

AVIATION MAINTENANCE TECHNICIAN CERTIFICATION SERIES

TURBINE AEROPLANE STRUCTURES AND SYSTEMS

11



EASA 2023-889 COMPLIANT

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VERSION	EFFECTIVE DATE	DESCRIPTION OF REVISION(S)
001	2015.01	Module creation and release.
002	2016.01	Minor Revisions
003	2017.09	Format Updates
003.1	2019.02	Added section on Pneumatic and Pressure Pumps in Submodule 16.
003.2	2019.05	Corrected incorrect answers in Submodule 20.
004	2019.12	Typographic format updated; Sequencing of content to Appendix 1 refined.
004.1	2021.04	Enhanced content of M11A Submodule 08(b).
004.2	2023.01	Added Measurement Standards. Improved Figures 13-51, 18-5, and 18-6.
004.3	2023.04	Enhanced content in Submodule 14 - Lights.
005	2024.04	Regulatory update for EASA 2023-989 Compliance.
005.1	2024.05	Replaced Figures 1-39 and 5-69, adjusted small text errors throughout Module.
005.2	2025.01	Page viii and page 8.1 - Corrected Submodule 11.8(A) to level 3. Page 3.18 - Corrected term thermoplastics to thermoset polymers. Page 9.7 - Corrected the orientation of left side checknut. Page 12.16 - Replaced to improve Figure 12-27.

Module was reorganized based upon the EASA 2023-989 subject criteria. Enhancements included in this version 005.2 are:

- 11.1 *Drag Inducing Devices* - complete rewrite.
- 11.2 *Fuselage Components, Structural Assembly Techniques, Reinforcement* - added content.
- 11.3.1(B) *Airborne Towing Devices* - added content.
- 11.3.5 *Engine Mounts* - complete rewrite.
- 11.4(C) *Control and Indication Control Valves* - added content.
- 11.5.2 *Controller Pilot Datalink* - added content.
- 11.5.2 *Audio Systems* - added content.
- 11.5.2 *Cockpit Voice Recorders* - added content.
- 11.5.2 *Microwave Landing Systems* - added content.
- 11.5.2 *ARINC Communications* - added content.
- 11.5.2 *Avionics Test Equipment* - added content from Module 7.4.
- 11.6 *Battery Maintenance and Troubleshooting* - added content.
- 11.10 *Inert Gas Systems* - added content.
- 11.11 *Servicing Hydraulic Systems* - added content.
- 11.11 *Boeing 737NG Hydraulic System* - added content.
- 11.13 *Tail Protection and Tail Skids* - added content.
- 11.16 *Pneumatic System Components* - added content.
- 11.21 *Electronic Flight Bag Classifications* - added content.
- Question and Answer updates for all Submodules.

MEASUREMENT STANDARDS

SI Units

The measurements used in this book are presented with the International System of Units (SI) standards in all cases except when otherwise specified by ICAO (for example, altitude expressed in feet or performance numbers as specified by a manufacturer). The chart below can be used should your studies call for conversions into imperial numbers.

Number Groups

This book uses the International Civil Aviation Organization (ICAO) standard of writing numbers. This method separates groups of 3 digits with a space, versus the European method by periods and the American method by commas.

For example, the number one million is expressed as:

ICAO Standard	1 000 000
European Standard	1.000.000
American Standard	1,000,000

Prefixes

The prefixes used in the table below form names of the decimal equivalents in SI units.

PREFIX AND SYMBOLS CHART

MULTIPLICATION FACTORS	PREFIX	SYMBOL
1 000 000 000 000 000 000 = 10^{18}	exa	E
1 000 000 000 000 000 = 10^{15}	peta	P
1 000 000 000 000 = 10^{12}	tera	T
1 000 000 000 = 10^9	giga	G
1 000 000 = 10^6	mega	M
1 000 = 10^3	kilo	k
100 = 10^2	hecto	h
10 = 10^1	deca	da
0.1 = 10^{-1}	deci	d
0.01 = 10^{-2}	centi	c
0.001 = 10^{-3}	milli	m
0.000 001 = 10^{-6}	micro	μ
0.000 000 001 = 10^{-9}	nano	n
0.000 000 000 001 = 10^{-12}	pico	p
0.000 000 000 000 001 = 10^{-15}	femto	f
0.000 000 000 000 000 001 = 10^{-18}	atto	a

COMMON CONVERSIONS CHART

IMPERIAL	TO	SI (METRIC)
Distance		
1 Inch	is equal to	2.54 Centimeters
1 Foot	is equal to	0.304 Meters
1 (Statute) Mile	is equal to	1.609 Kilometers
Weight		
1 Pound	is equal to	0.454 Kilograms
Volume		
1 Quart	is equal to	0.946 Liters
1 Gallon	is equal to	3.785 Liters
Temperature		
$^{\circ}$ Fahrenheit	is equal to	(-) 17.778° Celsius ($^{\circ}$ C)
$^{\circ}$ Fahrenheit	is equal to	255.37 Kelvin (K)
Area		
1 Square Inch	is equal to	6.451 Square Centimeters
1 Square Foot	is equal to	0.093 Square Meters
1 Square Mile	is equal to	2.59 Square Kilometers
Velocity		
1 Foot Per Second	is equal to	0.304 Meters Per Second
1 Mile Per Hour	is equal to	1.609 Kilometers Per Hour
1 Knot	is equal to	1.852 Kilometers Per Hour

SI (METRIC)	TO	IMPERIAL
Distance		
1 Centimeter	is equal to	0.394 Inches
1 Meter	is equal to	3.28 Feet
1 Kilometer	is equal to	0.621 Miles
Weight		
1 Kilogram	is equal to	2.204 Pounds
Volume		
1 Liter	is equal to	1.057 Quarts
1 Liter	is equal to	0.264 Gallons
Temperature		
$^{\circ}$ Celsius ($^{\circ}$ C)	is equal to	33.8° Fahrenheit
$^{\circ}$ Kelvin (K)	is equal to	(-) 437.87° Fahrenheit
Area		
1 Square Centimeter	is equal to	0.155 Square Inches
1 Square Meter	is equal to	10.764 Square Feet
1 Square Kilometer	is equal to	0.386 Square Miles
Velocity		
1 Meter Per Second	is equal to	3.281 Feet Per Second
1 Kilometer Per Hour	is equal to	0.621 Miles Per Hour
1 Kilometer Per Hour	is equal to	0.540 Knots

Pressure

pounds per square inch (psi)	kiloPascals (kPa)	6.897
pounds per square inch (psi)	Pascals (Pa)	6.894

BASIC KNOWLEDGE REQUIREMENTS

Qualification on basic subjects for each aircraft maintenance license category or subcategory is accomplished in accordance with the following matrix. Where applicable, subjects are indicated by an "X" in the column below the license heading.

EASA LICENSE CATEGORY CHART MODULE NUMBER AND TITLE		A1 Airplane Turbine	B1.1 Airplane Turbine	B1.2 Airplane Piston	B1.3 Helicopter Turbine	B1.4 Helicopter Piston	B2 Avionics
1	Mathematics	X	X	X	X	X	X
2	Physics	X	X	X	X	X	X
3	Electrical Fundamentals	X	X	X	X	X	X
4	Electronic Fundamentals		X	X	X	X	X
5	Digital Techniques, Electronic Instrument Systems	X	X	X	X	X	X
6	Materials and Hardware	X	X	X	X	X	X
7	Maintenance Practices	X	X	X	X	X	X
8	Basic Aerodynamics	X	X	X	X	X	X
9	Human Factors	X	X	X	X	X	X
10	Aviation Legislation	X	X	X	X	X	X
11	Aeroplane Aerodynamics, Structures and Systems	X	X				
12	Rotorcraft Aerodynamics, Structures and Systems				X	X	
13	Aircraft Aerodynamics, Structures and Systems						X
14	Propulsion						X
15	Gas Turbine Engine	X	X		X		
16	Piston Engine			X		X	
17	Propeller	X	X	X			

Basic knowledge requirements as outlined in Part-66, Appendix I

The knowledge level indicators are defined on 3 levels as follows:

Level 1

A familiarization with the principal elements of the subject.

Objectives:

- The applicant should be familiar with the basic elements of the subject.
- The applicant should be able to give a simple description of the whole subject, using common words and examples.
- The applicant should be able to use typical terms.

Level 2

A general knowledge of the theoretical and practical aspects of the subject and an ability to apply that knowledge.

Objectives:

- The applicant should be able to understand the theoretical fundamentals of the subject.
- The applicant should be able to give a general description of the subject using, as appropriate, typical examples.
- The applicant should be able to use mathematical formula in conjunction with physical laws describing the subject.
- The applicant should be able to read and understand sketches, drawings and schematics describing the subject.
- The applicant should be able to apply his knowledge in a practical manner using detailed procedures.

Level 3

A detailed knowledge of the theoretical and practical aspects of the subject and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.

Objectives:

- The applicant should know the theory of the subject and interrelationships with other subjects.
- The applicant should be able to give a detailed description of the subject using theoretical fundamentals and specific examples.
- The applicant should understand and be able to use mathematical formula related to the subject.
- The applicant should be able to read, understand and prepare sketches, simple drawings and schematics describing the subject.
- The applicant should be able to apply his knowledge in a practical manner using manufacturer's instructions.
- The applicant should be able to interpret results from various sources and measurements and apply corrective action where appropriate.

