VH-LAT

CLUB HANDLING NOTES

AIRPLANE SERIAL NO. **90484**

AIRPLANE REGISTRN. **VH-LAT**

VH-LAT IS APPROVED IN THE NORMAL CATEGORY UNDER SPECIAL CERTIFICATE OF AIRWORTHINESS (EXPERIMENTAL CERTIFICATE) NUMBER SX 8227. REF: CASR 21.191(g).

THIS DOCUMENT INCLUDES EXTRACTS OF INFORMATION FROM VARIOUS SOURCES INCLUDING INFORMATION PUBLISHED BY VAN'S AICRAFT, VH-LAT SPECIAL CERTIFICATE OF AIRWORTHINESS AND ASSOCIATED DOCUMENTATION, MANUALS SUPPLIED WITH THE AIRCRAFT, CASA, LYCOMING AND OBSERVATIONS FROM CLUB OPERATIONS.

UNIVERSITY FLYING CLUB MAKE NO GUARENTEE THAT THE INFORMATION IS ACCURATE AND IT IS THE RESPONSIBILITY OF THE PILOT IN COMMAND TO ENSURE ANY REFRENCES ARE UP TO DATE AND THAT THEY ARE EQUIPPED WITH ALL OF THE INFORMATION REQUIRED TO SAFELY PILOT THE AIRCRAFT.

VAN'S AIRCRAFT
TOTAL PERFORMANCE

REVISION LOG

Date	Revision	Notes
06/07/2020	1.0	Initial issue
13/7/2020	1.1	Added additional info for Aithre Shield 2.0 CO Sensor. Added additional information for AoA Sensor. Added additional information for Dynon Integrations. Added notes about disabled Audio Alarms.
15/07/2020	1.2	Table of Contents formatting change. Added 7.2.3. Pitot / Static / ADAHRS. Fixed errors with Table of contents. Added minimum oil quantity. Corrected reference to Figure 13.
03/12/2021	1.3	Adjusted simplified circuit diagram. Added detailed circuit diagram with attitude and power settings. Added taxiing handling instructions. Minor formatting adjustments. Changed Section 7 (Minimum Equipment) to reflect upcoming Part 91 requirements Updated Section 2.12 (Placards) and 2.13 (Passenger Briefing) to reflect Part 91. Also added Passenger Briefing Example in 2.13. Added Figures 17 and 18.
01/02/2022	1.4	Re-format entire document Simplified Section 7 Added maximum recommended crosswind component. Added appendix for “After Each Flight” (Stow and Secure) Added picture of LAT’s airspeed indicator in Section 2.3 Added No Smoking in Section 2.11 Included aircraft build place and date in Section 1.2 Added Table 1 in Section 5.3 Planned Performance Combined Cabin and Electrical Fire as procedures identical. Moved “MINIMUM RECOMMENDED RUNWAY DISTANCES” to Section 5 (Performance) Updated and simplified LAT aircraft checklist Changed ceiling capability to 19,000 ft per Van’s website Added pictures of fuse panel and the circuit breakers Added life vest information in Appendix II Added aircraft quiz in Appendix III Added information on cabin heating and ventilation Added information on seat adjustment Added information on how to add engine oil

27/11/2022	1.5	Formatting changes Removed reference to engine priming system Updated PLB make and model and hyperlink Added info on Dynon Skyview WIFI in Section 7.3.2 Changed alternator make and model Updated pictures for baggage compartment and flight bag Updated cockpit photo pictures Minor formatting changes Inserted Section 12 “Air Handling Notes”

Reserved for future revision log

TABLE OF CONTENTS

Revision Log **2**
1 GENERAL **7**
1.1 Introduction 7
1.2 Airframe 9
1.3 Engine 9
1.4 Propeller 10
1.5 Fuel 10
1.6 Oil 10
1.7 Maximum Weights 10
1.8 Specific Loading 10
1.9 Abbreviations 11
2 LIMITATIONS **13**
2.1 General 13
2.2 Airspeed Limitations 13
2.3 Airspeed Indicator / Skyview Ranges 14
2.4 Powerplant Limitations 15
2.5 Powerplant Skyview Ranges 15
2.6 Weight and Balance 16
2.7 Centre of Gravity Limits 16
2.8 Maneuver Limits & Flight Load Factors 16
2.9 Operating Restrictions 17
2.10 No Smoking 17
2.11 Fuel Limitations 17
2.12 Placards 18
2.13 Passenger Brief Example 18
3 EMERGENCY PROCEDURES **19**
3.1 General 19
3.2 Airspeeds for Safe Operation 19
3.3 Emergency Procedures Checklist 20
3.3.1 Engine Failure 20
3.3.2 Engine Fire 21
3.3.3 Cabin or Electrical Fire 21
3.3.4 Wing Fire 22
3.3.5 Alternator Failure 22

3.3.6 High CO Alarm 22
4 NORMAL PROCEDURES 23
4.1 General 23
4.2 Airspeeds for Safe Operation 23
4.3 LAT Checklist 24
5 PERFORMANCE 27
5.1 RV-9A Performance 27
5.2 Minimum Recommended Runway Distances 27
5.3 Planned Performance 28
5.4 Engine Out Glide Performance 29
5.5 Engine Power Charts 30
6 WEIGHT & BALANCE 32
6.1 Weight & Balance Data 32
6.2 Forward Weight Limitation 33
6.3 Current Weight & Balance Documents 34
6.4 Weight and Balance Form 37
6.5 Full Fuel, Full Bags, Max Crew Weights 38
6.6 Forward CG Example 39
7 DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS 40
7.1 Minimum Equipment 40
7.2 Cockpit Photo 41
7.3 Installed Equipment 42
7.3.1 Electrical 42
7.3.2 Avionics 44
7.3.3 Cabin Equipment 45
7.3.4 Pitot-Static 47
7.4 Fuel System 47
7.5 Nose Gear Care 49
7.6 Operation on Unsealed Runways 49
7.6.1 Gravel Runways 49
7.6.2 Grass Runways 49
7.7 Engine Leaning 50
7.7.1 Ground 50
7.7.2 In-Flight 50
7.8 Audio Alarms 53
7.9 Aithre Shield 2.0 Carbon Monoxide (CO) Sensor 53

7.10 Stall Warning System (Angle of Attack) 54
7.11 Cabin Ventilation & Heating 55
7.12 Seat Adjustment 56
8 NORMAL CIRCUIT DIAGRAM (SIMPLE) 57
9 NORMAL CIRCUIT DIAGRAM (DETAIL) 58
10 FLAPLESS CIRCUIT DIAGRAM (DETAIL) 59
11 GROUND HANDLING NOTES 60
11.1 Taxi and Brake Use 60
11.2 Steering Bar 62
11.3 Tire Inflation 63
11.4 Canopy & Throttle Lock 63
11.5 Adding Engine Oil 64
11.6 Fuel Caps 65
11.7 Entering & Exiting the Aircraft 65
12 TAKEOFF/LANDING & AIR HANDLING NOTES 66
12.1 Takeoff 66
12.2 Landing / Go-Around / Touch & Go 67
12.3 Manouvering Speed 67
12.4 Air Handling Notes 67
13 GENERAL NOTES 69
14 ALARMS, DEFECTS, DAMAGE 70
15 APPENDIX I: AFTER EACH FLIGHT (STOW & SECURE) 71
16 APPENDIX II: Heli Vest Life Preserver 80
17 APPENDIX III: LAT CHECKOUT QUIZ AND SLIP 82
17.1 VH-LAT Checkout Slip 96

1 GENERAL

1.1 INTRODUCTION

This document has been prepared for VH-LAT, owned by the University Flying Club and operated by its members.

The goal of this document is to provide the pilot with key operating information and club procedures.

The PIC is responsible for ensuring the following documents are kept in good condition in the aircraft's Flight Folder and are carried onboard the aircraft at all times during flight:

1. Certificate of Registration
2. Certificate of Appointment of Registered Operator
3. Special Certificate of Airworthiness
4. Annex to the Certificate of Airworthiness
5. Noise Exemption Letter from Air Services Australia
6. Load Data Sheet
7. Weight and Balance Record
8. Handling Notes (this document)
9. Maintenance Release

The PIC must notify University Flying Club committee members of any omissions prior to operating this aircraft.

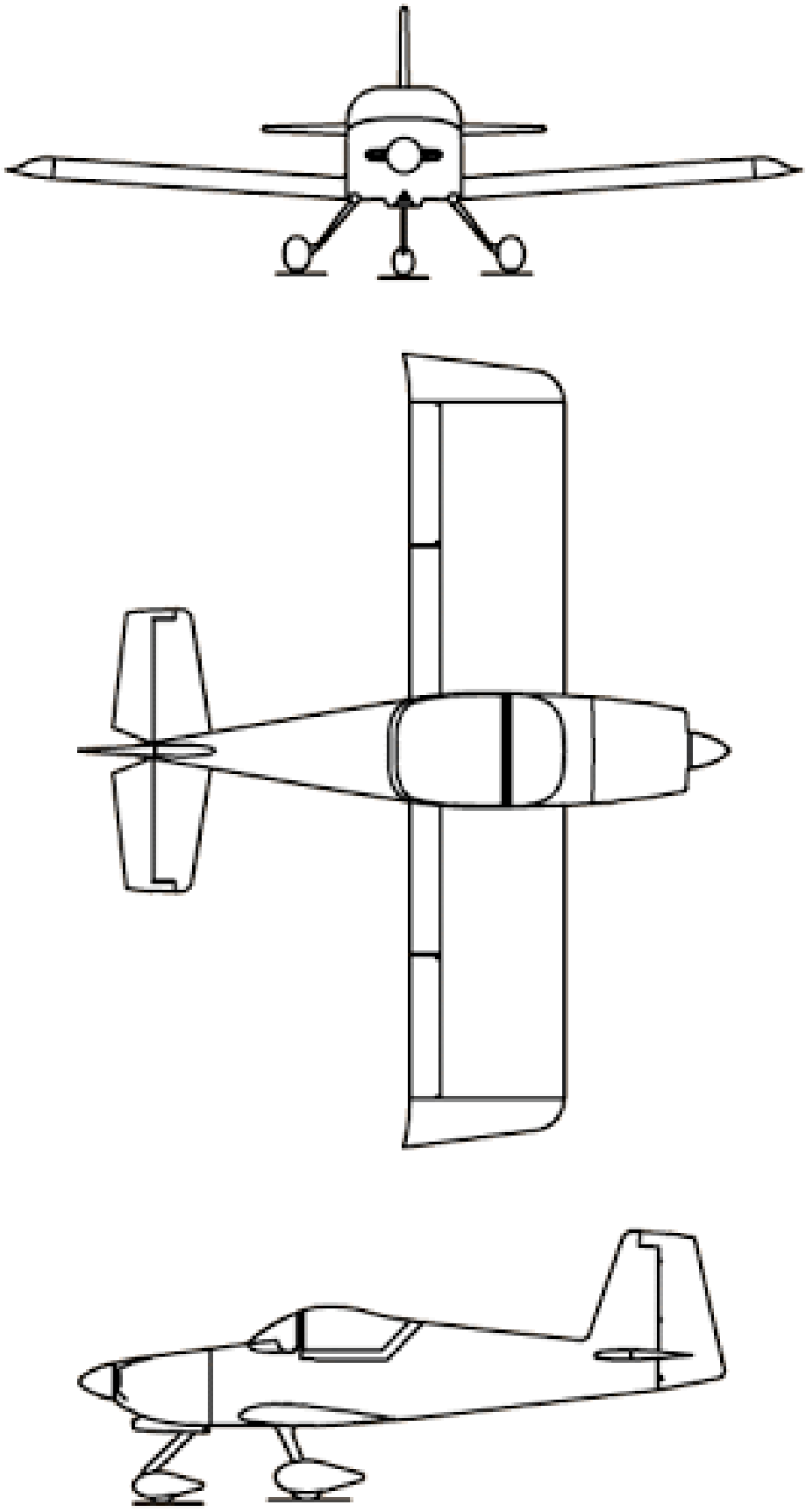


Figure 1 – Aircraft Diagram

1.2 AIRFRAME

(a) Span	8.54 m	(28 ft)
(b) Length	6.22 m	(20 ft 5 in)
(c) Height	2.39 m	(7 ft 10 in)
(d) Wing Area	11.52 m^2	(124 sq ft)
(e) Datum	70” forward of wing leading edge (LE)	
(f) Main wheel Right	91.5" aft of datum	
(g) Main wheel Left	91.5" aft of datum	
(h) Nose Wheel	37.75” aft of datum	
(i) Place and Year of Completion	Canada, 2003	
(j) Seats	2	

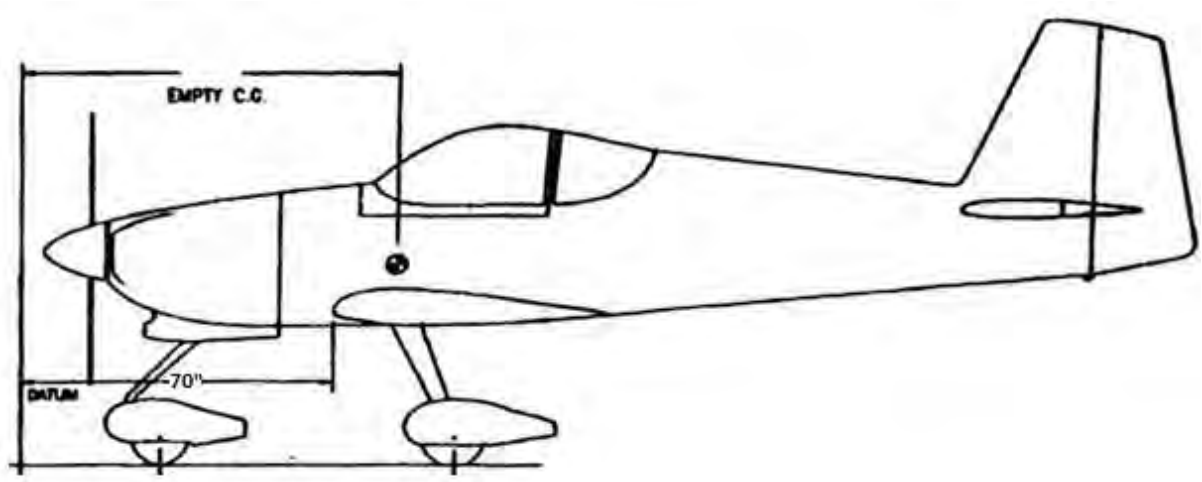


Figure 2 – Datum and empty CG measurement

1.3 ENGINE

(a) Number of Engines	1
(b) Engine Manufacturer	Lycoming
(c) Engine Model Number	O-320-D2G
(d) Rated Horsepower (w/o propeller)	160
(e) Rated Speed (rpm) (propeller limitation)	2600
(f) Bore (inches)	5.125
(g) Stroke (inches)	3.875
(h) Displacement (cubic inches)	319.8
(i) Compression Ratio	8.5:1
(j) Engine Type	Four Cylinder, Direct Drive, Horizontally Opposed, Air Cooled

1.4 PROPELLER

(a) Number of Propellers	1
(b) Propeller Manufacturer	Sensenich
(c) Model	Cruise,70CM7-S9-0-81
(d) Number of Blades	2
(e) Propeller Diameter (inches)	
(i) Maximum	70
(ii) Minimum	68
(f) Propeller Type	Fixed Pitch

1.5 FUEL

(a) Fuel Capacity (Litres) (total)	136
(b) Measurable Capacity (Litres) (total)	
(i) Minimum	40
(ii) Maximum	130
(c) Fuel	
(i) Minimum Octane	100/130
(ii) Type	AVGAS 100/100LL

1.6 OIL

(a) Oil Capacity (U.S. quarts)	8
(b) Oil Specification	20W50 Refer to latest issue of Lycoming Service Instruction 1014M
(c) Club minimum oil quantity to start a flight (U.S. quarts)	4, but 5 recommended

1.7 MAXIMUM WEIGHTS

	Normal
(a) Maximum Takeoff Weight (kgs)	794
(b) Maximum Ramp Weight (kgs)	794
(c) Maximum Landing Weight (kgs)	794
(d) Maximum Weight in Baggage Compartment (kgs)	34

1.8 SPECIFIC LOADING

(a) Wing Loading (lbs per sq ft)	14.1
(b) Power Loading (lbs per hp)	10.9

1.9 ABBREVIATIONS

” or in **mm** **kg** **lb**	Inches Millimeters Kilograms Pounds
ADAHRS	Air Data Attitude and Heading Referencing System
ASI	Airspeed Indicator
CG	Centre of Gravity
GS	Ground Speed
GW	Gross Weight
HP	Horse Power
KIAS	Knots Indicated Air Speed
KTAS	Knots True Air Speed
LPH	Litres Per Hour
MR	Maintenance Release
MTOW	Maximum Take Off Weight
PIC	Pilot In Command
PLB	Personal Locator Beacon
RPM	Revolutions Per Minute
UFC	University Flying Club
V_A	Design Manoeuvring Speed. This is the speed above which it is unwise to make full application of any single flight control (or "pull to the stops") as it may generate a force greater than the aircraft's structural limitations.
V_{FE}	Maximum Flap Extended Speed is the speed at which the airplane can be flown with its flaps fully extended Top of the White Arc

V_{GS0}	Best Power-Off Glide Speed Landing Configuration is the speed that provides the maximum lift-to-drag ratio in the landing configuration and thus the greatest gliding distance available
V_{GS1}	Best Power-Off Glide Speed Clean Configuration is the speed that provides the maximum lift-to-drag ratio in a clean configuration and thus the greatest gliding distance available
V_{NE}	Never Exceed Speed is the speed that may not be exceeded at any time Red Line
V_{NO}	Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air and only with caution Yellow Arc Range
V_{S0}	Stalling Speed Landing Configuration is the stall speed or minimum steady flight speed for which the aircraft is still controllable in the Landing configuration (Full Flaps) Bottom of White Arc
V_{S1}	Stalling Speed Clean Configuration is the stall speed or minimum steady flight speed for which the aircraft is still controllable in a clean configuration Bottom of Green Arc
V_X	Best Angle of Climb Speed is the speed which delivers the greatest gain of altitude in the shortest horizontal distance
V_Y	Best Rate of Climb Speed is the speed which delivers the greatest gain in altitude in the shortest time

2 LIMITATIONS

2.1 GENERAL

This airplane must be operated as a Normal Category airplane in compliance with the operating limitations stated in the form of placards and markings and those given in this section.

