

Levels 2 & 3 Diplomas in Accident Repair MET Principles (4291)

September 2017 Version 2.2





Qualification at a glance

Subject area	Accident Repair MET
City & Guilds number	4291
Age group approved	16-18, 19+
Assessment	Assignment Online Multiple Choice
Fast track	Not available. Automatic approval applies in some cases
Support materials	Centre handbook Practical assessment workbook
Registration and certification	Consult the Walled Garden/online catalogue for last dates

Title and level	GLH	TQT	City & Guilds number	Accreditation number
Level 2 Diploma in Accident Repair MET Principles	445	520	4291-32	501/0124/9
Level 3 Diploma in Accident Repair MET Principles	380	430	4291-33	501/1106/1

Version and date	Change detail	Section
2.0 Feb 2013	Corrected Unit 054	Units
2.1 Oct 2013	Unit supporting information updated with introductory text	Units
2.2 September 2017	Added TQT details Deleted QCF	Qualification at a glance, Structure Throughout



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1 Introduction

This document tells you what you need to do to deliver the qualifications:

Area	Description
Who are the qualifications for?	<p>The Level 2 and the Level 3 Diploma in Accident Repair MET Principles are for anyone developing a career in the motor industry. This practical qualification demonstrates candidates' skills on the job and in their own workplace showing that they meet national standards for automotive workers.</p> <p>Their structure and assessment strategy have been produced by the Institute of the Motor Industry, who are the Sector Skills Council for the Automotive Industry.</p>
What do the qualifications cover?	<p>Candidates cover areas such as removing and fitting trim, electrical components and mechanical components to motor vehicles. They are assessed in the workplace by using the following methods:</p> <ul style="list-style-type: none"> • Assignment • City & Guilds' GOLLA multiple choice test
Are the qualifications part of a framework or initiative?	<p>The qualification is part of the Automotive Maintenance and Repair Intermediate Apprenticeship and Advanced Apprenticeship Frameworks (framework 1) which will replace the current framework 4 from April 2011.</p>
What opportunities for progression are there?	<p>After taking this qualification, candidates will have a qualification that shows employers and customers they have the skills required to carry out paint repairs to and refitting of mechanical and electrical components as a result of accidents and will be able to progress into employment.</p> <p>Candidates may wish to progress onto the competency based qualification Level 2 Diploma in Accident Repair MET Competency (4271-32) or Level 3 Diploma in Accident Repair MET Competency (4271-33).</p> <p>In addition, candidates who enjoy leading teams of people at work could also move onto a qualification as a Team Leader or Supervisor such as qualifications at Levels 2, 3 and 4 through the Institute of Leadership and Management (ILM).</p>

Structure

To achieve the **Level 2 Diploma in Accident Repair MET Principles**, learners must achieve **29** credits from the mandatory generic units and **23** credits from the mandatory specialist units.

Unit accreditation number	City & Guilds unit	Unit title	Credit value
Mandatory generic units			
Y/601/7254	001	Skills in health, safety and good housekeeping in the automotive environment	7
J/601/6262	003	Skills in supporting job roles in the automotive work environment	5
Y/601/6279	004	Skills in materials, fabrication, tools and measuring devices used in the automotive environment	7
D/601/6171	051	Knowledge of health, safety and good housekeeping in the automotive environment	3
T/601/6175	053	Knowledge of support for job roles in the automotive work environment	3
K/601/6237	054	Knowledge of materials, fabrication, tools and measuring devices used in the automotive environment	4
Mandatory specialist units			
F/601/6048	301	Skills in removing and fitting vehicle mechanical components	5
Y/601/6055	302	Skills in removing and fitting electrical components	2
T/601/6063	303	Skills in removing and fitting trim components	3
H/601/6026	351	Knowledge of removing and fitting vehicle mechanical components	6
K/601/6030	352	Knowledge of removing and fitting electrical components	5
A/601/6033	353	Knowledge of removing and fitting trim components	2

To achieve the **Level 3 Diploma in Accident Repair MET Principles**, learners must achieve **29** credits from the mandatory generic units and a minimum of **14** credits from the mandatory specialist units.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value
Mandatory generic units			
Y/601/7254	001	Skills in health, safety and good housekeeping in the automotive environment	7
J/601/6262	003	Skills in supporting job roles in the automotive work environment	5
Y/601/6279	004	Skills in materials, fabrication, tools and measuring devices used in the automotive environment	7
D/601/6171	051	Knowledge of health, safety and good housekeeping in the automotive environment	3
T/601/6175	053	Knowledge of support for job roles in the automotive work environment	3
K/601/6237	054	Knowledge of materials, fabrication, tools and measuring devices used in the automotive environment	4
Mandatory specialist units			
L/601/6070	304	Skills in removing and fitting electronically controlled vehicle mechanical components	2
T/601/6113	305	Skills in removing and fitting vehicle electronic components and systems	2
F/601/6115	306	Skills in removing, refurbishing and fitting trim components	2
R/501/2950	311	Handle refrigerants	1
D/601/6039	354	Knowledge of removing and fitting electronically controlled vehicle mechanical components	2
D/601/6042	355	Knowledge of removing and fitting vehicle electronic components and systems	3
K/601/6044	356	Knowledge of removing, refurbishing and fitting trim components	2

Total Qualification Time

Total Qualification Time (TQT) is the total amount of time, in hours, expected to be spent by a Learner to achieve a qualification. It includes both guided learning hours (which are listed separately) and hours spent in preparation, study and assessment.

Title and level	GLH	TQT
Level 2 Diploma in Accident Repair MET Principles	445	520
Level 3 Diploma in Accident Repair MET Principles	380	430



2 Centre requirements

Approval

If your Centre is approved to offer the Level 2 Certificate/Diploma in Accident Body and Paint – MET/Body Fitting (4101-58) you will be granted automatic approval for the Level 2 Diploma in Accident Repair MET Principles (4291-32). If you are approved to offer the Level 3 Certificate/Diploma in Accident Body and Paint – MET/Body Fitting (4101-61) you will be granted automatic approval for the Level 2 Diploma in Accident Repair MET Principles (4291-33) and will be able to make registrations straight away.

For any other cases, centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Resource requirements

Physical resources and site agreements

Centres must have access to sufficient equipment in the college, training centre or workplace to ensure candidates have the opportunity to cover all of the practical activities.

Centre staffing

Staff delivering this qualification must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be occupationally competent or technically knowledgeable in the areas for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but cannot internally verify their own assessments.

Assessors and internal verifiers

All assessors must:

- have sufficient and relevant technical/occupational competence in the Unit, at or above the level of the Unit being assessed
- have in depth knowledge of the Qualification or credit based unit evidence requirements.

- hold or be working towards a relevant assessors' award as specified by the Sector Skills Council. This will include, but not be limited to the Assessor qualifications, Level 3 Award in Understanding the Principles and Practices of Assessment, Level 3 Award in Assessing Competence in the Work Environment, Level 3 Award in Assessing Vocationally Related Achievement, Level 3 Certificate in Assessing Vocational Achievement. (and by implication legacy Assessor units A1, A2 and D32/33 unit) but may be an appropriate equivalent as defined by the SSC).
- assessors working towards a relevant assessor qualification must achieve their qualification within 12 months.
- demonstrate knowledge and understanding of the competencies that a learner is required to demonstrate for the qualification that they are undertaking
- provide evidence of completing 5 days working/job shadowing in industry within their professional area in a 24 month period.
- provide evidence of 30 hours of technical/qualification related CPD within a 12 month period. (This is in addition to working / job shadowing).

All internal verifiers must:

- have in-depth knowledge of the occupational standards and credit based unit evidence requirements.
- be occupationally aware of the relevant industry sector being internally verified
- hold or be working towards a relevant verifier award as specified by the Sector Skills Council. This will include, but not be limited to the Quality Assurance qualifications Level 4 Award in Understanding the Internal Quality Assurance of Assessment Processes and Practice, Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practice, Level 4 Certificate in Leading the Internal Quality Assurance of Assessment Processes and Practice, (and by implication legacy Internal Verifier unit V1 D34 unit) but may be an appropriate equivalent as defined by the Sector Skills Council.
 - verifiers working towards a relevant qualification must achieve their qualification within 12 months.
 - provide evidence of CPD totalling not less than 30 hours from within their professional area within a 12 month period.

Continuing professional development (CPD)

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

Candidate entry requirements

City & Guilds does not set entry requirements for this qualification. However, centres must ensure that candidates have the potential and opportunity to gain the qualification successfully.

Age restrictions

There is no age restriction for this qualification unless this is a legal requirement of the process or the environment.



3 Delivering the qualification

Initial assessment and induction

An initial assessment of each candidate should be made before the start of their programme to identify:

- if the candidate has any specific training needs,
- support and guidance they may need when working towards their qualifications.
- any units they have already completed, or credit they have accumulated which is relevant to the qualifications.
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the candidate fully understands the requirements of the qualifications, their responsibilities as a candidate, and the responsibilities of the centre. This information can be recorded on a learning contract.

Support materials

City & Guilds will provide the following learning and support resources which will be posted on our website.

www.cityandguilds.com/automotive

- Practical Assessment workbook
- Centre Handbook

Recording documents

Candidates and centres may decide to use a paper-based or electronic method of recording evidence.

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To support the delivery of vocational qualifications we offer our own ePortfolio, Learning Assistant, an easy to use and secure online tool to support and evidence candidates' progress towards achieving qualifications. Further details are available at:

www.cityandguilds.com/eportfolios.

City & Guilds has developed training and assessment documentation specifically for these qualifications which are available from City & Guilds website.

Although new centres are expected to use these forms, centres may devise or customise alternative forms, which must be approved for use by the external verifier, before they are used by candidates and assessors at the centre.

Health and safety

The requirement to follow safe working practices is an integral part of all City & Guilds qualifications and assessments, and it is the responsibility of centres to ensure that all relevant health and safety requirements are in place before candidates start practical assessments.

Should a candidate fail to follow health and safety practice and procedures during an assessment, the assessment must be stopped. The candidate should be informed that they have not reached the standard required to successfully pass the assessment and told the reason why. Candidates may retake the assessment at a later date, at the discretion of the centre. In case of any doubt, guidance should be sought from the external verifier.

Data protection and confidentiality

Centres offering this qualification may need to provide City & Guilds with personal data for staff and candidates. Guidance on data protection and the obligations of City & Guilds and centres are explained in *Centre Manual - Supporting Customer Excellence*.

