Advisory Circular

AC66-2.30

Revision 2 (0)

Aircraft Maintenance Engineer Licence —
Mechanical Group Ratings **14 December 2021**

General

Civil Aviation Authority Advisory Circulars contain information about standards, practices, and procedures that the Director has found to be an **Acceptable Means of Compliance** (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate Advisory Circular.

An Advisory Circular may also include **guidance material** (GM) to facilitate compliance with the rule requirements. Guidance material must not be regarded as an acceptable means of compliance.

Purpose

This Advisory Circular provides an AMC for the syllabus content in respect of written examinations for Mechanical Group Ratings.

This Advisory Circular also provides GM for recommended study material in respect of the examination syllabi in this Advisory Circular.

Related Rules

This Advisory Circular relates specifically to Civil Aviation Rule Part 66 Subpart C — Aircraft Maintenance Engineer Licence.

Change Notice

Subject to “Memorandum for Technical Cooperation” between the CAA of Mongolia and New Zealand on mutual cooperation in implementation of the International Civil Aviation Organization Resolution of Global Rule Harmonization, which urges States to promote global harmonization of national rules, dated 6th of May, 1999, Mongolian Civil Aviation Safety Regulation has been reconciled to the Civil Aviation Regulation of New Zealand.

Amendment 164 of Annex 1 to the Chicago Convention on International Civil Aviation urges flight crew members, ATC personnel and aircraft maintenance engineers to comply with the language proficiency requirements; and

Under Article 14 of the Civil Aviation Law of Mongolia 1999, “Use of foreign language in civil aviation” the AC has been released in English version only, in order to prevent any mistranslation and misuse of the aviation safety related documents.

In Revision 2, editorial changes were made to standardize formatting and to correct references specific to New Zealand.

Table of Contents

Eligibility requirements

Rule 66.103(3)(i) requires an applicant for an AME group or type rating to have successfully completed examinations acceptable to the Director or a course of training.

The examinations acceptable to the Director should comply with the syllabi contained in this AC.

Knowledge Levels

These syllabi provide for the subject material covered in the Mechanical Group Rating examinations.

Each topic within the syllabi has a level number which provides an indication of the degree or level of knowledge required. There are three level numbers and they are defined as follows:

Level 1: A familiarisation with the principal elements of the subject

Objectives: The applicant should be:

1) familiar with the basic elements of the subject
2) able to give simple descriptions of the whole subject, using common words and examples
3) able to use typical terms.

Level 2: A general knowledge of the theoretical and practical aspects of the subject

An ability to apply the knowledge.

Objectives: The applicant must be able to:

1) understand the theoretical fundamentals of the subject
2) give a general description of the subject using, as appropriate, typical examples
3) use mathematical formulae in conjunction with physical laws describing the subject
4) read and understand sketches, drawings and schematics describing the subject
5) apply his/her knowledge in a practical manner using detailed procedures

Level 3: A detailed knowledge of the theoretical and practical aspects of the subject.

A capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.

Objectives: The applicant must:

1) know the theory of the subject and the interrelationships with other subjects
2) be able to give a detailed description of the subject using theoretical fundamentals and specific examples
3) understand and be able to use mathematical formulae related to the subject
4) be able to read, understand and prepare sketches, simple drawings and schematics describing the subject
5) be able to apply his/her knowledge in a practical manner using manufacturer's instructions
6) be able to interpret results and measurements from various sources and apply corrective action where appropriate.

Subject 60 (Written) & 61 (Oral)

Aeroplanes Group 1

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aircraft Inspection Procedures (CAIP)
2.	FAA or EA-AC43-13.1 & .2 Aircraft Inspection and Repair
3.	EA-AC-65-9 General Handbook
4.	EA-AC-65-15 Airframe Handbook
5.	Maintenance or service manuals applicable to the following aircraft types may be of assistance: • Cessna 100 series • Piper PA28 series • FU24 series • Grumman AA5 series • Manual applicable to the candidate's basic aircraft

The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.

1.	AIRCRAFT STRUCTURES	1	Monocoque airframe structure.
		2	Structural inspection. Airframe symmetry and rigging.
		3	Inspection after abnormal flight or ground occurrences.
		2	Minor repairs. The effects of disturbed airflow. Corrosion control and surface finish.