2.2 AIRSPEED LIMITATIONS[1]

Description	Abbr.	Value
Never Exceed Speed Do not exceed the lower of V_{NE} KIAS or V_{NE} KTAS (Dynon Skyview AHARS calculates V_{NE} KTAS to reduce with increase in density altitude) under any circumstances	$\mathbf{V_{NE}}$	182 KIAS or 182 KTAS
Maximum Structural Cruising Speed (Start of YELLOW ARC)	$\mathbf{V_{NO}}$	156 KIAS
Maximum Manoeuvring Speed	$\mathbf{V_A}$	102 KIAS
Maximum Flap Extended Speed	$\mathbf{V_{FE}}$	(15° Flap) 86 KIAS (32° Flap) 78 KIAS
Best Power-Off Glide Speed Clean Configuration	$\mathbf{V_{GS1}}$	80 KIAS
Best Power-Off Glide Speed Landing Configuration	$\mathbf{V_{GS0}}$	70 KIAS
Best Rate of Climb Speed	$\mathbf{V_Y}$	76 KIAS
Best Angle of Climb Speed	$\mathbf{V_X}$	66 KIAS
Stalling Speed Clean Configuration (MTOW)	$\mathbf{V_{S1}}$	49 KIAS
Stalling Speed Landing Configuration (MTOW)	$\mathbf{V_{S0}}$	44 KIAS
Turbulence Penetration Speed Range (Recommended)	$\mathbf{V_b}$	86 to 102 KIAS
Maximum Crosswind Component (Recommended)	-	15 KTS

[1] Source: Information provided by builder and/or Van's Aircraft
https://www.vansaircraft.com/wp-content/uploads/2019/02/speeds.pdf

2.3 AIRSPEED INDICATOR / SKYVIEW RANGES

MARKING		KIAS
Red Line	**(Never Exceed)**	**182**

Note
Dynon Skyview Vne (Never Exceed) Line is expressed as KTAS

Yellow Arc	**(Caution Range - Smooth Air Only)**	**156 to 182**
Green Arc	**(Normal Operating Range)**	**49 to 156**
White Arc	**(Flaps 30 or FULL)**	**44 to 78**

Figure 3 – LAT Analogue Airspeed Indicator with True Airspeed slide rule

(to use true airspeed set pressure altitude opposite outside air temperature)

2.4 POWERPLANT LIMITATIONS

(a) Number of Engines	1
(b) Engine Manufacturer	Lycoming
(c) Engine Model No.	O-320-D2G
(d) Engine Operating Limits	
(i) Maximum Horsepower	160
(ii) Maximum Rotation Speed (RPM) (propeller limitation)	2600
(iii) Maximum Oil Temperature	245°F
(e) Cylinder Head Temperatures	
Leaned for Best Economy	<400°F
Leaned for Best Performance	<435°F
Maximum (red line)	450°F
(f) Oil Pressure	
Idling	25 PSI
Minimum (red line)	60 PSI
Maximum (red line)	95 PSI
(g) Fuel Pressure	
Minimum (red line)	0.5 PSI
Desired	3.0 PSI
Maximum (red line)	8.0 PSI
(h) Fuel (AVGAS ONLY)	
(minimum grade)	100LL Aviation Grade
(i) Number of Propellers	1
(j) Propeller Manufacturer	Sensenich
(k) Propeller Model	70CM7-S9-0-81
(l) Propeller Diameter	
Minimum	68 IN.
Maximum	70 IN.
(m) Static RPM at Full Throttle (Observed)	**2150 RPM**

2.5 POWERPLANT SKYVIEW RANGES

(a) Tachometer (RPM)	
Green Arc (Normal Operating Range)	0000 to 2499
Yellow Arc (Caution Range)	2500 to 2599
Red Line (Maximum Continuous Power)	2600
(b) Cylinder Head Temperatures	
Lower Yellow Band (Caution Range)	100 to 149°F
Clear Band (Normal Operating Range)	150 to 434°F
Upper Yellow Band (Caution Range)	435 to 449°F
Red Line (Maximum)	450°F
(c) Exhaust Gas Temperatures	
Clear Band (Normal Operating Range)	0800 to 1500°F
Yellow Band (Caution Range)	1501 to 1550°F
Red Line (Maximum)	1551°F
(d) Oil Temperature	
Lower Yellow Band (Caution Range)	060 to 144°F
Clear Band (Normal Operating Range)	145 to 224°F
Upper Yellow Band (Caution Range)	225 to 234°F
Red Line (Maximum)	235°F

(e) Oil Pressure

Lower Red Line (Minimum Normal Operating)	00 to 24 PSI
Note: Minimum Idle pressure is 25PSI. Minimum flight pressure is 60PSI.	
Lower Yellow Band (Caution Range)	25 to 59 PSI
Clear Band (Normal Operating Range)	60 to 84 PSI
Upper Yellow Band (Caution Range)	85 to 89 PSI
Red Line (Maximum Continuous)	90 PSI

(f) Fuel Pressure

Lower Red Line (Minimum Normal Operating)	0.0 to 0.5 PSI
Lower Yellow Band (Caution Range)	0.6 to 0.9 PSI
Clear Band (Normal Operating Range)	1.0 to 7.9 PSI
Red Line (Maximum Continuous)	8.0 PSI

2.6 WEIGHT AND BALANCE

	Normal
(a) Maximum Weight	794 KGS
(b) Maximum Ramp Weight	794 KGS
(c) Maximum Weight on Nosewheel	147 KGS
(d) Maximum Baggage	34 KGS

2.7 CENTRE OF GRAVITY LIMITS

(a) Normal Category

Weight Kilograms	Forward Limit Millimetres Aft of Datum	Rearward Limit Millimetres Aft of Datum
794	1980	2155

NOTE

The datum used is 70" (1778 mm) forward of the Wing Leading Edge.
It is the responsibility of the PIC to ensure the airplane is properly loaded.
See Section 6 WEIGHT & BALANCE

2.8 MANEUVER LIMITS & FLIGHT LOAD FACTORS

(a) Normal Category - All aerobatic manoeuvres including spins are prohibited.

Positive Load Factor (Maximum)	+3.8 G
Negative Load Factor (Maximum)	-1.5 G

2.9 OPERATING RESTRICTIONS

This aircraft may be operated only PRIVATELY under the DAY VFR.
This aircraft is **not approved** for aerobatics.
This aircraft is **not approved** for spins or spin training.
This aircraft is **not approved** for Night Flight (NVFR).
This aircraft is **not approved** for Instrument Flight Rules (IFR).

2.10 NO SMOKING

Smoking is **not permitted** at any time in the aircraft
Smoking is **not permitted** any time inside the club hangar
Smoking is **not permitted** any time airside at Jandakot Airport including inside vehicles

2.11 FUEL LIMITATIONS

(a) Total Capacity 136 LTS
(b) Total Measurable Capacity (using calibrated dipstick provided) 130 LTS

CAUTION

Usable and Unusable quantities are not specified by the airframe designer or manufacturer. Fuel tank calibration has shown that the majority of fuel stored in the left- and right-wing tanks can be drained. This has not been verified in flight.

Dynon Skyview Fuel Quantity System Warning Indications account for 60 minutes Total Fuel Quantity Remaining (15 litres per tank) at a burn rate of 30 LPH at 55% Rated HP. This has been set for awareness purposes and in no way represents an assumption of liability on any person or any member of the University Flying Club.

Furthermore, Dynon Skyview Fuel Tank Quantity Indications are to be considered a guide only and does not absolve the PIC of the responsibility to maintain vigilance of fuel remaining by a robust method of calculation.

The fuel dipstick is unique to each tank and is calibrated to measure in 5-litre increments between 20 to 65 litres, giving a Total Measurable Capacity between 40 to 130 litres.

With respect to the information given here it is the sole responsibility of the PIC to determine a safe and acceptable minimum quantity of fuel for the purpose of flight, and to measure the quantity available in each tank with the fuel dipstick provided prior to flight.

2.12 PLACARDS

Part 91 Manual of Standards Extract Below:

CHAPTER 27 EXPERIMENTAL AND LIGHT SPORT AIRCRAFT PLACARDS

27.01 Experimental aircraft — placards

(1) For subparagraph 91.875 (2) (i) (iii), this section prescribes the requirements for a placard that must be displayed inside an experimental aircraft carrying one or more passengers.

(2) The placard must:

(a) be displayed in full view of the passengers; and

(b) contain the text set out in subsection (3).

(3) For subsection (2), the text is:

WARNING

PERSONS FLY IN THIS AIRCRAFT AT THEIR OWN RISK.

THIS AIRCRAFT IS NOT OPERATED TO THE SAME SAFETY STANDARDS AS A NORMAL COMMERCIAL PASSENGER FLIGHT.

CASA DOES NOT SET AIRWORTHINESS STANDARDS FOR EXPERIMENTAL AIRCRAFT.

2.13 PASSENGER BRIEF EXAMPLE

The civil air regulations require the PIC of an experimental aircraft to notify each passenger before boarding that the design, manufacture and airworthiness of the aircraft are not required to meet any standards recognised by CASA – Refer to Part 91.875.

"Here's what I need to tell you about this aeroplane before we get in:

This is an Experimental aircraft
(point out the big Experimental sticker)

We have a passenger warning placard fitted.
(point out the placard)

The design, manufacture and airworthiness of the aircraft is not required to meet any standards recognised by CASA. Persons fly in the aircraft at their own risk.

Do you understand and accept all that?
Do you have any questions?

I will assist you to get in the aircraft, ensure your seat belts are fastened properly, tell you how to get back out of the aircraft, advise any required actions in the event of an emergency, and finally, tell you more about the flight we are about to go on."

3 EMERGENCY PROCEDURES

3.1 GENERAL

The recommended procedures for coping with various types of emergencies and critical situations are provided by the section.

These procedures are suggested as a course of action for coping with the particular condition described, but are not a substitute for sound judgement and common sense. Pilots should familiarise themselves with the procedures given in this section and be prepared to take appropriate action should an emergency arise.

It is suggested that the pilot review standard emergency procedures periodically to remain proficient in them.

3.2 AIRSPEEDS FOR SAFE OPERATION[2]

STALL SPEEDS	
794 kgs (Full Flaps, V_{S0})	44 KIAS
794 kgs (0° Flaps, V_{S1})	49 KIAS
POWER OFF GLIDE SPEED	
794 kgs (Full Flaps, V_{GS0})	70 KIAS
794 kgs (0° Flaps, V_{GS1})	80 KIAS
MANEUVERING SPEED	
794 kgs (Maximum Gross Weight, V_A)	102 KIAS
NEVER EXCEED SPEED	
Never Exceed Speed (Sea Level, ISA Conditions, V_{NE})	182 KIAS

[2] Source: Information provided by builder and/or Van's Aircraft
https://www.vansaircraft.com/wp-content/uploads/2019/02/speeds.pdf

3.3 EMERGENCY PROCEDURES CHECKLIST[3]

3.3.1 Engine Failure

DURING TAKEOFF ROLL

1. Throttle……. IDLE
2. Brakes…….. APPLY
3. Ignition Switches…….OFF
4. BATT / ALT Switch….OFF

AFTER TAKEOFF

1. Airspeed…….. FULL FLAPS 70 KIAS
   ……... NO FLAPS 80 KIAS
2. Fuel Selector……...OFF
3. Ignition Switches…….OFF
4. Flaps…….AS REQUIRED
5. BATT / ALT Switch….OFF

DURING FLIGHT

1. Airspeed…….. FULL FLAPS 70 KIAS
   ……... NO FLAPS 80 KIAS
1. Fuel Selector……...SWITCH TANK
2. Fuel Pump……... ON
3. Mixture……..EXERCISE FULL RANGE THEN FULL RICH
4. Carb Heat…….EXERCISE FULL RANGE THEN HEAT ON
5. Throttle……. EXERCISE FULL RANGE THEN IDLE SET
6. Start Button……. PUSH
7. Transponder…… 7700

[3] Source: Builder supplied information

3.3.2 Engine Fire

ON GROUND

1. Start Button……. PUSH MINIMUM 30 SECS

If engine starts:

2. Power……... SET 1700 RPM FOR A FEW MINUTES
3. Mixture……...IDLE CUTOFF
4. Fire Extinguisher…….OBTAIN
5. Engine…….. SECURE
6. Fire Extinguisher…….ACTIVATE IF REQ
7. Evacuate……. IF REQUIRED

If engine fails to start:

1. Throttle……. FULL OPEN
2. Start Button……. HOLD ON
3. Fire Extinguisher…….OBTAIN & ACTIVATE IF REQ
4. Engine…….. SECURE
5. Evacuate……. IF REQUIRED

IN FLIGHT

1. Fuel Selector……... OFF
2. Mixture……. IDLE CUTOFF
3. Electrical Systems….. CONSIDER
4. Air / Heat Vents……... CLOSE
5. Fire Extinguisher……. ACTIVATE IF REQ
6. Transponder…… 7700
7. **LAND IMMEDIATELY**

3.3.3 Cabin or Electrical Fire

ON GROUND

1. Electrical Systems…..OFF
2. Fuel Systems……. OFF
3. Air / Heat Vents……...CLOSE ALL
4. Fire Extinguisher…….ACTIVATE
5. Evacuate……. IF REQUIRED

IN FLIGHT

1. Electrical Systems…..OFF
2. Fuel Systems…….. CONSIDER
3. Air / Heat Vents……...CLOSE ALL
4. Fire Extinguisher…….ACTIVATE
5. **LAND IMMEDIATELY**

3.3.4 Wing Fire

1. Electrical Systems…..OFF
2. Fuel Systems……. OFF
3. Fire Extinguisher…….ACTIVATE IF REQUIRED
4. Evacuate.……IF REQUIRED

IN FLIGHT

1. External Lighting…….OFF
2. Transponder……7700
3. **LAND IMMEDIATELY**

3.3.5 Alternator Failure

1. Avionics……OFF
2. Master Switch…….OFF
3. Alternator Breaker…..RESET
4. Master Switch…….ON

IF ALTERNATOR IS STILL OFFLINE

1. Alternator Breaker…..OFF
2. Avionics……ON
3. Electrical Loads…….. REDUCE
4. **LAND AS SOON AS POSSIBLE – AIRCRAFT IS ON RESERVE BATTERY POWER ONLY**

3.3.6 High CO Alarm

1. Cabin Heat…….. CLOSE
2. Fresh Air Vents…… OPEN

IF ALARM REMAINS ON:

1. **LAND AS SOON AS POSSIBLE**

4 NORMAL PROCEDURES

4.1 GENERAL

This section describes the normal checklist and procedures for the conduct of normal operations for the Van's RV-9A specific to VH-LAT.

These procedures are provided to present a source of reference and review and to supply information on procedures which are not the same for all aircraft. Pilots should familiarise themselves with the following procedures in order to become proficient in the normal operations of the airplane.

4.2 AIRSPEEDS FOR SAFE OPERATION[4]

STALL SPEEDS	
794 kgs (Full Flaps, V_{S0})	44 KIAS
794 kgs (0° Flaps, V_{S1})	49 KIAS
POWER OFF GLIDE SPEED	
794 kgs (Full Flaps, V_{GS0})	70 KIAS
794 kgs (0° Flaps, V_{GS1})	80 KIAS
MANEUVERING SPEED	
794 kgs (Maximum Gross Weight, V_A)	102 KIAS
NEVER EXCEED SPEED	
Never Exceed Speed (Sea Level, ISA Conditions, V_{NE})	182 KIAS

[4] Source: Information provided by builder and/or Van's Aircraft
https://www.vansaircraft.com/wp-content/uploads/2019/02/speeds.pdf

4.3 LAT CHECKLIST

PRE-FLIGHT	
Aircraft Exterior	Check Condition Thoroughly Fuel / Oil Leaks? Spats + Tires?
Fuel	DRAIN + DIP
Oil Quantity	CHECK MIN 4 QUARTS
Chocks / Ties	REMOVE
Intake Bungs	REMOVE
Pitot Cover	REMOVE
Rudder Lock	REMOVE
External Lighting + Pitot Heat	CHECK
Flight Controls	FULL + FREE

BEFORE START	
Pre-flight	COMPLETED
MR	VAILD + SIGNED
Pax Brief	COMPLETE
Fuel Caps	SECURED
Harness	TIGHTEN
Fuel Selector	FULLEST
Circuit Breakers	CHECK IN
Master (Bat+Alt)	ON
Dynon	POWERING ON

STARTING ENGINE	
Brakes	ON
Mixture	RICH
Fuel Pump	ON & GREEN For 3 seconds
Fuel Pump	OFF
Only If Engine Cold:	
Throttle	5 PUMPS
Throttle	1/4 INCH
Left Mag	ON
Area	CLEAR
Engine	START Crank up to 10 seconds
Right Mag	ON AFTER ENGINE START
Throttle	1000 RPM

AFTER START	
Oil Pressure	GREEN
Volts + Amps	14V, AMPS GREEN
Avionics	ON + SET
Flaps	UP
Mixture	LEAN (6-7 LPH)
Nav Lights	ON

TAXI	
Fuel Selector	SWITCH FOR TAXI
Brakes	CHECK
Directional Instruments	CHECK

ENGINE RUNUP	
Brakes	ON
Mixture	RICH
Fuel Selector	FULLEST
Throttle	2000 RPM
Mags	L + R CHECKED Max Drop 150 RPM Max Diff. 50 RPM
Carby Heat	>10 RPM DROP
Engine T + P	CHECK
Volts + Amps	CHECK
Low Idle	600-800 RPM
Throttle	1000 RPM

BEFORE TAKEOFF	
Mixture	RICH
Mags	BOTH ON
Elevator Trim	SLIGHTLY AFT
Aileron Trim	NEUTRAL
Flaps	SET 0 OR 15
Pitot Heat	AS REQUIRED
Instruments	SET
Fuel Pump	ON
Flight Controls	FULL + FREE
Canopy	LOCKED
Safety Brief	COMPLETE

HOLDING POINT	
Mixture	RICH
Fuel Pump	ON
Lights + Strobes	ON
Transponder	CHECK
Canopy	LOCKED

AFTER TAKEOFF	
300’ Flaps	UP
1000’ Fuel Pump	OFF
Fuel Pressure	CHECK
Landing Lights	OFF

CRUISE	
Compass	CHECK
Log	UPDATE
Engine	T + P
Altimetry	CHECK
Radios	CHECK + SET
Orientate	DO
Fuel	CONSIDER
Forced Landing	HAVE A PLAN

PRE-LANDING	
Autopilot	OFF
Brakes	CHECK
Mags	BOTH ON
Mixture	RICH
Fuel Selector	FULLEST
Fuel Pump	ON
Landing Lights	ON
Harness	TIGHT

FINAL	
Flaps	<78 KIAS, FULL
Speed	65 KIAS
Carby Heat	OFF

AFTER LANDING	
Elevator Trim	NEUTRAL
Fuel Pump	OFF
Flaps	UP
Transponder	STBY
Mixture	LEAN (6-7 LPH)
Strobe Lights	OFF
Landing Lights	OFF
Pitot Heat	OFF

SHUTDOWN	
Avionics	OFF
Flaps	FULL DOWN
Throttle	1000 RPM
Mixture	IDLE CUTOFF
Propeller	STOPPED
Mags	BOTH OFF
All Switches	OFF

ENGINE FAILURE AFTER TAKEOFF	
Airspeed	70 FLAPS FULL 80 FLAPS UP
Fuel Selector	OFF
Mixture	IDLE CUT OFF
Ignition Switches	OFF
Flaps	AS REQUIRED
Master (Bat+Alt)	OFF

ENGINE FAILURE IN FLIGHT	
Airspeed	80 FLAPS UP
Fuel Selector	SWITCH TANK
Fuel Pump	ON
Mixture	EXERCISE + RICH
Carb Heat	EXERCISE + ON
Throttle	EXERCISE + IDLE SET
Starter Button	PUSH
Radios	7700 + DECLARE EM

WING FIRE IN FLIGHT	
External Lighting	OFF
Radios	7700 + DECLARE EM
LAND IMMEDIATELY	

ENGINE FIRE IN FLIGHT	
Fuel Selector	OFF
Mixture	IDLE CUTOFF
Electrical Systems	CONSIDER
Air / Heat Vents	CLOSE
Fire Extinguisher	USE IF REQD
Radios	7700 + DECLARE EM
LAND IMMEDIATELY	

ENGINE FIRE ON GROUND	
Starter	PUSH MIN 30 SEC
IF ENGINE STARTS:	
Power	1700 (60sec)
Mixture	IDLE CUTOFF
Engine	SECURE
Fire Extinguisher	USE IF REQD
IF ENGINE FAIL TO START:	
Throttle	FULL
Starter	KEEP CRANKING (30sec)
Engine	SECURE
Fire Extinguisher	USE IF REQD

CABIN OR ELECTRICAL FIRE ON GROUND	
Electrical Systems	OFF
Fuel Systems	OFF
Air / Heat Vents	CLOSE ALL
Fire Extinguisher	USE IF REQD

CABIN OR ELECTRICAL FIRE IN FLIGHT	
Electrical Systems	OFF
Fuel Systems	CONSIDER
Air / Heat Vents	CLOSE ALL
Fire Extinguisher	USE IF REQD
LAND IMMEDIATELY	

ALTERNATOR FAILURE	
Avionics	OFF
Master Switch	OFF
Alternator Breaker	RESET
Master Switch	ON
IF ALTERNATOR STILL IS OFFLINE	
Alternator Breaker	OFF
Avionics	ON
Electrical Loads	REDUCE
Land	ASAP

HIGH CO ALARM	
Cabin Heat	CLOSE
Fresh Air Vents	OPEN
IF ALARM REMAINS: Land ASAP	

AIRSPEEDS	KIAS
Best Glide Clean	80
Best Glide Flaps	70
Vy	76
Vx	66
Vne	182
Vno	156
Va	102
Flaps 15	86
Flaps 30	78
Vso / Vs	44 / 49
IN THE CIRCUIT	
Base	75
Final	65
Add 5KT to base and final if flapless	

5 PERFORMANCE

5.1 RV-9A PERFORMANCE

- The RV-9A information published on Van's Aircraft Website and in various online publications is based on a Hartzell Constant Speed Propeller.

- VH-LAT has a Sensenich fixed pitch propeller and therefore landing and take-off distances will be greater than the figures Van's Aircraft have provided and climb rates will be lower.

- Guidance from Van's Aircraft technical department is to add at least 30% distance to the take-off run along with about the same reduction in climb rate at lower speeds (100 kts) with the difference declining as speed increases.

- Environmental conditions and airframe/engine handling technique may affect these values.

- It is the PICs responsibility to make an in-flight assessment that actual performance matches the planned performance before proceeding with any flight beyond which a safe return to the original point of departure can no longer be executed.

5.2 MINIMUM RECOMMENDED RUNWAY DISTANCES

- Experimental aircraft do not come with comprehensive take-off and landing charts.

- The information provided by Van's Aircraft on their website is based on a Constant Speed propeller and is therefore not accurate for VH-LAT.

- Pilots are required to make their own judgment on the minimum runway distance suitable for their intended operation.

- **The club recommends the following runway distance minimums assuming that no obstacles are in the immediate departure or arrival path:**
    - Sealed and Gravel Runways: 600m
    - Grass Runways: 800m
        - Particular care must be observed on short wet grass runways.
        - Correct short field take-off technique is critical.
- **Estimated accelerate – fly 5 seconds – land and stop distance:**
  1000m (3280 feet)

- Important Note: No soft field or rough runway operations are permitted in VH-LAT.

5.3 PLANNED PERFORMANCE

MTOW: 140 KTAS at 8500 feet with 35 Litres per hour fuel burn.

