Specification of Competency Standards
for the Automotive
Unit of Competency

Functional Area - Vehicle Servicing

Title	Conduct fault diagnosis and rectification of the heating, ventilation and air conditioning (HVAC) system of various vehicle types
Code	111719L3
Range	This unit of competency is applicable in vehicle service workshops. Practitioners should be able to independently conduct rectification and diagnosis of the HVAC system according to statutory requirements and the instructions in the vehicle manufacturer's service manual and the relevant requirements on environmental protection, occupational safety and health regulations. They should also be capable of conducting system tests and providing work report upon completion of work.
Level	3
Credit	4 *(For Reference Only)*
Competency	**Performance Requirements** 1. Knowledge (Structure and operating principles of HVAC systems on vehicles) • Master various types of refrigerants for vehicles, their characteristics, handling procedures and the possible impacts on the environment, as well as relevant statutory requirements. • Understand the structure and operating principles of HVAC system, including the electrical and mechanical power drive and functional controls. • Master the principles of refrigeration and electricity. • Be familiar with the inspection and service procedures of the HVAC systems according to relevant local statutory requirements and the service instructions provided by the vehicle manufacturer. • Understand the environmental protection regulations and requirements on the recovery of refrigerants. • Understanding of the relevant legal requirements on occupational safety and health and environmental protection, including the use of special service tools, personal protection and first-aid equipment.

	2. Performance (Conduct fault diagnosis and rectification on HVAC system) • Safely conduct the rectification procedures after diagnosis against faulty functions of the HVAC system according to relevant local statutory requirements, the information in the vehicle manufacturer's service manual and the requirements of occupational safety and health as well as environmental protection, including: ◦ Identify common problems of the HVAC system operation control and components by visual inspection; ◦ Select suitable tools or instruments to inspect and analyse the fault symptoms of the HVAC system, including the power supply, driving units and functional controls; ◦ Inspect and rectify the parts and electric/electronic components of the HVAC system according to data obtained from the diagnostic procedures; the rectification work may include dismantling, replacing, re-assembling, fine-tuning and testing relevant system components and accessories; ◦ Select suitable tools or instruments to accurately recharge the refrigerant and lubricant quantities, check refrigerant leakage and identify the location of problem precisely; ◦ With the use of suitable tools or instruments and application of the theories of refrigeration and electricity, analyse the faults and assess the performance of the HVAC system; ◦ Maintain the record of refrigerant consumption to comply with the environmental protection regulations; and ◦ Provide work report after the rectification of problem is done successfully.
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 independently conducting complicated fault diagnosis on the HVAC system performance, including but not limited to instable temperature, low efficiency and noisy operation, according to the instructions in the vehicle manufacturer's service manual; • Capable of handling the recycling and recharging procedures for the refrigerant of the air- conditioning system safely according to relevant legislative provisions, the instructions in the vehicle manufacturer's service manual and the relevant requirements on environmental protection, occupational safety and health regulations; • Capable of conducting the refrigerant leakage test and identifying the location of problem with the air-conditioning system; and • Capable of implementing or arranging rectification work for the HVAC system according to diagnostic results and performance check; conducting system tests and evaluation, and providing work report upon completion of work.
Remark	The credit value of this unit of competency is set on the presumption that the practitioner concerned already possesses comprehensive knowledge of vehicle electronic, electrical and HVAC systems servicing as well as refrigerant handling. If the practitioner is serving on electrified vehicles, he/she shall be a recognised competent person on electrified vehicles, such as a registered vehicle mechanic who has completed an electric vehicle – low voltage training course, or equivalent; the servicing process shall be under the high-voltage system power-down condition, and confirmed by the checking result of special service tools / authorised competent person. In the case that the diagnosis or rectification is conducted under the live electric power of high voltage, the practitioner shall possess of recognised competency/qualification, such as an electric vehicle – high voltage training course, or equivalent. (This UoC replaced 108708L3)