QUALIFICATION HANDBOOK

SVQ in Vehicle Body Repair & Alignment at SCQF Level 6 (4311-43)

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City & Guilds

A City & Guilds Group Business

Qualification at a glance

Subject area	**Vehicle Repair Body**
City & Guilds number	4311-43
Age group approved	16-18, 19+
Assessment	Portfolio of Evidence and E-Assessment Online Multiple Choice Tests.
Fast track	Not available. Automatic approval applies in some cases
Support materials	Centre handbook Exam Success Book
Registration and certification	See the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	Accreditation number
SVQ in Vehicle Body Repair & Alignment at SCQF Level 6	4311-43	GN9Y 46

Contents

1 Introduction

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

Area	Description
Who are the qualifications for?	These qualifications in Vehicle Body Repair are for anyone developing a career in the motor industry. These practical qualifications demonstrate candidates' skills on the job and in their own workplace showing that they meet national standards for automotive workers. Their structure and assessment strategy have been produced by the Institute of the Motor Industry, who are the Sector Skills Council for the Automotive Industry.
What do the qualifications cover?	Candidates cover areas such as routine vehicle maintenance, removal and replacement of vehicle units and components and carrying out repairs to motor vehicles. They are assessed in the workplace by using the following methods: • workplace observation • witness testimony • verbal questioning of essential knowledge • City & Guilds' e-assessment online multiple choice test
Are the qualifications part of a framework or initiative?	These qualifications are part of the Scottish Automotive Maintenance and Repair Modern Apprenticeship.
What opportunities for progression are there?	After taking these qualifications candidates will have a qualification that shows employers and customers they are competent and have the skills required to carry out body repairs as a result of accidents and will be able to progress into employment. In addition, candidates who enjoy leading teams of people at work could also move onto a qualification as a Team Leader or Supervisor such as qualifications at Levels 2, 3 and 4 through the Institute of Leadership and Management (ILM).

Structure

To achieve the **SVQ in Vehicle Body Repair & Alignment at SCQF Level 6**, learners must **all mandatory units** from (001, 002, 003, 304, 313, 314, 317, 319, 320, 364, 365, 367, 369, 370) **plus one optional unit** from (008, 306, 310, 311, 312, (321 and 371), (322 and 372)). Some units require learners to successfully complete an online multiple choice test. Details can be found in Section 4 of this Handbook and in the assessment requirements section of each individual unit.

City & Guilds unit	Unit title	SCQF level	SCQF credit value
	Mandatory		
4311-001	Contribute to Housekeeping in Motor Vehicle Environments	5	5
4311-002	Reduce Risk(s) to Health and Safety in the Motor Vehicle Environment	5	5
4311-003	Maintain Working Relationships in the Motor Vehicle Environment	6	7
4311-304	Use of Tools and Equipment in Motor Vehicle Environments	5	11
4311-313 4311-365	Remove and Replace Motor Vehicle Body Panels Including Permanently Fixed Panels	6	15
4311-314 4311-364	Identify and Rectify Major Repairs to Motor Vehicle Body Panels	6	14
4311-317 4311-367	Identify and Rectify Motor Vehicle Body Misalignment	6	16
4311-319 4311-369	Motor Vehicle Body MIG/MAG Welding Operations	6	15
4311-320 4311-370	Carry Out Motor Vehicle Body Resistance Spot Welding Operations	6	14
	Optional		
4311-008	Identify and Agree the Motor Vehicle Customer Needs	6	10
4311-306	Enable Learning Through Demonstration and Instruction	7	7
4311-310	Motor Vehicle Body Adhesive Bonding Operations	5	7
4311-311	Supervisory Skills	8	14
4311-312	Motor Vehicle Body Mechanical Fastening Operations	5	7
4311-321 4311-371	Carry Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations	6	14
4311-322 4311-372	Carry Out Motor Vehicle Body Cosmetic Aluminium Panel Welding Operations	6	14

2 Centre requirements

Approval

If your Centre is approved to offer the SVQ in Automotive Maintenance and Repair – Body Repair (4101-36), you will be granted automatic approval for the SVQ in Vehicle Body Repair & Alignment at SCQF Level 6 (4311-43).

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

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

Resource requirements

Physical resources and site agreements

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

Centre staffing

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

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

Assessors and internal verifiers

All assessors must:

- have sufficient and relevant technical/occupational competence in the Unit, at or above the level of the Unit being assessed.
- have in depth knowledge of the Qualification or SVQ unit evidence requirements.
- hold or be working towards a relevant assessors' award as specified by the Sector Skills Council. This will include, but not be limited to the Assessor qualifications, Level 3 Award in Understanding the Principles and Practices of Assessment, Level 3 Award in Assessing Competence in the Work Environment, Level 3 Award in Assessing Vocationally Related Achievement, Level 3 Certificate in Assessing Vocational Achievement (and by implication legacy Assessor units A1, A2 and D32/33 unit) but may be an appropriate equivalent as defined by IMI, the SSC).

- assessors working towards a relevant assessor qualification must achieve their qualification within 12 months.
- demonstrate knowledge and understanding of the competencies that a learner is required to demonstrate for the qualification that they are undertaking.
- provide evidence of completing 5 days working/job shadowing in industry within their professional area in a 24 month period.
- provide evidence of 30 hours of technical/qualification related CPD within a 12 month period. (This is in addition to working / job shadowing).

All internal verifiers must:

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

Continuing professional development (CPD)

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

Candidate entry requirements

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

Age restrictions

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

3 Delivering the qualification

Initial assessment and induction

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

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

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

Support materials

City & Guilds will provide the following learning and support resources which will be posted on our website. **www.cityandguilds.com/automotive**

- Useful material is available on SmartScreen **www.smartscreen.co.uk**.
- Exam Success book TL024290

Recording documents

Candidates and centres may decide to use a paper-based or electronic method of recording evidence. To support the delivery of vocational qualifications we offer our own ePortfolio, Learning Assistant, an easy to use and secure online tool to support and evidence candidates' progress towards achieving qualifications. Further details are available at: **www.cityandguilds.com/eportfolios**.

City & Guilds has developed training and assessment documentation specifically for these qualifications which are available from City & Guilds website. Although new centres are expected to use these forms, centres may devise or customise alternative forms, which must be approved for use by the external verifier, before they are used by candidates and assessors at the centre.

Simulation

The IMI SVQ units are work/competency based and therefore candidates are to be assessed under normal working conditions. It is recognised however, that there are situations where the workplace may not be appropriate or that waiting for naturally occurring evidence is impractical. In these situations centres will be allowed to set up or devise assessment situations. For example, it may not be possible to diagnose and rectify faults because they do not occur frequently, in which case a simulated environment could be used. In addition, dealing with fire and other emergencies such as recovering overturned vehicles, might be better assessed through a simulated environment because this would be a safer approach. They can only be set up after:

- all possible routes of naturally occurring evidence have been exhausted
- the exact make up and content of the centre devised assessment has been agreed and approved by the external verifier
- the assessor can assure that the simulation will provide evidence that is valid, reliable and authentic.

Any simulation must be carried out using actual vehicles; the use of engine rigs or electrical boards is not permitted. Simulated environments must not be used for the assessment of entire units.

Realistic Work Environment (RWE)

The use of approved simulation means that RWE is not to be used.

Expert witness

The use of witness testimony and expert witness testimony are appropriate methods for assessors to collect supplementary evidence on candidates' performance. Witness testimonies may be obtained from people that are occupationally competent and whom may be familiar with the NOS, such as the candidate's line manager.

The assessor must judge the validity of the witness testimony and these may vary depending on the source. Witness testimonies can only support the assessment process and may remove or reduce the need to collect supplementary evidence; however City & Guilds quality assurance requirements must be met. The person or persons providing the witness testimony must also be available to the external verifier for confirmation of evidence validity if required.

Health and safety

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

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

Data protection and confidentiality

Centres offering this qualification may need to provide City & Guilds with personal data for staff and candidates. Guidance on data protection and the obligations of

City & Guilds and centres are explained in *Centre Manual - Supporting Customer Excellence*.

Equal opportunities

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

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

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

Access to assessment

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

Appeals

Centres must have their own, auditable, appeals procedure that must be explained to candidates during their induction. Appeals must be fully documented by the quality assurance co-ordinator and made available to the external verifier or City & Guilds. Further information on appeals is given in *Centre Manual - Supporting Customer Excellence*. There is also information on appeals for centres and learners on the City & Guilds website or available from the Customer Relations department.

4 Assessment

Candidates must complete a portfolio of evidence for each unit (for all competence aspects of the unit).

Where stipulated, candidates must also attain an online multiple choice test, graded as Pass, Merit, and Distinction for particular units. The test will cover all or part of the knowledge aspects of the unit. Where the test does not cover all of the Essential Knowledge, the criterion must be assessed in one of the following ways:

- oral or written questioning
- professional discussion.

Time constraints

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

Recognition of prior learning (RPL)

Recognition of prior learning means using a learner's previous experience, or qualifications which have already been achieved to contribute to a new qualification. RPL is allowed and is also sector specific.

SVQ in Vehicle Body Repair & Alignment at SCQF Level 6

Title	Assessment method	Unit
Contribute to Housekeeping in Motor Vehicle Environments	Portfolio	4311-001
Reduce Risk(s) to Health and Safety in the Motor Vehicle Environment	Portfolio	4311-002
Maintain Working Relationships in the Motor Vehicle Environment	Portfolio	4311-003
Identify and Agree the Motor Vehicle Customer Needs	Portfolio	4311-008
Use of Tools and Equipment in Motor Vehicle Environments	Portfolio	4311-304
Enable Learning Through Demonstration and Instruction	Portfolio	4311-306
Motor Vehicle Body Adhesive Bonding Operations	Portfolio	4311-310
Supervisory Skills	Portfolio	4311-311
Motor Vehicle Body Mechanical Fastening Operations	Portfolio	4311-312
Remove and Replace Motor Vehicle Body Panels Including Permanently Fixed Panels	Portfolio	4311-313
	Multiple choice online test	4311-365
Identify and Rectify Major Repairs to Motor Vehicle Body Panels	Portfolio	4311-314
	Multiple choice online test	4311-364

Title	Assessment method	Unit
Identify and Rectify Motor Vehicle Body Misalignment	Portfolio	4311-317
	Multiple choice online test	4311-367
Motor Vehicle Body MIG/MAG Welding Operations	Portfolio	4311-319
	Multiple choice online test	4311-369
Carry Out Motor Vehicle Body Resistance Spot Welding Operations	Portfolio	4311-320
	Multiple choice online test	4311-370
Carry Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations	Portfolio	4311-321
	Multiple choice online test	4311-371
Carry Out Motor Vehicle Body Cosmetic Aluminium Panel Welding Operations	Portfolio	4311-322
	Multiple choice online test	4311-372

5 Units

Availability of units

The units in this qualification are written in a standard format and comprise the following:

- City & Guilds reference number
- title
- SCQF level
- SCQF credit value
- unit aim
- unit content
- unit range

Unit 001 Contribute to Housekeeping in Motor Vehicle Environments

Level:	**5**
Credit value:	5
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about the routine maintenance of the workplace, carrying out basic, non-specialist checks of work tools and equipment, cleaning the work area and using resources economically.

Essential knowledge

The learner will need to understand:

1. Legislative and organisational requirements and procedures	
1.1	the scope of their job responsibilities for the use and maintenance of hand tools, equipment and their work area
1.2	workplace policies and schedules for **housekeeping activities** and **equipment maintenance**
1.3	the manufacturer's requirements for the cleaning and general, non-specialist maintenance of the tools and equipment for which they are responsible
1.4	the regulations and information sources applicable to workshop cleaning and maintenance activities for which they are responsible
1.5	the importance of reporting faults quickly to the relevant person
1.6	the importance of reporting anticipated delays to the relevant person(s) promptly.

2. Equipment maintenance	
2.1	how to select and use equipment used for basic hand tool maintenance activities
2.2	how to store hand tools safely and accessibly
2.3	how to report faulty or damaged **work tools and equipment**
2.4	how to work safely when cleaning and maintaining **work tools and equipment**.

