QUALIFICATION HANDBOOK

SCQF Level 3 Certificate and Diploma in Introduction to Vehicle Body and Paint Maintenance (3902-72)

August 2011 Version 1.0

City & Guilds

Qualification at a glance

Subject area	Vehicle Body and Paint Maintenance
City & Guilds number	3902
Last registration date	31/07/2014
Age group approved	All
Entry requirements	None
Assessment and grading	Practical Tasks and questions
Fast track	Not available
Support materials	Qualification handbook Practical tasks and questions Recording forms
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number
SCQF Level 3 Certificate in Body and Paint Maintenance	3902-72
SCQF Level 3 Diploma in Body and Paint Maintenance	3902-72

Contents

1	Introduction	4
2	Centre requirements	6
3	Delivering the qualification	9
4	Assessment	12
5	Units	13
Unit 310	Introduction to principles of vehicle body and interior cleaning	14
Unit 312	Introduction to vehicle workshop bench skills	16
Unit 313	Basics of vehicle body fitting	18
Unit 314	Basics of vehicle Mechanical Electrical Trim (MET)	20
Unit 315	Fundamental vehicle body repair techniques	22
Unit 316	Introduction to vehicle MAG welding techniques	24
Unit 317	Introduction to vehicle resistance spot welding techniques	27
Unit 318	Introduction to vehicle panel preparation techniques	30
Unit 320	Application of paint materials to vehicles using spray gun techniques	33
Unit 321	Mix foundation coat materials for spray gun application	35
Unit 322	Manufacture single tolerance vehicle body components	37
Unit 323	Prepare vehicle body panels for foundation coat materials using masking materials and techniques	40
Appendix 1	Relationships to other qualifications	43
Appendix 2	Sources of general information	44

1 Introduction

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

Area	Description
Who is the qualification for?	Candidates wanting to develop some of the key skills and understanding in motor vehicle systems. Successful candidates will have the basic skills needed to apply for an automotive apprenticeship or similar engineering pathway. This qualification could also be used as an 'interest' course for a wide range of learners.
What does the qualification cover?	These qualifications cover a variety of automotive related areas including: • vehicle engine systems • lubrication systems • fuel systems • vehicle electrical systems • braking systems • steering • suspension systems.
What opportunities for progression are there?	The qualifications allow candidates to progress into employment or to the following City & Guilds qualification: • City & Guilds SCQF Level 4 Diploma/Certificate/ Award in Introduction to Vehicle Systems Maintenance (3902-74)

Structure

The aims of this qualification are to:

- meet the needs of customers for a modern, up-to-date and flexible qualification. It has been written to enable assessment to be carried out on a variety of vehicle types
- meet the needs of candidates who want to work in the automotive sector but are lacking experience or knowledge, and is particularly appropriate for young learners
- allow candidates to progress towards the minimum qualifications or skills levels required for entry into the automotive sector
- replace the existing City & Guilds SCQF Level 3 Award in Automotive Vehicle Maintenance (qualification 3901) which closed for registration on 31/08/2010.

Qualification title	City & Guilds qualification number	Units required (inclusive)
SCQF Level 3 Diploma in Body and Paint Maintenance	3902-72	A minimum of 40 credits from (310, 312-318 and 320-323)
SCQF Level 3 Certificate in Body and Paint Maintenance	3902-72	A minimum of 24 credits from (310, 312-318 and 320-323)

City & Guilds unit	Unit title	SCQF credit
310	Introduction to principles of vehicle body and interior cleaning	4
312	Introduction to vehicle workshop bench skills	4
313	Basics of vehicle body fitting	4
314	Basics of vehicle mechanical electrical trim	4
315	Fundamental vehicle body repair techniques	4
316	Introduction to vehicle MAG welding techniques	3
317	Introduction to vehicle resistance spot welding techniques	2
318	Introduction to vehicle panel preparation techniques	3
320	Application of paint materials to vehicles using spray gun techniques	3
321	Mix foundation coat materials for spray gun application	2
322	Manufacture single tolerance vehicle body components	4
323	Prepare vehicle body panels for foundation coat materials using masking materials and techniques	4

The following certificates will be awarded to successful candidates on completion of the required combinations of units. Candidates completing one or more units, rather than the full qualification(s), will receive a Certificate of Unit Credit (CUC).

City & Guilds also provides the following documents specifically for this qualification:

Publication	Available from
SCQF Level 3 recording documents	**www.cityandguilds.com**
SCQF Level 3 practical assignments	**www.cityandguilds.com**

See Appendix 2 for sources of general information on City & Guilds qualifications.

