Boeing 777 (Includes GE90 and PW4000 Powerplants)
General Familiarization

By Steve Oebermann

Presented by AeroEd LLC
Tel: 585-935-7239
Fax: 585-235-5940
www.AeroEd.com

July 2010
First Edition
Self-Paced Training Study Guide

Distributed Exclusively by:

AIRCRAFT TECHNICAL Book Company

Tel: 800-780-4115
Fax: 970-726-5115
www.ACTechbooks.com

Details:

This book is a study guide for the Boeing 777 Aircraft and includes ATA Chapters 71-80 for both the GE90 and PW4000 Powerplants. This book is a great tool for review, refresher, new hires, pre-requisite training, and preparation for systems level classes. There are many benefits for students, technicians, teachers, MRO Training Departments, and Airlines alike. With self-paced study, training time does not need to conflict with your billable time!

How to Enroll in the Certification Program:

You can convert this Study Guide to the AeroEd certificate program, which will award you with an official **Certificate of Completion** and the opportunity to collect 56 hours of **FAA AMT Awards Credits**. Successful completion of this course qualifies for 56 hours FAA AMT Awards Program credit for an FAA certificated mechanics or repairmen, technicians, instructors, and students. All materials required for registration are included in the available Certificate Packet. For more information on the program contact your local FSDO Airworthiness Safety Program Manager.

The General Familiarization that this course provides can serve as the springboard for Systems classes and a deeper level of detail. Just contact AeroEd and we will get you started. For the incremental cost of the program you will receive the following items in the Certification Packet: a set of tests or online test login, a registration number, and an online account to track your Chapter Scores and Mastery Results. Upon successful completion, you will receive a Certificate of Completion.

contact@aeroed.com
http://www.aeroed.com/?page=content

Contents - ATA Chapter List

AeroEd LLC Self Paced Training titles, as of July 2010:

- MD-80
- 747-400
- 747-Classics
- 737-3/4/500
- CRJ-100/200
- 757
- 767
- 777

See www.aeroed.com or www.actechbooks.com for more information.

Aircraft Technical Books, LLC
http://www.actechbooks.com

B777 GENERAL FAMILIARIZATION SELF-PACED

This course covers an overview of the Mechanical Systems to include: Description and Operation, Controls and Indications, Component Location, & Servicing.

OBJECTIVES

Upon completion of this training, using the study guide provided and appropriate Maintenance Manuals, the student will be able to:

1) Describe the safety precautions to be observed when working on or near the aircraft and its systems.

2) Describe the locations of principle components.

3) Describe the normal functions of each major system, including terminology and nomenclature.

4) Using the proper maintenance manual reference, perform all aircraft system servicing tasks.

5) Interpret reports provided by the crew members.

