QUALIFICATION HANDBOOK

City & Guilds Level 2 and 3 Diploma in Accident Repair Paint Competence (4271-22/23)

Version 1.3 March 2022

City & Guilds

Qualification at a glance

Subject area	Accident Repair Paint Competence
City & Guilds number	4271
Age group approved	16-18, 19+
Assessment	Portfolio of Evidence and 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 City & Guilds website for information

Title and level	City & Guilds number	Accreditation number
Level 2 Diploma in Accident Repair Paint Competence	4271-22	500/9987/5
Level 3 Diploma in Accident Repair Paint Competence	4271-23	500/9988/7

Version and date	Change detail	Section
Version 1.2 (September 2013)	Unit supporting information updated with introductory text	Units
Version 1.3 (March 2022)	GLH and TQT clarified and highlighted	Introduction

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1 Introduction

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

Area	Description
Who are the qualifications for?	These Level 2 and 3 Diplomas in Accident Repair Paint Competence are for anyone developing a career in the motor industry. These practical qualifications demonstrate candidates' skills on the job and in their own workplace showing that they meet national standards for automotive workers. Their structure and assessment strategy have been produced by the Institute of the Motor Industry, who are the Sector Skills Council for the Automotive Industry.
What do the qualifications cover?	Candidates cover areas such as repair to body panels, filing and painting motor vehicles and carrying out repairs to motor vehicles. They are assessed in the workplace by using the following methods: • workplace observation • witness testimony • verbal questioning of essential knowledge • City & Guilds' GOLA multiple choice test
Are the qualifications part of a framework or initiative?	These qualifications are part of the Automotive Maintenance and Repair Intermediate Apprenticeship and Advanced Apprenticeship Frameworks (framework 1) which will replace the current framework 4 from April 2011.
What opportunities for progression are there?	After taking these qualifications candidates will have a qualification that show employers and customers they are competent and have the skills required to carry out paint repairs as a result of accidents and will be able to progress into employment. In addition, candidates who enjoy leading teams of people at work could also move onto a qualification as a Team Leader or Supervisor such as qualifications at Levels 2, 3 and 4 through the Institute of Leadership and Management (ILM).

Structure

To achieve the **Level 2 Diploma in Accident Repair Paint Competence**, learners must achieve **76** credits from the mandatory units and a minimum of **5** credits from one pair of optional units available.

Unit reference number	City & Guilds unit	Unit title	Credit value
Mandatory			
A/601/6338	001	Competency in health, safety and good housekeeping in the automotive environment	7
K/601/6366	003	Competency in supporting job roles in the automotive work environment	5
D/601/6171	051	Knowledge of health, safety and good housekeeping in the automotive environment	3
T/601/6175	053	Knowledge of support for job roles in the automotive work environment	3
Y/601/6346	201	Competency in tools and equipment used in vehicle refinishing	5
M/601/6417	202	Competency in applying fillers and foundation materials	10
T/601/6421	204	Competency in preparing metal and pre-painted surfaces	10
J/601/6357	206	Competency in repairing minor paint defects	10
J/601/6116	251	Knowledge of tools and equipment used in vehicle refinishings	5
H/601/6141	252	Knowledge of applying fillers and foundation materials	6
A/601/6145	254	Knowledge of preparing metal and pre-painted surfaces	6
Y/601/6122	256	Knowledge of repairing minor paint defects	6
Optional Group 1			
R/601/5373	102	Competency in removing and fitting non-permanently fixed motor vehicle body panels	3
D/601/5425	152	Knowledge of removing and fitting non-permanently fixed motor vehicle body panels	2
Optional Group 2			
K/601/6352	203	Competency in working with plastic materials and components	10
Y/601/6119	253	Knowledge of working with plastic materials and components	6

To achieve the **Level 3 Diploma in Accident Repair Paint Competence,** learners must achieve **108** credits from the mandatory units.

Unit reference number	City & Guilds unit	Unit title	Credit value
Mandatory			
A/601/6338	001	Competency in health, safety and good housekeeping in the automotive environment	7
K/601/6366	003	Competency in supporting job roles in the automotive work environment	5
D/601/6171	051	Knowledge of health, safety and good housekeeping in the automotive environment	3
T/601/6175	053	Knowledge of support for job roles in the automotive work environment	3
Y/601/6346	201	Competency in tools and equipment used in vehicle refinishing	5
K/601/6352	203	Competency in working with plastic materials and components	10
T/601/6421	204	Competency in preparing metal and pre-painted surfaces	10
R/601/6362	207	Competency in establishing paint defects	10
J/601/6424	209	Competency in applying topcoats and completing refinishing operations	10
Y/601/6413	213	Competency in vehicle colour matching	10
J/601/6116	251	Knowledge of tools and equipment used in vehicle refinishings	5
Y/601/6119	253	Knowledge of working with plastic materials and components	6
A/601/6145	254	Knowledge of preparing metal and pre-painted surfaces	6
M/601/6126	257	Knowledge of establishing paint defects	6
J/601/6147	259	Knowledge of applying topcoats and completing refinishing operations	6
R/601/6135	263	Knowledge of vehicle colour matching	6

Guided Learning Hours (GLH) and Total Qualification Time (TQT)

Guided Learning Hours (GLH) gives an indication to centres of the amount of supervised learning and assessment that is required to deliver a unit and can be used for planning purposes.

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

in preparation, study and undertaking some formative assessment activities.

Credit is calculated using a formula that equates to the TQT value divided by 10.

The TQT for this qualification is specified below

Qualification	TQT	GLH
City & Guilds Level 3 Diploma in Accident Repair Paint Competence 4271-22/23	1080	915

2 Centre requirements

Approval

If your Centre is approved to offer the **Level 2 NVQ in Automotive Body and Paint – Body Refinishing (4101-12)** you will be granted automatic approval for the Level 2 Diploma in Accident Repair Body Competence (4271-12) and will be able to make registrations straight away.

If your Centre is approved to offer the **Level 3 NVQ in Automotive Body and Paint – Body Refinishing (4101-15)** you will be granted automatic approval for the Level 3 Diploma in Accident Repair Body Competence (4271-13).

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

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

Resource requirements

Physical resources and site agreements

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

Centre staffing

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

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

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

Assessors and internal verifiers

All assessors must:

- have sufficient and relevant technical/occupational competence in the Unit, at or above the level of the Unit being assessed
- have in depth knowledge of the Qualification or 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.
    - verifiers working towards a relevant qualification must achieve their qualification within 12 months.
    - provide evidence of CPD totalling not less than 30 hours from within their professional area within a 12 month period.

