ABC Awards Level 1 Award in

Automotive Studies

QUALIFICATION GUIDE

[60175424]

About ABC Awards

ABC Awards is a leading national awarding organisation which has a long-established reputation for developing and awarding high quality vocational qualifications. We are committed to developing qualifications, which help learners and organisations, by cultivating the relevant skills for learning, skills for employment and skills for life

We work with hundreds of centres nationally and thousands of learners achieve an ABC Awards qualification each year.

Established in 1998, ABC Awards combines more than 180 years of examination and assessment expertise but at the same time integrates a responsive, flexible approach to the needs of our customers.

ABC has an on-line registration system to help customers register learners on ABC's qualifications, units and exams. In addition it provides features to view exam results, invoices, mark sheets and other information about learners already registered.

The system is accessed via a web browser by connecting to our secure website using a username and password.

https://secure.abcawards.co.uk/ors/secure_login.asp

Sources of Additional Information

The ABC website www.abcawards.co.uk provides access to a wide variety of information

Contents

This is a live document and as such will be updated when required. It is the responsibility of the approved centre to ensure the most up-to-date version of the Qualification Guidance is in use. Any amendments will be published on our website and centres are encouraged to check this site regularly.

Qualification Overview

Introduction

The ABC Level 1 Award in Automotive Studies has been approved by the Department for Education, in the technical award category, for performance points and can be used in the Progress 8 tables. The qualification has been developed to provide an introduction to the automotive sector and combines a mixture of knowledge and practical assessment to ensure that the learners have the necessary skills to meet the requirements of the industry.

The structure and nature of the qualification provides the ideal route for learners to progress from the ABC Entry Level Award, Certificate and Diploma in Motor Vehicle Studies (Entry 3) on to a higher level of study and skills acquisition, such as automotive apprenticeships, as well as employment.

The Award in Automotive Studies has also been developed to support Key Stage 4 learning in literacy, numeracy and science. There are opportunities for learners to apply their literacy, numeracy and science knowledge to workplace scenarios.

Aims

The ABC Level 1 Award in Automotive Studies aims to:

- develop work-related skills in the area of automotive studies
- develop generic employability skills
- prepare for further training within the automotive sector
- give an insight into the core activities within the automotive sector in order to allow learners to make informed career decisions.
- encourages learners to apply their literacy, numeracy and science knowledge.

Target Group

This qualification is for learners who are aged 14 or over and who are interested in a career in the automotive industry. The overall aim is to provide a basic level of knowledge and skills to start a career working within the sector or for progression into further education.

ABC expects approved centres to recruit with integrity on the basis of a learner's ability to contribute to and successfully complete all the requirements of a component(s) or the full qualification.

Progression Opportunities

The Level 1 Award in Automotive Studies will give learners a broad understanding of the automotive sector whilst developing the numeracy, literacy and science knowledge applicable to the industry. This can be further enhanced by progressing onto the Level 2 Technical Certificates in Motor Vehicle Studies which will develop their knowledge further.

Technical Certificates

ABC Level 2 Certificate in Motor Vehicle Studies

ABC Level 2 Diploma in Motor Vehicle Studies

Successful completion of the Level 1 Award in Automotive Studies provides a sound preparation for further vocational training, such as Apprenticeships at Level 2. These include:

- Vehicle Fitting
    - ABC Level 2 Diploma in Vehicle Fitting Principles

- Vehicle Maintenance and Repair
    - ABC Level 2 Diploma in Light Vehicle Maintenance and Repair Principles
    - ABC Level 2 Diploma in Motorcycle Maintenance and Repair Principles
    - ABC Level 2 Diploma in Auto Electrical and Mobile Electrical Principles

- Vehicle Body and Paint Operations
- Roadside Assistance and Recovery
- Vehicle Parts Operations
- Vehicle Sales

Centres should be aware that Reasonable Adjustments which may be permitted for assessment may in some instances limit a learner's progression into the sector. Centres must, therefore, inform learners of any limits their learning difficulty may impose on future progression.

Resource Requirements

In order to deliver this qualification, centres will need to have access to relevant materials, workshops, appropriate specialist tools, equipment and motor vehicles.