3. General work area housekeeping	
3.1	how to select and use cleaning equipment
3.2	how to use resources economically
3.3	how to use work area cleaning materials and agents
3.4	how to clean and maintain the **work tools and equipment** and work areas for which they are responsible
3.5	how to dispose of unused cleaning agents, materials and debris
3.6	the properties and hazards associated with the use of cleaning agents and materials
3.7	the importance of wearing personal protective equipment
3.8	the importance of using resources economically and for their intended purpose only.

Performance objectives

To be competent the learner must:	
1.	wear suitable personal protective equipment throughout all **housekeeping** and **equipment maintenance activities**
2.	select and use cleaning equipment which is: • of the right type • suitable for the task
3.	use resources economically and for their intended purpose only, following manufacturers' instructions and workplace procedures
4.	follow workplace policies, schedules and manufacturers' instructions when cleaning and maintaining hand tools and equipment
5.	clean the work area(s), for which they are responsible, at the specified time and frequency
6.	carry out **housekeeping activities** safely and in a way which minimises inconvenience to customers and staff
7.	follow the manufacturer's instructions when using cleaning and sanitising agents
8.	ensure their **housekeeping activities** keep their work area clean and free from debris and waste materials
9.	ensure their **equipment maintenance** activities keep their **work tools and equipment** fit for purpose
10.	dispose of used cleaning agents, materials and debris to comply with legal and workplace requirements
11.	store their **work tools and equipment** in a safe manner which permits ease of access and identification for use
12.	report any faulty or damaged tools and equipment to the relevant person(s) clearly and promptly
13.	report any anticipated delays in completion to the relevant person(s) promptly.

Supporting information

Scope of this unit

1. **Equipment maintenance** covers:
    a. routine checks on work tools and equipment
    b. cleaning work tools and equipment
    c. replacing minor parts
    d. visual inspection of electrical equipment.

2. **Housekeeping activities** cover:
    a. day to day work area cleaning
    b. clearing away
    c. dealing with spillages
    d. disposal of waste, used materials and debris.

3. **Work tools and equipment** are:
    a. hand
    b. electrical
    c. mechanical
    d. pneumatic
    e. hydraulic.

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

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. trainees' 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
    xiii. unserviceable PPE
d. 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:

The procedure as:

a. raise the alarm
b. fight fire only if appropriate
c. evacuate building
d. call for assistance.

Product warning labels to include:

a. reasons for placing warning labels on containers
b. warning labels in common use:
    i. toxic
    ii. corrosive
    iii. poisonous
    iv. harmful
    v. irritant
    vi. flammable
    vii. explosive.

Warning signs and notices

a. colours used for warning signs:
    i. red
    ii. blue
    iii. green
b. shapes and meaning of warning signs:
    i. round
    ii. triangular
    iii. square
c. the meaning of prohibitive warning signs in common use
d. the meaning of mandatory warning signs in common use
e. the meaning of warning notices in common use
f. general design of safe place warning signs.

Hazards and risks to include:

a. the difference between a risk and a hazard
b. potential risks resulting from:
    i. the use and maintenance of machinery or equipment

ii. the use of materials or substances
iii. accidental breakages and spillages
iv. unsafe behaviour
v. working practices that do not conform to laid down policies
vi. environmental factors
vii. personal presentation
viii. unauthorised personnel, customers, contractors etc entering your work premises
ix. working by the roadside
x. vehicle recovery

c. the employee's responsibilities in identifying and reporting risks within their working environment
d. the method of reporting risks that are outside your limits of authority
e. potential causes of:
    i. fire
    ii. explosion
    iii. noise
    iv. harmful fumes
    v. slips
    vi. trips
    vii. falling objects
    viii. accidents whilst dealing with broken down vehicles.

Personal responsibilities

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

Action to be taken in the event of colleagues suffering accidents

a. the typical sequence of events following the discovery of an accident such as:
    i. make the area safe
    ii. remove hazards if appropriate, ie switch off power
    iii. administer minor first aid
    iv. take appropriate action to reassure 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, ie 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.

Evidence requirements

1. You must produce evidence of cleaning the part of the work area for which you are responsible on 3 separate occasions.

2. You must produce evidence of undertaking basic, routine checks of all the following types of work tools and equipment on 3 separate occasions:
   a. hand
   b. electrical
   c. mechanical
   d. pneumatic
   e. hydraulic

3. You must be observed by your assessor cleaning the part of the work area for which you are responsible on at least 1 occasion and checking all the types of work tools and equipment specified above on at least 1 occasion.

4. You must produce evidence must include at least 2 instances of you cleaning the part of the work area for which you are responsible and at least 2 instances of you checking all the types of work tools and equipment specified above within your normal workplace.

Unit 002 Reduce Risk(s) to Health and Safety in the Motor Vehicle Environment

Level:	**5**
Credit value:	5
Endorsement by a regulatory body:	This unit is endorsed by IMI.
Aim:	This unit covers the basic, legally required health and safety duties of everyone in the workplace. It describes the competence required to ensure that: • own actions do not create any health and safety risks • the learner does not ignore significant risks in your workplace, and • the learner takes sensible action to put things right, including reporting situations which pose a danger to people in the workplace, and seeking advice from others. This unit does **not** require the learner to undertake a full Risk Assessment. It is about having an appreciation of significant risks in the workplace and knowing how to identify them and deal with them. When the learner has completed this unit, they will have proved they can: • identify hazards and evaluate risks in their workplace • reduce the risks to health and safety in their workplace.

Essential knowledge

The learner will need to understand:

1. Health and safety legislation and workplace policies	
1.1	their legal duties for health and safety in the workplace as required by the Health and Safety at Work Act 1974, and any other policies or procedures that govern their working practices
1.2	their duties for health and safety as defined by any specific legislation covering their job role
1.3	agreed **workplace policies** relating to controlling risks to health and safety
1.4	responsibilities for health and safety in their job description
1.5	the responsible persons to whom they report health and safety matters.

2. Risks to health and safety	
2.1	what hazards may exist in their workplace (eg slips, trips and falls)
2.2	health and safety risks which may be present in their own job role and the precautions they must take
2.3	the importance of remaining alert to the presence of hazards in the whole workplace
2.4	how to deal with and report risks
2.5	the importance of dealing with or promptly reporting risks
2.6	the requirements and guidance on the precautions
2.7	the specific workplace policies covering their job role
2.8	suppliers' and manufacturers' instructions for the safe use of equipment, materials and products
2.9	safe working practices for their own job role
2.10	the importance of personal presentation in maintaining health and safety in the workplace
2.11	the importance of personal conduct in maintaining the health and safety of themselves and others
2.12	the importance of personal protective equipment, when and where it should be used and the importance of maintaining it correctly
2.13	their scope and responsibility for rectifying risks
2.14	workplace procedures for handling risks which they are unable to deal with.

Performance objectives

To be competent, the learner must:	
1.	carry out their working practices in accordance with legal requirements
2.	identify the correct personal and vehicle protective equipment required to correctly carry out their workplace practices
3.	carry out their workplace practices using the correct personal protective equipment
4.	follow the most recent **workplace policies** for their job role
5.	rectify health and safety **risks** that are within their capability and scope of their job responsibilities
6.	pass on any suggestions for reducing **risks** to health and safety within their job role to the responsible persons
7.	ensure their personal conduct in the workplace does not endanger the health and safety of themselves or other persons
8.	follow the **workplace policies** and suppliers' or manufacturers' instructions for the safe use of equipment, materials and products
9.	report any differences between **workplace policies** and suppliers' or manufacturers' instructions as appropriate
10.	ensure their personal presentation at work: • ensures the health and safety of themselves and others • meets any legal duties • is in accordance with workplace policies.

Supporting information

Scope of this unit

1. **Risks** resulting from:
    a. the use and maintenance of machinery and equipment
    b. the use of materials or substances
    c. working practices which do not conform to laid down policies
    d. unsafe behaviour
    e. accidental breakages and spillages
    f. environmental factors
    g. working at height
    h. lifting operations and manual handling
    i. incorrect use of personal protective equipment

2. **Workplace policies** cover:
    a. the use of safe working methods and equipment
    b. the safe use of hazardous substances
    c. smoking, eating, drinking and drugs
    d. what to do in the event of an emergency
    e. personal presentation
    f. personal protective equipment
    g. lifting operations and manual handling
    h. working at heights
    i. mobile phones and personal stereo equipment

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

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. trainees' 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
    xiii. unserviceable PPE
d. 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. CO_2
    iv. water
    v. fire blanket.

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

The procedure as:

a. raise the alarm
b. fight fire only if appropriate
c. evacuate building
d. call for assistance.

Product warning labels to include:

a. reasons for placing warning labels on containers
b. warning labels in common use:
    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, ie switch off power
    iii. administer minor first aid
    iv. take appropriate action to reassure 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, ie 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.

Evidence requirements

1. You must produce evidence to demonstrate competence in identifying hazards with reference to working activities or aspects of the workplace and acting upon your decisions as to whether the hazard presents a high or low risk.

2. You must produce evidence of identifying risks which may result from at least 2 of the items listed below:
   a. the use and maintenance of machinery or equipment
   b. the use of materials or substances
   c. working practices which do not conform to laid down policies
   d. unsafe behaviour
   e. accidental breakages and spillages
   f. environmental factors
   g. working at height
   h. lifting operations and manual handling
   i. incorrect use of personal protective equipment

3. You must produce evidence of following at least 4 of the workplace policies listed below:
   a. the use of safe working methods and equipment
   b. the safe use of hazardous substances
   c. smoking, eating, drinking and drugs
   d. what to do in the event of an emergency
   e. personal presentation
   f. personal protective equipment
   g. lifting operations and manual handling
   h. working at height
   i. mobile phones and personal stereo equipment

4. You must be observed following workplace policies on at least 2 occasions.

5. You must produce evidence of the risks you have identified from at least 1 of the items listed, and at least 3 instances of you following workplace policies, within your normal workplace.

Unit 003 Maintain Working Relationships in the Motor Vehicle Environment

Level:	**6**
Credit value:	7
Endorsement by a regulatory body:	This unit is endorsed by IMI.
Aim:	This unit is about maintaining good working relationships with all colleagues in the working environment by using effective communication and support skills.

Essential knowledge

The learner will need to understand:

1. Their responsibilities and constraints	
1.1	their own and their colleague's job role and limits of responsibility for giving advice and support
1.2	the operational constraints which may affect interaction with colleagues
1.3	lines of communication within their workplace.

2. Communication skills and working relationships	
2.1	how to use suitable and effective spoken communication skills when responding to and interacting with others
2.2	how to adapt written and spoken communication methods to satisfy the needs of colleagues
2.3	how to report problems using written and spoken methods of communication
2.4	the importance of developing positive working relationships with colleagues – the effect on morale, productivity, and company image
2.5	the importance of accepting other peoples' views and opinions
2.6	the importance of making and honouring realistic commitments to colleagues.

Performance objectives

To be competent, the learner must:	
1.	contribute actively to team working by initiating ideas and co-operating with colleagues
2.	respond promptly and willingly to requests for assistance from **colleagues** which fall within the limits of their own job responsibilities and capabilities
3.	where requests fall outside their responsibility and capability, refer colleagues to the relevant person(s)
4.	give colleagues sufficient, accurate information and support to meet their work needs
5.	make **requests for assistance** to **colleagues** clearly and courteously
6.	use methods of communication which meet the needs of colleagues
7.	treat colleagues in a way which shows respect for their views and opinions and promotes goodwill
8.	make and keep achievable commitments to **colleagues**
9.	inform colleagues promptly of any problems or information likely to affect their own work.

Supporting information

Scope of this unit

1. **Colleagues** are:
    a. immediate work colleagues
    b. supervisors and managers.

2. **Requests for assistance** covering:
    a. technical assistance
    b. personal assistance.

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.

Sections within a typical vehicle repair business

a. reception
b. body shop
c. service repair workshop
d. valeting
e. parts
f. sales
g. administration.

Different sources of information in an automotive work environment

a. other staff
b. manuals
c. parts lists
d. computer software / internet
e. manufacturer
f. diagnostic equipment.

Locating and using correct documentation and information for:

a. recording vehicle maintenance and repairs
b. vehicle specifications
c. component specifications
d. oil and fluid specifications
e. equipment and tools
f. identification codes.

Alternative methods of communication

a. verbal
b. signs and notices
c. memos
d. telephone
e. electronic mail
f. vehicle job card
g. notice boards
h. SMS text messaging.

