

## **Disclaimer**

FAA-S-8081-26A, Aviation Mechanic General Practical Test Standards (version 26A) was originally published in July 2012. This version was only made available briefly and was rescinded pending guidance material.

While awaiting the finalization of the guidance material, the previous version, FAA-S-8081-26 with changes 1, 2, & 3 (version 26), was reinstated as the effective version with change 4 added on April 18, 2014.

FAA Order 8900.2A, the guidance material needed to support version 26A, became effective on March 31, 2015 allowing for the re-issue of version 26A. Since the original publication, 26A has undergone a few minor changes. These changes are described in the Record of Changes. Because the changes were minor, 26A has maintained its original publication date with the new changes incorporated as Change 1.



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

**FAA-S-8081-26A**  
**(with Change 1 – April 27, 2015)**

# **Aviation Mechanic General Practical Test Standards**

**July 2012**

Flight Standards Service  
Washington, DC 20591

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**2012**

Flight Standards Service  
Washington, D.C. 20591

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**Note**

FAA-S-8081-26A, Aviation Mechanic General Practical Test Standards (PTS) supersedes FAA-S-8081-26 dated June 2003. Both FAA-S-8081-26 and the new test generator procedures will be in effect until six months after the effective date of FAA Order 8900.2A, at which time, all tests must be administered under FAA-S-8081-26A and the new test generator guidelines. Newly appointed Designated Mechanic Examiners (DMEs) must use FAA-S-8081-26A and the new test generator guidelines upon completion of initial training.

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## Foreword

This Aviation Mechanic General Practical Test Standards book has been published by the Federal Aviation Administration (FAA) to establish the standards for the Aviation Mechanic General Practical Test. The passing of this practical test is a required step toward obtaining the Aviation Mechanic certificate with Airframe and/or Powerplant ratings. **FAA inspectors and Designated Mechanic Examiners (DMEs) shall conduct practical tests in compliance with these standards.** Applicants should find these standards helpful in practical test preparation.

/s/ 7/18/2012

Raymond Towles, for

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John Allen, Director  
Flight Standards Service

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## Record of Changes

### Change 1 (April 27, 2015)

- Revised formatting throughout
- Revised the Note (page i).
- Revised the Introduction
  - Revised *Practical Test Standards Concept* section (pgs. 1 – 3).
  - Revised *Use of the Practical Test Standards* section (pg. 4).
  - Revised *Unsatisfactory Performance* section (pg. 7).
- Revised references for the following subject areas:
  - D. Fluid Lines and Fittings (pg. 13)
  - I. Maintenance Forms and Records (pg. 19)
- Removed Note from subject area H. Mathematics (pg. 19).
- Removed subject area M. Human Factors (pg. 25).

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## Major Enhancements

- Revised the Introduction
  - Updated references to FAA orders, instructional materials, and inspector guidance.
  - Added references to International Civil Aviation Organization (ICAO) aircraft maintenance performance, eligibility, skill, knowledge, and experience requirements.
- Removed the “\*core competency” denotation and blue text formatting from each subject area.
- Revised all subject areas to contain two objectives:
  - Objective 1: Exhibits knowledge in oral elements.
  - Objective 2: Demonstrates skill to perform practical elements.
- Added and/or revised elements within Objective 2 to expand the selection of projects for the oral and practical test generator in all subject areas.
- Added subject area M. Human Factors/Maintenance Resource Management (MRM).

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# Table of Contents

## Introduction

Practical Test Standards Concept.....	1
Use of the Practical Test Standards.....	4
Aviation Mechanic Practical Test Prerequisites .....	4
Examiner Responsibility .....	4
Performance Levels .....	5
Satisfactory Performance.....	7
Unsatisfactory Performance.....	7

## Section I—Aviation Mechanic General

A. Basic Electricity.....	9
B. Aircraft Drawings .....	10
C. Weight and Balance.....	11
D. Fluid Lines and Fittings.....	13
E. Materials and Processes .....	14
F. Ground Operation and Servicing .....	15
G. Cleaning and Corrosion Control .....	17
H. Mathematics .....	18
I. Maintenance Forms and Records.....	19
J. Basic Physics.....	21
K. Maintenance Publications.....	22
L. Aviation Mechanic Privileges and Limitations.....	24
M. [Reserved] .....	25

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## Introduction

The Federal Aviation Administration (FAA) aircraft mechanic's oral and practical test(s) are outcome-based examinations. Before being issued any airframe and/or powerplant certificate, all applicants must demonstrate the minimum level of knowledge and skills for the certificate or rating sought.

Skill tests are significant as they measure the applicant's ability to logically think and objectively apply their knowledge, while demonstrating the physical skills that enable them to carry out aircraft maintenance in a professional and safe manner.

Satisfactory demonstration of each skill test is evidence the applicant meets the acceptable degree of competency for the certificate or rating sought.

