



NZQA accredited and registered provider

## Ignition systems

# PRACTICE PAPER ONLY

**Test Paper One / Time allowed 90 mins**

To be completed by the student

**Student Name** \_\_\_\_\_ **Date** \_\_ / \_\_ /2020

**School/Provider** \_\_\_\_\_

To be completed by the School Invigilator/Coordinator/Tutor

**I confirm that this assessment was completed by the student named above as a closed book exercise under exam conditions**

**Invigilator Name** \_\_\_\_\_

**Invigilator Sign** \_\_\_\_\_

**Assessed By** \_\_\_\_\_

**Date** \_\_ / \_\_ / 2020

**Assessor's  
Stamp**

**Assessors Note: Materials relate to unit standard 235-30574**

### **ASSESSMENT INSTRUCTIONS**

- Before starting this assessment you should have achieved a mark of at least 80% for your workbook.
- Use a black or blue ball point pen. (do not use pencil)
- Write your full name on the cover page.
- This is a closed book assessment, so you cannot bring any reference material in, or seek help from anyone else.
- You need to answer all the questions.
- Read the questions carefully, and give detailed answers when asked to.
- You must complete the assessment under exam conditions.
- To achieve the unit standard you must show competency for each outcome.

Complete the following by circling Yes or No as appropriate:

Are you ready to be assessed? **Yes No**

Have the assessment instructions these been explained to you? **Yes No**

Do you understand the assessment instructions? **Yes No**

Have you all the materials/resources that you need for this assessment? **Yes No**

Please sign to acknowledge that you have read these instructions and are ready to be assessed.

**Student Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**You must complete the assessment instructions on Page 2 before starting this assessment!**

