	Unit ID: 477
Domain	**AUTOMOTIVE ELECTRICAL AND ELECTRONICS**
Title:	**Apply knowledge of automobile basic components and constructions**
Level: 1	**Credits: 6**

Purpose

This unit standard specifies the competencies required to apply knowledge of automobile basic components and constructions. It includes identifying automobile components, stating the purpose of these components, as well as identifying and explaining engine constructions, layouts, components and operating principles. This unit standard is intended for those who work as automotive electricians.

Special Notes

1. Entry information:

   Prerequisite
   - Unit 65 - *Apply safety rules and regulations in an automotive mechanics workshop* or demonstrated equivalent knowledge and skills.

2. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which automotive electrical and electronic operations are carried out.

3. Glossary of terms:
   - *reciprocating* means the back-and-forth or up-and-down movement of pistons

4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and workplace guidelines, instructions and reasonable flat rate time.

5. *'Specifications'* refers to any, or all of the following: manufacturers' specifications and recommendations, as well as workplace specific requirements.

6. Regulations and legislation relevant to this unit standard include the following:
   - Labour Act, No. 6, 1992
   - Occupational Health and Safety Regulations No. 18, 1997
   - Road Traffic and Transport Regulations No. 266, 2000

   and all subsequent amendments.

7. This unit standard applies to passenger and commercial vehicles, heavy plant and earthmoving equipment.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority on www.nta.com.na

Elements and Performance Criteria

Element 1: Identify automobile components and state their purpose

Range

Major mechanical components may include but are not limited to engine assembly, radiator, alternator, front and rear suspension, front and rear brakes, including handbrake, steering assembly, shock absorber, front and rear axle, fuel tank, exhaust system and battery.

Automobile construction includes unitised and body-over frame construction.

Drive train components may include but are not limited to clutch, propeller shaft, front- , rear, four and all- wheel drive arrangements, manual and automatic transmission.

Running gear components may include but are not limited to suspension, wheels and tyres, brakes, including retarder and steering.

Electrical system components may include but are not limited to battery, alternator, starter motor, switches, lamps, instruments, sensors and electronic control units.

Body components may include but are not limited to body panels, glass, body hardware, interior trim, ornamentation, mouldings, bumper bars, grilles and paintwork.

Performance Criteria

1.1 Basic arrangements of the major mechanical components of an automobile are identified and described.

1.2 Different sections of a motor vehicle and their purpose are identified and described.

1.3 Purpose and layout of the engine assembly is described.

1.4 Different automobile construction types are identified.

1.5 Drive train components are identified and their purposes are described.

1.6 Running gear components are identified and their purpose is described.

1.7 Electrical system components are identified and their purpose is described.

1.8 Body components and associated parts are identified.

Element 2: Identify and explain engine constructions, layouts, components and operating principles

Range

Engine locations may include north-south, east-west, front engine, mid-engine and rear engine locations.

Cylinder arrangements may include but are not limited to in-line engines, V-type engines and horizontally opposed engines.

Performance Criteria

2.1 Engine locations are identified and described.

2.2 Key features of diesel and petrol reciprocating engine layouts are described.

2.3 Cycles of four-stroke petrol engines, four-stroke diesel engines, two-stroke petrol engines including valve operation, are explained.

2.4 Cylinder arrangements of multi-cylinder engines are identified and described.

2.5 Basic internal construction components of reciprocating engines are identified and their operation is described.

2.6 Basic external engine construction components are identified.

Registration Data

Subfield:	Automotive Engineering
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