Tutor/Assessor Requirements

We require those involved in the assessment process to be suitably experienced and / or qualified. In general terms, this usually means that the assessor is knowledgeable of the subject / occupational area to a level above that which they are assessing.

Assessors should also be trained and qualified to assess or be working towards appropriate qualifications.

Assessment

Learners will be assessed in two ways:

Assessment Type	Grading	% Contribution
Portfolio of Evidence	P/M/D	60%
Multiple Choice Test	P/M/D	40%

The first method is via a Portfolio of Evidence that learners will work towards throughout the duration of their course that meets the necessary assessment criteria and this will contribute towards 60% of the overall grade. Each portfolio component will be internally assessed by tutors and externally moderated.

The second method is via an invigilated on-line Multiple Choice Test which will synoptically assess the knowledge that learners have developed during the course. This will contribute to 40% of the overall grade.

To achieve a pass in each portfolio graded component, learners will be required to provide suitable evidence for all assessment criteria. To achieve a merit, learners will be required to achieve all pass criteria and all of the merit criteria. To achieve a distinction in each graded component, learners will be required to achieve all pass, merit and distinction criteria.

The multiple choice test will synoptically assess all of the content within the qualification through set scenarios which draw across the breadth of knowledge learners have gained in each component. The pass mark for this external assessment will be 57%, but this will be subject to a periodic review. To achieve the qualification, learners must pass the external assessment. Learners will have one opportunity to re-sit the external assessment. The re-sit will be a different Multiple Choice Test to the original one.

The grade boundaries for the Multiple Choice Test are arithmetically set as follows:

Pass	57%
Merit	67%
Distinction	77%

These boundaries will be subject to a periodic review.

Awarding of the Grade

The awarding of the overall grade will be determined by the learner performance in each component. Each component is given a score and this is then weighted and the final grade is determined by the overall score. The weighting given to each component and the external assessment can be found in Appendix 1. To achieve the qualification, learners must achieve at least a Pass in each internally assessed component as well as the externally assessed Multiple Choice Test.

The scoring for each aspect of the qualification is as follows:

	Pass	Merit	Distinction
Component 1	1	N/A	N/A
Component 2	1	2	3
Component 3	1	2	3
Component 4	1	2	3
Multiple Choice Test	1	2	3

The grade boundaries for this qualification are as follows:

Score	Grade
1	Pass
1.62	Merit
2.250	Distinction

Examples are available in Appendix 1.

Language

These specifications and associated assessment materials are in English only.

Qualification Structure and Content

ABC Awards Level 1 Award in Automotive Studies

Qualifications	
ABC Awards Level 1 Award in Automotive Studies (601/7542/4)	
Assessment	Internal assessment, internal and external moderation. Multiple choice synoptic assessment.
Grading	Pass/Merit/Distinction Each component will be assessed via a Portfolio of Work and these will contribute towards the overall grade. A multiple choice synoptic assessment will account for 40% of the overall grade. Learners will need to pass the Multiple Choice Test and all portfolio components to achieve the qualification. Learners will have one opportunity to re-sit the Multiple Choice Test.
Operational Start Date	01/09/16
Review Date	31/08/19
ABC Sector	Motor Vehicle
Ofqual SSA Sector	4.3 Transportation Operations and Maintenance
Stakeholder Support	The Institute of the Motor Industry
Contact	See ABC website for the Centre Support Officer responsible for this qualification.

Level 1 Award in Automotive Studies (601/7542/4)

Rules of Combination: Learners must achieve all of the mandatory components and also pass the external assessment.

Component title	Component Number	Level	GLH	Page No.
Mandatory Components				
Working in an automotive industry environment	D/507/5226	1	30	9
Using engineering materials and skills	L/507/5237	1	30	13
Remove and re-fit mechanical components	Y/507/5239	1	30	18
Introduction to basic automotive electrical principles	L/507/5240	1	30	23

Qualification Purpose	As on RITS submission							
Entry Requirements								
Age Range	**Pre 16**	✓	**16 – 18**		**18+**		**19 +**	
Recommended GLH[1]	120							
Recommended TQT[2]	120							
Credit Value								
Learning Aims Ref.	601/7542/4							
Type of Funding Available	See Learning Aims Search website							
Qualification Fee	See ABC website for current fees and charges							
Additional Information	See ABC website for resources available for this qualification.							

