Demonstrate knowledge of automotive electronic ignition system operation

Level 4
Credits 5

Purpose
This theory-based unit standard is for people in the automotive repair industry. People credited with this unit standard are able to demonstrate knowledge of: electronic ignition triggering; electronic dwell angle control; distributorless electronic ignition systems; and high tension (HT) circuitry specifications in an electronic ignition system.

Subfield Motor Industry
Domain Automotive Electrical and Electronics
Status Registered
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Entry information
Recommended: Unit 235, *Describe automotive ignition systems and their operation*, or demonstrate equivalent knowledge and skills.

Accreditation
Evaluation of documentation and visit by NZQA and industry.

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

Accreditation and Moderation Action Plan (AMAP) reference 0014

Special notes
None.
Elements and performance criteria

Element 1

Demonstrate knowledge of electronic ignition triggering.

Range  magnetic inductor (distributor, crankshaft), Hall effect, optical trigger.

Performance criteria

1.1 The differences between a Kettering ignition system and an electronic ignition system are explained in terms of conversion from direct current (dc) to alternating current (ac).

1.2 Methods of controlling the coil primary current are described in accordance with manufacturer specifications.

1.3 Ignition triggering operation is described in accordance with manufacturer specifications.

Range  description by the use of diagrams showing components and circuit operation.

1.4 Amplifier circuit operation is described in accordance with manufacturer specifications.

Range  power transistor circuit, current limiting circuit, coil impedance, ballast ignition.

Element 2

Demonstrate knowledge of electronic dwell angle control.

Range  closed loop, open loop.

Performance criteria

2.1 Purpose and effects of dwell angle control are defined.

Range  providing high ignition energy, preventing misfiring at high speed, improving fuel consumption, controlling emissions, developing burn time.

2.2 The method of achieving dwell angle control by electronic control of primary current using integrated circuitry (IC) is explained in accordance with manufacturer specifications.

2.3 Testing methods of dwell angle control are described in accordance with manufacturer design specifications.
Element 3

Demonstrate knowledge of distributorless electronic ignition systems.

Performance criteria

3.1 Circuit layout for a distributorless ignition system is described, and the function of each main part defined, in accordance with manufacturer specifications.

Range spark plugs, ignition coils, sensors, electronic control module (ECM), battery, ignition coil switching device.

3.2 HT distribution methods are described in accordance with manufacturer specifications.

Range includes but is not limited to – double ignition coils, single spark ignition coils, four spark ignition coils.

Element 4

Demonstrate knowledge of HT circuitry specifications in an electronic ignition system.

Performance criteria

4.1 The importance of spark plug specifications is explained in accordance with manufacturer specifications.

Range heat ranges, diagnosing face appearance, manufacturer warranty, operation and condition of engine, alternative applications.

4.2 The importance of HT distribution system specifications in an electronic ignition system is explained in accordance with manufacturer specifications.

Range HT leads, distributor caps, rotor, insulation, suppression, alternative applications.

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.

**Comments on this unit standard**

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