This PTS is available for download, free of charge, at:

[www.faa.gov](http://www.faa.gov)

Comments regarding this PTS should be sent to:

[AFS630comments@faa.gov](mailto:AFS630comments@faa.gov)

-or-

U.S. Department of Transportation  
Federal Aviation Administration  
Regulatory Support Division  
Airman Testing Standards Branch, AFS-630  
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### Practical Test Standards Concept

Title 49 U.S. Code, Subpart III, Chapter 447 is the foundation for the FAA's safety regulations, and provides flexibility through FAA Order 8900.2 (as revised), General Aviation Airman Designee Handbook, to examine and issue an airman certificate. This order is policy and mandatory standardized procedures for those who administer all aviation mechanic oral and practical tests.

**Note:** *A designee conducting an oral and/or practical test must not test more than one applicant at a time.*

## Change 1 (4/27/2015)

Definitions within:

- **Knowledge**—(oral) elements are indicated by use of the words "*Exhibits knowledge in....*"
- **Skill**—(practical) elements are indicated by the use of the words "*Demonstrates the skill to perform....*"

This practical test book is a variety of knowledge and skill projects or tasks contained in each subject area which is prescribed in Title 14 of the Code of Federal Regulations (14 CFR) part 147 appendices.

Compliance with these procedures makes certain that airman applicants meet a satisfactory level of competency and workmanship required for certification.

Every applicant is required to demonstrate a minimum satisfactory competency level, regardless of their previous education background.

Adherence to the following standards is mandatory when evaluating an applicant's test performance for an FAA Airframe and/or Powerplant Certificate:

- International Civil Aviation Organization (ICAO) Annex 1: 4.2.1.5
- 14 CFR part 65, section 65.79
- FAA Order 8900.2 (as revised)

All applicants for an FAA Aviation Mechanic Certificate must qualify by meeting the prescribed requirements as stated in 14 CFR part 65, section 65.77. They must additionally pass a written knowledge test, and the oral and practical tests for the certificate and/or rating sought, in accordance with 14 CFR part 65, section 65.77.

FAA written knowledge tests contain topics that include the construction and maintenance of aircraft, relevant FAA regulations, basic principles for installation and maintenance of propellers, and powerplants, depending on the certificate and rating sought, based on the following standards:

- ICAO Annex 1: 4.2.1.2
- 14 CFR part 65, section 65.75

Aviation maintenance instructors and applicants should find these standards helpful during training and preparing for the skill test, which are required under 14 CFR part 65, section 65.79.

These practical test standards are based on the following references:

<b>14 CFR part 1</b>	Definitions and Abbreviations
<b>14 CFR part 3</b>	General Requirements
<b>14 CFR part 21</b>	Certification Procedures for Products and Parts
<b>14 CFR part 39</b>	Airworthiness Directives
<b>14 CFR part 43</b>	Maintenance, Preventive Maintenance, Rebuilding, and Alteration
<b>14 CFR part 45</b>	Identification and Registration Marking
<b>14 CFR part 47</b>	Aircraft Registration
<b>14 CFR part 65</b>	Certification: Airmen Other Than Flight Crewmembers
<b>14 CFR part 91</b>	Air Traffic and General Operating Rules
<b>AC 20-62E</b>	Eligibility, Quality, and Identification of Aeronautical Replacement Parts
<b>AC 21-12C</b>	Application for U.S. Airworthiness Certificate
<b>AC 23-21</b>	Airworthiness Compliance Checklist Used to Substantiate Major Alteration for Small Airplanes
<b>AC 23.1309-1E</b>	System Safety Analysis and Assessment for Part 23 Airplanes
<b>AC 43.9C</b>	Maintenance Records
<b>AC 43.9-1F</b>	Instructions for Completion of FAA Form 337
<b>AC 43-206</b>	Inspection, Prevention, Control and Repair or Corrosion on Avionics Equipment
<b>AC 43-210</b>	Standardized Procedures for Requesting Field Approval of Data, Major Alteration and Repairs
<b>AC 43.13-1B</b>	Acceptable Methods, Techniques and Practices A/C Inspection & Repair
<b>AC 43.13-2B</b>	Acceptable Methods, Techniques and Practices-Aircraft Alterations
<b>FAA-H-8083-1</b>	Aircraft Weight and Balance Handbook
<b>FAA-H-8083-30</b>	Aviation Maintenance Technician Handbook—General

## Change 1 (4/27/2015)

**FAA-H-8083-31**

**ICAO**

Aviation Maintenance Technician Handbook—Airframe  
International Civil Aviation Organization Annex 1, *Personnel Licensing*

Each subject area has an objective. The objective lists the important knowledge and skill elements that must be utilized by the examiner in planning and administering aviation mechanic tests, and that applicants must be prepared to satisfactorily perform.