[1] See Glossary of Terms
[2] See Glossary of Terms

Component Details

Component Title	**Working in an automotive industry environment (D/507/5226)**
Level	**1**
Guided Learning Hours	**30**
Component Summary	This component will give learners a basic understanding of the health and safety issues in the automotive industry. They will also have the opportunity to look at different career opportunities in the automotive sector and get an introduction to the environmental issues that are linked to the automotive industry. This component is assessed as Pass/Fail.
Learning Outcomes (1 to 3) ***The learner will***	**Assessment Criteria (1.1 to 3.4)** ***The learner can***
1. Be aware of health and safety issues in an automotive industry environment.	1.1 State own responsibilities in relation to health and safety legislation. 1.2 State employer responsibilities in relation to health and safety legislation. 1.3 Identify safety equipment suitable for use in automotive engineering. 1.4 Identify safety signs and equipment.
2. Know about career pathways in the automotive industry.	2.1 Identify various employment opportunities in the automotive industries.
3. Be aware of environmental impacts related to the automotive industry.	3.1 State key environmental impacts of vehicle emissions. 3.2 Identify potential environmental impacts of waste disposal by the automotive industry. 3.3 Identify environmental impact of vehicle end of life cycle. 3.4 Identify different types of waste produced by the automotive industry.

SUPPORTING INFORMATION

Working in an automotive industry environment (Level 1)

INDICATIVE CONTENT

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the component. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

1. Be aware of health and safety issues in an automotive industry environment.

1.1 Learners will need to be aware of Health and Safety statutory requirements and the penalties that can be enforced by legislation.

1.2 Learners will need to state the responsibilities of the employer and employee in relation to ensuring the health and safety of their workers such as providing PPE, maintain safe areas and systems, safe exits.

1.3 Equipment such as eyewear, gloves, overalls, hearing protection, suitable footwear

1.4 Signs to include fire exits, hazard, general danger, electricity warning, no smoking/no flames, eye protection, ear protection, safety boots, safety gloves, safety overalls.

2. Know about career pathways in the automotive industry.

2.1 Learners will need to be considering routes into the automotive industry and career paths such as:
Traineeships, Apprenticeships, full-time college courses with work experience, Graduate programmes

Mechanic, Technician, Body Repair, Vehicle Paint, Parts Department, Retail Sales, Design including motor sport.

3. Be aware of environmental impacts related to the automotive industry.

3.1 Engine emissions, noise of vehicles (standard v electric), alternative energy sources (hybrid, electric v petrol/diesel), current Euospec for diesel engines.

3.2 Such as oil contaminating water courses, disposal of batteries, tyres and plastics.

3.3 The ways in which whole or component parts of vehicles are recycled. The typical uses for recycled tyres, plastics, body panels and non-metallic body panels.

3.4 As above in 3.1-3.3

TEACHING STRATEGIES AND LEARNING ACTIVITIES

Centres should adopt a delivery approach which supports the development of their particular

learners. The aims and aspirations of all learners, including those with identified special needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

METHODS OF ASSESSMENT

This component will be internally assessed, internally and externally moderated via a learner's portfolio and other related evidence, against the learning outcomes and assessment criteria.

This component will also be assessed as part of the multiple choice synoptic test set by ABC Awards.

MINIMUM REQUIREMENTS WHEN ASSESSING THIS COMPONENT

ABC expects that staff will be appropriately qualified to assess learners against the outcomes and criteria within the components. Generally teaching staff should be qualified and/or vocationally experienced to at least a level above that which they are teaching.

To achieve a pass in this component, learners will be required to provide suitable evidence for all assessment criteria.

The Multiple Choice Test will assess all knowledge content across the qualification.

EVIDENCE OF ACHIEVEMENT

All evidence must be clearly signposted and made available for the external moderator upon request

All internal assessments must be accompanied by a signed Declaration of Authenticity (this document is available on the ABC website)

ADDITIONAL INFORMATION

All internal assessments must be accompanied by a signed Declaration of Authenticity (this document is available on the ABC Awards web site).