TABLE OF CONTENTS
777 GENERAL FAMILIARIZATION SELF-PACED
ATA 06

MANUAL ARRANGEMENT AND NUMBERING SYSTEM

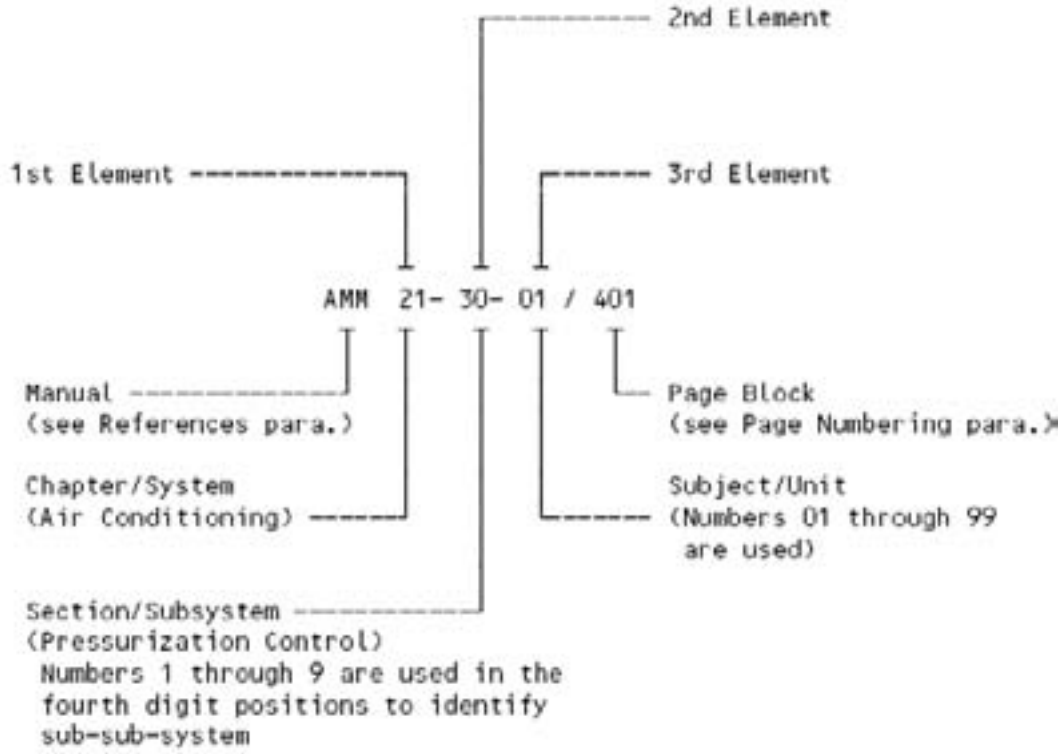
The Manual is divided into chapters and groups of chapters. Each group and every chapter has a tab provided for ease of location. These chapters separate the manual into the primary functions and systems of the airplane. The chapters are further divided into sections and subjects to provide for subsystem and individual unit breakout. Each chapter, section and subject is identified by an assigned number. Each page carries the assigned subject number, page number, the Maintenance Manual document number and the revision date. The numbering system is described in detail in the paragraphs that follow.

Chapter Numbering

Chapterization of the maintenance manual has provided a functional breakdown of the entire airplane. The chapter breakdown numbering system uses a three element number (XX-XX-XX). It provides for dividing the material into Chapters, Sections, and Subjects.

The three elements of the indicator each contain two digits.

For example:



Chapter Numbering (Continued):

The chapter number (1st element) and the first number of the section number (2nd element) are assigned by ATA Specification No. 100. Material which is applicable to a system as a whole uses zeros in the 2nd and 3rd elements of the numbers. That is, the chapter number followed by "-00-00".

For example:

AMM 22-00-00 /001 (Auto Flight) is used for general description information which provides an outline breakdown of the sections in the chapter.

Effectivity and Configuration Numbering

On each page, there is effectivity data at the lower, inner margin (Fig. 1). When a page applies to all airplanes, the word ALL is in the effectivity block. If the data does not apply to all airplanes, then the effectivity will be one of these types:

1. Physical description - A description of the differences that you can see.

   When a physical description is used, a reference to the applicable service bulletin and PRR (production change) are provided when that is possible. This is done primarily for the benefit of airline engineering, and maintenance planning groups.

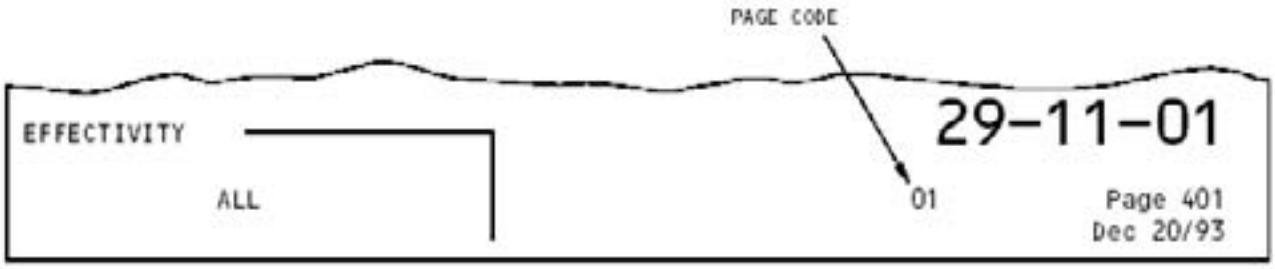
   For example: AIRPLANES WITH VALVE INSTALLED AWAY FROM THE FILTER (POST-SB 28A-17 OR PRR 54009) AIRPLANES WITH VALVE INSTALLED NEAR THE FILTER (PRE-SB 28A-17)

