

Log book owners name



NOT transferrable

Section 8 **POWER PLANT**

THIS MODULE CONTAINS A BASIC KNOWLEDGE SELF STUDY GUIDE AND SUGGESTED MAINTENANCE TASKS

Module 8L – POWER PLANT BASIC THEORETICAL KNOWLEDGE (self study guide)

See Section 1 Instructions for use

Module 8L.1 Noise limits (Level 1)	Completed,
Explanation of the concept of noise level Noise certificate Enhanced sound proofing Possible reduction of sound emissions	

Module 8L.2 Piston engines (Level 2)	Completed,
Four-stroke spark ignition engine, air-cooled engine, fluid-cooled engine Two-stroke engine Rotary-piston engine Efficiency and influencing factors (pressure/volume diagram, power curve) Noise control devices	

Module 8L.3 Propeller (Level 2)	Completed,
Blade, spinner, backplate, accumulator pressure, hub Operation of propellers and safety precautions Variable-pitch propellers, ground and in-flight adjustable propellers, mechanically, electrically and hydraulically Balancing (static, dynamic) Inspection requirements Damage assessment and repair options. Overspeed indication of wooden/composite propellers Blade protection and painting/refinishing Propeller TBO and life limits Noise problems	

Log book owners name

NOT transferrable

Module 8L.4 Engine control devices (Level 2)	Completed,
Mechanical control devices Electrical control devices Tank displays Functions, characteristics, typical errors and error indications	

Module 8L.5 Hoses and pipes (Level 2)	Completed,
Material and machining fabrication/repair of fuel and oil hoses Control of life limit, testing and marking Different types of pipes, hoses and materials. Various connections types and uses and limitations Flexible hose installation, twist avoidance, routing, tightening process, bend radius	

Module 8L.6 Accessories (Level 2)	Completed,
Ignition Operation of magneto ignition, various types of magneto and advantages/limitations of each Magneto internal timing (e-Gap) and timing to engine Control of maintenance limits, various inspection criteria, on engine and bench adjustment and testing Electronic unit magneto replacements (e.g. E-Mag) Fuel system Various types of carburettor, advantages and limitations Operation of carburettors Fuel injection system, principals of continuous flow and pulse/timed injection Maintenance instructions on characteristic features (e.g. air and fuel filters, dampers, drains) Synchronisation of twin carburettors, out of balance indication, synchronisation set points Electric fuel pumps, mechanical fuel pumps, flow return systems Importance of correct fuel (and oil) hose routing to avoid air locks and damage Fuel flow checks, pressure checks Propeller Operation of propeller controls, understanding of fine, course and feather positions and how achieved Electrically operated propeller control, slip rings and brush module inspection and testing Hydraulically operated propeller control, governors, accumulator, spring pot.	

Log book owners name

NOT transferrable

Module 8L.7 Ignition system (Level 2)	Completed,
Constructions Coil ignition, magneto ignition, and thyristor ignition Efficiency of the ignition and preheat system Modules of the ignition and preheat system Inspection and testing of a spark plug and high tension leads, fault indications Magneto synchronisation	

Module 8L.8 Induction and exhaust systems (Level 2)	Completed,
Operation and assembly Supercharger and turbocharger components and principal of operation, servicing and inspection Silencers and heater installations Nacelles and cowlings, describe reasons for bulkhead sealing Inspection and test, carbon monoxide contamination/poisoning, active and passive detection CO emission test and tuning	

Module 8L.9 Fuels, lubricants and coolant (Level 2)	Completed,
Fuel Fuel characteristics, different types of fuel suitable for aircraft use. Approved fuel list for particular aircraft type. Limitations with some fuel types (Mogas, Unleaded Avgas, leaded Avgas, Low octane Avgas, two-stroke mix, Jet A1/kerosene) Labelling, environmentally friendly storage, refuel and transfer precautions Oil Mineral and synthetic lubricating oils and their parameters: labelling and characteristics, application Environmentally friendly storage and proper disposal of used oil Oil changes requirements, suction and pressure filter changes and inspection Dry sump systems, components and scavenge design Importance of priming oil systems in wet and dry sump engines Oil spectrographic examination – Benefits and limitations. Coolant Coolant types and precautions. Maintenance and life limits. Proper disposal of used coolant Importance of using the correct coolant Cooling system components identification and leak testing. Filling methods Hydraulics Hydraulic fluid types and applications	

