

# MEMORANDUM OF UNDERSTANDING (MOU)

BETWEEN

**Hang Gliding Federation of Australia (HGFA)**

4C/60 Keilor Park Drive,  
KEILOR PARK VIC 3033

and

**Recreational Aviation Australia (RAAus)**

Box 1265,  
FYSHWICK ACT 2609

## Definitions

<b>BFR</b>	Biennial Flight Review
<b>CASA</b>	Civil Aviation Safety Authority
<b>MoU or MOU</b>	Is the Memorandum Of Understanding
<b>RAAus</b>	Recreation Aviation Australia
<b>HGFA</b>	Hang Gliding Federation of Australia
<b>WSM</b>	Weightshift Microlight or Trike registered by RAAus or HGFA in accordance with provisions stipulated by CAO 95.8 or CAO 95.32
<b>Aircraft</b>	As for WSM

## Purpose

In accordance with the CASA directive issued 22 July 2011, both parties are to provide assurance to CASA that the oversight of Weightshift Microlights administered by the HGFA & RAAus under CAO95.32 are standardised. This standardisation is to be across those elements of flight training and training aircraft maintenance as specified during the meeting attended by all parties 13 July 2011.

## Validity

1. This document unless otherwise re-negotiated will be reviewed and ratified by each organisation every 2 years.
2. The review process will include assessment of the current agreement and appropriate international standards by the HGFA and RAAus.
3. The ratified agreement will be a new agreement and approved by CASA.

## Adjustment

An interim adjustment during the period of validity to the MoU will constitute a new MoU and will be approved and lodged with CASA as the new agreement.

## Items agreed to by RAAus and HGFA for free exchange of information

Both organisations commit to a free and open exchange of information related to:

- Membership information
- Disciplinary action related to a member, maintainer or rating or approval holder
- Pilot certificate and endorsements
- Instructor rating or higher Approval holders
- Aircraft registration
- Aircraft accident history
- Aircraft maintenance issues
- Medical information related to a member

### Recognition of Biennial Flight Reviews (BFR)

A common BFR form has been created for the Examiners of an organisation to conduct BFRs for Pilot Certificate holders of the other organisation. Use of the form ensures standardisation and minimum competency standards by using checklists to be completed by the Examiner and provided to the administration department of the relevant organisation for processing.

This BFR form will be available on each organisations website for use, and uses the common syllabus of flight training attached as **Attachment 1** as a reference.

### Commitment to common processes

Further both organisations commit to use of common syllabus, exams and maintenance processes as outlined below.

#### Elements specified

##### Element 1

###### Requirement

A standardised weightshift microlight pilot certificate syllabus acceptable to CASA.

###### Outcome

**Attachment 1**- Weightshift Microlight Syllabus, 14 February 2012

##### Element 2

###### Requirement

A standardised weightshift microlight pilot certificate Basic Aeronautical Knowledge syllabus.

**Outcome**

**Attachment 2** - A standardised syllabus of Basic Aeronautical Knowledge (BAK). Each organisation may create examinations based on this syllabus with criteria including:

- a. Exams must contain a minimum of fifty (50) questions;
- b. the pass mark will be 80%;
- c. multiple BAK exams may be created.

**Element 3****Requirement**

**A common minimum standard for weightshift microlight Flight Training Facilities acceptable to CASA e.g. documenting student records.**

**Outcome****1) Classroom facilities may be permanent or temporary and must contain:**

- a. Sufficient tables and chairs to accommodate at least four trainees, plus instructional staff;
- b. a blackboard or whiteboard (recommended size 1200 mm x 1800 or larger);
- c. Wall maps defining the training area and local area procedures; and
- d. Lockable filing cabinets in which training records can be stored safely.

**2) Aircraft:** One or more approved and registered training aircraft.**3) Documentation**

- a. Competency based record system for student training which includes:
  - i. A student's signature confirms the competency achievement;
  - ii. A system of confirming competency across all syllabus items;
  - iii. A system chart confirming systematic achievement of membership, exams, age minimums and certification as required; and
  - iv. To reference competencies and standards within the respective *Operations Manuals*.
- b. Including:
  - i. Student Pilot training program and progress sheets;
  - ii. Training aircraft logbook(s) and training aircraft maintenance record sheets;
  - iii. Hand out information sheets outlining training activities any local procedures, organisation manuals and specific documentation, associated costs, certificate requirements, organisation membership requirements, health standards requirements, and suitable clothing;
  - iv. Organisation membership and pilot certificate application forms and Accident and Incident reporting procedures;
  - v. Organisation's *Operations Manual* and any other applicable manual or documentation; and
  - vi. Access to relevant CASA and Air Services documentation (e.g. CARs, AIP, CAOs & CAAPs)

- 4) **Audits:** Flight Training Facilities will undergo an inspection every 2 years at a minimum and it is to be conducted by the Operations Manager or approved delegate of the respective organisation.

#### Element 4

##### Requirement

**A common minimum standard of maintenance for weightshift microlight Flight Training aircraft only, acceptable to CASA. Annex A provides detail of acceptable elements for Line Maintenance.**

##### Outcome

1. Only the following appropriately registered two seat factory built aircraft will be used for the purpose of flying training:
  - a. Factory built type certified aircraft or an aircraft with a certificate acceptable to CASA that relates to the airworthiness of the aircraft; or
  - b. A light Sport Aircraft manufactured by a qualified manufacturer as defined in regulation 21.172 of CASR 1998, which holds a current Special Certificate of Airworthiness.
2. Maintenance on aircraft used for hire and reward must be carried out by a person that holds a valid Authority and conducted in accordance with the manufacturer's maintenance schedules and requirements.
3. Modifications to training aircraft as defined in Paragraph 1 of this section must only be conducted in accordance with:
  - a. for aircraft in 1.a. of this section, the procedures and requirements of the manufacturer, or the requirements of Regulation 21M of CASR 1998 (old CAR 35 approval); or
  - b. for aircraft described in 1.b. of this section, may only be modified within the requirements, procedures and approvals of the aircraft's manufacturer.
4. Authorities (to conduct maintenance) are issued in accordance with *MAINTENANCE AUTHORITIES (Attachment 3)* and procedure specified *CRITERIA FOR AUTHORITY ASSESSMENT (Attachment 4)*.

