

Title	Demonstrate knowledge of electrical and electronic applications to aircraft mechanical systems		
Level	3	Credits	10

Purpose	People credited with this unit standard are able to: demonstrate knowledge of: direct current (DC) circuits, alternating current (AC) circuits, electronic devices used in aircraft mechanical systems, aircraft electrical power systems and safety precautions; and to identify aircraft electrical and wiring components.
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Classification	Aeronautical Engineering > Aircraft Mechanical Maintenance
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Available grade	Achieved
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Guidance Information

None.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of DC circuits.

Performance criteria

- 1.1 DC circuits are described in terms of their generation methods, properties, and use in aircraft components and systems.
- Range may include but is not limited to – static electricity, electrical terms, electrical cells.
- 1.2 DC resistive circuits are described in terms of their properties and use in aircraft mechanical components and systems.
- Range may include but is not limited to – resistance and resistors, circuit operation, electrical power, variable resistors.
- 1.3 Capacitors are described in terms of their application to mechanical components and systems.
- Range may include but is not limited to – principles, types, operation in circuits.

- 1.4 Magnetism is described in terms of its properties and application to aircraft mechanical components and systems.

Range may include but is not limited to – properties of magnets, magnetic fields, electromagnetic induction.

- 1.5 DC rotating machines are described in terms of operating principles and use in aircraft.

Range may include but is not limited to – generators, motors.

Outcome 2

Demonstrate knowledge of AC circuits.

Performance criteria

- 2.1 Single phase AC circuits are described in terms of their properties and use in aircraft components and systems.

Range may include but is not limited to – terms, reactance, impedance, series and parallel circuits, resonance.

- 2.2 AC rotating machines are described in terms of construction, operating principles, and use in aircraft.

Range may include but is not limited to – generators, motors, alternators.

- 2.3 Three phase AC circuits are described in terms of their properties and use in aircraft systems.

Range may include but is not limited to – star and delta connection, line and phase values.

- 2.4 Transformers are described in terms of types and principles of operation.

Range may include but is not limited to – double-wound, autotransformer.

Outcome 3

Identify aircraft electrical and wiring components.

Performance criteria

- 3.1 Aircraft wiring is identified in terms of circuit specifications.

Range may include but is not limited to – insulation, wire gauge, conductor material, wire numbering.

3.2 Components are identified to match circuit specifications.

Range may include but is not limited to – semiconductors, fuses, plugs, connectors, terminals, solenoids, relays, transformers, circuit breakers, switches, resistors, capacitors, batteries, ground points; by appearance, from circuit diagram symbols.

Outcome 4

Demonstrate knowledge of electronic devices used in aircraft mechanical systems.

Performance criteria

4.1 Semiconductor devices are described in terms of operation and use in mechanical components and systems.

Range may include but is not limited to – diode, zener diode, transistor, silicon controlled rectifier (SCR), field effect transistor (FET).

4.2 Semiconductor circuits are described in terms of their operation and use in mechanical equipment.

Range may include but is not limited to – full wave rectifier, bridge rectifier, zener regulator, filters, single stage amplifier.

4.3 Digital electronic gates are described in terms of their symbols, operation and application to mechanical systems.

Range may include but is not limited to – AND, OR, NOT, NAND, NOR, XOR.

Outcome 5

Demonstrate knowledge of aircraft electrical power systems and safety precautions.

Performance criteria

5.1 Aircraft electrical generating systems are described in terms of operation, indication and control.

Range may include but is not limited to – shunt generator, alternator-rectifier, brushless generator, constant speed drives.

5.2 Aircraft electrical distribution systems are described in terms of their function, structure, and operation.

Range may include but is not limited to – paralleled DC, paralleled AC, split bus, parallel/split, transfer, standby systems, frequency wild.

5.3 Safety precautions are described in terms of their application to electrical system maintenance activities.

Planned review date	31 December 2027
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	21 May 1996	31 December 2016
Revision	2	7 August 1997	31 December 2016
Revision	3	8 May 2001	31 December 2016
Review	4	20 April 2006	31 December 2016
Review	5	18 June 2014	31 December 2021
Review	6	26 March 2020	N/A
Rollover and Revision	7	26 April 2024	N/A

Consent and Moderation Requirements (CMR) reference	0028
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Ringa Hora Services Workforce Development Council qualifications@ringahora.nz if you wish to suggest changes to the content of this unit standard.