National Unit Specification: general information

UNIT Automotive: Fuel Supply Systems (Intermediate 2)

NUMBER DE42 11

COURSE Scottish Progression Award (SPA)
in Vehicle Maintenance and Repair

SUMMARY
This unit will be suitable for candidates who need to develop the basic skills and knowledge associated with the repair, servicing and maintenance of vehicles at Intermediate 2 level. The unit will enable the candidate to acquire essential skills in the identification of the main petrol and diesel fuel supply systems and components. It will also develop an understanding of these components and their routine maintenance requirements.

The unit is derived from Automotive Skills' National Occupational Standards units:

Unit 10 – Remove and replace units and components
Unit 19 – Inspect vehicles

It also applies to the units relating to vehicle maintenance and repair S/NVQs and Modern Apprenticeships.

It is designed to meet the knowledge requirements of Automotive Skills' Technical Certificate specification (Phase 1):

LV10 – Petrol Fuel Systems (1)
LV11 – Diesel Fuel Systems (1)

and to provide progression towards the related S/NVQs and Modern Apprenticeships.

OUTCOMES
1. Identify the components of vehicle fuel supply systems.
2. Explain the operation of vehicle fuel supply systems.

Administrative Information

Superclass: XS

Publication date: August 2003

Source: Scottish Qualifications Authority

Version: 01

National Unit Specification: general information (cont)

RECOMMENDED ENTRY

Entry is at the discretion of the centre but a good standard in communication skills would be desirable. It would also be beneficial for candidates to have a practical aptitude for vehicle maintenance and repair.

CREDIT VALUE

1 credit at Intermediate 2 (6 SCQF points at SCQF level 5*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

CORE SKILLS

Information on the automatic certification of any core skills in this unit is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, publication code BA0906).

National Unit Specification: statement of standards

UNIT Automotive: Fuel Supply 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 the components of vehicle fuel supply systems

Performance criteria
a) Correctly identify the components of petrol fuel supply systems.
b) Correctly identify the components of diesel fuel supply systems.

OUTCOME 2
Explain the operation of vehicle fuel supply systems

Performance criteria
a) Correctly explain the operation of petrol fuel supply systems.
b) Correctly explain the operation of diesel fuel supply systems.

EVIDENCE REQUIREMENTS FOR THE UNIT
Written evidence of the candidate's ability to correctly identify vehicle fuel supply system components and explain the operation of the vehicle fuel supply system.

The candidate should produce sufficient correct responses to achieve an overall pass of 70% for the unit.

National Unit Specification: support notes

UNIT Automotive: Fuel Supply Systems (Intermediate 2)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

This unit is designed to develop the basic skills and knowledge associated with the repair, servicing and maintenance of vehicles at Intermediate 2. The unit provides the underpinning knowledge for Phase 1 of Automotive Skills' Modern Apprenticeship (MA), and to operate in conjunction with the SVQ level II, Vehicle Mechanical, building the underpinning knowledge which will assist in the attainment of the SVQ.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Corresponding to all outcomes:

The candidate could be given the opportunity in a practical situation / location, working on vehicles and actual components / assemblies experiencing practical demonstrations in order to examine the components, develop the knowledge of operation and maintenance of the systems.
A "hands on" approach by the candidate would reinforce their knowledge and develop the practical skills /practice required in the maintenance routines of these systems.

A brief description of basic carburation theory and identification of carburettors and components could be taught to introduce and give the candidate an appreciation of fuel systems then processing to modern fuel injection systems.

Outcome 1

The components could be identified from:

Petrol and diesel fuel supply systems

The components and the layout of petrol and diesel:

- storage and supply systems.
- single point and multi point fuel injection systems.
- in-line and rotary diesel fuel injection pumps.

Storage and supply systems:

- fuel tank
- pipelines
- filters
- fuel gauge
- electric and mechanical fuel pumps
- air filtration.

National Unit Specification: support notes (cont)

UNIT Automotive: Fuel Supply Systems (Intermediate 2)

Single and multi point fuel injection systems:
- single point (mono point)
- multi point (continuous and pulsed)
- fuel pump
- fuel pressure Regulator
- injector valve
- idle speed control valve
- temperature sensor
- airflow sensors (air flow meter and air mass meter)

In-line and rotary diesel fuel injection systems:
- pumps (rotary and in-line)
- fuel filters
- injector types (single, multi and pintle nozzle types)
- fuel pipes
- glow plugs
- vacuum pumps
- fuel cut-off solenoid

Outcome 2
The understanding of operation of the systems and the maintenance required:

Petrol and diesel fuel supply systems

The components and the layout of petrol and diesel:
- storage and supply systems.
- single point and multi point fuel injection systems.
- in-line and rotary diesel fuel injection pumps.

Storage and supply systems:
- fuel tank
- pipelines
- filters
- fuel gauge
- electric and mechanical fuel pumps
- air filtration.

Single and multi point fuel injection systems:
- single point (mono point)
- multi point (continuous and pulsed)
- fuel Pump
- fuel pressure Regulator
- injector valve
- idle speed control valve
- temperature sensor
- airflow sensors (air flow meter and air mass meter)

National Unit Specification: support notes (cont)

UNIT Automotive: Fuel Supply Systems (Intermediate 2)

In-line and rotary diesel fuel injection systems:

- pumps (rotary and in-line)
- fuel filters
- injector types (single, multi and pintle nozzle types)
- fuel pipes
- glow plugs
- vacuum pumps
- fuel cut-off solenoid

Reference should be made to the safety implications when handling fuel, (petrol and diesel) and regulations regarding fuel storage and handling.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Assessment of the knowledge could take the form of a multiple-choice test to cover all the outcomes.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering special alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements* (SQA, publication code AA0645).