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Edexcel BTEC Level 2 and 3 Diploma in Auto Electrical and Mobile Electrical Principles (QCF)

Edexcel Level 2 and 3 Diploma in Auto Electrical and Mobile Electrical Competence (QCF)

Specification

Issue 1

First registration September 2010

Edexcel, a Pearson company, is the UK's largest awarding organisation offering vocational and academic qualifications and testing, to employers, training providers, colleges, schools, and other places of learning in the UK, and in over 85 countries worldwide.

Our specialist suite of qualifications include NVQs, Apprenticeships, WorkSkills, Functional Skills, Foundation Learning, as well as our exclusive range of BTECs, from entry level right through to Higher National Diplomas.

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Publications Code AP030054

Contents

Qualification titles covered by this specification

This specification gives you the information you need to offer the Edexcel Principles and Competence qualifications in Auto Electrical and Mobile Electrical at Level 2 and Level 3.

Qualification title	Qualification Number (QN)	Operational start date
EDEXCEL BTEC Level 2 Diploma in Auto Electrical and Mobile Electrical Principles (QCF)	501/0195/X	01/09/2010
EDEXCEL Level 2 Diploma in Auto Electrical and Mobile Electrical Competence (QCF)	501/0250/3	01/09/2010
EDEXCEL BTEC Level 3 Diploma in Auto Electrical and Mobile Electrical Principles (QCF)	501/0198/5	01/09/2010
EDEXCEL Level 3 Diploma in Auto Electrical and Mobile Electrical Competence (QCF)	501/0251/5	01/09/2010

These qualifications have been accredited within the Qualifications and Credit Framework (QCF) and are eligible for public funding as determined by the Department for Education (DfE) under Section 96 of the Learning and Skills Act 2000.

The qualification titles listed above feature in the funding lists published annually by the DfE and the regularly updated website. They will also appear on the Learning Aim Reference Application (LARA), where relevant.

You should use the QCF Qualification Number (QN), when you wish to seek public funding for your learners. Each unit within a qualification will also have a unique QCF unit reference number, which is listed in this specification.

The QCF qualification title and unit reference numbers will appear on the learners' final certification document. Learners need to be made aware of this when they are recruited by the centre and registered with Edexcel.

Key features of the Edexcel Principles and Competence qualifications in Auto Electrical and Mobile Electrical (QCF) at Level 2 and Level 3

These qualifications:

- are nationally recognised
- are based on the Auto Electrical and Mobile Electrical Installation National Occupational Standards (NOS). The NOS, assessment strategy and qualification structure(s) are owned by the Sector Skills Council, The Institute of the Motor Industry (IMI).

The Edexcel BTEC Level 2 Diploma in Auto Electrical and Mobile Electrical Principles (QCF) and the Edexcel Level 2 Diploma in Auto Electrical and Mobile Electrical Competence (QCF) have been approved as components of the Intermediate apprenticeship framework in Vehicle Maintenance and Repair.

The Edexcel BTEC Level 3 Diploma in Auto Electrical and Mobile Electrical Principles (QCF) and the Edexcel Level 3 Diploma in Auto Electrical and Mobile Electrical Competence (QCF) have been approved as component of the Advanced apprenticeship framework in Vehicle Maintenance and Repair.

What is the purpose and benefits of these qualifications?

These qualifications provide learners with flexible access to industry supported Level 2 and 3 skills programmes, which act as a real alternative to academic qualifications for those who prefer this style of learning and achievement. As part of apprenticeship frameworks, the qualification supports learners in providing a career pathway into jobs and training at technician level and higher.

Learners will have the opportunity to learn and demonstrate their skills, knowledge and competence in the removal and replacement of electrical units and components including inspecting, locating and correcting faults, system enhancements, installation and testing; and also the routine installation and testing of new security, audio or navigation equipment and advising customers on different equipment.

Who are these qualifications for?

These qualifications are for all learners aged 16 and above who are capable of reaching the required standards.

Edexcel's policy is that the qualifications should:

- be free from any barriers that restrict access and progression
- ensure equality of opportunity for all wishing to access the qualification(s).

Centres should be aware that within the Level 2 qualifications in this specification, learners will be required to meet the demands of unit(s) at Level 3. Centres are advised to consider the support, guidance and opportunities they give to learners to meet the demands of the higher level units during delivery and assessment of the qualification.

What are the potential job roles for those working towards these qualifications?

- Auto Electrical Technician (Level 2)
- Auto Electrical Diagnostic Technician (Level 3)

What progression opportunities are available to learners who achieve these qualifications?

Learners can progress on to other Edexcel automotive apprenticeship programmes and/or related qualifications detailed in *Annexe* A. Other progression routes include; further work or work experience, academic qualification(s) such as one or more GCSEs, Higher Education and or Foundation Degree, or employment into a range of jobs at Level 2 and 3.

What is the qualification structure for the Edexcel BTEC Level 2 Diploma in Auto Electrical and Mobile Electrical Principles (QCF)?

In order to achieve this qualification, learners must achieve 70 credits: 29 credits from the 6 mandatory generic units (Group A), 36 credits from the 8 mandatory specialist units (Group B) and a minimum of 5 credits from 1 of the optional groups (Groups D, E or F) ensuring all components of the selected optional unit group are achieved.

Individual units can be found in the *Units* section.

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group A – Mandatory generic units Learners must achieve 29 credits from this group.				
1	D/601/6171	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	3	2
2	Y/601/7254	Skills in Health, Safety and Good Housekeeping in the Automotive Environment	7	2
3	T/601/6175	Knowledge of Support for Job Roles in the Automotive Work Environment	3	3
4	J/601/6262	Skills in Supporting Job Roles in the Automotive Work Environment	5	3
5	K/601/6237	Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	4	2
6	Y/601/6279	Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	7	2
Group B – Mandatory specialist units Learners must achieve 36 credits from this group.				
9	K/601/6013	Knowledge of Locating and Correcting Simple Electrical Faults in the Automotive Workplace	6	2
10	F/601/6034	Skills in Locating and Correcting Simple Electrical Faults in the Automotive Workplace	5	2
11	F/601/6017	Knowledge in Enhancing Vehicle Electrical Systems	6	2

Unit Number	Unit Reference Number	Unit Title	Credit	Level
12	J/601/6035	Skills in Enhancing Vehicle Electrical Systems	5	2
13	M/601/6028	Knowledge of Inspecting Vehicles Using Prescribed Methods	1	2
14	T/601/6046	Skills in Inspecting Vehicles Using Prescribed Methods	2	2
15	T/601/3731	Knowledge of Removing and Replacing Light Vehicle Electrical Units and Components	6	2
16	T/601/3874	Skills in Removing and Replacing Light Vehicle Electrical Units and Components	5	2
Optional Groups Learners must achieve a minimum of 5 credits from 1 of the optional groups. All sub-components of the chosen group must be completed.				
Group D – Optional units If this group is chosen, learners must achieve 11 credits.				
17	L/601/6022	Knowledge of the Overhauling of Electrical Units	6	2
18	R/601/6037	Skills in the Overhauling of Electrical Units	5	2
Group E – Optional units If this group is chosen, learners must achieve 6 credits.				
19	K/601/6027	Knowledge of Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2
20	H/601/6043	Skills in Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2
Group F – Optional units If this group is chosen, learners must achieve 5 credits.				
21	F/601/3747	Knowledge of Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	2	2
22	K/601/3869	Skills in Removing and Fitting of Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	3	2

What is the qualification structure for the Edexcel Level 2 Diploma in Auto Electrical and Mobile Electrical Competence (QCF)?

In order to achieve this qualification, learners must achieve 88 credits: 29 credits from the 6 mandatory generic units (Group A), 52 credits from the 8 mandatory specialist units (Group B) and a minimum of 7 credits from 1 of the optional groups (Groups D, E or F) ensuring all components of the selected optional unit group are achieved.

Individual units can be found in the Units section.

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group A – Mandatory generic units Learners must achieve 29 credits from this group.				
7	A/601/6338	Competency in Health, Safety and Good Housekeeping in the Automotive Environment	7	2
1	D/601/6171	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	3	2
8	K/601/6366	Competency in Supporting Job Roles in the Automotive Work Environment	5	3
3	T/601/6175	Knowledge of Support for Job Roles in the Automotive Work Environment	3	3
5	K/601/6237	Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	4	2
6	Y/601/6279	Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	7	2
Group B – Mandatory specialist units Learners must achieve 52 credits from this group.				
23	H/601/6057	Competency in Locating and Correcting Simple Electrical Faults in the Automotive Workplace	10	2
9	K/601/6013	Knowledge of Locating and Correcting Simple Electrical Faults in the Automotive Workplace	6	2
24	K/601/6061	Competency in Enhancing Vehicle Electrical Systems	10	2

Unit Number	Unit Reference Number	Unit Title	Credit	Level
11	F/601/6017	Knowledge in Enhancing Vehicle Electrical Systems	6	2
25	K/601/6108	Competency in Inspecting Vehicles Using Prescribed Methods	3	2
13	M/601/6028	Knowledge of Inspecting Vehicles Using Prescribed Methods	1	2
26	Y/601/3771	Competency in Removing and Replacing Light Vehicle Electrical Units and Components	10	2
15	T/601/3731	Knowledge of Removing and Replacing Light Vehicle Electrical Units and Components	6	2
Optional Groups Learners must achieve a minimum of 7 credits from 1 of the optional groups. All sub-components of the chosen group must be completed.				
Group D – Optional units If this group is chosen, learners must achieve 16 credits.				
27	J/601/6066	Competency in the Overhauling of Electrical Units	10	2
17	L/601/6022	Knowledge of the Overhauling of Electrical Units	6	2
Group E – Optional units If this group is chosen, learners must achieve 8 credits.				
28	D/601/6106	Competency in Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	5	2
19	K/601/6027	Knowledge of Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2
Group F – Optional units If this group is chosen, learners must achieve 7 credits.				
29	J/601/3751	Competency in Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	5	2
21	F/601/3747	Knowledge of Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	2	2

What is the qualification structure for the Edexcel BTEC Level 3 Diploma in Auto Electrical and Mobile Electrical Principles (QCF)?

In order to achieve this qualification, learners must achieve a minimum of 62 credits: 29 credits from the 6 mandatory generic units (Group A), 14 credits from the 4 mandatory specialist units (Group B). In addition learners must take either pathway C specialising in Auto Electrician units (26 credits) or pathway E specialising in Aftermarket Enhancement units (19 credits).

Pathway C-Auto Electrical Technician: If this pathway is chosen, learners must complete 22 credits from 4 mandatory specialist units (Group C1) and a minimum of 4 credits from 1 of the optional groups (D1, D2, D3, D4, D5, D6 or D7) to achieve a minimum total of 69 credits.

Pathway E-Auto Electrician Aftermarket Enhancement Technician: If this pathway is chosen, learners must complete 15 credits from 4 mandatory specialist units (Group E1) and a minimum of 4 credits from 1 of the optional groups (F1, F2, F3, F4, F5, F6 or F7) to achieve a minimum total of 62 credits.

Individual units can be found in the Units section.

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group A – Mandatory generic units Learners must achieve 29 credits from this group.				
1	D/601/6171	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	3	2
2	Y/601/7254	Skills in Health, Safety and Good Housekeeping in the Automotive Environment	7	2
3	T/601/6175	Knowledge of Support for Job Roles in the Automotive Work Environment	3	3
4	J/601/6262	Skills in Supporting Job Roles in the Automotive Work Environment	5	3
5	K/601/6237	Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	4	2
6	Y/601/6279	Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	7	2

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group B – Mandatory specialist units Learners must achieve 14 credits from this group.				
30	A/601/3746	Knowledge of Diagnosis and Rectification of Vehicle Auxiliary Electrical Faults	6	3
31	H/601/3868	Skills in Diagnosing and Rectifying Vehicle Auxiliary Electrical Faults	5	3
13	M/601/6028	Knowledge of Inspecting Vehicles Using Prescribed Methods	1	2
14	T/601/6046	Skills in Inspecting Vehicles Using Prescribed Methods	2	2

Pathway C-Auto Electrical Technician:

If this pathway is chosen, learners must complete 22 credits from 4 mandatory specialist units (Group C1) and a minimum of 4 credits from 1 of the optional group (Groups D1, D2, D3, D4, D5, D6 or D7) to achieve a minimum total of 69 credits.

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group C1 – Mandatory specialist units (Auto Electrical) Learners must achieve 22 credits from this group.				
32	K/503/6879	Knowledge of Diagnosis and Rectification of Engine Electrical Faults	6	3
33	Y/601/6038	Skills in Diagnosing and Rectifying Engine Electrical Faults	5	3
34	Y/601/6024	Knowledge of Diagnosis and Rectification of Transmission and Chassis Electrical Faults	6	3
35	Y/601/6041	Skills in Diagnosing and Rectifying Transmission and Chassis Electrical Faults	5	3

Optional Groups Learners must achieve a minimum of 4 credits from 1 of the optional groups. All sub-components of the chosen group must be completed.				
Unit Number	**Unit Reference Number**	**Unit Title**	**Credit**	**Level**
Group D1 – Optional units If this group is chosen, learners must achieve 10 credits.				
36	T/601/6242	Knowledge of How to Make Learning Possible through Demonstrations and Instruction	5	3
37	Y/601/6282	Skills in How to Make Learning Possible through Demonstrations and Instruction	5	3
Group D2 – Optional units If this group is chosen, learners must achieve 10 credits.				
38	R/601/6247	Knowledge of How to Identify and Agree Motor Vehicle Customer Service Needs	5	3
39	M/601/6286	Skills to Identify and Agree Motor Vehicle Customer Service Needs	5	3
Group D3 – Optional units If this group is chosen, learners must achieve 4 credits.				
40	M/601/6255	Knowledge of Supporting Customer Service Improvements in the Automotive Sector	2	2
41	T/601/6337	Skills in Supporting Customer Service Improvements in the Automotive Sector	2	2
Group D4 – Optional units If this group is chosen, learners must achieve 6 credits.				
19	K/601/6027	Knowledge of Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2
20	H/601/6043	Skills in Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group D5 – Optional units If this group is chosen, learners must achieve 11 credits.				
42	T/601/6029	Knowledge of the Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems	6	3
43	A/601/6050	Skills in Identifying Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems	5	3
Group D6 – Optional units If this group is chosen, learners must achieve 4 credits.				
44	M/601/6031	Knowledge of Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment	2	3
45	L/601/6053	Skills in Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment	2	3
Group D7 – Optional units If this group is chosen, learners must achieve 5 credits.				
21	F/601/3747	Knowledge of Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	2	2
22	K/601/3869	Skills in Removing and Fitting of Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	3	2

Pathway E-Auto Electrician Aftermarket Enhancement Technician:

If this pathway is chosen, learners must complete 15 credits from 4 mandatory specialist units (Group E1) and a minimum of 4 credits from 1 of the optional group (Groups F1, F2, F3, F4, F5, F6 or F7) to achieve a minimum total of 62 credits.

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group E1 – Mandatory specialist units Learners must achieve 15 credits from this group.				
42	T/601/6029	Knowledge of the Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems	6	3
43	A/601/6050	Skills in Identifying Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems	5	3
44	M/601/6031	Knowledge of Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment	2	3
45	L/601/6053	Skills in Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment	2	3
Optional Groups Learners must achieve a minimum of 4 credits from 1 of the optional groups. All sub-components of the chosen group must be completed.				
Group F1 – Optional units If this group is chosen, learners must achieve 10 credits.				
36	T/601/6242	Knowledge of how to Make Learning Possible through Demonstrations and Instruction	5	3
37	Y/601/6282	Skills in how to Make Learning Possible through Demonstrations and Instruction	5	3
Group F2 – Optional units If this group is chosen, learners must achieve 10 credits.				
38	R/601/6247	Knowledge of how to Identify and Agree Motor Vehicle Customer Service Needs	5	3
39	M/601/6286	Skills to Identify and Agree Motor Vehicle Customer Service Needs	5	3

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group F3 – Optional units If this group is chosen, learners must achieve 4 credits.				
40	M/601/6255	Knowledge of Supporting Customer Service Improvements in the Automotive Sector	2	2
41	T/601/6337	Skills in Supporting Customer Service Improvements in the Automotive Sector	2	2
Group F4 – Optional units If this group is chosen, learners must achieve 11 credits.				
32	K/503/6879	Knowledge of Diagnosis and Rectification of Engine Electrical Faults	6	3
33	Y/601/6038	Skills in Diagnosing and Rectifying Engine Electrical Faults	5	3
Group F5 – Optional units If this group is chosen, learners must achieve 11 credits.				
34	Y/601/6024	Knowledge of Diagnosis and Rectification of Transmission and Chassis Electrical Faults	6	3
35	Y/601/6041	Skills in Diagnosing and Rectifying Transmission and Chassis Electrical Faults	5	3
Group F6 – Optional units If this group is chosen, learners must achieve 6 credits.				
19	K/601/6027	Knowledge of Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2
20	H/601/6043	Skills in Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2

Group F7 – Optional units If this group is chosen, learners must achieve 5 credits.				
21	F/601/3747	Knowledge of Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	2	2
22	K/601/3869	Skills in Removing and Fitting of Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	3	2

What is the qualification structure for the Edexcel Level 3 Diploma in Auto Electrical and Mobile Electrical Competence (QCF)?

In order to achieve the qualification candidates must achieve a minimum of 76 credits: 29 credits from the 6 mandatory generic units (Group A), 20 credits from the 4 mandatory specialist units (Group B). In addition learners must take either pathway C specialising in Auto Electrician units (36 credits) or pathway E specialising in Aftermarket Enhancement units (27 credits).

Pathway C-Auto Electrical Technician: If this pathway is chosen, learners must complete 32 credits from 4 mandatory specialist units (Group C1) and a minimum of 4 credits from 1 of the optional groups (D1, D2, D3, D4, D5, D6 or D7) to achieve a minimum total of 85 credits.

Pathway E-Auto Electrician Aftermarket Enhancement Technician: If this pathway is chosen, learners complete 23 credits from 4 mandatory specialist units (Group E1) and a minimum of 4 credits from 1 of the optional groups (F1, F2, F3, F4, F5, F6 or F7) to achieve a minimum total of 76 credits.

Individual units can be found in the Units section.