Communication with a supervisor

a. referral of problems
b. reporting delays
c. additional work identified during repair or maintenance
d. keep others informed of progress.

Agreed timescales

a. relationship between time and cost
b. customer expectation.

Evidence requirements

1. You must produce evidence that you have worked in a professional manner with employers, colleagues and customers/public.

2. You must be observed by your assessor on at least 3 occasions working in a professional manner with employers, colleagues and customers/public.

Unit 304 Use of Tools and Equipment in Motor Vehicle Environments

Level:	**5**
Credit value:	11
Endorsement by a regulatory body:	This unit is endorsed by IMI.
Aim:	This unit is about the basic use of tools, materials and fabrications relevant to the Automotive Sector. This unit is about: • interpreting information • adopting safe and healthy working practices • selecting tools, materials and equipment. This unit is for those working in technical support roles. It is also appropriate for workshop planners.

Essential knowledge

The learner will need to know and understand:

1. the relevant organisational procedures developed to report and rectify inappropriate information and unsuitable resources, and how they are implemented
2. the types of information, their source and how they are interpreted
3. the relevant organisational procedures to solve problems with the information and why it is important they are followed
4. the relevant legislation and official guidance and how it is applied
5. what the accident reporting procedures are and who is responsible for making the reports
6. why and when personal protective equipment (PPE) should be used
7. the relevant requirements for the disposal of waste, used materials and debris taking into account relevant environmental factors
8. material properties relevant to the task and their appropriate applications
9. the appropriate use of materials for fabrication and repair
10. how to file, fit, tap, thread, cut and drill materials you are working on
11. how to select and use gaskets, sealants, seals, fittings and fasteners.

Performance objectives

The learner must be able to:

1. select and use suitable personal protective equipment appropriate to the task
2. interpret the information supplied relating to the task
3. carry out pre-start preparation inspections on tools and equipment in accordance with approved procedures
4. carry out operations using tools and equipment in accordance with safe working practices to achieve the work outcome
5. highlight and identify problems associated with tools and equipment to the relevant person
6. demonstrate work skills to manufacture and repair components using measure, mark out, file, fit, tap, thread, cut, drill, finish, position and secure
7. use and maintain the relevant tools and equipment
8. dispose of waste in accordance with relevant legislation including environmental to maintain a clean work space
9. carry out checks in accordance with manufacturer's/operator's guidance, schedules, relevant legislation and official guidance and relevant organisational requirements
10. demonstrate correct selection of materials for manufacture or repair
11. inspect, clean and store tools and equipment after use.

Supporting information

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

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

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

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

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

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

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

Common electrical terms when measuring:

a. voltage
b. current
c. resistance.

Workshop equipment (including appropriate PPE) to include:

a. hydraulic jacks
b. axle stands
c. pillar drills
d. air tools
e. vehicle lifts

f. cranes
g. hoists
h. electrical power tools.

The properties, application and limitations to include safe use of ferrous and non-ferrous metals

Materials to include:

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

The properties, application and limitations to include safe use of non-metallic materials

Materials to include:

a. glass
b. plastics
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.

Evidence requirements

1. You must produce evidence that you have interpreted information, adopted safe and healthy working practices using tools and equipment and correctly selected materials and equipment.

2. You must produce evidence of the following 11 work skills listed below:
   a. measure
   b. mark out
   c. file
   d. fit
   e. tap
   f. Thread
   g. Cut
   h. Drill
   i. Finish
   j. Position
   k. Secure

3. You must produce evidence of fabricating at least 1 item from suitable materials to known tolerances, which includes the following processes:
   a. filing
   b. tapping threads
   c. cutting
   d. drilling
   e. joining

4. You must be observed by your assessor carrying out routine checks during stages of fabrication.

Unit 306 Enable Learning Through Demonstration and Instruction

Level:	**7**
Credit value:	7
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about demonstrating skills and methods to learners and instructing learners in procedures and processes. These include; demonstrating how equipment is used, showing a learner how to do something, giving learners instructions on what to do or how to carry out a particular activity, deciding when you should use demonstration or instruction to encourage learning, reviewing the potential use of technology-based learning, checking on the progress of learners and giving feedback to learners.

Essential knowledge

The learner will need to understand:

The nature and role of demonstrations and instruction	
K1	the separate areas of demonstrations which encourage learning
K2	which types of learning are best achieved and supported through demonstrations
K3	how to identify and use different learning opportunities
K4	how to structure demonstrations and instruction sessions
K5	how to choose from a range of demonstration techniques.

Principles and concepts	
K6	how to put learners at their ease and encourage them to take part
K7	how to choose between demonstration and instruction as learning methods
K8	how to identify individual learning needs
K9	which factors are likely to prevent learning and how to overcome them
K10	how to check learners' understanding and progress
K11	how to put information in order and decide whether the language you will be using is appropriate
K12	how to choose and prepare appropriate materials, including technology based materials
K13	the separate areas of instructional techniques which encourage learning
K14	which types of learning are best achieved and supported through instruction.

External factors influencing human resource development	
K15	how to make sure everybody acts in line with health, safety and environmental protection legislation and best practice

K16 how to analyse and use developments in learning and new ways of delivery, including technology-based learning.

Performance objectives

To be competent, the learner must:

Demonstrate skills and methods to learners
P1 base the demonstration on an analysis of the skills needed and the order they must be learned in
P2 ensure that the demonstration is accurate and realistic
P3 structure the demonstration so the learner can get the most out of it
P4 encourage learners to ask questions and get explanation at appropriate stages in the demonstration
P5 give learners the opportunities to practise the skill being demonstrated and give them positive feedback
P6 give extra demonstrations of the skills being taught to reinforce learning
P7 ensure that demonstrations take place in a safe environment and allow learners to see the demonstration clearly
P8 respond to the needs of learners during the demonstration
P9 reduce distractions and disruptions as much as possible.

Instruct learners
P10 match instruction to the needs of the learners
P11 identify which learning outcomes will be achieved through instruction
P12 ensure that the manner, level and speed of the instruction encourages learners to take part
P13 regularly check that learners understand and adapt instruction as appropriate
P14 give learners positive feedback on the learning experience and the outcomes achieved
P15 identify anything that prevents learning and review this with the learners.

Unit 306 Enable Learning Through Demonstration and Instruction

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.

Separate areas of demonstration which encourage learning, to include:

a. Demonstration is particularly applicable to learning manual skills.
b. Learning to do something usually involves:
   i. purpose – the aim or objective
   ii. procedure – the most effective way of completing the task
   iii. practice – all skills require practice to improve.
c. Practical tasks are more quickly learnt through demonstration.
d. Emphasis to body movements is required when demonstrating.
e. The demonstrator should encourage learners to ask questions.
f. Emphasis should be placed upon key points whilst demonstrating.
g. Any demonstration should ensure that all safety aspects are covered.

Types of learning which are best achieved and supported through demonstrations, to include:

a. Types of learning:
   i. psychomotor – measurement of manual skill performance
   ii. cognitive – learning involving thought processes
   iii. affective – demonstration of feelings, emotions or attitudes
b. Demonstration – involves learning to do something (Psychomotor Domain).
c. Combination of instruction and practical demonstrations are very effective means of learning practical skills.

How to structure demonstration and instruction sessions, to include:

a. Before the demonstration and/or instruction ensure that the following good practice is recognised:
   i. identify key points
   ii. relate theoretical underpinning knowledge to key points
   iii. rehearse to ensure that all equipment is working
   iv. ensure all students can see even small equipment and processes
   v. time the demonstration
   vi. consider how to make students participate
   vii. consider how to emphasise safe working practices.
b. During the demonstration and/or instruction good practice is to:
   i. give a clear introduction
   ii. identify any tools/equipment
   iii. determine the current audience level of knowledge
   iv. complete the demonstration correctly (do not show how not to do it)
   v. stress key points and show links between them
   vi. monitor safety aspects

vii. check learner understanding.

c. After the demonstration (if possible):
   i. enable the audience to practice the techniques
   ii. provide feedback on their performance.

How to identify individual learning needs

a. Diagnose the learning needs of your audience to include:
   i. what competencies they already have
   ii. what experience they have of the subject area
   iii. what competencies they need to achieve
   iv. what demonstration techniques are best suited to their needs
   v. how to assess their needs have been met.

What factors are likely to prevent learning to include:

a. Language barriers.
b. Physical barriers.
c. Specialist knowledge.
d. Pace of learning.
e. Method of delivery.
f. Environmental factors.
g. Teaching styles.
h. Dyslexia.

How to check learners understanding and progress

a. Questionnaires.
b. Verbal questioning.
c. Observation.
d. Assessment.
e. Role play.
f. Projects/assignments.
g. Multi-choice questions.
h. Simulation.
i. Tests.

How to organise information and prepare materials

a. Identify the course aim.
b. Identify the subject aim.
c. Identify the lesson aim.
d. Complete a lesson plan – plan the teaching.
e. Identify a series of 'cues' to be used during the lesson.
f. Logically organise the information.
g. Use suitable resources and equipment to maximise learning opportunities.
h. Assess the learner's progress and understanding.

Instructional techniques

a. Lectures.
b. Handouts.
c. Team teaching.
d. Peer teaching.
e. Discussion – individual, group and peer.
f. Question and answer.

g. Multimedia.
h. Seminars.
i. Case studies.
j. Project/assignments.

Environmental factors that effect learning

a. Environmental factors that should be considered before demonstration/instruction to include:
    i. loud noises
    ii. bright colours
    iii. bright lights
    iv. strong smells
    v. atmosphere
    vi. temperature
    vii. classroom seating
    viii. classroom layout.

Health and safety factors that affect learning

a. Health and safety factors that should be considered before demonstration/instruction to include:
    i. assessment of risk and hazards
    ii. condition of electrical/electronic equipment
    iii. position of cables and wires
    iv. safety of equipment used in demonstration/instruction
    v. condition of classroom equipment/furniture/structure
    vi. suitable protective clothing/equipment.

Analysis of demonstration/instruction to include:

a. Feedback from students.
b. Feedback from colleagues.
c. Organisational quality assessment.
d. Feedback from external organisations.
e. Awarding body requirements.

Developments in learning to include:

a. Multimedia based materials.
b. Web based materials.
c. Interactive materials.

How to choose and prepare appropriate materials, to include:

a. Putting information in order.
b. Deciding whether the language used is appropriate.
c. Type of material i.e. paper and technology based.

Evidence Requirements

1. You must produce evidence of enabling individuals to:
   a. acquire or improve skills and knowledge
   b. practice the application of skills and knowledge

2. You must be observed by your assessor on at least 1 occasion carrying out the above.

3. You must provide evidence of:
   a. providing feedback to learners
   b. encouraging learners to reflect on achievements and make improvements

4. You must be observed by your assessor on at least 1 occasion carrying out the above.

Unit 008 Identify and Agree the Motor Vehicle Customer Needs

Level:	**6**
Credit value:	10
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about: gaining information from customers on their perceived needs; giving advice and information and agreeing a course of action; contracting for the agreed work and completing all necessary records and instructions.

Essential knowledge

The learner will need to understand:

1. Legislative and organisational requirements and procedures	
1.1	the fundamental legal requirements of current consumer legislation and the consequences of their own actions in respect of this legislation
1.2	the content and limitations of company and product warranties for the vehicles dealt with by their company
1.3	the limits of their own authority for accepting vehicles
1.4	the importance of keeping customers informed of progress
1.5	their workplace requirements for the completion of records
1.6	how to complete and process all the necessary documentation.

2. Customer communication and care	
2.1	how to communicate effectively with, and listen to, customers
2.2	how to adapt their language when explaining technical matters to non-technical customers
2.3	how to use effective questioning techniques
2.4	how to care for customers and achieve customer satisfaction.

3. Company products and services	
3.1	the range of options available to resolve vehicle problems
3.2	the range and type of services offered by their company
3.3	the effect of resource availability upon the receipt of customer vehicles and the completion work
3.4	how to access costing and work completion time information.

