



Australian Government

MEA399 Lay out and set up aircraft systems

Release: 1

MEA399 Lay out and set up aircraft systems

Modification History

Release 1. Equivalent to MEA340 Lay out and set up aircraft systems. Revised as a result of changed prerequisites. Unit codes updated.

Application

This unit of competency describes the skills and knowledge required to lay out and set up aircraft systems. It requires the application of basic knowledge of aircraft system design and schematic layout, including the relative advantages of different types of systems.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

This unit forms part of the CASA requirement for maintenance certification licences under Civil Aviation Safety Regulation (CASR) Part 66. Where a CASA licensing outcome is sought, users must refer to the licensing provisions in the MEA Aeroskills Companion Volume Implementation Guide.

Pre-requisite Unit

MEA154 Apply work health and safety practices in aviation maintenance

Competency Field

Aeronautical engineering

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1. Select and lay out schematically aircraft mechanical systems

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1 Identify mechanical system applications in aircraft design and their relative advantages and disadvantages compared to other system types
- 1.2 Identify components of mechanical systems
- 1.3 Select a mechanical system for an application, sketch the schematic layout, and label all components

ELEMENTS**PERFORMANCE CRITERIA**

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| | 1.4 Identify mechanical system maintenance requirements |
| 2. Select and lay out schematically aircraft hydraulic systems | 2.1 Identify hydraulic system applications in aircraft design, their operation, and their relative advantages and disadvantages compared to other system types |
| | 2.2 Identify aircraft hydraulic fluids, their characteristics and handling precautions |
| | 2.3 Identify components of hydraulic systems and describe their operation in general terms |
| | 2.4 Select a hydraulic system for an application, sketch the schematic layout, and label all components |
| | 2.5 Determine hydraulic system maintenance requirements |
| 3. Select and lay out schematically aircraft pneumatic systems | 3.1 Identify pneumatic system applications in aircraft design, their operation, and their relative advantages and disadvantages compared to other system types |
| | 3.2 Determine components of pneumatic systems and describe their operation in general terms |
| | 3.3 Select a pneumatic system for an application, sketch the schematic layout, and label all components |
| | 3.4 Identify pneumatic system maintenance requirements |
| 4. Select and lay out schematically aircraft fuel storage and distribution systems | 4.1 Identify typical fuel storage and distribution systems used in aircraft design |
| | 4.2 Determine components of fuel storage and distribution systems and describe their operation |
| | 4.3 Select a fuel storage and distribution system for an application, sketch the schematic layout, and label all components |
| | 4.4 Determine types of aircraft fuel, their characteristics, and handling precautions |
| | 4.5 Identify fuel storage and distribution system maintenance requirements |
| 5. Set up and operate a simple hydraulic system | 5.1 Sketch the hydraulic system and label all components |
| | 5.2 Obtain required components according to hydraulic |

ELEMENTS**PERFORMANCE CRITERIA**

system requirements

- 5.3 Assemble and operate system while observing work health and safety (WHS) requirements, including the use of safety data sheets (SDS) and items of personal protective equipment (PPE)

Foundation Skills

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

Unit Mapping Information

Release 1. Equivalent to MEA340 Lay out and set up aircraft systems.

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 MEA399 Lay out and set up aircraft systems

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, which must include the ability to:

- lay out one typical aircraft mechanical system
- lay out one typical aircraft hydraulic system
- lay out one typical aircraft pneumatic system
- lay out one typical fuel storage and distribution system
- set up and operate one basic aircraft hydraulic system that includes:
 - hydraulic rig
 - manual selector valve
 - filter
 - accumulator
 - check valve
 - linear actuators
 - rigid and flexible plumbing
- apply required work health and safety (WHS) precautions, including using safety data sheets (SDS) and items of personal protective equipment (PPE) required for task.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- key characteristics of mechanical aircraft systems, their components as follows, and maintenance requirements:
 - cables
 - chains
 - sprockets
 - pulleys
 - fairleads
 - cable tensioners
 - gearboxes
 - screwjacks
 - rods

- universal joints
- constant velocity joints
- clutches
- bearings and bushes
- key characteristics of hydraulic aircraft systems, their components as follows, and maintenance requirements:
 - pumps
 - plumbing
 - manual and electrically operated valves
 - actuators
 - motors
 - check valves
 - direct reading and electrical pressure gauges
 - electrical control circuit micro switches
 - reservoirs
 - accumulators
 - filters
- key characteristics of pneumatic aircraft systems, their components as follows, and maintenance requirements:
 - precoolers
 - pressure regulator and shutoff valves
 - temperature modulating valve
 - check valves
 - over-pressure valves
 - temperature regulating valves
 - underloading valves
 - shuttle valves
 - back pressure valves
 - outflow valves
 - heat exchangers
 - moisture separators
 - chemical driers
 - filters
 - mechanical compressors
 - compressed air bottles
 - de-icing boots
 - ducting
- relative advantages and disadvantages of mechanical, hydraulic and pneumatic systems
- aircraft fuel storage and distribution systems and their components, including:
 - integral fuel cells

- rigid and flexible fuel cells
- external fuel tanks
- rigid and flexible plumbing and couplings
- manifolds
- selector valves
- anti-surge valves
- anti-gravity valves
- fuel quantity indication
- fuel flow indication
- boost pumps
- transfer pumps
- filters
- strainers
- fuel heaters
- fluid power principles
- plumbing identification marking
- hydraulic fluid types, characteristics and handling precautions
- aircraft fuels, their characteristics and handling precautions
- WHS precautions relating to aircraft systems and their operation, including procedures for using SDS and items of PPE.

Assessment Conditions

The following conditions of assessment represent the requirements of the regulators (Australian Defence Force [ADF] and Civil Aviation Safety Authority [CASA]) and maintenance stakeholders, and must be rigorously observed.

This unit may be assessed off the job in a training environment equipped to provide exposure to the range of system types and provide for the layout, set-up and operation of basic hydraulic systems.

The candidate must be permitted to refer to relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals, and reference materials.

The candidate must have access to:

- tools, equipment, materials, and relevant documentation required to demonstrate the performance evidence above.

Assessors must gather a range of evidence through a variety of ways including direct observation, teacher's reports, project work, samples and questioning.

Assessors of this unit must satisfy the assessor requirements in applicable vocational education and training legislation, frameworks and/or standards.

Where the unit is to be used for CASA licensing purposes the assessor must also meet the criteria specified in the Civil Aviation Safety Regulation (CASR) Part 147 Manual of Standards.

Links

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