2 Centre requirements

Approval

Centres already approved to offer the qualification SCQF Level 3 Automotive Vehicle Maintenance (3901) will be automatically approved to register and certificate candidates on the 3902-72 complex (unless the centre is already subject to sanctions).

To offer this qualification, new 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 qualification before designing a course programme.

Internal quality assurance

Approved centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications.

Quality assurance includes: initial centre approval, qualification approval and the centre's own internal procedures for monitoring quality. Centres are responsible for internal quality assurance, and City & Guilds is responsible for external quality assurance.

National standards and rigorous quality assurance are maintained by the use of:

- City & Guilds practical tasks, marked by the centre according to externally set marking criteria
- internal (centre) quality assurance
- City & Guilds external verification.

To meet the quality assurance criteria for this qualification, the centre must ensure that the following internal roles are undertaken:

- quality assurance co-ordinator
- assessor
- internal verifier/moderator
- examinations secretary.

Full details and guidance on the internal and external quality assurance requirements and procedures are provided in *Centre Manual - Supporting Customer Excellence,* together with full details of the tasks, activities and responsibilities of quality assurance staff.

In order to fully support candidates, centres are required to retain copies of candidates' assessment records for three years after certification.

External quality assurance

External verifiers are appointed by City & Guilds to approve centres, and to monitor the assessment and internal quality assurance carried out by centres. External verification is carried out to ensure that assessment is valid and reliable, and that there is good assessment practice in centres.

To carry out their quality assurance role, external verifiers/moderators must have appropriate occupational and verifying knowledge and expertise. City & Guilds external verifiers attend training and development designed to keep them up-to-date, to facilitate standardisation between verifiers and to share good practice.

External verifiers

The role of the external verifier is to:

- provide advice and support to centre staff
- ensure the quality and consistency of assessments within and between centres by the use of systematic sampling
- regularly visit centres to ensure they continue to meet the centre and qualification approval criteria
- provide feedback to centres and to City & Guilds

External quality assurance for the qualification will be provided by the usual City & Guilds external verification process. This includes the use of an electronically scannable report form which is designed to provide an objective risk analysis of individual centre assessment and verification practice. Further details of the role of external verifiers are given in *Centre Manual - Supporting Customer Excellence*.

Resource requirements

Physical resources and site agreements

Centres must have access to sufficient equipment in the centre or workplace to ensure candidates have the opportunity to cover all of the practical activities. The equipment, systems and machinery must meet industry standards and be capable of being used under normal working conditions.

Centre staffing

Centre staff must satisfy the requirements for occupational expertise for this qualification. These requirements are as follows:

- Staff should be technically competent in the areas for which they are delivering training and/or should also have experience of providing training.
- Assessors and tutors should have at least two years' recent relevant experience in the specific area they will be assessing. If this experience is part-time it should be over a period of five years.

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

Assessors and internal verifiers

Assessor and verifier requirements

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

Continuing professional development (CPD)

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

Candidate entry requirements

There are no formal entry requirements for candidates undertaking this qualification. However, centres must ensure that candidates have the potential and opportunity to be successful in gaining their qualification.

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

Age restrictions

There are no age limits attached to candidates undertaking the qualification.

3 Delivering the qualification

Initial assessment and induction

Centres will need to make an initial assessment of each candidate prior to the start of their programme to ensure they are entered for an appropriate type and level of qualification.

The initial assessment should identify any specific training needs the candidate may have, and the support and guidance they may require when working towards their qualification.

City & Guilds recommends that centres provide an induction programme to ensure the candidate fully understands the requirements of the qualification they will work towards, their responsibilities as a candidate, and the responsibilities of the centre. It may be helpful to record the information on a learning contract.

Further guidance about initial assessment and induction, as well as a learning contract that centres may use, are available in the *Centre Manual - Supporting Customer Excellence*.

Support materials

For further information to assist with the planning and development of the programme, please refer to the following:

- Practical training tasks
- Recording forms
- Useful material is available on SmartScreen.

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 e-portfolio, Learning Assistant, an easy-to-use and secure online tool to support and evidence learners' progress towards achieving qualifications. Further details are available at: **www.cityandguilds.com/eportfolios**.

City & Guilds has developed a set of recording forms specifically for this qualification. Recording forms and practical training tasks are available on the 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. Amendable (MS Word) versions of the forms are available on the City & Guilds website.

Recommended delivery strategies

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

Provided that the requirements for the qualification are met, centres may design course programmes of study in any way that they feel best meets the needs and capabilities of their candidates. Centres may wish to include topics as part of the course programme, which will not be assessed through the qualification.

