



CAA, SLMG, FI
The UK's only Type Conversion Specialist

Self Launching Sailplane Difference Training for DG1001M Version 3

Pilot's Name

License Number

This difference training is designed for Silver C with badge holders with BGA Cross country endorsement, the new EASA SPL, LAPL(S) or PPLA CPL holders.

It does not cover Airmanship/knowledge expected to be known by these licence holders.

It's written as an aid-memoir for the purposes of discussion & training around each topic.

It is not designed to supersede manufacturer's instructions or be an all-inclusive list.

Participants are encouraged to give feedback to improve the content.

Andy Miller's Mini 'Out Briefing' Card

Pilots: qualified, attitude of mind, personal equipment

Preparation: weather, booked out, NOTAMs/AIS

Aircraft: fuel, documents, weight & balance, pre-flight inspection, T/O & land distances

PRE FLIGHT

1. DI as per club glider, especially tyre Pressures- DG1001M is 700 kilo's with two pilots.
3. Two strokes have a tendency to shake themselves to bits, careful inspection is required especially engine bay where damaged/loose articles appear. All loose bolts, plugs, fixings must be re secured, they will fail, check belt deflection, if in doubt seek the advice of an experienced pilot or engineer.
4. Propeller – clean & undamaged, check integrity of lock wire
5. Inspect steerable Tail wheel whilst on dolly, to allow full movement & inspection
6. Battery life – it is essential the engine receives minimum 11V for electric start, I would never consider flying without at least 12.5 V, Ensure that tailfin & parcel shelf batteries are also fully charged so it never becomes necessary to switch instruments over to engine battery & risk non start due to low voltage, be prepared to switch off some instruments during long flight. It's not possible to do a windmill start with DG1001M, ensure you have a suitable recharging facility for the engine & tail-wheel batteries in situ; it's not really practical to remove & charge these batteries on daily basis for a 240V input; have a solar panel installation on Hanger/Trailer.
7. Fuel cock position & refuelling (50:1 two stroke oil mix) Contents, gauges are notoriously unreliable, keep a track of fuel levels in DI book
8. Ignition switches main power off, rotate prop by hand through 360 Degrees
9. Main Power on
10. Ensure Ignition switch for P2 is on & PIC is off position
11. Ensure both red Emergency Electronic ignition failure switches are set to Normal
12. Weight & balance – brass tail weights/cockpit indicator plus 40% for rear seat pilot.
13. Transponder & TCAS, ELT Emergency Locator
14. FLARM
15. Com's, headphones/switch over mechanism/boom-mic

Tick

Emergency Drills

Parachute
Cockpit egress,
Fire

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Signature Date

ENGINE START ON THE GROUND

Pre start checks – Laminated DG1001M engine instruction in cockpit

- a. Check if the fuel cock is open
- b. Master switch on
- c. Extend the power plant; check coms
There are two methods;
 - 1. Extension via black manual override button
 - 2. Switch on the ignition via gated toggle switch
(Duplicates switches front & rear both need to be on)
- d. Apply wheel brake via end of airbrake travel & secure with Piggott hook ensure rear canopy is closed & locked front canopy open.
- e. Ignition on, check DEI NT for engine extension complete
- f. Throttle setting, fully aft, then move forward 5mm
- g. Visually check propeller clear, deflect mic & shout **clear prop**
- h. The engine is primed via electronic fuel injection, no need to carry out special instruction simply push starter button until engine runs, release starter immediately upon firing, check DEI NT to ensure starter warning engaged isn't displayed, when cold the engine may run rough allow time for CHT to rise engine until runs smoothly 30-60 seconds.
- i. Close & lock canopy
- j. Magneto checks, set throttle to 3000 RPM to carry out magneto checks, maximum drop 50 RPM. Do not apply check for longer than 5 seconds per circuit, otherwise a failure message will appear.
- k. Red Emergency bypass Switch, Increase RPM to 4000, switch over from normal too emergency to test in event of electronic ignition failure, there's a drop 300 RPM, be prepared for the engine to cough & splutter but will quickly run smoothly again.
- l. Switch back to the normal electronic ignition circuit
- m. Check full power minimum 6000 PRM, recommended to do this on initial ground run accelerating to take off speed

Problems - Engine won't start upon pressing starter button

- I. Poor technique pressing starter button
- II. One of two ignition switches isn't on
- III. Either the front or back, emergency switcher-over is off
- IV. Battery, low voltage
- V. Fuel cock off
- VI. Complete mechanical failure, **switch off ignition** investigate.
- VII. Some SLS's i.e. DG800 the auto prime switch set to manual