#### Element 5

##### Requirement

**An agreed process between the organisations on the transfer of aircraft from one to another.**

##### Outcome

1. Member to submit to both organisations a *Notification of Transfer* application form or email.
2. The organisation holding the registration will:

- a. advise and coordinate with the other organisation when de-registration will take place
  - b. advise the member who submitted the notification, the time frame for the transfer.
3. Member to prepare documentation including but not limited to:
  - a. The Airworthiness Compliance certificate;
  - b. Flight Manual and Engine Operations Manual and/or other similar named Operators Manuals;
  - c. Airframe, wing and engine Logs;
  - d. Aircraft Condition Report (RAAus) or WSM Inspection Report (HGFA); and
  - e. Any other notice issued by the manufacturer, CASA or by the HGFA or RAAus.
4. The de-registering organisation will issue a *De-Registration Notice* to the member submitting the *Notification of Transfer* application and any other party nominated on the *Notification of Transfer* application;
  - a. Documentation previously prepared will be transferred at the time of de-registration or as agreed
5. On receipt of a *De-Registration Notice* the organisation accepting registration will, upon completion of the new registration, issue a Registration notice to the nominated party on the *Notification of Transfer* application to receive notice.



Signed .....  
HGFA Operations Manager  
Brett Coupland  
Date: 24/10/2017



Signed  
RAAus Operations Manager  
Jill Bailey  
Date: 1/09/2017



HGFA President  
Paul Green  
Date: 24/10/2017

RAAus Chair  
Michael Monck  
Date: X/XX/2017

Signed .....  
Mr Lee Ungermann  
CASA Sport  
Date XX/XX/2017

## Attachment 1

### Weightshift Flight Training Syllabus

Revised Oct 2013

#### 1. THE AIRCRAFT

- 1.1. Aircraft Stability and Control
- 1.2. Complete Pre & Post Flight Administration
- 1.3. Perform Daily Inspection
- 1.4. Certify Daily Inspection

#### 2. THE CONTROLS

- 2.1. Pitch
- 2.2. Roll
- 2.3. Trim
- 2.4. Master/Ignition
- 2.5. Throttle
- 2.6. Start And Stop Engine

#### 3. INSTRUMENTS

- 3.1. Engine Management
- 3.2. Fuel Management
- 3.3. Flight Instruments

#### 4. FUEL SYSTEM, USE AND MANAGEMENT

- 4.1. Fuel System
- 4.2. Plan Fuel Requirements
- 4.3. Refuel Aircraft

#### 5. TAXIING

- 5.1. Taxi Aircraft

#### 6. CARRY OUT PRE-TAKEOFF CHECKS

- 6.1. Carry Out Pre-Takeoff Checks

#### 7. TAKEOFF AIRCRAFT

- 7.1. Line Up Aircraft
- 7.2. Takeoff
- 7.3. Perform After Takeoff Checks

#### 8. OPERATION OF CONTROLS / STRAIGHT AND LEVEL FLIGHT

- 8.1. Demonstration Of Stability
- 8.2. Operation Of Controls
- 8.3. Maintain Straight And Level Flight
- 8.4. Straight and Level Flight at Various Airspeed

#### 9. CLIMBING AND DESCENDING

- 9.1. Climbing
- 9.2. Descending

#### 10. TURNING FLIGHT <45 ANGLE OF BANK

- 10.1. Level, Climbing And Descending Turns
- 10.2. Billow Shift, effect on turning

#### 11. STALL ENTRY AND RECOVERY

- 11.1. Approach Stall
- 11.2. Stall Entry
- 11.3. Stall Recovery
- 11.4. Stall Recovery While Turning

#### 12. CIRCUITS

- 12.1. Perform Circuits And Approach For Landing

**13. LANDING**

- 13.1. Normal Landing
- 13.2. Crosswind Landing

**14. MISSED APPROACHES**

- 14.1. Missed Approach And Go Around

**15. ENGINE FAILURE ON TAKEOFF**

- 15.1. Manage Engine Failure On Takeoff

**16. ENGINE FAILURE IN CIRCUIT**

- 16.1. Manage Engine Failure In All Areas Of The Circuit

**17. FIRST SOLO**

- 17.1. Perform Solo Flight

**18. STEEP TURNS**

- 18.1. Steep Turns >45 Angle Of Bank
- 18.2. Steep Descending Turns
- 18.3. Spiral Dive Recovery

**19. FORCED LANDINGS**

- 19.1. Perform A Forced Landing

**20. MANAGE ABNORMAL SITUATIONS**

- 20.1. Recover From Unusual Attitudes
- 20.2. Tuck / Tumble Avoidance
- 20.3. Manage In-Flight Abnormal Situations

**21. PRECAUTIONARY SEARCH AND LANDING**

- 21.1. Conduct Precautionary Search And Landing

**22. OFF-AIRFIELD OPERATIONS**

- 22.1. Short Field Takeoff
- 22.2. Short Field Landing
- 22.3. Soft Field Takeoff
- 22.4. Soft Field Landing

