QUALIFICATION HANDBOOK

Level 3 Diploma in Light Vehicle Maintenance and Repair Principles (4290-13)

Version 3.1 (September 2013)

City & Guilds

Qualification at a glance

Subject area	**Vehicle Maintenance and Repair**
City & Guilds number	4290
Age group approved	16+
Entry requirements	There are no entry requirements
Assessment	Online multiple choice tests (graded Pass, Merit, Distinction) and assignments (graded Pass)
Fast track	Not available; automatic approval applies in some cases
Support materials	Centre handbook SmartScreen Exam Success book Online practice tests Practical assessment workbook Practical training workbook
Registration and certification	See online catalogue/Walled Garden for last dates.

Title and level	**City & Guilds number**	**Accreditation number**
Level 3 Diploma in Light Vehicle Maintenance and Repair Principles	4290-13	501/0019/1

Version and date	**Change detail**	**Section**
Version 3 (August 2012)	General clarification of Unit Range, grammatical errors corrected. Addition of statements in Section 4.	Various
Version 3.1 (September 2013)	Unit supporting information updated with introductory text	Units

Contents

1	**Introduction**	**5**
	Structure	5
2	**Centre requirements**	**8**
	Approval	8
	Resource requirements	8
	Candidate entry requirements	9
3	**Delivering the qualification**	**10**
	Initial assessment and induction	10
	Support materials	10
4	**Assessment**	**11**
	Assessment of the qualification	11
	Test specifications	11
	Recognition of prior learning (RPL)	11
5	**Units**	**15**
	Summary of units	15
Unit 001	**Skills in health, safety and good housekeeping in the automotive environment**	**17**
Unit 003	**Skills in supporting job roles in the automotive work environment**	**20**
Unit 004	**Skills in materials, fabrication, tools and measuring devices in the automotive environment**	**23**
Unit 006	**Skills in how to make learning possible through demonstrations and instruction**	**26**
Unit 008	**Skills to identify and agree motor vehicle customer service needs**	**29**
Unit 051	**Knowledge of health, safety and good housekeeping in the automotive environment**	**32**
Unit 053	**Knowledge of support for job roles in the automotive work environment**	**41**
Unit 054	**Knowledge of materials, fabrication, tools and measuring devices in the automotive environment**	**45**
Unit 056	**Knowledge of how to make learning possible through demonstrations and instruction**	**49**
Unit 058	**Knowledge of how to identify and agree motor vehicle customer service needs**	**55**
Unit 105	**Skills in inspecting light vehicles using prescribed methods**	**59**
Unit 107	**Skills in diagnosing and rectifying light vehicle engine faults**	**62**
Unit 108	**Skills in diagnosing and rectifying light vehicle chassis system faults**	**65**

Unit 111	**Skills in overhauling light vehicle engine mechanical units**	**68**
Unit 113	**Skills in diagnosing and rectifying light vehicle transmission and driveline faults**	**71**
Unit 121	**Skills in overhauling light vehicle transmission units**	**74**
Unit 131	**Skills in overhauling light vehicle steering and suspension units**	**77**
Unit 155	**Knowledge of inspecting light vehicles using prescribed methods**	**80**
Unit 157	**Knowledge of diagnosis and rectification of light vehicle engine faults**	**84**
Unit 158	**Knowledge in diagnosis and rectification of light vehicle chassis faults**	**94**
Unit 161	**Knowledge of overhauling light vehicle engine units**	**101**
Unit 163	**Knowledge of diagnosis and rectification of light vehicle transmission and driveline faults**	**104**
Unit 171	**Knowledge of overhauling light vehicle transmission units**	**109**
Unit 181	**Knowledge of overhauling light vehicle steering and suspension units**	**112**
Unit 218	**Skills in removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels**	**115**
Unit 268	**Knowledge of removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels**	**118**
Unit 406	**Skills in diagnosing and rectifying vehicle auxiliary electrical faults**	**123**
Unit 456	**Knowledge of diagnosis and rectification of vehicle auxiliary electrical faults**	**126**
Appendix 1	**Relationships to other qualifications**	**135**
Appendix 2	**Sources of general information**	**136**

1 Introduction

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

Area	Description
Who is the qualification for?	It is for candidates wanting to develop practical skills in, and broaden their understanding of motor vehicle systems. It also gives them the opportunity to learn how to develop others.
What does the qualification cover?	It allows candidates to learn, develop and practise the skills required for employment and/or career progression in the automotive industry.
Is the qualification part of a framework or initiative?	This qualification is part of the Automotive Maintenance and Repair Advanced Apprenticeship Framework (framework 1) which replaced the current framework 4 from April 2011.
Who did we develop the qualification with?	This qualification was developed in collaboration with the Institute of the Motor Industry (IMI) the sector skills council for the automotive retail industry and other awarding organisations.
What opportunities for progression are there?	It allows candidates to progress into employment or to the following City & Guilds qualifications: • 4270-13 City & Guilds Level 3 Diploma in Light Vehicle Maintenance and Repair Competence • ILM management and leadership qualifications.

Structure

Qualification	Total credits	Credits from mandatory units	Credits from optional units
City & Guilds Level 3 Diploma in Light Vehicle Maintenance & Repair Principles	**73**	**68**	**5 (min)**
		001, 003, 004, 051, 053, 054, 107, 108, 157, 158, 163, 406, 456	- 006 and 056, or - 008 and 058, or - 105 and 155, or - 111 and 161, or - 113, or - 121 and 171, or - 131 and 181, or - 218 and 268

Unit accreditation number	City & Guilds unit number	Unit title	Credit value
Mandatory			
Y/601/7254	001	Skills in health, safety and good housekeeping in the automotive environment	7
J/601/6262	003	Skills in supporting job roles in the automotive work environment	5
Y/601/6279	004	Skills in materials, fabrication, tools and measuring devices used in the automotive environment	7
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
K/601/6237	054	Knowledge of materials, fabrication, tools and measuring devices used in the automotive environment	4
J/601/3877	107	Skills in diagnosing and rectifying light vehicle engine faults	5
R/601/3879	108	Skills in diagnosing and rectifying light vehicle chassis system faults	5
F/601/3733	157	Knowledge of diagnosis and rectification of light vehicle engine faults	6
L/601/3735	158	Knowledge in diagnosis and rectification of light vehicle chassis faults	6
D/601/3741	163	Knowledge of diagnosis and rectification of light vehicle transmission and driveline faults	6
H/601/3868	406	Skills in diagnosing and rectifying vehicle auxiliary electrical faults	5
A/601/3746	456	Knowledge of diagnosis and rectification of vehicle auxiliary electrical faults	6
Optional			
Y/601/6282	006	Skills in how to make learning possible through demonstrations and instruction	5
M/601/6286	008	Skills to identify and agree motor vehicle customer service needs	5
T/601/6242	056	Knowledge of how to make learning possible through demonstrations and instruction	5

Unit accreditation number	City & Guilds unit number	Unit title	Credit value
R/601/6247	058	Knowledge of how to identify and agree motor vehicle customer service needs	5
A/601/3889	105	Skills in inspecting light vehicles using prescribed methods	4
L/601/3881	111	Skills in overhauling light vehicle engine mechanical units	2
T/601/3888	113	Skills in diagnosing and rectifying light vehicle transmission and driveline faults	5
D/601/3884	121	Skills in overhauling light vehicle transmission units	2
H/601/3885	131	Skills in overhauling light vehicle steering and suspension units	2
H/601/3742	155	Knowledge of inspecting light vehicles using prescribed methods	4
R/601/3736	161	Knowledge of overhauling light vehicle engine units	3
Y/601/3737	171	Knowledge of overhauling light vehicle transmission units	3
D/601/3738	181	Knowledge of overhauling light vehicle steering and suspension units	3
K/601/3869	218	Skills in removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels	3
F/601/3747	268	Knowledge of removing and fitting basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels	2

2 Centre requirements

Approval

Centres already approved to offer the Level 3 Certificate/Diploma in Maintenance and Repair - Light Vehicle (4101-51) will be automatically approved to register and certificate candidates on the 4290-13 (unless the centre is already subject to sanctions).

For all other cases, centres will need to gain both centre and qualification approval. Please refer to the *Centre guide* and *Providing City & Guilds Qualifications* 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 area(s) for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training.

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

Assessor and verifiers

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

Continuing professional development (CPD)

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

Candidate entry requirements

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

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

Age restrictions

This qualification is accredited for candidates aged 16 years or older.

3 Delivering the qualification

Initial assessment and induction

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

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

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

Support materials

The following resources are available for these qualifications:

Description	How to access
Centre handbook	**www.cityandguilds.com/automotive**
Practical assessment workbook	**www.cityandguilds.com/automotive**
Practical training workbook	**www.cityandguilds.com/automotive**
Exam Success book	Walled Garden (TL024290)
Online practice tests	Walled Garden
SmartScreen	**www.smartscreen.co.uk**

4 Assessment

Assessment of the qualification

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

- Assignments (practical assessment workbooks) comprising of practical tasks and knowledge based questions to cover all learning outcomes graded Pass only.
- Online multiple choice tests graded Pass, Merit, Distinction.
- Assignments can be downloaded from www.cityandguilds.com/automotive. These assessments are carried out in centres and must be completed to current industry standards and practice. It is important to note that although the units within these qualifications bear a close relationship to the VCQ units, they do not imply occupational competence.

Time constraints

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

- Candidates must complete their assessments within their registration period.

Test specifications

Summary test specifications for all 4290 online tests can be found in the *Automotive online test specifications* document, downloadable from the 4290 website.

Recognition of prior learning (RPL)

Proxy units / credit transfer

Learners transferring from City & Guilds 4101 NQF qualifications or from another awarding organisation may be exempt from taking the 4290/4270/4291/4271 online multiple choice tests, on production of a valid certificate of equivalent units achieved. Proxy units are available in these circumstances. Please note that a certificate of unit credit (CUC) is not available when claiming a proxy unit. For more information on credit transfer please refer to our 9420 Automotive Apprenticeship Framework centre guide available from www.cityandguilds.com

Full details of the assessment requirements relating to these qualifications can be obtained directly from the Institute of the Motor Industry (IMI) http://www.motor.org.uk

Level 3 Diploma in Light Vehicle Maintenance & Repair Principles

City & Guilds unit number	Level	Unit title	Credit value	Assessment method
001	2	Skills in health, safety and good housekeeping in the automotive environment	7	Assignment
003	3	Skills in supporting job roles in the automotive work environment	5	Assignment
004	2	Skills in materials, fabrication, tools and measuring devices used in the automotive environment	7	Assignment
006	3	Skills in how to make learning possible through demonstrations and instruction	5	Assignment
008	3	Skills to identify and agree motor vehicle customer service needs	5	Assignment
051	2	Knowledge of health, safety and good housekeeping in the automotive environment	3	Assignment
053	3	Knowledge of support for job roles in the automotive work environment	3	Assignment
054	2	Knowledge of materials, fabrication, tools and measuring devices used in the automotive environment	4	Assignment
056	3	Knowledge of how to make learning possible through demonstrations and instruction	5	Assignment
058	3	Knowledge of how to identify and agree motor vehicle customer service needs	5	Assignment
105	2	Skills in inspecting light vehicles using prescribed methods	4	Assignment
107	3	Skills in diagnosing and rectifying light vehicle engine faults	5	Assignment
108	3	Skills in diagnosing and rectifying light vehicle chassis system faults	5	Assignment
111	3	Skills in overhauling light vehicle engine mechanical units	2	Assignment

City & Guilds unit number	Level	Unit title	Credit value	Assessment method
113	3	Skills in diagnosing and rectifying light vehicle transmission and driveline faults	5	Assignment
121	3	Skills in overhauling light vehicle transmission units	2	Assignment
131	3	Skills in overhauling light vehicle steering and suspension units	2	Assignment
155	2	Knowledge of inspecting light vehicles using prescribed methods	4	Multiple choice test
157	3	Knowledge of diagnosis and rectification of light vehicle engine faults	6	Multiple choice test
158	3	Knowledge in diagnosis and rectification of light vehicle chassis faults	6	Multiple choice test
161	3	Knowledge of overhauling light vehicle engine units	3	Multiple choice test
163	3	Knowledge of diagnosis and rectification of light vehicle transmission and driveline faults	6	Multiple choice test
171	3	Knowledge of overhauling light vehicle transmission units	3	Multiple choice test
181	3	Knowledge of overhauling light vehicle steering and suspension units	3	Multiple choice test
218	2	Skills in removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels	3	Assignment
268	2	Knowledge of removing and fitting basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels	2	Multiple choice test
406	3	Skills in diagnosing and rectifying vehicle auxiliary electrical faults	5	Assignment

City & Guilds unit number	Level	Unit title	Credit value	Assessment method
456	3	Knowledge of diagnosis and rectification of vehicle auxiliary electrical faults	6	Multiple choice test

5 Units

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
- learning outcomes which are comprised of a number of assessment criteria
- unit range.