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group A – Mandatory generic units Learners must achieve 29 credits from this group.				
7	A/601/6338	Competency in Health, Safety and Good Housekeeping in the Automotive Environment	7	2
1	D/601/6171	Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment	3	2
8	K/601/6366	Competency in Supporting Job Roles in the Automotive Work Environment	5	3
3	T/601/6175	Knowledge of Support for Job Roles in the Automotive Work Environment	3	3
5	K/601/6237	Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	4	2
6	Y/601/6279	Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment	7	2

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group B – Mandatory specialist units Learners must achieve 20 credits from this group.				
46	L/601/3749	Competency in Diagnosing and Rectifying Vehicle Auxiliary Electrical Faults	10	3
30	A/601/3746	Knowledge of Diagnosis and Rectification of Vehicle Auxiliary Electrical Faults	6	3
25	K/601/6108	Competency in Inspecting Vehicles Using Prescribed Methods	3	2
13	M/601/6028	Knowledge of Inspecting Vehicles Using Prescribed Methods	1	2

Pathway C-Auto Electrical Technician:

If this pathway is chosen, learners must complete 32 credits from 4 Mandatory specialist units (Group C1) and a minimum of 4 credits from 1 of the optional groups (Group D1/D2/D3/D4/D5/D6/D7)

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group C1 – Mandatory specialist units Learners must achieve 32 credits from this group.				
47	Y/601/6069	Competency in Diagnosing and Rectifying Engine Electrical Faults	10	3
32	K/503/6879	Knowledge of Diagnosis and Rectification of Engine Electrical Faults	6	3
48	L/503/6924	Competency in Diagnosing and Rectifying Transmission and Chassis Electrical Faults	10	3
34	Y/601/6024	Knowledge of Diagnosis and Rectification of Transmission and Chassis Electrical Faults	6	3

Optional Groups Learners must achieve a minimum of 4 credits from 1 of the optional groups. All sub-components of the chosen group must be completed.				
Unit Number	**Unit Reference Number**	**Unit Title**	**Credit**	**Level**
Group D1 – Optional units If this group is chosen, learners must achieve 10 credits.				
49	K/601/6383	Competency in Identifying and Agreeing Motor Vehicle Customer Service Needs	5	3
38	R/601/6247	Knowledge of How to Identify and Agree Motor Vehicle Customer Service Needs	5	3
Group D2 – Optional units If this group is chosen, learners must achieve 10 credits.				
50	Y/601/6380	Competency in Making Learning Possible through Demonstrations and Instruction	5	3
36	T/601/6242	Knowledge of How to Make Learning Possible through Demonstrations and Instruction	5	3
Group D3 – Optional units If this group is chosen, learners must achieve 4 credits.				
40	M/601/6255	Knowledge of Supporting Customer Service Improvements in the Automotive Sector	2	2
51	R/601/6393	Competency in Supporting Customer Service Improvements in the Automotive Sector	2	2
Group D4 – Optional units If this group is chosen, learners must achieve 8 credits.				
28	D/601/6106	Competency in Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	5	2
19	K/601/6027	Knowledge of Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group D5 – Optional units If this group is chosen, learners must achieve 16 credits.				
52	H/601/6110	Competency in Identifying Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems	10	3
42	T/601/6029	Knowledge of the Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems	6	3
Group D6 – Optional units If this group is chosen, learners must achieve 7 credits.				
53	M/601/6112	Competency in Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment	5	3
44	M/601/6031	Knowledge of Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment	2	3
Group D7 – Optional units If this group is chosen, learners must achieve 7 credits.				
29	J/601/3751	Competency in Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	5	2
21	F/601/3747	Knowledge of Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	2	2

Pathway E-Auto Electrician Aftermarket Enhancement Technician:

If this pathway is chosen, learners must complete 23 credits from 4 Mandatory specialist units (Group E1) and a minimum of 4 credits from 1 of the optional groups (Group F1, F2, F3, F4, F5, F6 or F7)

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group E1 – Mandatory specialist units Learners must achieve 23 credits from this group.				
52	H/601/6110	Competency in Identifying Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems	10	3
42	T/601/6029	Knowledge of the Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems	6	3
53	M/601/6112	Competency in Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment	5	3
44	M/601/6031	Knowledge of Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment	2	3
Optional Groups Learners must achieve a minimum of 4 credits from 1 of the optional groups. All sub-components of the chosen group must be completed.				
Unit Number	**Unit Reference Number**	**Unit Title**	**Credit**	**Level**
Group F1 – Optional units If this group is chosen, learners must achieve 10 credits.				
50	Y/601/6380	Competency in Making Learning Possible through Demonstrations and Instruction	5	3
36	T/601/6242	Knowledge of how to Make Learning Possible through Demonstrations and Instruction	5	3

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group F2 – Optional units If this group is chosen, learners must achieve 10 credits.				
49	K/601/6383	Competency in Identifying and Agreeing Motor Vehicle Customer Service Needs	5	3
38	R/601/6247	Knowledge of How to Identify and Agree Motor Vehicle Customer Service Needs	5	3
Group F3 – Optional units If this group is chosen, learners must achieve 4 credits.				
40	M/601/6255	Knowledge of Supporting Customer Service Improvements in the Automotive Sector	2	2
51	R/601/6393	Competency in Supporting Customer Service Improvements in the Automotive Sector	2	9
Group F4 – Optional units If this group is chosen, learners must achieve 16 credits.				
47	Y/601/6069	Competency in Diagnosing and Rectifying Engine Electrical Faults	10	3
32	K/503/6879	Knowledge of Diagnosis and Rectification of Engine Electrical Faults	6	3
Group F5 – Optional units If this group is chosen, learners must achieve 16 credits.				
48	L/503/6924	Competency in Diagnosing and Rectifying Transmission and Chassis Electrical Faults	10	3
34	Y/601/6024	Knowledge of Diagnosis and Rectification of Transmission and Chassis Electrical Faults	6	3
Group F6 – Optional units If this group is chosen, learners must achieve 8 credits.				
28	D/601/6106	Competency in Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	5	2
19	K/601/6027	Knowledge of Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)	3	2

Unit Number	Unit Reference Number	Unit Title	Credit	Level
Group F7 – Optional units If this group is chosen, learners must achieve 7 credits.				
29	J/601/3751	Competency in Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	5	2
21	F/601/3747	Knowledge of Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels	2	2

How are the qualifications graded and assessed?

The overall grade for the qualifications is a 'pass'. The learner must achieve all the required units within the specified qualification structure.

To pass a unit the learner must:

- achieve **all** the specified learning outcomes
- satisfy **all** the assessment criteria by providing sufficient and valid evidence for each criterion
- show that the evidence is their own.

The qualifications are designed to be assessed:

- in the workplace or
- in conditions resembling the workplace, as specified in the assessment requirements/strategy for the sector, or
- as part of a training programme.

Assessment strategy for Competence based qualifications (VCQs)

The assessment strategy for the competence qualifications (VCQ) has been included in *Annexe C*. It has been developed by IMI in partnership with employers, training providers, awarding organisations and the regulatory authorities. The assessment strategy includes details on:

- criteria for defining realistic working environments
- roles and occupational competence of assessors, expert witnesses, internal verifiers and standards verifiers
- quality control of assessment
- evidence requirements.

Evidence of competence may come from:

- **current practice** where evidence is generated from a current job role
- a **programme of development** where evidence comes from assessment opportunities built into a learning/training programme whether at or away from the workplace
- the **Recognition of Prior Learning (RPL)** where a learner can demonstrate that they can meet the assessment criteria within a unit through knowledge, understanding or skills they already possess without undertaking a course of learning. They must submit sufficient, reliable and valid evidence for internal and standards verification purposes. RPL is acceptable for accrediting a unit, several units or a whole qualification
- a **combination** of these.

It is important that the evidence is:

Valid	relevant to the standards for which competence is claimed
Authentic	produced by the learner
Current	sufficiently recent to create confidence that the same skill, understanding or knowledge persist at the time of the claim
Reliable	indicates that the learner can consistently perform at this level
Sufficient	fully meets the requirements of the standards.

Types of evidence

To successfully achieve a unit the learner must gather evidence which shows that they have met the required standard in the assessment criteria. Evidence can take a variety of different forms including the examples below. Centres should refer to the assessment strategy for information about which of the following are permissible.

Centres should also refer to the assessment strategy (for competence based qualifications (VCQs) and the assessment requirements/evidence requirements section within each individual unit.

- direct observation of the learner's performance by their assessor (O)
- outcomes from oral or written questioning (Q&A)
- products of the learner's work (P)
- personal statements and/or reflective accounts (RA)
- outcomes from simulation, where permitted by the assessment strategy (S)
- professional discussion (PD)
- assignment, project/case studies (A)
- authentic statements/witness testimony (WT)
- expert witness testimony (EWT)
- evidence of Recognition of Prior Learning (RPL).

The abbreviations may be used for cross-referencing purposes.

Learners can use one piece of evidence to prove their knowledge, skills and understanding across different assessment criteria and/or across different units. It is, therefore, not necessary for learners to have each assessment criterion assessed separately. Learners should be encouraged to reference the assessment criteria to which the evidence relates.

Evidence must be made available to the assessor, internal verifier and Edexcel standards verifier. A range of recording documents is available on the Edexcel website www.edexcel.com. Alternatively, centres may develop their own.

Centre recognition and approval

Centre recognition

Centres that have not previously offered Edexcel qualifications need to apply for and be granted centre recognition as part of the process for approval to offer individual qualifications. New centres must complete both a centre recognition approval application and a qualification approval application.

Existing centres will be given 'automatic approval' for a new qualification if they are already approved for a qualification that is being replaced by the new qualification and the conditions for automatic approval are met. Centres already holding Edexcel approval are able to gain qualification approval for a different level or different sector via Edexcel online.

Approvals agreement

All centres are required to enter into an approvals agreement which is a formal commitment by the head or principal of a centre to meet all the requirements of the specification and any linked codes or regulations. Edexcel will act to protect the integrity of the awarding of qualifications, if centres do not comply with the agreement. This could result in the suspension of certification or withdrawal of approval.

Quality assurance

Quality assurance is at the heart of vocational qualifications. Assessment on BTEC and Competency qualifications is completed by your centre. You use quality assurance to ensure that your managers, internal verifiers and assessors are standardised and supported. We use quality assurance to check that all centres are working to national standards. It gives us the opportunity to identify and provide support where it is needed in order to safeguard certification. It also allows us to recognise and support good practice.

For the qualifications in this specification, the Edexcel quality assurance model will follow one of the three processes listed below.

1 Delivery of the **Competence and Principles** qualifications as part of a BTEC apprenticeship (single click registration)

- integrated annual visits by a Standards Verifier to review centre-wide quality assurance systems and sampling of internal verification and assessor decisions

2 Delivery of the **Competence** qualification outside the apprenticeship

- annual visits to centres by a Centre Quality Reviewer to review centre-wide quality assurance systems
- annual visits by a Standards Verifier for sampling of internal verification and assessor decisions for the qualification

3 Delivery of the **Principles** qualification outside the apprenticeship

- annual visits to centres by a Centre Quality Reviewer to review centre-wide quality assurance systems
- Lead Internal Verifier accreditation. This involves online training and standardisation of Lead Internal Verifiers using our OSCA platform, accessed via Edexcel Online. Please note that not all qualifications are covered by Lead Internal Verifier accreditation. Where this is the case we will annually allocate a Standards Verifier to conduct postal sampling of internal verification and assessor decisions for the Principal Subject Area.

For further details, go to the UK BTEC Quality Assurance Handbook 2011-12 http://www.edexcel.com/quals/BTEC/quality/Pages/documents.aspx

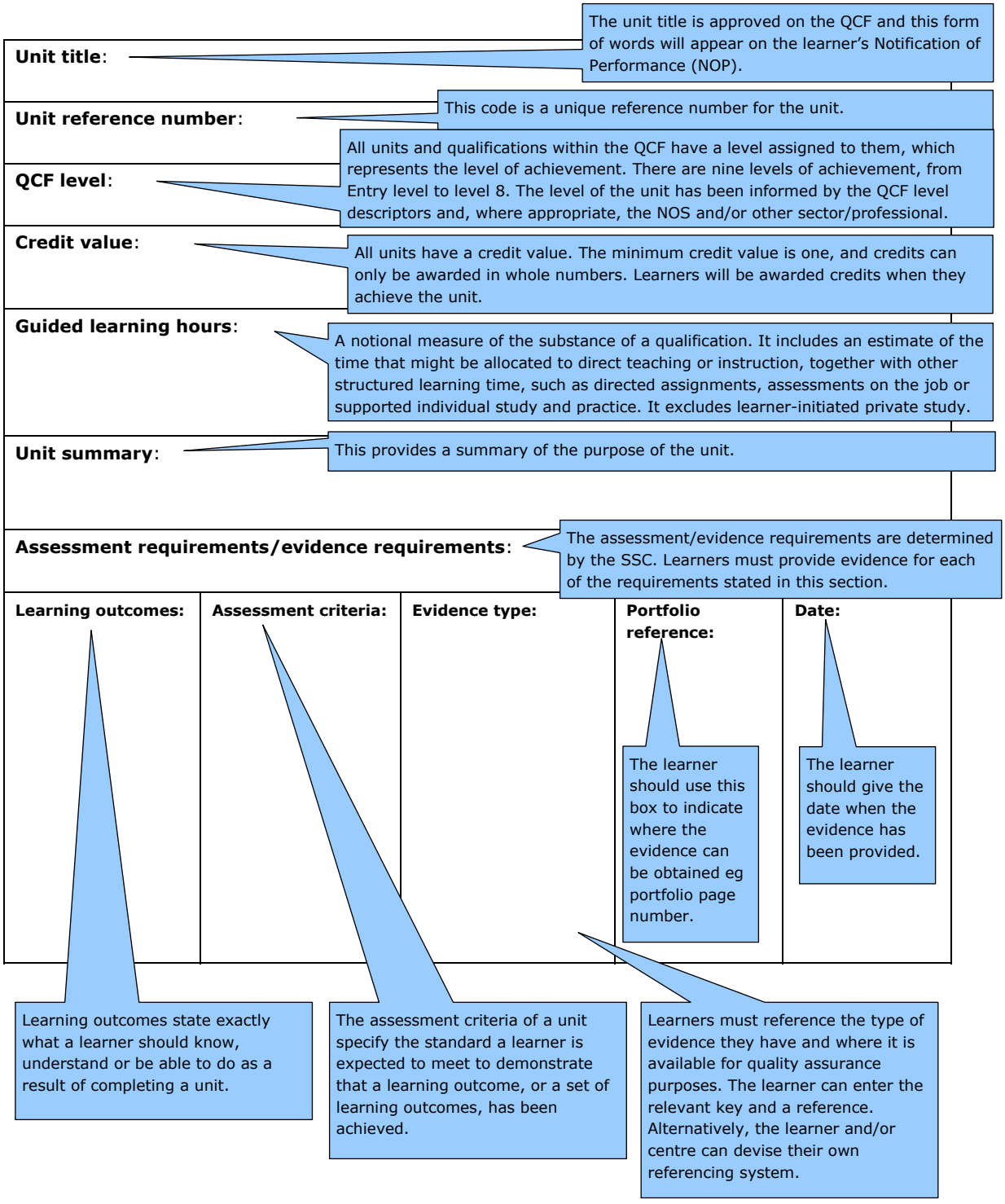
What resources are required?

Each qualification is designed to support learners working in the automotive sector. Physical resources need to support the delivery of the qualifications and the assessment of the learning outcomes and must be of industry standard.

For competence based qualifications (VCQs), centres must meet any specific resource and staff requirements outlined in Annexe C: *Assessment strategy.*

Unit format

Each unit in this specification contains the following sections.



Units

Unit 1: Knowledge of Health, Safety and Good Housekeeping in the Automotive Environment

Unit reference number: D/601/6171

QCF level: 2

Credit value: 3

Guided learning hours: 30

Unit Summary

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.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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 Power Presses Regulations 1992

c Pressure Systems and Transportable Gas Containers Regulations 1989

d Electricity at Work Regulations 1989

e Noise at Work Regulations 1989

f Manual Handling Operations Regulations 1992

g Health and Safety (Display Screen Equipment) Regulations 1992

h Abrasive Wheel Regulations (current)

i Safe Working Loads

j Working at Height Regulations (current)

Routine maintenance of the workplace

a trainees personal responsibilities and limits of their authority with regard to work equipment

b risk assessment of the workplace activities and work equipment

c workplace person responsible for training and maintenance of workplace equipment

d when and why safety equipment must be used

e location of safety equipment

f particular hazards associated with their work area and equipment

g prohibited areas

h plant and machinery that trainees must not use or operate

i why and how faults on unsafe equipment should be reported

j storing tools, equipment and products safely and appropriately

k using the correct PPE

l following manufacturers' recommendations

m location of routine maintenance information eg electrical safety check log

Legislation relevant to health and safety

a HASAWA

b COSHH

c EPA

d Manual Handling Operations Regulations 1992

e PPE Regulations 1992

General regulations to include an awareness of:

a Health and Safety (Display Screen Equipment) Regulations 1992

b Health and Safety (First Aid) Regulations 1981

c Health and Safety (Safety Signs and Signals) Regulations 1996

d Health and Safety (Consultation with Employees) Regulations 1996

e Employers Liability (Compulsory Insurance) Act 1969 and Regulations 1998

f Confined Spaces Regulations 1997

g Noise at Work Regulations 1989

h Electricity at Work Regulations 1989

i Electricity (Safety) Regulations 1994

j Fire Precautions Act 1971

k Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985

l Pressure Systems Safety Regulations 2000

m Waste Management 1991

n Dangerous Substances and Explosive Atmospheres Regulations

o (DSEAR) 2002

p Control of Asbestos at Work Regulations 2002

Legislative duties

a the purpose of a health and safety policy

b the relevance of the Health and Safety Executive

c the relevance of an initial induction to health and safety requirements at your workplace

d general employee responsibilities under the HASAWA and the consequences of non-compliance

e general employer responsibilities under the HASAWA and the consequences of non-compliance

f the limits of authority with regard to health and safety within a personal job role

g workplace procedure to be followed to report health and safety matters

Precautions to be taken when working with vehicles, workshop materials, tools and equipment including

a electrical safety, pneumatics and hydraulics

b accessing and interpreting safety information

c seeking advice when needed

d seeking assistance when required

e reporting of unsafe equipment

f storing tools, equipment and products safely and appropriately

g using the correct PPE

h following manufacturers recommendations

i following application procedures eg hazardous substances

j 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. 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, to include:
- 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 personal, customers, contractors etc entering your work premises
- ix working by the roadside
- x vehicle recovery

c the employee's responsibilities in identifying and reporting risks within their working environment

d the method of reporting risks that are outside your limits of authority

e potential causes of:
   i fire
   ii explosion
   iii noise
   iv harmful fumes
   v slips
   vi trips
   vii falling objects
   viii accidents whilst dealing with broken down vehicles

Personal responsibilities

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

b the importance of personal appearance in the control of health and safety

Action to be taken in the event of colleagues suffering accidents

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

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

vii administer water for minor burns or chemical injuries
viii wash eyes with water to remove dust or ingress of chemicals (battery acid)
ix need to seek professional help for serious injuries

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

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand the correct personal and vehicle protective equipment to be used within the automotive environment	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			
2	Understand effective housekeeping practices in the automotive environment	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.7	describe procedures for starting and ending the working day which ensure effective housekeeping practices are followed			
3	Understand key health and safety requirements relevant to the automotive environment	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			
4	Understand about hazards and potential risks relevant to the automotive environment	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			
5	Understand personal responsibilities	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 2: Skills in Health, Safety and Good Housekeeping in the Automotive Environment

Unit reference number: Y/601/7254

QCF level: 2

Credit value: 7

Guided learning hours: 60

Unit Summary

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.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre

3 be observed by an assessor as defined by the IMI Assessment Strategy

4 produce evidence of use of personal and vehicle protection, cleaning the work environment and disposal of waste on **2** separate **occasions**

5 produce evidence of identifying risks which may result from at least **2** of the items listed below:

- a the use and maintenance of machinery or equipment
- b the use of materials or substances
- c working practices which do not conform to laid down policies
- d unsafe behaviour
- e accidental breakages and spillages
- f environmental factors

6 produce evidence of identifying risks

7 produce evidence of following at least **2** of the workplace policies listed below:

   a he use of safe working methods and equipment

   b the safe use of hazardous substances

   c smoking, eating, drinking and drugs

   d what to do in the event of an emergency

   e personal presentation

8 produce evidence of following workplace policies.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to use correct personal and vehicle protection within the automotive environment	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			
2	Be able to carry out effective housekeeping practices in the automotive environment	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.3	use materials and equipment to carry out cleaning and maintenance duties in allocated work areas, following automotive work environment policies, schedules and manufacturer's instructions			
		2.4	perform housekeeping activities safely and in a way which 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			
3	Be able to recognise and deal with dangers in order to work safely within the automotive workplace	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.4	rectify health and safety risks encountered at work, within the scope and capability of their job role			
4	**Be able to conduct themselves responsibly**	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 3: Knowledge of Support for Job Roles in the Automotive Work Environment

Unit reference number: T/601/6175

QCF level: 3

Credit value: 3

Guided learning hours: 20

Unit Summary

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.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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

Organisational and customer requirements:

a importance of time scales to customer and organization

b relationship between time and costs

c meaning of profit

Choice of communication

a distance

b location

c job responsibility

Importance of maintaining positive working relationships

a morale

b productivity

c company image

d customer relationships

e colleagues

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand key organisational structures, functions and roles within the automotive work environment	1.1	identify the purpose of different sections of a typical automotive work environment			
		1.2	explain organisational structures and lines of communication within the automotive work environment			
		1.3	explain levels of responsibility within specific job roles in automotive workplace. To include: a trainee b skilled technician c supervisor d manager			
2	Understand the importance of obtaining, interpreting and using information in order to support their job role within the automotive work environment	2.1	explain the importance of different sources of information in a 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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			
3	Understand the importance of different types of communication within the automotive work environment	3.1	explain where different methods of communication would be used within the automotive environment			
		3.2	explain the factors which can determine your choice of communication			
		3.3	explain how the communication of information can change with the target audience to include uninformed and informed people			
4	Understand communication requirements when carrying out vehicle repairs in the automotive work environment	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Understand how to develop good working relationships with colleagues and customers in the automotive workplace	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 4: Skills in Supporting Job Roles in the Automotive Work Environment

Unit reference number: J/601/6262

QCF level: 3

Credit value: 5

Guided learning hours: 40

Unit Summary

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.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre

3 be observed by an assessor as defined by the IMI Assessment Strategy

4 produce witness testimony from your peers **and** supervisor **or** tutor that you have worked well with others

