



## AIRFRAME

# 2022 TEST GUIDE

### STUDY & PREPARE

Pass your test and know what is essential to become a safe, competent aviation mechanic—from the most trusted source in aviation training

**5** FREE  
ONLINE  
PRACTICE  
TESTS

Activation Code Included

# AIRFRAME

# 2022 TEST GUIDE

## STUDY & PREPARE

Pass your test and know what is essential to become a safe, competent aviation mechanic—from the most trusted source in aviation training

### READER TIP

The FAA Knowledge Exam Questions can change throughout the year. Stay current with test changes; sign up for ASA's free email update service at [asa2fly.com/testupdate](https://asa2fly.com/testupdate)



AVIATION SUPPLIES & ACADEMICS, INC.  
NEWCASTLE, WASHINGTON

---

*Airframe Test Guide*  
2022 Edition

Aviation Supplies & Academics, Inc.  
7005 132nd Place SE  
Newcastle, Washington 98059-3153  
asa@asa2fly.com | 425.235.1500 | asa2fly.com

© 2021 Aviation Supplies & Academics, Inc.

Visit [asa2fly.com/reader/AMA](https://asa2fly.com/reader/AMA) for the Reader Resources page containing additional information and updates related to this book.

All rights reserved. No part of the explanations to the Federal Aviation Administration (FAA) questions may be reproduced in any manner whatsoever without written permission of the publisher.

FAA questions herein are from United States government sources and contain current information as of September 2021.

None of the material in this publication supersedes any documents, procedures, or regulations issued by the FAA.

ASA assumes no responsibility for any errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

Cover photo: Gorodenkoff/stock.adobe.com

**ASA-AMA-22**

ISBN 978-1-64425-147-8

Additional format available:

eBook PDF ISBN 978-1-64425-148-5

Printed in the United States of America

2022 2021 5 4 3 2 1

Stay informed with ASA online resources.

**Website**



[asa2fly.com](https://asa2fly.com)

**Updates**



[asa2fly.com/testupdate](https://asa2fly.com/testupdate)

**Follow, like, share.**

-  [twitter.com/asa2fly](https://twitter.com/asa2fly)
-  [instagram.com/asa2fly](https://instagram.com/asa2fly)
-  [facebook.com/asa2fly](https://facebook.com/asa2fly)
-  [youtube.com/asa2fly](https://youtube.com/asa2fly)
-  [linkedin.com/company/asa2fly](https://linkedin.com/company/asa2fly)

---

# Contents

<b>Updates and Practice Tests</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vi</b>
<b>Instructions</b> .....	<b>vii</b>
<b>Learning Statement Codes</b> .....	<b>x</b>
<b>Knowledge Exam References</b> .....	<b>xiii</b>
<b>Airframe Test Questions, Explanations, Answers, and References</b> .....	<b>1</b>
Wood Structures.....	3
Aircraft Covering.....	5
Aircraft Finishes.....	6
Sheet Metal and Non-Metallic Structures.....	8
Welding.....	29
Assembly and Rigging.....	33
Airframe Inspection.....	45
Aircraft Landing Gear Systems.....	47
Hydraulic and Pneumatic Power Systems.....	58
Cabin Atmosphere Control Systems.....	73
Aircraft Instrument Systems.....	87
Communication and Navigation Systems.....	95
Aircraft Fuel Systems.....	105
Aircraft Electrical Systems.....	120
Position and Warning Systems.....	138
Ice and Rain Control Systems.....	144
Fire Protection Systems.....	148
<b>Airframe Oral &amp; Practical Study Guide</b> .....	<b>153</b>
The Oral and Practical Tests.....	154
Wood Structures.....	156
Aircraft Covering.....	158
Aircraft Finishes.....	160
Sheet Metal Structures.....	162
Welding.....	164
Assembly and Rigging.....	166
Airframe Inspection.....	168
Landing Gear Systems.....	170
Hydraulic and Pneumatic Power Systems.....	172

*(continued)*

---

Cabin Atmosphere Control Systems.....	174
Instrument Systems.....	176
Communication and Navigation Systems.....	178
Fuel Systems.....	180
Electrical Systems.....	182
Position and Warning Systems.....	184
Ice and Rain Control Systems.....	186
Fire Protection Systems.....	188

SAMPLE

# 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.

## We Invite Your Feedback

After you take your FAA exam, let us know how you did. Were you prepared? Did ASA's products meet your needs and exceed your expectations? We want to continue to improve these products to ensure applicants are prepared and become safe aviators. Send your feedback to: [cfi@asa2fly.com](mailto:cfi@asa2fly.com).

# prepware.com

See inside front cover  
for FREE account!

