

2025 AIRCRAFT MAINTENANCE

Program Standards

CONTENT STANDARD 1.0: PROFESSIONAL ORGANIZATIONS AND LEADERSHIP

Performance Standard 1.1: Student Leadership in Career Technical Student Organizations (CTSO) and Professional Associations

- 1.1.1 Explore the role of professional organizations and/or associations in the Aircraft Maintenance Industry.
- 1.1.2 Define the value, role, and opportunities provided through career technical student organizations.
- 1.1.3 Engage in career exploration and leadership development.

CONTENT STANDARD 2.0: GENERAL

Performance Standard 2.1: Fundamentals of Electricity and Electronics

- 2.1.1 Perform circuit continuity test.
- 2.1.2 Measure voltage in a circuit.
- 2.1.3 Measure current in a circuit.
- 2.1.4 Measure resistance in a circuit.
- 2.1.5 Test a switch or relay.
- 2.1.6 Test a fuse or circuit breaker.
- 2.1.7 Interpret aircraft electrical circuit diagrams and symbols (e.g., grounds, shields, resistors, capacitors, fuses, circuit breakers, batteries, diodes, transistors, integrated circuits), including those for solid state devices and logic functions.
- 2.1.8 Troubleshoot a circuit (i.e., test for short-circuit and open-circuit conditions).
- 2.1.9 Measure voltage drop across a resistor.

Performance Standard 2.2: Aircraft Drawings

- 2.2.1 Draw a sketch of a repair or alteration.
- 2.2.2 Identify the meaning of lines and symbols used in an aircraft drawing.
- 2.2.3 Interpret dimensions used in an aircraft drawing.
- 2.2.4 Identify changes made to an aircraft drawing.
- 2.2.5 Determine material requirements from an aircraft drawing.
- 2.2.6 Interpret graphs and charts used in aircraft drawings.

Performance Standard 2.3: Weight and Balance

- 2.3.1 Describe the purpose of weighing an aircraft.
- 2.3.2 Describe proper ballast placement.
- 2.3.3 Describe the procedures for weighing an aircraft.
- 2.3.4 Calculate ballast weight shift and required weight location.
- 2.3.5 Check aircraft weighing scales for calibration.
- 2.3.6 Calculate weight and balance for an aircraft after an equipment change.
- 2.3.7 Compute forward and aft loaded Center of Gravity (CG) limit.
- 2.3.8 Create a maintenance record for a weight and balance change.
- 2.3.9 Compute the empty weight and empty weight CG of an aircraft.
- 2.3.10 Calculate the moment of an item of equipment.
- 2.3.11 Identify tare items.
- 2.3.12 Locate weight and balance information, datum, placarding, and limitation requirements for an aircraft.
- 2.3.13 Revise an aircraft equipment list after equipment change.
- 2.3.14 Calculate the change needed to correct an out-of-balance condition.

- 2.3.15 Determine an aircraft's CG range, using aircraft specifications, Type Certificate Data Sheets (TCDSs), and aircraft listings.
- 2.3.16 Calculate a weight change and complete required records.

Performance Standard 2.4: Fluid Lines and Fittings

- 2.4.1 Fabricate a rigid line with a flare and a bend.
- 2.4.2 Describe installation of an aircraft rigid line.
- 2.4.3 Describe installation of an aircraft flexible hose.
- 2.4.4 Fabricate a flexible hose.
- 2.4.5 Fabricate a flareless-fitting-tube connection.

Performance Standard 2.5: Aircraft Materials, Hardware, and Processes

- 2.5.1 Install safety wire on nuts, bolts, and turnbuckles.
- 2.5.2 Inspect and check welds.
- 2.5.3 Determine required aircraft bolts needed for a repair or installation.
- 2.5.4 Determine alloys used in structural repair (e.g., heat-treated and non-heat-treated aluminum, steel).
- 2.5.5 Identify rivets by physical characteristics.
- 2.5.6 Check for proper calibration of a micrometer.