PART 66 BASIC KNOWLEDGE REQUIREMENTS

[illegible]

PART 66 BASIC KNOWLEDGE REQUIREMENTS

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		B1
11.4	Air Conditioning and Cabin Pressurization (ATA 21) (a) Pressurization systems; Cabin pressure controllers, control, and safety valves; Control and indication. (b) Air supply Sources of air supply including engine bleed, APU and ground cart; Distribution systems. (c) Air conditioning Air-conditioning systems; Air cycle and vapour cycle machines; Flow, temperature and humidity control system; Control and indication control valves. (d) Safety and warning devices. Protection and warning devices. (e) Heating and ventilation systems.	3 3 3 3 -
11.5	Instruments/Avionics Systems	
11.5.1	Instrument Systems (ATA 31) Pitot-static: Airspeed indicators, Vertical speed indicators, Altimeters; Gyroscopic: Gyroscopic principles, Artificial horizons, Attitude directors, Direction indicators, Horizontal situation indicators (HSI), Slip indicators, Turn indicators, Turn coordinators; Compass systems: Systems, Direct reading, Remote reading, Stall-warning systems and angle-of-attack indicating systems, Glass cockpit; Indications of other aircraft systems.	2
11.5.2	Avionics Systems Fundamentals of system layouts and operation of: Autoflight (ATA 22); Communication Systems (ATA 23): — Very High Frequency (VHF) communications, — High Frequency (HF) communications, — Satellite Communications (SATCOM), — Controller–pilot data link communications (CPDLC), — Audio systems, — Emergency Locator Transmitters (ELTs), — Cockpit Voice Recorder (CVR); Navigation systems (ATA 34): — Very high frequency omnidirectional range (VOR), — Automatic direction finder (ADF), — Instrument landing system (ILS), — Microwave landing system (MLS), — Flight director systems (FDSs), distance-measuring equipment (DME), — Area navigation (RNAV) systems, — Flight management systems (FMSs), — Satellite navigation systems, — Air traffic control transponder, secondary surveillance radar, — Traffic alert and collision avoidance system (TCAS), — Weather avoidance radar, — Radio altimeter, — Inertial navigation system (INS), — ARINC (Aeronautical Radio Incorporated) communication and reporting. Types and uses of avionics general test equipment.	1

PART 66 BASIC KNOWLEDGE REQUIREMENTS

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		B1
11.6	Electrical Power (ATA 24) — Installation and operation of batteries; — DC power generation; — AC power generation; — Emergency power generation; — Voltage regulation; — Power distribution; — Inverters, transformers, rectifiers; — Circuit protection; — External/ground power.	3
11.7	Equipment and Furnishings (ATA 25) (a) Emergency equipment: Emergency equipment requirements. (b) Cabin and cargo layout: — Seats, harnesses, and belts; — Cabin layout; — Equipment layout; — Cabin furnishing installation; — Galley installation; — Cargo handling and retention equipment; — Airstairs.	2 1
11.8	Fire Protection (ATA 26) (a) Fire and smoke detection system, and fire-extinguishing systems: — Fire and smoke detection and warning systems; — Fire-extinguishing systems; — System tests. (b) Portable fire extinguisher.	3 1
11.9	Flight Controls (ATA 27) (a) Primary and secondary flight controls: — Primary controls: aileron, elevator, rudder, spoiler; — Trim control, trim tabs; — High-lift devices; — System operation: manual; — Gust locks and gust lock systems; — Artificial feel, yaw damper, Mach trim, rudder limiter; — Stall-warning systems. (b) Actuation and protection: — Active load control; — Lift dump, speed brakes; — Hydraulic, pneumatic systems; — Stall-protection systems. (c) System operation: Electrical systems, fly-by-wire systems. (d) Balancing and rigging.	3 3 3 3
11.10	Fuel Systems (ATA 28, ATA 47) (a) Systems: — System layout; — Fuel tanks; — Supply systems. (b) Fuel handling: — Cross-feed and transfer; — Refuelling and defuelling. (c) Indication and warnings. (d) Special systems: — Dumping, venting, and draining; — Inert gas systems. (e) Balancing: Longitudinal balance fuel systems.	3 3 3 3 3

PART 66 BASIC KNOWLEDGE REQUIREMENTS

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PART 66 BASIC KNOWLEDGE REQUIREMENTS

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		B1
11.18	Onboard Maintenance Systems (ATA 45) Central maintenance computers; Data-loading system; Electronic library system; Printing systems; Structure monitoring (damage-tolerance monitoring).	2
11.19	Integrated Modular Avionics (IMA) (ATA 42) (a) Overall system description and theory: Core system; network components; Functions that may be typically integrated in the integrated modular avionics (IMA) modules are, among others: Bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension and retraction, tire pressure indication, oleo pressure indication, brake temperature monitoring, etc. (b) Typical system layout.	2
11.20	Cabin Systems (ATA 44) System architecture, operation, and control of systems for: — passenger in-flight entertainment; — communication within the aircraft (Cabin intercommunication data system (CIDS); — communication between the aircraft cabin and ground stations; — including voice, data, music, and video transmission. CIDS interface between cockpit/cabin crew and cabin systems. Data exchange between the different related line replaceable units (LRUs). Flight attendant panels (FAPs). Cabin network server (CNS) and interfaces with the following systems: — Data/radio communication; — Cabin core system (CCS); — In-flight entertainment system (IFES); — External communication system (ECS); — Cabin mass memory system (CMMS); — Cabin monitoring system (CMS); — Miscellaneous cabin systems (MCSs); and — Other systems. Cabin network server (CNS) hosting functions: — Access to predeparture/departure reports; — Email/intranet/internet access; passenger database; — In-flight entertainment system; — External communication system; — Cabin mass memory system; — Cabin monitoring system; — Miscellaneous cabin system.	2
11.21	Information Systems (ATA 46) System architecture, operation, and control of: — Storage and electronic library; — Updating; — Retrieving of digital information; — Air traffic and information management systems (ATIMS) and network server systems; — Aircraft general information system; — Flight deck information system; — Maintenance information system; — Passenger cabin information system; — Miscellaneous information systems; — Other linked systems.	2

TABLE OF CONTENTS

TURBINE AEROPLANE STRUCTURES AND SYSTEMS

Revision Log	iii	Electrical Bonding	2.4
Measurement Standards	iv	Bonding Procedures and Precautions	2.4
Basic Knowledge Requirements	v	Lightning Strike Protection	2.4
Part 66 Basic Knowledge Requirements	vi	Section B	2.5
Table of Contents	xi	Structural Classification	2.5
		Primary Structure	2.5
		Secondary Structure	2.5
		Tertiary Structure	2.5
		Damage Tolerant Concepts	2.5
		Fail Safe	2.5
		Safe Life	2.5
		Damage Tolerance	2.5
		Structural Stresses	2.6
		Hoop Stress	2.7
		Metal Fatigue	2.7
		Drains and Ventilation	2.7
		Drainage	2.7
		Ventilation	2.7
		System Installation Provisions	2.8
		Section C	2.8
		Airframe Structural Methods	2.8
		Fuselage Types	2.8
		Truss Type	2.8
		Stressed Skin Monocoque	2.8
		Semimonocoque Type	2.8
		Fuselage Components	2.9
		Frames	2.9
		Formers	2.9
		Stringers and Longerons	2.9
		Bulkheads	2.9
		Doublers	2.10
		Struts & Ties	2.10
		Beams and Floor Structure	2.10
		Reinforcement	2.10
		Skinning	2.11
		Skin Doublers	2.11
		Wing and Empennage Attachment	2.11
		Engine Attachment	2.11
		Structural Assembly Techniques	2.11
		Corrosion Protection	2.14
		Methods of Surface Protection	2.15
		Chromating	2.15
		Anodizing	2.15
		Cladding	2.15
		Painting	2.15
		Surface Cleaning	2.15
		Exterior Aircraft Cleaning	2.16
		Airframe Symmetry	2.16
		Checking Dihedral	2.17
		Checking Incidence	2.18
		Checking Fin Verticality	2.18
		Checking Engine Alignment	2.18
		Symmetry Check	2.19
		Submodule 2 Practice Questions	2.21
		Submodule 2 Practice Answers	2.22
11.1 THEORY OF FLIGHT	1.1		
Section A	1.1		
Primary Flight Control Surfaces	1.1		
Roll Control Devices	1.2		
Ailerons	1.2		
Spoilers	1.3		
Pitch Control Devices	1.3		
Elevators	1.3		
Stabilators	1.3		
Variable Incidence Stabilizers	1.3		
Canards	1.4		
Yaw Control Devices	1.5		
Rudders	1.5		
Rudder Limiters	1.5		
Elevons and Ruddervators	1.5		
Elevons	1.5		
Ruddervators	1.5		
High Lift Devices	1.6		
Slots	1.6		
Slats	1.6		
Flaps	1.6		
Flaperons	1.8		
Drag Inducing Devices	1.8		
Secondary and Auxiliary Control Surfaces	1.9		
Trim Tabs	1.9		
Servo Tabs	1.10		
Control Surface Bias	1.10		
Section B	1.10		
Operation and Effects	1.10		
Balance Tabs	1.10		
Anti-Servo/Anti-Balance Tabs	1.10		
Spring Tabs	1.11		
Mass Balance	1.11		
Aerodynamic Balance Panels	1.11		
Wing Fences	1.11		
Saw Tooth Leading Edge	1.11		
Boundary Layer Control	1.11		
Vortex Generators	1.12		
Stall Wedges	1.13		
Wing Tip Vortices	1.13		
Winglets	1.13		
Submodule 1 Practice Questions	1.15		
Submodule 1 Practice Answers	1.16		
11.2 AIRFRAME STRUCTURES (ATA 51)	2.1		
Section A	2.1		
Zonal And Station Identification Systems	2.1		
Zonal Identification System	2.2		
Access And Inspection Panels	2.2		

TABLE OF CONTENTS

11.3 AIRFRAME STRUCTURES — AEROPLANES.....	3.1
11.3.1 Section A.	3.1
Fuselage, Doors, Windows (ATA 52/53/56).	3.1
Fuselage Construction.	3.1
Pressurization Sealing.	3.1
Attachments.	3.2
Wings.	3.2
Stabilizers.	3.2
Pylons.	3.2
Undercarriage.	3.2
Seat Installation.	3.3
Windows and Windscreens.	3.3
Construction.	3.3
Mechanisms.	3.3
Attachment.	3.4
Windscreens.	3.5
11.3.1 Section B.	3.5
Airborne Towing Devices.	3.5
Tow Hook Inspection.	3.5
Tow Rope Inspection.	3.5
11.3.1 Section C.	3.6
Doors and Emergency Exits.	3.6
Construction.	3.6
Mechanisms.	3.6
Cargo Loading Systems.	3.6
11.3.2 Wings (ATA 57).	3.7
Wing Construction.	3.7
Wing Spars.	3.8
Wing Ribs.	3.10
Wing Roots and Tips.	3.10
Wing Skin.	3.10
Fuel Storage.	3.11
Attachments.	3.11
Landing Gear.	3.11
Pylons.	3.13
Control Surfaces.	3.14
High Lift and Drag Devices.	3.14
11.3.3 Stabilizers (ATA 55).	3.14
Stabilizer Construction.	3.14
Stabilizer Attachment.	3.15
11.3.4 Flight Control Surfaces (ATA 57).	3.16
Construction and Attachment.	3.16
Balancing Flight Controls.	3.16
Static Balancing.	3.16
Aerodynamic (Dynamic) Balancing.	3.16
11.3.5 Nacelles/Pylons (ATA 54).	3.17
Nacelles.	3.17
Nose Cowl.	3.17
Cowling Doors.	3.17
Pylons.	3.17
Firewalls.	3.18
Submodule 3 Practice Questions.	3.19
Submodule 3 Practice Answers.	3.20