## Helping you practice for written exams.

As the experts in FAA Knowledge Exam preparation, we want you to have the confidence needed before heading to the testing center, and help eliminate the hassle and expense of retaking exams.

### > Realistic Test Simulation

Test questions and time allowed replicate the official FAA exam

### > Performance Graphs

Review how you did, track your performance and review explanations for the questions you missed

### > Gain Confidence

Go into your exam fully prepared after practicing up to 5 simulated tests

### > Succeed

Pass your exam, achieve your goals, and set new ones



Remote Pilot • Sport Pilot • Private Pilot • Instrument Rating • Commercial Pilot • Flight Instructor • Ground Instructor  
Fundamentals of Instructing • Flight Engineer • Airline Transport Pilot • Aviation Mechanic General • Airframe • Powerplant

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

---

# 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 AMT textbook. Once complete, visit the dedicated Reader Resource webpage for this Test Guide ([asa2fly.com/reader/AMA](http://asa2fly.com/reader/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 correct answer at the bottom of each page to identify additional resources for further study. Upon completion of your studies, take practice tests at [prepware.com](http://prepware.com) (see inside the front cover for your five free practice tests).

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.**

7005 132nd Place SE  
Newcastle, WA 98059-3153  
Email: [cfi@asa2fly.com](mailto:cfi@asa2fly.com)  
Voice: 425-235-1500  
Fax: 425-235-0128  
Website: [asa2fly.com](http://asa2fly.com)

The FAA appreciates testing experience feedback. Contact them at:

**Federal Aviation Administration**

AFS-630, Airman Testing Standards Branch  
PO Box 25082  
Oklahoma City, OK 73125  
Email: [afs630comments@faa.gov](mailto:afs630comments@faa.gov)

---

# Airframe Test Questions, Explanations, Answers, and References

---

Answers are printed at the bottom of the page, with other coded items as explained below:

This is the question number.

The brackets enclose the letter answer selected by ASA's researchers. (For those questions for which none of the answer choices provide an accurate response, we have noted [X] as the Answer.)

8001 [B] (102) AMT-STRUC, 3

The parentheses enclose the appropriate Learning Statement Code (LSC)—refer to Pages x–xii. FAA Learning Statement Codes have letter-identifying prefixes, but for reference purposes in this book the letter prefix (“AMA”) is omitted and only the number-identifying portion of the code is shown in parentheses.

The reference following the Learning Statement Code is the source from which the answer was derived. The meanings of these abbreviations are found on Page xiii. The number following the abbreviations is the specific chapter within that source to study for more information about the derived answer.

## Hydraulic and Pneumatic Power Systems

**8386.** To protect seals from damage when installed over a threaded section, the threaded section should be

- A—coated with a heavy grease.
- B—covered with tape.
- C—covered with a suitable sleeve.

*Packing rings or seals can be protected from damage when slipping them over the threads on an actuator by covering the threads with a suitable sleeve.*

**8387.** Which of the following is the most commonly used seal to prevent internal and external leakage in both directions of a hydraulic unit?

- A—O-ring.
- B—V-ring.
- C—U-ring.

*The most commonly used type of seal for preventing both internal and external leakage in a hydraulic system component is an O-ring seal.*

**8388.** Which of the following allows fluid to flow unimpeded in one direction but prevents fluid flow in the other direction?

- A—Check valve.
- B—Sequence valve.
- C—Relief valve.

*A check valve is a fluid power system component that allows a free flow of fluid in one direction, but it prevents any flow in the opposite direction.*

**8389.** Select the valve used in a hydraulic system that directs pressurized fluid to one end of an actuating cylinder and simultaneously directs return fluid to the reservoir from the other end.

- A—Sequence.
- B—Shuttle.
- C—Selector.

*A selector valve is a fluid power system component that directs the flow of pressurized fluid to one end of an actuating cylinder, and simultaneously, directs return fluid to the reservoir from the other end of the cylinder.*

**8390.** What function does the absolute pressure regulator perform in the pneumatic power system?

- A—Regulates the compressor outlet air pressure to stabilize the system pressure.
- B—Regulates the pneumatic system pressure to protect the moisture separator from internal explosion.
- C—Regulates the compressor inlet air to provide a stabilized source of air for the compressor.

*The absolute pressure regulator in an aircraft pneumatic system regulates the air pressure at the inlet to the compressor.*

*In doing this, it provides a stabilized source of air for the compressor.*

**8392.** One of the distinguishing characteristics of an open-center selector valve used in a hydraulic system is that

- A—fluid flows through the valve in the OFF position.
- B—fluid flows in three directions in the ON position.
- C—a limited amount of fluid flows in one direction and no fluid flows in the opposite direction.

