

Overview

This standard identifies the competences you need to carry out maintenance activities on rotorcraft main and/or tail rotors, in accordance with the approved rotorcraft maintenance manual, approved change documentation (service bulletin) and airworthiness requirements. It covers the main and tail rotor head assembly, rotor blades and blade folding system, swashplate assemblies, and the rotor shaft units if not an integral part of the gearbox. It also includes indicating systems which show operation or activation of the rotor systems. The maintenance activities will include the removal, fitting and testing of a range of main and/or tail rotor system components. You will remove the required components and fit approved replacements, as appropriate. You will then need to test and adjust the completed system to meet the rotorcraft maintenance manual, change documentation (service bulletin) and airworthiness requirements.

Your responsibilities will require you to comply with the specific practices and procedures identified in the rotorcraft manual, change/service bulletin documentation and airworthiness requirements for the maintenance activities undertaken, and to report any problems with these requirements that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You must ensure that all tools, equipment and materials used are correctly accounted for on completion of the activities, and that all necessary job/task documentation is completed thoroughly, 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 the appropriate maintenance techniques and procedures to rotorcraft main and/or tail rotor systems. You will understand the component removal, fitting and testing methods and procedures, and their application, along with the rotor system maintenance requirements. You will know how the equipment functions, the common problems that can occur, the purpose of the individual components and associated defects, in adequate depth to provide a sound basis for carrying out the maintenance activities, correcting faults and for ensuring that the main and tail rotor system is maintained to the required standard.

You will understand the safety precautions required when working on the rotor system,

especially those for ensuring that the power system is safely and correctly isolated. 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.

Notes:

1. This standard is designed to cover the practical experience requirements of the Airline Transport Association (ATA) Chapter 62 Main Rotors and ATA Chapter 64 Tail Rotor.
2. To display competence in this standard, it is necessary to both remove and fit rotor system components. You must remove components; however, you may fit a replacement component where the original was previously removed by another person. You should also be aware of how to leave a system in a safe condition if maintenance tasks cannot be completed. This covers both the physical systems and the job documentation.

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 maintenance schedules to carry out the required work
3. carry out the maintenance activities within the limits of your personal authority
4. carry out the maintenance activities, and replace components in the specified sequence and in an agreed timescale
5. report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule
6. complete relevant documentation in accordance with organisational requirements
7. dispose of waste materials in accordance with safe working practices and approved procedures
8. leave the aircraft and system in a safe and appropriate condition, free from foreign object debris on completion of the activities

Knowledge and understanding

You need to know and understand:

1. the specific safety practices and procedures that you need to observe when working on rotorcraft main and tail rotor systems (including any specific legislation, regulations/codes of practice for the activities, equipment or materials)
2. the importance of maintenance on rotorcraft rotor systems, and impact upon legislation and local procedures
3. the need to check that cabin/cockpit switches, selectors and circuit breakers are in the correct position before applying any form of external power (such as electrical, hydraulic, air or vacuum)
4. 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
5. the hazards associated with carrying out maintenance activities on rotorcraft main and tail rotor systems, and with the tools and equipment used (such as handling oils, greases, traps from moving parts, hot parts of engines, misuse of tools), and how to minimise them and reduce any risk
6. the protective equipment that you need to use for both personal protection (PPE) and protection of the rotorcraft
7. the importance of aircraft husbandry and of ensuring that, throughout the maintenance activity, the aircraft and work area are maintained free from foreign objects, and the implications of FOD to the safety of the aircraft
8. how to extract and use information from rotorcraft manuals, log books, flight logs, charts, system and physical layouts, specifications, symbols used in rotorcraft main and tail rotor systems, and other documents needed in the maintenance activities
9. how to carry out currency/issue checks on the specifications you are working with
10. terminology used in rotorcraft main rotor systems, and the use of system diagrams and associated symbols
11. the principles of operation of the main and/or tail rotor system being worked on, and the function of the units that make up the system (such as rotor blade, rotor heads, swash plate assemblies, blade folding mechanisms, de-ice boot, blade braking and blade control and indicating)
12. the techniques used to remove components from rotorcraft main and/or tail rotor systems without damage to the components or surrounding structure (such as

release of pressures/force, draining of fluids, removal of components and the need to protect the system integrity by fitting blanking plugs and ensuring that exposed components are correctly covered/protected)

13. the various mechanical fasteners that will need to be removed and replaced, and their methods of removal and replacement (such as threaded fasteners, special securing devices)

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

15. the importance of ensuring that any exposed components or pipe ends are correctly covered/protected

16. the need to label and store correctly components that require repair or overhaul, and to check that replacement components have the correct part/identification markings and accompanying release documentation

17. how to fit main rotor components safely and correctly (such as use of lifting and handling equipment; ensuring the correct tightness of connections; eliminating stress on pipework/connections; carrying out visual checks of all components)

18. how to make adjustments to components/assemblies to ensure that they function correctly (such as travel and working clearance)

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

20. why securing devices need to be tightened to the correct torque, locked and labelled, and the different methods that are used

21. the tools and equipment used in the maintenance activities, and their calibration/care and control procedures

22. 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

23. how to carry out routine checks and servicing of the rotorcraft main and/or tail rotor system

24. the types of test to be carried out on the rotorcraft main and/or tail rotor system, and the test equipment to be used

25. the methods and procedures to be used to carry out the various tests on the rotor systems

26. the importance of carrying out the tests in the specified sequence, checking all readings and movements at each stage

27. how to record the results of each individual test, and the documentation that must be used

28. how to analyse the test results and how to make valid decisions about the

acceptability of the rotor system

29. the procedures to be followed if the equipment or system fails to meet the test specification

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, scrap components and fuel/fluids

32. the extent of your own authority 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 maintenance of the rotorcraft main and/or tail rotor system:

1.1 ensure that appropriate authorisation to work on the rotorcraft is obtained, and observe all relevant isolation and safety procedures

1.2 obtain and use the correct documentation (such as job instructions, technical instructions, rotorcraft manuals and maintenance documentation)

1.3 obtain the correct tools and equipment for the activity, and check that they are in a safe, tested and usable condition and within current calibration dates

1.4 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

1.5 ensure that the relevant safety devices and mechanical/physical locks are in place (where appropriate)

1.6 use approved removal, fitting and testing techniques and procedures at all times

1.7 return tools and equipment to the correct storage location on completion of the activities

1.8 ensure that work carried out is correctly documented and recorded

1.9 ensure that any outstanding tests are correctly documented

2.

