



0171-516 MARCH 2018

Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)

Level 3 Land-Based Engineering – Theory exam (1)

If provided, stick your candidate barcode label here.

Wednesday 14 March 2018
13:30 – 15:30

Candidate name (first, last)

First

Last

Candidate enrolment number

Date of birth (DDMMYYYY)

Gender (M/F)

Assessment date (DDMMYYYY)

Centre number

Candidate signature and declaration*

• If any additional answer sheets are used, enter the additional number of pages in this box.

• Please ensure that you **staple** additional answer sheets to the **back** of this answer booklet, clearly labelling them with your full name, enrolment number, centre number and qualification number in BLOCK CAPITALS.

• All candidates need to use a **black/blue pen**. **Do not** use a pencil or gel pen.

• If provided with source documents, these documents **will not** be returned to City & Guilds, and will be shredded. **Do not** write on the source documents.

***I declare that I had no prior knowledge of the questions in this assessment and that I will not divulge to any person any information about the questions.**

You should have the following for this examination

- a pen with blue or black ink
- a non-programmable calculator

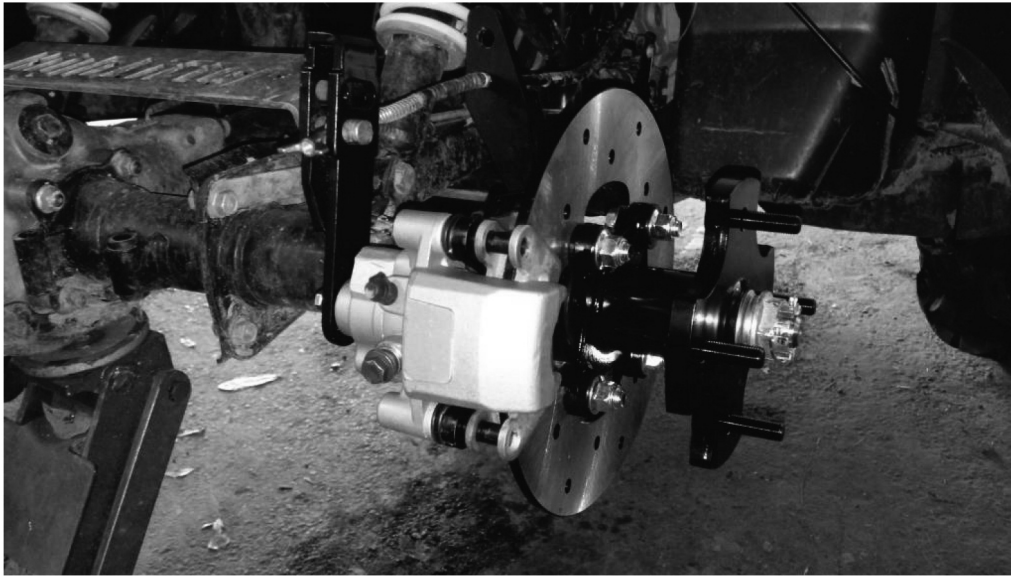
General instructions

- Use black or blue ball-point pen.
- The marks for questions are shown in brackets.
- This examination contains 13 questions. Answer **all** questions.
- Answer the questions in the spaces provided. Answers written in margins or on blank pages will **not** be marked.
- Cross through any work you do not want to be marked.



1 Name **three** types of brakes fitted to land based vehicles. (3 marks)

2 Explain how the type of braking system, shown in Figure 1, operates. (4 marks)



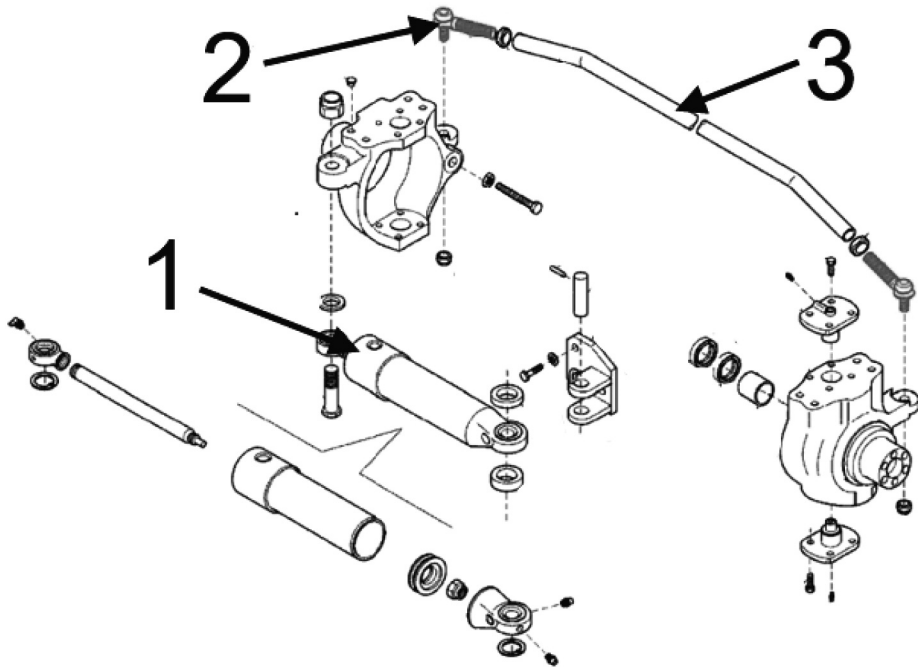
Hondaforeman.com

Figure 1



3 Describe the procedure to adjust the front wheel alignment on the steering system in Figure 2.

(5 marks)



5500-mahindra-tractors

Figure 2



4 State **three** risks when repairing vehicle electrics.

(3 marks)

5 Explain **each** of the following vehicle electrical faults.

a) Open circuit.