Performance objectives

To be competent the learner must:
12. obtain sufficient, relevant information from the customer to make an assessment of their own and perceived vehicle needs

13. provide customers with accurate, current and relevant advice and information on:
    - suitable vehicle inspection, repair and/or service procedures
    - potential courses of action
    - the implications of courses of action
    - the estimated costs
14. provide advice and information clearly and in a form and manner which the customer will understand
15. actively encourage customers to ask questions and seek clarification during their conversation
16. support the accurate identification and clarification of customer and vehicle needs, by referring to:
    - vehicle data
    - operating procedures
17. before accepting the vehicle, agree with the customer and record:
    - the extent and nature of the work to be undertaken
    - the terms and conditions of acceptance
    - the cost
    - the timescale
18. confirm their customer's understanding of the agreement they have made
19. ensure their recording systems are complete, accurate, in the format required and signed by the customer where necessary
20. pass all completed records to the next person in the process promptly
21. gain further customer approval where the contracted agreement is likely to be exceeded.

Unit 008 Identify and Agree the Motor Vehicle Customer Needs

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.

Organisational requirements

a. Explain the organisation's terms and conditions applicable to the acceptance of customer vehicles.
b. Explain the content and limitations of vehicle and component warranties for the vehicles dealt with by your organisation.
c. Detail what, if any, limits there are to the authority for accepting vehicles.
d. Detail why it is important to keep customers advised of progress and how this is achieved within the organisation.
e. Detail the organisation's procedures for the completion and processing of documentation and records, including payment methods and obtaining customer signatures as applicable.

Principles of customer communication and care

a. First impressions.
b. Listening skills – 80:20 ratio.
c. Eye contact and smiling.
d. Showing interest and concern.
e. Questioning techniques and customer qualification.
f. Giving clear non-technical explanations.
g. Confirming understanding (statement/question technique, reflective summary).
h. Written communication – purpose, content, presentation and style.
i. Providing a high quality service – fulfilling (ideally exceeding) customer expectations within agreed time frames.
j. Obtaining customer feedback and corrective actions when dissatisfaction expressed.
k. Dealing with complaints.

Company products and services

a. Service standards:
    i. national
    ii. manufacturer
    iii. organisational.
b. The range and type of services offered by the organisation:
    i. diagnostic
    ii. servicing
    iii. repair
    iv. warranty
    v. MOT testing
    vi. fitment of accessories/enhancements
    vii. internal.

c. The courses of action available to resolve customer problems:
    i. the extent and nature of the work to be undertaken
    ii. the terms and conditions of acceptance
    iii. the cost
    iv. the timescale
    v. required payment methods.
d. The effect of resource availability upon the receipt of customer vehicles and the completion of work:
    i. levels and availability of equipment
    ii. levels and availability of technicians
    iii. workshop loading systems.
e. How to access costing and work completion time information:
    i. manuals
    ii. computer based.

Vehicle information systems, servicing and repair requirements

a. Accessing technical data including diagnostics.
b. Servicing to manufacturer requirements/standards.
c. Repair/operating procedures.
d. MOT standards/requirements.
e. Quality controls – interim and final.
f. Requirements for cleanliness of vehicle on return to customer.
g. Handover procedures.

Consumer legislation to include:

a. Consumer protection.
b. Sale of goods.
c. Data protection.
d. Product liability.
e. Health and safety.
f. Discrimination.

Evidence requirements

1. You must produce evidence, including records, to show that you have dealt with 3 different customers on three separate occasions.
2. You must be observed by your assessor in your normal workplace dealing with at least 1 customer.

Unit 310 Motor Vehicle Body Adhesive Bonding Operations

Level:	**5**
Credit value:	7
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about joining materials effectively using adhesive bonding processes.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-375 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.2 1.3 1.6** This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

K1	the health, safety and legal requirements relating to the joining of materials using adhesive processes
K2	your workplace procedures for:
	K2.1 the referral of problems
	K2.2 reporting of delays to the completion of work
	K2.3 completion of work records
K3	the work that needs to be done and the standard required
K4	the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using adhesive processes
K5	the importance of selecting, using and maintaining the appropriate personal protective equipment when the joining of materials using adhesive processes
K6	how to find, interpret and use sources of information applicable to the joining of materials using adhesive processes
K7	how to select, check and use all the tools and equipment required to join materials using adhesive processes
K8	the different types of techniques and joints used for the joining of materials when using adhesive processes
K9	the faults that can occur when carrying and using adhesives and the causes of these faults
K10	the need for correct alignment of materials and the methods used to achieve this
K11	the types of quality control checks that can be used to ensure correct joining of materials
K12	how to carry out and assess test coupons.
K13	the principles of good joint design for the type of adhesive being used

Performance objectives

P1 use the appropriate personal protective equipment when carrying out adhesive processes

P2 protect the vehicle and its contents effectively when carrying out adhesive processes

P3 prepare material and align to enable suitable join to be achieved. Adjoining edges must be treated before joining

P4 select and use the correct **tools and equipment** for carrying out adhesive processes

P5 ensure that the **tools, equipment and PPE** they require are in a safe working condition

P6 set up their equipment to carry out adhesive processes.

P7 carry out adhesive processes following:

- P7.1 recognised researched repair methods
- P7.2 your workplace procedures
- P7.3 health, safety and legal requirements

P8 avoid damaging other components, units and panels on the vehicle

P9 recognise when your joint is not forming correctly and what action needs to be taken

P10 visually check integrity of the join

P11 dress and protect the repaired area to inhibit corrosion where applicable

P12 clean and store PPE and equipment in appropriate manner

P13 report any additional faults you notice during the course of your work to the relevant person(s) promptly

P14 report any delays in completing your work to the relevant person(s) promptly

P15 carry out adhesive processes within the agreed timescale

P16 complete work records accurately, in the format required and pass them to the relevant person(s) promptly.

Supporting information

Scope of this unit

1. Examples of **PPE for adhesive bonding processes** includes:
    a. dust mask with appropriate eye shield
    b. flame retardant coveralls
    c. flame retardant gauntlets
    d. steel toe cap boots
    e. appropriate vehicle protection
    f. appropriate protection for others in the workshop
    g. appropriate extraction/well ventilated area.

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 engineering materials using adhesives in a fabrication environment (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 housekeeping; ventilation and fume control equipment; first aid procedures and actions; hazardous substances and relevant sections of COSHH
d. the hazards associated with bonding fabricated components, and how they can be minimised
e. how to obtain the necessary drawings and joining specifications
f. how to extract information from research repair methodology in relation to the work undertaken
g. types of adhesives:
    i. compact
    ii. two parts
    iii. cyanoacrylate
    iv. anaerobic
    v. sealants
    vi. toughened
h. knowledge of curing mechanisms including:
    i. moisture/solvent evaporation
    ii. chemical/thermal reaction
    iii. exposure/exclusion to oxygen
    iv. the importance of recording shelf life, pot life, setting and curing times
    v. knowledge of adhesion and cohesion
i. understanding the material preparations that are required, and the equipment and consumables that are used
j. understanding the importance of working to organisational and bonding agent manufacturers' instructions whilst carrying out the bonding activities

k. understanding the methods and techniques used for bonding the materials (such as gluing, impact, chemical and thermal reaction techniques)
l. understanding the characteristics of the adhesives that are to be used
m. understanding the application of, and precautions to be taken when using, adhesives and solvents
n. understanding maintenance and care of tools and equipment
o. understanding methods of degreasing components and producing a keying surface
p. understanding type and suitability of adhesive; setting or curing requirements and time; strength and appearance
q. understanding common causes of defects associated with the bonding processes, and how to avoid them
r. understanding the effects of the environment on the bonding process (such as temperature humidity, cleanliness)
s. understanding how to identify, select, use, and clean, the appropriate bonding agent holding vessels, brushes, stirrers and spatulas, scrapers, knives, clamps and weights
t. understanding the importance of cleaning up after use, to ensure everything can be used again and to minimise the need for replacement of equipment
u. understanding 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
v. understanding how to check that completed joints are firm, sound and fit for purpose
w. understanding procedures for cleaning off surplus adhesive and tidying up the appearance of joints
x. understanding the extent of their own authority and whom they should report to if they have problems that they cannot resolve
y. understanding reporting lines and procedures, line supervision and technical experts.

Evidence requirements

1. You must produce evidence from your normal workplace of carrying out adhesive bonding operations in joining a vehicle body panel to a vehicle on at least 3 separate occasions.

2. You must be observed by your assessor on at least 2 occasions in your normal workplace.

Unit 311 Supervisory Skills

Level:	**8**
Credit value:	14
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about ensuring that the work required in your area of responsibility is effectively planned and fairly allocated to individuals and/or teams. It also involves monitoring the progress and quality of the work of individuals and/or teams to ensure that the required level or standard of performance is being met and reviewing and updating plans of work in the light of developments. The 'area of responsibility' may be, for example, a branch or department or functional area or an operating site within an organisation. The unit is recommended for first line managers and middle managers.

Essential knowledge

The learner will need to know and understand:

K1 how to select and successfully apply different methods for communicating with people across an area of responsibility

K2 the importance of confirming/clarifying the work required in your area of responsibility with your manager and how to do this effectively

K3 how to identify and take due account of health and safety issues in the planning, allocation and monitoring of work

K4 how to produce a plan of work for your area of responsibility, including how to identify any priorities or critical activities and the available resources

K5 how to identify sustainable resources and ensure their effective use when planning the work for your area of responsibility

K6 the importance of seeking views from people working in your area and how to take account of their views in producing the plan of work

K7 the values, ethics, beliefs, faith, cultural conventions, perceptions and expectations of any team members from a different country or culture and how their own values, ethics, beliefs, faith, cultural conventions, perceptions, expectations, use of language, tone of voice and body language may appear to them

K8 why it is important to allocate work to individuals and/or teams on a fair basis and how to do so effectively

K9 why it is important that individuals and/or teams are briefed on allocated work and the standard or level of expected performance and how to do so effectively

K10 the importance of showing individuals and/or teams how their work fits with the vision and objectives of the area and those of the organisation

K11 ways of encouraging individuals and/or teams to ask questions and/or seek clarification in relation to the work which they have been allocated

K12 effective ways of regularly and fairly monitoring the progress and quality of work of individuals and/or teams against the standards or level of expected performance

K13 how to provide prompt and constructive feedback to individuals and/or teams

K14 why it is important to monitor their area for conflict and how to identify the cause(s) of conflict when it occurs and deal with it promptly and effectively how to take account of diversity and inclusion issues when supporting and encouraging individuals and/or teams to complete the work they have been allocated

K15 why it is important to identify unacceptable or poor performance by individuals and/or teams and how to discuss the cause(s) and agree ways of improving performance with them

K16 the type of problems and unforeseen events that may occur and how to support individuals and/or teams in dealing with them

K17 the additional support and/or resources which individuals and/or teams might require to help them complete their work and how to assist in providing this

K18 how to select and successfully apply different methods for encouraging, motivating and supporting individuals and/or teams to complete the work they have been allocated, improve their performance and for recognising their achievements

K19 how to log information on the ongoing performance of individuals and/or teams and use this information for formal performance appraisal purposes.

4. Industry/sector specific knowledge and understanding

K20 industry/sector requirements for the development or maintenance of knowledge, understanding and skills

K21 industry/sector specific legislation, regulations, guidelines, codes of practice relating to carrying out work.

Performance objectives

To be competent the learner must be able to:
22. confirm the work required in their area of responsibility with their manager and seek clarification, where necessary, on any outstanding points and issues 23. plan how the work will be undertaken, seeking views from people in their area of responsibility, identifying any priorities or critical activities and making best use of the available resources 24. ensure that work is allocated to individuals and/or teams on a fair basis taking account of skills, knowledge and understanding, experience and workloads and the opportunities for development 25. ensure that individuals and/or teams are briefed on allocated work, showing how it fits with the vision and objectives for the area and the overall organisation, and the standard or level of expected performance 26. recognise and seek to find out about differences in expectations and working methods of any team members from a different country or culture and promote ways of working that take account of their expectations and maximise productivity 27. encourage individuals and/or team members to ask questions, make suggestions and seek clarification in relation to allocated work 28. monitor the progress and quality of the work of individuals and/or teams on a regular and fair basis against the standard or level of expected performance and provide prompt and constructive feedback 29. support individuals and/or teams in identifying and dealing with problems and unforeseen events 30. motivate individual and/or teams to complete the work they have been allocated and provide, where requested and where possible, any additional support and/or resources to help completion 31. monitor their area for conflict, identifying the cause(s) when it occurs and dealing with it promptly and effectively 32. identify unacceptable or poor performance, discuss the cause(s) and agree ways of improving performance with individuals and/or teams 33. recognise successful completion of significant pieces of work or work activities by individuals and/or teams 34. use information collected on the performance of individuals and/or teams in any formal appraisals of performance 35. review and update plans of work for their area, clearly communicating any changes to those affected.

