



**2025**

Airframe Mechanic

# **TEST GUIDE**



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**2025**

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AVIATION SUPPLIES & ACADEMICS, INC.  
NEWCASTLE, WASHINGTON

*Airframe Mechanic Test Guide*  
2025 Edition

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**Aviation Supplies & Academics, Inc. (ASA)** is an industry leader in the development and sale of aviation supplies and publications for pilots, flight instructors, aviation mechanics, aircraft dispatchers, air traffic controllers, and drone operators. ASA has provided FAA test preparation materials to millions of aviators resulting in successful airman certification for over 80 years. Visit [asa2fly.com](https://asa2fly.com) to learn more.

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# Updates and Practice Tests

## Free Test Updates for the One-Year Life Cycle of Test Guide Books

The FAA modifies tests as needed throughout the year. ASA keeps abreast of changes to the tests and posts free Test Updates on the ASA website. Before taking your test, be certain you have the most current information by visiting the ASA Test Updates webpage: [asa2fly.com/testupdate](http://asa2fly.com/testupdate). Additionally, sign up for free email notifications, which are sent when new Test Updates are available.

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Practice tests are also available as an app! [asa2fly.com/apps](http://asa2fly.com/apps)

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# Introduction

Welcome to the Aviation Supplies & Academics, Inc., (ASA) Test Guide Series, based on the original Fast-Track series written by Dale Crane. This series has been helping aviation mechanics prepare for FAA Knowledge Exams with great success for more than 60 years. We are confident that with the proper use of this book you will score very well on your FAA Knowledge Exam. Additionally, the ASA Test Guides include typical oral test questions and practical projects to help you prepare for the final step in the Aviation Mechanic certification process.

Begin your studies with an instructor-led or home-study ground school course, which will involve reading a comprehensive textbook for aviation maintenance technicians (AMTs). Once complete, visit the Reader Resources for this Test Guide ([asa2fly.com/AMA](http://asa2fly.com/AMA)) and become familiar with the FAA guidance material available for this certification exam. Then use this Test Guide to prepare for your exam: Read the question, select your choice for the correct answer, and then read the explanation. Use the references that accompany the explanation to identify additional resources for further study. Upon completion of your studies, take practice tests at [preppware.com](http://preppware.com) (see inside the front cover for your activation code).

Prior to taking an FAA Airman Knowledge Test, all applicants must establish an FAA Tracking Number (FTN) by creating a profile in the Integrated Airman Certification and Rating Application (IACRA) system at [iacra.faa.gov](http://iacra.faa.gov). Then visit [faa.psiexams.com](http://faa.psiexams.com) to register for your exam and take FAA-created practice tests to become familiar with the computer testing platform.

The FAA exams are “closed tests” which means the exact database of questions is not available to the public. The question and answer choices in this book are based on our extensive history and experience with the FAA testing process as well as the FAA’s publicly available information. You might see similarly worded questions on your official FAA exam and answer stems may be rearranged from the A, B, C order you see in this book. Therefore, be sure to fully understand the intent of each question and corresponding answer while studying, rather than memorizing the letter associated with the correct response. Studying and understanding the information in this book and the associated references will give you the tools to answer question variations with confidence.

If your study leads you to question an answer choice, we recommend you seek the assistance of a local instructor. We welcome your questions, recommendations or concerns—send them to:

**Aviation Supplies & Academics, Inc.**

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The FAA appreciates testing experience feedback. Contact them at:

**Federal Aviation Administration, AFS-810**

Training & Certification Group, Testing Standards Section  
PO Box 25082  
Oklahoma City, OK 73125  
Email: [afs630comments@faa.gov](mailto:afs630comments@faa.gov)

# Instructions

The general qualifications for an Aviation Mechanic certificate require you to have a combination of experience, knowledge, and skill. If you are pursuing an Aviation Mechanic certificate with Airframe and Powerplant ratings, you should review the appropriate sections of 14 CFR Part 65 for detailed information pertaining to eligibility requirements. Further information may be obtained from [faa.gov/mechanics](http://faa.gov/mechanics).

The table below lists the number of questions, allotted testing time, and required passing score for each aviation mechanic knowledge exam, as well as the Test Code you'll use to register for your test.

Test Code	Test Name	Number of Questions	Min. Age	Allotted Time (hrs)	Passing Score
AMA	Aviation Mechanic—Airframe	100	N/A	2.0	70
AMG	Aviation Mechanic—General	60	N/A	2.0	70
AMP	Aviation Mechanic—Powerplant	100	N/A	2.0	70

## Description of the Knowledge Test

All test questions are objective multiple-choice and can be answered by the selection of a single response. Each test question is independent of other questions; therefore, a correct response to one does not depend upon, or influence, the correct response to another. Considerable effort is expended to write each question in a clear, precise manner. Make sure you read the instructions given with the test, as well as the statements in each test item. When taking a test, keep the following points in mind:

1. Answer each question in accordance with the latest regulations and guidance publications.
2. Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.
3. After formulating an answer, determine which choice corresponds with that answer. The answer chosen should completely resolve the problem.
4. From the answers given, it may appear that there is more than one possible answer; however, there is only one answer that is correct and complete. The other answers are either incomplete, erroneous, or represent common misconceptions.
5. If a certain question is difficult for you, mark it for review and proceed to the next question. After you answer the less difficult questions, return to those you marked for review and answer them. The review marking procedure will be explained to you prior to starting the test. Although the computer should alert you to unanswered questions, make sure every question has an answer recorded. This procedure will enable you to use the available time to maximum advantage.
6. When solving a calculation problem, select the answer closest to your solution. The problem has been checked several times by various individuals; therefore, if you have solved it correctly, your answer will be closer to the correct answer than any of the other choices.

Your test will be graded immediately upon completion and your score will display on the computer screen.

## Knowledge Test Eligibility Requirements

Before taking the certification knowledge and practical tests, you must meet the eligibility requirements for authorization. Applicants may present one or more of the following acceptable forms of authorization:

- Original FAA Form 8610-2, Airman Certificate and/or Rating Application. The proctor will verify that applicable blocks are marked (in upper left corner of form). Those not applicable will have a line drawn through them (identifying Airframe and/or Powerplant).
- Certificate of graduation or completion from an FAA-certificated Aviation Maintenance Technician School (AMTS).
- Military Certificate of Eligibility.

Learn more about the FAA's test authorization requirement by reviewing 14 CFR Parts 65 and 147 and the FAA Airman Knowledge Testing Authorization Requirements matrix posted in the reader resources at [asa2fly.com/AMA](http://asa2fly.com/AMA).