Learner Achievement Checklists are provided on the ABC web site for learners/centres to track learner achievement evidence against Learning Outcomes and Assessment Criteria.

Additional guidance for Delivering and Assessing ABC qualifications and information about Internal Quality Assurance are also available on ABC's web site.

Component Title	**Using engineering materials and skills (L/507/5237)**		
Level	**1**		
Guided Learning Hours	**30**		
Component Summary	This component will give the learner an introduction to different materials and their properties. They will learn how to safely use these materials and skills in order to create an accessory or tool.		
Learning Outcomes (1 to 4) ***The learner will***	**Assessment Criteria (1.1 to 4.3)** ***The learner can***	**Merit Criteria**	**Distinction Criteria**
1. Know specific health and safety regulations and practices when working with engineering materials.	1.1 State health and safety legislation applicable to manufacturing vehicle accessories or tools. 1.2 Identify suitable PPE for manufacturing automotive accessories or tools.		
2. Know about different materials used in automotive engineering.	2.1 Identify different types of engineering materials. 2.2 Identify different engineering tools. 2.3 State how to handle engineering materials safely.	2.1(M) Identify ferrous, non-ferrous and non-metallic materials. 2.2 (M) Identify mechanical fasteners used on the tools.	2.1 (D) Identify thermoset plastic and thermosetting plastics. 2.2 (D) Identify material properties and characteristics of the tools.
3. Manufacture an automotive accessory or hand tool suitable for use in the automotive industry from a given specification.	3.1 Use written instructions to create a tool/accessory.	3.1 (M) Interpret technical drawings to create tools.	3.1 (D) Produce a technical drawing to scale of the tool you will create.

	3.2 Select and use appropriate hand and power tools following instructions for: - Measuring and marking out - Metal cutting and forming - Drilling - Thread forming 3.3 Use tools safely to produce an automotive accessory or hand tool.	3.3 (M) Produce tool/accessory to an accuracy of 3.0mm.	3.3 (D) Produce tool to an accuracy of 1.0mm.
4. Know how to dispose of waste materials.	4.1 Know why safety equipment is needed when disposing engineering material waste. 4.2 Know why engineering material waste should be disposed of safely. 4.3 Know how to dispose of hazardous and non-hazardous waste engineering materials safely and appropriately.		

SUPPORTING INFORMATION

Engineering materials and skills (Level 1)

INDICATIVE CONTENT

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the component. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

1. Know specific health and safety regulations and practices when working with engineering materials

1.1 Learners will need to be aware of Health and Safety statutory requirements and the penalties that can be enforced by legislation which are applicable to manufacturing vehicle accessories or tools.

1.2 Equipment such as eyewear, gloves, overalls, hearing protection, suitable footwear.

2. Know about different materials used in automotive engineering.

2.1 Identify different types of engineering materials. – learners will need to identify different types of engineering materials by image and description such as carbon steel, mild steel, cast iron, copper, brass, aluminium, plastics.

2.1**(M)** Identify ferrous, non-ferrous and non-metallic materials through image and description.

2.1 **(D)** Identify thermoset plastic such as araldite, polyester and thermosetting plastics. Identify the properties and state typical motor vehicle applications where the following are used; Thermoset and Thermosetting Plastics to include; Polyamide (Nylon), Poly(methyl methacrylate (Acrylic) and Composite materials e.g. Glass Reinforced Plastic (GRP)

2.2 This should include air tools, bars & levers, axle stands & ramps, body repair, brake tools. These items to be removed and replaced with; Bench drill, hand drill (electric and air operated), drill bits, files, reamers, taps & dies, hacksaw & blades, punches, drifts, scribers measuring and marking out equipment. To include all items listed in 3.2.

2.2 (**M)** Such as rivets, pins, washers to include, spring, shake proof, flat and lock washers, Pop rivets, bolts, nuts, lock nuts, nylon nuts.

2.2 **(D)** Learners should be able to identify what the tools are made of, is it the right material and is it fit for purpose.

2.3 Learners should be able to state the intended purpose of the tools listed in 2.2 and the procedures or instructions for using the tool.