**23. LOW LEVEL OPERATIONS (500'-1000' AGL)**

- 23.1. Safety And Navigation

**24. DEPART AND REJOIN CIRCUIT**

- 24.1. Depart Circuit
- 24.2. Rejoin Circuit

**25. FIRST TRAINING AREA SOLO**

- 25.1. Perform Solo Flight In Training Area

**End of Syllabus**



## Attachment 2

### SYLLABUS OF WEIGHTSHIFT BASIC AERONAUTICAL KNOWLEDGE

#### LEVELS OF KNOWLEDGE AND APPLICATION

The following syllabus specifies the **MINIMUM** standard of knowledge required. Qualifying letters are used to indicate the specific levels of knowledge necessary for each individual item within a particular subject, as follows:

- A A **basic** understanding of the subject matter, sufficient, with some assistance from an instructor, for the solution of simple practical problems either by calculation or by the exercise of judgment.
- B A **sound** understanding of the subject matter, sufficient, without assistance, for the solution of more advanced practical problems either by calculation or by the exercise of judgment.
- C A **thorough** understanding of the subject matter, achieving without assistance, a first attempt accuracy of 80% in the solution of advanced practical problems either by calculation or by the exercise of judgment.
- P- **Basic** practical application of relevant procedures
- P+ **Thorough** practical application of relevant procedures

**Note** The pass mark for the examinations set to this syllabus is 80%.

#### 1 PRICIPLES OF FLIGHT

1.1- AERODYNAMICS		Standard Prior to:	
		Solo	P/Cert
1.1.1	<b>Terminology</b> Identify descriptions/drawings of the following terms:		
	(a) aerofoil; span; chord; camber; thickness/chord ratio	A	B
	(b) relative airflow; angle of attack	A	B
	(c) total reaction; lift; drag	A	B
1.1.2	<b>Design features</b> State the purpose of the following design features/controls:		
	(a) aspect ratio; wash-out	A	B
	(b) Keels	A	B
	(c) Dive sticks, Reflex bridle and Luff lines	A	B
	(d) Sweep back	A	B
1.1.3	<b>Lift and drag</b> Define the relationship between the following factors in the production of lift by an aerofoil;	A	B
	(a) Air density (b) Surface area (c) Angle of attack (d) Airspeed		
	Define the relationship between the following factors in the production of drag by an aerofoil;	A	B
	(a) Angle of attack		

	<p>(b) Airspeed (c) Shape (d) Effect of damage to an aerofoil surface</p> <p>State whether lift and drag of an aerofoil will increase or decrease with changes in:</p> <p>(a) airspeed; (b) angle of attack;</p> <p>List the types of drag, which affect an aircraft in flight.</p> <p><b>Note:</b> Types are:</p> <p>(a) Parasite (zero lift): form, interference, skin friction; (b) Induced (lift dependent).</p> <p>State how Total Drag varies with airspeed.</p> <p><b>Note:</b> Students should be aware that these values are representative only.</p>	A	B
<b>1.1.4</b>	<p><b>Straight and level flight</b></p> <p>State the relationship between attitude, angle of attack and airspeed in level flight.</p> <p><b>Note:</b> Students should appreciate that this relationship is only true in level flight.</p>	A	B
<b>1.1.5</b>	<p><b>Changes in angle of attack</b></p> <p>State/identify the effect of changes in angle of attack up to the stalling angle on:</p> <p>(a) pressure changes above and below the wing; (b) changes in airflow characteristics; streamlined to turbulent (c) lift and drag;</p> <p>Recall typical angles of attack at which a basic low speed aerofoil:</p> <p>(a) generates maximum lift (16 degrees); (b) is most efficient (best L/D : 4 degrees);</p> <p>and relate these angles to:</p> <p>i. stall speed; ii. best glide speed.</p>	A  A  A	B  B  B

<b>1.2 – STABILITY AND CONTROL</b>		<b>Standard prior to:</b>	
		<b>Solo</b>	<b>P/Cert</b>
<b>1.2.1</b>	<p>State the effect of the factors listed below on the stability and control of an aircraft in each of the three planes of movement:</p> <p>(a) longitudinal stability:</p> <p>i. position of CG; ii. movement of centre of pressure; iii. changes in thrust;</p> <p>(b) lateral stability: (c) directional stability:</p> <p>i. large fore/aft displacement of the CoG;</p> <p>Recognise statements/diagrams which describe static and dynamic stability.</p> <p>Explain the purpose of:</p> <p>(a) trim and hang point (b) Aircraft design features</p>	A  A  A  A	B  B  B  B

2 OPERATION OF AIRCRAFT

2.1- MANOEUVERING		Standard prior to:	
		Solo	P/Cert
2.1.1	Identify the forces of lift, weight, thrust and drag acting on an aircraft in: (a) "steady" level flight; (b) a "steady" climb; (c) a "steady" descent; (d) a balanced level turn.	B	C
	State why: (a) power must be applied to maintain height in a level turn; (b) an aircraft tends to overbank in level and climbing turns and not in descending turns.	B	C/P
2.1.2	<b>Climbing</b> Differentiate between rate and angle of climb.	B	C
	State the effect (increase/decrease) on climb rate and angle resulting from changes in: (a) weight; (b) power; (c) airspeed (changed from recommended); (d) head/tailwind component, windshear; (e) bank angle; (f) altitude and density altitude.	B	C
2.1.3	<b>Descents:</b> State the effect on rate/angle of descent and attitude resulting from changes in: (a) power - constant IAS; (b) drag - constant IAS.	B	C
	State the effect of head/tail wind on the glide path and glide distance (relevant to the earth's surface).	B	C
	Explain why a pilot should maintain the recommended glide speed, if undershooting an approach to land.	B	C
2.1.4	<b>Turning</b> Describe what is meant by a balanced turn, effect of Billow shift on turning	B	C
	Describe the terms "g"; wing loading; load factor.	B	C
	During a level turn, state the effect (increase/decrease) of bank angle on: (a) stall IAS; (b) the aircraft's structure (load factor).	A	C
	List reasons for avoiding steep turns: (a) shortly after take-off; (e) during a glide - particularly on approach.	B	C
2.1.5	<b>Stalling &amp; spiral dives.</b> Define stalling angle and describe: (a) the symptoms when approaching the stall; (b) the characteristics of a stall. (c) spin and tumble avoidance	B	C
	Explain: (a) why an aircraft may stall at different speeds.	B	C