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## Taking the Knowledge Test

The FAA testing provider authorizes hundreds of test center locations that offer a full range of airman knowledge tests. For information on authorized testing centers and to register for the knowledge test, visit [faa.psiexams.com](http://faa.psiexams.com).

When you contact a knowledge testing center, be prepared to select a test date and make a payment. You may register for test(s) several weeks in advance online or with a telephone call, and you may cancel in accordance with the testing center's cancellation policy. Regardless of your registration method, you will need an FAA Tracking Number (FTN). This FTN will follow you throughout your aviation career. You will obtain your FTN by creating a profile in the Integrated Airman Certificate and Rating Application (IACRA) system at [iacra.faa.gov](http://iacra.faa.gov). This FTN will be printed on your Airman Knowledge Test Report (AKTR).

For more information, contact:

**PSI Services LLC**

844-704-1487 or [examschedule@psionline.com](mailto:examschedule@psionline.com)

[faa.psiexams.com](http://faa.psiexams.com)

On the day of the Airman Knowledge Test the applicant must provide the following information to be collected in order to complete the registration process at the testing center prior to the test proctor administering the Airman Knowledge Test: name, FAA Tracking Number (FTN), physical address, date of birth, email address, photo identification, phone number, test authorization (credentials of the individual such as an instructor endorsement), and previous number of test attempts. The [faa.psiexams.com](http://faa.psiexams.com) website, your instructor, or local FAA office can assist you with what documentation to take to the testing facility. Testing center personnel will not begin the test until your identification is verified. Acceptable forms of authorization are:

- FAA Form 8610-2.
- A graduation certificate or certificate of completion from an affiliated testing center.
- A failed, passing, or expired AKTR.

## Retesting Procedure

Retests do not require a 30-day waiting period if the applicant presents a signed statement from an airman holding the certificate and rating sought by the applicant. This statement must certify that the airman has given the applicant additional instruction in each of the subjects failed, and that the airman considers the applicant ready for retesting. A 30-day waiting period is required for retesting if the applicant presents a failed airman knowledge test report, but no authorized instructor endorsement.

Applicants taking retests *after failure* are required to submit the applicable test report indicating failure to the testing center prior to retesting. The original failed test report shall be retained by the proctor and attached to the applicable sign-in/out log. The latest test taken will reflect the official score.

Applicants retesting *in an attempt to achieve a higher passing score* may retake the same test for a better grade after 30 days. The latest test taken will reflect the official score. Applicants are required to submit the *original* applicable test report indicating previous passing score to the testing center prior to testing. Testing center personnel must collect and destroy this report prior to issuing the new test report.

## Use of Test Aids and Materials

Airman knowledge tests require applicants to analyze the relationship between variables needed to solve aviation problems, in addition to testing for accuracy of a mathematical calculation. The intent is that all applicants are tested on concepts rather than rote calculation ability. It is permissible to use certain calculating devices when taking airman knowledge tests, provided they are used within the following guidelines. The term "calculating devices" is interchangeable with such items as calculators, computers, or any similar devices designed for aviation-related activities.

1. Guidelines for use of test aids and materials. The applicant may use test aids and materials within the guidelines listed below, if actual test questions or answers are not revealed.
  - a. Applicants may use test aids, such as a calculating device that is directly related to the test. In addition, applicants may use any test materials provided with the test.



- 
- b. The test proctor may provide a calculating device to applicants and deny them use of their personal calculating device if the applicant's device does not have a screen that indicates all memory has been erased. The test proctor must be able to determine the calculating device's erasure capability. The use of calculating devices incorporating permanent or continuous type memory circuits without erasure capability is prohibited.
  - c. The use of magnetic cards, magnetic tapes, modules, computer chips, or any other device upon which prewritten programs or information related to the test can be stored and retrieved is prohibited. Printouts of data will be surrendered at the completion of the test if the calculating device used incorporates this design feature.
  - d. The use of any booklet or manual containing instructions related to the use of the applicant's calculating device is not permitted.
  - e. Dictionaries are not allowed in the testing area.
  - f. The test proctor makes the final determination relating to test materials and personal possessions that the applicant may take into the testing area.
2. Guidelines for applicant's with learning or reading disabilities. An applicant with a learning or reading disability may request approval from the local Flight Standards Office to take an airman knowledge test using one of the following options listed in preferential order:
    - (1) The applicant may request up to 1½ times the standard time allotted to complete the knowledge test.
    - (2) The applicant may use a self-contained electronic device which pronounces and displays typed-in words (e.g., the Franklin Speaking Wordmaster®) to facilitate the testing process. The applicant must provide his or her own device, with approval of the device to be determined by the administrator. Note: The device should consist of an electronic thesaurus that audibly pronounces typed-in words and presents them on a display screen. The device should also have a built-in headphone jack for private listening in order to avoid disturbing others during testing.

## Cheating or Other Unauthorized Conduct

Computer testing centers are required to follow strict security procedures to avoid test compromise. These procedures are established by the FAA and are covered in FAA Order 8080.6, Conduct of Airman Knowledge Tests. The FAA has directed testing centers to terminate a test at any time a test proctor suspects a cheating incident has occurred. An FAA investigation will then be conducted. If the investigation determines that cheating or other unauthorized conduct has occurred, then any airman certificate or rating that you hold may be revoked, and you will be prohibited for 1 year from applying for or taking any test for a certificate or rating under 14 CFR Part 65.

## Test Reports

Your test will be graded immediately upon completion and your score will display on the computer screen. You will receive your Airman Knowledge Test Report (AKTR), which will state your score. See sample AKTR on the next page.

Visit [faa.psiexams.com](http://faa.psiexams.com) to request a duplicate or replacement AKTR due to loss or destruction.

Airman Knowledge Test Reports are valid for 24 calendar months. If the AKTR expires before completion of the practical test, you must retake the knowledge test.

Your AKTR lists the Airman Certification Standard (ACS) code for questions answered incorrectly. The total number of ACS codes shown on the AKTR is not necessarily an indication of the total number of questions answered incorrectly. Study these knowledge areas to improve your understanding of the subject matter. See Cross-Reference B in the back of this book for a listing of ACS codes and their associated questions.

During the oral and practical test, the examiner will re-evaluate the noted areas of deficiency. You will be retested on the subjects identified by the ACS code on the AKTR.