Relationship to other qualifications and the wider curriculum

City & Guilds recommends centres to address the wider curriculum, where appropriate, when designing and delivering the course. Opportunities to address social, moral, spiritual and cultural issues, and environmental education and Health and Safety issues during the delivery of the qualification have been identified, and can be found in Appendix 2.

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.

Guidance on risk management of pre 16 candidates

Centres offering the SCQF Level 3 and Level 4 Award, Certificate and Diploma in Vehicle Systems and Body and Paint Maintenance (3902) to candidates under the age of 16 must assume responsibility for the safe delivery of the qualification. This will include those units that require using and working with power tools and machinery and using and working under lifts and hoists.

In order to ensure that the risk related to the delivery and assessment of this qualification is managed appropriately, City & Guilds requires the Head of Centre to provide a satisfactory risk assessment. The risk assessment should outline those activities within the units which, specific to the centre, may pose a risk or hazard to the safety of the candidate and identify how these risks/hazards will be managed to reduce or alleviate risk.

The risk assessment should be forwarded to your local City & Guilds regional office to be held on file. A copy should be retained by the centre and made available to a City & Guilds external verifier or representative on request.

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 *Providing City & Guilds qualifications*.

Equal opportunities

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

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

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

Access to assessment

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

Appeals

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

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

4 Assessment

For this qualification, candidates will be required to complete a specified number of assessment tasks for each unit, as defined within each unit. The assessment tasks may be completed in any order. Assessors/tutors will decide when each candidate should complete a task and will be expected to organise the tasks in a logical order according to the requirements of the candidates and the course. The assessment tasks are graded Pass or Fail. The Practical training tasks and Recording forms can be downloaded from the City & Guilds website.

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.

Assessment strategy

The units within this qualification must assess the candidate's practical skills and understanding for each unit.

This should be done by carrying out practical tasks with oral questioning. Centres can choose to use the example oral questions as a written exam as long as all of the necessary knowledge is covered.

Recognition of prior learning (RPL)

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

Registration and certification

Full details of City & Guilds' administrative procedures for this qualification are provided in the *Directory of qualifications*, provided online to City & Guilds registered centres via the Walled Garden. This information includes details on:

- registration procedures
- enrolment numbers
- fees
- entry for examinations
- claiming certification.

These details are also available in the *Directory of qualifications.*Centres should be aware of time constraints regarding the registration and certification periods for the qualification, as specified in the City & Guilds *Directory of qualifications*. Centres should follow all guidance carefully, particularly noting that fees, registration and certification end dates for the qualification are subject to change.

5 Units

Below is a list of the learning outcomes for all the units.

Structure of units

These units each have the following:

- City & Guilds reference number
- title
- level
- credit value
- unit aim
- information on assessment
- learning outcomes which are comprised of a number of assessment criteria
- notes for guidance.

Unit 310 Introduction to principles of vehicle body and interior cleaning

Level:	SCQF Level 3
Credit value:	4
GLH:	33
Aim	This unit is about the valeting of light vehicle interiors and exteriors.

Learning outcome	The learner will:
1. Be able to follow approved and safe procedures when valeting light vehicle interiors and exteriors	
The learner can: 1.1 correctly use required PPE 1.2. follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 identify the relevant information sources 1.5 state the importance of keeping records	

Learning outcome	The learner will:
2. Be able to carry out body and cleaning activities	
Assessment criteria	
The learner can: 2.1 identify the correct **equipment** and check it is fit for purpose 2.2 correctly use **equipment** 2.3 **examine** vehicle 2.4 demonstrate vehicle **cleaning activities** to include: internal, external, glass, wheels and tyres 2.4 state how to recognise and report cosmetic damage to vehicle components and units outside normal vehicle body and cleaning activities 2.5 identify wheel and tyre types and markings	

Unit 310 Introduction to principles of vehicle body and interior cleaning

Supporting information

Unit range

Approved workplace procedures

Safely handle and dispose of used and waste cleaning materials
Safely start and run engines in a confined space

Equipment

Pressure washer, cleaning cloths, sponges and brushes, vacuum cleaner

Examination

Visual, functional

Cleaning activities

Exterior, interior wheels, tyres, glass

Guidance

This unit can be adapted to suit a range of vehicle and engine types.

- Light vehicle
- Heavy vehicle
- Motorcycle
- Quad bike
- Horticulture vehicles

It is important that candidates have a good understanding of how to:

- work safely at all times
- protect the vehicle
- identify areas which need cleaning
- select the correct cleaning materials
- use the correct equipment
- show an ability to self assess their work
- report vehicle damage

Unit 312 Introduction to vehicle workshop bench skills

Level:	SCQF Level 3
Credit value:	4
GLH:	26
Aim	This unit is an introduction to the vehicle workshop bench skills needed to work in the automotive maintenance and repair industry.

