



Australian Government

MEA351 Maintain airframe systems of basic light fixed wing aircraft

Release: 2

MEA351 Maintain airframe systems of basic light fixed wing aircraft

Modification History

Release 2. Equivalent to MEA351 Maintain airframe systems of basic light fixed wing aircraft with amended prerequisite codes.

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot, and replace components of airframe systems of fixed wing aircraft that have fixed undercarriage and a normally aspirated engine driving a fixed pitch propeller, or a small gas turbine engine. This may be done during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA154	Apply work health and safety practices in aviation maintenance
MEA155	Plan and organise aviation maintenance work activities
MEA156	Apply quality standards during aviation maintenance activities
MEA157	Complete aviation maintenance industry documentation
MEA158	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1.	Inspect basic light fixed wing airframe systems	1.1	Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
		1.2	Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
		1.3	Airframe system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
		1.4	Defects are correctly identified and reported
2.	Test/adjust basic light fixed wing airframe systems and components	2.1	Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
		2.2	Airframe system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
		2.3	System adjustment/rigging is performed in accordance with maintenance manual
3.	Troubleshoot basic light fixed wing airframe systems	3.1	Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
		3.2	Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
		3.3	Specialist advice is obtained, where required, to assist with the troubleshooting process
		3.4	Airframe system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in

			accordance with standard enterprise procedures
		3.5	Rectification requirements are determined
4.	Remove and install basic light fixed wing airframe system components	4.1	System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
		4.2	Airframe system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
		4.3	Required maintenance documentation is accurately completed and correctly processed
		4.4	Removed components are tagged, sealed and packaged in accordance with specified procedures
		4.5	Components to be installed are checked to confirm correct part numbers, serviceability and modification status
		4.6	Mass balance of control surfaces to be installed is checked in accordance with the applicable maintenance manual, if required
		4.7	Installation is carried out in accordance with the applicable maintenance manual
		4.8	Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

- Maintenance documentation includes:**
 - Servicing schedules
 - Maintenance manuals
- Airframe systems include:**
 - Flight control systems
 - Fixed undercarriage shock absorbers
 - Master/slave cylinder brake systems
 - Fuel systems
 - Cabin heating systems
- Airframe system components include:**
 - Ailerons, elevators, rudders, trim tabs, flaps and slats
 - Flight control wheels or sticks, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains, sprockets, trim wheels or handles and rudder pedals or bars
 - Fixed undercarriage hydraulic and rubber shock absorbers
 - Wheels and brake units
 - Brake master cylinders and rigid or flexible plumbing
 - Rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing
 - Cabin heater ducting and control valves
- Procedures and requirements include:**
 - Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2. Equivalent to MEA351 Maintain airframe systems of basic light fixed wing aircraft

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA351 Maintain airframe systems of basic light fixed wing aircraft

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Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of airframe systems and components, including airframe system component removal and installation
- recognising system and component defects/external damage, correct installation and security for the range of airframe systems listed in the Range of Conditions
- removing, installing and rigging of flight controls
- checking flight control mass balance
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant WHS procedures, including the use of PPE and MSDS.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with airframe systems and components of basic light fixed wing aircraft. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across a range of airframe systems and components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS precautions relevant to airframe system maintenance, including the use of PPE and MSDS
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- flight control system layout and operation

- theory of flight:
 - airflow
 - conditions of flight
 - lift and forces
 - drag
 - wings, tailplane and vertical stabiliser
 - lift augmentation (flaps, slats and slots)
 - aircraft control surfaces and their function (elevator, ailerons, rudder, elevons and trim tabs)
 - flight control balancing and flutter
 - stability and control and flight control rigging
- system layout and operation:
 - cockpit controls
 - cables and cable tensioning
 - pulleys and fairleads
 - bellcranks
 - levers
 - control surface horns
 - screwjacks
 - push/pull rods
- mechanical flight control system maintenance procedures and troubleshooting
- fixed undercarriage and shock absorber systems:
 - undercarriage configurations and types (tail wheel, tricycle and bicycle)
 - relative advantages of undercarriage configurations
 - steering systems
 - types of shock absorber (springs, leaf, coil, spring tube, rubber disc, bungee and oleo)
 - wheels and tyres
 - axles and wheel bearings
 - wheel spats
 - fixed undercarriage maintenance procedures and troubleshooting
- small aircraft brake systems:
 - types of brake system (mechanical and hydraulic)
 - master/slave cylinder hydraulic brake system operation
 - hydraulic fluids and seals
 - rigid and flexible plumbing
 - brake pads and shoes
 - brake discs and drums/linings
 - brake system maintenance procedures and troubleshooting
- cabin heater system layout and operation:
 - heat source (muff heaters)

- ducting for heating and demisting
- valves and linkages
- fan
- cabin heating system maintenance procedures and troubleshooting
- fuel system layout and operation:
 - fuel tank types and location
 - selector valves and linkages
 - drain valves
 - rigid and flexible plumbing
 - fuel filters
 - boost pumps
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision as follows:
 - at least one (1) of each system:
 - flight control systems
 - fixed undercarriage shock absorbers
 - master/slave cylinder brake systems
 - fuel systems
 - cabin heating systems
 - a representative range of components from each of the following groups:
 - ailerons, elevators, rudders, trim tabs, flaps and slats
 - flight control wheels or sticks, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains, sprockets, trim wheels or handles and rudder pedals or bars
 - fixed undercarriage hydraulic and rubber shock absorbers
 - wheels and brake units

- brake master cylinders and rigid or flexible plumbing
- rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing
- cabin heater ducting and control valves.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

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