

Overview

This standard identifies the competences you need to carry out overhauling activities on components of aircraft indication and gauging equipment in accordance with approved procedures. The equipment to be overhauled will have been removed from the aircraft and the overhauling activities may take place in a workshop or hangar.

It covers equipment used in both fixed wing and rotary winged aircraft and covers a range of indication and gauging equipment associated with powerplant and auxiliary power; engine fuel and lubrication; flying controls; fluid power; wheels, brakes and steering; transmission systems; aircraft fuel systems; environmental control systems; ice and rain protection and airframe systems and components, as applicable to the aircraft type. The overhauling activities will include carrying out all necessary safety checks, dismantling the equipment to unit or component level, inspecting and checking all components for damage and wear, replacing all 'lived' items and worn/faulty components or units, reassembling the equipment and carrying out all necessary tests/checks.

Your responsibilities will require you to comply with organisational policy and procedures for the overhauling activities undertaken, and to report any problems with the overhauling activities, or with the tools and equipment used that you cannot personally resolve or that is outside your permitted authority, to the relevant people. You must ensure that all tools, equipment and materials used in the overhauling activities are removed from the work area, and that all necessary job/task documentation is completed accurately and legibly. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work and will provide an informed approach to applying appropriate overhauling procedures to aircraft indication and gauging equipment. You will understand the dismantling and reassembly methods and procedures used, and their application. You will know how the equipment functions, the common faults encountered, the purpose of the individual components and associated defects, in adequate depth to provide a sound basis for carrying out the overhauling activities and ensuring that the overhauled equipment meets the required specification.

You will understand the safety precautions required when carrying out the overhauling

activities. You will be required to demonstrate safe working practices throughout and will understand your responsibility for taking the necessary safeguards to protect yourself and others in the workplace.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the relevant overhauling schedules to carry out the required work
3. establish the components to be removed and where appropriate, mark/label components to aid re-assembly
4. carry out the overhaul to the agreed level, using the correct tools and techniques
5. ensure that all removed components are correctly identified and stored in the correct location
6. replace/refit components using appropriate methods and techniques
7. carry out checks on the overhauled equipment using correct procedures
8.
report any instances where the overhauling activities cannot be fully met, or where there are identified defects outside the planned overhauling schedule
9.
complete the relevant documentation, in accordance with organisational requirements
10. dispose of unwanted components, waste materials and substances, in accordance with safe working practices and approved procedures
11. deal promptly and effectively with problems within your control and report those that cannot be solved
12. leave the equipment in a safe and appropriate condition, free from foreign object debris

Knowledge and understanding

You need to know and understand:

1. the safe working practices and procedures and the specific safety precautions to be taken when overhauling aircraft indication and gauging equipment (to include wearing protective clothing and equipment; lifting and handling techniques; safe working practices and procedures with regard to working on avionic indication and gauging equipment; procedures and guidelines which satisfy current regulations such as HASAWA, COSHH and other work related legislation and guidelines)
2. the hazards associated with overhauling aircraft indication and gauging equipment, and with the tools and equipment used, and how they can be minimised
3. the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to
4. the protective equipment that you need to use for both personal protection (PPE) and protection of the aircraft indication and gauging equipment
5. what constitutes a hazardous voltage and how to recognise victims of electric shock
6. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber matting and isolating transformers)
7. how to extract and use information from equipment manuals, history/maintenance reports, charts, circuit and physical layouts, specifications, symbols used in avionic indication and gauging systems, and other documents needed in the overhauling process
8. how to carry out currency/issue checks on the specifications you are working with
9. terminology used in aircraft indication and gauging equipment and the use of system diagrams and associated symbols
10. the principles of operation of the aircraft indication and gauging equipment being overhauled, and the performance characteristics and function of the components within the equipment
11. the techniques used to remove components from aircraft indication and

gauging equipment, without damage to the components or surrounding structure (such as de-soldering components, applying electrostatic discharge (ESD) protection procedures)

12. the various types of electrical connector that are used, methods of unlocking, orientation indicators, and locating and locking in of the connections

13. the various mechanical fasteners that are used, and their method of removal and replacement (such as threaded fasteners, special securing devices)

14. the importance of using the specified fasteners for the installation and why you must not substitute others

15. why securing devices need to be locked and labelled and the different methods that are used to remove and install them

16. the torque loading requirements on the fasteners and what to do if these loadings are exceeded or not achieved

17. the need to label and store components correctly and to check that replaced components have the correct part/identification markings

18. the procedure for obtaining replacement parts, materials and other consumables necessary for the overhaul

19. the techniques used to position, align, adjust and secure the replaced components to the equipment, without damage to the components or surrounding structure

20. the quality control procedures to be followed during the overhauling operations

21. procedures for ensuring that you have the correct tools, equipment, components and fasteners for the activities

22. methods of lifting, handling and supporting the components/equipment during the removal and replacement activities

23. the use of seals, sealant and adhesives and anti-electrolysis barriers, and the precautions to be taken

24. why electrical bonding is critical and why it must be both mechanically and electrically secure

25. how to conduct any necessary checks and adjustments to ensure the system integrity, accuracy and quality of the overhaul

26. the tools and equipment used in the overhauling activities and their calibration/care and control procedures

27. why tool/equipment control is critical and what to do if a tool or piece of equipment is unaccounted for on completion of the overhauling activities

28. the problems that can occur with the overhauling operations and how these can be overcome

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29. how to recognise defects (such as poor seals, misalignment, incorrectly seated plugs and sockets, ineffective fasteners, foreign object damage or contamination)
 30. the recording documentation to be completed for the activities undertaken and where appropriate, the importance of marking and identifying specific pieces of work in relation to the documentation
 31. the procedure for the safe disposal of waste materials and scrap components
 32. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve

Scope/range related to performance criteria

1.