Table 1 – Planned performance in LAT

	Power RPM	Mixture	Speed (KIAS or KTAS)	Fuel Burn (LPH)	ROC or ROD (fpm)
Climb	Full	Rich	80 KIAS	50	1000
Climb	Full	Rich	90 KIAS	50	900
Climb	Full	Rich	100 KIAS	50	700
Climb	Full	Rich	110 KIAS	50	600
Slow Cruise / Circuit	1800	Rich	100 KIAS	26	-
Cruise 65%	**2300**	**Leaned**	**130 KTAS**	**27 to 31**	**-**
Cruise 75%	**2400**	**Leaned**	**140 KTAS**	**31 to 35**	**-**
Cruise Descent	2100	Rich	140 KIAS	~30	500

CAUTION
RV aircraft are easily capable of exceeding V_{NE} during descent

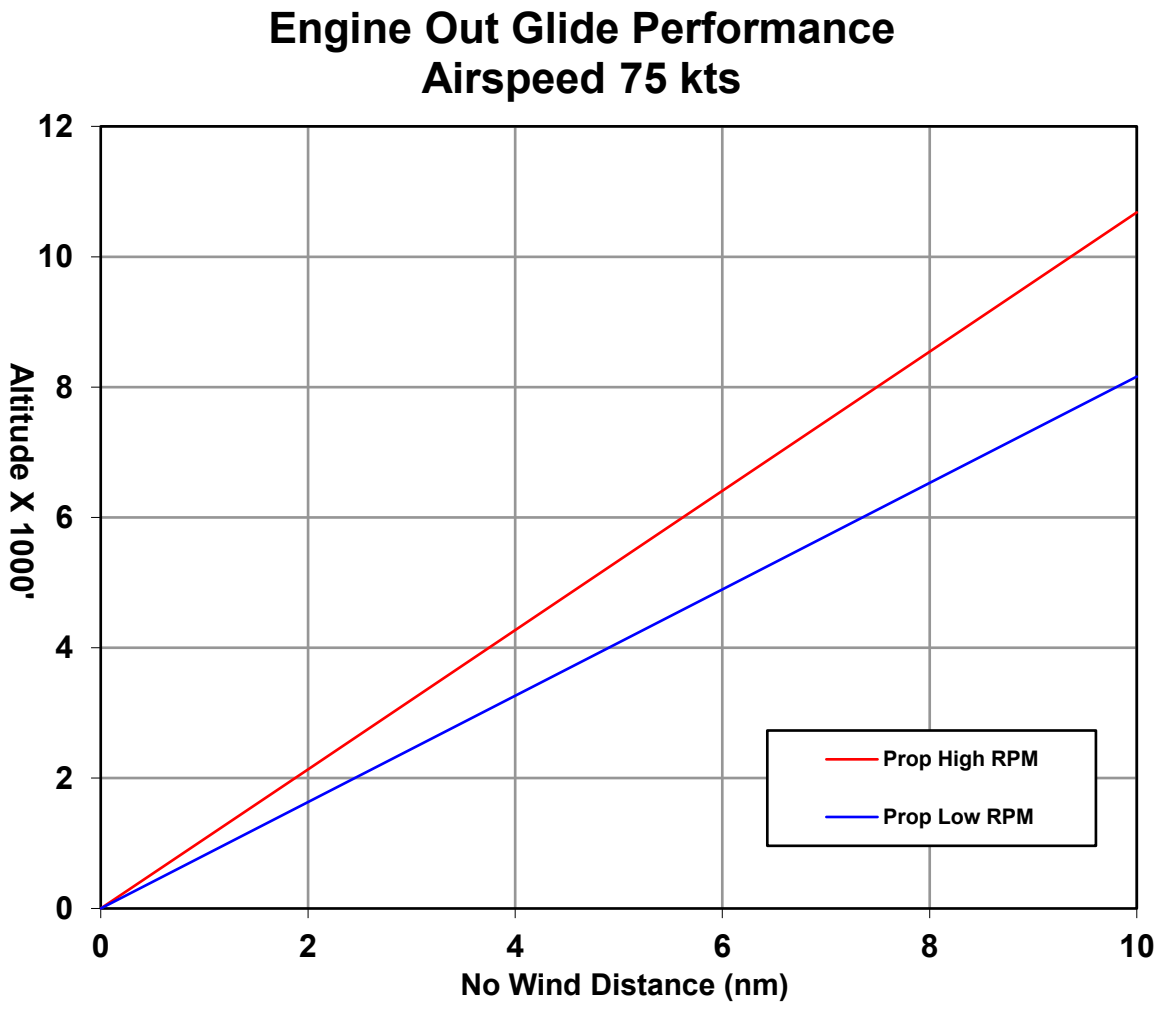
Fixed Reserve:
45 min fixed reserve at 35 L/h fuel flow: 27 L
30 min fixed reserve at 35 L/h fuel flow: 18 L

Slow Flight:
1500 RPM and 70 KIAS with Flaps Up
1600 RPM and 70 KIAS with Flaps 15

Climb Ceiling:
19,000 ft

5.4 ENGINE OUT GLIDE PERFORMANCE[5]

The following figure is provided by Van's Aircraft. Glide performance is based on a Hartzel Constant Speed propeller and is not accurate for VH-LAT which is using a fixed Pitch Sensenich propeller.



This chart is based on a different propeller combination to LAT, it is for reference only and will not be accurate for LAT

Figure 4 – Engine out glide performance 75kts

[5] Source: Van's Aircraft – Constant Speed Propeller data only. Fixed Pitch data not available.

5.5 ENGINE POWER CHARTS[6]

- An extract of the power charts from the Lycoming Manual are included below.
- Always check the latest version of the Engine Manual and verify the below extract is current before use. Source provided in footnote.
- Lycoming extract taken from Part No. 60297-30 3rd Edition October 2006

Table 2 – Engine operating conditions for O-320-D2G (abbreviated)

OPERATING CONDITIONS

Operation	RPM	HP	Fuel Cons. Gal./Hr.	Max. Oil Cons. Qts./Hr.	*Max. Cyl. Head Temp.
		O-320- D Series			
Normal Rated	2700	160	------	.72	500°F (260°C)
Performance Rated (75% Rated)	2450	120	10.0	.40	500°F (260°C)
Economy Cruise (65% Rated)	2350	104	8.8	.35	500°F (260°C)

* - At Bayonet Location – For maximum service life of the engine, maintain cylinder head temperatures between 150°F (66°C) and 435°F (223.86°C) during continuous operation.

Table 3 – O-320-B Series Fuel Flow for a Constant Speed Unit installation.

Highlighted Figures are approximate and to be used as a guide for LAT

FUEL AND POWER CHART LYCOMING MODEL O-320-B SERIES

Press Alt. 1000 Feet	Std. Alt TEMP Deg.C	88 HP 55% Rated Approx Fuel 28.4 Lit. per Hour RPM & MAN. PRESS 2100	2200	2300	2400	104 HP 65% Rated Approx Fuel 32.2 Lit. per Hour RPM & MAN. PRESS 2100	2200	2300	2400	120 HP 75% Rated Approx 37.9 Lit. per Hr. RPM & MAN. PRESS 2200	2300	2400
S.L.	15	21.9	21.0	20.2	19.5	24.2	23.3	22.5	21.7		24.9	24.0
1	13	21.6	20.8	19.9	19.2	23.9	23.0	22.2	21.4		24.6	23.8
2	11	21.3	20.4	19.6	19.0	23.6	22.7	21.9	21.2	25.1	24.3	23.5
3	9	20.9	20.1	19.3	18.7	23.3	22.4	21.7	21.0	24.8	24.0	23.3
4	7	20.6	19.8	19.1	18.5	23.0	22.1	21.4	20.7	24.5	23.7	23.0
5	5	20.3	19.6	18.8	18.3	22.7	21.8	21.1	20.5	F.T.	23.4	22.8
6	3	20.0	19.3	18.6	18.0	22.4	21.5	20.9	20.3		F.T.	22.6
7	1	19.8	19.1	18.3	17.8	22.1	21.2	20.6	20.0			F.T.
8	-1	19.5	18.8	18.1	17.6	F.T.	21.0	20.4	19.8			
9	-3	19.2	18.6	17.8	17.4		F.T.	20.2	19.6			
10	-5	19.0	18.3	17.6	17.2			F.T.	19.4			
11	-7	18.7	18.1	17.4	17.0				F.T.			
12	-9	18.4	17.9	17.2	16.8							
13	-11	F.T.	17.6	17.0	16.6	F.T. = Full Throttle						
14	-13		F.T.	16.8	16.4							
15	-15			F.T	16.2							

Fuel consumption is with carburetor leaned to best power with standard altitude temperature and pressure at carburettor inlet
To maintain constant power, correct manifold pressure add/subtract approximately 1% for each 6 Deg C above/below standard

[6] https://www.lycoming.com/content/operator%27s-manual-O-320-60297-30

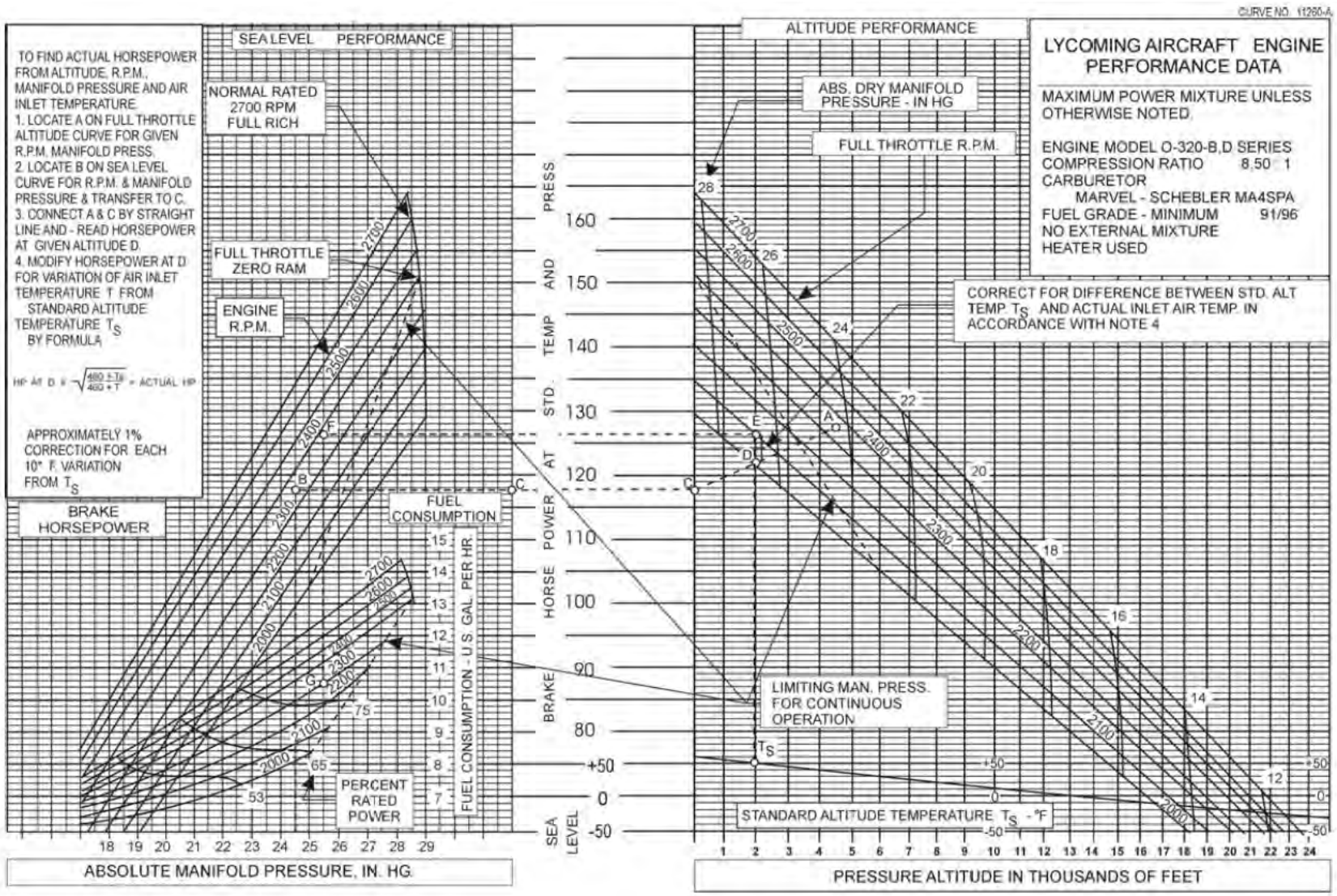


Figure 3-7. Sea Level and Altitude Performance – O-320-B and –D Series (Except O-320-B2D, -B2E, -D2J)

Figure 5 – Lycoming O-320-D engine power chart (sea level and at altitude)

6 WEIGHT & BALANCE

6.1 WEIGHT & BALANCE DATA

Weight and balance data are reproduced from the latest Australian Load Data Sheet issued 7-Nov-08 by Jabiru Aircraft Pty Ltd with indefinite date of expiry. A copy of the original load data sheet is attached in Section 6.3 Current Weight & Balance Documents.

Make:	Van's	Model:	RV-9A
Serial:	90484	Registration:	VH-LAT

Aircraft Empty Weight: 482 kg (1062 lb)

NOTE
Aircraft weight empty in level flight attitude. Includes 8 quarts of oil, no fuel

Maximum Gross Weights: 794 kg (1750 lb)

Datum: 1778mm (70") forward of wing leading edge (LE)

Design CG Range: 1980 to 2155 mm aft of Datum
(77.95 to 84.84" aft of Datum)

15% to 28% of wing chord

7.95" to 14.84" from LE

Fuel	1949.45 mm aft of datum	(76.75")
Pilot and Passenger	2355 mm aft of datum	(92.7")
Baggage	3099 mm aft of datum	(122")

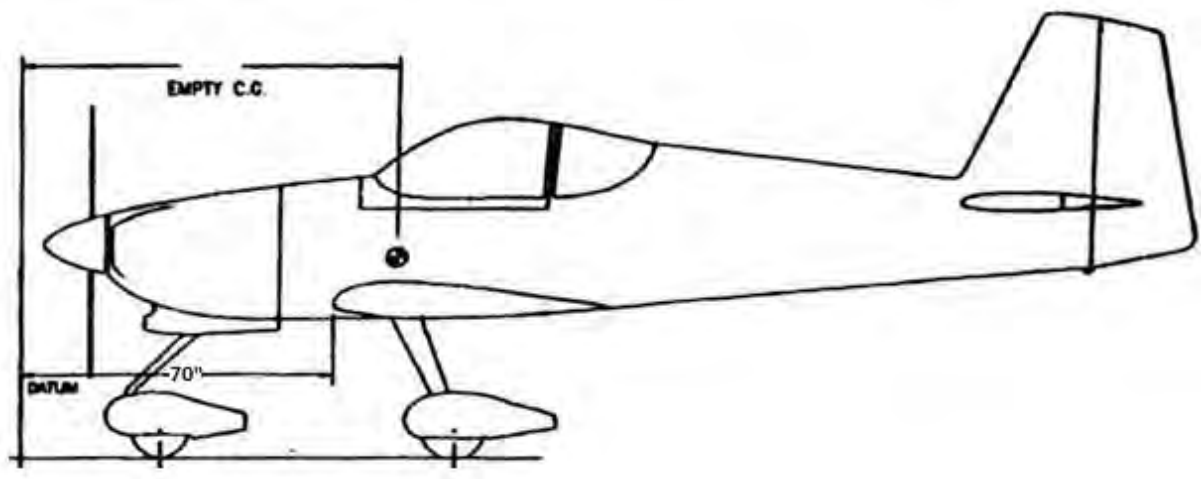


Figure 6 – Datum and empty CG measurement

6.2 FORWARD WEIGHT LIMITATION

The RV-9A has a 325lb / 147kg forward weight limitation due to the nose wheel design. Calculating the weight and balance is a two-step process.

First the pilot must calculate the Gross Weight and CG then verify the nose wheel weight using the chart below.

"Maximum Weight on Nose Wheel (Applicable to RV-9A only) - The weight on the nose wheel varies with both gross weight and CG location and must be checked so as to be sure that it is within limits. Because of the inter-relationship an aircraft with forward CG but low gross weight may place an unacceptably high load on the nosewheel. Use the chart on the last page to calculate the nose wheel weight for a particular CG and gross weight."

Ref: RV9A Van's Builders Manual

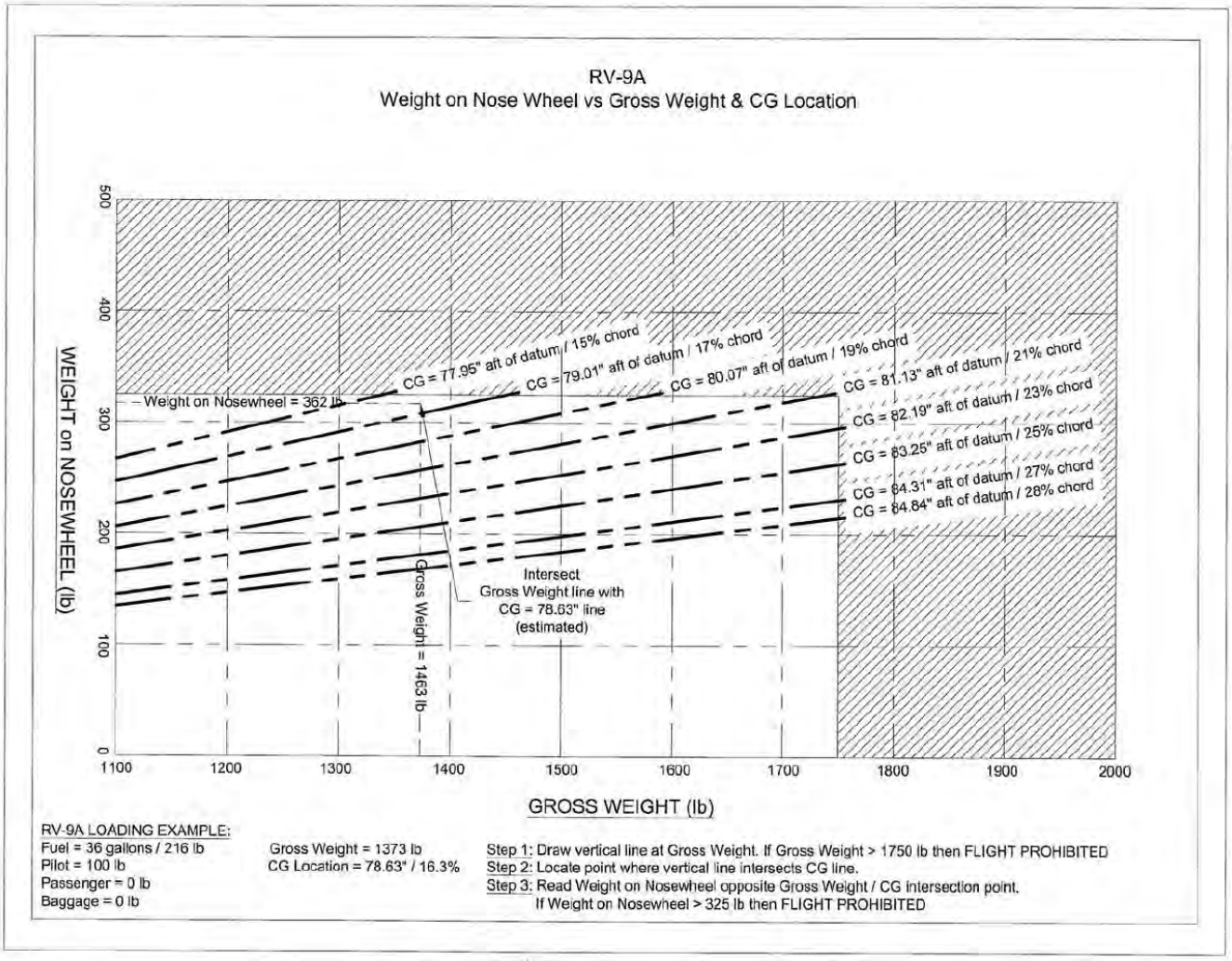
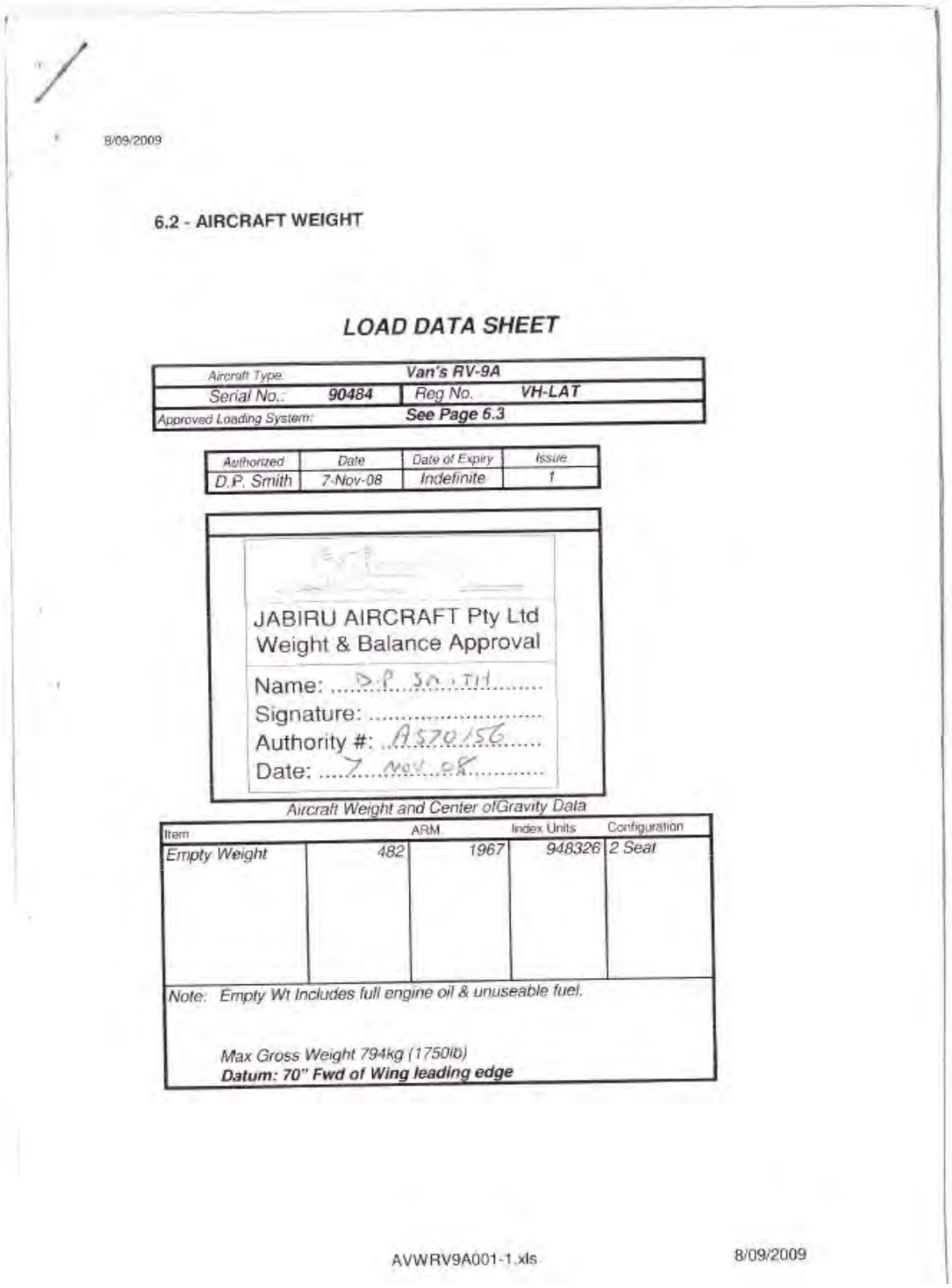