	<p>List the effect (increase/decrease/nil) of the following variables on the level flight stall IAS:</p> <ul style="list-style-type: none"> <li>(a) power;</li> <li>(b) wind shear; vertical gusts;</li> <li>(c) manoeuvres</li> <li>(d) weight;</li> <li>(e) frost and ice;</li> <li>(f) altitude.</li> </ul>	B	C
2.1.6	<p><b>Taxi, take-off and landing</b></p> <p>Describe the stability and control characteristics, during ground operation of;</p> <ul style="list-style-type: none"> <li>(a) nose wheel aircraft</li> </ul> <p>Describe the result of the following factors on the controllability of an aircraft:</p> <ul style="list-style-type: none"> <li>(a) propeller torque and slipstream effect;</li> <li>(b) gyroscopic effect;</li> </ul> <p>Describe the term “ground effect” and its effect on aircraft performance.</p> <p>Cite situations which may cause an aircraft to “wheel barrow” and state the recommended pilot action in the event of such an occurrence.</p> <p>List the advantages of taking-off and landing into wind.</p> <p>Compare a powered approach to a glide approach in terms of:</p> <ul style="list-style-type: none"> <li>(a) attitude during descent;</li> <li>(b) approach path angle;</li> <li>(c) landing roll.</li> </ul> <p>Describe the effect of wind shear, wind gradient and ground effect on aerodynamic and flight characteristics and identify.</p>	<p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p>	<p>C</p> <p>C</p> <p>C</p> <p>C</p> <p>C</p> <p>C</p> <p>C</p>
2.1.7	<p><b>Turbulence</b></p> <p><b>Wake turbulence:</b> <i>If a student is operating from an aerodrome where helicopters or heavy aircraft also operate, all 'B' items must be taught prior to pre-solo.</i></p> <p>List factors affecting the strength of Wake turbulence:</p> <ul style="list-style-type: none"> <li>(a) aircraft weight, speed, wing shape</li> </ul> <p>State the primary control hazard that may result from Wake turbulence.</p> <ul style="list-style-type: none"> <li>(a) approximate location of vortices (in still air) generated by a preceding aircraft during: <ul style="list-style-type: none"> <li>i. cruise flight;</li> <li>ii. take-off and landing;</li> </ul> </li> <li>(b) approximate take-off/touch-down points and flight profiles</li> </ul> <p><b>Caution:</b> Students should be advised that heavy/med. aircraft are capable of steep climb gradients after take-off when operating at low take-off weights.</p> <p>Recall that rotor downwash can be a hazard to a radius of approximately thrice the rotor diameter, and that this area should be avoided by light aircraft.</p> <p><b>Note:</b> <i>Students should be aware of wake turbulence separation standards in order to make value judgements to provide their own separation at non-controlled aerodromes.</i></p> <p><b>Mechanical Turbulence</b></p> <ul style="list-style-type: none"> <li>a) Describe factors creating mechanical turbulence</li> <li>b) Effect on manoeuvring aircraft</li> <li>c) Effect on takeoff and landing</li> </ul>	<p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p>	<p>C</p> <p>C</p> <p>C</p> <p>C</p> <p>C</p> <p>C</p> <p>C</p>

	<p><b>In flight Turbulence</b></p> <ul style="list-style-type: none"> <li>a) Describe factors that may cause in flight turbulence</li> <li>b) Aircraft structure and airframe limitations</li> <li>c) Manoeuvring speed</li> </ul>	B	C
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2.2 –AIRCRAFT PERFORMANCE CONSIDERATIONS		Standard Prior to:	
		Solo	P/Cert
2.2.1	<p>Given that certain flight conditions remain constant, state the effect of:</p> <ul style="list-style-type: none"> <li>(a) changes in weight and altitude (height) on:                             <ul style="list-style-type: none"> <li>i. angle of attack and IAS in level flight;</li> <li>ii. level flight range and endurance;</li> <li>iii. glide range and endurance.</li> <li>iv. rate of climb</li> <li>v. takeoff distance required.</li> <li>vi. landing distance required.</li> </ul> </li> <li>(b) changes in head/tail wind component on:                             <ul style="list-style-type: none"> <li>i. level flight range and endurance;</li> <li>ii. glide range and endurance.</li> <li>iii. takeoff distance required.</li> <li>iv. landing distance required.</li> </ul> </li> </ul>	B	C
	<p>Identify different types of climbs;</p> <ul style="list-style-type: none"> <li>(a) maximum angle climb</li> <li>(b) maximum rate climb</li> <li>(c) cruise climb</li> </ul>	B	C
2.2.2	<p>Takeoff techniques</p> <p>Explain the techniques required for</p> <ul style="list-style-type: none"> <li>(a) into wind</li> <li>(b) cross wind</li> <li>(c) Various surface and slope conditions</li> </ul> <p>Explain differences in aircraft performance from low density to high density altitude airstrips</p> <p>Explain the importance of pre-takeoff checks</p> <p>Explain the importance of pre-takeoff safety brief</p>	B/P	C/P+
2.2.3	<p>Explain landing techniques;</p> <ul style="list-style-type: none"> <li>(a) into wind</li> <li>(b) cross wind</li> </ul>	B/P	C/P+
2.2.4	<p>Circuit Operations;</p> <ul style="list-style-type: none"> <li>(a) legal requirements</li> <li>(b) circuit pattern, names of circuit legs</li> <li>(c) mandatory/recommended radio calls</li> <li>(d) pre-landing checks</li> </ul>	B/P	C/P+
2.2.5	<p>Ground operations;</p> <ul style="list-style-type: none"> <li>(a) effect of wind on ground handling</li> <li>(b) braking and testing of brakes</li> </ul>	B/P	C/P+
2.2.6	<p>Emergency procedures</p> <ul style="list-style-type: none"> <li>(a) forced landings</li> <li>(b) engine failure on takeoff</li> <li>(c) engine failure in the circuit</li> <li>(d) missed approach/ go round</li> </ul>	B/P	C/P+