2.	STRUCTURE REPAIRS	2	Spar cap and web repairs. Fuselage stringer repairs. Wing skin replacement. Wing rib repairs.
		2	Replacement of special fittings for wing and landing gear attachment.
		2	Repair of metal honeycomb panels, reinforced plastic honeycomb panels, FRP-skin structure, plastic and polymer foam inserts and insulation. Integral fuel tank repairs including specialised self- sealing fasteners, sealing practices, leak testing and tracing.
3.	MAJOR STRUCTURAL INSPECTIONS	2	Identification of structural defects. Mass balancing of flying controls after major repair. Use of special sealants and repair of sealants including polysulphides, RTV silicones, and polyurethanes. Wet assembly and faying surface sealing of structural repair.
		2	Structural fatigue identification and damage repair. Standard repair to tubular structures including welded joints and tube replacement. Windscreen and window replacement. Repair of smooth skin, panels, formers, stringers, longerons, leading and trailing edges.

4.	OVERHAUL & MANUFACTURING PROCESSES	2	Sheet metal bending, bend allowance calculation, bumping, crimping, stretching, shrinking, folding, duplication of patterns, joggling, rivet layout, rivet installation, rivet defects, rivet identification, and rivet removal. Blind fasteners: blind friction locked and blind mechanically locked types. High strength fasteners: Hi-Shear rivets, Hi-Lok pins, Lockbolts, Jo-Bolts, Taperlock pins.
		3	Inspection and installation of critical bolted joints.
		2	Heat treatment of aluminium alloys. Selection of alternative materials. Machining, milling, drilling turning, grinding, boring, spark erosion, shaping, sawing, shearing. Jigging, trestling, structural alignment, and levelling.
5.	SPECIAL INSPECTIONS	3	Heavy landings, severe turbulence, lightning strikes, taxiing damage, internal fire or explosion damage
6.	CONTROL SURFACES & SYSTEMS	1	Control system components.
		2	Systematic correction of flying faults.
		3	Installation and inspection of flying controls.
		2	Repair and balancing.
7.	HYDRAULIC SYSTEMS	1	Components of simple hydraulic systems.
		2	Installation of rigid and flexible lines. Hydraulic system maintenance. Hydraulic fluid identification.
8.	LANDING GEAR	1	Types of landing gear including oleo, rubber, flat or tubular spring and fibre glass.
		2	Wheels. Brakes. Balancing of wheel assemblies. Landing gear maintenance

9.	AIRCRAFT FUEL SYSTEM UP TO ENGINE BULKHEAD	1	Types of tanks including metal, integral, bladder.
		2	Installation of rigid and flexible fuel pipes. Fuel flow checks. Fuel gauge calibration.
		1	Fuel cocks, check valves. Non-return valves, boost pumps.
		2	Fuel system maintenance. Auxiliary systems.
10.	TRANSPARENT PLASTIC PANELS	1	Storage and installation. Effect of heat coefficient on installation. Approved methods of repair.
		2	Cleaning and protection from detrimental compounds.
11.	CABIN & COCKPIT FURNISHINGS & SAFETY EQUIPMENT	2	Seat installations. Safety harness.
		3	Testing of safety harnesses.
		2	Selection of furnishing fabrics. Axe, first aid kit, life jackets.
12.	ENVIRONMENTAL CONTROL	2	Cabin heating, defrosting, and ventilation.
		1	Carbon monoxide checks. Airconditioning systems.

13.	ELECTRICAL SYSTEMS	2	Aircraft batteries. Generators and charging circuits. Alternator circuits and protection. Electric pumps. Flap motors. Limit switches. Installation of wiring looms, connectors and junction boxes. Bonding. Electrical circuit drawings. Electrical system maintenance. Troubleshooting.
14.	INSTRUMENT SYSTEMS	1	Basic flight instruments. Engine and airframe instruments.
		2	Simple autopilot systems.
		1	Placarding.
		2	Pitot static systems. Pump and venturi vacuum systems.
		1	Use of common test equipment.
		3	Installation and compensation of Direct and remote reading compasses.
15.	RADIO SYSTEMS	2	Antenna maintenance. ELT and antenna installation. Isolation of radio interference. Fabrication, installation and maintenance of wiring looms and cables. Installation of HF and VHF communications in VFR aircraft.
16.	ROLE EQUIPMENT	2	Dispersal systems in agricultural aircraft including: hopper boxes, spray systems, and seeding systems. Air ambulance stretchers.