2. Component dash number - The last digits of the identification number that are on an electrical box.

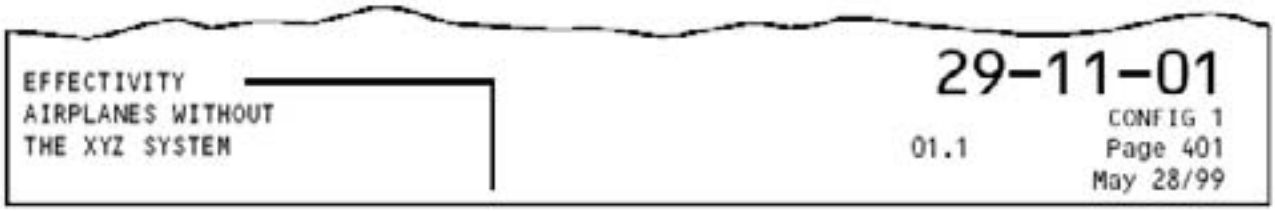
3. Airplane effectivity numbers - The airline three-letter code, and the numbers or letters that Boeing and each airline agreed on to identify each airplane. If the effectivity is applicable to all subsequent airplanes, the last digits will be 999.

   For example: 205-999 indicates airplane 205 and all subsequent airplanes.

   Each paragraph can have an effectivity. Each effectivity is in upper-case letters, on the first line of the paragraph.



NON-CONFIG PROCEDURE EXAMPLE



CONFIG 1 PROCEDURE EXAMPLE

CONFIG 2 PROCEDURE EXAMPLE

CONFIG - NOT USED EXAMPLE

Effectivity, Page Code and Configuration Procedure Examples
Figure 1

Effectivity and Configuration Numbering (Continued):

When effectivity differences are extensive and the preceding method becomes cumbersome and distracting from the continuity of subject matter, new page blocks are created. These added page blocks are identified by the addition of a configuration code (CONFIG) immediately above the page number. A previously issued page block is re-issued to incorporate the configuration code as shown in Fig. 1. Configuration codes are issued at page block level only. They are usually used when a change to the airplane results in a major change to the manual. Configuration codes are typically used when there are multiple configurations of page block applicable to a customer's fleet.

In some instances, you can have CONFIGs that are provided as place holders. These procedures will be indicated as "NOT USED" in the effectivity block in the lower left corner of the page (Fig. 1).

For the effectivity information in the power plant (70 series) chapters of the manual, two situations can exist. The word ALL placed in the effectivity block on a page means that the page pertains to either all airplanes or all engines, whichever the case may be. When the effectivity is limited to a system or component that remains with the airplane during the power plant replacement, the effectivity is expressed in a manner described in the preceding paragraphs. When a manual section, page, step or illustration is limited to an engine type or component, the effectivity is given using the engine model, physical difference, or part number.

The word "ALL" in the effectivity block on a page means that the page pertains to all airplanes (if you have only one engine type in your model fleet) or 2) All engines (if you have multiple engine types in your model fleet), whichever the case may be.