2.2.7	Aircraft Weight and Balance a) MTOW b) Empty Weight c) Useful load calculation d) Effect on in-flight and ground roll performance	B/P	C/P+
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2.3 – AIRCRAFT GENERAL KNOWLEDGE		Standard prior to:	
		Solo	P/Cert
2.3.1	<p><b>Terminology</b></p> <p>With respect to the items listed below, recall the standard abbreviations used and meet the objectives stated:</p> <p><b>Direction:</b></p> <ul style="list-style-type: none"> <li>(a) recall the following methods of expressing direction:                             <ul style="list-style-type: none"> <li>i. as a three figure group;</li> <li>ii. as a two figure group for runways;</li> <li>iii. in the clock code;</li> </ul> </li> <li>(b) define heading (HDG);</li> <li>(c) define True (T), Magnetic (M), and Compass North;</li> </ul>	A	B
	<p><b>Distance, Speed and Velocity</b></p> <ul style="list-style-type: none"> <li>(a) state the units used for distance:                             <ul style="list-style-type: none"> <li>i. navigation - nautical miles (NM);</li> <li>ii. visibility - metres (m), kilometres (km);</li> </ul> </li> <li>(b) define wind velocity (W/V);</li> </ul>	A	B
	<p><b>Time:</b></p> <ul style="list-style-type: none"> <li>(a) mentally convert local time (EST, CST, WST) to UTC and vice versa;</li> </ul> <p><b>Vertical measurement.</b></p> <ul style="list-style-type: none"> <li>(a) state the unit used (ft) for vertical measurement and differentiate between:                             <ul style="list-style-type: none"> <li>i. height;</li> <li>ii. altitude;</li> <li>iii. elevation;</li> </ul> </li> </ul> <p><b>Other units.</b></p> <ul style="list-style-type: none"> <li>(a) state the units used for:                             <ul style="list-style-type: none"> <li>i. runway dimensions;</li> <li>ii. temperature;</li> <li>iii. pressure;</li> <li>iv. weight;</li> <li>v. volume;</li> </ul> </li> <li>(b) given W/V and runway directions determine the appropriate runway for take-off/landing:                             <ul style="list-style-type: none"> <li>i. the direction (left/right) of any cross wind component;</li> <li>ii. the value of crosswind component.</li> </ul> </li> </ul>	A	B
		A	B
		A	B

<p><b>2.3.2</b></p>	<p><b>Power plants and systems – Basics.</b></p> <p>Demonstrate a basic understanding of the principle of operation of a two/four stroke cycle internal combustion engine and state the purpose of the following components:</p> <p>(a) cylinders; pistons; piston rings; inlet/exhaust valves; crank shaft; cam shaft; spark plugs.</p> <p>State the purpose of the following components/features:</p> <p>(a) carburettor;</p> <p>(b) throttle;</p> <p>(c) CDI, dual ignition;</p> <p>(d) regulator/rectifier;</p> <p>(e) battery, battery compartment vent;</p> <p>(f) propeller;</p> <p>(g) circuit breaker, fuse, bus bar;</p> <p>(h) oil cooler;</p> <p>(i) fuel tank vents.</p> <p>State the purpose of the following gauges:</p> <p>(a) RPM (Tachometer);</p> <p>(b) CHT, EGT;</p> <p>(c) voltmeter, ammeter;</p> <p>(d) fuel pressure;</p> <p>(e) oil temperature and pressure.</p> <p><i>Note: "Purpose" means the importance in relation to monitoring the powerplant and systems.</i></p> <p>State how the following affect the power output of an engine:</p> <p>(a) throttle position;</p> <p>(b) RPM;</p> <p>(c) air density.</p> <p>State the purpose of engine lubrication.</p> <p><i>Note: "Purpose" means the reduction of friction and engine cooling.</i></p> <p>Describe the effect of excessively rich and lean mixture strengths on engine operation.</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>B</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p>
<p><b>2.3.3</b></p>	<p><b>Fuels and Oils.</b></p> <p>List safety precautions when refuelling aircraft;</p> <p>List reasons why a fuel drain is taken and when;</p> <p>List sources of fuel contamination;</p> <p>State the advantage of filling tanks prior to overnight parking;</p> <p>Explain the terms:</p> <p>(a) viscosity, oil sump, multi-grade oils;</p> <p>(b) octane rating;</p> <p>(c) Avgas, Avtur, ULP;</p> <p>and indicate how to identify Avtur, Avgas and ULP;</p> <p>List factors conducive to fuel vaporisation and identify procedures to minimise this phenomenon.</p> <p>Identify differences in fuel gauge indications in tail and level flight attitudes in a tail wheel aircraft.</p> <p>Pre-mix requirements for two strokes</p> <p>Explain the fuel system terms;</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>C</p>

