

1. Title	Piston engine II (Simple Light Aeroplane Repair and Maintenance)
2. Code	EMAMBY503A
3. Range	The knowledge is needed for a wide range of simple light aeroplane repair and maintenance works, e.g. applicable to aircrafts, analysis, machineries, airworthiness, airframes, avionics, materials, tests, documentation, safety, health and tools etc.
4. Level	5
5. Credit	5
6. Competency	<p style="text-align: center;"><u>Performance Requirement</u></p> <p>6.1 Knowledge</p> <ul style="list-style-type: none"> ◆ Able to understand the piston engine fundamentals <ul style="list-style-type: none"> • Mechanical, thermal and volumetric efficiencies. • Operating cycles. • Piston displacement and compression ratio. • Engine configuration and firing order. ◆ Able to understand the engine performance <ul style="list-style-type: none"> • Power calculation and measurement. • Factors affecting engine power. • Mixtures / leaning, pre-ignition. ◆ Able to understand the engine construction <ul style="list-style-type: none"> • Crank case, crank shaft, cam shaft and sumps. • Accessory gearbox. • Cylinder and piston assemblies. • Connecting rods, inlet and exhaust manifolds. • Valve mechanisms. • Propeller reduction gearboxes.

- ◆ Able to understand the engine fuel systems
 - Carburetors type, construction and principles of operation.
 - Carburetors icing and heating.
 - Fuel injection systems type, construction and principles of operation.
- ◆ Able to understand the starting and ignition systems
 - Starting systems.
 - Magneto types, construction and principles of operation.
 - Ignition harnesses and spark plugs.
 - Low and high tension systems.
- ◆ Able to understand the induction, exhaust and cooling systems
 - Construction and operation of induction systems, including alternate air systems
 - Exhaust systems and engine cooling systems.
- ◆ Able to understand the supercharging / turbocharging
 - Principles and purpose of supercharging and its effects on engine parameters.
 - Construction and operation of supercharging / turbocharging system.
 - System terminology.
 - Control systems.
 - System protection.
- ◆ Able to understand the lubricants and fuels
 - Properties and specifications.
 - Fuel additives.
 - Safety precautions.
- ◆ Able to understand the lubrication systems
 - System operation / lay-out and components.

	<ul style="list-style-type: none"> ◆ Able to understand the engine indication systems <ul style="list-style-type: none"> • Engine speed. • Cylinder head temperature. • Oil pressure and temperature. • Exhaust Gas Temperature. • Fuel pressure and flow. • Manifold pressure. ◆ Able to understand the powerplant installation <ul style="list-style-type: none"> • Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains. ◆ Able to understand the engine monitoring and ground operation <ul style="list-style-type: none"> • Procedures for starting and ground run-up. • Interpretation of engine power output and parameters. • Inspection of engine and components: criteria, tolerances, and data specified by engine manufacturer. ◆ Able to understand the engine storage and preservation <ul style="list-style-type: none"> • Preservation and depreservation for the engine and accessories / systems. <p>6.2 Theoretical and practical aspects</p> <ul style="list-style-type: none"> ◆ Able to apply the following knowledge in the aircraft maintenance. <ul style="list-style-type: none"> • Engine fundamental. • Engine performance. • Engine construction. • Engine fuel system. • Carburetors.
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	<ul style="list-style-type: none"> • Fuel injection systems. • Starting and ignition systems. • Induction, exhaust and cooling systems. • Supercharging / turbocharging. • Lubricants and fuels. • Engine indication system. • Powerplant installation. • Engine monitoring and ground operation. • Engine Storage and Preservation <p>6.3 Professional approach</p> <ul style="list-style-type: none"> ◆ Able to understand the principal elements of the subjects. ◆ Able to understand the general knowledge of the theoretical and practical aspects of the subjects ◆ Able to apply the knowledge in the aircraft maintenance task. ◆ Able to understand the detailed knowledge of the theoretical and practical aspects of the following subjects. <ul style="list-style-type: none"> • Engine monitoring and ground operation.. ◆ Able to combine and apply the separate elements of knowledge in a logical and comprehensive manner.
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<p>7. Assessment Criteria</p>	<p>The integral outcomes requirement of this UoC are:</p> <ul style="list-style-type: none"> (i) Able to understand the theory of the subjects and interrelationships with other subjects. (ii) Able to give a detailed description of the subject using theoretical fundamentals and specific examples. (iii) Able to understand and be able to use mathematical formulae related to the subject. (iv) Able to read, understand and prepare sketches, simple drawings and schematics describing the subject. (v) Able to apply the knowledge relating to simple light aeroplane repair and maintenance in a practical manner using manufacturer's instructions. (vi) Able to interpret results from various sources and measurements and apply corrective action where appropriate.
<p>8. Remarks</p>	<p>Ref: HKAR-66 Module 16: Piston engine.</p>