Specification of Competency Standards
for the Automotive
Unit of Competency

Functional Area - Vehicle Servicing

Title	Execute the maintenance procedures for electric vehicle systems
Code	111737L3
Range	This unit of competency is applicable in electrified vehicle service workshops. Practitioners should be able to master the maintenance procedures of electric vehicle systems safely according to the instructions in the corresponding vehicle manufacturer's service manual and the relevant requirements on environmental protection, occupational safety and health regulations. They should also be able to provide a written report upon completion of work.
Level	3
Credit	5 *(For Reference Only)*
Competency	**Performance Requirements** 1. Knowledge (Operating principles of various electric vehicle systems and the associated circuits) • Conversant with the operating principles of various electric vehicle systems, the locations of major components and the interpretation of wiring circuit diagrams of electrical operating systems, the application of different cable and wire harness types, their protection and connection means. • Identify the normal operating conditions of various electric vehicle systems, and accurately differentiate the voltage levels of their components and cables, such as the rechargeable energy storage system (REESS), onboard charger (OBC), powertrain, heating, ventilation and air conditioning (HVAC), steering, cooling, suspension, and braking systems, etc., as well as the safety awareness. • Understand the potential hazards associated with electric vehicle system servicing according to the instructions in the corresponding vehicle manufacturer's service manual. • Master the necessary preventive and protective measures for the general services of different electric vehicle systems. • Acquainted with the requirements for service workplace set up according to the instructions in the corresponding vehicle manufacturer's service manual and the guidelines for occupational safety and health. • Master the functions and applications of various special tools and equipment for electric vehicle maintenance. • Familiar with the requirements and procedures for the maintenance of the low-voltage and high-voltage operating systems onboard, such as the steering, cooling, lighting, suspension and braking systems, powertrain, OBC, REESS, HVAC system, etc. • Understanding of the relevant legal requirements on road and vehicle safety, and environmental protection.

	2. Performance (Maintenance of the operating systems onboard) • Explain the working principles of various electric vehicle systems and correctly interpret the voltage levels and operation of components from the wiring circuit diagrams of the low-voltage and high-voltage operating systems, such as the OBC, REESS, powertrain, HVAC, steering, braking, suspension, cooling, lighting, etc. • Correctly differentiate the voltage levels of various operating systems, including cables. • Identify the applications of different wire harness and cable types, and the protection of various connectors / adaptors for the electric vehicle systems. • Correctly master the general work scope of electrical system maintenance under non- isolated high-voltage circuit power conditions. • Correctly set up an isolated servicing area with barricade and warning signage for the service, and apply effective personal protective and first-aid equipment, with reference to the instructions in the corresponding vehicle manufacturer's service manual and the legal requirements of occupational safety and health, road and vehicle safety, and environmental protection, for electric vehicle system maintenance. • Conduct the proper maintenance procedures safely for the normal operating conditions of low-voltage electrical systems, including but not limited to, steering, braking, suspension, cooling and lighting, according to the instructions in the corresponding vehicle manufacturer's service manual and associated safety guidelines, with the application of proper personal protection equipment and special service tools. • Conduct the typical maintenance procedures safely for the normal operating conditions of high-voltage operating system components under isolated status, including but not limited to, powertrain, OBC, and HVAC systems, with the application of the correct special service tools and equipment, according to the instructions in the corresponding vehicle manufacturer's service manual and the requirements of occupational safety and health as well as that of environmental protection. • Provide a written report on the system maintenance, focusing on the abnormalities, measurement results, actions taken and the effectiveness.
Assessment Criteria	The integrated outcome requirements of this unit of competency are that the practitioner being assessed shall prove that he/she is: • Capable of identifying the system layouts, location, and operating principles of various electric vehicle systems and components, and correctly interpreting the voltage levels and operation of components from the wiring circuit diagrams of electrical operating systems, such as the OBC, REESS, powertrain, HVAC, steering, braking, suspension, cooling, lighting, etc.; • Capable of differentiating the voltage levels of various operating systems, the wire harness, cables and the connector / adaptor protection, as well as mastering the associated safety awareness; • Capable of identifying the general work scope of electrical system maintenance under non-isolated high-voltage circuit power conditions correctly; • Capable of conducting the proper maintenance procedures for the normal operation of low-voltage electrical systems safely, including but not limited to, steering, braking, suspension, cooling and lighting, with the application of effective personal protective and first-aid equipment, and the proper special service tools and equipment according to the instructions in the corresponding vehicle manufacturer's service manual and associated safety guidelines; • Capable of conducting the proper maintenance procedures for high-voltage operating system components under isolated status, such as the powertrain, OBC and HVAC systems, etc., safely in the designated area with the application of effective personal protective and first-aid equipment, and the proper special service tools and equipment according to the instructions in the vehicle manufacturer's service manual and the relevant requirements on environmental protection, occupational safety and health regulations; and • Capable of conducting functionality / performance tests safely on the electrical operating systems / components, and providing working report upon completion of work.

Remark	The credit value of this unit of competency is set on the presumption that the practitioner concerned has already possessed good knowledge of the operation of electric vehicles. The major ordinance involved in this unit of competency is as follows: • Relevant ordinances to the Road Traffic (Construction and Maintenance of vehicles) Regulations • Occupational Safety and Health