3. Manufacture an automotive accessory or hand tool suitable for use in the automotive industry from a given specification.

3.1 Learners will be required to follow set instructions to create a hand tool or accessory. This

could be anything that will be useful in an automotive environment.

3.2 Learners will need to select and use the correct tools for all of the following aspects:

- Measuring and marking out – metal rulers, scale rulers, try square, geometry tools, marking knife
- Metal cutting and forming – saws, reamer, jigsaw, shear
- Drilling – carbon steel drill bits such as brad-point, auger bit, twist bit, installer bit
- Thread forming – suitable use tools require with use of drill taps (taper, plug and bottom) and dies (round and hex die nuts).

3.3 Learners will need to use the tools in a way that ensures the safety of themselves and others whilst creating the tool.

3.3 **(M)** Overall dimensions of the finished tool must be within an accuracy of 3.0mm.

3.3 **(D)** Overall dimensions of the finished tool must be within an accuracy of 1.0mm.

4. Know how to dispose of waste materials.

4.1 Learners will need to understand that safety equipment is required for their own protection as well as others e.g. using gloves to remove waste metals to protect hands.

4.2 Legal requirement in Hazardous Waste. To protect environment from pollution (air, water), themselves, others from harm.

4.3 Learners will need to be able to identify hazardous and non-hazardous waste and appropriate recycling symbols for them.

TEACHING STRATEGIES AND LEARNING ACTIVITIES

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METHODS OF ASSESSMENT

This component will be internally assessed, internally and externally moderated via a learner's portfolio and other related evidence, against the learning outcomes and assessment criteria.

This component will also be assessed as part of the multiple choice synoptic test set by ABC Awards.

MINIMUM REQUIREMENTS WHEN ASSESSING THIS COMPONENT

ABC expects that staff will be appropriately qualified to assess learners against the outcomes and criteria within the components. Generally teaching staff should be qualified and/or vocationally experienced to at least a level above that which they are teaching.

To achieve a pass in this component, learners will be required to provide suitable evidence for

all assessment criteria. To achieve a merit, learners will be required to achieve all pass criteria and all of the merit criteria. To achieve a distinction in this component, learners will be required to achieve all pass, merit and distinction criteria.

The Multiple Choice Test will assess all knowledge content across the qualification.

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Component Title	**Remove and re-fit mechanical components (Y/507/5239)**		
Level	**1**		
Guided Learning Hours	**30**		
Component Summary	This component will introduce learners to the processes and procedures that are required to remove and re-fit mechanical components in a safe manner. They will also learn to report on the condition of the components.		
Learning Outcomes (1 to 5) ***The learner will***	**Assessment Criteria (1.1 to 5.3)** ***The learner can***	**Merit Criteria**	**Distinction Criteria**
1. Know specific health & safety regulations and practices when removing and re-fitting mechanical components.	1.1 State health and safety legislation applicable to the removal and re-fit of mechanical components. 1.2 Identify suitable PPE for removing and re-fitting mechanical components. 1.3 Identify suitable workshop tools and equipment required for removal and re-fit of mechanical components.		
2. Remove mechanical components.	2.1 Remove: - Engine components - Brake components - Steering components - Suspension components	2.1 (M) Follow manufacturers removal procedures.	

3. Report on condition of mechanical components.	3.1 Report on the condition and serviceability of: - Engine components - Brake components - Steering components - Suspension components	3.1 (M) Obtain technical specifications to determine serviceability.	3.1 (D) Make recommendations based on the condition and serviceability of the components.
4. Re-fit mechanical components.	4.1 Re-fit: - Engine components - Brake components - Steering components - Suspension components	4.1 (M) Follow manufacturers re-fit procedures.	4.1 (D) Check operation to industry standards.
5. Know how to dispose of waste materials.	5.1 Know why safety equipment is needed when disposing of waste associated with the removal and re-fit of components. 5.2 Know why waste material should be disposed of safely. 5.3 Know how to dispose of hazardous and non-hazardous mechanical component waste safely and appropriately.		