**U.S. DEPARTMENT OF TRANSPORTATION  
Federal Aviation Administration  
Airman Knowledge Test Report**

**NAME:** CHARLES TAYLOR  
**FAA TRACKING NUMBER (FTN):** C1234567 **EXAM ID:** 98765432109876543  
**EXAM:** Aviation Maintenance Technician Airframe (AMA)  
**EXAM DATE:** 08/15/2024 **EXAM SITE:** ABC12345  
**SCORE:** 88% **GRADE:** Pass **TAKE:** 1

The Airman Certification Standards (ACS) codes listed below represent incorrectly answered questions. These ACS codes and their associated Areas of Operation/Tasks/Elements may be found in the appropriate ACS document at [http://www.faa.gov/training\\_testing/testing/acs](http://www.faa.gov/training_testing/testing/acs).

A single code may represent more than one incorrect response.

AM.II.A.K8 AM.II.C.K10 AM.II.E.K6 AM.II.E.K12 AM.II.H.K24 AM.II.J.K3 AM.II.M.K6

**EXPIRATION DATE:** 08/30/2026

**DO NOT LOSE THIS REPORT**

-----  
AUTHORIZED INSTRUCTOR'S STATEMENT: (if applicable)

On \_\_\_\_\_ (date) I gave the above named applicant \_\_\_\_\_ hours of additional instruction, covering each subject area shown to be deficient, and consider the applicant competent to pass the knowledge test.

Name \_\_\_\_\_

Cert. No. \_\_\_\_\_ (print clearly)

Type of instructor certificate \_\_\_\_\_

Signature \_\_\_\_\_

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ISSUED BY: PSI Services LLC  
FEDERAL AVIATION ADMINISTRATION

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Sample Airman Knowledge Test Report

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# Knowledge Exam References

The FAA references the following documents to write the FAA Knowledge Exam questions. You should be familiar with all of these as part of your classroom studies, which you should complete before starting test preparation:

FAA-H-8083-30	<i>Aviation Maintenance Technician Handbook—General (FAA)</i>
FAA-H-8083-31	<i>Aviation Maintenance Technician Handbook—Airframe (FAA)</i>
FAA-H-8083-32	<i>Aviation Maintenance Technician Handbook—Powerplant (FAA)</i>
FAA-H-8083-3	<i>Airplane Flying Handbook (FAA)</i>
14 CFR Parts 1, 3, 21, 23, 39, 43, 45, 47, 65, 91, 147	
Advisory Circulars (AC) 21-12, 23-21, 23.1309-1, 43.9-1, 43.13-1	

Additional resources helpful for AMT studies:

AMT-G	<i>Aviation Mechanic Series: General (ASA)</i>
AMT-STRUC	<i>Aviation Mechanic Series: Airframe Structures (ASA)</i>
AMT-SYS	<i>Aviation Mechanic Series: Airframe Systems (ASA)</i>
AMT-P	<i>Aviation Mechanic Series: Powerplant (ASA)</i>
DAT	<i>Dictionary of Aeronautical Terms (ASA)</i>
AIM	<i>Aeronautical Information Manual (FAA)</i>

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# Acronyms

For reference, acronyms appearing in this book are defined below.

AC	alternating current	NO	normally open (switch)
AD	Airworthiness Directive	PDS	pilot's display system
AD (rivet)	aluminum alloy 2117 rivet	PMA	Parts Manufacturer Approval
ADF	automatic direction finder	psi	pounds per square inch
AFM	airplane flight manual	psig	pounds per square inch gauge (gauge pressure)
AGL	above ground level (altitude)	RPM	rotations per minute
AMS	Aerospace Material Specification	SES	Society of Electrical Specifications
AN	Army-Navy (specification standard)	SG	symbol generator
ATC	air traffic control	SPDT	single-pole, double-throw (switch)
AWG	American Wire Gauge	SPST	single-pole, single-throw
BTU	British thermal unit	STC	Supplemental Type Certificate
CDS	copilot's display system	TCAS	traffic collision avoidance system
CG	center of gravity	TCDS	Type Certificate Data Sheet
CO <sub>2</sub>	carbon dioxide	TSO	Technical Standard Order
CRT	cathode-ray tube	VD	voltage drop
CSD	constant speed drive	VHF	Very High Frequency
DC	direct current	VOR	Very-High-Frequency Omni Range
DME	distance measuring equipment	WX	weather radar
DOT	Department of Transportation		
DPST	double-pole, single-throw (switch)		
EFIS	electronic flight instrument system		
ELT	emergency locator transmitter		
EMF	electromotive force		
FCC	Federal Communications Commission		
FMC	flight management computer		
GCU	generator control unit		
GPWS	ground proximity warning system		
GTA	gas tungsten arc (welding)		
HSI	horizontal situation indicator		
HRD	high-rate discharge		
IA	Inspection Authorization		
IDG	integrated drive generator		
ILS	instrument landing system		
MEK	methyl ethyl ketone		
mph	miles per hour		
MS	military specification (standard)		
MSL	mean sea level (altitude)		

# ASA Test Guide Layout

Sample FAA questions have been sorted according to subject matter, as defined in the Airman Certification Standards. Some sample FAA questions refer to Figures immediately following the question number, e.g., “8157. (Refer to Figure 4.)” These are FAA Figures from the Airman Knowledge Testing Supplement (FAA-CT-8080-4G) and can be found in Cross-Reference C at the back of this book. The figures will be provided to you as a separate booklet when you take your FAA test.

Following each sample FAA test question is ASA’s explanation in italics. The last line of the explanation contains an Airman Certification Standards (ACS) code, as well as a reference for further study. Answers to each question are found at the bottom of each page.

## EXAMPLE:

**Question number**

**See the Airman Knowledge Testing Supplement at the back of the book.**

**8157.** (Refer to Figure 4.) The length of flat A is

A— 3.750 inches.  
B— 3.875 inches.  
C— 3.937 inches.

*The length of flat A is its mold-line length of 4.00 inches, minus the setback. The setback is the metal thickness (0.0625 inch), plus the bend radius (0.1875 inch) or 0.250 inch. The length of flat A is  $4.00 - 0.250 = 3.750$  inches. (AM.II.A.K5) — FAA-H-8083-31*

8157 [A]

**Question**

**Answer choices**

**Explanation**

**FAA ACS code in parentheses, followed by reference for further study.**

**Correct answer is found at the bottom of the page.**

# Airframe Knowledge Exam Study Guide

## Metallic Structures

**8107.** Which statement is true regarding the inspection of a stressed skin metal wing assembly known to have been critically loaded?

- A—If rivets show no visible distortion, further investigation is unnecessary.
- B—If bearing failure has occurred, the rivet shanks will be joggled.
- C—If genuine rivet tipping has occurred, groups of consecutive rivet heads will be tipped in the same direction.

