

Title	Demonstrate general helicopter technical knowledge for commercial aircraft operations		
Level	5	Credits	15

Purpose	People credited with this unit standard are, for commercial aircraft operations in accordance with Subject No 28, able to demonstrate knowledge of: helicopter engines and engine instruments; helicopter rotor systems; helicopter support systems; and helicopter weight and balance.
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Classification	Aviation > Aircraft Operation
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Available grade	Achieved
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Guidance Information

- 1 This unit standard is aligned with the relevant parts of the prescribed syllabi of the Civil Aviation Authority of New Zealand (CAA) for Subject No 28, published in CAA Advisory Circular 61-5, for a commercial pilot licence (helicopter). Credit will be awarded on meeting the requirements of the CAA-approved assessment or examination.
- 2 Commercial aircraft operations are those which are performed for hire or reward.
- 3 Definitions, abbreviations, and acronyms used in this unit standard are to be found in:
 - a *Civil Aviation Rules Part 1* on the CAA website at <https://www.caa.govt.nz>, and
 - b *Aeronautical Information Publication (AIP)* published by Aeronautical Information Management (AIM), PO Box 294, Wellington 6140 or on the AIM website at <http://www.aip.net.nz>.
- 4 All references to the CAA refer specifically to the Civil Aviation Authority of New Zealand.
- 5 Industry standards and recommended practices are those set in place by the CAA.
- 6 Industry texts may include but are not limited to – aircraft flight manuals, CAA Rules, CAA Advisory Circulars, CAA Flight Test Standards Guides, operator exposition.
- 7 For the purpose of this unit standard, *knowledge* refers to the knowledge, understanding, and application of the subject matter.
- 8 Recommended skills and knowledge:
Industry requirements are that the candidate must meet the eligibility requirements of the Civil Aviation Act 1990 and the Civil Aviation Rules Part 61 for a commercial pilot licence.

- 9 Industry requirements are that the candidate must meet the eligibility requirements of the Civil Aviation Act 1990 and the Civil Aviation Rules Part 61 for a commercial pilot licence.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of helicopter engines and engine instruments for commercial aircraft operations in accordance with Subject No 28.

Performance criteria

- 1.1 Helicopter reciprocating (piston) engine types, the purpose of major components, and the fundamental principles of operation are explained in accordance with industry texts and standards.
- Range may include but is not limited to – four-stroke cycle.
- 1.2 Engine performance is defined and explained in accordance with industry texts and standards.
- Range may include but is not limited to – force, work, power, energy, engine torque.
- 1.3 Carburation and fuel injection, and their principles and operation, are explained in accordance with industry texts and standards.
- Range includes but is not limited to – fuel/air mixture, mixture control, effects of ice.
- 1.4 Induction, exhaust systems, and supercharging are explained in accordance with industry texts and standards.
- 1.5 Fuel, fuel systems and their components, and their principles and operation, are described in accordance with industry texts and standards.
- 1.6 Ignition systems and their components are described in accordance with industry texts and standards.
- 1.7 Lubrication and cooling systems, their components, and their principles are described in accordance with industry texts and standards.
- 1.8 Electricity and magnetism, and their principles are described in accordance with industry texts and standards.
- Range may include but is not limited to – Ohm's law.
- 1.9 The electrical system, its major components, and their functions are explained in accordance with industry texts and standards.

- 1.10 Engine instruments and their principles of operation are explained in accordance with industry texts and standards.
- 1.11 Pressure instruments and their principles of operation are described in accordance with industry texts and standards.
- 1.12 Gyroscopic instruments, and their properties and principles of operation, are described in accordance with industry texts and standards.
- 1.13 Compasses and their principles are described in accordance with industry texts and standards.
- 1.14 Helicopter airframes are explained in accordance with industry texts and standards.
- Range may include but is not limited to – effects of load application, requirements of undercarriage/landing skid system.
- 1.15 Transmission systems, their major components, and their purpose are explained in accordance with industry texts and standards.

Outcome 2

Demonstrate knowledge of helicopter rotor systems for commercial aircraft operations in accordance with Subject No 28.

Performance criteria

- 2.1 Main rotor systems and their principles of operation are explained in accordance with industry texts and standards.
- Range includes but is not limited to – rotor blade construction; design features of rigid, semi-rigid, and fully articulated rotor systems.
- 2.2 Tail rotor systems and their principles of operation are described in accordance with industry texts and standards.
- 2.3 Helicopter controls and their principles of operation are described in accordance with industry texts and standards.
- Range includes but is not limited to – collective control, throttle cam-linkage, cyclic control.

Outcome 3

Demonstrate knowledge of helicopter support systems for commercial aircraft operations in accordance with Subject No 28.

Performance criteria

- 3.1 Hydrodynamics is described in accordance with industry texts and standards.
- Range may include but is not limited to – Pascal's principle.
- 3.2 Hydraulic systems and their principles of operation are described in accordance with industry texts and standards.
- 3.3 Pneumatic systems and their principles of operation are described in accordance with industry texts and standards.
- Range may include but is not limited to – back-up systems, low pressure systems.
- 3.4 Fire protection systems and their principles of operation are described in accordance with industry texts and standards.

Outcome 4

Demonstrate knowledge of helicopter weight and balance for commercial aircraft operations in accordance with Subject No 28.

Performance criteria

- 4.1 Helicopter weight and balance are explained in accordance with industry texts and standards.
- 4.2 Weight computations are calculated in accordance with industry texts and standards.
- Range may include but is not limited to – take-off weight, landing weight, fuel weight, available payload.
- 4.3 Centre of gravity and the principles of helicopter balance are explained and calculated in accordance with industry texts and standards.
- Range may include but is not limited to – longitudinal centre of gravity, lateral centre of gravity.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 June 2010	31 December 2018
Revision	2	18 February 2011	31 December 2018
Review	3	20 October 2016	31 December 2027
Review	4	28 September 2023	31 December 2027

Consent and Moderation Requirements (CMR) reference

0169

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.