QUALIFICATION HANDBOOK

Diploma in Vehicle Accident Repair Paint Principles at SCQF Level 6 (4391-53)

July 2018, Version 1.0

City & Guilds

A City & Guilds Group Business

Qualification at a glance

Subject area	**Vehicle Accident Repair Paint**
City & Guilds number	4391-53
Age group approved	16-18, 19+
Assessment	Assignment Online Multiple Choice
Fast track	Not available. Automatic approval applies in some cases
Support materials	Centre handbook Practical assessment workbook
Registration and certification	Consult the Walled Garden/online catalogue for last dates

Title and level	City & Guilds number	Accreditation number
Diploma in Vehicle Accident Repair Paint Principles at SCQF Level 6	4391-53	R560 04

Contents

1 Introduction

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

Area	Description
Who is the qualification for?	This Diploma in Vehicle Accident Repair Paint Principles at SCQF Level 6 is for anyone developing a career in the motor industry. This practical qualification demonstrates candidates' skills on the job and in their own workplace showing that they meet national standards for automotive workers. The 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 does the qualification cover?	Candidates cover areas such as preparing, painting and finishing different surfaces, applying fillers and carrying out repairs to motor vehicles paintwork. They are assessed in the workplace by using the following methods: • assignment • verbal questioning of essential knowledge • City & Guilds' GOLA multiple choice test
Is the qualification part of a framework or initiative?	The qualification is part of the Scottish Automotive Maintenance and Repair Modern Apprenticeship Frameworks.
What opportunities for progression are there?	After taking this qualification, candidates will have a qualification that shows employers and customers they have the skills required to carry out paint repairs to paintwork as a result of accidents and will be able to progress into employment. Candidates may also wish to progress onto the competency based qualification SVQ in Vehicle Paintwork Repair at SCQF Level 6 (4311-53).

Structure

To achieve the **Diploma in Vehicle Accident Repair Paint Principles at SCQF Level 6**, learners must achieve **all 20 mandatory units** from (001, 003, 051, 053, 304, 305, 307, 308, 309, 313, 354, 355, 357, 358, 359, 363, 403, 409, 453, 459)

City & Guilds unit	Unit title	SCQF Level	SCQF Credit value
001	Skills in Health, Safety and Good Housekeeping in the Automotive Environment	5	7
003	Skills in Supporting Job Roles in the Automotive Work Environment	6	5
051	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	5	3
053	Knowledge of Support for Job Roles in the Automotive Work Environment	6	3
304	Skills in Preparing Metal and Pre-Painted Substrates in an Automotive Environment	5	5
305	Skills in Spot Repair on Automotive Vehicles	6	3
307	Skills in Establishing Defects in Paintwork on Automotive Vehicles	6	5
308	Skills in Working with Plastic and Reinforced Components in an Automotive Environment	6	5
309	Skills in Applying Masking Materials to Automotive Vehicles	5	3
313	Skills in Mixing and Matching Colours for Automotive Vehicles	6	5
354	Knowledge of Preparing Metal and Pre-painted Substrates in an Automotive Environment	5	5
355	Knowledge of Spot Repair on Automotive Vehicles	6	5
357	Knowledge of Establishing Defects in Paintwork on Automotive Vehicles	6	5
358	Knowledge of Working with Plastic and Reinforced Components in an Automotive Environment	6	6
359	Knowledge of Applying Masking Materials to Automotive Vehicles	5	4
363	Knowledge of Mixing and Matching Colours for Automotive Vehicles	6	5
403	Skills in Blend and Fade out Repairs on Automotive Vehicles	6	3
409	Skills in Carrying out Edge to Edge Repairs on Automotive Vehicles	6	3
453	Knowledge of Blend and Fade out Repairs on Automotive Vehicles	6	5
459	Knowledge of Carrying out Edge to Edge Repairs on Automotive Vehicles	6	5

2 Centre requirements

Approval

If your Centre is approved to offer the Level 3 Certificate/Diploma in Automotive Body and Paint – Body Refinishing (4101-63) you will be granted automatic approval for the Diploma in Vehicle Accident Repair Paint Principles at SCQF Level 6 (4391-53) and will be able to make registrations straight away.

For any other cases, centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information. Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Resource requirements

Physical resources and site agreements

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

Centre staffing

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

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

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

Assessors and internal verifiers

All assessors must:

- have sufficient and relevant technical/occupational competence in the unit, at or above the level of the unit being assessed
- have in depth knowledge of the qualification or credit based unit evidence requirements.
- hold or be working towards a relevant assessors' award as specified by the Sector Skills Council. This will include, but not be limited to the Assessor qualifications, Level 3 Award in Understanding the Principles and Practices of Assessment, Level 3 Award in Assessing Competence

in the Work Environment, Level 3 Award in Assessing Vocationally Related Achievement, Level 3 Certificate in Assessing Vocational Achievement. (and by implication legacy Assessor units A1, A2 and D32/33 unit) but may be an appropriate equivalent as defined by the SSC).

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

All internal verifiers must:

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

Continuing professional development (CPD)

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

Candidate entry requirements

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

Age restrictions

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

3 Delivering the qualification

Initial assessment and induction

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

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

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

Support materials

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

- Practical Assessment workbook
- Centre Handbook

Recording documents

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

Health and safety

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

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

Data protection and confidentiality

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

Equal opportunities

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

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

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

Access to assessment

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

Appeals

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

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

4 Assessment

Assessment of the qualification

Candidates must:

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

City & Guilds unit	Unit title	Assessment method
001	Skills in Health, Safety and Good Housekeeping in the Automotive Environment	Assignment
003	Skills in Supporting Job Roles in the Automotive Work Environment	Assignment
051	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	Assignment
053	Knowledge of Support for Job Roles in the Automotive Work Environment	Assignment
304	Skills in Preparing Metal and Pre-Painted Substrates in an Automotive Environment	Assignment
354	Knowledge of Preparing Metal and Pre-painted Substrates in an Automotive Environment	Multiple choice test
305	Skills in Spot Repair on Automotive Vehicles	Assignment
355	Knowledge of Spot Repair on Automotive Vehicles	Multiple choice test
307	Skills in Establishing Defects in Paintwork on Automotive Vehicles	Assignment
357	Knowledge of Establishing Defects in Paintwork on Automotive Vehicles	Multiple choice test
308	Skills in Working with Plastic and Reinforced Components in an Automotive Environment	Assignment
358	Knowledge of Working with Plastic and Reinforced Components in an Automotive Environment	Portfolio
309	Skills in Applying Masking Materials to Automotive Vehicles	Assignment
359	Knowledge of Applying Masking Materials to Automotive Vehicles	Multiple choice test

City & Guilds unit	Unit title	Assessment method
313	Skills in Mixing and Matching Colours for Automotive Vehicles	Assignment
363	Knowledge of Mixing and Matching Colours for Automotive Vehicles	Multiple choice test
403	Skills in Blend and Fade out Repairs on Automotive Vehicles	Assignment
453	Knowledge of Blend and Fade out Repairs on Automotive Vehicles	Multiple choice test
409	Skills in Carrying out Edge to Edge Repairs on Automotive Vehicles	Assignment
459	Knowledge of Carrying out Edge to Edge Repairs on Automotive Vehicles	Multiple choice test

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.

5 Units

Availability of 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
- relationship to NOS, other qualifications and frameworks
- endorsement by a sector or other appropriate body
- information on assessment
- learning outcomes which are comprised of a number of assessment criteria
- notes for guidance.

Unit 001 Skills in Health, Safety and Good Housekeeping in the Automotive Environment

Level:	**5**
Credit value:	7
Relationship to NOS:	This unit is linked to the NOS G1 Contribute to the housekeeping in motor vehicle environments and NOS G2 Reduce risks to health and safety in the motor vehicle environment.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will enable the learner to develop the skills required to: • carry out day to day work area cleaning, clearing away, dealing with spillages and disposal of waste, used materials and debris. • identify hazards and risks in the automotive environment and complying with relevant legislation and good practice. • work safely at all times within the automotive environment, both as an individual and with others.

Learning outcome	**The learner will:**
1. be able to use correct personal and vehicle protection within the automotive work environment	
Assessment criteria	
The learner can: 1.1 select and use personal protective equipment throughout activities. To include appropriate protection of: a. eyes b. ears c. head d. skin e. feet f. hands g. lungs 1.2 select and use vehicle protective equipment throughout all activities.	

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

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

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

Unit 003 Skills in Supporting Job Roles in the Automotive Work Environment

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to G3 Maintain working relationships in the motor vehicle environment.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will help the learner develop the skills required to keep good working relationships with all colleagues and customers in the automotive work environment by using effective communication and support.

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

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

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

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

Unit 051 Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment

Level:	**5**
Credit value:	3
Relationship to NOS:	This unit is linked to the NOS G1 Contribute to the housekeeping in motor vehicle environments and NOS G2 Reduce risks to health and safety in the motor vehicle environment.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding of: • routine maintenance and cleaning of the automotive environment and using resources economically • health and safety legislation and duties of everyone in the motor vehicle environment. It will provide an appreciation of significant risks in the automotive environment and how to identify and deal with them. Once completed the learner will be able to identify hazards and evaluate and reduce risk.

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

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

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

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

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

Unit 051 Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment

Supporting information

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

Economic use of resources

a. Consumable materials, eg grease, oils, split pins, locking and fastening devices.

Requirement to maintain work area effectively

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

Spillages, leaks and waste materials

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

Basic legislative requirements

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

Routine maintenance of the workplace

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

Legislation relevant to Health and Safety

i. HASAWA
ii. COSHH
iii. EPA
iv. Manual Handling Operations Regulations 1992
v. PPE Regulations 1992.

General regulations to include an awareness of:

i. Health and Safety (Display Screen Equipment) Regulations 1992
ii. Health and Safety (First Aid) Regulations 1981
iii. Health and Safety (Safety Signs and Signals) Regulations 1996
iv. Health and Safety (Consultation with Employees) Regulations 1996
v. Employers Liability (Compulsory Insurance) Act 1969 and Regulations 1998
vi. Confined Spaces Regulations 1997
vii. Noise at Work Regulations 1989
viii. Electricity at Work Regulations 1989
ix. Electricity (Safety) Regulations 1994
x. Fire Precautions Act 1971
xi. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985
xii. Pressure Systems Safety Regulations 2000
xiii. Waste Management 1991
xiv. Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002
xv. 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 manufacturer's recommendations.
h. Following application procedures, eg hazardous substances.
i. The correct selection and use of extraction equipment.

PPE to include:

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

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

Fire and extinguishers

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

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

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

Product warning labels to include:

a. reasons for placing warning labels on containers
b. warning labels in common use
    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 the 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 own limits of authority
e. potential causes of:
    i. fire
    ii. explosion
    iii. noise
    iv. harmful fumes
    v. slips
    vi. trips
    vii. falling objects
    viii. accidents whilst dealing with broken down vehicles.

Personal responsibilities

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

Action to be taken in the event of colleagues suffering accidents

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

b. Typical examples of first aid which can be administered by persons at the scene of an accident:
    i. check for consciousness
    ii. stem bleeding
    iii. keep the injured person's airways free
    iv. place in the recovery position if injured person is unconscious
    v. issue plasters for minor cuts
    vi. action to prevent shock, 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.

Unit 053 Knowledge of Support for Job Roles in the Automotive Work Environment

Level:	**6**
Credit value:	3
Relationship to NOS:	This unit is linked to G3 maintain working relationships in the motor vehicle environment.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the Automotive industry.
Aim:	This unit enables the learner to develop an understanding of how to keep good working relationships with all colleagues in the automotive work environment by using effective communication and support skills.

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

Learning outcome	**The learner will:**
2. understand the importance of obtaining, interpreting and using information in order to support their job role within the automotive work environment	
Assessment criteria	
The learner can: 2.1 explain the importance of different sources of information in an automotive work environment.	

2.2 explain how to find, interpret and use relevant sources of information. 2.3 describe the main legal requirements relating to the vehicle, including road safety requirements 2.4 explain the importance of working to recognised procedures and processes 2.5 explain when replacement units and components must meet the manufacturer's original equipment specification 2.6 explain the purpose of how to use identification codes.

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

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

Learning outcome	**The learner will:**
5. understand how to develop good working relationships with colleagues and customers in the automotive workplace	
Assessment criteria	
The learner can: 5.1 describe how to develop positive working relationships with colleagues and customers 5.2 explain the importance of developing positive working relationships 5.3 explain the importance of accepting other peoples' views and opinions 5.4 explain the importance of making and honouring realistic commitments to colleagues and customers.	