11.4 AIR CONDITIONING AND CABIN PRESSURIZATION	4.1
(ATA 21)	4.1
Section A.	4.1
Pressurization Theory.	4.1
Temperature and Altitude.	4.1
Pressurization Terms.	4.3
Pressurization Systems.	4.4
Cabin Pressure Controllers, Control and Safety Valves.	4.4
Pressurization Modes.	4.4
Cabin Pressure Controllers.	4.5
Control Valve (Outflow Valve).	4.6
Control and Indication.	4.6
Cabin Air Pressure Safety Valve Operation.	4.6
Pressurization Indication.	4.8
Pressurization Operation.	4.8
Cabin Pressurization Troubleshooting.	4.9
Section B.	4.9
Sources of Air Supply.	4.9
Bleed Air.	4.9
Auxiliary Power Unit (APU).	4.10
Ground Cart.	4.10
Distribution System.	4.10
Section C.	4.11
Air Cycle Air Conditioning.	4.11
System Operation.	4.11
Pneumatic System Supply.	4.11
Component Operation.	4.12
Pack Valve.	4.12
Bleed Air Bypass.	4.13
Primary Heat Exchanger.	4.13
Refrigeration Turbine Unit or Air Cycle Machine and	
Secondary Heat Exchanger.	4.13
Water Separator.	4.13
Refrigeration Bypass Valve.	4.13
Vapor Cycle Air Conditioning.	4.15
Theory of Refrigeration.	4.15
Basic Vapor Cycle.	4.16
Vapor Cycle Air Conditioning System Components.	4.17
Refrigerant.	4.17
Receiver Dryer.	4.19
Expansion Valve.	4.20
Evaporator.	4.21
Compressor.	4.21
Condenser.	4.23
Service Valves.	4.23
Flow, Temperature and Humidity Control.	4.23
Flow Control.	4.23
Temperature Control.	4.24
Humidity Control.	4.24
Section D.	4.24
Protection and Warning Devices.	4.24
Submodule 4 Practice Questions.	4.27
Submodule 4 Practice Answers.	4.28

TABLE OF CONTENTS

11.5 INSTRUMENTS/AVIONICS SYSTEMS.....	5.2
Instrument Systems	5.2
Classifying Instruments.....	5.3
Flight Instruments.....	5.3
Engine Instruments.....	5.3
Navigation Instruments.....	5.3
Pitot-Static Systems.....	5.4
Pitot Tubes and Static Vents	5.4
Air Data Computers	5.7
Pitot-Static Pressure Sensing Flight Instruments.....	5.7
Pitot-Static System Maintenance	5.7
Altimeters	5.9
Airspeed Indicators	5.13
Vertical Speed Indicators.....	5.14
Gyroscopic Instruments.....	5.15
Sources of Power for Gyroscopic Instruments.....	5.15
Pressure Driven Gyroscopic Instruments	5.15
Electrically Driven Gyroscopic Instruments.....	5.16
Principles Of Gyroscopic Instruments	5.16
Solid State Gyro Systems.....	5.17
Ring Laser Gyros.....	5.17
Microelectromechanical Attitude And Directional Systems	5.18
Attitude Heading and Reference Systems (AHRS)	5.18
Common Gyroscopic Instruments	5.19
Vacuum Driven Attitude Gyros	5.19
Electric Attitude Indicators.....	5.20
Gyroscopic Direction Indicator/Directional Gyro (DG) ..	5.20
Turn Coordinators.....	5.21
Turn And Slip Indicators.....	5.21
Compass Systems.....	5.22
Direct Indicating Magnetic Compass.....	5.22
Vertical Magnetic Compass.....	5.24
Remote Indicating Compass	5.24
Remote Indicating Slaved Gyro Compass	
(Flux Gate Compass).....	5.24
Solid State Magnetometers	5.26
Magnetic Compass Maintenance	5.26
Stall Warning and Angle of Attack Indicators.....	5.27
Pressure Measuring Instruments.....	5.29
Types of Pressure	5.31
Pressure Instruments	5.31
Engine Oil Pressure.....	5.31
Engine Pressure Ratio (EPR)	5.32
Fuel Pressure	5.33
Hydraulic Pressure.....	5.33
Vacuum Pressure	5.33
Pressure Switches.....	5.33
Mechanical Movement Indicators.....	5.34
Tachometers.....	5.34
Electric Tachometers.....	5.35
Synchroscope	5.35
Accelerometers.....	5.36
Temperature Measuring Instruments	5.36
Non-Electric Temperature Indicators	5.36
Electrical Temperature Measuring Indication	5.37
Electrical Resistance Thermometer	5.37
Ratiometer Electrical Resistance Thermometers.....	5.38
Thermocouple Temperature Indicators	5.39
Turbine Gas Temperature Indicating Systems	5.40
Total Air Temperature Measurement	5.41
Remote Sensing and Indication.....	5.42
Synchro Type Remote Indicating Instruments	5.42
DC Selsyn Systems	5.43
AC Synchro Systems	5.43
Remote Indicating Fuel and Oil Pressure Gauges	5.44
Glass Cockpit.....	5.45
Autoflight.....	5.45
Basis For Autopilot Operation.....	5.47
Autopilot Components	5.47
Sensing Elements.....	5.47
Computer and Amplifier	5.48
Output Elements	5.48
Command Elements	5.48
Feedback or Follow up Element	5.48
Autopilot Functions.....	5.49
Yaw Dampening.....	5.49
Automatic Flight Control System	5.49
Communications	5.50
Very High Frequency (VHF) Radios	5.50
High Frequency Radios.....	5.50
Selective Calling	5.50
Satellite Communication Systems (SATCOM)	5.50
Controller Pilot Data Link Communications (CPDLC) ...	5.50
Audio Systems	5.51
Service Interphone System	5.52
Emergency Locator Transmitter (ELT)	5.52
Cockpit Voice Recorders	5.53
Navigation Systems	5.54
VOR Navigation System	5.54
Automatic Direction Finder (ADF)	5.56
Instrument Landing Systems (ILS).....	5.57
Localizer	5.58
Glideslope	5.59
Compass Locators	5.59
Marker Beacons	5.60
Microwave Landing Systems.....	5.60
Flight Director Systems.....	5.61
Distance Measuring Equipment (DME)	5.61
Area Navigation (RNAV)	5.62
Flight Management Systems (FMS).....	5.62
Satellite Navigation Systems	5.63
Global Positioning System.....	5.63
Wide Area Augmentation System.....	5.65
Air Traffic Control Transponder.....	5.65
Transponder Tests And Inspections	5.66
Altitude Encoders	5.67
Collision Avoidance Systems.....	5.68
Traffic Collision Avoidance Systems (TCAS).....	5.68
ADS-B.....	5.69
Weather Radar	5.70
Radio Altimeter.....	5.72
Inertial Navigation Systems.....	5.73

TABLE OF CONTENTS

ARINC Communications and Reporting	5.73
Communication and Navigation Avionics Installations	5.74
Avionics General Test Equipment	5.75
Built-in Test Equipment	5.75
Avionics Test Equipment	5.75
Multimeters	5.75
Oscilloscope	5.76
Time Domain Reflectometer (TDR)	5.76
Pitot-Static Test Equipment	5.76
Specialized Test Equipment	5.76
Data Bus Analyzers	5.76
Test Equipment Calibration	5.76
Submodule 5 Practice Questions	5.79
Submodule 5 Practice Answers	5.80
Submodule 5 Practice Questions	5.81
Submodule 5 Practice Answers	5.82
11.6 ELECTRICAL POWER (ATA 24)	6.1
Battery Charging	6.1
Constant Volt Charging	6.2
Constant Current Charging	6.2
Battery Maintenance	6.2
Battery Inspection	6.3
Ventilation Systems	6.3
Installation Practices	6.3
Battery Troubleshooting	6.3
DC Power Generation	6.3
Generator Control Systems	6.5
Voltage Regulation	6.5
Over Voltage Protection	6.5
Parallel Generator Operations	6.5
Over Excitation Protection	6.5
Differential Voltage	6.5
Reverse Current Sensing	6.5
Generator Controls for High Output Generators	6.5
Other Voltage Regulation	6.6
Carbon Pile Regulators	6.6
Three Unit Regulators	6.6
AC Power Generation	6.8
AC Alternators	6.10
Alternator Drive	6.10
AC Alternator Control Systems	6.11
Emergency Power Generation	6.13
Standby Power	6.14
Power Distribution on Small Multi-Engine Aircraft	6.14
Power Distribution on Large Aircraft	6.16
Split Bus Systems	6.16
Parallel Bus Systems	6.17
Split Parallel Systems	6.18
Inverters, Transformers and Rectifiers	6.19
Inverters	6.19
Rotary Inverters	6.19
Permanent Magnet Rotary Inverter	6.19
Inductor Type Rotary Inverter	6.20
Static Inverters	6.20
Transformers	6.21
Current Transformers	6.25
Transformer Losses	6.26
Power In Transformers	6.26
Rectifiers	6.26
Silicon Controlled Rectifiers	6.27
Transformer Rectifiers	6.29
Circuit Protection	6.29
Current Limiting Devices	6.29
Fuses	6.29
Circuit Breakers	6.30
External/Ground Power	6.30
Submodule 6 Practice Questions	6.33
Submodule 6 Practice Answers	6.34
11.7 EQUIPMENT AND FURNISHINGS (ATA 25)	7.1
Section A	7.1
Emergency Equipment Requirements	7.1
Section B	7.2
Seats, Harnesses, And Belts	7.2
Seats	7.2
Seat Belts and Harnesses	7.2
Equipment Layout	7.3
Cabin Furnishing Installation	7.4
Cabin Entertainment Equipment	7.4
Galley Installation	7.4
Cargo Handling And Retention Equipment	7.5
Airstairs	7.6
Submodule 7 Practice Questions	7.7
Submodule 7 Practice Answers	7.8
11.8 FIRE PROTECTION (ATA 26)	8.1
Section A	8.1
Fire Protection	8.1
Requirements For Fire To Occur	8.1
Classes Of Fires	8.1
Fire Zones	8.1
Fire Prevention	8.2
Fire Detection and Warning Systems	8.2
Requirements For Overheat and Fire Detection Systems	8.2
Thermal Switch Systems	8.2
Thermocouple Systems	8.3
Continuous Loop Systems	8.3
Fenwal System	8.3
Kidde System	8.4
Sensing Element	8.4
Combination Fire and Overheat Warning	8.5
Temperature Trend Indication	8.5
System Test	8.5
Fault Indication	8.5
Dual Loop Systems	8.5
Automatic Self Interrogation	8.5
Support Tube Mounted Sensing Elements	8.5
Fire Detection Control Unit (Fire Detection Card)	8.6
Pressure Sensor Responder Systems	8.6
Pneumatic Continuous Loop Systems	8.6
Averaging Function	8.6