5 produce evidence carrying out the above whilst performing your normal duties.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work effectively within the organisational structure of the automotive work environment	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			
2	Be able to obtain and use information in order to support their job role within the automotive work environment	2.1	select and use legal and technical information, in an automotive work environment			
3	Be able to communicate with and support colleagues and customers effectively within the automotive work environment	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to develop and keep good working relationships in the automotive work environment	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 5: Knowledge of Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment

Unit reference number: K/601/6237

QCF level: Level 2

Credit value: 4

Guided learning hours: 40

Unit Summary

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 automotive environment equipment
- the correct selection and fabrication of materials used when modifying and repairing
- the correct application of automotive engineering fabrication and fitting principles.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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 workplace. To include:

a rule/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

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

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 (inc. GRP)

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

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how to select, use and care for hand tools and measuring devices in the automotive environment	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Understand how to prepare and use common workshop equipment	2.1	describe the preparation and safe use of workshop equipment			
		2.2	explain the term: safe working load			
3	Understand how to select materials when fabricating, modifying and repairing vehicles and fitting components	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			
4	Understand how to apply automotive engineering, fabrication and fitting principles when modifying and repairing vehicles and components	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.4	identify locking, fastening and fixing devices			
		4.5	state the importance of correct operating specifications for limits, fits and tolerances in the automotive environment			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 6: Skills in Materials, Fabrication, Tools and Measuring Devices used in the Automotive Environment

Unit reference number: Y/601/6279

QCF level: 2

Credit value: 7

Guided learning hours: 60

Unit Summary

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.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as detailed below:

You must

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre

3 be observed by an assessor as defined by the IMI Assessment Strategy

4 produce evidence of undertaking basic routine checks of hand tools, measuring devices and workshop equipment covering all of those listed below:

   a electrical

   b mechanical

   c pneumatic

   d hydraulic

5 produce evidence of fabricating **at least 1 item** from suitable materials to known tolerances, which includes the following processes:

   a filing

   b tapping threads

   c cutting

   d drilling

   e joining

6 be observed by your assessor carrying out routine checks and during stages of fabrication.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to select, maintain and use and hand tools and measuring devices in the automotive environment	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			
2	Be able to prepare and use common workshop equipment	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Be able to select materials when fabricating, modifying and repairing vehicles and fitting components	3.1	select and use appropriate materials whilst constructing, fitting, modifying or repairing vehicles and components			
4	Be able to apply automotive engineering, fabrication and fitting principles when modifying and repairing vehicles and components	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 7: Competency in Health, Safety and Good Housekeeping in the Automotive Environment

Unit reference number: A/601/6338

QCF level: 2

Credit value: 7

Guided learning hours: 60

Unit Summary

This unit will enable the learner to develop competency in order to:

- carry out day to day work area cleaning, clearing away, dealing with spillages and disposal of waste, used materials and debris
- identify hazards and risks in the automotive environment and complying with relevant legislation and good practice
- work safely at all times within the automotive environment, both as an individual and with others.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence of use of personal and vehicle protection, cleaning the work environment and disposal of waste on 3 separate occasions

5 be observed by your assessor on at least 1 occasion carrying out the above

6 produce evidence of identifying risks which may result from at least 2 of the items listed below:

   a the use and maintenance of machinery or equipment

   b the use of materials or substances

   c working practices which do not conform to laid down policies

   d unsafe behaviour

   e accidental breakages and spillages

   f environmental factors

7 be observed by your assessor on at least 1 occasion carrying out the above

8 produce evidence of following at least 4 of the workplace policies listed below:

   a the use of safe working methods and equipment

   b the safe use of hazardous substances

   c smoking, eating, drinking and drugs

   d what to do in the event of an emergency

   e personal presentation

9 be observed by your assessor following workplace policies on at least 1 occasion.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to use correct personal and vehicle protection within the automotive environment	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			
2	Be able to carry out effective housekeeping practices in the automotive environment	2.1	select and use cleaning equipment which is of the right type and suitable for the task			
		2.2	use utilities and appropriate consumables, avoiding waste			
		2.3	use materials and equipment to carry out cleaning and maintenance duties in allocated work areas, following automotive work environment policies, schedules and manufacturer's instructions			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			
3	Be able to recognise and deal with dangers in order to work safely within the automotive workplace	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to conduct themselves responsibly	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 8: Competency in Supporting Job Roles in the Automotive Work Environment

Unit reference number: K/601/6366

QCF level: 3

Credit value: 5

Guided learning hours: 40

Unit Summary

This unit will help the learner develop competency in order to keep good working relationships with all colleagues and customers in the automotive work environment by using effective communication and support.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment requirements as detailed below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence that you have worked well with others in the automotive industry

5 be observed by your assessor on at least **3** occasions carrying out the above whilst performing your normal work duties.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work effectively within the organisational structure of the automotive work environment	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			
2	Be able to obtain and use information in order to support their job role within the automotive work environment	2.1	select and use legal and manufacturers information, in an automotive work environment			
3	Be able to communicate with and support colleagues and customers effectively within the automotive work environment	3.1	use methods of communication with customers and colleagues which meet their needs			
		3.2	give customers and colleagues accurate information			
		3.3	make requests for assistance from or to customers and colleagues clearly and courteously			
		3.4	report any anticipated delays in completion to the relevant persons promptly			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to develop and keep good working relationships in the automotive work environment	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			

earner name:_____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 9: Knowledge of Locating and Correcting Simple Electrical Faults in the Automotive Workplace

Unit reference number: K/601/6013

QCF level: 2

Credit value: 6

Guided learning hours: 45

Unit Summary

This unit enables the learner to develop an understanding in conducting a range of routine electrical tests, identifying simple faults on a variety of basic electrical components and undertaking suitable correction activities.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

Basic electrical principles

a explain the direction of current flow and electron flow

b these principles must include:
- i volts
- ii amps
- iii ohms
- iv power
- v AC/DC
- vi magnetism
- vii electromagnetism
- viii electromotive force
- ix electromagnetic induction
- x electrical heating effect

c the terms used within these principles:
- i volt (electrical pressure)
- ii ampere (electrical current)
- iii ohm (electrical resistance)
- iv watt (power)

d calculations for the basic principles:
   i amps
   ii ohms
   iii volts
   iv watts

e circuit principles to include:
   i series circuits
   ii parallel circuits
   iii current flow
   iv voltage of components
   v volt drop
   vi resistance
   vii the effect on circuit operation of open circuit component(s)

f earth and insulated return systems

g cable sizes and colour codes

h different types of connectors, terminals and circuit protection devices

i meaning of and checks for:
   i short circuit
   ii open circuit
   iii bad earth
   iv high resistance
   v security
   vi functionality
   vii performance to specific

Vehicle and electrical unit wiring diagrams

a describe and identify vehicle and unit electrical symbols

b interpret information from vehicle wiring diagrams
   i vehicle systems
   ii electrical units
   iii wire colour and size
   iv earth locations
   v wiring junction locations
   vi fuse size and location
   vii connection pin numbers

Safety procedures and precautions when working on electrical and electronic systems

a safety precautions when working on electrical and electronic systems to include:
- i avoidance of short circuits
- ii power surges
- iii prevention of electric shock
- iv protection of electrical and electronic components
- v protection of circuits from overload or damage

Electrical test equipment, its function and correct use

a equipment to include:
- i voltmeters
- ii ammeters
- iii ohmmeters
- iv lock torque testers
- v regulator testers
- vi insulation testers
- vii oscilloscopes
- viii specialist test equipment

Different types of Batteries

a identify various types
- i lead acid – conventional
- ii maintenance free
- iii gel
- iv alkaline
- v sodium

Battery structure and chemical composition

a lead-acid and alkaline batteries:
- i construction
- ii capacity
- iii rating
- iv reserve capacity
- v cranking rating
- vi polarity
- vii electrochemical action
- viii electrolyte type

Battery maintenance and charging

a maintenance including:
- i cleaning terminals and battery tops
- ii protecting terminals
- iii cell top-up for non-sealed units
- iv securing to the vehicle
- v removal and refitting procedures

b charging to include:
- i trickle charging
- ii boost charging
- iii charging rates
- iv safe charging techniques
- v charging equipment

Lead-acid battery testing techniques and identify basic battery faults

a testing techniques for:
- i testing of electrolyte
- ii high rate discharge testing
- iii testing equipment

b faults including:
- i low charge
- ii battery not holding charge
- iii sulphating
- iv battery voltage drop during different component operation
- v damaged plates and insulators

Different types of generators

- a dynamos and regulators
- b alternators with internal and external regulators

Charging principles and function of generators

a charging principles:
- i supply current demands
- ii battery charging
- iii constant voltage at different engine speeds

Components of generators

a dynamo and alternator components:
- i field coils
- ii armature
- iii brush assemblies
- iv alternator stator
- v rotor
- vi slip rings
- vii rectifier
- viii end frame packs
- ix bearings
- x regulator
- xi drive system

Basic testing procedures and identify charging system faults

a basic test procedures:
- i testing of generator outputs (under and off load)
- ii testing for rectification and regulation
- iii removal and fitting procedure
- iv bench testing
- v vehicle testing

b faults to include:
- i slipping drive belt
- ii corroded or loose connections
- iii secure mounting
- iv not charging
- v noisy operation

Types, structure and operating principles of starter motors

a starter motor types:
- i pre-engaged
- ii permanent magnet for heavy and diesel vehicles
- iii add gear reduction to starter motor types

b components to include:
- i solenoid
- ii armature
- iii commutator
- iv brush assemblies
- v drive systems
- vi ignition switches

Basic common faults and testing procedures for starter motors

a basic test to include:
- i pre-engaged
- ii permanent magnet for heavy and diesel vehicles and light vehicle
- iii gear reduction starters
- iv wiring related to the circuits
- v ignition switches
- vi removal and refitting procedures

b faults to include:
- i starter not engaging
- ii slow engine cranking speed
- iii insecure mounting

Types of ignition systems and ignition fundamentals

a ignition system types:
- i conventional
- ii electronic
- iii programmed
- iv distributorless

b ignition system functional requirements

The function of ignition components

a components to include:
- i ignition switch
- ii coil
- iii distributor
- iv spark plugs
- v leads
- vi ballast resistor
- vii contact breakers
- viii condenser
- ix electronic systems

Testing procedures and basic common faults relating to the ignition system

a testing procedures relating to the ignition system and components including:
- i wiring
- ii connections
- iii switching of the primary circuit
- iv removal and refitting procedures

b failing to start and running erratic

The operating principles of the fuel system

Different fuel types and the relevant combustion process

a fuel and air mix

b compression ratios

c exhaust emissions

The different types of fuel system and components

a petrol fuel systems and components:
- i carburettor
- ii choke
- iii fuel cut off
- iv stepper motors
- v sensors
- vi injectors
- vii fuel pumps
- viii relays
- ix cold start
- x anti run on solenoid
- xi lambda sensors
- vii idle control actuators
- viii single and multipoint injection systems

b compression ignition systems:
- i engine stop solenoid
- ii injectors
- iii fuel pumps
- iv relays
- v heater plugs
- vi injection pumps
- vii filters

Test procedures and basic common faults associated electronic elements of fuel systems and components

a basic testing procedures:
- i diesel engine failing to start
- ii failing to stop when switched off
- iii petrol engine not starting
- iv difficult to start when cold

The function of the engine management system and its components

a describe the engine management working processes

b system component including:
- i pulse, hall, optimum inductive generators
- ii ECU
- iii control modules

c sensors including:
- i crankshaft
- ii manifold
- iii temperature
- iv knock

Different types of components

a components to include:
- i constant energy systems
- ii pulse generators
- iii hall effect generators
- iv optimum inductive pulse generators
- v modules
- vi ECU
- vii sensors

Basic common faults and testing methods associated with engine management systems

a basic faults and tests to include:
- i engine fails to start
- ii erratic running
- iii poor fuel consumption
- iv poor connections

b removal and replacement procedures

The different lighting system components

a components to include:
- i side and tail lights
- ii brake lights
- iii reverse lights
- iv rear and front fog lights
- v headlights
- vi driving lights
- vii spot lights
- viii indicators
- ix headlamp trim motors
- x index lights

The function of component parts

a components to include:
- i lamp holders
- ii bulbs
- iii relays
- iv switches
- v warning systems
- vi trim motors

Basic common faults and testing methods associated with external lighting system

a faults relating to:
- i switches
- ii relays
- iii lamp holders
- iv wiring
- v connections
- vi fuses and fuse ratings
- vii headlamp alignment

The operating principles of external lighting systems

a principles including:
- i side and tail lights
- ii brake lights
- iii reverse lights
- iv rear and front fog lights
- v headlights
- vi spot lights
- vii indicators

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand the use of electrical testing equipment and measurements taken	1.1	identify commonly used electrical test equipment			
		1.2	describe how to use and operate electrical test equipment			
		1.3	describe the safety and operational checks that should be carried out on tools and equipment required to remove and replace electrical components			
		1.4	describe how to measure voltage, resistance, current, and specific gravity in determining simple circuit faults			
		1.5	describe when and where to use voltage, ohm, amp and specific gravity measurements in determining simple circuit faults			
		1.6	describe the fundamental operation of motors, capacitors, resistors, semi-conductors, transistors, actuators and sensors (including active or self-generating and passive or modulating)			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Understand how to carry out electrical testing techniques	2.1	describe common types of testing methods used to check the operation of vehicle electrical/electronic circuits and components			
		2.2	describe how to determine component condition and suitability based upon calculations using ohms law			
		2.3	describe how to conduct tests following electrical safety and workplace procedures			
		2.4	explain how to evaluate and interpret test results found in diagnosing simple electrical circuit faults against vehicle manufacturer specifications and settings			
		2.5	describe how and the importance of making recommendations for rectification based upon the analysis of the test information gained			
		2.6	explain how to identify common faults and their causes found in fundamental electrical systems and components			
		2.7	explain how to evaluate the performance of any replaced electrical components against vehicle specification and the importance of doing so			
		2.8	describe the procedures for disposing of any removed electrical components			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 10: Skills in Locating and Correcting Simple Electrical Faults in the Automotive Workplace

Unit reference number: F/601/6034

QCF level: 2

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit will help the learner to demonstrate and conduct a range of routine electrical tests and identifying simple faults on a variety of basic electrical components and undertaking suitable correction activities.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor locating and correcting simple faults occurring in **5 out of the 11** engine systems listed, which covers the learning outcomes.

- a power storage devices
- b power generating devices
- c vehicle starting devices
- d vehicle lighting devices
- e wiring harness and connection devices
- f vehicle sensors and actuators
- g circuit protection devices
- h information and entertainment systems
- i telematic and tracking systems
- j security systems
- k communication systems

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out electrical testing techniques and rectification activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out vehicle electrical testing and rectification activities			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the identification of electrical faults, by reviewing: a technical data b diagnostic test procedures			
		2.2	use technical information to support the identification of electrical faults			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out electrical testing techniques and rectification activities			
		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 electrical testing techniques and rectification activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out electrical testing techniques and rectification activities	4.1	carry out a functionality test of the electrical system and or component			
		4.2	use electrical testing methods that are suitable for assessing the performance of the electrical system and or components concerned			
		4.3	carry out all diagnostic and rectification activities following: a manufacturers' instructions b recognised researched repair methods c workplace procedures d health and safety requirements			
		4.4	ensure all electrical testing techniques clearly identifies the cause of the identified faults			
		4.5	seek assistance of the relevant person promptly where the results of the testing are unclear			
		4.6	ensure all repaired and replaced electrical components are secure and function as specified by the manufacturer or any legal requirements			
		4.7	dispose of any removed electrical components safely to comply with legal requirements and workplace procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 11: Knowledge in Enhancing Vehicle Electrical Systems

Unit reference number: F/601/6017

QCF level: 2

Credit value: 6

Guided learning hours: 45

Unit Summary

This unit enables the learner to develop an understanding of the operation and fitting of electrical enhancement components and systems to improve the original vehicle features and specification to meet customer requirements

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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

a systems and components to include:
- i radio/CD players
- ii multi-play CD players
- iii DVD
- iv MP3 players
- v speakers
- vi aerial systems
- vii amplifiers
- viii visual display screens
- ix satellite navigation
- x mobile communication units

The function of component parts in the I.C.E. systems

a components include:
- i radio
- ii CD
- iii video
- iv DVD players
- v aerial systems
- vi speakers

vii amplifiers
viii visual display screens
ix mobile communication systems

The operating principles of I.C.E systems

a operation of entertainment systems speaker systems and aerial systems

The relevant legislation relevant to I.C.E systems

a find and apply all relevant legislation for the fitment and use of I.C.E systems

Basic common faults and testing methods associated I.C.E. systems

a test and procedures for the following:
i radio/CD players
ii speakers
iii aerial systems
iv amplifiers
v wiring
vi connections
vii relays
viii fuses
ix removal and refitting procedures

Types of 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 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 diodes
viii horns

The operating principles of 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

Basic common faults and testing methods associated security and warning systems

a components to include:
- i control units
- ii audible warning units
- iii immobiliser units
- iv horns
- v relays
- vi diodes
- vii wiring
- viii connections and protection devices
- ix removal and refitting procedures

The different types of safety fitment systems and components

a components to include:
- i reversing aids and systems
- ii working lamps
- iii driving lamps
- iv additional fog lights
- v fuel cut off switches
- vi engine cut off switches

The function of component parts in safety fitment systems

a components to include:
- i reversing aids and systems
- ii working lamps
- iii driving lamps
- iv additional fog lights
- v fuel cut off switches
- vi engine cut off switches

The operating principles of safety fitment systems

a the following safety fitments:
- i reversing aids and systems
- ii working lamps
- iii driving lamps
- iv. additional fog lights
- v. fuel cut off switches
- vi. engine cut off switches

The relevant legislation relevant to safety fitment systems

a find and apply all relevant legislation for the fitment and use of safety fitment systems

Basic common faults and testing methods associated with safety fitment systems

a to include the following systems and components:
- i control units
- ii components
- iii horns
- iv relays
- v diodes
- vi wiring
- vii connections
- viii protection devices
- ix removal and refitting procedures

The different types of towing systems and components

a components to include:
- i reversing aids and systems
- ii towbar mounting systems
- iii single and double plug wiring systems
- iv audible warning systems
- v split charging systems
- vi trailer lighting board

The function of component parts in towing systems

a components must include:
- i reversing aids
- ii towbar
- iii wiring connectors
- iv audible warning systems
- v visible warning systems
- vi split charge control units
- vii relays
- viii lighting boards

The operating principles of towing systems

a principles to include:
- i reversing aids
- ii 7 pin plug systems
- iii vehicle lighting systems
- iv audible warning systems
- v visible warning systems
- vi split charge systems

The relevant legislation relevant to Towbar systems

a find and apply all relevant legislation for the fitment and use of towbar systems

Basic common faults and testing methods associated with towing systems

a basic faults and tests to include:
   i lighting systems
   ii split charge systems
   iii warning systems
   iv reversing aid systems
   v earth faults
   vi voltage test methods
   vii resistance testing
   viii functional tests

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how electrical enhancement systems and components operate	1.1	identify commonly fitted electrical enhancement systems and components			
		1.2	describe the function and operation of the electrical enhancement systems and components			
		1.3	describe how the enhancement may be limited by the existing vehicle systems and fitments			
		1.4	compare the advantages and disadvantages of carrying out the vehicle electrical customisation			
2	Understand how to fit electrical enhancement systems and components	2.1	describe the procedures involved in fitting vehicle enhancement systems and components			
		2.2	describe how to follow manufacturers requirements relating to the components that are fitted			
		2.3	compare the differences in fitting a tow bar between a light vehicle and a draw bar on a heavy vehicle			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Understand how to carry out checks to any electrical enhancement systems and components fitted	3.1	describe the checks that are made to make sure the components are compatible with the vehicle specification and the customer requirements			
		3.2	explain how to test and evaluate the performance of any electrical enhancements fitted against vehicle specification and the importance of doing so			
		3.3	explain how to make adjustments to components and to any surrounding systems to ensure effective operation			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 12: Skills in Enhancing Vehicle Electrical Systems

Unit reference number: J/601/6035

QCF level: 2

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit will help the learner to develop the skills required to demonstrate they can carry out a range of vehicle enhancement activities to improve the original vehicle features and specification and to meet customer requirements.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor carrying out electrical enhancement from 3 different systems out of the 10 listed below, which covers the learning outcomes.