Figure 7 – Weight on nosewheel vs gross weight and CG location

6.3 CURRENT WEIGHT & BALANCE DOCUMENTS



8/09/2009

6.2 - AIRCRAFT WEIGHT

LOAD DATA SHEET

Aircraft Type:	Van's RV-9A		
Serial No.:	90484	Reg No.	VH-LAT
Approved Loading System:	See Page 6.3		

Authorized	Date	Date of Expiry	Issue
D.P. Smith	7-Nov-08	Indefinite	1

JABIRU AIRCRAFT Pty Ltd
Weight & Balance Approval

Name: D.P. SMITH
Signature: .....
Authority #: A570156
Date: 7 NOV 08

Aircraft Weight and Center ofGravity Data

Item		ARM	Index Units	Configuration
Empty Weight	482	1967	948326	2 Seat

Note: Empty Wt Includes full engine oil & unuseable fuel.

Max Gross Weight 794kg (1750lb)
Datum: 70" Fwd of Wing leading edge

AVWRV9A001-1.xls 8/09/2009

Figure 8 – Load sheet page 1 of 3 (copy)

8/09/2009

6.3 - LOADING SYSTEM

Aircraft Type: Van's RV-9A

Registration: VH-LAT S/No.: 90484

Issue	Date
1	7-Nov-08

Load the aircraft in accordance with the load table shown below.
The load table is to be used as follows:

1. Refer to the current Weight & Balance Record for the current starting weight & arm
2. Calculate the item moment by multiplying the item weight with the corresponding item arm
3. Sum the weights & moments to find the totals.
4. Divide the total moment by the total weight to obtain the total arm.
5. Ensure the arm falls within the range:

1980 - 2155mm aft of Datum
(77.95 - 84.84 inches aft of Datum)

6. Ensure the total weight does not exceed **MTOW** limit of **794kg**.

	Weight (kg)	Arm (mm)	Moment (kg.mm)
Empty Weight			
Pilot		2355	
Passenger		2355	
Baggage		3099	
Fuel		1949.45	
Total			

JABIRU AIRCRAFT Pty Ltd
Weight & Balance Approval

Name: D P SMITH
Signature: .....
Authority #: A570156
Date: 7 NOV 08

8/09/2009

Figure 9 – Load sheet page 2 of 3 (copy)

WEIGHT AND BALANCE RECORD

Part A - Weight and Balance Maintenance Data (to be competed by Weight and Balance Control Officer)

Revision & Re-Issue Required: Indefinite

JABIRU AIRCRAFT Pty Ltd
Weight & Balance Approval
Name: D.P. SMITH
Signature: .....
Authority #: A570/156
Date: 7 NOV 08

Weight and Balance Report Reference:

Centre of Gravity Position (CG) is Longitudinal: Measured aft of Datum

Configuration: Van's RV-9A (2 Seat Experimental)

Aircraft Longitudinal Datum: 1778mm (70") Fwd of Wing Leading Edge

	Weight (kg)	Arm (mm)	Index (kg.mm)
Empty Weight & Empty Weight CG Weighing Dated	482	1967	948326

Maximum and Minimum Empty Weight & Empty Weight CG
Revision and Re-Issue by WBCO is Required When Calculated

Running Totals Are	Weight (kg)	Arm (mm)
More Than or	492	1972
Less Than	472	1962

Part B - Record of Empty Weight and Balance Changes. (The person co-ordinating maintenance shall ensure that Part B is calculated and recorded in accordance with CAO 100.7)

Date	Description of Alteration	Moment Arm From Datum (mm)	Weight and Balance Change: Added (+) Weight (kg)	Added (+) Index	Removed (-) Weight (kg)	Removed (-) Index	Running Total of Empty Weight & Empty Weight CG: Weight	Arm (mm)	Index
7-Nov-08							482	1967	948326

Organisation:	David Harney Constructions P/L	Aircraft Type:	Van's RV-9A	Registration:	VH-LAT	Serial No.:	90484

Figure 10 – Load sheet page 3 of 3 (copy)

6.4 WEIGHT AND BALANCE FORM

	Weight (kg)	Arm (mm)	Moment (kg.mm)
Aircraft	482	1967	948,326
Pilot	_____	2355	_____
Passenger	_____	2355	_____
Baggage	_____	3099	_____
Fuel	_____	1949.45	_____
Total	_____		_____

CG = Total Moment / Total Weight

CG = _____ mm aft of datum

CG Range = 1980 to 2155 mm aft of datum

6.5 FULL FUEL, FULL BAGS, MAX CREW WEIGHTS

The first example shows LAT at MTOW with a 90kg pilot, 90kg passenger, maximum 34kg baggage and full fuel. Full Fuel is 136L. AVGAS weighs 0.72kg/L. 136L of AVGAS is 98kg of fuel.

Description	Weight (kg)	Arm (mm)	Moment (kg.mm)
Aircraft	482	1967	948,326
Pilot	90	2355	211,950
Passenger	90	2355	211,950
Baggage	34	3099	105,366
Fuel	98	1949.45	191,046.1
TOTAL	**794**	**2102**	**1,668,638.1**
	CG is 2102 MM aft of datum and within limits		

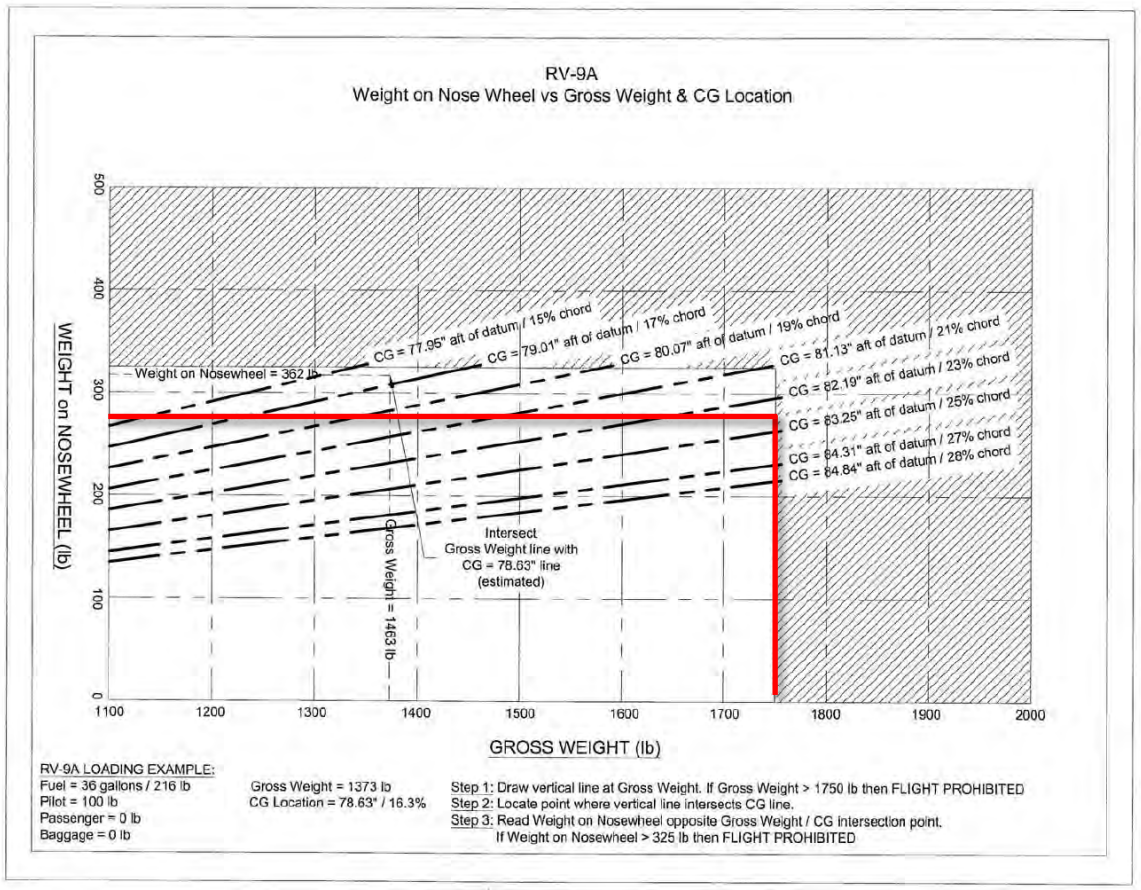


Figure 11 – MTOW example (red line)

To use the chart convert metric units to imperial. 794kg is 1750lb. 2102mm is 82.75". The weight on nosewheel is 270lb (123kg). The aircraft is safe for flight.

6.6 FORWARD CG EXAMPLE

The second example shows LAT with a forward CG with a 55kg pilot, no passenger, no baggage and 40L of fuel (29kg).

Description	Weight (kg)	Arm (mm)	Moment (kg.mm)
Aircraft	482	1967	948,326
Pilot	55	2355	129,525
Passenger	0	2355	0
Baggage	0	3099	0
Fuel	29	1949.45	56,534.1
TOTAL	**566**	**2004**	**1,134,385.1**
	CG is 2004 MM aft of datum and within limits		

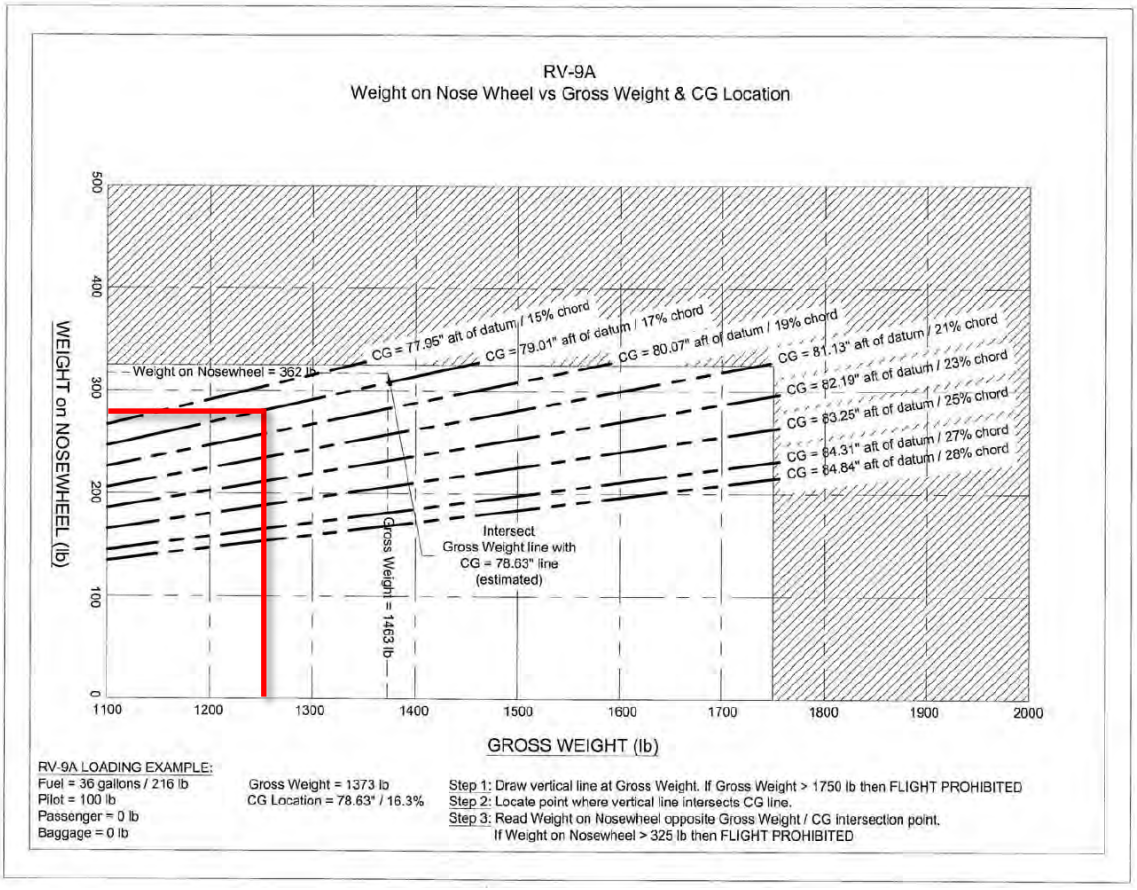


Figure 12 – Forward CG example (red line)

571kg is 1259lb. 2004mm is 78.89".
The weight on nosewheel is 280lb (127kg). The aircraft is safe for flight.

7 DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS

7.1 MINIMUM EQUIPMENT

Private VFR Flight by Day: Part 91 MOS 26.06 & 26.14	
Requirement	**LAT Equipment**
(a) Indicated airspeed	Dynon EFIS or analogue ASI
(b) Pressure altitude	Dynon EFIS or analogue altimeter
(c) Magnetic heading	Dynon EFIS
(d) Time	Dynon EFIS or watch

NOTE

Presently the standby magnetic compass on the roll bar in LAT is not accurate and should not be used as a heading reference. The Dynon EFIS magnetic heading is sufficient for an experimental aircraft to meet the minimum equipment requirements.

7.2 COCKPIT PHOTO

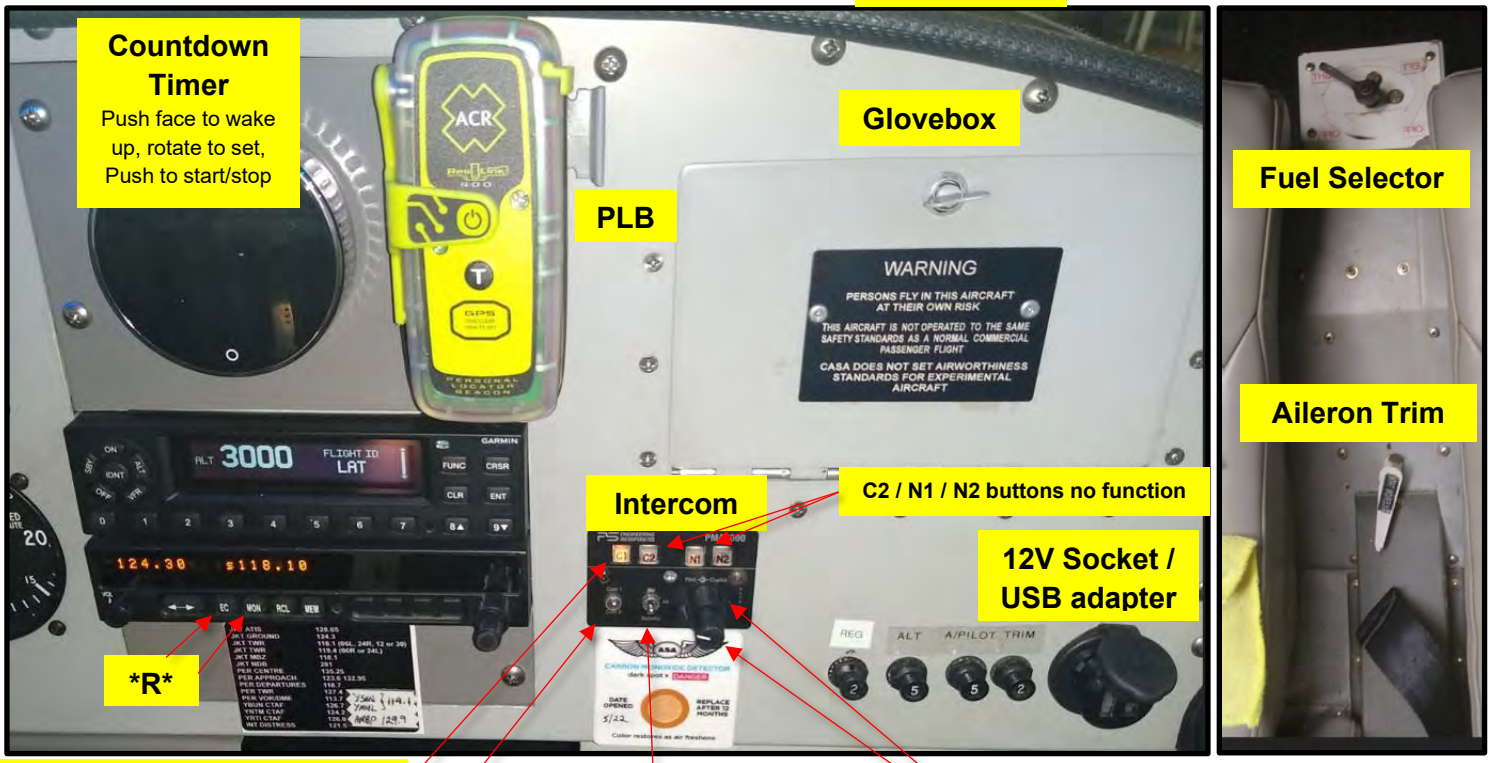


Figure 13 – Cockpit Photo.

7.3 INSTALLED EQUIPMENT

7.3.1 Electrical

12V Socket (USB Adapter)	The 12V car socket has a two port USB adapter fitted
Alternator	B&C LX60 Aircraft Alternator (14 Volt, 60 Amp)
Battery	Concorde (12 Volt) The amount of time the aircraft battery can supply power to the avionics, transponder and radio has not been determined. A conservative estimate is 20 minutes. The aircraft has a battery monitor and a battery charger unit. The battery monitor indicates battery voltage by flashing green, yellow or red status lights. The battery trickle charger can also be used to provide external power when running avionics on the ground for long periods. Use AGM mode.
Circuit Breakers	See photos below
Cockpit Lights	Blue flood lights and white instrument lights controlled by two knobs underneath the magneto switches
Elevator Trim	Elevator trim is electric only and indicated to the left of the analogue ASI. Controlled from the pilot's stick.
Fuse Panel	See photos below. Spare fuses are stored in the flight bag
Magnetos	Slick Magnetos 4370/4373 The aircraft is fitted with individual magneto switches and a push-to-start button. Checklist use will be necessary to guard against inadvertent taxiing or departure on one magneto. **Only the left magneto is used for engine starting (it has an impulse coupling). Never start the engine with the right magneto on. Repeated starting attempts with the right magneto on will cause starter motor and engine damage.** **Note** Conventional key switches as in a C172 also isolate the right magneto for engine start

Figure 14 – TOP: Battery monitor and trickle charge connector located on the firewall. Accessible through the oil flap.

BOTTOM: Trickle charger stored in payment cabinet with the spare headsets.