TABLE OF CONTENTS

Discrete Function	8.6	Jackscrews	9.6
Smoke, Flame, And Carbon Monoxide Detection Systems	8.7	Torque Tubes	9.7
Smoke Detectors	8.7	Gust Locks and Gust Lock Systems	9.7
Light Refraction Type	8.7	Artificial Feel, Yaw Damper, Mach Trim, Rudder Limiter	9.7
Ionization Type	8.7	Artificial Feel.	9.7
Flame Detectors.	8.7	Yaw Damper.	9.8
Carbon Monoxide Detectors	8.7	Mach Trim.	9.8
Fire Extinguishing Systems.	8.8	Rudder Limiter	9.9
Fire Extinguisher Agents	8.8	Stall Warning Systems.	9.9
Fixed Container Fire Extinguishing Systems	8.9	Takeoff Configuration Warnings	9.9
Containers	8.9	Landing Configuration Warnings.	9.10
Discharge Valves	8.9	Section B	9.10
Pressure Indication	8.10	Active Load Control	9.10
Two Way Check Valve.	8.11	Lift Dump and Speed Brakes	9.10
Discharge Indicators	8.11	Hydraulic and Pneumatic Actuation Systems	9.10
Thermal Discharge Indicator (Red Disk)	8.11	Hydromechanical Control.	9.10
Normal Discharge Indicator (Yellow Disk).	8.11	Pneumatic Control.	9.11
Fire Switch.	8.11	Stall Protection Systems	9.11
Fire Protection in Cargo Compartments	8.11	Section C	9.11
Cargo Compartment Classification.	8.11	Electric and Electronic Control.	9.11
Cargo Compartment Fire Protection and Warning	8.12	Fly-By-Wire Control	9.12
Smoke Detector Systems	8.12	Fly-By-Optics Control	9.12
Cargo Compartment Extinguishing Systems	8.13	Fly-By-Wireless Control	9.13
Fire Protection in Lavatories.	8.13	Section D	9.13
Lavatory Smoke Detector and Warning Systems	8.13	Static Balance.	9.13
Lavatory Fire Extinguisher Systems	8.14	Dynamic Balance.	9.13
System Tests and Maintenance	8.14	Rebalancing	9.13
Fire Detection Maintenance	8.14	Rebalancing Methods	9.14
Fire Detection System Troubleshooting	8.16	Aircraft Rigging	9.15
Fire Extinguisher System Maintenance	8.16	Submodule 9 Practice Questions	9.17
Container Pressure Check	8.16	Submodule 9 Practice Answers	9.18
Discharge Cartridges.	8.16		
Agent Containers.	8.17		
Section B	8.17	11.10 FUEL SYSTEMS (ATA 28, ATA 47)	10.1
Cockpit and Cabin Interiors	8.17	Fuel System Requirements	10.1
Portable Extinguisher Types	8.17	Fuel System Independence	10.1
Operation of Portable Fire Extinguishers	8.18	Lightning Protection	10.2
Inspection of Portable Fire Extinguishers.	8.18	Fuel Flow	10.2
Maintenance of Portable Fire Extinguishers.	8.18	Flow Between Interconnected Tanks	10.2
Submodule 8 Practice Questions	8.21	Unusable Fuel Supply.	10.2
Submodule 8 Practice Answers	8.22	Hot Weather Operation.	10.2
		Fuel Tanks	10.2
11.9 FLIGHT CONTROLS (ATA 27)	9.1	Fuel Tank Tests	10.2
Primary and Secondary Flight Controls	9.1	Fuel Tank Installation	10.2
Primary Controls	9.1	Fuel Tank Expansion Space.	10.3
Elevators.	9.1	Fuel Tank Sump.	10.3
Ailerons	9.1	Fuel Tank Filler Connection	10.3
Rudder	9.2	Fuel Tank Vents	10.3
Secondary Flight Controls.	9.2	Fuel Tank Outlets	10.3
Trim Control, Trim Tabs.	9.3	Pressure Fueling Systems.	10.3
High Lift Devices	9.3	Fuel Pumps	10.3
Control System Operation.	9.4	Fuel Lines and Fittings	10.4
Mechanical Control.	9.4	Fuel Valves and Controls	10.4
Control Cables.	9.5	Fuel Strainers or Filters	10.4
Push-Pull Tubes.	9.6	Other Fuel System Components	10.4
Bellcranks and Levers	9.6	Section A	10.4
		Fuel Systems	10.4

TABLE OF CONTENTS

Fuel System Layout	10.4	Dumping, venting, and draining.....	10.28
Fuel Tanks	10.4	Fuel System Drains	10.28
Integral Fuel Tanks	10.5	Fuel Vent Systems	10.28
Bladder Fuel Tanks	10.6	Fuel Jettisoning Systems	10.29
Fuel Tank Repair	10.7	Inert Gas Systems	10.29
Integral Tank Repair	10.7	Section E	10.30
Bladder Tank Repair	10.7	Longitudinal Balance Systems	10.30
Fuel Supply Systems	10.8	Submodule 10 Practice Questions	10.33
Fuel Feed	10.8	Submodule 10 Practice Answers	10.34
Fuel System Components	10.9		
Fuel Lines and Fittings	10.9	11.11 HYDRAULIC POWER (ATA 29)	11.1
Fuel Valves	10.10	Section A	11.1
Manually Operated Gate Valves	10.11	System Layout	11.1
Motor Operated Valves	10.11	Open Center Hydraulic Systems	11.2
Solenoid Operated Valves	10.11	Closed Center Hydraulic Systems	11.2
Fuel Pumps	10.11	Evolution of Hydraulic Systems	11.3
Centrifugal Boost Pumps	10.12	Hydraulic Powerpack Systems	11.3
Ejector Pumps	10.12	Modern High Performance Systems	11.3
Fuel Filters	10.13	Hydraulic Fluids	11.3
Fuel System Repairs	10.14	Hydraulic Fluid Properties	11.3
Troubleshoot the Fuel System	10.15	Viscosity	11.3
Location of Leaks and Defects	10.15	Chemical Stability	11.3
Fuel Leak Classification	10.15	Flash Point	11.4
Replacement of Gaskets, Sals, and Packings	10.15	Fire Point	11.5
Section B	10.16	Hydraulic Fluid Types	11.5
Fuel Handling	10.16	Mineral Based Fluids	11.5
Cross-Feed and Transfer Systems	10.16	Polyalphaolefin Based Fluids	11.5
Refueling and Defueling	10.16	Phosphate Ester Based Fluid (Skydrol®)	11.5
Fueling	10.17	Intermixing of Fluids	11.5
Over the Wing Fueling	10.17	Compatibility with Aircraft Materials	11.5
Pressure Refueling	10.18	Hydraulic Fluid Contamination	11.5
Defueling	10.18	Contamination Check	11.6
Fire Hazards when Fueling or Defueling	10.19	Sampling Schedule	11.6
Fuel Servicing and Contamination	10.19	Sampling Procedure	11.6
Fuel and Fuel system Contaminates	10.19	Contamination Control	11.6
Water	10.19	Filters	11.6
Solid Particle Contaminates	10.20	Hydraulic System Flushing	11.7
Surfactants	10.20	Health and Handling	11.7
Microorganisms	10.20	Reservoirs and Accumulators	11.7
Foreign Fuel Contamination	10.21	Reservoirs	11.7
Detection of Contaminates	10.21	Non-Pressurized Reservoirs	11.7
Fuel Contamination Control	10.23	Pressurized Reservoirs	11.8
Section C	10.23	Air Pressurized Reservoirs	11.8
Indications and Warning	10.23	Fluid Pressurized Reservoirs	11.10
Fuel Quantity Indicating Systems	10.23	Reservoir Servicing	11.10
Ratiometer Indicating Systems	10.23	Accumulators	11.10
Capacitance Indicating Systems	10.23	Types of Accumulators	11.11
Mechanical Indicating Systems	10.25	Spherical Accumulators	11.11
Fuel Flowmeters	10.25	Cylindrical Accumulators	11.12
Fuel Temperature Gauges	10.26	Operation of Accumulators	11.12
Fuel Heaters	10.26	Maintenance of Accumulators	11.12
Fuel Pressure Gauges	10.27	Filters	11.12
Pressure Warning Signal	10.27	Micron Type Filters	11.13
Valve In Transit Indicator Lights	10.28	Maintenance of Filters	11.13
Section D	10.28	Filter Bypass Valves	11.13
Special Systems	10.28	Filter Differential Pressure Indicators	11.13

TABLE OF CONTENTS

Heat Exchangers	11.14	Pressure Generation: Pneumatic	11.35
Power Distribution	11.14	Emergency Pressure Generation	11.35
Shutoff Valves.....	11.14	Ram Air Turbine	11.35
Selector Valves	11.15	Hydraulic Motors.....	11.35
Check Valves	11.16	Power Transfer Unit (PTU)	11.35
Orifice Type Check Valves	11.16	Hydraulic Motor Driven Generators (HMDGS).....	11.36
Sequence Valves	11.16	Interface with Other Systems	11.37
Pressure Controlled Sequence Valves	11.17	Example System - Boeing 737 NG	11.37
Mechanically Operated Sequence Valves	11.17	Boeing 737 Next Generation Hydraulic System.....	11.37
Priority Valves	11.18	Reservoirs.....	11.38
Shuttle Valves.....	11.18	Pumps	11.38
Quick Disconnect Valves.....	11.18	Filter Units.....	11.38
Hydraulic Fuses	11.18	Power Transfer Unit (PTU)	11.39
Hydraulic Actuators.....	11.19	Landing Gear Transfer Unit	11.39
Linear Actuators	11.19	Standby Hydraulic System.....	11.40
Rotary Actuators	11.20	Indications	11.40
Section B	11.20	Submodule 11 Practice Questions.....	11.41
System Operation	11.20	Submodule 11 Practice Answers	11.42
Pressure Generation: Electric and Mechanical.....	11.20	11.12 ICE AND RAIN PROTECTION (ATA 30).....	12.1
Hand Pumps	11.21	Section A	12.1
Powered Pump Classification	11.21	Principles	12.1
Constant Displacement Pumps	11.22	Ice Formation.....	12.1
Gear Type Power Pump.....	11.22	Icing Effects.....	12.1
Gerotor Pump	11.22	Classification	12.2
Piston Pumps.....	11.22	Detection	12.3
Bent Axis Piston Pump	11.23	Section B	12.3
Inline Piston Pump	11.24	De-icing.....	12.3
Vane Pump.....	11.24	Anti-ice Versus De-ice.....	12.3
Variable Displacement Pumps.....	11.24	De-icing Systems.....	12.3
Basic Pumping Operation	11.25	Electrical De-Icing Systems	12.4
Normal Pumping Mode.....	11.25	Electric Propeller De-Ice.....	12.4
Depressurized Mode	11.26	Electric Airfoil De-Ice Boots	12.4
Pressure Control	11.26	Hot Air De-Ice/De-Fog	12.4
Relief Valves.....	11.26	Pneumatic De-Ice Boots	12.5
Pressure Regulators	11.28	Construction and Installation of De-Ice Boots.....	12.5
Pressure Reducers	11.28	Sources of Operating Air.....	12.5
Hydraulic Seals	11.28	De-Ice system for Turboprop Aircraft.....	12.6
Packings.....	11.29	Inspection, Maintenance and Troubleshooting of Rubber	
V-Rings	11.29	De-Icer Boot Systems	12.7
U-Rings	11.29	Operational Checks.....	12.7
O-Rings.....	11.29	Adjustments	12.9
O-Ring Color Coding.....	11.29	Troubleshooting.....	12.9
Backup Rings.....	11.30	Inspection.....	12.9
O-Ring Installation.....	11.30	De-Ice Boot Maintenance	12.10
Gaskets.....	11.30	Chemical De-Ice Systems	12.10
Wipers	11.31	Windshield Chemical De-Ice	12.10
Hydraulic Indication and Warning	11.31	Propeller Chemical De-Ice	12.10
Servicing	11.33	Ground Chemical De-Icing of Aircraft	12.10
Hydraulic Fluid Contamination	11.33	Frost Removal	12.10
Contamination Prevention	11.33	De-Icing Fluid.....	12.11
Fluid Monitoring.....	11.34	Holdover Time (HOT)	12.11
Fluid Compatibility.....	11.34	Critical Surfaces.....	12.11
Hydraulic System Maintenance & Troubleshooting		Ice and Snow Removal.....	12.12
Checklist	11.34	Probe and Drain Heating	12.12
Section C	11.35	Probe De-Ice/Anti-Ice.....	12.12
System Operation	11.35		

