

## Explain the operation of two and four stroke petrol and diesel engines

**Level** 2

**Credits** 4

**Purpose** This theory-based unit standard is for people who wish to enter or are employed in the automotive industry. People credited with this unit standard are able to demonstrate knowledge of spark ignition (SI) engine operation, compression ignition (CI) engine operation, and engine capacity and performance ratings.

**Subfield** Motor Industry

**Domain** Engines

**Status** Registered

**Status date** 27 July 2005

**Date version published** 26 November 2007

**Planned review date** 31 December 2012

**Entry information** Open.

**Accreditation** Evaluation of documentation by NZQA and industry.

**Standard setting body (SSB)** NZ Motor Industry Training Organisation (Incorporated)

**Accreditation and Moderation Action Plan (AMAP) reference** 0014

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

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### Special notes

Information on engine principles can be found from:  
training provider, industry and/or manufacturer's courses;  
automotive engineering textbooks (contact your local book retailer, school or polytechnic library or the public library lending service); vehicle workshop manuals; useful websites include but are not limited to:

- Automotive Books Ltd <http://www.autobooks.co.nz>;
- Capital Books <http://www.capitalbooks.co.nz>;
- How Stuff Works <http://www.howstuffworks.com>;
- New Zealand Book Find <http://www.nzbookfind.com>;
- public libraries <http://www.libraries.co.nz>;
- Technical Books <http://www.techbooks.co.nz>;
- Whitcoulls <http://www.whitcoulls.co.nz>.

## Elements and performance criteria

### Element 1

Demonstrate knowledge of spark ignition (SI) engine operation.

#### Performance criteria

- 1.1 The operational cycle of a two stroke SI engine is described according to textbook descriptions.
- 1.2 The operational cycle of a four stroke SI engine is described according to textbook descriptions.

### Element 2

Demonstrate knowledge of compression ignition (CI) engine operation.

#### Performance criteria

- 2.1 The operational cycle of a two stroke CI engine is described according to textbook descriptions.
- 2.2 The operational cycle of a four stroke CI engine is described according to textbook descriptions.

### Element 3

Demonstrate knowledge of engine capacity and performance ratings.

#### Performance criteria

- 3.1 Engine capacity measurements are calculated from given specifications.
- 3.2 Engine compression ratio and how it affects engine performance is described according to textbook descriptions.
- 3.3 Engine torque and power ratings are described according to the engine manufacturer's specifications.  
  
Range          definition, relationship to performance.

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#### Please note

Providers must be accredited by NZQA, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP 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.

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

Please contact the NZ Motor Industry Training Organisation (Incorporated) [info@mito.org.nz](mailto:info@mito.org.nz) if you wish to suggest changes to the content of this unit standard.