Page Numbering

Each page block has its own page numbers. The page numbers are in the lower right corner of each page. The page blocks categorize the tasks that they contain. The page blocks are defined by ATA Specification 100:

NOMENCLATURE	PAGE BLOCK
DESCRIPTION AND OPERATION (D&O)	1 to 99
FAULT ISOLATION (FI)	101 to 199
MAINTENANCE PRACTICES (MP)	201 to 299
SERVICING (SRV)	301 to 399
REMOVAL/INSTALLATION (R/I)	401 to 499
ADJUSTMENT/TEST (A/T)	501 to 599
INSPECTION/CHECK (I/C)	601 to 699
CLEANING/PAINTING (C/P)	701 to 799
APPROVED REPAIRS (AR)	801 to 899

When it is convenient for the user to have different types of tasks in one page block, MAINTENANCE PRACTICES, the 201-to-299 page block, is used.

AMTOSS

Maintenance practices are structured to incorporate features of AMTOSS (Aircraft Maintenance Task Oriented Support System). AMTOSS arranges maintenance practices to facilitate automated data retrieval by the airlines. Typical procedural structure is as follows:

1.	General
2.	(Task)
A.	General
B.	References
C.	Equipment
D.	Consumable Materials
E.	Parts (TOD Items Only)
F.	Access
G.	(Topic)
(1)	(Sub Task)
(a)	(Sub Step)

CAUTION: MAKE SURE THAT YOU DO ALL OF THE STEPS TO THE END OF THE TASK. LARGE BLANK SPACES CAN OCCUR AT THE BOTTOM OF PAGES WHICH DO NOT ALWAYS INDICATE THAT YOU ARE AT THE END OF THE TASK. IF YOU DO NOT MAKE SURE THAT YOU COMPLETED THE TASK, DAMAGE TO THE EQUIPMENT OR SYSTEM MALFUNCTION COULD OCCUR.

TASKS are procedures for specific maintenance requirements. For example, R/I page blocks normally contain two tasks:

- Removal of the LRU
- Installation of the LRU

A/T page blocks typically have three tasks:

- Operational Test of the System
- Functional Test of the System
- System Test of the System

TOPICS are generic headings used within tasks to provide groupings of sub-tasks. One or more topics are used for each task. Typical topic headings

Prepare for Removal
Restore Airplane to Normal

AMTOSS Continued

Less complicated procedures use the topic "Procedure".

SUB-TASKS are major action steps within tasks and provide a complete outline of significant steps.

- Ø A sub-task contains a reference to hardware being worked on. Example: "Disconnect hydraulic lines" is a sub-task, while "Prepare for Removal" is not a sub-task.
- Ø Separate skill requirements are contained in separate sub-tasks. Example: A step involving hydraulic tubing and electrical wiring are separate sub-tasks and would be structured as two separate steps.
- Ø All sub-tasks are structured to conform to the requirements of the AMTOSS numbering system.

AMTOSS Numbers

All tasks and sub-tasks are coded with an AMTOSS number. These numbers will print in the AMM. Typical AMTOSS numbers are as follows:

- Ø For a task: TASK 29-11-05-400-801-002
- Ø For a subtask: SUBTASK 870-001-002

The AMTOSS task numbers have these elements (from the example above):

AMTOSS Element	Description
29	ATA Chapter
11	ATA Section
05	ATA Subject
400	Function Code
801	Sequence Number (used to provide a unique number when the first four elements are not unique). The sequence number starts at 801 for tasks and continues thru 999. If there are more than 200 tasks, the number continues with A01 through A99, B01-B99 etc.
002	Configuration - the first position is the engine prefix, the second and third positions are the pageblock configuration (if there is no data for these character positions, they can be filled with a blank or a zero).

The AMTOSS Sub-task numbers have the same elements as the AMTOSS task numbers. In the printed version of the AMM, the first three elements of the sub-task numbers are not printed because they are the same as the first three elements of the task number.

PRINCIPAL DIMENSIONS AND AREAS

This procedure contains dimensions for the wing, horizontal stabilizer, vertical stabilizer, and fuselage. This procedure also contains areas for the wing and stabilizer surfaces.

