**PURPOSE:** To inform the Office of Apprenticeship Training, Employer and Labor Services (OATELS), Bureau of Apprenticeship and Training (BAT) Staff of a revision to an apprenticeable occupation:

- **Airframe and Powerplant Mechanic**
  - RAIS Code: 0005
  - O*NET Code: 49-3011.01
  - Training Term: 5000 hours
  - Type of Training: Time - based

**BACKGROUND:** The United Services Military Apprenticeship Program (USMAP) initiated the apprenticeability request for this occupation. This occupation has been previously recognized as apprenticeable with a prescribed training term of 8000 hours.

Airframe and Powerplant Mechanic with a 5000-hour training term will be added to the list of occupations recognized as apprenticeable by the Office of Apprenticeship Training, Employer and Labor Services when the list is reissued.

**ACTION:** BAT staff should review and retain a copy of this bulletin, including all attachments, as a source for developing apprenticeship standards and/or providing technical assistance.

Attachment
DESCRIPTION: Services, repairs, and overhauls aircraft and aircraft engines to ensure airworthiness: Repairs, replaces, and rebuilds aircraft structures, such as wings and fuselage, and functional components including, rigging, surface controls, and plumbing and hydraulic units, using hand-tools, power tools, machine machines, and equipment such as shears, sheet metal brakes, welding equipment, rivet gun, and drills. Reads and interprets manufacturers’ and airline’s maintenance manuals, service bulletins, and other specifications to determine feasibility and method of repairing or replacing malfunctioning or damaged components. Examines engines for cracked cylinders and oil leaks, and listens to operating engine to detect and diagnose malfunctions, such as sticking or burned valves. Inspects turbine blades to detect cracks or breaks. Tests engine operation, using testing equipment such as ignition analyzer, compression checker, distributor timer, and ammeter, to locate source of malfunction. Replaces or repairs worn or damaged components, such as carburetors, alternators, and magnetos, using hand tools, gauges, and testing equipment. Removes engine from aircraft, using hoist or forklift truck. Disassembles and inspects parts for wear, warping, or other defects. Repairs or replaces defective engine parts and reassembles and installs engine in aircraft. Adjusts, repairs, or replaces electrical wiring system and aircraft accessories. Performs miscellaneous duties to service aircraft, including flushing crankcase, cleaning screens, greasing moving parts, and checking brakes.

SKILL AREA HOURS
A. GENERAL TASKS 1100
1. BASIC ELECTRICITY (100)
   Calculate and measure capacitance and inductance; calculate and measure electrical power; measure voltage, current, resistance, and continuity; determine the relationship of voltage, current, and resistance in electrical circuits; read and interpret aircraft electrical circuit diagrams, including solid state devices and logic functions; inspect and service batteries.

2. AIRCRAFT DRAWINGS (100)
   Use aircraft drawings, symbols, and system schematics; draw sketches of repairs and alterations; use blueprint information; use graphs and charts.

3. WEIGHT AND BALANCE (20)
   Weigh aircraft; perform complete weight-and-balance check and record data.

4. FLUID LINES AND FITTINGS (25)
   Fabricate and install rigid and flexible fluid lines and fittings.

5. MATERIALS AND PROCESSES (50)
   Identify and select appropriate non-destructive testing methods; perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections; perform basic heat-treating processes; identify and select aircraft hardware and materials; inspect and check welds; perform precision measurements.

6. GROUND OPERATION AND SERVICING (150)
   Start, ground operate, move, service, and secure aircraft and identify typical ground operation hazards; identify and select fuels.
7. **CLEANING AND CORROSION CONTROL (145)**
   Identify and select cleaning materials, inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning.

8. **MATHEMATICS (75)**
   Extract roots and raise numbers to a given power; determine areas and volumes of various geometrical shapes; solve ratio, proportion, and percentage problems; perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.

9. **MAINTENANCE FORMS AND RECORDS (125)**
   Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records; complete required maintenance forms, records, and inspection reports.

10. **BASIC PHYSICS (70)**
    Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight.

11. **MAINTENANCE PUBLICATIONS (70)**
    Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturer’s aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory materials, read technical data.

