



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL DIPLOMA

IN

AUTOMOTIVE ENGINEERING: AUTOMOTIVE TECHNICIAN

MODULE: Braking Systems

PAPER NO: 635/23/M03

DURATION: 3 Hours

NOVEMBER/DECEMBER 2025 EXAMINATION

REQUIREMENTS

Drawing instruments and answer booklet.

INSTRUCTIONS TO CANDIDATE

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| 1. | Section A: Answer all questions. | 40 marks. |
| 2. | Section B: Answer any six questions. | 60 marks. |

SECTION A

QUESTION 1

1.1 Define the following terms:-

- (i) brakes (2 marks)
- (ii) friction (2 marks)
- (iii) co-efficient of friction (2 marks)

1.2 Define two (2) types of friction. (4 marks)

1.3 State any three (3) desirabilities of a good braking system. (6 marks)

1.4 State four types of brakes as classified according to mode of operation. (8 marks)

1.5 List down three (3) factors that affects tyre –rod addesion. (6 marks)

1.6 State the functions of the following units as used with pneumatic braking system

- (i) air filters (2 marks)
- (ii) pressure regulator (2 marks)
- (ii) anti freeze pump (2 marks)
- (iv) protection valves (2 marks)
- (v) air reservoirs (2 marks)

SECTION B

QUESTION 2

- (a) Outline three (3) roles of foot valve in the primary circuit. (6 marks)
- (b) Give the other name of foot valve. (2 marks)
- (c) Give two (2) functions of an air drier. (2 marks)

QUESTION 3

- (a) Define the term slack adjusters with reference to braking system. (2 marks)
- (b) Outline the main functions of a slack adjuster. (2 marks)
- (c) List two (2) types of slack adjusters. (2 marks)
- (d) Explain the main advantages of why (SAE) Society of Automotive Engineers and Department of Transportation (DOT) prefers DOT 3 and DOT 4 types of brake fluid. (4 marks)

QUESTION 4

- (a) Explain briefly the construction of a tandem master cylinder. (4 marks)
- (b) State the function of vacuum or hydraulic power booster. (2 marks)
- (c) Outline the merits behind using the a booster in conjunction with tandem master cylinder. (2 marks)
- (d) State the function of Pressure Differential Valve. (2 marks)

QUESTION 5

A truck is brought in the workshop for servicing the master cylinder. Detail out the procedure of how the master cylinder should be removed from the truck. (10 marks)

QUESTION 6

Describe how a wheel cylinder should be removed, observing the correct general procedures. (10 marks)

QUESTION 7

- (a) State what does ABS stands for. (2 marks)
- (b) Define the term ABS (3 marks)
- (c) List five (5) major components of ABS. (5 marks)

QUESTION 8

- (a) Define the term Yaw with reference to braking system. (2 marks)
- (b) State four (4) factors that influence yaw stability. (8 marks)

QUESTION 9

Outline the sequence of removing a Relay valve. (10 marks)

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