Unit 053 Knowledge of Support for Job Roles in the Automotive Work Environment

Supporting information

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

The structure of a typical vehicle repair business

a. How these areas relate to each other within the business:

i. body shop
ii. vehicle repair workshop
iii. paint shop
iv. valeting
v. vehicle parts store
vi. main office
vii. vehicle sales
viii. reception.

Sources of information:

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

Communication requirements when carrying out vehicle repairs

a. Procedures for:

i. referral of problems
ii. reporting delays
iii. additional work identified during repair or maintenance
iv. keeping others informed of progress.

b. Methods of communication:

i. verbal
ii. signs and notices
iii. memos
iv. telephone
v. electronic mail
vi. vehicle job card
vii. notice boards
viii. SMS text messaging
ix. letters.

c. Choice of communication

i. distance
ii. location
iii. job responsibility**.**

d. How the communication of information can change with the target audience. To include:
    i. uninformed people
    ii. informed people.

e. Locating and using correct documentation and information for:
    i. recording vehicle maintenance and repairs
    ii. vehicle specifications
    iii. component specifications
    iv. oil and fluid specifications
    v. equipment and tools
    vi. identification codes.

f. Organisational and customer requirements:
    i. importance of time scales to customer and organisation
    ii. relationship between time and costs
    iii. meaning of profit.

Importance of maintaining positive working relationships:

a. morale

b. productivity

c. company image

d. customer relationships

e. colleagues.

Unit 304 Skills in Preparing Metal and Pre-Painted Substrates in an Automotive Environment

Level:	**5**
Credit value:	5
Relationship to NOS:	This unit is linked to PO04S demonstrating skills in preparing metal and pre-painted substrates in an automotive environment.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will help the learner to develop the skills required to carry out the preparation of a wide variety of different panels and component surfaces to accept foundation/paint topcoat materials. It also covers the importance of following guidelines and recommended procedures.

Learning outcome	**The learner will:**
1. Be able to work safely when carrying out the preparation of metal and pre-painted surfaces	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings throughout the preparation of metal and pre-painted surfaces 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.	

Learning outcome	**The learner will:**
2. Be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support the preparation of metal and pre-painted surfaces 2.2 use technical information to support the preparation of metal and pre-painted surfaces	

Learning outcome	The learner will:
3. Be able to use appropriate tools and equipment	
Assessment criteria	
The learner can: 3.1 select the appropriate tools and equipment necessary for carrying out the preparation of metal and pre-painted surfaces 3.2 ensure that the equipment is safe and has been calibrated to meet manufacturers requirements 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying the preparation of metal and pre-painted surfaces 3.4 leave all application equipment in a clean and serviceable condition.	

Learning outcome	The learner will:
4. Be able to carry out the preparation of metal and pre-painted surfaces to accept foundation materials and paint topcoats	
Assessment criteria	
The learner can: 4.1 identify prior to working on the vehicle the type of substrate 4.2 use surface cleaning agents and protect all surfaces adjacent to those being prepared using the specified method 4.3 remove and store safely any components likely to be affected by the preparation process 4.4 prepare all panel surfaces required following: a. vehicle manufacturer technical data b. product data c. recognised methods and techniques 4.5 keep the work area clean and tidy throughout all preparation activities 4.6 dispose of waste materials to conform with legal and workplace requirements 4.7 ensure all preparation is finished to an agreed standard and free from contamination ready for the next process.	

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

Evidence Requirements

1. You must be observed by an assessor preparing metal and pre-painted surfaces on 3 different vehicle body panels out of the 8 listed below, which covers the learning outcomes.
    a. electro-coated panels
    b. repaired panels
    c. original manufacturers finish
    d. plastic components
    e. zinc coated panels
    f. steel panels
    g. aluminium panels
    h. primed panel

2. You must be observed by an assessor covering all of the techniques listed below in carrying out the preparation listed above.
    a. feathering out
    b. flatting using guide coats,
    c. hand sanding
    d. machine sanding
    e. dry sanding

Unit 305 Skills in Spot Repair on Automotive Vehicles

Level:	**6**
Credit value:	3
Relationship to NOS:	This unit is linked to PO04S demonstrating skills in spot repair on automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will help the learner to develop the skills required to follow guidelines and procedures for the refinishing of new and repaired vehicle panels. Including the preparation of the surface panel and application of the topcoat using spot repair.

Learning outcome	**The learner will:**
1. Be able to work safely when carrying out preparation and application of topcoat materials using spot repair	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when carrying out preparation and application of topcoat materials in vehicle refinishing 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.	

Learning outcome	**The learner will:**
2. Be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support preparation and application of topcoat materials to vehicles 2.2 use technical information to support preparation and application of topcoat materials to vehicles.	

Learning outcome	The learner will:
3. Be able to use appropriate tools and equipment	
Assessment criteria	
The learner can: 3.1 select the appropriate tools and equipment necessary for carrying out preparation and application of topcoat materials to vehicles 3.2 ensure that equipment has been calibrated to meet manufacturers requirements 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out preparation and application of topcoat materials to vehicles 3.4 leave all application equipment in a clean and serviceable condition.	

Learning outcome	The learner will:
4. Be able to carry out preparation and application of topcoat materials using spot repair	
Assessment criteria	
The learner can: 4.1 identify the type of substrate prior to working on the vehicle 4.2 use of surface cleaning agents materials 4.3 prepare all the refinishing systems and materials required following health and safety requirements 4.4 mix and check the viscosity of topcoat materials 4.5 apply all topcoat materials 4.6 dry and cure all topcoat materials 4.7 ensure the finish product meets the requirements of the manufacturers warranty, the refinishing specification required and customer needs 4.8 dispose of waste materials to conform with legal and workplace requirements.	

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

Evidence Requirements

You must be observed on at least 2 occasions by an assessor carrying out spot repair operations.

Unit 307 Skills in Establishing Defects in Paintwork on Automotive Vehicles

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to PO07S demonstrating skills in establishing defects in paintwork on automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will help the learner to develop the skills required to identify a range of faults in vehicle paintwork that often require the removal of materials to a sound substrate in order for the defect to be established and rectification to take place.

Learning outcome	**The learner will:**
1. Be able to work safely when carrying out the identification and rectification of paint defects	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when establishing and carrying out repairs to paint defects and faults 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.	

Learning outcome	**The learner will:**
2. Be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support the identification and rectification of paint defects 2.2 interpret technical information to support the rectification of minor paint defects.	

Learning outcome	**The learner will:**

3. Be able to use appropriate tools and equipment
Assessment criteria
The learner can: 3.1 select the appropriate tools and equipment necessary for carrying out the identification and rectification of paint defects 3.2 check that the equipment is safe and has been calibrated to meet manufacturers requirements 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out the identification and rectification of paint defects 3.4 leave all application equipment in a clean and serviceable condition.

Learning outcome	**The learner will:**
4. Be able to carry out the identification and rectification of paint defects	
Assessment criteria	
The learner can: 4.1 identify on the vehicle the type of paint defect and the body panel substrate accurately prior to establishing defects and undertaking any rectification work 4.2 use surface cleaning agents and protect all surfaces adjacent to those being prepared using the specified method 4.3 remove and store safely any components likely to be affected by the preparation process 4.4 correct defects using the approved tools and equipment required 4.5 keep the work area clean and tidy throughout all rectification activities 4.6 dispose of waste materials in compliance with environment, legal and workplace requirements 4.7 ensure all paint defects are rectified to an agreed standard.	

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

Evidence Requirements

You must be observed by an assessor establishing and rectifying paint defects from 3 out of the 8 listed below, which covers the learning outcomes.

a. poor application
b. environmental conditions
c. contamination
d. corrosion
e. wear and tear
f. adverse chemical reactions
g. panel deformation
h. poor preparation.

Unit 308 Skills in Working with Plastic and Reinforced Components in an Automotive Environment

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to PO03.1S Skills in Working with Plastic and Reinforced Components in an Automotive Environment.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will help the learner to develop the skills required to carry out the identification of plastic substrates. Mixing and adjusting the viscosity of foundation materials. Applying foundation materials to plastics following guidelines and procedures.

Learning outcome	**The learner will:**
1. Be able to work safely when carrying out repairs to plastic and composite materials, and the preparation and application of foundation materials used in vehicle refinishing	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings throughout all repairs to plastic and reinforced composite materials, and during the preparation and application of foundation materials used in vehicle refinishing 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.	

Learning outcome	**The learner will:**
2. Be able to use relevant information to carry out repair and paint operation tasks	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support repairs to plastic and reinforced composite materials, and for the preparation and application of foundation materials used in vehicle refinishing	

2.2	use technical information to support repairs to plastic and reinforced composite materials, and for the preparation and application of foundation materials used in vehicle refinishing
2.3	identify the correct repair method as per the vehicle manufacturer's specification.

Learning outcome	**The learner will:**
3. Be able to use appropriate tools and equipment	
Assessment criteria	
The learner can:	
3.1	select and use the appropriate tools and equipment for the type of surface perpetration activities and application of foundation materials to plastics in vehicle refinishing
3.2	ensure that tools and equipment are in safe working condition has been calibrated to meet manufacturers requirements where necessary
3.3	use the correct tools and equipment in the way specified by manufacturers when carrying out preparation and application of foundation materials to plastics in vehicle refinishing
3.4	leave all application equipment and the work environment in a clean and serviceable condition.

Learning outcome	**The learner will:**
4. Be able to carry out repairs to plastics and reinforced composite materials and the preparation and application of foundation materials used in vehicle refinishing	
Assessment criteria	
The learner can:	
4.1	identify the plastic components and check compatibility for refinishing prior to undertaking any preparation work
4.2	remove and store safely any components likely to be affected by the preparation process
4.3	keep the work area clean and tidy throughout all repair and preparation activities
4.4	use surface cleaning agents and protect adjacent panels to those being repaired
4.5	leave the prepared areas free from contamination and ready for the application of foundation and topcoats
4.6	dispose of waste material to conform with legal, environmental and workplace requirements
4.7	ensure all completed repairs are finished to an agreed standard and timescale ready for the next process.

Learning outcome	The learner will:
5. Be able to record information and make suitable recommendations	
Assessment criteria	
The learner can: 5.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 5.2 make suitable and justifiable recommendations for cost effective repairs 5.3 report any unrecorded damage to surfaces and ancillary fittings to the relevant person promptly	

Evidence Requirements

You must be observed by an assessor carrying out each of the following listed below, which covers the learning outcomes:

a. Identify and prepare a plastic material to accept foundation materials. Prepare and apply all foundation materials relevant to the plastic material.

b. Identify and prepare a composite material to accept foundation materials. Prepare and apply all foundation materials relevant to the composite material

Unit 309 Skills in Applying Masking Materials to Automotive Vehicles

Level:	**5**
Credit value:	3
Relationship to NOS:	This unit is linked to PO02S Skills in applying masking materials to automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop the skills needed to undertake masking activities efficiently and effectively during vehicle body and paint operations.

Learning outcome	**The learner will:**
1. Be able select, use, store and maintain masking tools and equipment	
Assessment criteria	
The learner can: 1.1 select, prepare and maintain suitable tools and equipment when carrying out masking activities 1.2 report any faulty / damaged tools or equipment to the relevant person 1.3 store tools and equipment in an appropriate area.	

Learning outcome	**The learner will:**
2. Be able to mask a vehicle and its components during vehicle body and paint operations	
Assessment criteria	
The learner can: 2.1 identify safety hazards associated with masking activities and work safely through the tasks 2.2 select and use the correct masking materials for different applications and job specifications clean and prepare surfaces for masking 2.3 use appropriate tools and equipment whilst carrying out accurate masking activities and demonstrate economical use of materials 2.4 assess the standard of masking and rectify any inaccuracies to prevent faults 2.5 remove masking without causing damage and within the appropriate timescale	

2.6	assess and rectify masking faults / defects and remove any residue left on any components and trims
2.7	dispose of waste masking materials to conform with legal, environmental and workplace requirements
2.8	complete all masking activities efficiently and to the required standard
2.9	report any anticipated delays in completing masking.

Evidence Requirements

You must be observed by an assessor carrying out 3 different masking operations out of the 8 listed below, which covers the learning outcomes:

a. Masking a road wheel / tyre during preparation and painting
b. Mask / 'sheet' out a full vehicle leaving the panels for priming or painting exposed
c. Vehicle apertures – 'masking out' doors, boot, bonnet or tailgate
d. Masking components and trim – e.g. headlight or door moulding
e. Masking shapes, chevrons or custom designs
f. Masking front or rear windscreens
g. Masking areas prior to applying seam sealers and / or textured foundation materials
h. Masking techniques prior to 'spot priming', or performing localised repairs, blending / fading techniques.