Summary of units

City & Guilds unit number	Unit title	Unit accreditation number
001	Skills in health, safety and good housekeeping in the automotive environment	Y/601/7254
003	Skills in supporting job roles in the automotive work environment	J/601/6262
004	Skills in materials, fabrication, tools and measuring devices used in the automotive environment	Y/601/6279
006	Skills in how to make learning possible through demonstrations and instruction	Y/601/6282
008	Skills to identify and agree motor vehicle customer service needs	M/601/6286
051	Knowledge of health, safety and good housekeeping in the automotive environment	D/601/6171
053	Knowledge of support for job roles in the automotive work environment	T/601/6175
054	Knowledge of materials, fabrication, tools and measuring devices used in the automotive environment	K/601/6237
056	Knowledge of how to make learning possible through demonstrations and instruction	T/601/6242
058	Knowledge of how to identify and agree motor vehicle customer service needs	R/601/6247

City & Guilds unit number	Unit title	Unit accreditation number
105	Skills in inspecting light vehicles using prescribed methods	A/601/3889
107	Skills in diagnosing and rectifying light vehicle engine faults	J/601/3877
108	Skills in diagnosing and rectifying light vehicle chassis system faults	R/601/3879
111	Skills in overhauling light vehicle engine mechanical units	L/601/3881
113	Skills in diagnosing and rectifying light vehicle transmission and driveline faults	T/601/3888
121	Skills in overhauling light vehicle transmission units	D/601/3884
131	Skills in overhauling light vehicle steering and suspension units	H/601/3885
155	Knowledge of inspecting light vehicles using prescribed methods	H/601/3742
157	Knowledge of diagnosis and rectification of light vehicle engine faults	F/601/3733
158	Knowledge in diagnosis and rectification of light vehicle chassis faults	L/601/3735
161	Knowledge of overhauling light vehicle engine units	R/601/3736
163	Knowledge of diagnosis and rectification of light vehicle transmission and driveline faults	D/601/3741
171	Knowledge of overhauling light vehicle transmission units	Y/601/3737
181	Knowledge of overhauling light vehicle steering and suspension units	D/601/3738
218	Skills in removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels	K/601/3869
268	Knowledge of removing and fitting basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels	F/601/3747
406	Skills in diagnosing and rectifying vehicle auxiliary electrical faults	H/601/3868
456	Knowledge of diagnosis and rectification of vehicle auxiliary electrical faults	A/601/3746

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

UAN:	**Y/601/7254**
Level:	2
Credit value:	7
GLH:	60
Relationship to NOS:	This unit is linked to G1 Contribute to Housekeeping in Motor Vehicle Environment and G2 Reduce Risks to Health and Safety in the Motor Vehicle Environment.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will enable the learner to develop the skills required to: • carry out day to day work area cleaning, clearing away, dealing with spillages and disposal of waste, used materials and debris. • identify hazards and risks in the automotive environment and complying with relevant legislation and good practice. • work safely at all times within the automotive environment, both as an individual and with others.

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

1.2 select and use vehicle protective equipment throughout all activities.

Learning outcome	**The learner will:**
2. be able to carry out effective housekeeping practices in the automotive work environment	
Assessment criteria	
The learner can: 2.1 select and use cleaning equipment which is of the right type and suitable for the task 2.2 use utilities and appropriate consumables, avoiding waste 2.3 use materials and equipment to carry out cleaning and maintenance duties in allocated work areas, following automotive work environment policies, schedules and 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 Skills in health, safety and good housekeeping in the automotive environment

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

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

UAN:	**J/601/6262**
Level:	3
Credit value:	5
GLH:	40
Relationship to NOS:	This unit is linked to G3 Maintain Working Relationships in the Motor Vehicle Environment.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will help the learner develop the skills required to keep good working relationships with all colleagues and customers in the automotive work environment by using effective communication and support.

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

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

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

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

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

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 004 Skills in materials, fabrication, tools and measuring devices in the automotive environment

UAN:	**Y/601/6279**
Level:	2
Credit value:	7
GLH:	60
Relationship to NOS:	This unit is linked to G4 Use of hand tools and equipment in motor vehicle engineering.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit helps the learner to develop the skills required for: • the correct selection, care and use of key hand tools and measuring devices for modification, fabrication and repair in the automotive environment • the correct preparation and use of common work environment equipment • the correct selection and fabrication of materials used when modifying and repairing • the correct application of automotive engineering fabrication and fitting principles.

Learning outcome	**The learner will:**
1. be able to select, maintain and use hand tools and measuring devices in the automotive environment	
Assessment criteria	
The learner can: 1.1 select, maintain and use suitable hand tools safely when fabricating and fitting in the automotive workplace 1.2 select, maintain and use suitable measuring devices safely when fabricating and fitting in the automotive environment 1.3 select, maintain and use suitable PPE for fabrication, repair and fitting in the automotive environment 1.4 select, maintain and use suitable electrical measuring tools safely when repairing vehicles and components.	

Learning outcome	The learner will:
2. be able to prepare and use common workshop equipment	
Assessment criteria	
The learner can: 2.1 use suitably maintained workshop equipment safely 2.2 use correct interpretation of 'safe working load' on lifting and supporting equipment 2.3 report any faulty or damaged tools and equipment to the relevant persons clearly and promptly 2.4 store work tools and equipment in a safe manner which permits ease of access and identification for use.	

Learning outcome	The learner will:
3. be able to select materials when fabricating, modifying and repairing vehicles and fitting components	
Assessment criteria	
The learner can: 3.1 select and use appropriate materials whilst constructing, fitting, modifying or repairing vehicles and components.	

Learning outcome	The learner will:
4. be able to apply automotive engineering, fabrication and fitting principles when modifying and repairing vehicles and components	
Assessment criteria	
The learner can: 4.1 use correct procedures when: a. filing b. tapping threads c. cutting plastics and metals d. drilling plastics and metals e. fitting 4.2 use appropriate techniques when fabricating, repairing and modifying vehicles and components 4.3 select and use: a. gaskets b. seals c. sealants d. fittings and fasteners 4.4 apply modification and repair techniques to automotive electrical circuits 4.5 select and use locking, fixing and fastening devices.	

Unit 004 Skills in materials, fabrication, tools and measuring devices in the automotive environment

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 006 Skills in how to make learning possible through demonstrations and instruction

UAN:	**Y/601/6282**
Level:	Level 3
Credit value:	5
GLH:	40
Relationship to NOS:	This unit is linked to G6 Enable Learning through Demonstration and Instruction.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit covers the skills needed in order to carry out demonstrations and instruction which will help the learner to learn. It includes demonstrating equipment, showing skills, giving instruction, deciding when to use demonstration or instruction, potential of technology based learning, checking on learners' progress and giving feedback.

Learning outcome	**The learner will:**
1. be able to demonstrate skills and methods to learners	
Assessment criteria	
The learner can: 1.1 perform demonstrations based on an analysis of the skills needed and the order in which they must be learned 1.2 perform demonstrations that are accurate and realistic 1.3 perform structured demonstrations so that the learner can get the most out of it 1.4 perform demonstrations whilst encouraging learners to ask questions and get explanation at appropriate stages in the demonstration 1.5 provide positive feedback to learners whilst they are being given the opportunity to practise the skills that have been demonstrated 1.6 perform additional demonstrations of skills being taught to reinforce learning 1.7 perform demonstrations in a safe environment which also allows learners to see clearly 1.8 respond to the needs of the learners during demonstrations 1.9 reduce distractions and disruptions as much as possible.	

Learning outcome	The learner will:
2. be able to instruct learners	
Assessment criteria	
The learner can: 2.1 implement instruction which is matched to the needs of learners 2.2 use identified learning outcomes which can be achieved through instruction 2.3 perform instruction, ensuring that the manner, level and speed of the instruction encourages learners to take part 2.4 perform instruction whilst regularly checking that the learners understand and adapt instruction as appropriate 2.5 give learners positive feedback on the learning experience and the outcomes achieved 2.6 carry out a review with the learners to identify anything that prevented learning and adapt instruction as appropriate.	

Unit 006 Skills in how to make learning possible through demonstrations and instruction

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 008 Skills to identify and agree motor vehicle customer service needs

UAN:	**M/601/6286**
Level:	3
Credit value:	5
GLH:	40
Relationship to NOS:	This unit is linked to G8 Identify and agree the motor vehicle customer needs.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit is about the skills required to: gain information from customers on their perceived needs; give advice and information and agree a course of action; contract for the agreed work and complete all necessary records and instructions.

Learning outcome	**The learner will:**
1. be able to obtain relevant information from the customer	
Assessment criteria	
The learner can: 1.1 obtain and interpret sufficient, relevant information, from the customer to make an assessment of their needs 1.2 clarify customer and vehicle needs by referring to vehicle data and operating procedures.	

Learning outcome	**The learner will:**
2. be able to provide relevant information to the customer	
Assessment criteria	
The learner can: 2.1 provide customers with accurate, current and relevant advice and information, in a form that the customer will understand 2.2 demonstrate techniques which encourage customers to ask questions and seek clarification during conversation.	

Learning outcome	The learner will:
3. be able to agree work undertaken with the customer	
Assessment criteria	
The learner can: 3.1 summarise and record work agreed with the customer, before accepting the vehicle 3.2 implement confirmation of the agreement by ensuring customer understanding.	

Learning outcome	The learner will:
4. be able to ensure recording systems are implemented correctly	
Assessment criteria	
The learner can: 4.1 use recording systems which are accurate and complete, in the required format and signed by the customer where necessary 4.2 perform the next stage in the process by passing on completed records to the correct person promptly 4.3 demonstrate correct procedures for customer approval where the contracted agreement is likely to be exceeded.	

Unit 008 Skills to identify and agree motor vehicle customer service needs

Assessment requirements

The assessment 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 G1 Contribute to Housekeeping in Motor Vehicle Environment and G2 Reduce Risks to Health and Safety in the Motor Vehicle Environment.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of: • routine maintenance and cleaning of the automotive environment and using resources economically • health and safety legislation and duties of everyone in the motor vehicle environment. It will provide an appreciation of significant risks in the automotive environment and how to identify and deal with them. Once completed the learner will be able to identify hazards and evaluate and reduce risk.

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

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

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

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

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

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

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

Supporting information

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

Economic use of resources

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

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. Provision and Use of Work Equipment Regulations 1998 as applied to power presses
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 Wheels Regulations 1970
i. The Lifting Operations and Lifting Equipment Regulations 1998
Work at Height Regulations 2005.

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

Action to be taken in the event of colleagues suffering accidents

a. The typical sequence of events following the discovery of an accident such as:
i. make the area safe
ii. remove hazards if appropriate i.e. switch off power
iii. administer minor first aid
iv. take appropriate action to re-assure the injured party
v. raise the alarm
vi. get help
vii. report on the accident.
b. Typical examples of first aid which can be administered by persons at the scene of an accident:
i. check for consciousness
ii. stem bleeding
iii. keep the injured person's airways free
iv. place in the recovery position if injured person is unconscious
v. issue plasters for minor cuts
vi. action to prevent shock i.e. keep the injured party warm
vii. administer water for minor burns or chemical injuries
viii. wash eyes with water to remove dust or ingress of chemicals (battery acid)
ix. need to seek professional help for serious injuries.

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

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

UAN:	**T/601/6175**
Level:	3
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to G3 Maintain Working Relationships in the Motor Vehicle Environment.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of how to keep good working relationships with all colleagues in the automotive work environment by using effective communication and support skills.

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

Learning outcome	**The learner will:**
2. understand the importance of obtaining, interpreting and using information in order to support their job role within the automotive work environment	

Assessment criteria
The learner can: 2.1 explain the importance of different sources of information in an automotive work environment 2.2 explain how to find, interpret and use relevant sources of information 2.3 describe the main legal requirements relating to the vehicle, including road safety requirements 2.4 explain the importance of working to recognised procedures and processes 2.5 explain when replacement units and components must meet the 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 their choice of communication 3.3 explain how the communication of information can change with the target audience to include informed and uninformed 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 honouring realistic commitments to colleagues and customers.	

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

Supporting information

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

The structure of a typical vehicle repair business

a. How these areas relate to each other within the business:
   i. body shop
   ii. vehicle repair workshop
   iii. paint shop
   iv. valeting
   v. vehicle parts store
   vi. main office
   vii. vehicle sales
   viii. reception.

b. Sources of information
   i. Other staff.
   ii. Manuals.
   iii. Parts lists.
   iv. Computer software and the internet.
   v. Manufacturer.
   vi. 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.

Methods of communication:

a. verbal

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

a. Organisational and customer requirements:
    i. importance of time scales to customer and organization
    ii. relationship between time and costs
    iii. meaning of profit.
b. Choice of communication
    i. distance
    ii. location
    iii. job responsibility.
c. Importance of maintaining positive working relationships:
    i. morale
    ii. productivity
    iii. company image
    iv. customer relationships
    v. colleagues.

Unit 054 Knowledge of materials, fabrication, tools and measuring devices in the automotive environment

UAN:	**K/601/6237**
Level:	2
Credit value:	4
GLH:	40
Relationship to NOS:	This unit is linked to G4 Use of hand tools and equipment in Motor Vehicle Engineering.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of: • the correct selection, care and use of key hand tools and measuring devices for modification, fabrication and repair in the automotive environment • the correct preparation and use of common work environment equipment • the correct selection and fabrication of materials used when modifying and repairing • the correct application of automotive engineering fabrication and fitting principles.

Learning outcome	**The learner will:**
1. understand how to select, use and care for hand tools and measuring devices in the automotive environment	
Assessment criteria	
The learner can: 1.1 identify and explain the use of common types of hand tools used for fabricating and fitting in the automotive environment 1.2 identify and explain the use of common measuring devices used for fabrication and fitting in the automotive environment 1.3 describe, within the scope of their responsibilities, how to select, prepare and maintain hand tools, measuring devices and PPE used for fabrication, repair and fitting in the automotive environment 1.4 state the limitations of common hand tools and measuring devices	

used for fabricating, repair and fitting in the automotive workplace 1.5 explain how common hand tools and measuring devices used for fabricating, repair and fitting in the automotive environment should be stored and maintained 1.6 identify common electrical measuring tools used in the repair of vehicles and components 1.7 explain the preparation and safe and correct use of common electrical tools when measuring voltage, current and resistance.

Learning outcome	**The learner will:**
2. understand how to prepare and use common workshop equipment	
Assessment criteria	
The learner can: 2.1 describe the preparation and safe use of workshop equipment 2.2 explain the term: safe working load.	

Learning outcome	**The learner will:**
3. understand how to select materials when fabricating, modifying and repairing vehicles and fitting components	
Assessment criteria	
The learner can: 3.1 describe the properties, application and limitations of ferrous and non-ferrous metals, including their safe use 3.2 describe the properties, application and limitations of common non-metallic materials, including their safe use 3.3 define common terms relating to the properties of materials.	