Carry out maintenance on three of the following parts of the rotorcraft rotor system:

2.1 main rotor blades

2.2 rotor servos

2.3 swash plate assembly

2.4 tail rotor blades

2.5 blade folding system

2.6 indicating system

2.7 rotor heads

2.8 rotor shafts

2.9 pivoting and swivelling actuators

2.10 trim actuators

3.

Remove and fit six different rotor system components (at least two must be from group A):

Group A

1. rotor blades
2. azimuth star assembly (collective pitch)
3. wobble ring
4. mast assembly
5. blade governor synchronizes

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6. pitch control beam
7. clutch assembly
8. pitch change linkage
9. brake mechanisms
10. bumper/damper
11. rotor/drive shafts
12. wear/grip pads
13. coupling
14. speed governor
15. cams
16. rotor/rudder hub assembly
17. rudder blade plate
18. housings
19. rotor head
20. trunnion
21. scupper assembly
22. swash plate
23. main drive actuator
24. lead/lag damper

Group B

25. levers/linkages
26. folding hinge pin
27. anti-ice heater mats
28. pulleys
29. blade lock pin
30. fairing assemblies
31. bearings
32. control lock pin
33. balance weights
34. seals/gaskets
35. springs
36. de-icer boot
37. bolt assemblies
38. pipes and hoses
39. cable harness/wiring/switches/plugs
40. support brackets
41. rotor head fairings
42. indicators and warning devices
43. lubrication tank
44. covers
45. other specific components

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1.

Carry out fifteen of the following maintenance activities:

- 1.1 removing fairings to expose components to be removed
- 1.2 carrying out fault diagnosis and system checks
- 1.3 preparing the system for maintenance (such as isolating, draining fluids)
- 1.4 disconnecting electrical connections
- 1.5 refitting components in the correct position, orientation and alignment
- 1.6 disconnecting/removing hoses and pipes
- 1.7 removing securing devices and mechanical fasteners
- 1.8 setting and adjusting replaced components (such as travel, working clearance)
- 1.9 supporting equipment to be removed
- 1.10 dismantling equipment to an appropriate level
- 1.11 making mechanical connections
- 1.12 covering (protecting) exposed components, wires, pipework or vents
- 1.13 making electrical connections
- 1.14 disconnecting/reconnecting bonding leads
- 1.15 torque loading as required
- 1.16 checking components for serviceability
- 1.17 replenishing fluid systems
- 1.18 replacing damaged/defective components
- 1.19 carrying out system functional checks
- 1.20 replacing single use items such as seals, filters, gaskets
- 1.21 ensuring that replacement components have the correct part numbers
- 1.22 fitting blanks, labelling (and storing in the correct location) components that require repair or overhaul
- 1.23 applying bolt locking methods (such as split pins, wire locking, lock nuts)
- 1.24 carrying out area inspections prior to task close down

2.

Service/check rotorcraft main and tail rotor systems, to include carrying out five of the following:

- 2.1 visually checking the system for damage and leaks
- 2.2 adjusting main rotor trim tab
- 2.3 adjusting the governor
- 2.4 adjusting main/tail rotor pitch change linkage
- 2.5 performing static function checks
- 2.6 fitting and removing rigging pins
- 2.7 examining main and tail rotor blades for damage and corrosion
- 2.8 checking and adjusting main rotor control rigging
- 2.9 checking and adjusting tail rotor control rigging
- 2.10 carrying out blend repair to rotor blades
- 2.11 checking indicating and warning systems
- 2.12 replacing main rotor blade erosion tape
- 2.13 lubricating rotor mechanism
- 2.14 performing main rotor blade debonding check
- 2.15 checking spar integrity system

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- 2.16 checking main/tail rotor pitch change mechanism
- 2.17 servicing lead/lag damper
- 2.18 tracking/balancing the main rotor
- 2.19 examining flapping hinge and droop stop

3.

Carry out two of the following tests on the rotorcraft rotor system:

- 3.1 checking that ground start mechanisms operate correctly
- 3.2 testing electric anti-icing system
- 3.3 testing rotor braking system
- 3.4 built in test equipment (BITE) test
- 3.5 'special-to-type' tests
- 3.6 blade tracking

Using two of the following:

- 7. stroboscope
- 8. ground test rig
- 9. 'special-to-type' test equipment
- 10. tachometer
- 11. built in test equipment (BITE)

1.

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

- 1.1 job cards/work sheets
- 1.2 rotorcraft cabin log
- 1.3 computer records
- 1.4 rotorcraft log book
- 1.5 rotorcraft technical log

2.

Carry out maintenance on rotorcraft main and tail rotor systems in compliance with one of the following:

- 2.1 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
- 2.2 Ministry of Defence (MoD)
- 2.3 Military Aviation Authority (MAA)
- 2.4 Aerospace Quality Management Standards (AS)
- 2.5 Federal Aviation Authority (FAA)
- 2.6 rotorcraft maintenance manual/approved change documentation (service bulletin)
- 2.7 manufacturers standards and procedures

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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