Specification of Competency Standards
for the Automotive
Unit of Competency

Functional Area - Vehicle Servicing

Title	Diagnose and rectify vehicle exhaust emission control systems
Code	111765L4
Range	This unit of competency is applicable to technicians working in vehicle servicing and inspection departments. With reference to the guidelines of the corresponding manufacturer's manual, practitioners should be able to master the operating principles of various exhaust emission control systems and their effectiveness in pollutant treatment in order to enhance the efficiency and accuracy of inspection and fault diagnosis of exhaust emission problems.
Level	4
Credit	6 *(For Reference Only)*
Competency	**Performance Requirements** 1. Knowledge (Generation of exhaust pollutants) • Master the change of concentrations of pollutants generated during normal and abnormal fuel oxidation processes. • Good understanding of the impact of different fuel types and qualities on the generation of pollutants. • Good understanding of the harm of various kinds of pollutants. • Master the causes and sources of various kinds of pollutants generated in the internal combustion engines using different fuel types. • Good understanding of the impact of different engine lubricant types and qualities on the exhaust pollutant emission. • Good understanding of the reduction methods of exhaust pollutant generation, including driving patterns, engine design, exhaust gas recirculation and combustion control, and after-treatment of exhaust emissions. • Good understanding of the testing methods of exhaust pollutant emission level, including the selection and use of related equipment as well as measuring methods. • Master the standards of vehicle manufacturers on pollutant emission levels, and governing regulations set by the Environmental Protection Department. • Understand the structure, functions, control methods and operating principles of various emission control setups/systems, such as exhaust gas recirculation, valve timing control, evaporative emission control, catalytic converters, particulate filters, NOx adsorbers, selective catalytic reduction, various sensors for exhaust temperature, pressure, oxygen and nitrogen oxide, etc.

	2. Performance (Emission control systems diagnosis and rectification) • Inspect the normal operation and effectiveness of various emission control systems, including emission reduction and exhaust after-treatment, with reference to the guidelines of the respective manufacturer's manual and standards of the governing authority. • Diagnose the engine performance and emission control setups/systems with specialised tools and equipment to locate the faulty components leading to excessive pollutant concentrations and conduct rectification procedures. • Review the causes of defects and diagnostic methods; compile report covering preventive measures, instructions on inspection and maintenance as well as suggestions for improvement.
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 mastering the structure, functions, control methods and operating principles of various kinds of emission control systems (including related components and subsystems) to enhance the efficiency and accuracy of inspection and fault diagnosis with reference to the guidelines of the respective manufacturer's manual and standards of governing authority; • Capable of mastering the factors affecting pollutant emission concentrations, such as the causes of pollutant generation, emission control methods and engine design features, to solve the complicated emission problems effectively and accurately; • Capable of rectifying the faulty components to resume the normal performance of the emission control setups/systems; and • Capable of compiling reports covering preventive measures, compiling instructions on inspection and routine maintenance as well as providing suggestions for improvement, etc., according to specific defects found in respective emission control systems.
Remark	The credit value of this competency unit assumes that the practitioner has already recognised the engine operation and combustion technologies and possessed comprehensive knowledge of automobile emission control design and corresponding system diagnosis. (This UoC replaced 108742L4)