Subject 62 (Written) & 63 (Oral)

Aeroplanes Group 2

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aircraft Inspection Procedures (CAIP)
2.	FAA-EA-AC43-13-1 & 2 Aircraft Inspection and Repair
3.	EA-AC-65-9 General Handbook
4.	EA-AC-65-15 Airframe Handbook
5.	Maintenance or service manuals applicable to the following aircraft types may be of assistance: Cessna 310 Cessna 402 Piper PA 31 Beech 58 Progressive Care Manual as applicable Manual applicable to the candidate's basic aircraft type

The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.

1.	AIRCRAFT STRUCTURES	1	Monocoque airframe structure.
		2	Structural inspection. Airframe symmetry and rigging.
		3	Inspection after abnormal flight or ground occurrences.
		2	Minor repairs. The effects of disturbed airflow. Corrosion control and surface finish.

2.	STRUCTURAL REPAIRS	2	Spar cap and web repairs. Fuselage stringer repairs. Wing skin replacement. Wing rib repairs.
		2	Replacement of special fittings for wing and landing gear attachment.
		2	Repair of metal honeycomb panels, reinforced plastic honeycomb panels, FRP-skin structure, plastic and polymer foam inserts and insulation. Integral fuel tank repairs including specialised self- sealing fasteners, sealing practices, leak testing and tracing.
3.	MAJOR STRUCTURAL INSPECTIONS	2	Identification of structural defects. Mass balancing of flying controls after major repair. Use of special sealants and repair of sealants including polysulphides, RTV silicones and polyurethanes. Wet assembly and faying surface sealing of structural repair.
		2	Structural fatigue identification and damage repair. Standard repair to tubular structures including welded joints and tube replacement. Windscreen and window replacement. Repair of smooth skin, panels, formers, stringers, longerons, leading and trailing edges.

4.	OVERHAUL & MANUFACTURING PROCESSES	2	Sheet metal bending, bend allowance calculation, bumping, crimping, stretching, shrinking, folding, duplication of patterns, joggling, rivet layout, rivet installation, rivet defects, rivet identification, and rivet removal. Blind fasteners: blind friction locked and blind mechanically locked types. High strength fasteners: Hi-Shear rivets, Hi-Lok pins, Lockbolts, Jo-Bolts, Taperlock pins.
		3	Inspection and installation of critical bolted joints.
		2	Heat treatment of aluminium alloys. Selection of alternative materials. Machining, milling, drilling turning, grinding, boring, spark erosion, shaping, sawing, shearing. Jigging, trestling, structural alignment and levelling.
5.	SPECIAL INSPECTIONS	3	Heavy landings, severe turbulence, lightning strikes, taxiing damage, internal fire or explosion damage
6.	CONTROL SURFACES & SYSTEMS	1	Control system components.
		2	Systematic correction of flying control faults.
		3	Installation and inspection of flying controls. Repair and balancing.
7.	HYDRAULIC SYSTEMS	2	Components of hydraulic systems. Installation of rigid and flexible lines. Hydraulic system maintenance. Hydraulic fluid identification.

8.	LANDING GEAR	2	Types of landing gear including oleo, rubber, springs and liquid spring. Retraction systems: electrical, hydraulic and compound. Emergency extension systems. Safety systems. Gear position indicator systems. Wheels. Brakes. Balancing of wheel assemblies. Landing gear maintenance.
9.	PNEUMATIC SYSTEMS	1	Types of compressors. Air bottles, relief valves, check valves.
		2	Filters, restrictors, selectors, and actuators. Pneumatic system maintenance.
10.	AIRCRAFT FUEL SYSTEM UP TO THE ENGINE BULKHEAD	1	Types of tanks including metal, integral, bladder.
		2	Installation of rigid and flexible fuel pipes. Fuel flow checks. Fuel gauge calibration.
		1	Fuel cocks, check valves. Non-return valves, boost pumps.
		2	Fuel system maintenance. Auxiliary systems.
11.	DE-ICING & ANTI-ICING	2	Pneumatic. Electrical.
		1	Heated air.
		2	Maintenance of systems.

