

Airframe

2020 TEST GUIDE

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The FAA Knowledge Exam Questions can change throughout the year.
Stay current with test changes; sign up for ASA's free email update service
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AVIATION SUPPLIES & ACADEMICS
NEWCASTLE, WASHINGTON

Airframe Test Guide
2020 Edition

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

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ASA-AMA-20-PD

PDF eBook ISBN 978-1-61954-793-3

Print Book ISBN 978-1-61954-792-6

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Updates and Practice Tests

Free Test Updates for the One-Year Life Cycle of the Book

The FAA rolls out new tests as needed throughout the year. The FAA exams are “closed tests” which means the exact database of questions is not available to the public. ASA combines more than 60 years of experience with expertise in airman training and certification tests to prepare the most effective test preparation materials available in the industry.

You can feel confident you will be prepared for your FAA Knowledge Exam by using the ASA Test Guides. ASA publishes test books each June and keeps abreast of changes to the tests. These changes are then posted on the ASA website as a Test Update.

Visit the ASA website before taking your test to be certain you have the most current information. While there, sign up for ASA’s free email Update service. We will then send you an email notification if there is a change to the test you are preparing for so you can review the Update for revised and/or new test information.

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Preface

Welcome to ASA's Test Guide Series, based on the original "Fast-Track" series written by Dale Crane. ASA's test books have been helping Aviation Maintenance Technicians (AMTs) prepare for the FAA Knowledge Exams for more than 60 years with great success. We are confident with the proper use of this book, you will score very well on your FAA Knowledge Exam.

The ASA "Fast-Track" Test Guide has proven to be the most effective way to study for an FAA A&P Knowledge Test. This method turns a multiple-choice examination into a study aid, helping you learn the material in the shortest possible time and learn it in a way that you retain it.

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 AMT testing process. You might see similar although not exactly the same questions on your official FAA exam. Answer stems may be rearranged from the A, B, C order you see in this book. Therefore, be careful to fully understand the intent of each question and corresponding answer while studying, rather than memorize the A, B, C answer. You may be asked a question that has unfamiliar wording; studying and understanding the information in this book and the associated references will give you the tools to answer all types of questions with confidence.

Begin your studies with a classroom or home-study ground school course, which will involve reading a comprehensive AMT textbook. Conclude your studies with this Test Guide. Read the question, select your choice for the correct answer, then read the explanation. At the bottom of the page you will find the correct answer, along with the Learning Statement Code and reference from which the answer was derived. Use these references if you need further study of a subject. Upon completion of your studies, take practice tests at www.prepware.com (see inside front cover for your free account).

It is important to answer every question assigned on your FAA Knowledge Test. If in their ongoing review, the FAA test authors decide a question has no correct answer, is no longer applicable, or is otherwise defective, your answer will be marked correct no matter which one you choose. However, you will not be given the automatic credit unless you have marked an answer. Unlike some other exams you may have taken, there is no penalty for "guessing" in this instance.

The ASA Test Guides include, as an important extra feature, typical oral test questions and typical practical projects. These will give you an idea of the questions you will be asked orally, and the projects you will be assigned to demonstrate your skills and reasoning.

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
Voice: 425.235.1500
Fax: 425.235.0128
Email: cfi@asa2fly.com
Website: www.asa2fly.com

The FAA appreciates testing experience feedback. You can contact the branch responsible for the FAA Knowledge Exams at the following address:

Federal Aviation Administration

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

Quick-Reference FAA Exam Information

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

Explanation of Requirements, Authorization and Retesting

Acceptable Authorization for All Aviation Mechanic Tests

1. Original Federal Aviation Administration (FAA) Form 8610-2, Airman Certificate and/or Rating Application.
2. Graduates of a Part 147 school, officially affiliated with a testing center, may take the knowledge test upon presenting an appropriate graduation certificate or certificate of completion to the affiliated testing center. A graduate's name must be on the certified list received from the Part 147 school prior to administering the appropriate test(s).
3. Failed, passing or expired Airman Knowledge Test Report, provided the applicant still has the original test report in his/her possession. (See Retesting explanation.)

Retesting for AMA, AMG, and AMP

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.

