

-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
24 Douglas Street
GLASGOW G2 7NQ**

NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-	2210480	-Session-1990-91
-Superclass-	XS	

-Title-	EXHAUST SYSTEMS: FITTING AND FAULT DIAGNOSTICS (X¹/₂)
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-DESCRIPTION-

Purpose	This module is designed to develop the skills and knowledge required to remove and replace vehicle exhaust systems and to carry out necessary fault diagnosis procedures.
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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 LV105C Exhaust System: Fitting and Fault Finding and HV181C Engine Exhaust System: Remove, Replace, Adjust and Fault Diagnosis. 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.

Preferred Entry Level	Modules numbered 94370 through 94377 inclusive and Module 2210470 Introduction Metal Inert Gas (MIG) Welding or 2210550 Introduction to Oxy-Acetylene Welding.
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Outcomes	The student should: <ol style="list-style-type: none">1. identify the layout of vehicle exhaust systems;2. outline the functions of the exhaust system and its components;3. remove and replace vehicle exhaust systems;4. diagnose faults in exhaust systems.
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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**IDENTIFY THE LAYOUT OF VEHICLE EXHAUST SYSTEMS**

PCs

The student:

- (a) identifies components in a system;
- (b) identifies the types of mountings used;
- (c) identifies types of fixings used.

IA Objective Test

The student will be presented with objective test to test the recall of knowledge relating to the identification of exhaust system layouts.

The test could take the form of short answer questions or matching exercise.

The test will consist of 10 items allocated as follows:

- | | |
|----------------------------|-----|
| (a) identity of components | - 6 |
| (b) types of mountings | - 2 |
| (c) types of fixing | - 2 |

Satisfactory achievement of the Outcome will be based on all performance criteria being met. This will be demonstrated by the student producing at least 5 correct responses for (a), and 1 correct response for each of (b) and (c) above.

OUTCOME 2**OUTLINE THE FUNCTIONS OF THE EXHAUST SYSTEM AND ITS COMPONENTS**

PCs

The student:

- (a) states the function of the exhaust system;
- (b) outlines the operation of the expansion type

- silencer unit;
- (c) outlines the operation of the absorption type silencer unit;
- (d) states the purpose of a catalytic converter in an exhaust system;
- (e) states why flexible exhaust system mountings must be used.

IA Objective Test

The student will be presented with an objective test to test the recall of knowledge relating to the functions of the exhaust system and components.

The test could take the form of short answer questions or matching exercise.

The test will consist of five questions allocated as follows:

- | | | |
|-----|---------------------------------------|---|
| (a) | function of system | 1 |
| (b) | operation of expansion silencer unit | 1 |
| (c) | operation of absorption silencer unit | 1 |
| (d) | purpose of catalytic converter | 1 |
| (e) | flexible exhaust system mountings | 1 |

Satisfactory achievement of the Outcome will be based on all performance criteria being met. This will be demonstrated by the student producing correct responses to all questions.

OUTCOME 3

REMOVE AND REPLACE VEHICLE EXHAUST SYSTEMS

PCs

The student:

- (a) uses appropriate procedures to remove exhaust system components;
- (b) uses appropriate procedures to fit exhaust system components;
- (c) follows all safe working practices relevant to the task.

IA Practical Exercise

The student will be presented with a series of practical exercises in a workshop environment to test the recall of knowledge and application of skills relating to the removal and replacement of exhaust systems and 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) remove and replace complete exhaust system (single pipe)
- (ii) remove studs (locked nuts and stud extractor methods)
- (iii) remove broken studs (drill and tap method)
- (iv) weld exhaust pipes (oxy-acetylene or MIG)
- (v) remove and replace gaskets and seals

Satisfactory achievement of the Outcome will be based on all performance criteria being met. A suitable checklist may be used to record student performance.

OUTCOME 4 DIAGNOSE FAULTS IN EXHAUST SYSTEMS

PCs

The student:

- (a) identifies exhaust gas leaks;
- (b) identifies faults relating to silencer failure;
- (c) identifies faults caused by incorrect mounting;
- (d) reports on suitable rectifications for given faults;
- (e) reports on extent of corrosion on components;
- (f) follows all safe work practices relevant to the task;
- (g) 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 recall of knowledge and application of skills relating to the diagnosis of faults in exhaust systems 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) identify high noise level
- (ii) trace sources of 'blowing'
- (iii) trace sources of 'chafing' and 'mechanical noise'
- (iv) trace sources of fumes
- (v) identify extent of corrosion

Satisfactory achievement of the Outcome will be based on all performance criteria being met. This will be demonstrated by the student producing a report on defects found and recommended rectification procedures. A suitable checklist may be used to record student performance.

**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 1-4:

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 exhaust systems, as a means of promoting vehicle safety, prolonging operational life and maintaining to original specification.

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, special tools and test equipment for the satisfactory performance of the tasks.

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