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City & Guilds

0171-516 JUNE 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.

Tuesday 19 June 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. ➡ 0 0
- 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 9 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.

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1 Name the steering parts labelled 1 to 3 in Figure 1. (3 marks)

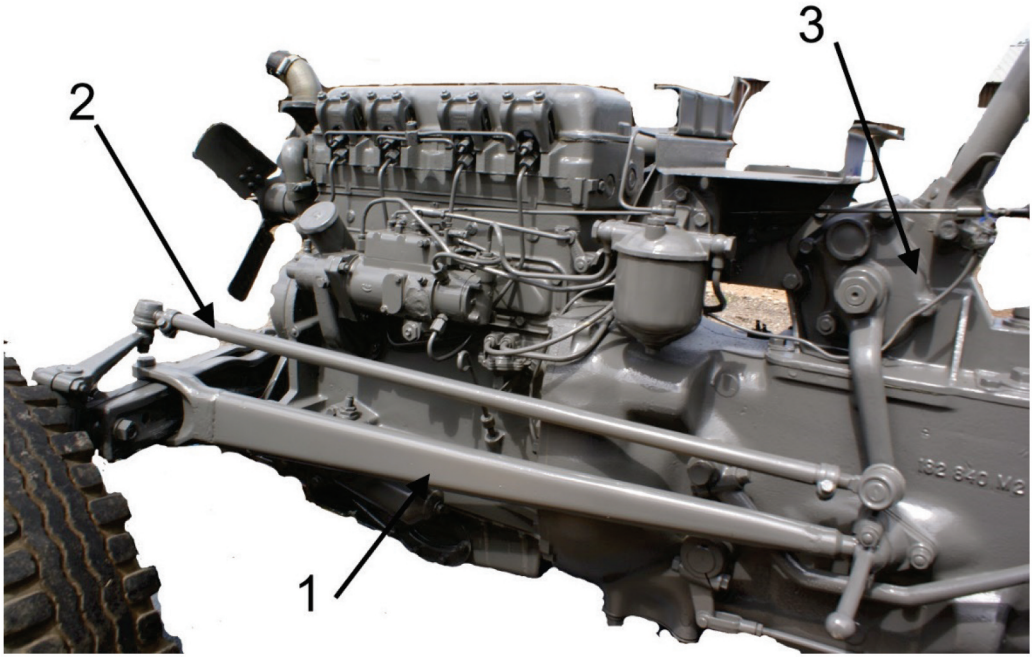

Figure 1

2 Describe the procedure to adjust the front wheel bearing on a manual steering two wheel drive tractor. (9 marks)

3 a) Calculate the current flowing, in amperes, in the following 12 volt vehicle light circuits.

i) 4 sidelights each with 5 watt bulbs and 2 head lamps on dip beam, each with a 55 watt bulb. (4 marks)

ii) 4 sidelights each with 10 watt bulbs and 2 head lamps on a main beam, each with a 60 watt bulb. (3 marks)

b) State what size fuse should be fitted to protect **each** of the circuits in i) and ii). (2 marks)

4 State the meaning of the following electrical terms.

a) Volts. (1 mark)

b) Resistance. (1 mark)

c) Watt. (1 mark)

5 a) Explain the role of the electronic control unit (ECU) in engine management systems. (6 marks)

b) Describe the two inputs required to generate a signal by the following sensors.

i) Camshaft sensor. (1 mark)

ii) Coolant sensor. (1 mark)

iii) Intake air temperature. (1 mark)

See next page

6 In relation to yield mapping, state the meaning of the following terms.

a) RTK. (1 mark)

b) GALILEO. (1 mark)

c) DGPS. (1 mark)