Some dimensions change with the center of gravity location and the airplane loads. For these dimensions a minimum and maximum are given.

Location Zones

100 Lower Half of Fuselage
200 Upper Half of Fuselage
300 Empennage and Body Section 48
400 Powerplants and Nacelle Struts
500 Left Wing
600 Right Wing
700 Landing Gear and Landing Gear Doors

Dimensions

Airplane:
Height Minimum -- 58 feet and 8 inches (17.9 m)
Maximum -- 64 feet and 7 inches (19.7 m)
Length -- 209 feet and 1 inches (63.7 m) (777-200 airplanes)
Width -- 199 feet and 11 inches (60.9 m)

Engines:
Engine to Ground Distance:
Minimum -- 2 feet and 8 inches (812 mm)
Maximum -- 3 feet and 1 inch (939.8 mm)
Fuselage to Engine Distance (centerline of fuselage to centerline of engine) -- 31 feet and 5 inches (9.6 m)

Fuselage:
Height of Body Reference Plane (WL 200.44) Above Ground at Main Landing Gear:
Minimum -- 16 feet and 6 inches (5.1 m)
Maximum -- 18 feet and 4 inches (5.6 m)

Height (constant cross section):
Above Body Reference Plane -- 11 feet and 11 inches (3.6 m)
Below Body Reference Plane -- 8 feet and 5 inches (2.6 m)

Height to Centerline of Windows Above Body Reference Plane -- 3 feet and 4 inches (1.02 m)

Length:
Nose to Tail End of Body -- 205 feet and 10 inches (62.7 m)

Nose to Tail End of Strobe Light -- 206 feet and 6 inches (62.9 m)
Width -- 20 feet and 4 inches (6.2 m)

Horizontal Stabilizer:
Aspect Ratio -- 4.50
Dihedral (stabilizer reference plane in relation to the body reference plane) -- 7 degrees
Span -- 70 feet and 7.5 inches (21.5 m)
Sweepback (25 percent chord line) -- 35 degrees
Taper Ratio -- 0.35
Tip Chord -- 8 feet and 1 inch (2.5 m)

Landing Gear:
Truck Length -- 9 feet 6 inches (2.9 m)
Track -- 36 feet (11 m)
Nose Landing Gear Offset -- 19 feet and 4 inches (5.9 m)
Wheelbase -- 84 feet and 11 inches (25.9 m)