12. **MECHANIC PRIVILEGES AND LIMITATIONS (70)**
    Exercise mechanic privileges within the limitations prescribed by FAR 65.

13. **AVIATION SAFETY (100)**
    Fuels, lubricants, or hydraulic fluids; flammable cements, rosins, sealants, paints and thinners; fluids under pressure; compressed gasses, including oxygen; batteries; aviation ordnance and pyrotechnics; electrical and electronic circuits; operating radio transmitters and radar systems; hazardous noise sources.

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**HOURS**

**B. AIRFRAME STRUCTURES 800**

1. **AIRCRAFT COVERING (100)**
   Select and apply fabric and fiberglass covering materials; inspect, test, and repair fabric and fiberglass.

2. **AIRCRAFT FINISHES (100)**
   Apply trim, letters, and touchup paint; identify and select aircraft finishing materials; apply finishing materials; inspect finishes and identify defects.

3. **SHEET METAL AND NON-METALLIC STRUCTURES (200)**
   Select, install, and remove special fasteners for metallic, bonded, and composite structures; inspect bonded structures; inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures; inspect, check, service, and repair windows, doors, and interior furnishings; inspect and repair sheet-metal structures; install conventional rivets, form, lay out, and bend sheet metal.
4. **WELDING (150)**
   Weld magnesium and titanium; solder stainless steel; fabricate tubular structures; solder, braze gas-and arc-weld steel, weld aluminum and stainless steel.

5. **ASSEMBLY AND RIGGING (150)**
   Rig rotary-wing aircraft; rig fixed-wing aircraft; check alignment of structures; assemble aircraft components, including flight control surfaces; balance, rig and inspect movable primary and secondary flight control surfaces; jack aircraft.

6. **AIRFRAME INSPECTION (100)**
   Perform airframe conformity and airworthiness inspections.

C. **AIRFRAME SYSTEMS AND COMPONENTS**

1. **AIRCRAFT LANDING GEAR SYSTEMS (100)**
   Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems.

2. **HYDRAULIC AND PNEUMATIC POWER SYSTEMS (100)**
   Repair hydraulic and pneumatic power system components; identify and select hydraulic fluids; inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power systems.

3. **CABIN ATMOSPHERE CONTROL SYSTEMS (100)**
   Inspect, check, troubleshoot, service, and repair heating, cooling, air conditioning, pressurization systems, and air cycle machine; inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, and pressurization systems; inspect, check, troubleshoot, service and repair oxygen systems.

4. **AIRCRAFT INSTRUMENT SYSTEMS (150)**
   Inspect, check, service, troubleshoot, and repair electronic flight instrument systems and both mechanical and electrical heading, speed, altitude, temperature, pressure, and position indication systems to include the use of built-in test equipment; install instruments and perform a static pressure systems leak test.

5. **COMMUNICATION AND NAVIGATION SYSTEMS (150)**
   Inspect, check, and troubleshoot autopilot, servos and approach coupling systems; inspect, check, and service aircraft electronic communication and navigation systems, including VHF, passenger address interphones and static discharge devices, aircraft VOR, ILS, LORAN, Radar beacon transponders, flight management computers and GPWS; inspect and repair antenna and electronic equipment installations.
6. **AIRCRAFT FUEL SYSTEMS (100)**
   Check and service fuel dump systems; perform fuel management, transfer and defueling; inspect, check, and repair pressure-fueling systems; repair aircraft fuel system components; inspect and repair fluid quantity indicating systems; troubleshoot, service, and repair fluid pressure and temperature warning systems; inspect, check, service, troubleshoot, and repair aircraft fuel systems.

7. **AIRCRAFT ELECTRICAL SYSTEMS (150)**
   Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacture’s specifications; and repair pins and sockets of aircraft connectors; install, check, and service airframe electrical wiring, controls, switches, indicators and protective devices; inspect, check, troubleshoot, service, and repair alternating and direct current electrical systems; inspect, check, and troubleshoot constant speed and integrated speed drive generators.