Learning outcome	**The learner will:**
4. understand how to apply automotive engineering, fabrication and fitting principles when modifying and repairing vehicles and components	
Assessment criteria	
The learner can: 4.1 describe how to tap threads, file, cut and drill plastics and metals when modifying or repairing vehicles 4.2 describe how to measure, mark out, shape and join materials when fabricating 4.3 describe the selection and fitting procedures of the following: a. gaskets and seals b. sealants and adhesives c. fittings and fasteners d. electrical circuit components 4.4 identify locking, fastening and fixing devices 4.5 state the importance of current operating specifications for limits, fits and tolerances in the automotive environment.	

Unit 054 Knowledge of materials, fabrication, tools and measuring devices in the automotive environment

Supporting information

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

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

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

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

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

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

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

Common electrical terms when measuring:

a. voltage
b. current
c. resistance.

Workshop equipment (including appropriate PPE) to include:

a. hydraulic jacks
b. axle stands
c. pillar drills
d. air tools
e. vehicle lifts
f. cranes
g. hoists
h. electrical power tools.

The properties, application and limitations to include safe use of ferrous and non-ferrous metals used when constructing, modifying and repairing vehicles and components. Materials to include:

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

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

constructing, modifying and repairing vehicles and components. Materials to include:

a. glass
b. plastics
c. Kevlar
d. rubber.

Terms relating to the properties of materials to include:

a. hardness
b. toughness
c. ductility
d. elasticity
e. tenacity
f. malleability
g. plasticity.

Unit 056 Knowledge of how to make learning possible through demonstrations and instruction

UAN:	**T/601/6242**
Level:	Level 3
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to G6 Enable Learning through Demonstration and Instruction.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of how to carry out demonstrations and instruction which will help the learner to learn. It includes demonstrating equipment, showing skills, giving instruction, deciding when to use demonstration or instruction, potential of technology based learning, checking on learners' progress and giving feedback.

Learning outcome	**The learner will:**
1. understand the nature and role of demonstrations and instruction	
Assessment criteria	
The learner can: 1.1 classify the separate areas of demonstrations which encourage learning 1.2 identify which types of learning are best achieved and supported through demonstrations 1.3 explain how to identify and use different learning opportunities 1.4 explain how to structure demonstrations and instruction sessions 1.5 explain how to choose from a range of demonstration techniques.	

Learning outcome	The learner will:
2. understand the principles and concepts of demonstration and instruction	
Assessment criteria	
The learner can: 2.1 describe how to put learners at ease and encourage them to take part 2.2 justify the choice between demonstration and instruction as a learning method 2.3 explain how to identify individual learning needs 2.4 clarify which factors are likely to prevent learning and how to overcome them 2.5 explain how to check learners' understanding and progress 2.6 explain how to choose and prepare appropriate materials 2.7 explain the separate areas of instructional techniques which encourage learning 2.8 describe which types of learning are best achieved and supported through instruction.	

Learning outcome	The learner will:
3. understand the external factors influencing human resource development	
Assessment criteria	
The learner can: 3.1 explain how to make sure everybody acts in line with health, safety and environmental protection, legislation and best practice 3.2 analyse developments in technology based learning and new ways of delivery.	

Unit 056 Knowledge of how to make learning possible through demonstrations and instruction

Supporting information

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

Separate areas of demonstration which encourage learning to include:

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

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

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

How to structure demonstration and instruction sessions to include:

a. Before the demonstration and/or instruction ensure that the following good practice is recognised:
    i. identify key points
    ii. relate theoretical underpinning knowledge to key points
    iii. rehearse to ensure that all equipment is working
    iv. ensure all students can see even small equipment and processes
    v. time the demonstration
    vi. consider how to make students participate
    vii. consider how to emphasise safe working practices.

b. During the demonstration and/or instruction good practice is to:
    i. give a clear introduction
    ii. identify any tools/equipment
    iii. determine the current audience level of knowledge
    iv. complete the demonstration correctly (do not show how not to do it)
    v. stress key points and show links between them
    vi. monitor safety aspects
    vii. check learner understanding.
c. After the demonstration (if possible)
    i. enable the audience to practise the techniques
    ii. provide feedback on their performance.

How to identify individual learning needs

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

What factors are likely to prevent learning, to include:

a. language barriers
b. physical barriers
c. specialist knowledge
d. pace of learning
e. method of delivery
f. environmental factors
g. teaching styles
h. dyslexia.

How to check learner's understanding and progress

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

How to organise information and prepare materials

a. Identify the course aim.
b. Identify the subject aim.
c. Identify the lesson aim.
d. Complete a lesson plan - plan the teaching.
e. Identify a series of 'cues' to be used during the lesson.
f. Logically organise the information.

g. Use suitable resources and equipment to maximise learning opportunities.
h. Assess the learner's progress and understanding.

Instructional techniques

a. Types of instructional techniques to include:
   i. lectures
   ii. handouts
   iii. team teaching
   iv. peer teaching
   v. discussion – individual, group and peer
   vi. question and answer
   vii. multimedia
   viii. seminars
   ix. case studies
   x. project/assignments.

Environmental factors that affect learning

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

Health and safety factors that affect learning

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

Analysis of demonstration/instruction

a. Analysis of demonstration/instruction to include:
   i. feedback from students
   ii. feedback from colleagues
   iii. organisational quality assessment
   iv. feedback from external organisations
   v. awarding body requirements.

Developments in learning

To include:

a. multimedia based materials
b. web based materials
c. interactive materials.

How to choose and prepare appropriate materials.
To include:
a. putting information in order
b. deciding whether the language used is appropriate
c. type of material i.e. paper and technology based etc.

Unit 058 Knowledge of how to identify and agree motor vehicle customer service needs

UAN:	**R/601/6247**
Level:	3
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to G8 Identify and agree the motor vehicle customer needs.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of how to gain: information from customers on their perceived needs; give advice and information and agree a course of action; contract for the agreed work and complete all necessary records and instructions.

Learning outcome	**The learner will:**
1. understand legislative and organisational requirements and procedures	
Assessment criteria	
The learner can: 1.1 describe the fundamental legal requirements of current consumer legislation and the consequences of their own actions in respect of this legislation 1.2 describe the content and limitations of company and product warranties for the vehicles dealt with by their company 1.3 explain the limits of their own authority for accepting vehicles 1.4 explain the importance of keeping customers informed of progress 1.5 describe their workplace requirements for the completion of records 1.6 explain how to complete and process all the necessary documentation.	

Learning outcome	The learner will:
2. understand how to communicate and care for customers	
Assessment criteria	
The learner can: 2.1 explain how to communicate effectively with customers 2.2 describe how to adapt their language when explaining technical matters to non-technical customers 2.3 explain how to use effective questioning techniques 2.4 describe how to care for customers and achieve customer satisfaction.	

Learning outcome	The learner will:
3. understand company products and services	
Assessment criteria	
The learner can: 3.1 describe the range of options available to resolve vehicle problems 3.2 describe the range and type of services offered by their company 3.3 explain the effect of resource availability upon the receipt of customer vehicles and the completion work 3.4 explain how to access costing and work completion time information.	

Unit 058 Knowledge of how to identify and agree motor vehicle customer service needs

Supporting information

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

Organisational requirements

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

Principles of customer communication and care

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

Company products and services

a. Service standards:
    i. national
    ii. manufacturer
    iii. organisational.
b. The range and type of services offered by the organisation:
    i. diagnostic
    ii. servicing

iii. repair
iv. warranty
v. MOT testing
vi. fitment of accessories/enhancements
vii. internal.

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

Vehicle information systems, servicing and repair requirements

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

Consumer legislation to include:

a. consumer protection
b. sale of goods
c. data protection
d. product liability
e. health and safety
f. discrimination.

Unit 105 Skills in inspecting light vehicles using prescribed methods

UAN:	**A/601/3889**
Level:	2
Credit value:	4
GLH:	40
Relationship to NOS:	This unit is linked to LV05 Inspect Light Vehicles using Prescribed Inspection Methods and LV06 Inspect Light Vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit allows the learner to develop skills to carry out a range of light vehicle inspections on vehicles using a variety of prescribed testing and inspection methods.

Learning outcome	**The learner will:**
1. be able to work safely when carrying out light vehicle inspections using prescribed methods	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings throughout all light vehicle inspection 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 light vehicle inspection activities including: a. vehicle technical data b. inspection procedures c. legal requirements 2.2 use technical information to support light vehicle inspection 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 a range of inspections on light vehicle systems 3.2 ensure that equipment has been calibrated to meet manufacturers' and legal requirements 3.3 use the correct tools and equipment in the way specified by manufacturers when carrying out a range of inspections on light vehicle systems.	

Learning outcome	The learner will:
4. be able to carry out light vehicle inspections using prescribed methods	
Assessment criteria	
The learner can: 4.1 carry out light vehicle inspections using prescribed methods, adhering to the correct specifications and tolerances for the vehicle and following: a. the manufacturer's approved inspection methods b. recognised researched inspection methods c. health and safety requirements 4.2 ensure that inspected light vehicle conforms to the vehicle operating specification and any legal requirements 4.3 ensure any comparison of the vehicle against specification accurately identifies any: a. differences from the vehicle specification b. vehicle appearance and condition faults 4.4 use suitable testing methods to evaluate the performance of the inspected systems.	

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

Unit 105 Skills in inspecting light vehicles using prescribed methods

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 107 Skills in diagnosing and rectifying light vehicle engine faults

UAN:	**J/601/3877**
Level:	Level 3
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to LV07 Diagnose and Rectify Light Vehicles Engine and Component Faults.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit allows the learner to demonstrate they can diagnose and rectify light vehicle engine mechanical, electrical, hydraulic and fluid systems faults. It also covers the evaluation of performance of the replaced or repaired units and systems. This includes SI, CI, Hybrid and Alternative fuel vehicles.

Learning outcome	**The learner will:**
1. be able to work safely when carrying out light vehicle engine diagnostic and rectification activities	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when using light vehicle diagnostic methods and carrying out rectification 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 light vehicle diagnostic and rectification activities including: 2.2 vehicle technical data 2.3 diagnostic test procedures	

2.4	use sufficient diagnostic information in a systematic way to enable an accurate diagnosis of light vehicle engine system faults.

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 diagnostic and rectification activities
3.2	ensure that equipment has been calibrated to meet manufacturers' and legal requirements
3.3	use the equipment required, correctly and safely throughout all light vehicle engine diagnostic and rectification activities.

Learning outcome	**The learner will:**
4. be able to carry out light vehicle engine diagnosis, rectification and test activities	
Assessment criteria	
The learner can:	
4.1	use diagnostic methods that are relevant to the symptoms presented
4.2	evaluate their assessment of dismantled sub-assemblies and identify their condition and suitability for repair or replacement accurately
4.3	carry out all diagnostic and rectification activities following:
4.4	manufacturers' instructions
4.5	recognised researched repair methods
4.6	health and safety requirements
4.7	ensure all repaired or replacement components and units conform to the vehicle operating specification and any legal requirements
4.8	adjust components and units correctly to ensure that they operate to meet system requirements
4.9	use testing methods that are suitable for assessing the performance of the system rectified
4.10	ensure the rectified light vehicle engine system performs to the vehicle operating specification and any legal requirements.

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

Unit 107 Skills in diagnosing and rectifying light vehicle engine faults

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 108 Skills in diagnosing and rectifying light vehicle chassis system faults

UAN:	**R/601/3879**
Level:	Level 3
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to LV08 Diagnose and Rectify Light Vehicle Chassis System Faults.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit allows the learner to demonstrate they can diagnose and rectify light vehicle braking steering and suspension systems faults. It also covers the evaluation of performance of the replaced or repaired units and systems. This includes SI, CI, Hybrid and Alternative fuel vehicles.

Learning outcome	**The learner will:**
1. be able to work safely when carrying out light vehicle chassis diagnostic and rectification activities	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when using light vehicle diagnostic methods and carrying out rectification 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 light vehicle diagnostic and rectification activities including: 2.2 vehicle technical data 2.3 diagnostic test procedures 2.4 use sufficient diagnostic information in a systematic way to enable an accurate diagnosis of light vehicle chassis system faults.	

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 diagnostic and rectification activities 3.2 ensure that equipment has been calibrated to meet manufacturers' and legal requirements 3.3 use the equipment required, correctly and safely throughout all light vehicle chassis diagnostic and rectification activities.	

Learning outcome	The learner will:
4. be able to carry out light vehicle chassis diagnosis, rectification and test activities	
Assessment criteria	
The learner can: 4.1 use diagnostic methods that are relevant to the symptoms presented 4.2 evaluate their assessment of dismantled sub-assemblies and identify their condition and suitability for repair or replacement accurately 4.3 carry out all diagnostic and rectification activities following: 4.4 manufacturers' instructions 4.5 recognised researched repair methods 4.6 health and safety requirements 4.7 ensure all repaired or replacement components and units conform to the vehicle operating specification and any legal requirements 4.8 adjust components and units correctly to ensure that they operate to meet system requirements 4.9 use testing methods that are suitable for assessing the performance of the system rectified 4.10 ensure the rectified light vehicle chassis system performs to the vehicle operating specification and any legal requirements.	

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

Unit 108 Skills in diagnosing and rectifying light vehicle chassis system faults

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 111 Skills in overhauling light vehicle engine mechanical units

UAN:	**L/601/3881**
Level:	3
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to LV11 Overhaul Light Vehicle Mechanical Units.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit allows the learner to demonstrate skills in overhauling engines. It also covers the evaluation of performance of the overhauled units and systems.

Learning outcome	**The learner will:**
1. be able to work safely when overhauling light vehicle engine mechanical units	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when overhauling light vehicle engine units 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.	

Learning outcome	**The learner will:**
2. be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support the overhauling of light vehicle engine units including: a. vehicle technical data b. overhauling procedures c. legal requirements 2.2 use technical information to support the overhauling of light vehicle engine units.	

