

## National Unit Specification: General Information

**UNIT** Automotive: Lubrication Systems (Intermediate 2)

**NUMBER** 2210268

### COURSE

### SUMMARY

A unit designed to develop a knowledge of lubrication systems and associated components fitted to a vehicle, how they operate, the areas of potential failure or wear, the need for settings and adjustment including removal and replacement techniques.

### OUTCOMES

- 1 Identify engine lubrication and crankcase ventilation system components.
- 2 Explain the operation of the engine lubrication and crankcase ventilation system components.
- 3 Identify main engine lubrication and crankcase ventilation system components that are subject to wear and/or failure.
- 4 Demonstrate the procedure for testing, removal and fitting of an engine lubrication and crankcase ventilation system component.

### RECOMMENDED ENTRY

Access to this unit is at the discretion of the centre, however no entry prerequisites are envisaged.

### CREDIT VALUE

0.5 Credit at Intermediate 2.

### CORE SKILLS

Information on the automatic certification of the core skills in this unit is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999)

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### Administrative Information

**Superclass:** XS

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## National unit specification: statement of standards

**UNIT**           Automotive: Lubrication Systems (Intermediate 2)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

### **OUTCOME 1**

Identify engine lubrication and crankcase ventilation system components.

#### **Performance Criteria**

- a) The main lubrication system components of a wet sump system are correctly identified.
- b) The components of a full flow oil filter are correctly identified.
- c) The components of a positive crankcase ventilation system are correctly identified.

#### **Evidence Requirements**

Written and/or oral evidence of the candidate's ability to identify lubrication and crankcase ventilation system components from diagrams, videos, slides or actual vehicles and units.

Satisfactory achievement of the outcome will be demonstrated by the candidate achieving:

PC (a) correct identification of 6 main lubrication system components.

PC (b) correct identification of 3 oil filter components.

PC (c) correct identification of 3 main crankcase ventilation components.

### **OUTCOME 2**

Explain the operation of the engine lubrication and crankcase ventilation system components.

#### **Performance Criteria**

- a) The explanation of the operation of an oil pump is correct.
- b) The explanation of the operation of an oil filter is correct.
- c) The explanation of the oil flow through the lubrication system is correct.
- d) The explanation of the operation of a lubrication system pressure relief valve during running conditions is correct.
- e) The explanation of the operation of an oil pressure switch is correct.
- f) The explanation of the operation of a crankcase ventilation system is correct.

## **National unit specification: statement of standards (cont)**

**UNIT** Automotive: Lubrication Systems (Intermediate 2)

### **Evidence Requirements**

Written and/or oral evidence of the candidate's ability to explain the operation of the engine lubrication and crankcase ventilation system components.

Satisfactory achievement will be demonstrated by the candidate achieving:

- PC (a) correct explanation of an oil pump operation.
- PC (b) correct explanation of an oil filter operation.
- PC (c) correct explanation of the oil flow through the lubrication system.
- PC (d) correct explanation of the pressure relief valve operation.
- PC (e) correct explanation of the oil pressure switch operation.
- PC (f) correct explanation of the crankcase ventilation system operation.

### **OUTCOME 3**

Identify main engine lubrication and crankcase ventilation system components that are subject to wear and/or failure.

### **Performance Criteria**

- a) The identification of the main lubrication system components subject to wear and/or failure is correct.
- b) The identification of the main crankcase ventilation system components subject to wear and/or failure is correct.

### **Evidence Requirements**

Written and/or oral evidence of the candidate's ability to identify, using diagrams or actual components, the main lubrication system and crankcase ventilation system components that are subject to wear.

Satisfactory achievement will be demonstrated by the candidate achieving for:

- PC (a) correct identification of 3 main lubrication components that are subject to wear and/or failure.
- PC (b) correct identification of 1 main crankcase ventilation component that is subject to wear and/or failure.