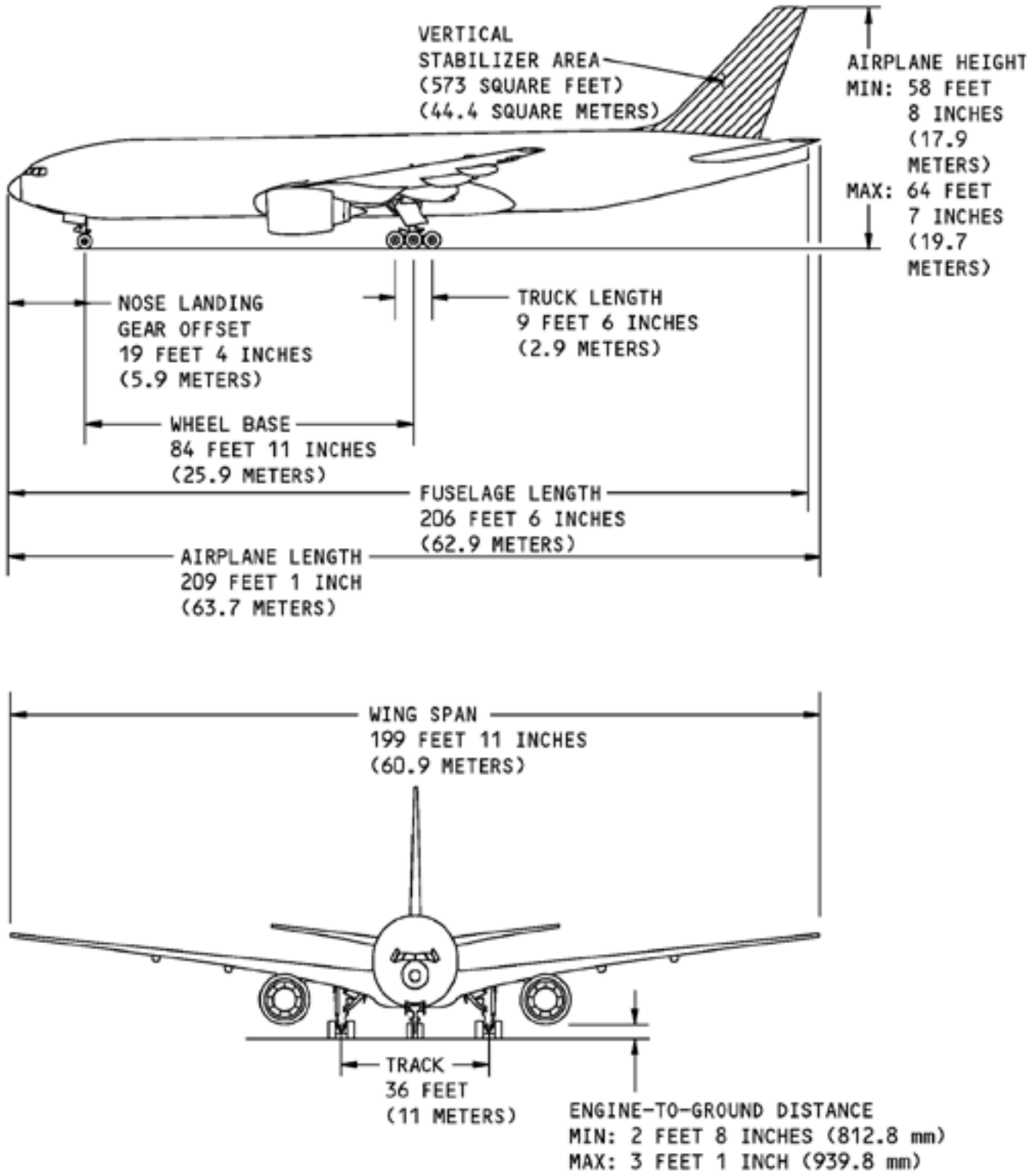
Vertical Stabilizer:
Aspect Ratio -- 1.78
Height (root chord, WL 326.7, to top of stabilizer) -- 32 feet and 3 inches (9.8 m)
Root Chord -- 27 feet and 7 inch (8.4 m)
Sweepback (25 percent chord line) -- 40 degrees
Taper Ratio -- 0.30

Wing:
Aspect Ratio -- 9.69
Basic Chord (theoretical) -- 50 feet and 2 inches (15.3 m)
Dihedral (wing reference plane in relation to the body reference plane) -- 6 degrees
Mean Aerodynamic Chord (basic wing only) -- 23 feet and 3 inches (7.1 m)