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 overhauling light vehicle engine units 3.2 ensure that equipment has been calibrated to meet manufacturers' and legal requirements 3.3 use the tools and equipment in the way specified by manufacturers to overhaul light vehicle engine units.	

Learning outcome	The learner will:
4. be able to carry out the overhauling of light vehicle engine mechanical units	
Assessment criteria	
The learner can: 4.1 carry out all overhauling of light vehicle engine mechanical units, adhering to the specifications and tolerances for the vehicle and following: a. the manufacturer's approved overhauling methods b. recognised researched repair methods c. health and safety requirements. 4.2 sure the assessment of the dismantled unit identifies accurately its condition and suitability for overhaul 4.3 inform the relevant person(s) promptly where an overhaul is uneconomic or unsatisfactory to perform 4.4 use testing methods that comply with the manufacturer's requirements 4.5 adjust the unit's components correctly where necessary to ensure that they operate to meet the vehicle operating requirements. 4.6 ensure the overhauled units and assemblies conform to the vehicle operating specification and any legal requirements.	

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

Unit 111 Skills in overhauling light vehicle engine mechanical units

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 113 Skills in diagnosing and rectifying light vehicle transmission and driveline faults

UAN:	**T/601/3888**
Level:	Level 3
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to LV13 Diagnose and Rectify Light Vehicle Transmission and Driveline System Faults.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit allows the learner to demonstrate they can diagnose and rectify light vehicle gearboxes, hubs and bearings, driveline shafts, clutches, differentials and final drive unit faults. It also covers the evaluation of performance of the replaced or repaired units and systems. This includes SI, CI, Hybrid and Alternative fuel vehicles.

Learning outcome	**The learner will:**
1. be able to work safely when carrying out light vehicle transmission and driveline diagnostic and rectification activities	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when using light vehicle diagnostic methods and carrying out rectification activities 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people or 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 light vehicle diagnostic and rectification activities including: a. vehicle technical data	

b. diagnostic test procedures 2.2 use sufficient diagnostic information in a systematic way to enable an accurate diagnosis of light vehicle transmission and driveline system faults.

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 diagnostic and rectification activities 3.2 ensure that equipment has been calibrated to meet manufacturers' and legal requirements 3.3 use the equipment required, correctly and safely throughout all light vehicle transmission and driveline diagnostic and rectification activities	

Learning outcome	The learner will:
4. be able to carry out light vehicle transmission and driveline diagnosis, rectification and test activities	
Assessment criteria	
The learner can: 4.1 use diagnostic methods that are relevant to the symptoms presented 4.2 evaluate dismantled sub-assemblies for their condition and suitability for repair or replacement 4.3 carry out all diagnostic and rectification activities following: a. manufacturers' instructions b. recognised researched repair methods c. health and safety requirements 4.4 ensure all repaired or replacement components and units conform to the vehicle operating specification and any legal requirements 4.5 adjust components and units correctly to ensure that they operate to meet system requirements 4.6 use testing methods that are suitable for assessing the performance of the system rectified 4.7 ensure the light vehicle transmission and driveline system rectified performs to the vehicle operating specification and any legal requirements.	

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

Unit 113 Skills in diagnosing and rectifying light vehicle transmission and driveline faults

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 121 Skills in overhauling light vehicle transmission units

UAN:	**D/601/3884**
Level:	3
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to LV11 Overhaul Light Vehicle Mechanical Units.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit allows the learner to demonstrate skills in overhauling gearboxes and final drive assemblies. It also covers the evaluation of performance of the overhauled units and systems.

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

Learning outcome	**The learner will:**
2. be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support the overhauling of light vehicle transmission units including: a. vehicle technical data b. overhauling procedures c. legal requirements 2.2 use technical information to support the overhauling of light vehicle transmission units.	

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 overhaul of light vehicle transmission systems 3.2 ensure that equipment has been calibrated to meet manufacturers' and legal requirements 3.3 use the tools and equipment in the way specified by manufacturers to overhaul light vehicle transmission units.	

Learning outcome	The learner will:
4. be able to carry out the overhauling of light vehicle transmission units	
Assessment criteria	
The learner can: 4.1 carry out all overhauling of light vehicle transmission units, adhering to the specifications and tolerances for the vehicle and following: a. the manufacturer's approved overhauling methods b. recognised researched repair methods c. health and safety requirements 4.2 ensure the assessment of the dismantled unit identifies accurately its condition and suitability for overhaul 4.3 inform the relevant person(s) promptly where an overhaul is uneconomic or unsatisfactory to perform 4.4 use testing methods that comply with the manufacturer's requirements 4.5 adjust the unit's components correctly where necessary to ensure that they operate to meet the vehicle operating requirements 4.6 ensure the overhauled units and assemblies conform to the vehicle operating specification and any legal requirements.	

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

Unit 121 Skills in overhauling light vehicle transmission units

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 131 Skills in overhauling light vehicle steering and suspension units

UAN:	**H/601/3885**
Level:	3
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to LV11 Overhaul Light Vehicle Mechanical Units.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit allows the learner to demonstrate skills in overhauling steering and suspension units. It also covers the evaluation of performance of the overhauled units and systems.

Learning outcome	**The learner will:**
1. be able to work safely when overhauling light vehicle steering and suspension units	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings when overhauling light vehicle steering and suspension units 1.2 work in a way which minimises the risk of damage or injury to the vehicle, people and the environment.	

Learning outcome	**The learner will:**
2. be able to use relevant information to carry out the task	
Assessment criteria	
The learner can: 2.1 select suitable sources of technical information to support the overhauling of light vehicle steering and suspension units including: a. vehicle technical data b. overhauling procedures c. legal requirements 2.2 use technical information to support the overhauling of light vehicle steering and suspension units.	

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 overhauling light vehicle steering and suspension units 3.2 ensure that equipment has been calibrated to meet manufacturers' and legal requirements 3.3 use the tools and equipment in the way specified by manufacturers for overhauling light vehicle steering and suspension units.	

Learning outcome	The learner will:
4. be able to carry out the overhauling of light vehicle steering and suspension units	
Assessment criteria	
The learner can: 4.1 carry out all overhauling of light vehicle steering and suspension units, adhering to the specifications and tolerances for the vehicle and following: a. the manufacturer's approved overhauling methods b. recognised researched repair methods c. health and safety requirements 4.2 ensure the assessment of the dismantled unit identifies accurately its condition and suitability for overhaul 4.3 inform the relevant person(s) promptly where an overhaul is uneconomic or unsatisfactory to perform 4.4 use testing methods that comply with the manufacturer's requirements 4.5 adjust the unit's components correctly where necessary to ensure that they operate to meet the vehicle operating requirements 4.6 ensure the overhauled units and assemblies conform to the vehicle operating specification and any legal requirements.	

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

Unit 131 Skills in overhauling light vehicle steering and suspension units

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 155 Knowledge of inspecting light vehicles using prescribed methods

UAN:	**H/601/3742**
Level:	2
Credit value:	4
GLH:	40
Relationship to NOS:	This unit is linked to LV05 Inspect Light Vehicles using Prescribed Inspection Methods and LV06 Inspect Light Vehicles.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of carrying out a range of inspections on light vehicles using a variety of prescribed testing and inspection methods.

Learning outcome	**The learner will:**
1. understand how to carry out inspections on light vehicles using prescribed methods	
Assessment criteria	
The learner can: 1.1 explain the difference between the various prescribed light vehicle inspection methods to include: a. pre-work b. post-work c. pre-delivery d. maintenance inspection (brake, seasonal and tyre) 1.2 identify the different systems to be inspected when using the prescribed inspection methods 1.3 identify the procedures involved in carrying out the systematic inspection of the prescribed inspection methods on light vehicles 1.4 identify correct conformity of vehicle systems and condition on light vehicles inspections 1.5 compare test and inspection results against light vehicle specification and legal requirements 1.6 explain how to record and complete the inspection results in the format required 1.7 identify the recommendations that can be made based on results of the light vehicle inspections	

1.8	explain the implications of failing to carry out light vehicle inspections activities correctly
1.9	explain the implications of signing workplace documentation and vehicle records
1.10	explain the procedure for reporting cosmetic damage to light vehicle components and units outside normal inspection items.

Unit 155 Knowledge of inspecting light vehicles using prescribed methods

Supporting information

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

Pre and post work vehicle inspections and record findings

a. PPE and vehicle protection relating to:
   i. vehicle body panels
   ii. paint surfaces
   iii. seats
   iv. carpets and floor mats prior to conduction vehicle inspections.

b. Pre and post work vehicle inspection procedures:
   i. aural
   ii. visual and functional assessments on engine
   iii. engine systems
   iv. chassis systems
   v. wheels and tyres
   vi. transmission system
   vii. electrical and electronic systems
   viii. exterior vehicle body
   ix. vehicle interior.

c. The methods for carrying out inspections for: damage, corrosion, fluid leaks, wear, security, mounting security and condition to include:
   i. engines and engine systems
   ii. chassis systems
   iii. brakes
   iv. steering
   v. suspension
   vi. wheels
   vii. tyres
   viii. body panels
   ix. electrical and electronic systems and components
   x. vehicle seating and vehicle interior
   xi. vehicle instrumentation
   xii. driver controls.

d. Check conformity to manufacturer's specifications and legal requirements.

e. Completion of documentation to include:
   i. inspection records
   ii. job cards

iii. vehicle records.

f. Make recommendations based on results of vehicle inspections.

g. The checks necessary to ensure customer satisfaction for:
   i. vehicle body panels
   ii. paint surfaces
   iii. seats
   iv. carpets and floor mats following pre or post vehicle inspections.

h. Prepare and use appropriate inspection equipment and tools.

i. Inspection procedures following inspection checklists.

Unit 157 Knowledge of diagnosis and rectification of light vehicle engine faults

UAN:	**F/601/3733**
Level:	3
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to LV07 Diagnose and Rectify Light Vehicles Engine and Component Faults.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of diagnosis and rectification of engine mechanical, electrical, hydraulic and fluid systems. It also covers light vehicle engine systems and the evaluation of their performance.

Learning outcome	**The learner will:**
1. understand how the light vehicle engine systems operate	
Assessment criteria	
The learner can: 1.1 explain the construction and operation of light vehicle engine systems to include: a. SI fuel systems b. CI fuel systems c. ignition systems d. engine management e. valve mechanisms f. pressure charged induction systems g. exhaust emission reduction systems h. heating, ventilation and cooling 1.2 explain the interaction between electrical, electronic and mechanical components within light vehicle engine systems 1.3 explain how electrical systems interlink and interact, including multiplexing and fibre optics 1.4 compare light vehicle engine system components and assemblies against alternatives to identify differences in construction and operation	

1.5 identify the engineering principles that are related to light vehicle engine systems a. volumetric efficiency b. flame travel, pre ignition and detonation c. fuel properties d. composition of carbon fuels e. combustion process f. legal requirements for exhaust emissions.

Learning outcome	**The learner will:**
2. understand how to diagnose and rectify faults in light vehicle engine systems	
Assessment criteria	
The learner can: 2.1 describe how to analyse symptoms and causes of faults found in light vehicle engine systems to include: 2.2 engine mechanical components 2.3 ignition systems 2.4 fuel systems 2.5 engine management system 2.6 pressure charged induction systems 2.7 heating, ventilation and cooling 2.8 explain systematic diagnostic techniques used in identifying engine system faults 2.9 explain how to examine, measure and make suitable adjustments to the components including: 2.10 settings 2.11 input and output values 2.12 voltages 2.13 current consumption 2.14 resistance 2.15 output patterns with oscilloscope 2.16 pressures 2.17 condition 2.18 wear and performance 2.19 explain how to carry out the diagnosis and rectification activities in order to correct the faults in the light vehicle engine systems 2.20 explain how to select, prepare and use diagnostic and rectification equipment for light vehicle engine systems 2.21 explain how to evaluate and interpret test results found in diagnosing light vehicle engine system faults against vehicle manufacturer specifications and settings 2.22 explain how to evaluate the operation of components and systems following diagnosis and repair to confirm system performance.	

Unit 157 Knowledge of diagnosis and rectification of light vehicle engine faults

Supporting information

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

Single and multi-point petrol injection systems

a. The operation and construction of single and multi-point injection systems including:
    i. types of air flow sensor
    ii. fuel supply system
    iii. fuel pump
    iv. filter
    v. fuel regulator
    vi. injectors
    vii. sequential injection
    viii. continuous injection
    ix. semi-continuous injection
    x. electronic control unit (ECU)
    xi. injector pulse width
    xii. sensors.
b. The operation of each system under various operating conditions including:
    i. cold starting
    ii. warm up
    iii. hot starting
    iv. acceleration
    v. deceleration
    vi. cruising
    vii. full load.
c. Engine speed limiting and knock sensing.

Engine management

a. The function and purpose of engine management systems.
b. The difference between analogue, digital, programmable and non-programmable systems.
c. Open loop and closed loop control, types of input and output devices.
d. The function and operation of digital components and systems.
e. The operation of engine management systems under various conditions.

Valve mechanisms

a. The reasons for variable valve timing and multi-valve arrangements and the effect on performance.
b. Layout of multi-valve arrangements, components, operation and drive arrangements.
c. Construction features and operation of variable valve timing engines and electronic control.

Pressure charged induction systems

a. The meaning of volumetric efficiency; explain the effect of volumetric efficiency on engine performance, torque and power.
b. The methods used to improve volumetric efficiency:
    i. variable valve timing
    ii. turbo-charging
    iii. supercharging
    iv. intercoolers.
c. The operation of turbo-chargers and the purpose of:
    i. turbo-charging
    ii. supercharging
    iii. intercoolers
    iv. waste gates
    v. exhaust gas recirculation.
d. Advantages and disadvantages of pressure charging induction systems.