Supporting information

Skills

Listed below are the main generic 'skills' which need to be applied in allocating and monitoring the progress and quality of work in the learner's area of responsibility. These skills are explicit/implicit in the detailed content of the unit and are listed here as additional information:

- communicating
- consulting
- decision making
- delegating
- information management
- leadership
- managing conflict
- monitoring
- motivating
- planning
- problem solving
- providing feedback
- prioritising
- reviewing
- setting objectives
- stress management
- valuing and supporting others.

Evidence Requirements

The learner must:

1. You must be observed by an assessor as defined by the IMI Assessment Strategy on communication techniques to include body language, tone of voice and words used the following situations:
   a. reasons for allocation of work
   b. quality and timing of work expectations have been met or exceeded
   c. quality or timing of work expectations have not been achieved
   d. customer complaint

2. You must produce evidence on at least 2 occasions where prompt and accurate feedback has been given to a team or individual.

3. You must produce evidence of planning work on at least 3 occasions to be undertaken to include:
   a. fair allocation of work to complement an individual's skill set
   b. allocation of work to provide an individual with experience
   c. allowing for health and safety issues

4. You must produce evidence of regularly monitoring progress and quality of work. Evidence may be obtained from:
   a. customer feedback
   b. time taken to complete the work
   c. quality inspection on completion of work

5. You must be observed by an assessor as defined by the IMI Assessment Strategy dealing with at least 2 of the following situations:
   a. customer complaint
   b. unacceptable or poor performance of a team or individual
   c. conflict

Unit 312 Motor Vehicle Body Mechanical Fastening Operations

Level:	**5**
Credit value:	7
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about joining materials effectively using mechanical joining techniques.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-374 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.2 1.3 1.6** This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

K1	the health, safety and legal requirements relating to the joining of materials using mechanical joining techniques and processes
K2	your workplace procedures for:
	K2.1 the referral of problems
	K2.2 reporting of delays to the completion of work
	K2.3 completion of work records
K3	the work that needs to be done and the standard required
K4	the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using mechanical joining techniques.
K5	the importance of selecting, using and maintaining the appropriate personal protective equipment when joining of materials using mechanical joining techniques
K6	how to find, interpret and use sources of information applicable to the joining of materials using mechanical joining techniques
K7	how to select, check and use all the tools and equipment required to join materials using mechanical joining techniques
K8	how to select and use the correct mechanical fastener considering the materials used, strength required, anticipated loading, grip range, maintenance, appearance and cost
K9	the different types of techniques and joints used for the joining of different types of materials when using mechanical joining techniques
K10	the faults that can occur when mechanical joining and the causes of these faults
K11	the need for correct alignment of materials and the methods used to achieve this
K12	the types of quality control checks that can be used to ensure correct joining of materials
K13	how to carry out and assess mechanical joining.

Performance objectives

P1 use the appropriate personal protective equipment when carrying out **mechanical joining operations**

P2 protect the vehicle and its contents effectively when carrying out **mechanical joining operations**

P3 prepare material and align to enable suitable join to be achieved

P4 (Meeting flanges must be treated before joining)

P5 select and use the correct **tools and equipment** for carrying out **mechanical joining operations**

P6 ensure that the **tools, equipment and PPE** they require are in a safe working condition

P7 set up your equipment to carry out **mechanical joining operations**:

- P7.1 check suitability of joining technique
- P7.2 check suitability of tooling
- P7.3 check consumables are correct

P8 carry out mechanical joining operations following:

- P8.1 manufacturers processes, methods and procedures
- P8.2 your workplace procedures
- P8.3 health, safety and legal requirements

P9 avoid damaging other components, units and panels on the vehicle

P10 recognise when your joint is not forming correctly and what action needs to be taken

P11 check integrity of the join

P12 dress and protect the repaired area to inhibit corrosion where applicable

P13 clean and store PPE and equipment in appropriate manner

P14 report any additional faults you notice during the course of your work to the relevant person(s) promptly

P15 report any delays in completing your work to the relevant person(s) promptly

P16 carry out **mechanical joining operations** within the agreed timescale

P17 complete work records accurately, in the format required and pass them to the relevant persona(s) promptly

Supporting information

Scope of this unit

1. **PPE for vehicle body mechanical fastening operations,** including:
    a. face mask with appropriate eye shield
    b. flame retardant coveralls
    c. flame retardant gauntlets
    d. steel toe cap boots
    e. appropriate vehicle protection
    f. appropriate protection for others in the workshop.

2. **Mechanical joining operations,** including:
    a. riveting, (single sided, double sided, self piercing)
    b. clinching
    c. bolts and fasteners
    d. screwing, (self threading, self piercing)
    e. hybrid joining, (combinations of techniques listed that may also include adhesives).

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, using hot metal riveting techniques, 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 the learner's own authority and whom they should report to if they have problems that they cannot resolve
o. reporting lines and procedures, line supervision and technical experts.

Evidence requirements

1. You must produce evidence from your normal workplace of carrying out 4 of the 5* different types of joints listed below on at least 2 occasions:
   a. riveting
   b. clinching
   c. bolts and fasteners
   d. screwing
   e. hybrid joining (combinations of techniques listed that may also include adhesives)

2. You must be observed by your assessor on at least 2 occasions, each observation covering a different mechanical fastening joint. Both of the observations must be carried out in your normal workplace.

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of all of the mechanical fastening techniques.

Unit 313+365 Remove and Replace Motor Vehicle Body Panels Including Permanently Fixed Panels

Level:	**6**
Credit value:	15
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about removing a variety of exterior and sub-structure body panels and panel sections, including permanently fixed panels, where these are damaged and replaced with new or repaired replacements. The ability to weld vehicle panels is required.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-365 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.2** **1.3** **1.4** **1.6** **1.7** 1.8 2.2 3.1 3.4 4.1 4.4 4.6 4.8 4.9 4.16 4.17 This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

1. the health and safety legislation and workplace procedures relevant to workshop practices, personal and vehicle protection when removing and replacing vehicle body panels
2. the dangers of cross contamination of material such as aluminium and steel
3. the requirements of manufacturer's warranty agreements
4. the vehicle work specification agreed
5. your workplace procedures for the referral of problems, reporting of delays to the completion of work and personal protection
6. the requirements for protecting the vehicle and contents for damage before, during and after removing and replacing vehicle body panels
7. the importance of working to agreed timescales and keeping others informed of progress
8. the relationship between time, cost and profitability
9. the importance of reporting anticipated delays to the relevant person(s) promptly
10. how to prepare, test and use the tools and equipment required for the removal and replacement of vehicle body panels and ancillary fittings
11. how to operate resistance spot welding and Metal Inert Gas (MIG)/Metal Active Gas (MAG) welding equipment to achieve welds to the current British Standard
12. how to test Resistance Spot weld strength
13. how to carry out bonding/riveting cold repairs
14. the properties of component materials involved in the construction of the vehicle in the areas that will be worked on during repair
15. the properties of sealants, adhesives and anti-corrosion materials and the requirements for their safe use
16. the type of sealants and anti-corrosion materials to use and the manufacture's recommended methods for their application and thickness
17. how to use adhesive bonding materials
18. how to select and apply sealants and anti-corrosion materials
19. the principles of chassis frame and monocoque vehicle construction
20. how to remove vehicle manufacturers original joining techniques
21. how to identify manufacturer's joining techniques and how they may differ to the repair method
22. the principles of thermal and non-thermal joining techniques i.e. Spot welding, Metal Inert Gas (MIG)/Metal Active Gas (MAG), Bonding etc
23. the different types of mechanical fixings for vehicle body panels and when and why they should be used
24. the repair and welding implications of working with galvanised coatings, mild steels, HSS, UHSS and aluminium alloys
25. how panel removal and refitting affects the overall body structure if the vehicle
26. the causes and rectification of distortion resulting from welding

27. how to find, interpret and use sources of information relevant to the removal and replacement of vehicle body panels and assemblies
28. how to remove and replace vehicle body panels and assemblies
29. how to remove and replace door skins
30. how to establish cut lines for partial panel replacement
31. how to prepare all edges to be joined
32. how to select the correct joints and joining processes to match the repair area
33. the importance and implications of panel clamping and alignment to match existing contours and gaps
34. how to work safely avoiding damage to the vehicle and its systems
35. the importance and implications of checking the accuracy of repair work
36. the types of quality control checks that can be used to ensure correct alignment and contour of panels and the operation of components to manufacturer's specification
37. the methods of storing removed components and the importance of storing them correctly and in accordance with legal requirements

Performance objectives

To be competent the learner must:

1. identify component materials involved in the construction of the vehicle in the areas that will be worked on during repair, prior to working on the vehicle
2. wear suitable Personal Protective Equipment (PPE) throughout all **vehicle body panel** removal and replacement activities
3. inspect, prepare and use all the **tools and equipment** required, following manufacturers' instructions, prior to use
4. remove replace and/or refit all necessary **vehicle body panels** and assemblies following:
   - the manufacturer's methods/instructions
   - recognised researched repair methods
   - your workplace procedures
   - health, safety and legal requirements
5. seek guidance from the relevant person(s) promptly where there is the potential for their work to disturb other vehicle systems
6. use replacement body panels and assemblies which conform to the vehicle specifications for dimensions, materials and functional capability
7. use and apply sealants and weld primers and anti-corrosion treatments conforming to the material or vehicle manufacturer's specification
8. ensure all test weld pieces conform to the current British Standard for appearance and penetration
9. ensure permanently fixed panels are replaced without incurring damage to the vehicle systems
10. ensure all refitted body panels are aligned correctly with adjacent panels and fittings to manufacturers tolerances (panel gaps)
11. complete all removal and replacement activities within the agreed timescale
12. report any anticipated delays in completion to the relevant person(s) promptly.

Supporting information

Scope of this unit

1. **Body panels** are:
   a. non-permanently fixed body panels
   b. welded exterior
   c. welded sub-structure panels (eg rear quarter panel, rear panel, roof, chassis legs, inner wheel housing, boot floors, complete sill, A post, B post, C post, D post and cross members)
   d. bonded panels (eg any panel that is fixed by adhesive bonding as part of the original manufacturer's process).

2. **Fitting methods** are:
   a. welding
   b. mechanical fastening
   c. adhesive bonding.

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.

Selection and use of tools and equipment

a. how to prepare, test and use the tools and equipment required for the removal and replacement of vehicle body panels and ancillary fittings
b. how to operate spot welding and gas shielded arc-welding equipment to achieve welds to the current industry standard.

Selection and use of materials

a. the properties of sealants, adhesives and anti-corrosion materials and the requirement for their safe use
b. the type of sealants and anti-corrosion materials to use and the manufacturer's recommended methods of their application and thickness
c. how to use adhesive bonding materials
d. how to select and apply sealants and anti-corrosion materials
e. the properties and different types of materials used in the construction of vehicle bodies.

Removing and replacing vehicle body panels

a. the principles governing how unitary and separate chassis vehicle bodies are constructed
b. how to identify and remove spot and gas shielded arc welds to meet manufacturers' and current Industry Standards
c. how to identify the difference between manufacturers' processes and repair processes
d. the principles of resistance spot welding, gas shielded arc plug welding, gas shielded arc welding and gas shielded brazing
e. correct procedures for the removal and replacement of vehicle body panels

f. the manufacturer's approved methods of working for the removal and replacement of vehicle body panels
g. the different types of mechanical fixings for vehicle body panels and when and why they should be used
h. the repair and welding implications of working with:
    i. high strength steels (HSS)
    ii. low carbon steels (LCS)
    iii. aluminium alloys
    iv. galvanized coatings
    v. Boron steels
    vi. TRIP
    vii. TWIP
    viii. laminate
i. how panel removal and refitting affects the overall body structure of the vehicle
j. the cause and rectification of distortion resulting from welding
k. how to find, interpret and use sources of information relevant to the removal and replacement of vehicle body panels and assemblies
l. how to remove and replace vehicle body panels and assemblies
m. how to remove and replace door skins
n. how to establish cut lines for partial panel replacement
o. how to prepare all edges to be joined
p. how to select the correct joints and joining process to match the repair area
q. the importance and implications of panel clamping and alignment to match existing contours and gaps
r. how to test spot weld strength
s. how to load a vehicle onto a jig system to ensure correct alignment and positioning of new panels
t. how to remove and replace supplementary restraint systems (SRS) using the manufacturer's approved method
u. how to work safely avoiding damage to the vehicle and its systems
v. the importance and implications of checking accuracy of repair work
w. the types of quality control checks that can be used to ensure correct alignment and contour of panels and the operation of components to manufacturer's specification
x. the method of storing removed panels and the importance of storing them correctly.