*In an open-center hydraulic selector valve, fluid flows through the valve when it is in the OFF position.*

*Open-center selector valves are installed in series with each other, while closed-center valves are installed in parallel with each other.*

**8393.** What type of packings should be used in hydraulic components to be installed in a system containing Skydrol?

- A—AN packings made of natural rubber.
- B—Packing materials made for ester-base fluids.
- C—AN packings made of neoprene.

*Any packing used in a hydraulic system using Skydrol hydraulic fluid must be compatible with ester-base fluids, of which Skydrol is a type.*

*Only packings specifically called out by part number should be used in an aircraft hydraulic system.*

### Answers

8386 [C] (065) AC 43.13-1

8387 [A] (065) AMT-STRUC, 5

8388 [A] (063) AMT-STRUC, 5

8389 [C] (063) AMT-STRUC, 5

8390 [C] (063) AMT-STRUC, 5

8392 [A] (063) AMT-STRUC, 5

8393 [B] (065) AMT-STRUC, 5

**8394.** Relief valves are used in pneumatic systems

- A—for one direction flow control.
- B—to reduce the rate of airflow.
- C—as damage-preventing units.

*Relief valves in pneumatic systems are damage-preventing units that are preset and safetied.*

*They are installed to protect the system from excessive pressure buildup that can be caused by thermal expansion or by a compressor power system malfunction.*

**8395.** An aircraft pneumatic system, which incorporates an engine-driven multistage reciprocating compressor, also requires

- A—an oil separator.
- B—a surge chamber.
- C—a moisture separator.

*A moisture separator must be used in an aircraft pneumatic system that incorporates engine-driven compressors. The moisture separator separates the moisture from the compressed air before the air is allowed to expand in the system.*

*If moisture were allowed to remain in the air, the temperature drop that occurs when the air expands would cause it to freeze and block the system.*

**8396.** The removal of air from an aircraft hydraulic system is generally accomplished

- A—through automatic bleed valves on individual components during system operation.
- B—by operating the various hydraulic components through several cycles.
- C—by allowing the system to remain inoperative for several hours.

*Air is removed from most hydraulic systems by cycling the components through several operating cycles.*

*This operation will remove the fluid that contains air from double-acting hydraulic components.*

*Single-acting components, such as brakes, must be bled separately by bleeding some of the fluid from the system to remove the air.*

**8397.** Pneumatic systems utilize

- A—thermal valves.
- B—relief valves.
- C—shuttle valves.

*The only components among the choices given with this question that are used in a pneumatic system are relief valves.*

**8398.** The component in the hydraulic system that is used to direct the flow of fluid is the

- A—check valve.
- B—orifice check valve.
- C—selector valve.

*A selector valve is used in a hydraulic system to direct the flow of fluid.*

**8399.** What type of selector valve is one of the most commonly used in hydraulic systems to provide for simultaneous flow of fluid into and out of a connected actuating unit?

- A—Four-port, closed-center valve.
- B—Three-port, four-way valve.
- C—Two-port, open-center valve.

*The most commonly used selector valve in an aircraft hydraulic system is a four-port, closed-center selector valve.*

**8400.** What is the purpose of using backup rings with O-rings in hydraulic systems above 1,500 psi?

- A—Prevent internal and external leakage of all moving parts within a hydraulic system.
- B—Provide a seal between two parts of a unit which move in relation to each other.
- C—Prevent high pressure from extruding the seal between the moving and stationary part.

*A backup ring is used behind an O-ring in a high-pressure hydraulic system to prevent the high pressure from extruding the O-ring between the moving and the stationary parts.*

**8401.** The purpose of the pressure regulator in a hydraulic system is to

- A—maintain system operating pressure within a predetermined range and to unload the pump.
- B—regulate the amount of fluid flow to the actuating cylinders within the system.
- C—prevent failure of components or rupture of hydraulic lines under excessive pressure.

*A hydraulic system pressure regulator maintains a system operating pressure within a predetermined range. The regulator unloads the pump when the upper limit of this pressure is reached.*

*The pump remains unloaded, circulating the fluid through the system with no opposition until the lower limit of the pressure is reached, at which time the pump again forces fluid into the system.*

**Answers**

8394 [C] (063) AMT-STRUC, 5  
8398 [C] (063) AMT-STRUC, 5

8395 [C] (079) AMT-STRUC, 5  
8399 [A] (063) AMT-STRUC, 5

8396 [B] (079) AMT-STRUC, 5  
8400 [C] (063) AMT-STRUC, 5

8397 [B] (079) AMT-STRUC, 5  
8401 [A] (063) AMT-STRUC, 5

- 8402.** A flexible sealing element subject to motion is a
- A—compound.
  - B—packing.
  - C—gasket.

*A packing is a flexible sealing element that is subject to motion. A gasket is a flexible sealing element that is not subject to motion.*

- 8403.** Which characteristics apply to aircraft hydraulic systems?