TABLE OF CONTENTS

Water System and Drain De-Ice/Anti-Ice	12.13	Tire Inspection on the Aircraft	13.17
Section C	12.13	Inflation	13.17
Anti-icing	12.13	Tread Condition	13.18
Thermal Electrical Anti-Icing	12.13	Tread Depth and Wear Pattern	13.18
Windshield Anti-Ice	12.13	Tread Damage	13.19
Propeller Anti-Ice	12.15	Sidewall Condition	13.21
Thermal Pneumatic Anti-Ice	12.15	Tire Removal	13.21
Wing Anti-Ice Systems (WAI)	12.15	Tire Inspection Off the Aircraft	13.22
Slat Leading Edges	12.17	Tire Repair and Retreading	13.23
WAI Operation	12.17	Tire Storage	13.23
WAI Control	12.19	Aircraft Tubes	13.24
WAI Indication System	12.20	Tube Construction and Selection	13.24
WAI System BITE Test	12.20	Tube Storage and Inspection	13.24
Engine Anti-Ice (EAI)	12.21	Tube Tire Inspection	13.24
Chemical Anti-Ice	12.21	Tire Mounting	13.25
Ground Applied Anti-Ice	12.21	Tubeless Tires	13.25
Section D	12.23	Tube Type Tires	13.26
Wipers	12.23	Tire Balancing	13.27
Windshield Wiper Systems	12.23	Operation and Handling Tips	13.27
Pneumatic Rain Removal Systems	12.23	Taxiing	13.27
Section E	12.24	Braking and Pivoting	13.28
Rain Repellent Systems	12.24	Landing Field and Hangar Floor Condition	13.28
Chemical Rain Repellent	12.24	Takeoffs and Landings	13.28
Windshield Surface Seal Coating	12.25	Hydroplaning	13.28
Submodule 12 Practice Questions	12.27	Section B	13.29
Submodule 12 Practice Answers	12.28	Systems	13.29
11.13 LANDING GEAR (ATA 32)	13.1	Extension and Retraction Systems: Normal and Emergency	13.29
Section A	13.1	Normal Operation	13.29
Description	13.1	Nose Wheel Centering	13.30
Construction, Shock Absorbing	13.1	Emergency Operation	13.30
Landing Gear Configuration	13.1	Landing Gear Retraction Test	13.30
Tail Wheel Type Landing Gear	13.1	Indications and Warnings	13.31
Tandem Landing Gear	13.3	Landing Gear Safety Devices	13.31
Tricycle Landing Gear	13.3	Ground Locks	13.31
Fixed and Retractable Landing Gear	13.4	Safety Switches	13.32
Landing Gear Alignment and Support	13.5	Proximity Sensors	13.32
Alignment	13.6	Wheels, Brakes, Antiskid, and Autobraking	13.33
Support	13.7	Aircraft Wheels	13.33
Shock Absorbing	13.7	Wheel Construction	13.33
Shock Struts	13.8	Inboard Wheel Half	13.34
Shock Strut Operation	13.9	Outboard Wheel Half	13.34
Servicing Shock Struts	13.11	Wheel Inspection	13.35
Bleeding Shock Struts	13.12	On Aircraft Inspection	13.35
Tires and Tubes	13.13	Proper Installation	13.35
Tire Classification	13.13	Axle Nut Torque	13.36
Tire Types	13.13	Off Aircraft Wheel Inspection	13.36
Ply Rating	13.14	Loosening the Tire from the Wheel Rim	13.36
Tube Type or Tubeless	13.15	Disassembly of the Wheel	13.36
Bias Ply or Radial	13.15	Cleaning the Wheel Assembly	13.37
Tire Construction	13.15	Inspection of the Wheel Halves	13.37
Bead	13.15	Wheel Tie Bolt Inspection	13.37
Carcass Plies	13.15	Key and Key Screw Inspection	13.37
Tread	13.16	Fusible Plug Inspection	13.38
Sidewall	13.17	Balance Weights	13.38
Chine	13.17	Wheel Bearings	13.38
		Cleaning the Wheel Bearings	13.38

TABLE OF CONTENTS

Inspection of Wheel Bearings	13.38	Steering Damper	13.67
Bearing Handling and Lubrication	13.40	Shimmy Dampers	13.68
Aircraft Brakes.	13.40	Piston Type	13.68
Types and Construction of Aircraft Brakes	13.41	Vane Type.	13.68
Single Disc Brakes	13.41	Non-Hydraulic Shimmy Damper	13.68
Floating Disc Brakes	13.41	Landing Gear System Maintenance	13.69
Fixed Disc Brakes	13.42	Landing Gear Rigging and Adjustment	13.69
Dual Disc Brakes	13.43	Adjusting Landing Gear Latches	13.69
Multiple Disc Brakes	13.43	Gear Door Clearances	13.69
Segmented Rotor Disc Brakes	13.44	Drag and Side Brace Adjustment	13.71
Carbon Brakes	13.45	Section C	13.71
Expander Tube Brakes.	13.46	Air-Ground Sensing	13.71
Brake Actuating Systems.	13.46	Section D	13.72
Independent Master Cylinders	13.47	Tail Protection.	13.72
Boosted Brakes.	13.50	Preventing Tailstrikes	13.72
Power Brakes	13.51	Preventing Tailstrikes During Landing	13.72
Brake Control Valve/Brake Metering Valve	13.51	Preventing Tailstrikes During Takeoff	13.73
Emergency Brake Systems.	13.53	Design Factors	13.73
Parking Brake	13.55	Skids.	13.73
Brake Deboosters.	13.55	Tail Stands	13.73
AntiSkid Systems.	13.56	Submodule 13 Practice Questions.	13.75
System Operation	13.56	Submodule 13 Practice Answers	13.76
Wheel Speed Sensors.	13.57	Submodule 13 Practice Questions.	13.77
Control Units	13.58	Submodule 13 Practice Answers	13.78
Antiskid Control Valves.	13.59	11.14 LIGHTS..... 14.1	
Touchdown and lock Wheel Protection	13.59	Light Sources	14.1
Antiskid System Tests	13.60	High Intensity Discharge Bulbs (HID)	14.1
Ground Test.	13.60	HID Precautions	14.1
Inflight Test	13.60	Light Emitting Diodes (LED)	14.2
Antiskid System Maintenance.	13.60	Xenon Flash Tubes	14.2
Wheel Speed Sensor	13.60	Fluorescent Lights	14.2
Control Valve	13.60	Fluorescent Lamp Operating Circuit	14.3
Control Unit.	13.60	External: Navigation, Anti-Collision, Landing, Taxiing, Ice	14.3
Autobraking.	13.60	Navigation/Position Lights	14.3
Brake Inspection and Service	13.61	Anti-Collision Lights	14.4
On Aircraft Servicing	13.61	Rotating Beacons	14.4
Lining Wear.	13.61	Strobe Lighting	14.4
Air in the Brake System.	13.62	Landing Lights	14.5
Bleeding Master Cylinder Brake Systems	13.62	Taxi Lights.	14.5
Bleeding Power Brake Systems	13.63	Wing Ice Inspection Lights.	14.6
Fluid Quantity and Type	13.63	Internal: Cabin, Cockpit, Cargo	14.6
Inspection For Leaks	13.63	Cabin Lighting	14.6
Proper Bolt Torque.	13.64	Cockpit Lighting	14.7
Off Aircraft Brake Maintenance.	13.64	Integral Instrument Lighting	14.7
Bolt and Threaded Connections	13.64	Cargo Compartment Lights	14.8
Discs.	13.64	Emergency Lighting	14.8
Automatic Adjuster Pins	13.64	Electroluminescence	14.8
Torque Tube.	13.64	Self Illuminating Signs	14.9
Brake Housing and Piston Condition	13.64	Emergency Exit Lighting Activation	14.9
Seal Condition	13.64	Submodule 14 Practice Questions.	14.11
Replacement of Brake Linings.	13.65	Submodule 14 Practice Answers	14.12
Brake Malfunctions and Damage	13.65	11.15 OXYGEN (ATA 35)..... 15.1	
Overheating	13.65	Oxygen and the Atmosphere.	15.1
Dragging	13.65	Human Respiration and Circulation.	15.1
Chattering or Squealing	13.65		
Steering	13.65		