## **National unit specification: statement of standards (cont)**

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### **OUTCOME 4**

Demonstrate the procedure for testing, removal and fitting of an engine lubrication and crankcase ventilation system component.

#### **Performance Criteria**

- a)     The tools/equipment are used in accordance with manufacturer's or companies' set procedures.
- b)     The removal and fitting task is carried out correctly.
- c)     The tests used to establish lubrication and crankcase ventilation system condition are correct.
- d)     The torque setting to set specifications for the given task is carried out correctly.
- e)     The alignment of components is correct.
- f)     The relevant safety requirements are correctly adhered to for the given task.

#### **Evidence Requirements**

Evidence of actual performance of the candidate's ability to follow instructions (manufacturers' or company set procedures), use tools, observe relevant/set safety requirements for the given task and meet set time scales within defined criteria.

## National unit specification: support notes

**UNIT** Automotive: Lubrication Systems (Intermediate 2)

This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

### GUIDANCE ON CONTENT AND CONTEXT

This unit is designed to operate in conjunction with the SVQ Level II, Vehicle Mechanical: Unit Replacement, building the underpinning theory which will assist in the attainment of the SVQ, the PDA Certificate in Motor Vehicle Systems, Intermediate 2 of the Higher Still programme, or as a freestanding unit.

The main components could be identified from the following:

sump	oil warning lights and sender units
oil pump	oil coolers
pressure relief valve	dipsticks
oil filter (full flow)	oil seal and gaskets
oil galleries	crankcase ventilation valves
oil pump drives	

### GUIDANCE ON TEACHING AND LEARNING APPROACHES

Candidates should/could be given the opportunity to examine, in a practical location, an engine lubrication system, to identify the main components, layout, the principle of operation, components and the system in operation and the importance of crankcase ventilation in meeting emission control regulations.

The principal operation could be demonstrated in a practical situation/location with video and other demonstration aids used as reinforcement to the practical demonstration.

### GUIDANCE ON APPROACHES TO ASSESSMENT

Selection of an Instrument of Assessment appropriate for each outcome. Examples of Instruments of Assessment which may be selected are as follows:

Outcome 1

Multi choice test/matching exercise from diagrams, slides, videos or actual units.

The methods used to determine wear in the oil pump gears, incorrect seating/setting of the pressure relief valve, filter by-pass valve and crankcase ventilation valve. The importance of correct/accurate adjustment and regular servicing should be stressed. The effect of incorrect selection of oil type and grade should also be stressed. The methods and selection of the lubricant for the engine could be explored during this part of the unit.

During the practical exercise, comparison could be made to the serviceability of a component, identification of components subject to wear/failure should be stressed.

## National unit specification: support notes (cont)

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This could be from the following list:

sump	oil gauges, warning lights and sender units
oil pump	oil coolers
pressure relief valve	dipsticks
oil filter (full flow)	oil seal and gaskets
oil galleries	crankcase ventilation valves
oil pump drives	

Outcome 2

Multi choice or matching exercise from diagrams, slides, videos or actual units.

Outcome 3

Multi choice or matching exercise from diagrams, slides, videos or actual units.

The following fault areas and components could be covered:

### **Fault Areas**

low oil pressure  
high oil pressure  
high oil consumption  
oil leakage  
oil contamination  
overfilling.

### **Components**

oil pump  
oil seals and gaskets  
crankcase ventilation valves/pipes  
oil pressure switch  
warning lights

Outcome 4

Practical exercise testing, removing and fitting a lubrication and crankcase ventilation system component. Satisfactory achievement will be demonstrated by the candidate removing and replacing a lubrication/crankcase ventilation system component, whilst complying with all the performance criteria.

This could be from the following list:

oil and filter  
oil pump  
sump  
crankcase ventilation valve

## National unit specification: support notes (cont)

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Note: The criteria or critical points (the points the candidate **must** do for each performance criteria to achieve that PC where performing the task) against which the candidate is measured in order to achieve the outcome, should be clearly set out and the candidate's results recorded on a check list.