- A—About 80 percent operating efficiency (20 percent loss due to fluid friction).
- B—Minimum maintenance requirements and simple to inspect.
- C—Minimum maintenance requirements, lightweight, and simple to inspect.

*Hydraulic systems have many advantages as a power source for operating various aircraft units. Hydraulic systems combine the advantages of light weight, ease of installation, simplicity of inspection, and minimum maintenance requirements. Hydraulic operations are also almost 100 percent efficient, with only a negligible loss due to fluid friction.*

- 8404.** If a rigid tube is too short for the flare to reach its seat before tightening, pulling it into place by tightening

- A—is acceptable.
- B—may distort the flare.
- C—may distort the cone.

*You must never pull a rigid tube into position by using the flare nut on the fitting.*

*This poor practice will distort the flare and could actually pull it off of the tube.*

- 8405.** The installation of a new metal hydraulic line should be made with

- A—a straight tube to withstand the shocks and vibration to which it will be subjected.
- B—a straight tube to permit proper alignment of the fitting and thereby reduce fluid loss through leakage.
- C—enough bends to allow the tube to expand and contract with temperature changes and to absorb vibration.

*All metal hydraulic lines should have enough bends in them to allow the tube to expand and contract with temperature and pressure changes and to absorb vibration.*

- 8406.** Extrusion of an O-ring seal is prevented in a high-pressure system by the use of a

- A—backup ring on the side of the O-ring next to the pressure.
- B—U-ring on the side of the O-ring away from the pressure.
- C—backup ring on the side of the O-ring away from the pressure.

*Extrusion of an O-ring seal is prevented in a high-pressure system by installing a backup ring in the groove with the O-ring, on the side of the O-ring away from the pressure.*

*The backup ring prevents the high-pressure fluid from forcing the O-ring into the space between the piston and cylinder wall.*

- 8407.** What is one advantage of piston-type hydraulic motors over electric motors?

- A—They are considerably quieter in operation.
- B—There is no fire hazard if the motor is stalled.
- C—They work satisfactorily over a wider temperature range.

*One of the main advantages of a piston-type hydraulic motor over an electric motor is the fact that there is no fire hazard when the hydraulic motor is stalled.*

- 8408.** Generally, the first step in removing an accumulator from an aircraft is to

- A—relieve system pressure.
- B—discharge the preload.
- C—drain the reservoir.

*Generally, the first step in removing an accumulator from an aircraft is to relieve all of the system pressure.*

*An accumulator can be removed from an aircraft with the air preload still in it, but the preload must be discharged before the accumulator is disassembled.*

**Answers**

8402 [B] (063) AMT-STRUC, 5  
8406 [C] (063) AMT-STRUC, 5

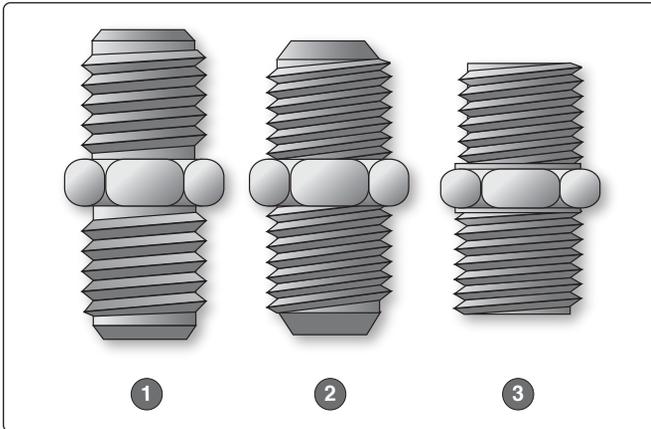
8403 [C] (063) AMT-STRUC, 5  
8407 [B] (063) AMT-STRUC, 5

8404 [B] (065) AMT-G Ch 9  
8408 [A] (065) AMT-STRUC, 5

8405 [C] (063) AMT-G Ch 9

**8409.** (Refer to Figure 11.) The AN flared-tube fitting is referred to in which picture?

- A—1.
- B—2.
- C—3.

