

Diploma in Vehicle Body Repair at SCQF Level 5 (4391-42)

July 2018, Version 1.0





Qualification at a glance

Subject area	Vehicle Accident Repair
City & Guilds number	4391-42
Age group approved	16-18, 19+
Entry requirements	There are no entry requirements
Assessment	Online multiple choice tests (graded Pass, Merit, Distinction) and assignments (graded Pass)
Fast track	Not available
Support materials	Centre handbook Practical assessment workbook
Registration and certification	Consult the Walled Garden/online catalogue for last dates

Title and level	City & Guilds number	Accreditation number
Diploma in Vehicle Body Repair at SCQF Level 5	4391-42	R557 04



Contents

1	Introduction	5
	Structure	6
2	Centre requirements	8
	Approval	8
	Candidate entry requirements	9
3	Delivering the qualification	10
	Initial assessment and induction	10
	Support materials	10
4	Assessment	11
5	Units	14
Unit 001	Skills in Health, Safety and Good Housekeeping in the Automotive Environment	15
Unit 003	Skills in Supporting Job Roles in the Automotive Work Environment	18
Unit 004	Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	20
Unit 051	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	23
Unit 053	Knowledge of Support for Job Roles in the Automotive Work Environment	32
Unit 054	Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	37
Unit 401	Skills in Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles	41
Unit 402	Skills in Removing and Fitting Non Permanently Fixed Vehicle Body Panels	44
Unit 405	Skills in Removing, Replacing and/or Refitting Vehicle Body Panels	47
Unit 406	Skills in Identifying and Rectifying Minor Repairs to Vehicle Body Panels	50
Unit 419	Skills in Motor Vehicle Body MIG/MAG Welding Operations	53
Unit 420	Skills in Carrying Out Motor Vehicle Body Resistance Spot Welding Operations	56
Unit 421	Skills in Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations	59
Unit 424	Skills in Motor Vehicle Body Mechanical Fastening Operations	62
Unit 425	Skills in Motor Vehicle Body Adhesive Bonding Operations	65

Unit 451	Knowledge of Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles	67
Unit 452	Knowledge of Removing and Fitting Non Permanently Fixed Vehicle Body Panels	72
Unit 455	Knowledge of Removing, Replacing and/or Refitting Vehicle Body Panels	75
Unit 456	Knowledge of Identifying and Rectifying Minor Repairs to Vehicle Body Panels	78
Unit 469	Knowledge of Motor Vehicle Body MIG/MAG Welding Operations	82
Unit 470	Knowledge of Carrying Out Motor Vehicle Body Resistance Spot Welding Operations	86
Unit 471	Knowledge of Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations	89
Unit 474	Knowledge of Motor Vehicle Body Mechanical Fastening Operations	92
Unit 475	Knowledge of Motor Vehicle Body Adhesive Bonding Operations	95
Unit 476	Knowledge of Motor Vehicle Construction and Materials	99
Appendix 1	Relationships to other qualifications	105
Appendix 2	Sources of general information	106



1 Introduction

This document tells you what you need to do to deliver the qualification.

Area	Description
Who is the qualification for?	This is ideal for young or adult learners with little or no knowledge and experience of the automotive industry. They are a route into the automotive industry and will enable you to work on routine accident repair tasks under minimal supervision. Successful candidates will have the basic skills needed to apply for an automotive apprenticeship or similar engineering pathway.
What does the qualification cover?	It combines theoretical knowledge and the development of practical skills in automotive accident repair. It covers areas such as body, mechanical and electrical repairs, and paint and trim.
Is the qualification part of a framework or initiative?	This qualification is part of the Scottish Automotive Maintenance and Repair Modern Apprenticeship Framework.
Who did we develop the qualification with?	This qualification was developed in collaboration with the Institute of the Motor Industry (IMI) the sector skills council for the automotive retail industry and other awarding organisations.
What opportunities for progression are there?	Allows candidates to progress into employment or to the following City & Guilds qualifications: <ul style="list-style-type: none">• 4311-43 SVQ in Vehicle Body Repair and Alignment at SCQF Level 6• 4391-43 Diploma in Vehicle Body Repair & Alignment Principles at SCQF Level 6.

Structure

To achieve the **Diploma in Vehicle Body Repair at SCQF Level 5**, learners must achieve **17 mandatory units** (001, 051, 003, 053, 004, 054, 402, 452, 405, 455, 406, 456, 419, 469, 420, 470, 476) **plus a pair of optional units** from (401 and 451) or (421 and 471) or (424 and 474) or (425 and 475)

City & Guilds unit	Unit title	SCQF Level	SCQF Credit value
Mandatory			
001	Skills in Health, Safety and Good Housekeeping in the Automotive Environment	5	7
003	Skills in Supporting Job Roles in the Automotive Work Environment	6	5
004	Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	5	7
051	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	5	3
053	Knowledge of Support for Job Roles in the Automotive Work Environment	6	3
054	Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	5	4
402	Skills in Removing and Fitting Non Permanently Fixed Vehicle Body Panels	5	2
405	Skills in Removing, Replacing and/or Refitting Vehicle Body Panels	5	3
406	Skills in Identifying and Rectifying Minor Repairs to Vehicle Body Panels	5	5
419	Skills in Motor Vehicle Body MIG/MAG Welding Operations	6	5
420	Skills in Carrying Out Motor Vehicle Body Resistance Spot Welding Operations	6	4
452	Knowledge of Removing and Fitting Non Permanently Fixed Vehicle Body Panels	5	2
455	Knowledge of Removing, Replacing and/or Refitting Vehicle Body Panels	5	3
456	Knowledge of Identifying and Rectifying Minor Repairs to Vehicle Body Panels	5	6
469	Knowledge of Motor Vehicle Body MIG/MAG Welding Operations	6	4
470	Knowledge of Carrying Out Motor Vehicle Body Resistance Spot Welding Operations	6	4
476	Knowledge of Motor Vehicle Construction and Materials	5	3

City & Guilds unit	Unit title	SCQF Level	SCQF Credit value
Optional			
401	Skills in Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles	5	2
451	Knowledge of Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles	5	2
421	Skills in Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations	6	5
471	Knowledge of Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations	6	4
424	Skills in Motor Vehicle Body Mechanical Fastening Operations	5	4
474	Knowledge of Motor Vehicle Body Mechanical Fastening Operations	5	4
425	Skills in Motor Vehicle Body Adhesive Bonding Operations	5	3
475	Knowledge of Motor Vehicle Body Adhesive Bonding Operations	6	4



2 Centre requirements

Approval

Centres already approved to offer the Level 2 Certificate/Diploma in Maintenance and Repair - Body (4101-59) will be automatically approved to register and certificate candidates on the 4391-42 Diploma in Vehicle Body Repair at SCQF Level 5 (unless the centre is already subject to sanctions).

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.

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 these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be occupationally competent or technically knowledgeable in the area(s) 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

While the Assessor/Verifier (A/V) units are valued as qualifications for centre staff, they are not currently a requirement for this qualification.

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.

Please note that for funding purposes, candidates should not be entered for a qualification of the same type, content and level as that of a qualification they already hold.

Age restrictions

City & Guilds cannot accept any registrations for candidates under 16 as this qualification is not approved for under 16s.



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 qualification
- any units they have already completed, or credit they have accumulated which is relevant to the qualification
- the appropriate type and level of qualification.

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

Support materials

The following resources are available for this qualification:

Description	How to access
Centre handbook	www.cityandguilds.com/automotive
Practical assessment workbook	www.cityandguilds.com/automotive



4 Assessment

City & Guilds has written the following assessments to use with this qualification:

- Assignments (practical assessment workbooks) comprising of practical tasks and knowledge based questions to cover all learning outcomes. Graded Pass only.
- Online multiple choice tests graded as Pass, Merit, Distinction.
- Assignments can be downloaded from **www.cityandguilds.com/automotive**. These assessments are carried out in centres and must be completed to current industry standards and practice. |

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

The following must be applied to the assessment of this qualification:

- Candidates must complete their assessments within their registration period.

Test specifications

Summary test specifications for all 4391 online tests can be found in the 'Automotive online test specifications' document, downloadable from the 4391 website.

City & Guilds unit	SCQF Level	Unit title	Credit value	Assessment method
001	5	Skills in Health, Safety and Good Housekeeping in the Automotive Environment	7	Assignment
003	6	Skills in Supporting Job Roles in the Automotive Work Environment	5	Assignment
004	5	Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	7	Assignment

City & Guilds unit	SCQF Level	Unit title	Credit value	Assessment method
051	5	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	3	Assignment
053	6	Knowledge of Support for Job Roles in the Automotive Work Environment	3	Assignment
054	5	Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	4	Assignment
402	5	Skills in Removing and Fitting Non Permanently Fixed Vehicle Body Panels	2	Assignment
405	5	Skills in Removing, Replacing and/or Refitting Vehicle Body Panels	3	Assignment
406	5	Skills in Identifying and Rectifying Minor Repairs to Vehicle Body Panels	5	Assignment
419	6	Skills in Motor Vehicle Body MIG/MAG Welding Operations	5	Assignment
420	6	Skills in Carrying Out Motor Vehicle Body Resistance Spot Welding Operations	4	Assignment
452	5	Knowledge of Removing and Fitting Non Permanently Fixed Vehicle Body Panels	2	Multiple choice test
455	5	Knowledge of Removing, Replacing and/or Refitting Vehicle Body Panels	3	Multiple choice test
456	5	Knowledge of Identifying and Rectifying Minor Repairs to Vehicle Body Panels	6	Multiple choice test
469	6	Knowledge of Motor Vehicle Body MIG/MAG Welding Operations	4	Multiple choice test
470	6	Knowledge of Carrying Out Motor Vehicle Body Resistance Spot Welding Operations	4	Multiple choice test
476	5	Knowledge of Motor Vehicle Construction and Materials	3	Multiple choice test
401	5	Skills in Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles	2	Assignment
451	5	Knowledge of Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles	2	Multiple choice test

City & Guilds unit	SCQF Level	Unit title	Credit value	Assessment method
421	6	Skills in Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations	5	Assignment
471	6	Knowledge of Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations	4	Multiple choice test
424	5	Skills in Motor Vehicle Body Mechanical Fastening Operations	4	Assignment
474	5	Knowledge of Motor Vehicle Body Mechanical Fastening Operations	4	Multiple choice test
425	5	Skills in Motor Vehicle Body Adhesive Bonding Operations	3	Assignment
475	6	Knowledge of Motor Vehicle Body Adhesive Bonding Operations	4	Multiple choice test



5 Units

Structure of units

These units each have the following:

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

Unit 001

Skills in Health, Safety and Good Housekeeping in the Automotive Environment

Level:	5
Credit value:	7
Relationship to NOS:	This unit is linked to NOS 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.
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 g. lungs

1.2 select and use vehicle protective equipment throughout all activities.