Continuing professional development (CPD)

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

Candidate entry requirements

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

Age restrictions

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

3 Delivering the qualification

Initial assessment and induction

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

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

- Online practice tests
- Practical Assessment workbook
- Practical training workbook.
- Useful material is available on SmartScreen **www.smartscreen.co.uk**.
- Exam Success book TL024290

Recording Documents

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

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

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

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

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.*

Initial assessment and induction

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

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

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

Further guidance about initial assessment and induction, as well as a learning contract that centres may use, are available in the Centre toolkit.

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 complete

- Online multiple choice tests graded as Pass, Merit, Distinction for the knowledge units.
- A portfolio of evidence for each competence unit

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.

Level 2 Diploma in Accident Repair Paint Competence (QCF)

Unit	Title	Assessment method
001	Competency in health, safety and good housekeeping in the automotive environment	Portfolio
003	Competency in supporting job roles in the automotive work environment	Portfolio
051	Knowledge of health, safety and good housekeeping in the automotive environment	Multiple choice
053	Knowledge of support for job roles in the automotive work environment	Multiple choice
102	Competency in removing and fitting non-permanently fixed motor vehicle body panels	Portfolio
152	Knowledge of removing and fitting non-permanently fixed motor vehicle body panels	Multiple choice
201	Competency in tools and equipment used in vehicle refinishing	Portfolio
202	Competency in applying fillers and foundation materials	Portfolio
203	Competency in working with plastic materials and components	Portfolio
204	Competency in preparing metal and pre-painted surfaces	Portfolio

Unit	Title	Assessment method
206	Competency in repairing minor paint defects	Portfolio
251	Knowledge of tools and equipment used in vehicle refinishings	Multiple choice
252	Knowledge of applying fillers and foundation materials	Multiple choice
253	Knowledge of working with plastic materials and components	Multiple choice
254	Knowledge of preparing metal and pre-painted surfaces	Multiple choice
256	Knowledge of repairing minor paint defects	Multiple choice

Level 3 Diploma in Accident Repair Body Competence (QCF)

Unit	Title	Assessment method
001	Competency in health, safety and good housekeeping in the automotive environment	Portfolio
003	Competency in supporting job roles in the automotive work environment	Portfolio
051	Knowledge of health, safety and good housekeeping in the automotive environment	Multiple choice
053	Knowledge of support for job roles in the automotive work environment	Multiple choice
201	Competency in tools and equipment used in vehicle refinishing	Portfolio
203	Competency in working with plastic materials and components	Portfolio
204	Competency in preparing metal and pre-painted surfaces	Portfolio
207	Competency in establishing paint defects	Portfolio
209	Competency in applying topcoats and completing refinishing operations	Portfolio
213	Competency in vehicle colour matching	Portfolio
251	Knowledge of tools and equipment used in vehicle refinishings	Multiple choice
253	Knowledge of working with plastic materials and components	Multiple choice
254	Knowledge of preparing metal and pre-painted surfaces	Multiple choice
257	Knowledge of establishing paint defects	Multiple choice
259	Knowledge of applying topcoats and completing refinishing operations	Multiple choice
263	Knowledge of vehicle colour matching	Multiple choice

5 Units

Availability of units

The following units can be obtained from The Register of Regulated Qualifications: **http://register.ofqual.gov.uk/Unit**

Structure of units

These units each have the following:

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

Unit 001 Competency in health, safety and good housekeeping in the automotive environment

UAN:	**A/601/6338**
Level:	2
Credit value:	7
GLH:	60
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 Sector Skills Council for the automotive retail industry.
Aim:	This unit will enable the learner to develop competency in order 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 environment
Assessment criteria
The learner can: 1.1 select and use personal protective equipment throughout activities, to include appropriate protection of: a) eyes b) ears c) head d) skin e) feet f) hands

g) lungs 1.2 select and use vehicle protective equipment throughout all activities.

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

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

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

Unit 001 Competency in health, safety and good housekeeping in the automotive environment

Supporting information

Evidence Requirements

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

Unit 003 Competency in supporting job roles in the automotive work environment

UAN:	**K/601/6366**
Level:	3
Credit value:	5
GLH:	40
Relationship to NOS:	This unit is linked to the NOS 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 Sector Skills Council for the automotive retail industry.
Aim:	This unit will help the learner develop competency in order 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 manufacturers 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 3.4 report any anticipated delays in completion to the relevant persons promptly

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 003 Competency in supporting job roles in the automotive work environment

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

UAN:	**D/601/6171**
Level:	2
Credit value:	3
GLH:	30
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 Sector Skills Council for the automotive retail industry.
Aim:	This unit will give the learner; the knowledge they need to carry out routine maintenance and cleaning of the automotive environment and using resources economically as well as 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 of 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

Evidence Requirements

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

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

Economic use of resources

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

Requirement to maintain work area effectively

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

Spillages, leaks and waste materials

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

Basic legislative requirements

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

j. Working at Height Regulations.

Routine maintenance of the workplace

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

Legislation relevant to Health and Safety

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

General regulations to include an awareness of:

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

Legislative duties

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

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

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

PPE to include:

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

d. Unserviceable PPE.

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

Action to be taken in the event of colleagues suffering accidents

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

b. Typical examples of first aid which can be administered by persons at the scene of an accident:
   i. check for consciousness
   ii. stem bleeding
   iii. keep the injured person's airways free
   iv. place in the recovery position if injured person is unconscious
   v. issue plasters for minor cuts
   vi. action to prevent shock i.e. keep the injured party warm
   vii. administer water for minor burns or chemical injuries
   viii. wash eyes with water to remove dust or ingress of chemicals (battery acid)
   ix. need to seek professional help for serious injuries.

c. Examples of bad practice which may result in further injury such as:
   i. moving the injured party
   ii. removing foreign objects from wounds or eyes
   iii. inducing vomiting
   iv. straightening deformed limbs.

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

UAN:	**T/601/6175**
Level:	3
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to the NOS 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 Sector Skills Council for the automotive retail 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 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 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 manufacturers' 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 your choice of communication. 3.3 explain how the communication of information can change with the target audience to include uninformed and informed people

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

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

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

Supporting information

Evidence Requirements

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

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

The structure of a typical vehicle repair business

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/administration
vii. sales
viii. reception.

Sources of information:

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

Communication requirements when carrying out vehicle repairs

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

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

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

e. Choice of communication
    i. Distance
    ii. Location
    iii. job responsibility.

f. Importance of maintaining positive working relationships:
    i. morale
    ii. productivity
    iii. company image
    iv. customer relationships
    v. colleagues.

Unit 102 Competency in removing and fitting non-permanently fixed motor vehicle body panels

UAN:	**R/601/5373**
Level:	2
Credit value:	3
GLH:	30
Relationship to NOS:	This unit is linked to the NOS BP02 Remove and fit non permanently fixed motor vehicle body panels
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will enable the learner to demonstrate competency in the removal and fitting of non-permanently fixed vehicle panels such as wings, doors, bonnets, boot lids and tailgates. It also covers the evaluation of the operation of the components when fitted.