SUPPORTING INFORMATION

Remove and re-fit mechanical components (Level 1)

INDICATIVE CONTENT

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the component. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

1. Know specific health & safety regulations and practices when removing and re-fitting mechanical components.

1.1 State health and safety legislation applicable to the removal and re-fit of mechanical components.

1.2 Identify suitable PPE for removing and re-fitting mechanical components.

1.3 Identify suitable workshop tools and equipment for:
Engine – torque wrench, valve spring compression, piston ring compressor, feeler gauge, micrometer, dial test indicator, gear pullers, engine locking devices.
Brakes – Dial test indicator, micrometer, torque wrench, brake piston retraction tool, brake pipe clamp.
Steering – front wheel alignment gauge, ball joint splitter, locking wheel nut tool, torque wrench.
Suspension – spring compressors, torque wrench, locking wheel nut tool.

2. Remove mechanical components.

2.1 Learners are required to remove:

- Engine components
- Brake components
- Steering components
- Suspension components

2.1 **(M)** Remove the components following instructions that are in workshop manuals, Haynes manuals, manufacturer manuals, autodata etc.

3. Report on condition of mechanical components.

3.1 Learners should make reference to the technical and MOT standards along with the manufacturing service standards and the legal limits for all of the below:

- Engine components
- Brake components
- Steering components

- Suspension components

3.1 **(M)** Learners should be able to find the data for legal requirements, MOT and service standards from a suitable data source such as the internet, car manuals etc.

3.1 **(D)** Recommendations should be given as to whether the components should be replaced/repaired/left as they are based on the data referenced in 3.1.

4. Re-fit mechanical components.

4.1 Learners are required to re-fit:

- Engine components
- Brake components
- Steering components
- Suspension components

4.1 **(M)** Re-fit the components following instructions that are in workshop manuals, Haynes manuals, manufacturer manuals, autodata etc.

4.1 **(D)** Learners will need to check that the components are in full working order as described in workshop manuals, Haynes manuals, manufacturer manuals, autodata etc.

5. Know how to dispose of waste materials.

5.1 Learners will need to understand that safety equipment is required for their own protection as well as others e.g. using eye protection when removing components in case of split material damaging eyes.

5.2 Legal requirement in Hazardous Waste. To protect environment from pollution (air, water), themselves, others from harm.

5.3 Learners will need to be able to identify hazardous and non-hazardous waste and appropriate recycling symbols for them.

TEACHING STRATEGIES AND LEARNING ACTIVITIES

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified special needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

METHODS OF ASSESSMENT

This component will be internally assessed, internally and externally moderated via a learner's portfolio and other related evidence, against the learning outcomes and assessment criteria.

This component will also be assessed as part of the multiple choice synoptic test set by ABC Awards.

MINIMUM REQUIREMENTS WHEN ASSESSING THIS COMPONENT

ABC expects that staff will be appropriately qualified to assess learners against the outcomes and criteria within the components. Generally teaching staff should be qualified and/or vocationally experienced to at least a level above that which they are teaching.

To achieve a pass in this component, learners will be required to provide suitable evidence for all assessment criteria. To achieve a merit, learners will be required to achieve all pass criteria and all of the merit criteria. To achieve a distinction in this component, learners will be required to achieve all pass, merit and distinction criteria.

The Multiple Choice Test will assess all knowledge content across the qualification.

EVIDENCE OF ACHIEVEMENT

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Component Title	**Introduction to basic automotive electrical principles (L/507/5240)**		
Level	**1**		
Guided Learning Hours	**30**		
Component Summary	This component will introduce learners to the basic principles of automotive electrics. Learners will explore the different types of batteries and lighting systems. Learners will also develop practical skills on assembling and testing electrical circuits.		
Learning Outcomes (1 to 4) ***The learner will***	**Assessment Criteria (1.1 to 4.3)** ***The learner can***	**Merit Criteria**	**Distinction Criteria**
1. Know specific health & safety regulations and practices when working on automotive electrical systems.	1.1 Identify health and safety legislation 1.2 Identify safe practices when working on or around a range of automotive vehicles applicable to working on automotive electrical systems. 1.3 Identify suitable PPE for working on automotive electrical systems. 1.4 Identify suitable workshop tools and equipment for working on automotive electrical systems.	1.1 (M) Find manufacturers' procedures for fitting electrical components.	
2. Understand basic automotive electrical principles	2.1 Identify different types of automotive battery. 2.2 Understand basic electric circuits.	2.1 (M) Obtain technical specifications to determine serviceability. 2.2 (M) Be able to identify:	2.1 (D) Evaluate condition and serviceability of circuits and make recommendations.

