SEMAE3135

Carrying out tests on aircraft pitot static systems

Overview

This standard identifies the competences you need to test aircraft pitot static systems, in accordance with approved procedures. It covers both fixed wing and rotary winged aircraft, and includes pitot static systems associated with height, speed, rate of climb, navigation, auto-pilot, flying control surfaces, ice and rain protection components, as applicable to the aircraft type. You will be required to select the appropriate tools and equipment to use, based on the operations to be performed and the systems to be tested.

The testing activities will include making all necessary checks and adjustments to ensure that components are correctly positioned and aligned and have the required range of movement, and carrying out built-in test equipment (BITE) tests, functional checks, sense and leak tests and independent sense and leak tests.

Your responsibilities will require you to comply with organisational policy and procedures for the testing activities undertaken and to report any problems with these activities that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You will 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 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 testing techniques and procedures for aircraft pitot static systems. You will understand the pitot static system under test and its application, and will know about the tools and equipment used, and the testing requirements, in adequate depth to provide a sound basis for carrying out the activities, and for ensuring that the tested system performs to the required specification.

You will understand the safety precautions required when carrying out the testing activities and when using the associated tools and equipment. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to 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 appropriate procedures for use of tools and equipment to carry out the required tests
3. set up and carry out the tests using the correct procedures and within agreed timescales
4. record the results of the tests in the appropriate format
5. review the results and carry out further tests if necessary
6. leave the aircraft and the pitot static 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 testing aircraft pitot static systems (including any specific legislation, regulations/codes of practice for the activities, equipment or materials)
2. the importance of maintenance on and impact upon (extended twin operations procedures) ETOpS systems, legislation and local procedures
3. the health and safety requirements of the work area where you are carrying out the activities and the responsibility these requirements place on you
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 safety procedures that must be carried out before work is started on the aircraft
6. the protective clothing and equipment (PPE) to be worn and where it can be obtained
7. hazards associated with testing aircraft pitot static systems and with the tools and equipment used, and how to minimise them and reduce any risks
8. what constitutes a hazardous voltage and how to recognise victims of electric shock
9. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber matting and isolating transformers)
10. the correct operating procedures of the pitot static system being tested
11. electrical bonding specifications and their importance
12. how to extract and use information from engineering drawings and related specifications
13. how to obtain the required test schedules and specifications for the system and aircraft type being tested and how to check their currency and validity
14. how to read and interpret the test schedules and specifications and from whom you can seek assistance if you have problems or issues regarding the test schedules or specifications

15. the methods and procedures to be used to carry out the various tests on the aircraft pitot static system and its system components
16. the test equipment to be used and its selection and application for particular tests
17. the calibration of test equipment (where applicable) and the requirement for currency/issue checks
18. the techniques, methods and procedures to be used during the tests
19. the importance of applying electrostatic discharge (ESD) procedures when working on sensitive equipment or devices
20. 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
21. the principle of operation of the pitot static system under test and the function of the individual components within the system
22. the importance of carrying out the tests in the specified sequence, checking all readings, movements and levels at each stage
23. from whom to seek authorisation if you need to alter or change the test procedures
24. how to record the results of each individual test and the documentation that must be used
25. how to analyse the test results and how to make valid decisions about the acceptability of the system
26. the procedures to be followed if the equipment or system fails to meet the test specification
27. problems that can occur with the testing activities and how they can be overcome
28. the problems that may cause errors or discrepancies with the test results and how to avoid these
29. any required environmental controls relating to the testing
30. the documentation to be completed at the end of the testing activities
31. 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 testing of the pitot static systems:

1.1 obtain and use the appropriate documentation (such as job instructions, aircraft pitot static test procedures, quality control documentation, history sheets, flight logbook, aircraft standards and specifications)
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 a safe working environment for the testing activities
1.4 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 date
1.5 obtain clearance to work on the aircraft and observe all relevant isolation and safety procedures
1.6 ensure that safe working distance procedures are set up (where appropriate)
1.7 where appropriate, apply electrostatic discharge (ESD) protection procedures
1.8 carry out the tests using the specified techniques and procedures
1.9 make any permitted adjustments to components and equipment, to bring the system to the specification requirements
1.10 return all tools and equipment to the correct location on completion of the testing activities

2.

Carry out testing on three of the following aircraft pitot static systems:

2.1 rate of climb
2.2 aircraft height indication
2.3 auto-pilot
2.4 air speed indication
2.5 navigation
2.6 oxygen drop out
2.7 flying controls (such as flaps, elevators, ailerons/tailerons, spoilers, wing sweep, reaction controls, rudder, rotor, airbrakes, horizontal stabilisers, artificial feel, gust alleviation, modal suppression)
2.8 engine control systems (such as FADEC, FAFC, EEC)
2.9 environmental control systems (such as pressure control)
2.10 ice and rain protection systems (such as pitot static protection, ice accretion)

3.

Test aircraft pitot static systems, using four of the following:

3.1 measuring equipment
3.2 'special-to-type' test sets

3.3 external power source (electrical/hydraulic)
3.4 internal power source (electrical/hydraulic)
3.5 pressure/suction equipment
3.6 internal aircraft computing systems

4.

Carry out five of the following types of test/check:

4.1 soak test
4.2 BITE test
4.3 'special-to-type' tests
4.4 functional check
4.5 comparison check
4.6 sense and leak tests
4.7 independent sense and leak test

Including the following:

8. a full system test that incorporates three of the above tests

1.

Carry out tests in compliance with one of the following:

1.1 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
1.2 extended twin operations procedures (ETOpS) (where appropriate)
1.3 Ministry of Defence (MoD)
1.4 Military Aviation Authority (MAA)
1.5 Aerospace Quality Management Standards (AS)
1.6 customer standards and requirements
1.7 Federal Aviation Authority (FAA)
1.8 company standards and procedures
1.9 BS, ISO or BSEN standards and procedures
1.10 specific system requirements
1.11 aircraft manufacturer's requirements

2.

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

2.1 computer records
2.2 test records
2.3 job cards
2.4 aircraft service/flight log
2.5 aircraft log book
2.6 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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