Performance Standard 2.6: Ground Operations and Servicing

- 2.6.1 Describe how to prepare an aircraft for towing.
- 2.6.2 Move an aircraft, using hand signals.
- 2.6.3 Describe inspection procedures for an aircraft fuel system for water and foreign object debris (FOD) contamination.
- 2.6.4 Identify different grades of aviation fuel (e.g., car gas, lower-lead fuel, jet fuel).
- 2.6.5 Describe procedure for selecting fuels and fueling an aircraft.
- 2.6.6 Summarize the steps to start up or shut down an aircraft reciprocating and turbine engine.
- 2.6.7 Describe the procedures for extinguishing fires in an engine induction system.

Performance Standard 2.7: Cleaning and Corrosion Control

- 2.7.1 Describe procedures for conducting corrosion inspection.
- 2.7.2 Determine corrosion prevention method and cleaning materials, based on corrosion.
- 2.7.3 Apply corrosion prevention/coating materials.
- 2.7.4 Inspect defects in finishes from a part.
- 2.7.5 Identify areas in which aircraft are likely to corrode.
- 2.7.6 Identify procedures to clean and protect plastics.
- 2.7.7 Determine location and size requirements for aircraft registration numbers.
- 2.7.8 Describe procedures for preparing composite and metal surfaces for painting (e.g., 10, 11, 12, 13).
- 2.7.9 Describe finishing materials and appropriate thinners.
- 2.7.10 Identify types of protective finishes (e.g., urethane, enamel, primer).

Performance Standard 2.8: Mathematics

- 2.8.1 Compute the volume of a cylinder.
- 2.8.2 Compute the area of a proposed structural repair.
- 2.8.3 Calculate the volume of a shape, such as a baggage compartment or fuel tank.
- 2.8.4 Convert between fractional and decimal numbers.
- 2.8.5 Compare two numerical values using ratios proportions.
- 2.8.6 Compute the torque value when converting from inch-pounds to foot-pounds and from foot-pounds to inch-pounds.

Performance Standard 2.9: Regulations, Maintenance Forms, Records, and Publications

- 2.9.1 Describe privileges and limitations of a mechanic certificate.
- 2.9.2 Describe the process for recording an entry for approval for return to service after maintenance and alterations.

- 2.9.3 Describe the process for recording entry for approval for return to service after inspection.
- 2.9.4 Identify agency publications and guidance materials, including aircraft specifications, TCDSs, advisory circulars (ACs), and airworthiness directives (ADs).
- 2.9.5 Identify manufacturer publications, including maintenance manuals, service bulletins, maintenance alerts, and master minimum equipment lists.
- 2.9.6 Identify Federal Aviation Administration (FAA) databases and resources available, including TCDSs and supplemental type certificates.
- 2.9.7 Describe compliance requirements for manufacturer-specified maintenance and inspection intervals.
- 2.9.8 Identify and define alert, caution, and warning indications, and notes that are used in maintenance and operating manuals.
- 2.9.9 Describe methods used to establish the serial number effectiveness of an item (i.e., suitability of parts for repairs).
- 2.9.10 Complete an FAA Form 337 for a major repair or alteration.
- 2.9.11 Interpret an FAA Form 337 for accuracy.
- 2.9.12 Determine an aircraft's inspection status by reviewing the aircraft's maintenance records.
- 2.9.13 Complete an aircraft maintenance record entry for the compliance of a reoccurring AD for a specific airframe, aircraft engine, appliance, or propeller.
- 2.9.14 Locate applicable FAA aircraft specifications and FAA TCDS for an aircraft or component.
- 2.9.15 Complete an aircraft maintenance record entry for return to service.
- 2.9.16 Determine applicability of an AD.
- 2.9.17 Check a Technical Standard Order (TSO) or part manufacturing authorization for the proper markings.
- 2.9.18 Locate a specific part number and applicability, using a manufacturer's illustrated parts catalog.
- 2.9.19 Locate supplemental type certificates applicable to a specific aircraft.
- 2.9.20 Determine approved replacement parts for installation on a given aircraft.
- 2.9.21 Determine maximum allowable weight of a specific aircraft.
- 2.9.22 Complete a 100-hour inspection aircraft maintenance record entry.