Log book owners name

NOT transferrable

Module 8L.10 Documentation (Level 2)	Completed,
<p>Manufacturer documents for the engine and propeller, TCDS, STC Log books, maintenance records, release documents, approved engine/propeller combinations Instructions for Continuing Airworthiness (ICA), various maintenance programmes Aircraft Flight Manuals (AFMs) and Aircraft Maintenance Manuals (AMM) Time Between Overhaul (TBO) and life limits, top overhaul, propeller ground strike inspection Airworthiness Directives (AD), Technical Notes (TN) and Service Bulletins (SB)</p>	

Module 8L.11 Illustrative material (Level 2)	Completed,
<p>Engine Cylinder unit with valve; Cylinder, cylinder head, valve train, crankcase, accessory housing, mountings Describe different types of cylinder treatments (plain, chrome, nitride, Nicasil) and the correct piston rings for each type</p> <p>Accessories Carburettor, alternator, starter motor, fuel pump, hydraulic pump High-tension magneto, HT leads, control wire, electrical supply for electronic magnetos</p> <p>Inspection/test Differential-compression tester for cylinders, magneto timing tool, vacuum and pressure test tools, special engine tools Recognition of damage Overheated/damaged pistons, low compression, oil leaks, cracks, worn/broken mounts Spark plugs of engines that were operated differently; Identification of running problems by spark plug inspection</p>	

Module 8L.12 Practical experience (Level 2)	Completed,
<p>Work safety/accident prevention (handling of fuels and lubricants, start-up of engines) use of PPE Dangers of a live magneto Rigging engine control rods and bowden cables, required inspections Setting of no-load idle speed Checking and setting the ignition point Operational test of magnetos Checking the ignition system Testing and cleaning of spark plugs Performance of the engine tasks contained in an aeroplane 100-hour/annual inspection Cylinder compression test and interpretation of results. Different types of test Static test and evaluation of the engine run Explain the difference between max continuous power and take off power</p>	

Log book owners name

NOT transferrable

Documentation of maintenance work including replacement of components
Engine preservation procedures

Module 8L.13 Gas exchange in internal-combustion engines (Level 2)

Completed,

Four-stroke reciprocating engine and control units
Energy losses
Ignition timing
Direct flow behaviour of control units
Wankel engine and control units
Two-stroke engine and control units
Scavenging
Scavenging blower
Idle range and power range

Module 8L.14 Ignition, combustion and carburation (Level 2)

Completed,

Ignition

Spark plugs, Ignition system

Combustion process

Normal combustion, Efficiency and medium pressure, Engine knock and octane rating

Combustion chamber shapes,

Fuel system

Fuel/air mix in the carburettor

Carburettor principle, carburettor equation

Simple carburettor, Problems of the simple carburettor and their solutions

Carburettor models

Fuel/air mix during injection, Mechanically controlled injection, Electronically controlled injection, Continuous injection

Carburettor-injection comparison

Module 8L.15 Engine Flight instruments in aircraft with carburettor and injection engines (Level 2)

Completed,

Special flight instruments (injection engine)

Interpretation of indications in a static test

Thermocouple principal, hot and cold joints, conductors, system resistance

Direct and indirect gauge systems, uses, advantages and disadvantages, common faults

Special requirements for towing aircraft

Interpretation of indications in flight at various flight levels

Module 8L.16 Maintenance of aircraft with carburettor and injection engines (Level 2)

Completed,

Log book owners name

NOT transferrable

Documentation, manufacturer documents, etc
General maintenance instructions (hourly inspections)
Functional tests
Ground test run
Test flight
Troubleshooting in the event of faults in the injection system and their correction