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

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

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

Learning outcome
The learner will: 4. be able to carry out removal and fitting of non-permanently fixed vehicle panels
Assessment criteria
The learner can: 4.1 carry out removal and fitting of non-permanently fixed vehicle panels 4.2 carry out removal and fitting of non-permanently fixed vehicle panels adhering to the correct specifications and tolerances for the vehicle. 4.3 ensure that the removal and fitting of non-permanently fixed panels conforms to the vehicle operating specification and any legal requirements 4.4 ensure the components are realigned correctly in a way which regains their original manufactured tolerance 4.5 ensure no damage occurs to other components when removal and fitting of non-permanently fixed vehicle panels 4.6 ensure all components and panels are stored safely and in the correct location 4.7 work to the specified timescale for the activity

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 identify and report any expected delays in completion to the relevant person(s) promptly in the format required. 5.4 record and report any additional faults noticed during the course of their work promptly in the format required

Unit 102 Competency in removing and fitting non-permanently fixed motor vehicle body panels

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 152 Knowledge of removing and fitting non permanently fixed motor vehicle body panels

UAN:	**D/601/5425**
Level:	2
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to the NOS BP02 Remove and fit non permanently fixed motor vehicle body panels.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit enables the learner to develop knowledge in order to carry out removal and fitting of non-permanently fixed vehicle panels such as wings, doors, bonnets, boot lids and tailgates. It also covers the evaluation of the operation of the components when fitted.

Learning outcome
The learner will: 1. understand how to carry out removal and fitting of non-permanently fixed motor vehicle body panels
Assessment criteria
The learner can: 1.1 identify the procedures involved in carry out the systematic removal and fitting of non-permanently fixed vehicle body panels: a) wings b) doors c) bonnets d) boot lids e) tailgates 1.2 identify the procedures involved in working with supplementary safety systems when fitting basic non-permanently fixed vehicle body panels 1.3 describe the methods and procedures for storing removed non-permanently fixed vehicle body panels 1.4 identify the different types of fastenings and fixings used when removing and fitting non-permanently fixed vehicle body panels 1.5 explain the reasons for the use of different types of fastenings and fixings used in non-permanently fixed vehicle body panels

1.6	describe the procedures, methods and reasons for ensuring alignment of non-permanently fixed vehicle body panels
1.7	identify the quality checks that can be used to ensure alignment and operation of non-permanently fixed vehicle body panels
1.8	identify conformity of vehicle systems against vehicle specification and legal requirements on completion
1.9	explain the procedure for reporting damage to vehicle non-permanently fixed vehicle body panels

Unit 152 Knowledge of removing and fitting non permanently fixed motor vehicle body panels

Supporting information

Evidence requirements

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

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

Removing and fitting non permanently fixed body panels

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

Unit 201 Competency in tools and equipment used in vehicle refinishing

UAN:	**Y/601/6346**
Level:	2
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO1 Demonstrating competency in tools and equipment used in vehicle refinishing
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry
Aim:	This unit allows the demonstration of competency in: • the correct selection, maintenance and use of hand and power tools used in vehicle refinishing • the correct preparation, use and maintenance of vehicle refinishing equipment

Learning outcome
The learner will: 1. be able to select, use and care for hand and power tools used in vehicle refinishing
Assessment criteria
The learner can: 1.1 select, prepare, safely use and maintain suitable hand and power tools when vehicle refinishing 1.2 report any faulty or damaged tools to the relevant person(s) clearly and promptly 1.3 store work tools in a clean, serviceable and safe manner, which permits ease of access and identification for use.

Learning outcome
The learner will: 2. be able to prepare and use vehicle refinishing equipment
Assessment criteria
The learner can: 2.1 select, prepare and safely use vehicle refinishing workshop equipment 2.2 report any faulty or damaged equipment to the relevant person(s) clearly and promptly 2.3 store work equipment in a clean, serviceable and safe manner, which permits ease of access and use.

Unit 201 Competency in tools and equipment used in vehicle refinishing

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 202 Competency in applying fillers and foundation materials

UAN:	**M/601/6417**
Level:	2
Credit value:	10
GLH:	90
Relationship to NOS:	This unit is linked to the NOS P05 Applying fillers and foundation materials in the motor vehicle environment
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will enable the learner to demonstrate competency in the identification of substrates, mixing and adjusting the viscosity of fillers and foundation materials and applying fillers and foundation materials following guidelines and procedures.

Learning outcome
The learner will: 1. be able to work safely when carrying out preparation and application of foundation materials to vehicles
Assessment criteria
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings throughout all preparation and application of foundation materials to plastics 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 carry out preparation and application of foundation materials to vehicles
Assessment criteria
the learner can: 2.1 identify prior to working on the vehicle the type of substrate 2.2 use surface cleaning agents, fillers and foundation materials 2.3 mix and adjust the viscosity of fillers and foundation materials

2.4 apply all foundation materials 2.5 dry and cure all foundation materials 2.6 ensure all completed repairs are finished to an agreed standard ready for the next process 2.7 work to the specified timescale for the activity

Learning outcome
The learner will: 3. be able to record information and make suitable recommendations
Assessment criteria
The learner can: 3.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 3.2 make suitable and justifiable recommendations for cost effective repairs 3.3 identify and report any expected delays in completion to the relevant person(s) promptly in the format required. 3.4 record and report any additional faults noticed during the course of their work promptly in the format required

Learning outcome
The learner will: 4. be able to use appropriate tools and equipment
Assessment criteria
The learner can: 4.1 select the appropriate tools and equipment necessary for carrying out preparation and application of foundation materials to vehicles 4.2 ensure that equipment has been calibrated to meet manufacturers requirements 4.3 use the correct tools and equipment in the way specified by manufacturers when carrying out preparation and application of foundation materials to vehicles 4.4 leave all application equipment in a clean and serviceable condition.

Learning outcome
The learner will: 5. be able to use relevant information to carry out the task
Assessment criteria
The learner can: 5.1 select suitable sources of technical information to support preparation and application of foundation materials to vehicles 5.2 use technical information to support preparation and application of foundation materials to vehicles.

Unit 202 Competency in applying fillers and foundation materials

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 203 Competency in working with plastic materials and components

UAN:	**K/601/6352**
Level:	3
Credit value:	10
GLH:	90
Relationship to NOS:	This unit is linked to the NOS P03 Working with plastic components in the motor vehicle environment
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will enable the learner to demonstrate competency in the identification of plastic substrates, mixing and adjusting the viscosity of foundation materials and applying foundation materials to plastics following guidelines and procedures.