Learning outcome	The learner will:
1.	Be able to follow approved and safe procedures when working on engine systems
Assessment criteria	
The learner can: 1.1 correctly use required PPE 1.2. follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 identify the relevant information sources 1.5 state the importance of keeping records	

Learning outcome	The learner will:
2.	Be able to carry out vehicle workshop bench skill techniques
Assessment criteria	
The learner can: 2.1 identify the correct **equipment** and check it is fit for purpose 2.2 correctly use **equipment** 2.3 state why materials properties are important 2.4 draw **simple sketches** 2.5 carry out vehicle workshop **bench skills and manufacturing techniques**	

Unit 312 Introduction to vehicle workshop bench skills

Supporting information

Unit range

Approved workplace procedures

Safely handle and dispose of used and waste components, and fluids
Safely start and run engines in a confined space

Equipment

Hand tools, centre punch, measuring equipment, specialist, hammer, files, taps, dies, drills, vice

Bench skills and manufacturing techniques

Joining techniques, making threads, cutting metals, measuring, bending, folding, filing

Simple sketches

Dimensions, materials, joining, thread

Guidance

This unit can be adapted to suit a range of vehicle and engine types.

- Light vehicle
- Heavy vehicle
- Motorcycle
- Quad bike
- Horticulture vehicles

It is important that candidates have a good understanding of:

- sketches and simple engineering drawings
- how to use tools and equipment correctly and safely
- how to carry out manufacturing techniques using bench skills

Unit 313 Basics of vehicle body fitting

Level:	SCQF Level 3
Credit value:	4
GLH:	38
Aim	This unit is about demonstrating the skills and knowledge required to remove and refit vehicle body components that are fixed using threaded fasteners. Learners will carry out adjustments as instructed, and with appropriate support and guidance take some responsibility for the outcomes of the activities.

Learning outcome	The learner will:
1. Be able to follow approved and safe procedures when removing and refitting detachable vehicle body panels	
Assessment criteria	
The learner can: 1.1 correctly use required PPE 1.2. follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 identify the relevant information sources 1.5 state the importance of keeping records	

Learning outcome	The learner will:
2. Be able to carry out the removal and replacement of detachable vehicle body components	
Assessment criteria	
The learner can: 2.1 identify the correct **hand tools** and check they are fit for purpose 2.2 correctly use **hand tools** 2.3 identify vehicle body panels using the correct terminology 2.4 correctly align **detachable vehicle body components** 2.5 identify the different types of fasteners 2.6 securely fix **detachable vehicle body components** 2.7 follow prescribed quality checks to ensure correct alignment and secure fixing.	

Unit 313 Basics of vehicle body fitting

Supporting information

Unit range

Workplace procedures

Minimising the risk of damage to self and others and their property, the vehicle, its systems, the environment.

Complying with good housekeeping practices and correctly store workshop hand tools during and after use.

Detachable vehicle body components

- bonnets
- doors
- tailgates
- bolt on wings.

Fasteners and fixings

- hexagonal head bolts
- nuts; plain hexagonal
- washers; plain and spring.

Hand tools should include**:**

- spanners; open end, ring and combination
- ratchet, strong bar, sockets and extension bars
- screwdrivers; cross point and plain.

Unit 314 Basics of vehicle Mechanical Electrical Trim (MET)

Level:	SCQF Level 3
Credit value:	4
GLH:	36
Aim	This unit is about demonstrating the skills and knowledge required to remove and refit vehicle mechanical, electrical and trim components. Learners will carry out adjustments as instructed, and with appropriate support and guidance take some responsibility for the outcomes of the activities.

Learning outcome	The learner will:
1. Be able to follow approved and safe procedures when removing and refitting detachable vehicle body panels	
Assessment criteria	
The learner can: 1.1 correctly use required PPE 1.2. follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 identify the relevant information sources 1.5 state the importance of keeping records	

Learning outcome	The learner will:
2. Be able to remove and replace MET components	
Assessment criteria	
The learner can: 2.1 identify the correct **hand tools** and check they are fit for purpose 2.2 correctly use **hand tools** 2.3 identify the different **types of vehicle** 2.4 identify vehicle **MET components** using the correct terminology 2.5 correctly align **MET components**. 2.6 identify the different types of **fasteners** 2.7 securely fix detachable vehicle body components 2.8 follow prescribed quality checks to ensure correct alignment and secure fixing.	