TABLE OF CONTENTS

Sources, Storage, Charging and Distribution	15.2	Medium Pressure Pneumatic Systems	16.5
Sources of Oxygen	15.2	System Layout	16.5
Oxygen Storage	15.2	Sources	16.6
Gaseous Oxygen Tanks	15.2	Storage	16.6
Chemical and Solid Oxygen	15.4	Pressure Control	16.6
Onboard Oxygen Generating Systems	15.4	Distribution	16.8
Liquid Oxygen	15.4	Vacuum Systems	16.9
Oxygen Charging	15.5	Indications and Warnings	16.9
Oxygen Distribution	15.6	Interface with Other Systems	16.10
Supply Regulation	15.7	Section B	16.10
Continuous Flow Systems	15.7	Pumps	16.10
Cabin Continuous Flow Systems	15.7	Pressure and Vacuum Pumps	16.10
Demand Flow Systems	15.9	Classification of Pumps	16.11
Diluter-Demand	15.10	Types of Pumps	16.11
Pressure Demand	15.11	Vane Pump, Wet and Dry Types	16.11
Cockpit Demand Systems	15.11	Piston Pump	16.11
Chemical Oxygen Systems	15.12	Centrifugal Impeller Pump	16.11
Electronic Pulse Demand Systems	15.12	Turbine Engine Compressor	16.12
LOX Systems	15.13	Roots Type Blower	16.12
Indication and Warnings	15.13	Vacuum Pumps	16.13
Oxygen System Maintenance	15.14	Submodule 16 Practice Questions	16.15
Leak Testing Gaseous Oxygen Systems	15.14	Submodule 16 Practice Answers	16.16
Draining an Oxygen System	15.15		
Purging an Oxygen System	15.15		
Inspection of Masks and Hoses	15.15		
Replacement of Tubing, Valves, and Fittings	15.15		
Oxygen System Safety	15.16		
Submodule 15 Practice Questions	15.17		
Submodule 15 Practice Answers	15.18		
11.16 PNEUMATIC/VACUUM (ATA 36)	16.1	11.17 WATER/WASTE (ATA 38)	17.1
Section A	16.1	Section A	17.1
Pneumatic Systems	16.1	Water/Waste Systems	17.1
High-pressure Pneumatic Systems	16.1	Water System Layout	17.1
System Layout	16.1	Water Supply	17.1
System Components	16.1	Water Distribution	17.2
Air Compressors	16.1	Water System Servicing	17.2
Relief Valves	16.1	Water System Draining	17.3
Control Valves	16.1	Toilet System Layout	17.3
Check Valves	16.2	Flushing	17.3
Restrictors	16.2	Lavatory Layout	17.5
Variable Restrictor	16.2	Servicing Lavatories	17.5
Filters	16.3	Section B	17.5
Desiccant/Moisture Separator	16.3	Corrosion	17.5
Chemical Drier	16.3	Submodule 17 Practice Questions	17.9
Sources	16.3	Submodule 17 Practice Answers	17.10
Storage	16.3		
Charging	16.3		
Distribution	16.4		
Supply Regulation	16.4		
Emergency Back-up Systems and Pneudraulics	16.4		
Nitrogen Bottles	16.4		
Gear Emergency Extension Cable and Handle	16.4		
Dump Valve	16.4		
Emergency Extension Sequence	16.4		
High-pressure Pneumatic System Maintenance	16.5		
		11.18 ONBOARD MAINTENANCE SYSTEMS (ATA 45)	18.1
		Central Maintenance Computers	18.1
		BITE	18.3
		Data Loading Systems	18.4
		Electronic Library System	18.5
		Printing	18.5
		Structure Monitoring	18.5
		Submodule 18 Practice Questions	18.7
		Submodule 18 Practice Answers	18.8
		11.19 INTEGRATED MODULAR AVIONICS (IMA) (ATA 42)	19.1
		Section A	19.1
		Integration of Avionics	19.1
		Digital Data Buses Reduce Wiring	19.2
		Core Systems	19.4
		Common Core Systems Concepts	19.4

TABLE OF CONTENTS

Core Processor Input/Output Module (CPIOM)	19.4
Network Components	19.4
Section B	19.4
Typical System Layout	19.4
Boeing 777 Airplane Information Management System	19.4
Submodule 19 Practice Questions	19.9
Submodule 19 Practice Answers	19.10
11.20 CABIN SYSTEMS (ATA 44).....	20.1
Introduction	20.1
System Architecture, Operation and Control	20.1
In Flight Entertainment (IFE)	20.2
IFE Server	20.3
Internal Communication Systems	20.4
External Communication Systems	20.4
Wi-Fi Access	20.5
Flight Attendant's Panel	20.5
Director Interface Board	20.5
Cabin Network Server Interface and Hosting.	20.5
Cabin Mass Memory Systems	20.6
Cabin Core Systems.	20.6
Submodule 20 Practice Questions	20.7
Submodule 20 Practice Answers	20.8
11.21 INFORMATION SYSTEMS (ATA 46).....	21.1
Aircraft Information System	21.1
System Architecture, Operation and Control	21.2
The Airbus System	21.2
Network Server System (NSS)	21.2
Secure Communication Interface	21.2
Central Data Acquisition Module (CDAM)	21.2
Data Loading And Configuration Systems.	21.2
Flight Deck Information System: Electronic Flight Bag. . . .	21.2
Boeing 777 EFB	21.2
Maintenance Information System	21.3
Passenger Cabin Information System	21.4
Miscellaneous Information System	21.4
Submodule 21 Practice Questions	21.5
Submodule 21 Practice Answers	21.6
Acronym Definitions	A.1



Figure 1-12. The Piaggio P180 includes a variable-sweep canard design, which provides longitudinal stability about the lateral axis.

aircraft. Canard designs include two types, one with a horizontal surface of about the same size as a normal aft tail design, and the other with a surface of the same approximate size and airfoil shape of the aft mounted wing known as a tandem wing configuration. Theoretically, the canard is considered more efficient because using the horizontal surface to help lift the weight of the aircraft should result in less drag for a given amount of lift.

YAW CONTROL DEVICES

RUDDERS

The rudder is the primary control surface that causes an aircraft to yaw or move about the vertical axis. This provides directional control and thus points the nose of the aircraft in the direction desired. Most aircraft have a single rudder hinged to the trailing edge of the vertical stabilizer. It is controlled by a pair of foot operated rudder pedals in the cockpit. When the right pedal is pushed forward, it deflects the rudder to the right which moves the nose of the aircraft to the right. The left pedal is rigged to simultaneously move left. When the left pedal is pushed forward, the nose of the aircraft moves to the left.

As with the other primary flight controls, the transfer of the movement of the cockpit controls to the rudder varies with the complexity of the aircraft. Many aircraft incorporate the directional movement of the nose or tail wheel into the rudder control system for ground operation. This allows the operator to steer the aircraft with the rudder pedals during taxi when the airspeed is not high enough for the control surfaces to be effective. Some large aircraft have a split rudder arrangement. This is actually two rudders, one above the other. At low speeds, both rudders deflect in the same direction when the pedals are pushed. At higher speeds, one of the rudders becomes inoperative as the deflection of a single rudder is aerodynamically sufficient to maneuver the aircraft.

RUDDER LIMITERS

In flight, most large aircraft oscillate slightly from side to side. Yaw dampener units automatically detect this movement and send signals to the hydraulic power control unit (PCU) that moves the rudder so that it can correct for these yaw oscillations. Similarly, rudders are known to deflect without being commanded to do so by the flight crew. Again, the yaw dampener is designed

to correct the fluctuations by signaling the PCU. However, too large of an involuntary deflection to a rudder can cause a loss of control of the aircraft.

A rudder limiter is fitted to many aircraft to prevent any more than a few degrees of involuntary motion of the rudder. Essentially, it limits the movement unless it is commanded from the flight deck.

ELEVONS AND RUDDERVATORS

ELEVONS

Elevons perform the combined functions of the ailerons and the elevator. [Figure 1-13] They are typically used on aircraft that have no true separate empennage such as a delta wing or flying wing aircraft.

They are installed on the trailing edge of the wing. When moved in the same direction, the elevons cause a pitch adjustment. When moved in opposite directions, the aircraft rolls. Elevons may also move differentially in the same direction causing adjustments to roll and pitch. The control yoke or stick activated elevon movement through a mechanical or electronic mixing device.

RUDDERVATORS

A ruddervator combines the action of the rudder and elevator. [Figure 1-14] This is possible on aircraft with V-tail empennages where the traditional horizontal and vertical stabilizers do not exist. Instead, two stabilizers angle upward and outward from the aft fuselage in a "V" configuration. Each contains a movable



Figure 1-13. Elevons.



Figure 1-14. Ruddervator.

and formers as used in the monocoque design but, additionally, the skin is reinforced by longitudinal members called longerons. Longerons usually extend across several frame members and help the skin support primary bending loads. They are typically made of aluminum alloy either of a single piece or a built up construction.

Stringers are also used in the semimonocoque fuselage. These longitudinal members are typically more numerous and lighter in weight than the longerons. They come in a variety of shapes and are usually made from single piece aluminum alloy extrusions or formed aluminum. Stringers have some rigidity but are chiefly used for giving shape and for attachment of the skin. Stringers and longerons together prevent tension and compression from bending the fuselage. [Figure 2-11]

Other bracing between the longerons and stringers can also be used. Often referred to as web members, these additional support pieces may be installed vertically or diagonally. It must be noted that manufacturers use different nomenclature to describe structural members. For example, there is often little difference between some rings, frames, and formers.

One manufacturer may call the same type of brace a ring or a frame. Manufacturer instructions and specifications for a specific aircraft are the best guides.

The semimonocoque fuselage is constructed primarily of alloys of aluminum and magnesium, although steel and titanium are sometimes found in areas of high temperatures. Individually, no one of the aforementioned components is strong enough to carry the loads imposed during flight and landing. But, when combined, those components form a strong, rigid framework. This is accomplished with gussets, rivets, nuts and bolts, screws, and even friction stir welding. A gusset is a type of connection bracket that adds strength. [Figure 2-12]

To summarize, in semimonocoque fuselages, the strong, heavy longerons hold the bulkheads and formers, and these, in turn, hold the stringers, braces, web members, etc. All are designed to be attached together and to the skin to achieve the full strength benefits of semimonocoque design. It is important to recognize

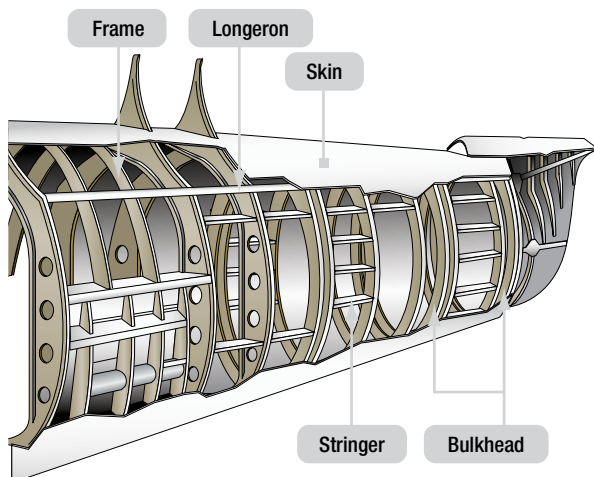


Figure 2-11. The fuselage terminates at the tail cone with similar but more light weight construction.

that the metal skin or covering carries part of the load. The fuselage skin thickness can vary with the load carried and the stresses sustained at a particular location.