- a audio systems
- b visual systems
- c communication equipment
- d safety fitments
- e lamps
- f tow bars
- g reversing aids
- h navigation systems
- i alarm systems
- j immobilization system

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out vehicle electrical enhancement activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out vehicle electrical enhancement activities			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the vehicle enhancement activities, by reviewing manufacturer: a technical data b fitting procedures c legal requirements			
		2.2	use technical information to support the vehicle enhancement activities			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out vehicle enhancement activities			
		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 vehicle enhancement activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out vehicle electrical enhancement activities	4.1	ensure prior to fitment that components are compatible with the vehicle specification and the customer's requirements			
		4.2	carry out all vehicle enhancement activities following: a manufacturers' instructions b legal requirements c workplace procedures d health and safety requirements			
		4.3	ensure when necessary that adjustments to components and systems are carried out to ensure correct and effective operation			
		4.4	ensure all enhanced vehicle electrical components are secure and function as specified by the manufacturer or any legal requirements			
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant persons 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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 13: Knowledge of Inspecting Vehicles Using Prescribed Methods

Unit reference number: M/601/6028

QCF level: 2

Credit value: 1

Guided learning hours: 4

Unit Summary

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

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how to carry out inspections on light vehicle using prescribed methods	1.1	explain the difference between the various prescribed light vehicle inspection methods to include: a pre-work b installed system functional check c post-work d vehicle handover inspection			
		1.2	identify the different systems to be inspected when using the prescribed inspection methods			
		1.3	identify the procedures involved in carry 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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 14: Skills in Inspecting Vehicles using Prescribed Methods

Unit reference number: T/601/6046

QCF level: 2

Credit value: 2

Guided learning hours: 4

Unit Summary

This unit allows the learner to demonstrate they can carry out a range of light vehicle inspections on vehicles using a variety of prescribed testing and inspection methods.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor carrying out **2 different inspections from the 4 listed below,** which covers the learning outcomes.

- a pre-work
- b installed system functional check
- c post-work
- d vehicle handover inspection

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out light vehicle inspections using prescribed methods	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out vehicle inspection activities			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out a range of inspections on light vehicle systems			
		3.2	use tools and equipment in the way specified by manufacturers when carrying out a range of inspections on light vehicle systems including:			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out light vehicle inspections using prescribed methods	4.1	carry out light vehicle inspections using prescribed methods, adhering to the specifications and tolerances for the vehicle and following: a manufacturer's approved inspection methods b recognised researched inspection methods c health and safety requirements d prescribed documentation			
		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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 15: Knowledge of Removing and Replacing Light Vehicle Electrical Units and Components

Unit reference number: T/601/3731

QCF level: 2

Credit value: 6

Guided learning hours: 45

Unit Summary

This unit enables the learner to develop an understanding of the principles, construction and operation and testing methods of common electrical and electronic systems and components. It also covers the procedures involved in the removal and replacement of system components and the evaluation of their performance.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

Electrical/electronic principles

a electrical units:
- i volt (electrical pressure)
- ii ampere (electrical current)
- iii ohm (electrical resistance)
- iv watt (power)

b the requirements for an electrical circuit:
- i battery
- ii cables
- iii switch
- iv current consuming device
- v continuity

c the direction of current flow and electron flow

d series and parallel circuits to include:
   i current flow
   ii voltage of components
   iii volt drop
   iv resistance
   v the effect on circuit operation of open circuit component(s)

e earth and insulated return systems

f cable sizes and colour codes

g different types of connectors, terminals and circuit protection devices

h common electrical and electronic symbols

i the meaning of:
   i short circuit
   ii open circuit
   iii bad earth
   iv high resistance
   v electrical capacity

j the principles of vehicle electronic systems and component

k interpret vehicle wiring diagrams to include:
   i vehicle lighting
   ii auxiliary circuits
   iii indicators
   iv starting and charging systems

l function and construction of electrical components including:
   i circuit relays
   ii bulb types
   iii fan and heater
   iv circuit protection

m the safety precautions when working on electrical and electronic systems to include:
   i disconnection and connection of battery
   ii avoidance of short circuits
   iii power surges
   iv prevention of electric shock
   v protection of electrical and electronic components
   vi protection of circuits from overload or damage

n the set-up and use of:
   i digital and analogue multi-meters
   ii voltmeter
   iii ammeter
   iv ohmmeter
   v oscilloscope
   vi manufacturer's dedicated test equipment

o electrical and electronic checks for electrical and electronic systems to include:
   i connections
   ii security
   iii functionality
   iv performance to specifications
   v continuity, open circuit
   vi short circuit
   vii high resistance
   viii volt drop
   ix current consumption
   x output patterns (oscilloscope)

p symptoms and faults associated with electrical and electronic systems to include:
   i high resistance
   ii loose and corroded connections
   iii short circuit
   iv excessive current consumption
   v open circuit
   vi malfunction
   vii poor performance
   viii battery faults to include flat battery
   ix failure to hold charge
   x low state of charge
   xi overheating
   xii poor starting

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

b inertia and pre-engaged principles

c 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

a function and construction of electrical components including:
   i front and tail lamps
   ii main and dip beam headlamps
   iii fog and spot lamps
   iv lighting and dip switch
   v directional indicators

b the circuit diagram and operation of components for:
   i side and tail lamps
   ii headlamps
   iii interior lamps
   iv fog and spot lamps
   v direction indicators

c the statutory requirements for vehicle lighting when using a vehicle on the road

d headlamp adjustment and beam setting

Auxiliary systems

a function and construction of electrical components including:
   i central door locking
   ii anti theft devices
   iii manual locking and dead lock systems
   iv window winding
   v demisting systems
   vi door mirror operation mechanisms
   vii interior lights and switching
   viii sun roof operation

b the circuit diagram and operation of components for:
   i central door locking
   ii anti theft devices
   iii manual locking and dead lock systems
   iv window winding
   v demisting systems
   vi door mirror operation mechanisms
   vii sun roof operation

c comfort and convenience systems to include:
   i heated seats
   ii electrically adjusted seats
   iii heated screens
   iv electric mirrors
   v heating
   vi climate control
   vii air conditioning

General

a the preparation, testing and use of:
   i tools and equipment
   ii electrical meters and equipment used for dismantling
   iii 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 important 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

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand light vehicle electrical and electronic principles	1.1	identify electrical symbols and units found in light vehicle circuits			
		1.2	describe how to interpret simple light vehicle wiring diagrams			
		1.3	describe the operation of key light vehicle circuit protection devices and why these are necessary			
		1.4	describe earthing principles and earthing methods			
		1.5	identify the use of different cables and connectors used in light vehicle circuits			
		1.6	describe the operation of electrical and electronic sensors and actuators and their application			
		1.7	describe the key electrical and electronic control principles that are related to light vehicle electrical circuits			
		1.8	state common terms used in light vehicle electrical circuits			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Understand how light vehicle batteries, starting and charging systems operate	2.1	identify light vehicle batteries, starting and charging system components			
		2.2	describe the construction and operation of light vehicle batteries, starting and charging system components			
		2.3	describe how to remove and replace batteries, starting and charging system units and components			
		2.4	compare light vehicle batteries, starting and charging system components and assemblies against alternatives to identify differences in construction and operation			
		2.5	state common terms used in conjunction with light vehicle batteries, starting and charging systems			
3	Understand how light vehicle auxiliary electrical systems operate	3.1	identify light vehicle auxiliary system components			
		3.2	describe the construction and operation of light vehicle auxiliary systems auxiliary systems to include: a lighting b wiper c security and alarm d comfort and convenience			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
			e information and entertainment f telephone and two-way communication g electric window h monitoring and instrumentation			
		3.3	compare key light vehicle auxiliary system components and assemblies against alternatives to identify differences in construction and operation			
		3.4	state common terms used in light vehicle auxiliary system design			
4	Understand how to check, replace and test light vehicle electrical systems and components	4.1	describe how to remove and replace light vehicle electrical system units and components			
		4.2	describe common types of testing methods used to check the operation of light vehicle electrical systems and components and their purpose			
		4.3	explain how to test and evaluate the performance of replacement units against specifications			
		4.4	identify common faults found in light vehicle electrical systems and components			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 16: Skills in Removing and Replacing Light Vehicle Electrical Units and Components

Unit reference number: T/601/3874

QCF level: 2

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit allows the learner to develop skills to remove and replace motor vehicle electrical system components. It also covers the evaluation of performance of the replaced units and systems

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 produce evidence of carrying out the removal and replacement of vehicle electrical units and components from:

- a engine starting systems
- b engine charging systems
- c **PLUS** 2 different systems out of the 8 listed below:
  - i lighting
  - ii wiper
  - iii security and alarm
  - iv comfort and convenience
  - v information and entertainment
  - vi telephone and two-way communication
  - vii electric window systems
  - viii monitoring and instrumentation system

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out removal and replacement activities	1.1	use suitable personal protective equipment and vehicle coverings when working on light vehicle electrical systems and components			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support light vehicle electrical unit and component removal and replacement activities including: a vehicle technical data b removal and replacement procedures c legal requirements			
		2.2	use technical information to support light vehicle electrical unit and component removal and replacement activities			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for removal and replacement of motor vehicle electrical system components			
		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 remove and replace motor vehicle electrical systems			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out removal and replacement of light vehicle electrical units and components.	4.1	remove and replace the motor vehicle's electrical systems and components, adhering to the specifications and tolerances for the vehicle and following: a the manufacturer's approved removal and replacement methods b recognised researched repair methods c health and safety requirements.			
		4.2	ensure that replacement motor vehicle electrical units and components conform to the vehicle operating specification and any legal requirements			
		4.3	use suitable testing methods to evaluate the performance of the reassembled system			
		4.4	ensure that the reassembled motor vehicle electrical systems performs to the vehicle operating specification and meets any legal requirements			
5	Be able to record information and make suitable recommendations	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		5.3	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 17: Knowledge of the Overhauling of Electrical Units

Unit reference number: L/601/6022

QCF level: 2

Credit value: 6

Guided learning hours: 45

Unit Summary

This unit enables the learner to develop an understanding of the repair and overhauling of electrical units.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

The various types of generators fitted to motor vehicles

a generators must include:
- i alternator with an internal regulator
- ii alternator with an external regulator
- iii alternator with a separate regulator
- iv DC generators

The operating principles of each generator

a generators must include:
- i alternators with an internal regulator
- ii alternators with an external regulator
- iii alternators with a separate regulator
- iv DC generators

The components and how they function within each type of generator

a generators must include:
- i alternators with an internal regulator
- ii alternators with an external regulator
- iii alternators with a separate regulator
- iv DC generators

b components must include:
   i rotors
   ii stators
   iii rectifiers
   iv regulator
   v slip rings
   vi bearings
   vii housings
   viii fans and pulleys
   ix armatures
   x field windings
   xi brushes and brush boxes
   xii surge protection diode

Test each component within each type of generator

a generators must include:
   i alternators with an internal regulator
   ii alternators with an external regulator
   iii alternators with a separate regulator
   iv DC generators

b components must include:
   i rotors
   ii stators
   iii rectifiers
   iv regulator
   v slip rings
   vi bearings
   vii housings
   viii fans and pulleys
   ix armatures
   x field windings
   xi brushes and brush boxes
   xii surge protection diode

c tools must include:
   i voltmeters
   ii ammeters
   iii ohmmeters
   iv insulation testers
   v regulator testers

Symptoms and faults associated with basic generators

a generators must include:
- i alternators with an internal regulator
- ii alternators with an external regulator
- iii alternators with a separate regulator
- iv DC generators

Test procedures for the repaired generators and evaluate the results

a generators must include:
- i alternators with an internal regulator
- ii alternators with an external regulator
- iii alternators with a separate regulator
- iv DC generators

b tools must include:
- i voltmeters
- ii ammeters
- iii specialist test equipment

The various types of starter motor fitted to motor vehicles

a starter motors must include:
- i inertia starter motors
- ii pre-engaged starter motors
- iii axial starter motors
- iv co-axial starter motors

The operating principles of each type of starter motor

a starter motors must include:
- i pre-engaged starter motors
- ii axial starter motors
- iii co-axial starter motors
- iv gear reduction starters add

The components and how they function within each type of starter motors

a starter motors must include:
- i pre-engaged starter motors
- ii axial starter motors
- iii co-axial starter motors
- iv gear reduction starters add

b components must include:
- i armatures
- ii field windings
- iii brushes and brush boxes
- iv bearings and bushes

v solenoids
vi drive gears and clutches
vii housings
viii fans and pulleys
ix reduction gears

Test each component within each type of starter motors

a starter motors must include:
i pre-engaged starter motors
ii axial starter motors
iii co-axial starter motors
iv gear reduction starters

b components must include:
i armatures
ii field windings
iii brushes and brush boxes
iv bearings and bushes
v solenoids
vi drive gears and clutches
vii housings
viii fans and pulleys
ix reduction gears

c tools must include:
i voltmeters
ii ammeters
iii ohmmeters
iv insulation testers

Symptoms and faults associated with starter motors

a starter motors must include:
i pre-engaged starter motors
ii axial starter motors
iii co-axial starter motors
iv gear reduction

Tests and adjustment procedures for the repaired starter motors and evaluate the results

a starter motors must include:
i pre-engaged starter motors
ii axial starter motors
iii co-axial starter motors
iv gear reduction add

b tools must include:

i voltmeters
ii ammeters
iii specialist test equipment
iv lock torque testers

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how to use appropriate electrical testing equipment	1.1	identify specialist electrical test equipment used for overhauling electrical units			
		1.2	describe how to use and operate specialist electrical test equipment used for overhauling electrical units			
		1.3	describe how to prepare, assess and test the accuracy and operation of all the electrical repair and testing equipment			
2	Understand how to find, select and use sources of overhaul information	2.1	identify suitable sources of technical information to support electrical repair procedures including: a technical data b manufacturer's instructions c legal requirements d industry recognised repair methods			
		2.2	explain how to interpret and use technical information to support the electrical repair procedures			
3	Understand how to carry out testing to electrical systems and components	3.1	describe how to test and evaluate the performance of vehicles electrical systems against vehicle specification			
		3.2	explain how to interpret test results and carry out electrical efficiency calculations			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.3	identify common symptoms, causes and faults found in vehicle charging and starting systems			
		3.4	explain methods used to identify vehicle charging and starting systems faults			
		3.5	describe how the condition of the components are assessed within charging and starting systems to find faults			
		3.6	describe how to test the following alternator components: a diode pack b rotor field c stator windings			
		3.7	describe the purpose and when to use torque, resistance, insulation and visual tests			
		3.8	explain the suppression requirements applicable to electrical components and the types of faults which can occur in charging, starting and motor systems			
4	Understand how to overhaul starting, charging, motor and actuator systems	4.1	describe how to overhaul charging, starting, motor and actuator systems			
		4.2	describe how to carry out a solder repair			
		4.3	explain the procedures to make suitable adjustments to the starter drive setting			
		4.4	describe how to evaluate the operation of components and systems following overhaul			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 18: Skills in the Overhauling of Electrical Components

Unit reference number: R/601/6037

QCF level: 2

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit will help the learner to develop the skills required to demonstrate overhaul of starting, charging and other electrical units.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor carrying out electrical overhauling activities from **3 different electrical units,** covering at least 2 of the areas listed below, which covers the learning outcomes.

- a generators
- b starters
- c motors
- d actuators

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when overhauling electrical components	1.1	use suitable personal protective equipment and vehicle coverings throughout when overhauling vehicle electrical components			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the electrical overhaul activities, by reviewing manufacturers: a technical data b manufacturers overhauling procedures c test procedures			
		2.2	use technical information to support the electrical overhaul activities			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out the electrical overhaul activities			
		3.2	check 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 electrical overhaul activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to overhaul electrical components	4.1	ensure initial assessment and testing methods of electrical units identifies accurately the condition and suitability for reconditioning, repair or replacement			
		4.2	use electrical testing methods which are suitable for assessing the performance of the type of electrical unit being tested			
		4.3	carry out all electrical overhauling activities following: a manufacturers' instructions b recognised researched repair methods c health and safety requirements			
		4.4	ensure when necessary that adjustments to components are carried out to ensure correct and effective operation			
		4.5	ensure all repaired alternators and starters are secure and function as specified by the manufacturer or any legal requirements			
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant persons 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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 19: Knowledge of Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)

Unit reference number: K/601/6027

QCF level: 2

Credit value: 3

Guided learning hours: 25

Unit Summary

This unit enables the learner to develop an understanding of the operation and fitting of auxiliary locks and security devices to improve the original features and specification of the vehicle and to meet customer requirements.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

The identification of different types of auxiliary locks and security devices components

a systems and components to include:
- i electronic/electro mechanical lock mechanisms
- ii additional auxiliary mechanical door locks using cylinder type locks
- iii additional auxiliary mechanical door/aperture locks using external locking systems
- iv mechanical window protection devices (internal and external)
- v replacement security windows/ window security films
- vi pneumatic locking systems

The function of components in the auxiliary locks and security devices components

a components include:
- i electronic/electro mechanical lock mechanisms
- ii additional auxiliary mechanical door locks using cylinder type locks
- iii additional auxiliary mechanical door/aperture locks using external locking systems
- iv mechanical window protection devices (internal and external)
- v replacement security windows/ window security films
- vi pneumatic locking systems

The operating principles of auxiliary locks and security systems

a systems include:
   i electronic/electro mechanical lock mechanisms
   ii additional auxiliary mechanical door locks using cylinder type locks
   iii additional auxiliary mechanical door/aperture locks using external locking systems
   iv mechanical window protection devices (internal and external)
   v replacement security windows/ window security films
   vi pneumatic locking systems

The relevant legislation relevant to the auxiliary locks and security systems

a find and apply all relevant legislation for the fitment and use of auxiliary locks and security systems

Faults and testing methods associated with auxiliary locks and security systems

a test and procedures for the following:
   i lock mechanisms
   ii cylinder locks
   iii external locks
   iv window protection devices
   v pneumatic locks

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how auxiliary locks and security devices operate	1.1	identify auxiliary locks and security devices including: a electronic and electro mechanical lock mechanisms b additional auxiliary mechanical door locks using cylinder type locks c additional auxiliary mechanical door and aperture locks using external locking systems d mechanical window protection devices (internal and external) e replacement security windows and window security films f pneumatic locking systems			
		1.2	describe the function and operation of the auxiliary locks and security devices			
		1.3	describe how the fitment may be limited by the existing vehicle systems and fitments			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.4	compare the advantages and disadvantages of carrying out the fitting of auxiliary locks and security devices			
		1.5	describe the interaction between electrical and electronic and mechanical components within auxiliary locks and security devices			
2	Understand how to fit auxiliary locks and security devices	2.1	describe the procedures involved in fitting auxiliary locks and security devices			
		2.2	describe how to integrate vehicle electrical systems with auxiliary locks and security devices			
		2.3	describe how to apply vehicle body anticorrosion to meet vehicle requirements			
3	Understand how to carry out checks to auxiliary locks and security devices fitted	3.1	describe the checks that are made to make sure the components are compatible with the vehicle specification and the customer requirements			
		3.2	explain how to test and evaluate the performance of any auxiliary locks and security devices fitted against vehicle specification and the importance of doing so			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.3	describe how to prepare, calibrate and use any equipment required to fit auxiliary security devices			
		3.4	explain how to make adjustments to components and to any surrounding systems to ensure effective operation			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 20: Skills in Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)

Unit reference number: H/601/6043

QCF level: 2

Credit value: 3

Guided learning hours: 25

Unit Summary

This unit will help the learner to develop the skills required to demonstrate they can carry out a range of vehicle enhancement activities fitting auxiliary locks and security devices. It also covers the evaluation of performance of the fitted auxiliary locks and security devices.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre

3 be observed by an assessor as defined by the IMI Assessment Strategy

4 be observed by an assessor fitting auxiliary locks and security devices (electrical & mechanical) from **2 different systems out of the 6 listed below,** which covers the learning outcomes.