Unit 314 Basics of vehicle Mechanical Electrical Trim (MET)

Supporting information

Unit range

Approved workplace procedures

Minimising the risk of damage to self and others, their property, the vehicle, its systems, the environment.

Complying with good housekeeping practices and correctly storing workshop hand tools during and after use.

MET components

- Bumpers front and rear
- Rear lamps
- Front grille/trim
- Road wheel

Fasteners and fixings

- Hexagonal head bolts
- Nuts; plain hexagonal, wheel lock and plastic insert (nyloc)
- Washers; plain and spring
- Trim clips

Hand tools

- Spanners; open end, ring and combination
- Ratchet, strong bar, sockets and extension bars
- Screwdrivers; cross point and plain
- Torque wrench
- Vehicle jacks
- Axle stands
- Wheel brace
- Wheel chocks

Types of vehicle

Saloon, hatchback, sports, estate.

Unit 315 Fundamental vehicle body repair techniques

Level:	SCQF Level 3
Credit value:	4
GLH:	38
Aim	This unit is about demonstrating the skills and knowledge required to; complete preliminary vehicle body repair activities, identify the materials used, and with appropriate guidance take some responsibility for the quality of the work.

Learning outcome	The learner will:
1.	Be able to follow approved and safe procedures when carrying out preliminary body panel repairs
Assessment criteria	
The learner can: 1.1 correctly use required PPE 1.2. follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 identify the relevant information sources 1.5 state the importance of keeping records	

Learning outcome	The learner will:
2.	Be able to carry out body repair techniques
Assessment criteria	
The learner can: 2.1 identify the correct **hand and power tools** and check they are fit for purpose 2.2 correctly use **hand and power tools** 2.3 identify the panel/substrate **material** 2.4 rough out small dents using a variety of hand tools 2.5 mix and apply plastic body filler in an economical manner 2.6 rub down body filler to the correct profile 2.7 follow prescribed quality checks to ensure acceptable profile of repair.	

Unit 315 Fundamental vehicle body repair techniques

Supporting information

Unit range

Approved workplace procedures:

Minimising the risk of damage to self and others, their property, the vehicle, its systems, the environment.

Complying with good housekeeping practices and correct storage of workshop tools and equipment during and after use.

Materials:

- carbon steels
- plastic body filler
- flatting papers

Hand and power tools:

- hammers
- dollies
- filler applicators
- flatting blocks
- sanders; disc, and DA.

Unit 316 Introduction to vehicle MAG welding techniques

Level:	SCQF Level 3
Credit value:	3
GLH:	30
Aim	This unit is about the skills and knowledge required to; use MAG welding equipment to complete plug and lap welds in low carbon steel sheet (0.75 – 1mm), and carry out operational adjustments on the equipment.

Learning outcome	The learner will:
1. Be able to follow approved and safe procedures when using MAG welding equipment	
Assessment criteria	
The learner can: 1.1 state the health and safety requirements relevant to electric welding principles 1.2 correctly use required PPE 1.3 follow **approved workplace procedures** 1.4 identify **potential health and safety hazards and risks** 1.5 identify the relevant information sources 1.6 state the importance of keeping records.	

Learning outcome	The learner will:
2. Be able to produce MAG plug and lap welds	
Assessment criteria	
The learner can: 2.1 complete effective tacking of **materials** prior to lap and plug welding. 2.2 complete **effective** lap **welds** 2.3 complete **effective** plug **welds**.	

Learning outcome	The learner will:
3. Know the principles and techniques of using MAG welding processes.	
Assessment criteria	
The learner can: 3.1 state why it is important to use correct MAG **welding techniques** 3.2 state the purpose of the shielding gas 3.3 identify distortion caused by the application of heat.	

Unit 316 Introduction to vehicle MAG welding techniques

Supporting information

Unit range

Approved workplace procedures

Minimising the risk of damage to self and others, their property, the vehicle, its systems, the environment.

Complying with good housekeeping practices and correct storage of workshop tools and equipment during and after use

Health and safety hazards and risks

- heat
- fire
- burns
- ultra violet rays
- fumes
- arc eye
- spatter

Effective welds

When destructive testing is applied to effective welds the material will fail before the weld. The aesthetics of the weld is therefore of secondary importance.

Materials

Lap weld approximately 100mm x 60mm x 0.75mm – 1mm mild steel. With a length of 30mm and a pitch of 30mm.

Plug weld on material 150mm x 60mm x 0.75mm – 1mm mild steel using three plugs approximately 12mm in diameter over the length of material

All dimensions, length and pitch provided are for guidance only and may be modified to suit the local situation.