Learning outcome
The learner will: 1. be able to work safely when carrying out preparation and application of foundation materials to plastics used in vehicle refinishing
Assessment criteria
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings throughout all preparation and application of foundation materials to plastics 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 carry out preparation and application of foundation materials to plastics used in vehicle refinishing
Assessment criteria
The learner can: 2.1 identify the type of plastic component prior to working on the vehicle 2.2 remove and store safely any components likely to be affected by the preparation process 2.3 keep the work area clean and tidy throughout all preparation activities 2.4 use surface cleaning agents and protect adjacent panels to those being repaired 2.5 leave the prepared areas free from contamination and ready for the application of foundation materials 2.6 check the viscosity of foundation materials 2.7 prepare and apply all foundation materials to plastics 2.8 dry and cure all foundation materials to plastics 2.9 dispose of waste material to conform with legal and workplace requirements 2.10 ensure all completed repairs are finished to an agreed standard ready for the next process 2.11 work to the specified timescale for the activity.

Learning outcome
The learner will: 3. be able to record information and make suitable recommendations
Assessment criteria
The learner can: 3.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 3.2 make suitable and justifiable recommendations for cost effective repairs 3.3 identify and report any expected delays in completion to the relevant person(s) promptly in the format required. 3.4 record and report any additional faults identified during the course of their work promptly in the format required

Learning outcome
The learner will: 4. be able to use appropriate tools and equipment
Assessment criteria
The learner can: 4.1 select the appropriate tools and equipment necessary for carrying out preparation and application of foundation materials to plastics in vehicle refinishing 4.2 ensure that equipment has been calibrated to meet manufacturers requirements 4.3 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 4.4 leave all application equipment in a clean and serviceable condition

Learning outcome
The learner will: 5. be able to use relevant information to carry out the task
Assessment criteria
The learner can: 5.1 select suitable sources of technical information to support preparation and application of foundation materials to plastics in vehicle refinishing 5.2 use technical information to support preparation and application of foundation materials to plastics in vehicle refinishing

Unit 203 Competency in working with plastic materials and components

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 204 Competency in preparing metal and pre-painted surfaces

UAN:	**T/601/6421**
Level:	2
Credit value:	10
GLH:	90
Relationship to NOS:	This unit is linked to the NOS P04 Preparing metal and pre-painted surfaces in the motor vehicle environment
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will enable the learner to demonstrate competency in 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 carry out the preparation of metal and pre-painted surfaces to accept foundation materials and paint topcoats
Assessment criteria
The learner can: 2.1 identify prior to working on the vehicle the type of substrate 2.2 use surface cleaning agents and protect all surfaces adjacent to those being prepared using the specified method 2.3 remove and store safely any components likely to be affected by the preparation process 2.4 prepare all panel surfaces required following: a) vehicle manufacturer technical data b) product data c) recognised methods and techniques 2.5 keep the work area clean and tidy throughout all preparation activities 2.6 dispose of waste materials to conform with legal and workplace requirements 2.7 ensure all preparation is finished to an agreed standard and free from contamination ready for the next process 2.8 work to the specified timescale for the activity

Learning outcome
The learner will: 3. be able to record information and make suitable recommendations
Assessment criteria
The learner can: 3.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 3.2 make suitable and justifiable recommendations for cost effective repairs 3.3 identify and report any expected delays in completion to the relevant person(s) promptly in the format required. 3.4 record and report any additional faults noticed during the course of their work promptly in the format required

Learning outcome
The learner will: 4. be able to use appropriate tools and equipment
Assessment criteria
The learner can: 4.1 select the appropriate tools and equipment necessary for carrying out the preparation of metal and pre-painted surfaces 4.2 ensure that the equipment is safe and has been calibrated to meet manufacturers requirements 4.3 use the correct tools and equipment in the way specified by manufacturers when carrying the preparation of metal and pre-painted surfaces 4.4 leave all application equipment in a clean and serviceable condition

Learning outcome
The learner will: 5. be able to use relevant information to carry out the task
Assessment criteria
The learner can: 5.1 select suitable sources of technical information to support the preparation of metal and pre-painted surfaces 5.2 use technical information to support the preparation of metal and pre-painted surfaces

Unit 204 Competency in preparing metal and pre-painted surfaces

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 206 Competency in repairing minor paint defects

UAN:	**J/601/6357**
Level:	2
Credit value:	10
GLH:	90
Relationship to NOS:	This unit is linked to the NOS P06 Repair minor paint defects on motor vehicles
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will help the learner to develop the competency required to carry out the rectification of minor paint defects using a range of tools, equipment and 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 rectification of minor paint defects
Assessment criteria
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when carrying out the rectification of minor paint defects 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 carry out the rectification of minor paint defects
Assessment criteria
The learner can 2.1 identify the type of paint defect prior to working on the vehicle 2.2 use surface cleaning agents and protect all surfaces adjacent to those being prepared and rectified using the specified method 2.3 remove and store safely any components likely to be affected by the preparation and rectification process 2.4 correct defects using the approved tools and equipment required

2.5	keep the work area clean and tidy throughout all rectification activities
2.6	dispose of waste materials to conform with legal and workplace requirements
2.7	ensure all minor paint defects are rectified to a commercially acceptable standard.
2.8	work to the specified timescale for the activity

Learning outcome
The learner will: 3. be able to record information and make suitable recommendations
Assessment criteria
The learner can:
3.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required
3.2 make suitable and justifiable recommendations for cost effective repairs
3.3 identify and report any expected delays in completion to the relevant person(s) promptly in the format required.
3.4 record and report any additional faults noticed during the course of their work promptly in the format required

Learning outcome
The learner will: 4. be able to use appropriate tools and equipment
Assessment criteria
The learner can:
4.1 select the appropriate tools and equipment necessary for carrying out the rectification of minor paint defects
4.2 ensure that the equipment is safe and has been calibrated to meet manufacturers requirements
4.3 use the correct tools and equipment in the way specified by manufacturers when carrying out the rectification of minor paint defects
4.4 leave all equipment in a clean and serviceable condition

Learning outcome
The learner will: 5. be able to use relevant information to carry out the task
Assessment criteria
The learner can:
5.1 select suitable sources of technical information to support the rectification of minor paint defects
5.2 use technical information to support the rectification of minor paint defects

Unit 206 Competency in repairing minor paint defects

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 207 Competency in establishing paint defects