- a electronic and electro mechanical lock mechanisms
- b additional auxiliary mechanical door locks using cylinder type locks
- c additional auxiliary mechanical door and aperture locks using external locking systems
- d mechanical window protection devices (internal and external)
- e replacement security windows and window security films
- f pneumatic locking systems

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out the fitting of auxiliary locks and security devices	1.1	use suitable personal protective equipment and vehicle coverings throughout when fitting auxiliary locks and security devices			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the fitting of auxiliary locks and security devices including: a vehicle technical data b manufacturers fitting procedures			
		2.2	use technical information to support the fitting of auxiliary locks and security devices			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for the fitting of auxiliary locks and security devices			
		3.2	check that equipment has been calibrated to meet manufacturers' and legal requirements			
		3.3	use the equipment required, correctly and safely throughout all of the fitting activities			
4	Be able to carry out the fitting of auxiliary locks and security devices	4.1	ensure fitment of components are compatible with the vehicle specification and the customer's requirements			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.2	carry out all vehicle fitting activities following: a manufacturers' instructions b legal requirements c workplace procedures d health and safety requirements			
		4.3	ensure when necessary that adjustments to components and systems are carried out to ensure correct and effective operation			
		4.4	ensure all auxiliary locks and security devices conform to the vehicle operating specification and are secure and function as specified by the manufacturer or any legal requirements			
5	Be able to record information and make suitable recommendations	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 21: Knowledge of Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels

Unit reference number: F/601/3747

QCF level: 2

Credit value: 2

Guided learning hours: 20

Unit Summary

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.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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
   f aperture gaps
   g alignment of panel features
   h best fit of components to panels
   i vehicle geometry

j operation of openings such as doors, tailgates, bonnets etc

k 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

l the method of storing removed panels and the importance of storing them correctly

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how to carry out removal and fitting of basic light vehicle mechanical electrical and trim (MET) components	1.1	identify the procedures involved in carry 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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			
2	Understand how to carry out removal and fitting of basic light vehicle non permanently fixed vehicle body panels	2.1	identify the procedures involved in carry 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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	explain the procedure for reporting cosmetic damage to light vehicle non-welded, non-structural body panels			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 22: Skills in Removing and Fitting Basic Motor Mechanical, Electrical and Trim Components and non Permanently Fixed Vehicle Body Panels

Unit reference number: K/601/3869

QCF level: 2

Credit value: 3

Guided learning hours: 20

Unit Summary

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.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy.

4 produce evidence from your normal workplace of removing and replacing 4 of the 12 units or components from the list below on at least 2 occasions.

- a bumpers
- b headlamp units
- c road wheels
- d batteries
- e bonnet fittings
- f interior trim components

g exterior trim components

h wings

i doors

j bonnets

k boot lids and tailgates

l bumper bars, covers and components

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out removal and fitting of basic MET components and non-permanently fixed light vehicle body panels	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			
2	Be able to use relevant information to carry out the task	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			
3	Be able to use appropriate tools and equipment	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			
4	Be able to carry out removal and fitting of basic MET components and non-permanently fixed light vehicle body panels	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 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			
5	Be able to record information and make suitable recommendations	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		5.3	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 23: Competency in Locating and Correcting Simple Electrical Faults in the Automotive Workplace

Unit reference number: H/601/6057

QCF level: 2

Credit value: 10

Guided learning hours: 90

Unit Summary

This unit will enable the learner to demonstrate competency in conducting a range of routine electrical tests and identifying simple faults on a variety of basic electrical components and undertaking suitable correction activities.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk.

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy.

4 produce evidence of locating and correcting **simple** faults occurring in **7 out of the 11*** engine systems listed, **at least 5** of which must come from work carried out **in your normal workplace.**

- a power storage devices
- b power generating devices
- c vehicle starting devices
- d vehicle lighting devices
- e wiring harness and connection devices
- f vehicle sensors and actuators

g circuit protection devices

h information and entertainment systems

i telematic and tracking systems

j security systems

k communication systems

5 be observed by your assessor on at least 2 occasions, each observation covering the location and correction of the fault in different systems.

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in locating and correcting faults in all the systems.

Simulated activity **will be** acceptable to assess candidates' competence in location and correction on no more than **2** occasions.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out electrical testing techniques and rectification activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out vehicle electrical testing and rectification activities			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the identification of electrical faults, by reviewing: a technical data b diagnostic test procedures			
		2.2	use technical information to support the identification of electrical faults			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out electrical testing techniques and rectification activities			
		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 electrical testing techniques and rectification activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out electrical testing techniques and rectification activities	4.1	carry out a functionality test of the electrical system and or component			
		4.2	use electrical testing methods that are suitable for assessing the performance of the electrical system and or components concerned			
		4.3	carry out all diagnostic and rectification activities following: a manufacturers' instructions b recognised researched repair methods c workplace procedures d health and safety requirements			
		4.4	ensure all electrical testing techniques clearly identifies the cause of the identified faults			
		4.5	seek assistance of the relevant person promptly where the results of the testing are unclear			
		4.6	ensure all repaired and replaced electrical components are secure and function as specified by the manufacturer or any legal requirements			
		4.7	dispose of any removed electrical components safely to comply with legal requirements and workplace procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.8	complete all electrical fault location and correction activities within the agreed timescale			
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 24: Competency in Enhancing Vehicle Electrical Systems

Unit reference number: K/601/6061

QCF level: 2

Credit value: 10

Guided learning hours: 90

Unit Summary

This unit will enable the learner to demonstrate competency in carrying out a range of vehicle enhancement activities to improve the original vehicle features and specification and to meet customer requirements.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk.

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy.

4 produce evidence from your normal workplace of carrying out electrical enhancement from 4 different systems out of the 10 **listed below *.**

- a audio systems
- b visual systems
- c communication equipment
- d safety fitments
- e lamps
- f tow bars
- g reversing aids
- h navigation systems

i alarm systems

j immobilization system

5 be observed by your assessor on **at least 1 occasion** carrying out the electrical enhancement

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of **all** the types of electrical enhancements listed above.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out vehicle electrical enhancement activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out vehicle electrical enhancement activities			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the vehicle enhancement activities, by reviewing manufacturer: a technical data b fitting procedures c legal requirements			
		2.2	use technical information to support the vehicle enhancement activities			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out vehicle enhancement activities			
		3.2	ensure that equipment has been calibrated to meet manufacturers' and legal requirements			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.3	use the correct tools and equipment in the way specified by manufacturers when carrying out vehicle enhancement activities			
4	Be able to carry out vehicle electrical enhancement activities	4.1	ensure prior to fitment that components are compatible with the vehicle specification and the customer's requirements			
		4.2	carry out all vehicle enhancement activities following: a manufacturers' instructions b legal requirements c workplace procedures d health and safety requirements			
		4.3	ensure when necessary that adjustments to components and systems are carried out to ensure correct and effective operation			
		4.4	ensure all enhanced vehicle electrical components are secure and function as specified by the manufacturer or any legal requirements			
		4.5	complete all vehicle enhancement activities within the agreed timescale			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant persons promptly in the format required			
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant persons promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 25: Competency in Inspecting Vehicles Using Prescribed Methods

Unit reference number: K/601/6108

QCF level: 2

Credit value: 3

Guided learning hours: 8

Unit Summary

This unit will enable the learner to demonstrate competency in carrying out a range of light vehicle inspections on vehicles using a variety of prescribed testing and inspection methods.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk.

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy.

4 produce evidence from your normal workplace of carrying out 3 different inspection activities from the 4 listed below *.

- a pre-work
- b installed system functional check
- c post-work
- d vehicle handover inspection

5 be observed by your assessor on at least 2 occasions one from each area

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of **all** the types of inspection activities listed above.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out light vehicle inspections using prescribed methods	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out vehicle inspection activities			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	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			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out a range of inspections on light vehicle systems			
		3.2	use tools and equipment in the way specified by manufacturers when carrying out a range of inspections on light vehicle systems including:			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out light vehicle inspections using prescribed methods	4.1	carry out light vehicle inspections using prescribed methods, adhering to the 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 d prescribed documentation			
		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			
		4.5	work to the specified timescale for the activity			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 26: Competency in Removing and Replacing Light Vehicle Electrical Units and Components

Unit reference number: Y/601/3771

QCF level: 2

Credit value: 10

Guided learning hours: 90

Unit Summary

This unit enables the learner to demonstrate competency in removing and replacing motor vehicle electrical system components. It also covers the evaluation of performance of the replaced units and systems.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk.

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy.

4 produce evidence of removing and replacing at least 5 units or components, each from a different electrical system. At least 4 of these 5 pieces of evidence must come from work in your normal workplace.

5 be observed by your assessor on at least 1 occasion in your normal workplace carrying out the removal and replacement of at least 1 of the following*:

   a engine starting

   b battery charging

6 be observed by your assessor on **at least 1 occasion in your normal workplace** successfully carrying out the removal and replacement of electrical units and components ***:**

a lighting

b wiper

c security and alarm

d comfort and convenience

e information and entertainment

f telephone and two-way communication

g electric window systems

h monitoring and instrumentation systems

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

Simulated activities **will be** acceptable to assess candidates' removal and replacement competence on no more than **1** occasion.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out removal and replacement activities	1.1	use suitable personal protective equipment and vehicle coverings when working on light vehicle electrical systems and components			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support light vehicle electrical unit and component removal and replacement activities including: a vehicle technical data b removal and replacement procedures c legal requirements			
		2.2	use technical information to support light vehicle electrical unit and component removal and replacement activities			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for removal and replacement of motor vehicle electrical system components			
		3.2	ensure that equipment has been calibrated to meet manufacturers' and legal requirements			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.3	use the tools and equipment in the way specified by manufacturers to remove and replace motor vehicle electrical systems: a auxiliary			
4	Be able to carry out removal and replacement of light vehicle electrical units and components	4.1	remove and replace the motor vehicle's electrical systems and components, adhering to the specifications and tolerances for the vehicle and following: a the manufacturer's approved removal and replacement methods b recognised researched repair methods c health and safety requirements			
		4.2	ensure that replacement motor vehicle electrical units and components conform to the vehicle operating specification and any legal requirements			
		4.3	use suitable testing methods to evaluate the performance of the reassembled system			
		4.4	ensure that the reassembled motor vehicle electrical systems performs to the vehicle operating specification and meets any legal requirements			
		4.5	complete all the system diagnostic activities within the agreed timescale			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 27: Competency in the Overhauling of Electrical Components

Unit reference number: J/601/6066

QCF level: 2

Credit value: 10

Guided learning hours: 90

Unit Summary

This unit will enable the learner to demonstrate competency in the overhauling of starting, charging and other electrical units.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk.

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy.

4 produce evidence of carrying out electrical overhauling activities from **4 different electrical units,** covering at least 2 of the areas listed below. **At least 3** of which must come from work carried out **in your normal workplace.**

   a generators

   b starters

   c motors

   d actuators

5 be observed by your assessor on **at least 2 occasions** carrying out electrical overhauling activities

   Simulated activity **will be** acceptable to assess candidates' competence in electrical overhauling on no more than **1** occasion.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when overhauling electrical components	1.1	use suitable personal protective equipment and vehicle coverings throughout when overhauling vehicle electrical components			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the electrical overhaul activities, by reviewing manufacturers: a technical data b manufacturers overhauling procedures c test procedures			
		2.2	use technical information to support the electrical overhaul activities			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out the electrical overhaul activities			
		3.2	check 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 electrical overhaul activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to overhaul electrical components	4.1	ensure initial assessment and testing methods of electrical units identifies accurately the condition and suitability for reconditioning, repair or replacement			
		4.2	use electrical testing methods which are suitable for assessing the performance of the type of electrical unit being tested			
		4.3	carry out all electrical overhauling activities following: a manufacturers' instructions b recognised researched repair methods c health and safety requirements			
		4.4	ensure when necessary that adjustments to components are carried out to ensure correct and effective operation			
		4.5	ensure all repaired alternators and starters are secure and function as specified by the manufacturer or any legal requirements			
		4.6	complete all the electrical overhaul activities within the agreed timescale			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant persons promptly in the format required			
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant persons promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 28: Competency in Fitting Auxiliary Locks and Security Devices (Electrical & Mechanical)

Unit reference number: D/601/6106

QCF level: 2

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit will enable the learner to demonstrate competency in carrying out a range of vehicle enhancement activities fitting auxiliary locks and security devices. It also covers the evaluation of performance of the fitted auxiliary locks and security devices.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence of fitting auxiliary locks and security devices (electrical and mechanical) from **2 different systems out of the 6 listed below * At least 1** pieces of evidence must come from work carried out **in your normal workplace**

- a electronic and electro mechanical lock mechanisms
- b additional auxiliary mechanical door locks using cylinder type locks
- c additional auxiliary mechanical door and aperture locks using external locking systems
- d mechanical window protection devices (internal and external)

e replacement security windows and window security films

f pneumatic locking systems

5 be observed by your assessor on **at least 1 occasion** carrying out the electrical enhancement

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of **all** the types of auxiliary locks and security devices listed above.

Simulated activity **will be** acceptable to assess candidates' competence in diagnosis and rectification on no more than **1** occasion.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out the fitting of auxiliary locks and security devices	1.1	use suitable personal protective equipment and vehicle coverings throughout when fitting auxiliary locks and security devices			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the fitting of auxiliary locks and security devices including: a vehicle technical data b manufacturers fitting procedures			
		2.2	use technical information to support the fitting of auxiliary locks and security devices			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for the fitting of auxiliary locks and security devices			
		3.2	check that equipment has been calibrated to meet manufacturers' and legal requirements			
		3.3	use the equipment required, correctly and safely throughout all of the fitting activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out the fitting of auxiliary locks and security devices	4.1	ensure fitment of components are compatible with the vehicle specification and the customer's requirements			
		4.2	carry out all vehicle fitting activities following: a manufacturers' instructions b legal requirements c workplace procedures d health and safety requirements			
		4.3	ensure when necessary that adjustments to components and systems are carried out to ensure correct and effective operation			
		4.4	ensure all auxiliary locks and security devices conform to the vehicle operating specification and are secure and function as specified by the manufacturer or any legal requirements			
		4.5	complete all vehicle fitting activities within the agreed timescale			
5	Be able to record information and make suitable recommendations	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 29: Competency in Removing and Fitting Basic Light Vehicle Mechanical, Electrical and Trim (MET) Components and Non Permanently Fixed Vehicle Body Panels

Unit reference number: J/601/3751

QCF level: 2

Credit value: 5

Guided learning hours: 40

Unit Summary

This unit enables the learner to demonstrate competency in removing and fitting 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.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk.

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy.

4 produce evidence from your normal workplace of removing and replacing 6 of **the 12** units or components from the list below on at **least 2 occasions**.

- a bumpers
- b headlamp units
- c road wheels

d batteries

e bonnet fittings

f interior trim components

g exterior trim components

h wings

i doors

j bonnets

k boot lids and tailgates

l bumper bars, covers and components

5 be observed by your assessor on at least 2 occasions, each observation covering the removal and replacement of **different** units.

Evidence from simulated activities is acceptable for this unit on no more than 20% in line with the IMI VCQ Assessment Strategy.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out removal and fitting of basic MET components and non-permanently fixed light vehicle body panels	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			
2	Be able to use relevant information to carry out the task	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			
3	Be able to use appropriate tools and equipment	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			
4	Be able to carry out removal and fitting of basic MET components and non-permanently fixed light vehicle body panels	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 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			
		4.5	complete all activities within the agreed timescale			
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 30: Knowledge of Diagnosis and Rectification of Vehicle Auxiliary Electrical Faults

Unit reference number: A/601/3746

QCF level: 3

Credit value: 6

Guided learning hours: 45

Unit Summary

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.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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 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 screen elements
- ii mirror elements
- iii time control relays
- iv multifunction relays and switched

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 In Car Entertainment (ICE) 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 ICE 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 ICE systems

a operation of entertainment systems speaker and aerial systems

Common faults and testing methods associated with ICE 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 LED's
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 LED's
- vii wiring
- viii connections and protection devices
- ix removal and refitting procedures
- x using computer diagnostics to identify faults
- xi use of manufacturers 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
- iii valves
- iv switches
- v relays
- vi cooling fan motors
- vii air conditioning units
- viii 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

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

i 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 are:

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 measurements)

g condition

h 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

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand vehicle electrical and electronic principles	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			
2	Understand how light vehicle auxiliary electrical systems operate	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			
3	Understand how to diagnose and rectify faults in auxiliary electrical systems	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 31: Skills in Diagnosing and Rectifying Vehicle Auxiliary Electrical Faults

Unit reference number: H/601/3868

QCF level: 3

Credit value: 5

Guided learning hours: 45

Unit Summary

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.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2. produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor carrying out diagnosis and rectification activities from 3 different systems out of the 14 listed below, which covers the learning outcomes. The fault should involve a 2 or more step diagnostic activity.

- a lighting systems
- b heated seats
- c electrically adjusted seats
- d heated screens
- e electric mirrors
- f electric sunroofs
- g electric windows
- h heating and ventilation systems
- i information and entertainment systems
- j communication systems

k SRS

l wash wipe

m locking systems

n security and warning systems

o alternators

p starter motors

5 be observed by your assessor on at least 1 occasion, covering the diagnosis and rectification of a fault.

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of faults occurring in all the types of electrical systems.

Simulated activity will be acceptable to assess candidates' competence in diagnosis and rectification on no more than 1 occasion.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out automotive vehicle auxiliary electrical diagnostic and rectification activities	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			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support automotive 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 automotive auxiliary electrical system faults			
3	Be able to use appropriate tools and equipment	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out automotive vehicle auxiliary electrical diagnosis, rectification and test activities	4.1	use diagnostic methods that are relevant to the symptoms presented			
		4.2	evaluate your 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: 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 rectified automotive auxiliary electrical system performs to the vehicle operating specification and any legal requirements			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 32: Knowledge of Diagnosis and Rectification of Engine Electrical Faults

Unit reference number: K/503/6879

QCF level: 3

Credit value: 6

Guided learning hours: 45

Unit Summary

This unit enables the learner to develop an understanding of diagnosis and rectification of engine electrical system faults. It also covers the evaluation of performance of the systems.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

Advanced battery technology

a batteries must include:
- i maintenance free
- ii sodium-nickel-chloride
- iii fuel cell
- iv sodium sulphur and swing lead acid
- v fuel cell

b electrochemistry

c calculation on battery efficiency/rating

Battery condition and faults

a faults including:
- i battery not holding charge
- ii unwanted drain
- iii diluted electrolyte
- iv Impurities in electrolyte
- v excessive gassing
- vi low state of charge
- vii sulphating
- viii excessive volt drop during component operation

ix open circuit cell
x overcharging
xi temperature related faults

Operating principles charging systems

a charging systems should include:
  i alternators with internal and external regulators
  ii water cooled alternators
  iii integrated alternators (ISAD)
  iv dynalto systems

b electrical loads imposed by vehicle systems

c rectification and regulation

Test procedures for diagnosing faults with charging systems

a stages in the fault finding process to include:
  i hand and eye checks
  ii supply voltage
  iii generator outputs
  iv under and off load testing for rectification and regulation
  v bench testing
  vi vehicle testing

Symptoms of faults found on charging systems.

a faults to include:
  i charging light inoperative
  ii charging light staying on all the time
  iii battery discharges during normal operation
  iv high resistance in charging circuits
  v loose broken wiring/connections

b internal faults:
  i diode open circuit
  ii worn brushes
  iii regulator faults
  iv rotor open circuit
  v stator open circuit

Advanced charging system technology

a charge balance calculation

b charging system problems and solutions including:
  i upgrading alternator
  ii power management systems
  iii two stage
  iv dual voltage systems

Advanced starting system technology

a outputs in relation to engine size:
   i speed
   ii torque
   iii power
   iv efficiency

b system design characteristics:
   i DC motor characteristics
   ii parallel
   iii shunt
   iv compound
   v series

c electronic starter control

d high voltage systems

e inhibitor circuits

f starter types to include:
   i pre – engaged
   ii permanent magnet for heavy and diesel vehicles
   iii integrated starters

Faults and diagnostic procedures for starting systems

a components to include:
   i solenoid
   ii armature
   iii commutator
   iv brush assemblies
   v drive systems
   vi ignition switches
   vii torque drive systems

b faults to include:
   i battery
   ii wiring
   iii starter switch
   iv inhibitor switch
   v pinion
   vi flywheel
   vii bearings
   viii internal starter components

c identify stages of fault finding

Ignition system technology

a components to include:
   i ignition switch
   ii oil packs
   iii spark plugs and leads
   iv distributors and amplifier units
   v knock sensor
   vi engine speed sensor
   vii manifold sensor
   viii coolant sensor
   ix ECU

b materials used in component manufacture

c systems top include:
   i constant energy systems
   ii hall effect
   iii inductive pulse
   iv open and closed loop
   v distributorless ignition
   vi direct ignition
   vii advance angle timing
   viii integrated ignition circuit

The construction of ignition components

a spark plugs including:
   i heat range
   ii electrode gap
   iii choosing correct plug

b ignition components to include:
   i ignition switch
   ii coil packs and leads
   iii resistors
   iv amplifier units
   v electronic systems