“Examiner” is used in this standard to denote either the FAA Inspector or FAA Designated Mechanic Examiner (DME) who conducts the practical test.

### **Use of the Practical Test Standards**

The FAA requires that all practical tests be conducted in accordance with the appropriate Aviation Mechanic Practical Test Standards and the policies and standardized procedures set forth in the current version of FAA Order 8900.2, General Aviation Airman Designee Handbook.

When using this PTS, the examiner must evaluate the applicant’s knowledge and skill in sufficient depth to determine that the objective for each subject area element selected is met.

An applicant is not permitted to know before testing begins which selections in each subject area are to be included in his/her test. Therefore, an applicant should be well prepared in **all** oral and skill areas included in the practical test standards.

Further information and requirements for conducting a practical test is contained in FAA Order 8900.2 (as revised).

### **Aviation Mechanic Practical Test Prerequisites**

All applicants must have met the prescribed experience requirements as stated in 14 CFR part 65, section 65.77 or be an authorized school student per 14 CFR part 65, section 65.80. (See FAA Order 8900.2 (as revised) for information about testing under the provisions of 14 CFR part 65, section 65.80.)

### **Examiner Responsibility**

All applicants must demonstrate an approval for return to service standard, where applicable and demonstrate the ability to locate and apply the required reference materials, where applicable. In instances where an approval for return to service standard cannot

be achieved, the applicant must be able to explain why the return to service standard was not met (e.g., when tolerances are outside of a product's limitations).

The examiner must personally observe all practical projects performed by the applicant. The examiner who conducts the practical test is responsible for determining that the applicant meets acceptable standards of knowledge and skill in the assigned subject areas within the appropriate practical test standard. Since there is no formal division between the knowledge and skill portions of the practical test, this becomes an ongoing process throughout the test.

The following terms may be reviewed with the applicant prior to, or during, element assignment.

1. **Inspect**—means to examine by sight and/or touch (with or without inspection enhancing tools/equipment).
2. **Check**—means to verify proper operation.
3. **Troubleshoot**—means to analyze and identify malfunctions.
4. **Service**—means to perform functions that assure continued operation.
5. **Repair**—means to correct a defective condition. Repair of an airframe or powerplant system includes component replacement and adjustment, but not component repair.
6. **Overhaul**—means disassembled, cleaned inspected, repaired as necessary, and reassembled.

## Performance Levels

The following is a detailed description of the meaning of each level.

### Level 1

- Know basic facts and principles.
- Be able to find information, and follow directions and written instructions.
- Locate methods, procedures, instructions, and reference material.
- Interpretation of information not required.
- No skill demonstration is required.

*Example:*

- Z3b.** Locate specified nondestructive testing methods. (Level 1)

*Performance Standard:*

The applicant will locate information for nondestructive testing.

**Level 2**

- Know and understand principles, theories, and concepts.
- Be able to find and interpret maintenance data and information, and perform basic operations using the appropriate data, tools, and equipment.
- A high level of skill is not required.

*Example:*

**Z3c.** Detect electrical leakage in electrical connections, terminal strips, and cable harness (at least ten will have leakage faults). (Level 2)

*Performance Standard:*

Using appropriate maintenance data and a multimeter, the applicant will identify items with leakage faults.

**Level 3** (This is the approval for return to service standards.)

- Know, understand, and apply facts, principles, theories, and concepts.
- Understand how they relate to the total operation and maintenance of aircraft.
- Be able to make independent and accurate airworthiness judgments.
- Perform all skill operations to a return-to-service standard using appropriate data, tools, and equipment. Inspections are performed in accordance with acceptable or approved data.
- A fairly high skill level is required.

*Example:*

**Z3e.** Check control surface travel. (Level 3)

*Performance Standard:*

Using type certificate data sheets and the manufacturer's service manual, the applicant will measure the control surface travel, compare the travel to the maintenance data, and determine if the travel is within limits.

### **Satisfactory Performance**

The practical test is passed if the applicant demonstrates the prescribed proficiency in the assigned elements in each subject area to the required standard. Applicants shall not be expected to memorize all mathematical formulas that may be required in the performance of various elements in this practical test standard. However, where relevant, applicants must be able to locate and apply necessary formulas to obtain correct solutions.

### **Unsatisfactory Performance**

If the applicant does not meet the standards of any of the elements performed (knowledge or skill elements), the associated subject area is failed, and thus that section of the practical test is failed. See the current version of FAA Order 8900.2 for further information about retesting.

Typical areas of unsatisfactory performance and grounds for disqualification include the following.

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 acceptable or approved maintenance procedures while performing skill (practical) projects.
3. Exceeding tolerances stated in the maintenance instructions.
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.

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## Section I—Aviation Mechanic General

### A. Basic Electricity

*Reference:* FAA-H-8083-30.