12.	FIRE PROTECTION SYSTEM	1	Thermal switch system. Thermocouple system. Continuous loop.
		2	Maintenance.
13.	TRANSPARENT PLASTIC PANELS	1	Storage and installation. Effect of heat coefficient on installation. Approved methods of repair.
		2	Cleaning and protection from detrimental compounds.
14.	CABIN & COCKPIT FURNISHINGS & SAFETY EQUIPMENT	2	Seat installations. Safety harness.
		3	Testing of safety harnesses.
		2	Selection of furnishing fabrics. Axe, first aid kit, life jackets.
15.	ENVIRONMENTAL CONTROL	2	Cabin heating, defrosting, and ventilation. Combustion heaters.
		1	Carbon monoxide checks. Air conditioning systems.
16.	ELECTRICAL SYSTEMS	2	Aircraft batteries. Generators and charging circuits. Alternators, circuits and protection. Electric pumps. Flap motors. Limit switches. Installation of wiring looms, connectors and junction boxes. Bonding. Electrical circuit drawings. Electrical system maintenance. Troubleshooting.

17.	INSTRUMENT SYSTEMS	1	Basic flight instruments. Engine and airframe instruments.
		2	Simple autopilot systems.
		1	Placarding.
		2	Pitot & static systems. Pump and venturi vacuum systems.
		1	Use of common test equipment.
		3	Installation and compensation of direct- and remote- reading compasses.
18.	RADIO SYSTEMS	2	Antenna maintenance. ELT and antenna installation. Isolation of radio interference. Fabrication, installation and maintenance of wiring looms and cables. Installation of HF and VHF communications in VFR aircraft.
19.	ROLE EQUIPMENT	2	Dispersal systems in agricultural aircraft including: hopper boxes, spray systems and seeding systems. Air ambulance stretchers.

Subject 64 (Written) & 65 (Oral)

Aeroplanes Group 3

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aircraft Inspection Procedures (CAIP)
2.	FAA-EA-AC43-13-1&2 Aircraft Inspection and Repair
3.	EA-ADF-1 Aircraft Fabric Covering
4.	EA-AP-1 Aircraft Painting & Finishing
5.	Manuals for the aircraft of your choice

The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.

1.	AIRCRAFT STRUCTURES	2	Description of Structure including: semi-monocoque, wire braced, girder braced and welded tube.
		2	Airframe symmetry and rigging.
		3	Inspection after abnormal flight or ground occurrences.
		2	Minor repairs. • The effects of disturbed airflow. • Corrosion control.
2.	CONTROL SURFACES & SYSTEMS	1	Control system components.
		2	Systematic correction of flying control faults.
		3	Installation and inspection of flying controls.
		2	Repair and balancing.

3.	LANDING GEAR	1	Types of landing gear including: oleo, rubber, flat or tubular spring, and fibre glass.
		2	Wheels. • Brake systems. • Balancing of wheel assemblies. • Landing gear maintenance.
4.	AIRCRAFT FUEL SYSTEM UP TO ENGINE BULKHEAD	1	Metal fuel tanks.
		2	Installation of rigid and flexible fuel tanks. Fuel flow checks. Fuel gauge calibration.
		1	Non-return valves, boost pumps.
		2	Fuel system maintenance. Auxiliary systems.
5.	MAINTENANCE OF ASSEMBLIES	1	Types of wood and their properties.
		2	Permissible and non-permissible defects. • Storage of wood. • Moisture content and control. • Glue types and properties. • Glueing procedures. • Glue deterioration. • Water penetration.

6.	TUBULAR STEEL ASSEMBLIES	1	Material selection and identification.
		2	Tubular steel fabrication. Jigging techniques. Fatigue and stress identification. Corrosion control. Minor repairs.
7.	FABRICS	1	Fabric types and properties.
		2	Fabric repair technique.
		3	Fabric condition assessment.
8.	DOPING	1	Dope types, properties and uses.
		2	Doping procedures and precautions. • Storage of dopes.
9.	TRANSPARENT PLASTIC PANELS	1	Storage and installation. Approved methods of repair.
		2	Cleaning and protection from detrimental compounds.
10.	CABIN & COCKPIT FURNISHINGS & SAFETY EQUIPMENT	2	Seat installations. • Safety harness.
		3	Testing of safety harnesses.
		2	Selection of furnishing fabrics. Axe, first aid kit, life jackets.
11.	ENVIRONMENTAL CONTROL	2	Cabin heating, defrosting and ventilation.
		1	Carbon monoxide checks. Air conditioning systems.