*If the structure has actually been damaged, this would be indicated by groups of consecutive rivet heads being tipped in the same direction caused by a major deflection of the skin under load. (AM.II.A.K1) — FAA-H-8083-31*

**8061.** What precaution, if any, should be taken to prevent corrosion inside a repaired metal honeycomb structure?

- A—Prime the repair with a corrosion inhibitor and seal from the atmosphere.
- B—Paint the outside area with several coats of exterior paint.
- C—None. Honeycomb is usually made from a manmade or fibrous material which is not susceptible to corrosion.

*When a repair to a metal honeycomb structure is made, the repair should be primed with a corrosion-inhibiting primer and should be sealed so no moisture or air can get to the inside of the repair. (AM.II.A.K3) — FAA-H-8083-31*

**8114.** When repairing a small hole on a metal stressed skin, the major consideration in the design of the patch should be

- A—the shear strength of the riveted joint.
- B—to use rivet spacing similar to a seam in the skin.
- C—that the bond between the patch and the skin is sufficient to prevent dissimilar metal corrosion.

*When repairing a small hole in a metal stressed skin, the rivets should take all the stress from the skin and carry it into the patch. On the opposite side of the damage, this stress is carried back into the skin.*

*The shear strength of the riveted joints should be slightly less than the bearing strength of the skin. If a failure should occur, it will be a shear failure of the rivets,*

*rather than a bearing failure of the skin. (AM.II.A.K3) — FAA-H-8083-31*

**8116.** Repairs or splices involving stringers on the lower surface of stressed skin metal wings are usually

- A—not permitted.
- B—permitted only if the damage does not exceed 6 inches in any direction.
- C—permitted but are normally more critical in reference to strength in tension than similar repairs to the upper surface.

*Repairs or splices to the stringers on the lower surface of a stressed skin metal wing are permitted, but since the lower surface of the wing is under a tensile load in flight, these repairs are more critical with regard to tensile strength than repairs to the upper surface. (AM.II.A.K3) — AC 43.13-1B*

**8118.** Clad aluminum alloys are used in aircraft because they

- A—are naturally corrosion resistant, so they do not require corrosion resistant materials for protection.
- B—have surface layers of pure aluminum or aluminum alloy bonded to the core material to inhibit corrosion.
- C—are highly corrosion resistant because an oxide film forms on their surfaces upon contact with air.

*Clad aluminum alloys are used in aircraft construction because they are less subject to corrosion than uncoated aluminum alloys. Pure aluminum which is not susceptible to corrosion is used to coat a sheet of high-strength aluminum alloy to protect it from corrosion. (AM.II.A.K3) — FAA-H-8083-31*

**8120.** Aircraft structural units, such as spars, engine supports, etc., which have been built up from sheet metal, are normally

- A—repairable, using approved methods.
- B—repairable, except when subjected to compressive loads.
- C—not repairable, but must be replaced when damaged or deteriorated.

### Answers

8107 [C]

8061 [A]

8114 [A]

8116 [C]

8118 [B]

8120 [A]



*Aircraft structural units which are built up from sheet metal are normally repairable, using procedures recommended by the manufacturer of the airframe and approved by the FAA. (AM.II.A.K3) — FAA-H-8083-31*

**8123.** Parts fabricated from Alclad 2024-T3 aluminum sheet stock must have all

- A—bends made with a small radius to develop maximum strength.
- B—bends 90° to the grain
- C—scratches, kinks, tool marks, nicks, etc., held to a minimum.

*When fabricating parts from Alclad 2024-T3 aluminum sheet stock, be sure that all damage such as scratches, kinks, tool marks, and nicks are held to a minimum to prevent exposing the alloy core through the damaged pure aluminum surface coating. (AM.II.A.K3) — FAA-H-8083-31*

**8161.** If a streamline cover plate is to be hand formed using a form block, a piece of dead soft aluminum should first be placed over the hollow portion of the mold and securely fastened in place. The bumping operation should be

- A—distributed evenly over the face of the aluminum at all times rather than being started at the edges or center.
- B—started by tapping the aluminum lightly around the edges and gradually working down into the center.
- C—started by tapping the aluminum in the center until it touches the bottom of the mold and then working out in all directions.

*When using the bumping operation to form a compound curve in a piece of soft aluminum, use light blows of the mallet to work the material down gradually from the edges. Remember that the object of the bumping process is to work the material into shape by stretching it, rather than by forcing it into the form with heavy blows. Always start bumping near the edge of the form. Never start in the center. (AM.II.A.K3) — FAA-H-8083-31*

**8170.** You can distinguish between aluminum and aluminum alloy by

- A—filing the metal.
- B—testing with an acetic acid solution.
- C—testing with a 10 percent solution of caustic soda.

*Aluminum alloys of the 2XXX series can be identified by using a 10 percent solution of caustic soda. When this solution is applied to the material, it reacts with the copper in the alloy and forms a dark spot. (AM.II.A.K3) — FAA-H-8083-31*

**8058.** When repairing puncture-type damage to a metal-faced laminated honeycomb panel, the edges of the doubler should be tapered to

- A—two times the thickness of the metal.
- B—100 times the thickness of the metal.
- C—whatever is desired for a neat, clean appearance.

*When repairing puncture-type damage to a metal-faced laminated honeycomb panel, cut a piece of aluminum alloy the same thickness or thicker than the original face. Taper the edges of this patch back to a ratio of about 100 to one. (AM.II.A.K4) — FAA-H-8083-31*

**8112.** Which is correct concerning the use of a file?

- A—Apply pressure on the forward stroke, only, except when filing very soft metals such as lead or aluminum.
- B—A smoother finish can be obtained by using a double-cut file than by using a single-cut file.
- C—The terms “double-cut” and “second-cut” have the same meaning in reference to files.

*To prevent undue wear on the file, when filing any metal other than lead or soft aluminum, apply pressure only during the forward stroke. Relieve the pressure during the return stroke. (AM.II.A.K4) — FAA-H-8083-31*

**8115.** Which procedure is correct when using a reamer to finish a drilled hole to the correct size?

- A—Turn the reamer in the cutting direction when enlarging the hole and in the opposite direction to remove from the hole.
- B—Turn the reamer only in the cutting direction.
- C—Apply considerable pressure on the reamer when starting the cut and reduce the pressure when finishing the cut.