Unit 313 Skills in Mixing and Matching Colours for Automotive Vehicles

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to PO13S Demonstrating skills in mixing and matching colours for automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will help the learner to develop the skills required to identify, mix and match vehicle paint colours including the use of tinters and preparation of test cards.

Learning outcome	**The learner will:**
1. Be able to work safely when carrying out vehicle mixing and matching	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when carrying out vehicle mixing and matching 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.	

Learning outcome	**The learner will:**
2. Be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support paint mixing and matching activities 2.2 use technical information to support paint mixing and matching activities.	

Learning outcome	**The learner will:**
3. Be able to use appropriate tools and equipment	
Assessment criteria	
The learner can:	

3.1	select the appropriate tools and equipment necessary for carrying out paint mixing and matching activities
3.2	ensure that equipment has been calibrated to meet manufacturer's requirements
3.3	use the correct tools and equipment in the way specified by manufacturers when carrying out paint mixing and matching activities
3.4	leave all mixing and application equipment in a clean and serviceable condition.

Learning outcome	**The learner will:**
4. Be able to carry out vehicle mixing and matching activities	
Assessment criteria	
The learner can:	
4.1	identify prior to working on the vehicle the type of substrate to be painted
4.2	prepare all the refinishing systems and materials required following health and safety requirements
4.3	mix, compare and adjust colour tones and effects using suitable mixing and matching techniques
4.4	estimate the appropriate amount of mix material
4.5	select an appropriate refinishing technique
4.6	ensure all refinishing systems and materials prepared meet the specification required for colour and viscosity prior to application
4.7	apply refinishing systems and materials to colour test cards
4.8	dry all colour test cards before checking colour
4.9	ensure the colour produced meets the material manufacturer's technical data, the customer requirements and is a blendable match to the existing colour
4.10	dispose of waste materials to conform with legal, environmental and workplace requirements.

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

Evidence Requirements

You must be observed by an assessor matching and mixing 1 non-metallic colour and 1 metallic or mica colour, which covers the learning outcomes.

Unit 354 Knowledge of Preparing Metal and Pre-painted Substrates in an Automotive Environment

Level:	**5**
Credit value:	5
Relationship to NOS:	This unit is linked to PO04K Knowledge of preparing metal and pre-painted substrates in an automotive environment.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding for preparing a wide variety of different panels and component surfaces to accept foundation/paint topcoat materials.

Learning outcome	**The learner will:**
1. Understand how to identify body surfaces requiring the application of foundation/paint topcoat materials in vehicle refinishing	
Assessment criteria	
The learner can: 1.1 identify the types of substrate likely to be found in vehicle refinishing 1.2 identify the main methods used to determine the vehicle substrate 1.3 identify the properties of the substrate.	

Learning outcome	**The learner will:**
2. Understand how to prepare new and repaired panels for the application of foundation/paint topcoat materials in vehicle refinishing	
Assessment criteria	
The learner can: 2.1 describe the choice and use of surface cleaning agents, including wax and grease remover to ensure adequate adhesion 2.2 describe the types of materials used to prepare the surface and the factors governing their use 2.3 describe how to prepare new and repaired panels 2.4 describe the factors governing the choice of panel preparation methods	

2.5	describe how to prepare panels and parts adjacent to the area being painted
2.6	identify the methods of protecting panels and parts adjacent to the areas being painted and the circumstances in which they should be used
2.7	identify the requirements for protecting the vehicle and contents from damage before, during and after preparing panel surfaces.

Unit 354 Knowledge of Preparing Metal and Pre-painted Substrates in an Automotive Environment

Supporting information

Content

Types of substrate likely to be found in modern vehicles

a. Substrates to determine selection of undercoat with reference to:
    i. condition of surface
    ii. type of substrate
    iii. process requirements
    iv. material requirements.
b. The physical properties of a substrate to include:
    i. surface condition
    ii. adhesion
    iii. flexibility
    iv. porosity.
c. The technical properties of a substrate to include:
    i. type of paint
    ii. steel
    iii. aluminium
    iv. plastic
    v. coated steels
    vi. repaired panels
    vii. OE finish
    viii. primed panels (including 'E'-coat).

Methods used in determining vehicle substrates

a. Workshop tests to determine substrates to include:
    i. solvent wipe test (1K or 2K)
    ii. colour of flatting sludge (straight colour or C O B).
    iii. VIN plate

The main stages required in preparing a vehicle for refinishing, including areas adjacent to the painting area

a. Manufacturer's protective coatings and explain their warranty implications such as:
    i. electrostatic dip
    ii. under-body compounds
    iii. cavity wax
    iv. body caulking.
b. A vehicle must be thoroughly washed and cleaned prior to refinishing to include:
    i. outside body panels
    ii. under arches
    iii. under bonnet
    iv. all apertures

v. degreased.

c. The reasons for vehicle masking.

d. The correct preparation of parts prior to painting to include products use for the removal of:
   i. wax
   ii. grease
   iii. skin oils
   iv. dust
   v. water
   vi. abrasive contaminates
   vii. environmental pollution.

The procedures used in preparing listed substrates

a. The required preparation for the listed substrates to include:
   i. steel
   ii. aluminium alloys
   iii. GR plastics
   iv. thermo plastics
   v. cured 2K materials

b. The procedures for the preparation of plastics to include:
   i. identification
   ii. tempering
   iii. porefilling
   iv. release agent removal
   v. cleaning
   vi. adhesion promotion
   vii. elastic primers.

The procedures for the preparation and application of chemical solutions and solvents to remove paint

a. Materials used for conditioning processes such as:
   i. wax and grease removers
   ii. spirit wipes
   iii. acid based
   iv. water based

b. The correct and safe use of the above materials

c. The properties of pre-preparation materials to include:
   i. neutralisation
   ii. ability to alter the surface
   iii. reaction with oxide

d. Types of paint stripper available to include:
   i. aggressive
   ii. non-aggressive

e. The procedures for the preparation and application of chemical solutions and solvents to include:
   i. health and safety
   ii. PPE
   iii. mixing schedules
   iv. application schedules
   v. waste disposal.

f. The process of stripping paint from:

i. steel
ii. aluminium
iii. plastics.

The selection and uses of a range of abrasives in common use

a. Types and uses of abrasives materials to include:
   i. aluminium oxide
   ii. silicon carbide
   iii. wet and dry types
   iv. open coat
   v. closed coat
   vi. papers, pastes and woven plastics.
b. Forms of abrasive to include:
   i. pad
   ii. disc
   iii. sheet
   iv. roll
   v. backing materials
   vi. methods of attachments.
c. How grit sizes are classified according to the FEPA standards using 'P' grades with regard to:
   i. the process being carried out
   ii. the material being abraded
   iii. the technique being employed.
d. The differences between open and closed coat abrasives:
   i. open coat
   ii. closed coat
   iii. 'P' grades.

Define the term 'feather edging' and explain why correct operation is required in achieving the required surface finish

a. The procedure for the preparation of a repaired area on a large panel in terms of:
   i. repair edge preparation
   ii. surrounding area
   iii. bare metal.
b. Why correct preparation is required with reference to:
   i. surface finish
   ii. film thickness
   iii. sinkage
   iv. mapping
   v. contouring.

The procedures for the preparation of minor damage prior to the application of body fillers

a. The procedure for the preparation of a repaired area on a large panel in terms of:
   i. paint removal
   ii. feather edge
   iii. surface condition
   iv. substrate identification

v. cleanliness
vi. achieving correct contour.

b. The problems of over catalysed body filled areas.
c. The correct health and safety procedures associated with body fillers.
d. Aids and techniques which can be used to achieve the correct contour of a filled area.

Unit 355 Knowledge of Spot Repair on Automotive Vehicles

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to PO10K Knowledge of spot repair on automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding for following guidelines and procedures for the refinishing of new and repaired vehicle panels. Including the preparation of the surface panel, application of the topcoat using spot repair.

Learning outcome	**The learner will:**
1. Understand how to prepare panels and refinishing systems for the application of topcoat materials using spot repair	
Assessment criteria	
The learner can: 1.1 explain how to prepare panels and parts adjacent to the area being paint 1.2 explain how to prepare refinishing systems and materials for use 1.3 explain the properties of the refinishing system and materials and the factors affecting their use.	

Learning outcome	**The learner will:**
2. Understand how to identify, mix and apply topcoat materials using spot repair	
Assessment criteria	
The learner can: 2.1 explain how to condition and clean surfaces prior to the application of topcoat coatings 2.2 explain the importance of proper cleaning and correct use of foundation material to ensure adequate adhesion 2.3 explain the methods of protecting panels and parts adjacent to the areas being painted and the circumstances in which they should be used 2.4 describe the choice and use of topcoat materials 2.5 explain how to mix and check the viscosity of topcoat materials	

2.6	explain the importance of viscosity and its effects on the surface finish
2.7	explain the principles of paint mixing, the importance of the right additive (hardener or thinner) in the correct ratio
2.8	explain how to apply topcoat coatings avoiding contamination and defects during the spot repair process
2.9	explain the curing and drying recommendations for the various topcoat materials
2.10	explain the effects of the spray environment and natural environment on vehicle refinishing
2.11	explain the techniques used in polishing the vehicle topcoat finish
2.12	explain the requirements for protecting the vehicle and contents from damage before, during and after preparing and applying topcoat materials.

Unit 355 Knowledge of Spot Repair on Automotive Vehicles

Supporting information

Content

The types of substrates likely to be found in vehicle refinishing

a. List types of substrate to include:
   i. steel
   ii. aluminium
   iii. all plastics
   iv. coated steels
   v. high bake Enamels (O E finishes)
   vi. 2 K Paints
   vii. 1K Paints
   viii. clear over bases
   ix. polyester fillers
   x. repaired panels
   xi. primed panels (E coat)

Methods used in determining vehicle substrates

a. Workshop tests to determine substrates to include:
   i. visual test for aluminium, plastics
   ii. magnet test for steel
b. For determination of paint type:
   i. compound small area
   ii. solvent wipe test (1k or 2k)
   iii. colour of flatting sludge (straight colour or C O B)
   iv. VIN plate

The main stages required in preparing a vehicle for refinishing, including areas adjacent to the painting area

a. Manufacturers protective coatings and explain their warranty implications such as:
   i. electrostatic dip
   ii. under-body compounds
   iii. cavity wax
   iv. body caulking
b. Vehicles must be thoroughly washed and cleaned prior to refinishing to include:
   i. outside body panels
   ii. under arches
   iii. under bonnet
   iv. all apertures
   v. degreased
c. The reasons for vehicle masking
d. The correct preparation of parts prior to painting to include products used for the removal of:
   i. wax
   ii. grease
   iii. skin oils
   iv. dust
   v. water

vi. abrasive contaminates
vii. environmental pollution

The procedures used in preparing listed substrates

a. The required preparation for the listed substrates to include:
   i. steel
   ii. aluminium alloys
   iii. GR plastics
   iv. thermo plastics
   v. cured 2k materials
   vi. synthetic enamels
   vii. timber (trim parts only)
b. The procedures for the preparation of plastics to include:
   i. identification
   ii. tempering
   iii. porefilling
   iv. cleaning
   v. adhesion promotion
   vi. elastic primers

The selection and uses of a range of abrasives in common use

a. Types and uses of abrasives materials to include:
   i. aluminium oxide
   ii. silicon carbide
   iii. wet and dry types
   iv. open coat
   v. closed coat
   vi. papers, pastes and woven plastics
b. Forms of abrasive to include:
   i. pad
   ii. disc
   iii. sheet
   iv. roll
   v. backing materials
   vi. methods of attachments
c. How grit sizes are classified according to the FEPA standards using 'P' grades with regard to:
   i. the process being carried out
   ii. the material being abraded
   iii. the technique being employed
d. The differences between Open and Closed coat abrasives
   i. open coat
   ii. closed coat
   iii. P grades

The term 'feather edging' and why correct operation is required in achieving the required surface finish

a. The procedure for the preparation of a repaired area on a large panel in terms of:
   i. repair edge preparation
   ii. surrounding area
   iii. bare metal
b. Why correct preparation is required with reference to:
   i. surface finish
   ii. film thickness
   iii. sinkage
   iv. mapping
   v. contouring