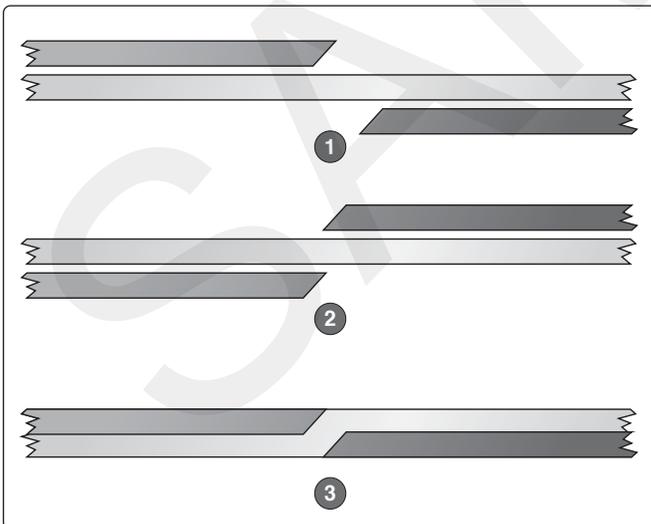


**Figure 11.** Fittings

An AN flared-tube fitting is shown as 1 in Figure 11. The AN fitting differs from the AC fitting shown as 2 because of the unthreaded portion of the fitting between the end of the threads and the flare cone.

**8410.** (Refer to Figure 12.) Which illustration(s) show(s) the correct spiral for teflon backup rings?

- A—1 and 2.
- B—3.
- C—1 and 3.



**Figure 12.** Backup rings

The correct spiral for a Teflon backup ring is shown in 1 and 3. View 1 shows the ring before pressure is applied. View 3 shows the way the ring shapes itself when pressure is applied.

**8411.** If a hydraulic brake system uses neoprene rubber packing materials, the correct hydraulic fluid to service the system is

- A—mineral-base oil.
- B—synthetic-base oil.
- C—phosphate ester-base oil.

A hydraulic system that uses mineral-base fluid should use neoprene rubber packing materials. Systems using vegetable-base fluid should use natural rubber seals, and systems using phosphate ester-base fluid should use butyl seals.

**8412.** The internal resistance of a fluid which tends to prevent it from flowing is called

- A—volatility.
- B—viscosity.
- C—stability.

The internal resistance of a fluid which tends to prevent its flowing is called the viscosity of the fluid.

**8413.** What is the viscosity of hydraulic fluid?

- A—The increase in volume of a fluid due to temperature change.
- B—The fluid's ability to resist oxidation and deterioration for long periods.
- C—The internal resistance of a fluid which tends to prevent it from flowing.

The viscosity of a fluid is its internal resistance, which tends to prevent its flowing.

**8414.** Which is a characteristic of petroleum-base hydraulic fluid?

- A—Flammable under normal conditions.
- B—Compatible to natural rubber seals and packings.
- C—Nonflammable under all conditions.

Petroleum-base hydraulic fluid is flammable under normal conditions.

Because of the flammability of mineral-base fluid, synthetic fluids have been developed.

**Answers**

8409 [A] (011) AMT-G Ch 9  
8413 [C] (064) AMT-STRUC, 5

8410 [C] (011) AMT-STRUC, 5  
8414 [A] (064) AMT-STRUC, 5

8411 [A] (065) AMT-STRUC, 5

8412 [B] (064) AMT-STRUC, 5

**8415.** When servicing aircraft hydraulic systems, use the type fluid specified in the

- A—aircraft manufacturer's maintenance manual.
- B—instruction plate affixed to the unit.
- C—aircraft manufacturer's maintenance manual or instruction plate affixed to the unit.

*When servicing aircraft hydraulic systems, be sure to use only the type of fluid specified in the aircraft manufacturer's maintenance manual or on the instruction plate attached to the reservoir or to the unit.*

**8416.** Petroleum-base hydraulic fluid is which color?

- A—Purple.
- B—Blue.
- C—Red.

*MIL-H-5606 petroleum-base hydraulic fluid is dyed red.*

**8417.** Which of the following is adversely affected by atmospheric humidity if left unprotected?

- A—MIL-H-5606 and Skydrol hydraulic fluid.
- B—MIL-H-5606 hydraulic fluid.
- C—Skydrol hydraulic fluid.

*Skydrol phosphate ester-base hydraulic fluid is susceptible to contamination from moisture in the atmosphere. Containers of Skydrol should be kept tightly closed to prevent this contamination.*

**8418.** Which is a characteristic of synthetic-base hydraulic fluid?

- A—Low moisture retention.
- B—High flash point.
- C—Low flash point.

*One of the main advantages of the new synthetic-base hydraulic fluids over the older mineral-base hydraulic fluids is their higher flash point.*

**8419.** Which statement about fluids is correct?

- A—Any fluid will completely fill its container.
- B—All fluids are considered to be highly compressible.
- C—All fluids readily transmit pressure.

*All fluids, whether gases or liquids, transmit pressure in a fluid power system.*

*A liquid is a noncompressible fluid and a gas, such as air, is a compressible fluid.*

**8420.** Two types of hydraulic fluids currently being used in civil aircraft are

- A—mineral base, and phosphate ester base.
- B—mixed mineral base and phosphate ester base.
- C—petroleum base and mixed mineral base.