Faults and diagnostic procedures for ignition systems

a diagnostic equipment and procedures relating to the ignition system and components including:
   i wiring, and connections
   ii code readers
   iii oscilloscopes
   iv ohmmeter
   v volt meter
   vi other dedicated equipment
   vii testing sequences

b faults to include:
  i no spark
  ii cold and hot starting problems
  iii erratic running
  iv damp components
  v worn components
  vi incorrect plug gaps
  vii high resistance in circuit
  viii intermittent connections
  ix incorrect timing
  x coil or distributor cap tracking
  xi HT breaking down
  xii running on when switched off
  xiii pinking and knocking
  xiv misfire
  xv erratic idle
  xvi lack of power
  xvii backfire and fouling

The operation and requirements of fuel systems

a fuel systems to include:
  i single point
  ii multi point control layout
  iii sequential multi point
  iv diesel fuel injection
  v petrol injection
  vi computer controlled
  vii lean burn
  viii common rail
  ix catalytic converters

b theories and terms to include:
  i combustion
  ii burn range and rate
  iii detonation
  iv mixture strength effects
  v air-fuel ratios
  vi fuelling and emissions
  vii CoNox
  viii HC
  ix exhaust emission regulations

The function of fuel system components and the relationship between components

a petrol fuel systems:
- i stepper motors
- ii sensors
- iii injectors
- iv fuel pumps
- v relays
- vi cold start
- vii lambda sensors
- viii idle control actuators
- ix single and multipoint injection systems
- x throttle valve potentiometer
- xi phase sensor

b compression ignition systems:
- i engine stop solenoid
- ii injectors
- iii fuel pumps
- iv relays
- v heater plugs
- vi injection pumps
- vii high pressure pumps
- viii filters

c block, flow and circuit diagrams

Faults and diagnostic procedures for fuel system systems

a the stages of fault finding

b diagnostic procedures for including:
- i the use of fault code readers
- ii oscilloscopes
- iii break out boxes
- iv on-board diagnostics
- v other dedicated equipment

c faults:
- i no fuel
- ii filters dirty or blocked
- iii fuel pump
- iv hot and cold start
- v erratic idle
- vi misfire
- vii stalling
- viii lack of power
- ix backfire
- x incorrect co
- xi air leaks

The operation of engine management components and relationship with vehicle systems

a components:
  i ecu units
  ii input sensors
  iii output actuators

b data flow, distribution and interconnection

c control of phases:
  i starting
  ii enrichment
  iii cold running
  iv idle
  v full load
  vi acceleration
  vii deceleration
  viii engine speed limitation

d CANBUS

e performance mapping implications

f block, flow and circuit diagrams

Faults and diagnostic procedures for engine management systems

a the stages of fault finding

b diagnostic procedures including:
  i the use of fault code readers
  ii oscilloscope
  iii break out boxes
  iv on-board diagnostics
  v other dedicated equipment

c faults:
  i engine fails to start
  ii hot and cold start
  iii erratic idle
  iv misfire
  v hesitation under acceleration or constant speed
  vi knock
  vii poor response
  viii poor fuel consumption
  ix incorrect co
  x poor performance
  xi limp home mode
  xii fuses

Adjustments to components are:

a settings

b input and output values

c voltages

d current consumption

e resistance

f output patterns with oscilloscope

g condition

h wear and performance

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how engine electrical systems operate	1.1	identify engine electrical system components			
		1.2	explain the construction and operation of engine electrical systems to include: a starting systems b charging systems c engine management systems d electrical components of the cooling system			
		1.3	explain the interaction between electrical, electronic and mechanical components within the system defined			
		1.4	explain how the electrical systems interlink and interact, including multiplexing and fibre optics			
		1.5	explain how to dismantle and reassemble the electrical and electronic units of engine electrical systems			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Understand how to find, select and use sources of information	2.1	identify suitable sources of technical information to support engine electrical repair and diagnostic procedures including: a technical data b manufacturer's instructions c legal requirements d industry recognised repair methods			
		2.2	explain how to interpret and use technical information to support the engine electrical repair and diagnostic procedures			
3	Understand how to diagnose and rectify faults in engine electrical systems	3.1	describe symptoms and causes of faults found in engine electrical systems			
		3.2	explain how to select the most appropriate diagnostic testing method for the symptoms present			
		3.3	explain systematic diagnostic techniques used in identifying engine electrical system faults			
		3.4	explain how to examine, measure and make suitable adjustments to components			
		3.5	explain how to evaluate and interpret test results found in diagnosing engine electrical system faults against vehicle manufacturer specifications and settings			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.6	explain how to carry out the rectification activities in order to correct the faults in the engine electrical systems			
		3.7	explain the engine electrical and unit replacement procedures and the circumstances which will necessitate replacement and or other possible courses of action			

Learner name: _____ Date:_____

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Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 33: Skills in Diagnosis and Rectification of Engine Electrical Faults

Unit reference number: Y/601/6038

QCF level: 3

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit will help the learner to develop the skills required to demonstrate they can diagnose and rectify engine electrical system faults. It also covers the evaluation of performance of the replaced or repaired units and systems.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor diagnosing and rectifying 3 faults from 3 different electrical systems listed. The fault should involve a 2 or more step diagnostic activity, which covers the learning outcomes.

a starting systems

b charging systems

c engine management systems (including ignition and fuel)

d electrical components of the cooling system

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out engine electrical diagnostic and rectification activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out engine 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			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support engine electrical 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 engine electrical system faults			
3	Be able to use appropriate tools and equipment	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 engine electrical diagnostic and rectification activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out engine electrical diagnosis, rectification and test activities	4.1	use diagnostic methods that are relevant to the symptoms presented			
		4.2	evaluate your 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: a manufacturers' instructions b recognised researched repair methods c workplace procedures d health and safety requirements			
		4.4	ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements			
		4.5	when necessary carry out adjustments to 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 engine electrical system rectified performs to the vehicle operating specification and any legal requirements			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	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			

Learner name: _____ Date:_____

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(*if sampled*)

Unit 34: Knowledge of Diagnosis and Rectification of Transmission and Chassis Electrical Faults

Unit reference number: Y/601/6024

QCF level: 3

Credit value: 6

Guided learning hours: 45

Unit Summary

This unit enables the learner to develop an understanding of diagnosis and rectification of transmission and chassis electrical system faults. It also covers the evaluation of performance of the systems.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

Identification of various types of electrical/electronic transmission control systems

a electronic clutch control, torque converter control systems.

b electronically controlled manual transmission/powershift

c electronically controlled automatic transmission

d retarders and diff-lock systems

The function and operating principles of each of these areas

a electronic clutch control, torque converter control systems

b electronically controlled manual transmission/powershift

c electronically controlled automatic transmission

d retarders and diff-lock systems

Common faults and basic tests for these systems

a hand held diagnostics, meters and oscilloscopes

b electronic clutch control, torque converter control systems

c electronically controlled manual transmission/powershift

d electronically controlled automatic transmission

e retarders and diff-lock systems

The function and operating principles of the following systems

a ABS

b traction control

Identification of components and their function within the system

a sensors, actuators, modulators and the control system for ABS

b sensors, actuators, modulators and the control system for traction control

Common faults and basic tests for these systems

a ABS

b traction control

Function and operating principles of steering systems

a electro/hydraulic systems

b speed sensitive systems

c full electric assistance systems

d 4 wheel steering systems

Identification of all components and their function within the steering system

a sensors, actuators and control systems for each system

Common faults and basic tests for these steering systems

a electro/hydraulic systems

b speed sensitive systems

c full electric assistance systems

Function and operating principles of electric/electronic suspension control

a sensors, actuators and control systems

b hydro-electric systems

c pneumatic electric

Identification of all components and their function within the suspension systems

a sensors, actuators and control systems

b hydro-electric systems

c pneumatic electric

Common faults and basic tests for these suspension systems

a sensors, actuators and control systems

b hydro-electric systems

c pneumatic electric

How the below systems come together to create a stability control system

a aerodynamic control systems

b transmission systems

c ABS/traction control systems

d steering systems

e suspension systems

f engine management system

Identification and description how all these systems unite to create stability control

a aerodynamic control systems

b transmission systems

c ABS/traction control systems

d steering systems

e suspension systems

f engine management system

Common faults and basic tests for these combined systems

a aerodynamic control systems

b transmission systems

c ABS/traction control systems

d steering systems

e suspension systems

f engine management system

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how transmission and chassis electrical systems operate	1.1	identify transmission and chassis electrical system components			
		1.2	explain the construction and operation of transmission and chassis electrical systems			
		1.3	explain the interaction between electrical, electronic and mechanical components within the system defined			
		1.4	explain how the electrical systems interlink and interact, including multiplexing and fibre optics			
		1.5	explain how to dismantle and reassemble the electrical and electronic units of transmission and chassis electrical systems			
2	Understand how to find, select and use sources of information	2.1	identify suitable sources of technical information to support transmission and chassis electrical repair and diagnostic procedures including: a technical data b manufacturer's instructions c legal requirements d industry recognised repair methods			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.2	explain how to use technical information to support the transmission and chassis electrical repair and diagnostic procedures			
3	Understand how to diagnose and rectify faults in transmission and chassis electrical systems	3.1	describe symptoms and causes of faults found in engine electrical systems			
		3.2	explain how to select the most appropriate diagnostic testing method for the symptoms present			
		3.3	explain systematic diagnostic techniques used in identifying transmission and chassis electrical system faults			
		3.4	explain how to examine, measure and make suitable adjustments to components			
		3.5	explain how to evaluate and interpret test results found in diagnosing transmission and chassis electrical system faults against vehicle manufacturer specifications and settings			
		3.6	explain how to carry out the rectification activities in order to correct the faults in the transmission and chassis electrical systems			
		3.7	explain the transmission and chassis electrical and unit replacement procedures and the circumstances which will necessitate replacement and or other possible courses of action			

Learner name: _____ Date:_____

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Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 35: Skills in Diagnosis and Rectification of Transmission and Chassis Electrical Faults

Unit reference number: Y/601/6041

QCF level: 3

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit will help the learner to develop the skills required to demonstrate they can diagnose and rectify transmission and chassis electrical system faults. It also covers the evaluation of performance of the replaced or repaired units and systems.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor diagnosing and rectifying faults occurring in **3 out of the 9** systems listed, which covers the learning outcomes.

- a electronic clutch control system
- b electronic gearbox control system
- c electronic automatic gearbox control system
- d electric retarder system
- e electronically controlled slip differential system
- f electronic suspension control system
- g ABS and traction control system
- h electronic steering control systems
- i electronic stability control system

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out transmission and chassis electrical diagnostic and rectification activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out transmission and chassis 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			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support transmission and chassis electrical diagnostic and rectification activities including: a vehicle technical data b diagnostic test procedures			
		2.2	use technical information to support transmission and chassis electrical diagnostic and rectification activities			
3	Be able to use appropriate tools and equipment	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 transmission and chassis electrical diagnostic and rectification activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out transmission and chassis electrical diagnosis, rectification and test activities	4.1	use diagnostic methods that are relevant to the symptoms presented			
		4.2	evaluate your 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: a manufacturers' instructions b recognised researched repair methods c workplace procedures d health and safety requirements			
		4.4	ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements			
		4.5	carry out adjustments to 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 transmission and chassis electrical system rectified performs to the vehicle operating specification and any legal requirements			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

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Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 36: Knowledge of How to Make Learning Possible through Demonstrations and Instruction

Unit reference number: T/601/6242

QCF level: 3

Credit value: 5

Guided learning hours: 45

Unit Summary

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.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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:
   iv give a clear introduction
   v identify any tools/equipment
   vi determine the current audience level of knowledge
   vii complete the demonstration correctly (do not show how not to do it)
   viii stress key points and show links between them
   ix monitor safety aspects
   x check learner understanding

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

How to identify individual learning needs

a diagnose the learning needs of your audience to include:
   i what competencies they already have
   ii what experience they have of the subject area
   iii what competencies they need to achieve
   iv what demonstration techniques are best suited to their needs
   v how 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 learners understanding and progress

a questionnaires

b verbal questioning

c observation

d assessment

e role play

f projects/assignments

g multi-choice questions

h simulation

i tests

How to organise information and prepare materials

a identify the course aim

b identify the subject aim

c identify the lesson aim

d complete a lesson plan — plan the teaching

e identify a series of 'cues' to be used during the lesson

f logically organise the information

g use suitable resources and equipment to maximise learning opportunities

h assess the learners 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 effect learning

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

Health and safety factors that effect 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 ie paper and technology based etc

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand the nature and role of demonstrations and instruction	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			
2	Understand the principles and concepts of demonstration and instruction	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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			
3	Understand the external factors influencing human resource development	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 37: Skills in How to Make Learning Possible through Demonstrations and Instruction

Unit reference number: Y/601/6282

QCF level: 3

Credit value: 5

Guided learning hours: 40

Unit Summary

This unit will help the learner to develop the skills required 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.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 provide **1 record** of an activity which has been a combination of demonstration and instruction.

5 provide records of an **observation,** which covers **a combination** of **demonstration** and **instruction.**

It is expected that the **records** must include evidence to show how you:

a decided on the sequence of the demonstration

b ensured that the demonstration was accurate and realistic

c identified which learning outcomes were achieved

d ensured a safe environment for the demonstration and allowed all learners to see the demonstration clearly

In preparing the record you should consider:

a which types of learning are best achieved and supported through demonstrations

b how to choose between instruction and demonstration as learning methods

c how to identify individual learning needs

d which factors are likely to prevent learning and how to overcome them

e how to choose and prepare appropriate materials, including technology based materials

f which types of learning are best achieved through instruction

g how to make sure everybody acts in line with health, safety and environmental protection legislation and best practice

h how to analyse developments in learning and new ways of delivery, including technology based learning

It is also expected that evidence from your observations **will show** how you:

a structured the demonstration so that the learner got the most out of it

b encouraged learners to ask questions and get explanations at appropriate stages in the demonstration

c gave learners the opportunities to practice the skill being demonstrated

d gave learners positive feedback

e reinforced learning by repeating demonstration

f responded to the needs of learners during the demonstration

g reduced distractions and disruptions as much as possible

h matched instruction to the needs of learners

i ensured that the manner, level and speed of the instruction encourages learners to take part

j regularly check that learners understand and adapt instruction as appropriate

k gave learners positive feedback on the learning experience and the outcome achieved

l identified anything that prevented learning and reviewed this with the learner

Evidence from **real** or **simulated** activities and **role play is** acceptable for this unit.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to demonstrate skills and methods to learners	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Be able to instruct learners	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 38: Knowledge of how to Identify and Agree Motor Vehicle Customer Service Needs

Unit reference number: R/601/6247

QCF level: 3

Credit value: 5

Guided learning hours: 45

Unit Summary

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.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

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
   iv diagnostic
   v servicing
   vi repair
   vii warranty
   viii mot testing
   ix fitment of accessories/enhancements
   x 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

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand legislative and organisational requirements and procedures	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			
2	Understand how to communicate and care for customers	2.1	explain how to communicate effectively with customers			
		2.2	describe how to adapt your 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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Understand company products and services	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 39: Skills to Identify and Agree Motor Vehicle Customer Service Needs

Unit reference number: M/601/6286

QCF level: 3

Credit value: 5

Guided learning hours: 40

Unit Summary

This unit helps the learner to develop 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.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out as managed and organised by an approved centre.

3 be observed by an assessor as defined by the

4 produce evidence, including records, to show that you have dealt with **3 different customers.**

5 be observed by your assessor on at least **1** occasion.

Evidence from real activity **or role-play is acceptable** for this unit

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to obtain relevant information from the customer	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			
2	Be able to provide relevant information to the customer	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			
3	Be able to agree work undertaken with the customer	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			
4	Be able to ensure recording systems are implemented correctly	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.3	demonstrate correct procedures for customer approval where the contracted agreement is likely to be exceeded			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 40: Knowledge of Supporting Customer Service Improvements in the Automotive Sector

Unit reference number: M/601/6255

QCF level: 2

Credit value: 2

Guided learning hours: 12

Unit Summary

This unit will enable the learner develop knowledge in Supporting Customer Service Improvement in the Automotive Sector.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how support customer service improvements	1.1	describe how customer experience is influenced by the way service is delivered			
		1.2	identify how customer feedback is obtained			
		1.3	describe how to work with others to identify and support change in the way service is delivered			
		1.4	identify why it is important to give a positive impression to the customer about the changes made by their organisation, even if they disagree with the changes			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 41: Skills in Supporting Customer Service Improvements in the Automotive Sector

Unit reference number: T/601/6337

QCF level: 2

Credit value: 2

Guided learning hours: 8

Unit Summary

This unit will enable the learner to develop skills in Supporting Customer Service Improvement in the Automotive Sector.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out as managed and organised by an approved centre

3 be observed by an assessor as defined by the IMI Assessment Strategy

4 produce evidence, including records, to show that you have supported customer service improvements in the automotive sector on **3 different occasions**

5 be observed by your assessor on **at least 1** occasion supporting customer service improvements within the automotive sector.

Evidence from real activity **or role-play is acceptable** for this unit.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to use feedback to identify potential customer service improvements	1.1	gather informal feedback from their customers			
		1.2	use customer feedback procedures to collect information from the customers			
		1.3	use the information from customers to develop a better understanding of the customer's experience			
		1.4	identify ways the service they give could be improved based on information they have gathered			
		1.5	share their ideas for improving customer service with colleagues			
2	Be able to implement changes in customer service	2.1	identify a possible change that could be made to improve customer service			
		2.2	present their idea for improving customer service to a colleague with the appropriate authority to approve the change			
		2.3	carry out changes to customer service procedures based on their own idea or proposed by the organisation			
		2.4	keep their customers informed of changes to customer service			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.5	give customers a positive impression of changes that have been made			
		2.6	work positively with others to support customer service changes			
3	Be able to assist with the evaluation of changes in customer service	3.1	discuss with others how changes to customer service are working			
		3.2	work with others to identify any negative effects of changes and how these can be avoided			
4	Be able to support customer service improvements	4.1	show that they know and understand how customer experience is influenced by the way service is delivered			
		4.2	show that they know and understand how customer feedback is obtained			
		4.3	show that they know and understand how to work with others to identify and support change in the way service is delivered			
		4.4	show that they know and understand why it is important to give a positive impression to the customer about the changes made by their organisation even if they disagree with the changes			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 42: Knowledge of the Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Security Systems

Unit reference number: T/601/6029

QCF level: 3

Credit value: 6

Guided learning hours: 45

Unit Summary

This unit enables the learner to develop an understanding of identifying the suitability and installation of vehicle electrical enhancements, electrical security and tracking systems to improve the original vehicle features and specification to meet customer requirements.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

The different types of electrical enhancement systems and components

a systems and components to include:
- i radio/CD players
- ii multi-play CD players
- iii DVD
- iv MP3 players
- v speakers
- vi aerial systems
- vii amplifiers
- viii visual display screens
- ix satellite navigation
- x mobile communication units
- xi networking systems
- xii body electrical systems
- xiii data logging

The function of component parts in the electrical enhancement systems

a components include:
- i radio
- ii CD
- iii video
- iv DVD players
- v aerial systems
- vi speakers
- vii amplifiers
- viii visual display screens
- ix mobile communication systems
- x networking systems
- xi body electrical systems
- xii data logging

The operating principles of electrical enhancement systems

a in car entertainment

b audio systems

c communication systems

d networking systems

e body electrical systems

The relevant legislation relevant to the electrical enhancement systems

a find and apply all relevant legislation for the fitment and use of I.C.E systems

Faults and testing methods associated electrical enhancement systems

a test and procedures for the following:
- i radio/CD players
- ii speakers
- iii aerial systems
- iv amplifiers
- v wiring
- vi connections
- vii relays
- viii fuses
- ix removal and refitting procedures
- x networking systems
- xi body electrical systems
- xii data logging

Types of security/warning systems and components

i components to include:
ii control units
iii alarm modules
iv audible warning units
v immobiliser units
vi location/tracking units
vii electronic deadlocking units
viii sensing units
ix horn
x audible warning speakers

The function of component parts in 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 location/tracking units
vii electronic deadlocking units
viii relays
ix diodes
x horns

The operating principles of security and warning systems

a operation of alarm systems and audible warning units

b immobiliser systems

c location/tracking systems

d electronic deadlocking systems

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

Faults and testing methods associated security and warning systems

a components to include:
i control units
ii audible warning units
iii immobiliser units
iv horns
v relays
vi diodes
vii wiring

viii connections and protection devices
ix removal and refitting procedures

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how vehicle electrical enhancement and vehicle electrical security systems operate	1.1	identify the vehicle electrical enhancement systems and components fitted in: a in car entertainment b audio systems c communication equipment d networking systems e body electrical systems f data logging			
		1.2	identify the vehicle electrical security systems and components fitted in: a alarm systems b immobiliser systems c location tracking systems d electronic deadlocking systems			
		1.3	explain the function and operation of the vehicle electrical enhancement systems and components			
		1.4	explain the function and operation of the vehicle electrical security systems and components			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.5	explain how the enhancement may be limited by the existing vehicle systems and fitments			
		1.6	compare the advantages and disadvantages of carrying out the vehicle electrical customisation			
2	Understand how to use relevant information to carry out the task	2.1	explain how to find, interpret and use technical information to support the vehicle electrical enhancement and security activities, by reviewing manufacturer and workshop information			
3	Understand how to specify and fit vehicle electrical enhancement and vehicle electrical security systems	3.1	explain the procedures involved in fitting electrical vehicle enhancement equipment and security systems			
		3.2	explain how to follow manufacturers requirements relating to the components that are fitted			
		3.3	explain the interaction between electrical, electronic and mechanical components within the system defined			
		3.4	explain how electrical systems interlink and interact, including multiplexing and fibre optics			
		3.5	explain how installed electrical enhancements can interact with factory fitted electrical components including network systems			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.6	explain how to use dedicated and computer based equipment to configure vehicle electronic controlled systems to operate correctly			
		3.7	explain how to prepare and reconfigure electronically controlled vehicle enhancement systems to allow them to function correctly with factory fit vehicle systems			
4	Understand how to carry out checks to vehicle electrical enhancement and vehicle electrical security systems fitted	4.1	describe the checks that are made to make sure the components are compatible with the vehicle specification and the customer requirements			
		4.2	explain how to test and evaluate the performance of any electrical enhancements fitted against vehicle specification and the importance of doing so			
		4.3	explain how to make adjustments to components and to any surrounding systems to ensure effective operation			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 43: Skills in Identifying Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Vehicle Security Systems

Unit reference number: A/601/6050

QCF level: 3

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit will help the learner to develop the skills required to demonstrate they can identify suitability and installation of vehicle electrical enhancements and vehicle electrical security systems to improve the original vehicle features/specification and to meet customer requirements.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor carrying out 1 enhancement activity out of the **6 listed below** and **1 security** activity out of the **4 listed below,** which covers the learning outcomes.