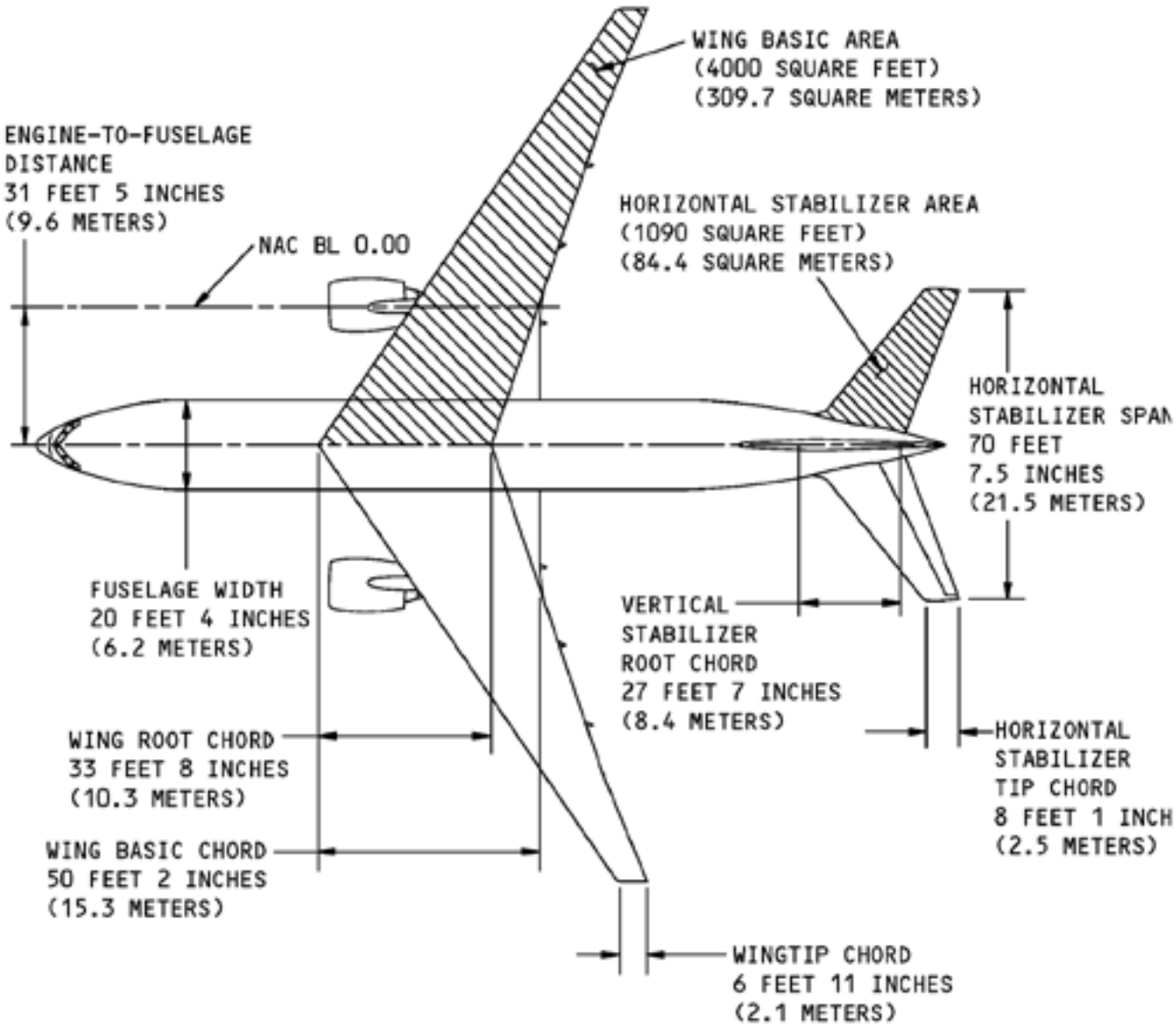
Platform Taper Ratio:
Tip Chord /Basic Chord -- 0.138
Tip Chord /Root Chord -- 0.205
Root Chord (theoretical, at body centerline) -- 33 feet and 8 inches (10.3 m)
Sweepback (25 percent chord line) -- 31.64 degrees
Tip Chord (theoretical) -- 6 feet and 11 inches (2.1 m)

Areas

Horizontal Stabilizer Area -- 1090 square feet (84.4 square meters)
Vertical Stabilizer Area -- 573 square feet (44.4 square meters)
Wing Basic Area -- 4000 square feet (309.7 square meters)