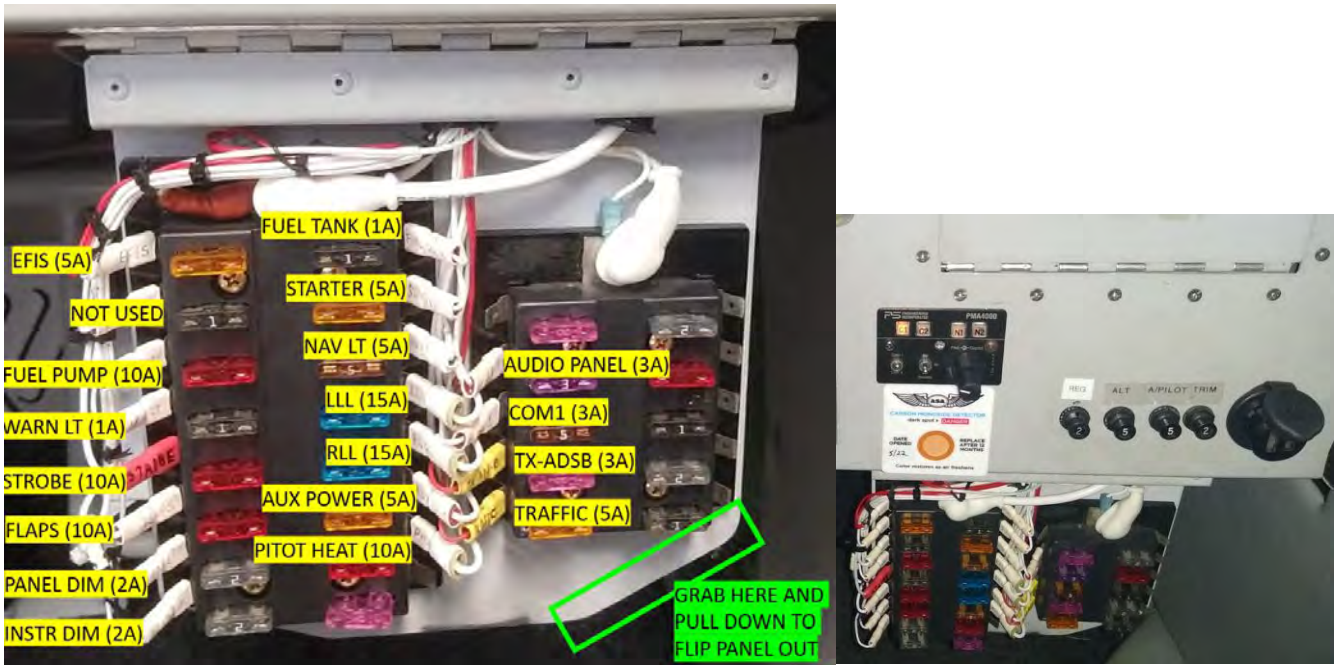


Figure 15 – LEFT: The fuse panel (flips out on passenger side from under dash).

RIGHT: Four panel circuit breakers (Alternator Regulator, Alternator Field, Autopilot, Elevator Trim) plus the aux power (2x USB) with fuse panel below.

7.3.2 Avionics

Click to follow link to the user manual

Autopilot	Trutrak Digiflight VSII The autopilot can be disconnected using the red AP disconnect button on the control stick, pushing in the circular knob on the AP interface or pulling the AP circuit breaker out as a last resort.
EFIS / EMS Battery	Dynon SV-BAT-320 Backup Battery The backup battery will provide power to the Dynon Skyview unit for at least one hour in the event of total loss of electrical power (alternator and aircraft battery failure)
EFIS & EMS	Dynon Skyview Classic D1000 Dynon SV-ADAHRS-200 Air Data/Attitude/Heading Reference System The Dynon Skyview IS NOT a touchscreen. Please do not touch the screen at any time. Please clean the screen when required with a damp clean cloth. **Devices with Avplan or Ozrunways can connect to the Dynon Skyview via WIFI** **WIFI Network Name: SkyView-VHLAT** **WIFI Network Password: 12345678**
Intercom	PS Engineering PMA4000 Intercom
Radio	Garmin SL40 Comm Radio
Standby Instruments	Analogue Airspeed Indicator Analogue Altimeter Analogue Vertical Speed Indicator Magnetic Compass (currently unserviceable)
Transponder	Garmin GTX335 Class 1 1090MHz ADSB “OUT” transponder with a built-in certified WAAS GPS position source

7.3.3 Cabin Equipment

Click to follow link to the user manual

CO Detector	Aithre Shield EX 2.0 Behind-the-Panel Carbon Monoxide Detector – Integrated with Dynon Skyview
Control Lock	Lock the controls when in hangar or away from aircraft. Folded and stored in baggage compartment or the Flight Bag during flight.
Flight Bag & First Aid Kit	Stored in baggage compartment
Fire Extinguisher	Amerex A384T 1.4lb Halotron I Class B C Mounted on seat pillar in baggage compartment
Fuel Dipstick	Stored in glovebox
Fuel Tester	Stored in glovebox
Life Jackets	Two Heli Vest (FAA TSO C13e) life jackets. Pouch pack design buckles around the waist for constant wear. Stored in baggage compartment
Personal Locator Beacon	ACR ResQLink PLB-400. Mounted on dash
Seat Cushions	Two stored in baggage compartment
Sick Bags	Stored in glovebox
Throttle Lock	Stored in glovebox (yellow bag). Key is in white folder

Figure 16 – LEFT: LAT Glovebox contents. RIGHT: Baggage compartment fire extinguisher

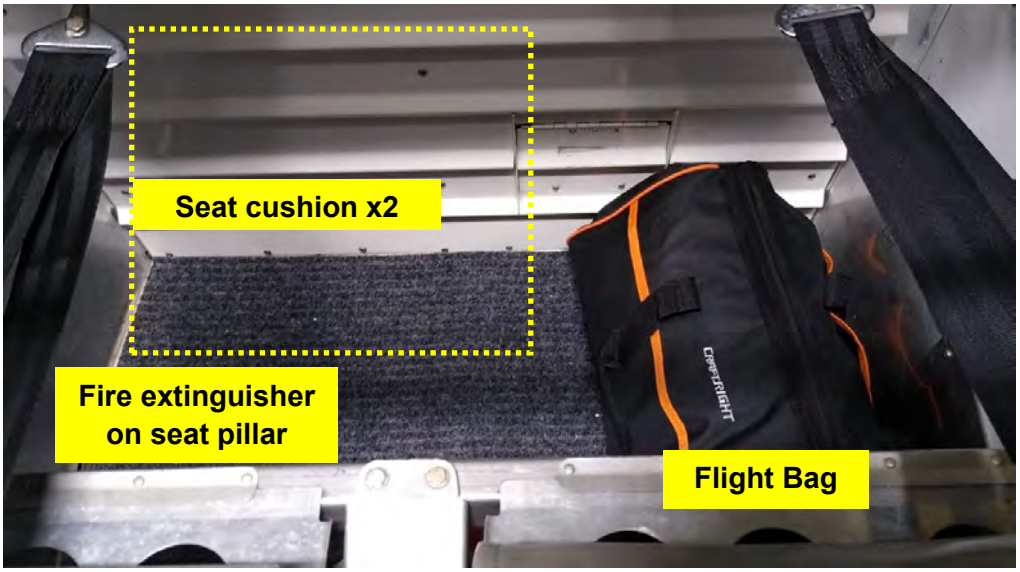


Figure 17 – LAT Baggage compartment contents. Two seat cushions are also kept in the back if not being used.

Figure 18 – Flight Bag Contents

7.3.4 Pitot-Static

- Dynon Heated Angle of Attack Pitot Probe installed on port wing integrated with Dynon Skyview
- Dual flush static ports on the port and starboard side of the fuselage section in front of the horizontal stabiliser

7.4 FUEL SYSTEM

The fuel system consists of two tanks (left and right) controlled by a central fuel switch in between the seats which can be operated in the LEFT, RIGHT or OFF positions. **The fuel selector does not have a detent between the LEFT, RIGHT or OFF positions** so care must be taken to not select the OFF position when changing fuel tanks in flight.

The aircraft has a gascolator on the co-pilots side of the firewall, a mechanical fuel pump and a backup electrical fuel pump that should be operated for take-off, climb and landing – and switched off during cruise. The gascolator is the lowest point in the fuel system.

Each fuel tank has a vent positioned on the lower fuselage just behind the firewall, and a tank drain positioned at the inboard end of each fuel tank underneath the wing.

The fuel selector should be set to the fullest tank for take-off and landing.

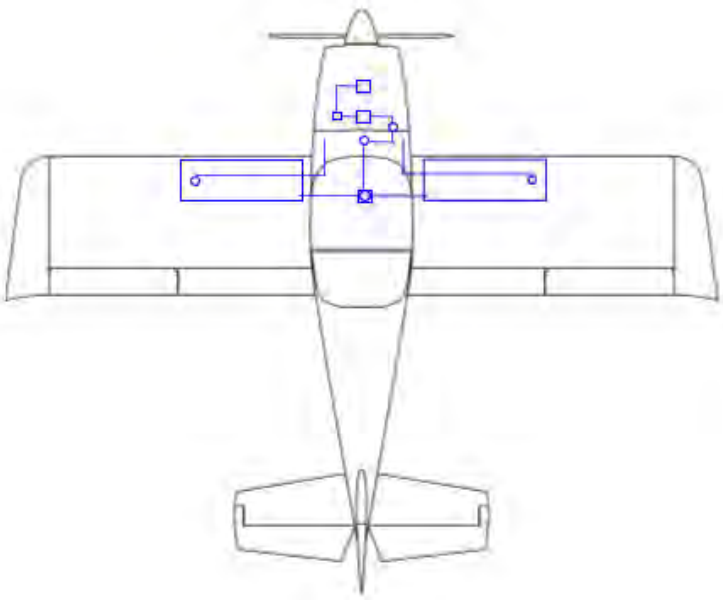


Figure 19 – Fuel system diagram

Figure 20 – Port wing fuel vent next to the transponder aerial

Figure 21 – Hold fuel tester with a slight backward angle to sample the gascolator

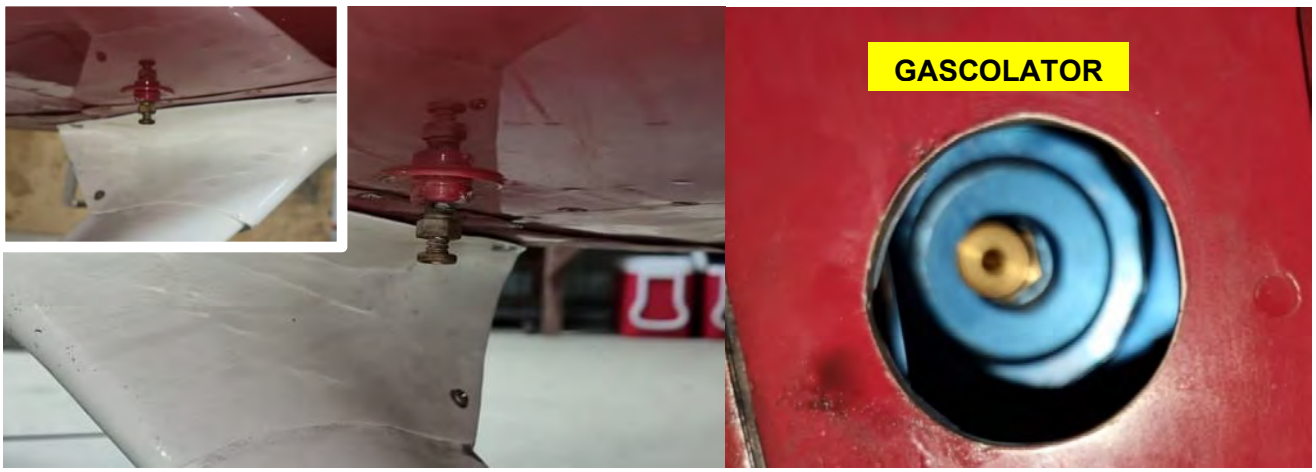


Figure 22 – All three fuel drains are of the same type

7.5 NOSE GEAR CARE[7]

It is critical that all pilots are aware of the correct handling technique for the Van's nosewheel. Please refer to the information below from Vans Aircraft:

Van's emphasizes to pilots that the nose wheel should always be kept as light as possible using aft-elevator during ground operations, and that the aircraft nose gear is not intended to be used in the same manner as main landing gear.

Rather, it is designed to be used when the aircraft is on the ground and the wings have stopped flying. In other words, one should land on the main gear and hold the nose wheel off, and then gently lower the nose wheel when it can no longer be held off the ground.

When taxiing, maintain aft elevator to keep the nosewheel light. This is a common best practice in nearly all tricycle light-aircraft designs.

7.6 OPERATION ON UNSEALED RUNWAYS

Note: No soft field or rough runway operations are permitted in VH-LAT.

7.6.1 Gravel Runways

Where available sealed run-up pads/areas should be used. Run-ups should be conducted while moving when operating on a gravel runway. The pilot should plan the taxi so that the runup can be completed whilst moving.
Do not perform a runup while stationary on a loose surface. Performing a static runup on gravel may damage the propeller, wheel spats and fibreglass components, and may cause damage to the wing leading edge as the propeller can eject loose stones from the gravel surface at high velocity.
Slowly and gradually apply power on the take-off roll
Holding the nose gear off is particularly important on gravel runways. Full elevator backpressure to ensure maximum propeller clearance during taxi operations.

7.6.2 Grass Runways

Pilots are reminded that take-offs distances on grass runways will be higher than from paved runways, especially if the grass is wet. Use flaps 15 for takeoff and lift off into ground effect. Accelerate in level flight in ground effect and climb out.
As grass runways are often undulating it is critical pilots observe the correct Vans piloting technique of holding off the nosewheel as in Section 7.5 Nose Gear Care

[7] https://www.vansaircraft.com/2019/06/new-engine-mount-and-nose-gear-option-for-rv-7a-and-rv-9a-finish-kits/

7.7 ENGINE LEANING

7.7.1 Ground

Lean the engine on the ground to avoid spark plug fouling. Fuel flow approx. 6 to 7 litres per hour at 1000 RPM.
Ensure the mixture is returned to FULL RICH for pre-flight engine run-ups and take-off.

7.7.2 In-Flight[8]

Fuel Mixture Leaning Procedure
Improper fuel/air mixture during flight is responsible for many engine problems, particularly during take-off and climb power settings. The procedures described in this manual provide proper fuel/air mixture when leaning Lycoming engines; they have proven to be both economical and practical by eliminating excessive fuel consumption and reducing damaged parts replacement. It is therefore recommended that operators of all Lycoming aircraft power plants utilize the instructions in this publication any time the fuel/air mixture is adjusted during flight.

Manual leaning may be monitored by exhaust gas temperature indication, fuel flow indication, and by observation of engine speed and/or airspeed. However, whatever instruments are used in monitoring the mixture, the following general rules should be observed by the operator of Lycoming aircraft engines.

General Rules

- Never exceed the maximum red line cylinder head temperature limit.
- For maximum service life, cylinder head temperatures should be maintained below 435°F (224°C) during high performance cruise operation and below 400°F (205°C) for economy cruise powers.
- Maintain mixture control in "Full Rich" position for rated take-off, climb and maximum cruise powers (above approximately 75%). **However, during take-off from high elevation airport or during climb, roughness or loss of power may result from over-richness. In such a case adjust mixture control only enough to obtain smooth operation – not for economy**. Observe instruments for temperature rise. Rough operation due to over-rich fuel/air mixture is most likely to be encountered in carburetted engines at altitude above 5,000 feet.

[8] Extract from LYCOMING OPERATOR'S MANUAL O-320 SERIES OPERATING INSTRUCTIONS Section 3-4.
https://www.lycoming.com/content/operator%27s-manual-O-320-60297-30

- Always return the mixture to full rich before increasing power settings.

- Operate the engine at maximum power mixture for performance cruise powers and at best economy mixture for economy cruise power; unless otherwise specified in the airplane owner's manual.

- During let-down flight operations it may be necessary to manually lean uncompensated carburetted engines to obtain smooth operation.

There are three acceptable techniques to lean the fuel mixture from the Lycoming Operations Manual

1) LEANING TO EXHAUST GAS TEMPERATURE GAGE.

a) Normally aspirated engines with uncompensated carburettors.

i) Maximum Power Cruise (approximately 75% power) – Never lean beyond 150°F on rich side peak EGT unless aircraft operator's manual shows otherwise. Monitor cylinder head temperatures.

In other words: at high power settings greater than 75%, keep the mixture sufficiently rich (MORE than 150°F rich of peak) to provide sufficient cooling for the engine.

ii) Best Economy Cruise (approximately 75% power and below) – Operate at peak EGT, or if desired, drop 50°F on rich side of peak EGT.

2) LEANING TO FLOWMETER.

a) Lean to applicable fuel-flow tables or lean to indicator marked for correct fuel-flow for each power setting.

3) LEANING WITH MANUAL MIXTURE CONTROL (Economy Cruise, 75% power or less, without flowmeter or EGT gage).

a) Slowly move mixture control from "Full Rich" position toward lean position.
b) Continue leaning until engine roughness is noted.
c) Enrich until engine runs smoothly and power is regained.

As shown in Figure 23, if engine speed and throttle setting are kept constant at normal cruise conditions, the effect of leaning on engine power and engine temperatures will be as shown. Power drops rapidly when the engine is leaned beyond peak exhaust gas temperature; also, best power is attained on the rich side of peak exhaust gas temperature.

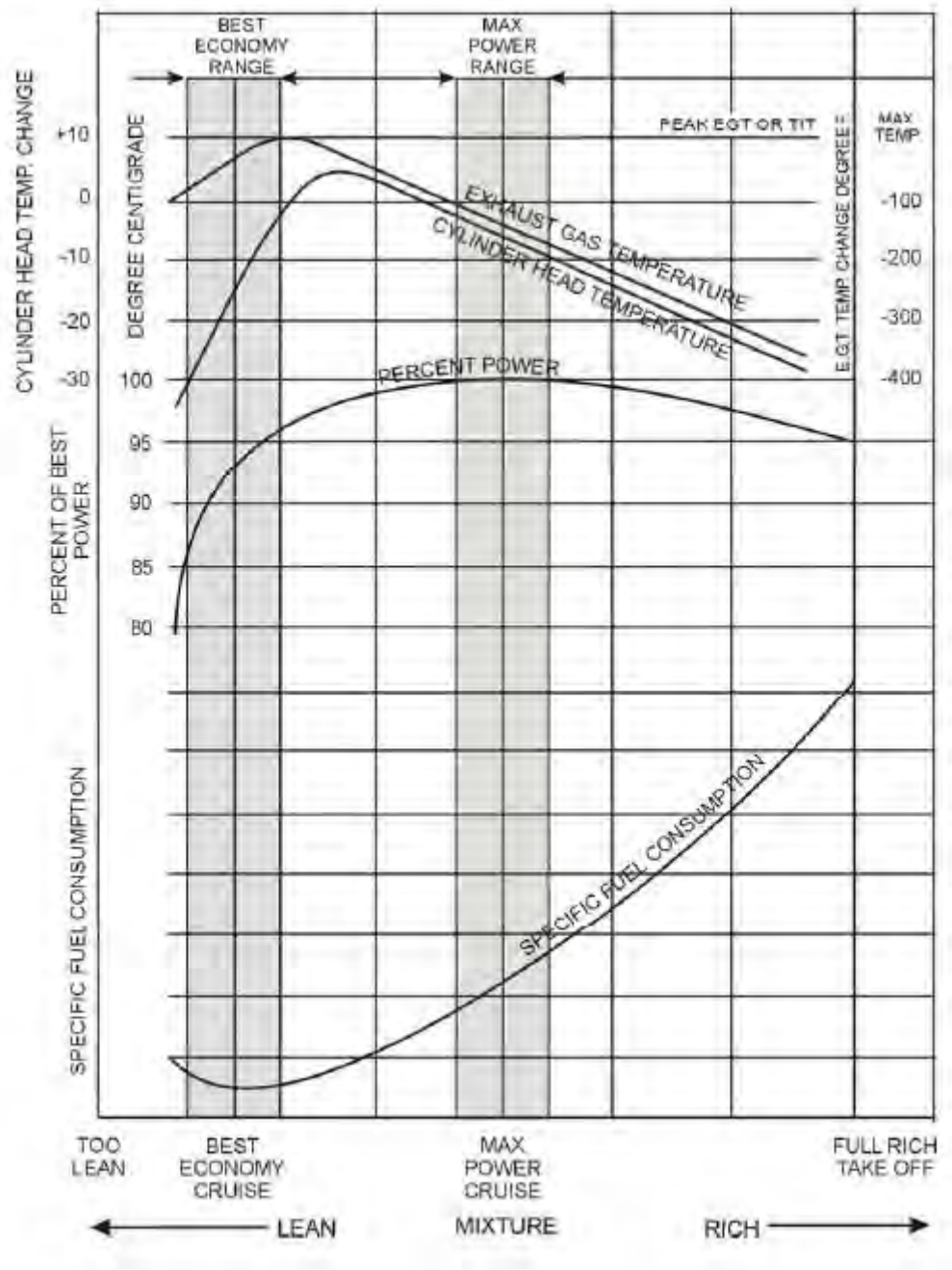


Figure 23 – Representative effect of leaning on CHT, EGT, engine and specific fuel consumption at constant Engine RPM and manifold Pressure[9]

[9] https://www.lycoming.com/content/operator%27s-manual-O-320-60297-30

7.8 AUDIO ALARMS

Due to interference with the intercom system the Dynon Audio alarms are currently disabled.