UAN:	**R/601/6362**
Level:	3
Credit value:	10
GLH:	90
Relationship to NOS:	This unit is linked to the NOS P06 Repair minor paint defects on motor vehicles
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will help the learner to develop the competency required to identify and rectify paint defects using suitable tools and equipment. 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 identification and rectification of paint defects
Assessment criteria
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when carrying out the identification and rectification of paint defects 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 carry out the identification and rectification of paint defects
Assessment criteria
The learner can: 2.1 identify on the vehicle the type of paint defect and the body panel surface prior to working on the vehicle 2.2 use surface cleaning agents and protect all surfaces adjacent to those being prepared using the specified method 2.3 remove and store safely any components likely to be affected by the preparation process

2.4	correct defects using the approved tools and equipment required
2.5	keep the work area clean and tidy throughout all rectification activities
2.6	dispose of waste materials to conform with legal and workplace requirements
2.7	ensure all paint defects are rectified to an agreed standard
2.8	work to the specified timescale for the activity

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

Learning outcome
The learner will:
4. be able to use appropriate tools and equipment
Assessment criteria
The learner can:
4.1 select the appropriate tools and equipment necessary for carrying out the identification and rectification of paint defects
4.2 check that the equipment is safe and has been calibrated to meet manufacturers requirements
4.3 use the correct tools and equipment in the way specified by manufacturers when carrying out the identification and rectification of paint defects
4.4 leave all application equipment in a clean and serviceable condition

Learning outcome
The learner will:
5. be able to use relevant information to carry out the task
Assessment criteria
The learner can:
5.1 select suitable sources of technical information to support the identification and rectification of paint defects
5.2 interpret technical information to support the rectification of minor paint defects

Unit 207 Competency in establishing paint defects

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 209 Competency in applying topcoats and completing refinishing operations

UAN:	**J/601/6424**
Level:	3
Credit value:	10
GLH:	90
Relationship to NOS:	This unit is linked to the NOS CR11 Carry out complete motor vehicle refinishing operations
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will help the learner to develop the competency required to undertake the vehicle repainting process including the preparation and application of topcoat materials on repaired and new vehicle panels

Learning outcome
The learner will: 1. be able to work safely when carrying out preparation and application of topcoat materials in vehicle refinishing
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 carry out preparation and application of topcoat materials in vehicle refinishing
Assessment criteria
The learner can: 2.1 identify the type of substrate prior to working on the vehicle use of surface cleaning agents materials 2.2 prepare all the refinishing systems and materials required following health and safety requirements

2.3 mix and check the viscosity of topcoat materials 2.4 apply all topcoat materials 2.5 dry and cure all topcoat materials 2.6 ensure the finish product meets the requirements of the manufacturers warranty, the refinishing specification required and customer needs 2.7 dispose of waste materials to conform with legal and workplace requirements 2.8 work to the specified timescale for the activity

Learning outcome
The learner will: 3. be able to record information and make suitable recommendations
Assessment criteria
The learner can: 3.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 3.2 make suitable and justifiable recommendations for cost effective repairs 3.3 identify and report any expected delays in the completion to the relevant person(s) promptly in the format required 3.4 record and report any additional faults noticed during the course of their work promptly in the format required

Learning outcome
The learner will: 4. be able to use appropriate tools and equipment
Assessment criteria
The learner can: 4.1 select the appropriate tools and equipment necessary for carrying out preparation and application of topcoat materials to vehicles 4.2 ensure that equipment has been calibrated to meet manufacturers requirements 4.3 use the correct tools and equipment in the way specified by manufacturers when carrying out preparation and application of topcoat materials to vehicles 4.4 leave all application equipment in a clean and serviceable condition

Learning outcome
The learner will: 5. be able to use relevant information to carry out the task
Assessment criteria
The learner can: 5.1 select suitable sources of technical information to support preparation and application of topcoat materials to vehicles 5.2 use technical information to support preparation and application of topcoat materials to vehicles

Unit 209 Competency in applying topcoats and completing refinishing operations

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 213 Competency in vehicle colour matching

UAN:	**Y/601/6413**
Level:	3
Credit value:	10
GLH:	90
Relationship to NOS:	This unit is linked to the NOS CR12 Mix and match motor vehicle paint colours
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will help the learner to develop the competency required to identify, mix and match vehicle paint colours including the use of tinters and the preparation of colour 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 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 carry out vehicle mixing and matching activities
Assessment criteria
The learner can: 2.1 identify prior to working on the vehicle the type of substrate to be painted 2.2 prepare all the refinishing systems and materials required following health and safety requirements 2.3 mix, compare and adjust colour tones and effects using suitable mixing and matching techniques 2.4 ensure all refinishing systems and materials prepared meet the specification required for colour and viscosity prior to application 2.5 apply refinishing systems and materials to colour test cards

2.6 dry all colour test cards before checking colour 2.7 ensure the colour produced meets the material manufacturer's requirements, the customer requirements and is a blendable match to the existing colour 2.8 dispose of waste materials to conform with legal and workplace requirements 2.9 work to the specified timescale for the activity

Learning outcome
The learner will: 3. be able to record information and make suitable recommendations
Assessment criteria
The learner can: 3.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required 3.2 make suitable and justifiable recommendations for cost effective repairs 3.3 identify and report any expected delays in completion to the relevant person(s) promptly in the format required. 3.4 record and report any additional faults noticed during the course of their work promptly in the format required

Learning outcome
The learner will: 4. be able to use appropriate tools and equipment
Assessment criteria
The learner can: 4.1 select the appropriate tools and equipment necessary for carrying out paint mixing and matching activities 4.2 ensure that equipment has been calibrated to meet manufacturers requirements 4.3 use the correct tools and equipment in the way specified by manufacturers when carrying out paint mixing and matching activities 4.4 leave all mixing and application equipment in a clean and serviceable condition

Learning outcome
The learner will: 5. be able to use relevant information to carry out the task
Assessment criteria
The learner can: 5.1 select suitable sources of technical information to support paint mixing and matching activities 5.2 use technical information to support paint mixing and matching activities

Unit 213 Competency in vehicle colour matching

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

Unit 251 Knowledge of tools and equipment used in vehicle refinishings

UAN:	**J/601/6116**
Level:	2
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO01 PPE, tools & equipment, health & safety in the motor vehicle environment
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will help the learner to understand how to select, use and care for hand and power tools used in vehicle refinishing

Learning outcome
The learner will: 1. understand how to select, use and care for hand and power tools used in vehicle refinishing
Assessment criteria
The learner can: 1.1 describe the use of common types of hand and power tools used for vehicle refinishing 1.2 identify the main components of a spray gun 1.3 describe, within the scope of their responsibilities, how to select, prepare and maintain hand and power tools used in vehicle refinishing 1.4 state the limitations of hand and power tools used in vehicle refinishing 1.5 explain how hand and power tools used in vehicle refinishing should be stored 1.6 describe the methods of adjusting compressed air pressures by use of: a) transformer/regulator b) spray gun pressure gauge 1.1 describe the operation of gun cleaning machines to include the use of solvent and water based gun cleaners 1.2 describe the cleaning and maintenance of suction/gravity feed guns 1.3 identify spray gun faults, their cause and how they should be rectified.