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. sources and/or effects of capacitance in a circuit.
  - b. uses of capacitance in a circuit.
  - c. sources and/or effects of inductance in a circuit.
  - d. uses of inductance in a circuit.
  - e. operation of basic AC and/or DC electrical circuits.
  - f. Ohm's law.
  - g. Kirchhoff's law(s).
  - h. procedures used in the measurement of voltage, current, and/or resistance.
  - i. determining power used in simple circuits.
  - j. troubleshooting, and/or repair or alteration using electrical circuit diagrams.
  - k. common types of defects that may occur in an installed battery system.
  - l. aircraft battery theory/operation.
  - m. servicing aircraft batteries.
2. Demonstrates skill to perform, as a minimum, one of the following elements—
  - A1.** Install wires in an electrical connector plug. (Level 3)
  - A2.** Measure voltage, resistance, current, or continuity in a circuit and determine the appropriateness of the measurement. (Level 3)
  - A3.** Calculate and measure aircraft electrical power requirements. (Level 2)
  - A4.** Calculate and measure total capacitance in an electrical circuit. (Level 2)
  - A5.** Read and interpret aircraft electrical circuit diagrams, including solid state devices and logic functions. (Level 3)

- A6.** Determine or measure for open electrical circuits. (Level 3)
- A7.** Interpret electrical system shorts. (Level 2)
- A8.** Measure electrical system voltages. (Level 3)
- A9.** Measure electrical system component resistance. (Level 3)
- A10.** Compute voltage of electrical circuits. (Level 3)
- A11.** Measure resistance, current, and/or voltage in an electrical circuit. (Level 3)
- A12.** Calculate and measure total inductance in an electrical circuit. (Level 2)
- A13.** Identify commonly used aircraft electrical symbols. (Level 2)
- A14.** Interpret aircraft electrical circuit diagrams. (Level 2)
- A15.** Service an aircraft battery. (Level 3)
- A16.** Inspect an aircraft battery. (Level 3)
- A17.** Remove and install an aircraft battery. (Level 3)
- A18.** Inspect battery compartments. (Level 3)
- A19.** Measure the voltage drop across a resistor. (Level 3)

## **B. Aircraft Drawings**

*Reference:* FAA-H-8083-30.

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. characteristics and/or uses of any of the various types of drawings/blueprints and/or system schematics.
  - b. the meaning of any of the lines and symbols commonly used in aircraft sketches/drawings/blueprints.
  - c. using charts or graphs.
  - d. troubleshooting an aircraft system or component(s) using drawings/blueprints and/or system schematics.
  - e. inspection of an aircraft system or component(s) using drawings/blueprints and/or system schematics.

- f. repair or alteration of an aircraft system or component(s) using drawings/blueprints and/or schematics.
  - g. use of drawings/blueprints in component fabrication.
  - h. terms used in conjunction with aircraft drawings/blueprints and/or system schematics.
2. Demonstrates skill to perform, as a minimum, one of the following elements—
- B1.** Identify lines and symbols. (Level 2)
  - B2.** Interpret dimensions. (Level 2)
  - B3.** Use installation diagrams and/or schematics. (Level 3)
  - B4.** Draw a sketch of a major repair or alteration. (Level 3)
  - B5.** Use blueprint information. (Level 3)
  - B6.** Use graphs and charts. (Level 3)
  - B7.** Identify blueprint changes. (Level 2)
  - B8.** Determine material requirements from a drawing. (Level 2)

### **C. Weight and Balance**

*Reference:* FAA-H-8083-30.

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
- a. the purpose(s) of weighing or reweighing.
  - b. general preparations for weighing, with emphasis on aircraft preparation and/or weighing area considerations.
  - c. the general location of airplane center of gravity (CG) in relation to the center of lift for most fixed main airfoils.
  - d. definitions of any of the following: datum, arm, moment (positive or negative), or moment index.
  - e. the meaning and/or application of any terms/nomenclature associated with weight and balance other than those mentioned in element “d” above, including but not limited to any of the following: tare, ballast, and residual fuel/oil.