8. **POSITION AND WARNING SYSTEMS (125)**
   Inspect, check, and service speed and configuration warning systems, electrical brake controls, and anti-skid systems; inspect, check, troubleshoot, and service landing gear position indicating and warning systems.

9. **ICE AND RAIN CONTROL SYSTEMS (125)**
   Inspect, check, troubleshoot, service and repair airframe ice and rain control systems.

10. **FIRE PROTECTION SYSTEMS (100)**
    Inspect, check, and service smoke and carbon monoxide detection systems; inspect, check, troubleshoot, and repair aircraft fire detection and extinguishing systems.

D. **POWERPLANT THEORY AND MAINTENANCE**

1. **RECIPROCATING ENGINES (100)**
   Inspect and repair a radial engine; overhaul reciprocating engine; inspect, check, service, and repair reciprocating engines and engine installations; install, troubleshoot, and remove reciprocating engine.

2. **TURBINE ENGINES (250)**
   Overhaul turbine engine; inspect, check, service, and repair turbine engines and turbine engine installations; install, troubleshoot, and remove turbine engines.

3. **ENGINE INSPECTION (250)**
   Perform powerplant conformity and airworthiness inspections.

E. **POWERPLANT SYSTEMS AND COMPONENTS**

1. **ENGINE INSTRUMENT SYSTEMS (100)**
   Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems; inspect, check, service, troubleshoot, and repair electrical and mechanical engine temperature, pressure, and R.P.M indicating systems.

2. **ENGINE FIRE PROTECTION SYSTEMS (100)**
   Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems.
3. **ENGINE ELECTRICAL SYSTEMS (100)**  
   Repair engine electrical system components; install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices.

4. **LUBRICATING SYSTEMS (100)**  
   Identify and select lubricants; repair engine lubrication system components; inspect, check, service, troubleshoot, and repair engine lubrication systems.

5. **IGNITION AND STARTING SYSTEMS (100)**  
   Overhaul magneto and ignition harness; inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components; inspect, service, troubleshoot, and repair turbine engine electrical starting systems; inspect, service, and troubleshoot turbine engine pneumatic starting systems.

6. **FUEL METERING SYSTEM (100)**  
   Troubleshoot and adjust turbine engine fuel metering systems and electronic engine fuel controls; overhaul carburetor; repair engine fuel metering system components; inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.

7. **ENGINE FUEL SYSTEMS (100)**  
   Repair engine fuel system components; inspect, check, service, troubleshoot, and repair engine fuel systems.

8. **INDUCTION AND ENGINE AIRFLOW SYSTEMS (100)**  
   Inspect, check, troubleshoot, service, and repair engine ice and rain control systems; inspect, check, troubleshoot, service, and repair heat exchangers, supercharger and turbine engine airflow and temperature control systems; inspect, check, service, and repair carburetor air intake and induction manifolds.

9. **ENGINE COOLING SYSTEMS (100)**  
   Repair engine cooling system components; inspect, check, troubleshoot, service, and repair engine-cooling systems.

10. **ENGINE EXHAUST SYSTEM COMPONENTS (100)**  
    Repair engine exhaust system components; inspect, check, troubleshoot, service, and repair engine exhaust systems; troubleshoot and repair engine thrust reverser systems and related components.

11. **PROPELLERS (100)**  
    Inspect, check, service, and repair propeller synchronizing and ice control systems; identify and select propeller lubricants; balance propellers; repair propeller control systems components; inspect, check, service, and repair fixed-pitch, constant-speed, and feathering propellers and propeller governing systems; install, troubleshoot, and remove propellers; repair aluminum alloy propeller blades.
12. **UNDUCTED FANS (100)**
   Inspect and troubleshoot unducted fan systems and components.

13. **AUXILIARY POWER UNITS (100)**
   Inspect, check, service and troubleshoot turbine-driven auxiliary power units.

   **GENERAL (1100)**
   **POWERPLANTS (1900)**

**TOTAL HOURS** 5000
AIRFRAME AND POWERPLANT MECHANIC
RAIS Code: 0005  O*NET Code: 49-3011.01

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**TOTAL HOURS**

695