7 A hydraulic circuit using ISO standard hydraulic symbols is shown in Figure 2.

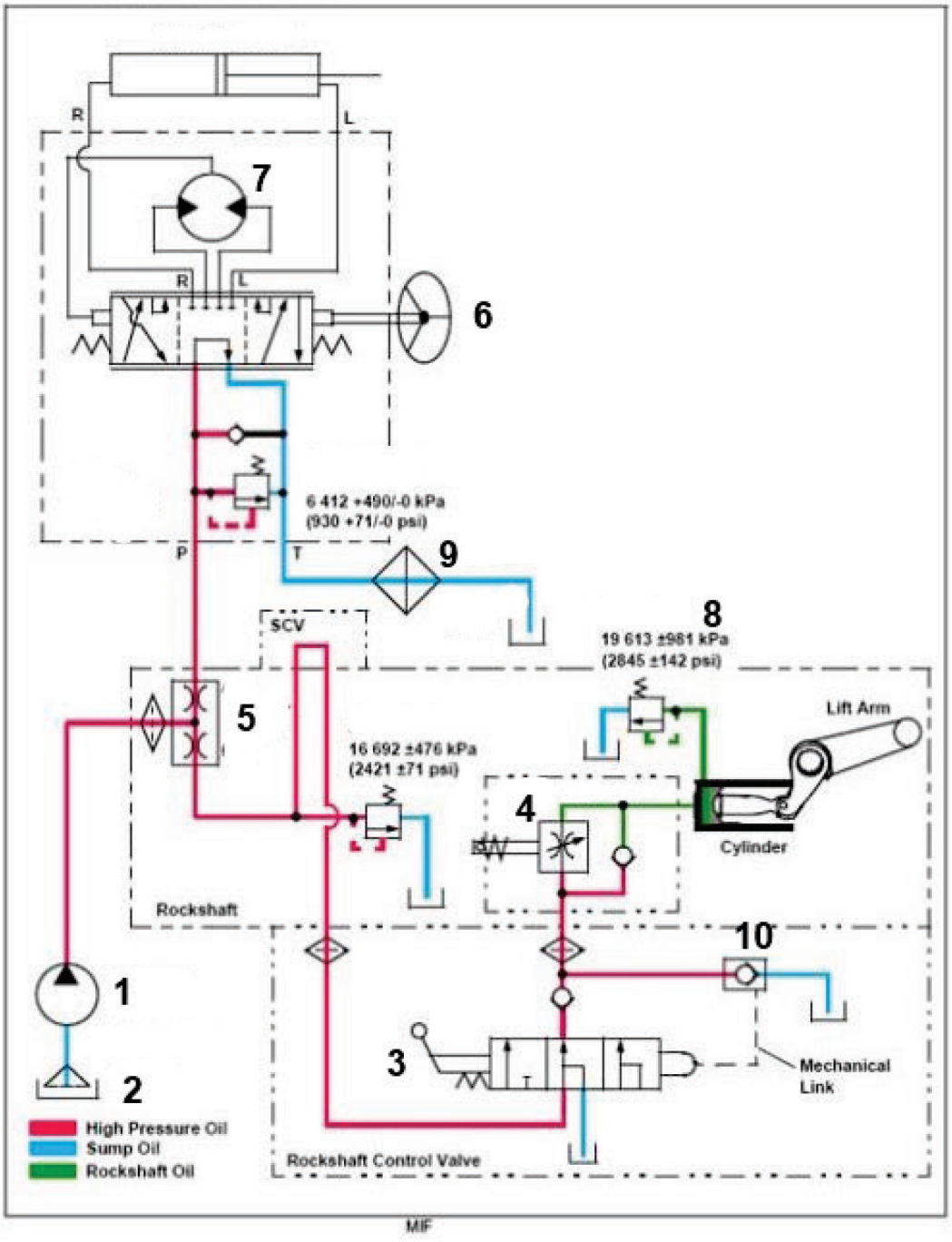

Figure 2

a) Name the parts labelled 1, 4 and 9 in Figure 2. (3 marks)

b) State the type of hydraulic system shown in Figure 2. (1 mark)

c) Describe the operation of the parts labelled 6, 8 and 10, in Figure 2. (6 marks)

8 Explain the difference between positive and non-positive displacement hydraulic pumps. (2 marks)

9 A customer complains that a 3 cylinder indirect injection engine is a poor starter from cold and misfires when starting. The workshop has assessed that the engine is mechanically good.

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

End of examination