- f. procedures for finding any of the following: datum, arm, moment (positive or negative), or moment index.
  - g. purpose and/or application of mean aerodynamic chord (MAC).
  - h. adverse loading considerations.
2. Demonstrates skill to perform, as a minimum, one of the following elements—
- C1.** Compute the empty weight and empty weight CG of an aircraft. (Level 3)
  - C2.** Check aircraft weighing scales for calibration. (Level 2)
  - C3.** Establish new weight and balance data for an aircraft after an equipment change. (Level 3)
  - C4.** Compute forward and aft loaded CG. (Level 3)
  - C5.** Prepare an aircraft for weighing. (Level 2)
  - C6.** Determine a location for permanent ballast to bring an aircraft back into balance. (Level 2)
  - C7.** Make a maintenance record entry for a weight and balance change. (Level 3)
  - C8.** Compute the amount of fuel needed for minimum fuel for weight and balance computations. (Level 3)
  - C9.** Weigh an aircraft. (Level 3)
  - C10.** Record scale readings from a weighed aircraft. (Level 2)
  - C11.** Compute weight and balance CG. for a helicopter. (Level 3)
  - C12.** Calculate the moment of an item of equipment. (Level 3)
  - C13.** Determine the distance between the forward and aft CG limits of a helicopter. (Level 3)
  - C14.** Identify tare items. (Level 3)
  - C15.** Locate weight and balance information. (Level 1)
  - C16.** Locate datum. (Level 1)
  - C17.** Locate the baggage compartment placarding requirements for an aircraft. (Level 1)
  - C18.** Revise an aircraft equipment list after equipment change. (Level 3)
  - C19.** Determine the weight and location of required ballast. (Level 2)

- C20.** Calculate the change needed to correct an overweight or out of balance condition. (Level 3)

***D. Fluid Lines and Fittings***

*References: AC 43.13-1B; FAA-H-8083-30.*

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. tubing materials.
  - b. tubing materials application.
  - c. tubing sizes.
  - d. flexible hose material.
  - e. flexible hose materials application.
  - f. flexible hose sizes.
  - g. flexible hose identification.
  - h. AN, MS, and/or AC plumbing fittings.
  - i. rigid line fabrication techniques/practices.
  - j. rigid line installation techniques/practices.
  - k. flexible hose fabrication techniques/practices.
  - l. flexible hose installation techniques/practices.
  
2. Demonstrates skill to perform, as a minimum, one of the following elements—
  - D1.** Make a replacement fluid line (aluminum or stainless steel). (Level 3)
  - D2.** Form a bead on tubing. (Level 3)
  - D3.** Fabricate a flare on tubing. (Level 3)
  - D4.** Fabricate and install fittings on a flexible hose. (Level 3)
  - D5.** Identify defects in metal tubing. (Level 2)
  - D6.** Repair a section of tubing. (Level 3)
  - D7.** Install and secure a fluid line with clamps. (Level 3)
  - D8.** Identify fluid and air lines that may be installed on aircraft. (Level 2)
  - D9.** Identify different flexible fluid lines. (Level 2)
  - D10.** Determine fluid line routing. (Level 3)
  - D11.** Fabricate and install metal tubing. (Level 3)
  - D12.** Identify aircraft fittings. (Level 2)

**D13.** Install a flareless-fitting-tube connection. (Level 3)

**E. Materials and Processes**

*Reference:* FAA-H-8083-30.

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. any of the metals commonly used in aircraft and their general application.
  - b. composites and other nonmetallic components and their general application.
  - c. heat-treated parts precautions, using DD or "icebox" rivets.
  - d. typical wood materials and fabric coverings.
  - e. visible characteristics of acceptable and/or unacceptable welds.
  - f. precision measurement and precision measurement tools.
  - g. using inspection techniques/methods, including any of the following: visual, metallic ring test, dye/fluorescent penetrant, magnetic particle, and/or eddy current.
  - h. identification, selection, installation, and/or use of aircraft hardware.
  - i. safe tying of components and/or hardware.
  - j. finding information about material types for specific application(s).
  
2. Demonstrates skill to perform, as a minimum, one of the following elements—
  - E1.** Perform a visual inspection of various welds. (Level 2)
  - E2.** Perform magnetic particle inspection of a steel part. (Level 2)
  - E3.** Identify different kinds of aircraft materials and hardware by using manufacturer's markings. (Level 2)
  - E4.** Select and install aircraft bolts. (Level 3)
  - E5.** Perform dye penetrant inspection of an aircraft part. (Level 2)

- E6.** Make precision measurements with an instrument that has a vernier micrometer scale. (Level 3)
- E7.** Check the alignment of a shaft. (Level 3)
- E8.** Safety wires a turnbuckle, using an approved method. (Level 3)
- E9.** Identify aircraft control cable. (Level 3)
- E10.** Fabricate a cable assembly using a swaged end fitting. (Level 3)
- E11.** Select the correct aluminum alloy for a structural repair. (Level 2)
- E12.** Identify rivets by physical characteristics. (Level 2)
- E13.** Determine suitability of materials for aircraft repairs. (Level 2)
- E14.** Determine if certain materials can be welded. (Level 2)
- E15.** Distinguish between heat-treated and non-heat-treated aluminum alloys. (Level 2)
- E16.** Determine required torque value of given item. (Level 3)
- E17.** Check for proper calibration of a micrometer. (Level 2)
- E18.** Identify proper installation procedures for a seal, backup ring, and/or gasket. (Level 2)

***F. Ground Operation and Servicing***

*Reference:* FAA-H-8083-30.

