Title	**Demonstrate knowledge of the operation, service checks, fault diagnosis, and repair of carburettors**		
Level	**3**	**Credits**	**6**

Purpose	This theory-based unit standard is intended for people in the automotive repair industry. People credited with this unit standard are able to demonstrate knowledge of: carburettor operation; basic carburettor service checks; and carburettor fault diagnosis and repair procedures.

Classification	Motor Industry > Automotive Fuel Systems and Exhaust

Available grade	Achieved

Guidance Information

1 It is recommended that people hold credit for Unit 30436, *Demonstrate knowledge of an electronic fuel injection (EFI) system,* before being assessed against this unit standard.

2 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable service information, and company requirements and legislative requirements. This includes the knowledge and use of suitable tools and equipment.

3 Performance of the outcomes of this unit standard must comply with the following: Health and Safety at Work Act 2015.

4 Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

5 Definitions
Company requirements refer to instructions to staff on policy and procedures that are available in the workplace. These requirements may include – company policies and procedures, work instructions, product quality specifications and legislative requirements.
Service information refers to technical information for a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions; technical terms and descriptions; and detailed illustrations.
Suitable tools and equipment refer to industry approved tools and equipment that are recognised within the industry as being the most suited to complete the task in a professional and competent manner with due regard to safe working practices.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of carburettor operation.

Performance criteria

1.1 The functions of single barrel downdraft carburettor components are described.

Range includes but is not limited to – venturi, main discharge nozzle, accelerator pump discharge nozzle, float bowl vent, choke valve, high speed air bleed, idle air bleed, idle tube, vacuum piston, accelerator pump, float and needle valve, throttle valve, idle discharge holes, main jet, power jet, accelerator pump inlet valve, accelerator pump bypass jet.

1.2 The main component parts and features of twin barrel (dual) downdraft carburettors are described.

Range air horn, main body, throttle body.

1.3 Two stage operation of a twin barrel carburettor is described.

Range primary section – idle system, low speed system, main metering system, power system, accelerator pump system, choke system; secondary section – transition system, main metering system.

1.4 Primary and secondary throttle valve operation from idle to full throttle is described.

Range fuel and air supply in relation to throttle valve position, vacuum control and mechanical control of second stage.

1.5 The functions of CD (constant depression) carburettor components are described.

Range depression chamber, diaphragm, throttle valve, depression transfer, jet adjustment, metering needle, enrichment device for starting, air-valve piston, air-valve return spring, hydraulic damper.

1.6 Purpose and method of mixture correction are described.

Range air bleed, metering rod and jet, compensating jet, engine management.

1.7 Automatic choke operation is described.

Range thermostatic, electric, wax element.

1.8 Purpose and operation of carburettor ancillary components are described.

Range includes but is not limited to – fuel cut-off (anti-dieseling) solenoid, two-stage idle, diaphragm accelerator pumps, power valve system, idle-up system, throttle dashpot.

Outcome 2

Demonstrate knowledge of basic carburettor service checks.

Performance criteria

2.1 Choke control checks and adjustment procedures are described.

Range manual choke, automatic choke.

2.2 Throttle cable and linkage adjustments are described.

2.3 Engine idle and emission adjustment procedures are described.

Range CO (carbon monoxide) percentage; HC ppm (hydrocarbons parts per million); O_2 (oxygen) percentage; CO_2 (carbon dioxide) percentage; rpm (engine speed); compensating for or disconnecting external influences.

2.4 Procedure to check lines, hose condition, and connections is described.

Range hoses perished or deteriorated, fuel leaks, vacuum leaks, pollution equipment connections loose, line damage, component security.

2.5 Procedure to check fuel supply is described.

Range fuel pump pressure and flow tests, accelerator pump operation, float level.

2.6 The use of a hand vacuum pump to check vacuum controls is described.

Outcome 3

Demonstrate knowledge of carburettor fault diagnosis and repair procedures.

Performance criteria

3.1 Precautions to be taken when diagnosing and repairing carburettor faults are identified.

Range includes but is not limited to – effects of petrol on the skin, dealing with petrol spills, fire risk, effects of petrol on componentry, danger of moving parts on a running engine, danger of petrol fumes, danger of exhaust fumes, using compressed air.

3.2 Carburettor faults and their causes are described.

Range includes but is not limited to – flat spot and hesitation, running lean, running rich, poor idle, flooding, fuel leaks, poor high-speed operation, excessive fuel consumption, engine hard to start.

3.3 External influences affecting carburettor and fuel system performance are described.

Range includes but is not limited to – engine condition, cooling system condition, brakes and steering, contaminated fuel, operating conditions, intake and exhaust systems, engine management functions, driver ability.

3.4 Procedures for dismantling a twin barrel carburettor are described.

Range includes but is not limited to – external components, external linkages, separating the main component parts, internal dismantling.

3.5 Procedures for cleaning and inspecting twin barrel carburettor components are described.

Range includes but is not limited to – cleaning jets and passages, removing carbon and sediment;
inspecting – mating surfaces, seals and gaskets, linkage, needle and seat, idle mixture circuit, accelerator pump, throttle shaft and valve, choke mechanism, vacuum hoses, emission components.

3.6 Procedures for reassembling a twin barrel carburettor are described.

Range includes but is not limited to – replacing seals and gaskets, rechecking jets and plugs, float settings, adjusting linkages.

3.7 Procedures for installing a twin barrel carburettor to an engine are described.

Range includes but is not limited to – mounting flange, reconnecting linkage, controls and hoses, checking operating adjustments, inspecting for fuel and air leaks.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	21 August 1996	31 December 2022
Review	2	20 December 1998	31 December 2022
Revision	3	16 October 2003	31 December 2022
Review	4	25 January 2008	31 December 2022
Review	5	29 April 2021	N/A

Consent and Moderation Requirements (CMR) reference	0014

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.