Equal opportunities

It is a requirement of centre approval that centres have an equal opportunities policy (see *Centre Manual - Supporting Customer Excellence*). The regulatory authorities require City & Guilds to monitor centres to ensure that equal opportunity policies are being followed.

The City & Guilds equal opportunities policy is set out on the City & Guilds website, in *Centre Manual - Supporting Customer Excellence*, and is also available from the City & Guilds Customer Relations department.

Access to qualifications on the Regulated Qualifications Framework is open to all, irrespective of gender, race, creed, age or special needs. The centre co-ordinator should ensure that no candidate is subject to unfair discrimination on any ground in relation to access to assessment and the fairness of the assessment.

Access to assessment

City & Guilds' guidance and regulations on access to assessment are designed to facilitate access to assessments and qualifications for candidates who are eligible for adjustments to assessment arrangements. Access arrangements are designed to allow attainment to be demonstrated. For further information, please see *Access to assessment and qualifications*, available on the City & Guilds website.

Appeals

Centres must have their own, auditable, appeals procedure that must be explained to candidates during their induction. Appeals must be fully documented by the quality assurance co-ordinator and made available to the external verifier or City & Guilds.

Further information on appeals is given in *Centre Manual - Supporting Customer Excellence*. There is also information on appeals for centres and learners on the City & Guilds website or available from the Customer Relations department.



4 Assessment

Assessment of the qualification

Candidates must:

- successfully complete one assignment for each unit as stated below
- successfully complete one multiple choice test for each unit as stated below.

Assessment requirements for all skills units are shown in full in our assessment documentation.

Full details of the assessment requirements relating to these qualifications can be obtained directly from the Institute of the Motor Industry (IMI)

<http://www.motor.org.uk>

Time constraints

There are no time constraints applied to the assessment of this qualification. If centres have queries regarding the length of time required to complete a particular task, they should contact their external verifier in the first instance who will advise accordingly and feed this information back to City & Guilds where appropriate.

Recognition of prior learning (RPL)

Proxy units / credit transfer

Learners transferring from City & Guilds 4101 NQF qualifications or from another awarding organisation may be exempt from taking the 4290/4270/4291/4271 online multiple choice tests, on production of a valid certificate of equivalent units achieved. Proxy units are available in these circumstances. Please note that a certificate of unit credit (CUC) is not available when claiming a proxy unit. For more information on credit transfer please refer to our 9420 Automotive Apprenticeship Framework centre guide available from www.cityandguilds.com

Unit	Title	Assessment method
001	Skills in health, safety and good housekeeping in the automotive environment	Assignment
003	Skills in supporting job roles in the automotive work environment	Assignment
004	Skills in materials, fabrication, tools and measuring devices used in the automotive environment	Assignment
051	Knowledge in health, safety and good housekeeping in the automotive environment	Assignment

Unit	Title	Assessment method
053	Knowledge of support for job roles in the automotive work environment	Assignment
054	Knowledge of materials, fabrication, tools and measuring devices used in the automotive environment	Assignment
301	Skills in removing and fitting vehicle mechanical components	Assignment
302	Skills in removing and fitting electrical components	Assignment
303	Skills in removing and fitting trim components	Assignment
304	Skills in removing and fitting electronically controlled vehicle mechanical components	Assignment
305	Skills in removing and fitting vehicle electronic components and systems	Assignment
306	Skills in removing, refurbishing and fitting trim components	Assignment
311	Handle refrigerants	Assignment
351	Knowledge of removing and fitting electronically controlled vehicle mechanical components	Multiple Choice
352	Knowledge of removing and fitting vehicle electronic components and systems	Multiple Choice
353	Knowledge of removing, refurbishing and fitting trim components	Multiple Choice
354	Knowledge of removing and fitting electronically controlled vehicle mechanical components	Multiple Choice
355	Knowledge of removing and fitting vehicle electronic components and systems	Multiple Choice
356	Knowledge of removing, refurbishing and fitting trim components	Multiple Choice



5 Units

Availability of units

Below is a list of the learning outcomes for all the units. They are also on The Register of Regulated Qualifications:

<http://register.ofqual.gov.uk/Unit>

Structure of units

These units each have the following:

- City & Guilds reference number
- unit accreditation number (UAN)
- title
- level
- credit value
- unit aim
- relationship to NOS, other qualifications and frameworks
- endorsement by a sector or other appropriate body
- information on assessment
- learning outcomes which are comprised of a number of assessment criteria

Unit 001

Skills in health, safety and good housekeeping in the automotive environment

UAN:	Y/601/7254
Level:	2
Credit value:	7
GLH:	60
Relationship to NOS:	This unit is linked to G1 Contribute to Housekeeping in Motor Vehicle Environment and G2 Reduce Risks to Health and Safety in the Motor Vehicle Environment.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	<p>This unit will enable the learner to develop the skills required to:</p> <ul style="list-style-type: none">• carry out day to day work area cleaning, clearing away, dealing with spillages and disposal of waste, used materials and debris• identify hazards and risks in the automotive environment and complying with relevant legislation and good practice• work safely at all times within the automotive environment, both as an individual and with others.

Learning outcome
The learner will: 1. be able to use correct personal and vehicle protection within the automotive environment.
Assessment criteria
The learner can: 1.1 select and use personal protective equipment throughout activities. To include appropriate protection of: a. eyes b. ears c. head d. skin e. feet f. hands

<p style="text-align: center;">g. lungs</p> <p>1.2 select and use vehicle protective equipment throughout all activities.</p>

Learning outcome
The learner will:
2. be able to carry out effective housekeeping practices in the automotive environment.
Assessment criteria
The learner can:
2.1 select and use cleaning equipment which is of the right type and suitable for the task
2.2 use utilities and appropriate consumables, avoiding waste
2.3 use materials and equipment to carry out cleaning and maintenance duties in allocated work areas, following automotive work environment policies, schedules and manufacturers instructions
2.4 perform housekeeping activities safely and in a way which minimizes inconvenience to customers and staff
2.5 keep the work area clean and free from debris and waste materials
2.6 keep tools and equipment fit for purpose by regular cleaning and keeping tidy
2.7 dispose of used cleaning agents, waste materials and debris to comply with legal and workplace requirements.

Learning outcome
The learner will:
3. be able to recognise and deal with dangers in order to work safely within the automotive workplace.
Assessment criteria
The learner can:
3.1 name and locate the responsible persons for health and safety in their relevant workplace
3.2 identify and report working practices and hazards which could be harmful to themselves or others
3.3 carry out safe working practices whilst working with equipment, materials and products in the automotive environment
3.4 rectify health and safety risks encountered at work, within the scope and capability of their job role.

Learning outcome
The learner will:
4. be able to conduct themselves responsibly.
Assessment criteria
The learner can:
4.1 show personal conduct in the workplace which does not endanger the health and safety of themselves or others
4.2 display suitable personal presentation at work which ensures the health and safety of themselves and others at work.

Unit 003

Skills in supporting job roles in the automotive work environment

UAN:	J/601/6262
Level:	Level 3
Credit value:	5
GLH:	40
Relationship to NOS:	This unit is linked to G3 Maintain Working Relationships in the Motor Vehicle Environment.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit is about the skills needed to develop and keep good working relationships with all colleagues in the workplace by using effective communication and support skills.

Learning outcome	The learner will:
1.	be able to work effectively within the organisational structure of the automotive work environment.
Assessment criteria	
The learner can:	
1.1	respond promptly and willingly to requests for assistance from customers and colleagues
1.2	refer customers and colleagues to the correct person should requests fall outside their responsibility and capability.

Learning outcome	The learner will:
2.	be able to obtain and use information in order to support their job role within the automotive work environment.
Assessment criteria	
The learner can:	
2.1	select and use legal and technical information, in an automotive work environment.

Learning outcome	The learner will:
	3. be able to communicate with and support colleagues and customers effectively within the automotive work environment.
Assessment criteria	
The learner can:	
3.1 use methods of communication with customers and colleagues which meet their needs	
3.2 give customers and colleagues accurate information	
3.3 make requests for assistance from or to customers and colleagues clearly and courteously.	

Learning outcome	The learner will:
	4. be able to develop and keep good working relationships in the automotive work environment.
Assessment criteria	
The learner can:	
4.1 contribute to team work by initiating ideas and co-operating with customers and colleagues	
4.2 treat customers and colleagues in a way which shows respect for their views and opinions	
4.3 make and keep achievable commitments to customers and colleagues	
4.4 inform colleagues promptly of anything likely to affect their own work.	

Unit 004

Skills in materials, fabrication, tools and measuring devices used in the automotive environment

UAN:	Y/601/6279
Level:	2
Credit value:	7
GLH:	60
Relationship to NOS:	This unit is linked to G4 Use of hand tools and equipment in motor vehicle engineering.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	<p>This unit helps the learner to develop the skills required for:</p> <ul style="list-style-type: none">• the correct selection, care and use of key hand tools and measuring devices for modification, fabrication and repair in the automotive environment• the correct preparation and use of common work environment equipment• the correct selection and fabrication of materials used when modifying and repairing• the correct application of automotive engineering fabrication and fitting principles.

Learning outcome
The learner will: 1. be able to select, maintain and use hand tools and measuring devices in the automotive environment.
Assessment criteria
The learner can: 1.1 select, maintain and use suitable hand tools safely when fabricating and fitting in the automotive workplace 1.2 select, maintain and use suitable measuring devices safely when fabricating and fitting in the automotive environment 1.3 select, maintain and use suitable PPE for fabrication, repair and fitting in the automotive environment. 1.4 select, maintain and use suitable electrical measuring tools safely when repairing vehicles and components.

Learning outcome
The learner will: 2. be able to prepare and use common workshop equipment.
Assessment criteria
The learner can: 2.1 use suitably maintained workshop equipment safely 2.2 use correct interpretation of 'safe working load' on lifting and supporting equipment 2.3 report any faulty or damaged tools and equipment to the relevant persons clearly and promptly. 2.4 store work tools and equipment in a safe manner which permits ease of access and identification for use.

Learning outcome
The learner will: 3. be able to select materials when fabricating, modifying and repairing vehicles and fitting components.
Assessment criteria
The learner can: 3.1 select and use appropriate materials whilst constructing, fitting, modifying or repairing vehicles and components.

Learning outcome
The learner will: 4. be able to apply automotive engineering, fabrication and fitting principles when modifying and repairing vehicles and components.
Assessment criteria
The learner can: 4.1 use correct procedures when: a. filing b. tapping threads c. cutting plastics and metals d. drilling plastics and metals e. fitting 4.2 use appropriate techniques when fabricating, repairing and modifying vehicles and components 4.3 select and use: a. gaskets b. seals c. sealants d. fittings and fasteners 4.4 apply modification and repair techniques to automotive electrical circuits 4.5 select and use locking, fixing and fastening devices.

