

**Specification of Competency Standards**  
**for the Automotive Industry**  
**Unit of Competency**

Functional Area - Vehicle Servicing

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| Title      | Master the complicated techniques of alternative power systems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Code       | 108741L4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Range      | This unit of competency is applicable to technicians working at vehicle servicing and inspection departments. Practitioners should be able to master the operating principles of various types of alternative power systems to enhance the efficiency and accuracy of inspection and complicated fault diagnosis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Level      | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Credit     | 6 (For Reference Only)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Competency | <p>Performance Requirements</p> <p>1. Knowledge (Electric and hybrid systems)</p> <ul style="list-style-type: none"> <li>• The principles of electrical engineering: <ul style="list-style-type: none"> <li>○ Master basic electric theory</li> <li>○ Good understanding of the working principles of DC and AC motors, generator and alternator, their output characteristics, and relevant electricity supply control methods</li> </ul> </li> <li>• Electric energy management: <ul style="list-style-type: none"> <li>○ Master the performance, structure, operating principles and applicative limitations of different kinds of secondary batteries, such as lead acid battery, nickel-based battery and lithium-based battery</li> <li>○ Good understanding of the methods of battery charging management, the structure and operating principles of all related components</li> <li>○ Good understanding of the structure, operating principles and applicative limitations of various kinds of fuel cells, fuel cell systems and related components</li> </ul> </li> <li>• Electric vehicles: <ul style="list-style-type: none"> <li>○ Good understanding of the layout, characteristics, structure and operating principles of different transmission systems</li> <li>○ Master the control principles of electricity supply and regeneration as well as the structure, functions and operating principles of their related circuits and components</li> </ul> </li> <li>• Hybrid systems: <ul style="list-style-type: none"> <li>○ Master the definition, operating characteristics, structure and control methods of various types of hybrid systems, such as the operating sequence of engine, alternator and electric motor</li> <li>○ Good understanding of the structure and operating principles of power splitting devices of transmission system</li> <li>○ Master the control principles of electricity supply and regeneration as well as the structure, functions and operating principles of their related circuits and components</li> <li>○ Good understanding of the electric supply and control methods of motors and various electrical accessories</li> </ul> </li> </ul> <p>2. Performance (Inspection, fault diagnosis and analysis of electric and hybrid systems performance)</p> <ul style="list-style-type: none"> <li>• Conduct inspection, fault diagnosis and analysis procedures according to fault symptoms (including recurrent or intermittent defects) of electric systems and related components, such as: <ul style="list-style-type: none"> <li>○ Efficiency declining in charging and discharging of battery</li> </ul> </li> </ul> |