(2 marks)

b) Short circuit.

(2 marks)

c) High resistance.

(2 marks)



- 6 A windscreen wiper system consisting of a 60 watt wiper motor operates at 12 V. Calculate the size of fuse needed to protect the circuit. Show all calculations. (3 marks)

- 7 State **one** aim for **each** of the following. (1 mark)
- a) G.P.S. (1 mark)

- b) CANBUS. (1 mark)

- c) ISOBUS. (1 mark)



8 Explain the function of **each** of the following electronic components.

a) Resistor.

(3 marks)

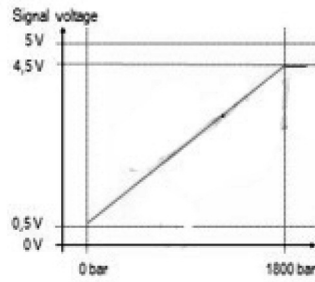
b) Zener diode.

(3 marks)

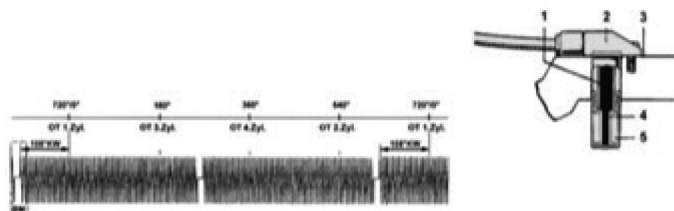
9 Describe the **three** signals in Waves 1, 2 and 3 in Figure 3.

(3 marks)

Wave 1



Wave 2



Wave 3

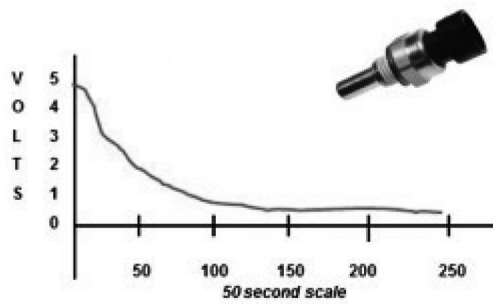


Figure 3

Question 9 continued

10 Define **each** of the following hydraulic terms.

a) Micron μM .

(1 mark)

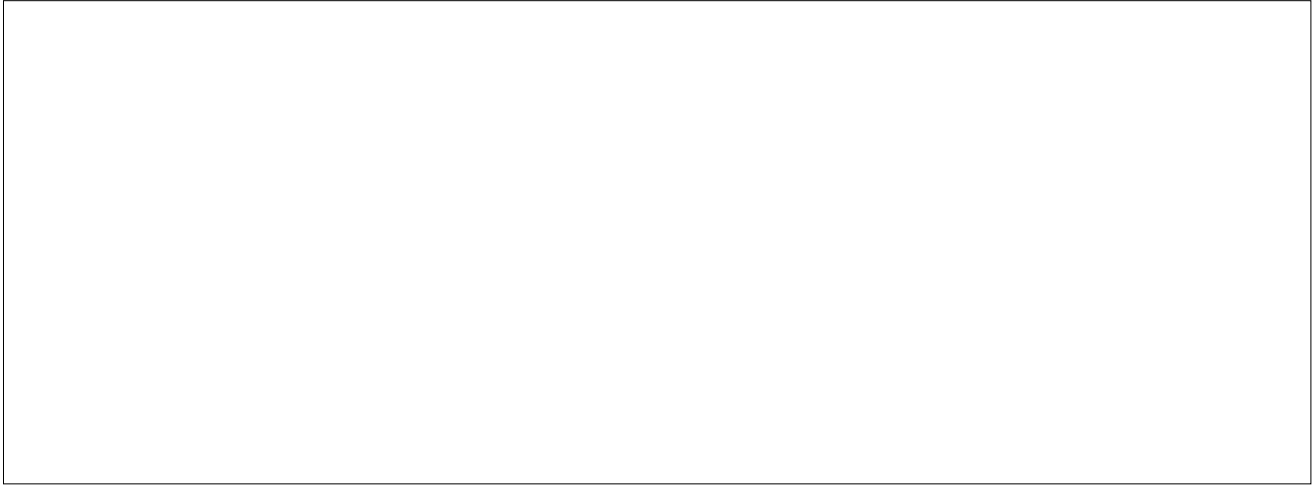
b) Cavitation.

(1 mark)

c) Cracking pressure.

(1 mark)

12 A typical system pressure is 3000 psi. Convert this reading to bar. Show all working. (3 marks)



- 13 A customer complains that the tractor’s brake pedal ‘goes to the floor’ when pressed, with poor braking effect.

Discuss the diagnostic procedures to identify the possible cause(s) for this problem. (12 marks)

Lined area for writing the answer.