*When using a reamer to enlarge a hole, always turn the reamer in the direction of cutting. If the direction of reamer motion is reversed, the reamer will be seriously dulled. (AM.II.A.K4) — FAA-H-8083-31*

**8117.** When straightening members made of 2024-T4, you should

- A—straighten cold and reinforce.
- B—straighten cold and anneal to remove stress.
- C—apply heat to the inside of the bend.

*If a structural member made of 2024-T4 aluminum alloy is bent, it should be straightened cold and then reinforced. (AM.II.A.K4) — FAA-H-8083-31*

Answers

8123 [C]  
8117 [A]

8161 [B]

8170 [C]

8058 [B]

8112 [A]

8115 [B]

**8138.** The primary alloying agent of 2024-T3 is indicated by the number

- A—2.
- B—20.
- C—24.

*The primary alloying agent in 2024-T36 aluminum alloy is copper, which is identified by the first digit 2. (AM.II.A.K4) — FAA-H-8083-31*

**8139.** Which part of the 2017-T36 aluminum alloy designation indicates the primary alloying agent used in its manufacture?

- A—2.
- B—17.
- C—20.

*The primary alloying agent in 2017-T36 aluminum alloy is copper which is identified by the digit 2. (AM.II.A.K4) — FAA-H-8083-31*

**8175.** The sight line on a sheet metal flat layout to be bent in a cornice or box brake is measured and marked

- A—one-half radius from either bend tangent line.
- B—one radius from either bend tangent line.
- C—one radius from the bend tangent line that is placed under the brake.

*When making a bend in a piece of sheet metal in a cornice or box brake, draw a sight line inside the bend allowance that is one bend radius from the bend tangent line that is placed under the brake. Sight down vertically over the edge of the radius bar and place this sight line directly in line with the edge of the radius bar. In this position the bend tangent line is at the beginning of the radius. (AM.II.A.K4) — FAA-H-8083-31*

**8042.** A main difference between Lockbolt/Huckbolt tension and shear fasteners (other than their application) is in the

- A—number of locking collar grooves.
- B—shape of the head.
- C—method of installation.

*A lockbolt has locking grooves in its pin into which the collar is swaged. A shear lockbolt has two locking grooves, and the tension lockbolt has five grooves. (AM.II.A.K5) — FAA-H-8083-31*

**8044.** The general rule for finding the proper rivet diameter is

- A—three times the thickness of the materials to be joined.
- B—two times the rivet length.
- C—three times the thickness of the thickest sheet.

*A rule of thumb for determining the rivet diameter to be used for repairing aircraft sheet metal is to use a rivet whose diameter is approximately three times the thickness of the thickest sheet being joined. (AM.II.A.K5) — FAA-H-8083-31*

**8045.** The shop head of a rivet should be

- A—one and one-half times the diameter of the rivet shank.
- B—one-half times the diameter of the rivet shank.
- C—one and one-half times the diameter of the manufactured head of the rivet.

*The shop, or bucked, head of a rivet should have a diameter of 1-1/2 times the rivet shank diameter and a thickness of 1/2 of the shank diameter. (AM.II.A.K5) — FAA-H-8083-31*

**8046.** One of the main advantages of HI-LOK type fasteners over earlier generations is that

- A—they can be removed and reused again.
- B—the squeezed on collar installation provides a more secure, tighter fit.
- C—they can be installed with ordinary hand tools.

*HI-LOK fasteners are a new form of Hi-Shear fastener that can be installed with ordinary hand tools rather than requiring the special riveting tools. The pin is installed in an interference-fit hole and the collar screwed down over the threaded end. The pin is held with an Allen wrench and the collar is screwed down, using an open-end wrench until the proper torque is reached. At this point, the hex shear-nut portion of the collar will break off. (AM.II.A.K5) — FAA-H-8083-31*

**8046-1.** Which of the following is one advantage of HI-LOK fasteners?

- A—Shorter transition area between the shank and thread.
- B—External counterbore at the base to accommodate material thickness.
- C—Inability to be over-torqued.

*The advantages of a HI-LOK two-piece fastener include its light weight, high fatigue resistance, high strength, and its inability to be over-torqued. (AM.II.A.K5) — FAA-H-8083-31*

#### Answers

8138 [A]  
8046 [C]

8139 [A]  
8046-1 [C]

8175 [C]

8042 [A]

8044 [C]

8045 [A]

**8047.** The markings on the head of a Dzus fastener identify the

- A—body diameter, type of head, and length of the fastener.
- B—body type, head diameter, and type of material.
- C—manufacturer and type of material.

*Dzus fasteners are identified by marks on the head of the stud. A letter identifies the type of head, a number identifies the body diameter in 1/16-inch increments, and another number identifies the stud length in hundredths of an inch. (AM.II.A.K5) — FAA-H-8083-31*

**8048.** The Dzus turnlock fastener consists of a stud, grommet, and receptacle. The stud length is measured in

- A—hundredths of an inch.
- B—tenths of an inch.
- C—sixteenths of an inch.

*The stud length of a Dzus fastener is measured in 1/100-inch increments. (AM.II.A.K5) — FAA-H-8083-31*

**8049.** The Dzus turnlock fastener consists of a stud, grommet, and receptacle. The stud diameter is measured in

- A—tenths of an inch.
- B—hundredths of an inch.
- C—sixteenths of an inch.

*The diameter of the stud of a Dzus fastener is measured in 1/16-inch increments. (AM.II.A.K5) — FAA-H-8083-31*

**8050.** Threaded rivets (Rivnuts) are commonly used to

- A—join two or more pieces of sheet metal where shear strength is desired.
- B—attach parts or components with screws to sheet metal.
- C—join two or more pieces of sheet metal where bearing strength is desired.

*Rivnuts are a special type of blind rivet whose shank has internal threads. When the Rivnut is upset in a piece of thin sheet metal, the threaded shank acts as a nut to receive a machine screw. Rivnuts were originally designed to attach deicer boots to thin sheet metal wing and empennage leading edges. (AM.II.A.K5) — FAA-H-8083-31*

**8100.** Select the alternative which best describes the function of the flute section of a twist drill.

- A—Provides a method for cooling oil to be delivered to the cutting surface.
- B—Forms the area where the drill bit attaches to the drill motor.
- C—Forms the cutting edges of the drill point.

*One of the functions of the flutes cut into the shank of a twist drill is to form the cutting edges of the drill point. (AM.II.A.K5) — FAA-H-8083-31*

**8101.** How many MS20470 AD-4-6 rivets will be required to attach a 10" x 5" plate, using a single row of rivets, minimum edge distance, and 4D spacing?

- A—56.
- B—54.
- C—52.

