



ZIMBABWE

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

NATIONAL CERTIFICATE

IN

PRECISION MACHINING MOTOR VEHICLE MECHANICS

MODULE: Engine Fuel Management

PAPER NO: 346/22/M09

DURATION: 3 Hours

MAY/ JUNE 2025 EXAMINATION

REQUIREMENTS

Pen, Ruler, Pencil, Rubber

INSTRUCTIONS TO CANDIDATES

Answer all questions (100 marks).

This paper consists of 5 printed page.

QUESTION 1

- a) Identify the components in the fuel injection system in fig. A and state their functions by filling in the table below:

COMPONENT	NAME OF COMPONENT	FUNCTION
2		
4		
6		
8		
10		
14		
18		
19		
20		
22		

(20 marks)

- b) Explain what happens to the engine when the following components develop faults:
- | | | |
|------|----|----------|
| i) | 2 | (1 mark) |
| ii) | 10 | (1 mark) |
| iii) | 11 | (1 mark) |
| iv) | 20 | (1 mark) |
| v) | 22 | (1 mark) |

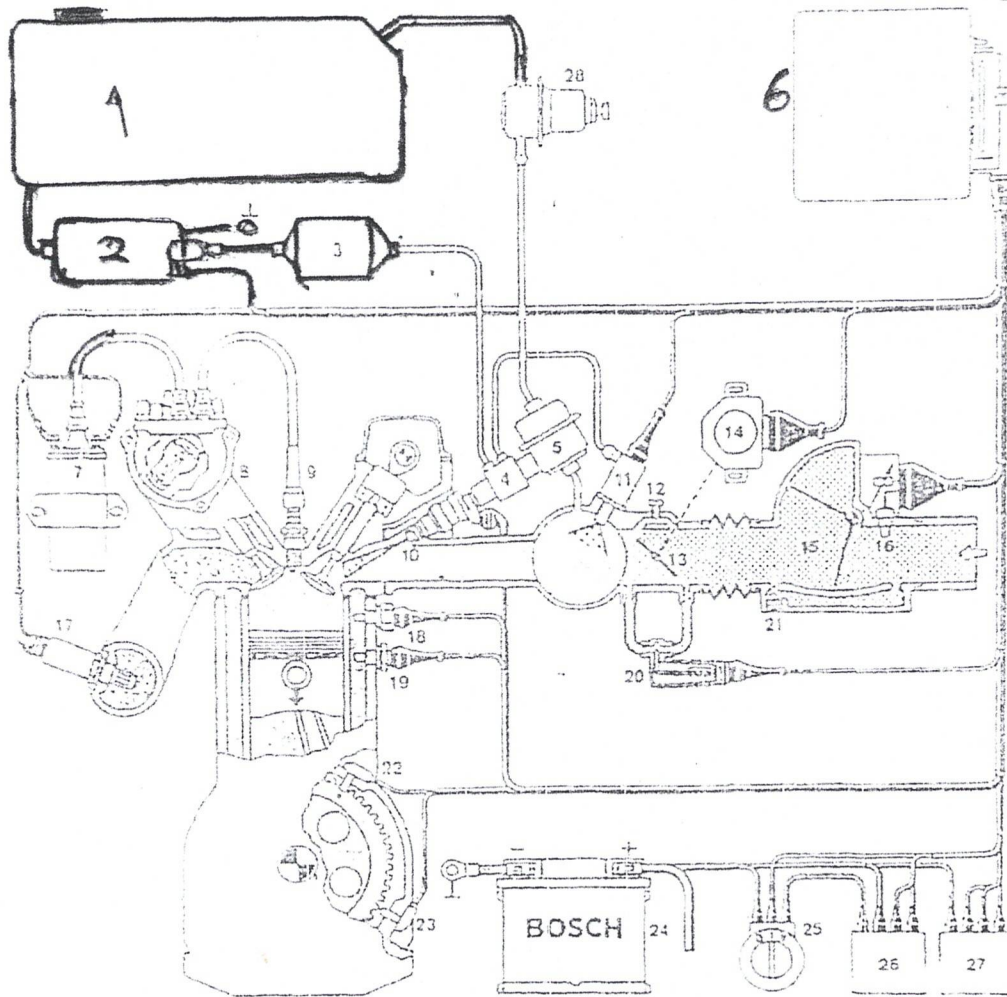


FIG A

QUESTION 2

- a) Briefly describe the procedure of identifying a faulty petrol injector on a running petrol engine. (10 marks)
- b) Differentiate between a mechanical fuel pump and electronic fuel pump. (4 marks)
- c) List three (3) precautions undertaken when working on an ECU. (3 marks)
- d) Explain four (4) causes of high fuel consumption. (8 marks)

QUESTION 3

- a) Explain the following fuel injection terms:
 - i) eFuel (3 marks)
 - ii) Blended Fuel (3 marks)
- b)
 - i) Explain two (2) disadvantages associated with eFuels. (4 marks)
 - ii) Explain three (3) disadvantages associated with blended fuel. (6 marks)
- c)
 - i) Explain what is meant by E10? (4 marks)
 - ii) Explain two (2) advantages associated with E10 graded fuel. (4 marks)
 - iii) In fuel injection system EFI stands for (1 mark)

QUESTION 4

- a) Explain the causes of a fuel injector open circuit. (4 marks)
- b) Explain how the fuel injectors are wired. (4 marks)
- c) When using OBD, a fault is detected by a code e.g P1101. Explain what the letter P and the digits represent. (8 marks)
- d) Explain the duty of a lambda sensor. (4 marks)
- e) Explain the purpose of air vent found on the fuel tank. (3 marks)
- f) List any two (2) fuel injection systems you know. (2 marks)

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