

National Unit Specification: General Information

UNIT Automotive: Introduction to Vehicle Layout (Intermediate 2)

NUMBER 2210258

COURSE

SUMMARY

A unit designed to develop a knowledge of the body/chassis construction of the vehicle, the identification of the main mechanical and electrical components including the function of the main systems.

OUTCOMES

- 1 Identify the layout of the main body/chassis components of a vehicle.
- 2 Identify the layout of the main mechanical and electrical components of a vehicle.
- 3 Outline the purpose of the main mechanical and electrical components of a vehicle.

RECOMMENDED ENTRY

Access to this unit is at the discretion of the centre, however no entry prerequisites are envisaged.

CREDIT VALUE

0.5 Credit at Intermediate 2.

CORE SKILLS

Information on the automatic certification of the core skills in this unit is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999)

Administrative Information

Superclass: XS

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National unit specification: statement of standards

UNIT Automotive: Introduction to Vehicle Layout (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 layout of the main body/chassis components of a vehicle.

Performance Criteria

- a) Identification of the vehicle chassis component layout is correct.
- b) Identification of the load bearing chassis members/panels is correct.
- c) Identification of different vehicle layouts is correct.
- d) Identification of different body types is correct.

Evidence Requirements

Written and/or oral evidence of the candidate's ability to correctly identify, from diagrams, slides, video or actual units or actual vehicles, main body/chassis components.

Satisfactory achievement of the outcome will be based on all performance criteria being met. This will be demonstrated by the candidate producing for:

- PC a) correct identification of 3 vehicle chassis components.
- PC b) correct identification of 3 chassis load bearing component panels.
- PC c) correct identification of 3 vehicle layouts.
- PC d) correct identification of 5 vehicle body types.

OUTCOME 2

Identify the layout of the main mechanical and electrical components of a vehicle.

Performance Criteria

- a) Identification of the main mechanical components is correct.
- b) Identification of the main electrical components is correct.

Evidence Requirements

Written and/or oral evidence of the candidate's ability to correctly identify, from diagrams, slides, video, actual units or vehicles, for PC (a) and (b) main mechanical and electrical components.

Satisfactory achievement of the outcome will be based on all performance criteria being met. This will be demonstrated by the candidate producing for:

- PC a) correct identification of 10 main mechanical components.
- PC b) correct identification of 5 main electrical components.

National unit specification: statement of standards (cont)

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OUTCOME 3

Outline the purpose of the main mechanical and electrical components of a vehicle.

Performance Criteria

- a) The purpose of the engine, radiator and exhaust is outlined correctly.
- b) The purpose of the clutch, gearbox, propeller shaft/drive shaft and final drive within the transmission system is outlined correctly.
- c) The purpose of the steering box or rack and pinion, track rod end and swivel joints, within the steering system, is outlined correctly.
- d) The purpose of the road spring, strut/shock absorber, anti roll bar within the suspension system is outlined correctly.
- e) The purpose of the master cylinder, hand brake, brake assembly within the braking system is outlined correctly.
- f) The purpose of the battery, alternator, starter motor, within the electrical system is outlined correctly.
- g) The purpose of the side lamps, head lamps, directional indicators, stop lamps is outlined correctly.

Evidence Requirements

Written and/or oral evidence for performance criteria (a) to (g), of the candidate's ability to outline the purpose within the system, from diagrams, slides, video, actual units or vehicles, of the main mechanical and electrical components.

Satisfactory achievement of the outcome will be based on all performance criteria being met. This will be demonstrated by the candidate producing for:

- PC a) correct outline of 1 purpose for engine, radiator and exhaust.
- PC b) correct outline of 1 purpose for clutch, gearbox, propeller shaft/drive shaft and final drive.
- PC c) correct outline of 1 purpose of the steering box or rack and pinion, track rod end and swivel joints.
- PC d) correct outline of 1 purpose of road spring, strut/shock absorber and anti roll bar.
- PC e) correct outline of 1 purpose of master cylinder, handbrake and brake assembly.
- PC f) correct outline of 1 purpose of battery, alternator and starter motor.
- PC g) correct outline of 1 purpose of side lamps, head lamps, directional indicators and stop lamps.