Terms associated with combustion

a. Flame travel, pre-ignition and detonation.
b. Fuel properties:
    i. octane rating
    ii. flash point
    iii. fire point
    iv. volatility
    v. composition of petrol and diesel fuels
    vi. hydro-carbon content.
c. Composition of carbon fuels (petrol and diesel):
    i. % hydrogen and carbon
    ii. composition of air
    iii. % oxygen
    iv. % nitrogen
d. Combustion process for spark ignition and compression ignition engines:
    i. air fuel ratio
    ii. lambda ratio
    iii. stoichiometric ratio.
e. The by-products of combustion for different engine conditions and fuel mixtures:
    i. CO
    ii. CO2
    iii. O
    iv. N

v. H2O
vi. NOx.

f. Describe the legal requirements for exhaust emissions;
   i. MOT requirements
   ii. EURO 3
   iii. 4 & 5 regulations.

Assessment, repair and restoration of mechanical engine components

a. How engine mechanical components are assessed and measured for wear and serviceability:
   i. cylinder bores
   ii. cylinder heads
   iii. crankshaft journals
   iv. valve faces
   v. valve guides
   vi. valve seats
   vii. camshafts
b. The methods used for the repair and restoration of engine components.

Cooling, heating and ventilation

a. The components, operating principles, and functions of engine cooling systems.
b. Procedures used to remove, replace and adjust cooling system components:
   i. cooling fans and control devices
   ii. header tanks, radiators and pressure caps
   iii. heater matrices and temperature control systems
   iv. expansion tanks hoses, clips and pipes
   v. thermostats impellers and coolant
   vi. ventilation systems.
c. The preparation and method of use of appropriate specialist equipment used to evaluate system performance following component replacement:
   i. system pressure testers
   ii. pressure cap testers
   iii. hydrometer, or anti-freeze testing equipment
   iv. chemical tests for the detection of combustion gas.
d. The layout and construction of internal heater systems.
e. The controls and connections within internal heater system.
f. Symptoms and faults associated with cooling systems:
   i. water leaks
   ii. water in oil
   iii. internal heating system: efficiency, operation, leaks, controls, air filtration, air leaks and contamination
   iv. excessively low or high coolant temperature.
g. The procedures used when inspecting
   i. internal heating system
   ii. cooling system.

Air conditioning systems

a. The operation of air conditioning components including:
    i. compressors
    ii. condensers
    iii. receivers
    iv. dryers
    v. connections
    vi. valves
    vii. hoses
    viii. thermostats
    ix. refrigerants.
b. The layout and operation of air conditioning systems.

Climate control systems

a. Identify components used in climate control systems including:
    i. sensors
    ii. speed controls
    iii. control systems
    iv. servomotors
    v. electronic components.
b. The layout of climate control systems.
c. The operation of climate control system.

Symptoms and faults in engine mechanical systems and components

a. Symptoms and faults related to:
    i. worn cylinders
    ii. cylinder liners
    iii. pistons
    iv. piston rings
    v. crankshaft
    vi. camshaft
    vii. bearings
    viii. cylinder head and gasket
    ix. valves
    x. valve seats and valve guides
    xi. cambelts
    xii. lubrication system and components
    xiii. oil pump
    xiv. relief valve
    xv. filter
    xvi. turbo-charger
    xvii. supercharger.

Diagnosis of faults in engine mechanical systems and components

a. Interpret information for:
    i. diagnostic tests
    ii. manufacturer's vehicle and equipment specifications
    iii. use of equipment
    iv. testing procedures

v. test plans
vi. legal requirements.

b. The preparation of tools and equipment for use in diagnostic testing and assessment.
c. Systematic assessment, testing and inspection of engine components and systems including:
    i. mechanical system & component condition
    ii. engine balance
    iii. power balance
    iv. performance and operation
    v. wear
    vi. run out
    vii. alignment.
d. Use of appropriate tools and equipment including:
    i. compression gauges
    ii. leakage testers
    iii. cylinder balance tester
    iv. pressure gauges
    v. micrometers
    vi. vernier gauges.
e. Evaluate and interpret test results from diagnostic testing.
f. Compare test result and values with vehicle manufacturer's specifications and settings.
g. The procedures for dismantling, components and systems and the use of appropriate equipment and procedures.
h. Assess, examine and measure components including:
    i. settings
    ii. values
    iii. condition
    iv. wear and performance of components and systems.
i. Probable faults:
    i. malfunctions
    ii. incorrect settings
    iii. wear.
j. Rectification or replacement procedures.
k. Evaluate operation of components and systems following diagnosis and repair to confirm system performance.

Faults and symptoms in ignition systems

a. Ignition system failure or malfunctions including:
    i. no spark
    ii. misfiring
    iii. backfiring
    iv. cold or hot starting problems
    v. poor performance
    vi. pre-ignition
    vii. detonation
    viii. exhaust emission levels
    ix. fuel consumption
    x. low power
    xi. unstable idle speed.

Faults and symptoms in electronic petrol and diesel injection systems

a. Petrol and diesel injection system failures or malfunctions including:
    i. cold or hot starting problems
    ii. poor performance
    iii. exhaust emissions
    iv. high fuel consumption
    v. erratic running
    vi. low power
    vii. unstable idle speed.

Faults and symptoms in engine management systems

a. Engine management system failure or malfunctions including:
    i. misfiring
    ii. backfiring
    iii. cold or hot starting problems
    iv. poor performance
    v. pre-ignition
    vi. detonation
    vii. exhaust emission levels
    viii. fuel consumption
    ix. low power
    x. unstable idle speed.

Diagnosis of faults in electronic ignition, petrol and diesel injection and engine management systems

a. Locate and interpret information for:
    i. diagnostic tests
    ii. manufacturer's vehicle and equipment specifications
    iii. use of equipment
    iv. testing procedures
    v. test plans
    vi. fault codes
    vii. legal requirements.
b. The preparation of tools and equipment for use in diagnostic testing and assessment.
c. Conduct systematic assessment, testing of engine systems including:
    i. component condition and performance
    ii. component settings
    iii. component values
    iv. electrical and electronic values
    v. system performance and operation
    vi. use of appropriate tools and equipment including gauges
    vii. multi-meter
    viii. breakout box
    ix. oscilloscope
    x. diagnostic tester
    xi. manufacturer's dedicated equipment
    xii. exhaust gas analyser

xiii. fuel flow meter
xiv. pressure gauges.

d. Evaluate and interpret test results from diagnostic testing.
e. Compare test result, values and fault codes with vehicle manufacturer's specifications and settings.
f. The procedures for dismantling, components and systems using appropriate equipment.
g. Assess, examine and measure components including:
    i. settings
    ii. input and output values
    iii. voltages
    iv. current consumption
    v. resistance
    vi. output patterns with oscilloscope
    vii. condition
    viii. wear and performance of components and systems.
h. Identify probable faults and indications of:
    i. faults
    ii. malfunctions
    iii. incorrect settings
    iv. wear
    v. values
    vi. inputs and outputs
    vii. fault codes.
i. Rectification or replacement procedures.
j. Evaluation and the operation of components and systems following diagnosis and repair to confirm system performance.

Faults and symptoms in vehicle comfort systems

a. System failure, malfunction or ineffectiveness of internal heating system, air conditioning system or climatic control system including:
    i. leaks
    ii. abnormal noise
    iii. ineffective operation
    iv. failure to operate
    v. control faults
    vi. inadequate operation.

Diagnosis of faults in vehicle comfort systems

a. Locate and interpret information for:
    i. diagnostic tests
    ii. manufacturer's vehicle and equipment specifications
    iii. use of equipment
    iv. testing procedures
    v. test plans
    vi. fault codes
    vii. legal requirements.
b. The preparation of tools and equipment for use in diagnostic testing and assessment.
c. Conduct systematic assessment and testing of comfort systems including:

i. component condition and performance
ii. component settings
iii. component values
iv. electrical and electronic values
v. system performance and operation
vi. drive belts
vii. controls
viii. compressors
ix. condensers
x. receivers
xi. dryers
xii. connections
xiii. valve
xiv. hoses
xv. thermostats and refrigerants
xvi. sensors
xvii. speed controls
xviii. control systems
xix. servomotors.

d. Use of appropriate tools and equipment including:
   i. pressure gauges
   ii. multi-meter
   iii. breakout box
   iv. oscilloscope
   v. diagnostic tester
   vi. manufacturer's dedicated equipment
   vii. flow meter.
e. Evaluate and interpret test results from diagnostic testing.
f. Compare test result, values and fault codes with vehicle manufacturer's specifications and settings.
g. How to dismantle, components and systems using appropriate equipment and procedures.
h. How to assess, examine and measure components including: settings, input and output values, voltages, current consumption, resistance, output patterns with oscilloscope, pressures, condition, wear and performance of components and systems.
i. Identification of probable faults and indications of faults, malfunctions, incorrect settings, wear, values, inputs and outputs, fault codes, pressures and leaks.
j. Rectification or replacement procedures.
k. Evaluation and operation of components and systems following diagnosis and repair to confirm system performance.

Unit 158 Knowledge in diagnosis and rectification of light vehicle chassis faults

UAN:	**L/601/3735**
Level:	3
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to LV08 Diagnose and Rectify Light Vehicle Chassis System Faults.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of diagnosis and rectification of braking steering and suspension systems. It also covers light vehicle chassis systems and the evaluation of their performance.

Learning outcome	**The learner will:**
1. understand how the light vehicle chassis systems operate	
Assessment criteria	
The learner can: 1.1 explain the construction and operation of light vehicle chassis systems to include: 1.2 electronic braking 1.3 front and rear wheel geometry 1.4 four wheel steer 1.5 hydraulic power steering 1.6 electronic power steering 1.7 self levelling suspension 1.8 ride control system 1.9 explain the interaction between electrical, electronic and mechanical components within light vehicle chassis systems 1.10 explain how light vehicle chassis electrical systems interlink and interact, including multiplexing 1.11 compare light vehicle chassis system components and assemblies against alternatives to identify differences in construction and operation 1.12 identify the engineering principles that are related to light vehicle chassis systems 1.13 inertia force, mass and acceleration	

1.14 laws of friction 1.15 statics (springs and torsion bars) 1.16 hydraulic machines.

Learning outcome	**The learner will:**
2. understand how to diagnose and rectify faults in light vehicle chassis systems	
Assessment criteria	
The learner can: 2.1 explain symptoms and causes of faults found in light vehicle chassis systems 2.2 explain systematic diagnostic techniques used in identifying chassis system faults 2.3 explain how to examine, measure and make suitable adjustments to the components 2.4 explain how to carry out the diagnosis and rectification activities in order to correct the faults in the light vehicle chassis systems 2.5 explain how to select, prepare and use diagnostic and rectification equipment for light vehicle chassis systems 2.6 explain how to evaluate and interpret test results found in diagnosing light vehicle chassis system faults against vehicle manufacturer specifications and settings 2.7 explain how to evaluate the operation of components and systems following diagnosis and repair to confirm system performance.	

Unit 158 Knowledge in diagnosis and rectification of light vehicle chassis faults

Supporting information

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

Electrical and electronic principles of light vehicle chassis systems

a. The operation of electrical and electronic systems and components related to light vehicle chassis systems including:
    i. ECU
    ii. sensors and actuators
    iii. electrical inputs
    iv. voltages
    v. oscilloscope patterns
    vi. digital and fibre optic principles.
b. The interaction between the electrical/electronic system and mechanical components of chassis systems.
c. Electronic and electrical safety procedures.

Operation of electronic ABS and EBD braking systems

a. Layout of:
    i. ABS and EBD braking systems
    ii. anti-lock braking
    iii. anti-skid control systems
    iv. warning systems.
b. Operation of:
    i. hydraulic and electronic control units
    ii. wheel speed sensors
    iii. load sensors
    iv. hoses
    v. cables and connectors.
c. Advantage of ABS and EBD braking systems over conventional braking systems.
d. The relationship and interaction of ABS braking with and other vehicle systems – traction control.

Steering geometry for light vehicle applications

a. Non-steered wheel geometry settings.
b. Front/rear wheel geometry:
    i. castor
    ii. camber
    iii. kingpin or swivel pin inclination
    iv. negative offset
    v. wheel alignment (tracking)
    vi. toe in and toe out
    vii. toe out on turns and steered wheel geometry

viii. Ackerman principle
ix. slip angles
x. self-aligning torque
xi. oversteer and understeer
xii. neutral steer.

c. The operation and layout of rear and four wheel steering.
d. The construction and operation of power assisted steering systems:
   i. hydraulic system
   ii. power cylinders
   iii. drive belts and pumps
   iv. hydraulic valve (rotary, spool and flapper type).
e. The operation of:
   i. electronic power steering systems (EPS)
   ii. electrical and electronic components.

Components and operation of self-levelling suspension

a. The components, construction and operation of a self levelling suspension system.
b. The operation of self-levelling suspension system under various conditions:
   i. self-energising
   ii. pump operated self-levelling suspension.

Operation of fitting ride-controlled systems

a. The reasons for fitting ride controlled systems.
b. The operation of driver controlled and ride controlled systems.

Symptoms and faults in braking systems

a. Symptoms and faults associated with conventional braking systems, ABS, and EBD systems:
   i. mechanical
   ii. hydraulic
   iii. electrical and electronic systems
   iv. fluid leaks
   v. warning light operation
   vi. poor brake efficiency
   vii. wheel locking under braking.

Diagnosis and faults in braking systems

a. Locate and interpret information for:
   i. diagnostic tests
   ii. vehicle and equipment specifications
   iii. use of equipment
   iv. testing procedures
   v. test plans
   vi. fault codes
   vii. legal requirements.
b. Prepare equipment for use in diagnostic testing.
c. Conduct systematic testing and inspection of:
   i. braking system
   ii. ABS
   iii. EBD
   iv. mechanical
   v. hydraulic
   vi. electrical and electronic systems.
d. Using appropriate tools and equipment including:

i. multi-meters
ii. oscilloscope
iii. pressure gauges.

e. Evaluate and interpret test results from diagnostic testing.
f. Compare test result and values with vehicle manufacturer's specifications and settings.
g. How to dismantle, components and systems using appropriate equipment and procedures.
h. Assess, examine and evaluate the operation, settings, values, condition and performance of components and systems.
i. Probable faults, malfunctions, incorrect settings.
j. Rectification or replacement procedures.
k. Operation of systems following diagnosis and repair to confirm operation and performance.

