

VH-UPG

Super Decathlon (8KCAB)

Operating Notes

Written in conjunction with the Approved Flight Manual, the manufacturer's Pilot Operating Manual, the Lycoming Operator's Manual and relevant Service Letters.

These notes should be read in conjunction with the checklist for VH-UPG.

Version 7
4 February 2025

GENERAL INFORMATION

Engine: Lycoming AEIO 360 H1B of 180HP

Propeller: MT 2 blade composite constant speed

Fuel Capacity: 152 litres (usable)

Fuel grade: 100LL Avgas

Oil Capacity: 8 quarts (minimum for aerobatics 6 quarts but do not operate with much more than 6)

Oil grade: Use Shell W100 Plus or 15W-50

WEIGHT & BALANCE:

Max. Gross Weight (normal cat.): 884 kg

Max. Gross Weight (aerobatic cat.): 816 kg

Max. baggage (normal cat. only): 45 kg

Note revised seat moment arm per SL 448.

FLIGHT LOAD FACTORS:

Normal category: +3.8 -1.52

Aerobatic category: +6 -5

BUT PLEASE KEEP G'S BELOW 4.0 - see SL 445

SPEEDS (all CAS, KTS):

Vne: 174

Vno: 139

Va: 110-115 (aero cat) : 93 (normal cat)

Vy: 71

Vs₁: 49 (power off at maximum weight)

Best glide: 65

Threshold: 61

Max. demonstrated X-wind: 17

NORMAL PROCEDURES

TAXI – lean on the ground approx 30 mm to minimise fouling of spark plugs. Do not ride the brakes. When stationary set 1000-1200 RPM.

TAKE OFF

Normal: Full throttle (stick back)
Raise tail by 40 kts
Rotate 55 kts
Climb 71 kts

Short/Soft: Full throttle (stick back)
Accelerate in tail down attitude
Lift off ASAP (43 kts)

NB: Reg 91.795 MOS does not permit use of the old DoT P Chart and it only applies to weights up to 816 kg so must not be used. The Operating Manual specifies speed at 50 ft to be 50 kts cf stall speed of 49 kts which is much less than the safety standard of $1.2V_s$!

Refer David's book, Aerobatics Down Under as well as CASA AC 91-02 and FAA AC 91-79. The take-off distance on grass at maximum weight, 2500 ft altitude and 30°C is 762 m.

IMPORTANT: Short field take-offs would require pitch forward to a safe speed should a power failure occur during climb-out; failure to respond immediately may result in a stall at low altitude.

CLIMB

When the climb is stable after take-off, throttle back to about 24" MP and reduce RPM to 2500 - the MP will increase as RPM drops. Maintain 25" & 2500 RPM during climb (approx 80% power). Maintain best rate of climb speed IAS 71-75 kts until a safe height then cruise climb 80 kts if desired.

CRUISE

Use 65% power for circuits and normal training area operations. i.e. at low altitude: 21.5" to 22" MP & 2400 RPM. Normally, do not lean on short local flights as it takes quite some time to correctly lean with the EGT gauge but note that fuel flows will be much higher than shown below.

For cross-country flying, refer to the Operating Manual with the mixture leaned as below.

2500ft:

75% power 24" MP & 2400 RPM 36.1 litre/hr
65% power 21.5" MP & 2400 RPM 32.3 litre/hr

5000ft:

75% power 23.6" MP & 2400 RPM 36.1 litre/hr
65% power 21" MP & 2400 RPM 32.3 litre/hr

7500ft:

75% power 23" MP & 2400 RPM 36.1 litre/hr

65% power 20.5" MP & 2400 RPM 32.3 litre/hr

Leaning:

Lean the mixture only if at or below 75% of maximum power. Lean to peak EGT.

DESCENT

Enrich mixture as required. Avoid low power descents (less than 15" MP) unless necessary (avoid windmilling). Typically use 15" to 17" MP and 2400 RPM with normal cruise speed.

CIRCUITS

Base leg: 75-80 KTS

Prop to max. RPM – full fine (only after power is significantly reduced so the propeller is off the governor)

Final approach: 65 KTS

with CASA tolerance of -0/+5 kts
so 65 to 70 kts.