Module 8L.17 Workplace safety and safety provisions Work safety and safety provisions for work on carburettor and injection systems (Level 2)	Completed,
--	------------

High pressure pumps, deactivation and depressurisation of fuel system

Module 8L.18 Visual aids (Level 2)	Completed,
---	------------

Carburettor Components of injection system Aircraft with injection engine Tools for work on injection systems
--

Module 8L.19 Electrical propulsion (Level 2)	Completed,
---	------------

Safety precautions when working with electrical propulsion systems. Li-ion battery care and maintenance Energy system, accumulators, installation, wing and/or fuselage mounted battery systems precautions and handling Electrical motor Heat, noise and vibration checks Charging Li-ion batteries, charger, location, damaged batteries, fire precautions, disposal Testing windings Electrical wiring and control systems Pylon, extension and retraction systems Motor/propeller brake systems, FES propeller precautions Motor ventilation systems and battery cooling Practical experience of 100-hour/annual inspections
--

Module 8L.20 Jet propulsion (Level 2)	Completed,
--	------------

Engine installation Pylon, extension and retraction systems Fire protection, fire walls and sealing Fuel systems including lubrication

Log book owners name

NOT transferrable

Engine starting systems, gas assist
 Engine damage assessment
 Engine servicing
 Engine removal/refit and test
 Practical experience of conditional/run time/annual inspections
 Conditional inspections

Module 8L.21 Full Authority Digital Engine Control (FADEC) (Level 2)

Completed,

Principals of operation, single and dual channel systems. BITE and laptop fault finding.

**Module 8L – POWER PLANT
 SUGGESTED MAINTENANCE TASKS**

Registration & date	Maintenance task performed	Confirmed by Licence No.
---------------------	----------------------------	-----------------------------

General activities

	Refuel aircraft, defuel aircraft	
--	----------------------------------	--

	Verification and adjustment of folding system of powered sailplanes	
--	---	--

Propeller

	Assemble propeller after transportation and inspect	
--	---	--

	Replace, remove/refit propeller	
--	---------------------------------	--

	Check propeller mounting bolt torque and wire lock	
--	--	--

	Inspect slip rings and brush packs	
--	------------------------------------	--

	Perform static functional checks	
--	----------------------------------	--

	Check operation during ground run	
--	-----------------------------------	--

	Check track	
--	-------------	--

	Check setting of micro switches	
--	---------------------------------	--

	Assessment of blade damage in accordance with Aircraft maintenance Manual (AMM)	
--	---	--

Log book owners name

NOT transferrable

	Replace leading edge erosion tape	
	Dynamically balance propellor	
	Troubleshoot faulty system	
Power plant		
	Build up engine Electronic Control Unit (ECU), install and test	
	Replace engine	
	Repair cooling baffles	
	Repair cowling, adjust bay doors	
	Adjust cowl flaps	
	Repair faulty wiring	
	Troubleshoot	
	Assist in dry motoring check	
Piston Engines		
	Remove/install reduction gear	
	Check crankshaft run-out	
	Check/adjust tappet clearance	
	Check compression (state method) interpretation of results	
	Cylinder leakage check	
	Remove and replace cylinder head	
	Remove and replace cylinder(s) and piston(s)	
	Check piston ring gap and groove side clearance	

Log book owners name

NOT transferrable

	Remove and replace intake and exhaust valves, decarbonise, lap and leak check	
	Inspect/test valve springs	
	Extract broken stud	
	Install helicoil thread insert	
	Perform ground run	
	Establish/check reference RPM	
	Troubleshoot	
Fuel and control, piston		
	Replace engine driven fuel pump	
	Replace electrical fuel pump	
	Replace/service fuel filters	
	Replace/service air filters	
	Replace fuel hose	
	Carry out fuel flow test	
	Adjust Automatic Mixture Control (AMC) or carburettor with temperature compensation	
	Adjust Automatic Boost Control (ABC) or waste gate	
	Install carburettor/injector	
	Adjust carburettor/injector mixture and idle stop	
	Clean injector nozzles	
	Replace/repair primer line, check primer system for leaks	
	Repair or replace fuel primer pump	