Please note ALL alarms are currently visual only either via the Skyview System or via the EMS warning light.

7.9 AITHRE SHIELD 2.0 CARBON MONOXIDE (CO) SENSOR

The aircraft is fitted with a behind-the-panel Carbon Monoxide sensor which is integrated with the Dynon Skyview Classic. Further information about the device can be obtained in the Aithre Datasheet[10].

There is no audio alarm.

Figure 24 – LEFT: Aithre Shield 2.0 CO sensor.

RIGHT: CO indication in the engine section

[10] https://drive.google.com/file/d/1YO5Obo4busOssK8kMPKWW5Ndh3CRdX0T/view

7.10 STALL WARNING SYSTEM (ANGLE OF ATTACK)

Visual stall warnings are provided by the Dynon Angle of Attack (AoA) sensor and is displayed on Dynon Skyview. Pilots should familiarise themselves with the operation of the AoA system by reading the Dynon Skyview Pilots User Guide[11].

There is no audio alarm.

Angle of Attack Indicator (Extract from Dynon Manual)

The Angle Of Attack (AOA) Indicator will display only when a Dynon AOA/Pitot probe has been properly installed and calibrated.

During normal flight, the AOA Indicator will display green. As the AOA approaches and then reaches critical, the green and yellow bars will disappear, leaving only red.

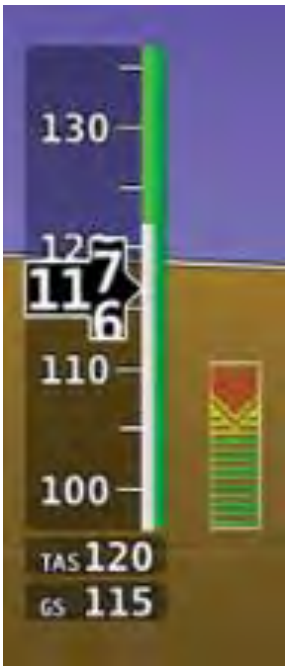


Figure 25 – Angle of attack display next to the airspeed indicator

[11] https://www.dynonavionics.com/skyview-documentation.php - Select Skyview Classic

7.11 CABIN VENTILATION & HEATING

Two separate adjustable vents supply fresh air; one in each corner of the dashboard. Airflow can be adjusted by pushing or pulling the inside of the inlet open or closed.

The cabin heater system operates by allowing ambient air to flow through an exhaust shroud where it is heated before being ducted into the cabin. If an exhaust leak occurs (caused by a crack in the exhaust pipe) in the area surrounded by this shroud it will allow exhaust fumes to mix with the heated ambient air being ducted into the cabin.

Carbon monoxide (CO) is a colourless, odourless, tasteless product of an internal combustion engine and is always present in exhaust fumes. Even minute quantities of carbon monoxide breathed over a long period of time may lead to dire consequences. The symptoms of carbon monoxide poisoning are difficult to detect by the person affected and may include blurred thinking, a feeling of uneasiness, dizziness, headache, and loss of consciousness.

Therefore, if anyone in the cabin smells exhaust fumes, experiences any of the symptoms mentioned above, or the CO warning annunciation comes on when using the cabin heater, immediately turn off the cabin heat and open the air vents. Land as soon as possible if the alarm remains.

Figure 26 – Pilot side air vent with the cabin heating knob next to it

7.12 SEAT ADJUSTMENT

- The seat backrest may be upright or reclined. Check your eye-height with your instructor or check pilot.

- The middle setting (row 2) **with or without an extra seat cushion** on the backrest will provide a comfortable leg distance to the rudder pedals for most people. Make sure you can apply full rudder deflection and the toe brakes.

- To further adjust leg distance to the rudder pedals the seat backrest can be moved fore-aft using the rows of piano hinges on the floor. Row 1 (closest), 2 (middle) and 3 (furthest)

Figure 27 – Seat backrest upright or reclined.

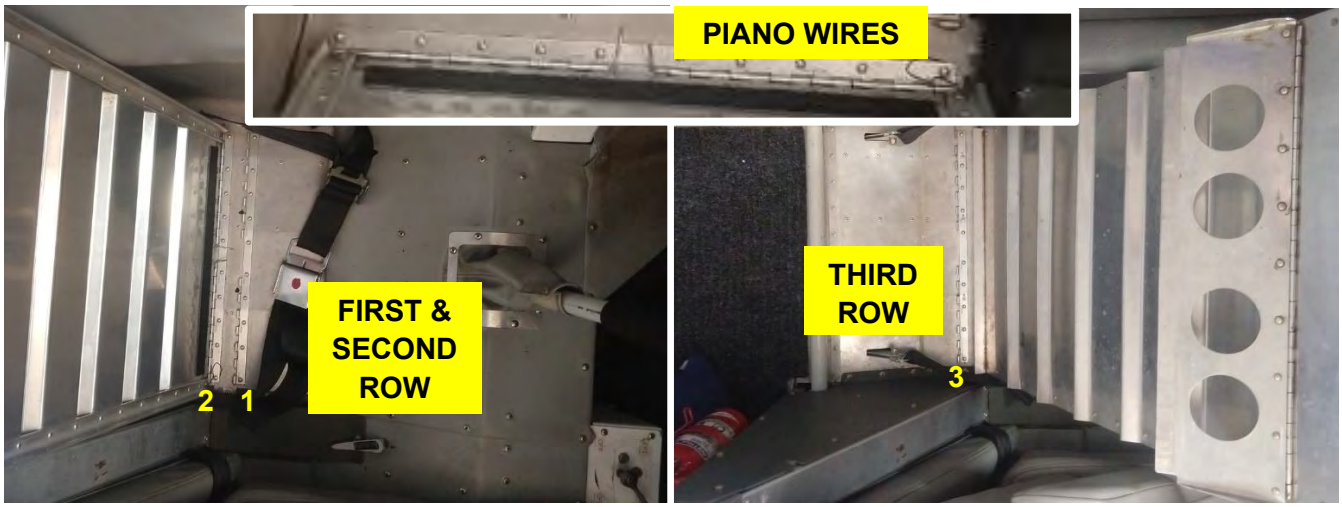
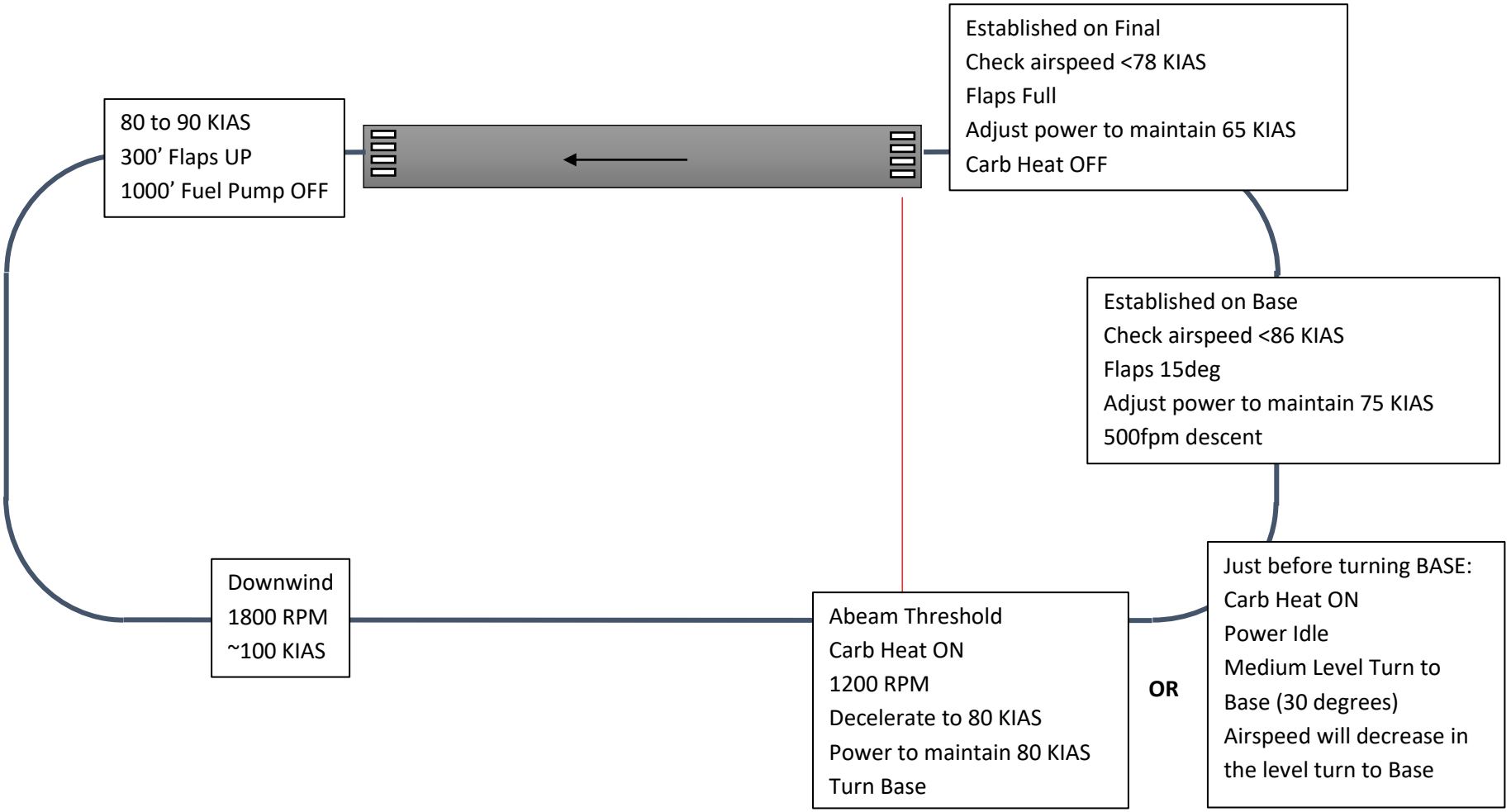


Figure 28 – The seats have three selectable fore-aft positions.

The middle setting (pictured) is adequate for most people.

8 NORMAL CIRCUIT DIAGRAM (SIMPLE)



9 NORMAL CIRCUIT DIAGRAM (DETAIL)

1) Upwind

Power: Full

Attitude: Dash to horizon

Cruise Climb Attitude

Speed: 80 to ~90 KIAS

300' Flaps Up

500' Fuel Pump Off

Cruise Climb Attitude

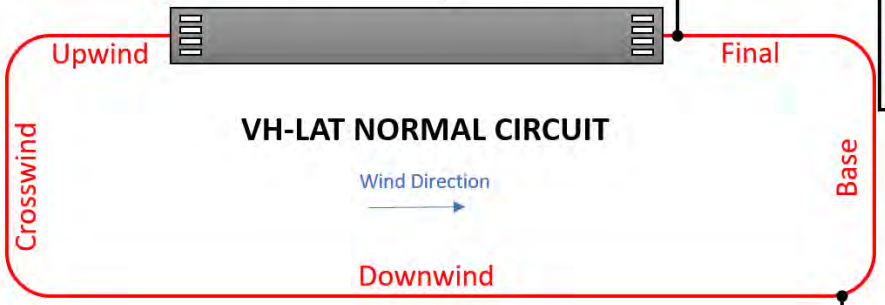
Initial attitude for Vy climb (76 KIAS). Horizon cutting thru top of analogue instruments.

6) Short Final

65 KIAS Over Numbers

Power Idle & Hold Off

Land on Main Wheels



5) Final

Power: Usually 1100 to ~1300 RPM - As required to maintain 65 KIAS.

Flaps: 30° (Full)**

Attitude: ½ ground ½ sky.

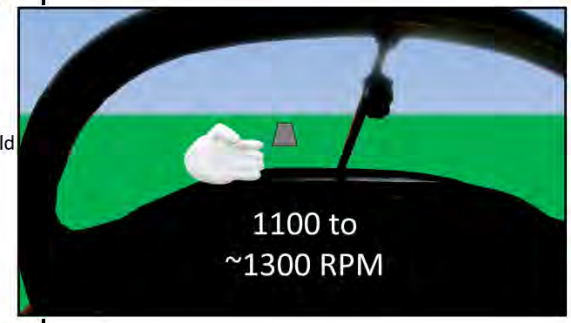
Aim Point (threshold or keys) should be at the 4 finger position

Speed: 65 KIAS

Carb Heat OFF

Approach stabilised

Heels on the floor! Do NOT land with your toes on the brakes!



4) Base

Power as required. Usually Idle to ~1300 RPM

Flaps: 15° (Half)*

Attitude: 5 to 6 fingers

(1/3rd ground 2/3rds sky).

Speed: 75 KIAS

2) Downwind

Power: 1800 RPM

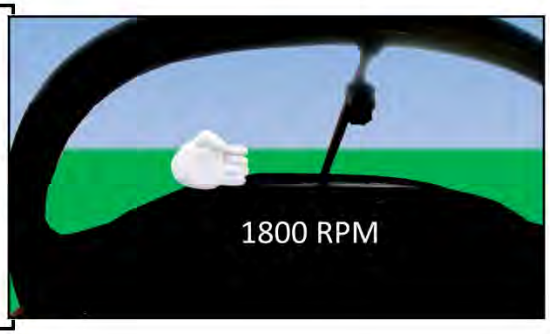
Attitude: 4 fingers

This power and attitude setting will give a speed of about 100 to 105 KIAS

Check spacing/tracking/altitude

Radio Call

Pre-Landing Checks



3) Turning Downwind to Base

Carb Heat ON

POWER IDLE

30° MEDIUM LEVEL TURN to Base

Airspeed will wash off in the level turn to Base

Select Flaps 15* when below 86KIAS & then set the power and attitude for Base (next picture).

Notes:

*** 15° Flaps Extended Speed Limit = 86 KIAS**

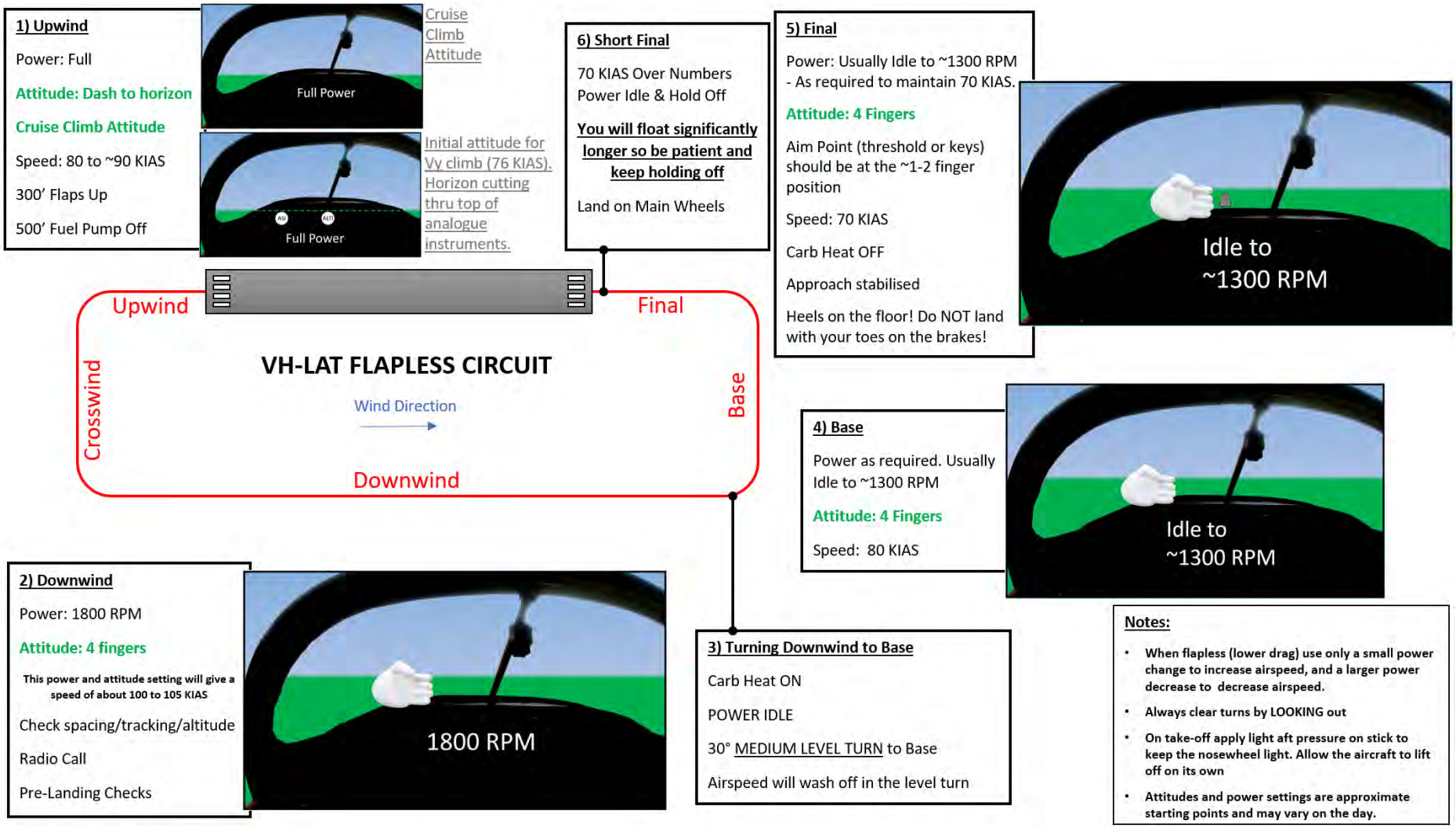
**** 30° Flaps Extended Speed Limit = 78 KIAS**

Always clear turns by LOOKING out

On take-off apply light aft pressure on stick to keep the nosewheel light. Allow the aircraft to lift off on its own

Attitudes and power settings are approximate starting points and may vary on the day.

10 FLAPLESS CIRCUIT DIAGRAM (DETAIL)



11 GROUND HANDLING NOTES

11.1 TAXI AND BRAKE USE

- LAT does not presently have a working park brake.

- **In general, when taxiing, keep the stick back to reduce the weight on the nosewheel** and to prevent the nosewheel getting stuck. Use standard aileron positioning to prevent the upwind wing from lifting when taxiing. Normal taxi speed should not exceed 13kt (refer to the Groundspeed readout on the Dynon Skyview).

- Brake pad condition is slightly more difficult to inspect due to the wheel spats. Brake pads can be inspected by using a mirror or your phone to look vertically up at the brake calliper. Take care to preserve the brake pads as much as possible.
    - **Thou shalt not ride the brakes!**
    - Firstly, always use the throttle (power) to help control the taxi speed
    - The continuous RPM during taxiing should not normally exceed 1000RPM
    - Keep your heels on the floor unless needing to use the brakes

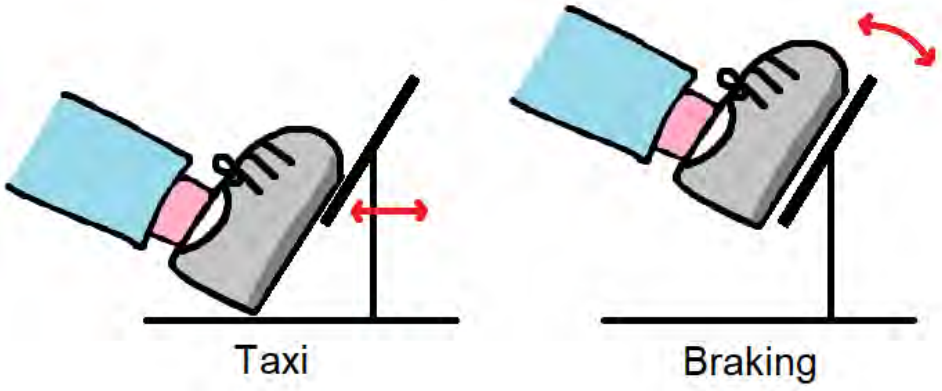


Figure 29 – Foot positioning on rudder pedals and toe brakes during taxi and braking

- Riding the brakes will cause the brake pads and callipers to heat up, brake fluid to boil and leak and render the brakes inoperable. This is especially critical after a rejected take-off where the brake pads and callipers will be extremely hot.
- We do not drive a car with a foot on the brake pedal working against the accelerator pedal – apply this principle when you taxi an aircraft.

- At normal taxi speeds and taxi power settings (800-1000 RPM) the rudder on its own (bottom of the pedals, no toe brake) has enough authority to gently steer the aircraft. Hold the rudder full down and you will see the nose of the aircraft will gently turn in the same direction. Whenever possible use this technique to steer the aircraft to preserve the brakes.

