Unit ID: 2214

Domain **AUTOMOTIVE MECHATRONICS**

Title: **Service hydraulic and electronically controlled motor vehicle braking systems**

Level: 3 **Credits: 10**

Purpose

This unit standard is intended for those who service hydraulic and electronically controlled motor vehicle braking systems. People credited with this unit standard are able to describe function and operation of a braking system, maintain hydraulic brake system, maintain parking brake systems, maintain electronically controlled hydraulic brake system, maintain traction control system, maintain active and emergency brake assist systems, maintain anti-lock brake system, and hill start, hold and downhill descent control system.

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 an appropriate simulated realistic environment 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 function and operation of a braking system

Performance Criteria

1.1 Different braking systems are identified.

1.2 Different parts of a braking system are identified.

1.3 Operation of different braking system is explained.

1.4 Functions of different braking system components are explained.

1.5 Brake circuit configurations are explained.

1.6 Advantages and disadvantages of different braking system are explained.

Element 2: Maintain hydraulic brake system

Performance Criteria

2.1 Different components of the hydraulic brake system are identified.

2.2 Components of the hydraulic system are dismantled and cleaned according to vehicle manufacturers' procedures.

2.3 Components of the hydraulic system are checked for wear and tear according to vehicle manufacturers' procedures.

2.4 Faulty components are identified and replaced according to vehicle manufacturers' procedures.

2.5 Moving parts of the hydraulic brake system are lubricated according to manufacturers' procedures.

2.6 Brake fluid is checked for moisture and dirt according to vehicle manufacturers' procedures.

2.7 Braking system is bled according to vehicle manufacturers' procedures.

Element 3: Maintain parking brake systems

Range

Parking brake system includes and is not limited to manual and electronic parking brake.

Performance Criteria

3.1 Different parts of a braking system are dismantled and cleaned according to vehicle manufacturers' procedures.

3.2 Faulty components are identified and replaced according to vehicle manufacturers' procedures.

3.3 Moving parts are lubricated according to vehicle manufacturers' procedures.

3.4 Electronic parking brake system is explained.

Element 4: Maintain electronically controlled hydraulic brake system

Performance Criteria

4.1 Components of the electronically controlled hydraulic brake system are identified.

4.2 Principle of operation of electronically controlled hydraulic brake system is explained.

4.3 Components of electronically controlled hydraulic brake system are dismantled and cleaned according to workplace procedures.

4.4 Faulty components of electronically controlled hydraulic brake system are identified and replaced according to workplace procedures.

4.5 Replacing components of electronically controlled hydraulic brake system are fitted and tested according to vehicle manufacturers' procedures.

4.6 Moving parts are lubricated according to vehicle manufacturers' procedures.

Element 5: Maintain traction control system

Performance Criteria

5.1 Components of the traction control system are identified.

5.2 Principle of operation of traction control system is explained.

5.3 Components of traction control system are dismantled and cleaned according to manufacturer's procedures.

5.4 Faulty components of traction control system are identified and replaced according to workplace procedures.

5.5 Replacing components of traction control are fitted and tested according to vehicle manufacturers' procedures.

5.6 Moving parts are lubricated according to vehicle manufacturers' procedures.

Element 6: Maintain active and emergency brake systems

Performance Criteria

6.1 Components of the active and emergency brake system are identified.

6.2 Principle of operation of active and emergency brake system are explained.

6.3 Components of active and emergency brake system are dismantled and cleaned according to workplace procedures.

6.4 Faulty components of active and emergency brake system are identified and replaced according to workplace procedures.

6.5 Replacing components of active and emergency brake system are fitted and tested according to vehicle manufacturers' procedures.

6.6 Moving parts are lubricated according to vehicle manufacturers' procedures.

Element 7: Maintain anti-lock brake system

Performance Criteria

7.1 Components of the anti-lock brake system are identified.

7.2 Principle of operation of anti-lock brake system is explained.

7.3 Components of anti-lock brake system are dismantled and cleaned according to workplace procedures.

7.4 Faulty components of anti-lock brake system are identified and replaced according to workplace procedures.

7.5 Replacing components of anti-lock brake system are fitted and tested according to vehicle manufacturers' procedures.

7.6 Moving parts are lubricated according to vehicle manufacturers' procedures.

Element 8: Hill start, hold and downhill descent control system

Performance Criteria

8.1 Hill start, hold and downhill descent control system is explained.

8.2 Components of hill start, hold and downhill descent control system are dismantled and cleaned according to workplace procedures.

8.3 Faulty components of hill start, hold and downhill descent control system are identified and replaced according to workplace procedures.

8.4 Replacing components of hill start, hold and downhill descent control system are fitted and tested according to vehicle manufacturers' 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