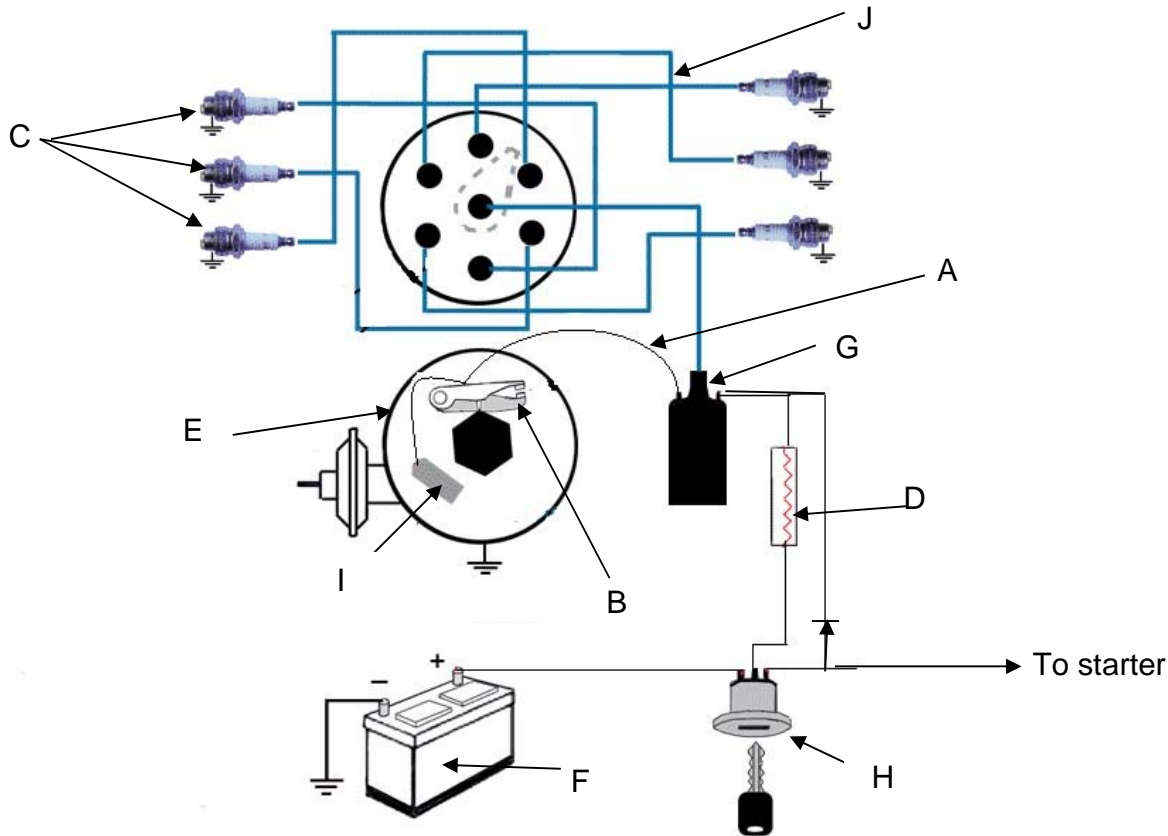
**ELEMENT ONE**

Demonstrate knowledge of the operation of a contact breaker ignition system.

1. From the list provided identify the contact breaker ignition system components listed A-I in the diagram below.

Ballast resistor, Battery, Capacitor, Distributor,  
 Ignition switch, Contact breakers, High tension leads,  
 Low tension lead, Coil, spark plugs

A		F	
B		G	
C		H	
D		I	
E		J	





3. Match up the contact breaker ignition system components with their function. For example:

**A – Battery = 3 – Provides current for the ignition system**

A	Battery	A3	1	Produces a spark to ignite the air/fuel mixture in the combustion chamber
B	Starter solenoid		2	Produces a magnetic field within the ignition coil
C	Spark plugs		3	<b>Provides current for the ignition system</b>
D	Condenser		4	Designed to absorb current and to prevent arcing at contacts
E	Contact breaker points		5	Receives battery voltage when the ignition switch is in the start position to activate the starter motor
F	Primary winding		6	Reduces voltage supply to the primary circuit when the engine is running
G	Secondary winding		7	To switch the ignition on and off and to operate the engine starter motor
H	Distributor		8	Relays high voltage spark to the right cylinder at the correct time
I	Rotor		9	Interrupts the primary circuit
J	Ballast resistor		10	Steps up the primary coil voltage to around 30,000v
K	Ignition switch		11	Provides a means of passing HT voltage from the coil to the spark plug via HT leads



**ELEMENT TWO**

Demonstrate knowledge of the operation of distributor type electronic ignition systems.

