

Annex A to AMC/GM Part 147 - Module 11B – Piston Aeroplane aerodynamics, structures, and systems

CASA module Examination subjects	CASA Mechanical Basics exams equivalent	CASA avionics basics exams equivalent
Module 11B – Piston Aeroplane aerodynamics, structures, and systems (B1.2 Licence)		
11.1 Theory of flight		
11.1.1 Aeroplane aerodynamics and flight controls		
Operation and effect of the following:		
roll control: ailerons and spoilers	BB	QB
pitch control: elevators, stabilators, variable incidence stabilisers and canards	BB	QB
yaw control, rudder limiters	BB	QB
Control using elevons, ruddervators;	BB	QB
High-lift devices, slots, slats, flaps, flaperons;	BB	QB
Drag-inducing devices, spoilers, lift dumpers, speed brakes;	BB	QB
Effects of wing fences, sawtooth leading edges;	BB	Nil
Boundary layer control, using vortex generators, stall wedges or leading-edge devices;	BB	Nil
Operation and effect of trim tabs, balance and anti-balance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.	BB	Nil
11.1.2 High-speed flight – (This subject not required for B1.2)	This subject N/A for B1.2	This subject N/A for B1.2
11.2 Airframe structures – general concepts		
(a)		
Airworthiness requirements for structural strength;	FG	Nil
Structural classification, primary, secondary and tertiary;	FG	Nil
Fail safe, safe life, damage tolerance concepts;	FG	Nil
Zonal and station identification systems	FG	QB
Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;	FG	Nil
Drains and ventilation provisions;	FG	Nil
System installation provisions	FG	Nil
Lightning strike protection provision;	FG	Nil
Aircraft bonding	FG	QB
(b)		
Construction methods of stressed-skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments;	FG	Nil
Structure assembly techniques: riveting	FG	Nil
bolting	FG	Nil
bonding	FG	QB

Methods of surface protection, such as chromating, anodising, painting;	FG	Nil
Surface cleaning;	FG	Nil
Airframe symmetry: methods of alignment and symmetry checks.	FG	Nil
11.3 Airframe structures — aeroplanes		
11.3.1 Fuselage (ATA52/53/56)		
Construction and pressurisation sealing;	FG	Nil
Wing, tailplane, pylon and undercarriage attachments;	FG	Nil
Seat installation;	FG	Nil
Doors and emergency exits: construction and operation and safety devices	FG	Nil
Windows and windscreen construction and mechanisms.	FG	Nil
11.3.2 Wings (ATA57)		
Construction;	FG	Nil
Fuel storage;	FG	Nil
Landing gear, pylon, control surface and high-lift/drag attachments.	FG	Nil
11.3.3 Stabilisers (ATA55)		
Construction;	FG	Nil
Control surface attachment.	FG	Nil
11.3.4 Flight control surfaces (ATA55/57)		
Construction and attachment;	FG	Nil
Balancing — mass and aerodynamic	FG	QB
11.3.5 Nacelles and pylons (ATA54)		
Construction	FG	Nil
Firewalls	FG	Nil
Engine mounts.	FG	Nil
11.4 Air-conditioning and cabin pressurisation (ATA21)		
Pressurisation and air-conditioning systems;	FM	EB & ED
Cabin pressure controllers;	IM	IM
Protection and warning devices;	IM	IM
Heating systems	FM	Nil
11.5 Instruments and avionic systems		
11.5.1 Instrument systems (ATA31)		
Pitot static: altimeter, airspeed indicator, vertical speed indicator;	BC	IA
Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;	BC	IZ
Compasses: direct reading, remote reading;	BC	IZ

Angle of attack indication, stall warning systems;	Nil	NIL
Glass cockpit;	Nil	IZ
Other aircraft system indication.	Nil	IZ
11.5.2 Avionic systems		
Fundamentals of system layouts, and operation of the following:		
auto flight (ATA22)	BC	IF
communications (ATA23)	Nil	WA & WZ
navigation systems (ATA34)	Nil	WC & WD & WE & WJ
11.6 Electrical power (ATA24)		
Batteries installation and operation;	BC	EB
DC-power generation	BC	EB
Voltage regulation	BC	EB
Power distribution;	BC	ED
Circuit protection;	BC	QB
Inverters, transformers.	NIL	ED
11.7 Equipment and furnishings (ATA25)		
(a)		
Emergency equipment requirements;	FG	Nil
Seats, harnesses and belts;	FG	Nil
(b)		
Cabin layout;	FG	Nil
Equipment layout;	FG	Nil
Cabin furnishing installation;	FG	Nil
Cabin entertainment equipment;	Nil	Nil
Galley installation;	FG	Nil
Cargo handling and retention equipment;	FG	Nil
Airstairs.	FG	Nil
11.8 Fire protection (ATA26)		
(a)		
Fire and smoke detection and warning systems;	BC	ED
Fire extinguishing systems;	BC	ED
System tests;	BC	ED
(b)		
Portable fire extinguisher.	BC	ED
11.9 Flight controls (ATA27)		
Primary controls: aileron, elevator, rudder	BB	QB
Trim tabs;	BB	QB
High-lift devices;	BB	QB
System operation: manual;	BB	QB
Gust locks;	BB	QB
Balancing and rigging;	BB	Nil
Stall warning system.	BB	Nil
11.10 Fuel systems (ATA28)		
System layout;	FA	Nil

Fuel tanks;	FA	Nil
Supply systems;	FA	Nil
Cross-feed and transfer;	FA	Nil
Indications and warnings;	FA	IA
Refuelling and defuelling.	FA	Nil
11.11 Hydraulic power (ATA29)		
System layout;	FF	Nil
Hydraulic fluids;	FF	Nil
Hydraulic reservoirs and accumulators;	FF	Nil
Pressure generation: electric, mechanical;	FF	Nil
Filters;	FF	Nil
Pressure control;	FF	Nil
Power distribution;	FF	Nil
Indication and warning systems.	FF	IA
11.12 Ice and rain protection (ATA30)		
Ice formation, classification and detection;	FG	ED
De-icing systems: electrical, hot air, pneumatic and chemical;	FG	ED
Probe and drain heating;	FG	ED
Wiper systems	FG	Nil
11.13 Landing gear (ATA32)		
Construction, shock absorbing;	FG	Nil
Extension and retraction systems: normal and emergency;	FG	Nil
Indications and warning;	FG	EB
Wheels, brakes, antiskid and autobraking;	FG	ED
Tyres;	FA	Nil
Steering;	FF	Nil
Air-ground sensing.	FG	EB
11.14 Lights (ATA33)		
External: navigation, anti-collision, landing, taxiing, ice	Nil	EB
Internal: cabin, cockpit, cargo;	Nil	EB
Emergency.	Nil	EB
11.15 Oxygen (ATA35)		
System layout: cockpit, cabin;	FG	IZ
Sources, storage, charging and distribution;	FG	IZ
Supply regulation	FG	IZ
Indications and warnings.	FG	IZ
11.16 Pneumatic and vacuum (ATA36)		
System layout;	FM IM	IM
Sources: engine/APU, compressors, reservoirs, ground supply;	FF	Nil
Pressure and vacuum pumps;	FM	Nil
Pressure control;	FM IM	IM
Distribution;	FM IM	Nil
Indications and warnings;	FM IM	IM
Interfaces with other systems.	FM IM	Nil
11.17 Water and waste (ATA38)		
Water system layout, supply, distribution, servicing and draining;	FG	Nil
Toilet system layout, flushing and servicing;	Nil	Nil
Corrosion aspects.	FG	Nil