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 manufacturer's instructions
- 2.4 perform housekeeping activities safely and in a way which minimises 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.

Evidence Requirements

1. You must be observed by your assessor successfully demonstrating the use of personal and vehicle protection, cleaning the work environment and disposal of waste on 2 separate occasions.
2. You must be observed by your assessor successfully identifying risks which may result from at least 2 of the items listed below:
 - the use and maintenance of machinery or equipment
 - the use of materials or substances
 - working practices which do not conform to laid down policies
 - unsafe behaviour
 - accidental breakages and spillages
 - environmental factors
3. You must be observed by your assessor successfully following at least 2 of the workplace policies listed below:
 - the use of safe working methods and equipment
 - the safe use of hazardous substances
 - smoking, eating, drinking and drugs
 - what to do in the event of an emergency
 - personal presentation

Unit 003

Skills in Supporting Job Roles in the Automotive Work Environment

Level:	6
Credit value:	5
Relationship to NOS:	This unit is linked to NOS 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.
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.

Evidence Requirements

You must be observed by your assessor successfully working well with others.

Unit 004

Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment

Level:	5
Credit value:	7
Relationship to NOS:	This unit is linked to NOS 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.
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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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.

Evidence Requirements

1. **You must** be observed by your assessor successfully undertaking basic routine checks of hand tools, measuring devices and workshop equipment covering all of those listed below:

- electrical
- mechanical
- pneumatic
- hydraulic

2. **You must** be observed by your assessor fabricating **at least 1 item** from suitable materials to known tolerances, which includes the following processes

- filing
- tapping threads
- cutting
- drilling

Unit 051

Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment

Level:	5
Credit value:	3
Relationship to NOS:	This unit is linked to NOS 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.
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. <p>It will provide an appreciation of significant risks in the automotive environment and how to identify and deal with them.</p> <p>Once completed the learner will be able to identify hazards and evaluate and reduce risk.</p>

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 minimise 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

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 eg 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

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 eg 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 non-compliance.
- e. General employer responsibilities under the HASAWA and the consequences of non-compliance.

- 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 eg 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.
- c. 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 polices 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

Level:	6
Credit value:	3
Relationship to NOS:	This unit is linked to NOS 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.
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 your 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 people's 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.

Sources of information:

- a. Other staff.
- b. Manuals.
- c. Parts lists.
- d. Computer software and the internet.
- e. Manufacturer.
- f. 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.
- c. Methods of communication:
 - i. verbal
 - ii. signs and notices
 - iii. memos

- iv. telephone
 - v. electronic mail
 - vi. vehicle job card
 - vii. notice boards
 - viii. SMS text messaging
 - ix. letters.
- d. Organisational and customer requirements:
- i. importance of time scales to customer and organization
 - ii. relationship between time and costs
 - iii. meaning of profit.
- e. Choice of communication
- i. distance
 - ii. location
 - iii. job responsibility.
- f. Importance of maintaining positive working relationships:
- i. morale
 - ii. productivity
 - iii. company image
 - iv. customer relationships
 - v. colleagues.

Unit 054 Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment

Level:	5
Credit value:	4
Relationship to NOS:	This unit is linked to NOS 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.
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 for fabrication, repair and fitting in the automotive environment
1.4	state the limitations of common hand tools and measuring devices used for fabricating, repair and fitting in the automotive workplace

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
1.6	identify common electrical measuring tools used in the repair of vehicles and components
1.7	explain the preparation and safe and correct use of common electrical tools when measuring voltage, current and resistance.

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: <ul style="list-style-type: none"> 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 workplace. 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 jack.
- 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 401

Skills in Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles

Level:	5
Credit value:	2
Relationship to NOS:	This unit is linked to NOS BP01 - Remove and Fit Basic Motor Mechanical, Electrical and Trim (MET) Components to Vehicles.
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.
Aim:	This unit will help the learner to develop the skills in order to remove and fit a range of mechanical, electrical and trim (MET) components to vehicles. The learner must also check the operation of the components fitted.

Learning outcome	The learner will:
1.	Be able to use relevant information to carry out the task
Assessment criteria	
The learner can:	
1.1	Select suitable sources of technical information to support vehicle removal and recognised fitting activities including: a. vehicle technical data b. removal and fitting procedures c. legal requirements
1.2	Use technical information to support vehicle removal and recognised fitting activities

Learning outcome	The learner will:
2.	Be able to use appropriate tools and equipment
Assessment criteria	
The learner can:	
2.1	Select the appropriate tools and equipment necessary for carrying out removal and fitting of MET components
2.2	Ensure that equipment has been calibrated to meet manufacturers' and legal requirements

2.3 Use the correct tools and equipment in the way specified by manufacturers when carrying out removal and fitting of MET components

Learning outcome	The learner will:
3.	Be able to carry out removal and fitting of MET components
Assessment criteria	
The learner can:	
3.1	Carry out removal and fitting of MET components adhering to the correct specifications and tolerances for the vehicle and following: <ul style="list-style-type: none">a. the manufacturer's approved removal and fitting methodsb. recognised researched removal and fitting methodsc. health and safety requirementsd. workplace procedures
3.2	Ensure that the removal and fitting of MET components conforms to the vehicle operating specification and any legal requirements
3.3	Ensure no damage occurs to other components when removal and fitting of MET components
3.4	Ensure all components and panels are stored safely and in the correct location ensuring no further damage occurs
3.5	Work to the specified timescale for the activity

Learning outcome	The learner will:
4.	Be able to record information and make suitable recommendations
Assessment criteria	
The learner can:	
4.1	Produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required
4.2	Make suitable and justifiable recommendations for cost effective repairs
4.3	Identify and report any expected delays in completion to the relevant person(s) promptly in the format required
4.4	Record and report any additional faults or further damage noticed during the course of their work promptly in the format required

Evidence Requirements

You must produce evidence of removing and refitting 8 out of the 10 units or components listed below which cover the learning outcomes. You must check that the refitted components conform to manufacturers' vehicle operating specification and legal requirements.

- Bumpers
- Lamp units
- Road wheels
- Batteries
- Bonnet and boot lid trim
- Interior trim components
- Exterior trim components
- Accessories
- Driver aids
- Occupancy Safety Systems (active and passive)

Unit 402

Skills in Removing and Fitting Non Permanently Fixed Vehicle Body Panels

Level:	5
Credit value:	2
Relationship to NOS:	This unit is linked to NOS BP02 Remove and Fit Non Permanently Fixed Motor Vehicle Body Panels.
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.
Aim:	This unit will help the learner to develop skills in order to carry out the removal and fitting of a range of non-permanently fixed vehicle panels such as wings, doors, bonnets, boot lids and tailgates. It also covers the evaluation of the operation of the components when fitted.

Learning outcome	The learner will:
1.	be able to work safely when carrying out removal and fitting of non-permanently fixed vehicle body panels
Assessment criteria	
The learner can:	
1.1	use suitable personal protective equipment and vehicle coverings throughout all removal and replacement activities
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 panel removal and recognised 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 recognised 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 removal and fitting of non-permanently fixed vehicle panels
3.2	ensure that equipment has been calibrated 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 non-permanently fixed vehicle panels.

Learning outcome	The learner will:
4.	be able to carry out removal and fitting of non-permanently fixed vehicle body panels
Assessment criteria	
The learner can:	
4.1	carry out removal and fitting of non-permanently fixed vehicle panels whilst adhering to the correct manufacturers specifications and tolerances for the vehicle.
4.2	Ensure that the removal and fitting of non-permanently fixed panels conforms to the vehicle operating specification and any legal requirements
4.3	Ensure the components are realigned correctly in a way which regains their original manufactured tolerance
4.4	Ensure no damage occurs to other components, and panels when removing and fitting non permanently fixed vehicle panels
4.5	Ensure all components and panels are stored safely and in the correct location in accordance with relevant legislation

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 ensure they are 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 and further damage noticed during the course of their work promptly in the format required

Evidence Requirements

You must produce evidence of removing and replacing 4 out of the 8 panels listed below in line with manufacturer methods, specifications and tolerances, which cover all the learning outcomes.

- wings
- doors
- bonnets
- boot lids
- tailgates
- bumpers
- sun roof panels
- hard top panel sections

Unit 405

Skills in Removing, Replacing and/or Refitting Vehicle Body Panels

Level:	5
Credit value:	3
Relationship to NOS:	This unit is linked to NOS BP05 – Remove and Replace Exterior Motor Vehicle Body Panels Including Permanently Fixed 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.
Aim:	This unit will help the learner to develop the skills required to carry out a range of removal replacement and/or refitting of panels using mechanical fastening and adhesive bonding. It also covers the evaluation of the operation of the components when fitted.