12.	ELECTRICAL SYSTEMS	2	Aircraft batteries. Generators and charging circuits. Alternators circuits and protection. Electric pumps. Installation of wiring looms, connectors, and junction boxes. Bonding. Electrical circuit drawings. Electrical system maintenance. Troubleshooting.
13.	INSTRUMENT SYSTEMS	1	Basic flight instruments. • Engine and airframe instruments. • Placarding.
		2	Pitot static systems. Venturi vacuum systems.
		1	Use of common test equipment.
		3	Installation and compensation of Direct reading compasses.
14.	RADIO SYSTEMS	2	Antenna maintenance. ELT and antenna installation. Isolation of radio interference. Fabrication, installation and maintenance of wiring looms and cables. Installation and VHF communications in VFR aircraft.

Subject 66 (Written) & 67 (Oral)

Aeroplanes Group 4

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1	Civil Aircraft Inspection Procedures (UK CAIP)
2	Maintenance or repair manual for the candidate's basic aeroplane

The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.

1.	FRP AIRCRAFT STRUCTURES	1	FRP airframe structure.
		2	Structural inspection. Airframe symmetry and rigging.
		3	Inspection after abnormal flight or ground occurrences.
		2	Minor FRP repairs and repair schemes. The effects of disturbed airflow. Surface finishes.
2.	FRP MATERIALS	1	Properties of FRP materials.
		2	Storage of materials.
		3	Safety precautions. Identification of material defects.
		2	Inspection techniques.
3.	CONTROL SURFACES & SYSTEMS	1	Control system components.
		2	Systematic correction of flying control faults.
		3	Installation and inspection of flying controls.
		2	Repair and balancing.

4.	HYDRAULIC SYSTEMS	1	Components of simple hydraulic systems
		2	Installation of rigid and flexible lines. Hydraulic system maintenance
5.	LANDING GEAR	1	Oleo landing gear construction.
		2	Wheels. Brakes. Balancing of wheel assemblies. Landing gear maintenance.
6.	AIRCRAFT FUEL SYSTEM UP TO ENGINE BULKHEAD	1	Fuel tanks.
		2	Installation of rigid and flexible fuel pipes. Fuel flow checks. Fuel gauge calibration
		1	Fuel cocks, check valves. Non-return valves, boost pumps.
		2	Fuel system maintenance. Auxiliary systems
7.	TRANSPARENT PLASTIC PANELS	1	Storage and installation. Effect of heat coefficient on installation. Approved methods of repair.
		2	Cleaning and protection from detrimental compounds.
8.	CABIN & COCKPIT FURNISHINGS & SAFETY EQUIPMENT	2	Seat installations. Safety harness.
		3	Testing of safety harnesses.
		2	Selection of furnishing fabrics. Axe, first aid kit, life jackets

9.	ENVIRONMENTAL CONTROL	2	Cabin heating, defrosting and ventilation
10.	ELECTRICAL SYSTEMS	2	Aircraft batteries. Alternator circuits and protection. Electric pumps. Flap motors. Limit switches. Installation of wiring looms, connectors and junction boxes. Bonding. Electrical circuit drawings. Electrical system maintenance. Troubleshooting.
11.	INSTRUMENT SYSTEMS	1	Basic flight instruments.
		2	Engine and airframe instruments.
		1	Placarding.
		2	Pitot static systems. Vacuum systems.
		1	Use of common test equipment.
		3	Installation and compensation of direct reading compasses.
12.	RADIO SYSTEMS	2	Antenna maintenance. ELT and antenna installation. Isolation of radio interference. Fabrication, installation and maintenance of wiring looms and cables. Installation and VHF communications in VFR aircraft.

Subject 70 (Written) & 71 (Oral) Powerplant Group I

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aircraft Inspection Procedures
2.	FAA EA-AC43-13-1 Aircraft Inspection and Repair
3.	EA-AC-65-12 Power Plant Handbook
4.	EA-IGS Aviation Technical Training Aircraft
5.	PWA 01-100 The Aircraft Engine and its Operation
6.	Continental, Lycoming, Gypsy Major service manuals for normally aspirated engines
7.	Manuals applicable to the candidate's basic power plant

The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.

