Demonstrate knowledge of the operation, service checks, fault diagnosis, and repair of carburettors

Level 3
Credits 6

Purpose
This theory-based unit standard is 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.

Subfield Motor Industry
Domain Automotive Fuel Systems and Exhaust
Status Registered
Status date 25 January 2008
Date version published 25 January 2008
Planned review date 31 December 2012

Entry information
Recommended: Unit 240, Demonstrate knowledge of petrol fuel systems, or demonstrate equivalent knowledge and skills.

Accreditation Evaluation of documentation and visit by NZQA and industry.

Standard setting body (SSB) NZ Motor Industry Training Organisation (Incorporated)

Accreditation and Moderation Action Plan (AMAP) reference 0014
This AMAP can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Special notes
1 Legislation relevant to this unit standard includes but is not limited to – Health and Safety in Employment Act 1992.

2 Definition
Service information may include but is not limited to – technical information of a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions and specifications; technical terms and descriptions; and detailed illustrations. This can be accessed in hard copy or electronic format and is normally sourced from the manufacturer.
Elements and performance criteria

Element 1

Demonstrate knowledge of carburettor operation.

Performance criteria

1.1 The functions of single barrel downdraft carburettor components are described in accordance with service information.

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 in accordance with service information.

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 in accordance with service information.

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

1.5 The functions of constant depression (CD) carburettor components are described in accordance with service information.

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 in accordance with service information.

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

1.7 Automatic choke operation is described in accordance with service information.

Range thermostatic, electric, wax element.
1.8 Purpose and operation of carburettor ancillary components are described in accordance with service information.

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.

Element 2

Demonstrate knowledge of basic carburettor service checks.

Performance criteria

2.1 Choke control checks and adjustment procedures are described in accordance with service information.

Range manual choke, automatic choke.

2.2 Throttle cable and linkage adjustments are described in accordance with service information.

2.3 Engine idle and emission adjustment procedures are described in accordance with service information.

Range carbon monoxide (CO) percentage, hydrocarbons (HC) parts per million (ppm), oxygen (O²) percentage, carbon dioxide (CO²) percentage, engine speed (rpm), compensating for or disconnecting external influences.

2.4 Procedure to check lines, hose condition, and connections is described in accordance with service information.

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 in accordance with service information.

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 in accordance with service information.
Element 3

Demonstrate knowledge of carburettor fault diagnosis and repair procedures.

Performance criteria

3.1 Safe working practices when diagnosing and repairing carburettor faults are identified in accordance with legislative requirements.

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 in accordance with service information.

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 in accordance with service information.

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 in accordance with service information.

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 in accordance with service information.

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 in accordance with service information.

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 in accordance with service information.

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

Please note

Providers must be accredited by NZQA, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact the NZ Motor Industry Training Organisation (Incorporated) info@mito.org.nz if you wish to suggest changes to the content of this unit standard.