Welding techniques:

- torch angle inclination
- direction of torch travel
- speed of torch travel
- distance of torch from work piece
- tacking prior to welding
- preparation of material prior to welding
- cleaning and presentation of material post welding
- cleaning and presentation of MAG welding equipment post welding.

Unit 317 Introduction to vehicle resistance spot welding techniques

Level:	SCQF Level 3
Credit value:	2
GLH:	18
Aim	This unit is about the skills and knowledge required to; set up and use resistance spot welding equipment, complete sample welds in low carbon steel sheet (0.75 – 1mm) and carrying out destructive testing.

Learning outcome	The learner will:
1. Be able to follow approved and safe procedures when setting up and using resistance spot welding equipment	
Assessment criteria	
The learner can: 1.1 state the health and safety requirements relevant to electric welding principles 1.2 correctly use required PPE 1.3 follow **approved workplace procedures** 1.4 identify potential **health and safety hazards and risks** 1.5 identify the relevant information sources 1.6 state the importance of keeping records.	

Learning outcome	The learner will:
2. Be able to carry out resistance spot welding	
Assessment criteria	
The learner can: 2.1 set up resistance spot welding equipment to include: • welding arms • welding tips 2.2 adjust resistance spot welding equipment to include: • the voltage • timer mechanisms 2.3 prepare **materials** for resistance spot welding 2.4 complete resistance spot welding 2.5 complete destructive testing on resistance spot welds	

Learning outcome	The learner will:
3. Understand the principles and techniques of resistance spot welding processes	
Assessment criteria	
The learner can: 3.1 list the **variables of resistance spot welding** 3.2 state the methods used to check the effectiveness of resistance spot welds 3.3 identify distortion caused by the application of heat	

Unit 317 Introduction to vehicle resistance spot welding techniques

Supporting information

Unit range

Approved workplace procedures

Minimising the risk of damage to self and others, their property, the vehicle, its systems, the environment.

Complying with good housekeeping practices and correct storage of workshop tools and equipment during and after use.

Health and safety hazards and risks

- heat
- fire
- burns
- fumes
- spatter

Materials

All dimensions (approx 100mm x 25mm x 0.75 - 1mm) are for guidance only and may be modified to suit the local situation.

Variables of resistance spot welding

- heat
- pressure
- time

Unit 318 Introduction to vehicle panel preparation techniques

Level:	SCQF Level 3
Credit value:	3
GLH:	28
Aim	This unit is about demonstrating the skills and knowledge required to prepare vehicle body panels for subsequent paint coats while working under clear guidelines.

Learning outcome	The learner will:
1.	Be able to follow approved and safe procedures when preparing vehicle body panels
Assessment criteria	
The learner can: 1.1 correctly use required PPE 1.2 follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 identify the relevant information sources 1.5 state the importance of keeping records.	

Learning outcome	The learner will:
2.	Be able to prepare vehicle body panels
Assessment criteria	
The learner can: 2.1 identify the correct **hand, power tools and equipment** and check they are fit for purpose 2.2 correctly use **hand, power tools and equipment** 2.3 hand flat vehicle body panels 2.4 flat vehicle body panels using power tools 2.5 feather edge a repaired body panel 2.6 clean tools and equipment and obtain confirmation that that they are left in a clean and serviceable condition.	

Learning outcome	The learner will:
3. Know the materials used in vehicle body panel preparation.	
Assessment criteria	
The learner can: 3.1 identify the types and grades of **abrasive materials** used for vehicle body panel preparation 3.2 list the different types of **paint material** 3.3 list the different types of **paint coat**.	

Unit 318 Introduction to vehicle panel preparation techniques

Supporting information

Unit range

Approved workplace procedures

Minimising the risk of damage to self and others their property, the vehicle, its systems, the environment including the disposal of waste materials.

Complying with good housekeeping practices and correct storage of workshop tools and equipment during and after use.

Hand, power tools and equipment

- power sanders, pneumatic and electric
- dust extraction equipment
- airlines and power leads.
- flatting blocks

Abrasive materials

- scouring pads
- latting papers.

Paint materials

Thinners, activators, primers and undercoats

Paint coats

Primers and undercoats

Unit 320 Application of paint materials to vehicles using spray gun techniques

Level:	SCQF Level 3
Credit value:	3
GLH:	28
Aim	In this unit learners will be able to demonstrate the skills and knowledge required to apply foundation coat materials using a previously prepared and set spray gun.

Learning outcome	The learner will:
1.	Be able to follow approved and safe procedures when applying foundation coat materials.
Assessment criteria	
The learner can: 1.1 correctly use required PPE 1.2 follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 identify the relevant information sources 1.5 state the importance of keeping records 1.6 state the need for fume extraction when applying **foundation coat materials**.	