Performance Standard 2.10: Physics for Aviation

- 2.10.1 Describe the areas of physics that should be foundational to aircraft repair technicians (e.g., heat and pressure; Bernoulli's principle; Newton's law of motion; gas law and fluid mechanics; theory of flight [aerodynamics]; standard atmosphere and factors affecting atmospheric conditions; primary and secondary aircraft flight controls; additional aerodynamic devices including vortex generators, wing fences, and stall strips; relationship between temperature, density, weight, and volume; force, area, or pressure).
- 2.10.2 Convert temperature units (e.g., Celsius to Fahrenheit, metric to standard).
- 2.10.3 Determine density altitude.
- 2.10.4 Determine pressure altitude.
- 2.10.5 Calculate force, area, or pressure in a specific application.
- 2.10.6 Describe mechanical advantage of various types of levers.
- 2.10.7 Describe mechanical advantages and applications.
- 2.10.8 Identify changes in pressure and velocity as fluid passes through a venturi.

Performance Standard 2.11: Inspection Concepts and Techniques

- 2.11.1 Identify aircraft inspection programs (e.g., progressive, 100-hour, annual).
- 2.11.2 Inspect equipment and repairs, using precision measuring instruments (e.g., micrometers, calipers, gauges).
- 2.11.3 Calibrate precision measuring equipment.
- 2.11.4 Select inspection techniques appropriate to repairs and maintenance.

Performance Standard 2.12: Human Factors

- 2.12.1 Describe safety culture and organizational factors affecting safety.
- 2.12.2 Describe human error factors.
- 2.12.3 Investigate historic events of aircraft accidents (e.g., dirty dozen, magnificent seven).
- 2.12.4 Locate information regarding human factor errors.

CONTENT STANDARD 3.0: AIRFRAME

Performance Standard 3.1: Repairs

- 3.1.1 Describe basic procedures for airframe repairs for metallic structures, based on FAA standards for acceptable practices and techniques.
- 3.1.2 Describe basic procedures for airframe repairs for non-metallic structures, based on FAA standards for acceptable practices and techniques.
- 3.1.3 Describe basic procedures for airframe repairs for flight controls, based on FAA standards for acceptable practices and techniques.
- 3.1.4 Describe basic procedures for airframe repairs for aircraft instrument systems, based on FAA standards for acceptable practices and techniques.
- 3.1.5 Describe basic procedures for airframe repairs for aircraft fuel systems, based on FAA standards for acceptable practices and techniques.
- 3.1.6 Describe basic procedures for airframe repairs for aircraft electrical systems, based on FAA standards for acceptable practices and techniques.
- 3.1.7 Describe basic procedures for airframe repairs for rotocraft fundamentals, based on FAA standards for acceptable practices and techniques.

CONTENT STANDARD 4.0: POWERPLANT

Performance Standard 4.1: Engines, Fuel, Induction, Cooling, Exhaust, and Propellers

- 4.1.1 Describe reciprocating engine theory, components, and controls, according to FAA standards.
- 4.1.2 Describe turbine engine theory, types, components, and common repairs, according to FAA standards.
- 4.1.3 Describe a 100-hour inspection of an engine in accordance with part 43, FAA standards.
- 4.1.4 Describe engine instrument systems and operational parameters (e.g., temperatures, pressures), according to FAA standards.
- 4.1.5 Identify fire detection sensing units and the schematics of a fire extinguisher discharge circuit, according to FAA standards.
- 4.1.6 Describe the components of engine electrical wiring, switches, and protective devices and related troubleshooting procedures, according to FAA standards.
- 4.1.7 Describe engine lubrication system oil types, components, common engine oil pressure malfunctions and indications, and replacement procedures, according to FAA standards.
- 4.1.8 Describe procedures for troubleshooting and repairing a starting and ignition system, according to FAA standards.
- 4.1.9 Describe engine fuel systems and fuel metering systems operation, components, and common repairs, according to FAA standards.
- 4.1.10 Describe reciprocating engine induction and cooling systems operation, components, and common repairs, according to FAA standards.
- 4.1.11 Describe steps in a turbine engine induction and cooling system inspection, according to FAA standards.
- 4.1.12 Describe engine exhaust and reverser system types and components, according to FAA standards.
- 4.1.13 Describe procedures to install, repair, and inspect propellers, according to FAA standards.



IDCTE Document Control Information

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