*Nearly all of the hydraulic fluid used in modern civilian aircraft is either mineral-base MIL-H-5606 (red oil), or phosphate ester-base fluid such as the various types of Skydrol.*

**8421.** Which of the following lists only desirable properties of a good hydraulic fluid that has chemical stability?

- A—High viscosity, low flash point, high fire point.
- B—High flash point, low viscosity, low fire point.
- C—Low viscosity, high flash point, high fire point.

*A good hydraulic fluid must have a low viscosity so it is free to flow. It must be chemically stable and must have a high flash point and a high fire point.*

**8422.** Characteristics of MIL-H-8446 hydraulic fluid are

- A—blue color, phosphate ester base, fire resistant, butyl rubber seals.
- B—light purple color, phosphate ester base, fire resistant, butyl rubber seals.
- C—light green color, phosphate ester base, fire resistant, butyl rubber seals.

*MIL-H-8446 hydraulic fluid is a light purple, phosphate ester-base, fire-resistant fluid.*

*Butyl rubber seals are used with MIL-H-8446 fluid.*

**8423.** Where can information be obtained about the compatibility of fire-resistant hydraulic fluid with aircraft materials?

- A—Fluid manufacturer's technical bulletins.
- B—Aircraft manufacturer's specifications.
- C—AC 43.13-1A.

*Manufacturer's technical bulletins provide information on the compatibility of fire-resistant hydraulic fluids with aircraft materials.*

**Answers**

8415 [C] (064) AMT-STRUC, 5  
8419 [C] (064) AMT-STRUC, 5

8416 [C] (064) AMT-STRUC, 5  
8420 [A] (064) AMT-STRUC, 5

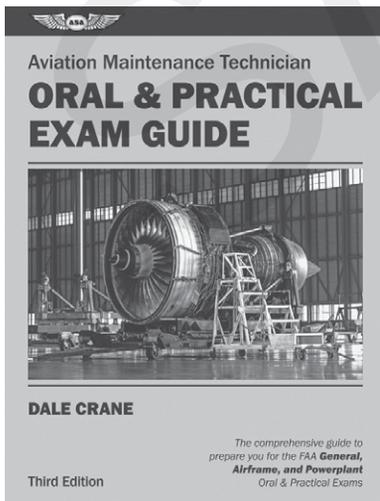
8417 [C] (064) AMT-STRUC, 5  
8421 [C] (064) AMT-STRUC, 5

8418 [B] (064) AMT-STRUC, 5  
8422 [B] (064) AMT-STRUC, 5  
8423 [A] (064) AMT-STRUC, 5

# Airframe Oral & Practical Study Guide

The Oral and Practical Tests.....	154
Wood Structures.....	156
Aircraft Covering.....	158
Aircraft Finishes.....	160
Sheet Metal Structures.....	162
Welding.....	164
Assembly and Rigging.....	166
Airframe Inspection.....	168
Landing Gear Systems.....	170
Hydraulic and Pneumatic Power Systems.....	172
Cabin Atmosphere Control Systems.....	174
Instrument Systems.....	176
Communication and Navigation Systems.....	178
Fuel Systems.....	180
Electrical Systems.....	182
Position and Warning Systems.....	184
Ice and Rain Control Systems.....	186
Fire Protection Systems.....	188

For more Oral & Practical projects and sample questions, covering General, Airframe, and Powerplant!



## **AMT 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).

# The Oral and Practical Tests

## Prerequisites

All applicants must have met the prescribed experience requirements as stated in 14 CFR §65.77. In addition, all applicants must provide:

1. Proof of having unexpired passing credit for the Aviation Mechanic General (AMG) knowledge test by presenting an Airman Computer Test Report (except when properly authorized under the provisions of 14 CFR §65.80 to take the practical tests before the airman knowledge tests).
2. Identification with a photograph and signature.

## Test Standards

The examiner will download an oral and practical examination that is generated at random for each applicant that reflects all the knowledge and skill “Areas of Operation.”

“Areas of Operation” are subject areas in which aviation mechanic applicants must have knowledge or demonstrate skill.

“Tasks” are the items that should be performed according to standards acceptable to the examiner.

“Reference” identifies the publication(s) that describe the task. Information contained in manufacturer and/or FAA approved data always takes precedence over textbook referenced data.

The objective of each Task lists the elements that must be satisfactorily performed to demonstrate competency in the Task.

The objective includes:

1. Specifically what the applicant will be able to do.
2. Conditions under which the Task is to be performed.
3. Acceptable standards of performance.

These terms apply to each Task:

- “Inspect” means to examine by sight and touch.
- “Check” means to verify proper operation.
- “Troubleshoot” means to analyze and identify malfunctions.
- “Service” means to perform functions that ensure continued operation.
- “Repair” means to correct a defective condition.
- “Overhaul” means to disassemble, inspect, repair as necessary, and check.