Learning outcome	The learner will:
1.	be able to work safely when carrying out removal and replacement of vehicle body panels
Assessment criteria	
The learner can:	
1.1	use suitable personal protective equipment and vehicle coverings throughout all removal and replacement activities
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: <ul style="list-style-type: none"> 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 removal and fitting of body panels
3.2	ensure that equipment has been calibrated to meet manufacturers' and legal requirements
3.3	use the appropriate tools and equipment in the way specified by manufacturers when carrying out removal and fitting of body panels

Learning outcome	The learner will:
4.	be able to carry out removal, replacement and fitting of vehicle body panels
Assessment criteria	
The learner can:	
4.1	identify prior to working on the vehicle the component materials involved that will be worked on during the repair
4.2	remove and re-fit adjacent body panels including those that are permanently fixed
4.3	carry out removal, replacement and/or refitting of body panels including permanently fixed vehicle panels adhering to specifications and tolerances for the vehicle and following: <ul style="list-style-type: none"> a. recognised researched repair methods b. health and safety requirements c. workplace procedures
4.4	use and apply sealants and anti corrosion materials conforming to the manufacturers specification
4.5	ensure that the replacement panels conform to the vehicle specifications for dimension, material and functional capability
4.6	ensure the components are realigned correctly in a way which regains their original manufactured tolerance
4.7	ensure any damage is minimised to mating surfaces. Any damage caused should be correctly reinstated
4.8	ensure permanently fixed panels are replaced without incurring damage to the vehicle systems
4.9	ensure all components and panels 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 ensure they are 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.

Evidence Requirements

You must produce evidence of carrying out the removal and replacement of vehicle *body panels in combinations of 3 or more adjacent panels, one of which should be bonded. All learning outcomes must be covered.

*Body panels examples include: two doors and a wing, two wings and a bonnet; bonnet, wing and door on the same side; bumper, wing and bonnet

Unit 406

Skills in Identifying and Rectifying Minor Repairs to Vehicle Body Panels

Level:	5
Credit value:	5
Relationship to NOS:	This unit is linked to NOS BP06 – Repair Motor Vehicle Exterior Body Panels.
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.
Aim:	This unit will help the learner to develop the skills required to identify and carry out minor repairs to vehicle body panels using a variety of techniques. It also covers the evaluation of the repair once completed.

Learning outcome	The learner will:
1.	be able to work safely when carrying out minor repairs to vehicle body panels
Assessment criteria	
The learner can:	
1.1	use suitable personal protective equipment and vehicle coverings throughout all repair activities
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. manufacturers' instructions b. vehicle technical data c. removal and fitting procedures d. 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 repairs to vehicle body panels
3.2	check that equipment has been calibrated to meet manufacturers' and legal requirements
3.3	use the correct tools and equipment in the way specified by manufacturers when carrying out repairs to vehicle body panels.

Learning outcome	The learner will:
	4. be able to carry out minor repairs to vehicle body panels
Assessment criteria	
The learner can:	
4.1	identify prior to working on the vehicle the component materials involved that will be worked on during the repair
4.2	carry out minor repairs to motor vehicle exterior body panels so they are restored to their original contour using hand tools and filling materials effectively
4.3	carry out minor repairs to motor vehicle exterior body panels adhering to specifications and tolerances for the vehicle and following: <ul style="list-style-type: none"> a. the manufacturer's approved removal and fitting methods b. recognised researched removal and fitting methods c. health and safety requirements d. workplace procedures
4.4	replace any sealer, anti corrosion and sound deadening materials which were removed prior to the repair and conforming to the manufacturer's specification
4.5	ensure all plastic repairs regain the strength of the original part
4.6	ensure any damage is minimised to mating surfaces. Any damage caused should be correctly reinstated
4.7	ensure all completed repairs are finished to and agreed standard ready for the refinishing process

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.

Evidence Requirements

1. You must be observed by an assessor carrying out each of the following repairs listed below, that cover all the learning outcomes:
 - Body filing and finishing of flat areas of panel
 - Repairs to dents that are over 70mm in diameter in body panels, including curvature panels and swage lines
 - Repairs to scuffs on plastic components

2. You must produce evidence of covering all of the techniques and processes listed below in carrying out the repairs listed above:
 - Plastic repairs
 - Shrinking techniques
 - Panel pulling
 - Metal finishing
 - Plastic filling
 - Panel beating
 - Indirect hammering
 - Direct hammering
 - Spring hammering
 - Body filing
 - Application of body filler/stopper

Unit 419

Skills in Motor Vehicle Body MIG/MAG Welding Operations

Level:	6
Credit value:	5
Relationship to NOS:	This unit is linked to NOS BP19 – Motor Vehicle Body MIG/MAG Welding Operations.
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.
Aim:	This unit enables the learner to develop the skills required to join materials using Metal Inert Gas (MIG) Metal Active Gas (MAG) welding techniques. It also covers the evaluation of the completed welded component.

Learning outcome	The learner will:
1.	be able to work safely when carrying out motor vehicle body MIG/MAG welding operations
Assessment criteria	
The learner can:	
1.1	use suitable personal protective equipment and vehicle coverings throughout all motor vehicle body MIG/MAG welding operations
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 motor vehicle body MIG/MAG welding operation activities including: a. vehicle technical data b. welding procedures c. legal requirements
2.2	use technical information to support motor vehicle body MIG/MAG welding operation 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 motor vehicle body MIG/MAG welding operations
3.2	ensure all tools and equipment that are required are in a safe working condition
3.3	set up and use the appropriate tools and equipment in the way specified by manufacturers when carrying out motor vehicle body MIG/MAG welding operations
3.4	clean and store PPE and equipment in the appropriate manner.

Learning outcome	The learner will:
4.	be able to carry out motor vehicle body MIG/MAG welding operations
Assessment criteria	
The learner can:	
4.1	prepare surface to ensure a good MIG/MAG weld is achieved
4.2	ensure alignment, mating and treatment of flanges to enable a suitable joint to be achieved
4.3	conduct MIG/MAG weld operations including: <ul style="list-style-type: none"> a. lap plug b. lap seam c. butt joint d. fillet joint
4.4	conduct MIG/MAG weld operations following: <ul style="list-style-type: none"> a. manufacturer's processes, methods and procedures b. test procedures to provide test coupons on equivalent material in accordance with Industry Standards c. recognised researched repair methods d. health, safety and legal requirements e. workplace procedures
4.5	dress the weld area without reducing material thickness and protect the area to inhibit corrosion where applicable
4.6	recognise when the weld is not forming correctly and what action needs to be taken
4.7	inspect and assess quality of welds in accordance with Industry Standards and manufacturer's specification
4.8	avoid damaging other components, units, panels and surfaces on the vehicle and the surrounding work area. Any damage caused should be correctly reinstated

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.

Evidence requirements

You must produce evidence of carrying out all of the different types of joints listed below to join materials using MIG/MAG welding. All learning outcomes must be covered

- lap plug
- lap seam
- butt joint
- fillet joint

Unit 420

Skills in Carrying Out Motor Vehicle Body Resistance Spot Welding Operations

Level:	6
Credit value:	4
Relationship to NOS:	This unit is linked to NOS BP 20 – Motor Vehicle Body Resistance Spot Welding Operations.
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.
Aim:	This unit will help the learner to develop the skills required to join materials correctly and effectively using resistance spot welding techniques and procedures. It also covers the evaluation of the completed welded component.

Learning outcome	The learner will:
1.	be able to work safely when carrying out motor vehicle body resistance spot welding operations
Assessment criteria	
The learner can:	
1.1	Use suitable personal protective equipment checking it is fit for purpose before carrying out motor vehicle body resistance spot welding operations
1.2	Protect the vehicle, it's systems and its contents effectively when carrying out resistance spot welding operations
1.3	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 and use suitable sources of technical information to support motor vehicle body resistance spot welding operation activities including:
a.	vehicle technical data
b.	welding procedures
c.	legal requirements

2.2 use technical information to support motor vehicle body resistance spot welding operation 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 motor vehicle body resistance spot welding operations
3.2	ensure tools and equipment that are required are in a safe working condition
3.3	set up and use the correct tools and equipment in the way specified by manufacturers when carrying out motor vehicle body resistance spot welding operations
3.4	clean and store PPE and equipment in the appropriate manner.

Learning outcome	The learner will:
4.	be able to carry out motor vehicle body resistance spot welding operations
Assessment criteria	
The learner can:	
4.1	carry out surface preparation to ensure a good resistance spot weld is achieved
4.2	ensure alignment and mating and treatment of flanges to enable a suitable join to be achieved
4.3	produce resistance spot welding operations following: a. recognised research repair methods b. test procedures In accordance to British Standards and providing test coupons on equivalent material in manufacturers processes, methods and procedures
4.4	dress and protect the area to inhibit corrosion where applicable
4.5	identify when the weld is not forming correctly and what action needs to be taken
4.6	inspect and assess all resistance spot weld quality in accordance with Industry Standards and manufacturer's specification
4.7	ensure the integrity of the weld and record the type of weld achieved on the appropriate paperwork
4.8	record all weld test pieces
4.9	avoid damaging other components, units, panels and surfaces on the vehicle and the surrounding work area. Any damage caused should be correctly reinstated

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.

Evidence requirements

1. You must produce evidence of carrying out resistance spot welding when joining a vehicle body panel to a vehicle, which covers the learning outcomes.

- weld pitch
- indentation
- heat zone
- nugget size
- peel or shear test

2. You must produce evidence of covering all the checks listed below to ensure the quality of the weld area

Unit 421

Skills in Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations

Level:	6
Credit value:	5
Relationship to NOS:	This unit is linked to NOS BP 21 – Motor Vehicle Body MIG Brazing Operations.
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.
Aim:	This unit will help the learner to develop the skills required to join materials correctly and effectively using Metal Inert Gas (MIG) brazing techniques and procedures. It also covers the evaluation of the completed brazed component.

Learning outcome	The learner will:
1.	be able to work safely when carrying out motor vehicle body MIG brazing operations
Assessment criteria	
The learner can:	
1.1	Use suitable personal protective equipment and check it is fit for purpose before carrying out MIG brazing operations
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 motor vehicle body MIG brazing operations activities including: a. vehicle technical data b. brazing procedures c. legal requirements
2.2	use technical information to support motor vehicle body MIG brazing operations 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 motor vehicle body MIG brazing operations
3.2	ensure all tools and equipment that are required are in a safe working condition
3.3	set up and use the correct tools and equipment in the way specified by manufacturers when carrying out motor vehicle body MIG brazing operations
3.4	clean and store PPE and equipment in the appropriate manner.