Note: The testing centers require a wait period of 24 hours before any applicant may retest.

Learning Statement Codes

The expression “learning statement,” as used in FAA airman testing, refers to measurable statements about the knowledge a student should be able to demonstrate following a certain segment of training. In order that each learning statement may be read and understood in context as a complete sentence, precede each statement with the words: “Upon the successful completion of training the student should be able to...” — complete the phrase with the subject indicated by the learning statement code (LSC) given in your knowledge test results.

When you take the applicable airman knowledge test required for an airman pilot certificate or rating, you will receive an Airman Knowledge Test Report. The test report will list the learning statement codes for questions you have answered incorrectly. Match the codes given on your test report to the ones in the official FAA Learning Statement Codes (listed below). Your instructor is required to provide instruction on each of the areas of deficiency listed on your Airman Knowledge Test Report and to give you an endorsement for this instruction. The Airman Knowledge Test Report must be presented to the examiner conducting your practical test. During the oral portion of the practical test, the examiner is required to evaluate the noted areas of deficiency.

FAA Learning Statement Codes are prefixed with a letter-identifier (for example, AMA031). For the purposes of reference within this ASA Test Guide, the letter prefix is omitted; therefore throughout this book, LSCs are referred to by their number-identifiers only, in parentheses.

The FAA appreciates testing experience feedback. You can contact the branch responsible for the FAA Knowledge Exams directly at:

Federal Aviation Administration
AFS-630, Airman Testing Standards Branch
PO Box 25082
Oklahoma City, OK 73125
Email: AFS630comments@faa.gov

LSC	Subject area
AMA001	Recall aerodynamic fundamentals
AMA002	Recall air conditioning system — components/operating principles/characteristics
AMA003	Recall aircraft component markings
AMA004	Recall aircraft components material — flame resistant
AMA005	Recall aircraft cooling system — charging/leaking/oil/pressure/water
AMA006	Recall aircraft cooling system — components/operating principles/characteristics
AMA007	Recall aircraft corrosion — principles/control/prevention
AMA008	Recall aircraft engines — indicating system
AMA009	Recall aircraft exterior lighting — systems/components
AMA010	Recall aircraft flight indicator system
AMA011	Recall aircraft hardware — bolts/nuts/fasteners/fittings/valves
AMA012	Recall aircraft heating system — exhaust jacket inspection
AMA013	Recall aircraft instruments — install/inspect/adjust/repair/markings
AMA014	Recall aircraft instruments — types/components/operating principles/characteristics
AMA015	Recall aircraft lighting — install/inspect/repair/service
AMA016	Recall aircraft metals — inspect/test/repair/identify
AMA017	Recall aircraft metals — types/tools/fasteners

Continued

LSC	Subject area
AMA018	Recall aircraft warning systems — navigation/stall/takeoff
AMA019	Recall airframe — inspections
AMA020	Recall airframe — repair/component installation
AMA021	Recall airframe design — structures/components
AMA022	Recall alternators — components/operating principles/characteristics
AMA023	Recall antenna system — install/inspect/repair/service
AMA024	Recall anti-icing/deicing — methods/systems
AMA025	Recall autopilot — components/operating principles/characteristics
AMA026	Recall autopilot — install/inspect/repair/service
AMA027	Recall avionics — components/operating principles/characteristics
AMA028	Recall avionics — install/inspect/repair/service
AMA029	Recall basic hand tools/torque values
AMA030	Recall batteries — capacity/charging/types/storage/rating/precautions
AMA031	Recall brake system — components/operating principles/characteristics
AMA032	Recall brake system — install/inspect/repair/service
AMA033	Recall carburetor — icing/anti-icing
AMA034	Recall chemical rain repellent
AMA035	Recall combustion heaters — components/operating principles/characteristics
AMA036	Recall compass — components/operating principles/characteristics
AMA037	Recall composite materials — types/repairs/techniques/processes
AMA038	Recall control cables — install/inspect/repair/service
AMA039	Recall DC electric motors — components/operating principles/characteristics
AMA040	Recall dope and fabric — materials/techniques/hazards
AMA041	Recall electrical system — components/operating principles/characteristics/symbols
AMA042	Recall electrical system — install/inspect/repair/service
AMA043	Recall electronic test equipment
AMA044	Recall Emergency Locator Transmitter (ELT) — operation/battery/testing
AMA045	Recall fiberglass — install/troubleshoot/service/repair
AMA046	Recall fire detection system — types/components/operating principles/characteristics
AMA047	Recall fire detection systems — install/inspect/repair/service
AMA048	Recall fire extinguishing systems — components/operating principles/characteristics
AMA049	Recall flap overload valve
AMA050	Recall flight characteristics — longitudinal stability/instability
AMA051	Recall fluid lines — material/coding
AMA052	Recall fuel — types/characteristics/contamination/fueling/defueling/dumping
AMA053	Recall fuel/oil — anti-icing/deicing
AMA054	Recall fuel system — components/operating principles/characteristics
AMA055	Recall fuel system — install/troubleshoot/service/repair
AMA056	Recall fuel system — types
AMA057	Recall fuel/air mixture — idle rich mixture — RPM rise
AMA058	Recall fundamental material properties
AMA059	Recall fuselage stations
AMA060	Recall helicopter control system