1. Identify the ignition sensors (A-C) as shown in the diagrams below and explain their operation.

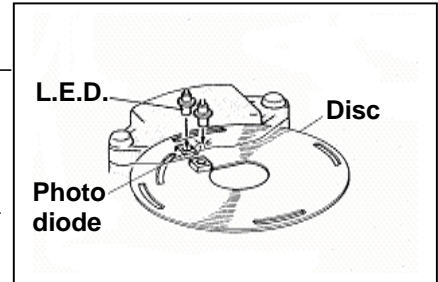
A: Name: \_\_\_\_\_

Operation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



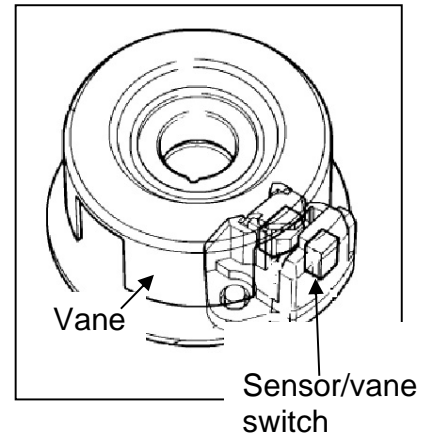
B: Name: \_\_\_\_\_

Operation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



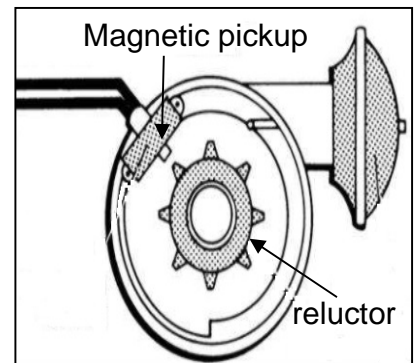
C Name: \_\_\_\_\_

Operation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

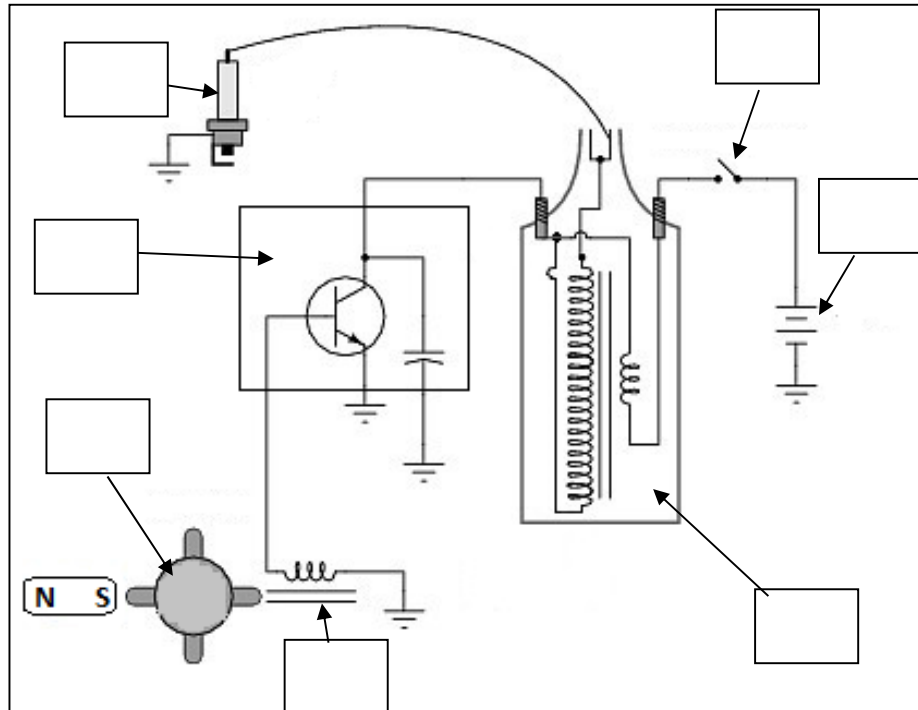
\_\_\_\_\_



2. Identify the electronic ignition system components labelled A, B, C, D, E, F and G.

A: Transistorised ignition module;  
 C: Spark plug;  
 E: Coil,  
 G: Ignition switch,

B: Magnetic pickup  
 D: Reluctor/position sensor,  
 F: Battery,



3. Describe the operation of the electronic ignition system above.

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4. List two precautions that should be taken when working with electronic ignition systems.

1. \_\_\_\_\_  
 \_\_\_\_\_

2. \_\_\_\_\_  
 \_\_\_\_\_

5. Match up the electronic ignition system components with their function. For example:

A – Battery = 3 – Provides current for the ignition system

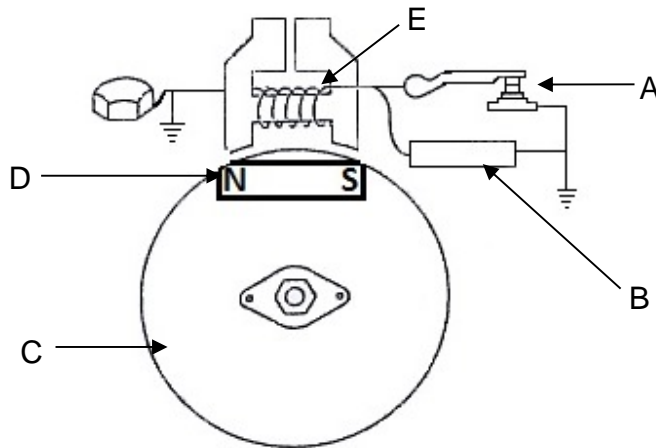
A	Battery	A3	1	Will open circuit if excessive current passes through
B	Fuse		2	Relays high voltage spark to the right cylinder at the correct time.
C	ECU		3	<b>Supplies electricity for the ignition system</b>
D	Sensor		4	To switch the ignition on and off and to operate the engine starter motor
E	Ignition coil		5	Interrupts primary circuit to induce high voltage in secondary circuit.
F	Distributor		6	Monitors engine performance and makes automatic adjustments to meet the engine demands.
G	Ignition switch			Generates high voltage for the high tension lead to the spark plug.