Learning outcome	The learner will:
4.	be able to carry out motor vehicle body MIG brazing welding operations
Assessment criteria	
The learner can:	
4.1	prepare surface to ensure a good MIG brazing operation is achieved
4.2	ensure alignment, and mating treatment of flanges to enable a suitable joint to be achieved
4.3	carry out MIG brazing operations including: <ul style="list-style-type: none"> a. lap plug b. lap seam c. butt joint
4.4	carry out MIG brazing operations following: <ul style="list-style-type: none"> a. manufacturer's processes, methods and procedures b. test procedures and providing test coupons on equivalent material in accordance with recognized Standards c. recognised researched repair methods
4.5	dress the brazing area without reducing material thickness and protect the area to inhibit corrosion where applicable
4.6	recognise when the brazing is not forming correctly and what action needs to be taken
4.7	inspect and assess all MIG brazing operations for quality in accordance with recognized Standards and manufacturer's specification
4.8	ensure the integrity of the brazing and record the type of brazing achieved on the appropriate paperwork
4.9	avoid damaging other components, units, panels and surfaces on the vehicle and the surrounding work area. Any damage caused should be correctly reinstated
4.10	ensure no damage is incurred to other vehicle systems when carrying out MIG brazing operations.

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.

Evidence requirements

You must produce evidence of carrying out all of the different types of joints listed below to join materials using MIG brazing. All learning outcomes must be covered

- lap slot
- lap seam
- butt joint

Unit 424

Skills in Motor Vehicle Body Mechanical Fastening Operations

Level:	5
Credit value:	4
Relationship to NOS:	This unit is linked to NOS BP24 – Motor Vehicle Body Mechanical Fastening Operations.
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.
Aim:	This unit will help the learner to develop the skills required to join materials using mechanical fastening techniques and procedures. It also covers the evaluation of the completed mechanical joint.

Learning outcome	The learner will:
1.	be able to work safely when carrying out motor vehicle body mechanical fastening operations
Assessment criteria	
The learner can:	
1.1	use suitable personal protective equipment and vehicle coverings throughout all motor vehicle body mechanical fastening operations
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 motor vehicle body mechanical fastening operations activities including: a. vehicle technical data b. joining procedures c. legal requirements
2.2	use technical information to support motor vehicle body mechanical fastening operations 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 motor vehicle body mechanical fastening operations
3.2	ensure all tools and equipment that are required are in a safe working condition
3.3	set up and use the correct tools and equipment in the way specified by manufacturers when carrying out motor vehicle body mechanical fastening operations
3.4	clean and store PPE and equipment in the appropriate manner.

Learning outcome	The learner will:
4.	be able to carry out motor vehicle body mechanical fastening operations
Assessment criteria	
The learner can:	
4.1	prepare surface to ensure a good mechanical fastening is achieved
4.2	ensure alignment and mating and treatment of flanges to enable a suitable join to be achieved
4.3	carry out a range of mechanical fastening
4.4	carry out mechanical fastening operations following: <ul style="list-style-type: none"> a. manufacturer's processes, methods and procedures b. recognised researched repair methods
4.5	dress and protect the joint area to inhibit corrosion where applicable
4.6	recognise when the joint is not forming correctly and what action needs to be taken
4.7	avoid damaging other components, units, panels and surfaces on the vehicle and the surrounding work area. Any damage caused should be correctly reinstated.

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.

Evidence Requirements

You must produce evidence of carrying out 3 of the 5 different types of joints listed below to join materials using mechanical fastenings. All learning outcomes must be covered

- riveting
- clinching
- bolts and fasteners

Unit 425

Skills in Motor Vehicle Body Adhesive Bonding Operations

Level:	5
Credit value:	3
Relationship to NOS:	This unit is linked to NOS BP25 – Motor Vehicle Body Adhesive Bonding Operations.
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.
Aim:	This unit will help the learner to develop the skills required to join materials using adhesive bonding techniques and procedures. It also covers the evaluation of the completed joint.

Learning outcome	The learner will:
1.	be able to work safely when carrying out motor vehicle body adhesive bonding operations
Assessment criteria	
The learner can:	
1.1	use suitable personal protective equipment and vehicle coverings throughout all motor vehicle body adhesive bonding operations
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 motor vehicle body adhesive bonding operation activities including: a. vehicle technical data b. joining procedures c. legal requirements
2.2	use technical information to support motor vehicle body adhesive bonding operation 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 motor vehicle body adhesive bonding operations
3.2	ensure tools and equipment that are required are in a safe working condition
3.3	set up and use the correct tools and equipment in the way specified by manufacturers when carrying out motor vehicle body adhesive bonding operations
3.4	clean and store PPE and equipment in the appropriate manner.

Learning outcome	The learner will:
4.	be able to carry out motor vehicle body adhesive bonding operations
Assessment criteria	
The learner can:	
4.1	prepare surface to ensure a good adhesive bond is achieved
4.2	ensure alignment and mating and treatment of flanges to enable a suitable joint to be achieved
4.3	carry out adhesive bonding operations following: <ul style="list-style-type: none"> a. manufacturer's processes, methods and procedures b. test procedures and providing test coupons on equivalent material c. recognised researched repair methods
4.4	dress and protect the area to inhibit corrosion where applicable
4.5	identify when the joint is not forming correctly and what action needs to be taken
4.6	avoid damaging other components, units, panels and surfaces on the vehicle and the surrounding work area. Any damage caused should be correctly reinstated.

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.

Evidence Requirements

You must produce evidence of carrying out adhesive bonding operations in joining a vehicle body panel to a vehicle, which covers the learning outcomes.

Unit 451

Knowledge of Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles

Level:	5
Credit value:	2
Relationship to NOS:	This unit is linked to NOS BP01 - Remove and Fit Basic Motor Mechanical, Electrical and Trim (MET) Components to Vehicles.
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.
Aim:	This unit enables the learner to develop an understanding of carrying out a range of removal and fitting of mechanical, electrical and trim (MET) components to vehicles. It also covers the evaluation of the operation of the components when fitted.

Learning outcome	The learner will:
1.	understand how to work safely when removing and fitting mechanical, electrical and trim components to vehicles
Assessment criteria	
The learner can:	
1.1	Describe the health, safety and legal requirements relating to the removal and fitting of mechanical, electrical and trim components
1.2	Explain the importance of using the appropriate personal protective equipment when removing and fitting mechanical, electrical and trim components
1.3	Describe the requirements for protecting the vehicle and its contents effectively when removing and fitting mechanical, electrical and trim components
1.4	Describe the safety aspects relating to removing, replacing and storing pyrotechnic devices

Learning outcome	The learner will:
2.	Understand how to carry out removal and fitting of vehicle mechanical electrical and trim (MET) components
Assessment criteria	
The learner can:	
2.1	Identify the procedures involved in carrying out the systematic removal and fitting of MET components to the standard required
2.2	Identify the procedures involved in working with supplementary safety systems when fitting MET components
2.3	Identify the procedures involved in working with different types of headlamp systems when fitting MET components
2.4	Explain the methods and procedures for storing removed MET components
2.5	Identify the different types of fastenings and fixings used when removing and fitting MET components
2.6	Explain the reasons for the use of different types of fastenings and fixings used in MET components
2.7	Describe the procedures, methods and reasons for ensuring correct alignment of MET components
2.8	Identify the quality checks that can be used to ensure correct alignment and operation of MET components
2.9	Identify correct conformity of vehicle systems against vehicle specification and legal requirements on completion
2.10	Explain the procedure for reporting cosmetic damage to MET components and units

Unit 451 Knowledge of Removing and Fitting Mechanical, Electrical and Trim (MET) Components to Vehicles

Supporting information

Content

Learning Outcome 1

1. Health, safety and legal requirements including awareness of electric and hybrid vehicles but not limited to:
 - a. Hazards associated with electric and hybrid vehicles
 - b. How to identify an electric and hybrid vehicle
 - c. The requirement and process for isolating a vehicle before work can commence

2. Examples of pyrotechnic devices may include but are not limited to
 - a. Air bags
 - b. Seat belt tensioners
 - c. Head restraints
 - d. Bonnet pedestrian protection systems

Learning Outcome 2

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

1. The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage:
 - e. bumpers
 - f. interior/exterior lighting components
 - g. road wheels
 - h. batteries
 - i. bonnet fittings
 - j. interior trim components
 - k. exterior trim components
 - l. accessories – e.g exterior temperature gauge
 - m. driver aids – this may include parking sensors, reverse cameras as examples
 - n. occupancy safety systems*

*Occupancy Safety Systems are both active and passive safety systems including pedestrian safety systems.

3. The process for the reporting of extra damage and items that may have broken when removed or refitted

Headlamp systems include gas discharge and LED matrix but are not limited to this

The processes involved when handling different types of batteries

- a. The procedure for the removal, storage and refitting of different types of batteries including those in electric vehicles
- b. The procedure for the disposal of different types of batteries
- c. Battery condition
- d. electrolyte
- e. discharge
- f. specific gravity
- g. The relevant manufacturers charging process and procedures:
- h. trickle charge
- i. normal charge
- j. boost / start
- k. The health and safety issues involved when charging

Types of fastenings and fixings

4. types of clips and identify reasons and limitations for their use.
Examples provided but are not limited to those listed below:
 - a. Speed
 - b. 'c'
 - c. 'd'
 - d. 'j' type captive nut
 - e. 'r'
 - f. 'u' type captive nut
 - g. Cable clip
 - h. Trim clips
5. Types of fixings and identify reasons and limitations for their use.
Examples provided but are not limited to those listed below:
 - a. Rivets
 - b. Plastic capture nut
 - c. Nut and bolt
 - d. Shoulder bolt
 - e. 'Nyloc' type nuts
 - f. Washers
 - g. 'Spring' type washers
 - h. Self tapping screws and bolts
 - i. Quick release plastic trim fastening
 - j. Trim tapes
 - k. Adhesives and sealers

The processes involved when carrying out quality checks

1. Items that may have been 'workshop' soiled and describe processes for rectifying:
 - a. Door cards
 - b. Seats
 - c. Carpets
 - d. Boot and bonnet trims
2. Methods for checking gaps
3. The process for checking and aligning headlamps:
 - a. Address handling procedures for headlamps components

- b. Address handling and health and safety issues relating to lighting systems
4. Operational checks and rectification methods to include:
- a. Lights
 - b. Washers and wipers
 - c. SRS systems (checking not rectification)
 - d. Horn
 - e. Fluid levels
 - f. Interior switches
 - g. Operation of door lock mechanisms

Unit 452

Knowledge of Removing and Fitting Non Permanently Fixed Vehicle Body Panels

Level:	5
Credit value:	2
Relationship to NOS:	This unit is linked to NOS BP02 Remove and Fit Non Permanently Fixed Motor Vehicle Body Panels.
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.
Aim:	This unit enables the learner to develop knowledge in order to carry out removal and fitting of non permanently fixed vehicle panels such as wings, doors, bonnets, boot lids, painted sun roof panels, hardtop panel sections and tailgates. It also covers the evaluation of the operation of the components when fitted.