	<p>(a) gravity feed</p> <p>(b) pump feed</p> <p>(c) difference between electronic boost pumps and mechanical pumps</p> <p>(d) fuel tank vents and importance</p>		
<b>2.3.4</b>	<p><b>Engine Handling.</b></p> <p>List the causes and effect of detonation.</p> <p>State the effect on engine operation of:</p> <p>(a) using a mixture that is too rich or too lean.</p> <p>Give reasons for the following limitations/actions:</p> <p>(a) minimum oil pressure;</p> <p>(b) minimum/maximum oil temperature;</p> <p>(c) minimum/maximum CHT;</p> <p>(d) maximum RPM;</p> <p>(e) ignition checks: pre-takeoff and shutdown;</p> <p>(f) prolonged use of starter motor.</p> <p>(g) engine warm up on prolonged descents.</p> <p>Explain the significance of blue or black exhaust smoke.</p>	<p>A</p> <p>B</p> <p>B</p> <p>A</p>	<p>B</p> <p>C</p> <p>C</p> <p>B</p>
<b>2.3.5</b>	<p><b>Malfunctions.</b></p> <p>With respect to a malfunction or a failure of the components listed in (a) to (h) below:</p> <ul style="list-style-type: none"> <li>• identify cockpit indications which may suggest a malfunction</li> <li>• state pilot actions (if any) to rectify the problem</li> <li>• describe the consequences if the malfunction cannot be rectified.</li> </ul> <p>Components:</p> <p>(a) Regulator/rectifier;</p> <p>(b) CDI's or ignition modules;</p> <p>(c) battery;</p> <p>(d) ignition switch;</p> <p>(e) fuel vent (blockage), fuel/booster pump;</p> <p>(f) oil cooler;</p> <p>(g) hydraulic brakes</p> <p>With respect to the following engine gauges:</p> <ul style="list-style-type: none"> <li>• identify reasons for an abnormality</li> <li>• state pilot actions (if any) to rectify a problem</li> <li>• state the consequences if the problem cannot be rectified by the pilot</li> </ul>	<p>A</p> <p>A</p> <p>A</p> <p>B</p> <p>B</p> <p>B</p>	<p>B</p> <p>B</p> <p>B</p> <p>C</p> <p>C</p> <p>C</p>
	<p><b>Engine Gauges:</b></p> <p>(a) oil temperature and pressure;</p> <p>(b) CHT;</p> <p>(c) fuel pressure;</p> <p>(d) tachometer;</p> <p>(e) ammeter;</p>		



<p><b>2.3.6</b></p>	<p><b>Engine Icing.</b></p> <p><i>Note: Students should be advised that the following material is general in nature and that the operational application of engine ice prevention/control varies between individual aircraft and engines. Pilots should therefore follow procedures recommended in the pilots' operating handbook.</i></p> <p>Describe the method for checking the operation of carburettor heat prior to take-off.</p> <p>For aircraft fitted with a fixed pitch propeller, identify cockpit indications which would signify the presence of engine ice.</p> <p>Discuss the use of carburettor heat for:</p> <ul style="list-style-type: none"> <li>(a) anti-icing;</li> <li>(b) de-icing;</li> <li>(c) ground operation.</li> </ul> <p>State the effect of the application of carburettor heat on engine performance and engine instrument indications.</p>	<p>B/P</p> <p>B</p> <p>B</p> <p>B</p>	<p>C/P+</p> <p>C</p> <p>C</p> <p>C</p>
<p><b>2.3.7</b></p>	<p><b>Flight Instruments.</b></p> <p>General:</p> <ul style="list-style-type: none"> <li>(a) explain the following terms: <ul style="list-style-type: none"> <li>i. pitot-static system;</li> <li>ii. pitot pressure; static pressure;</li> <li>iii. alternate static source;</li> <li>iv. pressure error;</li> </ul> </li> <li>(b) explain the relationship between: <ul style="list-style-type: none"> <li>i. IAS; TAS.</li> </ul> </li> <li>(c) have a basic knowledge of the principle of operation and construction of the: <ul style="list-style-type: none"> <li>i. ASI, VSI, altimeter;</li> </ul> </li> </ul> <p>State the effect of the following factors on the accuracy of pressure instrument indications:</p> <ul style="list-style-type: none"> <li>(a) ASI: <ul style="list-style-type: none"> <li>i. blockage/leaks (pitot or static);</li> </ul> </li> <li>(b) VSI: <ul style="list-style-type: none"> <li>i. blockage of the static source;</li> <li>ii. lag.</li> </ul> </li> <li>(c) Altimeter: <ul style="list-style-type: none"> <li>i. blockage of the static source;</li> <li>ii. lag;</li> <li>iii. incorrect sub-scale settings;</li> <li>iv. errors due to changes in atmospheric temperature and pressure.</li> </ul> </li> </ul> <p>Magnetic compass</p> <p>Background knowledge</p> <p>Principle of construction:</p> <ul style="list-style-type: none"> <li>• magnetic needles point to magnetic north</li> <li>• fluid decreases oscillations and friction</li> <li>• should not contain bubbles</li> </ul> <p>State the effect of the following errors on compass indications in the southern hemisphere:</p> <ul style="list-style-type: none"> <li>(a) turning errors;</li> <li>(b) acceleration errors.</li> </ul>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p> <p>B</p>