Masking procedures for part and whole vehicles. Masking processes and techniques

a. Common masking systems, materials and techniques to include:
   i. masking paper
   ii. plastic sheeting
   iii. masking tape
   iv. foam tape
   v. wheel covers
   vi. liquid masking
   vii. roll-back masking

b. The characteristics of a quality masking tape to include:
   i. ability to turn corners
   ii. non-aggressive adhesive/non-drying
   iii. clean edges to painted areas

c. The properties of these masking materials such as:
   i. economy of use
   ii. costs per unit
   iii. absorption
   iv. flexibility

d Where and how these masking materials and systems should be used.

e. The masking procedures for listed items such as:
   i. door glass and windscreens
   ii. handles
   iii. lights
   iv. mirrors
   v. wheels

f. Masking schedule for the type of repair to include:
   i. time efficiency
   ii. material costs
   iii. given protection

g. Faults which are caused by careless masking such as:
   i. flash lines
   ii. bridging
   iii. creep
   iv. hard edges

The factors affecting the choice and use of topcoat materials

a. The types of paints such as:

b. Non-convertible
   i. nitro cellulose
   ii. 1k acrylic

c. Convertible
   i. oil based synthetics
   ii. 2 k acrylics
   iii. 2k polyurethane
   iv. polyesters
   v. isocyanate resins

d. Waterborne basecoats
   i. microgel
   ii. latex

e. The reasons for using paint to include:
   i. protection
   ii. filling
   iii. decoration
   iv. identification
   v. safety

f. Use process data sheets to determine information such as:

i. material description
ii. material properties
iii. material characteristics
iv. limitations
v. related materials
vi. mixing ratios
vii. viscosity
viii. build film thickness
ix. pot life

g. The procedure for the preparation of minor damage to include:
i. paint removal
ii. feather edge
iii. surface condition
iv. substrate identification
v. cleanliness
vi. achieving correct contour

h. The problems of over catalysed body filled areas
i. The correct Health and Safety procedures associated with body fillers
j. Aids and techniques which can be used to achieve the correct contour of a filled area
k. Undercoat materials for plastics to include:
i. adhesion promoters
ii. surface modifiers
iii. flexible additives
iv. texture additives

l. Listed additives such as:
i. adhesion promoters
ii. flexible additives
iii. texture finishes
iv. extenders
v. UV absorbers
vi. flow aids

The properties of topcoat materials

a. The ingredients of paint include:
i. pigment
ii. binder/vehicle
iii. solvent/thinner/reducer
iv. additives

b. The different types of paints to include:
c. Non convertible:
i. nitro cellulose
ii. 1k acrylics
iii. basecoats

d. Convertibles:
i. two packs
ii. oil based synthetic enamels

e. The characteristics and properties of surface coatings to include:
i. nitro-cellulose- non convertible-low build –fast surface dry
ii. oil based synthetics-convertible-slow dry through uptake of oxygen
iii. two packs- convertible- chemical reaction –high build
iv. base coats- solvent or water borne -non convertible-very low build-high opacity-have to be over
v. coated with a clear coat

f. The principles of operation of water based materials
g. The materials used in water based paint technology

h. The environmental advantages of using water based paints
i. The materials in terms of their:
    i. preparation of substrates
    ii. mixing procedures
    iii. application
    iv. drying processes
    v. working techniques
    vi. covering and hiding power
    vii. rectification
    viii. cleaning process

Preparation and use of topcoat materials for refinishing procedures

a. The process data sheets to determine information such as:
    i. mixing ratios
    ii. viscosity
    iii. number of coats
    iv. flash off times
    v. build film thickness
    vi. spray gun type
    vii. spray gun set up
    viii. air pressure requirements
    ix. substrate requirements
    x. suitability as a substrate
    xi. drying times
    xii. suitability to be applied by methods other than spraying
b. Procedures for mixing topcoats such as:
    i. 1K – cellulose and acrylics
    ii. 2K solid finishes and clear lacquers
    iii. basecoats – solid, metallic and pearlescent

Tools and equipment used in the preparation of topcoat materials

a. the tools and equipment required for paint preparation to include:-
    i. mixing schemes
    ii. ratio/mixing sticks
    iii. calibrated mixing cups
    iv. paint filters
    v. viscosity cups
    vi. timers
    vii. appropriate PPE

The selection of appropriate techniques for refinishing new and repaired panels, using edge-to-edge, fade outs, blending and spot repair methods

a. The procedure for carrying out edge-to-edge paint application to include:
    i. panel preparation
    ii. masking
    iii. gun technique
b. The procedure for carrying out paint blend to include:
    i. panel preparation
    ii. masking
    iii. gun technique
    iv. final thinning
c. The procedure for carrying out spot or fade out repair to include:
    i. panel preparation
    ii. masking
    iii. gun technique

iv. final thinning
v. fade out thinners

Correct application of topcoat materials can help to avoid surface defects such as colour/tone variations, overspray, etc.

a. Spray gun motion to include:
i. gun distance
ii. gun angle
iii. gun speed
iv. overlaps

b. The relationship between the four motions to give an even film thickness.

c. The reason for flash off times between coats.

d. What is meant by 'Wet on Wet' applications.

e. The application differences of using MS, HS and UHS materials.

f. Methodology to refinish a large part of or complete vehicle.

g. The differences to applying a basecoat material compared with one stage solid colours such as:
i. gun distance
ii. gun speed
iii. air pressure
iv. 'drop coats'

h. The application of clearcoat with reference to:
i. gun speed
ii. flash off
iii. number of coats
iv. HS and UHS

The procedures to be adopted to rectify spray gun, topcoat surface defects and avoid their recurrence

a. The 'Spray Out' checks to establish spray gun faults such as:
i. spray flutter
ii. sickle-shaped patterns
iii. centre heavy pattern
iv. constricted centre pattern
v. top/bottom heavy patterns

b. The causes and remedies for these faults.

c. Application paint faults to include:
i. runs
ii. sags
iii. dirt
iv. contamination (fish eyes)
v. orange peel
vi. dry spray
vii. Solvent pop

d. The causes, prevention and rectification of these faults.

The importance of sourcing, correctly interpreting and following manufacturers' instructions and the consequences of failing to do so

a. Sources of material information to include:
i. PC based material
ii. paint manufacturers information
iii. paint data sheets
iv. world wide web
v. Thatcham methods manuals

b. Types of material recoverable from the above sources to include:
i. product and mixing information

ii. health and safety information
iii. first aid procedures
iv. application techniques
v. rectification procedures
vi. colour information

c. Sources of information relevant to equipment to include:
i. manufacturer's instructions
ii. operating manuals
iii. trade publications
iv. world wide web

d. The type of information recoverable from these sources such as:
i. maintenance schedules
ii. maintenance procedures
iii. replacing parts and consumables
iv. spare parts list and suppliers
v. accessories available
vi. trouble shooting information

e. adjustment and operation guides

Unit 357 Knowledge of Establishing Defects in Paintwork on Automotive Vehicles

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to PO07K Knowledge of establishing defects in paintwork on automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding about a range of faults in vehicle paintwork that often require the removal of materials to a sound substrate in order for the defect to be established and rectification to take place.

Learning outcome	**The learner will:**
1. Understand how to identify and explain paint defects	
Assessment criteria	
The learner can: 1.1 explain how to identify the existing paint surface finish on which the defect has occurred 1.2 explain the main methods used to determine the surface finish 1.3 explain the types and appearance of paint defects 1.4 explain the causes of the paint defects including: a. environment b. preparation c. application d. deterioration.	

Learning outcome	The learner will:
2. Understand how to repair paint defects	
Assessment criteria	
The learner can: 2.1 explain the factors affecting the choice and use of materials in the rectification of paint defects 2.2 explain the procedures involved in repairing paint defects 2.3 explain how to prevent further paint damage during rectification 2.4 describe the importance of proper cleaning prior to and after rectification work 2.5 explain the importance of keeping tools, equipment and materials clean and free from contamination during rectification work 2.6 explain the requirements for protecting the vehicle and contents from damage before, during and after repairing paint defects and faults.	

Unit 357 Knowledge of Establishing Defects in Paintwork on Automotive Vehicles

Supporting information

Content.

Type of defects

a. acid spotting
b. blistering
c. blushing
d. blooming
e. bridging
f. chalking
g. checking
h. crazing
i. dirt
j. dry spray
k. edge mapping
l. etching
m. fading
n. fish eyes
o. flaking
p. haloing
q. humidity blisters
r. mottling
s. orange peel
t. overspray
u. pin holes
v. poor opacity
w. plastic bleed through
x. runs
y. rust
z. sand scratch swelling
aa. shrinking and splitting
bb. streaking
cc. solvent popping
dd. tape marks
ee. water spotting
ff. webbing

Types of paint finishes likely to be found in modern vehicles

a. Types of substrate to include:
    i. steel
    ii. aluminium
    iii. all plastics
    iv. coated steels
    v. high bake enamels (o e finishes)
    vi. 2K paints
    vii. 1K paints

viii. clear over bases
ix. polyester fillers.

b. Substrates to determine selection of undercoat with reference to:
   i. condition of surface
   ii. type of substrate
   iii. process requirements
   iv. material requirement.
c. The physical properties of a substrate to include:
   i. surface condition
   ii. adhesion
   iii. flexibility
   iv. porosity
   v. texture.

Methods used in determining types of vehicle paint finishes

a. Workshop tests to determine paint substrates to include:
   i. compound small area
   ii. solvent wipe test (1K or 2K)
   iii. colour of flatting sludge (straight colour or C O B)]
   iv. VIN plate

Vehicle cleaning and protection procedures during paint defect rectification processes

a. Vehicle must be thoroughly washed and cleaned prior to refinishing to include:
   i. outside body panels
   ii. under arches
   iii. under bonnet
   iv. all apertures
   v. degreased
b. The reasons for masking components adjacent to repair areas.
c. The correct preparation of parts prior to painting to include products used for the removal of:
   i. wax
   ii. grease
   iii. skin oils
   iv. dust
   v. water
   vi. abrasive contaminates
   vii. environmental pollution.
d. Materials used for conditioning processes such as:
   i. wax and grease removers
   ii. spirit wipes
   iii. acid based
   iv. water based.
e. The correct and safe use of the above materials.
f. The properties of pre-preparation material to include:
   i. neutralisation
   ii. ability to alter the surface
   iii. reaction with oxide.

Paint defects and their causes

a. The reasons for the defects in vehicle finish such as:
    i. environmental pollution
    ii. ultra violet reaction
    iii. industrial pollution
    iv. accidental damage.

Which rectification procedure to use for each of the paint defects

a. The procedures for the rectification of defects to include:
    i. compound/polish surface
    ii. flat/polish surface
    iii. local paint removal/repaint
    iv. panel/edge-to-edge repaint.

Tools and equipment must be kept free from contamination to avoid further defects

a. The methods of cleaning tools and equipment after use:
    i. washing polishing/compound heads to remove residues
    ii. cleaning spray guns and brushes with appropriate solvents
b. explain that failure to carry out these procedures may lead to defects to include:
    i. surface scratches
    ii. surface contamination
    iii. silicone cratering
    iv. staining of painted surfaces
    v. equipment malfunction.

Materials used for the rectification of paint defects

a. Types and uses of abrasives to include:
    i. aluminium oxide
    ii. silicon carbide
    iii. wet and dry types
    iv. open coat
    v. closed coat
    vi. 'P' grades
    vii. papers, pastes and woven plastics.
b. The properties of compounds used to refurbish paintwork including:
    i. cutting compounds
    ii. cutting creams
    iii. surface polishes
    iv. protective waxes
    v. sponge cutting heads
    vi. polishing mops
    vii. polishing cloths.
c. Types and uses of filler materials to include:
    i. 2K polyester filler paste
    ii. 2K and 1K stopper.
d. Types and uses of paints to include:
    i. touch-up pots
    ii. self-adhesive coloured paint film

iii. aerosols
iv. standard 2K and 1K paints.

Select the correct materials for rectifying listed paint defects

a. Selection of materials for rectification will depend on:
    i. type of surface defect to be repaired
    ii. severity of defect
    iii. size of area to be repaired
    iv. equipment available
    v. expertise of operator
    vi. customer preference.

Correct preparation and use of materials for rectifying paint defects

a. The preparation of listed materials for defect rectification to include:
    i. replacing worn or used abrasive papers, pads and discs
    ii. checking compound and polish pastes for contamination
    iii. mixing of 2K fillers and stoppers to correct ratios.
b. The preparation required prior to paint application to include:
    i. stirring/shaking paint containers
    ii. mixing touch-up and standard paints to correct ratios
    iii. carrying out viscosity checks on mixed paint materials.