Carry out all of the following during the overhauling activities:

- 1.1 obtain and use the appropriate documentation (such as job instructions, aircraft manuals and overhauling documentation, technical instructions and other relevant maintenance documentation)
- 1.2 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
- 1.3 provide and maintain safe access and working arrangements for the overhauling area
- 1.4 obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date
- 1.5 where appropriate, apply electrostatic discharge (ESD) protection procedures
- 1.6 carry out the overhauling activities, using approved techniques and procedures at all times
- 1.7 ensure that the equipment is maintained free from damage and foreign objects
- 1.8 return all tools and equipment to the correct location on completion of the activities

2.

Carry out the overhauling activities to unit level on three of the following types of indication and gauging equipment:

- 2.1 power plant (such as main engine power, auxiliary power, thrust reverse, propeller, starting, monitoring, fire)
- 2.2 engine fuel, lubrication, air, cooling, control systems
- 2.3 fluid power (such as hydraulic power generation, undercarriage, pneumatic or vacuum pressure)
- 2.4 flying controls (such as flaps/slats, elevators, ailerons/ailerons, horizontal stabiliser, spoilers/speed brakes, wing sweep, reaction controls, rudder, rotor)
- 2.5 wheels, brakes, steering
- 2.6 transmission systems (such as main and auxiliary gear boxes)
- 2.7 aircraft fuel systems (such as supply, contents, transfer, venting system, fuel jettison, refuelling and defuelling)
- 2.8 environmental control systems (such as pressure control, heating and ventilation, equipment air conditioning)
- 2.9 ice and rain protection systems (such as windshield, engine protection, pitot static protection, ice accretion)
- 2.10 fuselage (such as access panels, cargo doors, boundary layer and suction doors)

3.

Carry out all of the following activities, as applicable to the equipment being overhauled:

- 3.1 cleaning parts prior to dismantling
- 3.2 replacing all 'lived' items (seals, dust caps)
- 3.3 pre-disassembly checks and tests
- 3.4 replacing all damaged/defective components
- 3.5 disconnecting and de-soldering electrical connections
- 3.6 reassembling equipment
- 3.7 removal of earth bonding
- 3.8 setting and adjusting/calibrating replaced components (such as power output, voltage)
- 3.9 removing cable securing devices
- 3.10 removing bolt securing devices and mechanical fasteners
- 3.11 making mechanical connections
- 3.12 dismantling equipment to unit/sub-assembly level
- 3.13 soldering electrical connections
- 3.14 dismantling units to component level
- 3.15 carrying out earth bonding
- 3.16 marking/labelling of components to aid reassembly
- 3.17 installing cable securing devices
- 3.18 checking components for serviceability
- 3.19 tightening fastenings to the required torque
- 3.20 securing components using mechanical fasteners and threaded devices
- 3.21 applying locking and retaining devices (such as circlips, pins, wire locking)

4.

Carry out overhauling activities to component level on three of the following aircraft indication and gauging equipment components:

- 4.1 transmitters (such as position, flow, pressure, level)
- 4.2 displays
- 4.3 actuators
- 4.4 generators (such as pulse, speed/tacho)
- 4.5 motors
- 4.6 computers
- 4.7 capacitance units
- 4.8 gauges/indicators

5.

Replace a range of aircraft indication and gauging equipment components, to include six of the following:

- 5.1 switches (such as micro, proximity)
- 5.2 plugs/sockets/terminations
- 5.3 fuses
- 5.4 circuit breakers
- 5.5 relays
- 5.6 input and follow-up potentiometers
- 5.7 transformers

- 5.8 batteries
- 5.9 printed circuit boards
- 5.10 desiccant units
- 5.11 electronic components (such as resistors, capacitors)
- 5.12 filament lamps/light emitting diodes
- 5.13 screws/bolts/washers
- 5.14 transducers/sensors
- 5.15 wires/cables
- 5.16 other specific components

6.

Carry out checks and tests on the overhauled equipment, to include four of the following:

- 6.1 visual inspection for completeness and freedom from damage or foreign objects
- 6.2 comparison check
- 6.3 continuity checks
- 6.4 soak test
- 6.5 standard serviceability test
- 6.6 bonding tests
- 6.7 'special-to-type' tests
- 6.8 signal injection tests

7.

Overhaul aircraft indication and gauging equipment in compliance with one of the following:

- 7.1 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
- 7.2 Ministry of Defence (MoD)
- 7.3 Military Aviation Authority (MAA)
- 7.4 Aerospace Quality Management Standards (AS)
- 7.5 Federal Aviation Authority (FAA)
- 7.6 BS, ISO or BSEN standards and procedures
- 7.7 customer standards and requirements
- 7.8 company standards and procedures
- 7.9 aircraft manufacturer's requirements

8.

Complete the relevant paperwork, to include one from the following and pass it to the appropriate people:

- 8.1 job cards
- 8.2 computer records
- 8.3 aircraft service/flight log
- 8.4 aircraft log book
- 8.5 permit to work/formal risk assessment

Behaviours

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

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Overhauling components of aircraft indication and gauging equipment



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