Evidence requirements

1. You must produce evidence from your normal workplace of removing and replacing each type of vehicle body panel listed below:
   a. non permanently fixed body panels
   b. welded exterior panels
   c. a welded sub structure panel (e.g. rear quarter panel, rear panel, roof, chassis legs, inner wheel housing, boot floors, complete sill, A post, B post, C post, D post and cross members)
   d. bonded panels (e.g. any panel that is fixed by adhesive bonding as part of the original manufacturers process)
2. You must be observed by your assessor on at least 2 occasions carrying out different panel removal and replacement fitting methods.

Unit 314+364 Identify and Rectify Major Repairs to Motor Vehicle Body Panels

Level:	**6**
Credit value:	14
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about repairing complex and difficult to access damage to a range of body panel types using a variety of preparation and reinstatement techniques, including hydraulic reforming and panel beating to regain panel contour and structural integrity.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-364 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.2** **1.3** **1.4** **1.5** **1.6** 1.7 1.8 1.9 2.4 3.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.10 4.11 4.12 4.14 4.18 This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

1. the health and safety legislation and workplace procedures relevant to workshop practices and personal and vehicle protection when repairing **vehicle body panels**
2. the requirements of manufacturer's warranty agreements
3. the vehicle work specification agreed
4. their workplace procedures for:
   - the referral of problems
   - reporting of delays to the completion of work
   - personal protection
5. the requirements for protecting the vehicle and contents from damage before, during and after repairing **vehicle body panels**
6. the importance of working to agreed timescales and keeping others informed of progress
7. the relationship between time, cost and profitability
8. their workplace procedures for the referral of problems
9. the importance of reporting anticipated delays to the relevant person(s) promptly.
10. the principles governing the selection and use of hand tools for metal finishing and plastic filling repairs
11. the selection and use of panel beating and hydraulic reforming equipment, including specialist pulling systems
12. how to prepare, test, use and maintain the **tools and equipment** required to repair **vehicle body panels**
13. how to adapt hydraulic push equipment to perform pulling operations
14. the properties of component materials involved in the construction of the vehicle in the areas that will be worked on during repair
15. the types and selection of filling materials, their preparation and application
16. the properties, types, grades and use of abrasives used in the **vehicle body panel** repair process
17. the properties and safe use of types of filling materials used to repair panels
18. how to mix and apply fillers and stoppers used in repair
19. how to prepare the vehicle to avoid contamination
20. how to assess the extent of damage, including corrosion damage
21. the principles of chassis frame and monocoque vehicle construction
22. how body panel and component damage can affect other panels and the operation of vehicle systems
23. the factors determining the use of specific preparation and repair methods
24. the repair and joining technique implications of working with mild, high and ultra high strength steels, aluminium alloys, galvanised coatings
25. the consequences of using inappropriate repair methods
26. the principles associated with hot and cold shrinking
27. how heat can be used to assist reforming
28. how heating can affect the properties of steels
29. the techniques for identifying the type of plastics used for manufactured components
30. the procedures for reinstating anti-corrosion, sealant and sound deadening materials
31. the causes and rectification of distortion resulting from welding

32. the manufacturer's approved methods of working for the preparation and repair of **vehicle body panels** and components
33. the specification for panel shapes, dimensions and tolerances for the vehicles worked upon
34. the type of quality control checks that can be used to ensure the correct contour and standard of finish
35. how to interpret and use sources of information relevant to the repair of **vehicle body panels** and components
36. how to prepare damaged areas to facilitate **repairs**
37. how to prepare the panel surface prior to filling
38. how to repair corrosion damage
39. how to remove protective materials
40. how to repair and reinstate **vehicle body panel** contours and retain structural integrity to components using body filling operations, metal finishing, plastic filling, panel beating, panel shrinking, hydraulic reforming, specialist dent removal tools
41. the techniques for reshaping damaged **vehicle body panels** using hand and specialist tools
42. how to check the accuracy of reinstated **vehicle body panel** shape
43. how to complete **repair** to an agreed condition ready for refinishing process
44. how to work safely avoiding damage to the vehicle and its systems
45. how pedestrian safety aspects affect the reparability of vehicles.

Performance objectives

To be competent the learner must:
1. identify component materials involved in the construction of the vehicle in the areas that will be worked on during repair, prior to working on the vehicle
2. select suitable personal protective equipment to wear and use vehicle coverings throughout all **vehicle body panel repair activities**
3. inspect, prepare and use the **tools and equipment** required following manufacturers' instructions prior to use
4. ensure their methods of preparation leave sub-structure body panels: • clean • free from materials likely to hinder repair • free of surface finishes when required
5. prepare and reinstate **vehicle body panels** using the equipment recommended and following: • the manufacturer's methods/instructions • recognised researched repair methods • your workplace procedures • health, safety and legal requirements
6. seek guidance from the relevant person(s) promptly where there is the potential for their work to disturb other vehicle systems
7. ensure all test weld pieces conform to the current British Standard for appearance and penetration
8. ensure all repaired body panels are reinstated to their original specified shape and dimensions
9. complete repaired components to an agreed condition ready for refinishing processes
10. complete all repair activities within the agreed timescale
11. report any anticipated delays in completion to the relevant person(s) promptly.

Supporting information

Scope of this unit

1. **Repair activities** are:
    a. correction of severely distorted panels
    b. to difficult to access panel damage
    c. to splits on metal panels, using relevant joining technique
    d. to fractures on plastic panels.

2. **Vehicle body panels** are:
    a. non-permanently fixed exterior panels
    b. permanently fixed exterior component
    c. sub-structure component
    d. bonded panels.
3. **Reinstatement methods** are:
    a. panel beating
    b. panel shrinking
    c. hydraulic reforming
    d. resistance spot welding (dent pulling kits)
    e. MIG/MAG welding
    f. MIG brazing
    g. body filling operations
    h. metal finishing
    i. plastic repair
    j. specialist dent removal methods.

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.

Selection and use of tools and equipment

a. the principle governing the selection and use of hand tools for metal finishing and plastic repairs
b. the factors governing the selection and use of panel beating and hydraulic reforming equipment, including specialist pulling systems
c. how to prepare, test, use and maintain the tools and equipment required to repair vehicle body panels
d. how to adapt hydraulic push equipment to perform pulling operations.

Selection and use of materials

a. the types and selection of filling materials, their preparation and application
b. the properties, types, grades and use of abrasives used in the vehicle body panel repair process
c. the properties and safe use of types of filling materials used to repair panels including:
    i. plastic fillers
    ii. body solder
d. how to mix and apply plastic fillers.

Repairing vehicle bodies

a. how to prepare the vehicle to avoid contamination
b. how to assess the extent of damage, including corrosion damage
c. how unitary vehicle bodies and cabs are constructed
d. the principles of resistance spot welding, gas shielded arc plug welding and gas shielded arc brazing
e. how body panels and component damage can affect other panels and the operation of vehicle systems
f. the factors determining the use of specific preparation and repair methods
g. the repair and welding implications of working with:
    i. high strength steels (HSS)
    ii. low carbon steels (LCS)
    iii. aluminium alloys
    iv. galvanized coatings
    v. Boron steels
    vi. TRIP
    vii. TWIP
    viii. laminate
h. the consequences of using inappropriate repair methods
i. how heat can be used to assist reforming
j. how heating can affect the properties of steels
k. the techniques for identifying the types of plastics used for manufactured components
l. the procedures for reinstating anti-corrosion, sealant and sound deadening materials
m. the causes and rectification of distortion resulting from welding
n. the manufacturer's approved methods of working for the preparation and repair of vehicle body panels
o. the specification of panel shapes, dimensions and tolerances for the vehicle worked on
p. the type of quality control checks that can be used to ensure the correct contour and standard of finish
q. how to interpret and use sources of information relevant to the repair of vehicle body panels and components
r. how to prepare damaged areas to facilitate repairs
s. how to repair corrosion damaged panels
t. how to remove protective materials
u. how to repair and reinstate vehicle body panel contours and components using:
    i. body filling operations
    ii. metal finishing
    iii. plastic filling
    iv. panel beating
    v. panel shrinking
    vi. hydraulic reforming
    vii. specialist dent removal tools
    viii. spot welding
    ix. gas shielded arc welding
    x. gas shielded arc brazing
v. the techniques of reshaping damaged vehicle body panels using hand and specialist tools
w. how to check the accuracy of reinstated vehicle body panel shapes

x. how to finish repairs to a suitable condition for handing on to the painting stage
y. how to work safely avoiding damage to the vehicle and its systems.

Evidence requirements

1. You must produce evidence from your normal workplace of repairing each of the following repairs listed below on 2 separate occasions:
   a. severely distorted panels
   b. difficult to access panel damage
   c. fractures on plastic repair

2. You must produce evidence of covering 5 of the 8 techniques and processes* listed below in carrying out the repairs listed above:
   a. panel beating
   b. panel shrinking
   c. hydraulic forming
   d. MIG brazing
   e. body filling operations
   f. metal finishing
   g. plastic repair
   h. specialist dent removal

3. You must be observed by your assessor on at least 2 occasions in your normal workplace.

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of all of the techniques and processes.

Unit 317+367 Identify and Rectify Motor Vehicle Body Misalignment

Level:	**6**
Credit value:	16
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about the identification and realignment of vehicle distortion using body alignment jigs.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-367 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.3** 1.8 3.2 **1.4** 1.9 **1.5** 1.10 **1.6** **1.7** This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

1. the safety requirements specific to vehicle misalignment rectification
2. the health and safety legislation and workplace procedures relevant to workshop practices and personal and vehicle protection
3. the vehicle work specification agreed
4. the requirements of manufacturers' warranty agreements
5. your workplace procedures for:
   - the referral of problems
   - reporting of delays to the completion of the work
   - personal protection
6. the importance of working to agreed timescales and keeping others informed of progress
7. the relationship between time, cost and profitability
8. your workplace procedures for the referral of problems
9. your workplace requirements for keeping records
10. the importance of reporting anticipated delays to the relevant person(s) promptly.
11. the constraints the type of materials used in vehicle construction places on the choice of repair equipment
12. how to prepare, test and setup all equipment required for misalignment rectification
13. how to install vehicles on misalignment rectification equipment, including the use of lifting equipment
14. how to use rectification equipment including hand and powered tools, safety chains (safety measure), hydraulic push and pull, and body alignment jigs (bracket system and/or measuring system)
15. the correct use of clamps, restraints and supports to minimise additional damage during repair.
16. the principles of chassis frame and monocoque vehicle construction
17. the principles of damage assessment and identification of direct and indirect damage
18. the function of the pulling system and the criteria for selection – vector, pull arm, and tower systems, both floor mounted and bench mounted
19. how to use geometric principles of alignment in the absence of a data sheet
20. the properties of vehicle body construction materials
21. how to find, interpret and use sources of information relevant to the rectification of vehicle misalignment
22. how to establish the extent of misalignment using measuring equipment and/or measuring system
23. how to realign vehicles to the manufacturer's original specification
24. how to work safely avoiding damage to vehicles, personal injury and injury to colleagues
25. the importance of following manufacturers' and/or approved research repair methods (including use of materials and equipment)
26. the consequences of failing to follow manufacturers' and/or research repair methods or instructions and data sheets.