Unit 051

Knowledge of health, safety and good housekeeping in the automotive environment

UAN:	D/601/6171
Level:	Level 2
Credit value:	3
GLH:	30
Relationship to NOS:	This unit is linked to G1 Contribute to Housekeeping in Motor Vehicle Environment and G2 Reduce Risks to Health and Safety in the Motor Vehicle Environment.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	<p>This unit enables the learner to develop an understanding of:</p> <ul style="list-style-type: none">• routine maintenance and cleaning of the automotive environment and using resources economically• health and safety legislation and duties of everyone in the motor vehicle environment. It will provide an appreciation of significant risks in the automotive environment and how to identify and deal with them. Once completed the learner will be able to identify hazards and evaluate and reduce risk.

Learning outcome	The learner will:
1.	understand the correct personal and vehicle protective equipment to be used within the automotive environment.
Assessment criteria	
The learner can:	
1.1	explain the importance of wearing the types of PPE required for a range automotive repair activities
1.2	identify vehicle protective equipment for a range of repair activities
1.3	describe vehicle and personal safety considerations when working at the roadside.

Learning outcome	The learner will:
2.	understand effective housekeeping practices in the automotive environment.
Assessment criteria	
The learner can:	
2.1	describe why the automotive environment should be properly cleaned and maintained
2.2	describe requirements and systems which may be put in place to ensure a clean automotive environment
2.3	describe how to minimize waste when using utilities and consumables
2.4	state the procedures and precautions necessary when cleaning and maintaining an automotive environment
2.5	describe the selection and use of cleaning equipment when dealing with general cleaning, spillages and leaks in the automotive environment.
2.6	describe procedures for correct disposal of waste materials from an automotive environment
2.7	describe procedures for starting and ending the working day which ensure effective housekeeping practices are followed.

Learning outcome	The learner will:
3.	understand key health and safety requirements relevant to the automotive environment.
Assessment criteria	
The learner can:	
3.1	list the main legislation relating to automotive environment health and safety
3.2	describe the general legal duties of employers and employees required by current health and safety legislation
3.3	describe key, current health and safety requirements relating to the automotive environment
3.4	describe why workplace policies and procedures relating to health and safety are important.

Learning outcome	The learner will:
4.	understand about hazards and potential risks relevant to the automotive environment.
Assessment criteria	
The learner can:	
4.1	identify key hazards and risks in an automotive environment
4.2	describe policies and procedures for reporting hazards, risks, health and safety matters in the automotive environment
4.3	state precautions and procedures which need to be taken when working with vehicles, associated materials, tools and equipment
4.4	identify fire extinguishers in common use and which types of fire they should be used on
4.5	identify key warning signs and their characteristics that are found in the vehicle repair environment
4.6	state the meaning of common product warning labels used in an automotive environment.

Learning outcome	The learner will:
5.	understand personal responsibilities.
Assessment criteria	
The learner can:	
5.1	explain the importance of personal conduct in maintaining the health and safety of the individual and others
5.2	explain the importance of personal presentation in maintaining health safety and welfare.

Unit 051 Knowledge of health, safety and good housekeeping in the automotive environment

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation.

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Economic use of Resources

- a Consumable materials e.g. grease, oils, split pins, locking and fastening devices.

Requirement to maintain work area effectively

- a Cleaning tools and equipment to maximise workplace efficiency.
- b Requirement to carry out the housekeeping activities safely and in a way that minimises inconvenience to customers and staff.
- c Risks involved when using solvents and detergents.
- d Advantages of good housekeeping.

Spillages, leaks and waste materials

- a Relevance of safe systems of work to the storage and disposal of waste materials.
- b Requirement to store and dispose of waste, used materials and debris correctly.
- c Safe disposal of special / hazardous waste materials.
- d Advantages of recycling waste materials.
- e Dealing with spillages and leaks.

Basic legislative requirements

- a Provision and Use of Work Equipment Regulations 1992.
- b Power Presses Regulations 1992.
- c Pressure Systems and Transportable Gas Containers Regulations 1989.
- d Electricity at Work Regulations 1989.
- e Noise at Work Regulations 1989.
- f Manual Handling Operations Regulations 1992.
- g Health and Safety (Display Screen Equipment) Regulations 1992.
- h Abrasive Wheel Regulations.
- i Safe Working Loads.
- j Working at Height Regulations (2005).

Routine maintenance of the workplace

- a Trainee's personal responsibilities and limits of their authority with regard to work equipment.
- b Risk assessment of the workplace activities and work equipment.
- c Workplace person responsible for training and maintenance of workplace equipment.
- d When and why safety equipment must be used.
- e Location of safety equipment.
- f Particular hazards associated with their work area and equipment.
- g Prohibited areas.
- h Plant and machinery that trainees must not use or operate.
- i Why and how faults on unsafe equipment should be reported.
- j Storing tools, equipment and products safely and appropriately.
- k Using the correct PPE.
- l Following manufacturers' recommendations.
- m Location of routine maintenance information e.g. electrical safety check log.

Legislation relevant to Health and Safety

- a HASAWA.
- b COSHH.
- c EPA.
- d Manual Handling Operations Regulations 1992.
- e PPE Regulations 1992.

General regulations to include an awareness of:

- a Health and Safety (Display Screen Equipment) Regulations 1992.
- b Health and Safety (First Aid) Regulations 1981.
- c Health and Safety (Safety Signs and Signals) Regulations 1996.
- d Health and Safety (Consultation with Employees) Regulations 1996.
- e Employers Liability (Compulsory Insurance) Act 1969 and Regulations 1998.
- f Confined Spaces Regulations 1997.
- g Noise at Work Regulations 1989.
- h Electricity at Work Regulations 1989.
- i Electricity (Safety) Regulations 1994.
- j Fire Precautions Act 1971.
- k Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985.
- l Pressure Systems Safety Regulations 2000.
- m Waste Management 1991.
- n Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002.
- o Control of Asbestos at Work Regulations 2002.

Legislative duties

- a The purpose of a Health and Safety Policy.
- b The relevance of the Health and Safety Executive.
- c The relevance of an initial induction to Health and Safety requirements at your workplace.
- d General employee responsibilities under the HASAWA and the consequences of noncompliance.
- e General employer responsibilities under the HASAWA and the consequences of noncompliance.
- f The limits of authority with regard to Health and Safety within a personal job role.
- g Workplace procedure to be followed to report Health and Safety matters.

Precautions to be taken when working with vehicles, workshop materials, tools and equipment including electrical safety, pneumatics and hydraulics

- a Accessing and interpreting safety information.
- b Seeking advice when needed.
- c Seeking assistance when required.
- d Reporting of unsafe equipment.
- e Storing tools, equipment and products safely and appropriately.
- f Using the correct PPE.
- g Following manufacturers recommendations.
- h Following application procedures e.g. hazardous substances.
- i The correct selection and use of extraction equipment.

PPE to include:

- a Typical maintenance procedures for PPE equipment to include:
 - i typical maintenance log
 - ii cleaning procedures
 - iii filter maintenance
 - iv variation in glove types
 - v air quality checks.
- b Choice and fitting procedures for masks and air breathing equipment.
- c Typical workplace processes which would require the use of PPE to include:
 - i welding
 - ii sanding and grinding
 - iii filling
 - iv panel removal and replacement
 - v drilling
 - vi cutting
 - vii chiselling
 - viii removal of broken glass
 - ix removal of rubber seals from fire damaged vehicles
 - x removal of hypodermic needles
 - xi servicing activities
 - xii roadside recovery.
- d Unserviceable PPE.

- e PPE required for a range of automotive repair activities. To include appropriate protection of:
 - i eyes
 - ii ears
 - iii head
 - iv skin
 - v feet
 - vi hands
 - vii lungs.

Fire and extinguishers

- a Classification of fire types.
- b Using a fire extinguisher effectively. Types of extinguishers:
 - i foam
 - ii dry powder
 - iii CO2
 - iv water
 - v fire blanket.

Action to be taken in the event of a fire to include:

- a The procedure as:
 - i raise the alarm
 - ii fight fire only if appropriate
 - iii evacuate building
 - iv call for assistance.

Product warning labels to include:

- a Reasons for placing warning labels on containers.
- b Warning labels in common use, to include:
 - i toxic
 - ii corrosive
 - iii poisonous
 - iv harmful
 - v irritant
 - vi flammable
 - vii explosive.

Warning signs and notices

- a Colours used for warning signs:
 - i red
 - ii blue
 - iii green.
- b Shapes and meaning of warning signs:
 - i round
 - ii triangular
 - iii square.
- c The meaning of prohibitive warning signs in common use.
- d The meaning of mandatory warning signs in common use.
- e The meaning of warning notices in common use.
- f General design of safe place warning signs.

Hazards and risks to include:

- a The difference between a risk and a hazard.
- b Potential risks resulting from:
 - i the use and maintenance of machinery or equipment
 - ii the use of materials or substances
 - iii accidental breakages and spillages
 - iv unsafe behaviour
 - v working practices that do not conform to laid down policies
 - vi environmental factors
 - vii personal presentation
 - viii unauthorised personnel, customers, contractors etc entering your work premises
 - ix working by the roadside
 - x vehicle recovery.
- c The employee's responsibilities in identifying and reporting risks within their working environment.
- d The method of reporting risks that are outside your limits of authority.
- e Potential causes of:
 - i fire
 - ii explosion
 - iii noise
 - iv harmful fumes
 - v slips
 - vi trips
 - vii falling objects
 - viii accidents whilst dealing with broken down vehicles.

Personal responsibilities

- a The purpose of workplace policies and procedures on:
 - i the use of safe working methods and equipment
 - ii the safe use of hazardous substances
 - iii smoking, eating , drinking and drugs
 - iv emergency procedures
 - v personal appearance.
- b The importance of personal appearance in the control of health and safety.

Action to be taken in the event of colleagues suffering accidents

- a The typical sequence of events following the discovery of an accident such as:
 - i make the area safe
 - ii remove hazards if appropriate i.e. switch off power
 - iii administer minor first aid
 - iv take appropriate action to re-assure the injured party
 - v raise the alarm
 - vi get help
 - vii report on the accident.