Touch-in techniques as required for the rectification of some paint defects

a. Touch-in techniques:
    i. may not exactly match factory (OE) finish
    ii. may be viewed as a temporary repair
    iii. should be confined to small areas.

Unit 358 Knowledge of Working with Plastic and Reinforced Components in an Automotive Environment

Level:	**6**
Credit value:	6
Relationship to NOS:	This unit is linked to PO03. 1K Knowledge of working with plastic and reinforced components in an automotive environment
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding for identifying substrates and plastics whilst undertaking paint operations following guidelines and procedures.

Learning outcome	**The learner will:**
1. Understand how to identify plastic body surfaces requiring the application of foundation materials in vehicle refinishing	
Assessment criteria	
The learner can: 1.1 list the types of substrate likely to be found in vehicle refinishing 1.2 outline the main methods used to determine the vehicle substrate 1.3 describe the properties of the vehicle substrate 1.4 outline the factors that influence the selection of the preparation process and foundation material 1.5 state the types of body components that are likely to be manufactured from plastic and reinforced composite materials.	

Learning outcome	The learner will:
2. Understand how to repair plastic and reinforced composite materials	
Assessment criteria	
The learner can: 2.1 explain the properties of plastic and reinforced composite materials used in vehicle body manufacturing. 2.2 explain the types of reinforcing materials used in the manufacture and repair of plastic and reinforced composite materials 2.3 explain the resins used in reinforced composite materials 2.4 explain the moulding and laminating techniques used in the manufacture and repair of plastic and reinforced composite materials 2.5 explain how to assess the extent of the repair to be carried out 2.6 explain the factors determining the use of specific preparation and repair methods 2.7 explain the implications of working with plastic and reinforced composite materials 2.8 explain the consequences of using inappropriate repair methods.	

Learning outcome	The learner will:
3. Understand how to prepare plastic and reinforced composite body surfaces prior to application of foundation materials	
Assessment criteria	
The learner can: 3.1 explain the choice and use of surface cleaning agents prior to applying foundation materials to plastics and reinforced composite materials 3.2 explain how to condition and clean surfaces prior to the application of foundation coatings to ensure adequate adhesion.	

Learning outcome	The learner will:
4. Understand how to mix and apply foundation materials onto plastics and reinforced composite materials in vehicle refinishing	
Assessment criteria	
The learner can: 4.1 explain how to mix and check the viscosity of foundation materials 4.2 explain the importance of viscosity and its effects on the surface finish 4.3 describe the properties of the foundation materials 4.4 explain the principles of paint mixing, the importance of the right additive (hardener or thinner) in the correct ratio 4.5 describe the curing and drying recommendations for the various foundation materials for plastics and reinforced composite materials 4.6 explain how to apply foundation coatings 4.7 describe how to find and interpret sources of information relevant to the mixing and application of foundation coatings relating to plastics and reinforced composite materials 4.8 describe how to avoid application defects 4.9 describe the masking procedures, methods and techniques for part or whole vehicles 4.10 explain how to carry out masking procedures to avoid material wastage and vehicle contamination for each stage of the process 4.11 identify the requirements for protecting the vehicle and contents from damage before, during and after preparing and applying foundation materials.	

Unit 358 Knowledge of Working with Plastic and Reinforced Components in an Automotive Environment

Supporting information

Content:

The types of substrates likely to be found in vehicle refinishing

a. Types of substrate to include:
   i. all plastics
   ii. high bake Enamels (O E finishes)
   iii. 2 K Paints
   iv. 1K Paints
   v. clear over bases
   vi. polyester fillers
   vii. repaired panels
   viii. primed panels

b. Substrates to determine selection of undercoat with reference to:
   i. condition of surface
   ii. type of substrate
   iii. process requirements
   iv. material requirement

c. list the physical properties of a substrate to include:
   i. surface condition
   ii. adhesion
   iii. flexibility
   iv. porosity
   v. texture

Methods used in determining vehicle substrates

a. Workshop tests to determine substrates to include:
   i. visual test for plastics and identification of plastic type through identification code

b. For determination of paint type:
   i. compound small area
   ii. solvent wipe test (1k or 2k)
   iii. colour of flatting sludge (straight colour or C O B)

The properties and correct use of conditioning materials

a. That a vehicle must be thoroughly washed and cleaned prior to refinishing to include:
   i. outside body panels
   ii. under arches
   iii. under bonnet
   iv. all apertures
   v. degreased

b. Reasons for masking components adjacent to repair areas.

The correct preparation of parts prior to painting to include products used for the removal of:

i. wax
ii. grease
iii. skin oils
iv. dust
v. water
vi. abrasive contaminates
vii. environmental pollution

c. Materials used for conditioning processes such as:
i. wax and grease removers
ii. spirit wipes
iii. acid based
iv. water based

d. The correct and safe use of the above materials.

e. The properties of pre-preparation material to include:
i. .
ii. ability to alter the surface
iii. reaction with oxide

The types and properties of foundation materials in common use

a. The types of undercoat in common use to include:
i. etch primer / adhesion promoters
ii. primer surfacer
iii. primer filler
iv. stopper/putty
v. sealers
vi. anti stone chip
vii. polyester fillers

b. The characteristics of these undercoats such as:
i. protection
ii. flexibility
iii. build
iv. drying
v. flatting
vi. The types and characteristics of common protective coatings such as bitumen based
vii. anti stone chip
viii. etch primer
ix. PVC

The factors affecting the choice and use of foundation materials

a. The reasons for using paint to include:
i. protection
ii. filling
iii. decoration
iv. identification
v. safety

b. Undercoat materials for plastics to include:
i. adhesion promoters
ii. surface modifiers
iii. flexible additives
iv. texture additives

c. The procedures for the preparation of plastics to include:
i. identification
ii. cleaning
iii. adhesion promotion
iv. elastic primers

d. Identify the preparation requirements for textured and special effect coatings to include:

i. spoilers
ii. bumpers
iii. exterior trim

The procedures for mixing foundation materials to the correct ratio with hardeners and thinners

a. Procedures for mixing undercoats such as:
   i. etch primers
   ii. anti-stone chip primers
   iii. surfacers
   iv. wash fillers
   v. primer fillers
   vi. plastic adhesion promoters
   vii. elastic primers
   viii. sealers
   ix. spraying polyester fillers
b. Listed additives such as:
   i. adhesion promoters
   ii. flexible additives
   iii. texture finishes
   iv. extenders
   v. UV absorbers
   vi. flow aids

The importance of checking and adjusting paint viscosity and its effect on surface finish

a. Why the viscosity of a paint is important to application to include:
   i. build
   ii. surface finish
   iii. speed of application
   iv. describe the procedure for checking viscosity
   v. describe the effects on viscosity of:
   vi. temperature
   vii. additions of thinner/reducer

Foundation material technical data sheets to extract listed information.

The importance of correctly interpreting and following manufacturers' instructions and the consequences of failing to do so

a. The process data sheets to determine information such as:
   i. mixing ratios
   ii. viscosity
   iii. number of coats
   iv. flash off times
   v. build film thickness
   vi. spray gun type
   vii. spray gun set up
   viii. air pressure requirements
   ix. substrate requirements
   x. suitability as a substrate
   xi. drying times
   xii. suitability to be applied by methods other than spraying
b. Be main information sourced from data sheets to include:
   i. product identification
   ii. product description
   iii. substrate suitability
   iv. pre-treatment requirement
   v. mixing ratio
   vi. pot life

vii. method of application
viii. spray viscosity
ix. nozzle/air cap set up
x. number of coats
xi. flash off times
xii. drying times
xiii. recoatability

c. Common pictograms and state their meaning including those for:
i. cleaning information
ii. mixing ratios
iii. use a measuring stick
iv. addition of hardener
v. application viscosity
vi. type of spray gun
vii. spray coats information
viii. flash-off
ix. drying time
x. drying with infrared
xi. sanding
xii. polishing
xiii. technical data required
xiv. hand stirring.

Unit 359 Knowledge of Applying Masking Materials to Automotive Vehicles

Level:	**5**
Credit value:	4
Relationship to NOS:	This unit is linked to PO02K Knowledge of applying masking materials to automotive vehicles
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding to undertake masking activities efficiently and effectively during vehicle body and paint operations.

Learning outcome	**The learner will:**
1. Understand how to select, use, store and maintain masking tools and equipment	
Assessment criteria	
The learner can: 1.1 identify the main tools and equipment used during the masking process 1.2 describe, how to select, prepare and maintain tools and equipment used during masking activities 1.3 state the limitations of tools and equipment used in vehicle masking 1.4 explain appropriate storage methods for masking tools and equipment	

Learning outcome	The learner will:
2. Understand how to identify and use appropriate masking materials for different applications	
Assessment criteria	
The learner can: 2.1 compare types of masking materials for different applications 2.2 describe the properties of masking materials and the factors which affect their use 2.3 describe cleaning processes used during masking activities 2.4 describe common masking techniques used to protect panels and components. 2.5 explain methods which allow easy removal of masking materials 2.6 explain the types of checks made during masking activities that will prevent faults 2.7 describe a range of masking faults, their cause and methods of rectification 2.8 explain how to avoid wastage during masking activities 2.9 describe how and when to remove masking materials 2.10 state the appropriate methods of disposing used masking materials.	

Learning outcome	The learner will:
3. Understand the purpose of quality control checks during and after masking operations	
Assessment criteria	
The learner can: 3.1 explain the implications of not following the correct masking procedures and its effect on the overall quality process 3.2 describe the implications of failing to rectify masking faults 3.3 explain the importance of working to agreed timescales and how masking faults may affect them	

Unit 359 Knowledge of Applying Masking Materials to Automotive Vehicles

Supporting information

Content:

Health and Safety:

The appropriate personal health and safety requirements and legislation must be included in this unit and any specific workplace polices highlighted.

Learning Outcome 1

Tools and Equipment Used in Vehicle Masking

a. Paper and sheeting / tape dispenser – masking machines
b. Trimming knife / safety cutter
c. Templates and shields – alloy wheel masking and paint repair

Equipment Selection

a. Choices and variety available – appropriate for the size of vehicle
b. How to reduce the risk of damage to the panel surface of the vehicle
c. Speed of operation
d. Economical use of materials

Safety – safety cutters and single person operation of masking machines for large areas, ease of trimming masking materials to length

Content Contd.

Equipment Preparation

a. Checks to ensure the equipment is safe, fit for purpose, complete and operational.
b. Cleanliness
c. How to fit masking materials and appropriate widths of tapes to masking dispensers

Equipment Maintenance

a. Training
b. Check moving parts
c. Security of fixings and fittings
d. Disposal of blunt cutters / blades
e. Replacing consumables when they run out
f. Keeping equipment clean to prevent contamination and paint faults
g. Cleaning masking templates and shields

Equipment Limitations

a. Correct size – appropriate for the task
b. Types of equipment available for different applications

Equipment Storage

a. Check cleanliness before use

b. Dry storage areas
c. Dust free environment
d. Organised storage to avoid equipment damage and health and safety issues

Reporting Equipment Faults

a. Responsibilities of reporting equipment faults
b. Persons to report equipment faults to
c. Methods of reporting
d. Logging equipment faults and rectification procedures
e. Out of service procedures

Learning Outcome 2

Masking Materials

a. Cleaning and degreasing consumables
b. Tape variations – purpose, limitations, widths and application
c. Foam tapes, 'smooth transition' tapes / specialist products
d. Lining / striping and flexible tapes
e. Masking templates, stencils and shields
f. Plastic sheeting and papers - purpose, limitations, widths and application
g. Taped masking products – sheeting and paper
h. Windscreen masking systems, cord and trim tapes

Material Properties

a. Flexible, easy to shape around vehicle trims and produce designs
b. Easy to reposition and easy to cut
c. Sheeting which clings to the vehicle
d. Can be used with IR-dryers
e. Avoids moisture staining
f. Masking tape easily removed and repositioned on the film or surface
g. Very fine flip edges – 'smooth transition' tapes
h. Suitable for style lines / swages
i. Leaves no residue
j. Used on a dispenser
k. Water and solvent resistant
l. Holds adhesion even through repeat bake cycles
m. Prevents 'creeping'
n. Colour enables easy identification of the product type and capabilities

Cleaning Processes

a. Techniques used during cleaning, prior to masking
b. Cleaning materials and consumables used during the masking process