Learning outcome	The learner will:
2.	Be able to apply foundation coat materials.
Assessment criteria	
The learner can: 2.1 use a pre-prepared spray gun to apply **foundation coat materials** 2.2 identify the correct spray gun pattern 2.3 clean tools and equipment and obtain confirmation that that they are left in a clean and serviceable condition.	

Unit 320 Application of paint materials to vehicles using spray gun techniques

Supporting information

Unit range

Approved workplace procedures:

Minimising the risk of damage to self and others their property, the vehicle, its systems, the environment including the disposal of waste materials.

Complying with good housekeeping practices, maintaining a clean working environment and correct storage of workshop tools and equipment during and after use.

Foundation coat materials:

- etch primers, primers
- thinners
- activators

Unit 321 Mix foundation coat materials for spray gun application

Level:	SCQF Level 3
Credit value:	2
GLH:	18
Aim	In this unit learners will be able to demonstrate the skills and knowledge required to mix foundation coat materials for application by spray gun.

Learning outcome	The learner will:
1.	Be able to follow approved and safe procedures when preparing vehicle body panels.
Assessment criteria	
The learner can: 1.1 correctly use required PPE 1.2 follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 state the importance of controlling paint shop substances which may be hazardous to health 1.5 identify the relevant information sources 1.6 state the importance of keeping records	

Learning outcome	The learner will:
2.	Be able to mix foundation coat materials.
Assessment criteria	
The learner can: 2.1 use pre-selected technical information to support the mixing of **foundation coat materials** 2.2 use **hand tools** for mixing **foundation coat materials** 2.3 use measuring equipment for mixing **foundation coat materials** 2.4 mix **foundation coat materials** 2.5 clean tools and equipment and obtain confirmation that they are left in a clean and serviceable condition.	

Unit 321 Mix foundation coat materials for spray gun application

Supporting information

Unit range

Approved workplace procedures:

Minimising the risk of damage to self and others their property, the vehicle, its systems, the environment including the disposal of waste materials.

Complying with good housekeeping practices and correct storage of workshop tools and equipment during and after use.

Hand tools:

- mixing sticks
- measuring sticks
- mixing containers

Foundation coat materials:

- etch primers and primers.
- thinners
- activators

Unit 322 Manufacture single tolerance vehicle body components

Level:	SCQF Level 3
Credit value:	4
GLH:	36
Aim	This unit is about demonstrating the skills, knowledge and understanding required to use a range of workshop tools and equipment to manufacture typical vehicle body components which have a single 'critical or key' dimension. Typical tolerances being ± 1mm in sheet metal and ± 0.5mm in non-sheet materials.

Learning outcome	The learner will:
1.	Be able to follow approved and safe procedures when manufacturing vehicle body components.
Assessment criteria	
The learner can:	
1.1	use appropriate PPE and methods
1.2	follow **approved workplace procedures**
1.3	identify potential health and safety hazards and risks.
1.4	identify the relevant information sources.
1.5	state the importance of keeping records
1.6	state how to safely handle and dispose of used and waste materials, components and fluids.

Learning outcome	The learner will:
2.	Be able to use tools and equipment to manufacture vehicle body components
Assessment criteria	
The learner can:	
2.1	identify the workshop hand tools used for the manufacture of vehicle body components
2.2	demonstrate how to check the condition and operation of the tools and equipment required for manufacturing vehicle body components
2.3	demonstrate how to prepare the tools and equipment required for manufacturing vehicle body components
2.4	demonstrate how to use the tools and equipment required for manufacturing vehicle body components
2.5	demonstrate a range of techniques for: • measuring

- marking out
- cutting
- fabrication
- forming
- drilling
- thread cutting
- filing

2.6 demonstrate how to check manufactured vehicle body components for compliance

2.7 produce working drawings or sketches that illustrate the main features of the manufactured vehicle body components.

Learning outcome	The learner will:
3.	Understand the methods and techniques when manufacturing vehicle body components
Assessment criteria	
The learner can:	
3.1	identify the different materials used to manufacture vehicle body components including carbon steels and aluminium alloys
3.2	state typical vehicle body component applications for the materials used
3.3	state how materials are modified to provide strength by forming, alloying and heat treatment
3.4	state the importance of hardness, toughness, rigidity and tensile strength as material properties.

Unit 322 Manufacture single tolerance vehicle body components

Supporting information

Unit range

Approved workplace procedures:

Minimising the risk of damage to self and others their property, the vehicle, its systems, the environment including the disposal of waste materials.

