
**AUTOMOTIVE ELECTRICAL AND
ELECTRONICS**
**Diagnose and rectify faults in an engine
flywheel ignition system**

level:	4
credit:	5
final date for comment:	December 2008
expiry date:	December 2009
sub-field:	Motor Industry
purpose:	This unit standard is for people in outdoor power equipment and motorcycle engineering industries. People credited with this unit standard are able to: demonstrate knowledge of capacitor discharge ignition systems (CDI) on small engines and motorcycles; demonstrate knowledge of a transistorised magneto ignition system; test flywheel magneto ignition systems and their components for faults; and rectify faults on a flywheel ignition system.
entry information:	Recommended: Unit 235, <i>Describe automotive ignition systems and their operation</i> , or demonstrate equivalent knowledge and skills.
accreditation option:	Evaluation of documentation and visit by NZQA and industry.
moderation option:	A centrally established and directed national moderation system has been set up by the NZ Motor Industry Training Organisation.
special notes:	<ol style="list-style-type: none">1 The following legislation must be consulted and followed where applicable: Health and Safety in Employment Act 1992.2 Reference to <i>suitable tools and equipment</i> means industry approved tools and equipment that are recognised within the industry as being the most suited to complete the task to a professional and competent manner with due regard to safe working practices.

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- 3 For this unit standard it is essential that the practical assessment evidence is obtained in the workplace under normal workplace conditions.

Elements and Performance Criteria

element 1

Demonstrate knowledge of CDI systems on small engines and motorcycles.

performance criteria

- 1.1 The circuit layout of the ignition system is described and the function of each part is defined, according to the manufacturer's specifications.
- 1.2 The operation of an assembled system is described according to the manufacturer's specifications.

element 2

Demonstrate knowledge of a transistorised magneto ignition system.

performance criteria

- 2.1 The circuit layout of the ignition system is described and the function of each part is defined, according to the manufacturer's specifications.
- 2.2 The operation of an assembled system is described according to the manufacturer's specifications.

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element 3

Test flywheel magneto ignition systems and their components for faults.

Range: may include but is not limited to – contact breaker (CB), CDI.

performance criteria

- 3.1 Safe working practices are observed throughout the task.
- Range: personal safety, safety of others, equipment safety.
- 3.2 Suitable tools and equipment are selected and used to enable the system to be tested.
- 3.3 A test is made to determine if high tension (HT) is present at the spark plug, and the result is noted.
- 3.4 The engine stop switch is tested to determine if it is operating correctly, and the result is noted.
- 3.5 The spark plug is examined, and its condition is noted.
- Range: specified type, size of spark gap, damaged insulation, oiling, carbon fouling.
- 3.6 The flywheel is removed according to the manufacturer's instructions, inspected for damage, and the results are noted.
- Range: inspection includes – cracks, breakage, key and keyway condition, magnet strength.
- 3.7 The CB contacts, leads, and condenser are inspected, and their condition is noted.
- Range: may include but is not limited to
lead – bare, frayed, broken;
contacts – burned, pitted, misaligned, rubbing block worn;
condenser – shorted, open circuit, wrong value.

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- 3.8 The serviceability of the CDI module is determined.
- Range: by eliminating all other possible causes of the fault, by use of test equipment.
- 3.9 The serviceability of the transistor control module is determined.
- Range: by eliminating all other possible causes of the fault, by use of test equipment.
- 3.10 The coil and HT lead are tested, and their condition is noted.
- Range: may include but is not limited to – open and short circuits, resistance value, insulation, security of terminals.

element 4

Rectify faults on a flywheel ignition system.

performance criteria

- 4.1 Safe working practices are observed throughout the task.
- Range: personal safety, safety of others, equipment safety.
- 4.2 Suitable tools and equipment are selected and used to enable faults to be rectified.
- 4.3 Component faults are rectified to restore full serviceability and to meet the manufacturer's specifications.
- 4.4 The contact breaker in a CB system is assembled and adjusted to the manufacturer's specifications.
- 4.5 The CDI control module is installed according to the manufacturer's specifications.

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- 4.6 The ignition timing is adjusted, and the flywheel and coil are installed to comply with the manufacturer's instructions and specifications.
- 4.7 The ignition system is tested to ensure correct operation according to the manufacturer's specifications.

Comments on this unit standard

Please contact the NZ Motor Industry Training Organisation jlane@mito.org.nz if you wish to suggest changes to the content of this unit standard.

Please Note

Providers must be accredited by the Qualifications Authority or a delegated inter-institutional body before they can register credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by the Qualifications Authority 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 providers wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

This unit standard is covered by AMAP 0014 which can be accessed at <http://www.nzqa.govt.nz/site/framework/search.html>.