Masking Techniques

a. Include techniques that reduce paint edge build up, stop overspray, produce shapes / designs, cover large areas, covering inaccessible areas and intricate components.
b. Roll-back masking
c. Back masking
d. Sheeting
e. Lining out / outlining edges of trim
f. Shaping paper and sheeting around panels, trim and components

g. Preventing overspray in vehicle body apertures
h. Appropriate masking when carrying out, localised repairs, blending and fading topcoats

Masking Checks

a. Adhesion
b. Any gaps
c. Lifting on curves and corners
d. Covering edges of panels and trim
e. Papers and sheeting are the correct way round
f. Positioned correctly on styling / swage lines
g. Excess paper or sheeting that may touch the panels being painted / repaired
h. Materials are fit for purpose
i. Inaccurate masking

Masking Faults, their cause and methods of rectification

a. Paint flaking off masking that is not fit for purpose or used the wrong way round
b. Overspray
c. Paint and primers creeping underneath
d. Lack of adhesion
e. Impression marks
f. Ghosting
g. Deformation and melting from applied heat
h. Lifting on corners or curves
i. Inaccurate masking

Avoiding Wastage During Masking Activities

a. Select masking which is fit for purpose
b. Use masking materials of the correct size and to suit the task
c. Cleaning surfaces prior to masking
d. Accurately shape masking material around panels and components
e. Use sheeting and / or papers to 'fill in' rather than use excessive amounts of tapes
f. Use for intended purposes only – for example not as a substitute for vehicle protection covers
g. Store correctly and avoid damage to materials
h. Use dispensers / machines to aid the masking process
i. Poor techniques - not wrapping masking around cylindrical components

Masking Removal

a. Within the correct timescale
b. Techniques to avoid damage to panel surfaces and trims
c. Angle of removal
d. Methods to remove residue
e. Techniques that promote easy removal of masking materials

Masking Standards and Reporting Delays

a. The importance of accurate masking
b. How to assess masking standards
c. Checking masking against job specifications – logos and designs
d. Masking training
e. How to report delays
f. The importance of reporting delays

g. Who to report expected delays to

Learning Outcome 3

Quality Control Checks and Processes

a. Inspection procedures to identify masking faults
b. How to record and report faults
c. How to arrange for any masking faults to be removed or rectified
d. How to monitor masking faults and improve on performance

Masking Procedures and its effect on the quality process

a. Highlight how masking procedures and standards affect:
   i. Quality
   ii. Timescales
   iii. Reputation
   iv. Cost
   v. Profitability

Implications of Failing to Rectify Masking Faults

a. Customer complaints
b. Effects or rework
c. Reputation

Working to Agreed Timescales and how Masking Faults May Affect Them

a. Include examples of faults that occur through inaccurate masking and estimate:
   i. The increase labour time and costs involved in rectifying the faults
   ii. The importance of working to agreed timescales and who it may affect – for example customers, hire car companies and insurance companies.

Unit 363 Knowledge of Mixing and Matching Colours for Automotive Vehicles

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to PO013K Knowledge of mixing and matching colours for automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding of colours, undercoats paints, identification, mixing and matching of vehicle paint colours including the use of tinters and preparation of test cards.

Learning outcome	**The learner will:**
1. Understand about colour theory	
Assessment criteria	
The learner can: 1.1 describe the colours of the spectrum 1.2 identify the primary colours 1.3 explain the effect by which pigments produce visible colour, including black and white 1.4 identify and recognise colour classification systems 1.5 describe the terms colour, strength, hue, chroma 1.6 explain the effects of the viewing environment on colour matching 1.7 explain the terms gloss, opacity and metamerism and their effects on colour matching.	

Learning outcome	**The learner will:**
2. Understand about vehicle paint coatings, ingredients and their application	
Assessment criteria	
The learner can: 2.1 explain the purpose of paint materials 2.2 describe the kinds of undercoats, their functions and use on motor vehicles	

2.3 describe the kinds of topcoats, their functions and use on motor vehicles including:
   a. solid colours
   b. clear over base colours
   c. metallic colours
   d. pearl colours
2.4 identify and explain the basic ingredients of paints
2.5 explain the types of paints available and their function including:
   a. single pack
   b. two pack
   c. acrylic
2.6 explain the types of pigments available and their function
2.7 explain the types of solvents available and their function
2.8 explain the purpose of testing paint materials.

Learning outcome	**The learner will:**
3. Understand about mixing and matching vehicle paint colours	
Assessment criteria	
The learner can: 3.1 describe how to use sources of information relevant to the mixing and matching of vehicle paint colours 3.2 describe the equipment used for the identification of colours 3.3 describe how to identify the paint substrate and the importance of doing so 3.4 explain how to compare, mix, test and adjust colour tones and effects, including metallic and mica and other specialist effects 3.5 explain the consequences of adding too much of one type of tinter and the process for correcting and adjusting it 3.6 the implications of combining different manufacturer's paint products 3.7 describe how to use test panels and colour test cards including drying and the importance of doing so 3.8 explain how spray equipment adjustments can alter colour 3.9 explain how to identify the causes of colour mismatch and how to rectify 3.10 explain how to assess and evaluate the need for blending techniques to achieve and acceptable colour match 3.11 describe the importance and implications of correctly preparing the existing finish for colour matching and checking the match using the correct light source.	

Unit 363 Knowledge of Mixing and Matching Colours for Automotive Vehicles

Supporting information

Content:

The effects of the viewing environment on colour matching:

a. Artificial light
b. Natural light
c. Light box
d. Direct sunlight
e. Shaded light
f. Reflection

The purpose of paint materials :

a Anti-corrosion
b Protection
c Reflection
d Visual
e Body sound deadening (all list to go in content)

Types of undercoats and their function:

a Primer
b Primer surfacer
c Anticorrosion
d Etch primers
e Plastic primers
f Primer fillers
g Electrodepositing (E-coating)
h e-coat replacement products
i Sealers/isolators
j Anti chip/texture coatings

Types of paints and their function:

a. Single pack
b. Two pack
c. Acrylic
d. Alkyd
e. Epoxy
f. Polyurethane
g. Phenolic
h. Polyester

Types of pigments available and their function:

a Coloured
b Metallic
c Pearl
d Anti corrosion

e Extender
f Special effects

The purpose of testing paint materials:

a. Adhesion
b. Durability
c. Corrosion
d. Resistance to chemicals
e. Abrasion
f. Acid rain
g. Ultraviolet

Types of topcoat

a. solid colours
b. clear over base colours
c. metallic colours
d. pearl colours

Methods and importance of correctly identifying paint substrates prior to undertaking any refinishing work

a. Workshop tests to determine substrates to include:
    i. solvent wipe test (1K or 2K)
    ii. colour of flatting sludge (straight colour or C O B).
    iii. VIN plate
b. Substrates to determine selection of undercoat with reference to:
    i. condition of surface
    ii. type of substrate
    iii. process requirements
    iv. material requirements.
c. The physical properties of a substrate to include:
    i. surface condition
    ii. adhesion
    iii. flexibility
    iv. porosity.
d. The technical properties of a substrate to include:
    i. type of paint
    ii. steel
    iii. aluminium
    iv. plastic
    v. coated steels
    vi. repaired panels
    vii. OE finish

How to prepare existing paint substrates for colour matching

a. The required preparation for the listed substrates to include:
    i. steel
    ii. aluminium alloys
    iii. GR plastics
    iv. thermo plastics
    v. cured 2K materials
    vi. synthetic enamels.
b. The procedures for the preparation of paint finishes to include:

i. thorough cleaning and drying
ii. compounding to restore original colour.

c. The procedures for the preparation of plastics to include:
i. identification
ii. tempering
iii. porefilling
iv. release agent removal
v. cleaning
vi. adhesion promotion
vii. elastic primers.

d. The preparation requirements for textured and special effect coatings to include:
i. spoilers
ii. bumpers
iii. exterior trim.

How different light sources can affect the perception of colour for matching purposes

a. Colour in terms of light reflected from a surface to include:
i. light quality
ii. surface quality
iii. absorbed light
iv. reflected light.

b. The effects of metamerism under:
i. sodium light
ii. mercury vapour
iii. explain how this phenomenon is created.

Spraying equipment adjustments can alter the colour of refinishing materials

a. The spray gun adjustments that can be made to determine the surface finish of a colour coat to include:
i. air pressure
ii. fluid volume
iii. fan width

Sources of information relevant to the mixing and matching of vehicle paint colours

a. The information that may be gained from the Vehicle Identification No. (VIN) plate with regard to paint codes.
b. Alternative areas of the vehicle where the paint code may be found.
c. The sources of information relevant to paint finishing to include:
i. PC based material
ii. paint manufacturers information
iii. trade magazines
iv. specialist magazines (customising periodicals)
v. vehicle manufacturers information sheets
vi. paint data sheets
vii. microfiche
viii. world wide web
ix. Thatcham methods manuals

d. Types of information recoverable from the above sources to include:
i. product and mixing information
ii. health and safety information

iii. first aid procedures
iv. application techniques
v. rectification procedures
vi. colour information

e. The meaning of the symbols used on most microfiche such as:
i. colour data
ii. formula field
iii. technical field
iv. on line finish
v. coding field
vi. formula in development
vii. special technical information
viii. variants
ix. respray
x. poor opacity
xi. 3-stage colour
xii. colours for mouldings/bumpers
xiii. revised formula

f. The extra colour information available such as:
i. colour variants
ii. colour 'wheel'
iii. on-line colour back up

g. The sources of tinting information available to the painter to aid colour matching of metallics.

The principles of colour, the colour wheel, and Munsell's Notation

a. The theory of colour matching to include:
i. primary and secondary colours
ii. metamerism
iii. quality of light source
iv. colour circles

b. The terminology used to describe the matching of metallic colours with reference to:
i. the munsell colour circle
ii. the variant shade
iii. hue
iv. chroma
v. value

c. What is meant by subtractive mixing

d. What is meant by additive mixing

The factors affecting colour and colour perception, including metamerism

a. Factors affecting colour variation such as:
i. orientation of metallic particles
ii. flip and face tones
iii. coating thickness and viscosity
iv. spraying temperatures
v. spraying pressures

b. How each of the above has an effect on the colour match

c. How the above problems can be overcome

d. The process of light and pigment interaction with reference to:
i. colour spectrum
ii. colour effects
iii. refraction
iv. diffusion
v. light wavelengths
vi. thickness of pigment particles

vii. type of pigment particles

e. The function of a light box testing unit as:
   i. testing under normal daylight conditions
   ii. testing for metamerism
   iii. comparison of colour standards

f. The operation of a light testing unit with reference to:
   i. operation
   ii. type of light used

How to obtain matching colours and how to compare them with the original finish in terms of colour, tone and effect, including the use of dried test cards or panels

a. The procedures and principles for using colour chips such as:
   i. cleaning the panel
   ii. matching in daylight conditions
   iii. matching adjacent panels

b. What is meant by subtractive mixing

c. What is meant by additive mixing

d. The mixing of basecoat materials to include:
   i. mixing tinters
   ii. thinners, solvents or water
   iii. additives

e. The preparation of a clearcoat material to include:
   i. hardeners
   ii. thinners/solvents
   iii. additives

f. The types of 'advanced pigments' used in modern paints:
   i. metallic (aluminium and titanium)
   ii. pearlescents (micas)
   iii. 'multi flip' pigments

g. The operation and characteristics of different pigments to include:
   i. acicular-noodle shaped-add strength and reinforcing
   ii. lamollar - flakes-increased durability
   iii. nodular- roughly spherical-most common

h. The function of spray out cards to determine:
   i. opacity of colour
   ii. hiding power
   iii. colour comparison
   iv. as a reference for future use

i. The functions of spray out cards with reference to a 'colour library':
   i. reference functions
   ii. colour tinting information
   iii. information required
   iv. recording of information

Different application techniques

a. The differences to applying a base coat material compared with one stage solid colours such as:
   i. gun distance
   ii. gun speed
   iii. air pressure
   iv. 'drop coats'
   v. flash off

b. The application of clear coat with reference to:
   i. gun speed
   ii. flash off
   iii. number of coats
   iv. MS, HS and UHS

The importance of using material application methods which assist in achieving colour match

a. The differences to applying a base coat material compared with one stage solid colours such as:
   i. gun distance
   ii. gun speed
   iii. air pressure
   iv. 'drop coats'
   v. flash off
b. The effects of applying metallic colours:
   i. wet
   ii. dry
c. The application of clear coat with reference to:
   i. gun speed
   ii. flash off
   iii. number of coats
   iv. MS, HS and UHS

The use of blending techniques as an aid to achieving an acceptable colour match

a. The procedure for carrying out paint blend to include:
   i. panel preparation
   ii. masking
   iii. gun technique
   iv. final thinning
   v. spraying onto adjacent areas and panels to assist in matching colours

The methods used to rectify mismatches caused by over tinting

a. The requirements of tinting colours to:
   i. lighten the colour
   ii. darken the colour
   iii. tint the colour
   iv. 'clean' the colour
b. The procedure of colour matching with reference to:
   i. identifying the mismatch
   ii. describing the hue and value
   iii. identifying the required tinter
   iv. regulating the tinter additions.