Learning outcome
The learner will: 2. understand how to prepare, use and care for vehicle refinishing equipment
Assessment criteria
The learner can: 2.1 identify workshop equipment used in vehicle refinishing 2.2 describe the preparation and safe use of workshop equipment 2.3 describe the maintenance requirements of a compressed air system oil level.

Unit 251 Knowledge of tools and equipment used in vehicle refinishings

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

Equipment used in Vehicle Refinishing

a. Flatting block
b. Sponge
c. Squeegee
d. Chamois leather
e. Trimming knife
f. Polishing mop
g. Denibbing blocks
h. Sealer gun
i. Air duster
j. Rotary sander
k. DA random orbital sander
l. Orbital flat bed sander
m. Belt sander
n. Vacuum extraction sander
o. Specialist extraction for aluminium particles (explosive)
p. Suction feed spray gun
q. Gravity feed spray gun
r. Pressure feed spray gun
s. HVLP spray guns
t. Identify spray gun cleaning machines

Workshop equipment

a. Combi-booth
b. Separate oven
c. Infra-red drying
d. Compressor
e. Main air line
f. Transformer/regulator
g. Water traps
h. Flexible air and fluid hoses

i. Pressure gauges
j. Automatic paper/tape dispenser
k. Plastic sheeting dispenser
l. Complete car covers dispenser
m. Wheel covers dispenser
n. Viscosity measuring equipment
o. Paint mixing schemes
p. Air feed breathing equipment
q. Smart scales

Paint Gun Cleaning and Maintenance
a. Loading
b. Cleaning cycle
c. Coagulant (water-based paints only)
d. Filtration of solids
e. Partial strip of paint spaying gun
f. Complete strip of paint spraying gun
g. Washer cycle
h. Blow through
i. Re-assembly
j. Lubrication

Main parts of a Spray gun
a. Trigger
b. Body
c. Packing gland
d. Air valve
e. Fluid needle
f. Fluid tip (nozzle)
g. Air cap
h. Paint volume control
i. Fan width control
j. Material cup
k. Filters

Compressed air systems
a. tank drainage
b. ring drainage
c. regular maintenance and service logs
d. air quality checks (breathable air)
e. Air filter/cartridge changes (breathable air)

Unit 252 Knowledge of applying fillers and foundation materials

UAN:	**H/601/6141**
Level:	2
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO0205 Applying fillers and foundation materials in the motor vehicle environment
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit enables the learner to understand how to identify substrates including unrecorded damage, mixing and adjusting the viscosity of fillers and foundation materials and applying fillers and foundation materials

Learning outcome
The learner will: 1. understand how to identify body surfaces requiring the application of foundation materials in vehicle refinishing
Assessment criteria
The learner can: 1.1 state 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 1.4 describe why the substrate will determine the selection of a suitable foundation material

Learning outcome
The learner will: 2. understand how to identify, mix and apply fillers and foundation materials in vehicle refinishing
Assessment criteria
The learner can: 2.1 describe the choice and use of surface cleaning agents, fillers and foundation material 2.2 describe how to condition and clean surfaces prior to the application of foundation coatings to ensure adequate adhesion 2.3 describe how to mix and check the viscosity of fillers and foundation materials 2.4 describe the importance of viscosity and its effects on the surface finish 2.5 describe the properties of the foundation materials 2.6 describe the principles of filler and paint mixing, the importance of the right additive (hardener or thinner) in the correct ratio 2.7 describe the curing and drying recommendations for the various fillers and foundation materials 2.8 describe how to apply foundation coatings 2.9 describe how to find and interpret sources of information relevant to the mixing and application of foundation coatings 2.10 describe how to avoid application defects 2.11 describe the masking procedures, methods and techniques for part or whole vehicles 2.12 describe how to carry out masking procedures to avoid material wastage and vehicle contamination for each stage of the process 2.13 identify the requirements for protecting the vehicle and contents from damage before, during and after preparing and applying foundation materials

Unit 252 Knowledge of applying fillers and foundation materials

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

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)

b. Identify 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 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)

The properties and correct use of conditioning materials

a. State 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. State the reasons for masking components adjacent to repair areas.

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

The types and properties of fillers and foundation materials in common use

a. State what the ingredients of paint are to include:
i. pigment
ii. binder/vehicle
iii. solvent/thinner/reducer
iv. additives

b. Properties of pigments to include:
i. opacity
ii. colour
iii. build
iv. easy flatting
v. corrosion resistance

c. State that the forms of pigments that are:
i. natural ground powders
ii. synthetic powders and dyes

d. The uses of pigments in paints such as:
i. stoppers/putties

ii. etch primers
iii. primer surfacers
iv. primer filler

e. The properties of binders to include:
i. film forming
ii. binding
iii. cohesion
iv. adhesion
v. flexibility

f. State the forms of binder which dry by the following methods:
i. solvent evaporation only
ii. oxidation
iii. polymerisation

g. The properties of solvent/thinners to include:
i. speed of evaporation
ii. its ability to dissolve the binder
iii. its ability to be tolerated by a binder

h. The use of solvent/thinner:
i. to make the paint fluid in the tin
ii. to reduce the paint to a spraying/ application viscosity

i. State the meaning of paint terms such as:
i. activator
ii. adhesion
iii. build
iv. cohesion
v. compatibility
vi. curtains
vii. degreaser
viii. drier
ix. enamel
x. etch
xi. flash off
xii. floating
xiii. gloss
xiv. hardener
xv. lacquer
xvi. opacity
xvii. pigment
xviii. polymerization
xix. pot life
xx. shelf life
xxi. substrate
xxii. thermoplastic
xxiii. thermosetting
xxiv. thixotropic
xxv. two pack
xxvi. viscosity

Explain the difference between types of paints to include:

non convertible:
ii. nitro cellulose

iii. 1k acrylics
iv. basecoats

convertibles:

i. two packs
ii. oil based synthetic enamels

a. List the types of undercoat in common use to include:

i. etch primer
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. corrosion resistance
iii. flexibility
iv. build
v. drying
vi. flatting

c. List the types and characteristics of common protective coatings such as:

i. zinc rich primers
ii. bitumen based
iii. anti stone chip
iv. etch primer
v. PVC

The factors affecting the choice and use of fillers and foundation materials

a. State the reasons for using paint to include:

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

b. 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

c. Describe 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

d. Describe the problems of over catalysed body filled areas

e. Identify the correct Health and Safety procedures associated with body fillers

f. Describe aids and techniques which can be used to achieve the correct contour of a filled area

g. List undercoat materials for plastics to include:

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

The procedures for the mixing, application and curing of single and 2-pack fillers and stoppers

a. The properties of 2k stoppers to include:

i. convertible coating
ii. drying
iii. build

b. The properties of 1K stoppers to include:

i. non convertible coating
ii. drying
iii. build

c. The use of 2K and 1K stoppers to include:

i. 2k used for the filling of minor imperfections in 2K system

d. That 1K stopper is ready for use

e. That 2k stopper is mixed with activator just prior to use

f. That 1K stopper has to be applied in thin layers and with adequate flash off

g. That 2K stopper can be applied.

i. in thicker layers and is cured after 20 mins (quicker with heat)
ii. 1K used for the filling of minor imperfections in 1K system

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

a. Describe 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

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

a. State 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

Filler and 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. Use the process data sheets to determine information:
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. Define the 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. List 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. application with spatula
ix. application with brush
x. application with roller
xi. flash-off

xii. drying time
xiii. drying with infrared
xiv. sanding
xv. polishing
xvi. technical data required
xvii. hand stirring

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

a. List 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. Identify 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. Describe the properties of these masking materials such as:
i. economy of use
ii. costs per unit
iii. absorption
iv. flexibility

d. Identify where and how these masking materials and systems should be used.

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

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

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

Unit 253 Knowledge of working with plastic materials and components

UAN:	**Y/601/6119**
Level:	3
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO03 Working with plastic components in the motor vehicle environment
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
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 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 1.4 identify substrate to determine the selection of the preparation process and suitable foundation material 1.5 identify the types of plastic likely to be found in vehicle body manufacturing

Learning outcome
The learner will: 2. understand how to prepare plastic body surfaces prior to application of foundation materials
Assessment criteria
The learner can: 2.1 describe the choice and use of surface cleaning agents prior to applying foundation materials to plastics 2.2 describe how to condition and clean surfaces prior to the application of foundation coatings to ensure adequate adhesion

Learning outcome
The learner will: 3. understand how to mix and apply foundation materials onto plastics in vehicle refinishing
Assessment criteria
The learner can: 3.1 describe how to mix and check the viscosity of foundation materials 3.2 describe the importance of viscosity and its effects on the surface finish 3.3 describe the properties of the foundation materials 3.4 describe the principles of paint mixing, the importance of the right additive (hardener or thinner) in the correct ratio 3.5 describe the curing and drying recommendations for the various foundation materials to plastics 3.6 describe how to apply foundation coatings 3.7 describe how to find and interpret sources of information relevant to the mixing and application of foundation coatings relating to plastics 3.8 describe how to avoid application defects 3.9 outline and describe the masking procedures, methods and techniques for part or whole vehicles 3.10 describe how to carry out masking procedures to avoid material wastage and vehicle contamination for each stage of the process 3.11 identify the requirements for protecting the vehicle and contents from damage before, during and after preparing and applying foundation materials to plastics

Unit 253 Knowledge of working with plastic materials and components

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

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. 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

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

c. The types and characteristics of common protective coatings such as:
    i. bitumen based
    ii. anti stone chip
    iii. etch primer
    iv. 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 paint is important to application to include:
    i. build
    ii. surface finish
    iii. speed of application

b. Describe the procedure for checking viscosity

c. Describe the effects on viscosity of:
    i. temperature
    ii. 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. The 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
    xvii. hand stirring

Masking procedures for part and whole vehicles. Describe 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

Unit 254 Knowledge of preparing metal and pre-painted surfaces

UAN:	**A/601/6145**
Level:	2
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO408 Preparing metal and pre-painted surfaces in the motor vehicle environments
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit enables the learner to develop an understanding of how to prepare a variety of different panel and component surfaces for foundation materials and paint topcoats

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 254 Knowledge of preparing metal and pre-painted surfaces

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

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. Manufacturers 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 minor damage to include:
   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 256 Knowledge of repairing minor paint defects

UAN:	**Y/601/6122**
Level:	2
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO06 Repair minor paint defects on motor vehicles
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit enables the learner to develop an understanding about the causes and rectification of minor paint defects using a range of tools, equipment and materials.

Learning outcome
The learner will: 1. understand how to identify the body surface requiring the rectification of minor paint defects
Assessment criteria
The learner can: 1.1 describe how to identify the existing paint surface finish on which the minor paint defect has occurred 1.2 identify the minor paint defects, their cause and methods of rectification suitable for the paint finish.

Learning outcome
The learner will: 2. understand how to repair minor paint defects
Assessment criteria
The learner can: 2.1 describe how to carry out flatting, burnishing, polishing and touch in techniques to correct minor paint defects 2.2 describe how to use polishing machines, denibbing blocks and flatting equipment 2.3 describe how to use compounds, flatting papers, polishes, pre-prepared paints and glazes 2.4 identify the factors affecting the choice and use of materials in the rectification of minor paint defects 2.5 describe how to prevent further paint damage during rectification 2.6 describe the importance of proper cleaning to the vehicle and work area prior to and after rectification work 2.7 describe the importance of keeping equipment and materials clean and free from contamination during rectification work 2.8 identify the requirements for protecting the vehicle and contents from damage before, during and after repairing minor paint defects.

Unit 256 Knowledge of repairing minor paint defects

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

Minor surface defects to include:

i. scratches
ii. chips
iii. dents
iv. corrosion
v. contamination
vi. blisters (including micro-blisters)
vii. fading
viii. loss of gloss
ix. chalking

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. 2 k 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

Identification of the common minor paint defects and list 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 minor paint defects

a. The procedures for the rectification of minor 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 used for the rectification of minor paint defects

a. The hand tools and equipment used by a paint refinisher to include:
    i. flatting block
    ii. squeegee
    iii. leather
    iv. trimming knife
    v. masking dispensers
    vi. sander
    vii. DA random orbital
    viii. orbital flat bed
    ix. belt sander
    x. polishing equipment
    xi. spray guns
    xii. sealer guns
    xiii. air dusters
    xiv. vacuum extraction
    xv. compressed air systems

The selection, operation and maintenance of listed tools and equipment for paint defect rectification

a. The above tools and equipment with regard to their:
    i. selection
    ii. correct and safe use
    iii. adjustment
    iv. maintenance
    v. accessories
b. The function and correct use of each of the sanders listed:
    i. rotary
    ii. DA random orbital
    iii. orbital flat bed
    iv. belt
c. Comparison of the above sanders in terms of:
    i. selection
    ii. abrasive pattern produced
    iii. aggressiveness
    iv. heat produced
    v. adjustment
    vi. abrasive change
d. The equipment required for polishing to include:
    i. air polisher

ii. electric polisher
iii. foam compound mop
iv. foam polishing mop
v. lambs-wool mop
vi. types of paste compound
vii. types of liquid compound
viii. types of polishing cloth
ix. lubricants
x. specialist de-nib equipment

e. The maintenance requirement of these tools.