Warnings - Engine running Monitor DEI NT for alerts

- 1. Starter not disengaged displayed on DEI NT **stop engine immediately**
- 2. Horrid & unnatural noises, **stop engine immediately**
- 3. Check the alternator working should indicate 14.4 Volts
- 4. Full power upon starting, **retract throttle immediately**. Before starting engine it is essential throttle is set to idle, double check throttle setting, an excellent reason for engaging Piggott

wheel brake lock & always start engine with clear space directly in front of you preferably with tail wheel as straight as possible

5. Engine running rough, possibly advance throttle to quickly, wait 10 seconds, engine should run smoothly, try increasing RPM to 4000 to see if it clears problem, if not cut power, switch off ignition refer to manual/engineer
6. Engine slip appears on DEI NT, common when engine 1st fires, press mode to clear message, if warning reappears; Check slip rate indications above 7% or above **stop engine**, refer to engineer for drive belt tension check/adjustment.
7. Cylinder temperature rising rapidly in excess of 74 degrees, **cut power immediately** switch off ignition, inspect, refer to engineer.
8. Loss of comm's stop engine evacuate investigate problem

*Warm up & magneto checks, avoid excessive run -overheating & loss of power
Two strokes produce more power when cold.*

Tick

Emergencies *Fire*

Warning *It's Essential to ensure rear canopy is closed & locked before start, the prop is clear & before commencing power checks front canopy is closed & locked*

Signature Date

TAXI-ING CONSIDERATIONS - Especially glider pilots who don't hold PPL!

- a) Pre taxi checks especially lookout on the ground & Circuit
- b) Unlock wheel brake/ Piggott lock, by closing & locking airbrakes
- c) Starting, control of speed & stopping
- d) Engine handling
- e) Directional control via steerable tail-wheel, remembering there's no differential braking & 20M span
- f) Parking areas procedure & precautions
- g) Effect of wind & prop wash when using flying controls
- h) Effect of ground surfaces
- i) Effect of steerable tail wheel
- j) Brake & Instrument Checks i.e. compass
- k) Airmanship & ATC/Radio, noise abatement, clear runway.
- l) Two strokes the cooling & lubrication system less effective @ low RPM, monitor CHT. Be kind to the airframe & engine; where possible consider using tow out gear rather than taxi full length of airfield.

Cautions for taxiing -always use a power setting at which the engine runs smoothly. This prevents damage to the engine mount. On tarmac apply a little wheel brake to avoid excess taxi speed.

Signature Date

TAKE OFF – Consideration

- 1) You're P1 & completely responsible for Lookout, good airmanship & noise abatement.
- 2) Performance calculations/soft ground/upslope/wind/RPM/VA/EFATO- considerations
- 3) Recommended 2nd pre take off check, CB SIFT CBE, fuel on & sufficient, especially as some of these checks are done out of order i.e. upon starting, which maybe immediately prior to taking off, the front cockpit is open to start, airbrake brakes fully aft to apply the wheel brake, **close & lock airbrakes & canopy**
- 4) Cross wind, down wing on the ground should a runner be unavailable
- 5) Look out especially, circuit & runway free

- 6) Radio call
- 7) Directional stability, there's no rope!
- 8) Applying 1/3 power smoothly & ensure directionally stability, then continue apply power smoothly to full, approximately 4-5 seconds, check RPM is in excess 6,000, smooth application of throttle is kind to engine & gives time, alignment & checks.
- 9) Ground run under full power, hold stick fully back & apply full aileron to raise wing, immediately centralize aileron as the wing rises, maintain level wings whilst continuing to have enough elevator authority to prevent the nose going onto the ground, then set elevator to present airfoil to normal flying attitude. Apply sufficient control inputs to maintain directional control on the ground, when the aircraft has sufficient speed for takeoff apply appropriate control inputs to achieve safe transition into flight.
- 10) You may need to adjust elevator slightly to enable earlier take off, experience has taught me that too much elevator often results in a longer ground roll. I have found a slight easing of the back pressure near take off speed often results becoming airborne & acceleration a little earlier. Unlike most TMG's where you normally need to hold the glider in ground effect for short distance until sufficient speed is indicated. The SOLO two stroke engine provides excellent acceleration; you can almost immediately set 51Kts for an efficient climb.
- 11) Consider wing runner, it reduces take off distance by as much as 20 meters.
- 12) Don't do the glider pilot trick of using rudder to raise wing, the tail-wheel is very effective, you will veer off to one side!
- 13) If adverse conditions apply i.e. Cross winds soft ground high wing loading etc. consider either not taking a launch or an aerotow.