Unit 403 Skills in Blend and Fade out Repairs on Automotive Vehicles

Level:	**6**
Credit value:	3
Relationship to NOS:	This unit is linked to PO11S demonstrating skills in blend and fade out repairs on automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will help the learner to develop the skills required to follow guidelines and procedures for the refinishing of new and repaired vehicle panels. Including the preparation of the surface panel and application of the topcoat using blend/face out repair

Learning outcome	**The learner will:**
1. Be able to work safely when carrying out preparation and application of topcoat materials using blend/fade out repair	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when carrying out preparation and application of topcoat materials in vehicle refinishing 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment	

Learning outcome	**The learner will:**
2. Be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support preparation and application of topcoat materials to vehicles 2.2 use technical information to support preparation and application of topcoat materials to vehicles.	

Learning outcome	The learner will:
3. Be able to use appropriate tools and equipment	
Assessment criteria	
The learner can: 3.1 select the appropriate tools and equipment necessary for carrying out preparation and application of topcoat materials to vehicles 3.2 ensure that equipment has been calibrated to meet manufacturers requirements 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out preparation and application of topcoat materials to vehicles 3.4 leave all application equipment in a clean and serviceable condition.	

Learning outcome	The learner will:
4. Be able to carry out preparation and application of topcoat materials in blend/fade out repair	
Assessment criteria	
The learner can: 4.1 identify the type of substrate prior to working on the vehicle 4.2 use of surface cleaning agents materials 4.3 prepare all the refinishing systems and materials required following health and safety requirements 4.4 mix and check the viscosity of topcoat materials 4.5 apply all topcoat materials 4.6 dry and cure all topcoat materials 4.7 ensure the finish product meets the requirements of the manufacturer's warranty, the refinishing specification required and customer needs 4.8 dispose of waste materials to conform with legal and workplace requirements.	

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

Evidence Requirements

You must be observed on at least 2 occasions by an assessor carrying out blend/fade out repair.

Unit 409 Skills in Carrying out Edge to Edge Repairs on Automotive Vehicles

Level:	**6**
Credit value:	3
Relationship to NOS:	This unit is linked to PO12S demonstrating skills in carrying out edge to edge repairs on automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit will help the learner to develop the skills required to follow guidelines and procedures for the refinishing of new and repaired vehicle panels. Including the preparation of the surface panel and application of the topcoat using edge to edge repair.

Learning outcome	**The learner will:**
1. Be able to work safely when carrying out preparation and application of topcoat materials using edge to edge repair	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when carrying out preparation and application of topcoat materials in vehicle refinishing 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.	

Learning outcome	**The learner will:**
2. Be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support preparation and application of topcoat materials to vehicles 2.2 use technical information to support preparation and application of topcoat materials to vehicles.	

Learning outcome	The learner will:
3. Be able to use appropriate tools and equipment	
Assessment criteria	
The learner can: 3.1 select the appropriate tools and equipment necessary for carrying out preparation and application of topcoat materials to vehicles 3.2 ensure that equipment has been calibrated to meet manufacturers requirements 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out preparation and application of topcoat materials to vehicles 3.4 leave all application equipment in a clean and serviceable condition.	

Learning outcome	The learner will:
4. Be able to carry out preparation and application of topcoat materials in edge to edge repair	
Assessment criteria	
The learner can: 4.1 identify the type of substrate prior to working on the vehicle 4.2 use of surface cleaning agents materials 4.3 prepare all the refinishing systems and materials required following health and safety requirements 4.4 mix and check the viscosity of topcoat materials 4.5 apply all topcoat materials 4.6 dry and cure all topcoat materials 4.7 ensure the finish product meets the requirements of the manufacturer's warranty, the refinishing specification required and customer needs 4.8 dispose of waste materials to conform with legal and workplace requirements.	

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

Evidence Requirements

You must be observed on at least 2 occasions by an assessor carrying out edge to edge repair.

Unit 453 Knowledge of Blend and Fade out Repairs on Automotive Vehicles

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to PO11K Knowledge of blend and fade out repairs on automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding for following guidelines and procedures for the refinishing of new and repaired vehicle panels. Including the preparation of the surface panel, application of the topcoat using blend/fade out repair.

Learning outcome	**The learner will:**
1. Understand how to prepare panels and refinishing systems for the application of topcoat materials using blend/fade out repair	
Assessment criteria	
The learner can: 1.1 explain how to prepare panels and parts adjacent to the area being paint 1.2 explain how to prepare refinishing systems and materials for use 1.3 explain the properties of the refinishing system and materials and the factors affecting their use.	

Learning outcome	**The learner will:**
2. Understand how to identify, mix and apply topcoat materials in blend/fade out repair	
Assessment criteria	
The learner can: 2.1 explain how to condition and clean surfaces prior to the application of topcoat coatings 2.2 explain the importance of proper cleaning and correct use of foundation material to ensure adequate adhesion 2.3 explain the methods of protecting panels and parts adjacent to the areas being painted and the circumstances in which they should be used	

2.4	describe the choice and use of topcoat materials
2.5	explain how to mix and check the viscosity of topcoat materials
2.6	explain the importance of viscosity and its effects on the surface finish
2.7	explain the principles of paint mixing, the importance of the right additive (hardener or thinner) in the correct ratio
2.8	explain how to apply topcoat coatings avoiding contamination and defects during fade out/blending processes
2.9	explain the curing and drying recommendations for the various topcoat materials
2.10	explain the effects of the spray environment and natural environment on vehicle refinishing
2.11	explain the techniques used in polishing the vehicle topcoat finish
2.12	explain the requirements for protecting the vehicle and contents from damage before, during and after preparing and applying topcoat materials.

Unit 453 Knowledge of Blend and Fade out Repairs on Automotive Vehicles

Supporting information

Content:

The types of substrates likely to be found in vehicle refinishing

a. List types of substrate to include:
   i. steel
   ii. aluminium
   iii. all plastics
   iv. coated steels
   v. high bake Enamels (O E finishes)
   vi. 2 K Paints
   vii. 1K Paints
   viii. clear over bases
   ix. polyester fillers
   x. repaired panels
   xi. primed panels (E coat)

Methods used in determining vehicle substrates

b. For determination of paint type:
   i. compound small area
   ii. solvent wipe test (1k or 2k)
   iii. colour of flatting sludge (straight colour or C O B)
   iv. VIN plate

The main stages required in preparing a vehicle for refinishing, including areas adjacent to the painting area

c. Vehicles must be thoroughly washed and cleaned prior to refinishing to include:
   a. outside body panels
   b. under arches
   c. under bonnet
   d. all apertures
   e. degreased

d. The reasons for vehicle masking

e. The correct preparation of parts prior to painting to include products used for the removal of:
   a. wax
   b. grease
   c. skin oils
   d. dust
   e. water
   f. abrasive contaminates
   g. environmental pollution

The selection and uses of a range of abrasives in common use

a. Types and uses of abrasives materials to include:
   vii. aluminium oxide

viii. silicon carbide
ix. wet and dry types
x. open coat
xi. closed coat
xii. papers, pastes and woven plastics

b. Forms of abrasive to include:

vii. pad
viii. disc
ix. sheet
x. roll
xi. backing materials
xii. methods of attachments

c. How grit sizes are classified according to the FEPA standards using 'P' grades with regard to:

iv. the process being carried out
v. the material being abraded
vi. the technique being employed

d. The differences between Open and Closed coat abrasives

i. open coat
ii. closed coat
iii. P grades

The term 'feather edging' and why correct operation is required in achieving the required surface finish

a. The procedure for the preparation of a repaired area on a large panel in terms of:

i. repair edge preparation
ii. surrounding area
iii. bare metal

b. Why correct preparation is required with reference to:

i. surface finish
ii. film thickness
iii. sinkage
iv. mapping
v. contouring

The factors affecting the choice and use of topcoat materials

a. The types of paints such as:

b. Non-convertible

i. nitro cellulose
ii. 1k acrylic

c. Convertible

i. oil based synthetics
ii. 2 k acrylics
iii. 2k polyurethane
iv. polyesters
v. isocyanate resins

d. Waterborne basecoats

e. The reasons for using paint to include:

i. protection
ii. filling
iii. decoration
iv. identification
v. safety

f. Use process data sheets to determine information such as:

i. material description
ii. material properties

iii. material characteristics
iv. limitations
v. related materials
vi. mixing ratios
vii. viscosity
viii. build film thickness
ix. pot life

The properties of topcoat materials

a. The ingredients of paint include:
i. pigment
ii. binder/vehicle
iii. solvent/thinner/reducer
iv. additives

b. The different types of paints to include:

c. Non convertible:
i. nitro cellulose
ii. 1k acrylics
iii. basecoats

d. Convertibles:
i. two packs
ii. oil based synthetic enamels

e. The characteristics and properties of surface coatings to include:
i. nitro-cellulose- non convertible-low build –fast surface dry
ii. oil based synthetics-convertible-slow dry through uptake of oxygen
iii. two packs- convertible- chemical reaction –high build
iv. base coats- solvent or water borne -non convertible-very low build-high opacity-have to be over
v. coated with a clear coat

f. The principles of operation of water based materials

g. The materials used in water based paint technology

h. The environmental advantages of using water based paints

i. The materials in terms of their:
i. preparation of substrates
ii. mixing procedures
iii. application
iv. drying processes
v. working techniques
vi. covering and hiding power
vii. rectification
viii. cleaning process

Preparation and use of topcoat materials for refinishing procedures

a. The process data sheets to determine information such as:
i. mixing ratios
ii. viscosity
iii. number of coats
iv. flash off times
v. build film thickness
vi. spray gun type
vii. spray gun set up
viii. air pressure requirements
ix. substrate requirements
x. suitability as a substrate
xi. drying times
xii. suitability to be applied by methods other than spraying

b. Procedures for mixing topcoats such as:
   i. 1K – cellulose and acrylics
   ii. 2K solid finishes and clear lacquers
   iii. basecoats – solid, metallic and pearlescent

Tools and equipment used in the preparation of topcoat materials

a. the tools and equipment required for paint preparation to include:-
   i. mixing schemes
   ii. ratio/mixing sticks
   iii. calibrated mixing cups
   iv. paint filters
   v. viscosity cups
   vi. timers
   vii. appropriate PPE

The selection of appropriate techniques for refinishing new and repaired panels, using fade outs, blending processes

a. The procedure for carrying out paint blend to include:
i. panel preparation
ii. masking
iii. gun technique
iv. final thinning

Correct application of topcoat materials can help to avoid surface defects such as colour/tone variations, overspray, etc.

a. Spray gun motion to include:
   i. gun distance
   ii. gun angle
   iii. gun speed
   iv. overlaps

b. The relationship between the four motions to give an even film thickness.
c. The reason for flash off times between coats.
d. What is meant by 'Wet on Wet' applications.
e. The application differences of using MS, HS and UHS materials.
Blend repair techniques and methods. The differences to applying a basecoat material compared with one stage solid colours such as:
   i. gun distance
   ii. gun speed
   iii. air pressure
   iv. 'drop coats'

h. The application of clearcoat with reference to:
   i. gun speed
   ii. flash off
   iii. number of coats
   iv. HS and UHS

The procedures to be adopted to rectify spray gun, topcoat surface defects and avoid their recurrence

a. The 'Spray Out' checks to establish spray gun faults such as:
   i. spray flutter
   ii. sickle-shaped patterns
   iii. centre heavy pattern
   iv. constricted centre pattern
   v. top/bottom heavy patterns

b. The causes and remedies for these faults.
c. Application paint faults to include:

i. runs
ii. sags
iii. dirt
iv. contamination (fish eyes)
v. orange peel
vi. dry spray
vii. Solvent pop

d. The causes, prevention and rectification of these faults.