	2.3 Identify different types of bulbs, lamps/lighting systems suitable for automotive vehicles.	- Series circuit - Parallel circuit - Open circuit - Short circuit - High resistance	
3. Assemble basic electric circuits.	3.1 Assemble a working series circuit. 3.2 Assemble a working parallel circuit. 3.3 Correct faults in the following electrical components: - Battery - Alternator - Lighting cluster	3.1 (M) Measure circuit voltages. 3.2 (M) Test continuity of circuits.	3.1 (D) Measure circuit current and calculate wattage. 3.2 (D) Fault trace and resolve any issues.
4. Know how to dispose of waste materials.	4.1 Know why safety equipment is needed when disposing electrical waste. 4.2 Know why electrical material waste should be disposed of safely. 4.3 Know how to dispose of hazardous and non-hazardous waste engineering materials safely and appropriately.		

SUPPORTING INFORMATION

Introduction to basic automotive electrical principles (Level 1)

INDICATIVE CONTENT

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the component. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

1. Know specific health & safety regulations and practices when working on automotive electrical systems.

1.1 Learners will need to be aware of Health and Safety statutory requirements and the penalties that can be enforced by legislation.

1.2 Automotive electrical systems to include petrol, diesel and hybrid/electric vehicles. Hybrid & electric vehicles to include knowledge of the need to recognise warning signs and not to enter areas where the vehicle is cordoned off and clearly signed 'Danger, Electric Vehicle'.

1.3 Equipment such as eyewear, overalls, suitable footwear, masks.

1.4 Tools and equipment to include multimeter, battery tester, diagnostic scan tools and code readers.

2. Understand basic automotive electrical principles

2.1 Battery types to include lead acid battery and AGM battery.

2.1 **(M)** Obtain technical specifications to determine serviceability.

2.1 **(D)** Evaluate condition and serviceability of circuits and make recommendations.

2.2 Learners will need to be able to understand series circuit, parallel circuit, open circuit, short circuit and high resistance.

2.2 **(M)** Identify series and parallel circuit through diagram and description. Identify open circuit, short circuit and high resistance via description.

2.3 To include sidelight, headlight, direction indicator, brake light by voltage and wattage and for different types of bulb such as halogen bulbs, LED, bayonet and festoon.

3. Assemble basic electric circuits.

3.1 Learners will be required to assemble as a minimum a small 3 resistor series and parallel circuits.

3.1 **(M)** Measure circuit voltage and **(D)** measure circuit current and calculate wattage

3.2 Assemble a working parallel circuit.

3.2 **(M)** Test the circuit continuity

3.2 **(D)** Trace the fault e.g. open circuit and resolve the issue.

3.3 Correct faults in the following electrical components:

- Battery – To include corroded terminals, discharge battery, insecure battery
- Alternator – drive belt incorrectly adjusted, alternator producing no charge, alternator overcharging.
- Lighting cluster – blown fuse, blown bulb, open circuit, short circuit, high resistance in lighting circuit.

4. Know how to dispose of waste materials.

4.1 Learners will need to understand that safety equipment is required for their own protection as well as others e.g. using gloves to remove waste electrical material to protect hands from hot material.

4.2 Legal requirement in Hazardous Waste. To protect environment from pollution (air, water), themselves, others from harm.

4.3 Learners will need to be able to identify hazardous and non-hazardous waste relating to electrical materials and appropriate recycling symbols for them.

TEACHING STRATEGIES AND LEARNING ACTIVITIES

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified special needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

METHODS OF ASSESSMENT

This component will be internally assessed, internally and externally moderated via a learner's portfolio and other related evidence, against the component outcomes and assessment criteria.

This component will also be assessed as part of the multiple choice synoptic test set by ABC Awards.