- For tighter turns feel free to use differential braking (eg. runup bay) to achieve a smaller turn radius

- LAT has a castering nosewheel. It is not steerable like in a Cessna. Taxiing in a crosswind will make the nose of the aircraft want to weathercock (turn into the wind) somewhat more than a similar aircraft with a steerable nosewheel.
    - Firstly, use opposite rudder (no brake) to help continue taxiing straight
    - If aircraft is still weathercocking then apply brake as required to help taxi straight – avoid riding the brake as much as possible
    - The pilot needs to remain vigilant of causing excessive brake pad temperatures.

- On the ground, a strong tailwind will decrease the effectiveness of rudder-only steering. You will sometimes need to encourage the nose to start turning in such cases by applying some brake pressure

- If the brakes feel spongy or soft do not fly. If landing with suspected brake issue use the longest runway available, apply gentle braking to and maintain directional control with the rudder.

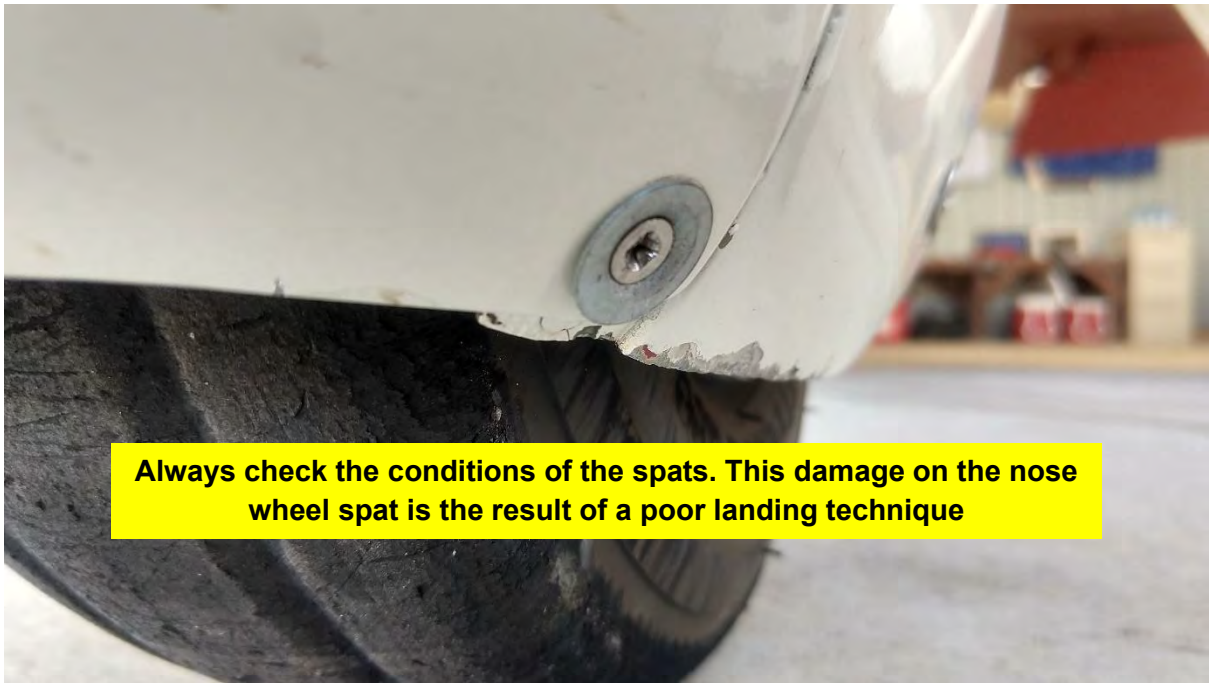


Figure 30 – Nosewheel spat damage. Check the spats for damage or rubbing before flight.

- Figure 30 shows why it is critical to be patient in the hold-off and to land on the main wheels first. Avoid three pointer landings. Keep the nose wheel off the ground until it can not be held any longer.

- This is not a flying trainer aircraft. The nose strut is the weakest part of the landing gear and will be the first to fail.

11.2 STEERING BAR

- The steering bar is often incorrectly called or used as a “tow bar”

- **When moving the aircraft forwards (out of the hangar) there is no need to attach and use the steering bar. Pull the aircraft in desired direction by the root of the propeller blade.**

- The steering bar is only needed to help reverse the aircraft into the hangar or other position due to the castering nosewheel. When reversing the aircraft push on the root of the propeller and only steer the nosewheel with your other hand to get the aircraft to where you want it to go.

- Have a firm grip and slowly close and open the steering bar to prevent damage to the spats.
    - Always use the front holes to attach the steering bar.
    - When attaching the steering bar hold it firmly open and then insert one side first against the bolt. Then slowly and gently close the bar onto the opposite side.

- When reversing the aircraft go slowly so that the castering nosewheel remains easy to control – the castering nosewheel is unstable going backwards, similar to a shopping trolley wheel.

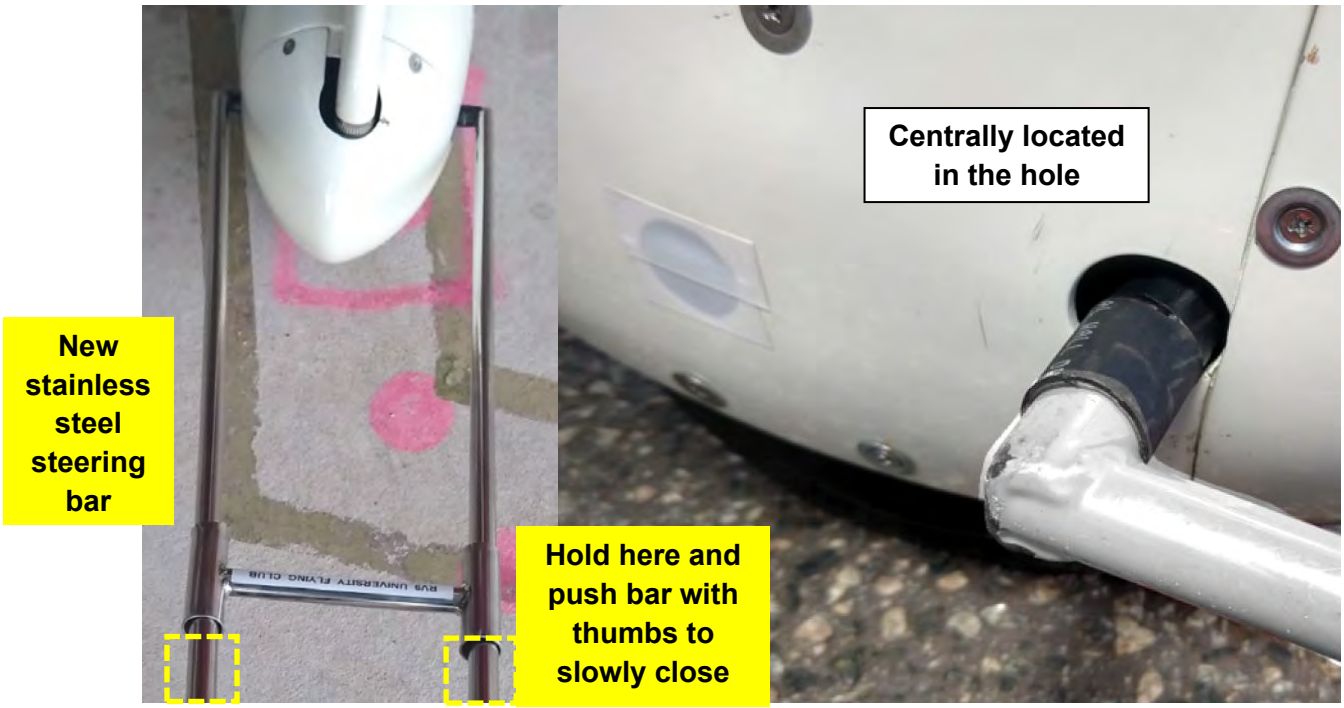


Figure 31 – Steering bar in the attached and closed position. Do not push or pull the aircraft with the steering bar! Only push or pull on the root of the propeller blade.

11.3 TIRE INFLATION

- Proper tire inflation is critical. There should be about a 4 to 5cm gap between the floor and bottom of the spats.

- If the gap is 3cm or less, then suspect a leak or flat tire.

Figure 32 – Visually check tire inflation before flight.

11.4 CANOPY & THROTTLE LOCK

- There is a canopy lock located on the lower left side of the canopy. The keys to the canopy are kept in the white aircraft flight folder on a red key tag.

- When the aircraft is parked overnight away from the club hangar the throttle lock should also be installed.

Figure 33 – Aircraft keys are kept in the white aircraft flight folder

11.5 ADDING ENGINE OIL

- When the engine oil level is 5 quarts or less, add one whole quart of engine oil (one entire blue bottle).

- It is poor practice to leave partly used and opened bottles of oil in the hangar due to risk of contamination.

- Engine oil, funnels and a drip tray are stored in the bottom drawer of the payment folder as shown below. Use disposable rags to clean excess oil and keep it neat.

Figure 34 – Oil and accessories in the payment cabinet.

11.6 FUEL CAPS

- The fuel caps are tight. Carefully use the below procedure to help you open them.

Figure 35 – Carefully insert the flathead of the fuel tester and twist to help lift the flap.

Please take care to not scratch the paint

11.7 ENTERING & EXITING THE AIRCRAFT

- There are steps located behind each flap

- Only one person at a time to step on or off the wingwalk. Otherwise, the aircraft will tip and damage the tail.
    - When in the hangar leave the flaps full down to make stepping on and off the wingwalk easier.
    - Be careful where you step. Do not stand on or lean against the flap surfaces.

- The canopy can be opened by turning the handle on top of the canopy counter clockwise 90 degrees

- **Do not lean on the fibreglass canopy shroud or the seat backs when entering and exiting the aircraft, instead;**
    - Hold onto the canopy roll bar and step onto the seat cushion
    - Lower yourself while holding onto the canopy roller-track and central pillar-tube behind the main windshield.
    - Exit in the reverse order

12 TAKEOFF/LANDING & AIR HANDLING NOTES

12.1 TAKEOFF

Refer to Figure 36. The takeoff technique is slightly different to a C172 or other nosewheel GA aircraft. Start the takeoff roll with slight aft elevator. As you accelerate continue smoothly bringing the stick back until the nosewheel lifts. By 40-45kts indicated airspeed there is always enough elevator authority to lift the nosewheel off the ground. Continue to accelerate with nosewheel off the ground until she is airborne. Rudder to maintain centerline.

At the start of the takeoff roll, with full power set, you should see 2150 RPM or greater on the tachometer. Engine RPM will increase as the airspeed increases down the runway (and the angle of attack on the propeller blades decreases).

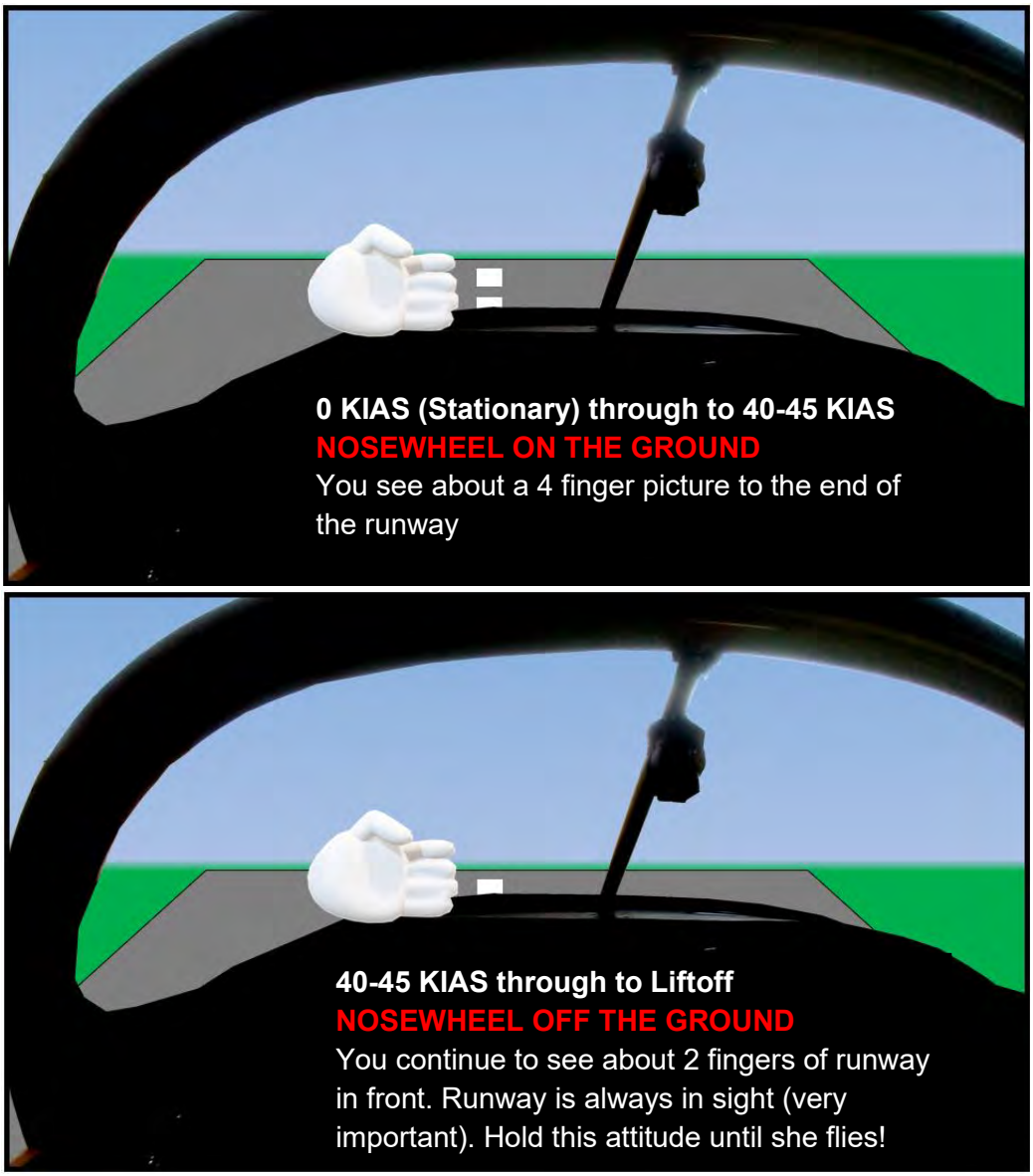


Figure 36 – What you will see during takeoff with the correct takeoff technique

12.2 LANDING / GO-AROUND / TOUCH & GO

Landing
Transition from the approach to fly parallel to the runway and then bring the power all the way to idle. Continue holding off at a safe height above the runway and be patient. If you continue holding off correctly, the attitude will look similar to the bottom image of Figure 36 as the main wheels touch the ground. Continue holding the nosewheel off until it cannot be held off any longer. You must never force the aircraft, or the nose of the aircraft onto the ground.

Go-Around
The attitude will need to be nose on the horizon to prevent exceeding flap limiting speeds.

Touch & Go
Set flaps to 15 or up on the ground roll. Alternatively, you may also leave the flaps 30, apply full power and get airborne and set the climbing attitude and then raise the flaps slowly to 15, and then to up. Just like in the go-around, the attitude will need to be nose on the horizon to prevent exceeding flap limiting speeds as the aircraft accelerates will full power.

12.3 MANOUVERING SPEED

LAT's normal cruise speed range lies significantly above the manoeuvring speed (Va) of 102 kts, therefore smooth application of control inputs is required at all times.[12]

WARNING

Flying at or below the design manoeuvring speed ***does not*** allow a pilot to make multiple large control inputs in one airplane axis ***or*** single full control inputs in more than one airplane axis at a time. Structural failures can result at any speed including below Va when reckless control inputs are applied.

12.4 AIR HANDLING NOTES

Leveling Off from Climb to a Cruise (Attitude – Power – Trim)
From the climb set the attitude to about 4 to 5 fingers. Leave the power at full and be patient, as the aircraft accelerates more forward pressure will be needed to hold this attitude. At 120/125 knots reduce the power to cruise setting. Trim the control pressure away.

Entering Climb or Descent / Leveling Off from a Descent (Power – Attitude – Trim)

[12] At 140 kts there is twice the force available on control surfaces for the same control deflection as at 100 kts, and four times the force as at 70 kts.

Circuits
Placing the runway on the left wingtip at 1000’ AGL will usually provide an adequate circuit spacing. Leave the fuel pump on for repetitive circuits.

Sideslipping
Sideslipping does not significantly increase rates of descent and is not recommended in the circuit – just go around if you are high.

Carburettor Heat
For descents below about 1800 RPM it is good practice to select CARB HEAT ON.

Stalls
A slight aerodynamic buffet briefly precedes the stall by a few knots with flaps up. Recovery is conventional and quick by simply releasing the backpressure on the stick (reducing angle of attack).

A normal descending attitude to ½ ground ½ sky will recover the stall. 100’ to 250’ is a typical altitude loss with a proper and smooth recovery.

Unusual Attitude Recovery
Apply smooth, sequential and separate actions

- Low Nose Attitude
    - Power IDLE
    - Roll Wings LEVEL
    - Nose to HORIZON

- High Nose Attitude
    - Pitch for LEVEL ATTITUDE
    - Power FULL
    - Roll Wings LEVEL

13 GENERAL NOTES

- Please report anything out of the ordinary to the committee.
- Members are expected to demonstrate good airmanship and use the spray bottle and cloths to **wipe down LAT's windscreen and leading edges after every flight**. This will help keep the aircraft in good condition for all members.
- LAT is booked on a first-come-first-served basis online on the GOBOKO website. You will receive access to GOBOKO after your club induction is completed.
- Overnight trips of flights to remote areas do require prior committee approval
  - committee@uniflying.org.au
  - The committee and member need to consider what engineering services, if any, are available should the aircraft become disabled (eg. flat tire) and how the aircraft will be recovered and the potential costs of such an event.
  - Figure 37 below shows the locations and contents of the overnight tie-down kit.

Figure 37 – LEFT: Tie down kit is on the shelf. RIGHT: Tie down kit contents.

- The excess is currently $5000 for pilots with less than 150 hours total time and $2500 otherwise.
- Every pilot is to check and order their own fuel. UFC does not have a fuel top-up procedure after a flight.

14 ALARMS, DEFECTS, DAMAGE

It is a legal requirement to report any suspected hard landings or events where there are reasonable grounds for believing that the aircraft has suffered serious damage.

Report any such events immediately to the committee so that it can be followed up ASAP.

Refer to the AIP ENR 1.14 regarding your reporting obligations.

If you find or suspect a defect with the aircraft:

1. Contact the UFC maintenance officer or the committee
2. Only after consulting with the maintenance officer or the committee endorse the MR if required to do so
3. Cancel your flight

If you notice an alarm during flight:

1. Maintain control of the aircraft and when able consider the cause of the alarm and the available checklists
2. Upon landing contact the UFC maintenance officer or committee so that it can be followed up
3. Only after consulting with the maintenance officer or the committee endorse the MR if required to do so

15 APPENDIX I: AFTER EACH FLIGHT (STOW & SECURE)

1. Make sure the hangar doors are fully opened. Park aircraft in the club hangar. If parking LAT elsewhere, out of sight or overnight and the aircraft is not hangered then the aircraft MUST be tied down for insurance.

   Before reversing the aircraft into the hangar, make sure the two traffic cones are placed in front of the Zenith (one in front of the propeller arc and one in front of the wingtip as shown below) and that it's propeller is in the ' Y ' position.

Figure 38 – Line the aircraft up nice and straight with the markings outside the hangar first. The wheels should be in line with the ground markings and the tail in line with the hangar support beam. Then go straight back (do not follow the curved pink dots inside the hangar)

Figure 39 – Aircraft in the parked position. Make sure to go slowly and check the wingtips.

Figure 40 – Wingtip clearance when parked in the hangar

Figure 41 – Wingtip clearance when parked in the hangar.

2. Install the two big engine cooling air intake bungs on top and the single small bung in the engine air intake at the bottom. Make sure the flags are visible. Install the pitot tube cover.

Figure 42 – Bungs and pitot cover

3. Chock the front wheel and install the rudder locking pin. Dip the fuel tanks (not pictured)

Figure 43 – Nose wheel chock and the rudder locking pin

4. Take care when handling the control lock so that you do not scratch the Dynon Skyview screen or anything inside the aircraft. Extend the metal tube to the marked position for the correct length and insert the length adjust pin. Slide the red slider over the join to lock the bar straight.

Figure 44 – Cockpit control lock

5. Make sure the arrow points up for installation. Install the prongs on the bottom inside of the rudder pedals. Now move the stick forward secure the bar at the bottom of the foam grip. Push forward with the stick slightly to make inserting the locking pin easier. With the control lock correctly installed there will be some play left-right in the ailerons, but they will not easily hit the control stops.

Figure 45 – Control lock installed. Move the stick sheath out of the way to install it properly

6. Clean the windshield with a clean microfibre cloth and Plexus plastic cleaner

Figure 46 – Clean the windshield.

7. Using a different microfibre cloth and a spray bottle wipe down all the leading edges of the aircraft:
    - Wings
    - Cowl (top and bottom) including the lip below the windshield
    - Propeller cone
    - All spats and their struts
    - Horizontal & vertical stabiliser

Figure 47 –Clean all of the leading edges.

