Specification of Competency Standards
for the Automotive
Unit of Competency

Functional Area - Vehicle Servicing

Title	Overhaul internal combustion engines
Code	111728L3
Range	This unit of competency is applicable to the technicians working in the vehicle service department. Practitioners should be able to obtain a thorough understanding of the structure and operating principles of internal combustion engines and the impact on power output and fuel consumption, and to inspect and repair the engines efficiently and accurately according to the instructions in the vehicle manufacturer's service manual and the relevant requirements on environmental protection, occupational safety and health regulations.
Level	3
Credit	3 *(For Reference Only)*
Competency	**Performance Requirements** 1. Knowledge (Structure and operation of various types of internal combustion engines) • Master the use and function of special service and measuring tools/equipment, including non-destructive tests for engine component inspection and repair. • Master the structure, materials, functions and service specifications of all engine components. • Understand the configuration of various movable components and the needs of dynamic balance. • Understand the relation between engine setting and relevant specifications, such as capacity, compression ratio, bore-stroke ratio, torque, revolving resistance, etc. • Understand the structure and operating principles of devices enhancing breathing efficiency and emission control, such as variable intake and exhaust tract lengths, variable valve timing and lift, matching of pressure charging system with engine, exhaust gas recirculation device, crankcase ventilation, etc. • Understand the principles of engine working temperature control and reduction of movable component wear. • Good understanding of engine operating condition effect on the power development, fuel consumption and emission quality.

	2. Performance (Overhaul internal combustion engines) • Conduct dismantling, checking, repairing and restoring procedures for various types of internal combustion engines according to the instructions in the vehicle manufacturer's service manual and the relevant requirements on environmental protection, occupational safety and health regulations. • Determine the serviceability of engine components, including but not limited to journal bearings, cylinder bores, pistons and piston rings, using recognised measurement equipment and methodology, including non-destructive tests. • Identify the adaptation of replacement parts, including gaskets and seals. • Install and align the phasing of peripheral components, including sensors and actuators, attached to the engine, such as the valve timing control mechanism and injection/pressure pumps, injectors, etc. • Review the causes of defects and excessive wear of engine components; submit a written report to seniors covering abnormalities, measurement results and decisions made, the proposal of preventive measures and 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 obtaining a thorough understanding of the structure, functions, operating principles and service specifications of all engine components, such as pistons, piston rings, bearings, etc.; • Capable of conducting the engine overhaul procedures, precise measurement of engine components, identifying the replacement parts for restoration and aligning the phasing of peripheral components, 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 compiling written report covering the inspection results and decisions made to resume normal service condition, the preventive measures proposal and suggestions for improvement, according to the specific defects found in respective components.
Remark	The credit value for this competency unit assumes that the practitioner has already acquired extensive knowledge of internal combustion engine structure and operating principle, and general overhaul skills. (This UoC replaced 108647L2)