WELCOME

The publishers of this Aviation Maintenance Technician Certification Series welcome you to the world of aviation maintenance. As you move towards EASA certification, you are required to gain suitable knowledge and experience in your chosen area. 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.

For other educational tools created to prepare candidates for licensure, contact Aircraft Technical Book Company.

We wish you good luck and success in your studies and in your aviation career!

REVISION LOG

VERSION	EFFECTIVE DATE	DESCRIPTION OF CHANGE
001	2015 10	Module Creation and Release
002	2016 01	Minor Revisions
003	2017 09	Format Update
003.1	2019 02	Added section on Pneumatic and Pressure Pumps in Sub-Module 16.
003.2	2019 05	Corrected incorrect answers in Sub-Module 20.
004	2019 12	Typographic format updated; Sequencing of content to Appendix 1 refined.
004.1	2021 04	Enhanced content of M11A Sub-Module 08(b)
004.2	2023 01	Added Measurement Standards. Improved Figures 13-51, 18-5, and 18-6.

MODULE EDITIONS AND UPDATES

ATB EASA Modules are in a constant state of review for quality, regulatory updates, and new technologies. This book's edition is given in the revision log above. Update notices will be available Online at *www.actechbooks.com/revisions.html*
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MEASUREMENT STANDARDS

SI Units

Measurements in this book are presented with 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 in the table below form names of the decimal equivalents in SI units.

MULTIPLICATION FACTOR	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
0.0 1 = 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

IMPERIAL SYSTEM	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		
°0 Fahrenheit	is equal to	(-)17.778 Celsius (°C)
°0 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 SYSTEM
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		
°0 Celsius (°C)	is equal to	33.8° Fahrenheit
°0 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)	6.895
pounds per square inch (psi)	Pascals (Pa)	6 895