Adjust, set up and use listed tools and equipment for paint defect rectification

a. The process of using a polishing machine to refurbish paint work to include:

i. speed of polishing machine
ii. application of the machine to the surface
iii. application of compound to the surface
iv. operation of polishing machine
v. awareness of polishing near to edges and swage lines
vi. avoiding burn marks
vii. removal of dried polish

b. the process of using sanders to prepare surface defects to include:

i. choosing correct sander for job in hand
ii. selection of appropriate grade of abrasive
iii. correct technique with regard to pressure applied
iv. avoiding sanding to bare metal on edges
v. use of dust extraction

c. The methods of paint application for defect repair to include:

i. touch-up brushes
ii. coloured film patches
iii. aerosols
iv. touch-up spray guns and air brushes
v. standard spray guns
vi. adjusting spray guns for optimum atomisation

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 minor 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

Procedures for the safe disposal of waste material and the consequences of failing to follow disposal regulations

a. How the disposal of products is influenced by the duty of care regulations.

b. The disposal procedures for used products to include:

- i. waste paper and card
- ii. empty containers
- iii. waste thinners
- iv. body filler dust
- v. spray booth filters
- vi. soiled rags
- vii. body panels
- viii. damaged vehicle parts

c. Documentation required for correct disposal of the above items.

d. The penalties for non compliance.

e. The effects on the environment of non compliance.

Unit 257 Knowledge of establishing paint defects

UAN:	**M/601/6126**
Level:	3
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO07 Establish defects on motor vehicles
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit enables the learner to understand about the causes and rectification of minor paint defects using a range of tools, equipment and materials.

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 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 257 Knowledge of establishing paint defects

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

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. 2 k 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 259 Knowledge of applying topcoats and completing refinishing operations

UAN:	**J/601/6147**
Level:	3
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO0912K Knowledge of applying topcoats and completing refinishing operations
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit will help the learner to develop the knowledge required to undertake the vehicle repainting process including the preparation and application of topcoat materials on repaired and new vehicle panels.

Learning outcome
The learner will: 1. understand how to prepare panels and refinishing systems for the application of topcoat materials in vehicle refinishing
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 vehicle refinishing
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 including a) edge to edge techniques b) spot repairs c) fade out and blending techniques 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 259 Knowledge of applying topcoats and completing refinishing operations

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

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:
- i. non convertible:
  - nitro cellulose
  - 1K acrylic
- ii. convertible:
  - oil based synthetics
  - 2K acrylics
  - 2K polyurethane
  - polyesters
  - isocyanate resins
- iii. waterborne basecoats:
  - microgel
  - latex.

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

c. 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

d. 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

e. The problems of over catalysed body filled areas

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

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

h. Undercoat materials for plastics to include:

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

i. 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:

Non convertible:

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

Convertibles:

- i. two packs
- ii. oil based synthetic enamels

c. 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 coated with a clear coat

d. The principles of operation of water based materials

e. The materials used in water based paint technology

f. 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

Unit 263 Knowledge of vehicle colour matching

UAN:	**R/601/6135**
Level:	3
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to the NOS PO013 Mix and match colours for motor vehicles and NOS PO14 Advanced colour matching for motor vehicles
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry.
Aim:	This unit enables the learner to understand how to identify vehicle paint colours including the use of tinters and preparation of colour 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 there 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 find, interpret and use sources of information relevant to the mixing and matching of vehicle paint colours 3.2 describe how to identify the paint substrate and the importance of doing so 3.3 explain how to compare, mix, test and adjust colour tones and effects, including metallic and mica effects 3.4 explain the consequences of adding too much of one type of tinter and the process for correcting and adjusting it 3.5 describe how to use test panels and colour test cards including drying and the importance of doing so 3.6 explain how spray equipment adjustments can alter colour 3.7 explain how to identify the causes of colour mismatch and how to rectify 3.8 explain how to assess and evaluate the need for blending techniques to achieve and acceptable colour match 3.9 describe the importance of correctly preparing the existing finish for colour matching and checking the match using the correct light source.

Unit 263 Knowledge of vehicle colour matching

Supporting information

Evidence requirements

The Evidence Requirements are shown in full in the Assessment Documentation

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

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

Types of refinishing materials by their film forming characteristics

a. The different types of paints to include:
    i. non convertible
    ii. nitro cellulose
    iii. 1k acrylic
    iv. convertible
    v. oil based synthetics
    vi. 2 k acrylics
    vii. 2k polyurethane
    viii. polyesters
    ix. isocyanate resins
    x. waterborne basecoats

xi. microgel
xii. latex

b. The properties of binders to include:
i. convertible
ii. oxidise
iii. high temperature reactants
iv. chemical reactants

c. Non-convertible: solvent evaporation

d. The forms of binder such as:
i. nitro-cellulose
ii. alkyds
iii. urethanes
iv. polyesters
v. isocyanates
vi. acrylics

e. The uses of binders in paints:
i. film forming
ii. binding the pigments
iii. adhesion
iv. cohesion
v. flexibility

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.

Distinguish between paint system classification, such as MS, HS, UHS, waterbased

a. The difference between paint systems to include:
i. medium solids
ii. high solids
iii. ultra high solids
iv. waterbased

The properties of different types of solvents, thinners and hardeners

a. The properties of different types of solvent, thinners and hardeners such as:
i. evaporation rate
ii. ability to dissolve the binder
iii. ability to be tolerated by the binder
iv. fade out properties
v. drying rate

b. The forms of solvent/thinner such as:
i. alcohols
ii. ketones
iii. glycol ethers
iv. blends

c. The use of solvent/thinner
i. to make the paint fluid in the tin
ii. to reduce the paint to a spraying/ application viscosity

d. The properties of 2K hardeners to include:

i. effectiveness at blocking out harmful ultra violet light
ii. necessity for adding to 2k paints to effect curing
iii. inclusion of isocyanates requires special H&S procedures

The properties of paint system additives

a. Listed additives and describe their properties to include:

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

b. The characteristics of additives to be added to textured paints such as those for:

i. textured finish
ii. leather look finishes
iii. crackle finishes
iv. metallic additives other than aluminium

The factors to be considered when choosing and using refinishing systems

a. 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. basecoats- solvent or water borne -non convertible-very low build-high opacity have to be overcoated with clearcoat

b. The listed paint 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 processes

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

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
- **Qualifications and Credit Framework (QCF)**: general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs
- **Events**: dates and information on the latest Centre events
- **Online assessment**: information on how to register for GOLA/e-volve assessments.

Useful contacts

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

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