LSC	Subject area
AMA061	Recall helicopter control system — collective
AMA062	Recall helicopter drive system — free wheeling unit
AMA063	Recall hydraulic systems — components/operating principles/characteristics
AMA064	Recall hydraulic systems — fluids
AMA065	Recall hydraulic systems — install/inspect/repair/service
AMA066	Recall instrument panel installation — shock mounts
AMA067	Recall instruments — manifold pressure indicating system
AMA068	Recall landing gear system — components/operating principles/characteristics
AMA069	Recall landing gear system — install/inspect/repair/service
AMA070	Recall maintenance publications — service/parts/repair
AMA071	Recall navigation/communication systems — types/operational characteristics
AMA072	Recall oxygen system — components/operating principles/characteristics
AMA073	Recall oxygen system — install/inspect/repair/service/precautions
AMA074	Recall oxygen system — quality/types/contamination/cylinders/pressure
AMA075	Recall physics — work forces
AMA076	Recall pitot-static system — components/operating principles/characteristics
AMA077	Recall pitot-static system — install/inspect/repair/service
AMA078	Recall plastic fundamentals — installation/cleaning/repair/characteristics
AMA079	Recall pneumatic system — components/operating principles/characteristics
AMA080	Recall pressurization system — components/operating principles/characteristics
AMA081	Recall primary flight controls — inspect/adjust/repair
AMA082	Recall primary flight controls — types/purpose/functionality
AMA083	Recall radar altimeter — indications
AMA084	Recall radar altimeter — signals
AMA085	Recall radio system — components/operating principles/characteristics
AMA086	Recall radio system — install/inspect/repair/service
AMA087	Recall radio system — license requirements/frequencies
AMA088	Recall regulations — airworthiness requirements/responsibilities
AMA089	Recall regulations — maintenance reports/records/entries
AMA090	Recall regulations — privileges/limitations of maintenance certificates/licenses
AMA091	Recall rotor system — components/operating principles/characteristics
AMA092	Recall secondary flight control system — inspect/adjust/repair
AMA093	Recall secondary flight control system — types/purpose/functionality
AMA094	Recall sheet metal fabrication — blueprints/shaping/construction
AMA095	Recall smoke detection systems — types/components/operating principles/characteristics
AMA096	Recall static pressure system — install/inspect/repair/service
AMA097	Recall tires — install/inspect/repair/service/storage
AMA098	Recall turbine engines — components/operational characteristics/associated instruments
AMA099	Recall type certificate data sheet (TCDS)/supplemental type certificate (STC)
AMA100	Recall weight and balance — equipment installation/CG/general principles
AMA101	Recall welding/soldering — types/techniques/equipment
AMA102	Recall wooden components — failures/decay/patching/gluing/substitutions