1.	ENGINE CONSTRUCTION & CONFIGURATION	3	Description of candidate's basic engine including: crankcase, crankshaft, camshaft, bearing arrangements, reduction gearing valve operating mechanism, cylinders, rear cover, component drive arrangements, breather systems and piston assemblies.
		1	Differences between the candidate's basic engine and other engines in the Group.
2	LUBRICATION SYSTEMS	2	Wet and dry sump installations. Filter location and maintenance. Flexible and rigid pipelines. Oil coolers and thermostat systems. Pressure relief valves and cooling jets. Lubricant types, properties deterioration and identification. Hot oil priming procedures.
		3	Oil system troubleshooting including wear-debris analysis.

3.	IGNITION	1	Magneto construction.
		2	Internal timing procedure. Magneto installation and timing. Harness layout and maintenance. Auxiliary starting aids. Ignition switches and low-tension wiring. Spark plug maintenance. Radio interference.
		3	Ignition system maintenance and troubleshooting.
4.	FUEL SYSTEMS	1	Description and location of components.
		2	Carburettor types. Check valves, filters, pumps, non-return valves, fuel hoses, and pipes. Fuel injector systems. Fuel system maintenance, including running, mixture, & pressure adjustments
		3	Fuel system defects and troubleshooting.
		2	Fuel system inhibiting.
5.	VACUUM SYSTEMS	1	System description.
		2	Maintenance of pump, oil separator regulator and filters.
		3	Troubleshooting and defect rectification.
6.	POWERPLANT	2	Engine mounting frames and rubbers. Cooling baffles and control systems. Induction filters and boxes. Exhaust systems including heater muffs and shrouds. Carburettor heat systems. Cabin heat systems including exhaust and oil cooler heat source.

7.	PROPELLERS	1	Construction and maintenance of wooden and metal fixed pitch propellers.
		1	Construction and differences between the various propeller types in the group.
		2	Blade and hub maintenance. Propeller governors and associated control mechanisms. Blade repair limits.
		3	Propeller system troubleshooting.
8.	ENGINE ELECTRIC	1	Starting system description and maintenance.
		2	Charging system description and maintenance. Electrical wiring installation and maintenance. Interpretation of wiring diagrams.
		3	Electrical system troubleshooting.
		2	Use of common test equipment.
9.	ENGINE INSTRUMENTS	2	Description and maintenance of: tachometers, manifold pressure gauges, oil pressure and temperature gauges, cylinder head temperature gauges, and fuel flow systems.
		3	Troubleshooting engine instrument defects.
		2	Use of common test equipment.
10.	TOP OVERHAUL	3	Understand fully the top overhaul procedure for one engine in the group. This should include: inspection and NDT, valve guide replacement, valve seat replacement, valve lapping, rectification of cooling fin damage and identification of cylinder bores.

11.	GENERAL POWERPLANT MAINTENANCE	2	Periodic inspection techniques. Engine change procedure. ADs applicable to candidate's basic engine. Ground testing procedures. Reference RPM procedure, including computation of correction factors. Engine running adjustments. Long- and short-term storage.
		3	Troubleshooting and defect rectification.
		2	Evaluation for engine life extensions. Compilation of work records, including log book procedure. Engine running-in procedures.
		3	Duplicate inspection of engine controls.
		2	Inspection after abnormal flight occurrence. Flight test and test report analysis.

Subject 72 (Written) & 73 (Oral)

Powerplant Group 2

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	UK Civil Aircraft Inspection Procedures
2.	FAA EA-AC43-13-1 Aircraft Inspection and Repair
3.	EA-AC-65-12 Power Plant Handbook
4.	EA-IGS Aviation Technical Training Aircraft Ignition and Electrical Power Systems
5.	PWA 01-100 The Aircraft Engine and its Operation
6.	Pratt and Whitney R1340 and R1830 maintenance manuals
7.	Manuals applicable to the Common Lycoming and Continental turbocharged engines and their systems

The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.

1. RADIAL POWERPLANTS	1	Basic construction and layout of cylinder and crankcase assemblies.
	2	Lubrication system. Ignition system. Fuel system. Exhaust system. Accessory gearbox. Reduction gear assemblies. Cooling system. Mounting frames. Periodic inspection and routine maintenance. Ground testing. Running adjustments.
	3	Troubleshooting and defect rectification.
	2	Long- and short-term storage. Oil priming. Reference RPM. Running-in procedure. Flight testing and performance analysis. Propellers and control systems.

