

071605T4AUT

AUTOMOTIVE ENGINEERING LEVEL 5

ENG/OS/AUT/CR/6/5/A

Service Vehicle Suspension System

July/August 2024



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

WRITTEN ASSESSMENT

TIME: 3 HOURS

INSTRUCTIONS TO THE CANDIDATE

- 1. This paper consists of **TWO** sections: **A** and **B**.*
- 2. Attempt **ALL** the questions in Section **A** and any **THREE** questions from Section **B**.*
- 3. Marks for each question are as indicated.*
- 4. You are provided with a separate answer booklet.*
- 5. Do not write on the question paper.*

This paper consists of THREE (3) printed pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

Turn over

SECTION A: (40 MARKS)***Attempt ALL the questions in this section***

1. Non-independent suspension is commonly fitted to heavy commercial vehicles that have beam axles. State FIVE advantages of this type of suspension. (5 Marks)
2. The suspension system plays many roles in automobile. List FOUR such functions. (4 Marks)
3. Automotive technicians are required to observe safety precautions while servicing a motor vehicle. Outline FIVE safety precautions observed when dismantling a Macpherson strut. (5 Marks)
4. Highlight TWO purposes of a stabilizer bar in the suspension system (2 Marks)
5. Identify FOUR components of the leaf spring suspension which can be checked for wear or damage. (4 Marks)
6. The suspension system uses different types of springs depending on the type of vehicle and the manufacturer. List FOUR common types of springs used in suspension systems. (4 Marks)
7. Explain the role of a control arm in a suspension system. (2 Marks)
8. Identify FOUR signs of worn-out shock absorbers. (4 Marks)
9. Most wastes generated by the automotive industry are hazardous materials. As an automotive technician, outline FOUR methods you would use to manage the waste (4 Marks)
10. Differentiate between sprung and unsprung weight. (4 Marks)
11. Outline TWO recommendations for storage of lubricating oils in an automotive workshop. (2 Marks)

SECTION B: (60 MARKS)

Attempt any THREE questions in this section

12.

- a) Outline THREE functional requirements of a suspension system. (6 Marks)
- b) Explain why it is not advisable to apply heat or flame to gas-pressurized shock absorbers during removal. (2 Marks)
- c) Shock absorbers can be mounted either vertically or at an angle. Outline TWO advantages of mounting shock absorbers at an angle. (2 Marks)
- d) Most motorists fail to notice gradual changes in the operation of their cars as a result of worn shock absorbers. Identify FIVE common indications of shock absorber failure. (10 Marks)

13.

- a) Explain THREE advantages of gas pressurized dampers. (6 Marks)
- b) State SIX advantages of rubber suspension. (6 Marks)
- c) Sketch and label FOUR parts of a Wishbone suspension system. (8 Marks)

14.

- a) Discuss FIVE safety precautions to observe while servicing the leaf spring. (10 Marks)
- b) Outline the function of the following leaf spring components.
 - i). Main leaf (2 Marks)
 - ii). Rebound clip (2 Marks)
 - iii). Eye (2 Marks)
 - iv). Shackle (2 Marks)
 - v). Centre bolt (2 Marks)

15.

- a) Discuss FOUR precautions observed when handling rotating machinery. (8 Marks)
- b) Define the following terms as used in suspension system (4 Marks)
 - i). Rolling
 - ii). Pitching
- c) Highlight FOUR inspection checks carried out on a stabilizer bar. (8 Marks)