*The plate is 10 inches long and 5 inches wide. The rivets have a diameter of 1/8 inch and there is an edge distance of two rivet diameters. This requires two rows of rivets 9-1/2 inches long and two rows that are 4-1/2 inches long. The total length of the rivet seams is 28 inches. If the rivets are spaced every 1/2 inch (4D spacing), 56 rivets are needed. (AM.II.A.K5) — AC 43.13-1B*

**8104.** What should be the included angle of a twist drill for soft metals?

- A—118°.
- B—90°.
- C—65°.

*For drilling soft metals, an included angle of about 90° (45° either side of center) is suitable. For normal metals, an angle of 118° (59° on either side of center) is considered the standard lip angle. (AM.II.A.K5) — FAA-H-8083-31*

**8105.** When comparing the machining techniques for stainless steel sheet material to those for aluminum alloy sheet, it is normally considered good practice to drill the stainless steel at a

- A—higher speed with less pressure applied to the drill.
- B—lower speed with more pressure applied to the drill.
- C—lower speed with less pressure applied to the drill.

*When drilling stainless steel, you should use a drill with a larger included angle. Use a lower speed and more pressure than you would use for aluminum alloy. (AM.II.A.K5) — FAA-H-8083-31*

Answers

8047 [A]	8048 [A]	8049 [C]	8050 [B]	8100 [C]	8101 [A]
8104 [B]	8105 [B]				

# Airframe Oral & Practical Study Guide

## The Oral and Practical Tests

Each applicant for a Mechanic Certificate must successfully pass a written test, an oral test, and a practical test to comply with the general eligibility requirements to obtain a mechanic certificate or rating (see 14 CFR §65.53). The O&P tests are typically conducted by an FAA Designated Mechanic Examiner (DME); however, in some circumstances, an FAA inspector may conduct an oral and/or practical test. 14 CFR §65.11 provides that application for a certificate and/or rating must be made on a form and in a manner prescribed by the administrator. As part of the application process, the applicant must contact a DME to schedule the O&P tests. A list of DMEs is available at [www.faa.gov](http://www.faa.gov) or from a local Flight Standards District Office.

Prior to the tests, the evaluator conducts a pretest interview with the applicant. This pretest interview provides the evaluator and applicant with information needed for the test, such as the date, time, and location of the test. It also establishes a testing schedule and allows the evaluator to see any codes associated with the written test report and identify any deficient areas that should be included on the oral test. FAA designees may charge a reasonable fee for their services and this fee should be discussed and agreed upon prior to taking the scheduled test.

The applicant should bring the following documentation to the pretest interview and the O&P test:

- Two identically-prepared FAA Forms 8610-2, Airman Certificate and/or Rating Application, with original signatures;
- Unless early testing under 14 CFR §65.80, written test results indicating a passing grade, applicable to the appropriate rating(s) sought ; and
- A current government-issued photo identification with a signature from the issuing official, such as a passport, U.S. Military ID, driver's license, etc.

Additionally, the applicant should bring the following eligibility documentation:

<b>If testing on the basis of this eligibility:</b>	<b>The applicant should bring this documentation:</b>
Graduation from an FAA certificated 14 CFR Part 147 AMTS	An authenticated document from an AMTS indicating the applicant's date of graduation and curriculum completed, applicable to the certificate or rating sought
Civil or Military Practical experience as provided by 14 CFR §65.77	A signature in Block V of FAA Form 8610-2 authorizing the applicant to test
Practical experience through the JSAMTCC program	A military certificate of eligibility, applicable to the certificate or rating sought
Satisfactory progress at an FAA certificate 14 CFR Part 147 AMTS pursuant to 14 CFR §65.80	A signature in Section II of FAA Form 8610-2 from a school official and FAA inspector authorizing the applicant to test

## Oral-related Questions

As per the structure of the mechanic ACS, there will be three oral tests—one for General, one for Airframe, and one for Powerplant. The number of questions that must be asked in the oral test will vary by applicant, depending on the results of the applicant's written test:

- Under the ACS, 14 CFR §65.17 is met at a 70% standard applied to the entire oral test (General, Airframe, Powerplant) as a whole, and not by subject area.
- Each oral test will have a minimum of 4 questions in each section (i.e., a minimum of 4 General questions, 4 Airframe questions, and 4 Powerplant questions), randomly generated by the Mechanic Test Generator, even if an applicant has scored a 100% on their AKTR.
- An applicant that passed the written test with a 70% could get the maximum number of questions on the oral test (i.e., 22 General questions, 34 Airframe questions, 34 Powerplant questions).
- For every ACS code missed on the Airman Knowledge Written Test Report (AKTR) the applicant will have an additional oral question added to on their oral test to validate their knowledge of the material presented.



- Several missed AKTR questions may fall under the same ACS code. In this case, only one additional oral question will be added to the test, as the questions are based on ACS codes missed and NOT number of questions missed.
- Each applicant may be asked a different number of oral questions on their tests, depending on how many ACS codes were missed on their AKTRs, even if they scored the same grade (percentage) on their respective AKTRs.

The oral portion of the test is a standalone test. It must be kept separate from the practical portion of the test. Under §65.17, the minimum passing grade for each test is 70%. The 70% standard is applied to the entire oral test (i.e., either the General, Airframe, or Powerplant test) as a whole, and not by subject area. This does mean that an applicant can miss all the questions in a subject such as electricity and still pass the test. If an applicant fails the oral General test (as a whole), they will have to retest for General, which means they will have to retake the entire General oral test. During the oral testing the applicant is NOT allowed to use reference material. All questions that are on the DME's planning sheet must be asked. The DME does NOT get to pick and choose which questions to ask.

## Practical-related Questions

As per the structure of the mechanic ACS, there will be three practical tests—one for General, one for Airframe, and one for Powerplant. The number of practical projects that must be tested is 9 for General, 11 for Airframe, and 11 for Powerplant.

During the practical portion of the test each project is standalone; projects cannot be combined during testing. At a safe and appropriate time during the applicant's performance of the project, the DME must ask 2 practical questions that are relevant to the project, as provided by the Mechanic Test Generator (MTG, the tool DMEs use to generate the O&P for each applicant).

Under §65.17, the minimum passing grade for each test is 70%. The 70% standard is applied to the entire practical test (i.e., either the General, Airframe, or Powerplant test) as a whole, and not by project. Each project, however, is graded using a pass/fail standard. Therefore, the applicant may fail projects and still pass the test. For example, in General there are 9 projects, so the applicant must pass 7 of the 9 projects to pass. If the applicant fails 3 projects, that is less than 70%, and the practical General test is failed. If an applicant completes the project satisfactorily but answers a practical question incorrectly, then the entire project is failed. If the applicant answers the practical questions correctly but fails to complete the project satisfactorily, then the entire project is considered failed.