Throttle as required

Sideslip if required to lose height

LANDING

Normal: Close throttle

Flare to 3 point attitude

Wheeler: Contact main wheels first

Hold tail up as appropriate
Lower tail gradually

Balloon or bounce – go around; failure to respond immediately may result in a stall at low altitude.

Short Field: Reg 91.800 MOS does not permit use of the old DoT P Chart and it only applies to weights up to 816 kg so must not be used. The Operating Manual specifies an approach speed of 52 kts cf stall speed of 49 kts which is significantly less than the safety standard of $1.3V_s$!

Refer David's book, Aerobatics Down Under, as well as CASA AC 91-02 and FAA AC 91-79. Landing distance with an approach speed of $1.3V_s$ 63 kts at maximum weight on grass, 2500 ft altitude and 30°C is 753 m.

At a weight of 816 kg the minimum approach speed is 61 kts. Refer CASA AC 91-02:

- Achieve stabilised approach speed
- Cross the threshold at 50 ft above the ground
- Threshold is the start of the piano keys

AEROBATICS

In normal aerobic training use climb power 25" MP and 2500 RPM. Fuel flow at this power setting is about 60 litres/hour.

AD/CHA/15 requires aerobatic hours to be recorded on the maintenance release. “The hours are those actually spent in aerobatic flight and do not include positioning time.” An aerobatic sequence of 10 figures takes <0.1 hr and a single figure typically only 10 - 20 secs. So, for a typical training sortie there may be 0.1 to 0.2 hr of aerobatics.

Do not reset the accelerometer – leave it for the next pilot to check. An electronic accelerometer is included in the MVP-50P.

FUEL PLANNING

For a typical aerobatic training sortie of one hour duration from engine start to engine stop from Moorabbin, including operation at high power in the aerobatic area, a typical block fuel usage is about 36 litres. Any extension to this time will require an extra litre of fuel per minute.

Recommended minimum fuel reserve is 23 litres so minimum fuel at start would be 60 litres. If you operate at such a low fuel at start then expect to call “minimum fuel” when inbound every time and occasionally call “mayday”.

A comfortable minimum fuel at start for that 1 hour flight is 70 litres. If you are down to 30 litres when

calling inbound then you should follow the “minimum fuel” procedures.

Commence your return from the aerobatic area when down to 37 litres regardless to ensure sufficient fuel.

A maximum of ½ tanks of fuel for aerobatics so the maximum fuel at start is about 80 to 85 litres.

IMPORTANT:

- **2600 RPM MAX for aerobatics**
- **Manoeuvre Speed, V_A – refer to the Flight Manual for appropriate limitations:**
 - **115 kts two up.**
 - **110 kts solo**
- **No snap/flick manoeuvres**
- **Please keep Gs below 4.0 – refer SL 445**

GUIDANCE

Some have difficulty completing CASA’s Endorsement Questionnaire and these notes will assist you overall.

One specific question is “How long can the battery supply emergency power?” Pilots are supposed to be able to work this out! More important for night VFR or IMC but still a useful skill. UPG has a 24Ahr

battery so assume it is 75% charged and the essential services require 6A. There you go: 3 hours.

NOTES

1. Wing span 9.8 m (32 ft).
2. Tyre pressures main 24 ± 2 & tail 40 ± 5 psi.
3. Use step ladder to access wing fuel tanks. Do not stand on the strut.
4. Use the tow bar to assist with ground handling – keep the spring underneath and avoid hitting the rudder.
5. To secure the control stick use the front harness – fully loosen the crotch strap and wrap it two turns around the upper bend in the control stick – then secure the belts to the lower lap belt (i.e. do not use the one with the ratchet).

The harness with the ratchet cannot be tightened too far as it binds on the support straps and stops at the stitching – so just tighten it to remove slack – use the other lap belt to restrain the stick on the ground
Check by moving the stick – if full aileron is achieved then the controls are not secure.

Similarly with securing the rear seat harness while flying solo. Attach the shoulder belts and crotch strap to the lower lap belt (the one without the ratchet. Then make snug – check by raising the harness and moving the stick fully aft to check for fouling.

When securing yourself in the harness, all belts should be secured to the top lapbelt (the one with the ratchet) so as to minimise flight loads on the stitching.