**ELEMENT THREE**

Demonstrate knowledge of the layout and components of magneto ignition systems.

1. From the diagram of the magneto ignition system below, identify the following components.

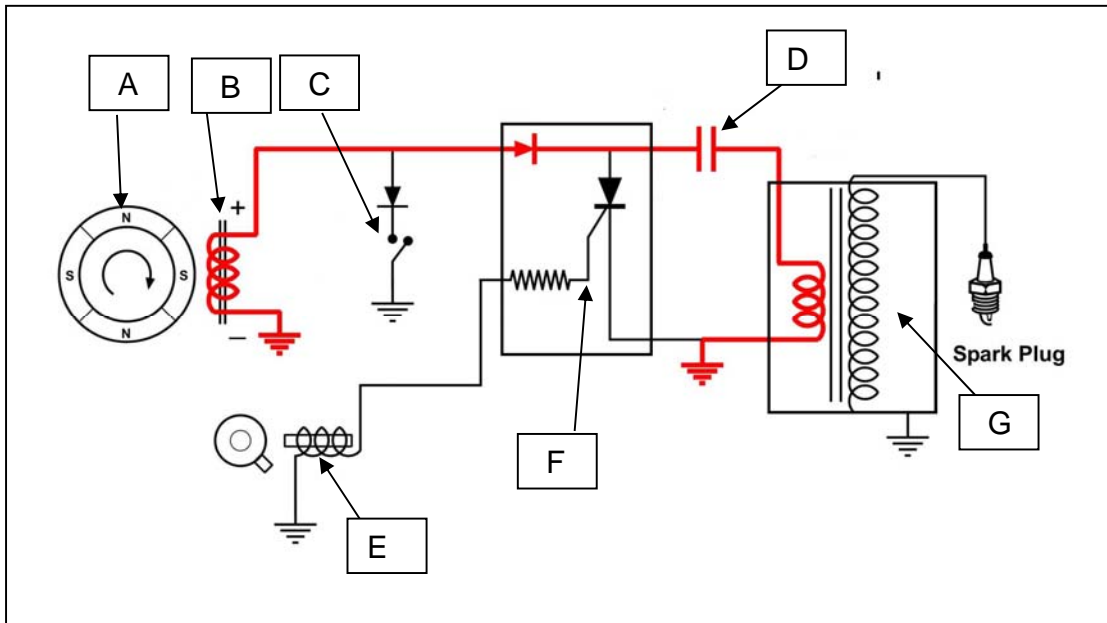
Capacitor Contact breaker Coil Flywheel Magnet



- A: \_\_\_\_\_  
B: \_\_\_\_\_  
C: \_\_\_\_\_  
D: \_\_\_\_\_  
E: \_\_\_\_\_

2. From the diagram of the capacitor discharge ignition system, identify the following components.

Magnet      Ignition coil      Exciter coil      Capacitor  
 Trigger coil      Ignition switch      Thyristor

