

-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 2210420
-Superclass- XS

-Session-1990-91

**-Title- PETROL INJECTION AND AIR SUPPLY SYSTEMS:
CONDITION ASSESSMENT AND FAULT DIAGNOSIS
(X¹/₂)**

-DESCRIPTION-

Purpose This module is designed to develop the necessary skills and knowledge required to diagnose faults in Petrol Injection and Air Supply Systems and to assess serviceability of related 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 module LV109B: Petrol Injection and Air Supply Systems: Removal, Replacement and Adjustment of Components, and will provide the student with the necessary skills to prepare for the RTITB skills test. It should be noted that adequate supporting industrial experience will also be necessary.

Preferred Entry Level Module number 94403 Petrol Injection and Air Supply Systems: Removal, Replacement and Adjustment of Components.

Outcomes The student should:

1. identify faults related to air supply systems and petrol injection systems using diagnostic procedures;
2. assess serviceability of petrol injection and air supply systems;
3. inspect and report on serviceability of petrol injection and air supply components.

Assessment Acceptable performance in the module will be

Procedures 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 FAULTS RELATED TO AIR SUPPLY SYSTEMS AND PETROL INJECTION SYSTEMS USING DIAGNOSTIC TECHNIQUES

PCs (a) The identification of common faults in air supply and petrol injection systems is correct.
(b) The identification of the effects of faults in air supply and petrol injection systems is correct.
(c) Causes of faults in air supply and petrol injection systems are correctly located.

IA Objective Test - Short Answer Questions

The student will be presented with an objective test/short answer test to test recall of knowledge relating to air supply and petrol injection system faults.

The test will consist of 15 short answer questions from three areas as follows:

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

The following is a list of common faults:

Loss of power/low power
Rough slow running and stalling
Incorrect mixtures and emissions
Induction noise
Hesitation
Poor and non starting
Heavy fuel consumption
Fuel leaks and odours
Backfiring, running on, detonation and pinking.

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 from (a) and 3 each from (b) and (c) to match the responses given for (a).

OUTCOME 2 ASSESS SERVICEABILITY OF PETROL INJECTION AND AIR SUPPLY SYSTEMS

- PCs
- (a) Recommended procedures outlined in the technical data for carrying out each task are followed.
 - (b) Safe working practices relevant to the task are followed.
 - (c) Vehicle protection as appropriate to the task/ used.
 - (d) Tools appropriate to the task are used.

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 and assessment of the condition of Petrol Injection and Air Supply Components in accordance with recommended procedures. These procedures will be found in a variety of technical publications including manufacturers' workshop manuals and service bulletins. Each student will undertake the inspection of an operational Air Supply and Fuel Injection System and assess the serviceability of the components listed below:

Inlet manifold
 Manifold heater
 Injectors
 Fuel pump
 Pipes and hoses.

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 of the data and measurements that have been obtained. Two of above items have faults for ID.

OUTCOME 3 INSPECT AND REPORT ON SERVICEABILITY OF PETROL INJECTION AND AIR SUPPLY COMPONENTS

- PCs
- (a) Component parts are checked and measurements are taken of data required and any defects found are reported.
 - (b) Safe working practices relevant to the tasks are carried out.

IA Practical Exercise

The student will be presented with a practical exercise to test the application of knowledge and skills relating to the ability to check and measure the relevant components of the fuel injection system.

Each student should undertake the inspection of and measurement of data of the following:

- Fuel system pressures
- Fuel and ambient air temperatures
- Fuel pump output
- Terminal voltages and resistance
- Air supply systems

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 of the data and measurements that have been obtained from 4 of the above items.

**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 methods and reasons for assessing, diagnosing and measurements to be taken when servicing Petrol Injection and Air Supply System Components, 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 for the satisfactory performance of the tasks.

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