The importance of sourcing, correctly interpreting and following manufacturers' instructions and the consequences of failing to do so

a. Sources of material information to include:
i. PC based material
ii. paint manufacturers information
iii. paint data sheets
iv. world wide web
v. Thatcham methods manuals

b. Types of material recoverable from the above sources to include:
i. product and mixing information
ii. health and safety information
iii. first aid procedures
iv. application techniques
v. rectification procedures
vi. colour information

c. Sources of information relevant to equipment to include:
i. manufacturer's instructions
ii. operating manuals
iii. trade publications
iv. world wide web

d. The type of information recoverable from these sources such as:
i. maintenance schedules
ii. maintenance procedures
iii. replacing parts and consumables
iv. spare parts list and suppliers
v. accessories available
vi. trouble shooting information
vii. adjustment and operation guides

Unit 459 Knowledge of Carrying out Edge to Edge Repairs on Automotive Vehicles

Level:	**6**
Credit value:	5
Relationship to NOS:	This unit is linked to PO12K knowledge of carrying out edge to edge repairs on automotive vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by the IMI, the Standards Setting Body for the automotive industry.
Aim:	This unit enables the learner to develop an understanding for following guidelines and procedures for the refinishing of new and repaired vehicle panels. Including the preparation of the surface panel, application of the topcoat using edge to edge repair.

Learning outcome	**The learner will:**
1. Understand how to prepare panels and refinishing systems for the application of topcoat materials using edge to edge repair	
Assessment criteria	
The learner can: 1.1 explain how to prepare panels and parts adjacent to the area being paint 1.2 explain how to prepare refinishing systems and materials for use 1.3 explain the properties of the refinishing system and materials and the factors affecting their use.	

Learning outcome	**The learner will:**
2. Understand how to identify, mix and apply topcoat materials in edge to edge repair	
Assessment criteria	
The learner can: 2.1 explain how to condition and clean surfaces prior to the application of topcoat coatings 2.2 explain the importance of proper cleaning and correct use of foundation material to ensure adequate adhesion 2.3 explain the methods of protecting panels and parts adjacent to the areas being painted and the circumstances in which they should be used	

2.4	describe the choice and use of topcoat materials
2.5	explain how to mix and check the viscosity of topcoat materials
2.6	explain the importance of viscosity and its effects on the surface finish
2.7	explain the principles of paint mixing, the importance of the right additive (hardener or thinner) in the correct ratio
2.8	explain how to apply topcoat coatings avoiding contamination and defects when using edge to edge repair
2.9	explain the curing and drying recommendations for the various topcoat materials
2.10	explain the effects of the spray environment and natural environment on vehicle refinishing
2.11	explain the techniques used in polishing the vehicle topcoat finish
2.12	explain the requirements for protecting the vehicle and contents from damage before, during and after preparing and applying topcoat.

Unit 459 Knowledge of Carrying out Edge to Edge Repairs on Automotive Vehicles

Supporting information

Content:

The types of substrates likely to be found in vehicle refinishing

a. List types of substrate to include:
   i. steel
   ii. aluminium
   iii. all plastics
   iv. coated steels
   v. high bake Enamels (O E finishes)
   vi. 2 K Paints
   vii. 1K Paints
   viii. clear over bases
   ix. polyester fillers
   x. repaired panels
   xi. primed panels (E coat)

Methods used in determining vehicle substrates

b. Workshop tests to determine substrates to include:
   i. visual test for aluminium, plastics
   ii. magnet test for steel

c. For determination of paint type:
   i. compound small area
   ii. solvent wipe test (1k or 2k)
   iii. colour of flatting sludge (straight colour or C O B)
   iv. VIN plate

The main stages required in preparing a vehicle for refinishing, including areas adjacent to the painting area

a. Manufacturers protective coatings and explain their warranty implications such as:
   i. electrostatic dip
   ii. under-body compounds
   iii. cavity wax
   iv. body caulking

b. Vehicles must be thoroughly washed and cleaned prior to refinishing to include:
   i. outside body panels
   ii. under arches
   iii. under bonnet
   iv. all apertures
   v. degreased

c. The reasons for vehicle masking

d. The correct preparation of parts prior to painting to include products used for the removal of:
   a. wax
   b. grease
   c. skin oils

d. dust
e. water
f. abrasive contaminates
g. environmental pollution

The procedures used in preparing listed substrates

a. The required preparation for the listed substrates to include:
   i. steel
   ii. aluminium alloys
   iii. GR plastics
   iv. thermo plastics
   v. cured 2k materials
   vi. synthetic enamels
   vii. timber (trim parts only)
b. The procedures for the preparation of plastics to include:
   i. identification
   ii. tempering
   iii. porefilling
   iv. cleaning
   v. adhesion promotion
   vi. elastic primers

The selection and uses of a range of abrasives in common use

a. Types and uses of abrasives materials to include:
   i. aluminium oxide
   ii. silicon carbide
   iii. wet and dry types
   iv. open coat
   v. closed coat
   vi. papers, pastes and woven plastics
b. Forms of abrasive to include:
   i. pad
   ii. disc
   iii. sheet
   iv. roll
   v. backing materials
   vi. methods of attachments
c. How grit sizes are classified according to the FEPA standards using 'P' grades with regard to:
   i. the process being carried out
   ii. the material being abraded
   iii. the technique being employed
d. The differences between Open and Closed coat abrasives
   iv. open coat
   v. closed coat
   vi. P grades

The term 'feather edging' and why correct operation is required in achieving the required surface finish

a. The procedure for the preparation of a repaired area on a large panel in terms of:
   i. repair edge preparation
   ii. surrounding area
   iii. bare metal
b. Why correct preparation is required with reference to:
   i. surface finish
   ii. film thickness
   iii. sinkage

iv. mapping
v. contouring

Masking procedures for part and whole vehicles. Masking processes and techniques

a. Common masking systems, materials and techniques to include:
   i. masking paper
   ii. plastic sheeting
   iii. masking tape
   iv. foam tape
   v. wheel covers
   vi. liquid masking
   vii. roll-back masking

b. The characteristics of a quality masking tape to include:
   i. ability to turn corners
   ii. non-aggressive adhesive/non-drying
   iii. clean edges to painted areas

c. The properties of these masking materials such as:
   i. economy of use
   ii. costs per unit
   iii. absorption
   iv. flexibility

d. Where and how these masking materials and systems should be used.

e. The masking procedures for listed items such as:
   i. door glass and windscreens
   ii. handles
   iii. lights
   iv. mirrors
   v. wheels

f. Masking schedule for the type of repair to include:
   i. time efficiency
   ii. material costs
   iii. given protection

g. Faults which are caused by careless masking such as:
   i. flash lines
   ii. bridging
   iii. creep
   iv. hard edges

The factors affecting the choice and use of topcoat materials

a. The types of paints such as:

b. Non-convertible
   i. nitro cellulose
   ii. 1k acrylic

c. Convertible
   i. oil based synthetics
   ii. 2 k acrylics
   iii. 2k polyurethane
   iv. polyesters
   v. isocyanate resins

d. Waterborne basecoats
   i. microgel
   ii. latex

e. The reasons for using paint to include:
   i. protection
   ii. filling
   iii. decoration
   iv. identification

v. safety

f. Use process data sheets to determine information such as:

i. material description
ii. material properties
iii. material characteristics
iv. limitations
v. related materials
vi. mixing ratios
vii. viscosity
viii. build film thickness
ix. pot life

g. The procedure for the preparation of minor damage to include:

i. paint removal
ii. feather edge
iii. surface condition
iv. substrate identification
v. cleanliness
vi. achieving correct contour

h. The problems of over catalysed body filled areas

i. The correct Health and Safety procedures associated with body fillers

j. Aids and techniques which can be used to achieve the correct contour of a filled area

k. Undercoat materials for plastics to include:

i. adhesion promoters
ii. surface modifiers
iii. flexible additives
iv. texture additives

l. Listed additives such as:

i. adhesion promoters
ii. flexible additives
iii. texture finishes
iv. extenders
v. UV absorbers
vi. flow aids

The properties of topcoat materials

a. The ingredients of paint include:

v. pigment
vi. binder/vehicle
vii. solvent/thinner/reducer
viii. additives

b. The different types of paints to include:

c. Non convertible:

i. nitro cellulose
ii. 1k acrylics
iii. basecoats

d. Convertibles:

i. two packs
ii. oil based synthetic enamels

e. The characteristics and properties of surface coatings to include:

i. nitro-cellulose- non convertible-low build –fast surface dry
ii. oil based synthetics-convertible-slow dry through uptake of oxygen
iii. two packs- convertible- chemical reaction –high build
iv. base coats- solvent or water borne -non convertible-very low build-high opacity-have to be over
v. coated with a clear coat

f. The principles of operation of water based materials

g. The materials used in water based paint technology
h. The environmental advantages of using water based paints
I. The materials in terms of their:
    i. preparation of substrates
    ii. mixing procedures
    iii. application
    iv. drying processes
    v. working techniques
    vi. covering and hiding power
    vii. rectification
    viii. cleaning process

Preparation and use of topcoat materials for refinishing procedures

a. The process data sheets to determine information such as:
    i. mixing ratios
    ii. viscosity
    iii. number of coats
    iv. flash off times
    v. build film thickness
    vi. spray gun type
    vii. spray gun set up
    viii. air pressure requirements
    ix. substrate requirements
    x. suitability as a substrate
    xi. drying times
    xii. suitability to be applied by methods other than spraying
b. Procedures for mixing topcoats such as:
    i. 1K – cellulose and acrylics
    ii. 2K solid finishes and clear lacquers
    iii. basecoats – solid, metallic and pearlescent

Tools and equipment used in the preparation of topcoat materials

a. the tools and equipment required for paint preparation to include:-
    i. mixing schemes
    ii. ratio/mixing sticks
    iii. calibrated mixing cups
    iv. paint filters
    v. viscosity cups
    vi. timers
    vii. appropriate PPE

The selection of appropriate techniques for refinishing new and repaired panels, using fade outs, blending processes

b. The procedure for carrying out paint blend to include:
    i. panel preparation
    ii. masking
    iii. gun technique
    iv. final thinning

Correct application of topcoat materials can help to avoid surface defects such as colour/tone variations, overspray, etc.

a. Spray gun motion to include:
    i. gun distance
    ii. gun angle
    iii. gun speed
    iv. overlaps

b. The relationship between the four motions to give an even film thickness.
c. The reason for flash off times between coats.
d. What is meant by 'Wet on Wet' applications?
e. The application differences of using MS, HS and UHS materials.
Blend repair techniques and methods. The differences to applying a basecoat material compared with one stage solid colours such as:

i. gun distance
ii. gun speed
iii. air pressure
iv. 'drop coats'

h. The application of clearcoat with reference to:

i. gun speed
ii. flash off
iii. number of coats
iv. HS and UHS

The procedures to be adopted to rectify spray gun, topcoat surface defects and avoid their recurrence

a. The 'Spray Out' checks to establish spray gun faults such as:

i. spray flutter
ii. sickle-shaped patterns
iii. centre heavy pattern
iv. constricted centre pattern
v. top/bottom heavy patterns

b. The causes and remedies for these faults.
c. Application paint faults to include:

i. runs
ii. sags
iii. dirt
iv. contamination (fish eyes)
v. orange peel
vi. dry spray
vii. Solvent pop

d. The causes, prevention and rectification of these faults.

The importance of sourcing, correctly interpreting and following manufacturers' instructions and the consequences of failing to do so

a. Sources of material information to include:

i. PC based material
ii. paint manufacturers information
iii. paint data sheets
iv. world wide web
v. Thatcham methods manuals

b. Types of material recoverable from the above sources to include:

i. product and mixing information
ii. health and safety information
iii. first aid procedures
iv. application techniques
v. rectification procedures
vi. colour information

c. Sources of information relevant to equipment to include:

i. manufacturer's instructions
ii. operating manuals
iii. trade publications
iv. world wide web

d. The type of information recoverable from these sources such as:

i. maintenance schedules
ii. maintenance procedures
iii. replacing parts and consumables
iv. spare parts list and suppliers
v. accessories available
vi. trouble shooting information
vii. adjustment and operation guides

Appendix 1 Sources of general information

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

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

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

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

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

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

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

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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The City & Guilds Group is a leader in global skills development. Our purpose is to help people and organisations to develop their skills for personal and economic growth. Made up of City & Guilds, City & Guilds Kineo, The Oxford Group and ILM, we work with education providers, businesses and governments in over 100 countries.

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