp")

Flight Plans are not necessary for all flights but can be submitted for any flight for safety reasons.

A Flight Plan is mandatory for:-

a) All flights wholly or partly in Controlled/Advisory Airspace (except: a local flight, a flight crossing Airway or Advisory Route at right angles, VFR flight from a CTR or ATZ to uncontrolled airfield or vice versa and not entering any other CTR or ATZ.)

b) Flights across International boundaries.

c) Where alerting action is required – (SAR.)

A flight Plan is not mandatory for flights below a TMA.

b) Filing a flight Plan:

A Flight Plan can be submitted either telephonically, by FAX (but followed by a telephone call), personally or electronically at

www.file2fly@ants.co.za.

c) Activating a Flight Plan:

A Flight Plan must be activated at least half an hour before departure (ETD). *This allows Aeronautical Information Service time to advise all relevant ATSUs to whom you may talk.*

*Your FP will be **cancelled** if not activated within one hour of the ETD and can be delayed or amended within this same period by contacting an ASTU or ATC.

*If a Flight Information Region (FIR) boundary is to be crossed, show the Estimated Elapsed Time (EET) from departure, of the crossing.

d) Closing a Flight Plan:

*A Flight Plan is **automatically closed** on landing at a Controlled Airport

* A Flight Plan must be **closed by the pilot** immediately on landing at an uncontrolled airfield.

c) Completing the Flight Plan form. Appendix (xiv) *The numbered blocks are known as “Items”*

Example 1 , Flight from Worcester to Cape town International

Item 3 Message Type	FPL
Item 7. Aircraft Identification. 5 letter registration if used as radio telephony call sign. .	ZSGUF
Item 8 Flight Rules: I (Instrument FR), V (Visual FR), Y (IFR first), Z (if VFR first). Type of Flight: S (Scheduled), N (Non-scheduled), G (General Aviation), M (Military), P (VIP)	V G
Item 9. Number and Type of A/C (If more than one and type as specified in ICAO Type Designators)	.. RF 5 B
Wake Turbulence Category (Heavy, Medium, Light)	L
Item 10 Equipment: N (no Transponder), S (standard VHF, ADF, VOR, ILS and type)	VG / C. * (see notes below)
Item 13 Departure Aerodrome and Time (Location indicator or ZZZZ if none and specify in Item 18 aerodrome name preceded by DEP)	FAWC 0830
Item 15 Route Insert first Cruising Speed in Knots (N), then Cruising Level as FL (F) or Alt. (A) then Route (including speed, level or Flight Rule changes)	
Cruising Speed (<i>Knots</i>) Level (<i>A=Alt., F=Flight Level</i>) Route	
N 0085 A 045 ...DCT.....	
Item 16 Destination Aerodrome plus EET and Alternates	FACT 01 05 FASH FAFK
Item 18. Other Information	SAR/ NORMAL , Scramatam Syndicate, 33 Bissett Rd. NEULANDS 7700, Cell 084 444 4131
Supplementary Information. Endurance, Persons, Emergency and Survival Equip, etc.	
Item 19 Endurance 0400 ., Persons on Board 002 , Emergency Radio UHF <input checked="" type="checkbox"/> , VHF <input checked="" type="checkbox"/> , VHF V* , ELBA <input checked="" type="checkbox"/> (*Hand held VHF)	
Survival Equipment <input checked="" type="checkbox"/> , / <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Jackets <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> UHF <input checked="" type="checkbox"/> VHF <input checked="" type="checkbox"/>	
Dinghies <input checked="" type="checkbox"/> / Number <input type="text"/> Capacity <input type="text"/> Cover <input checked="" type="checkbox"/> Colour <input type="text"/>	
Aircraft Colour and Markings	White with Red trimmings..... Remarks ...Strips / 5 litres water.....
Pilot in Command	Joe Soap.....

Notes * Item 10 **Com and Nav. Equip** (F=ADF, G=GPS, O= VOR, V= VHF) / **Secondary Surveillance Radar (SSR)**
N = no SSR, C = Mode A and C Transponder

Example 2 . Flight from De Aar to New Tempe.

Item 3 Message Type	FPL						
Item 7. Aircraft Identification. 5 letter registration if used as radio telephony call sign. .	ZSGUF						
Item 8 Flight Rules: I (Instrument FR), V (Visual FR), Y (IFR first), Z (if VFR first). Type of Fight: S (Scheduled), N (Non-scheduled), G (General Aviation), M (Military), P (VIP)	V G						
Item 9. Number and Type of A/C (If more than one and type as specified in ICAO Type Designators)	.. RF5B						
Wake Turbulence Catagory (Heavy, Medium, Light)	L						
Item 10 Equipment: N (no Com/Nav/App), S (standard VHF, ADF, VOR, ILS and type)	VG / C						
Item 13 Departure Aerodrome and Time (Location indicator or ZZZZ if none and specify in Item 18 aerodrome name preceded by DEP)	FADA 0600						
Item 15 Route Insert first Cruising Speed in Knots (N), then Cruising Level as FL (F) or Alt. (A) then Route (including speed, level or Flight Rule changes)							
<table border="0"> <tr> <td>Cruising Speed (<i>Knots</i>)</td> <td>Level (<i>A=Alt., F=Flight Level</i>)</td> <td>Route</td> </tr> <tr> <td>N 0085</td> <td>F075</td> <td>..DCT FAHV / N 00 80 F 065 DCT.....</td> </tr> </table>	Cruising Speed (<i>Knots</i>)	Level (<i>A=Alt., F=Flight Level</i>)	Route	N 0085	F075	..DCT FAHV / N 00 80 F 065 DCT.....	
Cruising Speed (<i>Knots</i>)	Level (<i>A=Alt., F=Flight Level</i>)	Route					
N 0085	F075	..DCT FAHV / N 00 80 F 065 DCT.....					
Item 16 Destination Aerodrome plus EET and Alternates	FATP 02 40 0105 FABL FAHV						
Item 18. Other Information	SAR/FABL 0940 , Scramatam Syndicate, 33 Bissett Rd. NEWLANDS 7700, Cell 084 444 4131						

Notes:
 Item 13 ZZZZ used if no location indicator assigned to airfield (but specify in Item 18) or aircraft type in Item 9
 Item 15 Note the change of flight level to 065 in accordance with the Semi-circular rule after FAHV.

Semi-Circular Rule : Aircraft at or above 1500’ agl, flying VFR in un-controlled airspace on a Magnetic Track, in the Eastern sector fly at ODD levels plus 500ft and EVEN levels plus 500 ft in the Western sector (*East = Oos = ODD*).

e) Flight Log. *see Appendix (xv)*

- field selection for advanced students..

This is a schedule of route planning with estimates, actual and frequencies which is updated in flight and is useful for monitoring and reporting changes to your flight plan en route.

It is strongly recommended that ab-initio students have their first few flights in the Rotax Motor Falke.

H) GLIDER TRAINING USING THE ROTAX MOTOR FALKE

The Rotax is ideal for training a new pupil in many aspects of gliding. More can be covered, and repeated, in a single flight and is thus far more cost effective for the pupil. It Exercises include the demonstration of:-

- the effect of controls,
- adverse yaw.
- co-ordinated flying.
- speed control or attitude in turns.
- gentle stalls.
- circuit judgement.
- approach speed control.



Augrabies Falls – photo Adriaan Hepburn



Fish River Canyon - Adriaan and Adri Hepburn (Lambada)



Fish River Canyon - Adriaan and Adri Hepburn (Lambada)



Bitterwasser