- b Typical examples of first aid which can be administered by persons at the scene of an accident:
 - i check for consciousness
 - ii stem bleeding
 - iii keep the injured person's airways free
 - iv place in the recovery position if injured person is unconscious
 - v issue plasters for minor cuts
 - vi action to prevent shock i.e. keep the injured party warm
 - vii administer water for minor burns or chemical injuries
 - viii wash eyes with water to remove dust or ingress of chemicals (battery acid)
 - ix need to seek professional help for serious injuries.
- c Examples of bad practice which may result in further injury such as:
 - i moving the injured party
 - ii removing foreign objects from wounds or eyes
 - iii inducing vomiting
 - iv straightening deformed limbs.

Unit 053

Knowledge of support for job roles in the automotive work environment

UAN:	T/601/6175
Level:	Level 3
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to G3 Maintain Working Relationships in the Motor Vehicle Environment.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of how to keep good working relationships with all colleagues in the automotive work environment by using effective communication and support skills.

Learning outcome
The learner will: 1. understand key organisational structures, functions and roles within the automotive work environment.
Assessment criteria
The learner can: 1.1 identify the purpose of different sections of a typical automotive work environment 1.2 explain organisational structures and lines of communication within the automotive work environment 1.3 explain levels of responsibility within specific job roles in an automotive workplace. To include: a. trainee b. skilled technician c. supervisor d. manager.

Learning outcome
The learner will: 2. understand the importance of obtaining, interpreting and using information in order to support their job role within the automotive work environment
Assessment criteria
The learner can: 2.1 explain the importance of different sources of information in a automotive work environment 2.2 explain how to find, interpret and use relevant sources of information 2.3 describe the main legal requirements relating to the vehicle, including road safety requirements 2.4 explain the importance of working to recognised procedures and processes 2.5 explain when replacement units and components must meet the manufacturers' original equipment specification. 2.6 explain how to use identification codes.

Learning outcome
The learner will: 3. understand the importance of different types of communication within the automotive work environment
Assessment criteria
The learner can: 3.1 explain where different methods of communication would be used within the automotive environment 3.2 explain the factors which can determine their choice of communication 3.3 explain how the communication of information can change with the target audience to include uninformed and informed people.

Learning outcome
The learner will: 4. understand communication requirements when carrying out vehicle repairs in the automotive work environment
Assessment criteria
The learner can: 4.1 explain how to report using written and verbal communication 4.2 explain the importance of documenting information relating to work carried out in the automotive environment 4.3 explain the importance of working to agreed timescales.

Learning outcome

The learner will:

5. understand how to develop good working relationships with colleagues and customers in the automotive workplace

Assessment criteria

The learner can:

- 5.1 describe how to develop positive working relationships with colleagues and customers
- 5.2 explain the importance of developing positive working relationships
- 5.3 explain the importance of accepting other peoples' views and opinions
- 5.4 explain the importance of making and honouring realistic commitments to colleagues and customers.

Unit 053 Knowledge of support for job roles in the automotive work environment

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

The structure of a typical vehicle repair business

- a How these areas relate to each other within the business:
 - i body shop
 - ii vehicle repair workshop
 - iii paint shop
 - iv valeting
 - v vehicle parts store
 - vi main office
 - vii vehicle sales
 - viii reception.
- b Sources of information:
 - i other staff
 - ii manuals
 - iii parts lists
 - iv computer software and the internet
 - v manufacturer
 - vi diagnostic equipment.

Communication requirements when carrying out vehicle repairs

- a Locating and using correct documentation and information for:
 - i recording vehicle maintenance and repairs
 - ii vehicle specifications
 - iii component specifications
 - iv oil and fluid specifications
 - v equipment and tools
 - vi identification codes.
- b Procedures for:
 - i referral of problems
 - ii reporting delays
 - iii additional work identified during repair or maintenance
 - iv keeping others informed of progress.

Methods of communication

- a Verbal.
- b Signs and notices.
- c Memos.
- d Telephone.
- e Electronic Mail.
- f Vehicle job card.
- g Notice boards.
- h SMS text messaging.
- i Letters.

Organisational & customer requirements

- a Importance of time scales to customer and organisation.
- b Relationship between time and costs.
- c Meaning of profit.

Choice of Communication

- a Distance.
- b Location.
- c Job responsibility.

Importance of maintaining positive working relationships:

- a morale
- b productivity
- c company image
- d customer relationships
- e colleagues.

Unit 054

Knowledge of materials fabrication, tools and measuring devices used in the automotive environment

UAN:	K/601/6237
Level:	2
Credit value:	4
GLH:	40
Relationship to NOS:	This unit is linked to G4 Use of Hand Tools and Equipment in Motor Vehicle Engineering.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	<p>This unit enables the learner to develop an understanding of:</p> <ul style="list-style-type: none">• the correct selection, care and use of key hand tools and measuring devices for modification, fabrication and repair in the automotive environment• the correct preparation and use of common automotive environment equipment• the correct selection and fabrication of materials used when modifying and repairing• the correct application of automotive engineering fabrication and fitting principles.

Learning outcome
The learner will: 1. understand how to select, use and care for hand tools and measuring devices in the automotive environment.
Assessment criteria
The learner can: 1.1 identify and explain the use of common types of hand tools used for fabricating and fitting in the automotive environment 1.2 identify and explain the use of common measuring devices used for fabrication and fitting in the automotive environment 1.3 describe, within the scope of their responsibilities, how to select, prepare and maintain hand tools, measuring devices and PPE used

<p>for fabrication, repair and fitting in the automotive environment</p> <p>1.4 state the limitations of common hand tools and measuring devices used for fabricating, repair and fitting in the automotive workplace</p> <p>1.5 explain how common hand tools and measuring devices used for fabricating, repair and fitting in the automotive environment should be stored and maintained</p> <p>1.6 identify common electrical measuring tools used in the repair of vehicles and components</p> <p>1.7 explain the preparation and safe and correct use of common electrical tools when measuring voltage, current and resistance.</p>
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Learning outcome
The learner will:
2. understand how to prepare and use common workshop equipment.
Assessment criteria
The learner can:
2.1 describe the preparation and safe use of workshop equipment
2.2 explain the term: safe working load.

Learning outcome
The learner will:
3. understand how to select materials when fabricating, modifying and repairing vehicles and fitting components.
Assessment criteria
The learner can:
3.1 describe the properties, application and limitations of ferrous and non-ferrous metals, including their safe use
3.2 describe the properties, application and limitations of common non-metallic materials, including their safe use
3.3 define common terms relating to the properties of materials.

Learning outcome
The learner will:
4. understand how to apply automotive engineering, fabrication and fitting principles when modifying and repairing vehicles and components.
Assessment criteria
The learner can:
4.1 describe how to tap threads, file, cut and drill plastics and metals when modifying or repairing vehicles
4.2 describe how to measure, mark out, shape and join materials when fabricating
4.3 describe the selection and fitting procedures of the following:
a. gaskets and seals
b. sealants and adhesives
c. fittings and fasteners
d. electrical circuit components
4.4 identify locking, fastening and fixing devices
4.5 state the importance of correct operating specifications for limits, fits and tolerances in the automotive environment.

Unit 054 Knowledge of materials fabrication, tools and measuring devices used in the automotive environment

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Common types of hand tools used for fabricating and fitting in the automotive workplace to include:

- a files
- b hacksaws and snips
- c hammers
- d screwdrivers
- e pliers
- f spanners
- g sockets
- h punches
- i types of drill and drill bits
- j taps and dies
- k stud removers
- l marking out tools.

Common measuring devices used for fabrication and fitting in the automotive environment to include:

- a rule or tape
- b callipers
- c feeler gauge
- d volume measures
- e micrometer
- f dial gauges
- g torque wrenches
- h depth gauges.

Common electrical measuring tools used in the repair of vehicles and components. To include:

- a ammeter
- b voltmeter
- c ohmmeter
- d multi-meter.

Common electrical terms when measuring:

- a voltage
- b current
- c resistance.

Workshop equipment (including appropriate PPE) to include:

- a hydraulic jacks
- b axle stands
- c pillar drills
- d air tools
- e vehicle lifts
- f cranes
- g hoists
- h electrical power tools.

The properties, application and limitations (to include safe use) of ferrous and non-ferrous metals used when constructing, modifying and repairing vehicles and components

Materials to include:

- a carbon steels
- b alloy steels
- c cast iron
- d aluminium alloys
- e brass
- f copper
- g lead.

Properties, application and limitations (to include safe use) of non-metallic materials used when constructing, modifying and repairing vehicles and components.

Materials to include:

- a glass
- b plastics (inc. GRP)
- c Kevlar
- d rubber.

Terms relating to the properties of materials to include:

- a hardness
- b toughness
- c ductility
- d elasticity
- e tenacity
- f malleability
- g plasticity.

Unit 301

Skills in removing and fitting vehicle mechanical components

UAN:	F/601/6048
Level:	2
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to the MET01S Demonstrating Skill in Removal and Fitting Vehicle Mechanical Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will help the learner to develop skills in order to carry out removal and fitting of a range of vehicle mechanical components.

Learning outcome
The learner will: 1. be able to work safely when carrying out the removal and fitting of vehicle mechanical components.
Assessment criteria
The learner can: 1.1 wear suitable personal protective equipment and use suitable vehicle coverings throughout all motor vehicle removal and fitting of vehicle mechanical components 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.

Learning outcome
The learner will: 2. be able to use relevant information to carry out the task.
Assessment criteria
The learner can: 2.1 select suitable sources of technical information to support vehicle removal and fitting activities including: a. vehicle technical data b. removal and fitting procedures c. legal requirements 2.2 use technical information to support vehicle removal and fitting activities.

Learning outcome
The learner will: 3. be able to use appropriate tools and equipment.
Assessment criteria
The learner can: 3.1 select the appropriate tools and equipment necessary for carrying out the removal and fitting of vehicle mechanical components 3.2 ensure that equipment has been calibrated and is in a safe working condition to meet manufacturers' and legal requirements 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out removal and fitting of vehicle mechanical components.

Learning outcome
The learner will: 4. be able to carry out removal and fitting of vehicle mechanical components.
Assessment criteria
The learner can: 4.1 remove and refit vehicle mechanical components 4.2 remove and refit vehicle mechanical components adhering to the correct specifications and tolerances for the vehicle and following: a. the manufacturer's approved removal and fitting methods b. recognised researched removal and fitting methods 4.3 ensure that the removal and fitting of vehicle mechanical components conforms to the vehicle operating specification and any legal requirements 4.4 ensure no damage occurs to other components when removing and fitting vehicle mechanical components 4.5 ensure all components are stored safely and in the correct location.