Log book owners name

NOT transferrable

	Clean/service primer jets	
	Check carburettor float setting	
	Check carburettor float weights	
	Replace carburettor diaphragm on Stromberg or Bing type	
	Wire lock fuel pipes	
	Wire lock component mounting nuts	
	Troubleshoot faulty system	
Ignition systems, piston		
	Change magneto, test and carry out magneto drop test	
	Check impulse coupling	
	Change ignition vibrator.	
	Change or remove/refit ignition coil	
	Change or remove/refit electronic ignition module and test	
	Change plugs, inspect	
	Test plugs	
	Check High Tension (HT) leads	
	Install new HT leads.	
	Check timing	
	Check magneto grounding wire (P lead) and switches	
	Check operation of combined ignition key/starter switch	
	Check system bonding	

Log book owners name

NOT transferrable

	Troubleshoot faulty system	
Engine Controls		
	Replace engine control cable	
	Rig RPM control (throttle)	
	Rig mixture/HP cock lever control	
	Rig carburettor heat (or alternate air) control	
	Install split/cotter pins in fuel and mixture controls	
	Check controls for correct assembly and locking	
	Check controls for range, and direction of movement full and free and sense	
	Troubleshoot faulty system	
Engine Indicating		
	Replace engine instruments(s)	
	Replace oil temperature bulb	
	Test/replace thermocouples	
	Check calibration of tachometer gauge	
	Inspect/change/lubricate tachometer drive cable	
	Check calibration of cylinder head temperature gauge	
	Check calibration of oil pressure gauge	
	Troubleshoot faulty system	
Exhaust, piston		
	Replace exhaust gasket	

Log book owners name

NOT transferrable

	Inspect exhaust system	
	Replace exhaust mountings and springs	
	Inspect welded repair	
	Pressure check cabin heater muff	
	Troubleshoot faulty system	
Oil		
	Change oil	
	Check/change suction and pressure filter(s) (cut open to inspect)	
	Service scavenge filters	
	Prime oil system (maintenance level prime not preflight)	
	Adjust oil pressure relief valve	
	Replace/service/clean oil tank	
	Replace/flush oil cooler	
	Clean oil cooler matrix	
	Wire lock oil pipes	
	Replace/test firewall shut off valve	
	Perform oil dilution or analysis test	
	Troubleshoot faulty system	

Starting

	Replace starter motor	
--	-----------------------	--

Log book owners name

NOT transferrable

	Test/replace starter motor engagement device (Bendix, sprag clutch)	
	Replace starter relay	
	Troubleshoot faulty system	
Turbines, Supercharger/turbocharger, piston engines		
	Inspect turbocharger and associated components	
	Turbocharger damage assessment	
	Replace turbocharger unit	
	Test turbocharger pop-off valve	
	Replace turbo-blower turbocharger pop-off valve	
	Replace/repair heat shields	
	Inspect/test/ adjust/Replace waste gate	
	Adjust density Turbocharger/wastegate controller	
Reduction gearbox (optional)		
	Replace propellor reduction gearbox	
	Test gearbox overload clutch	
	Inspect magnetic chip detector	
Electric propulsion (optional)		
	Replace engine batteries	
	Troubleshoot/remove/replace motor control unit	
	Troubleshoot/remove/replace motor unit	
	Troubleshoot/remove/replace motor cooling fan	

Log book owners name

NOT transferrable

	Inspect/replace propeller	
Jet propulsion (optional)		
	Inspect compressor and turbine for damage and condition	
	Troubleshoot engine	
	Remove/replace engine unit	
	Remove/inspect/replace ignitor	
	Remove/replace starter motor	
	Remove/replace fuel injector	
	Inspect motor retracting system and doors	
	Remove/replace/test fuel pump	
	Remove/replace/test engine control unit	
Module 8L POWER PLANT ADDITIONAL MAINTENANCE TASKS		

Log book owners name

NOT transferrable

[illegible]

Add additional pages as necessary