Learning outcome	The learner will:
1.	understand how to carry out removal and fitting of non permanently fixed vehicle body panels
Assessment criteria	
The learner can:	
1.1	identify the procedures involved in carrying out the systematic removal and fitting of non-permanently fixed vehicle body panels: <ul style="list-style-type: none">i. wingsii. doorsiii. bonnetsiv. boot lidsv. tailgatesvi. bumpersvii. sun roof panelsviii. hard top panel sections
1.2	Identify the procedures involved in working with supplementary safety systems when fitting non permanently fixed vehicle body panels
1.3	Explain the methods and procedures for storing removed non permanently fixed vehicle body panels

- 1.4 Identify the different types of fastenings and fixings used when removing and fitting non permanently fixed vehicle body panels
- 1.5 Explain the reasons for the use of different types of fastenings and fixings used in non permanently fixed vehicle body panels
- 1.6 Explain the procedures, methods and reasons for ensuring alignment of non permanently fixed vehicle body panels
- 1.7 Identify the quality checks that can be used to ensure alignment and operation of non permanently fixed vehicle body panels
- 1.8 Identify conformity of vehicle systems against vehicle specification and legal requirements on completion
- 1.9 Explain the procedure for reporting damage to non-permanently fixed vehicle body panels

Unit 452 Knowledge of Removing and Fitting Non Permanently Fixed Vehicle Body Panels

Supporting information

Content

Learning Outcome 1

Hard Top Panel Sections are, for example, a removable roof panel

Removing and Fitting Non Permanently fixed Body Panels

- a. Find, interpret and use sources of information applicable to the removal and fitting of non welded body panels
- b. Select, check and use all the tools and equipment required to remove and fit non welded body panels
- c. The different types of mechanical fixings for non welded panels and when and why they should be used
- d. The correct procedures and processes for removing and fitting of non welded body panels.
- e. The need for correct alignment of panels and methods to achieve this:
- f. Aperture gaps
- g. Alignment of panel features
- h. Fit of components to panels in line with manufacturers methods and specification
- i. Operation of openings such as doors, tailgates, bonnets etc
- j. The types of quality control checks that can be used to ensure correct alignment and contour of panels and operation of components to manufacturer's specification
- k. The method of storing removed panels and the importance of storing them correctly

Unit 455

Knowledge of Removing, Replacing and/or Refitting Vehicle Body Panels

Level:	5
Credit value:	3
Relationship to NOS:	This unit is linked to NOS BP05 – Remove and Replace Exterior Motor Vehicle Body Panels Including Permanently Fixed 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.
Aim:	This unit enables the learner to develop an understanding of carrying out removal, replacement and/or refitting of body panels using mechanical fastening and adhesive bonding.

Learning outcome	The learner will:
1.	understand material types and properties used in removing and replacing vehicle body panels
Assessment criteria	
The learner can:	
1.1	Identify the properties and different types of component materials used in the construction of vehicle bodies
1.2	Identify the properties and safe use of body component sealants, adhesives, and anti-corrosion materials
1.3	Describe the correct types of sealant and anti-corrosion materials to use in a given application in removing and replacing vehicle panels
1.4	Describe how to apply sealants and anti-corrosion materials following manufacturers recommended methods

Learning outcome	The learner will:
2.	understand how to carry out removal and replacement of non-permanently fixed vehicle body panels
Assessment criteria	
The learner can:	
2.1	Identify the procedures involved in carrying out the systematic removal of the manufacturers original joining technique
2.2	Identify the procedures involved in carrying out the systematic replacement of non-permanently fixed vehicle panels using recognised joining techniques
2.3	Identify the procedures involved in working with supplementary safety systems when replacing non-permanently fixed vehicle body panels
2.4	Describe the need for correct alignment of panels and the methods used to achieve this
2.5	Identify the quality checks that can be used to ensure correct alignment and contour of panels and the operation of components to manufacturers specification
2.6	Describe the methods and procedures for storing components and the importance of storing them correctly and in accordance with legal requirements
2.7	Identify the different types of fastenings, fixings and adhesives bonding used in the removal and replacement of vehicle body panels
2.8	Explain the reasons for the use of different types of fastenings, fixings and adhesives used in vehicle body panel replacement
2.9	Identify the procedures involved in carrying out the systematic replacement of vehicle panels using fastenings, fixings and adhesives bonding techniques
2.10	Explain how panel removal and refitting affects the overall body structure
2.11	Identify the manufacturers' approved methods of working for the removal and replacement of body panels
2.12	Identify correct conformity of vehicle systems against vehicle specification and legal requirements on completion
2.13	Explain the procedure for reporting damage caused to the vehicle during the panel replacement activities

Unit 455 Knowledge of Removing, Replacing and/or Refitting Vehicle Body Panels

Supporting information

Content

Learning Outcome 1

Selection and use of materials

- a. The properties and different types of materials used in the construction of vehicle bodies
- b. The properties and safe use of body component sealers, adhesives and anti-corrosion materials
- c. The type of sealants and anti-corrosion materials to use and the manufacturer's recommended methods for their application and thickness
- d. How to apply sealants and anti-corrosion materials
- e.

Learning Outcome 2

Removing and fitting of non welded body panels

- a. How to find, interpret and use sources of information applicable to the removal and fitting of non welded body panels
- b. How to select, check and use all the tools and equipment required to remove and fit non welded structural body panels.
- c. The different types of mechanical fixings for non welded body panels and when and why they should be used
- d. The correct procedures and processes for removing and fitting of non welded body panels
- e. The need for correct alignment of panels and methods to achieve this:
- f. Aperture gaps
- g. Alignment of panel features
- h. Correct fit of components to panels in line with manufacturers specifications
- i.
- j. Operation of openings such as doors, tailgates, bonnets etc
- k. The types of quality control checks that can be used to ensure correct alignment and contour of panels and operation of components to manufacturer's specification
- l. The method of storing removed panels and the importance of storing them correctly

Unit 456

Knowledge of Identifying and Rectifying Minor Repairs to Vehicle Body Panels

Level:	5
Credit value:	6
Relationship to NOS:	This unit is linked to NOS BP06 – Repair Motor Vehicle Exterior Body Panels.
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.
Aim:	This unit enables learner to develop an understanding of identifying and carrying out minor repairs to vehicle body panels using a variety of techniques.

Learning outcome	The learner will:
1.	Understand the principles of selection and use of appropriate tools and equipment in minor repairs on vehicle body panels
Assessment criteria	
The learner can:	
1.1	Identify the health and safety legislation and workplace procedures for personal and vehicle protection when repairing body panels
1.2	Identify tools used in the repair of metal finishing and plastic filling repairs
1.3	Identify tools to carry out reshaping work including specialist dent removal tools
1.4	Describe how to prepare, test, use and maintain the hand and power tools required to prepare damage and reshape damaged areas

Learning outcome	The learner will:
2.	Understand material types and properties used in minor repairs on vehicle body panels
Assessment criteria	
The learner can:	
2.1	Identify the properties and different types of metals and materials used in the construction of vehicle bodies
2.2	Describe the properties and use of metals and materials used to manufacturer body panels

2.3	Identify the properties and safe use of types of filling materials used to repair panels
2.4	Explain how to mix and apply plastic fillers
2.5	Describe the techniques for identifying the type of plastic used for manufactured components
2.6	Identify and describe the different types and grades of abrasive paper and their use

Learning outcome	The learner will:
3.	Understand how to carry out minor repairs to vehicle body panels
Assessment criteria	
The learner can:	
3.1	Describe how to prepare the vehicle to avoid contamination
3.2	describe how to prepare damaged areas to facilitate repairs
3.3	describe how to rough out and metal finish body panels
3.4	identify the procedures involved to reshape filling materials to match the original contour
3.5	describe how to finish repairs to a suitable agreed condition to enable the next stage of repairs to proceed
3.6	identify the procedures for repairing damage to plastic components including thermal and adhesive techniques
3.7	describe the techniques used to regain the contours of repaired plastic components
3.8	identify and describe the techniques for reshaping damaged body panels using hand and specialist tools
3.9	describe the methods used to check for panel contours for accuracy after reshaping
3.10	explain the procedures for reinstating anti-corrosion, sealant and sound deadening materials
3.11	describe the aspects of pedestrian safety in relation to the reparability of vehicles.

