

AIRFRAME & POWERPLANT MECHANICS

AIRFRAME WORKBOOK

Written, Oral, and Practical

ALIGNS WITH

FAA-H-8083-31B & FAA-H-8083-31B-ATB

Airframe & Powerplant Mechanics Airframe Handbook

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PREFACE

This Student Workbook is designed as a companion to the Aviation Maintenance Mechanics Airframe Handbooks FAA-H-8083-31 and FAA-H-8083-31B-ATB. Each chapter of this workbook matches the equivalent chapter in the Handbook and contains study questions, exercises, and a final exam for that chapter. Each is designed to enhance your understanding of the material in the textbook and to better prepare you for success with your actual FAA written exams and later in your career as a professional aviation maintenance technician.

Each chapter of this Workbook is presented in 3 parts:

1. Study Aid Questions are fill in the blank, multiple choice, true or false, or matching formats designed to reinforce the most important concepts presented in the Handbook.
2. Knowledge Application Questions; giving you an opportunity to actually use the material presented in each chapter to solve common problems.
3. Final Chapter Exam, in multiple choice format designed to further reinforce your study skills and to be used by instructors as end of chapter exam and as an evaluation of your progress.

The answers to Sections A and B questions may be found in the back of this workbook and can so be used by students as a part of your personal study habits. The answers to Section C - Final Chapter Exams, are available only to instructors as part of the instructor support package for the H-8083 textbook series, thus preserving the value of the exam as a valid instructional tool.

Each page in this book is perforated allowing students to tear out and turn in assigned sections which may be given as homework or in-class exercises.

For further information about this Workbook, its corresponding Textbook, or to order additional copies in print or electronic format, please contact Aircraft Technical Book Company at 970.726.5111, or email to orders@actechbooks.com, or visit our web site at www.actechbooks.com.

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Section A

Study Aid Questions - Fill In The Blanks

1. The part of the aircraft that is designed to carry a load or resist stress is the _____.
2. All aircraft are subjected to five major stresses: tension, compression, bending, _____, and _____.
3. Tensile strength is measured in _____ which is written as _____.
4. Wings that require no external bracing are known as _____ design.
5. _____ internal structures are made up of spars and stringers.
6. Spars are to wings as _____ are to the fuselage.
7. I-beam spars are made up of two components: the _____ which is the vertical section and the _____ which is the horizontal section.
8. A stainless steel or titanium bulkhead known as a _____ is used to isolate the _____ from the rest of the aircraft.
9. Cowl flaps are movable parts of the cowling that open and close to _____.
10. The primary flight controls include the ailerons, elevators, and rudders which control the stability around the _____, _____, and _____ axes respectively.
11. Primary flight control surfaces need to be balanced so they do not vibrate or _____.
12. When the aircraft is turned to the left, the aileron on the pilot's _____ points up.
13. Elevators move the aircraft around the _____ axis.
14. When the right pedal is pushed forward, it deflects the rudder to the _____ which moves the nose of the aircraft to the right.
15. Flaps that slide aft to increase the total area of the wing are known as _____ flaps.
16. Slats increase the _____ at which laminar airflow can exist.
17. Heavy or high performance aircraft have _____ on the top of their wings that disrupt airflow when deployed.

Section B

Knowledge Application Questions

1. Why are the rotors of a helicopter considered part of the airframe?
2. Define strain.
3. Describe stresses involved on a part being bent or subject to bending stress.
4. Cowlings and fairings do not require a high degree of strength but what characteristic is important for parts such as these?
5. What are the structural members that make up a truss-framed fuselage and what is it typically covered with?
6. What is the biggest problem associated with the monocoque type fuselage?
7. How is the monocoque type fuselage different than the semimonocoque type?
8. What causes metal fatigue in a pressurized aircraft fuselage structure?
9. When is the use of landing gear jury struts necessary and what purpose do they serve?
10. What is the function of the wing spar?
11. Where are false ribs located and what is their function?

Section C Final Chapter Exam

1. The material's internal resistance or counterforce that opposes deformation is called _____.
☐ A. rigidity.
☐ B. strength.
☐ C. stress.
2. What type of stress is a combination of compression and tension?
☐ A. Torsion.
☐ B. Shear.
☐ C. Bending.
3. What type of construction method is used for most aluminum aircraft constructions?
☐ A. Monocoque.
☐ B. Semimonocoque.
☐ C. Truss.
4. What is the angle called that is made between the fuselage and the horizontal plane of the wing?
☐ A. Angle of attack.
☐ B. Wing dihedral.
☐ C. Angle of incidence.
5. How is the load transferred from the skin and the stringers to the spars?
☐ A. Stiffeners.
☐ B. Caps.
☐ C. Ribs.
6. Where are wing butt ribs located?
☐ A. Forward of the front spar.
☐ B. In between the front and rear spar.
☐ C. At the inboard edge of the wing.
7. What is the purpose of a fairing?
☐ A. Allows for smooth airflow between the wing and fuselage.
☐ B. Provide a strong and secure method for attaching the wing to the fuselage.
☐ C. Receives compression loads that tend to force the wing spars together.
8. What are the names of the movable flight control surfaces on the empennage?
☐ A. Horizontal Stabilizer and Elevator.
☐ B. Vertical stabilizer and Rudder.
☐ C. Elevator and Rudder.
9. What flight control surface movement causes the aircraft to roll?
☐ A. Aileron.
☐ B. Elevator.
☐ C. Rudder.
10. What type of movement does the rudder control?
☐ A. Roll.
☐ B. Pitch.
☐ C. Yaw.
11. What is a common design feature of ailerons to prevent flutter?
☐ A. Hinge points aft of the leading edge.
☐ B. Hinge points forward of the leading edge.
☐ C. Hinge points at the leading edge.