8. Email a picture of the completed maintenance release, the flight log and the self-invoice form (and block hours, if used) all in one email to: treasurer@uniflying.org.au

   Title of the email is simply your full name and date of flight as shown below:

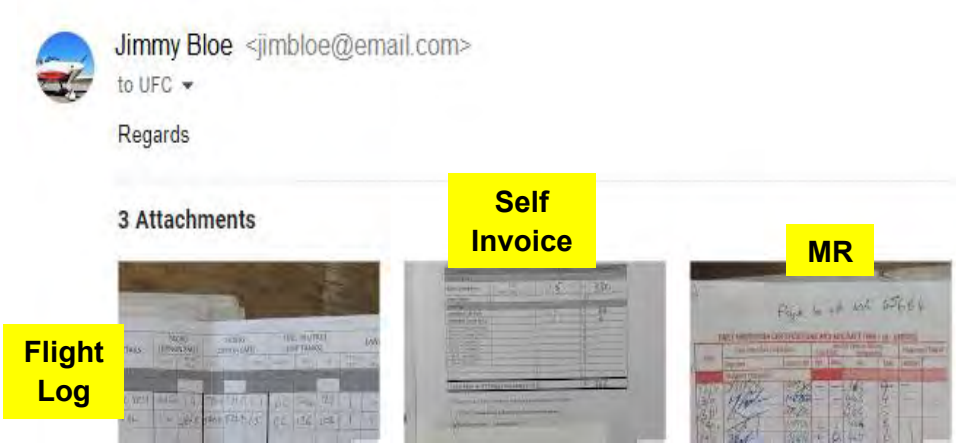


Figure 48 – Example email to UFC treasurer with attached documents

- Figure 49 to Figure 51 shows detailed examples of the three documents above. If you are using block hours then include that also.

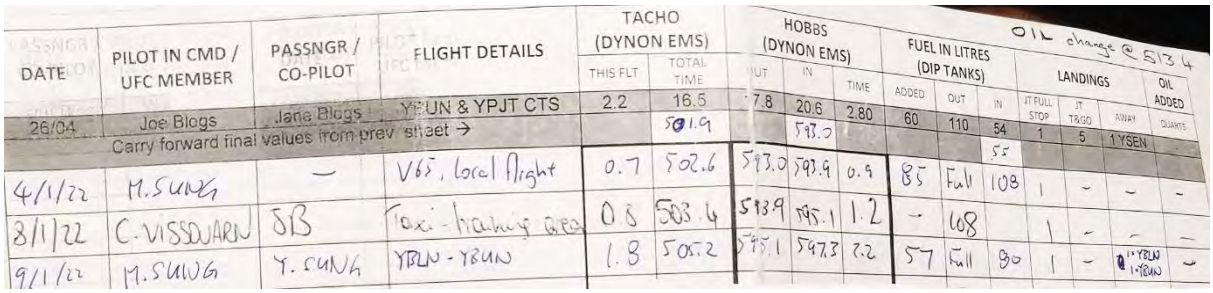


Figure 49 – Example of a completed flight log

UNIVERSITY FLYING CLUB

SELF INVOICE FORM

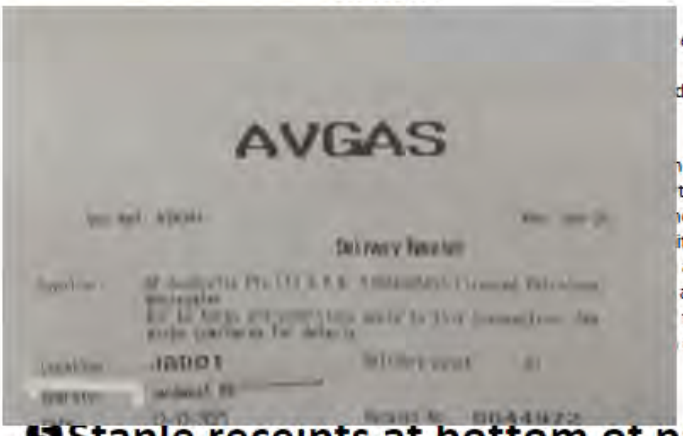
Name of Member Responsible for Aircraft	Date(s) of Hire:
Jim Pilot	08/07/2022
Member's Declaration: I confirm the details listed on this invoice are correct and accept liability for any and all charges and/or damages resulting from my hire of VH-LAT.	Signature:

Description	Price (inc. GST)	Hours / Units	Calculated Fee
Aircraft Hire			
Normal Hire Rate	$240 (per Hobbs hour)	1	$ 240
Block Hours	$0		$ 0
Landings			
Jandakot Full Stop	$30	1	$ 30
Jandakot Touch & Go			$
YRTI - Rottnest Island			$
YMUL - Murray Field			$
YESP - Esperance			$
YCUN - Cunderdin			$
YBLN - Busselton			$
YABA - Albany			$
			$
			$
Total Fees and Charges Payable to UFC			$ 270

Payment is due in full on the date of hire. Please indicate payment method:

[ ] EFTPOS – Please attach a receipt from EFTPOS terminal below.

[X] Internet Transfer – Uni Flying Club
BSB 036-054



eg. Jack 10Jan20

d) must be left in the Uni Flying Club folder.

surance requirements may hire VH-LAT
t the insurers minimum hours
eet these requirements will result in the
ity in the event of aircraft damage.
additional charges.
arranged via the Treasurer, they are NOT
the Treasures is attached.
charge is included on the invoice.

Staple receipts at bottom of page

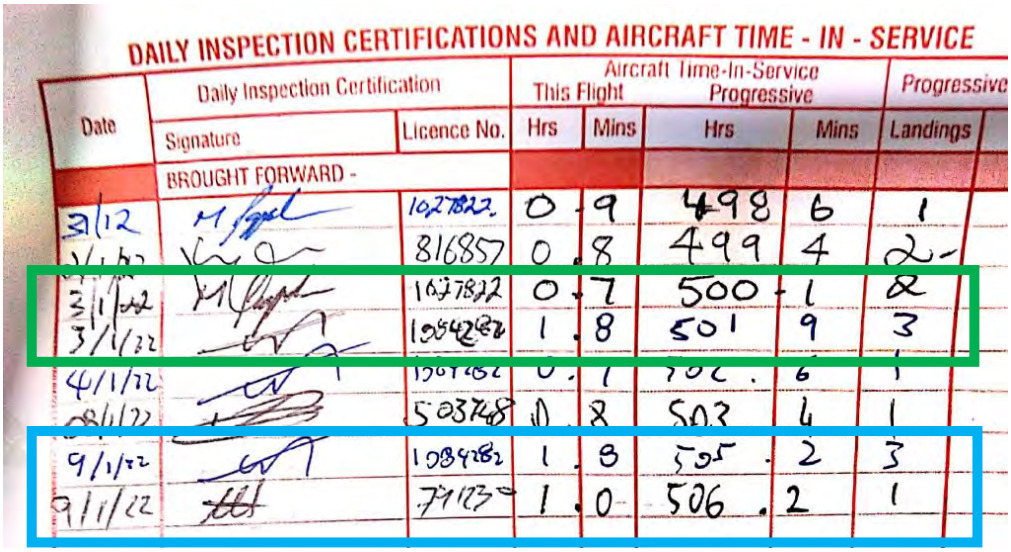
Figure 50 – Example of a completed self-invoice form with fuel receipt stapled at the bottom

- Pay via online bank transfer or the EFTPOS machine. Payments are to be made on the same day as your flight - no exceptions.

- Please staple any fuel or payment receipts to the bottom of your self-invoice form as shown above.

Note

The club procedure is to close the MR after each flight. Even if another member is scheduled to fly later in the day, they may cancel, so make sure the MR is completed when your flight is finished. Every member is responsible to conduct their own pre-flight inspection.



DAILY INSPECTION CERTIFICATIONS AND AIRCRAFT TIME - IN - SERVICE

Date	Daily Inspection Certification: Signature	Licence No.	Aircraft Time-In-Service This Flight: Hrs	Mins	Progressive: Hrs	Mins	Progressive: Landings
	BROUGHT FORWARD -						
31/12		1027822	0	9	498	6	1
		816857	0	8	499	4	2
31/12		1027822	0	7	500	1	2
3/1/22		1054282	1	8	501	9	3
4/1/22		1067482	0	1	502	6	1
8/1/22		503748	0	8	503	4	1
9/1/22		1084782	1	8	505	2	3
9/1/22		71173	1	0	506	2	1

Figure 51 – Close the MR after your flight even if there is another flight booked later in the day. This is how the MR should look after two flights on each day.

9. Place the white flight folder back inside the aircraft on the dashboard.

Figure 52 – Aircraft folder and checklist back on the dashboard

10. Check that switches are OFF, close the canopy (no need to lock the canopy inside the UFC hangar) and put the red canopy cover over the aircraft (UP side visible). Secure the canopy cover to the air intakes with one peg on each side.

Figure 53 - Canopy cover secured with a peg on each side. Keep the cover the right way up to help protect the windshield.

11. Lock the hangar doors and finally consult the exit checklist on the pedestrian door prior to leaving the hangar.

Figure 54: Lock both hangar doors.

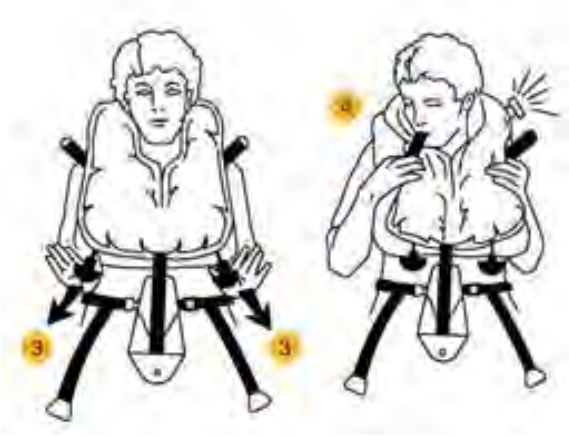
16 APPENDIX II: HELI VEST LIFE PRESERVER

The Heli Vest is a quick donning twin-cell life vest in a pouch pack which buckles around the waist for constant wear inside the aircraft. The life vest can easily be pulled out and donned over the head with one quick motion using a single hand.

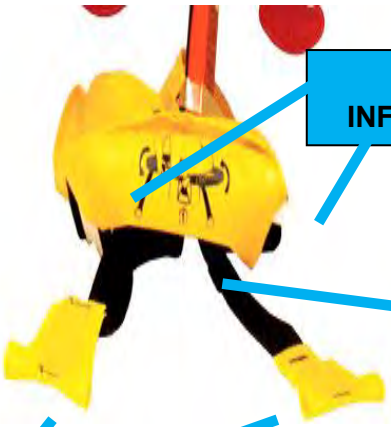
Onboard a single engine aircraft, a person must wear a life jacket if it is flown over water beyond the gliding range from land if the engine failed (wear as in step 1 below). However, a person does not have to wear a life jacket if the flight is higher than 2,000 feet above the water (MOS26.58).

1: Wear like this inside the aircraft

2: In an emergency it can be quickly donned over the head ready for use



3 & 4: Only inflate the vest once free & clear of the aircraft



CO2 INFLATOR

WATER ACTIVATED LIGHT BATTERY

HARNESS & HARNESS PULL

TOP TAB INSTRUCTIONS

LIGHT

WHISTLE

ORAL INFLATION SYSTEM

CO2 INFLATOR CARTRIDGE (BOTH SIDES)

17 APPENDIX III: LAT CHECKOUT QUIZ AND SLIP

Name of member:	
Licence Number and Type (eg: 123456 PPL)	

INSTRUCTIONS

Before your first flight with the instructor/check pilot, please complete this quiz.
On the day of your first flight in LAT, discuss the answers with your instructor and update.
Once completed with your check flights, scan this document plus the checkout slip and send to committee@uniflying.org.au so that we can approve you to fly.

This quiz is a combination of the CASA Single Engine Piston Aeroplane Endorsement and UFC specific questions and procedures.

To qualify for the issue of an aeroplane endorsement you must be able to fly the aeroplane to an acceptable standard as well as demonstrate a level of knowledge that satisfies the person conducting your endorsement that you have completed training in the operating limitations, procedures and systems of the type of aeroplane for which the endorsement is sought.

Weight & Balance

1. **The maximum gross (ramp) weight and maximum take-off weight and maximum landing weight for LAT is kg (lbs)**

2. **The maximum baggage compartment weight for LAT is kgs**

3. **LAT's acceptable CG range will lie between mm to mm aft of datum**

4. **The maximum number of adult persons onboard is:**

5. **What is the maximum fuel which can be carried with two 80kg adults and maximum baggage weight?**

Fuel

6. **LAT's total fuel capacity is Litres**

7. **Using the calibrated dipstick provided, the minimum and maximum measurable total fuel quantities in LAT are and litres respectively. The fuel dipsick is marked uniquely for each tank.**

8. **The unusable fuel stated in the POH is**

9. **LAT has two independent fuel tanks which are selectable with a located . The tank should be used for takeoff and landing.**

10. **The type and grade of fuel to be used is**

11. **Dynon Skyview fuel tank quantity indicators are to be considered ACCURATE / AS A GUIDE ONLY and ABSOLVES / DOES NOT ABSOLVE the Pilot In Command of the responsibility to maintain vigilance of fuel remaining by a robust method of calculation. (CIRCLE)**

12. **Describe the correct way to check the fuel quantity prior to flight**

13. **Where are the fuel tank vents located? Where are the fuel drains located?**

Engine

14. Make, model, number of cylinders and rated power output of the engine?

15. The aircraft's engine oil capacity is quarts

16. Minimum oil to start a flight is quarts, but recommended for longer flights

17. The maximum continuous RPM is RPM. This is a PROPELLER / ENGINE limitation (CIRCLE)

18. The engine is AIR / LIQUID cooled (CIRCLE)

19. The engine is FUEL INJECTED / TURBOCHARGED / CARBURETTED (CIRCLE)

20. The engine RPM used for checking the ignition system and carburettor heat is:

21. The maximum RPM drop and differential between magnetos when checking the ignition switches is:

22. State the minimum idle, minimum flight, normal range and maximum continuous oil pressure

23. State the normal oil temperature operating range

24. What will happen with repeated starting attempts if the right magneto is on?

25. What is the redline dynon CHT? What is the normal CHT operating range?

26. When cranking for engine start, crank for up to seconds at a time (refer to the checklist). After three start attempts, wait 5 minutes.

V-Speeds

27. LAT's Never Exceed Speed (V_{ne}) is KIAS. Do not exceed the lower of VNE KIAS or VNE KTAS (Dynon Skyview AHARS calculated to reduce with increase in density altitude) under any circumstances.

28. The maximum manoeuvring speed is KIAS

29. Maximum flap extended V_{FE} speeds are KIAS for degrees flap setting and KIAS for the degrees (full) flap setting

30. Best rate of climb (V_Y) speed is KIAS

31. Best angle of climb (V_X) speed is KIAS

32. Stalling speed in the clean configuration (V_{S1}) at maximum gross weight is KIAS

33. Stalling speed in landing configuration (full flaps, V_{S0}) at maximum gross weight is KIAS

34. Best glide speed in the clean configuration (V_{GS1}) is KIAS

35. Best glide speed in landing configuration (V_{GS0}) is KIAS

36. On base, with flaps 15, the target speed should be: KIAS

37. On final approach, with full flaps, the approach speed should be: KIAS

Emergency Procedures

38. **How long can the Aircraft Battery (not the Dynon Backup Battery) supply power?**

39. **Following an alternator failure in flight, which non-essential electric services should/could be switched off?**

Detail the following emergency procedures:

40. **Engine failure after takeoff**

41. **Engine failure in flight**

42. Alternator Failure

43. What would you do if you noticed a HIGH CO alarm in flight?

Airframe & Systems

44. The correct location to keep the Emergency Personal Locator Beacon, Fuel Dipstick and Fuel Tester is:

45. The Halotron fire extinguisher and first aid kit is located in:

46. LAT has ELECTRICALLY / MANUALLY operated flaps. Flaps are operated with the toggle switch next to the fuel pump and indicated on the Dynon Skyview EMS page.

47. LAT's main battery has a nominal voltage of volts. LAT's engine driven alternator provides a nominal voltage of volts.

48. LAT has two fuel pumps. The main fuel pump is driven. The backup fuel pump is driven.

49. The brakes are MECHANICALLY / HYDRAULICALLY / PNEUMATICALLY operated with the top of the rudder pedals (toe brakes). (CIRCLE)

50. LAT has a STEERABLE / CASTORING nosewheel. Care must be taken not to ride the brakes during taxi. (CIRCLE)

51. Where are the aircraft's static ports located?

52. Which control surfaces can be trimmed and how?

53. Where is the carbon monoxide warning indicator located?

54. List three ways the autopilot can be disconnected

55. Does LAT have a carburettor temperature probe? If so, is it indicated in degC or degF to the pilot? What is 0 degrees Celsius in degrees Farenheit?

56. The electric fuel pump should be selected for take-off and landing. But remember to turn it off in cruise.

57. It is good practice to turn PITOT HEAT ON / OFF when the outside air temperature is less than 5 degrees Celsius and there is visible moisture (CIRCLE).

58. Which magneto should be switched to ON for engine start? When should the right magneto be selected on?

59. State the location of the battery monitor and the trickle charger connector. The trickle charger can be used when operating the avionics on the ground for long periods of time (eg. more than 10 minutes).

60. What stall warning device is fitted to LAT? Aural or Visual indication of stall?

61. How is the cockpit ventilated? How is the cockpit heated?

62. In case of a total and complete electrical failure (including any standby batteries), which instruments will continue to function as normal on the panel?

Performance

63. VH-LAT as an experimental aircraft DOES NOT come with comprehensive takeoff and landing distance charts. UFC recommends the following runway distance minimums and assumes that there are no obstacles in the immediate departure or arrival path:

Sealed and Gravel Runways:

Grass Runways:

64. A typical 65% power setting, TAS and fuel flow when cruising is approximately

65. Assuming full fuel tanks on board at engine start (136L), and that that 130L is usable once you get airborne, with an average fuel burn of 35 litres per hour the TOTAL ENDURANCE in minutes would be:

66. In the question above you decide to carry 45 minutes fixed fuel reserve. Your SAFE ENDURANCE in minutes is:

Operations

67. LAT may only be operated under DAY VFR in the NORMAL category. What are LAT's maximum and minimum flight load factors (g-limits)?

68. Is LAT aircraft approved for aerobatics or spins?

69. What do you do if you find a defect with the aircraft?

70. What do you do if you notice an alarm during a flight?

71. Who is responsible for the aircraft during a hire and what is the excess?

72. What considerations need to be made when operating on gravel?

73. The aircraft is hired and billed on time (engine start to engine stop). Maintenance release time is logged as time. Also, the Maintenance Release is to be after each flight.

74. Before pulling the aircraft by the root of the propeller, describe what items in the cockpit you would check to safely handle the aircraft.

75. Briefly describe the correct taxi technique and throttle/brake usage.

76. What is a typical taxi power setting and what is the maximum recommended taxiing groundspeed? (Groundspeed readout is on the Dynon Skyview FYI)

77. Describe the sequence for engine start when the engine is cold

78. Describe the sequence for engine start when the engine is warm

79. Describe how to lean out the fuel flow in cruise without referencing fuel flow, EGT or the Dynon Skyview.

80. Describe the procedure for adding engine oil and what not to do

81. Briefly describe the proper landing and takeoff technique

82. When taking a passenger flying in LAT (an experimental aircraft) what items MUST the PIC brief the passengers BEFORE boarding the aircraft (refer to 91.875 Experimental aircraft – operating requirements)

83. In the hangar we leave the flaps UP / DOWN to make stepping on and off the wingwalk easier (CIRCLE).

84. When inspecting the tires and looking for proper inflation, how big a gap should be between the floor and the bottom of the wheel spats?

85. List the documents that you are to email to the UFC treasurer after each flight

I understand that it is my responsibility to report any damage, suspected damage, hard landings or anything else out of the ordinary to the committee.

Name:
Date:
Signature:

Knowledge Deficiency Remediation
This section is to be used to discuss any errors with your instructor and record the results of knowledge sharing exercise.

Instructor/Check Pilot Signoff
I have reviewed the UFC VH-LAT Questionnaire with the Club Member and any knowledge deficiencies in relation to the club procedures have been discussed and documented above.

Instructor/Check Pilot Name:

Instructor/Check Pilot Signature:

Date:

17.1 VH-LAT CHECKOUT SLIP

VH–LAT Checkout Slip

Full name of Applicant:			
ARN of Applicant:			
Licence Type (Minimum of PPL required):			
Date completed checked out on VH-LAT:			
Hours of training completed on VH-LAT: *Total Time <150 hours = Minimum 5 hours.* *Total Time >150 hours = Check ride.* *Both require flight evaluation in VH-LAT.*			
Instructor's Full Name:			
Instructors Declaration - I certify that the applicant has demonstrated proficiency in flying VH-LAT, has completed the above training hours requirements and is fit to fly as Pilot in Command.			
Instructor Signature:		Date	

NOTE: This form must be scanned and sent to committee@uniflying.org.au for the application to be completed.

Instructor Notes: