

National Unit Specification: general information

UNIT	Automotive: Manual Transmission Systems (Intermediate 2)
NUMBER	DE40 11
COURSE	Scottish Progression Award (SPA) in Vehicle Maintenance and Repair

SUMMARY

This unit will be suitable for candidates who need to develop and apply 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 and operation of transmission components.

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):

LV12 – Drive Shafts (1)

LV13 – Final Drive Systems (1)

LV14 – Manual Transmission Systems (1)

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

OUTCOMES

1. Identify the components of the transmission system.
2. Explain the operation of the transmission system.

Administrative Information

Superclass: XS

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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

0.5 credits at Intermediate 2 (3 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: Manual Transmission 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 the transmission system.

Performance criteria

- a) Correctly identify the components of the clutch assembly.
- b) Correctly identify the components of the gearbox assembly.
- c) Correctly identify the components of the final drive and differential assembly.
- d) Correctly identify the components of the driveline assembly.

OUTCOME 2

Explain the operation of the transmission system.

Performance criteria

- a) Correctly explain the operation of the clutch assembly.
- b) Correctly explain the operation of the gearbox assembly.
- c) Correctly explain the operation of the final drive assembly.
- d) Correctly explain the operation of the driveline assembly.

EVIDENCE REQUIREMENTS FOR THE UNIT

Written evidence of the candidate's ability, with reference to the transmission system, to

- a) Identify the components
- b) Explain the operation

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

National Unit Specification: support notes

UNIT Automotive: Manual Transmission 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 20 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 can operate in conjunction with the S/NVQ level II, Vehicle Mechanical, building the underpinning knowledge which will assist in the attainment of the S/NVQ.

Outcome 1

The components could be identified from:

Clutch

- cable
- cable adjuster
- master cylinder
- slave cylinder
- release arm
- thrust bearing
- pressure plate
- friction plate
- flywheel.

Gearbox

- bell housing
- gearbox casing
- input shaft
- output shaft
- layshaft
- mainshaft
- 1,2,3,4,5 and reverse gears
- baulk ring/syncro cone
- dog clutch
- selector mechanism
- detent
- speedo drive
- reverse light switch
- bearing
- bush
- seal
- gasket.

National Unit Specification: support notes (cont)

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Final drive and Differential

- pinion
- crown wheel (bevel, hypoid)
- differential gears
- collapsible spacer
- bearing
- seal
- gasket.

Halfshaft/Driveshaft

- halfshaft
- propellor shaft
- drive shaft
- universal joint
- cushion drive (layrub, doughnut)
- centre bearing
- constant velocity (CV) joint
- plunge joint
- hub assemblies (semi, three quarter and fully floating).

Outcome 2

Explain the operation of:

Clutch

- clutch assembly

Gearbox

- selector mechanism
- interlock
- detents
- gear train.

Drive shafts and Hub assemblies

- cushion drives (layrub, doughnut)
- universal joint
- centre bearing
- constant velocity (CV) joint
- plunge joint
- hub assembly.

Final drive and Differential

- Final drive and differential assembly

National Unit Specification: support notes (cont)

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GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Corresponding to all outcomes. Candidates could be given the opportunity to examine, in a practical situation, transmission systems, to identify and understand principles of operation including power flow, ratio (speed and torque) and the importance of correct lubrication including oil types. Reference to the servicing unit could be made at this point. A ‘hands on’ approach by the candidate would reinforce the knowledge and develop the practical skills/practice required in the maintenance/repair routines of these systems

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).