

Modifying aircraft mechanical systems

Overview

This standard identifies the competences you need to modify aircraft mechanical systems, in accordance with approved procedures. It covers both fixed wing and rotary winged aircraft. You will be required to select the appropriate tools and equipment to use, based on the modification operations required and to check that they are in a safe and serviceable condition. In carrying out the modification operations, you will be required to follow laid down procedures and to use specific modification leaflets or service bulletins. The modification requirements will include such items as undercarriage systems, flying controls systems, hydraulics systems, pneumatics systems, oxygen systems, air conditioning systems, cabin pressurisation systems, de-icing systems, engine/propulsion systems, aircraft fuel systems, oil storage systems and power transmission systems. The modification activities will also include making all necessary checks, including functional checks of systems that have been disturbed during the modification.

Your responsibilities will require you to comply with organisational policy and procedures for the modification activities undertaken and to report any problems with the modification activities that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You will be expected to work with minimal 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 the modification techniques and procedures. You will understand the systems being modified and their application and will know about the components, systems and fastening devices of systems disturbed during the modification operation, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the modification operations. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to yourself and others in the workplace.

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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. obtain and follow the relevant modification specifications and job instructions
3. confirm and agree what modifications are to be carried out to meet the specification
4. prepare the system for the required modification
5. carry out the system modification, using approved materials, methods and procedures
6. complete the modification within the agreed timescale
7. ensure that the modified system meets the specified operating conditions
8. produce accurate and complete records of all modification work carried out
9. deal promptly and effectively with problems within your control and report those that cannot be solved
10. complete the relevant documentation, in accordance with organisational requirements
11. leave the work area and airframe in a safe and appropriate condition, free from foreign object debris on completion of the activities

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Knowledge and understanding

You need to know and understand:

1. the specific safety precautions and procedures to be observed whilst carrying out the modifications (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
2. the health and safety requirements of the work area in which you are carrying out the modification activities and the responsibility these requirements place on you
3. the hazards associated with modifying aircraft mechanical systems and with the tools and equipment used and how to minimise them and reduce any risks
4. the personal protective equipment and clothing (PPE) to be worn during the modification activities
5. the various types of drawing and specification that are used during the modification
6. how to identify the components to be used; component identification systems (such as codes and component orientation indicators)
7. preparations to be undertaken on the system, prior to modification
8. the methods and procedures to be used and the importance of adhering to the procedures
9. the various mechanical fasteners that will be used, and their method of installation (such as open and blind rivets, threaded fasteners, special securing devices)
10. the importance of using the specified fasteners for the modification and why you must not use substitutes
11. the application of sealants and adhesives within the modification activities and the precautions that must be taken when working with them
12. the quality control procedures to be followed during the modification operations
13. how to conduct any necessary checks to ensure the accuracy and quality of the modification
14. how to recognise defects (such as leaks, poor seals, misalignment, ineffective fasteners, foreign object damage, or contamination)
15. the importance of ensuring that the completed modification is free from dirt, swarf and foreign object damage and of ensuring that any exposed components or pipe ends are correctly covered/protected
16. the methods and equipment used to transport, handle and lift components into position and how to check that the equipment is within its current certification dates
17. why tool/equipment control is critical and what to do if a tool or piece of equipment is unaccounted for on completion of the activities
18. the problems that can occur with the modification operations and

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how these can be overcome

19. 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
20. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve

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Scope/range related to performance criteria

1. Carry out all of the following during the modification activities:
 1. obtain and use the appropriate documentation (such as job instructions, aircraft modification drawings, planning and quality control documentation, aircraft procedures and specifications)
 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
 3. provide and maintain a safe working environment for the modification activities
 4. obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current calibration date
 5. obtain clearance to work on the aircraft and observe the power isolation and safety procedures
 6. ensure that correct part numbers are used, including (where appropriate) left or right handed parts
 7. follow safe practice/approved modification techniques and procedures at all times
 8. return all tools and equipment to the correct location on completion of the modification activities
 9. dispose of waste materials in accordance with approved procedures
2. Carry out modifications to mechanical systems, to include three from the following:
 1. undercarriage systems
 2. cabin pressurisation systems
 3. flying control systems
 4. de-icing systems
 5. hydraulic systems
 6. engine/propulsion systems
 7. pneumatic systems
 8. aircraft fuel systems
 9. oxygen systems
 10. oil storage systems
 11. air conditioning systems
 12. power transmission systems

3. Undertake all of the following procedures:

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1. dismantle systems
 2. undertake the modification
 3. check for wear
 4. set clearances and angular alignment
 5. reassemble systems
 6. replace 'out-of-specification' components
 7. check the modified system, in accordance with the modification leaflet or service bulletin
4. Carry out modifications in compliance with one of the following standards:
1. Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
 2. Ministry of Defence (MoD)
 3. Military Aviation Authority (MAA)
 4. Aerospace Quality Management Standards (AS)
 5. customer standards and requirements
 6. Federal Aviation Authority (FAA)
 7. company standards and procedures
 8. BS, ISO or BSEN standards and procedures
 9. manufacturers standards and procedures
5. Complete relevant paperwork, to include one from the following and pass it to the appropriate people:
1. build records
 2. job cards
 3. log cards
 4. aircraft flight log
 5. other specific recording method

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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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