When an applicant retests the failed practical portion of the test, they will only be retested on the failed projects, as well as any projects that were not tested in their previous test. The applicant will not have to retest on projects previously passed.

The applicant is given an assigned aircraft and appropriate reference material (assigned and provided by the DME) and is assigned the task. At a safe and appropriate time, the DME will ask the applicant the two practical questions associated with this project. If the applicant misses any part of this project, the project is failed.

## Sample Oral Exam

AM.II.A.K2 QUESTION: What are the four common basic stresses on an aircraft?

ANSWER: They are tension, compression, shear, and bearing.

REFERENCE: FAA-H-8083-31A

AM.II.B.K20 QUESTION: Name one aircraft structure that a honeycomb panel can be used for.

ANSWER: They have a variety of uses on the aircraft, such as floor panels, bulkheads, and control surfaces, as well as wing skin panels.

REFERENCE: FAA-H-8083-31A

AM.II.C.K12 QUESTION: In relation to an aircraft, what is the boundary layer?

ANSWER: It is the part of the airflow closest to the surface of the aircraft.

REFERENCE: FAA-H-8083-31A

- AM.II.D.K1 QUESTION: To establish conformity of an aircraft product the mechanic must start with what document?  
ANSWER: The document is the Type Certificate Data Sheet.  
REFERENCE: FAA-H-8083-31
- AM.II.E.K1 QUESTION: References to auxiliary landing gear refer to what gear on any particular aircraft?  
ANSWER: It refers to the nose gear, tail gear, or outrigger-type.  
REFERENCE: FAA-H-8083-31
- AM.II.F.K2 QUESTION: Hydraulic system liquids are used primarily for what?  
ANSWER: They are used primarily to transmit and distribute forces to various units to be actuated.  
REFERENCE: FAA-H-8083-31
- AM.II.G.K9 QUESTION: The production of gaseous oxygen for commercial or aircraft cylinders is often through what process?  
ANSWER: It is done by the process of liquefying air.  
REFERENCE: FAA-H-8083-31
- AM.II.H.K20 QUESTION: There are usually two parts to any instrument or instrument system. What are they?  
ANSWER: One part senses the situation and the other part displays it.  
REFERENCE: FAA-H-8083-31
- AM.II.I.K16 QUESTION: What is the actuating (output) element component of an autopilot system?  
ANSWER: It is the servo.  
REFERENCE: FAA-H-8083-31
- AM.II.J.K7 QUESTION: What does the first number in a fuel performance number indicate?  
ANSWER: It indicates the octane rating of the fuel in a lean air-fuel mixture.  
REFERENCE: FAA-H-8083-31
- AM.II.K.K17 QUESTION: What is battery capacity measured in?  
ANSWER: It is measured in amp-hours.  
REFERENCE: FAA-H-8083-31A
- AM.II.L.K3 QUESTION: Name one of the most common anti-icing systems in use.  
ANSWER: The most common anti-icing systems used are thermal pneumatic, thermal electric, and chemical.  
REFERENCE: FAA-H-8083-31
- AM.II.M.K5 QUESTION: What are the two most common types of portable fire extinguishers used in cabins or flight decks?  
ANSWER: The most common types are Halon 1211 and water.  
REFERENCE: FAA-H-8083-31
- AM.II.N.K5 QUESTION: What are the two main parts of a rotorcraft swash plate?  
ANSWER: The two main parts are the stationary swash plate and the rotating swash plate.  
REFERENCE: FAA-H-8083-31
- AM.II.O.K1 QUESTION: What are the components used to heat water supply lines and waste water tanks?  
ANSWER: They are heater blankets and in-line heaters  
REFERENCE: FAA-H-8083-31



## Sample Practical Exam

### Project—Airframe Inspection

**DESCRIPTION:** Provide a checklist for conducting a 100-hour inspection.

**GIVEN:** Assigned aircraft, appropriate reference material.

**PERFORMANCE STANDARD:** The applicant will provide a checklist for conducting a 100-hour inspection on the assigned aircraft.

**ACS CODE:** AM.II.D.S5

**REFERENCE:** 14 CFR Part 43

**QUESTION:** What is the first step in conducting a 100-hour inspection?

**ANSWER:** The first step is to clean the aircraft.

**REFERENCE:** 14 CFR Part 43

**ACS CODE:** AM.II.D.R4

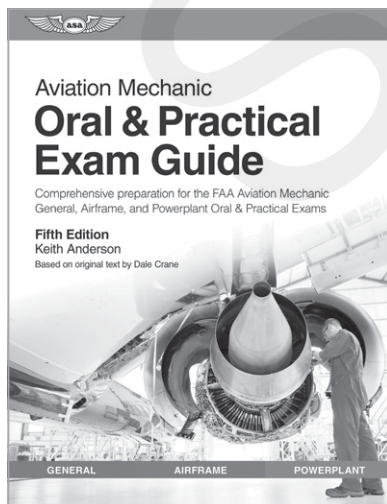
**QUESTION:** Who is required to maintain the records of inspection?

**ANSWER:** The owner/operator is required to retain records of inspection.

**REFERENCE:** 14 CFR Part 43

**ACS CODE:** AM.II.D.K2

*For more oral and practical projects and sample questions covering General, Airframe, and Powerplant:*



### **Aviation Mechanic Oral & Practical Exam Guide**

This comprehensive guide will prepare you for the General, Airframe, and Powerplant exams with additional information on the certification process, typical projects and required skill levels, practical knowledge requirements in a question and answer format, and reference materials for further study.

Available at [asa2fly.com](http://asa2fly.com) and at your local aviation retailer (order number ASA-OEG-AMT).

