

Title	Demonstrate knowledge of basic mechanics for mechanical engineering trades		
Level	2	Credits	3

Purpose	People credited with this unit standard are able to demonstrate knowledge of simple machines, friction in an engineering environment, and Pascal's Law.
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Classification	Mechanical Engineering > Engineering Core Skills
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Available grade	Achieved
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Guidance Information

- 1 Reference and legislation
The International System of Units (SI), 8th edition (France: Bureau International des Poids et Mesures, 2006). Available at http://www.bipm.org/utils/common/pdf/si_brochure_8_en.pdf.
- 2 Assessment information
 - Formulae shall be supplied.
 - Use of calculator is permitted.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of simple machines.

Performance criteria

- 1.1 Simple machines are identified and described according to mechanical engineering practice.

Range	simple machines – first, second, and third order levers; wedge, screw; pulley; wheel and axle.
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- 1.2 Calculations involving length, forces, moments, torque, work, and power are performed for simple machines.

Range	simple machines – lever; wedge, screw; pulley; wheel and axle; evidence of calculations for three simple machines is required.
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1.3 Calculations involving symmetrical triangular forces are performed.

Range evidence of a minimum of three calculations is required.

Outcome 2

Demonstrate knowledge of friction in an engineering environment.

Performance criteria

2.1 The nature of friction is explained with reference to applied forces and the coefficient of friction.

2.2 Static, sliding, and rolling friction are distinguished.

2.3 Advantages and disadvantages of friction are stated.

Range evidence of two advantages and one disadvantage is required.

2.4 Methods to reduce friction are stated.

Range evidence of two methods that are incorporated into the design of a machine and two methods that are under operator control is required.

Outcome 3

Demonstrate knowledge of Pascal's Law.

Performance criteria

3.1 Pascal's Law is explained and an example of its application in mechanical engineering stated.

3.2 Calculations involving hydrostatic pressure and piston forces in compressed fluid situations are performed.

Range evidence of a minimum of two different calculations is required.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	22 September 2005	31 December 2011
Revision	2	12 January 2006	31 December 2016
Review	3	17 November 2011	31 December 2022
Review	4	18 February 2016	31 December 2022
Rollover	5	28 September 2017	31 December 2022

Consent and Moderation Requirements (CMR) reference	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

This unit standard is expiring