Emergencies

- More than 20 degree divergence, **Abort***
- Wing fails to come unstuck/level, **Abort***
- Insufficient RPM indicated minimum 6,000 (RV is usually 6,350)*
- Or a distinct lack of acceleration/ASI increasing rapidly **Abort***
- DEI NT continues to show prop slip after resetting, **Abort***
- Engine begins to run rough beyond V1, **Red switch to carburettor***
- Ground run, sudden loss of power i.e. drive belt failure, **Abort***
- Unnatural or unhealthy noises, **Abort***
- EFATO- Engine failure after take off***
- Engine Failure during climb out, Options?*

Tick

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CLIMB TECHNIQUE

- A. Lookout & good airmanship
- B. Always consider the engine may stop, react quickly to overcome change in pitch, Lower nose, safe manoeuvring speed, there's an increased likelihood of a spin, restricted range, try to climb out over landable fields, remember self-preservation, gliders can always be repaired, and you're more valuable.
- C. Climb with full throttle to ensure smooth engine run. Set an attitude to give an RPM that doesn't exceed 6,350, the optimum climb speed blue line IAS 51kts, remember **PAT** Power Attitude Trim
- D. Climb in good air, increases safety, reduce fuel consumption & engine hours.
- E. Retract electric undercarriage at a safe altitude, whilst alternator is charging
- F. For straight & level flight i.e. avoiding cloud or airspace remember **APT** Attitude Power Trim plus **FREDA** checks (Fuel, Radio, Engine, Direction, and Altitude).

Advisory – if the engine runs rough or a loss of RPM, switch over to emergency system.

Warnings – Be familiar with & observe the DEI NT warning messages

*If Cylinder temperature rapidly rises exceeding 78 degrees **cut engine immediately**, allow to cool, retract, soar away if possible or land in suitable field*

Signature Date

RETRACTING ENGINE

Tick

Automatic procedure

Emergency

Black override button

Spindle fuse failure re set

Complete failure

Signature Date

IN FLIGHT ENGINE RESTART

Select field, deploy undercarriage

Normal restart procedure, f, g, i, j, k, C, D & F

Engine fails to start procedure, 2nd attempt, given sufficient height?

Warnings, be familiar with & observe DEI NT warnings

Signature Date

FLIGHT CHARACTERISTICS DG 100I M (Airframe Type Conversion)

SLS CofG's tend to be more AFT plus DG1001 has Brass Tail Weights

Stalling

Wing drop

Air brakes

Engine deployed & stopped

50 Hour/ 6 Monthly engine check

Warning Solo Pilots its Absolutely Critical to remove the brass tailfin weights

Signature Date

PRE LANDING CHECKS

WULF Wind/Water, Undercarriage, Landing Area/Lookout, Flaps

UFSTALL Undercarriage, Flaps, Speed, Trim, Airbrakes, Lookout, Landing Area

BUMFRICH Brakes, Undercarriage, Mixture, Fuel, radio, instruments, carb heat,
Hatches & harnesses

Signature Date

CIRCUITS - At what point do you abandon any idea of deploying engine?

Downwind into a good field with engine retracted, are you already to low?
Demonstration of height loss deploying engine which fails to start @ 2,000 feet, note height loss, calculate minimum safe height to deploy engine adjacent to suitable field

Warning - It is not recommended to land with engine deployed either running or stopped, unless in an emergency/performance considerations?

Signature Date

LANDING - With the engine retracted

It's a glider; apply good airmanship & the usual considerations, remember steerable tail wheel very effective on ground roll wing drop/wing wheels

Signature Date

TAILWHEEL AIRCRAFT - General Principles

Bounced landings/stick position
Cross winds
CofG directional stability/steerable tail wheel

FLAPS - Not all glider pilots have flown flapped aircraft !

Almost all types of SLMG are flapped, Considerations?

RADIO PROCEDURES

Joining procedures
Circuit calls
Radar services & Controlled/Radio Mandatory Zones
Emergencies - PAN and MAYDAY Calls
Phonical Alphabet

Training Completed Pilot's Signature**Date**.....

Supervising Instructor**Date**.....



Sailing the Skies DVD and Instructor Log Book

Managing Director Julian Hitchcock
Bedford House, 10 Culver Road, Felpham, Bognor Regis, West Sussex PO22 7EF
Tel 07860 469939 Email: braviation@btinternet.com

Company registered in England and Wales No. 7112667 VAT Number 156 5389 78