	<p>State the purpose of and use a compass correction card to determine magnetic heading.</p> <p>Interpret colour codes on an ASI.</p>	A	B
	<p><b>Note:</b> <i>Pressure instruments are the:</i></p> <ul style="list-style-type: none"> <li>• <i>ASI, altimeter, VSI.</i></li> </ul> <p>State the effect of a blockage of the pitot or static source on the indications displayed by each pressure instrument listed above.</p> <p>State the effect of an incorrect sub-scale setting on the reading of an altimeter;</p>	A	B
	<p>State the effect of using an alternate static source located inside the cockpit, on the reliability of pressure instrument indications.</p> <p>Describe checks which would ensure the serviceability of a magnetic compass and the flight instruments mentioned above.</p>	A	B

## Attachment 3

### MAINTENANCE AUTHORITIES

1. RAAus members for *RAAus Level 2*
2. HGFA members for *WSM Maintenance Endorsement*

### DEFINITIONS

**“Authority”** an approval issued, with or without limitation by either the HGFA or RAAus to undertake maintenance of a WSM

**WSM** a 1 or 2 place Weight Shift Microlight aircraft or Trike.

#### ***RAAus Level 2 Maintenance Authority***

#### ***HGFA WSM Maintenance Endorsement***

For suitable persons to conduct maintenance on all aircraft or conduct and/or authenticate maintenance on aircraft used for hire or reward.

#### ***RAAus Level 2 Restricted***

#### ***HGFA WSM Maintenance Endorsement Restricted***

For suitable persons to conduct *line maintenance* on training aircraft or aircraft used for hire and reward, unless as otherwise defined. *Line maintenance* is defined at Annex A of this section.

### Requirement for Issue

- a. Hold a current membership of the issuing association
- b. Fulfilling all requirements specified by the *Criteria for Authority Assessment* issued by the members respective association
- c. Lodging the completed form and references with the members association
- d. RAA and HGFA reviewing and approving the applicant submission, with or without limitation

### Privileges

- a. Undertake maintenance on WSM aircraft used for hire or reward as defined

**Responsibilities**

- a. Conduct maintenance on factory built aircraft used for hire and reward in accordance with any limitation specified on the Authority
- b. Conduct maintenance on private aircraft in accordance with any limitation specified on the Authority
- c. Conduct maintenance on factory built aircraft used for hire and reward in accordance with the manufactures Operations Manual
- d. Record all maintenance undertaken in the aircrafts log book
- e. Report the airworthiness and condition of an aircraft to an owner and record details in the aircraft log book
- f. Retain a log of maintenance undertaken on all aircraft

**Period of Validity**

- a. An Authority will be valid for period of 24 months

**Requirement for renewal or variation**

- a. An applicant for renewal of an Authority or variation to a condition must submit a new *Maintenance Authorisation Application* and 2 referees to the members association
- b. RAAus and HGFA will review and approve the applicant submission, with or without limitation

## Annex A

### DEFINITION OF LINE MAINTENANCE

#### INTRODUCTION

**Line maintenance is defined as:**

1. Removal or installation of landing gear tyres.
2. Repair of pneumatic tubes of landing gear tyres.
3. Servicing of landing gear wheel bearings.
4. Replacement of defective safety wiring or split pins.
5. Replacement of side windows.
6. Replacement of seats.
7. Repairs to upholstery or decorative furnishings inside the cockpit.
8. Replacement of seat belts or harnesses.
9. Replacement or repair of signs and markings.
10. Replacement of bulbs, reflectors, glasses, lenses and lights.
11. Replacement, cleaning, or setting gaps of, spark plugs.
12. Replacement of batteries.
13. Changing oil filters or air filters.
14. Changing or replenishing engine oil or fuel.
15. Lubrication of components.
16. Replenishment of hydraulic fluid.
17. Application of preservative or protective materials.
18. Removal or replacement of glider tow hooks.
19. Carrying out an inspection of a flight control system that has been assembled, adjusted, repaired, modified or replaced.
20. Carrying out a daily inspection on an aircraft.

## Attachment 4

### CRITERIA FOR AUTHORITY ASSESSMENT OF

1. RAAus members for *RAAus Level 2*
2. HGFA members for *WSM Maintenance Endorsement*

### DEFINITIONS

**“Authority”** an approval issued, with or without limitation by either the HGFA or RAAus to undertake maintenance of a WSM.

**WSM** a 1 or 2 place Weight Shift Microlight aircraft or Trike.

### INTRODUCTION

1. Technical maintenance is a combination of skill of hand, knowledge pertinent to the application of that skill and knowledge of the regulations. To competently examine an applicant, a combination of theory and practical tests would need to be successfully completed by the applicant. To acknowledge the wealth of technical skills held by members, a process of assessment has been introduced until formal qualifying courses can be put in place.
2. The assessment process begins with the applicant completing a Maintenance Authorisation Application [see Annex A], which is available from the respective organisation Office. This completed pro-forma is assessed by both the HGFA Operations Manager and RAAus Technical Manager or delegate for:
  - a. a recognised mechanical hand skill or equivalent;
  - b. extensive recreational experience or equivalent;
  - c. recommendations from two peers.
3. Applicants must provide as much detail as possible to substantiate their claims under paragraphs 2 a. and b. above. Suitability for acceptance will be based on the claims made in the application and the recommendation from two peers who currently hold an Authority or equivalent qualifications. Applicants are to complete the form at Annex A to this Section and forward the completed form to the member’s organisation Office.
4. Applications for Authorities can only be received from a financial member of their respective organisation.
5. An application for a WSM Authority will require both HGFA & RAAus assessment and approval before a valid Authority can be issued from the members organisation.
6. Authorities issued are valid only while the holder is a financial member of their respective organisation.
7. Authorities holders may only exercise the maintenance privilege issued on aircraft from the Authority holder’s organisation.