The advantages of the semimonocoque fuselage are many. The bulkheads, frames, stringers, and longerons facilitate the design and construction of a streamlined fuselage that is both rigid and strong. Spreading loads among these structures and the stressed skin means no single piece is failure critical.

This means that a semimonocoque fuselage, because of its stressed skin construction, may withstand considerable damage and still be strong enough to hold together.

FUSELAGE COMPONENTS

FRAMES

Frames and stringers make up the basic skeleton of the fuselage. Frames are generally open rings which form the basic shape. They are connected continuously around their peripheries to the fuselage shell by stringers or longerons to form the rigid structure. Figure 2-13 depicts these various components of a fuselage.

FORMERS

Formers are used in the construction of aircraft fuselage, of which a typical fuselage has a series from the nose to the empennage, typically perpendicular to the longitudinal axis of the aircraft.

STRINGERS AND LONGERONS

Stringers, (sometimes referred to as longerons), run lengthwise along an airplane's fuselage or span wise of a wing. Their purpose is to serve as structural components that transfer loads and stresses from the aircraft's skin to the formers. Generally, they are attached between formers and bulkheads and are more numerous than longerons and spaced more closely together.

BULKHEADS

Bulkheads separate sections of the aircraft. The first bulkhead function is to provide structural support to the fuselage, particularly where the fuselage attaches to other structures such as the wings. A second function is to separate pressurized from non-pressurized sections of the fuselage. [Figure 2-14]

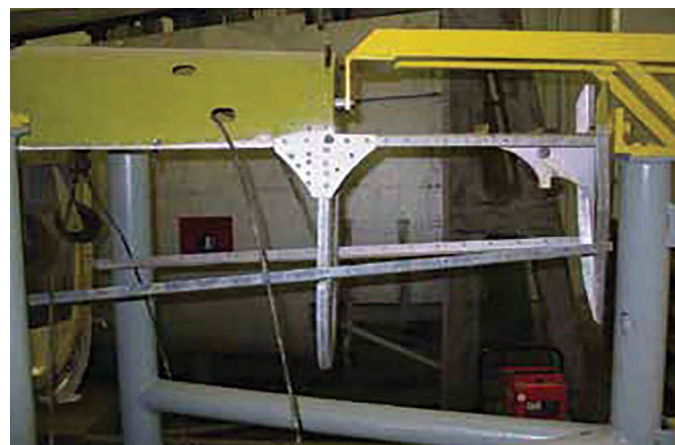


Figure 2-12. Gussets are used to increase strength.

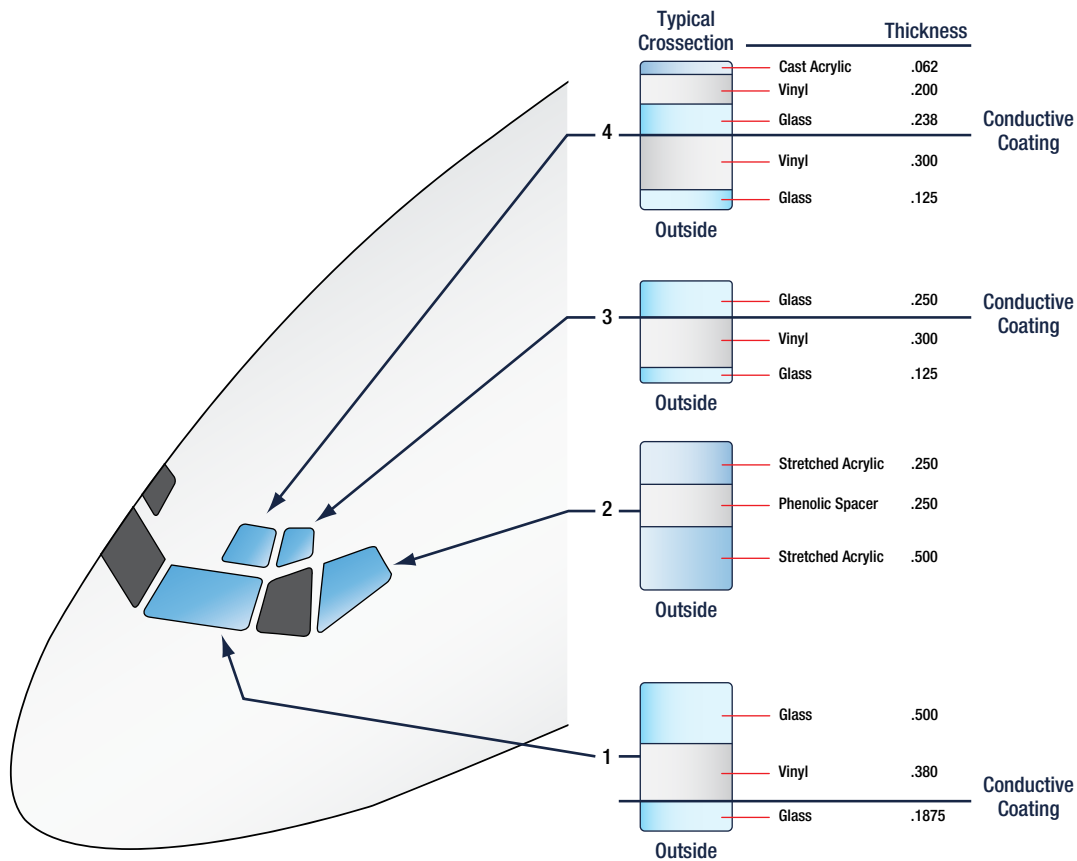


Figure 3-4. Flight deck window laminations.

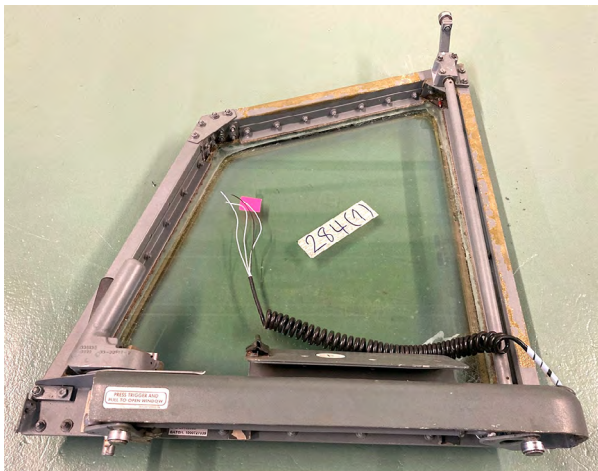


Figure 3-5. A Boeing 737 sliding window assembly.

ATTACHMENT

Passenger cabin windows are fixed plug type windows. They are installed from inside the aircraft between fuselage frame members with a single seal that accepts both the middle and outer window panes. [Figure 3-6]

Retaining clips hold the assembly in place against the window frame in the fuselage skin. The middle and outer window panes are each able to withstand the forces of pressurization so if one breaks or is damaged, cabin pressurization is not lost. As stated, flight deck window assemblies are bolted to the fuselage structure.

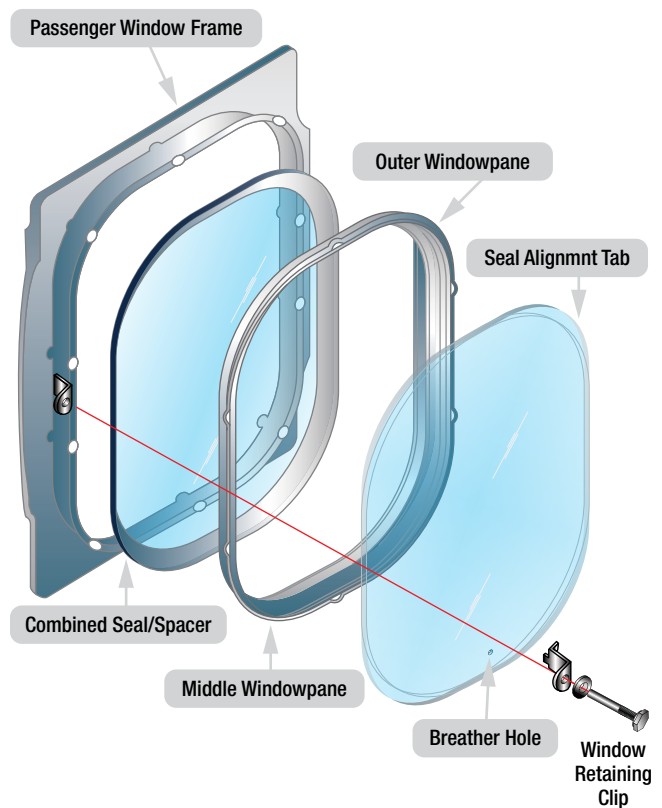


Figure 3-6. Middle and outer passenger cabin windows, seal and window frame.

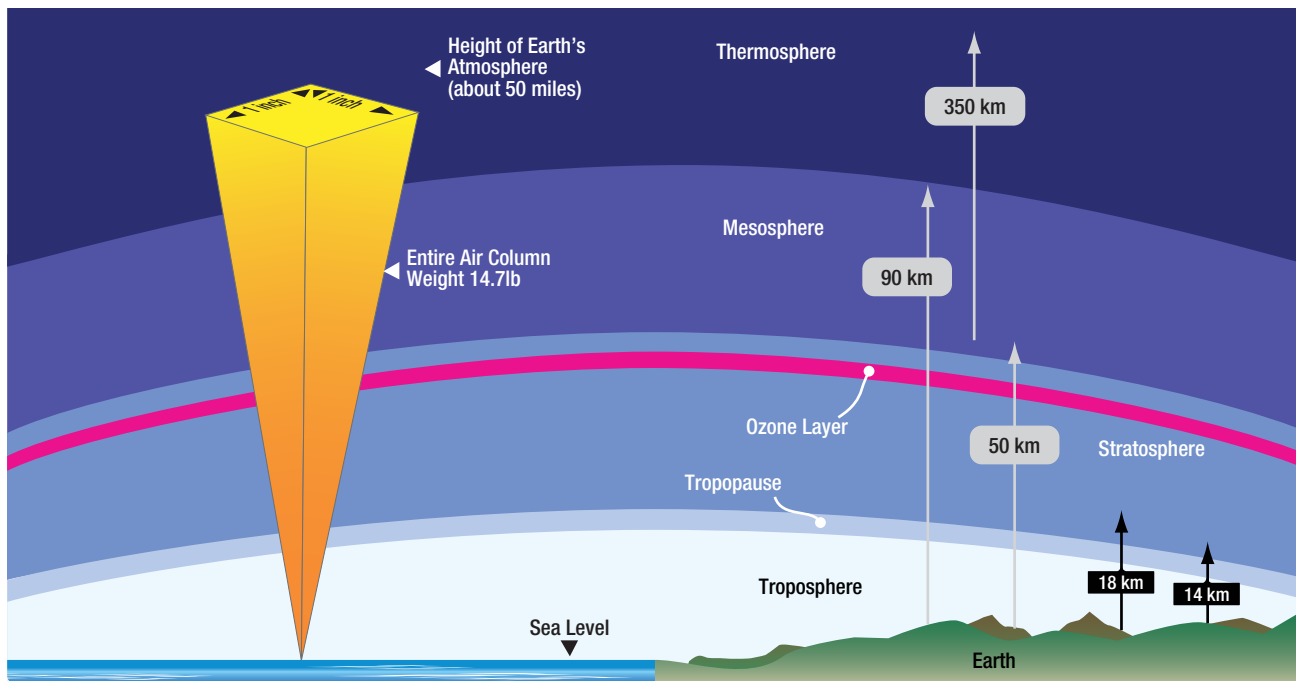


Figure 4-1. The weight exerted by a 1 square inch column of air stretching from sea level to the top of the atmosphere is what is measured when it is said that atmospheric pressure is equal to 14.7 pounds per square inch.

constant temperature of -57°C or -69°F . Above the tropopause lies the stratosphere. Temperature increases with altitude in the stratosphere to near 0°C before decreasing again in the mesosphere, which lies above it.