Principal Dimensions and Areas



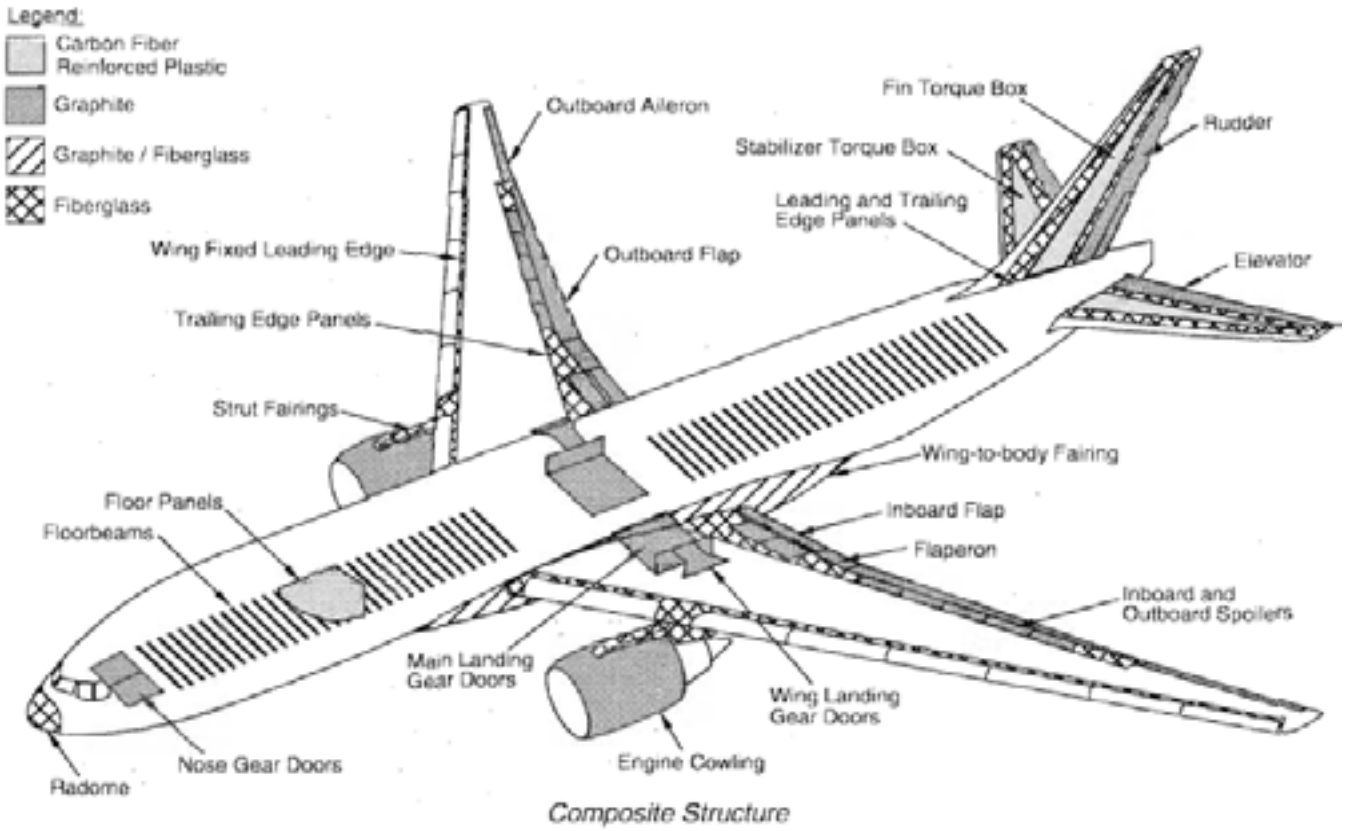
Principal Dimensions and Areas

COMPOSITE STRUCTURE

Some of the airplane structure is made of composite materials to improve resistance to damage and corrosion, and reduce airplane weight.

Composite materials are layers or piles of high strength fibers (carbon fibers or fiberglass) in a mixture of plastic resin. Components made of composite materials use laminations or combine layers of the composite materials with a honeycomb core to form a sandwich construction.

The structural repair manual contains the necessary inspections, damage limits, and repair procedures for each component.



Composite Structure