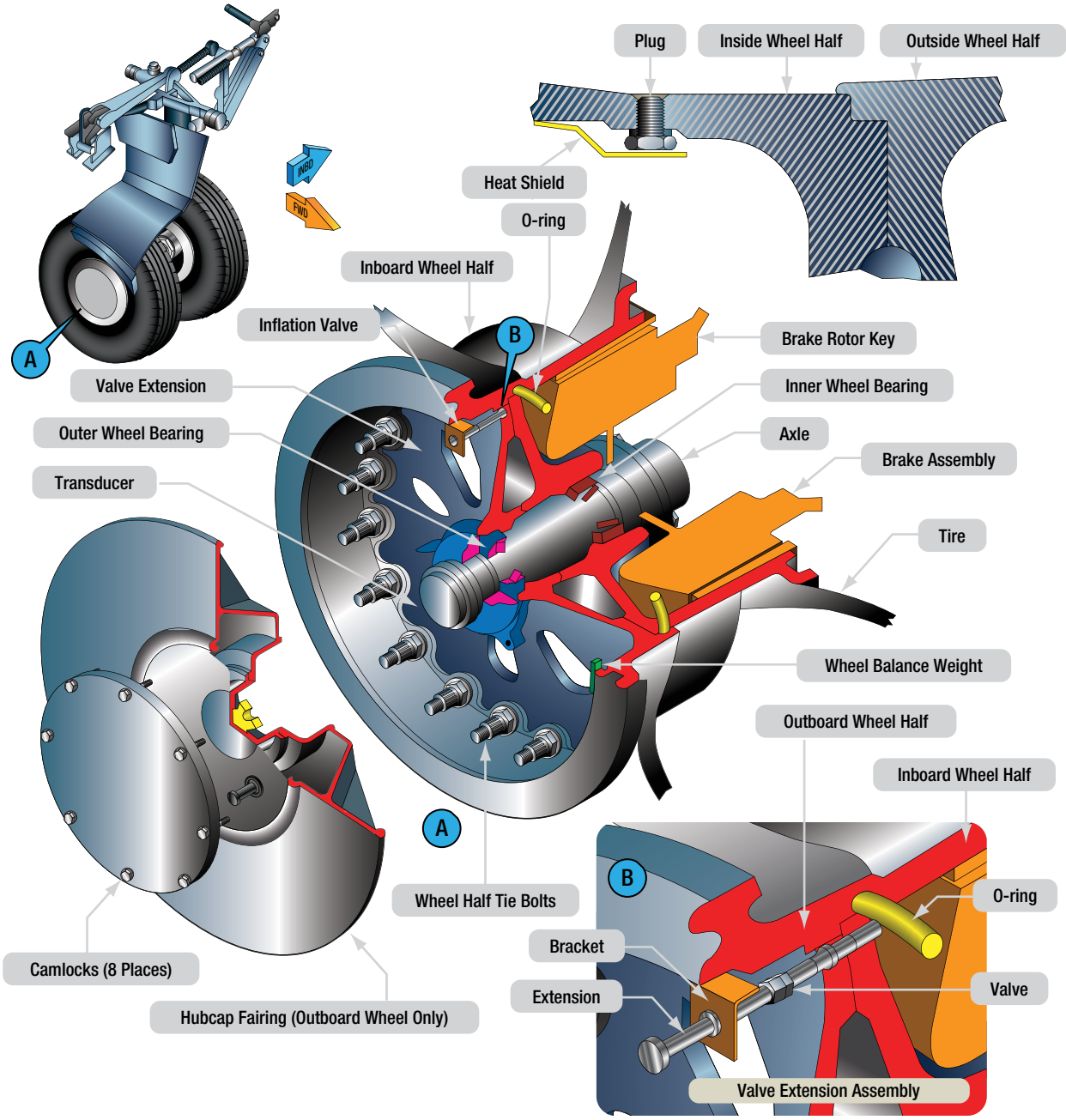

Figure 13-50. Features of a two piece aircraft wheel found on a modern airliner.

Figure 13-51. A pressure relief valve on an inner wheel half.

valve is also often installed in the inner wheel half with the stem extending through holes in the outer wheel half to permit access for inflation and deflation.

OUTBOARD WHEEL HALF

The outboard wheel half bolts to the inboard wheel half to make up the wheel assembly upon which the tire is mounted. The center boss is constructed to receive a bearing cup and bearing assembly as it does on the inboard wheel half. The outer bearing and end of the axle is capped to prevent contaminants from entering this area.

aircraft including navigation systems, flight control systems, environmental control systems, and others. Within each system, the BITE circuitry tests numerous individual parameters to determine whether the system is functioning properly. The individual system BITE circuits are connected to the CMC by a digital data bus. ARINC 429 buses are used for this purpose in many aircraft. Other data buses, such as ARINC 629, may also be used.

Whenever a system that contains BITE is first powered on, the BITE automatically performs a test of that system. This is referred to as an initialization test or a power-up check. If any fault is detected by the BITE during this test, an output is generated and sent to the CMC. If the system passes the initial test, BITE begins its regular monitoring of the system parameters. This monitoring is sometimes referred to as a "watchdog" function. During operation, the monitoring process is continuous. If anything that is being monitored fails, BITE will alert the CMC automatically.

In some aircraft, the user can run the BITE power-up check for a given system from the CMC control unit at any time. This capability is provided as a CMC menu item. This function can be useful when troubleshooting the system. Some LRUs containing BITE have indicator lights that indicate the status of the LRU. Green lights indicate a normal condition, red lights indicate that the BITE detected a fault in the LRU. ***Figure 18-5*** shows an LRU with BITE indicators.

BITE systems also have the capability of storing fault history. The history is kept in non-volatile memory. Non-volatile memory holds the stored information even after the system has been powered off.

Figure 18-5. Line replaceable units with BITE indicators.

DATA LOADING SYSTEMS

An aircraft's data loading system provides a means to upload data to, and download data from, the on board maintenance system. The data loading system connects to other on board systems, as well. The data loading system can be used with any digital system that requires data uploads and downloads while installed in the aircraft.

Early data loading systems used floppy disks as the data storage medium. An example of this is the MDDU (multipurpose disk drive unit) used on many Airbus models. The MDDU uses 3.5 inch floppy disks for uploading, downloading, and data storage. In the Airbus system, a Data Loader Selector switches the MDDU to the various systems that require a data upload or download. On the Boeing 777, data loading is accomplished through a maintenance access terminal (MAT) on the flight deck. ***Figure 18-6*** shows the MAT.

Data loading systems also allow for the use of other forms of storage media. Newer systems can be connected to a laptop computer through a USB (universal serial bus) cable. A CD-ROM disk, or a USB memory stick or "flash drive" may also be used. In some aircraft, there are multiple locations to connect external devices to the data loading system. For example, the 777 has two laptop maintenance access terminal interfaces. One is located on the flight deck, and one is located in the main equipment center below the flight deck.

The primary uses for the data loading system are the uploading of program updates, the uploading of database updates, and the downloading of reports.

Figure 18-6. Maintenance Access Terminal (MAT).