

MODULE 16. PISTON ENGINE

	Level		
	A	B1	B2
16.1 Fundamentals Mechanical, thermal and volumetric efficiencies; Operating principles — 2 stroke, 4 stroke, Otto and Diesel; Piston displacement and compression ratio; Engine configuration and firing order.	1	2	—
16.2 Engine Performance Power calculation and measurement; Factors affecting engine power; Mixtures/leaning, pre-ignition.	1	2	—

	Level		
	A	B1	B2
16.3 Engine Construction	1	2	—
Crank case, crank shaft, cam shafts, sumps;			
Accessory gearbox;			
Cylinder and piston assemblies;			
Connecting rods, inlet and exhaust manifolds;			
Valve mechanisms;			
Propeller reduction gearboxes.			
16.4 Engine Fuel Systems			
16.4.1 Carburettors	1	2	—
Types, construction and principles of operation;			
Icing and heating.			
16.4.2 Fuel injection systems	1	2	—
Types, construction and principles of operation.			
16.4.3 Electronic engine control	1	2	—
Operation of engine control and fuel metering systems including electronic engine control (FADEC);			
Systems lay-out and components.			
16.5 Starting and Ignition Systems	1	2	—
Starting systems, pre-heat systems;			
Magneto types, construction and principles of operation;			
Ignition harnesses, spark plugs;			
Low and high tension systems.			
16.6 Induction, Exhaust and Cooling Systems	1	2	—
Construction and operation of: induction systems including alternate air systems;			
Exhaust systems, engine cooling systems — air and liquid.			
16.7 Supercharging/Turbocharging	1	2	—
Principles and purpose of supercharging and its effects on engine parameters;			
Construction and operation of supercharging/turbocharging systems;			
System terminology;			
Control systems;			
System protection.			

	Level		
	A	B1	B2
16.8 Lubricants and Fuels	1	2	—
Properties and specifications;			
Fuel additives;			
Safety precautions.			
16.9 Lubrication Systems	1	2	—
System operation/lay-out and components.			
16.10 Engine Indication Systems	1	2	—
Engine speed;			
Cylinder head temperature;			
Coolant temperature;			
Oil pressure and temperature;			
Exhaust Gas Temperature;			
Fuel pressure and flow;			
Manifold pressure.			
16.11 Powerplant Installation	1	2	—
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.			
16.12 Engine Monitoring and Ground Operation	1	3	—
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.			
16.13 Engine Storage and Preservation	—	2	—
Preservation and depreservation for the engine and accessories/systems.			