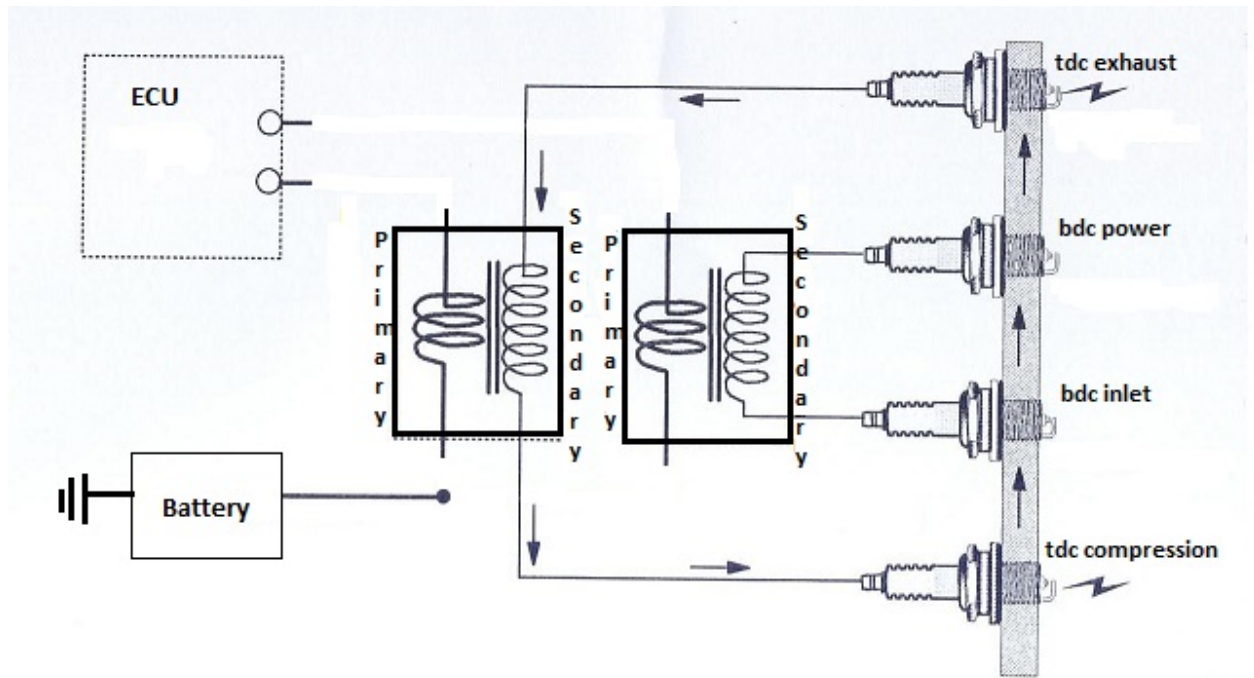


- A: \_\_\_\_\_
- B: \_\_\_\_\_
- C: \_\_\_\_\_
- D: \_\_\_\_\_
- E: \_\_\_\_\_
- F: \_\_\_\_\_
- G: \_\_\_\_\_

#### ELEMENT FOUR

Demonstrate knowledge of the circuit layout and components in distributorless ignition systems.