Unit 456 Knowledge of Identifying and Rectifying Minor Repairs to Vehicle Body Panels

Supporting information

Content

Learning Outcome 1

Selection and use of tools and equipment

1. The principles governing the selection and use of hand tools for metal finishing and plastic filler repair include:
 - a. panel beating hammers
 - b. dolly blocks
 - c. beating files
 - d. body spoons
 - e. dual action sanders
 - f. any specialist tooling
2. How to select the correct tools and equipment to carry out reshaping work, including specialist dent removal tools including panel pullers

Learning Outcome 2

Selection and use of materials

- a. How to mix and apply plastic fillers
- b. The properties and use of metals and materials used to manufacture body panels
- c. The properties and safe use of types of filling materials used to repair panels including plastic fillers
- d. The different types and grades of abrasive and their use
- e. The techniques to identify the type of plastics used for manufactured components

Learning Outcome 3

Repairing body panels

- a. How to interpret and use sources of information relevant to the removal of body components.
- b. How to prepare damaged areas to facilitate repairs
- c. How to repair plastic components using thermal and adhesive techniques

- d. How to rough out and metal finish body panels
- e. How to reshape filling materials to match the original panel contour
- f. How to finish repairs to a suitable condition for handing on to the painting stage
- g. How to work safely avoiding damage to the vehicle and its systems
- h. The techniques for reshaping damaged body panels using hand and specialist tools
- i. The procedures for reinstating anti-corrosion, sealant and sound deadening materials
- j. The procedures for repairing damage to plastic components
- k. The techniques for specialist repair processes and procedures for other materials for example
 - l. aluminium
 - m. mild steel
 - n. ultra-high strength steel
 - o. composites

This is not an exhaustive list

The techniques and processes for:

- a. plastic repairs
 - b. shrinking
 - c. panel pulling
 - d. metal finishing
 - e. plastic filling
 - f. panel beating
 - g. indirect hammering
 - h. direct hammering
 - i. spring hammering
 - j. body filing
 - k. application of body filler/stopper
 - l.
1. The techniques used to regain the contours of repaired plastic components
 2. Methods of checking reshaped panel contours for accuracy
 3. Standards of finish required to enable the next stage of repairs to proceed
 4. The manufacturer's approved methods of working for the preparation and repair of (non –structural)body panels

Unit 469 Knowledge of Motor Vehicle Body MIG/MAG Welding Operations

Level:	6
Credit value:	4
Relationship to NOS:	This unit is linked to NOS BP19 – Motor Vehicle Body MIG/MAG Welding Operations.
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.
Aim:	This unit enables the learner to develop an understanding of joining carbon steels using Metal Inert Gas (MIG)/Metal Active Gas (MAG) welding operations.

Learning outcome	The learner will:
1.	understand how to work safely when carrying out motor vehicle body MIG/MAG welding operations
Assessment criteria	
The learner can:	
1.1	describe the health, safety and legal requirements relating to the joining of carbon steels using MIG/MAG welding operations
1.2	describe the importance of selecting, using and maintaining the appropriate personal protective equipment when joining carbon steels using MIG/MAG welding operations
1.3	describe the requirements for protecting the vehicle and contents from damage before, during and after the joining of carbon steels by MIG/MAG welding operations.

Learning outcome	The learner will:
2.	understand how to select, check, use and maintain appropriate tools and equipment used in motor vehicle body MIG/MAG welding operations
Assessment criteria	
The learner can:	
2.1	explain the use of all tools and equipment required to join carbon steels using MIG/MAG welding techniques
2.2	describe, within the scope of their responsibilities, how to select, prepare and maintain the tools and equipment required to join carbon steels using MIG/MAG welding operations.

Learning outcome	The learner will:
3.	understand how to carry out motor vehicle body MIG/MAG welding operations
Assessment criteria	
The learner can:	
3.1	explain the importance of correct surface preparation methods to ensure a good MIG/MAG weld is achieved
3.2	identify the need for correct alignment and mating of carbon steels and the methods used to achieve this in MIG/MAG welding
3.3	describe the welding techniques used in MIG/MAG welding to include: <ul style="list-style-type: none"> a. lap plug b. lap seam c. butt joint d. fillet joint
3.4	identify the faults and defects that can occur when MIG/MAG welding and the common causes
3.5	describe the quality control measures that can be used to help ensure correct joining of carbon steels before, during and after the welding process
3.6	describe how to inspect and assess MIG/MAG welding in accordance to Industry Standards
3.7	explain the advantages and disadvantages of MAG welding over other welding methods
3.8	explain the importance and implications of checking and carrying out weld test pieces prior to carrying out the welding process.

Unit 469 Knowledge of Motor Vehicle Body MIG/MAG Welding Operations

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.

- a. The correct handling and storage of gas cylinders (manual handling and use of cylinder trolley, leak detection procedures, relevant BCGA codes of practice, cylinder identification, gas pressures, cylinder and equipment safety features, emergency shutdown procedures).
- b. The hazards associated with arc welding (live electrical components; current return (earth return); the electric arc; fumes and gases; gas supply leaks; spatter, hot slag and metal; elevated working; enclosed spaces; slips, trips and falls), and how they can be minimised.
- c. The manual, MIG/MAG or welding process (principles of fusion welding, AC and DC power sources, ancillary equipment, power ranges, care of equipment).
- d. The consumables associated with MIG/MAG or cored wire arc welding (types of wire and their application [solid and cored], types of shielding gas and their application, gas supply and control).
- e. The types of welded joints to be produced (fillet and butt welds and single welds, sheet and sections; welding positions)
- f. Setting up and restraining the joint (the use of jigs and fixtures, manipulators and positioners, restraining devices, tack welding size and spacing in relationship to material thickness).
- g. Preparing the welding equipment and checks that need to be made to ensure that it is safe and ready to use (electrical connections, power return and current return (earth return); wire feed mechanisms, gas supply, setting welding parameters, correct joint set-up, cleanliness of materials used; calibration before use; routine care and maintenance of equipment)
- h. The techniques of operating the welding equipment to produce a range of joints in the various joint positions (fine tuning parameters, correct manipulation of the welding gun, safe closing down of the welding equipment)
- i. The importance of complying with job instructions and the welding procedure specification
- j. Problems that can occur with the welding activities and how these can be overcome (causes of distortion and methods of control, effects of welding on materials and sources of weld defects; methods of prevention)

- k. The importance and usage of organisational quality systems used and weld standards to be achieved; weld inspection and test procedures used (including visual and non-destructive tests)
- l. Personal approval tests, and their applicability to your work
- m. The extent of your own authority and whom you should report to if you have problems that you cannot resolve
- n. Reporting lines and procedures, line supervision and technical experts

Unit 470

Knowledge of Carrying Out Motor Vehicle Body Resistance Spot Welding Operations

Level:	6
Credit value:	4
Relationship to NOS:	This unit is linked to NOS BP20 – Motor Vehicle Body Resistance Spot Welding Operations.
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.
Aim:	This unit enables the learner to develop the knowledge in order to join materials using resistance spot welding operations.

Learning outcome	The learner will:
1.	understand how to work safely when carrying out motor vehicle body resistance spot welding operations
Assessment criteria	
The learner can:	
1.1	describe the health, safety and legal requirements relating to the joining of materials using resistance spot welding operations
1.2	describe the importance of selecting, using and maintaining the appropriate personal protective equipment when joining materials using resistance spot welding operations
1.3	describe the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials by resistance spot welding operations.

Learning outcome	The learner will:
2.	understand how to select, check, use and maintain appropriate tools and equipment used in motor vehicle body resistance spot welding operations
Assessment criteria	
The learner can:	
2.1	identify and explain the use of all tools and equipment required to join materials using resistance spot welding operations
2.2	describe, within the scope of their responsibilities, how to select, prepare, test and maintain tools and equipment required to join materials using resistance spot welding operations.

Learning outcome	The learner will:
3.	understand how to carry out motor vehicle body resistance spot welding operations
Assessment criteria	
The learner can:	
3.1	Describe the constraints of the type of materials used in vehicle construction places on the choice of repair
3.2	Describe the importance of correct surface preparation methods to ensure the correct resistance spot weld is achieved and the reasons why surface preparation is important
3.3	Identify and explain the need for alignment and mating of materials and the best methods used to achieve this in resistance spot welding
3.4	Describe the welding processes, operations and joints used for the joining of materials using resistance spot welding
3.5	Identify the faults and defects that can occur when carrying out resistance spot welding
3.6	Identify common causes which produce the faults and defects in resistance spot welding and the common causes of these faults
3.7	Describe the types of quality control checks that can be used to ensure correct joining of materials e.g. test coupons
3.8	Describe how to inspect and assess resistance spot welding quality in accordance to Industry Standards including: <ul style="list-style-type: none"> a. Weld pitch b. Indentation/ weld profile c. Heat zone d. Nugget size e. Peel or shear test
3.9	Explain the importance and implications of checking and carrying out weld test pieces prior to carrying out the welding process

Unit 470 Knowledge of Carrying Out Motor Vehicle Body Resistance Spot Welding Operations

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.

- a. The specific safety precautions to be taken when operating resistance welding installations (working with machinery; the use of appropriate personal protective equipment machine guards; operation of machine safety devices; stopping the machine in an emergency; closing down the machine on completion of the welding activities; statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations; safe disposal of waste materials), any regulations relating to EMF (Electric Magnetic Field)
- b. The hazards associated with resistance welding machines (dangers from live internal electrical components, fumes, hot metal, expulsion of hot particles, moving parts of machines), and how they can be minimised
- c. The principles of resistance welding; terminology used in welding.
- d. Mechanised and automated welding s (types of installation; machine functions; control systems; safety features)
- e. The key components and features of the equipment used (power source; electrical parameters such as current, electrode pressure and welding time; systems for parameter control; how variation in the parameters influence weld features, quality and output)
- f. Extracting the information required from recognised researched repair methods
- g. Operation of the machine controls and their function; clamping of components and equipment care procedures
- h. Setting up and aligning the work piece
- i. Monitoring the welding process; recognition of problems, and action to be taken
- j. Problems that can occur with the welding activities, materials and weld defects
- k. Self inspection of completed work.
- l. Organisational quality systems (standards to be achieved; production records to be kept)
- m. Personal approval tests and their applicability to your work.
- n. The extent of your own authority and whom you should report to if you have problems that you cannot resolve
- o. Reporting lines and procedures, line supervision and technical experts
- p. The requirements of the power supply to the unit and the use of extension cables.

Unit 471

Knowledge of Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations

Level:	6
Credit value:	4
Relationship to NOS:	This unit is linked to NOS BP21 – Motor Vehicle Body MIG Brazing Operations.
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.
Aim:	This unit enables the learner to develop an understanding of joining materials using Metal Inert Gas (MIG) brazing operations and procedures.