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. general procedures for towing aircraft.
  - b. Air Traffic Control (ATC) considerations/requirements for towing aircraft on or across active runways.
  - c. general procedures for starting, ground operating, and/or taxiing a reciprocating engine powered aircraft.
  - d. general procedures for starting, ground operating, and/or taxiing a turbine engine powered aircraft.
  - e. the hazards associated with starting, ground operating, and/or taxiing aircraft and procedures for

preventing, minimizing or otherwise managing any of them.

- f. procedures for refueling and/or defueling aircraft.
  - g. oxygen system safety practices/precautions.
  - h. characteristics of aviation gasoline and/or turbine fuels, including basic types and means of identification.
  - i. fuel contamination hazards.
  - j. fuel additives commonly used in the field.
  - k. use of automobile fuel in aircraft engines.
  - l. types/classes of fires, using proper fire extinguishers/methods.
2. Demonstrates skill to perform, as a minimum, one of the following elements—
- F1.** Start and operate an aircraft reciprocating engine. (Level 2)
  - F2.** Start and operate an aircraft turbine engine. (Level 2)
  - F3.** Prepare an aircraft for engine starting. (Level 2)
  - F4.** Tie down and secure an aircraft for outside storage. (Level 2)
  - F5.** Connect a towbar to an aircraft and prepare for towing. (Level 2)
  - F6.** Use appropriate hand signals for the movement of aircraft. (Level 2)
  - F7.** Show the procedure for clearing a liquid lock in a reciprocating engine. (Level 2)
  - F8.** Fuel an aircraft (may be simulated). (Level 2)
  - F9.** Determine the remaining amount of fuel in an aircraft. (Level 2)
  - F10.** Select an approved fuel for an aircraft. (Level 2)
  - F11.** Inspect an aircraft fuel system for water contamination. (Level 2)
  - F12.** List the procedures for extinguishing fires in an engine induction system during starting. (Level 2)
  - F13.** Connect an external auxiliary power unit. (Level 2)
  - F14.** Identify different grades of aviation gasoline. (Level 2)
  - F15.** Secure a helicopter for high-wind conditions. (Level 2)

**F16.** Secure a turbine-powered aircraft after engine shutdown. (Level 2)

**G. Cleaning and Corrosion Control**

*Reference:* FAA-H-8083-30.

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. aircraft preparation for washing, and general aircraft cleaning (washing) procedures.
  - b. post cleaning (washing) procedures.
  - c. corrosion theory.
  - d. types/effects of corrosion.
  - e. conditions that cause corrosion.
  - f. corrosion prone areas in aircraft.
  - g. corrosion preventive maintenance procedures.
  - h. inspection for and identification of corrosion in any of its various forms.
  - i. corrosion removal and treatment procedures.
  - j. use of Material Safety Data Sheets (MSDS).
  
2. Demonstrates skill to perform, as a minimum, one of the following elements—
  - G1.** Clean aluminum and/or magnesium parts with caustic cleaners. (Level 3)
  - G2.** Identify approved cleaning agents. (Level 2)
  - G3.** Clean assigned area of aircraft. (Level 3)
  - G4.** Identify different types of corrosion. (Level 2)
  - G5.** Remove corrosion from an aluminum alloy. (Level 3)
  - G6.** Apply protective coating to a metallic material. (Level 3)
  - G7.** Remove iron oxide. (Level 3)
  - G8.** Remove grease or oil from an appropriate part or component. (Level 3)
  - G9.** Mechanically remove paint from a corroded aircraft part and determine extent of corrosion. (Level 3)
  - G10.** Locate procedures for preparing aircraft parts for extended storage. (Level 1)

- G11.** Clean and protect plastics and/or composite materials. (Level 3)
- G12.** Apply a protective coating to a metal surface. (Level 3)

## **H. Mathematics**

*Reference: FAA-H-8083-30.*

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. areas of various geometrical shapes.
  - b. volumes of various geometrical shapes.
  - c. definitions/descriptions of geometrical terms, including but not limited to any of the following: polygon, pi, diameter, radius, and hypotenuse.
  - d. ratio problems, including examples of where or how they may be used in relation to aircraft maintenance or system(s) operation.
  - e. proportion problems, including examples of where or how they may be used in relation to aircraft maintenance or system(s) operation.
  - f. percentage problems, including examples of where or how they may be used in relation to aircraft maintenance or system(s) operation.
  - g. algebraic operations, including examples of where or how they may be used in relation to aircraft maintenance.
  - h. conditions or areas where metric conversion may be necessary.
2. Demonstrates skill to perform, as a minimum, one of the following elements—
  - H1.** Determine the square root of given numbers. (Level 2)
  - H2.** Locate the instructions for determining square root. (Level 1)
  - H3.** Locate formulas to determine area and/or volume. (Level 1)
  - H4.** Compute the volume of a cylinder. (Level 3)
  - H5.** Compute the area of a wing. (Level 3)

