

<b>Title</b>	<b>Demonstrate and apply knowledge of mechanical dynamics</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>15</b>

<b>Purpose</b>	People credited with this unit standard are able to: describe concepts in mechanical dynamics; apply mechanical dynamics principles to workplace applications and problems; and demonstrate and apply knowledge of machines to workshop applications.
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<b>Classification</b>	Mechanical Engineering > Applied Principles of Mechanical Engineering
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<b>Available grade</b>	Achieved
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<b>Entry information</b>	
<b>Recommended skills and knowledge</b>	Previously acquired competence in the transposition of formulae, the manipulation of equations, and the use of trigonometric functions; understanding of fundamental concepts of physics (mass, length, and time) and their derived units, including pressure, force, gravitational effect, velocity, acceleration, and energy; and holds Unit 21773, <i>Demonstrate and apply knowledge of mechanical statics</i> .

**Explanatory notes**

- 1 References  
Health and Safety at Work Act 2015 and supporting Regulations.
- 2 Definitions  
*Accepted industry practice* refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.  
*Workplace procedures* refer to procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

### 3 Assessment information

Numerous reference texts and training manuals on mechanical dynamics are available and may be used; however no one textbook or source of information is envisaged. All activities must comply with applicable workplace procedures and must be consistent with accepted industry practice.

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## Outcomes and evidence requirements

### Outcome 1

Describe concepts in mechanical dynamics.

Range concepts – work, energy, power, friction, linear motion, angular motion, momentum.

### Evidence requirements

1.1 Concepts are described in terms of main features, purpose, and use.

1.2 Concepts are illustrated by actual practical examples from within the workplace.

### Outcome 2

Apply mechanical dynamics principles to workplace applications and problems.

### Evidence requirements

2.1 Linear and angular motion principles are applied to specified applications.

Range applications – displacement, velocity, acceleration, work, inertia, energy, centripetal force, centrifugal force.

2.2 Conservation and conversion of energy principles are applied to specified applications.

Range applications include but are not limited to – momentum, impulse, friction.

2.3 Conservation of energy principles are applied to solve workplace mechanical dynamics problems.

### Outcome 3

Demonstrate and apply knowledge of machines to workplace applications.

## Evidence requirements

3.1 Mechanical advantage, velocity ratio, mechanical efficiency, and the 'law of the machine' are determined for specified machines.

Range machines may include but are not limited to – levers, screws, gears, differential wheel and axle, worm and wheel, pulleys; evidence of three machines is required.

3.2 Use of flat belt drives and gear drives is described and applied in terms of power transmission.

<b>Replacement information</b>	This unit standard and unit standard 21773 replaced unit standard 11388 and unit standard 11389.
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<b>Planned review date</b>	31 December 2021
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### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 October 2005	31 December 2016
Rollover and Revision	2	19 March 2010	31 December 2021
Review	3	20 October 2016	N/A

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

### Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMRs). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

### **Comments on this unit standard**

Please contact Competenz [qualifications@competenz.org.nz](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.