Learning outcome
The learner will: 5. be able to record information and make suitable recommendations.
Assessment criteria
The learner can: 5.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 5.2 make suitable and justifiable recommendations for cost effective repairs 5.3 record and report any additional faults noticed during the course of their work promptly in the format required.

Unit 302

Skills in removing and fitting electrical components

UAN:	Y/601/6055
Level:	2
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to the MET02S Demonstrating Skill in Removal and Fitting the Principle Electrical Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will help the learner to develop skills in order to carry out removal and fitting of a range of electrical vehicle components. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. be able to work safely when carrying out the removal and fitting of electrical vehicle components.
Assessment criteria
The learner can: 1.1 wear suitable personal protective equipment and use suitable vehicle coverings throughout all motor vehicle removal and fitting of electrical vehicle components 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.

Learning outcome
The learner will: 2. be able to use relevant information to carry out the task.
Assessment criteria
The learner can: 2.1 select suitable sources of technical information to support vehicle removal and fitting activities including: a. vehicle technical data b. removal and fitting procedures c. legal requirements 2.2 use technical information to support vehicle removal and fitting activities.

Learning outcome
The learner will: 3. be able to use appropriate tools and equipment.
Assessment criteria
The learner can: 3.1 select the appropriate tools and equipment necessary for carrying out the removal and fitting of electrical components 3.2 ensure that equipment has been calibrated and is in a safe working condition to meet manufacturers' and legal requirements 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out removal and fitting of electrical components.

Learning outcome
The learner will: 4. be able to carry out the removal and fitting of electrical vehicle components.
Assessment criteria
The learner can: 4.1 remove and refit common electrical vehicle components 4.2 remove and refit the electrical vehicle components adhering to the correct specifications and tolerances for the vehicle and following: a. the manufacturer's approved removal and fitting methods b. recognised researched removal and fitting methods 4.3 ensure that the removal and fitting of electrical vehicle components conforms to the vehicle operating specification and any legal requirements 4.4 ensure no damage occurs to other components when removing and fitting electrical vehicle components 4.5 ensure all components are stored safely and in the correct location.

Learning outcome
The learner will: 5. be able to record information and make suitable recommendations.
Assessment criteria
The learner can: 5.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 5.2 make suitable and justifiable recommendations for cost effective repairs 5.3 record and report any additional faults noticed during the course of their work promptly in the format required.

Unit 303

Skills in removing and fitting trim components

UAN:	T/601/6063
Level:	2
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to the MET035 Demonstrating Skill in Removal and Fitting the Principle Trim Components
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will help the learner to develop skills in order to carry out the removal and fitting of a range of trim components. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. be able to work safely when carrying out the removal and fitting of trim components.
Assessment criteria
The learner can: 1.1 wear suitable personal protective equipment and use suitable vehicle coverings throughout all motor vehicle removal and fitting of trim components 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.

Learning outcome
The learner will: 2. be able to use relevant information to carry out the task.
Assessment criteria
The learner can: 2.1 select suitable sources of technical information to support vehicle trim removal and fitting activities including: a. vehicle technical data b. removal and fitting procedures c. legal requirements 2.2 use technical information to support vehicle trim removal and fitting activities.

Learning outcome
The learner will: 3. be able to use appropriate tools and equipment.
Assessment criteria
The learner can: 3.1 select the appropriate tools and equipment necessary for carrying out the removal and fitting of trim components 3.2 ensure that equipment has been calibrated and is in a safe working condition 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out removal and fitting of trim components.

Learning outcome
The learner will: 4. be able to carry out removal and fitting of trim components.
Assessment criteria
The learner can: 4.1 remove and refit common trim components 4.2 remove and refit trim components adhering to the correct specifications and tolerances for the vehicle and following: a. the manufacturer's approved removal and fitting methods b. recognised researched removal and fitting methods 4.3 ensure that the removal and fitting trim components conforms to the vehicle operating specification and any legal requirements 4.4 ensure no damage occurs to other components when removing and fitting trim components 4.5 ensure all components are stored safely and in the correct location.

Learning outcome
The learner will: 5. be able to record information and make suitable recommendations.
Assessment criteria
The learner can: 5.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 5.2 make suitable and justifiable recommendations for cost effective repairs 5.3 record and report any additional faults noticed during the course of their work promptly in the format required.

Unit 304

Skills in removing and fitting electronically controlled vehicle mechanical components

UAN:	L/601/6070
Level:	3
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to the MET04S Demonstrating Skill in Removal and Fitting Complex Mechanical Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will help the learner to develop skills in order to carry out the removal and fitting of a range of electronically controlled mechanical vehicle components. It also covers the procedures used when fitting components.

Learning outcome
The learner will: 1. be able to work safely when carrying out the removal and fitting of electronically controlled mechanical vehicle components.
Assessment criteria
The learner can: 1.1 wear suitable personal protective equipment and use suitable vehicle coverings throughout all motor vehicle removal and fitting electronically controlled mechanical vehicle components 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.

Learning outcome
The learner will: 2. be able to use relevant information to carry out the task.
Assessment criteria
The learner can: 2.1 select suitable sources of technical information to support vehicle removal and fitting activities including: a. vehicle technical data b. removal and fitting procedures

<p>c. legal requirements</p> <p>3.2 use technical information to support vehicle removal and fitting activities</p>

Learning outcome
The learner will:
3. be able to use appropriate tools and equipment.
Assessment criteria
The learner can:
3.1 select the appropriate tools and equipment necessary for carrying out the removal and fitting of complex mechanical components
3.2 ensure that equipment has been calibrated and is in a safe working condition to meet manufacturers' and legal requirements
3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out removal and fitting of complex mechanical components.

Learning outcome
The learner will:
4. be able to carry out removal and fitting of electronically controlled mechanical vehicle components.
Assessment criteria
The learner can:
4.1 remove and refit electronically controlled mechanical vehicle components
4.2 remove and refit the electronically controlled mechanical vehicle components adhering to the correct specifications and tolerances for the vehicle and following:
a. the manufacturer's approved removal and fitting methods
b. recognised researched removal and fitting methods
4.3 ensure that the removal and fitting of the electronically controlled mechanical vehicle components conforms to the vehicle operating specification and any legal requirements
4.4 ensure no damage occurs to other components when removing and fitting the electronically controlled mechanical vehicle components.
4.5 ensure all components are stored safely and in the correct location.

Learning outcome
The learner will:
5. be able to record information and make suitable recommendations.
Assessment criteria
The learner can:
5.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required
5.2 make suitable and justifiable recommendations for cost effective repairs
5.3 record and report any additional faults noticed during the course of their work promptly in the format required.

Unit 305

Skills in removing and fitting vehicle electronic components and systems

UAN:	T/601/6113
Level:	3
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to the MET05S Demonstrating Skill in Removal and Fitting Complex Electrical Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will help the learner to develop skills in order to carry out the removal and fitting of a range of Vehicle Electronics. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. be able to work safely when carrying out the removal and fitting of vehicle electronics.
Assessment criteria
The learner can: 1.1 wear suitable personal protective equipment and use suitable vehicle coverings throughout all motor vehicle removal and fitting of vehicle electronics 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.

Learning outcome
The learner will: 2. be able to use relevant information to carry out the task.
Assessment criteria
The learner can: 2.1 select suitable sources of technical information to support vehicle removal and fitting activities including: a. vehicle technical data b. removal and fitting procedures c. legal requirements

2.2 use technical information to support vehicle removal and fitting activities.

Learning outcome

The learner will:

3. be able to use appropriate tools and equipment.

Assessment criteria

The learner can:

- 3.1 select the appropriate tools and equipment necessary for carrying out the removal and fitting of vehicle electrical components
- 3.2 ensure that equipment has been calibrated and is in a safe working condition
- 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out removal and fitting of vehicle electrical components.

Learning outcome

The learner will:

4. be able to carry out removal and fitting of Vehicle electronics.

Assessment criteria

The learner can:

- 4.1 remove and refit vehicle electronics
- 4.2 remove and refit vehicle electronics adhering to the correct specifications and tolerances for the vehicle and following:
 - a. the manufacturer's approved removal and fitting methods
 - b. recognised researched removal and fitting methods
- 4.3 ensure that the removal and fitting of vehicle electronics conforms to the vehicle operating specification and any legal requirements
- 4.4 ensure no damage occurs to other components when removing and fitting the vehicle electronics
- 4.5 ensure all components are stored safely and in the correct location.

Learning outcome

The learner will:

5. be able to record information and make suitable recommendations.

Assessment criteria

The learner can:

- 5.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required
- 5.2 make suitable and justifiable recommendations for cost effective repairs
- 5.3 record and report any additional faults noticed during the course of their work promptly in the format required.

Unit 306

Skills in removing, refurbishing and fitting trim components

UAN:	F/601/6115
Level:	3
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to the MET06S Demonstrating Skill in Removal and Fitting Trim Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will help the learner to develop knowledge to carry out the removal, fitting and recovery of a range of trim components. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. be able to work safely when carrying out the removal, refurbishment and fitting of trim components.
Assessment criteria
The learner can: 1.1 wear suitable personal protective equipment and use suitable vehicle coverings throughout all motor vehicle removal, refurbishment and fitting of trim components 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.

Learning outcome
The learner will: 2. be able to use relevant information to carry out the task.
Assessment criteria
The learner can: 2.1 select suitable sources of technical information to support vehicle removal and refurbishment activities including: a. vehicle technical data b. removal and refurbishment procedures c. legal requirements

2.2 use technical information to support vehicle removal and refurbishment activities.

Learning outcome

The learner will:

3. be able to use appropriate tools and equipment.

Assessment criteria

The learner can:

- 3.1 select the appropriate tools and equipment necessary for carrying out the removal, refurbishment and fitting of trim components
- 3.2 ensure that equipment has been calibrated and is in a safe working condition to meet manufacturers' and legal requirements
- 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out removal, refurbishment and fitting of trim components.

Learning outcome

The learner will:

4. be able to carry out removal, refurbishment and fitting of trim components.

Assessment criteria

The learner can:

- 4.1 remove, refurbish and fit trim components
- 4.2 remove, refurbish and fit trim components adhering to the correct specifications and tolerances for the vehicle and following:
 - a. the manufacturer's approved removal and refurbishment methods
 - b. recognised researched removal and refurbishment methods
- 4.3 ensure that the removal, refurbishment and fitting of trim components conforms to the vehicle operating specification and any legal requirements
- 4.4 ensure no damage occurs to other components when removing, refurbishing and fitting trim components
- 4.5 ensure all components are stored safely and in the correct location.