2.	TURBOCHARGER SYSTEMS	2	Turbocharger construction. Lubrication system.
		3	Control systems fitted to Continental and Lycoming engines.
		2	Waste gates. Density controllers. System pressure-relief valves. Overboost protection. Absolute pressure controllers (Ratio controller). Fire protection and sensing systems. EGT sensing and control. Intercoolers.
3.	TURBOCHARGER SYSTEM MAINTENANCE	3	Identification and rectification of typical turbocharger defects including burning, cracking, coking, carburising, oil starvation, warping, and buckling. Control system adjustments. Identification and rectification of performance defects in boosted systems. Routine maintenance.
4.	FUEL SYSTEMS	1	Understand the operation of the Teledyne Continental continuous flow fuel injection system fitted to boosted engines. Understand the operation of the (AlliedSignal) Bendix fuel injection system for turbocharged engines. Understand the operation of fuel pumps, metering units, manifold valves, nozzles, flow dividers, injectors, air throttle bodies, and automatic mixture controls as used in the above systems.
		3	Fuel system troubleshooting and defect rectification.
		2	Routine maintenance and adjustments. Fuel systems inhibiting.

5.	IGNITION SYSTEMS	1	Magneto pressurisation. Ignition harnesses.
		2	Ignition system maintenance.
		3	Ignition system troubleshooting and defect rectification.
6.	TURBO CHARGED ENGINES GENERAL	2	Engine ground testing and performance analysis. Overboost or overspeed inspections. Reference RPM checks.
		3	Troubleshooting.
		2	Routine periodic maintenance.
		3	Flight testing and performance analysis.

Subject 80 (Written) & 81 (Oral) Rotorcraft Group I

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	UK Civil Aircraft Inspection Procedures.
2.	EA-HF-1 Basic Helicopter maintenance.
3.	Hughes 269 Helicopter maintenance manuals.
4.	Robinson R22 Helicopter maintenance manuals.
5.	Hiller 12E Helicopter maintenance manuals.
6.	Enstrom Helicopter maintenance manuals.
7.	Bell 47G Helicopter maintenance manual.

The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.

1.	ROTORCRAFT FUSELAGE STRUCTURE	1	General description of the fuselage including identification of primary, secondary, tertiary and crashworthy structure.
		2	Minor repairs. Cabin environment control. Transparent panels. Structural alignment checks. Corrosion control. Abnormal flight occurrence checks. Powerplant and transmission mounting structure. Identification of structural defects.

2.	MAIN ROTOR SYSTEM	2	Description of hub, blades, dampers, and mast. Main rotor hub maintenance. Blade maintenance. Damper maintenance.
		3	Main rotor balancing and tracking. Systematic correction of flying faults. Defect analysis and rectification.
3.	CONTROL SYSTEMS	2	Description and operation of main rotor control systems. Swash plates. Power or pitch correlation devices.
		3	Control system rigging and maintenance. Troubleshooting and defect rectification.
4.	MAIN ROTOR TRANSMISSIONS	1	Description and operation.
		2	Routine periodic maintenance. Components and accessories.
		3	Overspeed and overtorque inspections.
		2	Transmission mounts. Engine and transmission drive trains. Lubrication system maintenance. Free-wheel devices.
		3	Troubleshooting and defect rectification.
5.	ANTI TORQUE SYSTEM	1	Description and operation.
		2	Tail rotor drive. Tail rotor gearboxes. Tail rotor pitch control and rigging. Tail rotor hub and blade assembly. Routine maintenance including tracking and balancing.
		3	Troubleshooting and defect rectification.

6.	LANDING GEAR	1	Description and operation.
		2	Maintenance procedure. Damage areas and limits. Defect rectification.
7.	FUEL SYSTEM	1	Description and operation.
		2	Tanks, pumps, non-return valves, filters, strainers, and vents. Maintenance procedures.
		3	Troubleshooting.
8.	ELECTRICAL SYSTEM	1	Location and identification of electrical components.
		2	Interpretation of wiring diagrams. Starting system. Charging system.
		3	Maintenance of electrical components. Troubleshooting and defect rectification.
9.	INSTRUMENT SYSTEM	2	Pitot and static system. Maintenance of engine, airframe and flight instruments.
		3	Fuel system calibration. Troubleshooting instrument defects.
10.	RADIO SYSTEMS	2	Maintenance of Group 1 Communications equipment including antenna and ELT. Installation of VHF and HF radio systems. Troubleshooting and defect rectification.