Symptoms and faults associated with steering systems

a. Symptoms and faults associated with steering systems:
   i. mechanical
   ii. hydraulic
   iii. electrical and electronic
   iv. steering boxes (rack and pinion, worm and re-circulating ball)
   v. steering arms and linkages
   vi. steering joints and bushes
   vii. idler gears
   viii. bearings
   ix. steering columns (collapsible and absorbing)
   x. power steering system.

Diagnosis and faults in steering systems

a. Locate and interpret information for:
   i. diagnostic tests
   ii. vehicle and equipment specifications
   iii. use of equipment
   iv. testing procedures
   v. test plans
   vi. fault codes
   vii. legal requirements.
b. How to prepare equipment for use in diagnostic testing.
c. Conduct systematic testing and inspection of:
   i. steering systems
   ii. mechanical
   iii. hydraulic
   iv. electrical and electronic systems
   v. power steering system.
d. Using appropriate tools and equipment including:
   i. multi-meters
   ii. oscilloscope
   iii. pressure gauges
   iv. wheel alignment equipment
   v. steering geometry equipment.
e. Evaluate and interpret test results from diagnostic testing.
f. Compare test result and values with vehicle manufacturer's specifications and settings.
g. How to dismantle, components and systems using appropriate equipment and procedures.
h. Assess, examine and evaluate the:
   i. operation

ii. settings
iii. values
iv. condition and performance of components and systems.

i. Probable faults, malfunctions, and incorrect settings.
j. Rectification or replacement procedures.
k. Operation of systems following diagnosis and repair to confirm operation and performance.

Symptoms and faults associated with suspension systems

a. Symptoms and faults associated with suspension systems:
    i. mechanical
    ii. hydraulic
    iii. electrical and electronic
    iv. conventional
    v. self-levelling and ride controlled suspension systems
    vi. ride height (unequal and low)
    vii. wear
    viii. noises under operation
    ix. fluid leakage
    x. excessive travel
    xi. excessive tyre wear.

Diagnosis and faults in suspension systems

a. Locate and interpret information for:
    i. diagnostic tests
    ii. vehicle and equipment specifications
    iii. use of equipment
    iv. testing procedures
    v. test plans
    vi. fault codes
    vii. legal requirements.
b. How to prepare equipment for use in diagnostic testing.
c. How to conduct systematic testing and inspection of:
    i. suspension systems
    ii. mechanical
    iii. hydraulic
    iv. electrical and electronic systems
    v. conventional
    vi. self-levelling and ride controlled suspension systems.
d. Using appropriate tools and equipment including:
    i. multi-meters
    ii. oscilloscope
    iii. pressure gauges
    iv. alignment equipment
    v. geometry equipment.
e. Evaluate and interpret test results from diagnostic testing.
f. Compare test result and values with vehicle manufacturer's specifications and settings.
g. How to dismantle, components and systems using appropriate equipment and procedures.
h. Assess, examine and evaluate the operation, settings, values, condition and performance of components and systems.
i. Probable faults, malfunctions and incorrect settings.
j. Rectification or replacement procedures.
k. Operation of systems following diagnosis and repair to confirm operation and performance.

Measurements on components to include:

a. settings
b. input and output values
c. voltages
d. current consumption
e. resistance
f. output patterns with oscilloscope
g. pressures
h. condition
i. wear and performance.

Unit 161 Knowledge of overhauling light vehicle engine units

UAN:	**R/601/3736**
Level:	3
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to LV11 Overhaul Light Vehicle Mechanical Units.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of the construction, operation and overhaul of engine units.

Learning outcome	**The learner will:**
3. understand how to overhaul light vehicle engine units	
Assessment criteria	
The learner can: 1.1 identify light vehicle engine unit components 1.2 describe the construction and operation of light vehicle engine units 1.3 explain how to prepare, use and assess all of the overhauling equipment 1.4 explain how light vehicle engine units are dismantled, overhauled and reassembled 1.5 explain common symptoms, causes and faults found in light vehicle engine units 1.6 explain methods used to identify engine unit faults 1.7 explain how to examine, measure and make suitable adjustments to light vehicle engine components 1.8 explain how to evaluate and interpret test results found in diagnosing light vehicle engine unit faults and compare with manufacturers' specifications and settings 1.9 explain how to evaluate the operation of components and systems following overhauling units to confirm system performance.	

Unit 161 Knowledge of overhauling light vehicle engine units

Supporting information

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

How the units and assemblies being overhauled operate

a. Identify unit components.
b. Understand unit construction.
c. Describe unit operation.

How units are dismantled and reassembled

a. The dismantling procedure.
b. Tools and equipment used for stripping and rebuilding units and assemblies.
c. Methods of safe storage for removed components during overhaul activities.
d. The process for assessing the condition of sub-assemblies including:
    i. fit
    ii. tolerances
    iii. permitted limits.
e. The rebuild procedure for units and assemblies.
f. Adjustment procedures during re-assembly.

Unit and assembly testing and evaluation procedures

a. Appropriate testing and evaluation procedures prior to dismantling units.
b. Appropriate testing and evaluation procedures of components after dismantling units.
c. How to use overhauling and test equipment for the task.
d. The cost-benefit relationship between reconditioning, repair and replacement of components within units.
e. How to test and evaluate the performance of the overhauled units against the operating specification.
f. How to interpret test results.
g. Adjustment procedures during final evaluation.

Faults associated with units and assemblies being overhauled

a. Causes of faults and failures within units and assemblies.
b. The faults associated with units and assemblies.
c. How to make adjustments to meet final specification after testing and evaluation of assembled units and assemblies.

The procedures for dismantling, removal and replacement of units and components

a. The preparation, testing and use of:
    i. tools and equipment
    ii. removal and replacement of electrical and electronic systems and components.
b. Appropriate safety precautions:
    i. PPE
    ii. vehicle protection when dismantling
    iii. removal and replacing electrical and electronic components and systems.
c. The importance of logical and systematic processes.
d. The reasons why replacement components and units must meet the original specifications (OES) – warranty requirements, to maintain performance, safety requirements.
e. Refitting procedures
f. The inspection and testing of units and systems to ensure compliance with manufacturer's, legal and performance requirements.
g. Inspection and re-instatement of the vehicle following repair to ensure:
    i. customer satisfaction
    ii. cleanliness of vehicle interior and exterior
    iii. security of components and fittings
    iv. re-instatement of components and fittings
    v. cancelling of any fault codes and warning lights.

Unit 163 Knowledge of diagnosis and rectification of light vehicle transmission and driveline faults

UAN:	**D/601/3741**
Level:	3
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to LV13 Diagnose and Rectify Light Vehicle Transmission and Driveline System Faults.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of diagnosis and rectification of light vehicle gearboxes, hubs and bearings, driveline shafts, clutches, differentials and final drive units. It also covers the evaluation of performance of the systems.

Learning outcome	**The learner will:**
1. understand how the light vehicle transmission and driveline systems operate	
Assessment criteria	
The learner can: 1.1 explain the construction and operation of light vehicle transmission and driveline systems 1.2 explain the interaction between electrical, electronic and mechanical components within light vehicle transmission and driveline systems 1.3 explain how electrical systems interlink and interact, including multiplexing 1.4 compare light vehicle transmission and driveline system components and assemblies against alternatives to identify differences in construction and operation 1.5 identify the engineering principles that are related to light vehicle transmission and driveline systems 1.6 friction 1.7 torque transmission 1.8 materials	

1.9 fluids and energy 1.10 potential and kinetic energy.

Learning outcome	**The learner will:**
2. understand how to diagnose and rectify faults in light vehicle transmission and driveline systems	
Assessment criteria	
The learner can: 2.1 explain the symptoms and causes of faults found in light vehicle transmission and driveline systems 2.2 explain systematic diagnostic techniques used in identifying transmission and driveline system faults 2.3 explain how to examine, measure and make suitable adjustments to components 2.4 explain how to carry out the rectification activities in order to correct the faults in light vehicle transmission and driveline systems 2.5 explain how to select, prepare and use diagnostic and rectification equipment for light vehicle transmission and driveline systems 2.6 explain how to evaluate and interpret test results found in diagnosing light vehicle transmission and driveline system faults against vehicle manufacturer specifications and settings 2.7 explain how to evaluate the operation of components and systems following diagnosis and repair to confirm system performance.	

Unit 163 Knowledge of diagnosis and rectification of light vehicle transmission and driveline faults

Supporting information

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

Electrical and electronic principles related to light vehicle transmission systems

a. The operation of electrical and electronic systems and components related to light vehicle transmission systems including:
   i. ECU
   ii. sensors and actuators
   iii. electrical inputs and outputs
   iv. voltages
   v. oscilloscope patterns
   vi. digital and fibre optic principles.
b. The interaction between the electrical/electronic system, hydraulic system and mechanical components of the transmission systems.
c. Electronic and electrical safety procedures.

The operation of light vehicle clutches and fluid couplings

a. The construction and operation of friction clutches (coil spring, diaphragm) including single and twin clutch designs.
b. The construction and operation of fluid couplings including:
   i. fluid flywheel
   ii. torque converter (torque multiplication, efficiency)
   iii. benefits of fluid couplings
   iv. benefits of toque converter over fluid flywheel.

The operation of light vehicle transmissions and driveline systems

a. The construction and operation of manual gearboxes:
   i. 4, 5 and 6 speed gearboxes
   ii. gear arrangements
   iii. shaft and bearing arrangements
   iv. synchromesh devices
   v. interlock mechanisms
   vi. linkages
   vii. overdrive
   viii. lubrication.
b. The construction and operation of automatic gearboxes including hydraulic and electronic control systems: operations of epicyclic gears (sun, planet, annulus and carrier), method for achieving different gear ratios using epicyclic gearing; hydraulic control systems, components and operation; electronic control system, components and operation.

c. The construction and operation of continuously variable transmissions (CVT) and the benefits of this type of gearbox design.
d. The construction and operation of the sequential manual gearbox (SMG).
e. The construction and operation of final drive systems including:
    i. conventional crown wheel and pinion
    ii. differential gears
    iii. limited slip differential.
f. The construction and operation of light vehicle 4 wheel drive systems including third differential and differential locks.
g. The operation of light vehicle traction control systems and launch control.
h. The construction and operation of light vehicle hub arrangements.
i. The construction and operation of:
    i. drive shafts
    ii. prop shafts including flexible joints and couplings
    iii. universal joints
    iv. constant velocity joints
    v. sliding joints.

Symptoms and faults in light vehicle transmissions and drive-line systems

a. Clutch and coupling faults:
    i. abnormal noises
    ii. vibrations
    iii. fluid leaks
    iv. slip
    v. judder
    vi. grab
    vii. failure to release.
b. Gearbox faults:
    i. abnormal noises
    ii. vibrations
    iii. loss of drive
    iv. difficulty engaging or disengaging gears
    v. automatic gear box types
    vi. abnormal noises
    vii. vibrations
    viii. loss of drive
    ix. failure to engage gear
    x. failure to disengage gear
    xi. leaks
    xii. failure to operate
    xiii. incorrect shift patterns
    xiv. electrical and electronic faults.
c. Final drive faults:
    i. abnormal noises
    ii. vibrations
    iii. loss of drive
    iv. oil leaks
    v. failure to operate
    vi. electrical and electronic faults.
d. Drive-lines and couplings:
    i. abnormal noises
    ii. vibrations
    iii. loss of drive.

Faults in light vehicle transmission systems

a. Interpret information for diagnostic tests, vehicle and equipment specifications, use of equipment, testing procedures, test plans, fault codes and legal requirements.
b. How to prepare equipment for use in diagnostic testing.
c. How to conduct systematic testing and inspection of transmission system, mechanical, hydraulic, electrical and electronic systems using appropriate tools and equipment including, mullet-meters, oscilloscope and pressure gauges.
d. How to carry out workshop based and road testing of vehicle and transmission system.
e. Evaluate and interpret test results from diagnostic and/or road testing.
f. Compare test result and values with vehicle manufacturer's specifications and settings.
g. How to dismantle, components and systems using appropriate equipment and procedures.
h. Assess, examine and evaluate the operation, settings, values, condition and performance of components and systems.
i. Probable faults, malfunctions and incorrect settings.
j. Rectification or replacement procedures.
k. Operation of systems following diagnosis and repair to confirm operation and performance

   Measurements on components to include:

   i. settings
   ii. input and output values
   iii. voltages
   iv. current consumption
   v. resistance
   vi. output patterns with oscilloscope
   vii. pressures
   viii. condition
   ix. wear and performance.

Unit 171 Knowledge of overhauling light vehicle transmission units

UAN:	**Y/601/3737**
Level:	3
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to LV11 Overhaul Light Vehicle Mechanical Units.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of the construction, operation and overhaul of gearboxes and final drive assemblies.

Learning outcome	**The learner will:**
1. understand how to overhaul light vehicle gearbox and final drive units	
Assessment criteria	
The learner can: 1.1 identify light vehicle gearbox and final dive unit components 1.2 describe the construction and operation of light vehicle gearbox and final drive units 1.3 explain how to prepare, use and assess all of the overhauling equipment 1.4 explain how light vehicle gearbox and final drive units are dismantled, overhauled and reassembled 1.5 explain common symptoms, causes and faults found in light vehicle gearbox and final drive units 1.6 explain methods used to identify gearbox and final drive unit faults 1.7 explain how to examine, measure and make suitable adjustments to light vehicle gearbox and final drive components 1.8 explain how to evaluate and interpret test results found in diagnosing light vehicle gearbox and final drive unit faults and compare with manufacturers' specifications and settings 1.9 explain how to evaluate the operation of components and systems following overhauling units to confirm system performance.	