Learning outcome

The learner will:

5. be able to record information and make suitable recommendations.

Assessment criteria

The learner can:

- 5.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required
- 5.2 make suitable and justifiable recommendations for cost effective repairs
- 5.3 record and report any additional faults noticed during the course of their work promptly in the format required.

Unit 311

Handle refrigerants

UAN:	R/501/2950
Level:	3
Credit value:	1
GLH:	10
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.

Learning outcome
The learner will: 1. understand how to handle refrigerants.
Assessment criteria
The learner can: 1.1 interpret legislative and organisational requirements and procedures relevant to workplace practices whilst handling refrigerants 1.2 explain the operating principles and functional requirements of mobile air conditioning systems and components 1.3 compare the types of refrigerants; their properties, characteristics and the associated environmental issues 1.4 explain the use and application of special purpose tools, equipment and materials needed for system recovery, vacuum, recharging, flushing (if applicable), and leak detection for mobile air conditioning systems 1.5 explain procedures for handling refrigerant and minimising refrigerant losses and emissions.

Learning outcome

The learner will:

2. be able to handle refrigerants.

Assessment criteria

The learner can:

- 2.1 work safely, complying with Health & Safety and other relevant regulations and manufacturer guidelines
- 2.2 identify the system refrigerant type and act in accordance with legislation and operating procedures
- 2.3 demonstrate the ability to use the tools and equipment required, throughout activities for recovery, vacuum testing, recharging and, flushing (if applicable), and the ability to carry out at least two methods of leak detection
- 2.4 correctly store and transfer waste material following current legal requirements
- 2.5 complete records accurately, and pass to the relevant person(s) promptly in the format required and in accordance with any legal requirements.

Unit 351

Knowledge of removing and fitting vehicle mechanical components

UAN:	H/601/6026
Level:	2
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to the MET01K Knowledge of Removing and Fitting Vehicle Mechanical Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop knowledge in order to carry out the removal and fitting of a range of mechanical vehicle components. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. understand how to carry out the removal and fitting of vehicle mechanical components.
Assessment criteria
The learner can: 1.1 identify the procedures involved in carrying out the systematic removal and fitting of vehicle mechanical components to the standard required 1.2 explain the methods and procedures for storing removed vehicle mechanical components 1.3 identify the procedures involved in working with supplementary safety systems when fitting vehicle mechanical components 1.4 identify the different types of fastenings and fixings used when removing and fitting vehicle mechanical components 1.5 describe the reasons for the use of different types of fastenings and fixings used in vehicle mechanical components 1.6 describe the procedures, methods and reasons for ensuring correct alignment of vehicle mechanical components 1.7 identify the quality checks that can be used to ensure correct alignment and operation of components to manufacturers specification

- | |
|---|
| 1.8 identify correct conformity of vehicle mechanical systems against vehicle mechanical specification and legal requirements on completion |
| 1.9 explain the procedure for reporting damage to vehicle mechanical components and units. |

Learning outcome

The learner will:

- | |
|---|
| 2. understand how mechanical vehicle systems operate. |
|---|

Assessment criteria

The learner can:

- | |
|---|
| 2.1 identify common vehicle mechanical system components |
| 2.2 describe the construction and operation of common vehicle mechanical systems. |

Unit 351 Knowledge of removing and fitting vehicle mechanical components

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

The identification and operation of:

- a engine cooling systems
- b exhaust
- c fuel
- d supplementary restraint systems
- e suspension - with no electronic control
- f in vehicle entertainment – audio only
- g electro-mechanical locking
- h air conditioning – evacuation, re-gas and oil of system, RRR of Dryer, condenser & pipe work, legislation around refrigerant handling
- i engines components
- j drivelines and hubs
- k final drive assemblies
- l steering components
- m braking components
- n tow bars.

The specific manufacturers and workshop procedures for the removal, renewal and replacement of components and systems

- a The procedure and methods used to remove and fit exhaust systems addressing the following:
 - i. oxygen / gas sensors (explain why hammers or pneumatic tools should not be used)
 - ii. catalytic converters (explain why hammers or pneumatic tools should not be used)
 - iii. mounting systems
 - iv. seals and gaskets
 - v. alignment.
- b The procedure for the removal and fitting of brake system components:
 - i. fluid
 - ii. callipers
 - iii. discs
 - iv. drums
 - v. cables
 - vi. pipes and hoses.

- c Suspension systems and specific procedures relating to:
 - i. coil spring (McPherson strut)
 - ii. air
 - iii. hydrolastic
 - iv. leaf spring
 - v. torsion bar.
- d The procedure for the removal and fitting of interior items:
 - i. seats (including pre-tensioner)
 - ii. In Car Entertainment (I.C.E). systems – audio only
 - iii. Supplementary Restraint System (S.R.S). systems deployed and un-deployed.
- e The procedure for the removal and fitting of security devices:
 - i. mechanical locks
 - ii. electro-mechanical locks
 - iii. electronic ‘drop glass’ systems (note: glass will not be easily movable when door is removed)
 - iv. mechanical ‘drop glass’ systems.
- f The procedure for the removal and fitting of cooling system components:
 - i. radiator and cowlings
 - ii. cooling fans
 - iii. drive belts
 - iv. pipes, hoses and sensors
 - v. air locks and bleeding techniques.
- g The system components for power and non power steering and the removal / renewal and fitting of them.
- h The procedure for the removal of fuel tanks.
- i The procedure for the removal and fitting of transmission systems:
 - i. operating mechanisms; pedal and lever, mechanical systems, cable
 - ii. clutch components; pressure plate, centre plate, release bearing
 - iii. hydraulic system; master cylinder, slave cylinder, hydraulic pipes
 - iv. gearboxes
 - v. propshafts
 - vi. drive shafts
 - vii. universal joints
 - viii. sliding couplings
 - ix. constant velocity joints.
- j The reasons for using flexible couplings and sliding joints in transmissions systems.
- k The reason for using constant velocity joints in drive shafts incorporating steering mechanisms.
- l The importance of using approved parts, components and procedures:
 - i. operation
 - ii. warranty.

Techniques and tools to carry out operational checks

- a Equipment and process of checking and steering geometry:
 - i. skid plates
 - ii. two wheel alignment tracking gauges
 - iii. four wheel alignment tracking gauges
 - iv. castor
 - v. camber
 - vi. KPI.
 - vii. toe-in/out.
- b The tools and processes for checking fluid levels / pressures:
 - i. cooling system (pressure, level, thermostat operation, cooling fan operation and antifreeze protection level)
 - ii. steering, engine, transmission and braking systems
 - iii. tyre pressures
 - iv. tyre types and sizes relating to the mixing of tyres of different construction type.

Procedures to prevent damage to the vehicle, components and contents when removing, storing and refitting components

- a The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage.
- b The procedures for the correct storage of vehicle contents.
- c The process for the reporting of extra damage and items that may have broken when removed or refitted.

Types of clips and fixings

- a The following types of clips and identify reasons and limitations for their use:
 - i. speed
 - ii. 'c'
 - iii. 'd'
 - iv. 'j' type captive nut
 - v. 'r'
 - vi. 'u' type captive nut
 - vii. cable clip
 - viii. trim clips.
- b The following types of fixings and identify reasons and limitations for their use:
 - i. pop rivet
 - ii. plastic rivet
 - iii. plastic capture nut
 - iv. nut and bolt
 - v. shoulder bolt
 - vi. 'Nyloc' type nuts
 - vii. washers
 - viii. 'Spring' type washers
 - ix. self tapping screws and bolts
 - x. quick release plastic trim fastenings
 - xi. trim tapes
 - xii. adhesives and sealers.

The processes involved when carrying out quality checks

- a Items that may have been 'workshop' soiled and describe processes for rectifying:
 - i. door cards
 - ii. seats
 - iii. carpets
 - iv. boot and bonnet trims.
- b Methods for checking gaps.
- c The process for checking and aligning components.

Mechanical components

- a Road Wheels.
- b Engine Cooling Systems.
- c Exhaust.
- d Fuel.
- e Supplementary Restraint Systems.
- f Suspension with no Electronic Control.
- g In vehicle entertainment – audio only.
- h Central locking systems.
- i Air Conditioning – evacuation, re-gas and oil of system, RRR of dryer, condenser & pipe work, legislation around refrigerant handling.
- j External engine components.
- k Drivelines and hubs.
- l Final drive assemblies.
- m Steering components.
- n Braking components.
- o Tow bars.

Unit 352

Knowledge of removing and fitting electrical components

UAN:	K/601/6030
Level:	2
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to the MET02K Knowledge of Removing and Fitting Electrical Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop knowledge in order to carry out the removal and fitting of a range of electrical components. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. understand how to carry out the removal and fitting of electrical components.
Assessment criteria
The learner can: 1.1 identify the procedures involved in carrying out the systematic removal and fitting of common electrical components 1.2 explain the methods and procedures for storing removed vehicle electrical components 1.3 identify the procedures involved in working with supplementary safety systems when fitting vehicle components 1.4 identify the procedures involved in working with gas discharge headlamp systems 1.5 describe the procedures, methods and reasons for ensuring correct alignment of vehicle electrical components 1.6 identify the quality checks that can be used to ensure correct alignment and operation of components to manufacturers specification 1.7 identify correct conformity of vehicle systems against vehicle specification and legal requirements on completion 1.8 explain the procedure for reporting damage to vehicle electrical components and units.

Learning outcome
The learner will: 2. understand how electrical systems operate.
Assessment criteria
The learner can: 2.1 identify common electrical system components 2.2 describe the construction and operation of the main electrical systems.

Unit 352 Knowledge of removing and fitting electrical components

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Basic electrical and electronic principles and electrical circuits

- a Quantities:
 - i. basic volt (electrical pressure)
 - ii. ampere (electrical current)
 - iii. ohm (electrical resistance)
 - iv. watt (power).
- b The requirements of an electrical circuit:
 - i. battery
 - ii. cables
 - iii. switch
 - iv. current consuming device.
- c The direction of current flow and electron flow.
- d Simple series and parallel circuits.
- e Earth and insulated return.
- f Cable sizes and colour codes.
- g Types of connectors, terminals and circuit protection devices.
- h Common electrical and electronic symbols.
- i The meaning of:
 - i. short circuit
 - ii. open circuit
 - iii. bad earth
 - iv. high resistance
 - v. electrical capacity.
- j The basic principle of vehicle electronics and solid state.
- k Procedures involved in carrying out the systematic removal and fitting of electrical components:
 - i. batteries
 - ii. headlamps
 - iii. wiper systems
 - iv. electric window systems.
- l Electrical system components:
 - i. batteries
 - ii. headlamps
 - iii. wiper systems
 - iv. electric window systems.