1. Complete the primary circuit for the waste spark ignition system shown below.



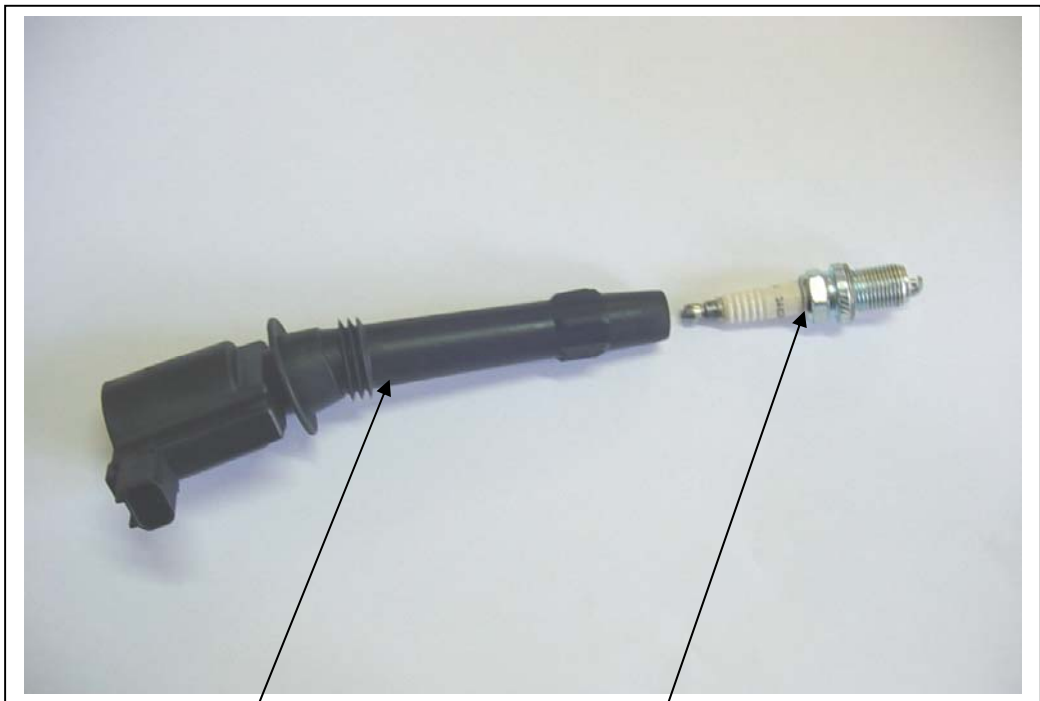
2. How many ignition coils are used in the system shown above?

3. Name the type of ignition system shown below and identify the components.

Ignition system type: \_\_\_\_\_

1. \_\_\_\_\_

2. \_\_\_\_\_



1

2

**FINISHED? CHECK THAT YOU HAVE ATTEMPTED ALL QUESTIONS!**

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## ASSESSMENT SCHEDULE – UNIT STANDARD 235

### ASSESSOR TO COMPLETE

**Element One: Demonstrate knowledge of the operation of a contact breaker ignition system.**

PCs	Activity	Judgement Statement	✓
1.1 1.3	1	Components correctly identified and appropriate description provided. Assessor to use professional judgement where answers provided differ to those suggested in the answer bank.	
1.3	2	Appropriate description provided as per answer bank. Assessor to use professional judgement where answers provided differ to those suggested in the answer bank.	
1.3	3	Table completed as per answer bank.	
1.2	4	Appropriate description provided as per answer bank. Assessor to use professional judgement where answers provided differ to those suggested in the answer bank.	

**Element Two: Demonstrate knowledge of the operation of distributor type electronic ignition systems.**

PCs	Activity	Judgement Statement	✓
2.2 2.3	1a 1b 1c	Sensors correctly identified and appropriate explanation provided. Assessor to use professional judgement where answers provided differ to those suggested in the answer bank.	
2.1	2	Appropriate description provided as per answer bank. Assessor to use professional judgement where answers provided differ to those suggested in the answer bank.	
2.4	3	Two appropriate safety precautions provided as per answer bank. Assessor to use professional judgement where answers provided differ to those suggested in the answer bank.	
2.1	4	Correct answers provided as per answer bank. Assessor to use professional judgement where answers provided differ to those suggested in the answer bank.	
2.1	5	Table completed as per answer bank.	

**Element Three: Demonstrate knowledge of the layout and components of magneto ignition systems.**

PCs	Activity	Judgement Statement	✓
3.1	1	Correct answers provided as per answer bank.	
3.1	2	Correct answers provided as per answer bank.	

**Element Four: Demonstrate knowledge of the circuit layout and components in distributorless ignition systems.**

PCs	Activity	Judgement Statement	✓
4.1	1	Correct answer provided as per answer bank.	
4.1	1b	Correct answer provided as per answer bank.	
4.1	2	Correct answer provided as per answer bank.	

**Assessor Comments:**



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