Unit 171 Knowledge of overhauling light vehicle transmission units

Supporting information

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

How the units and assemblies being overhauled operate

a. Identify unit components.
b. Understand unit construction.
c. Describe unit operation.

How units are dismantled and reassembled

a. The dismantling procedure.
b. Tools and equipment used for stripping and rebuilding units and assemblies.
c. Methods of safe storage for removed components during overhaul activities.
d. The process for assessing the condition of sub-assemblies including:
    i. fit
    ii. tolerances
    iii. permitted limits.
e. The rebuild procedure for units and assemblies.
f. Adjustment procedures during re-assembly.

Unit and assembly testing and evaluation procedures

a. Appropriate testing and evaluation procedures prior to dismantling units.
b. Appropriate testing and evaluation procedures of components after dismantling units.
c. How to use overhauling and test equipment for the task.
d. The cost-benefit relationship between reconditioning, repair and replacement of components within units.
e. How to test and evaluate the performance of the overhauled units against the operating specification.
f. How to interpret test results.
g. Adjustment procedures during final evaluation.

Faults associated with units and assemblies being overhauled

a. Causes of faults and failures within units and assemblies.
b. The faults associated with units and assemblies.
c. How to make adjustments to meet final specification after testing and evaluation of assembled units and assemblies.

The procedures for dismantling, removal and replacement of units and components

a. The preparation, testing and use of:
   i. tools and equipment
   ii. removal and replacement of electrical and electronic systems and components.
b. Appropriate safety precautions:
   i. PPE
   ii. vehicle protection when dismantling
   iii. removal and replacing electrical and electronic components and systems.
c. The importance of logical and systematic processes.
d. Preparation of replacement units for re-fitting or replacement electrical and electronic components and systems.
e. The reasons why replacement components and units must meet the original specifications (OES) – warranty requirements, to maintain performance, safety requirements.
f. Refitting procedures.
g. The inspection and testing of units and systems to ensure compliance with manufacturer's, legal and performance requirements.
h. Inspection and re-instatement of the vehicle following repair to ensure:
   i. customer satisfaction
   ii. cleanliness of vehicle interior and exterior
   iii. security of components and fittings
   iv. re-instatement of components and fittings
   v. cancelling of any fault codes and warning lights.

Unit 181 Knowledge of overhauling light vehicle steering and suspension units

UAN:	**D/601/3738**
Level:	3
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to LV11 Overhaul Light Vehicle Mechanical Units.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of the construction and operation and overhaul of steering and suspension units.

Learning outcome	**The learner will:**
1. understand how to overhaul light vehicle steering and suspension units	
Assessment criteria	
The learner can: 1.1 identify light vehicle steering and suspension unit components 1.2 describe the construction and operation of light vehicle steering and suspension units 1.3 explain how to prepare, use and assess all of the overhauling equipment 1.4 explain how light vehicle steering and suspension units are dismantled, overhauled and reassembled 1.5 explain common symptoms, causes and faults found in light vehicle steering and suspension units 1.6 explain methods used to identify steering and suspension unit faults 1.7 explain how to examine, measure and make suitable adjustments to light vehicle steering and suspension components 1.8 explain how to evaluate and interpret test results found in diagnosing light vehicle steering and suspension unit faults and compare with manufacturers' specifications and settings 1.9 explain how to evaluate the operation of components and systems following overhauling units to confirm system performance.	

Unit 181 Knowledge of overhauling light vehicle steering and suspension units

Supporting information

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

How the units and assemblies being overhauled operate

a. Identify unit components.
b. Understand unit construction.
c. Describe unit operation.

How units are dismantled and reassembled

a. The dismantling procedure.
b. Tools and equipment used for stripping and rebuilding units and assemblies.
c. Methods of safe storage for removed components during overhaul activities.
d. The process for assessing the condition of sub-assemblies including:
    i. fit
    ii. tolerances
    iii. permitted limits.
e. The rebuild procedure for units and assemblies.
f. Adjustment procedures during re-assembly.

Unit and assembly testing and evaluation procedures

a. Appropriate testing and evaluation procedures prior to dismantling units.
b. Appropriate testing and evaluation procedures of components after dismantling units.
c. How to use overhauling and test equipment for the task.
d. The cost-benefit relationship between reconditioning, repair and replacement of components within units.
e. How to test and evaluate the performance of the overhauled units against the operating specification.
f. How to interpret test results.
g. Adjustment procedures during final evaluation.

Faults associated with units and assemblies being overhauled

a. Causes of faults and failures within units and assemblies.
b. The faults associated with units and assemblies.
c. How to make adjustments to meet final specification after testing and evaluation of assembled units and assemblies.

The procedures for dismantling, removal and replacement of electrical and electronic units and components

a. The preparation, testing and use of:
   i. tools and equipment
   ii. removal and replacement of electrical and electronic systems and components
b. Appropriate safety precautions:
   i. PPE
   ii. vehicle protection when dismantling
   iii. removal and replacing electrical and electronic components and systems
c. The importance of logical and systematic processes.
d. Preparation of replacement units for re-fitting or replacement electrical and electronic components and systems.
e. The reasons why replacement components and units must meet the original specifications (OES) – warranty requirements, to maintain performance, safety requirements.
f. Refitting procedures.
g. The inspection and testing of units and systems to ensure compliance with manufacturer's, legal and performance requirements.
h. Inspection and re-instatement of the vehicle following repair to ensure:
   i. customer satisfaction
   ii. cleanliness of vehicle interior and exterior
   iii. security of components and fittings
   iv. re-instatement of components and fittings
   v. cancelling of any fault codes and warning lights.

Unit 218 Skills in removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels

UAN:	**K/601/3869**
Level:	2
Credit value:	3
GLH:	20
Relationship to NOS:	This unit is linked to BP18 Remove and Fit Basic Motor Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Motor Vehicle Body Panels.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim	This unit allows the learner to demonstrate they can carry out a range of removal and fitting of basic mechanical, electrical and trim (MET) components and non-permanently fixed light vehicle body panels. 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 basic MET components and non-permanently fixed light vehicle body panels	
Assessment criteria	
The learner can 1.1 use suitable personal protective equipment and vehicle coverings throughout all light vehicle removal and fitting of basic MET components and non-permanently fixed light vehicle body panels 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 light	

vehicle removal and fitting activities including:

a. vehicle technical data

b. removal and fitting procedures

c. legal requirements

2.2 use technical information to support light vehicle removal and fitting activities.

Learning outcome	The learner will:
3. be able to use appropriate tools and equipment	
Assessment criteria	
3.1 select the appropriate tools and equipment necessary for carrying out removal and fitting of basic MET components and non-permanently fixed light vehicle body 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 basic MET components and non-permanently fixed light vehicle body panels.	

Learning outcome	The learner will:
4. be able to carry out removal and fitting of basic MET components and non-permanently fixed light vehicle body panels	
Assessment criteria	
The learner can 4.1 remove and fit basic MET components and non-permanently fixed light vehicle body panels 4.2 ensure that the removal and fitting of basic MET components and non-permanently fixed light vehicle body panels conforms to the vehicle operating specification and any legal requirements 4.3 ensure no damage occurs to other components when carrying out removal and fitting of basic MET components and non-permanently fixed light vehicle body panels 4.4 ensure all components and panels are stored safely and in the correct location.	

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

Unit 218 Skills in removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 268 Knowledge of removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels

UAN:	**F/601/3747**
Level:	2
Credit value:	2
GLH:	20
Relationship to NOS:	This unit is linked to BP18 Remove and Fit Basic Motor Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Motor Vehicle Body Panels.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of carrying out a range of removal and fitting of basic mechanical, electrical and trim (MET) components and non-permanently fixed light vehicle body panels. 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 basic light vehicle mechanical electrical and trim (MET) components	
Assessment criteria	
The learner can 1.1 identify the procedures involved in carrying out the systematic removal and fitting of basic light vehicle MET components to the standard required including: a. bumpers b. headlamp units c. road wheels d. batteries e. bonnet and boot trim f. interior trim components g. exterior trim components	

1.2	identify the procedures involved in working with supplementary safety systems when fitting basic light vehicle MET components
1.3	identify the procedures involved in working with gas discharge headlamp systems when fitting basic light vehicle MET components
1.4	explain the methods and procedures for storing removed light vehicle MET components
1.5	identify the different types of fastenings and fixings used when removing and fitting light vehicle MET components
1.6	explain the reasons for the use of different types of fastenings and fixings used in light vehicle MET components
1.7	explain the procedures, methods and reasons for ensuring correct alignment of light vehicle MET components
1.8	identify the quality checks that can be used to ensure correct alignment and operation of light vehicle MET components
1.9	identify correct conformity of vehicle systems against light vehicle specification and legal requirements on completion
1.10	explain the procedure for reporting cosmetic damage to light vehicle MET components and units.

Learning outcome	**The learner will:**
2. understand how to carry out removal and fitting of basic light vehicle non permanently fixed vehicle body panels	
Assessment criteria	
The learner can	
2.1	identify the procedures involved in carrying out the systematic removal and fitting of basic light vehicle non-welded, non-structural body panels to the standard required including: a. wings b. doors c. bonnets d. boot lids and tailgates e. bumper bars, covers and components
2.2	identify the procedures involved in working with supplementary safety systems when fitting basic light vehicle non-welded, non-structural body panels
2.3	explain the methods and procedures for storing removed light vehicle non-welded, non-structural body panels
2.4	identify the different types of fastenings and fixings used when removing and fitting light vehicle non-welded, non-structural body panels
2.5	explain the reasons for the use of different types of fastenings and fixings used in light vehicle non-welded, non-structural body panels
2.6	explain the procedures, methods and reasons for ensuring correct alignment of light vehicle non-welded, non-structural body panels
2.7	identify the quality checks that can be used to ensure correct alignment and operation of light vehicle non-welded, non-structural body panels
2.8	identify correct conformity of vehicle systems against light vehicle specification and legal requirements on completion
2.9	explain the procedure for reporting cosmetic damage to light vehicle non-welded, non-structural body panels.

Unit 268 Knowledge of removing and fitting of basic light vehicle mechanical, electrical and trim (MET) components and non permanently fixed vehicle body panels

Supporting information

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

Describe procedures to prevent damage to the vehicle, components and contents when removing, storing and refitting basic MET components

a. The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage:
    i. bumpers
    ii. headlamp units
    iii. road wheels
    iv. batteries
    v. bonnet and boot trim
    vi. interior trim components
    vii. exterior trim components.
b. The procedures for the correct storage of vehicle contents.
c. The process for the reporting of extra damage and items that may have broken when removed or refitted.

The processes involved when handling batteries

a. The procedure for the removal, storage and refitting of lead acid batteries.
b. The procedure for the disposal of lead acid batteries.
c. Battery checks:
    i. electrolyte
    ii. discharge
    iii. specific gravity.
d. The charging process and procedures:
    i. trickle charge
    ii. normal charge
    iii. boost/start.
e. The health and safety issues involved when charging (explosive gasses).

Types of clips and fixings

a. The following types of clips and identify reasons and limitations for their use:
    i. speed
    ii. 'c'
    iii. 'd'
    iv. 'j' type captive nut
    v. 'r'
    vi. 'u' type captive nut
    vii. cable clip
    viii. trim clips.
b. The following types of fixings and identify reasons and limitations for their use:
    i. pop rivet
    ii. plastic rivet
    iii. plastic capture nut
    iv. nut and bolt
    v. soulder bolt
    vi. 'Nyloc' type nuts
    vii. washers
    viii. 'Spring' type washers
    ix. self tapping screws and bolts
    x. quick release plastic trim fastenings
    xi. trim tapes
    xii. adhesives and sealers.

The processes involved when carrying out quality checks

a. Items that may have been 'workshop' soiled and describe processes for rectifying:
    i. door cards
    ii. seats
    iii. carpets
    iv. boot and bonnet trims.
b. Methods for checking gaps.
c. The process for checking and aligning headlamps:
    i. address handling procedures for halogen bulbs
    ii. address handling and health and safety issues relating to xenon bulbs and systems.
d. Operational checks and rectification methods to include:
    i. lights
    ii. washers and wipers
    iii. SRS systems (checking not rectification)
    iv. charging system (checking not rectification)
    v. horn
    vi. fluid levels
    vii. interior switches
    viii. operation of door lock mechanisms.

Removing and fitting non-structural body panels

a. Find, interpret and use sources of information applicable to the removal and fitting of basic non welded non-structural body panels.

b. Select check and use all the tools and equipment required to remove and fit basic non welded non-structural body panels including:
    i. hinge pin removers
    ii. spanners
    iii. screwdrivers.
c. The different types of mechanical fixings for non welded non-structural body panels and when and why they should be used including:
    i. bolts
    ii. self tapping bolts
    iii. speed nuts
    iv. washers.
d. The correct procedures and processes for removing and fitting of non welded non-structural body panels.
e. The need for correct alignment of panels and methods to achieve this:
    i. aperture gaps
    ii. alignment of panel features
    iii. best fit of components to panels
    iv. vehicle geometry
    v. operation of openings such as doors, tailgates, bonnets etc.
f. 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.
g. The method of storing removed panels and the importance of storing them correctly.

Unit 406 Skills in diagnosing and rectifying vehicle auxiliary electrical faults

UAN:	**H/601/3868**
Level:	Level 3
Credit value:	5
GLH:	45
Relationship to NOS:	This unit is linked to AE06 Diagnose and Rectify Motor Electrical Units and Component Faults.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit will help the learner to develop the skills required to demonstrate they can diagnose and rectify automotive vehicle auxiliary electrical system faults. It also covers the evaluation of performance of the replaced or repaired units and systems. This includes SI, CI, Hybrid and Alternative fuel vehicles.