Performance objectives

To be competent the learner must:
1. use the appropriate personal protective equipment when carrying out all **rectification activities**
2. protect the vehicle, its contents and systems effectively when carrying out all **rectification activities**
3. support vehicle misalignment **rectification activities** by reviewing: • vehicle data from manufacturers • equipment data specific to the vehicle
4. prepare, test and adjust all the **tools and equipment** required, following manufacturers' instructions, prior to use
5. load and secure the vehicle to the body jig correctly following: • the manufacturer's instructions • health and safety requirements
6. establish the extent of the vehicle misalignment accurately and completely
7. align and anchor areas adjacent to the damage correctly, in a way that prevents further damage to the vehicle
8. attach the pulling system securely to the damaged components and operate it correctly to achieve the realignment required
9. operate the pulling system in a way that minimises the risk of injury to them and others
10. ensure their **rectification activities** restore the vehicle to the correct specification and tolerances
11. complete all **rectification activities** within the agreed timescale
12. report any anticipated delays in completion to the relevant person(s) promptly.

Supporting information

Scope of this unit

1. **Rectification activities** are:
    a. visual examination
    b. setting up
    c. measurement in conjunction with alignment measuring equipment
    d. realignment using pulling equipment.

2. **Tools and equipment** are:
    a. hand and powered tools
    b. measuring systems
    c. hydraulic push and pull
    d. body alignment jigs
    e. safety chains/wire/straps (safety measures).

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.

Selection and use of tools and equipment

a. the constraints the type of vehicle places on the choice of repair equipment
b. how to prepare, test and adjust all equipment required for misalignment rectification
c. how to install vehicles on misalignment rectification equipment, including the use of lifting equipment
d. how to use rectification equipment including:
    i. hand and power tools
    ii. safety chains
    iii. hydraulic push and pull
    iv. body jigs (bracket system and/or measuring system)
e. the correct use of clamps, restraints and supports to minimise additional damage during repair.

Realignment of vehicles

a. the principle of chassis frame and monocoque vehicle construction
b. the principle of damage assessment and identification of direct and indirect damage
c. the function of the pulling system and the criteria for selection:
    i. vector
    ii. pull arm
    iii. tower system
    iv. floor mounted
    v. bench mounted
d. how to use geometric principles of alignment in the absence of data sheets
e. the properties of vehicle body construction materials
f. how to find, interpret and use sources of information relevant to the rectification of vehicle misalignment

g. how to establish the extent of misalignment using measuring equipment and/or measuring system
h. how to realign vehicles to the manufacturers' original specification
i. how to work safely avoiding damage to vehicles, personal injury and injury to colleagues
j. the importance of following manufacturers' instructions and using their approved methods of working (including use of materials and equipment)
k. the consequences of failing to follow manufacturers' instructions and data sheets.

Evidence requirements

You must produce evidence from your normal workplace of rectifying vehicle body misalignment* covering all of the rectification activities listed below on at least 2 occasions:

a. visual examination
b. setting up
c. measurement in conjunction with alignment measuring equipment
d. realignment using pulling equipment

*Each vehicle re-alignment must have sustained misalignment of at least 2 critical measuring points.

Evidence from simulated activities is acceptable for this unit

Unit 319+369 Motor Vehicle Body MIG/MAG Welding Operations

Level:	**6**
Credit value:	15
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about joining materials correctly and effectively using MIG/MAG welding techniques and procedures.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-169 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.2 1.3** This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

K1 the health, safety and legal requirements relating to the joining of materials using MIG/MAG welding techniques

K2 your workplace procedures for:

- K2.1 the referral of problems
- K2.2 reporting of delays to the completion of work
- K2.3 completion of work records

K3 the work that needs to be done and the standard required

K4 the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using MIG/MAG welding techniques

K5 the importance of selecting, using and maintaining the appropriate personal protective equipment when the joining of materials using MIG/MAG welding techniques

K6 how to find, interpret and use sources of information applicable to the joining of materials using MIG/MAG welding techniques

K7 how to select, check, maintain and set up all of the tools and equipment required to correctly join materials using MIG/MAG welding techniques

K8 the different types of welding processes, techniques and joints used for the joining of materials when using MIG/MAG welding techniques

K9 the correct surface preparation methods to ensure a good MIG/MAG weld is achieved and the reasons why surface preparation is important

K10 the faults and defects that can occur when carrying out MIG/MAG welding and the common causes of these faults

K11 the need for correct alignment of materials and the methods used to achieve this

K12 the types of quality control checks that can be used to ensure correct joining of materials

K13 how to inspect and assess MIG/MAG welding in accordance to British Standards

K14 when MIG/MAG welding should be used to join materials

K15 the advantages of MIG/MAG welding techniques over other welding methods

K16 the different types of joint that can be used to join materials using MIG/MAG welding, including:

- lap plug
- lap seam
- butt joint
- brace joint
- fillet joint.

Performance objectives

To be competent the learner must:

P1 use the appropriate personal protective equipment when carrying out MIG/MAG welding operations

P2 protect the vehicle and its contents effectively when carrying out MIG/MAG welding operations

P3 prepare material and align to enable suitable join to be achieved

P4 (meeting flanges must be treated following manufacturers procedures before joining)

P5 select, set up and use the correct **tools and equipment** for carrying out MIG/MAG welding operations

P6 ensure that the **tools, equipment and PPE** they require are in a safe working condition

P7 set up their equipment to carry out MIG/MAG welding operations:

- P7.1 check suitability of gas/filler wire and size for material to be joined
- P7.2 check parameters are set correctly
- P7.3 check consumables are correct
- P7.4 feed rollers and welding tip

P8 carry out MIG/MAG welding operations following:

- P8.1 recognised researched repair methods(see guidance document)
- P8.2 test procedures and provide test coupons on equivalent material in accordance with British Standards
- P8.3 manufacturers processes, methods and procedures
- P8.4 their workplace procedures
- P8.5 health, safety and legal requirements

P9 avoid damaging other components, units, panels and surfaces on the vehicle and the surrounding work area

P10 recognise when their weld is not forming correctly and what action needs to be taken

P11 inspect and assess MIG/MAG weld quality in accordance with British Standards and manufacturers specification

P12 check integrity of weld and record the type of weld achieved on the appropriate paper work. Test pieces must be recorded and stored

P13 dress the joint area without reducing material thickness and protect the repaired area to inhibit corrosion where applicable

P14 clean and store PPE and equipment in appropriate manner

P15 report any additional faults they notice during the course of your work to the relevant person(s) promptly

P16 report any delays in completing your work to the relevant person(s) promptly

P17 carry out MIG/MAG welding operations within the agreed timescale

P18 complete work records accurately, in the format required and pass them to the relevant person(s) promptly.

Supporting information

Scope of this unit

1 Examples of **PPE for MIG/MAG welding operations** include:

- a face mask with appropriate eye protection
- b protective/flame retardant coveralls
- c protective/flame retardant gauntlets
- d steel toe cap boots
- e appropriate vehicle protection
- f appropriate protection for others in the workshop
- g fume mask.

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 working with MAGS or cored wire arc welding equipment (general workshop and site safety; appropriate personal protective equipment; fire prevention; protecting other workers from the effects of the welding arc; safety in enclosed/confined spaces; fume control; accident procedure; statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations; safe disposal of waste materials)

b. 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)

c. 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

d. the manual, MAGS or cored wire arc welding process (principles of fusion welding; AC and DC power sources; ancillary equipment; power ranges; care of equipment)

e. the consumables associated with MAGS 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)

f. the types of welded joints to be produced (fillet and butt welds, single and multi-run welds, sheet and sections; welding positions)

g. 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)

h. 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)

i. 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)

j. the importance of complying with job instructions and the welding procedure specification
k. 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)
l. 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)
m. personal approval tests and their applicability to the learner's work
n. the extent of the learner's own authority and whom they should report to if they have problems that they cannot resolve
o. reporting lines and procedures, line supervision and technical experts.

Evidence requirements

1. You must produce evidence from your normal workplace of carrying out 3 of the 4* different types of joints listed below on at least 2 occasions to join materials using MIG/MAG welding:
    a. lap plug
    b. lap seam
    c. butt joint
    d. fillet joint

2. You must be observed by your assessor on at least 1 occasion in your normal workplace.

Evidence from simulated activities is acceptable for this unit.

Unit 320+370 Carry Out Motor Vehicle Body Resistance Spot Welding Operations

Level:	**6**
Credit value:	14
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about joining materials correctly and effectively using resistance spot welding techniques.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-370 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.2 1.3 1.6** This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

1. Legislative and organisational requirements and procedures
1. the health, safety and legal requirements relating to the joining of materials using resistance spot welding techniques
2. your workplace procedures for carrying out appropriate risk assessment(s): • the referral of problems • reporting of delays to the completion of work • completion of work records
3. the constraints of the type of materials used in vehicle construction places on the choice of repair equipment
4. how to prepare, test and adjust all equipment required for Resistance Spot welding techniques
5. the work that needs to be done and the standard required
6. the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using Resistance Spot welding techniques
7. the importance of selecting, using and maintaining the appropriate Personal Protective Equipment (PPE) when the joining of materials using resistance spot welding techniques
8. how to find, interpret and use sources of information (including repair methods) applicable to the joining of materials using resistance spot welding techniques
9. how to select, check, maintain and set up all of the tools and equipment required to correctly join materials using Resistance Spot welding techniques
10. the different types of welding processes, techniques and joints used for the joining of materials when using Resistance Spot welding techniques
11. the correct surface preparation methods to ensure the correct Resistance spot weld is achieved and the reasons why surface preparation is important
12. the faults and defects that can occur when carrying out Resistance spot welding and the common causes of these faults
13. the need for correct alignment of materials and the methods used to achieve this
14. the types of quality control checks that can be used to ensure correct joining of materials e.g. test coupons
15. how to inspect and assess resistance weld quality in accordance to British Standards including: • weld pitch • indention • heat zone • nugget size • peel and shear test
16. the correct use of adhesives with Resistance Spot welding techniques

Performance objectives

To be competent the learner must:

1. use the appropriate personal protective equipment when carrying out resistance spot welding operations
2. protect the vehicle and its contents effectively when carrying out resistance spot welding operations
3. prepare material and align to enable suitable join to be achieved (mating flanges must be treated following manufacturers procedures before joining)
4. select, set up and use the correct **tools and equipment** in order to correctly carry out resistance spot welding operations
5. ensure that the **tools, equipment and PPE** they require are in a safe working condition and are correct for the joining operation that they are to be completing
6. set up their equipment to carry out spot welding operations:
   - check suitability air supply and pressure
   - check suitability of current supply
   - check consumables are correct
   - check suitability / serviceability of electrodes and tips
7. carry out spot welding operations following:
   - recognised researched repair methods(see glossary document)
   - test procedures in accordance to British Standards (peel/sheer/nugget size)
   - manufacturer's processes, methods and procedures
   - their workplace processes, methods and procedures
   - health, safety and legal requirements
8. avoid damaging other components, units, panels and surfaces on the vehicle and the surrounding work area
9. recognise when their weld is not forming correctly and what action needs to be taken
10. inspect and assess resistance spot weld quality in accordance to British Standards, including:
    - weld pitch
    - indention
    - heat zone
    - nugget size
    - peel and shear test
11. check integrity of weld and record the type of weld achieved on the appropriate paper work. Test pieces must be recorded and stored
12. dress and protect the repaired area to inhibit corrosion where applicable
13. clean and store PPE and equipment in appropriate manner
14. report any additional faults they notice during the course of their work to the relevant person(s) promptly
15. report any delays in completing their work to the relevant person(s) promptly
16. carry out resistance spot welding operations within the agreed timescale
17. complete work records accurately, in the format required and pass them to the relevant person(s) promptly.

Supporting information

Scope of this unit

1. Examples of **PPE for resistance spot welding operations** include:
    a. face mask with appropriate eye protection
    b. protective / flame retardant coveralls
    c. protective / flame retardant gauntlets
    d. steel toe cap boots
    e. appropriate vehicle protection
    f. appropriate protection for others in the workshop
    g. fume mask.

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 (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 arc voltage, 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 drawings and welding procedure specifications
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 the learner's work
n. the extent of the learner's own authority and whom they should report to if they have problems that they 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.

Evidence requirements

1. You must produce evidence from your normal workplace of carrying out resistance spot welding when joining a vehicle body panel to a vehicle on at least 3 separate occasions.