Complying with good housekeeping practices and correct storage of workshop tools and equipment during and after use.

Unit 323 Prepare vehicle body panels for foundation coat materials using masking materials and techniques

Level:	SCQF Level 3
Credit value:	4
GLH:	36
Aim	This unit is about demonstrating the skills and knowledge required to prepare vehicles for foundation coat materials using masking materials and techniques.

Learning outcome	The learner will:
1. Be able to follow approved and safe procedures when applying masking methods.	
Assessment criteria	
The learner can: 1.1 correctly use required PPE 1.2 follow **approved workplace procedures** 1.3 identify potential health and safety hazards and risks 1.4 identify the relevant information sources 1.5 state the importance of keeping records.	

Learning outcome	The learner will:
2. Be able to use masking materials and techniques to prepare vehicle body panels for foundation coat materials.	
Assessment criteria	
The learner can: 2.1 use suitable masking materials to mask up vehicle parts and components 2.2 mask vehicle parts and components 2.3 remove masking materials after foundation coat application 2.4 use suitable masking materials to mask up vehicle parts and components.	

Learning outcome	The learner will:
3. Understand the methods and techniques used in masking up vehicle panels and components.	
Assessment criteria	
The learner can: 3.1 list the materials used to mask vehicle parts and components: • masking tape • masking paper • plastic masking sheets 3.2 state the importance of accurate application of masking materials. 3.3 state the importance of using the correct masking material for the application. 3.4 remove masking materials without damaging the vehicle 3.5 state the importance of timely removal of masking materials.	

Unit 323 Prepare vehicle body panels for foundation coat materials using masking materials and techniques

Supporting information

Unit range

Approved workplace procedures:

Minimising the risk of damage to self and others their property, the vehicle, its systems, the environment including the disposal of waste materials.

Complying with good housekeeping practices and correct storage of workshop tools and equipment during and after use.

Appendix 1 Relationships to other qualifications

Links to other qualifications

Mapping is provided as guidance and suggests areas of commonality between the qualifications. It does not imply that candidates completing units in one qualification have automatically covered all of the content of another.

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

This qualification has connections to the:

- SCQF Level 3 3901 qualification in Award in Vehicle Systems and Body and Paint Maintenance

Appendix 2 Sources of general information

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

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

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

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

- 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.

Centre Guide – Delivering International Qualifications 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. Specifically, the document includes sections on:

- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

City & Guilds
Believe you can

www.cityandguilds.com

Useful contacts

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

Every effort has been made to ensure that the information contained in this publication is true and correct at the time of going to press. However, City & Guilds' products and services are subject to continuous development and improvement and the right is reserved to change products and services from time to time. City & Guilds cannot accept liability for loss or damage arising from the use of information in this publication.

If you have a complaint, or any suggestions for improvement about any of the services that we provide, email: **feedbackandcomplaints@cityandguilds.com**

About City & Guilds

City & Guilds is the global skills partner, empowering people, organisations and economies to develop the skills they need for growth. With almost 150 years of trusted expertise, we support people into work, help them develop on the job and move into the next job.

We work with Governments, employers, training providers, colleges and industry stakeholders to design and deliver high-quality training, qualifications, assessments and credentials that lead to meaningful career progression. We understand the life changing link between skills development, social mobility and success. Our solutions span critical sectors including construction, engineering, transport, energy and electrical, serving over 1 million learners annually.

Through our comprehensive portfolio of brands and trusted global network, we set industry-wide standards for technical, behavioural and commercial skills to improve performance and productivity. We believe you can achieve your potential - and we're here to help make it happen.

Copyright

The content of this document is, unless otherwise indicated, © City and Guilds Limited and may not be copied, reproduced or distributed without prior written consent. However, approved City & Guilds centres and candidates studying for City & Guilds qualifications may photocopy this document free of charge and/or include a PDF version of it on centre intranets on the following conditions:

- centre staff may copy the material only for the purpose of teaching candidates working towards a City & Guilds qualification, or for internal administration purposes
- candidates may copy the material only for their own use when working towards a City & Guilds qualification

The *Standard Copying Conditions* (see the City & Guilds website) also apply.

Please note: National Occupational Standards are not © City and Guilds Limited. Please check the conditions upon which they may be copied with the relevant Sector Skills Council.

©2025 City & Guilds Limited (Reg No 16513878). All rights reserved. City & Guilds is a trademark of City & Guilds Limited.

City & Guilds
Giltspur House
5-6 Giltspur Street
London, EC1A 9DE
T +44 (0)844 543 0000
F +44 (0)20 7294 2413
www.cityandguilds.com

WW-02-3902