8. The assessment to issue an Authority can be challenged in writing to the members Committee of Management or Board within 28 days of the decision being communicated to the applicant.

### NOTES FOR MAINTENANCE AUTHORITIES

A *Maintenance Supervisor Questionnaire* is to be completed by all applicants for RAAus Level Two Maintenance Authorities or HGFA WSM Maintenance Endorsement. Three criteria are set for assessing applicants for an Authority and determining if a person has the experience and skills necessary to qualify for the issue of an Authority.

Authority holders accept a high degree of responsibility for the maintenance and serviceability of recreational aircraft. They are the sport aviation equivalent of heavier aviation's LAME's who are required to pass significant written examinations and have at least 4 years experience in the aviation industry before being qualified. While WSM aircraft may be simpler than most of the aircraft on the CASA register, once airborne there is little difference to the outcome if inappropriate maintenance practices are perpetrated.

In applying for an Authority, members must list **IN DETAIL** their formal technical training and qualifications they have in the technical trades. Fitting and Turning Certificates, TAFE Certificates etc. should all be copied and forwarded with the application. Details of experience in one or more of the trades should be outlined in detail. Where this qualification is of only marginal relevance to aviation maintenance a connection should be established.

The second criterion is experience in working on WSM aircraft. Again, list **IN DETAIL** all work performed on WSM aircraft noting the nature of the work done and the aircraft types involved. More, rather than less detail should be included and the work should be able to be substantiated, if possible. Any information forwarded with the application will not be used to prosecute members who may have been undertaking maintenance work "illegally".

To assist assessing an application, the applicant is to obtain the recommendation of two peers to the effect that they consider the applicant has the experience and responsibility to be granted an Authority. The recommendation may be from either two current Authority holders or from one Authority holder and a LAME. A Form that may be signed to meet this requirement is also attached.

When issued by an Authority, it may be unlimited or may be restricted to permitting the applicant to work on specific aircraft, specific types of aircraft, or only on specified components, for example engines or wings only. When forwarding the application and other paperwork, applicants should specify if they wish to have the Authority limited to specific aircraft types or components. Notwithstanding any such request, Authorities may be limited at the discretion of the RAAus and or HGFA, in the interest of flying safety.

There is currently no compulsory training required for the acceptance of an application for a maintenance Authority nor is there likely to be a training requirement. The issuing of an Authorisation is primarily based on experience with recreational aircraft maintenance, similar general aviation maintenance experience, allied trade qualifications and experience.

**MAINTENANCE AUTHORISATION APPLICATION**

**Personal Details**

Member No: \_\_\_\_\_

RAAus or HGFA (circle your organisation)

Name (in full) \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

Mobile \_\_\_\_\_

Age: \_\_\_\_\_

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***Reasons for Requiring L2 Maintenance Authority***

Reasons and justification for requiring a L2 Maintenance Authority:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

State nature of approval requirement such as: the type WSM aircraft maintenance work you are requesting i.e. will be largely for private owners, or recreational flying school, or for some other organisation. In the case of Schools or Organisations, please advise the schools details, including types and numbers of aircraft they operate



**Formal Technical Training:**

Technical Training Institution(s) Attended:

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Periods of Employment in a Technical Capacity:

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Highest Trade Level Attained:

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Indentured Apprenticeship:

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Disciplines (trades) for which qualified:

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What Accreditation has been awarded for the formal training (copies of certificates to be included):

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**Aeronautical Experience**

Highest CASA maintenance (or other airworthiness authority) qualifications held, and periods:

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Aeronautical Equipment Types worked on:

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Level of Repairs undertaken on Equipment:

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Aircraft types on which maintenance has been conducted:

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Aircraft, Re-design work undertaken:

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Aircraft Components or Equipment manufactured (type & numbers):

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**Experience**

Periods of Employment: (in a maintenance capacity) (please indicate the employers details)

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Equipment worked on during the periods of employment indicated above:

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Maintenance skill and supervisory level(s) achieved while in employment:

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Maintenance Supervisory Responsibilities held (and periods):

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**Workshop Facilities you have or have access to:**

Location of Workshop:

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Workshop Floor Space:

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Workshop Machinery:

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Date Established: \_\_\_\_\_

CASA Maintenance Accreditation (if any):

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**RECOMMENDATION FOR ISSUE OF A MAINTENANCE AUTHORITY**

- Two recommendations are required.
- Persons signing this form should be holders of a current CASA LAME licence or an RAAus Level 2 Maintenance Authority or a HGFA WSM Maintenance Endorsement

**Applicant:**

**Name:**.....

**Address:**.....

**First Referee**

I, the undersigned, have known the above applicant for over..... years and I am fully familiar with the applicant’s technical training, work and expertise in maintaining recreational or other aircraft. I believe the applicant has demonstrated a satisfactory standard in approach to the maintenance of WSM aircraft and is fully aware of the responsibility and professionalism needed by the holder of an Authority.

Name.....Signature.....

Company.....Contact Number.....

LAME or RAAus or HGFA Authority Number.....

Position.....

**Second Referee**

I, the undersigned, have known the above applicant for over..... years and I am fully familiar with the applicant’s technical training, work and expertise in maintaining recreational or other aircraft. I believe the applicant has demonstrated a satisfactory standard in approach to the maintenance of recreational aircraft and is fully aware of the responsibility and professionalism needed by the holder of a RAAus Level 2 Maintenance Authority.

Name.....Signature.....

Company.....Contact Number.....

LAME or RAAus or HGFA Authority Number.....

Position.....