

Title	Demonstrate knowledge of advanced aerodynamics, performance and systems knowledge (aeroplane)		
Level	6	Credits	15

Purpose	People credited with this unit standard are able to demonstrate knowledge of advanced aerodynamics, performance and systems knowledge (aeroplane) in accordance with Subject No 48.
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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 48, for an airline transport pilot licence (aeroplane). Credit will be awarded upon meeting the requirements of the CAA-approved assessment or examination.
- 2 An airline transport pilot licence permits the holder to conduct aircraft operations as pilot-in-command in an aircraft requiring a co-pilot.
- 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 knowledge, understanding, and application of the subject matter.
- 8 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 an airline transport pilot licence (aeroplane).

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of advanced aerodynamics, performance and systems knowledge (aeroplane) in accordance with Subject No 48.

Performance criteria

- 1.1 Terminology and units of measurement of transonic speeds are stated, defined, and explained in accordance with industry texts and standards.
- 1.2 The mechanical advantage of hydraulics is explained in accordance with industry texts and standards.
- 1.3 The function and operating principles of flight controls are explained in accordance with industry texts and standards.
- 1.4 Stability and control are explained in accordance with industry texts and standards.
- 1.5 Transonic aerodynamics, its principles, and processes are described and explained in accordance with industry texts and standards.
- 1.6 Performance factors are calculated in accordance with industry texts and standards.
- 1.7 Take-off and climb performance is stated, defined, described, and explained in accordance with industry texts and standards.
- 1.8 Cruise is defined, stated, explained, and identified in accordance with industry texts and standards.
- 1.9 Approach and landing performance are stated, defined, and explained in accordance with industry texts and standards.
- 1.10 Weight and balance terminology, factors, and effects are described, explained, and calculated in accordance with industry texts and standards.
- 1.11 Determinations relating to pavement strength and/or a specific runway are demonstrated in accordance with industry texts and standards.
- 1.12 Control systems, their operating principles, and methods of actuation are explained in accordance with industry texts and standards.
- 1.13 Engine management, its operating principles, and functions are described and explained in accordance with industry texts and standards.
- 1.14 Hydraulic system, its advantages and disadvantages, its principles of operation, and its use are described and explained in accordance with industry texts and standards.

- 1.15 Pneumatic system, its function, principle of operation, control, and use are described in accordance with industry texts and standards.
- 1.16 Types of electrical system, their principle of operation, and function are described and explained, and relevant calculations are made, in accordance with industry texts and standards.
- Range AC, DC.
- 1.17 Landing gear-retractable, its requirements, components and characteristics are described and explained, and relevant components are listed and named in accordance with industry texts and standards.
- 1.18 Aircraft wheel brake system, its principle of operation, and function are described and explained in accordance with industry texts and standards.
- 1.19 Fuel safety considerations when refuelling an aircraft are explained in accordance with industry texts and standards.
- 1.20 The function and principle of operation of fuel pumps are explained in accordance with industry texts and standards.
- 1.21 The function and operating principle of fuel tanks-jet aircraft are in accordance with industry texts and standards.
- 1.22 Warning systems and their features are described in accordance with industry texts and standards.
- 1.23 Types of protection systems, their features, and limitations are described in accordance with industry texts and standards.
- 1.24 Ice and rain protections systems, their function, and principle of operation are described and explained in accordance with industry texts and standards.
- 1.25 Types of internal reference systems, their function, principle of operation, and limitations are described in accordance with industry texts and standards.
- 1.26 GNSS systems, their function, and principle of operation are described in accordance with industry texts and standards.
- 1.27 TCAS and GPWS systems, their function, and operation are described in accordance with industry texts and standards.
- 1.28 Auto flight systems, their function, and principle of operation are described and explained in accordance with industry texts and standards.
- 1.29 Oxygen systems, their function, and principle of operation are described and explained in accordance with industry texts and standards.

- 1.30 Environmental control systems, their function, and principle of operation are described, and relevant terminology is defined, in accordance with industry texts and standards.

Replacement information	This unit standard replaced unit standard 15353.
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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	21 January 2011	31 December 2018
Review	2	20 October 2016	31 December 2027
Review	3	28 September 2023	31 December 2027

Consent and Moderation Requirements (CMR) reference	0169
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.