# Metallic Structures

## Study Materials

AMT-STRUC, FAA-H-8083-31, AC 43.13-1

## Typical Oral Questions

1. What are three requirements for a repair to a piece of sheet metal aircraft structure?  
*The repair must restore the lost strength and rigidity, and it must not change the aerodynamic shape of the part.*
2. When making a riveted repair to an aircraft sheet metal structure, which should be the stronger, the shear strength of the rivet, or the bearing strength of the metal sheet?  
*The two strengths should be close to each other, but the bearing strength of the sheet should be the greater.*
3. What type of device is a Cleco fastener?  
*A patented fastener that is inserted in the rivet holes and is used to hold two pieces of sheet metal together until they can be riveted.*
4. What is the main function of throatless shears in an aircraft sheet metal shop?  
*Throatless shears are used to cut mild carbon steel up to 10-gage, and stainless steel up to 12-gage. They can be used to cut irregular curves in the metal.*
5. What is the purpose of a sight line when laying out sheet metal to be bent in a cornice brake?  
*The sight line allows the jaws of a cornice brake to be positioned so the bend made by the brake will start at the bend tangent line.*
6. What kind of metal forming is done by a slip roll former?  
*Simple curves with a large radius.*
7. What kind of metal forming is done by bumping?  
*Compound curves in sheet metal.*
8. What must be done to the flanges of an angle for it to be curved?  
*The flanges must be stretched for a convex curve and shrunk for a concave curve.*
9. What is meant by the bend allowance used in making a bend in a piece of sheet metal?  
*The bend allowance is the amount of metal that is actually used in making the bend in a piece of sheet metal.*
10. What determines the minimum bend radius that can be used with a piece of sheet metal?  
*The thickness of the material and its hardness.*
11. What is meant by setback when bending a piece of sheet metal in a cornice brake?  
*Setback is the distance the jaws of the brake must be set back from the mold line to form the bend.*
12. Why are the lightening holes in a sheet metal wing rib flanged?  
*Flanging the lightening holes gives the rib rigidity.*
13. When hand-forming a piece of sheet metal that has a concave curve, should the forming be started in the center of the curve, or at its edges?  
*Start at the edges and work toward the center.*
14. What is meant by a joggle in a piece of sheet metal?  
*A joggle is a small offset near the edge of a piece of sheet metal that allows the sheet to overlap another piece of metal.*
15. When drilling stainless steel, should the drill be turned fast or slow?  
*It should be turned slowly.*
16. What is the minimum edge distance allowed when installing rivets in a piece of aircraft sheet metal structure?  
*Two times the diameter of the rivet.*
17. What is the recommended transverse pitch to use when making a riveted two-row splice in a piece of sheet metal?  
*Three-fourths of the pitch of the rivets in the rows.*
18. Why should aluminum alloy rivets be driven with as few blows as is practical?  
*Excessive hammering will work-harden the rivets and make them difficult to drive.*
19. What determines whether a piece of sheet metal should be dimpled or countersunk when installing flush rivets?  
*The thickness of the sheet. Countersinking should be done only when the thickness of the sheet is greater than the thickness of the rivet head.*
20. What type of metal should be hot-dimpled?  
*7075-T6, 2024-T81 aluminum alloys, and magnesium alloys should be hot-dimpled.*

21. What is the purpose of anodizing a piece of aluminum alloy, and how is it applied?  
*Anodizing is a protective oxide film that is deposited on the surface of aluminum alloy by an electrolytic process.*
22. Why is TIG (GTA) welding preferred over oxyacetylene welding for building and repairing welded steel tube aircraft structure?  
*The heat is concentrated in the weld and does not cause as much distortion as gas welding.*
23. Why is it important that the pressure of the gas in an acetylene cylinder be kept low?  
*Acetylene gas becomes unstable when it is kept under pressure of more than about 15 psi.*
24. What is the difference in the appearance of an oxidizing flame, a neutral flame, and a reducing flame produced by an oxy-acetylene torch?  
*An oxidizing flame has a pointed inner cone, and the torch makes a hissing noise. A neutral flame has a rounded inner cone, and there is no feather around the inner cone. A reducing flame has a definite feather around the inner cone.*
25. What is meant by tack welding?  
*Tack welding is the use of small welded spots to hold the material together until the final bead is run.*
26. Why must thick plates of metal be preheated before they are welded?  
*Preheating is a method of controlling the expansion and contraction of the metal that is being welded. Preheating minimizes the stresses that are caused when welding thick metal.*
27. Why is it important that all traces of the welding flux be removed after a piece of aluminum or magnesium is welded?  
*Welding flux is corrosive and it must be removed to keep the metal from corroding.*
28. What is the function of the inert gas that is used in TIG (GTA) and MIG (GMA) welding?  
*The inert gas forms a shield to keep oxygen away from the weld puddle so oxides cannot form and weaken the weld.*
29. What is the difference between brazing and welding?  
*In brazing, the base metal is not melted, but is covered with a low-melting-point alloy. In welding, the base metal is melted.*

30. Is a heat-treated steel part normally repairable by welding?  
*No, welding destroys the heat treatment.*
31. What kind of solder is recommended for soldering electrical wires?  
*60/40 resin-core solder.*
32. What kind of flame should be used when gas welding aluminum?  
*A soft, neutral oxy-hydrogen flame is recommended.*
33. What is an acceptable acetylene line pressure to use when welding with an oxyacetylene rig?  
*About 5 psi.*
34. How much should the bead penetrate the material when welding two pieces of steel with a butt weld?  
*The joint should have 100 percent penetration.*
35. What is meant by a soft flame?  
*A soft flame is one that is made when the pressures of the gases are low enough that the flame does not make a noise and does not blow the puddle.*

## Typical Practical Projects

1. Lay out and form a channel of specified dimensions from a piece of aluminum alloy sheet. Use the minimum bend radius allowed for the material.
2. Select the correct length and diameter of special rivets furnished by the examiner, and properly install them to join two pieces of aluminum alloy sheet.
3. Make a flush patch repair to a hole in a sheet metal aircraft structure.
4. Select the proper twist drill and demonstrate to the examiner the correct way to drill stainless steel.
5. Given an assortment of aircraft rivets, identify each by their proper part number and the type of material.
6. Demonstrate to the examiner the correct way to set up and use a squeeze riveter.
7. Properly remove a series of rivets from a piece of aircraft structure.
8. Demonstrate to the examiner the correct way to install, light, and adjust an oxy-acetylene cutting torch. Demonstrate the correct way to cut across a piece of steel.

# 2025

# Airframe Mechanic TEST GUIDE

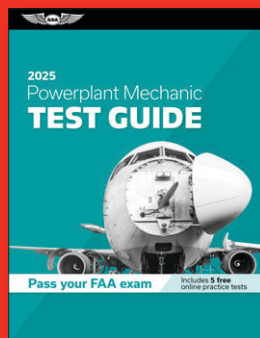
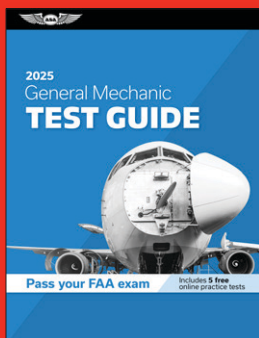
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