MINIMUM REQUIREMENTS WHEN ASSESSING THIS COMPONENT

ABC expects that staff will be appropriately qualified to assess learners against the outcomes and criteria within the component. Generally teaching staff should be qualified and/or vocationally experienced to at least a level above that which they are teaching.

To achieve a pass in this component, learners will be required to provide suitable evidence for all assessment criteria. To achieve a merit, learners will be required to achieve all pass criteria and all of the merit criteria. To achieve a distinction in this component, learners will be required to achieve all pass, merit and distinction criteria.

The Multiple Choice Test will assess all knowledge content across the qualification.

EVIDENCE OF ACHIEVEMENT

All evidence must be clearly signposted and made available for the external moderator upon request

All internal assessments must be accompanied by a signed Declaration of Authenticity (this document is available on the ABC website)

ADDITIONAL INFORMATION

All internal assessments must be accompanied by a signed Declaration of Authenticity (this document is available on the ABC Awards web site).

Learner Achievement Checklists are provided on the ABC web site for learners/centres to track learner achievement evidence against Learning Outcomes and Assessment Criteria.

Additional guidance for Delivering and Assessing ABC qualifications and information about Internal Quality Assurance are also available on ABC's web site.

Exemptions

There are no identified exemptions for these qualifications.

Equivalencies

There are no identified equivalencies for these qualifications.

Certification

Learners will be certificated for the qualification when it has been achieved and claimed.

ABC's policies and procedures are available on the ABC website.

Appendices

Appendix 1

Assessment weighting per components:

Grade: Pass

Component	Grade	Grade Pts	Weighting	Component Score
Component 1	Pass	1	0.06	0.06
Component 2	Pass	1	0.18	0.18
Component 3	Pass	1	0.18	0.18
Component 4	Pass	1	0.18	0.18
External Assessment	Pass	1	0.4	0.4
		Total	**1**	**1**
			Grade	**Pass**

Grade: Merit

Component	Grade	Grade Pts	Weighting	Component Score
Component 1	Pass	1	0.06	0.06
Component 2	Pass	1	0.18	0.18
Component 3	Merit	2	0.18	0.36
Component 4	Merit	2	0.18	0.36
External Assessment	Merit	2	0.4	0.8
		Total	**1**	**1.76**
			Grade	**Merit**

Grade: Distinction

Component	Grade	Grade Pts	Weighting	Component Score
Component 1	Pass	1	0.06	0.06
Component 2	Distinction	3	0.18	0.54
Component 3	Pass	1	0.18	0.18
Component 4	Merit	2	0.18	0.36
External Assessment	Distinction	3	0.4	1.2
		Total	**1**	**2.34**
			Grade	**Distinction**

Glossary of Terms

GLH (Guided Learning Hours)
GLH is where the learner participates in education or training under the immediate guidance or supervision of a tutor (or other appropriate provider of education or training). It may be helpful to think – 'Would I need to plan for a member of staff to be present to give guidance or supervision?'
GLH is calculated at qualification level and not unit/component level.

Examples of Guided Learning include:

- Face-to-face meeting with a tutor
- Telephone conversation with a tutor
- Instant messaging with a tutor
- Taking part in a live webinar
- Classroom-based instruction
- Supervised work
- Taking part in a supervised or invigilated assessment
- The learner is being observed.

TQT (Total Qualification Time)
'The number of notional hours which represents an estimate of the total amount of time that could reasonably be expected to be required, in order for a learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of a qualification.' The size of a qualification is determined by the TQT.

TQT is made up of the Guided Learning Hours (GLH) plus all other time taken in preparation, study or any other form of participation in education or training but not under the direct supervision of a lecturer, supervisor or tutor.

TQT is calculated at qualification level and not unit/component level.

Examples of unsupervised activities that could contribute to TQT include:

- Researching a topic and writing a report
- Watching an instructional online video at home/e-learning
- Watching a recorded webinar
- Compiling a portfolio in preparation for assessment
- Completing an unsupervised practical activity or work
- Rehearsing a presentation away from the classroom
- Practising skills unsupervised
- Requesting guidance via email – will not guarantee an immediate response.