Learning outcome	The learner will:
1.	understand how to work safely when carrying out motor vehicle body MIG brazing operations
Assessment criteria	
The learner can:	
1.1	describe the health, safety and legal requirements relating to the joining of materials using MIG brazing operations
1.2	describe the importance of selecting, using and maintaining the appropriate personal protective equipment when joining materials using MIG brazing operations
1.3	describe the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials by MIG brazing operations.

Learning outcome	The learner will:
2.	understand how to select, check, use and maintain appropriate tools and equipment used in motor vehicle body MIG brazing operations
Assessment criteria	
The learner can:	
2.1	explain the use of all tools and equipment required to join materials using MIG brazing operations

2.2 explain, within the scope of their responsibilities, how to select, prepare and maintain tools and equipment required to join materials using MIG brazing operations.

Learning outcome	The learner will:
3.	understand how to carry out motor vehicle body MIG brazing operations
Assessment criteria	
<p>The learner can:</p> <p>3.1 explain the importance of correct surface preparation methods to ensure a good MIG brazing technique is achieved</p> <p>3.2 identify the correct need for alignment/mating of materials and the best methods used to achieve this in MIG brazing operations</p> <p>3.3 explain the welding processes, techniques and joints used for the joining of materials using MIG brazing technique, joints include:</p> <ul style="list-style-type: none"> a. lap slot b. lap seam c. butt joint <p>3.4 identify the faults and defects that can occur when carrying out MIG brazing</p> <p>3.5 identify common causes which produce the faults and defects in MIG brazing</p> <p>3.6 describe the types of quality control checks that can be used to ensure correct joining of materials</p> <p>3.7 describe how to inspect and assess MIG brazing operation in accordance to recognised Standards</p> <p>3.8 Explain the importance and implications of checking and carrying out brazing test pieces prior to carrying out the brazing process</p> <p>3.9 Report any anticipated delays in completing our work to the relevant person(s)</p>	

Unit 471 Knowledge of Carrying Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations

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.

- a. The safe working practices and procedures to be observed when operating brazing installations (working with machinery; the use of appropriate personal protective equipment; machine guards; operation of machine safety devices; stopping the machine in an emergency; closing the machine down on completion of activities; statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations; safe disposal of waste materials)
- b. The hazards associated with MIG brazing machines (dangers from relevant equipment sources; fumes and gases; hot metal; moving parts of machinery), and how they can be minimized
- c. The hazards associated when preparing aluminium or cutting through a mix of materials due to the risk of explosion and how the correct type of extraction must be used when doing so
- d. Principles of the relevant brazing process; terminology used in brazing
- e. The key components and features of the equipment
- f. How to extract the information required from drawings and brazing procedure specifications
- g. Operation of the machine controls and their function; care of equipment; control and storage of consumables
- h. Setting up and aligning the work pieces
- i. Monitoring the installation during the brazing process; recognition of problems, and action to be taken
- j. Problems that can occur with the brazing activities, materials, filler metals and joint defects
- k. Self inspection of completed work
- l. Organisational quality systems (standards to be achieved; production records to be kept)
- m. Personal approval tests and their applicability to your work
- n. The extent of your own authority and whom you should report to if you have problems that you cannot resolve
- o. Reporting lines and procedures, line supervision and technical experts

Unit 474

Knowledge of Motor Vehicle Body Mechanical Fastening Operations

Level:	5
Credit value:	4
Relationship to NOS:	This unit is linked to NOS BP24 – Motor Vehicle Body Mechanical Fastening Operations.
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 joining materials using mechanical fastening techniques and procedures.

Learning outcome	The learner will:
1.	understand how to work safely when carrying out motor vehicle body mechanical fastening operations
Assessment criteria	
The learner can:	
1.1	explain the health, safety and legal requirements relating to the joining of materials using mechanical fastening operations
1.2	explain the importance of selecting, using and maintaining the appropriate personal protective equipment when joining materials using mechanical fastening operations
1.3	explain the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using mechanical fastening operations

Learning outcome	The learner will:
2.	understand how to select, check, use and maintain appropriate tools and equipment used in motor vehicle body mechanical fastening operations
Assessment criteria	
The learner can:	
2.1	explain the use of all tools and equipment required to join materials using mechanical fastening operations
2.2	explain, within the scope of their responsibilities, how to select, prepare and maintain tools and equipment required to join materials using mechanical fastening operations

Learning outcome	The learner will:
3. understand how to carry out motor vehicle body mechanical fastening operations	
Assessment criteria	
<p>The learner can:</p> <p>3.1 describe the importance of correct surface preparation methods to ensure a good mechanical fastening is achieved</p> <p>3.2 Identify the correct need for alignment and mating of materials and the best methods used to achieve this in mechanical fastening operations</p> <p>3.3 Explain the mechanical fastening processes, techniques and joints used for the joining of materials, joints include:</p> <ul style="list-style-type: none"> a. riveting (single sided, double sided and self piercing) b. clinching c. bolts and fasteners d. screwing (self threading and self piercing) e. hybrid joining (combinations of techniques listed that may also include adhesives) <p>3.4 Explain how different materials used in the construction of motor vehicles react with each other</p> <p>3.5 Identify the faults and defects that can occur when carrying out mechanical fastening operations</p> <p>3.6 Explain the types of quality control checks that can be used to ensure correct joining of materials</p> <p>3.7 Explain how to use adhesives with riveting techniques</p> <p>3.8 Explain the advantages and disadvantages of mechanical fastening operations over other joining methods</p>	

Unit 474 Knowledge of Motor Vehicle Body Mechanical Fastening Operations

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.

- a. The hazards associated with the joining operations (such as handling sheet/fabricated components, handling and using sealants and cleaning agents, dangerous or badly maintained tools and equipment), and how they can be minimised.
- b. How to obtain the necessary drawings and joining procedure specifications.
- c. How to extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS or ISO standards in relation to work undertaken).
- d. The use of manufacturers' specifications for the types of fasteners used.
- e. The various joining processes that are used, and the tools and equipment required.
- f. The preparations to be carried out on the materials/components prior to joining them (such as materials to be degreased, dry and clean, with holes and flanges de-burred).
- g. How to set up and align the joints prior to fixing, and the tools and methods that can be used (such as clamps, rivet gripping tools, temporary fixings, jacking and supporting devices).
- h. How to produce a secure joint using blind rivets, and the type of riveting tools that are available.
- i. The range of bolts and screwed fasteners that are to be used; why it is important to use the correct type of washer; sequence of tightening bolts on flanged joints; and the tools and equipment used to ensure they are tightened to the required torque.
- j. Checks to be carried out on the tools and equipment prior to use to ensure that they are in a safe and usable condition (such as condition of plugs and leads on power tools, condition of striking faces on hammers, condition of riveting tools)
- k. Equipment setting, operating and care procedures; why equipment and tools need to be correctly set up and in good condition
- l. The importance of using the tools only for the purpose intended; the care that is required when using the equipment and tools; the proper way of preserving and storing tools and equipment between operations
- m. The things that can go wrong with the joining operations, and how these can be avoided
- n. The extent of your own authority and whom you should report to if you have problems that you cannot resolve
- o. Reporting lines and procedures, line supervision and technical experts.

Unit 475

Knowledge of Motor Vehicle Body Adhesive Bonding Operations

Level:	6
Credit value:	4
Relationship to NOS:	This unit is linked to NOS BP25 – Motor Vehicle Body Adhesive Bonding Operations.
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.
Aim:	This unit enables the learner to develop an understanding of joining materials using adhesive bonding techniques and procedures

Learning outcome	The learner will:
1.	understand how to work safely when carrying out motor vehicle body adhesive bonding operations
Assessment criteria	
The learner can:	
1.1	explain the health, safety and legal requirements relating to the joining of materials using adhesive bonding techniques
1.2	explain the importance of selecting, using and maintaining the appropriate personal protective equipment when joining materials using adhesive bonding techniques
1.3	explain the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials by adhesive bonding techniques.

Learning outcome	The learner will:
2.	understand how to select, check, use and maintain appropriate tools and equipment used in motor vehicle body adhesive bonding operations
Assessment criteria	
The learner can:	
2.1	explain the use of all tools and equipment required to join materials using adhesive bonding techniques
2.2	explain, within the scope of their responsibilities, how to select, prepare and maintain tools and equipment required to join materials using adhesive bonding techniques.

Learning outcome	The learner will:
3.	understand how to carry out motor vehicle body adhesive bonding operations
Assessment criteria	
The learner can:	
3.1	explain the importance of correct surface preparation methods to ensure a good adhesive bonding joint is achieved
3.2	identify the need for alignment/mating of materials and the best methods used to achieve this in adhesive bonding
3.3	explain the joining processes, techniques and joints used for the joining of materials using adhesive bonding
3.4	identify the faults and defects that can occur when carrying out adhesive bonding
3.5	identify the faults and defects that can occur when carrying out adhesive bonding
3.6	identify common causes which produce the faults and defects in adhesive bonding
3.7	explain the types of quality control checks that can be used to ensure correct joining of materials
3.8	explain the advantages and disadvantages of adhesive bonding over other joining methods
3.9	explain the importance and implications of checking and carrying out test pieces prior to carrying out the joining process.

Unit 475 Knowledge of Motor Vehicle Body Adhesive Bonding Operations

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.

