

Unit ID: 2210	
Domain	AUTOMOTIVE MECHATRONICS
Title:	Maintain batteries and lightning system
Level: 3	Credits: 6

Purpose

This unit standard is intended for those who maintain batteries and lightning circuits. People credited with this unit standard are able to describe operation of a basic motor vehicle battery, describe battery maintenance, charge batteries, describe lighting system, repair lighting system, describe intelligent and adaptive headlights, and adjust headlights.

This unit standard is intended for those who work in automotive mechatronics environment.

Special Notes

1. Entry information
 - Prerequisite
 - *none*
2. This unit standard is to be assessed in the context of industrial safety operations and should be assessed in conjunction with other relevant technical unit standards selected from this domain.
3. Assessment evidence may be collected at a real workplace or simulated workplace in which safety operations are carried out.
4. Glossary of terms:
 - '*Specifications*' refers to any, or all the following: manufacturers' specifications and recommendations, workplace specific requirements, national and international standards and legislations
 - '*ISO*' refers to International Organization for Standards
5. Performance of all elements in this unit standard must comply with industry standards and workplace requirements.
6. Regulations and legislation relevant to this unit standard include the following:
 - Labour Act No. 11 of 2007
 - Regulations relating to the health and safety of employees at work under Schedule 1 (2) of the Labour Act No.11 of 2007
 - ISO 14001 (Environmental Management Standard) and all subsequent amendments to any of the above.

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 on www.namqa.org and the Namibia Training Authority on www.nta.com.na.

Elements and Performance Criteria

Element 1: Describe the operation of a basic motor vehicle battery

Performance Criteria

- 1.1 Different types of batteries and their components are identified.
- 1.2 Principles of operation for different batteries are explained.
- 1.3 Precautions to be taken when working on batteries are explained.
- 1.4 Different battery applications are explained.

Element 2: Describe battery maintenance

Performance Criteria

- 2.1 Measurement of battery parameters are explained.
- 2.2 Battery charging process is explained.
- 2.3 Battery electrolyte level is checked according to manufacturers' procedures.
- 2.4 Battery faults are identified and explained.
- 2.5 Tests on batteries are explained and performed.

Element 3: Charge batteries

Performance Criteria

- 3.1. Precautions to be taken when charging batteries are followed according to workplace procedures.
- 3.2. Different types of battery charging methods are listed and explained.
- 3.3. Battery is connected and charged according to manufacturer's procedures.
- 3.4. Battery voltage is measured according to manufacturers' specifications.

- 3.5. Distilled water is topped according to manufacturers' specifications.
- 3.6. Motor vehicle jump-starting is carried out according to vehicle manufactures procedures.

Element 4: Describe lighting system

Performance Criteria

- 4.1 Lighting system components are identified.
- 4.2 Different types of lighting systems are identified and explained.
- 4.3 Operation of lighting system is explained.
- 4.4 Function of each of the lighting system component is explained.

Element 5: Repair lighting system

Performance Criteria

- 5.1. Lighting faults are identified according to workplace procedures.
- 5.2. Troubleshooting of lighting systems are explained.
- 5.3. Faulty lighting components are removed according to workplace procedures.
- 5.4. Lighting components are replaced according to manufacturer's procedures.
- 5.5. Electrical wiring is replaced according to manufacturer's procedures.
- 5.6. Lighting system is tested for operation according to workplace procedures.

Element 6: Describe intelligent and adaptive headlights

Performance Criteria

- 6.1 Intelligent and adaptive headlights are identified.
- 6.2 Operational characteristics of intelligent and adaptive headlights are explained.
- 6.3 Disadvantages and advantages of intelligent and adaptive headlights are explained.
- 6.4 Applications of intelligent and adaptive headlights are explained.

Element 7: Adjust headlights

Performance Criteria

- 7.1. Tools and equipment for adjustment of headlights are identified and selected.

- 7.2. Procedures for headlights adjustment are followed according to manufacturers' specifications.
- 7.3. Headlights are checked for correct settings according to manufacturers' specifications.
- 7.4. None-tool headlight adjustment is explained.
- 7.5. None-tool headlight adjustment is carried out according to manufacturer's procedures.

Registration Data

Subfield:	Automotive Engineering
Date first registered:	22 April 2020
Date this version registered:	22 April 2020
Anticipated review:	2025
Body responsible for review:	Namibia Training Authority