2. You must produce evidence of covering all the checks listed below to ensure the quality of the weld area:
   a. weld pitch
   b. indentation
   c. heat zone
   d. nugget size
   e. peel or shear test

3. You must be observed by your assessor on at least 2 occasions in your normal workplace.

Unit 321+371 Carry Out Motor Vehicle Body Metal Inert Gas (MIG) Brazing Operations

Level:	**6**
Credit value:	14
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about joining materials correctly and effectively using MIG brazing techniques and procedures.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-371 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.2 1.3 1.6** This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

1. the health, safety and legal requirements relating to the joining of materials using Metal Inert Gas (MIG) brazing techniques
2. your workplace procedures for carrying out appropriate risk assessment(s):
   - the referral of problems
   - reporting of delays to the completion of work
   - completion of work records
3. the work that needs to be done and the standard required
4. the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using Metal Inert Gas (MIG) Brazing techniques
5. the importance of selecting, using and maintaining the appropriate Personal Protective Equipment (PPE) when the joining of materials using Metal Inert Gas (MIG) Brazing techniques
6. how to find, interpret and use sources of information and repair methods applicable to the joining of materials using MIG brazing techniques
7. how to select, check, maintain and set up all of the tools and equipment required to correctly join materials using Metal Inert Gas (MIG) Brazing techniques
8. the different types of processes, techniques and joints used for the joining of materials when using Metal Inert Gas (MIG) Brazing techniques
9. the correct surface preparation methods to ensure a good Metal Inert Gas (MIG) Braze joint is achieved
10. the faults and defects that can occur when carrying out Metal Inert Gas (MIG) Brazing and the common causes of these faults
11. the need for correct alignment of materials and the methods used to achieve this
12. the types of quality control checks that can be used to ensure correct joining of materials
13. how to inspect and assess Metal Inert Gas (MIG) Brazing in accordance with recognised standards
14. when MIG brazing should be used to join materials
15. the advantages of MIG brazing over other joining methods
16. the different types of joint that can be used to join materials using MIG brazing, including:
    - lap plug
    - lap seam
    - butt joint.

Performance objectives

To be competent the learner must:	
1	use the appropriate personal protective equipment and check it is fit for purpose before carrying out Metal Inert Gas (MIG) Brazing operations
2	protect the vehicle and its contents effectively when carrying out Metal Inert Gas (MIG) Brazing operations
3	prepare material and align to enable suitable join to be achieved Mating flanges must be treated following manufacturers procedures before joining
4	select, set up and use the correct tools and equipment for carrying out Metal Inert Gas (MIG) Brazing operations
5	ensure that the tools, equipment and Personal Protective Equipment (PPE) you require are in a safe working condition
6	set up their equipment to carry out Metal Inert Gas (MIG) Brazing operations checking: • suitability of gas/filler wire and size for material to be joined • parameters are set correctly • consumables are correct • feed rollers and welding tip
7	carry out Metal Inert Gas (MIG) Brazing operations following: • recognised researched repair methods (see guidance document) • test procedures and provide test coupons on equivalent material in accordance with recognised standards • manufacturers processes, methods and procedures • your workplace procedures • health, safety and legal requirements
8	avoid damaging other components, standards, panels and surfaces on the vehicle and the surrounding work area
9	recognise when their braze is not forming correctly and what action needs to be taken
10	inspect and assess Metal Inert Gas (MIG) Braze weld quality in accordance to British Standards
11	check integrity of braze and record the type of joint achieved on the appropriate paper work
12	make sure test pieces must be recorded and stored
13	dress the joint area without reducing material thickness and protect the repaired area to inhibit corrosion where applicable
14	clean and store Personal Protective Equipment (PPE) and equipment in appropriate manner
15	report any additional faults they notice during the course of your work to the relevant person(s) promptly
16	report any delays in completing your work to the relevant person(s) promptly
17	carry out Metal Inert Gas (MIG) brazing operations within the agreed timescale
18	complete work records accurately, in the format required and pass them to the relevant person(s) promptly.

Supporting information

Scope of this unit

1. Examples of **PPE for MIG brazing operations** includes:
    a. face mask with appropriate eye protection
    b. protective/flame retardant coveralls
    c. protective/flame retardant gauntlets
    d. steel toe cap boots
    e. appropriate vehicle protection
    f. appropriate protection for others in the workshop
    g. fume mask.

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 minimised
c. principles of the relevant brazing process; terminology used in brazing
d. the key components and features of the equipment
e. how to extract the information required from drawings and brazing procedure specifications
f. operation of the machine controls and their function; care of equipment; control and storage of consumables
g. setting up and aligning the work pieces
h. monitoring the installation during the brazing process; recognition of problems, and action to be taken
i. problems that can occur with the brazing activities, materials, filler metals and joint defects
j. self-inspection of completed work
k. organisational quality systems (standards to be achieved; production records to be kept)
l. personal approval tests and their applicability to the learner's work
m. the extent of the learner's own authority and whom they should report to if they have problems that they cannot resolve
n. reporting lines and procedures, line supervision and technical experts.

Evidence requirements

1. You must produce evidence from your normal workplace of carrying out all of the different types of joints listed below on at least 2 occasions to join materials using MIG brazing:

a. lap slot
b. lap seam
c. butt joint

2. You must be observed by your assessor on at least 1 occasion in your normal workplace.

Evidence from simulated activities is acceptable for this unit.

Unit 322+372 Carry Out Motor Vehicle Body Cosmetic Aluminium Panel Welding Operations

Level:	**6**
Credit value:	14
Endorsement by a regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about repairing cosmetic aluminium panels correctly and effectively using appropriate welding techniques, materials and procedures Note: This standard is **NOT** to be used for structural aluminium work.
Assessment requirements:	**Performance objectives must** be assessed via a portfolio of evidence, gathered through observing the candidate at work. See the **Evidence Requirements** at the end of this unit for further details. Candidates **must** take the City & Guilds 4311-372 on-line multiple choice test, which partly covers the **Essential Knowledge** within this unit. Those **not** covered by the test are **Essential Knowledge statements** numbered: **1.2 1.3 1.6** This criteria **must** be assessed in one of the following ways: • oral or written questioning • professional discussion. Centres must keep an audit trail to show that candidates have covered all of the Essential Knowledge.

Essential knowledge

The learner will need to understand:

1. the health, safety and legal requirements relating to the cosmetic welding of materials using cosmetic aluminium welding operations
2. your workplace procedures for carrying out appropriate risk assessment(s):
   - the referral of problems
   - reporting of delays to the completion of work
   - completion of work records
3. the work that needs to be done and the standard required
4. the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using cosmetic aluminium welding operations
5. the importance of selecting, using and maintaining the appropriate personal protective equipment when the joining of materials using cosmetic aluminium welding operations
6. how to find, interpret and use sources of information applicable to the cosmetic welding of materials using cosmetic aluminium welding operations
7. how to select, check, maintain and set up all of the tools and equipment required to correctly join materials using cosmetic aluminium welding operations
8. the different types of welding processes, techniques, materials and joints used for the joining of materials when using cosmetic aluminium welding operations
9. the correct surface preparation methods to ensure a good cosmetic aluminium weld is achieved and the reasons why surface preparation is important
10. the faults and defects that can occur when carrying out cosmetic aluminium welding and the common causes of these faults
11. the need for correct alignment of materials and the methods used to achieve this
12. when cosmetic aluminium welding operations should be used
13. how to ensure cross contamination does not occur and the effect of cross contamination on aluminium.

Performance objectives

1. use the appropriate Personal Protective Equipment (PPE) and check that it is fit for purpose before carrying out cosmetic aluminium welding operations
2. protect the vehicle and its contents effectively when carrying out cosmetic aluminium welding operations
3. prepare material surfaces and align to enable suitable join to be achieved making sure mating flanges are treated following manufacturers procedures before joining
4. select, set up and use the correct **tools and equipment** in order to correctly carry out cosmetic aluminium welding operations
5. ensure that the **tools, equipment and Personal Protective Equipment (PPE)** you require are in a safe working condition and are correct for the joining operation that they are to be completing
6. set up your equipment to carry out cosmetic aluminium welding operations checking:
   - suitability of gas/filler wire and size for material to be joined
   - parameters are set correctly
   - consumables are correct
   - feed rollers and welding tip
   - test kit
7. carry out cosmetic aluminium welding operations following recognised researched repair methods
8. carry out cosmetic aluminium welding operations following test procedures and provide test coupons on equivalent material in accordance with recognised standards
9. carry out cosmetic aluminium welding operations following the manufacturers processes, methods and procedures, your workplace procedures as well as the relevant health, safety and legal requirements.
10. avoid damaging other components, units, panels and surfaces on the vehicle and the surrounding work area
11. recognise when your weld is not forming correctly and what action needs to be taken
12. inspect and assess cosmetic aluminium weld quality in accordance to recognised standards
13. check integrity of the weld and record the type of weld achieved on the appropriate paper work.
14. dress the joint area without reducing material thickness and protect the repaired area to inhibit corrosion where applicable
15. clean and store Personal Protective Equipment (PPE) and other relevant equipment in appropriate manner
16. report any additional faults you notice during the course of your work to the relevant person(s) promptly
17. report any delays in completing their work to the relevant person(s) promptly
18. carry out cosmetic aluminium welding operations within the agreed timescale
19. complete work records accurately, in the format required and pass them to the relevant person(s) promptly.

Supporting information

Scope of this unit

1. Examples of **PPE for aluminium welding operations** includes:
    a. face mask with appropriate eye protection
    b. protective / flame retardant coveralls
    c. protective / flame retardant gauntlets
    d. steel toe cap boots
    e. appropriate vehicle protection
    f. appropriate protection for others in the workshop
    g. fume mask.

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 working with aluminium welding equipment (general workshop and site safety; appropriate personal protective equipment; fire prevention; protecting other workers from the effects of the electric arc; safety in enclosed/confined spaces; fume control; accident procedure; 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 aluminium welding (live electrical components; current return [earth return]arrangements; the electric arc; fumes and gases; gas supply leaks; spatter; hot slag and metal; grinding and mechanical metal/slag removal; elevated working; enclosed spaces; slips, trips and falls), and how they can be minimised
c. 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)
d. the manual MIG welding process (principles of fusion welding; power sources; ancillary equipment; power ranges; arc initiation system; care and maintenance of equipment)
e. the consumables associated with MIG welding (types of filler wire; types of shielding gas; welding electrodes; gas supply and control; control and storage of consumables)
f. the types of welded joints to be produced (fillet and butt welds, single and multi-run welds, sheet and sections; welding positions)
g. setting up and restraining the joint (confirming correct set-up of joint; cleanliness of materials used; the use of jigs and fixtures, manipulators and positioners, restraining devices; tack welding size and spacing in relationship to material thickness)
h. preparing the equipment, and checks that need to be made to ensure that it is safe to use (condition of electrical connections, power return and current return [earth return] arrangements, operating parameters)
i. the techniques of operating the welding equipment to produce a range of joints in the various joint positions (fine tuning parameters; correct manipulation of torch; safe closing down of the welding equipment)

j. the importance of complying with job instructions and the welding procedure specification
k. 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)
l. the organisational quality systems used and weld standards to be achieved; weld inspection and test procedures used (including visual and non-destructive tests)
m. personal approval tests and their applicability to the learner's work
n. the extent of the learner's own authority and whom they should report to if they have problems that they cannot resolve
o. reporting lines and procedures, line supervision and technical experts.

Evidence requirements

1. You must produce evidence from your normal workplace of carrying out 3 of the 4* different types of joints listed below on at least 2 occasions to join materials using aluminium welding:
   a. lap seam
   b. lap plug
   c. butt joint
   d. fillet joint

2. You must be observed by your assessor on at least 1 occasion in your normal workplace.

Evidence from simulated activities is acceptable for this unit.

Appendix 1 Sources of general information

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

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

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

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

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- 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
- **Qualifications and Credit Framework (QCF)**: general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs
- **Events**: dates and information on the latest Centre events
- **Online assessment**: how to register for e-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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As the UK's leading vocational education organisation, City & Guilds is leading the talent revolution by inspiring people to unlock their potential and develop their skills. We offer over 500 qualifications across 28 industries through 8500 centres worldwide and award around two million certificates every year. City & Guilds is recognised and respected by employers across the world as a sign of quality and exceptional training.

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City & Guilds
1 Giltspur Street
London EC1A 9DD
www.cityandguilds.com

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