- a. The specific safety precautions to be taken when bonding materials using adhesives (general workshop and site safety, appropriate personal protective equipment, accident procedure; statutory regulations, risk assessment procedures and COSHH regulations)
 - b. The personal protective clothing and equipment to be worn when carrying out bonding as part of the fabrication activities (gloves, eye protection,, respiratory protection, etc)
 - c. The importance of good workshop practice and house keeping, ventilation and fume control equipment, first aid procedures and actions, hazardous substances and relevant sections of COSHH
 - d. The hazards associated with bonding components, and how they can be minimised
 - e. How to obtain the necessary drawings and joining specifications
- How to extract information from research repair methodology in relation to the work undertaken.
- f. Types of adhesives:
 - i. impact
 - ii. two parts
 - iii. cyanoacrylate
 - iv. anaerobic
 - v. sealants
 - vi. toughened.
 - g. Knowledge of curing mechanisms including:
 - i. moisture/solvent evaporation
 - ii. chemical/thermal reaction
 - iii. exposure/exclusion to oxygen.
 - h. Understanding the importance of recording shelf life, pot life, setting and curing times
 - i. Knowledge of adhesion and cohesion.
 - j. Understanding
 - k. The material preparations that are required, and the equipment and consumables that are used.
 - l. The importance of working to organisational and bonding agent manufacturers' instructions whilst carrying out the bonding activities.

- m. The methods and techniques used for bonding the materials (such as gluing, impact, chemical and thermal reaction techniques).
- n. The characteristics of the adhesives that are to be used.
- o. The application of, and precautions to be taken when using, adhesives and solvents.
- p. Maintenance and care of tools and equipment.
- q. Methods of degreasing components and producing a keying surface.
- r. Type and suitability of adhesives, setting or curing requirements and time, strength and appearance.
- s. Common causes of defects associated with the bonding processes, and how to avoid them.
- t. The effects of the environment on the bonding process (such as temperature humidity, cleanliness).
- u. How to identify, select, use, and clean, the appropriate bonding agent holding vessels, brushes, stirrers and spatulas, scrapers, knives, clamps and weights.
- v. The importance of cleaning up after use, to ensure everything can be used again and to minimise the need for replacement of equipment.
- w. Reasons for checking that components are assembled in the correct sequence, are positioned dimensionally accurately and to the correct orientation, in accordance with the specifications, prior to bonding.
- x. How to check that completed joints are firm, sound and fit for purpose.
- y. Procedures for cleaning off surplus adhesive and tidying up the appearance of joints.
- z. The extent of your own authority and whom you should report to if you have problems that you cannot resolve.
- aa. Reporting lines and procedures, line supervision and technical experts.

Unit 476

Knowledge of Motor Vehicle Construction and Materials

Level:	5
Credit value:	3
Relationship to NOS:	This unit is linked to NOS BP26 – Knowledge of Motor Vehicle Construction and Materials.
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.
Aim:	This unit enables the learner to develop an understanding of types of metals and composites used in the construction of motor vehicles, the areas where these materials are used and what their properties are. It is also about the design and construction techniques used in the vehicle body and chassis.

Learning outcome	The learner will:
1. understand material types and properties used in motor vehicle construction	
Assessment criteria	
The learner can:	
1.1	describe the properties and different types of materials used in the construction of vehicle bodies including: <ul style="list-style-type: none">a. mild steelb. ultra high strength steelc. aluminium alloysd. stainless steele. plasticsf. compositesg. trim materials
1.2	identify the types of materials used in the construction of vehicle bodies and chassis components
1.3	explain the properties of materials used in vehicle body construction
1.4	describe how different materials used in the construction of motor vehicles react with each other
1.5	describe the importance of cleanliness and avoiding cross contamination when working with different materials

1.6 describe the importance of selecting and using the appropriate joining techniques for the type of material.

Learning outcome	The learner will:
2.	understand how the different types of materials and formation methods affect the construction of motor vehicle bodies
Assessment criteria	
The learner can:	
2.1	explain the principles of chassis frame and monocoque vehicle construction
2.2	identify the different types of chassis designs used for modern vehicles, including commercials
2.3	explain the effects on strength once the overall body structure is complete
2.4	identify the different body and chassis components that are made using different materials, including the advantages and disadvantages
2.5	describe how crumple zones affect the safety, design, cost and construction of motor vehicle bodies and chassis
2.6	describe how the type of material used affects the safety, design, cost and construction of motor vehicle bodies and chassis
2.7	identify the implications of recycling of vehicle bodies and chassis components, now and in the future.

Learning outcome	The learner will:
3.	understand how damage to the construction of a motor vehicle will affect its safety
Assessment criteria	
The learner can:	
3.1	describe how to carry out a vehicle inspection to assess for damage
3.2	describe how to check a vehicle for correct alignment
3.3	describe how manipulation of the vehicle body and chassis will affect its residual strength.

Unit 476 Knowledge of Motor Vehicle Construction and Materials

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 forms in which body repair materials are supplied

- a. Identify the common forms of supply of metals to include:
 - i. sheet
 - ii. roll
 - iii. bar
 - iv. section.
- b. Identify common forms of supply for non metals:
 - i. solid
 - ii. liquid
 - iii. composites
 - iv. laminated.

Mechanical properties and use examples of materials to illustrate these properties

- a. Define the three states of matter.
- b. State the definitions of the following mechanical properties:
 - i. ductility
 - ii. malleability
 - iii. hardness
 - iv. toughness
 - v. elasticity
 - vi. plasticity
 - vii. weld ability
 - viii. conductivity
 - ix. insulation.
- c. Give examples of materials and components exhibiting the above properties.
- d. Describe ways in which the above properties can be changed temporarily or permanently to include:
 - i. heating
 - ii. alloying
 - iii. cold working
 - iv. heat treatments.

Define and distinguish between classes of materials

- a. Define classes of materials as:

- i. metals
 - ii. non metals
 - iii. synthetic
 - iv. natural.
- b. Classify metals into:
- i. ferrous
 - ii. non ferrous
 - iii. pure metals
 - iv. alloys.

Factors which affect the selection of listed materials

- a. Identify the range of selection factors which determine the use of materials to include:
- i. material costs
 - ii. suitability for use
 - iii. form of supply
 - iv. joining characteristics
 - v. strength
 - vi. material properties
 - vii. corrosion resistance
 - viii. melting point.
- b. Compare the factors affecting the use of:
- i. pure metals
 - ii. alloys
 - iii. plastics.
- c. Understand the importance of melting points of the following:
- i. LC steel
 - ii. aluminium alloy
 - iii. stainless steel
 - iv. solder
 - v. common plastics.

Listed materials used in repair or construction

- a. Identify the types and properties of steels used in construction and repair to include:
- i. low carbon steels
 - ii. medium carbon steels
 - iii. high carbon steels
 - iv. cast irons
 - v. alloy steels
 - vi. UHSS.
- b. Describe the properties of common non ferrous metals used in construction and repair to include:
- i. aluminium
 - ii. zinc
 - iii. lead
 - iv. tin
 - v. copper.

- c. Compare and identify listed non-metals used in repair or construction to include:
 - i. plastics
 - ii. glass
 - iii. fabrics
 - iv. leather
 - v. rubber.
- d. Define the terms:
 - i. thermo plastic
 - ii. thermo setting plastics.
- e. Identify the uses and properties of materials used for interior furnishings such as:
 - i. rubber
 - ii. fabric
 - iii. leather
 - iv. glass.
- f. Give examples of common plastics used in repair and construction including:
 - i. ABS
 - ii. polyethylene
 - iii. polypropylene
 - iv. polyester
 - v. acrylic
 - vi. glass reinforced plastic.
- g. State the constituents and general properties of the following alloys:
 - i. solder
 - ii. stainless steel
 - iii. low carbon steel
 - iv. brass
 - v. aluminium alloys including duralumin.

Ways in which the properties of metals can be changed temporarily or permanently

- a. Explain the advantages of changing the material properties temporarily.
- b. Explain the effects of changing the material properties permanently
- c. State the advantages of changing materials properties.
- d. State that material properties can be changed by:
 - i. heat treatment
 - ii. cold working
 - iii. alloying.
- e. Describe how the properties of metals are changed under the above three headings

Causes of corrosion in steel car bodies

- a. Explain the principle of oxidation to include:
 - i. simple corrosion cell
 - ii. combination with oxygen
 - iii. effects of an electrolyte
 - iv. effects of dissimilar metals.

- b. Identify reasons for corrosion in vehicles to include:
 - i. bad joint design
 - ii. poor protection
 - iii. stone chips
 - iv. water leaks
 - v. industrial pollution.
- c. Explain that methods of corrosion protection can include:
 - i. protective metal coatings
 - ii. protective non-metal coatings
 - iii. cavity waxes
 - iv. anti chip coatings
 - v. sealers.
- d. Describe the effects of corrosion in a vehicle body to include:
 - i. loss of strength
 - ii. manufacturer's warranty consideration
 - iii. loss of appearance.

Characteristics of body assemblies

- a. Describe methods of producing body panels to include:
 - i. forming
 - ii. pressing
 - iii. moulding.
- b. Describe the methods of imparting strength to sheet metal to include:
 - i. swages
 - ii. edging
 - iii. forming into sections
 - iv. combining sections into box sections
 - v. the principles of crowned panels.
- c. Describe the characteristics of monocoque structures.
- d. Describe the characteristics of separate construction.
- e. Identify by name and description of use, the following:
 - i. sill panel
 - ii. bulkhead
 - iii. chassis leg
 - iv. inner flitch
 - v. cross member
 - vi. a, b, c and d posts
 - vii. roof
 - viii. cant rail
 - ix. windscreen header rails
 - x. floor assembly
 - xi. inner wheel arches
 - xii. dog leg
 - xiii. scuttle panels
 - xiv. front panel
 - xv. headlamp mounting panels
 - xvi. back panel.



Appendix 1 Relationships to other qualifications

Links to other qualifications

Centres are responsible for checking the different requirements of all qualifications they are delivering and ensuring that candidates meet requirements of all units/qualifications.

This qualification has connections to the 4311-43 SVQ in Vehicle Body Repair & Alignment at SCQF Level 6.



Appendix 2 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.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

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 GOLLA assessments.

Useful contacts

UK learners General qualification information	E: learnersupport@cityandguilds.com
International learners General qualification information	E: intcg@cityandguilds.com
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	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	E: singlesubjects@cityandguilds.com
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	E: intops@cityandguilds.com
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	E: walledgarden@cityandguilds.com
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	E: business@cityandguilds.com
Publications Logbooks, Centre documents, Forms, Free literature	

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