11.	ROTORCRAFT MAINTENANCE GENERAL	3	Understanding of manufacturers service information. Determination of overhaul lives. Significant ADs pertaining to candidate's basic rotorcraft. Finite life control. Sudden rotor stoppage inspections. Helicopter weight and balance procedure. Computation of empty weight change.
		2	Ground handling. Jacking and levelling.
		3	Identification of bogus parts.
		2	Ground performance checking.
12.	MAINTENANCE OF ROLE EQUIPMENT	2	Refuelling equipment maintenance.
		1	Firelighters. Cargo hooks. Spray gear. Monsoon buckets Stretchers. Spreaders.
		2	Fire extinguishers, first aid kits, and crash axe.

Subject 82 (Written) & 83 (Oral)

Rotorcraft Group 2

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as

Scope of the Subject

1.	Civil Aviation Inspection Procedures UK CAA.		
2.	EA HF-1 Basic Helicopter maintenance.		
3.	Hughes 369 Helicopter maintenance manuals.		
4.	Bell 206 Helicopter maintenance manuals.		
5.	Aerospatiale AS350 Helicopter maintenance manuals.		
The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe,	ROTORCRAFT FUSELAGE STRUCTURE	1	General description of the fuselage including identification of primary, secondary, tertiary, and crashworthy structure. Inspection, minor repair, and replacement of bonded panels.
		2	Structural alignment checks. Identification of structural defects. Corrosion control. Powerplant and transmission mounting structure.
		3	Abnormal flight occurrence checks.
		2	Cabin environment control. Maintenance of transparent panels. Minor metal and FRP repairs.

*EA-ITP-P Power plant.*1.			
2.	MAIN ROTOR SYSTEM	1	Description of main rotor assembly types and construction.
		2	Maintenance of main rotor hub, blades, dampers, and mast.
		3	Main rotor balancing and tracking. Systematic correction of flying faults. Defect analysis and rectification.
3.	CONTROL SYSTEMS	2	Description and operation of main rotor control systems. Maintenance of hydraulic power control systems. Swash plate assemblies. Power or pitch-correlation devices.
		3	Control system rigging and maintenance. Troubleshooting and defect rectification.
4.	MAIN ROTOR TRANSMISSIONS	1	Description and operation.
		2	Transmission mounts. Lubrication systems maintenance. Free wheel devices. Components and accessories. Routine periodic maintenance. Engine and transmission drive trains.
		3	Overspeed and overtorque inspections. Troubleshooting and defect rectification.
5.	ANTI TORQUE SYSTEM	1	Description and operation.
		2	Tail rotor drive. Tail rotor gearboxes. Tail rotor hub and blades. Tail rotor pitch control and rigging.
		3	Routine maintenance including tracking and balancing. Troubleshooting and defect rectification including

			maintenance after a tail rotor strike.
6.	LANDING GEAR	1	Description and operation.
		2	Maintenance procedure. Damage areas and limits. Defect maintenance.

7.	FUEL SYSTEM	1	Description and operation.
		2	Maintenance of tanks and fuel cells. Fuel pumps, non-return valves, filters, strainers and vents. Fuel system maintenance.
		3	Troubleshooting and rectification.
8.	ELECTRICAL SYSTEM	1	Location and identification of electrical components.
		2	Interpretation of wiring diagrams. Starting system. Charging system. Maintenance of electrical components. .
		3	Troubleshooting and defect rectification.
9.	INSTRUMENT SYSTEM	2	Pitot and Static system. Maintenance of engine, airframe and flight instruments.
		3	Fuel system calibration. Troubleshooting instrument defects.
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11.	ROTORCRAFT MAINTENANCE GENERAL	3	Understanding of manufacturer's service information. Determination of overhaul lives. Significant Airworthiness Directives pertaining to candidate's basic rotorcraft. Finite life control. Sudden rotor stoppage inspections. Helicopter weight and balance procedure. Computation of empty weight change
		2	Ground handling. Jacking and levelling.
		3	Identification of bogus parts.
		2	Ground performance checking. Refuelling equipment maintenance.
12.	MAINTENANCE OF ROLE EQUIPMENT	1	Firelighters. Cargo hooks. Spray gear. Monsoon buckets. Stretchers. Spreaders.
		2	Safety equipment including fire extinguishers, first aid kits, and crash axes.

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