Vehicle electrical wiring diagrams

- a Interpret circuits to include:

- i. vehicle lighting
- ii. auxiliary circuits
- iii. indicators.

Vehicle batteries

- a The construction and principles of vehicle batteries.

Vehicle lighting and auxiliary systems

- a Identify the function and operating principles of:
 - i. types of switches
 - ii. circuit protection devices
 - iii. relays
 - iv. types of bulb
 - v. front and tail lamps
 - vi. main and dip beam headlamps
 - vii. lighting and dip switch
 - viii. window winding
 - ix. heating and ventilation systems, fan and heater
 - x. door mirror mechanisms
 - xi. interior lights and switching
 - xii. directional indicators.
- b The statutory lighting requirements when using a vehicle on the road.
- c The need for headlamp adjustment.

Requirements of electrical and electronic systems

- a The requirements for checking security and cleanliness of components, connections, correct operation of components and instruments, battery electrolyte, headlamp alignment, drive belt wear and tension.
- b The basic procedures for checking the operation of electrical circuits:
 - i. use of multi-meters, volt, amps, ohms
 - ii. checking voltage supply
 - iii. checking current flow and consumption
 - iv. checking resistance and volt drop
 - v. checking lamp operation, dip and main beam
 - vi. checking indicators.
- c Safety precautions when working on electrical and electronic circuits to include:
 - i. disconnection and connection of battery
 - ii. avoidance of short circuits
 - iii. circuit protection.

Procedures to prevent damage to the vehicle, components and contents when removing, storing and refitting components

- a The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage.
- b The procedures for the correct storage of vehicle contents.
- c The process for the reporting of extra damage and items that may have broken when removed or refitted.

Types of clips and fixings

- a The following types of clips and identify reasons and limitations for their use:
- i. speed
 - ii. 'c'
 - iii. 'd'
 - iv. 'j' type captive nut
 - v. 'r'
 - vi. 'u' type captive nut
 - vii. cable clip
 - viii. trim clips.
- b The following types of fixings and identify reasons and limitations for their use:
- i. pop rivet
 - ii. plastic rivet
 - iii. plastic capture nut
 - iv. nut and bolt
 - v. shoulder bolt
 - vi. 'Nyloc' type nuts
 - vii. washers
 - viii. 'Spring' type washers
 - ix. self tapping screws and bolts
 - x. quick release plastic trim fastenings
 - xi. trim tapes
 - xii. adhesives and sealers.

The processes involved when carrying out quality checks

- a Items that may have been 'workshop' soiled and describe processes for rectifying:
- i. door cards
 - ii. seats
 - iii. carpets
 - iv. boot and bonnet trims.
- b Methods for checking gaps.
- c The process for checking and aligning headlamps:
- i. address handling procedures for halogen bulbs
 - ii. address handling and health and safety issues relating to xenon bulbs and systems.
- d Operational checks and rectification methods to include:
- i. lights
 - ii. washers and wipers
 - iii. Supplementary Restraint Structure (SRS) systems (checking not rectification)
 - iv. charging system (checking not rectification)
 - v. horn
 - vi. fluid levels
 - vii. interior switches
 - viii. operation of door lock mechanisms.

Electrical components

- a Batteries.
- b Headlamps.
- c Wiper systems.
- d Electric Window Systems.

Unit 353

Knowledge of removing and fitting trim components

UAN:	A/601/6033
Level:	2
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to MET03K Knowledge of Removing and Fitting Trim Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop knowledge in order to carry out the removal and fitting of a range of trim components. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. understand how to carry out the removal and fitting of trim components.
Assessment criteria
The learner can: 1.1 identify the procedures involved in carry out the systematic removal and fitting of trim components to the standard required 1.2 explain the methods and procedures for storing removed trim components 1.3 describe the procedures, methods and reasons for ensuring correct alignment of trim components 1.4 identify the quality checks that can be used to ensure correct alignment and operation of components to manufacturers specification 1.5 identify correct conformity of vehicle systems against vehicle specification and legal requirements on completion 1.6 explain the procedure for reporting damage to vehicle components and units.

Learning outcome
The learner will: 2. understand the types of common trim components and securing methods.
Assessment criteria
The learner can: 2.1 identify common trim system components 2.2 describe the construction and fastening methods used for common trim components and systems.

Unit 353 Knowledge of removing and fitting trim components

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Procedures to prevent damage to the vehicle, components and contents when removing, storing and refitting components

- a The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage:
 - i. trims
 - ii. mouldings
 - iii. bumpers
 - iv. door cards
 - v. headlamps
 - vi. window and waist mouldings
 - vii. bonnet and boot lid trim
 - viii. sunroof systems
 - ix. carpets
 - x. headlining
 - xi. spoilers.
- b The procedures for the correct storage of vehicle contents.
- c The process for the reporting of extra damage and items that may have broken when removed or refitted.

Tools and equipment

- a The use of the following:
 - i. trolley jack
 - ii. axle stands
 - iii. two post ramp
 - iv. four post ramp with 'wheel free'
 - v. torque wrenches
 - vi. trim tools
 - vii. general hand tool selection
 - viii. manufacturers specialist tools
 - ix. air drills and bits
 - x. impact drivers
 - xi. rivet guns.

The processes involved when handling batteries

- a The procedure for the removal, storage and refitting of batteries.
- b The procedure for the disposal of batteries.
- c Battery checks as appropriate:

- i. electrolyte
 - ii. discharge
 - iii. specific gravity.
- d The charging process and procedures:
 - i. trickle charge
 - ii. normal charge
 - iii. boost / start.
- e The health and safety issues involved when charging (explosive gasses).

Types of clips and fixings

- a The following types of clips and identify reasons and limitations for their use:
 - i. speed
 - ii. 'c'
 - iii. 'd'
 - iv. 'j' type captive nut
 - v. 'r'
 - vi. 'u' type captive nut
 - vii. cable clip
 - viii. trim clips.
- b The following types of fixings and identify reasons and limitations for their use:
 - i. pop rivet
 - ii. plastic rivet
 - iii. plastic capture nut
 - iv. nut and bolt
 - v. shoulder bolt
 - vi. 'Nyloc' type nuts
 - vii. washers
 - viii. 'Spring' type washers
 - ix. self tapping screws and bolts
 - x. quick release plastic trim fastenings
 - xi. trim tapes, adhesives and sealers.

The processes involved when carrying out quality checks

- a Items that may have been 'workshop' soiled and describe processes for rectifying:
 - i. door cards
 - ii. seats
 - iii. carpets
 - iv. boot and bonnet trims
 - v. headlamps
 - vi. window and waist mouldings
 - vii. bonnet and boot lid trim
 - viii. sunroof systems
 - ix. carpets
 - x. headlining
 - xi. spoilers.
- b Methods for checking gaps.

Principle trim components

- a Bumpers.
- b Door Trim.
- c Window and Waist Mouldings.
- d Bonnet and Boot lid Trim.
- e Sunroof Systems.
- f Carpets.
- g Headlining.
- h Spoilers.

Unit 354

Knowledge of removing and fitting electronically controlled vehicle mechanical components

UAN:	D/601/6039
Level:	3
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to the MET04K Knowledge of Removing and Fitting Electronically Controlled Vehicle Mechanical Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop knowledge in order to carry out the removal and fitting of a range of complex mechanical vehicle components. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. understand how to carry out the removal and fitting of electronically controlled mechanical vehicle components.
Assessment criteria
The learner can: 1.1 explain the procedures involved prior to carrying out the systematic removal and fitting of electronically controlled mechanical vehicle components to the standard required 1.2 explain the procedures involved in carrying out the systematic removal and fitting of electronically controlled mechanical vehicle components to the standard required 1.3 explain the methods and procedures for storing removed electronically controlled mechanical vehicle components 1.4 explain the reasons for the different types of fastenings and fixings used when removing and fitting complex mechanical vehicle components 1.5 explain the procedures involved to reinstate the system to manufacturers specification 1.6 explain correct conformity of vehicle systems against vehicle specification and legal requirements on completion 1.7 explain the procedure for identifying, evaluating, recording and reporting damage to vehicle components and units.

Learning outcome

The learner will:

2. understand how the electronically controlled mechanical vehicle systems operate

Assessment criteria

The learner can:

- 2.1 identify complex mechanical vehicle system components
- 2.2 explain the construction and operation of complex mechanical vehicle systems
- 2.3 explain how components and systems interact with other vehicle systems.

Unit 354 Knowledge of removing and fitting electronically controlled vehicle mechanical components

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

The construction and operating principals of electronically controlled suspension systems and assemblies

Suspension

- a The components and layout of electronically controlled suspension systems.
- b The operation of electronically suspension systems and components.
- c The advantages of different systems including:
 - i non-independent
 - ii independent suspension (IFS)
 - iii independent suspension (IRS)
 - iv hydraulic
 - v hydro-pneumatic
 - vi rigid axle.
- d The principles of electronic suspensions systems.
- e The forces acting on suspension systems during braking, driving and cornering.
- f The methods of locating the road wheels against braking, driving and cornering forces.
- g The methods of controlling cornering forces by fitting anti-roll torsion members
- h Suspension terms:
 - i rebound
 - ii bump
 - iii float
 - iv dive
 - v pitch
 - vi roll
 - vii compliance.
- i The procedures used for inspecting the serviceability and condition of the suspension system.

Components and operation of self-levelling suspension

- a The components, construction and operation of a self levelling suspension system.

- b The operation of self -levelling suspension system under various conditions:
 - i self-energizing
 - ii pump operated self-levelling suspension.

Operation of fitting ride-controlled systems

- a The reasons for fitting ride controlled systems.
- b The operation of driver controlled and ride controlled systems.

The construction and operating principals of climate control systems and assemblies

The function of component heater, cooling parts and climate control

- a Components include:
 - i heater motors
 - ii rheostats
 - iii valves
 - iv switches
 - v relays
 - vi cooling fan motors
 - vii air conditioning units
 - viii thermostatic switches.

The operating principles of heater, cooling systems and climate control

- a Principles to include:
 - i conduction
 - ii convection
 - iii radiation
 - iv circulation
 - v boiling points
 - vi states of matter (gas, liquid, solid)
 - vii temperature control
 - viii antifreeze mixtures
 - ix heat transfer.