- H6.** Calculate the volume of a baggage compartment. (Level 3)
- H7.** Convert fractional numbers to decimal equivalents. (Level 3)
- H8.** Compare two numerical values using ratios. (Level 3)
- H9.** Compute compression ratio. (Level 3)
- H10.** Add, subtract, multiply, and/or divide positive and negative numbers. (Level 3)
- H11.** Compute the least common denominator of two or more fractions. (Level 3)
- H12.** Compute the torque value change when using a torque wrench with an extension. (Level 3)

**I. Maintenance Forms and Records**

*References: 14 CFR parts 1, 43, and 91; FAA-H-8083-30.*

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. writing descriptions of work performed and approval for return to service after minor repairs or minor alterations.
  - b. the content, form, and disposition of aircraft maintenance records reflecting approval for return to service after a 100-hour inspection.
  - c. the content, form, and disposition of aircraft maintenance records reflecting disapproval for return to service after a 100-hour inspection.
  - d. the recording content, form, and disposition requirements for certificated aviation mechanics (without an Inspection Authorization) that perform major repairs and/or major alterations.
  - e. the inoperative instruments or equipment provisions of 14 CFR part 91.
  - f. the definition/explanation of any of the terms used in relation to aircraft maintenance, such as overhaul(ed), rebuilt, time in service, maintenance,

preventive maintenance, inspection, major alteration, major repair, minor alteration, and minor repair.

2. Demonstrates skill to perform, as a minimum, one of the following elements—
  11. Inspect an aircraft and prepare a condition report. (Level 3)
  12. Make a log book entry for a repair or alteration. (Level 3)
  13. Write a 100-hour inspection aircraft record entry. (Level 3)
  14. Write an AD compliance aircraft record entry. (Level 3)
  15. Complete an FAA Form 337. (Level 3)
  16. Determine aircraft airworthiness by examining maintenance record entries. (Level 3)
  17. Examine a FAA Form 337 for potential errors. (Level 3)
  18. Prepare a master AD list for a specific airframe, engine and/or propeller and determine applicability by make, model, and serial number. (Level 3)
  19. Write an annual inspection aircraft record entry. (Level 3)
  110. Make a maintenance record entry for a propeller minor repair that was performed by an individual that is being supervised by an appropriately rated mechanic that will be approving the repair for return to service. (Level 3)
  111. Write a 100-hour inspection aircraft maintenance record entry for an aircraft not approved for return to service. (Level 3)
  112. Write a maintenance record entry for compliance with manufacturer's Service Bulletin, Service Instruction, or Service Letter. (Level 3)
  113. Create a current equipment list for an aircraft, listing all equipment installed. (Level 3)
  114. Make the required maintenance record entries for approval for return to service after a major repair or major alteration. (Level 3)
  115. Complete the proper part or component tag for a part of known condition. (Level 3)

- 116. Make a maintenance record entry for the installation of a serviceable part. (Level 3)
- 117. Prepare a list of discrepancies and unairworthy items following a 100-hour inspection. (Level 3)

## **J. Basic Physics**

*Reference: FAA-H-8083-30.*

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. any of the simple machines, how they function, and/or how mechanical advantage is applied in one or more specific examples.
  - b. sound resonance, how it can be a hazard to aircraft, and how sound may be used to aid in inspecting aircraft.
  - c. the relationship between fluid density and specific gravity.
  - d. the characteristic of specific gravity of fluids and how it may be applied to aircraft maintenance.
  - e. the general effects of pressure and temperature on gases and liquids and how the qualities of compressibility and/or incompressibility of gases and liquids are generally applied to aircraft systems.
  - f. density altitude and the effects of temperature, and/or pressure, and/or humidity on aircraft and/or engine performance.
  - g. heat, how it is manifested in matter, and how heat transfer is accomplished through conduction, and/or convection, and/or radiation.
  - h. coefficient of linear (thermal) expansion as related to aircraft materials.
  - i. aircraft structures and theory of flight/physics of lift.
  - j. the operation of aerodynamic factors in the flight of airplanes and/or helicopters.
  - k. the relationship between force, area, and pressure.
  - l. the five forces or stresses affecting aircraft structures.
  - m. the two forms of energy and how they apply to aircraft and/or aircraft systems.