Learning outcome	**The learner will:**
1. be able to work safely when carrying out automotive vehicle auxiliary electrical diagnostic and rectification activities	
Assessment criteria	
The learner can: 1.1 use suitable personal protective equipment and vehicle coverings throughout when carrying out auxiliary electrical diagnostic and rectification 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 automotive vehicle diagnostic and rectification activities including: 2.2 vehicle technical data	

2.3	diagnostic test procedures
2.4	use sufficient diagnostic information in a systematic way to enable an accurate diagnosis of automotive auxiliary electrical system faults.

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 diagnostic and rectification activities
3.2	ensure that equipment has been calibrated to meet manufacturers' and legal requirements
3.3	use the equipment required, correctly and safely throughout all automotive auxiliary electrical diagnostic and rectification activities.

Learning outcome	**The learner will:**
4. be able to carry out automotive vehicle auxiliary electrical diagnosis, rectification and test activities	
Assessment criteria	
The learner can:	
4.1	use diagnostic methods that are relevant to the symptoms presented
4.2	evaluate their assessment of dismantled sub-assemblies and identify their condition and suitability for repair or replacement accurately
4.3	carry out all diagnostic and rectification activities following:
4.4	manufacturers' instructions
4.5	recognised researched repair methods
4.6	health and safety requirements
4.7	ensure all repaired or replacement components and units conform to the vehicle operating specification and any legal requirements
4.8	adjust components and units correctly to ensure that they operate to meet system requirements
4.9	use testing methods that are suitable for assessing the performance of the system rectified
4.10	ensure the rectified automotive auxiliary electrical system performs to the vehicle operating specification and any legal requirements.

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

Unit 406 Skills in diagnosing and rectifying vehicle auxiliary electrical faults

Assessment requirements

The assessment requirements are shown in full in the assessment documentation.

Unit 456 Knowledge of diagnosis and rectification of vehicle auxiliary electrical faults

UAN:	**A/601/3746**
Level:	3
Credit value:	6
GLH:	45
Relationship to NOS:	This unit is linked to AE06 Diagnose and Rectify Motor Electrical Units and Component Faults.
Assessment requirements specified by a sector or regulatory body:	This unit was developed by the IMI, the sector skills council for the automotive retail industry. All assessments have been developed in accordance with the IMI Assessment Requirements for VRQs.
Aim:	This unit enables the learner to develop an understanding of diagnosis and rectification of vehicle auxiliary electrical systems and their units. It also covers the evaluation of performance of the systems. This includes SI, CI, Hybrid and Alternative fuel vehicles.

Learning outcome	**The learner will:**
1. understand vehicle electrical and electronic principles	
Assessment criteria	
The learner can: 1.1 explain the principles of electrical inputs, outputs. voltages and oscilloscope patterns, digital and fibre optics 1.2 explain the principles of sensor inputs, computer processing and actuator outputs 1.3 identify sensor types (passive and active) 1.4 identify the electrical principles that are related to light vehicle electrical circuits.	

Learning outcome	**The learner will:**
2. understand how light vehicle auxiliary electrical systems operate	
Assessment criteria	
The learner can: 2.1 identify advanced automotive auxiliary electrical system components 2.2 explain the construction and operation of automotive auxiliary electrical systems	

2.3	explain the interaction between electrical, electronic and mechanical components within the system defined
2.4	explain the operation of the electrical and electronic systems for electric, hybrid and alternative fuel vehicles including regenerative braking systems
2.5	explain how electrical systems interlink and interact, including multiplexing and fibre optics
2.6	compare automotive auxiliary electrical system components and assemblies against alternatives to identify differences in construction and operation.

Learning outcome	**The learner will:**
3. understand how to diagnose and rectify faults in auxiliary electrical systems	
Assessment criteria	
The learner can:	
3.1	explain the symptoms and causes of faults found in automotive auxiliary electrical systems
3.2	explain systematic diagnostic techniques used in identifying automotive auxiliary electrical system faults
3.3	explain how to examine, measure and make suitable adjustments to components
3.4	explain how to carry out the rectification activities in order to correct the faults in the automotive auxiliary electrical systems
3.5	explain how to select, prepare and use diagnostic and rectification equipment for automotive auxiliary electrical systems
3.6	explain how to evaluate and interpret test results found in diagnosing automotive auxiliary electrical system faults against vehicle manufacturer specifications and settings
3.7	explain how to evaluate the operation of components and systems following diagnosis and repair to confirm system performance.

Unit 456 Knowledge of diagnosis and rectification of vehicle auxiliary electrical faults

Supporting information

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

The electrical principles that are related to light vehicle electrical circuits:

a. Ohms law
b. Voltage
c. Power
d. Current (AC and DC)
e. Resistance
f. Magnetism
g. Electromagnetism and electromagnetic induction
h. Digital and fibre optic principles
i. Electrical units and symbols
j. Electrical and electronic terminology
k. Relevant electrical safety.

Battery and charging

a. The construction and operation of vehicle batteries including:
    i. low maintenance and maintenance free
    ii. lead acid and nickel cadmium types
    iii. cells
    iv. separators
    v. plates
    vi. electrolyte.
b. The operation of the vehicle charging system:
    i. alternator
    ii. rotor
    iii. stator
    iv. slip ring
    v. brush assembly
    vi. three phase output
    vii. diode rectification pack
    viii. voltage regulation
    ix. phased winding connections
    x. cooling fan
    xi. alternator drive system.

Starting

a. The layout, construction and operation of engine starting systems: inertia and pre-engaged principles.
b. The function and operation of the following components:

i. inertia and pre-engaged starter motor
ii. starter ring gear
iii. pinion
iv. starter solenoid
v. ignition/starter switch
vi. starter relay (if appropriate)
vii. one-way clutch (pre-engaged starter motor).

Lighting systems and technology

a. Lighting systems should include:
   i. Xenon lighting
   ii. gas discharge lighting
   iii. ballast system
   iv. LED
   v. intelligent front lighting
   vi. blue lights
   vii. complex reflectors
   viii. fibre optic
   ix. optical patterning.

Lighting circuits and the relationship between each circuit

a. Circuits must include:
   i. sidelights including number plate lights and marker lights
   ii. dipped beam
   iii. main beam
   iv. dim/dip
   v. indicators and hazard lights
   vi. high intensity and fog light.

Common faults and testing methods associated with external lighting system

a. Fault diagnosis for:
   i. lighting systems failing to operate correctly
   ii. switches
   iii. relays
   iv. bulbs failing to operate.

The operating principles of external lighting systems and multiplexing systems

a. To include all external lighting systems and a good knowledge of multiplexing systems.

The different types of electric windows and mirror systems and components

a. Components should include:
   i. window
   ii. mirror motors
   iii. multi-functional switches
   iv. relays
   v. total closure modules.

The function of component parts in the electric window and mirror systems

a. Components must include:
   i. motors

ii. relays
iii. interfaces
iv. modules
v. switches.

The operating principles of electric windows and mirror systems

a. Operating principles of the following:
   i. motors
   ii. interfaces
   iii. switches
   iv. modules.

Common faults and testing methods associated with electric windows and mirror systems

a. Fault diagnosis for:
   i. electric windows failing to open or close
   ii. electric mirrors fail to adjust
   iii. slow operation on both systems.

The different types of screen heating systems and components

a. Systems must include:
   i. heated front screens
   ii. heated rear screens
   iii. heated mirrors.

The function and operating principles of components for heated screen and mirror systems

a. Components must include:
   i. front and rear screen elements
   ii. mirror elements
   iii. time control relays
   iv. multifunction relays and switches.

Common faults and testing methods associated with heated screen and mirror systems

a. Faults must include:
   i. screen elements not operating
   ii. timer relays not operating and staying on permanently.

The different types of I.C.E. systems and components

a. Systems and components must include:
   i. radio CD and multi play units
   ii. DVD players
   iii. MP3 players
   iv. speakers
   v. aerial systems
   vi. amplifiers
   vii. V.D.U. screens
   viii. Satellite Navigation
   ix. communication units.

The function of components in I.C.E. systems

a. Systems include:
   i. radios
   ii. CD players

iii. video players
iv. DVD players
v. aerial systems
vi. speakers
vii. amplifiers
viii. VDU screens
ix. mobile communication units.

The operating principles of I.C.E. systems

a. Operation of entertainment systems speaker and aerial systems.

Common faults and testing methods associated with I.C.E. systems

a. Faults to include:
   i. entertainment and navigation units not operating
   ii. speaker, aerial and amplifier systems not functioning correctly
   iii. excessive radio interference (suppression)
   iv. use of diagnostic computers and systems.

The different types of integrated security/warning systems and components

a. Components to include:
   i. control units
   ii. alarm modules
   iii. audible warning units
   iv. immobiliser units
   v. sensing units
   vi. horn
   vii. audible warning speakers.

The function of component parts in integrated security and warning systems

a. Components to include
   i. control units
   ii. alarm modules
   iii. audible warning units
   iv. interior sensing systems
   v. immobiliser units
   vi. relays
   vii. LEDs
   viii. horns.

The operating principles of integrated security and warning systems

a. Operation of alarm systems and audible warning units.

The relevant legislation relevant to security and warning systems

a. Find and apply all relevant legislation for the fitment and use of security and warning systems.

Common faults and testing methods associated with security and warning systems

a. Components to include:
   i. control units
   ii. audible warning units

iii. immobiliser units
iv. horns
v. relays
vi. LEDs
vii. wiring
viii. connections and protection devices
ix. removal and refitting procedures
x. using computer diagnostics to identify faults
xi. use of manufacturer's diagnostic equipment.

The different wiper system components

a. Components must include:
   i. wiper motors
   ii. washer motors
   iii. wiper linkage
   iv. multifunction relays
   v. headlamp wash/wipe.

The function of component wiper and washer components

a. Components and systems must include:
   i. wiper motors
   ii. intermittent wash wipe relays
   iii. parking systems.

The operating principles, faults and testing methods of wiper and washer systems

a. Principles, fault diagnosis and testing for:
   i. wiper motors failing
   ii. damaged linkages
   iii. incorrect operation of intermittent and parking systems
   iv. earth faults
   v. control unit failure.

The different heater, cooling system components and air con.

a. Components include:
   i. heater motors
   ii. speed rheostats
   iii. switches
   iv. valves
   v. radiator cooling fan motors
   vi. relays
   vii. air conditioning units.

The function of component heater, cooling parts and air conditioning

a. Components include:
   i. heater motors
   ii. rheostats
   ii. valves
   iii. switches
   iv. relays
   v. cooling fan motors
   vi. air conditioning units
   vii. thermostatic switches.

The operating principles of heater, cooling systems and air conditioning

a. Principles to include:
    i. conduction
    ii. convection
    iii. radiation
    iv. circulation
    v. boiling points
    vi. states of matter (Gas, liquid, solid)
    vii. temperature control
    viii. antifreeze mixtures
    ix. heat transfer.

Common faults and testing methods associated with heater, cooling systems and air conditioning

a. Fault diagnosis for:
    i. heater motor failing to operate on all/one speed
    ii. radiator cooling fan not operating
    iii. valves
    iv. relays
    v. switches not operating
    vi. electrical related faults on the air conditioning system.

The different types of locking system components

a. Door locking actuators, solenoids, deadlocking actuators, anti-theft modules and boot release solenoids.

The function of component parts in the locking system

a. Solenoids, actuators (electrical and pneumatic), multifunctional relays, anti-theft modules and release systems.

The operating principles of locking systems

a. Doors and cabs.

Common faults and testing methods associated with locking systems

a. Door locking actuators, solenoids, connections, wiring, relays, and protection devices/fuses.

The different types of Supplementary Restraint and Airbag systems

a. Components include:
    i. control units
    ii. sensors
    iii. seat belt pretensioners
    iv. airbag assemblies
    v. wiring systems
    vi. warning systems.

The function of component parts in the Supplementary Restraint and Airbag systems

a. Components include:
    i. control units
    ii. interfaces

iii. sensors
iv. airbag units
v. pretensioners.

The operating principles of Supplementary Restraint and Airbag systems

a. Operation of the sensors.
b. Operation of the airbag unit.
c. Operation of the various types of pretension.
d. Safe handling procedures and regulations.

Common faults and testing methods associated Supplementary Restraint and Airbag systems

a. Fault diagnosis for Airbag and SRS faults:
    i. fault code identification
    ii. wiring faults
    iii. component failure
    iv. earth problems
    v. sensor faults.

How to examine, measure and make suitable adjustments to components:

a. Settings
b. Input and output values
c. Voltages
d. Current consumption
e. Resistance
f. Input and output patterns with oscilloscope (including frequency and duty cycle
g. measurements)
h. Condition
i. Wear and performance

How to select, prepare and use diagnostic and rectification equipment for automotive auxiliary electrical systems:

a. Voltmeters
b. Ammeters
c. Ohmmeters
d. Multi-meters
e. Battery testing equipment
f. Dedicated and computer based diagnostic equipment
g. Oscilloscopes.

Appendix 1 Relationships to other qualifications

Links to other qualifications

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

This qualification has connections to the 4270 Level 2 and 3 VCQs in Light Vehicle Maintenance and Repair.

Literacy, language, numeracy and ICT skills development

This qualification can develop skills that can be used in the following qualifications:

- Functional Skills (England) – see **www.cityandguilds.com/functionalskills**
- Essential Skills (Northern Ireland) – see **www.cityandguilds.com/essentialskillsni**
- Essential Skills Wales (from September 2010).

Appendix 2 Sources of general information

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

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

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

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

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

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

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

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

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

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www.cityandguilds.com

Useful contacts

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

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As the UK's leading vocational education organisation, City & Guilds is leading the talent revolution by inspiring people to unlock their potential and develop their skills. We offer over 500 qualifications across 28 industries through 8500 centres worldwide and award around two million certificates every year. City & Guilds is recognised and respected by employers across the world as a sign of quality and exceptional training.

City & Guilds Group

The City & Guilds Group operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes the Institute of Leadership & Management (management and leadership qualifications), City & Guilds Land Based Services (land-based qualifications), the Centre for Skills Development (CSD works to improve the policy and practice of vocational education and training worldwide) and Learning Assistant (an online e-portfolio).

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