General

The procedures for dismantling, removal and replacement of suspension/climate control system components

- a The preparation:
 - i testing and use of tools and equipment
 - ii electrical meters and equipment used for dismantling
 - iii removing and replacing suspension/climate control systems and components.
- b Appropriate safety precautions:
 - i PPE
 - ii vehicle protection when dismantling
 - iii removing and replacing suspension/climate control systems and components.
- c The important of logical and systematic processes.
- d The inspection and testing of suspension/climate control systems and components.

- e The preparation of replacement units for re-fitting or replacement of suspension/climate control systems or components.
- f Identify the reasons why replacement components and units must meet the original specifications (OES):
 - i warranty requirements
 - ii to maintain performance
 - iii safety requirements.
- g Refitting procedures.
- h The inspection and testing of units and systems to ensure compliance with manufacturer's, legal and performance requirements.
- i The inspection and re-instatement of the vehicle following repair to ensure customer satisfaction:
 - i cleanliness of vehicle interior and exterior
 - ii security of components and fittings
 - iii re-instatement of components and fittings.

Procedures to prevent damage to the vehicle, components and contents when removing, storing and refitting components

- a The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage.
- b The procedures for the correct storage of vehicle contents.
- c The process for identifying, evaluating and reporting of extra damage and items that may have broken when removed, refitted or unscheduled work.

Types of clips and fixings

- a The following types of clips and identify reasons and limitations for their use:
 - i speed
 - ii 'c'
 - iii 'd'
 - iv 'j' type captive nut
 - v 'r'
 - vi 'u' type captive nut
 - vii cable clip
 - viii trim clips.
- b The following types of fixings and identify reasons and limitations for their use:
 - i pop rivet
 - ii plastic rivet
 - iii plastic capture nut
 - iv nut and bolt
 - v shoulder bolt
 - vi 'Nyloc' type nuts
 - vii washers
 - viii 'Spring' type washers
 - ix self tapping screws and bolts
 - x quick release plastic trim fastenings
 - xi trim tapes
 - xii adhesives and sealers.

The processes involved when carrying out quality checks

- a Items that may have been 'workshop' soiled and describe processes for rectifying:
 - i door cards
 - ii seats
 - iii carpets
 - iv boot and bonnet trims.
- b Methods for checking gaps.

Mechanical components

- a Suspension - active suspension.
- b Climate control.

Unit 355

Knowledge of removing and fitting vehicle electronic components and systems

UAN:	D/601/6042
Level:	3
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to the MET05K Knowledge of Removing and Fitting Vehicle Electronic Components and Systems.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs..
Aim:	This unit enables the learner to develop knowledge in order to carry out the removal and fitting of a range of vehicle electronics. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. understand how to carry out the removal and fitting of vehicle electronics.
Assessment criteria
The learner can: 1.1 explain the procedures involved in carrying out the systematic removal and fitting of vehicle electronic system components 1.2 explain the methods and procedures for storing removed vehicle electronic components 1.3 explain the quality checks that can be used to ensure correct alignment and operation of electronic components to manufacturer's specification 1.4 explain correct conformity of vehicle systems against vehicle specification and legal requirements on completion 1.5 explain the procedure for identifying, evaluating and reporting damage to vehicle electronics and units.

Learning outcome
The learner will: 2. understand how vehicle electronic systems operate.
Assessment criteria
The learner can: 2.1 identify vehicle electronic systems 2.2 explain the construction and operation of vehicle electronic systems 2.3 explain how components and systems interact with other vehicle systems.

Unit 355 Knowledge of removing and fitting vehicle electronic components and systems

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

The different types of In Car Entertainment (I.C.E.) systems and components

- a Systems and components must include:
 - i radio CD and multi play units
 - ii DVD players
 - iii MP3 players
 - iv speakers
 - v aerial systems
 - vi amplifiers
 - vii V.D.U. screens
 - viii satellite navigation
 - ix communication units.

The function of components in I.C.E. systems

- a Systems include:
 - i radios
 - ii CD players
 - iii video players
 - iv DVD players
 - v aerial systems
 - vi speakers
 - vii amplifiers
 - viii VDU screens
 - ix mobile communication units.

The operating principles of I.C.E. systems

- a Operation of entertainment systems speaker and aerial systems.

The different lighting systems and technology

- a Lighting systems should include:
 - i Xenon lighting
 - ii gas discharge lighting
 - iii ballast system
 - iv LED
 - v intelligent front lighting
 - vi blue lights
 - vii complex reflectors

- viii fibre optic
- ix optical patterning.

The function of components in lighting systems

- a Lighting systems should include:
 - i Xenon lighting
 - ii gas discharge lighting
 - iii ballast system
 - iv LED
 - v intelligent front lighting
 - vi blue lights
 - vii complex reflectors
 - viii fibre optic
 - ix optical patterning.

The operating principles of lighting systems

- a Operation of lighting systems.

The different types of integrated security/warning systems and components

- a Components to include:
 - i control units
 - ii alarm modules
 - iii audible warning units
 - iv immobiliser units
 - v sensing units
 - vi horn
 - vii audible warning speakers explain how components and systems interact with other vehicle systems.

The function of component parts in integrated security and warning systems

- a Components to include:
 - i control units
 - ii alarm modules
 - iii audible warning units
 - iv interior sensing systems
 - v immobiliser units
 - vi relays
 - vii horns.

The operating principles of integrated security and warning systems

- a Operation of alarm systems and audible warning units.

The relevant legislation relevant to security and warning systems

- a Find and apply all relevant legislation for the fitment and use of security and warning systems.

The operation and removal of the dash panel and auxiliary fittings

- a Operation and removal of the dash panel and auxiliary fittings.

Procedures to prevent damage to the vehicle, components and contents when removing, storing and refitting components

- a The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage.
- b The procedures for the correct storage of vehicle contents.
- c The process for identifying, evaluating and reporting extra damage and items that may have broken when removed, refitted or are unscheduled work.

Types of clips and fixings

- a The following types of clips and identify reasons and limitations for their use:
 - i speed
 - ii 'c'
 - iii 'd'
 - iv 'j' type captive nut
 - v 'r'
 - vi 'u' type captive nut
 - vii cable clip
 - viii trim clips.
- b The following types of fixings and identify reasons and limitations for their use:
 - i pop rivet
 - ii plastic rivet
 - iii plastic capture nut
 - iv nut and bolt
 - v shoulder bolt
 - vi 'Nyloc' type nuts
 - vii washers
 - viii 'Spring' type washers
 - ix self tapping screws and bolts
 - x quick release plastic trim fastenings
 - xi trim tapes
 - xii adhesives and sealers.

The processes involved when carrying out quality checks

- a Items that may have been 'workshop' soiled and describe processes for rectifying:
 - i door cards
 - ii seats
 - iii carpets
 - iv boot and bonnet trims.
- b Methods for checking gaps.
- c The process for checking and aligning headlamps:
 - i address handling procedures for halogen bulbs
 - ii address handling and health and safety issues relating to xenon bulbs and systems.

Vehicle Electronic Components

- a In vehicle entertainment – audio & visual.
- b Lighting – high voltage electronic/electrical directional control.
- c Security systems.
- d Dash panel and auxiliary fittings.

Unit 356

Knowledge of removing, refurbishing and fitting trim components

UAN:	K/601/6044
Level:	3
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to the MET06K Knowledge of Removing, Refurbishing and Fitting Trim Components.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop knowledge in order to carry out the removal, fitting and recovery of a range of trim components. It also covers functional testing of fitting components.

Learning outcome
The learner will: 1. understand how to carry out the removal, refurbishment and fitting of trim components.
Assessment criteria
The learner can: 1.1 explain the procedures involved in carrying out the systematic removal, refurbishment and fitting of trim components 1.2 explain the methods and procedures for storing removed trim and vehicle components 1.3 explain the procedures, methods and reasons for ensuring correct alignment of vehicle components 1.4 explain the quality checks that can be used to ensure correct alignment and operation of components to manufacturers specification 1.5 explain correct conformity of vehicle systems against vehicle specification and legal requirements on completion 1.6 explain the procedure for identifying, evaluating, recording and reporting damage to vehicle components and units.

Learning outcome
The learner will: 2. understand the construction of trim components and refurbishing methods.
Assessment criteria
The learner can: 2.1 identify the trim system components that may be refurbished 2.2 explain the construction and refurbishing methods used for trim components and systems.

Unit 356 Knowledge of removing, refurbishing and fitting trim components

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

The procedures relating to the removal, refurbishment and fitting of vehicle trim and fitment

- a How to remove and reinstate trim and fitments:
 - i seating systems
 - ii convertible roofs.
- b The tools and procedure for removing seat coverings.
- c The tools consumables and procedure for reinstating seat coverings.
- d The tools consumables and procedure for removing and reinstating convertible roof systems.

The procedures to prevent damage to the vehicle, components and contents when removing, storing and fitting components

- a The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage.
- b The procedures for the correct storage of vehicle contents.
- c The process for identifying, evaluating and reporting of extra damage and items that may have broken when removed refitted or are unscheduled work.

Types of clips and fixings

- a The following types of clips and identify reasons and limitations for their use:
 - i speed
 - ii 'c'
 - iii 'd'
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 - v 'r'
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 - vii cable clip
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- b The following types of fixings and identify reasons and limitations for their use:
- i pop rivet
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 - vii washers
 - viii 'Spring' type washers
 - ix self tapping screws and bolts
 - x quick release plastic trim fastenings
 - xi trim tapes
 - xii adhesives and sealers.

The processes involved when carrying out quality checks

- a Items that may have been 'workshop' soiled and describe processes for rectifying:
- i door cards
 - ii seats
 - iii carpets
 - iv boot and bonnet trims.
- b Methods for checking gaps.

Trim Components

- a Seat recovering.
- b Convertible roofs.



Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Centre Manual - Supporting Customer Excellence contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Events:** dates and information on the latest Centre events
- **Online assessment:** information on how to register for GOL/e-volve assessments.

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Useful contacts

UK learners General qualification information	T: +44 (0)844 543 0033 E: learnersupport@cityandguilds.com
International learners General qualification information	T: +44 (0)844 543 0033 F: +44 (0)20 7294 2413 E: intcg@cityandguilds.com
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: singlesubjects@cityandguilds.com
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: intops@cityandguilds.com
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, GOLLA, Navigation, User/menu option, Problems	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: walledgarden@cityandguilds.com
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 E: business@cityandguilds.com
Publications Logbooks, Centre documents, Forms, Free literature	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413

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