

**-SQA- SCOTTISH QUALIFICATIONS AUTHORITY**

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**NATIONAL CERTIFICATE MODULE DESCRIPTOR**

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**-Module Number- 2210500 -Session-1990-91**  
**-Superclass- XS**

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**-Title- ENGINE COOLING AND VEHICLE VENTILATION  
SYSTEMS (LIQUID TYPE): CONDITION ASSESSMENT  
AND FAULT DIAGNOSIS (x<sup>1</sup>/<sub>2</sub>)**

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**-DESCRIPTION-**

**Purpose** This module is designed to develop the skills and knowledge required to diagnose faults in engine cooling and vehicle ventilation systems and to accurately assess the serviceability of components.

It is aimed at those intending to pursue a career in the motor vehicle repair industry. The module is also designed to complement RTITB modules LV119C Engine Cooling and Vehicle Ventilation Systems Liquid Types: Condition Assessment and Fault Diagnosis and HV175C Air Cooling System: Condition Assessment, Fault Diagnosis and Component Overhaul. This will provide the student with the necessary skills and knowledge to prepare for the RTITB Skills Test. It should be noted however that adequate supporting industrial experience will also be necessary.

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**Preferred Entry Level** 2210490 Engine Cooling and Vehicle Ventilation Systems (Liquid Type): Removal, Replacement and Adjustment of Components

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**Outcomes** The student should:

1. recognise cooling and ventilation system faults;
2. inspect and report on cooling and ventilation systems;
3. use instruments to measure component condition.

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Assessment  
Procedures

Acceptable performance in the module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.

The following abbreviations are used below:

PC Performance Criteria  
IA Instrument of Assessment

**Note:** The Outcomes and PCs are mandatory and cannot be altered. The IA may be altered by arrangement with SQA. (Where a range of performance is indicated, this should be regarded as an extension of the PCs and is therefore mandatory.)

**OUTCOME 1**

**RECOGNISE COOLING AND VENTILATION SYSTEM FAULTS**

PCs

The student:

- (a) identifies common cooling and ventilation system faults;
- (b) identifies effects of cooling and ventilation system faults;
- (c) identifies causes of cooling and ventilation faults.

IA Structured Question

The student will be presented with a structured question to test the understanding of knowledge relating to the recognition of cooling and ventilation system faults.

The test will consist of 1 structured question relating to the faults in cooling and ventilation systems.

The question will have 3 parts allocated as follows:

- (a) identification of 5 faults
- (b) effects of 5 faults
- (c) causes of 5 faults.

The following common faults should be covered:

- (i) overheating
- (ii) overcooling
- (iii) incorrect heater, demister & ventilation performance
- (iv) coolant loss
- (v) coolant contamination
- (vi) abnormal noises
- (vii) odours

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student producing at least 4 correct responses for each of (a), (b), and (c) above.

## **OUTCOME 2            INSPECT AND REPORT ON COOLING AND VENTILATION SYSTEMS**

PCs

The student:

- (a) examines and reports on condition of components;
- (b) follows all safe working practices relevant to the task;
- (c) uses vehicle protection appropriate to the task.

### **IA Practical Exercise**

The student will be presented with a series of practical exercises in a workshop environment to test the application of knowledge and skills relating to the inspection of cooling and ventilation system components in accordance with recommended procedures. These procedures may be found in a variety of technical publications including manufacturers' workshop manuals and service bulletins. Each student should undertake tasks which include all components from the following list:

- (i) radiator
- (ii) radiator hoses
- (iii) fans
- (iv) fan drive
- (v) heater & ancillary hoses
- (vi) heater matrix
- (vii) heater motor
- (viii) water jackets
- (ix) gaskets & seals
- (x) expansion tank
- (xi) overflow pipe
- (xii) radiator cap
- (xiii) heater ducting
- (xiv) coolant.

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student producing an accurate report on the serviceability of the systems and components inspected.

## **OUTCOME 3            USE INSTRUMENTS TO MEASURE COMPONENT CONDITION**

PCs

The student:

- (a) uses literature to obtain recommended data;

- (b) measures and reports on cooling system components;
- (c) follows all safe working practices relevant to the task;
- (d) uses vehicle protection appropriate to the task.

#### IA Practical Exercise

The student will be presented with a series of practical exercises in a workshop environment to test the application of knowledge and skills relating to the measurement and reporting on (serviceability of) cooling system components in accordance with recommended procedures. These procedures may be found in a variety of technical publications including manufacturers' workshop manuals and service bulletins. Each student should undertake all the tasks from the following list:

- (i) test radiator pressure cap
- (ii) test opening temperature of thermostat
- (iii) pressure test cooling system
- (iv) test coolant density
- (v) report.

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student producing an accurate recording of manufacturers' data and all readings obtained and a report on the serviceability of the items tested.

**The following sections of the descriptor are offered as guidance.  
They are not mandatory.**

### CONTENT/CONTEXT

Safety regulations, safe working practices and procedures should be observed at all times.

Corresponding to Outcomes 1-3:

This module should be taught in the context most suited to the students' particular needs.

This module is intended to give students an understanding of the reasons for assessing the condition and diagnosing defects in servicing the vehicle cooling systems as a means of promoting vehicle safety, prolonging operational life and maintaining to original specification.

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### SUGGESTED LEARNING AND TEACHING APPROACHES

This module should be undertaken in a service workshop with an adequate range of vehicles equipped with the components to be covered. Students should have full access to relevant service publications for the satisfactory performance of the tasks.

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