



**Australian Government**

# **MEA340 Lay out and set up aircraft systems**

**Release: 1**

# ME A340 Lay out and set up aircraft systems

## Modification History

Release 1 - New unit of competency

## Application

This unit of competency requires application of basic knowledge of aircraft system design and schematic layout, including the relative advantages of the different types of system.

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

## Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

## Competency Field

Aeronautical engineering

## Unit Sector

## Elements and Performance Criteria

Elements describe the essential outcomes.

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

1. Select and lay out schematically aircraft mechanical systems	1.1 Mechanical system applications in aircraft design and their relative advantages and disadvantages compared to other system types are identified
	1.2 Components of mechanical systems are identified

- 1.3 A mechanical system is selected for an application, the schematic layout is sketched and all components are labelled
    - 1.4 Mechanical system maintenance requirements are identified
  2. Select and lay out schematically aircraft hydraulic systems
    - 2.1 Hydraulic system applications in aircraft design, their operation and their relative advantages and disadvantages compared to other system types are identified
    - 2.2 Aircraft hydraulic fluids, their characteristics and handling precautions are identified
    - 2.3 Components of hydraulic systems are identified and their operation is described in general terms
    - 2.4 A hydraulic system is selected for an application, the schematic layout is sketched and all components are labelled
    - 2.5 Hydraulic system maintenance requirements are identified
  3. Select and lay out schematically aircraft pneumatic systems
    - 3.1 Pneumatic system applications in aircraft design, their operation and their relative advantages and disadvantages compared to other system types are identified
    - 3.2 Components of pneumatic systems are identified and their operation is described in general terms
    - 3.3 A pneumatic system is selected for an application, the schematic layout is sketched and all components are labelled
    - 3.4 Pneumatic system maintenance requirements are identified
  4. Select and lay out schematically aircraft fuel storage and distribution systems
    - 4.1 Typical fuel storage and distribution systems used in aircraft design are identified
    - 4.2 Components of fuel storage and distribution systems are identified and their operation is described
    - 4.3 A fuel storage and distribution system is selected for an application, the schematic layout is sketched and all components are labelled

- 4.4 Types of aircraft fuel, their characteristics and handling precautions are identified
- 4.5 Fuel storage and distribution system maintenance requirements are identified
- 5. Set up and operate a simple hydraulic system
  - 5.1 The hydraulic system is sketched and all components are labelled
  - 5.2 Required components are obtained
  - 5.3 The system is assembled and operated 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)

## 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.

### **Mechanical system applications include:**

- Flight controls
- Flap operation
- Nose wheel steering
- Landing gear door operation
- Entrance door mechanisms

### **Components of mechanical systems include:**

- Cables
- Chains
- Sprockets
- Pulleys
- Fairleads
- Cable tensioners
- Gearboxes
- Screwjacks
- Rods
- Universal joints
- Constant velocity joints
- Clutches
- Bearings and bushes

### **Hydraulic system applications include:**

- Flight controls
- Flap and spoiler operation
- Landing gear retraction and extension
- Brakes (including anti-skid)
- Nose wheel steering
- Shimmy damping
- Door operation

### **Components of hydraulic systems include:**

- Pumps
- Plumbing
- Valves (manual and electrically operated)
- Actuators
- Motors
- Check valves
- Pressure gauges (direct reading and electrical)
- Electrical control circuit micro switches
- Reservoirs
- Accumulators
- Filters

**Pneumatic system applications include:**

- Landing gear retraction and extension
- Pneudraulic emergency systems for landing gear extension and brakes
- Engine bleed air
- Engine starting
- Anti-icing
- De-icing
- Pressurisation
- Air cycle air conditioning

**Components of pneumatic systems include:**

- 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

**Components of fuel storage and distribution systems include:**

- 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

## **Unit Mapping Information**

Release 1 – equivalent to MEA340A Lay out and set up aircraft systems

## **Links**

Companion Volume implementation guides are found in VETNet -  
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>