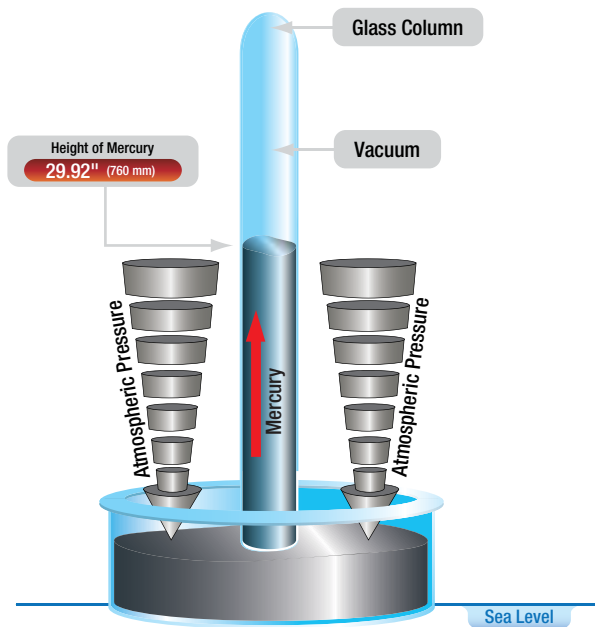


Figure 4-2. The weight of the atmosphere pushes down on the mercury in the reservoir of a barometer, which causes mercury to rise in the column. At sea level, mercury is forced up into the column approximately 29.92 inches. Therefore, it is said that barometric pressure is 29.92 inches of mercury at sea level.

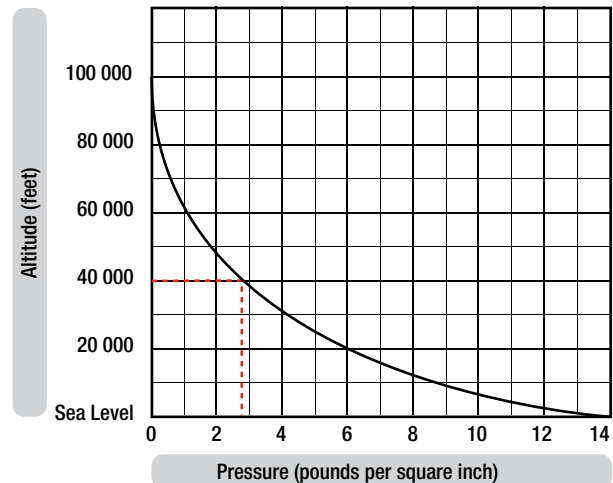


Figure 4-4. Atmospheric pressure decreasing with altitude. At sea level the pressure is 14.7 psi, while at 40 000 feet, as the dotted lines show, the pressure is only 2.72 psi.

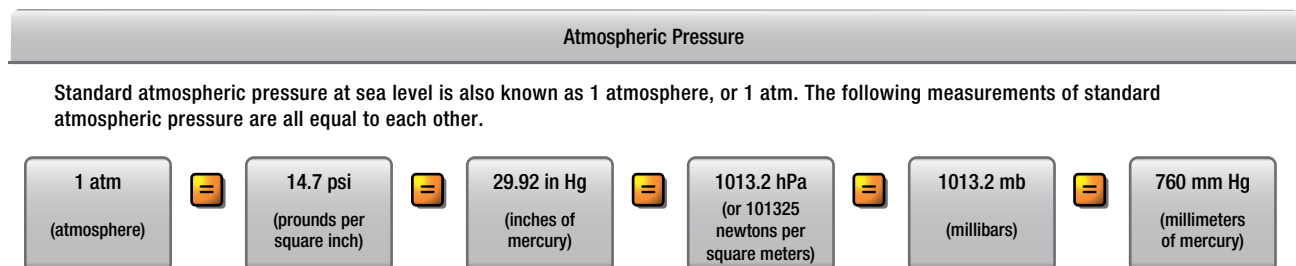


Figure 4-3. Various equivalent representations of atmospheric pressure at sea level.

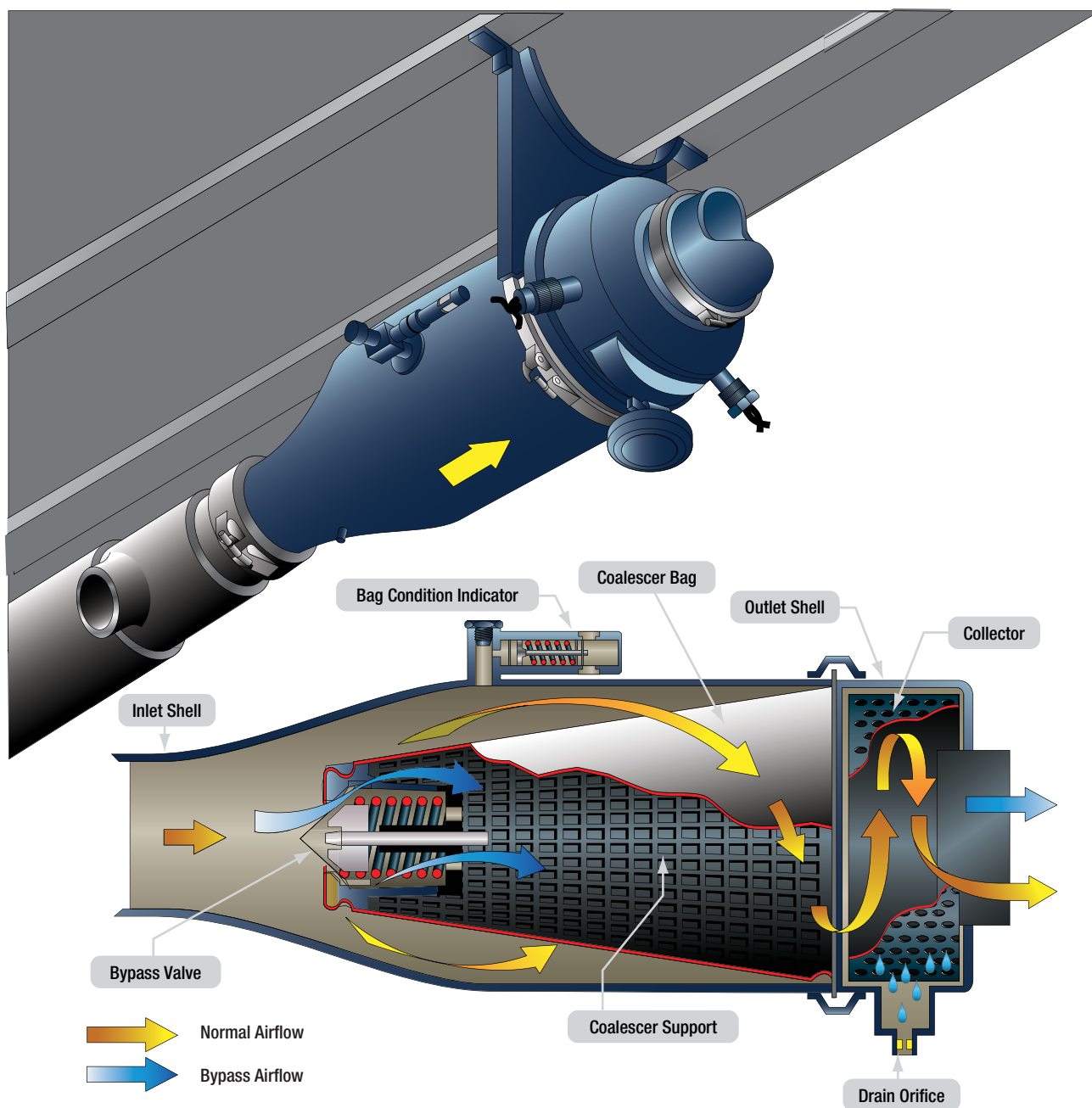


Figure 4-30. A water separator coalesces and removes water by swirling the air/water mixture from ACM expansion turbine. Centrifugal force sends the water to the walls of the collector where it drains from the unit.

gaseous refrigerant flows through tubing to a condenser. The condenser is like a radiator comprised of a great length of tubing with fins attached to promote heat transfer. Outside air is directed over the condenser. The temperature of the refrigerant inside is higher than the ambient air temperature, so heat is transferred from the refrigerant to the outside air. The amount of heat given off is enough to cool the refrigerant and to condense it back to a high-pressure liquid. It flows through tubing and back into the receiver dryer, completing the vapor cycle.

There are two sides to the vapor cycle air conditioning system. One accepts heat and is known as the low side. The other gives up heat and is known as the high side. The low and high refer to the temperature and pressure of the refrigerant. As such, the compressor and the expansion valve are the two components that

separate the low side from the high side of the cycle. [Figure 4-34] Refrigerant on the low side is characterized as having low pressure and temperature. Refrigerant on the high side has high-pressure and temperature.

VAPOR CYCLE AIR CONDITIONING SYSTEM COMPONENTS

By examining each component in the vapor cycle air conditioning system, greater insight into its function can be gained.

REFRIGERANT

For many years, dichlorodifluoromethane (R12) was the standard refrigerant used in aircraft vapor cycle air conditioning systems. Some of these systems remain in use today. R12 was found to have a negative effect on the environment; in particular, it