The applicant should be well prepared in all knowledge and skill areas included in the standards.

Satisfactory performance to meet the requirements for certification is based on the applicant’s ability to:

1. Show basic knowledge.
2. Demonstrate basic mechanic skills.
3. Perform the Tasks within the standards of the reference materials.

The practical test is passed if, in the judgment of the examiner, the applicant demonstrates the prescribed level of proficiency on the assigned Tasks in each Area of Operation. Each practical examination item must be performed, at a minimum, to the performance level in the practical test standards. For mechanic testing, there are three practical performance levels:

- Level 1: You must know basic facts and principles and be able to locate information and reference materials. You do not have to interpret information or demonstrate a physical skill.
- Level 2: Know and understand principles, theories, operations, and concepts. You must be able to find, interpret, and apply maintenance data and information. You must be able to select and utilize the appropriate tools and equipment. While you need to demonstrate adequate performance skills, you do not need to demonstrate skill at a high or return-to-service quality level.
- Level 3: Know and understand principles, theories, operations, and concepts. You must be able to find, interpret, and apply maintenance data and information, select and utilize the appropriate tools and equipment to the overall operation and maintenance of an aircraft. You must be able to demonstrate the ability to work independently and make accurate judgments of airworthiness. You must demonstrate skills at a high level which includes the ability to perform return-to-service levels of work.

If, in the judgment of the examiner, the applicant does not meet the standards of any Task performed, the associated Area of Operation is failed and therefore, the practical test is failed.

Typical areas of unsatisfactory performance and grounds for disqualification are:

1. Any action or lack of action by the applicant that requires corrective intervention by the examiner for reasons of safety.
2. Failure to follow recommended maintenance practices and/or reference material while performing projects.
3. Exceeding tolerances stated in the reference material.
4. Failure to recognize improper procedures.
5. The inability to perform to a return-to-service standard, where applicable.
6. Inadequate knowledge in any of the subject areas.

When an applicant fails a test the examiner will record the applicant's unsatisfactory performance and Tasks not completed in terms of Areas of Operation appropriate to the practical test conducted.

SAMPLE

# Wood Structures

## Study Materials

Aviation Maintenance Technician Series Airframe textbook, Vol. 1 ..... ASA ..... Pages 175–185  
 Aviation Maintenance Technician Airframe Handbook FAA-H-8083-31 Vol. 1 ..... FAA ..... Chapter 6  
 Advisory Circular 43.13-1B..... FAA ..... Pages 1-1-1-37