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>General Handbook (FAA)</i>
FAA-H-8083-31, Vol. 1 & 2	<i>Airframe Handbook (FAA)</i>
FAA-H-8083-32, Vol. 1 & 2	<i>Powerplant Handbook (FAA)</i>
FAA-H-8083-3	<i>Airplane Flying Handbook (FAA)</i>
FAA-G-8082-3	<i>Aviation Maintenance Technician Test Guide (FAA)</i>
FAA-G-8082-11	<i>Inspection Authorization Test Guide (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 Maintenance Technician Series General (ASA)</i>
AMT-STRUC	<i>Aviation Maintenance Technician Series Airframe, Volume 1: Structures (ASA)</i>
AMT-SYS	<i>Aviation Maintenance Technician Series Airframe, Volume 2: Systems (ASA)</i>
AMT-P	<i>Aviation Maintenance Technician Series Powerplant (ASA)</i>
DAT	<i>Dictionary of Aeronautical Terms (ASA)</i>
AIM	<i>Aeronautical Information Manual (FAA)</i>

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 Page xv. 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 xviii. 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.

8391. (1) Relief valves are used in pneumatic systems as damage-preventing units.

(2) Check valves are used in both hydraulic and pneumatic systems.

Regarding the above statements,

- A— both No. 1 and No. 2 are true.
- B— neither No. 1 nor No. 2 is true.
- C— only No. 1 is true.

Statement (1) is true. Relief valves are used in pneumatic systems as damage-preventing units.

Statement (2) is also true. Check valves are used in both hydraulic and pneumatic systems.

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.

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

8391 [A] (063) AMT-STRUC, 5

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

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.

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— shutter 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.

Answers

8393 [B] (065) AMT-STRUC, 5
8397 [B] (079) AMT-STRUC, 5

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

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.

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?

1. Minimum maintenance requirements.
2. Lightweight.
3. About 80 percent operating efficiency (20 percent loss due to fluid friction).
4. Simple to inspect.

- A— 1, 2, 3, 4.
- B— 1, 3, 4.
- C— 1, 2, 4.

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% 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.

Answers

8401 [A] (063) AMT-STRUC, 5
8405 [C] (063) AMT-G Ch 9

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. 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.

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

- A— 1.
- B— 2.
- C— 3.

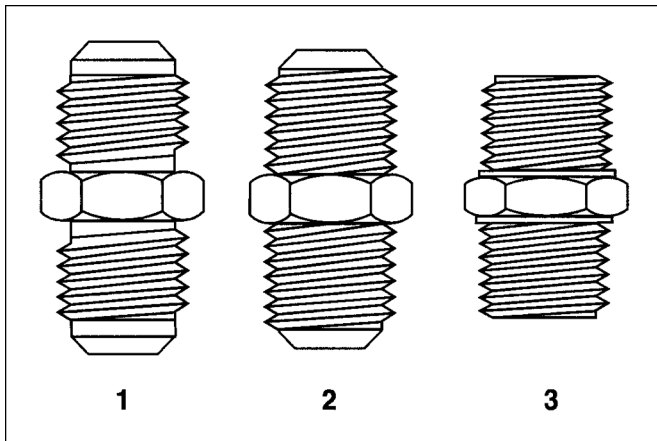


Figure 11. Fittings

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.

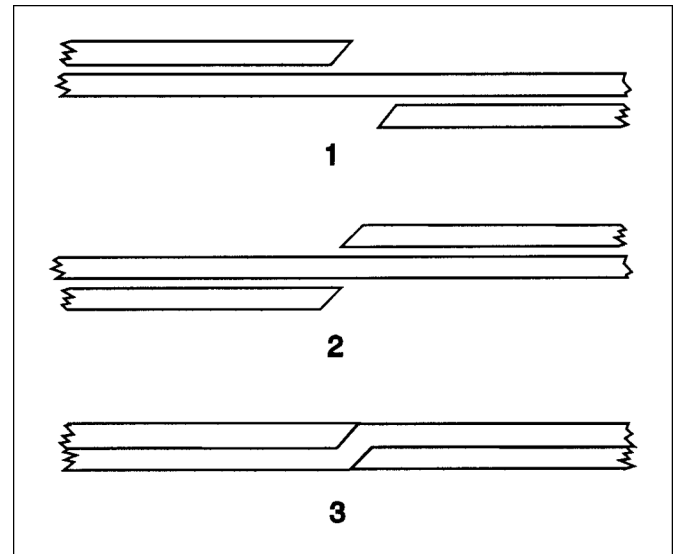


Figure 12. Backup Rings

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.