National unit specification: support notes

UNIT Automotive: Introduction to Vehicle Layout (Intermediate 2)

This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

GUIDANCE ON CONTENT AND CONTEXT

This unit is designed to operate in conjunction with the SVQ Level II, Vehicle Mechanical: Unit Replacement, building the underpinning theory which will assist in the attainment of the SVQ, the PDA Certificate in Motor Vehicle Systems, Intermediate Level 2 of the Higher Still programme, or as a freestanding unit.

The identification of the main body/chassis components which are critical to either the design - to allow for steering and suspension control; and the designer to meet the commercial practice styling or strength of the vehicle which allows the braking, acceleration, cornering, twisting, and load forces to be distributed. The layout of the chassis to accommodate the main mechanical and electrical components fitted to the vehicle, the identification of the main mechanical and electrical components including the purpose of the component in that system.

GUIDANCE ON TEACHING AND LEARNING APPROACHES

Outcome 1

Candidates could be given the opportunity to examine, in a practical location, the main body/chassis construction, for both integral construction and separate construction type chassis to identify the layout and the position of the main components. Seat and seat belt location and security should be taught as part of the chassis requirements. The following sample of components could be used for both the identification and the assessment of the outcome:

Side members, cross members, spring hanger, front valance, roof panel, sill, screen pillar, bulkhead, floor pan, front wing, rear quarter panel, wheel arch, suspension housing, suspension crossmember, centre pillar, front longitudinal member.

The following range of vehicles could be used:

front engine front wheel drive, front engine rear wheel drive, rear engine rear wheel drive, mid engine, cars, light goods vehicles, heavy goods vehicles, mini buses, and coaches.

Outcomes 2 and 3

Candidates could be given the opportunity to examine vehicles, in a practical situation/location to identify the main components, layouts, establish the function of the components, with video, slide, ohp's and other demonstration aids used as reinforcement.

National unit specification: support notes (cont)

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The following sample of components could be used for both the identification, purpose and the assessment of the outcome:

Mechanical: engine, radiator, exhaust, clutch, gearbox, propeller shaft/drive shaft, final drive, steering box, track rod end, swivel joints, road spring, strut/shock absorber, anti roll bar, master cylinder, hand brake and brake assembly (front and rear).

Electrical: battery, alternator, starter motor, coil, headlamp, side lamp, rear fog lamp, side marker lamp, indicator, head lamp switch, dipswitch, starter solenoid, distributor, ECU, fuse box, electric cooling fan, horn, heated rear screen, wiper motor, radio, dash instruments.

The following range of vehicles could be used: front engine front wheel drive, front engine rear wheel drive, rear engine rear wheel drive, mid engine, cars, light goods vehicles, heavy goods vehicles, mini buses, buses and coaches.

GUIDANCE ON APPROACHES TO ASSESSMENT

Outcome 1

Written and/or oral evidence, which may be in the form of multi choice questions, matching exercise with diagrams to allow the candidate to correctly identify from diagrams, slides, video or actual units or actual vehicles, to show the chassis components, load bearing chassis members, the layout of the main mechanical and electrical components and the type of vehicle bodies.

The following sample of components could be used for both the identification and the assessment of the outcome: side members, cross members, spring hanger, front valance, roof panel, sill, screen pillar, baulkhead, floor pan, front wing, rear quarter panel, wheel arch, suspension housing, suspension crossmember, centre pillar, front longitudinal member.

The following sample of vehicles could be used: front engine front wheel drive, front engine rear wheel drive, rear engine rear wheel drive, mid engine, light goods vehicles, heavy goods vehicles, mini buses, buses and coaches, box vans, low loaders etc.

Outcome 2

Written and/or oral evidence, which may be in the form of multi choice questions, matching exercise with diagrams to allow the candidate to correctly identify the main mechanical and electrical components.

National unit specification: support notes (cont)

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Outcome 3

Written and/or oral evidence which may be in the form of multi choice questions, matching exercise with diagrams to allow the candidate to correctly outline the purpose within the system the main mechanical and electrical components.

Full depth of content will be taught in the units relating directly to the individual systems.