Enhancements

a in car entertainment

b audio systems

c communication equipment

d networking systems

e body electrical systems

f data logging

Security

a alarm systems

b immobiliser systems

c location tracking systems

d electronic deadlocking systems

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out vehicle electrical enhancement and security activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out vehicle electrical enhancement and vehicle electrical security systems activities			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the vehicle electrical enhancement and security activities, by reviewing a technical data b fitting procedures c legal requirements d customer requirements			
		2.2	use technical information to support the vehicle electrical enhancement and security activities			
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out vehicle electrical enhancement and security activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		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 vehicle electrical enhancement and security activities			
4	Be able to install vehicle electrical enhancement and vehicle electrical security systems	4.1	ensure fitment of components are compatible with the vehicle specification and the customer's requirements			
		4.2	carry out all vehicle enhancement activities following: a manufacturers' instructions b legal requirements c workplace procedures d health and safety requirements			
		4.3	ensure when necessary that adjustments to components and systems are carried out to ensure correct and effective operation			
		4.4	ensure all vehicle electrical components are secure and function as specified by the manufacturer or any legal requirements			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		5.2	agree the next course of action with the relevant person if any issues arose during the enhancement of the vehicle			
		5.3	record and report any additional faults noticed during the course of their work promptly in the format required			
		5.4	explain to customers any action that has been taken regarding their vehicle in non technical terms to give a clear understanding of the work carried out			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 44: Knowledge of Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment

Unit reference number: M/601/6031

QCF level: 3

Credit value: 2

Guided learning hours: 20

Unit Summary

This unit enables the learner to develop an understanding of conducting installation and system consultations with customers to improve the original vehicle features/specification and to meet customer requirements. It also includes making recommendations to ensure that the customers concerns are addressed and explaining the outcomes that the enhancements will achieve so that customers fully understand the work that will be undertaken.

Assessment Requirements/Evidence requirements:

If this unit is offered within a competence qualification (VCQ) it must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*).

This unit must adhere to the IMI Knowledge Unit Syllabus as set out below:

The identification of different types of electrical enhancement systems and components

a systems and components to include:

- i radio/CD players
- ii multi-play CD players
- iii DVD
- iv MP3 players
- v speakers
- vi aerial systems
- vii amplifiers
- viii visual display screens
- ix satellite navigation
- x mobile communication units

xi networking systems

xii body electrical systems

The function of component parts in the electrical enhancement systems

b components include:

i radio
ii CD
iii video
iv DVD players
v aerial systems
vi speakers
vii amplifiers
viii visual display screens
ix mobile communication systems
x networking systems
xi body electrical systems
xii data logging

The operating principles of electrical enhancement systems

a operation of electrical enhancement systems

i in car entertainment
ii audio systems
iii communication systems
iv networking systems
v body electrical systems

The relevant legislation relevant to the electrical enhancement systems

a find and apply all relevant legislation for the fitment and use of electrical enhancement systems

Show positive personal image

a the importance of achieving and maintaining a physical appearance suitable for the motor industry

b why it is important to maintain good personal appearance whilst working in the motor industry

c the use of simple body language such as body posture, eye contact and smiling and recognize it in others

d how to meet and greet customers and recognize the importance of making a customer feel welcome

e how to start conversations

Respond to different types of motor industry customer

a why it is important to be able to assist all customers equally

b how best to assist customers with physical needs

c how best to assist customers with sensory needs

d how best to assist customers with learning needs

e how best to assist customers from other cultures

f the communication methods best suited to the needs of the individual customer

Respond to a motor industry customer by telephone

a the importance of using the correct greeting for incoming calls

b the correct methods for dealing with telephone enquiries

c the importance of obtaining and providing names

d the importance of creating a positive impression on the telephone

e why it is important to record information

f select the correct questioning techniques used to obtain information over the telephone

g the correct procedures for dealing with telephone calls

Handle motor industry customer complaints

a the variety of emotions customers may display when complaining

b identify that some customers are experienced at complaining and will need to be assisted in a specific manner

c explain that some unhappy customers may be reluctant to complain and they will need to be made to feel comfortable to do so

d explain why it is important to try to resolve a customer's complaint

e identify the importance of active listening

f explain how to approach a customer

g recognise the limits of their own authority and who to refer to when customer requests are outside own limitations

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand how to conduct installation and system consultations with customers	1.1	explain how to give straight forward presentations to customers on vehicle enhancements			
		1.2	identify and explain suitable communication methods to use when working with customers			
		1.3	explain how to present yourself in a positive and professional manner to customers			
		1.4	identify and explain different methods of handling customers who react differently			
		1.5	explain how to adapt language when explaining technical matters to customers			
		1.6	describe how to use effective questioning techniques with customers			
		1.7	identify and explain how to care for customers and achieve customer satisfaction			
		1.8	explain the organisational requirements for personal appearance and conduct when dealing with customers			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 45: Skills in Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment

Unit reference number: L/601/6053

QCF level: 3

Credit value: 2

Guided learning hours: 20

Unit Summary

This unit will help the learner to develop the skills required to demonstrate they can conduct installation and system consultations with customers to improve the original vehicle features/specification and to meet customer requirements. It also includes making recommendations to ensure that the customers concerns are addressed and explaining the outcomes that the enhancements will achieve so that customers fully understand the work that will be undertaken.

Assessment Requirements/Evidence requirements:

This unit must adhere to the IMI Skills Unit Assessment Requirements developed for the unit as set out below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your training workshop as managed and organised by an approved centre.

3 be observed by an assessor as defined by the IMI Assessment Strategy.

4 be observed by an assessor carrying out 2 different installation and system consultations with customers* out of the 5 listed below, which covers the learning outcomes.

- a in car entertainment
- b audio systems
- c communication equipment
- d networking systems
- e body electrical systems

* This can be assessed by the use of role-play if required

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to use relevant information to carry out the consultation with customers	1.1	select suitable sources of technical information to support the vehicle electrical enhancement activities			
		1.2	interpret technical information to support the vehicle electrical enhancement activities			
2	Be able to conduct pre-work vehicle electrical enhancement consultations with customers	2.1	explain clearly the implications of any vehicle enhancement			
		2.2	respond to customers concerns in a positive and friendly manner			
		2.3	give a positive impression of yourself and your organisation when dealing with customers			
		2.4	obtain sufficient, detailed information using suitably structured questions			
		2.5	provide customers with accurate, current and relevant advice and information on any further investigation that is needed			
		2.6	give technical advice clearly and accurately and in a manner which the customer will understand			
		2.7	liaise with the customer and or other relevant person to agree your recommendations for the next course of action			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Be able to carry out post work consultations and make suitable recommendations	3.1	explain clearly to customers the action that has been taken regarding their vehicle			
		3.2	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		3.3	suggest possible methods for improving the customer care process to your manager, when necessary			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 46: Competency in Diagnosing and Rectifying Vehicle Auxiliary Electrical Faults

Unit reference number: L/601/3749

QCF level: 3

Credit value: 10

Guided learning hours: 90

Unit Summary

This unit will enable the learner to demonstrate competency in diagnosing and rectifying automotive vehicle auxiliary electrical system faults. It also covers the evaluation of performance of the replaced or repaired units and systems.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence of carrying out diagnosis and rectification activities from 4 different systems out of the 16 listed below *. One of which must be alternator or a starter motor. The fault should involve a 2 or more step diagnostic activity. At least 3 pieces of evidence must come from work carried out in your normal workplace

   a lighting systems

   b heated seats

   c electrically adjusted seats

   d heated screens

   e electric mirrors

f electric sunroofs

g electric windows

h heating and ventilation systems

i information and entertainment systems

j communication systems

k SRS

l wash wipe

m locking systems

n security and warning systems

o alternators

p starter motors

5 be observed by your assessor on **at least 1 occasion**, covering the diagnosis and rectification of a fault.

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of faults occurring in all the types of electrical systems.

Simulated activity **will be** acceptable to assess candidates' competence in diagnosis and rectification on no more than **1** occasion.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out automotive vehicle auxiliary electrical diagnostic and rectification activities	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			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support automotive 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 automotive auxiliary electrical system faults			
3	Be able to use appropriate tools and equipment	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.3	use the equipment required, correctly and safely throughout all automotive auxiliary electrical diagnostic and rectification activities			
4	Be able to carry out automotive vehicle auxiliary electrical diagnosis, rectification and test activities	4.1	use diagnostic methods that are relevant to the symptoms presented			
		4.2	evaluate your 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: a manufacturers' instructions b recognised researched repair methods c workplace procedures d 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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.7	ensure the rectified automotive auxiliary electrical system performs to the vehicle operating specification and any legal requirements			
		4.8	complete all system diagnostic activities within the agreed timescale			
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____

(*if sampled*)

Unit 47: Competency in Diagnosing and Rectifying Engine Electrical Faults

Unit reference number: Y/601/6069

QCF level: 3

Credit value: 10

Guided learning hours: 90

Unit Summary

This unit will enable the learner to demonstrate competency in diagnosing and rectifying engine electrical system faults. It also covers the evaluation of performance of the replaced or repaired units and systems.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence of diagnosing and rectifying at least 1 fault from **each** system listed. The fault should involve a **2 or more** step diagnostic activity. **At least 3** of which must come from work carried out **in your normal workplace**

   a starting systems

   b charging systems

   c engine management systems (including ignition and fuel)

   d electrical components of the cooling system

5 be observed by your assessor on **at least 2 occasions**, **each** observation covering the diagnosis and rectification of a fault in **different** systems. **Both** of these observations must be carried out **in your normal workplace.**

Simulated activity **will be** acceptable to assess candidates' competence in diagnosis and rectification on no more than **1** occasion.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out engine electrical diagnostic and rectification activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out engine 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			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support engine electrical 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 engine electrical system faults			
3	Be able to use appropriate tools and equipment	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 engine electrical diagnostic and rectification activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to carry out engine electrical diagnosis, rectification and test activities	4.1	use diagnostic methods that are relevant to the symptoms presented			
		4.2	evaluate your 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: a manufacturers' instructions b recognised researched repair methods c workplace procedures d health and safety requirements			
		4.4	ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements			
		4.5	when necessary carry out adjustments to 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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.7	ensure the engine electrical system rectified performs to the vehicle operating specification and any legal requirements			
		4.8	complete all system diagnostic activities within the agreed timescale			
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 48: Competency in the Diagnosing and Rectifying of Transmission and Chassis Electrical Faults

Unit reference number: L/503/6924

QCF level: 3

Credit value: 10

Guided learning hours: 90

Unit Summary

This unit will enable the learner to demonstrate competency in diagnosing and rectifying transmission and chassis electrical system faults. It also covers the evaluation of performance of the replaced or repaired units and systems.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence of diagnosing and rectifying faults occurring in **3 out of the 9*** systems listed, **at least 2** of which must come from work carried out **in your normal workplace**

- a electronic clutch control system
- b electronic gearbox control system
- c electronic automatic gearbox control system
- d electric retarder system
- e electronically controlled slip differential system
- f electronic suspension control system

g ABS and traction control system

h electronic steering control systems

i electronic stability control system

5 be observed by your assessor on **at least 1 occasion** carrying out the fault rectification

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of faults occurring in all the types of transmission and chassis systems

Simulated activity **will be** acceptable to assess candidates' competence in diagnosis and rectification on no more than **1** occasion.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out transmission and chassis electrical diagnostic and rectification activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out transmission and chassis 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			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support transmission and chassis electrical diagnostic and rectification activities including: a vehicle technical data b diagnostic test procedures			
		2.2	use technical information to support transmission and chassis electrical diagnostic and rectification activities			
3	Be able to use appropriate tools and equipment	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		3.3	use the equipment required, correctly and safely throughout all transmission and chassis electrical diagnostic and rectification activities			
4	Be able to carry out transmission and chassis electrical diagnosis, rectification and test activities	4.1	use diagnostic methods that are relevant to the symptoms presented			
		4.2	evaluate your 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: a manufacturers' instructions b recognised researched repair methods c workplace procedures d health and safety requirements			
		4.4	ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements			
		4.5	when necessary carry out adjustments to components and units correctly to ensure that they operate to meet system requirements			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.6	use testing methods that are suitable for assessing the performance of the system rectified			
		4.7	ensure the transmission and chassis electrical system rectified performs to the vehicle operating specification and any legal requirements			
		4.8	complete all system diagnostic activities within the agreed timescale			
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		5.2	make suitable and justifiable recommendations for cost effective repairs			
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 49: Competency in Identifying and Agreeing Motor Vehicle Customer Service Needs

Unit reference number: K/601/6383

QCF level: 3

Credit value: 5

Guided learning hours: 40

Unit Summary

This unit helps the learner to develop competency in order 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.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet **all** of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence, including records, to show that you have dealt with **3 different customers**

5 be observed by your assessor in your normal workplace dealing with **at least 1 customer.**

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to obtain relevant information from the customer	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			
2	Be able to provide relevant information to the customer	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			
3	Be able to agree work undertaken with the customer	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			
4	Be able to ensure recording systems are implemented correctly	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			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.3	demonstrate correct procedures for customer approval where the contracted agreement is likely to be exceeded			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 50: Competency in Making Learning Possible through Demonstrations and Instruction

Unit reference number: Y/601/6380

QCF level: 3

Credit value: 5

Guided learning hours: 40

Unit Summary

This unit will help the learner to develop competency 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.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy **or** by a witness who has been previously agreed with the assessor prior to the observation taking place

4 provide at least **1 record** of an activity which has been demonstrated

5 provide records of at least **2 observations, 1** of which **must be** by your assessor, which cover at least **1 demonstration** and **1 instruction or a combination of both.**

It is expected that the **records** must include evidence to show how you:

a decided on the sequence of the demonstration

b ensured that the demonstration was accurate and realistic

c identified which learning outcomes were achieved

d ensured a safe environment for the demonstration and allowed all learners to see the demonstration clearly

In preparing the records you should consider:

a. which types of learning are best achieved and supported through demonstrations

b how to choose between instruction and demonstration as learning methods

c how to identify individual learning needs

d which factors are likely to prevent learning and how to overcome them

e how to choose and prepare appropriate materials, including technology based materials.

f which types of learning are best achieved through instruction

g how to make sure everybody acts in line with health, safety and environmental protection legislation and best practice

h how to analyse developments in learning and new ways of delivery, including technology based learning

It is also expected that evidence from your observations **will show** how you:

a structured the demonstration so that the learner got the most out of it

b encouraged learners to ask questions and get explanations at appropriate stages in the demonstration

c gave learners the opportunities to practice the skill being demonstrated

d gave learners positive feedback

e reinforced learning by repeating demonstration

f responded to the needs of learners during the demonstration

g reduced distractions and disruptions as much as possible

h matched instruction to the needs of learners

i ensured that the manner, level and speed of the instruction encourages learners to take part

j regularly check that learners understand and adapt instruction as appropriate

k gave learners positive feedback on the learning experience and the outcome achieved

l identified anything that prevented learning and reviewed this with the learner

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to demonstrate skills and methods to learners	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 outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Be able to instruct learners	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			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 51: Competency in Supporting Customer Service Improvements in the Automotive Sector

Unit reference number: R/601/6393

QCF level: 2

Credit value: 2

Guided learning hours: 9

Unit Summary

This unit will enable the learner develop competency in Supporting Customer Service Improvement in the Automotive Sector.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out with customers in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence, including records, to show that you have supported customer service improvements in the automotive sector on **3 different occasions**

5 be observed by your assessor on **at least 1** occasion supporting customer service improvements within the automotive sector.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Use feedback to identify potential customer service improvements	1.1	gather informal feedback from their customers			
		1.2	use customer feedback procedures to collect information from the customers			
		1.3	use the information from customers to develop a better understanding of the customer's experience			
		1.4	identify ways the service they give could be improved based on information they have gathered			
		1.5	share their ideas for improving customer service with colleagues			
2	Implement changes in customer service	2.1	identify a possible change that could be made to improve customer service			
		2.2	present their idea for improving customer service to a colleague with the appropriate authority to approve the change			
		2.3	carry out changes to customer service procedures based on their own idea or proposed by the organisation			
		2.4	keep their customers informed of changes to customer service			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.5	give customers a positive impression of changes that have been made			
		2.6	work positively with others to support customer service changes			
3	Assist with the evaluation of changes in customer service	3.1	discuss with others how changes to customer service are working			
		3.2	work with others to identify any negative effects of changes and how these can be avoided			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 52: Competency in Identifying Suitability, Installation and Configuration of Vehicle Electrical Enhancements and Vehicle Security Systems

Unit reference number: H/601/6110

QCF level: 3

Credit value: 10

Guided learning hours: 90

Unit Summary

This unit will enable the learner to demonstrate competency in identifying suitability and installation of vehicle electrical enhancements and vehicle electrical security systems to improve the original vehicle features or specification and to meet customer requirements.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence from your normal workplace of carrying out **2 different enhancement** activities from the **6 listed below *** and **1 security** activity from the **4 listed below *.**

a Enhancements

- i in car entertainment
- ii audio systems
- iii communication equipment
- iv networking systems

v body electrical systems
vi data logging

b Security

i alarm systems
ii immobiliser systems
iii location tracking systems
iv electronic deadlocking systems

5 be observed by your assessor on **at least 2 occasions** one from each area

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of **all** the types of electrical enhancements/security listed above.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work safely when carrying out vehicle electrical enhancement and security activities	1.1	use suitable personal protective equipment and vehicle coverings throughout when carrying out vehicle electrical enhancement and vehicle electrical security systems activities			
		1.2	work in a way which minimises the risk of damage or injury to the vehicle, people and the environment			
2	Be able to use relevant information to carry out the task	2.1	select suitable sources of technical information to support the vehicle electrical enhancement and security activities, by reviewing a technical data b fitting procedures c legal requirements d customer requirements			
		2.2	use technical information to support the vehicle electrical enhancement and security activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Be able to use appropriate tools and equipment	3.1	select the appropriate tools and equipment necessary for carrying out vehicle electrical enhancement and security activities			
		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 vehicle electrical enhancement and security activities			
4	Be able to install vehicle electrical enhancement and vehicle electrical security systems	4.1	ensure fitment of components are compatible with the vehicle specification and the customers requirements			
		4.2	carry out all vehicle enhancement activities following: a manufacturers' instructions b legal requirements c workplace procedures d health and safety requirements			
		4.3	ensure when necessary that adjustments to components and systems are carried out to ensure correct and effective operation			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		4.4	ensure all vehicle electrical components are secure and function as specified by the manufacturer or any legal requirements			
		4.5	complete all vehicle electrical enhancement and security activities within the agreed timescale			
5	Be able to record information and make suitable recommendations	5.1	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		5.2	agree the next course of action with the relevant person if any issues arose during the enhancement of the vehicle			
		5.3	identify and report any expected delays in completion to the relevant person(s) promptly in the format required			
		5.4	record and report any additional faults noticed during the course of their work promptly in the format required			
		5.5	explain to customers any action that has been taken regarding their vehicle in non technical terms to give a clear understanding of the work carried out			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 53: Competency in Conducting Vehicle Enhancement and Installation Consultations with Customers in the Motor Vehicle Environment

Unit reference number: M/601/6112

QCF level: 3

Credit value: 5

Guided learning hours: 45

Unit Summary

This unit will enable the learner to demonstrate competency in conducting installation and system consultations with customers to improve the original vehicle features/specification and to meet customer requirements. It also includes making recommendations to ensure that the customers concerns are addressed and explaining the outcomes that the enhancements will achieve so that customers fully understand the work that will be undertaken.