Answers

8408 [A] (065) AMT-STRUC, 5
8412 [B] (064) AMT-STRUC, 5

8409 [A] (011) AMT-G Ch 9

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

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

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.

8415. (1) When servicing aircraft hydraulic systems, use the type fluid specified in the aircraft manufacturer's maintenance manual or on the instruction plate affixed to the reservoir or unit.

(2) Hydraulic fluids for aircraft are dyed a specific color for each type of fluid.

Regarding the above statements,

- A— only No. 1 is true.
- B— only No. 2 is true.
- C— both No. 1 and No. 2 are true.

Statement (1) is true. 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.

Statement (2) is also true. Aircraft hydraulic fluids are dyed to identify them. MIL-H-5606 is dyed red. Some of the synthetic hydraulic fluids are dyed purple and others are dyed green. The color identifies the specific fluid.

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?

- 1. MIL-H-5606 hydraulic fluid.
- 2. Skydrol hydraulic fluid.
- 3. None of the above.

- A— 1 and 2.
- B— 3.
- C— 2.

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.

Answers

8413 [C] (064) AMT-STRUC, 5
8417 [C] (064) AMT-STRUC, 5

8414 [A] (064) AMT-STRUC, 5
8418 [B] (064) AMT-STRUC, 5

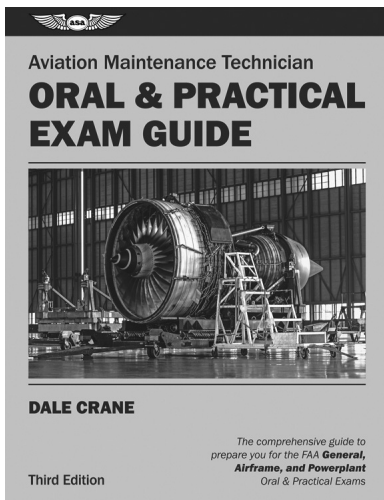
8415 [C] (064) AMT-STRUC, 5
8419 [C] (064) AMT-STRUC, 5

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

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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.

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..... FAAPages 1-1–1-37

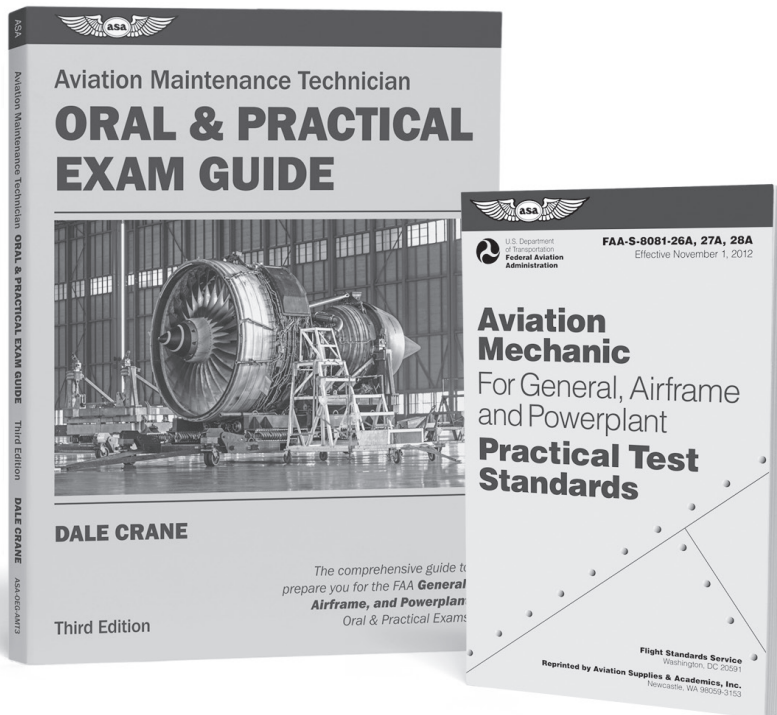
Typical Oral Questions

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.

You've passed your written, now get ready for the Oral & Practical.



Oral & Practical Essentials

These books 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.



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