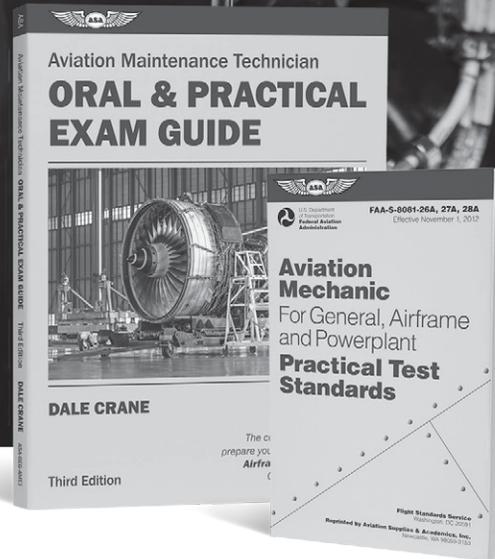
## Typical Oral Questions

1. Which species of wood is considered to be the standard when comparing other woods for use in aircraft structure?  
*Sitka spruce.*
2. What is the basic difference between plywood and laminated wood?  
*The grain in each layer of laminated wood runs in the same direction. The grain in the layers of plywood runs at 90 degrees or 45 degrees to each other.*
3. What kind of glue is recommended for making a repair to a wooden aircraft structure?  
*Synthetic resin glue.*
4. How is aircraft plywood prepared for making a compound bend?  
*The wood is soaked in hot water until it is pliable.*
5. How is pressure applied to the glued joint when splicing a wooden aircraft wing spar?  
*With cabinetmakers parallel clamps.*
6. How much pressure must be applied to a glue joint in a piece of softwood to produce a strong joint?  
*125 to 150 pounds per square inch.*
7. What is the correct repair to a wooden aircraft wing spar if the wing-attach bolt holes in the spar are elongated?  
*Splice in a new section of the spar and drill new holes.*
8. What kind of repair is recommended for a hole in the plywood skin of an aircraft wing?  
*A scarf patch.*
9. What is the recommended taper for a splayed patch in a plywood aircraft skin?  
*5 to 1.*
10. What is the recommended taper for a scarf patch in a plywood aircraft skin?  
*12 to 1.*
11. Why should sandpaper never be used when preparing a scarf joint in a wing spar for splicing?  
*The dust caused by sanding will plug the pores of the wood so the glue cannot get in to form a good bond.*
12. What is the largest hole in a plywood wing skin that can be repaired with a fabric patch?  
*One inch in diameter.*
13. Why are light steel bushings often used in bolt holes in a wooden wing spar?  
*The bushing keeps the spar from being crushed when the nut on the attachment bolt is tightened.*
14. How long should a glue joint be kept under pressure when splicing a wooden aircraft wing spar?  
*For at least seven hours.*
15. Are mineral streaks in a piece of structural aircraft wood reason for rejecting the wood?  
*No, if there is no evidence of decay in the wood.*
16. Which area of a wooden aircraft wing spar must not contain any splice?  
*There must be no splice under wing-attach fittings, landing gear fittings, engine mount fittings, or lift and interplane strut fittings.*
17. How is compression wood identified?  
*It has a high specific gravity, it appears to have an excessive growth of summer wood, and little contrast between the spring wood and the summer wood.*
18. What is done to a splice in a wooden aircraft wing spar to strengthen the splice?  
*Reinforcing plates are glued to both sides of the splice.*
19. Why must abrupt changes in the cross-sectional area of a wooden structural member be avoided?  
*Abrupt changes in the cross-sectional area of a structural member concentrate stresses and can cause failure.*

## Typical Practical Projects

1. Explain to the examiner the correct way to repair a wing spar that has an elongated bolt hole in its root end.
2. Install a scarf patch in a damaged piece of aircraft plywood.
3. Inspect a piece of wood for evidence of dry rot. Explain to the examiner what should be done if dry rot is found.
4. Make a scarf splice to a piece of wing rib cap strip material. Reinforce the splice to get maximum strength.
5. Inspect a piece of wing spar material to determine if the grain deviation is within the limits allowed for aircraft wood.
6. Properly mix a batch of resin glue and explain to the examiner the correct way to apply this glue to the wood when making a repair to aircraft wood structure.
7. Given several pieces of wood, examine them for condition and for meeting the specifications for aircraft structural wood.
8. Inspect a wooden aircraft structure to determine whether or not it is in an airworthy condition.
9. Inspect a plywood aircraft structure for evidence of delamination of the plywood or for the failure of the glue joint between the skin and the underlying structure.
10. Explain to the examiner the correct way of repairing a piece of aircraft structure that has been glued with casein glue, when the glue has deteriorated.

SAMPLE



Also available as 

# You're practically there...

The *Oral and Practical Exam Guide* and the *Aviation Mechanic Practical Test Standards* will prepare you for the certification process with typical projects and required skill levels, practical knowledge requirements in a question and answer format, and reference materials for further study.

[asa2fly.com/AMTpractical](http://asa2fly.com/AMTpractical)



## AIRFRAME

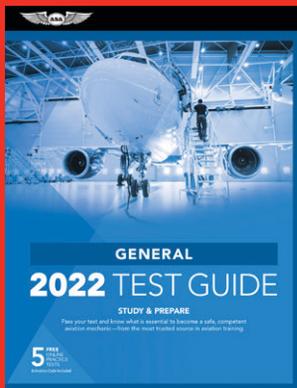
# 2022 TEST GUIDE

### STUDY & PREPARE

Pass your test and know what is essential to become a safe, competent aviation mechanic—from the most trusted source in aviation training

Rely on the most trusted source in aviation training with ASA's Fast-Track Test Guides to prepare for your FAA Knowledge Exams. Test questions are supported with answers, thorough and succinct explanations, and references for further study.

Also available for aviation mechanics:



The "Fast-Track" to study for and pass the FAA Aviation Mechanic Knowledge Exams

Questions, answers, and explanations are arranged in the Fast-Track method to accelerate learning and encourage retention

FAA test figures are included near the questions and explanations for easy reference

Free updates (online or email update service) keep you current with changes made to the tests

Plus: test tips and instructions, an Oral & Practical Study Guide, and 5 online practice tests at no additional cost!

Based on the original Fast-Track Series by Dale Crane

Explore more ways to study:



**SOFTWARE | APP | EBOOK**  
available on demand from ASA at  
[asa2fly.com/testprep](http://asa2fly.com/testprep)



**Aviation Supplies & Academics, Inc.**  
7005 132nd Place SE, Newcastle, Washington 98059  
425-235-1500 | [asa2fly.com](http://asa2fly.com)

**ASA-AMA-22**

TRANSPORTATION USD \$14.95

ISBN 978-1-64425-147-8



9 781644 251478