Assessment Requirements/Evidence requirements:

This unit must be assessed in accordance with the IMI Assessment Strategy (*Annexe C*) and adhere to the IMI Competency Unit Assessment Requirements as detailed below:

You must:

1 produce evidence to show you meet all of the Learning Outcomes

2 produce performance evidence resulting from work you have carried out on real vehicles in your normal workplace or as defined within the IMI VCQ Assessment Strategy as managed and organised by an approved centre when naturally occurring performance evidence does not occur at frequent intervals in your normal workplace or when safety is at risk

3 be observed by an assessor as defined in the IMI VCQ Assessment Strategy

4 produce evidence from your normal workplace of carrying out 2 different installation and system consultations with customers from the 5 listed below *

   a in car entertainment

   b audio systems

c communication equipment

d networking systems

e body electrical systems

5 be observed by your assessor on at least 1 occasion carrying out a consultation with the customer

*However, you must prove to your assessor that you have the necessary knowledge and understanding to be able to perform competently in respect of **all** the types of electrical installation and system consultations listed above.

Learning outcomes and assessment criteria

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to use relevant information to carry out the consultation with customers	1.1	select suitable sources of technical information to support the vehicle electrical enhancement activities			
		1.2	interpret technical information to support the vehicle electrical enhancement activities			
2	Be able to conduct pre-work vehicle electrical enhancement consultations with customers	2.1	explain clearly the implications of any vehicle enhancement			
		2.2	respond to customers concerns in a positive and friendly manner			
		2.3	give a positive impression of yourself and your organisation when dealing with customers			
		2.4	obtain sufficient, detailed information using suitably structured questions			
		2.5	provide customers with accurate, current and relevant advice and information on any further investigation that is needed			
		2.6	give technical advice clearly and accurately and in a manner which the customer will understand			
		2.7	liaise with the customer and or other relevant person to agree your recommendations for the next course of action			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Be able to carry out post work consultations and make suitable recommendations	3.1	explain clearly to customers the action that has been taken regarding their vehicle			
		3.2	produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required			
		3.3	suggest possible methods for improving the customer care process to your manager, when necessary			

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Further information

Our customer service numbers are:

BTEC and NVQ	0844 576 0026
GCSE	0844 576 0027
GCE	0844 576 0025
The Diploma	0844 576 0028
DiDA and other qualifications	0844 576 0031

Calls may be recorded for training purposes.

Useful publications

Related information and publications include:

- Centre Handbook for Edexcel QCF NVQs and Competence-based Qualifications published annually
- functional skills publications – specifications, tutor support materials and question papers
- Regulatory Arrangements for the Qualification and Credit Framework (published by Ofqual, August 2008)
- the current Edexcel publications catalogue and update catalogue.

Edexcel publications concerning the Quality Assurance System and the internal and standards verification of vocationally related programmes can be found on the Edexcel website.

NB: Some of our publications are priced. There is also a charge for postage and packing. Please check the cost when you order.

How to obtain National Occupational Standards

To obtain the National Occupational Standards go to www.ukstandards.org.uk.

Professional development and training

Edexcel supports UK and international customers with training related to NVQ and BTEC qualifications. This support is available through a choice of training options offered in our published training directory or through customised training at your centre.

The support we offer focuses on a range of issues including:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing student-centred learning and teaching approaches
- building functional skills into your programme
- building effective and efficient quality assurance systems.

The national programme of training we offer can be viewed on our website (www.edexcel.com/training). You can request customised training through the website or by contacting one of our advisers in the Training from Edexcel team via Customer Services to discuss your training needs.

The training we provide:

- is active
- is designed to be supportive and thought provoking
- builds on best practice
- may be suitable for those seeking evidence for their continuing professional development.

Annexe A: Progression pathways

The Edexcel qualification framework for the Automotive sector

Level	BTEC vocationally-related qualifications	BTEC specialist qualification/ professional	NVQ/competence
5	BTEC Level 5 HND Diploma in Vehicle Operations Management (QCF)		
4	BTEC Level 4 HNC Diploma in Vehicle Operations Management (QCF)		
3		Edexcel BTEC Level 3 Diploma in Light Vehicle Maintenance and Repair Principles (QCF) Edexcel BTEC Level 3 Diploma in Heavy Vehicle Maintenance and Repair Principles (QCF) Edexcel BTEC Level 3 Diploma in Auto Electrical and Mobile Electrical Principles (QCF) Edexcel BTEC Level 3 Diploma in Vehicle Fitting Supervisory Principles (QCF) Edexcel BTEC Level 3 Diploma in Vehicle Accident Repair Body Principles (QCF) Edexcel BTEC Level 3 Diploma in Vehicle Accident Repair Paint Principles (QCF)	Edexcel Level 3 Diploma in Light Vehicle Maintenance and Repair Competence (QCF) Edexcel Level 3 Diploma in Heavy Vehicle Maintenance and Repair Competence(QCF) Edexcel Level 3 Diploma in Auto Electrical and Mobile Electrical Competence (QCF) Edexcel Level 3 Diploma in Vehicle Fitting Supervisory Competence (QCF) Edexcel Level 3 Diploma in Vehicle Accident Repair Body Competence (QCF) Edexcel Level 3 Diploma in Vehicle Accident Repair Paint Competence (QCF)

Level	BTEC vocationally-related qualifications	BTEC specialist qualification/ professional	NVQ/competence
3		Edexcel BTEC Level 3 Diploma in Lift Truck Maintenance & Repair Principles (QCF) Edexcel BTEC Level 3 Diploma in Motorcycle Maintenance and Repair Principles (QCF) Edexcel BTEC Level 3 Diploma in Vehicle Sales Principles (QCF) Edexcel BTEC Level 3 Diploma in Body Building Principles (QCF)	Edexcel Level 3 Diploma in Lift Truck Maintenance & Repair Competence (QCF) Edexcel Level 3 Diploma in Motorcycle Maintenance and Repair Competence (QCF) Edexcel Level 3 Diploma in Vehicle Sales Competence (QCF) Edexcel Level 3 Diploma in Body Building Competence (QCF)
2		Edexcel BTEC Level 2 Diploma in Light Vehicle Maintenance and Repair Principles (QCF) Edexcel BTEC Level 2 Diploma in Heavy Vehicle Maintenance and Repair Principles (QCF) Edexcel BTEC Level 2 Diploma in Auto Electrical and Mobile Electrical Principles (QCF) Edexcel BTEC Level 2 Diploma in Vehicle Fitting Principles (QCF) Edexcel BTEC Level 2 Diploma in Vehicle Accident Repair Paint Principles (QCF) Edexcel BTEC Level 2 Diploma in Vehicle Accident Repair Body Principles (QCF)	Edexcel Level 2 Diploma in Light Vehicle Maintenance and Repair Competence(QCF) Edexcel Level 2 Diploma in Heavy Vehicle Maintenance and Repair Competence (QCF) Edexcel Level 2 Diploma in Auto Electrical and Mobile Electrical Competence (QCF) Edexcel Level 2 Diploma in Vehicle Fitting Competence (QCF) Edexcel Level 2 Diploma in Vehicle Accident Repair Paint Competence (QCF) Edexcel Level 2 Diploma in Vehicle Accident Repair Body Competence (QCF)

Level	BTEC vocationally-related qualifications	BTEC specialist qualification/ professional	NVQ/competence
2		Level 2 Diploma in Lift Truck Maintenance & Repair Principles (QCF) Edexcel BTEC Level 2 Diploma in Motorcycle Maintenance and Repair Principles (QCF)Edexcel BTEC Level 2 Diploma in Vehicle Sales Principles (QCF) Edexcel BTEC Level 2 Diploma in Vehicle Accident Repair Mechanical, Electrical and Trim (MET) Principles (QCF) Edexcel BTEC Level 2 Diploma in Body Building Principles (QCF) Edexcel BTEC Level 2 Diploma in Heavy Vehicle Trailer Maintenance & Repair Principles (QCF)	Edexcel Level 2 Diploma in Lift Truck Maintenance & Repair Competence (QCF) Edexcel Level 2 Diploma in Motorcycle Maintenance and Repair Competence (QCF) Edexcel Level 2 Diploma in Vehicle Sales Competence (QCF) Edexcel Level 2 Diploma in Vehicle Accident Repair Mechanical, Electrical and Trim (MET) Competence (QCF) Edexcel Level 2 Diploma in Body Building Competence (QCF) Edexcel Level 2 Diploma in Heavy Vehicle Trailer Maintenance & Repair Competence (QCF)
1			
Entry			

Annexe B: Centre certification and registration

Edexcel Standards Verifiers will provide support, advice and guidance to centres to achieve Direct Claims Status (DCS). Edexcel will maintain the integrity of Edexcel QCF NVQs through ensuring that the awarding of these qualifications is secure. Where there are quality issues identified in the delivery of programmes, Edexcel will exercise the right to:

- direct centres to take action
- limit or suspend certification
- suspend registration.

The approach of Edexcel in such circumstances is to work with the centre to overcome the problems identified. If additional training is required, Edexcel will aim to secure the appropriate expertise to provide this.

What are the access arrangements and special considerations for the qualifications in this specification?

Centres are required to recruit learners to Edexcel qualifications with integrity.

Appropriate steps should be taken to assess each applicant's potential and a professional judgement should be made about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the learner within the centre during their programme of study and any specific support that might be necessary to allow the learner to access the assessment for the qualification. Centres should consult Edexcel's policy on learners with particular requirements.

Edexcel's policy on access arrangements and special considerations for Edexcel qualifications aims to enhance access to the qualifications for learners with disabilities and other difficulties (as defined by the Equality Act 2010) without compromising the assessment of skills, knowledge, understanding or competence. Please refer to *Access Arrangements and Special Considerations for BTEC and Edexcel NVQ Qualifications* for further details. www.edexcel.com.

Please refer to Edexcel's Equality Policy for further details, www.edexcel.co/policies/pages/home.aspx

Assessment Strategy

For

Vocational Competency Qualifications (VCQs)

Introduction

This document sets out the recommendations of IMI for the assessment of VCQ qualifications based on IMI developed National Occupational Standards. The Strategy is designed to operate across all four nations, bringing parity to all learners. Awarding Organisations wishing to operate VCQs in the retail motor sector must take full part in the IMI Awarding Body Forum.

This is the overarching strategy for the assessment and verification of competency based qualifications (VCQs) that are based upon National Occupational Standards from the IMI and will come into force on the 30th June 2010, it will apply to any new competence -based units and qualifications.

Assessment

VCQs are a type of qualification which reflect the unique needs of the workplace. They should be assessed in a holistic way by technically competent assessors. The primary method of assessment should always be direct workplace observation. Some use of simulation is allowed (please see section, Workplace Assessment/Simulation).

Additionally Awarding Organisations are encouraged to make use of naturally occurring quality assurance and monitoring systems where they exist in workplace assessment environments.

The Institute of the Motor Industry require Awarding Organisations delivering VCQs to participate in an Awarding Body Forum. This will, as a minimum, involve an annual meeting to discuss issues of assessment and verification.

VCQ must attest to competence in an occupational role (where competence is defined as the ability to apply knowledge, understanding, practical and thinking skills to be effective in work: these skills will usually include problem-solving, being flexible to meet changing demands and the ability to work with or alongside others).

Any assessment must attest to competence in an occupational role (where competence is defined as the ability to apply knowledge, understanding, practical and thinking skills to be effective in work: these skills will usually include problem-solving, being flexible to meet changing demands and the ability to work with or alongside others)

Evidence Requirements for VCQ

Candidates working towards a VCQ must provide evidence from the workplace that covers a minimum of a 4 month, (16 week), period.

All evidence for VCQs must be assessed by suitably qualified assessors and must adhere to the requirements for the QCF units being assessed.

Rules of combination

Rules of combination must be that determined by the IMI SSC.

Evidence other than from direct workplace observation

Workplace Assessment/Simulation

IMI credit- based units are work/competency based and therefore candidates are to be assessed under normal workplace conditions. It is recognised however, that there are situations where the workplace may not be appropriate or that waiting for naturally occurring evidence is impractical. In these situations IMI will allow centres to set up or devise assessment situations.

These assessment situations can only be set up after:

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

We suggest that centres seek written confirmation before proceeding with assessment. The need for simulation may result from consideration of:

- Safety
- Legislation
- Regulation
- Contingency
- Cost
- Frequency.

In addition, IMI recognises that candidates using these credit- based units in the context of a Level 1 qualification may be in a learning environment and not in a workplace. In these situations, centres may set up or devise assessment situations as required, with prior written agreement of the external verifier.

Any simulation must be carried out using actual vehicles; the use of engine rigs or electrical boards is not permitted.

IMI re-iterates that its credit- based units have been designed to be capable of assessment in the normal workplace and that subject to the arrangements for simulation described above this should be the case.

Simulation will be monitored by the Awarding Organisations and where it is found to be the 'norm' rather than the exception suitable action will need to be taken.

Realistic Work Environment

The IMI requires that candidates are assessed within their normal workplace, or in exceptional circumstances as described previously via simulation. The use of approved simulation means therefore that RWE, Realistic Work Environment is not to be used.

Expert Witnesses

The use of **witness testimony** and **expert witness testimony** are appropriate methods for assessors to collect supplementary evidence on candidates' performance.

Witness testimonies can be obtained from people that are occupationally competent and who may be familiar with the national occupational standards, such as the candidate's line manager.

The assessor must judge the validity of the witness testimony and these may vary depending on the source. Witness testimonies can only support the assessment process and may remove or reduce the need to collect supplementary evidence, however, the awarding organisation's/body's quality assurance requirements must be met. Additionally the person or persons providing the witness testimony evidence must make themselves available to the external verifier for confirmation of evidence validity if required.

Remote Observation

The use of direct observation from a remote location is permitted as long as the centre seeks and receives the approval of their awarding organisation prior to its use and the awarding organisation discusses and agree this with the IMI prior to its use.

Assessor Requirements

The assessment of VCQs must be carried out by approved industry competent assessors.

Assessors will be responsible for, and accountable for, the validity, reliability and authenticity of evidence.

The primary responsibility of the assessor is to ensure that candidates satisfy the requirements of the national occupational standards. It is important that an assessor can recognise occupational competence as specified by the national occupational standards. Assessors therefore need to have a thorough understanding of assessment and quality assurance practices, as well as have in depth technical competence related to the qualifications for which they are assessing candidates.

It will be the responsibility of the approved centre to select and appoint assessors.

It will be the responsibility of the Awarding Organisation to approve centre selected assessors.

To be an approved assessor the person must:

- have sufficient and relevant technical/occupational competence in the Unit, at or above the level of the unit being assessed
- have in- depth knowledge of the qualification or credit- based unit evidence requirements.

hold or be working towards a relevant assessors award as specified by the Institute of the Motor Industry. This will include, but not be limited to the Assessor qualifications, Level 3 Award in Assessing Competence in the Work Environment, Level 3 Award in Assessing Vocationally Related Achievement, Level 3 Certificate in Assessing Vocational Achievement. (and by implication legacy Assessor units A1, A2 and D32/33 unit) but may be an appropriate equivalent as defined by the IMI, SSC).

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

Approval of assessors can be **removed.**

Assessors **cannot** assess the VCQ if they are not currently approved by, or have had their approval removed by, the Awarding Organisation.

Internal Verifier Requirements

VCQs must be underpinned by quality assurance appropriate to workplace based delivery. At a minimum this should reflect the principles outlined below.

Internal Verification of VCQ shall be the responsibility of approved industry competent internal verifiers.

The primary responsibility of the internal verifier is to assure the quality and consistency of assessments by the assessors for whom they are responsible. Internal verifiers therefore need to have a thorough understanding of quality assurance and assessment practices, as well as technical competence related to the qualifications that they are internally verifying.

Internal verifiers will be responsible for, and accountable for consistency, quality and reliability of evidence and assessors.

It will be the responsibility of the approved centre to select and appoint internal verifiers .

It will be the responsibility of the Awarding Organisation to approve centre selected internal verifiers.

To be an approved internal verifier the person must:

- have in-depth knowledge of the occupational standards and credit-based unit evidence requirements.
- be occupationally aware of the relevant industry sector being internally verified

- hold or be working towards a relevant verifier award as specified by the Institute of the Motor Industry. This will include, but not be limited to the Quality Assurance qualifications Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practice, Level 4 Certificate in Leading the Internal Quality Assurance of Assessment Processes and Practice, (and by implication legacy Internal Verifier unit V1 D34 unit) but may be an appropriate equivalent as defined by the SSC.
- verifiers working towards a relevant qualification must achieve their qualification within 12 months.
- provide evidence of CPD totalling not less than 30 hours from within their professional area within a 12 month period.
- be approved by the Awarding Organisation to carry out internal verification for relevant VCQ(s)
- demonstrate knowledge and understanding of the quality assurance processes required by the centre and the awarding organisation

Approval of internal verifiers can be **removed.**

Internal Verifiers **cannot** verify the VCQ if they are not approved by, or have had their approval removed by the Awarding Organisation.

Multi Discipline Assessors and Internal Verifiers

Assessors and Internal Verifiers who work across multi disciplines must agree to a programme of CPD that will, over an agreed period of time, show their competence across all areas that they assess.

The programme of CPD and the timescale must be agreed for each multi discipline assessor by their External Verifier and may be subject to scrutiny by the IMI.

It is the responsibility of the centre to keep a record of these agreements.

External Verifier Requirements

Awarding Organisations will be responsible for selection and appointment of external verifiers.

To be an approved external verifier or moderator the person must:

- hold or be working towards an appropriate qualification as specified by the Institute of the Motor Industry, confirming their competence to externally verify VCQ assessments This will include, but not be limited to the Level 4 Award in Externally Assuring the Quality of Assessment Processes and Practice, Level 4 Certificate in Leading the External Quality Assurance of Assessment Processes and Practice, (and by implication legacy External Verifier unit V2 and D35 units) but may be an appropriate equivalent as defined by the SSC
- external verifiers working towards a relevant qualification must achieve their qualification within 12 months
- have experience of working within the automotive industry gained through current or prior employment in order to have an up- to- date technical awareness relevant to the VCQ they are seeking to externally verify

have a sound and in-depth knowledge of the VCQ requirements

- demonstrate their commitment to maintaining their industry knowledge by providing evidence of CPD totalling not less than 30 hours from within their professional area within a 12 month period.

External Quality Control

It is expected that the awarding of qualifications will be underpinned by quality assurance appropriate to workplace based delivery. At a minimum this should reflect the principles outlined below.

External quality control of assessment is the responsibility of the Awarding Organisations, they must ensure that common approaches are employed and that consistent, high standards are achieved.

External verifiers will be required to implement rigorous risk management strategies consistently across all centres for which they are responsible.

IMI recommends that Awarding Organisations adopt a risk rating and risk management system for centres offering IMI VCQs.

IMI recommend that such systems identify:

- commercial risk – is there potential for commercial pressures to ensure that candidates achieve qualifications within unduly short time frames?
- assessment/verification risk – are factors apparent in the relationship between candidates, assessors and verifiers that might prejudice a fair and consistent assessment process?

Where risks or potential risks are identified, IMI expects that the Awarding Organisation, via the external verifier takes appropriate action to ensure that the credibility of the assessment process is not prejudiced

Awarding Organisations will be responsible for and accountable for the quality of VCQs delivered and assessed by their approved assessment centres.

Publications Code AP030054 February 2012