2. Demonstrates skill to perform, as a minimum, one of the following elements—
  - J1. Convert temperature from one scale to another, for example F° to C° or from C° to F°. (Level 2)
  - J2. Determine density altitude. (Level 2)
  - J3. Determine pressure altitude. (Level 2)
  - J4. Calculate force, area, or pressure in a specific application. (Level 3)
  - J5. Demonstrate the mechanical advantage of various types of levers. (Level 3)
  - J6. Design an inclined plane on paper, indicating the mechanical advantage. (Level 2)
  - J7. Identify changes in pressure and velocity as a fluid passes through a venturi. (Level 2)
  - J8. Design a mechanical pulley system. (Level 2)
  - J9. Determine density of a solid object with a specific gravity of less than one. (Level 2)
  - J10. Determine horsepower for a given weight, distance, and time. (Level 2)
  - J11. Calculate expansion due to temperature change. (Level 3)

### **K. Maintenance Publications**

*Reference:* FAA-H-8083-30.

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. how a mechanic makes use of Type Certificate Data Sheets (TCDS) and/or Aircraft Specifications in conducting maintenance or inspections.
  - b. aircraft maintenance manuals and associated publications including any of the following types of publications and how they are used: service bulletin, maintenance manual, overhaul manual, structural repair manual, or instructions for continued airworthiness.
  - c. the requirements of 14 CFR part 43, sections 43.13, 43.15, or 43.16 in the performance of maintenance.

- d. Airworthiness Directives (AD), including purpose and/or AD categories and/or ADs issued to other than aircraft.
  - e. in what form individuals may receive FAA published AD summaries and/or how they may be obtained.
  - f. the AD identification numbering system.
  - g. FAA Advisory Circulars (ACs) including any of the following: significance of the AC numbering system, one or more examples of ACs issued to provide information in designated subject areas, and one or more examples of ACs issued to show a method acceptable to the FAA complying with the CFRs.
  - h. the intent or function of the Aviation Maintenance Alerts.
  - i. the Air Transport Association (ATA) Specification 100.
2. Demonstrates skill to perform, as a minimum, one of the following elements—
- K1.** Locate applicable FAA aircraft specifications and/or FAA type certificate data sheet for assigned aircraft or component. (Level 1)
  - K2.** Locate the CG range of assigned aircraft using aircraft specifications and type certificate data sheets. (Level 1)
  - K3.** Locate aircraft flight control travel limits. (Level 1)
  - K4.** Locate manufacturer's service instructions. (Level 1)
  - K5.** Determine applicability of an AD. (Level 3)
  - K6.** Inspect aircraft for compliance with applicable ADs. (Level 3)
  - K7.** Check a technical standard order (TSO) part for the proper TSO marking. (Level 3)
  - K8.** Use a manufacturer's illustrated parts catalog to locate a specific part number. (Level 3)
  - K9.** Locate supplemental type certificates (STCs) applicable to a specific aircraft. (Level 2)
  - K10.** Determine the conformity of aircraft instrument range markings and/or placarding. (Level 3)
  - K11.** Determine approved tires for installation on a given aircraft. (Level 3)

- K12.** Determine the ATA code for a specific item. (Level 3)
- K13.** Determine maximum allowable weight of a specific aircraft. (Level 3)

**L. Aviation Mechanic Privileges and Limitations**

*References: 14 CFR part 65; AC 65-30A; FAA-H-8083-30.*

**Objective:** To determine that the applicant:

1. Exhibits knowledge in, as a minimum, two of the following elements—
  - a. required evidence of eligibility experience satisfactory to the Administrator.
  - b. length of experience required for eligibility.
  - c. practical experience required for eligibility.
  - d. the privileges of a mechanic in relation to 100-hour and annual inspections.
  - e. change of address reporting requirements.
  - f. minimum age requirements.
  - g. recent experience requirements to exercise privileges of a certificate.
  - h. who is authorized to perform maintenance/inspection, preventive maintenance, rebuilding, or alteration and/or approve for return to service afterwards.
  - i. causes for revocation or suspension.
  - j. criteria for determining major and minor repair or alteration.
2. Demonstrates skill to perform, as a minimum, one of the following elements—
  - L1.** Determine if a given repair is major or minor. (Level 3)
  - L2.** Determine if a given alteration is major or minor. (Level 3)
  - L3.** Locate address change notification procedures. (Level 1)
  - L4.** List airframe mechanic privileges and limitations. (Level 2)
  - L5.** List powerplant mechanic privileges and limitations. (Level 2)

## Change 1 (4/27/2015)

- L6. Locate mechanic privileges and limitations. (Level 1)
- L7. List the authorities to which an A&P mechanic must show his/her A&P certificate on demand. (Level 2)
- L8. Locate the 14 CFR reference that gives the privileges that a certified mechanic airframe or powerplant have. (Level 1)
- L9. List types of inspections that a certificated mechanic with airframe and powerplant ratings may perform and the 14 CFR reference for each one. (Level 2)
- L10. Determine references used in performing "preventive maintenance". (Level 2)
- L11. List the maintenance functions that a certificated mechanic may **not** supervise. (Level 2)

***M. [Reserved]***